Concordia University
Dept. of Computer Science & Software Engineering
COMP 353 – Databases
Fall 2017
Main Project

Project Title: Centralized Network of Online Communities - OCN.

Due: December 4, 2017
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 OCN 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

A new system needs to be designed and implemented for Centralized Network of Online Communities "OCN" within Canada for posting local ads and fetch all the reports from a front end. As a database designer, you must ensure the integrity, security and reliability of the OCN system by optimizing the design.

Following are the requirements for the OCN system:

1. As a user, I should be able to create an account by entering my information in a registration form on the platform.
2. As a user, I should be able to select a “Province” and “City” from pre-populated list of Provinces and Cities.
3. As a user, I should be able to select my membership plan by making the payment associated with the desired plan.
4. As a user, I should be able to select a category to buy/sell, rent, or hire services on the platform.
5. As a user, I should be able to post an ad for selling items from the sub categories by filling a form having all the information required*.

6. As a user, I should be able to able to promote my ad by purchasing the one of promotion packages** to increase the visibility of my ad.
7. As a user, I should be able to see all my ads that I have posted/expired.
8. As a user, I should be able to see the position of my ad within the list of ads in that same sub category on the platform.
9. As a user, I should be able to delete or edit my ad from the platform.
10. As a user, I should be able to view the ads from specific sellers.
11. As a user, I should be able to view any other ads with their required information* posted on the platform within same selected category.
12. As a user, I should be able to give a rating to the item from 1 (low) - 5 (high) based on the level of satisfaction after completing the transaction.
13. As an admin, I should be able to manage*** the payment of the users.
14. As an admin, I should be able to remove / alter any ad posted on the platform.
15. As an admin, I should be able to trigger payment backups to be sent to the Payment Processing Department "external".

Categories :

1. Buy and Sell
    a. Clothing
    b. Books
    c. Electronics
    d. Musical Instruments
2. Services
    a. Tutors
    b. Event Planners
    c. Photographers
    d. Personal trainers
3. Rent
    a. Electronics
    b. Car
    c. Apartments
    d. Wedding - Dresses
4. "*Create your own category*"
    a. IT SHOULD HAVE (4) CATEGORIES - 1
    b. IT SHOULD HAVE (4) CATEGORIES - 2
    c. IT SHOULD HAVE (4) CATEGORIES - 3
    d. IT SHOULD HAVE (4) CATEGORIES - 4

$ - alphabets Above indicate Sub-Categories

Membership Plans:

1. Normal Plan: Any Ad is visible for 7 days.
2. Silver Plan: Any Ad is visible for 14 days.
3. Premium Plan: Any Ad is visible for 30 days.

***Information Required:**

1. Contact Information - Email or Phone number.
2. Price - in CAD.
3. Ad type: Buy or Sell.
4. For Sale by - Owner/Business.
5. Title and Description.
6. Address.
7. Images.

****Promotion Packages:**

A promotion package increases the rank of your ad. The packages available are:

1. 7 days promotion - 10$
2. 30 days - 50$
3. 60 days - 90$

*****Payment Management system:**

Admin should be able to view the details of the payments made by the user. Details to be captured are:

1. Amount.
2. Card Details.
3. Date of Payment.
4. User ID.

Payments should be sent to the Payment Processing Department “external” every day at 11:00 PM.

Physical Stores:

In a brick and mortar campaign, sellers can contact the campaign admin and rent some space in a store by paying fees based on the following parameters:

1. The seller has the option of selecting a store based on Strategic Locations (SL). (SL-1 has 400 customers per hour (CpH) visiting the store, SL-2 - 300 CpH, SL-3 - 200 CpH, SL-4 has 100 CpH).
2. Each day a user can select the number of hours for renting a place, each hour on weekdays cost 10$ and on weekends it is 15$ per hour.

3. Delivery services are also provided at physical stores which cost extra 5$/hour on weekdays and 10$/hour on weekends. These charges are added in the rent for those sellers, who want delivery services for their customers.

4. In addition to this, all the buyers in the store can make payments with credit/debit cards which cost 1% of the total transaction for debit payments, and 3% of the total transaction for credit payments.

Notes:

1. The user should not be able to access the application without successful authentication/login.
2. Upon successful authentication/login/register, the user should select the province and the city from a list of at least 2 provinces and 4 cities.
3. A user can post multiple ads in various categories.

User interface:

Use the MySQL DBMS to develop a miniature database application system for the OCN system. The OCN system should provide its users with a good graphical user interface that is simple and dedicated for novice users. The system should be able to create/delete/edit/view whether for administrations or users of all kinds needed for the operations of the OCN system.

As an admin, a different authorization needs to be implemented wherein required tasks such as Create, Update, View of details can be done. 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. At least 2 provinces and 4 cities must contain valid data. 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 user(s) who have posted the highest number of ads in each category.
2. Give the details of the items posted within the last 10 days in buying/selling category.
3. Fetch the information of the users from the "Quebec" province selling winter men's jacket.
4. Give a list of all the items in the Rent category.
5. Generate one report for all categories that indicates the sellers whose items, sold in a given city, have the highest average rating for all items posted in that category and in the specified city.
6. For a given physical store manager, generate a report that indicates the daily revenue and the total number of transactions "online payments" of each physical store belonging to the manager for the past 15 days.
7. Is it profitable for a seller to rent store in SL-1 or SL-4 on weekends or weekdays.
8. Generate a report that indicates all different types of items sold by each physical store located in a given province.

9. For a given seller, generate a report that indicates the amount they have to pay for delivery services per day for the coming 7 days, and the total amount they have paid per day for the past 7 days.
10. Create a report of your choice that you see needed by every user type of the OCN system. The report should generate significant information/data for each one of the OCN system user types: admin, seller, buyer/regular user, store manager. This means that you need to generate at least four extra reports to satisfy the need of these types of users.

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 to make it more realistic.

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 absolutely 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 December 4 at midnight. Your project report (of about 12 pages) is also due on December 4 at midnight and must be submitted through moodle as well.