

# Information Systems 2

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## 1. What are Information Systems?

## 2. Course Outline

## 3. Organizational stuff

## 4. About ISMLL

## 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.

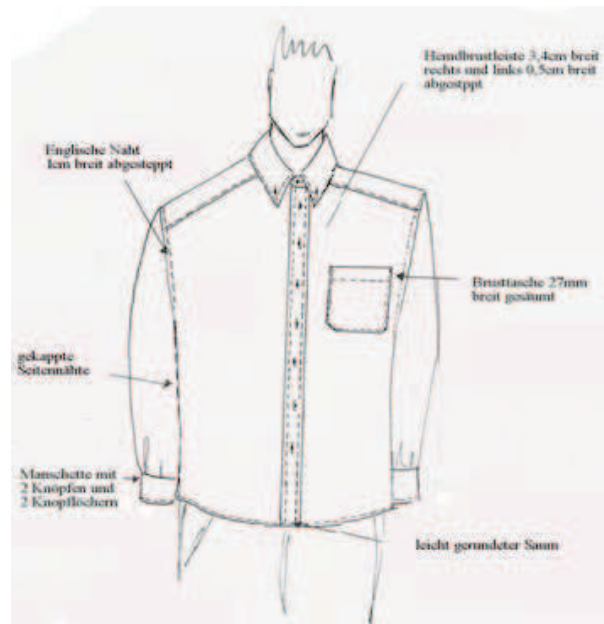


J.C. Penney

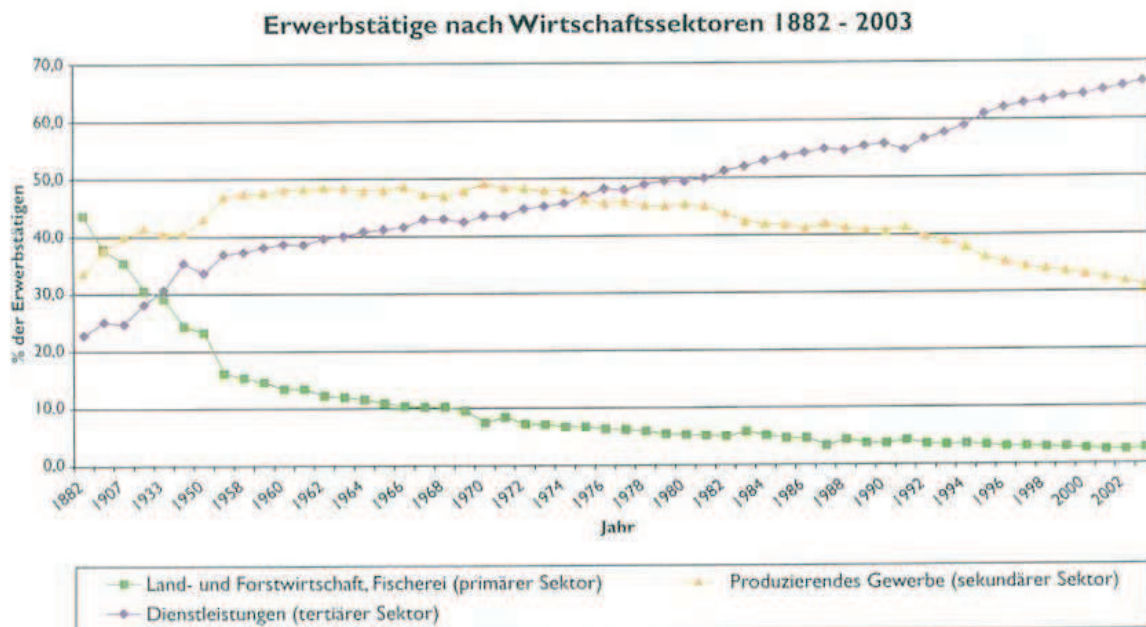
The new method for replenishing has side effects, e.g., for development and testing of new shirts:

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

[LLS06]

