

# Data Management and Database Technologies Theme

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## Why this theme is part of the iCSC?

- Database systems form the primary means for storing data and representing information
- Everybody has data
- Applications are disposable – data stays forever
- There will be always the need to manage your data in an efficient and standardized way
- Understanding of the capabilities of database systems is crucial for the professional development of any software system

## Objectives of the Theme

- To chart the lifecycle of database development and usage
- To give a brief overview of the capabilities of database management systems
- To present how to exploit these capabilities to their maximum
- To point out some common pitfalls and best practices
- To present the theoretical background behind the discussed subjects and to give *practical examples*
- To make you realize what are the benefits if you *take full advantage of the power* offered by the RDBMS

## The Team

- Miguel Anjo



- Michal Kwiatek



- Petr Olmer



- Zornitsa Zaharieva



## A Short Guide to 'Data Management and Database Technologies'

1. Fundamentals of Database Design - *Zornitsa Zaharieva*
2. SQL – basics and recent advances - *Miguel Anjo*
3. Advanced Database Features - *Miguel Anjo, Zornitsa Zaharieva*
4. Performance Optimization and Tuning - *Michal Kwiatek*
5. Data Mining – Extracting Knowledge from Data – *Petr Olmer*

# A Short Guide to 'Data Management and Database Technologies'

## 1. Fundamentals of Database Design - *Zornitsa Zaharieva*

- : give a practical overview of the process of designing a database
- : how to end up with a database model starting from the raw data
- : conceptual design of a database
- : logical design (relational model)
- : look at some recommendations when designing a database schema
- : all the topics discussed in the lecture are not specific to a particular vendor implementation of a RDBMS

## 2. SQL – basics and recent advances - *Miguel Anjo*

- : overview of the language used to interact with a relational database
- : investigating different possibilities of database queries
- : advanced SELECT forms
- : mainly based on SQL92 standard and a small part on Oracle features

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3. **Advanced Database Features - Miguel Anjo, Zornitsa Zaharieva**
  - : what a RDBMS offers to improve the performance of very big databases
  - : features for protecting the data when working in a multi-user environment
  - : how to put more logic into the database layer and what are the advantages of doing that
  - : the lecture is heavily based on the Oracle implementation of all these features
  
4. **Database Performance Optimization and Tuning - Michal Kwiatek**
  - : from the point of view of a database application developer
  - : organized around best practices and recommendations
  - : a detailed presentation of tuning tools and techniques (analyzing sql execution plans)
  - : both beginners and people who are well advanced in database applications may benefit from this lecture

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### 5. Data Mining – Extracting Knowledge from Data - Petr Olmer

- : how to discover the hidden knowledge stored in databases
- : an introduction to data mining and text mining
- : techniques for discovering structural patterns in data
- : basic mining algorithms



# Our 'Data Management and Database Technologies' Theme

Your Hitchhiker's Guide to  
Data Management and Database Technologies



Thank you for your attention!