Databases 2: optional project: Gamified marketing application

Functional Specifications

An application deals with gamified consumer data collection. A user registers with a username, a password and an email. A registered user logs in and accesses a HOME PAGE where a "Questionnaire of the day" is published.

The HOME PAGE displays the name and the image of the "product of the day" and the product reviews by other users. The HOME PAGE comprises a link to access a QUESTIONNAIRE PAGE with a questionnaire divided in two sections: a section with a variable number of marketing questions about the product of the day (e.g., Q1: "Do you know the product?" Q2: Have you purchased the product before?" and Q3 "Would you recommend the product to a friend?") and a section with fixed inputs for collecting statistical data about the user: age, sex, expertise level (low, medium high). The user fills in the marketing section, then accesses (with a *next* button) the statistical section where she can complete the questionnaire and submit it (with a *submit* button), cancel it (with a *cancel* button), or go back to the previous section and change the answers (with a *previous* button). All inputs of the marketing section are mandatory. All inputs of the statistical section are optional.

After successfully submitting the questionnaire, the user is routed to a page with a thanks and greetings message.

The database contains a table of offensive words. If any response of the user contains a word listed in the table, the transaction is rolled back, no data are recorded in the database, and the user's account is blocked so that no questionnaires can be filled in by such account in the future.

When the user submits the questionnaire one or more trigger compute the gamification points to assign to the user for the specific questionnaire, according to the following rule:

1. One point is assigned for every answered question of section 1 (remember that the number of questions can vary in different questionnaires).
2. Two points are assigned for every answered optional question of section 2.

When the user cancels the questionnaire, no responses are stored in the database. However, the database retains the information that the user X has logged in at a given date and time.

The user can access a LEADERBOARD page, which shows a list of the usernames and points of all the users who filled in the questionnaire of the day, ordered by the number of points (descending).

The administrator can access a dedicated application on the same database, which features the following pages

- A CREATION page for inserting the product of the day for the current date or for a posterior date and for creating a variable number of marketing questions about such product.
- An INSPECTION page for accessing the data of a past questionnaire. The visualized data for a given questionnaire include
  - List of users who submitted the questionnaire.
  - List of users who cancelled the questionnaire.
  - Questionnaire answers of each user.
- A DELETION page for ERASING the questionnaire data and the related responses and points of all users who filled in the questionnaire. Deletion should be possible only for a date preceding the current date.

HINTS:

1. The ORM annotations should express a proper design of fetch, cascade and orphan control policies for relationships, considering the expected cardinality of associations.
2. The software architecture should apply a proper division of responsibility of components in the various tiers: servlets, EJBs, entities, database triggers and constraints.

Technical specifications

The application should be realized with the following technologies:

1. MySQL DBMS
2. TomEE JEE application/web server
3. Java servlet and templating (JSP, JSTL or Thymeleaf) for the user interface
4. EJB (stateless or stateful) for the business objects
5. JPA for object relational mapping and transaction management
6. Triggers and constraints for database-level business constraints and rules.

The use of additional technologies is admitted but should be discussed with the teacher.

The use of alternative technologies is not possible.

A technical installation guide and examples of design specifications and coding are published in the Beep portal of the course.

Development and project verification rules

1. The project can be developed individually on in group
2. Preferable group size is 2-3. Motivated exceptions are admitted and should be authorized by the teacher.
3. Groups will be registered in an online **group spreadsheet** published by the teacher. When registering, the group will specify the session and exam date or period chosen for attending the written part of the exam. **The online group sheet must be filled in by each group IN ADDITION to the student's individual enrolment to an exam date made in the Politecnico's system**.

LINK TO THE GROUP REGISTRATION SHEET

Prof. Piero Fraternali section

https://docs.google.com/spreadsheets/d/1ux9uIozkYwY_9Q21zdutqiD9a79J-5ZgjkMWoPtsvkE

Prof. sara Comai section

https://docs.google.com/spreadsheets/d/1bfCPAeqJ9aONP9eHgO55RcJ7Rq5SVR6SpXyh7DLdEbY

The evaluation of the project is done via an oral exam.

4. The evaluation of the project is strictly individual, even if the project is done in group. Different students may get a different evaluation for the same project.
5. The date and time of the oral examination is assigned by the teacher within the exam session period chosen by the group. The assigned date and hour are communicated to the groups by means of the online group registration spreadsheet. Such communication is given by the teacher at the beginning of the exam session chosen by the group.

6. The day before the oral evaluation the groups must send to the teacher a presentation with the design of the application, edited following the examples of JPA exercises published in Beep.
7. The evaluation consists of:
    a. The discussion of the design presentation
    b. A demo of the application
    c. A code walkthrough with questions about the design and the coding. <u>Each member</u> of the group must demonstrate during the individual discussion full knowledge of <u>all the design and coding</u> decisions.