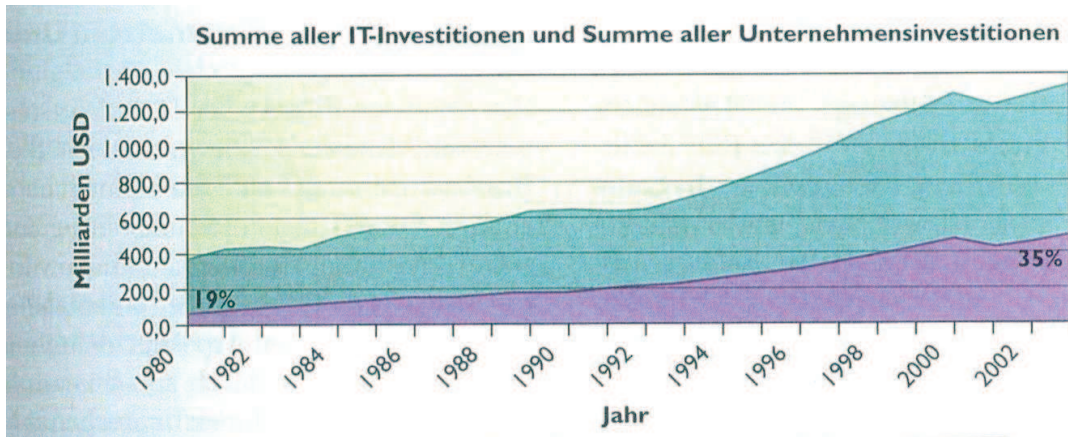


Information Technology in Business (1/2)



[LLS06]

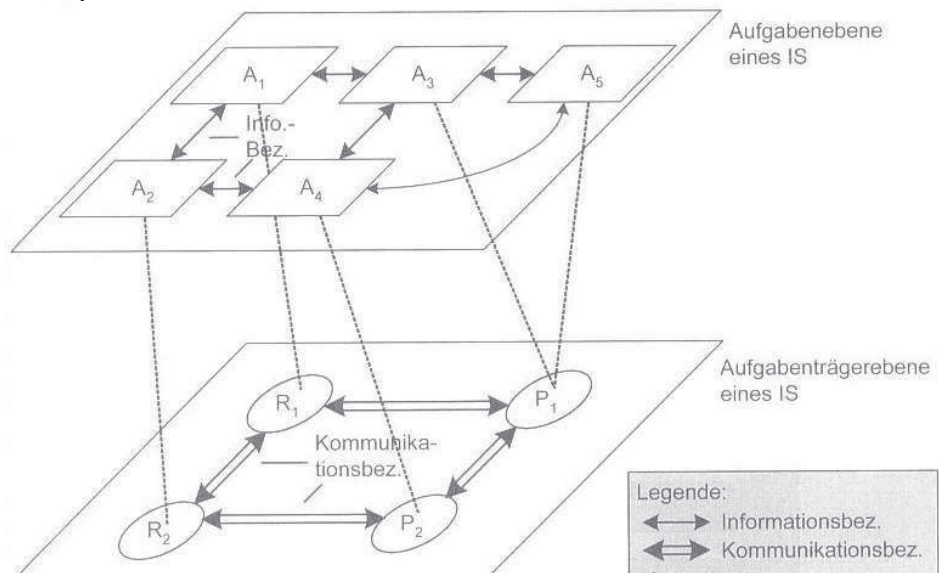
## Information Technology in Business (2/2)



[LLS06]

