# Business Intelligence

- a track within the computer and systems sciences master of science program

Information to master thesis students 2010-11-17

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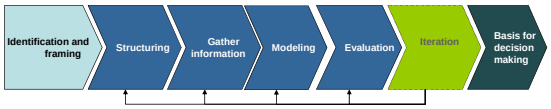
- What is business intelligence?
- Courses within the track
- Topics for master theses

## Business intelligence

Business intelligence is an area that deals with methods and techniques for collecting, organizing and analyzing data to support decision making.




Decision management processes

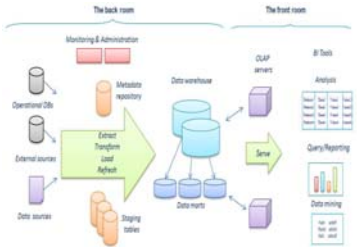
## Business intelligence track

| | Fall | | Spring | |
|---|---|---|---|---|
| | Period 1 | Period 2 | Period 3 | Period 4 |
| Year 1 | *Prep. course 1* | *Data ware-housing (recommended)* | *Risk and decision analysis* | *Risk and decision analysis, 2nd course** |
| | *Prep. course 2* | *Scientific writing and research methodology* | *Philosophy of science* | *Web mining** |
| | **Fall** | | **Spring** | |
| | Period 1 | Period 2 | Period 3 | Period 4 |
| Year 2 | *Data mining* | *Statistical programming*** | *Master's thesis* | |
| | *Elective course* | *Internet search techniques and business intelligence*** | | |

**One of these may be replaced by Strategic Management of IT*
*** One of these may be replaced by Data Warehousing, if not taken year 1*

## Data warehousing

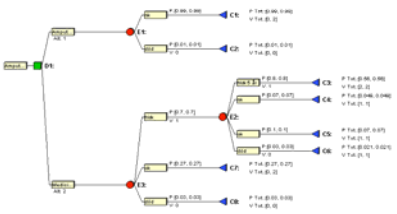
Data warehouse = decision support database that is maintained separately from the organization's operational databases




## Risk and decision analysis

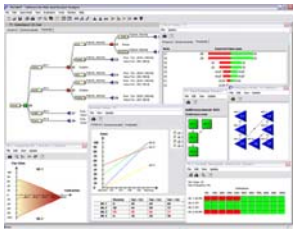
In this course, the student learns how to

- describe and handle different risk and decision theoretic concepts and models
- model and evaluate simple decision problems
- handle problems with multiple criteria
- elicit and handle model parameters



## Risk and decision analysis 2nd course

In this course, the student learns how to use software for modeling and analysis of decisions under risk and with conflicting objectives.



The *Decide*IT decision tool

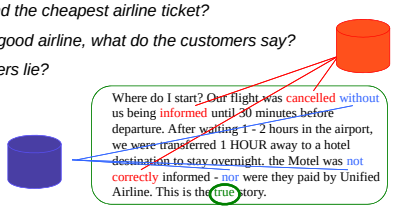
## Web mining

The Internet contains potentially valuable, interconnected information, which is utilized by different users. This course will give insights, methods and techniques to harvest the Internet for both web sources, connections and user behaviors.

*Where can I find the cheapest airline ticket?*

*Is the airline a good airline, what do the customers say?*

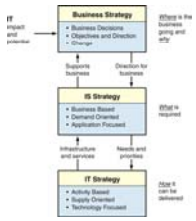
*Do the customers lie?*




## Strategic management of IT

During this course, the student will learn to analyze the strategic use of IT in organizations, the impact of IT on business operations and business strategy, evaluate IT investments and measure the organization performance and the way its supports the business strategy using balanced scorecard.

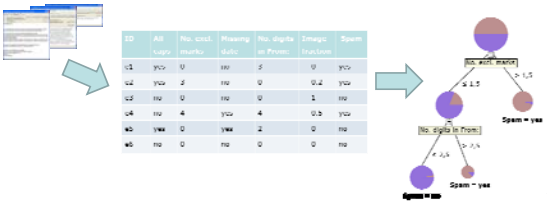

Source: (Pearlson and Saunders, 2009)




Source: (Ward and Peppard, 2002)

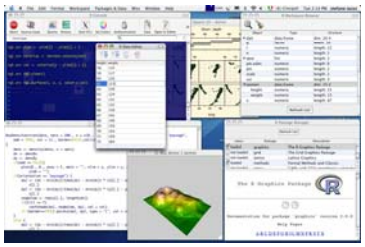
## Data mining

During this course, the student will learn how to use tools and techniques to generate predictive and descriptive models from data. The student will also get a good picture of the inner workings of the methods.



## Statistical programming

During this course, the student will learn how to implement techniques and tools for data analysis and decision support using a specific language (R) for this purpose.



## Internet search techniques and business intelligence

The course introduces techniques for information retrieval and news monitoring on the Internet. The student will learn about

- fundamentals of document processing and text summarization
- search engine principles and algorithms and website optimization methods
- business intelligence applications and extraction of information from news using automatic text summarization


## Master's theses within business intelligence

- Development projects
  - in which the student implements novel algorithms or methods, or variants thereof, and evaluates the implementations, comparing the results to state-of-the-art methods
- Application projects
  - in which the student applies existing tools or techniques in novel ways or in novel situations
- Theoretical investigations
  - in which the student analyzes existing or novel methods, which are proven to have certain properties

## Topics within predictive analytics

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- Development projects
  - how to handle uncertainty in input and output?
  - how to combine multiple models?
  - how to interact with the analysis method?
- Application projects
  - how to represent objects to be classified?
  - how to handle very large datasets?
  - how to cascade multiple models?

## Topics within decision analysis

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- Decision process development
- Handling of imprecise information
- Elicitation of decision data
- Decision evaluation and its computational aspects
- eDemocracy and public decision making
- Applications of risk and decision analytic methods in business and society