DEPARTMENT OF COMPUTING

ISYS254 2019 – ASSIGNMENT ONE (15%)

Applications Modelling and Development
Requirements and Modelling
Friday Apr 12, Wk7, 10 pm (Marked out of 100)

Submission Instructions

Submit a single (1) **PDF file.** You can use any editor of your choice to put your document together (e.g. Word, Pages, Open Office Writer, Google Docs, …), but the version that you submit must be a PDF file.

The document should include your answers in task number order. Make sure you label each diagram/ task to make it easy for the marker to find your work. Submit your single pdf file electronically on iLearn in the assignment submission box before the due date.

Problem Statement

The Campus Common is a precinct on campus where people can meet, eat, drink, and socialise. An extract from their website: "the Campus Common is the new temporary food, beverage and social precinct on campus for staff, students and visitors to enjoy."

https://www.mq.edu.au/about/about-the-university/our-campus/campus-development-plan/campus-common

For this assignment, you are being tasked with analysing the needs of many stakeholders and coming up with requirements for a system called the "Campus Common System" (CCS)***. This system will aim to provide a way for students, staff and student groups at the university to book spaces at Campus common for events, order food and beverages and register for university run events. You have been tasked with going through the initial proposal described below and detailing some features and processes that CCS would need to provide.

An extract from the proposal:

Macquarie University students and staffs do not automatically have an account created in CCS. A student or a staff member can optionally register to CCS to become a CCS Member and start to use its features. In order to register for a CCS account, the student/staff would need to register their details and validate their account with a connection to MQAuthServer. The reason for this is to cross-check if the student/staff has a valid identification. CCS also allows registration for student group and departments; However, the validation of the group is carried out through a different server, MQAuthGroupAuthServer to cross-check for authenticity.

Food and beverages could be ordered through CCS. While placing an order, a CCS Member can choose to order food and/or beverages. If it is a student/student group placing order for food, orders have to be pre-paid in advance and it goes through a Bank system. Orders can be picked up or delivered by a CCS Delivery Person. A student can register to be a CCS Delivery Person. Validation of the registration again goes through the same MQAuth server. CSS allows the Delivery person to accept an order delivery and be able to change the status of order as delivered. CCS Members can rate their order and delivery and may choose to write any comments. Restaurants are auto-registered in CCS. When an order is picked up at the counter, the person at the restaurant can use CSS to change the status of the order as picked up. They will also be able to process the payment through the bank when the order is not prepaid.

CCS Members can book spaces at Campus common to hold events. They can choose to add 'Bundles' whilst requesting for an event. If the bundle option is chosen, payment will be processed immediately either through the bank or MQ Budget Office System (if the booking is made by Department/Staff). CCS Members can see the status of their event booking and will also have the option to cancel their event booking. They can also 'raise a dispute' to help deal with issues/requests regarding their event booking.

CCS Managers are responsible for managing event bookings. They create event bookings and manage schedule conflicts. They can deny the event booking request and also can change the status of the event.

*** *This problem statement is fictitious. Therefore, do not contact Campus Life to ask for further details.*

Task Descriptions

Task 1: Requirements elicitation [10 marks]

Q1) [5 marks] List 5 different requirements gathering techniques that you would use to find out more about the problem. Why would these 5 you have selected be appropriate to use in this situation?

Q2) [5 marks] Outline a strategy (of between 3-4 requirements gathering stages) and detail which techniques you would use at each stage, and what data you would use from previously gathered information. Justify your approach.

Task 2: Requirements specification [20 marks]

Q3) [10 marks] Write two user scenarios that would describe a typical usage over the course of a day (one from a CCS Delivery person's perspective and another from CCS manager's perspective).

Q4) [4 marks] Provide four example user stories from different actors.

Q5) [3 marks] Write three functional requirements for the proposed system for different actors (1 example for each actor)

Q6) [3 marks] Write three non-functional requirements for the proposed system (include the measures / limitations as part of the requirement, not just the heading).

Task 3: Diagrams for different system perspectives [55 marks]

Q7) [5 marks] Draw a Context Diagram (**Level 0 DFD**) for CCS.

Q8) [15 marks] Draw a Use Case Diagram for CCS based on the problem statement and extract
Also: You need to add two more use cases for a CCS Delivery Person and add that to your diagram. Please add few sentences underneath the diagram explaining the newly added use cases.

Q9) [10 marks] Write a use case description for one of the use cases you created (choose one that meets the criteria in Q10).

Q10) [10 marks] Draw a Sequence Diagram for the use case description from Q9. Be sure to select a use case that has at least one actor, and a minimum of 3 entity objects (as lifelines) in the sequence diagram.

Q11) [10 marks] Draw an entity-class diagram for the entire problem statement.

Q12) [5 marks] Select one class from your class diagram and draw a State diagram for that class.

Task 4: Data and storage considerations [15 marks]

Q13) [10 marks] Draw an ER diagram using one of the following set of entities.

- CCS Member, Order, Delivery Person, Restaurant
- Event Booking, Bundle Package, Department, Payment

You need to have at least 3 attributes for each of the entities. You are allowed to add extra entities, if you feel the need. However, you will need to provide a set of justifications to explain your choice of entities.

Q14) [5 marks] Provide a list of tables with their primary and foreign keys, when ER model in Task 4 is transformed into tables.