## Information Systems

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



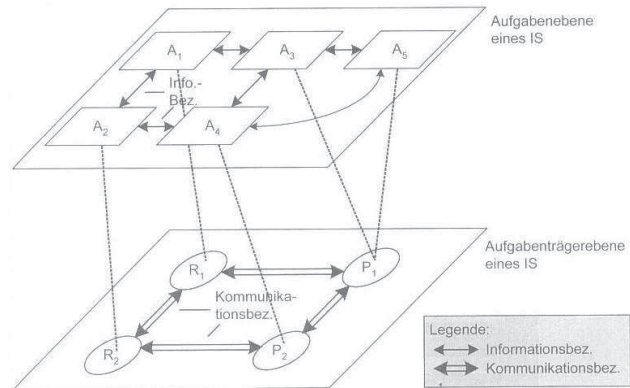
## Information Systems

“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

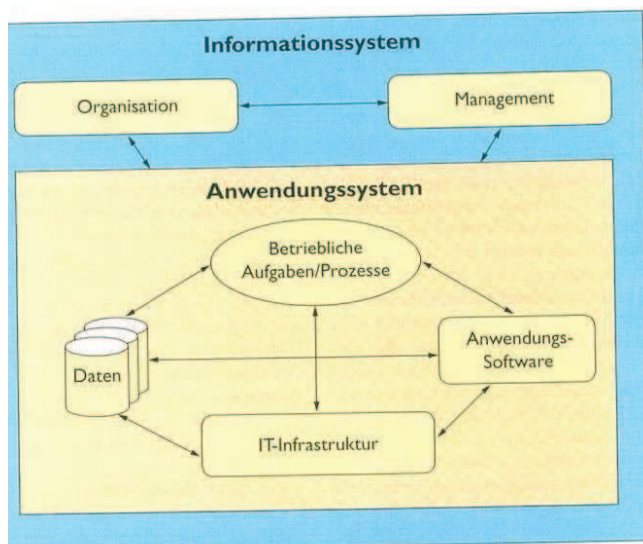
An **Application System** is a set of interoperating

- software programs,
- IT infrastructure and
- data

that supports a specific business domain.

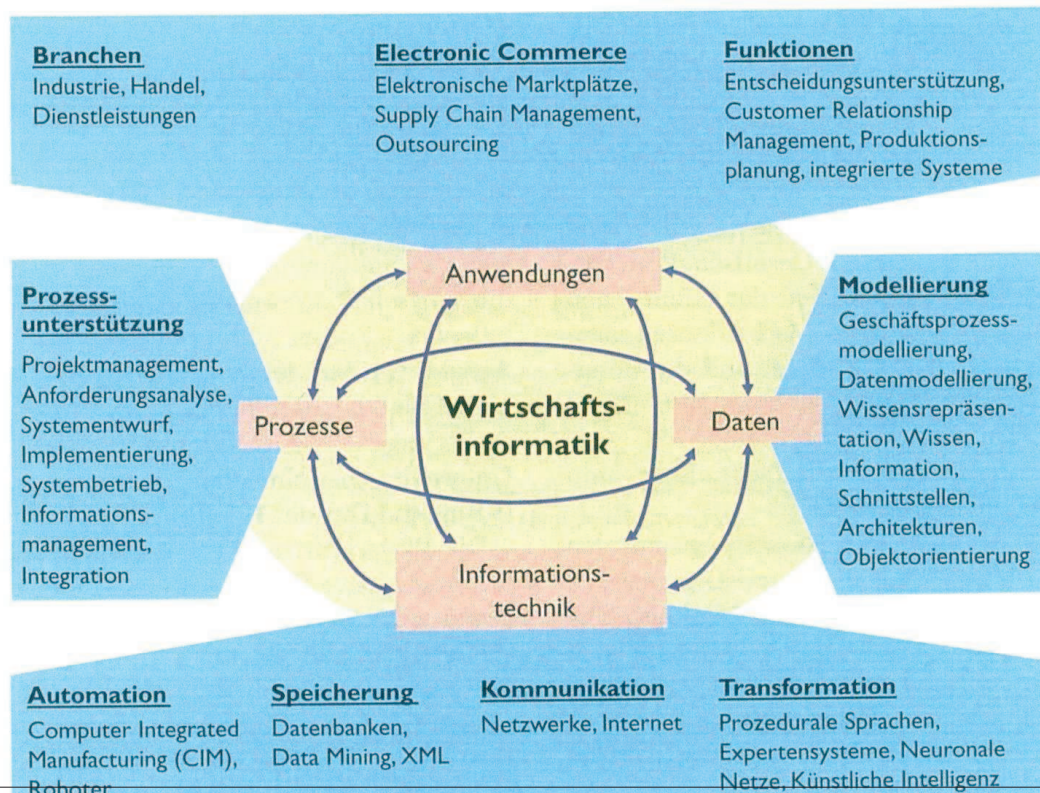
An **Information System** is an application system plus its business context, i.e., the organisation, people, etc. that use the system.

