

Free and Open Source Software for Database Design

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Abstract:

Since the evolvement of software engineering as a new discipline in computer science, the role of database design within the database software life-cycle has gained in importance. This has contributed towards increase in availability of CASE tools which aid in database design.

There are dozens of CASE tools for developing any software including databases, and tools for UML design, but rather still few of them supporting entity-relationship (ER) database design. We will make an overview of available free and open source ER diagramming tools, and the features they should support. Portability, uniformity, conformance in front of database development standards, completeness, forward and reverse engineering, documentation of requirements, modeling notations supported, and the ease of use are some of the features to consider when introducing these tools. Semi-structured (XML) data and ontologies, and their impact in current and future trends in CASE tools for database modeling and design conclude our discussion.

Keywords: Databases, Design, ER diagrams, Development, Open source software.

Short bio:

Lule Ahmedi received her PhD in computer science from Freiburg University, Germany in 2004 where she also did teaching and research as assistant in Databases and Information Systems Department for longer than five years. Since 2004 she is a lecturer at University of Prishtina, Kosova, and at South East European University, Macedonia.

FREE ENTITY-RELATIONSHIP DESIGN TOOLS

Among the prevailing tools today which aid database engineering are those with support for UML, ER diagrams, or both design paradigms. Since UML tools are widely available for more than just database design, we will here focus on tools which are typical for relational database design, i.e., support ER diagrams.

Some of the free and open source tools that support generating ER diagrams and their transformation into SQL scripts are MySQL Workbench Community Edition (CE) and its predecessor DBDesigner 4, Power Architect, Open System Architect, Mogwai ERDesigner NG, StarUML, SchemaSpy, Ferret, and WWW SQL Designer.

For brevity, we will enumerate some main features every database design tool should provide in its minimum.

- **Portability.** The tool should be available to run in different platforms, on Linux, Windows, and Mac OS.
- **Uniformity.** The tool :
 - Is designated to work within a single development environment, and as such is uniform when changing from one phase of the database life-cycle to the another, or
 - Is flexible and has multi-language support.
- **Conformance to the standard.** The tool enables a database designer to generate only diagrams which conform to the standard ER model.
- **Completeness.** There is evidence of support for all ER constructs including those advances one, such as generalization hierarchy, aggregation, and exclusion restriction.
- **Forward and reverse engineering.** Support for forward and reverse engineering from and to SQL scripts is provided. As for the forward engineering, the tool should provide interaction with the user for selecting among alternatives when the translation from ER into SQL code is in place.
- **Documentation of requirements.** A module should exist to assist in documenting requirements.
- **Notation.** Supports for several standard notation models, like Chen's notation, Crow's Foot, IDEF1X, instead of applying some own adapted notation formats is desirable.
- **Easy of use.** The tool should enable a designer to easily and efficiently deliver a database product through some handy interfaces for creating and modifying ER diagrams.

Support for schemas in XML and ontologies although growing in popularity are yet rarely an issue of support in most of the actual ER database design tools.

REFERENCES

MySQL Workbench at <http://www.mysql.com/products/workbench/>.

DBDesigner 4 at <http://www.fabforce.net/dbdesigner4/>.

Power Architect at <http://www.sqlpower.ca/page/architect>.

Open System Architect at <http://www.codebydesign.com/>.

Mogwai ERDesigner NG at http://mogwai.sourceforge.net/?Welcome:ERDesigner_NG.

StarUML at <http://staruml.sourceforge.net/en/>.

SchemaSpy at <http://schemaspy.sourceforge.net/>.

Ferret at <http://www.gnuferret.org/>.

WWW SQL Designer at <http://code.google.com/p/wwwsqldesigner/>.