Concordia University
Dept. of Computer Science & Software Engineering
COMP 353 – Databases
Summer 2018
Main Project

Project Title: Contract Management System - CMS.

Due: August 9, 2018
Points: 18%

Your team is required to design a relational database application system for a "realistic" situation, followed by an implementation of the system running on the DB server MySQL managed by AITS. The application is a two-tier system, a client side as a browser and http server with PHP parser at the server side. The CMS system is expected to support all "representative" queries and transactions, and produce various desired reports. Each team member will be responsible for the entire project and at least a well-defined portion of the project, to be agreed upon by the team members. You will be provided a 30 minutes time slot to demonstrate that your system performs as expected. A schedule for the demos will be prepared and posted. The project report must be submitted at demo time.

Project Description

Your client is a big company that has a need for a system that organize and manage the contracts done between its employees and their clients. You are to develop a Contract Management System (CMS) for your client. As a database designer, you must ensure the integrity, security and reliability of the CMS system by optimizing the design.

Following are the requirements for the CMS system:

1. As a sales associate, I should be able to create an account of a client by entering client details from the browser. (All details as in P-2: Warm up project)
2. As a sales associate, I should be able to select a "Province" and "City" from pre-populated list of Provinces and Cities of Canada.
3. As a sales associate, I should be able to select from the list of managers assigned to the contract.
4. As an employee, I should be able to select a category of the contracts such as Premium, Gold, Diamond or Silver on the platform which I wish to work on.
5. As a manager, I should be able to allocate employees to the contracts based on their selection (selected in feature #4).
6. As a client, I should be able to see all my active/expired contracts.
7. As a manager, I should be able to retrieve the report of number of hours and employee works on the contract.

8. As a manager, I should be able to remove employees from the contract.
9. As a client, I should be able to provide my satisfaction score (1 – low :10 – highest) in the database.
10. As a client, I should be able to check satisfaction score of all the contracts managed by the manager leading the contract.
11. As an admin, I should be able to update any details in the contract.
12. As an admin, I should be able to remove/alter any contract from the platform.

Categories:

1. Premium Contract - Must be delivered in 10 business days
    a. First deliverable – 3 business days (from contract start date–excluding start date).
    b. Second deliverable – 5 business days.
    c. Final deliverable – 10th day from the contract start date.
2. Diamond Contract - Must be delivered in 18 business days
    a. First deliverable – 6 business days (from contract start date–excluding start date).
    b. Second deliverable – 11 business days.
    c. Final deliverable – 18h day from the contract start date.
3. Gold Contract - Must be delivered in 20 business days
    a. First deliverable – 8 business days (from contract start date–excluding start date).
    b. Second deliverable – 14 business days.
    c. Final deliverable – 20th day from the contract start date.
4. Silver Contract - Must be delivered in 28 business days (*Note: Four deliverables*)
    a. First deliverable – 5 business days (from contract start date–excluding start date).
    b. Second deliverable – 15 business days.
    c. Third deliverable - 20 business days.
    d. Third deliverable – 28th day from the contract start date.

Employee Insurance Plans:

1. Premium Employee Plan: Employees reimbursed 90% of their medical cost.
2. Silver Employee Plan: Employees reimbursed 80% of their medical cost.
3. Normal Employee Plan: Employees reimbursed 70% of their medical cost.

Information Required in the reports from browser:

1. Number of employees with Premium Employee plan with working hours less than 60 hrs/month.
2. Number of Premium contracts delivered in more than 10 business days having more than 35 employees with “Silver Employee Plan”.
3. Make a report to compare the delivery schedule of "First deliverable" of all type of contracts (Premium/Diamond etc.) in each month of year 2017.

Notes:

1. Any user should not be able to access the application without successful authentication/login.
2. Upon successful authentication/login/register, the sales associate should select the line of business of the contracts and the type of contracts from a list of at least 5 lines of businesses and 10 contracts in the browser.
3. A sales associate can enter information in various categories.

User interface:

Use the MySQL DBMS to develop a miniature database application system for the CMS system. The CMS system should provide its users with a good graphical user interface that is simple and dedicated for novice users. You must identify what attributes are likely to be stored for each entity based on the prior knowledge or research.

Implement your design but include the Primary Keys, Foreign Keys and constraints.
Populate each table with at least 20 records. All the assumptions made and constraints must be listed in the deliverables.

The following reports must be supported by the OCN system:

1. Give a list of clients who have the highest number of contracts in each line of business.
2. Give the details of the contracts recorded within the last 10 days in all categories by sales associate.
3. Fetch all the details of the employees from the "Quebec" province.
4. Give a list of all the contracts in the "Gold" category.
5. Generate one report for each category that indicates the clients whose contracts have the highest satisfaction scores in that category, grouped by the cities of clients.

It is expected that he members of a team will discuss the application and educate themselves with some additional relevant information to enrich their application system.

What you should hand in:

1. Develop an E/R diagram for the entity sets and relationships described above. Determine the key attributes and the multiplicity of the relationships. The design should be as compact as possible without sacrificing the required objectives. Make sure you state clearly any reasonable assumption made in your design, which is not specified in the requirements specified above.

2. Convert your E/R diagram into a relational database schema. Make necessary refinements to the schema, if possible. Identify various integrity constraints such as primary keys, foreign keys, functional dependencies, and referential constraints. Make sure that your database schema is at least in 3NF.

3. Provide implementation details of your database system in MySQL with a suitable user interface using HTML and PHP. Populate your tables with enough data to show various functionalities of your system (10 to 20 tuples per table on average).

A working version of the project should be presented before the lab instructors during the presentation. Every member of the group MUST be present during their demo.

At the demo, you also need to submit a hard copy of your project report documenting your project and must include details on:

- The design of the DB using an E/R data model.
- Its conversion into a relational model satisfying at least 3NF.
- The user-interface for each supported application and reports.
- A sample session for each application (user guide).
- All DDL codes.
- List of members' contributions as its last part. The title of this section should be "Contributions", indicating who did what in the project. It is wise to be realistic since the lab instructors will also evaluate each team member's contributions and ask relevant questions.

Note 1: The document report should be printed on a laser printer. The source of the code you demonstrate at demo time should be provided on a CD and submitted at demo time as part of your project report.

Note 2: Your project report must be properly bound in a folder (or binder) with official names of the team members, student ID's clearly appearing on the cover. And make sure your submission includes a signed originality form. Inappropriate submission will be penalized. If you find any resources that can further help enrich your project, it is fine to use it/them, however it is important that your report includes proper citation and acknowledgements.

Note 3: The source code of the system that you will present at the demo time should be submitted through Moodle as a SINGLE zip file by **AUGUST 9th** at midnight. Your project report (of about 12 pages) is also due on **AUGUST 9th** at midnight and must be submitted through Moodle as well.