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



[LLS06]

## Aspects of Business Information Systems [LLS06]



Lars Schmidt-Thieme, Information Systems and Machine Learning Lab (ISMLL), Institute BW/WI & Institute for Computer Science, University of Hildesheim  
Course on Information Systems 2, summer term 2011

8/25

## 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 [f103]

- 1. Basics:**  
subdisciplines; relation to business management; law; behavioral sciences; computer industry.  
processes and functions; integration; electronic market places.
- 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
- 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.

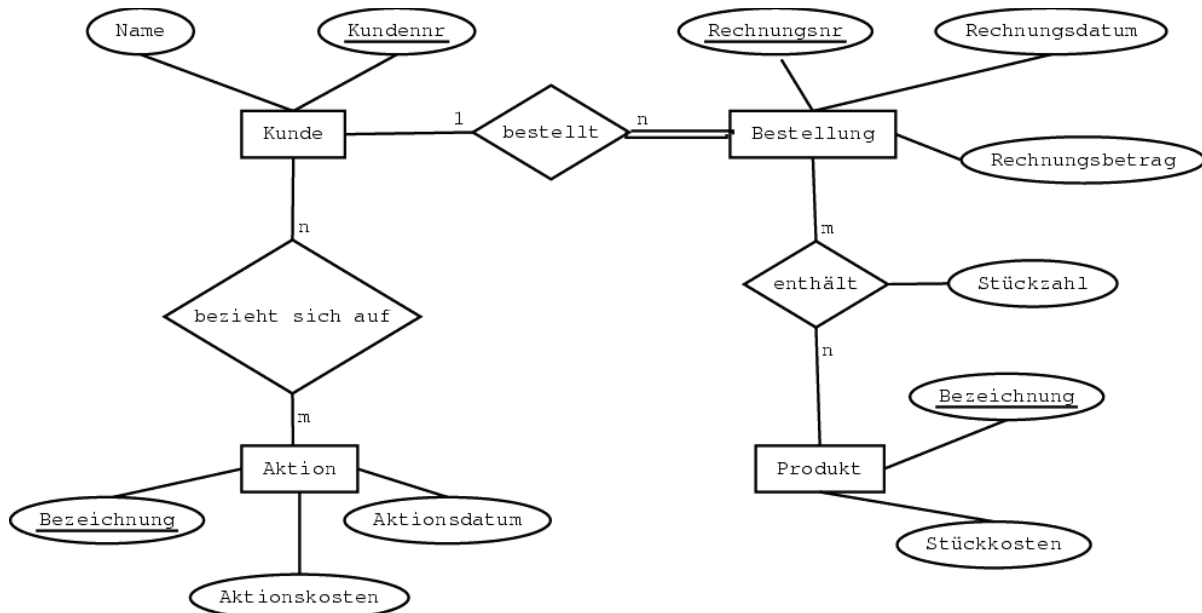
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## Modelling Information Systems / Databases



## Modelling Information Systems / Extended Markup Language XML

BUSINESS CONCEPTS

UML DIAGRAM

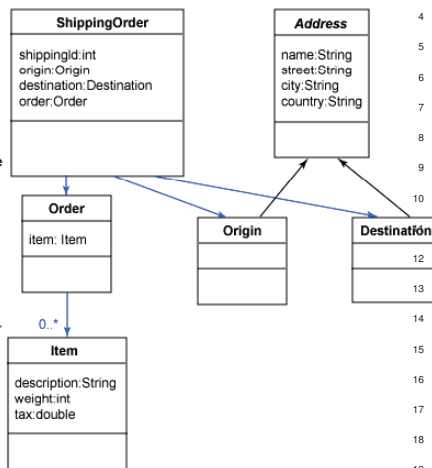
**A Shipping Order has:**  
 ShippingId  
 Origin  
 Destination  
 Order

