Project Description: General

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Aim

Aim of the projects is the construction of a centralized relational database system. This document describes the general requirements shared by all applications.

Applications

The final section list some applications. Other suggestions will be considered if submitted at the start of the course. However, to allow comparison each application domain must be chosen by one other team also for its choice to be approved. Teams have to get approval for their selected application before they get started.

General design

The applications consist of three modules: a database, a storage/query manager and a graphical user interface (see Figure 1). This application may be further used for additional developments. This database can be used to store informations about the books in the librarylenders, the books currently and their preferences, the books, magazine etc. that the shop sells, and the customer-orders to the shop (e.g. telephone orders of customer for books, etc.), to be sent to their address for example by regular mail.

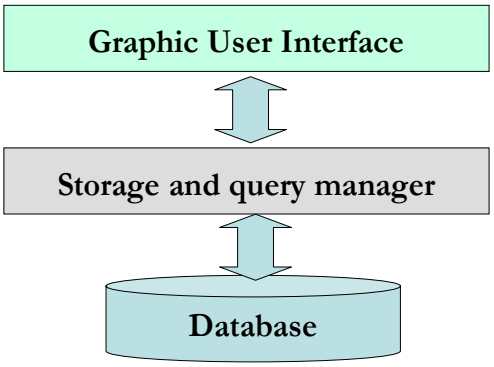

Figure 1. Overview of the Database Application

Modules

1. **Database**
   The database contains tables describing the entities and their relationships. At a minimum, your database should contain tables for at least 5 entities. Each entity should have at least one relationship with another entity. Tables should contain at least 3 attributes for each entity.

2. **Data manager**
   The data manager handles the storage and retrieval of information, authorisations and error checking. The minimum functionalities for manipulating the database contents include retrieving, adding, updating and deleting entities and relationships using different selection criteria. For example:
   Add entity A
   Update entity B
   Delete relationship R between A en B
   List all entities x such that P(x)
   ……
   Some of these functions will only be allowed by managers.

3. **Graphic User Interface (GUI)**
   The GUI interface allows users (clerks and the manager) to access the database and perform the various operations for which they have permission. The GUI should make common tasks as easy as possible and provide the user with adequate feedback on the outcomes. Whenever possible the GUI should help prevent errors, and where errors could not be avoided, present the user with clear error messages.

Project Requirements

The project should deliver the following:
1. The user requirements: what will the system be used for, by whom, in what context?
2. An E-R model of the conceptual structure of your database;
3. The relational schema's used to represent the entities and relationships in the E-R model;
4. A test database implementing these schema's to be used for development nd demonstration;
5. A reasonable set of basic functionalities, including all of those listed above, but not limited to these;
6. A GUI for at least two different types of users of this database (clerks and manager);
7. Short user and reference manual(s)
8. A demonstration of the system
9. A report describing the system, the choices made and the arguments for making these choices, ideas for future extensions.

Project Development Steps

The following steps can bedistinguished and should be used as the basis for planning the project and dividing tasks among project team members:

1. Design: decide on user requirements and use scenario, develop the E-R model, derive normalized relation schema's, create the tables and fill them with some test data. Try to define and use views.

2. Implementation of a datamanager that provides the basic functions listed plus any additional functions decided upon in the design phase. This module should also perform basic error checking.

3. Implementation of a (simple) graphical user interface/sample client on top of the data manager to allow users to enter and manipulate data in the database.

4. Testing, documentation and demonstration, including preparation of presentation and report.

Tools

The basic tools to use for this project are the MySQL database, the JDBC Java API and the Java Swing or SWT user interface packages for the GUI. The only alternative to Java that may be permitted is PHP. You have to get permission from your teaching assistant for this option.

MySQL – Each project team will be given an account on the mysql5 server. See www.mysql.com and in particular the developer zone (dev.mysql.com).

JDBC – JDBC is an API that provides cross-DBMS connectivity to a wide range of SQL databases and access to other tabular data sources, such as spreadsheets or flat files.
(See http://java.sun.com/products/jdbc/index.jsp for documentation and tutorials).

MySQL provides connectivity for client applications developed in the Java programming language via a JDBC driver, which is called MySQL Connector/J.
For information about this driver, see dev.mysql.com/usingmysql/java/

Projects

You can choose one of the following application domains:

Library
A basic information system for a small library, containing information about its books and its members. Members should at the very least be able to search for a book by title or author, see whether a book is present and if not, when it should be returned. Clerks should be able to check out and check in books, and make reservations for members. Additional functions could be: list the books currently lent out to member X, list books overdue, check that a member does not take more than his permitted number of books, show books about X etc.

Car dealer
A basic information system for a car dealer, containing information about the various models and the many different accessories available for these models. Each model has its own accessories, although some accessories can be used on multiple models. Accessories can be bought individually, but also as part of a package. Each model has its own options (color, engine type, number of doors etc.). The system should enable the dealer to help customers find the car they need and to calculate the cost of a car as specified. Additional information to store about the models could be milage, cost of maintenance, depreciation, insurance etc.

Used car parts marketplace
A basic information system for a marketplace for customers looking for used car parts, and junk yards offering such parts. Customers should be able to specify a search pattern, based on e.g. model, year, type of part.Dealers should be able to enter their stock in similar terms. If a part is found, customers should perhaps be able to order it or make an offer; if no parts are found, customers could leave a request, with an indication of the price they are willing to pay.

Friends network
Sites like myspace.com and hyves.nl are very popular. A multinational wants to start something similar to enable more informal contacts between its employees. This network should not only improve their sense of being part of a shared community, but also make it easier to find in-house expertise.

Hotel
A basic information system for hotels. It contains information about the rooms, their occupancy and prices, and about the guests staying at the hotel. Its basic function is to allow rooms to be booked and bills to be prepared. Additional functions could be to record requests for wake-up calls, room service etc.

Other
Other options include: sport center, language academy, all kinds of shops (furniture, appliances), various web-based applications (forum, blog etc.) or a dating site such as lexa.nl. On a dating site members can enter information about themselves, search for dates or ask the system to suggest dates by matching their profile with that of the other members.