Design And Implementation

Of

Projects Suggestions Database

A Project Report Submitted to the College of Science, Baghdad University in Partial Fulfillment of the Requirements for the BSc Degree of Science in Computer Science

BY

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Chapter One
Database In General
1. Database Definition

A database is an organized collection of data, today typically in digital form. The data are typically organized to model relevant aspects of reality (for example, the availability of rooms in hotels), in a way that supports processes requiring this information. The term database is correctly applied to the data and their supporting data structures, and not to the database management system (DBMS). The database data collection with DBMS is called a database system.

2. Database Concepts

The database concept has evolved since the 1960s to ease increasing difficulties in designing, building, and maintaining complex information systems (typically with many concurrent end-users, and with a large amount of diverse data). It has evolved together with database management systems which enable the effective handling of databases. Though the terms database and DBMS define different entities, they are inseparable: a database's properties are determined by its supporting DBMS and vice-versa. The Oxford English dictionary cites a 1962 technical report as the first to use the term "data-base." With the progress in technology in the areas of processors, computer memory, computer storage and computer networks, the sizes, capabilities, and performance of databases and their respective DBMSs have grown in orders of magnitudes. For decades it has been unlikely that a complex information system can be built effectively without a proper database supported by a DBMS. The utilization of databases is now spread to such a wide degree that virtually every technology and product relies on databases and DBMSs for its development and commercialization, or even may have such embedded in it. Also, organizations and companies, from small to large, heavily depend on databases for their operations.

3. Database Security
The definition of data security varies and may overlap with other database security aspects. Broadly it deals with protecting specific chunks of data, both physically or the interpretation of them, or parts of them to meaningful information.

4. Database Design

Database design is done before building it to meet needs of end-users within a given application/information-system that the database is intended to support. The database design defines the needed data and data structures that such a database comprises. A design is typically carried out according to the common three architectural levels of a database. First, the conceptual level is designed, which defines the over-all picture/view of the database, and reflects all the real-world elements (entities) the database intends to model, as well as the relationships among them. On top of it the external level, various views of the database, are designed according to (possibly completely different) needs of specific end-user types. More external views can be added later. External views requirements may modify the design of the conceptual level (i.e., add/remove entities and relationships), but usually a well designed conceptual level for an application well supports most of the needed external views. The conceptual view also determines the internal level (which primarily deals with data layout in storage) to a great extent. External views requirement may add supporting storage structures, like materialized views and indexes, for enhanced performance. Typically the internal layer is optimized for top performance, in an average way that takes into account performance requirements (possibly conflicting) of different external views according to their relative importance.
While the conceptual and external levels design can usually be done independently of any DBMS (DBMS-independent design software packages exist, possibly with interfaces to some specific popular DBMSs), the internal level design highly relies on the capabilities and internal data structure of the specific DBMS utilized.
Introduction

Projects Suggestions Database is an online simulation for projects reservation procedure, so students can explorer the suggested projects online.
This website provide full details for each project, and any changes applied on any project will be instantly updated, so student by a very simple look will get a full idea about each project and this will make decision easier to him.

The design of the web pages done by using ASP.net language, which is a part of Microsoft Visual Studio Package.

This website cannot stand alone, it is useless without records of information to deal with, and this is was achieved by using Microsoft Access to build tables contain all required information.

The main goal in the project is to provide flexibility in exploring suggested projects and displaying full details for each specific project to make reservation decision easier.

To be able to use the website you should register an account online, Users can be either students or professors, and also there exists a web administrator to manage the website and data administrator to manage the database.

A facility of Mail Box added to the website to make communication easier between website users, specially between students and professors.
Chapter Two

Projects Suggestions Database
1. Tables

Created Using Microsoft Access 2007, Because it provides full database options in simple way either in designing or dealing with the database.

9 tables used, each table contain related group of information, The unique one assigned as a Primary Key to protect from duplicate of data.

These tables grouped in one single file, this file represent a database server, so all database operations done on it.

These Table Are:

A. Login_Data
This table contains information of all registered accounts. It is used for identifying and authenticating information of any person who is trying to log in to the website.

As shown in the figure, the table consists of 5 columns:
1. Username: Contains Usernames of registered accounts.
2. Password: Contains Passwords of registered accounts.
3. Pr: Contains Priorities for each account, if an account’s priority equals 0, it means it is an administrator account; else if it equals 1, it means it is a professor account; and if it equals 2 then it means it is a student account.
4. IDSN: Contains ID Serial Number for each user as a unique information to distinguish between accounts that have the same username.
5. State: Describes the account status, either online or offline.

B. Professor:
Contain information about all professors in a specific department or college.
As shown in the figure, it consists of 3 columns:
1. Prof_Name: Contains the names of all professors in the specific college or department.
2. Prof_SD: Contains the scientific degree for each professor.
3. IDSN: Contains the ID serial number for each professor as a unique identifier to distinguish between professors who have the same name.