Marking Rubric

TASK 1	
Q1) Five requirements gathering techniques identified and justified?	/5
Q2) Strategy provided	/2
Q2) Data use justified	/3
TOTAL –TASK 1	**/10**
TASK 2	
Q3) CCS Delivery person student user scenario	/5
Q3) CCS Manager user scenario	/5
Q4) Correct user story structure	/1
Q4) Reasonable user story	/2
Q4) Different users	/1
Q5) Functional requirements	/3
Q6) Non-functional requirements-written with measures	/3
TOTAL –TASK 2	**/20**
TASK 3	
Q7) CONTEXT DIAGRAM	
Data flows correctly labelled with right notation	/1
Valid entities	/1
Process	/1
Covers/correct scope	/2
	/5
Q8) USE CASE DIAGRAM	
Covered main use cases and correct use of them	/3
Included new use cases	/2
Covered actors	/3
Correct includes/extends/generalisation	/4
Correct scope	/3
	/15
Q9) USE CASE DESCRIPTIONS	
Newly added usecase?	/2
Clear format	/3
Reasonable description/steps	/2
Pre/post conditions, exception, triggers	/3
	/10
Q10) SEQUENCE DIAGRAMS	
One actor and three objects at least?	/2
Sensible collaborations	/2
Objects correspond to classes	/2
Operations/assoc. found on class diagram	/2
Shows logic/conditions/branching/alternatives	/2
	/10
Q10) ANALYSIS/ENTITY CLASS DIAGRAM	
Covered classes/functionality	/4

Reasonable attributes	/1
Reasonable methods	/1
Reasonable assoc/role	/1
Reasonable multiplicity/visibility	/1
Inheritance/Composition correctly used	/2
	/10
Q12) STATE DIAGRAM	
Correct use of diagram (object on class diagram)	/1
Operations appear on class/sequence diagrams	/2
Reasonable states	/1
Reasonable events/actions	/1
	/5
TOTAL –TASK 3	**/55**
TASK 4	
Q13) Correct Attributes	/2
Q13) Correct Cardinalities	/4
Q13) Correct Constraints	/4
Q14) Correct tables	/2
Q14) Correct PK. FK	/3
TOTAL –TASK 4	**/15**
TOTAL	**/100**

Notes about PowerDesigner

If you would like to use PowerDesigner for your assignment, it is installed in the labs. There is also a trial version available online (trial version for 15 days only).

Download from:

http://PowerDesigner.de/en/trial-version-2/

Fill out the details on the form. You will receive an email with instructions to download.

Works only on Windows Client 32-bit, 64-bit, Windows for IA64, X86, X86_64.

Sorry Macbook users! You will have to use the lab computers to work on your assignment if you choose to use PowerDesigner. However, there are some other alternatives which work just as well...

(see next page for FAQs)

FAQs from last semester

1. **Is PowerDesigner the mandatory case tool to use? Can I just draw and submit the diagrams?**
   No, you can use any tool available (You can use Word/Visio diagram tools-even hand draw the diagrams). Please take care about the notation in each of the diagrams, as some case tools use different notation which may mean something else. Your aim is to clearly and concisely present your ideas. Only thing you need to be very particular about is legibility.

2. **Can I use a different version of PowerDesigner than the ones in the lab?**
   Of course ☺

3. **Are the labs locked over the weekend, and if so, how are they unlocked?**
   Labs are open over the weekend - 9AM to 5PM. Outside of those times on weekends, they are locked.

4. **Every time, I try to put my data model on MS word it appears blur, please help**
   Go to your model, do Ctrl-A(select all), Ctrl-C(copy) and Ctrl-V(paste) on word document. It is a high-res image. Another option is to take screenshots and then paste the screen shots in your document. Be sure to check that the image is readable in the PDF before submitting.

5. **Do we need to have a cover page on the document we are uploading?**
   Nope.

6. **Do we need to read the assignment forum?**
   This will be the primary place where assignment questions will be answered. Any updates will also be posted there. It is your responsibility to monitor this forum regularly. As with any job, you will want to be up to date on the latest information related to your tasks.

7. ***Are we only allowed to submit our assignment one time?***
   You can submit multiple times before the due date, so be sure to have early versions uploaded just in case iLearn (or your internet connection) has any issues.

8. **Can we make some of the pages landscape and some portrait?**
   Yes, you can have some pages in portrait and some in landscape (especially if it helps make the diagrams more readable).

9. **How many pages should my assignment be?**
   - *Task 1 and 2: should not need to take more than 2-2.5 pages total.*
   - *Task 3:*
     - *(Context diagram, Sequence diagram, Entity-Class diagram, State diagram): should be able to fit on 1 page per diagram (can be portrait or landscape as needed).*
     - *Use case diagram and explanations should not need to take more than 2 pages total (can be portrait or landscape as needed).*
     - *Use case description might be about 2 pages depending on the detail (or lack of detail) shown in your use case diagram.*
   - *Task 4:*
     - *ER diagram should fit on 1 page (can be portrait or landscape as needed).*
     - *Tables with PK and FKs can fit in a page as well.*

10. **How detailed / complicated should my diagrams be?**

As a general indication… It is easy to make something look complicated; it is hard to make something look simple. This is where your judgement and considered thought processes will be exercised. You should aim to make everything clear and easy to understand. If you think your diagrams are too simple, ask yourself if you are missing any information. If your diagrams look complicated, ask yourself if you can make it more simple without losing important details (or if that detail can be shown in another diagram or description).

Start early and allow yourself time to really think about your requirements and analysis conclusions in detail. Also, feel free to ask the tutors / lecturers in class or on the forums. As was indicated in Lecture 1 - 2019: These skills area easy to learn, but take a lifetime to master.