**Origin and Destination are**  
 both of type Address

**An Address has:**  
 Name  
 Street  
 City  
 Country

**An Order consists of one or**  
 more Items

**Each Item has**  
 Description  
 Weight  
 Tax

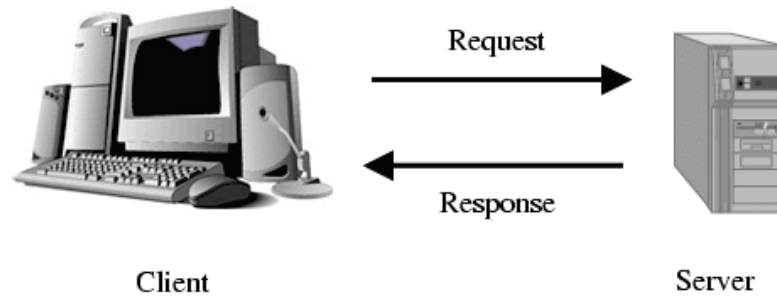


```

1 <?xml version="1.0" encoding="UTF-8"?>
2 <shippingOrder xmlns:xsi="http://www.w3.org/2001/XMLSchema"
3   xsi:noNamespaceSchemaLocation="C:\schemas\Shipping"
4   <shippingId>09887</shippingId>
5   <origin>
6     <name>Ayesha Malik</name>
7     <street>100 Wall Street</street>
8     <city>New York</city>
9     <country>USA</country>
10  </origin>
11  <destination>
12    <name>Mai Madar</name>
13    <street>Liivalaia 33</street>
14    <city>Tallinn</city>
15    <country>Estonia</country>
16  </destination>
17  <order>
18    <item>
19      <description>Ten Strawberry Jam bottles</description>
20      <weight>3.141</weight>
21      <tax>7.60</tax>
22    </item>
23  </order>
24 </shippingOrder>
    
```



## Distributed Information Systems / Remote Invocation



## Distributed Information Systems / Web Services

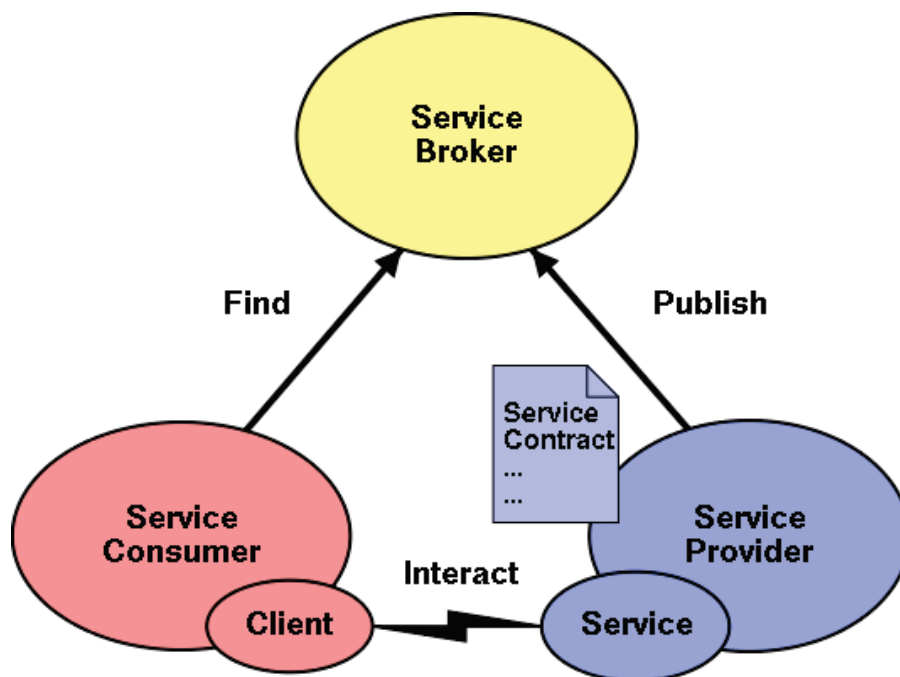


Figure 11: Service oriented architecture [Haa03].

