You MUST read this document carefully

CMPS310 Software Engineering

- Group Project -

Milestone-1: Software Requirements Analysis and Design (8%)

This is a compulsory project. If you do not submit this, your grade will be 0 in this course.

Each group must have four members.

Blackboard Submission Due: Midnight ***October 19, 2023***

Fall 2023

Objectives of the Project

The purpose of this project is to reinforce the concepts discussed in class. The project gives you the opportunity to practice the concepts and techniques taught in the class on a realistic problem. The main objectives of the project are to practice the software Requirements Specification and OO Analysis and Design Modeling for a software solution to a problem.

Background

Assume Qatar University (QU) wants to develop a software to manage various local and international conferences. Your team has been contracted by QU to advise regarding the development of this Conference Management System (CMS). QU has prepared the following requirements for you on how the CMS should work:

An organizer can register for a conference. The organizer first logs in, and the system finds the organizer details. It is assumed that the organizer has already registered and has login details. The organizer then provides the conference details such as conference name, dates, a list of reviewers, their expertise, and venue. The venue has an address. A conference may have multiple venues. The system records the conference if no other conference with the same name exists. If exists, the system asks the organizer to re-enter new conference details with a message, "The conference already exists." The system registers the new conference details and attaches this with the information of the organizer. An organizer can register any number of conferences, but a conference can be organized by only one organizer. All reviewers' information with their expertise is also recorded if not found in the system and is associated with the conference. The reviewer is informed about his/her association with the conference. The system finally generates a conference code and makes a confirmation to the organizer once the conference has been successfully registered.

Authors can submit their papers/articles to any conference before the deadline. An author first provides his/her details if not provided earlier. The system records the author's details if not exist and creates a login name and password for the author. If the author already exists, he/she simply logs in, and the system finds the author's details. It then finds all conferences and displays them. The author selects the conference, and the system records the selection. The author then provides

paper details such as the title of the paper, names of all authors, abstract of the paper, key words, and finally uploads the paper. The system stores the paper details. It includes the paper in the selected conference and attaches the paper with the author(s). It then produces a paper number to the author. An author can submit a maximum of three papers to a conference. If the total number of papers for a conference exceeds 3, the system terminates the session without registering the paper. A paper can have any number of authors. However, a paper can only be submitted to only one conference.

Once the deadline passes of a conference, the organizer starts assigning reviewers to the submitted papers. The organizer selects his/her conference. The system retrieves the conference details and the list of submitted papers. For each paper, the system searches for three reviewers who are assigned to less than 3 papers to review. It assigns three such reviewers to each paper. The system knows which paper has been assigned to which reviewers. A reviewer can review papers for any number of conferences, but for a particular conference, a reviewer can review at least 2 and at most 3 papers. The reviewer is given a deadline to submit the comments/feedback and a review result in terms of accept, reject, conditional accept. The system notifies the reviewer about the review task. The reviewer sends acknowledgement, and the system records the acknowledgement with the reviewer's details.

The reviewers can select a conference and see which papers have been assigned to them, and their deadline, assumed the reviewer is logged in. The reviewer can select a paper, the system shows the abstract of the paper. The reviewer has an option to decline to review the paper, in that case, the system then releases the reviewer from the paper, and finds another reviewer for the paper. If the reviewer accepts a paper to review, he/she submits the comments and review rating (1, 5, or 10) about the selected paper online. The system records all comments and review rating sent by the reviewer with the paper and the reviewer details. It then updates the system by marking the paper as already reviewed by the reviewer with the review date.

Once all three reviewers' comments are received, the organizer asks the system to make a decision (either accept or reject) on every paper automatically based on the comments and the review rating. The decision is recorded, attached with the paper, and the authors are notified about the decision of their paper. The accepted papers are classified separately from the rejected papers. For the accepted paper, the author is asked to submit the revised paper and to register for the conference by a submission date. In order to register, the author provides the paper number, and credit card details by the final submission deadline. The system finds out if the paper was accepted. If the paper number does not exist, it generates an error message and asks the author to enter correct paper number. The author has a choice to select the meal preferences (Vegetarian, Halal, or Vegan) for the conference. The system stores the choice. The card details and the paper number are forwarded to a payment system called QPay that is not a part of the CMS. QPay immediately sends back the outcome of the payment. If the payment gets accepted by QPay, it sends a receipt of the payment and the paper number to the system which stores this information, otherwise it sends an error message. The system informs the author about the payment outcome.

The organizer selects a conference after the final submission deadline has passed. The organizer requests for a conference proceeding. The system creates the proceedings and selects only those accepted papers with at least one author registered for the conference. If not, the paper will be removed from the accepted paper list. It prepares a table of contents of the proceedings and includes all selected papers and sends the final proceedings to the press for printing. The press notifies the system once the printing is complete. The final version of the proceedings is available to all registered authors of the conference.

