MTAT.03.105
Introduction to Databases

Lecture #9
Tools for Graphical Models

Ljubov Jaanuska
(ljubov.jaanuska@ut.ee)
Lecture 9.  Tools for designing graphical models

1. SAP Power Designer
2. ER/Studio Data Architect
3. MySQL Workbench
4. DB Designer
5. MS Visio
6. MS PowerPoint
Tools for DB design

- Simple tools
  - MS PowerPoint,
  - Open Office Draw
  - Dia
- MS Visio
- MYSQL Workbench (DB Designer)
- ER/Studio Data Architect
- SAP PowerDesigner
Conceptual Data Modeling: Conceptual data models based on Information Engineering (IE), Barker or IDEF 1/x notation provide a database and technology independent business representation of data concepts and core relationships. Conceptual data models iteratively generate into one or more logical and physical data models based on desired levels of abstraction and approaches to information architecture from a common business view.
Logical Data Model

Logical Data Modeling: Logical data models based on Information engineering (IE), Barker or IDEF 1/x notation provide database independent relational structures for use by developers and designers for optimization and understanding. Logical data models can be developed independently or generated from conceptual data models. Logical data models can generate to one or more physical data models.
Physical Data Model

Physical Data Modeling: Physical data models based on Information Engineering (IE) or IDEF 1/x notation document, generate and reverse-engineer structures for over 60 RDBMS (including the latest Oracle®, IBM®, Microsoft, Sybase, NCR Teradata®, MySQL® and many more). Support includes all database artifacts and new techniques such as Java, XML and Web Services in the database, security modeling, advanced techniques for views and more.
Data Mapping Editor

Data Warehouse Modeling: Multidimensional Diagrams document the OLAP environment by representing cubes, facts, dimensions, dimensional hierarchies and queries independent of the physical table structures used to store the warehouse or data mart information. Together with the data mapping editor or more sophisticated data movement modeling the complete business intelligence architecture from source definition, transformation, warehouse, mart and reporting environment can be completely documented. This provides for clear impact analysis and design time change management of any aspect of the BI environment.
Data model in SAP PowerDesigner
New model
A new model is being created with the following settings:

- **Model type:** Various model types are shown, including Business Process Model, Conceptual Data Model, Enterprise Architecture Model, Free Model, Information Liquidity Model, Logical Data Model, Object-Oriented Model, Physical Data Model, Requirements Model, and XML Model.

- **General tab:**
  - **Model name:** Male
  - **DBMS:** Sybase AS Enterprise 11.0 (Deprecated)
  - **First diagram:** Physical Diagram

- **Extended Model Definitions tab:**
  - Option to share or copy the DBMS definition is selected.
Generate database from diagram

Database → Generate Database
SAP Sybase PowerDesigner

Sybase PowerDesigner (YouTube)
Demo version for 15 days
16.1 (32-BIT) 04 FEB 2012 336.7 MB  DOWNLOAD

http://sybase-powerdesigner.software.informer.com/download/
Model Validation Wizard

Validation Options | Object Selection | Output

Model | Data Dictionary

Select model validation options:

- Physical Model Validations
  - Table
  - Column
  - Index
  - Foreign Key

Quick Launch

- Load
- Save
- Use file-based Quick Launch settings.

Load settings and options for Quick

- None

- Settings Only
- Settings and Objects

Run Validation

Close
ER/Studio Data Architect
https://downloads.embarcadero.com/free/er_studio_data_architect
MYSQL WORKBENCH
MYSQL Workbench
http://www.mysql.com/downloads/workbench/
DB DESIGNER
DB Designer

http://fabforce.net/dbdesigner4/downloads.php
MS VISIO
The image shows a database diagram created using Microsoft Visio. The diagram represents entity relationship modeling with tables and attributes. The tables include:

- **Isik**
  - PK: ID
  - Other fields: Name, Surname, Address

- **Raamat**
  - PK: ID
  - Other fields: Author, Title, Publisher

- **Laenutus**
  - PK1, PK2
  - Other fields: Key, Mida, Laenutati, Lasi, Tagastanud

The diagram illustrates relationships between these tables.
Simple Tools

MS PowerPoint,
Open Office Draw
Dia
Task

Make changes in the model so that a book may have several authors.
Project

Goal: demonstrate acquired knowledge and skills in DB design and SQL
Objectives: DB for any field of your interest
Scope: 3 entity types per person
Team: 1-2 persons
Deadline: 21st of May 2017 by 23:55 (1 submission per team via Moodle)

Output:
- project_description.pdf
- project.db
- project.log

* PDF file content
1. Title
2. Authors of the work
3. Description of the field:
   - Description of the field (specific terms and concepts)
   - Which problems occur in the field (generally)?
   - Which of these problems can be solved using the DB?
   - Who are the users of the DB?
4. Graphical model:
   - add a graphical model (readable print screen or image) designed in PowerDesigner/Workbench or any other program
   - add the name of the program where the model was designed
   - add a description of the entity types and attributes, explain your choices
5. Check if the entity types are in the third normal form or not. That means: put down the functional dependencies for each entity type and explain (in words or graphically) the normal forms.
6. Create a physical DB. Add the name of the DBMS.
7. Add (copy-paste) SQL statements on table creations.
8. Add at least 5 records into each table.
9. Put down 5 questions that can be solved using at least two tables of the DB. Add answers to each question.

NB! Demonstrate acquired knowledge and skills!

Evaluation criteria:
- Description of the field and terms: 1 p.
- Graphical model: 2 p.
- SQL statements (create table) and physical DB: 2 p.
- 3NF check: 2 p.

Total: 10 p.