- IT strategy
- IT organisation
- IT controlling

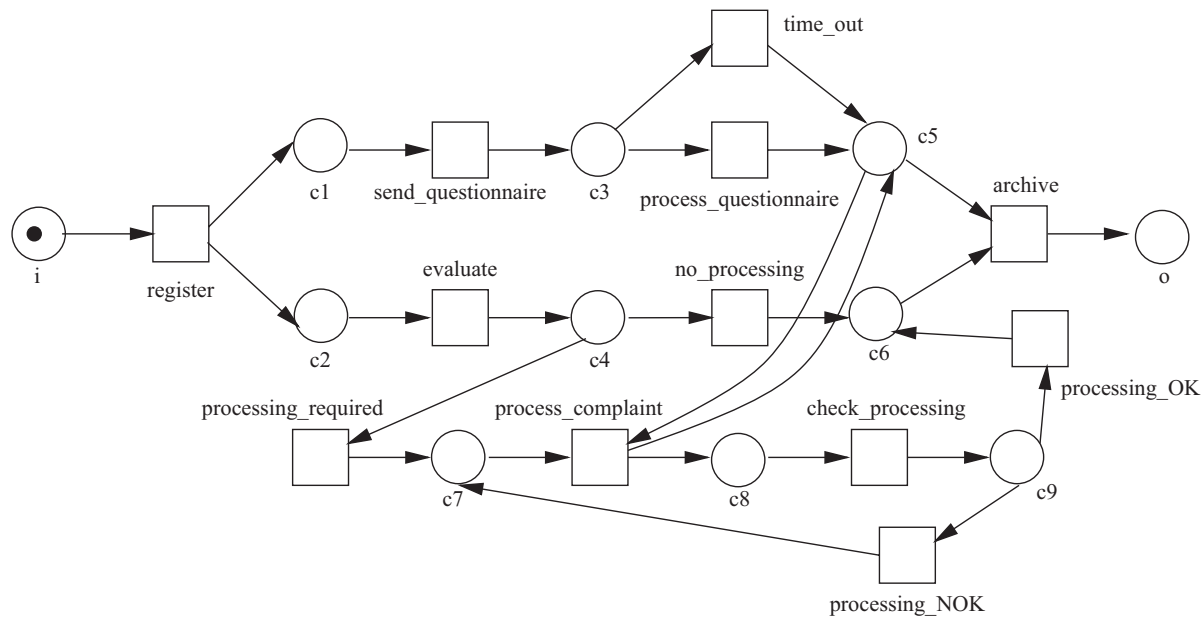


Figure 12: A workflow modeled as Petri net [vdA98].