The CMS can also book hotels for the authors who have already registered for their papers. In that case the author first provides their paper number along with their last name. The system asks for the date of check-in/check-out and the name of the city. The system finds a list of hotels that satisfies the author's preference. The author selects the preferred hotel. The system then contacts the hotel. The hotel makes reservation if the room is available and sends back a reservation number with the author's name, the date of check-in, check-out, and the price. Otherwise, the hotel sends a message that the room is not available. The system then forwards this to the customer. The author can later find the reservation details from the system just by entering the reservation number and the guest's name.

The administrator of Qatar University can generate various summary reports of the system such as how many conferences are registered in one month; which conferences are scheduled in a particular month, week, or day; how many papers submitted for a conference; what is the average acceptance rate, etc.

Additional Information

It is likely that you will require additional information about the operations of the system to complete this project. When a software engineer is working on a system design in the industry, it is common for the engineer to seek more information about the problem. For this project, your client is your Lab Instructor. You can ask any question directly to her. Send her emails or see her during her office hours. In most cases, you need to make logical assumptions. You may also explore other sources such as the Internet and related literature in order to know more about how such a system works, and what its typical core business entities, services, and functions are. Note that the above description may be confusing or incomplete. It is your responsibility to find additional information or clarifications from available sources. You MUST attach your justifications for any assumptions that you make with your project.

Tasks of Your Project

Milestone 1: Software Requirements Analysis

1. Propose:
   a. A data flow diagram (DFD) of the system: Include major processes, data storage/data files, data flows, and external entities (*15%*).
   b. A use case diagram of the system (*15%*):
   c. Explain which of these two you prefer best to analyze a system and why (*5%*).

2. Develop *use case specifications* for the most complex and key 4 use cases selected from your use case diagram. Each use case specification should include *brief description, primary actor(s), trigger, pre-condition(s), post-condition(s), normal scenario (actor action-system response table), alternative flows (if any)*. Use the "Use cases specification template" available from Blackboard (4 x 5%= *20%).*

3. Using *object-oriented design fundamentals (objects, inheritance, abstraction, classification, encapsulation, modularity, responsibility-driven design, patterns, etc.)*,

   a) Complete the *design class diagram* of the entire system with all required classes, their attributes and types, relationships (aggregation, generalization, association) with multiplicity where applicable, methods with major parameters, and visibility of attributes and methods (*20%).*
   b) Explain briefly how you applied design principles in your class diagram. In your explanation, give examples from your class diagram (*5%*).

Any assumptions you made regarding the system description must be explained. Assignment components will be evaluated for **accuracy**, **clarity**, **relevancy, and completeness** (especially among components and among artifacts) of your document.

- Each student must upload their electronic copy of Milestone-1 to Blackboard as a ***Word Document and .vpp files*** by the due date and time.
- Your word document and .vpp files must include all diagrams produced in Visual Paradigm.

Each student must submit an individual electronic copy on Blackboard by the due date and time.

Grading scheme for Milestone-1: Requirements Analysis

Tasks	Criteria	Grade
1	(a) DFD (15%), (b) Use case diagram (15%), (c) Explanation (5%)	35
2	4 use case specifications using the template (4 x 5%= 20%)	20
3	Design Class diagram of the entire system-20% for (a); 5% for (b)	25
Total		80

More details will be provided for the subsequent milestones.

Submission requirements

Your assignment group/team MUST comply with the following submission requirements; **otherwise, the grade will be deducted**:

1. Your group should have four members. If you have less than 4 members in your group, please contact your lab instructor. You will form your own group.

2. Each member must submit the electronic copy individually on Blackboard. The cover page of your submission MUST contain the following items in five bullets:

   [Each member of the group will be required to submit a peer group evaluation with an estimate of the contribution of each member to the project. Write the percentage contribution made by each team member so that it adds up to 100%. This evaluation *may* be used to adjust the marks awarded to each team member]

   - Effort distribution of the student:

     SID:_____STUDENT NAME: _____Effort given_____%
     SID:_____STUDENT NAME: _____Effort given_____%
     SID:_____STUDENT NAME: _____Effort given_____%
     SID:_____STUDENT NAME: _____Effort given_____%

   - Course number_____

   - Submission date_____

   - Theory Class section: **L01 / L02 / L51 / L52 / L53/** (select one)

- DECLARATION: *We hereby certify that no part of this project or product has been copied from any other student's work or from any other sources except where due acknowledgment is made in the project. No part of this project/product has been written/produced for us by any other person.*

Note: If the above submission requirements are not met, up to 10% of marks will be deducted from this milestone.

3. Be aware of
   - *Submitted work must be the student's own work, you cannot copy the project from other groups.*