C. Student:

Contain information about all students.
As shown in the figure, it consists of 5 columns:
1. **Stu_Name**: It contains **Names** of all students in the specific college or department.
2. **Stu_Stage**: Contains **Stage** of each student.
3. **Stu_Class**: Contains **Class** for each student.
4. **Grp**: Contains the **Group** of the student. This group created after reserving a project to make dealing easier when more than one student share a single project.
5. **IDSN**: Contains **ID Serial Number** for each student as a unique information to distinguish between students who have the same name.

D. **Msgs**:

![Message Table]

Contains information about all messages transferred between users.

As shown in the figure it consist of 4 columns:
1. **Src**: Contains names of messages **senders**.
2. **Dest**: Contains names of messages **receivers**.
3. **Msg**: Contains the transferred **message**.
4. **Status**: Describe the **message status**, either read or unread.
E. Requests:

<table>
<thead>
<tr>
<th>Request_Dest</th>
<th>Project_Name</th>
<th>Request_Src1</th>
<th>Request_Src2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ayman Fawzi</td>
<td>DAC</td>
<td>Mohammad Zuhair</td>
<td>Yasir Saadi</td>
</tr>
<tr>
<td>Adnan</td>
<td>PSD</td>
<td>Mahir</td>
<td>Samir</td>
</tr>
<tr>
<td>Nadir</td>
<td>USB</td>
<td>Ayman</td>
<td>Ali</td>
</tr>
</tbody>
</table>

Contain information about all requests sent to reserve a specific project.
As shown in the figure, it consist of 4 columns:
1. Request_Dest: Contain names of **requests receivers**.
2. Project_Name: Contain Names of **requested projects**.
3. Request_Src1: Contain Names of **requests senders**.
4. Request_Src2: Contain Names of **requests senders**.

F. Project:

Contain information about all suggested projects.
As shown in the figure, It consist of 8 columns:
1. Proj_Name: Contain the **Names** of the suggested projects.
2. Prof_N: Contain a **foreign key** for the professor number in the professor table, and this number represent the project supervisor.
3. Grp_N: Contain a **foreign key** for the group number, and it represent the number of the group that reserve the project.
4. Proj_Lang: Contain the **language** of each specific language.
5. Proj_R: Describe **Project Status** either **Free**, **Reserved** or **Pending**.
6. Proj_RD: Contain the **date of reservation** for each specific.
7. Proj_NOS: Contain **number of students** in each project.
8. Proj_No: Contain the project number.

G. **Groups**:  

This table created to solve a problem of sharing single project by group of students, so when 2 students reserve one single project, the numbers of the students will be saved together in this table as a group and this group will get a new number used for both of the students, so we can access the group by using the number of one of the students and access any student using the group number.
As shown in the figure, it consists of 3 columns:

1. Grp_No: Contains **numbers of groups**, each group consists of two students sharing one project.
2. Stu1_No: Contains **number of a member** in the group.
3. Stu2_No: Contains **number of a member** in the group.

H. Archive:

<table>
<thead>
<tr>
<th>No</th>
<th>Project_Nar</th>
<th>Professor_Name</th>
<th>Final_Rate</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PSD</td>
<td>Ammar Hassan</td>
<td>91</td>
<td>2012</td>
</tr>
<tr>
<td>2</td>
<td>Monitoring</td>
<td>Ehab Ahmed</td>
<td>84</td>
<td>2012</td>
</tr>
</tbody>
</table>

Consist of previous years completed projects, after the end of each year, all data will be erased from all tables and all completed projects will be added to the archive with its final rate.

I. Languages:
A relationship in the database means connecting two or more tables together using primary and foreign key. Primary key means a unique information that have no duplicate, this one will be assigned as foreign key in another table, so we can reach informations in the second table from the first table through the connection between the primary and foreign key.
Chapter Three

Design

And

Implementation
1. Start-Up Page

This page used for login and accounts registering. When the [Sign In] button clicked, a connection with the database server will be established, checking for match with the information the user provide, if a match found then a priority check will be done to decide for which page the user will be redirected. Else a message will be displayed that these provided information is invalid.

When the [Sign Up] button clicked, a connection with database will be established and the checking for the new account information, if they are fully true, the account will be created by saving the new information to the database and
user redirected to his new page, else a message will be displayed to specify the error to the user.

2. Administrator – Adding

When an administrator logged in, he’ll be redirected to this webpage.

Administrator can add new data for database tables, if any information missing or error, a message will be displayed to the administrator to correct the error.
3. Administrator – Editing

This page used by the administrator to editing, deleting data in a specific table (Project, Professor, Student, Groups), and any change will be instantly updated in the database server.
This table used by administrator to display information from any table, specially to copy information needed in to add or edit on another tables.
5. Professor

When a professor logged in, he’ll be redirected to this page. The professor’s job is to check for any requests on his projects, either to confirm or decline the requests.

6. Student
This page displayed for any student log in to the website, all suggested projects will be displayed to the student with its details. The student will be able to reserve a project either for himself alone or for share it with another student as GROUP.
Chapter Four

Conclusion

. Flexible interactive website helps to reserve projects online

. Faster reservation procedure, because of saving time of searching for
the professors to ask about project details and requirements

. Save all completed projects in electronic archive, so it will be easy to retrieve them in the future