## Business Process Modelling / Process Modelling Languages

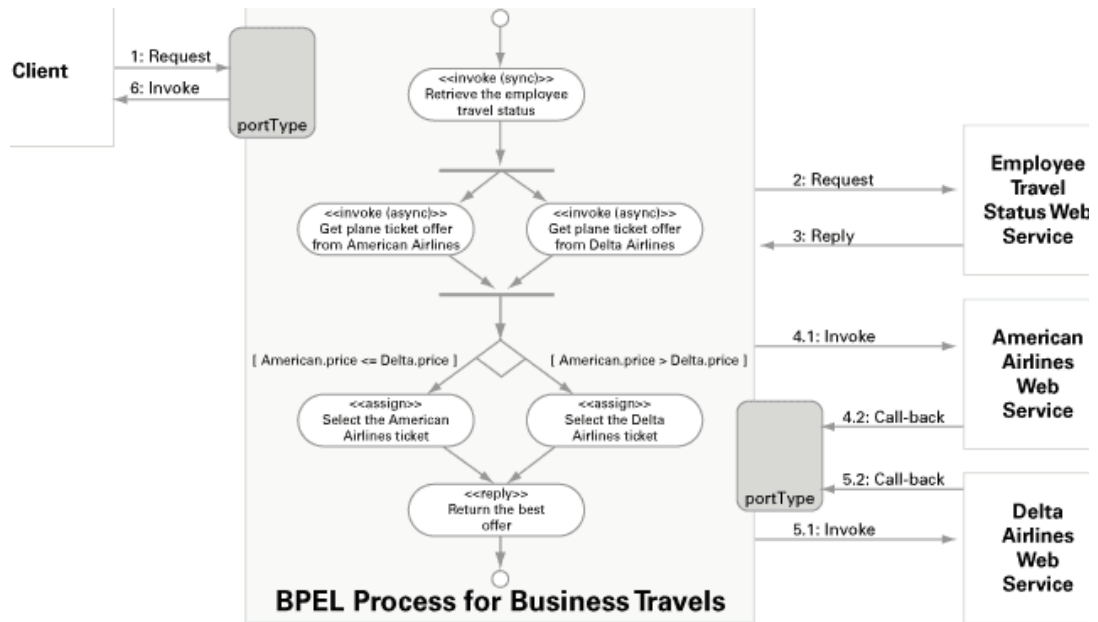
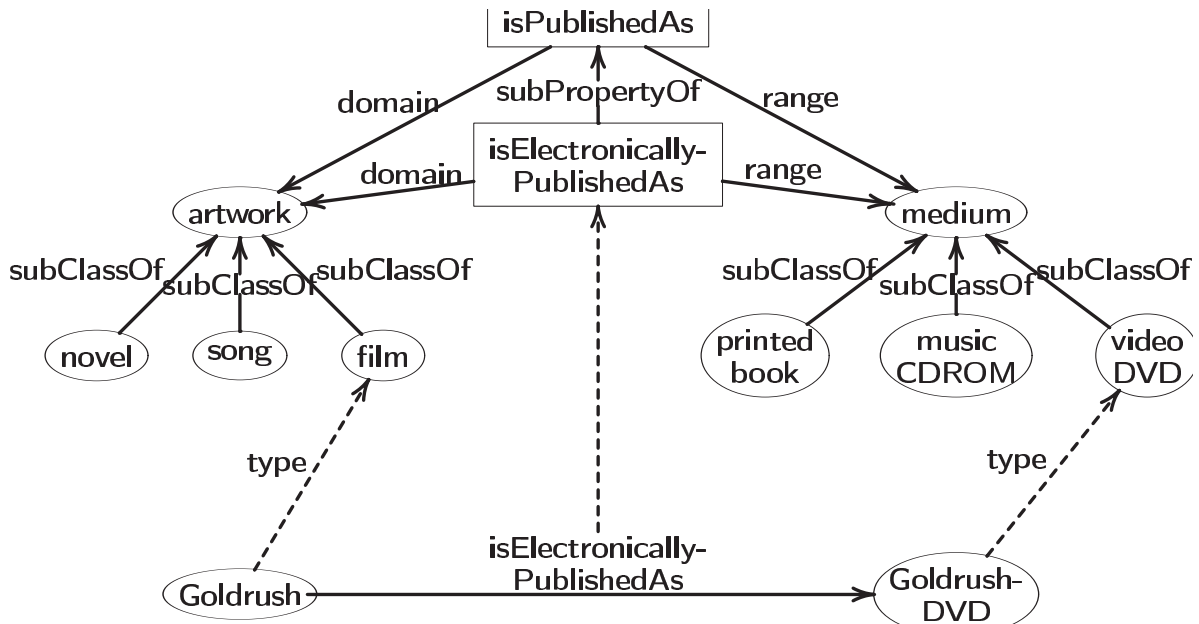


Figure 13: An example business process [Jurar].

## Knowledge Management & Semantic Web Technologies



## Business Intelligence & Data Mining

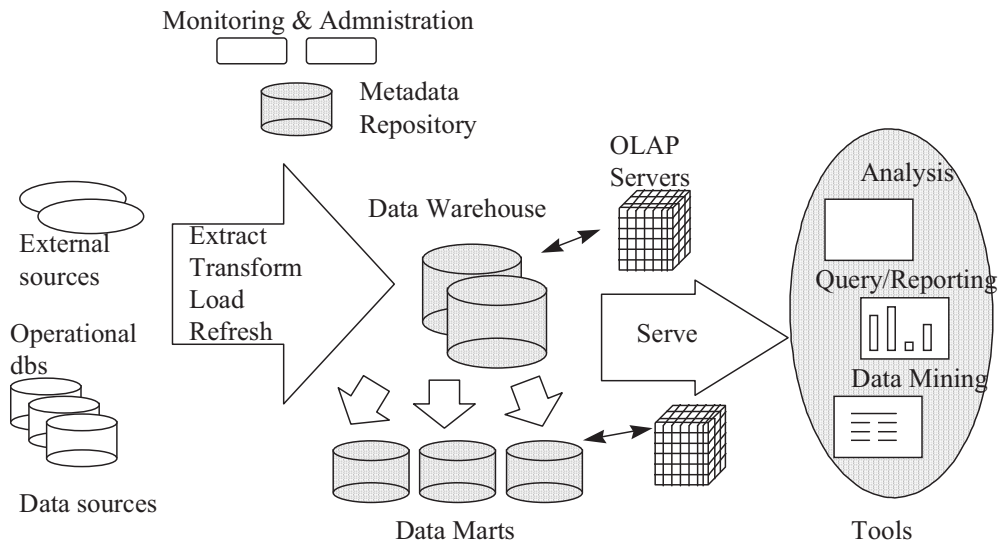


Figure 15: Data Warehouse-Architektur [CD97].

## E-Commerce & E-Business

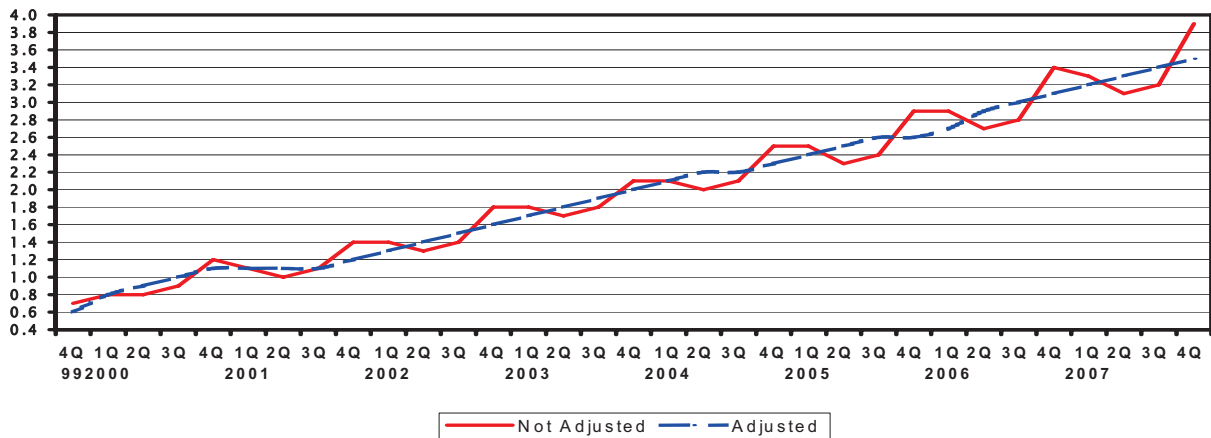


Figure 16: Quarterly Retail E-Commerce Sales (in percent of total retail sales) [SKK08].

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### Exercises and tutorials

- There will be a weekly sheet with two exercises handed out **each Tuesday** in the lecture.  
1st sheet will be handed out Tue. 12.4.
- Solutions to the exercises can be submitted until **next Tuesday before the lecture**,  
1st sheet is due Tue. 26.4.  
(So for the 1st sheet you have 2 weeks due to the Easter break.)
- Exercises will be corrected.
- Tutorials **each Wednesday 16–18**,  
1st tutorial at Wed. 13.4.
- 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 (3h, 5 problems).
- The exam covers both courses,
  - IS1 with 3 ECTS by 1 (more detailed) problem and
  - IS2 with 6 ECTS by 4 problems.
- Both courses together give 9 ECTS (2 SWS IS1, 2+2 SWS IS2).
- 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 (<sup>2</sup>2009):  
*Wirtschaftsinformatik — Eine Einführung*, Pearson Studium.
- Otto K. Ferstl, Elmar J. Sinz (<sup>6</sup>2008):  
*Grundlagen der Wirtschaftsinformatik*, Oldenbourg.
- Franz Lehner, Stephan Wildner, Michael Scholz (<sup>2</sup>2008):  
*Wirtschaftsinformatik — Eine Einführung*, Hanser.

Slides will be available online at the course webpage:

<http://www.ismll.uni-hildesheim.de/lehre/is2-11s/>

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### Persons

Lars Schmidt-Thieme  
Alexandros Nanopoulos  
Tomas Horvath  
— professors & postdocs

Osman Akcatepe  
Andre Busche  
Krizstian Buza  
Lucas Drumond  
Christoph Freudenthaler  
Zeno Gantner  
Rasoul Karimi  
Artus Krohn-Grimberghe  
Thai Nghe Nguyen  
— research assistants

Kerstin Hinze-Melching  
— secretary  
Jörg Striewski  
— technician

Florian Spichal  
— student research assistants



## Research Areas

