**ISYS2110 Analysis & Design of Web Information Systems**

**Semester 1, 2019**

Assignment 2, 2019 (20%)

## System Modelling and Design

## 1. Project Overview

The second assignment is based on the same case study you worked on in Assignment 1. The members of the team remain the same as in Assignment 1. This assignment aims to produce a system modelling and design document that uses appropriate notations with a clear explanation.

## 2. Deliverables

### 2.1. Documents

A written electronic system modelling document (doc or pdf format) need to be submitted to Learning Management System (https://canvas.sydney.edu.au).

**Note:**

- Official university academic honesty cover sheet must be signed by all members and attached to the electronic document

- Late submission is subject to a deduction of 10 marks (out of 100 marks) per day.

### 2.2. Prototype

All groups should create a medium fidelity prototype of your interface design using any prototyping tools of your choice. This prototype will be briefly demonstrated to the tutor during the tutorial in **week 12**.

## 3. Report Requirement

For the assignment 2, prepare a final report that includes (but not limited) the following parts:

1. Introduction, Background, and Motivation

   *A general introduction to the case that your group is working on (e.g. what is the background of the business presented in the case, how they currently operate, why the project is important, and so forth).*

2. Project Details
   a. Project Objectives
   b. Requirements Gathering (Functional & Non-Functional)

*Refer to week two lecture material to write Non-functional and Functional Requirements as many as you can think to carry on the project within project duration*

   c. Expected Benefit and Outcome

3. Market Research

   *Conduct a systematic review of the existing systems, what has been done, and what is the gap that your project can contribute.*

=================================================================

4. System modelling

   a. [Data Flow Diagram (DFD)](#)

   b. Object Relationship Diagram

   c. Use Case Description

   d. Use Case Diagram

   e. Sequence Diagram (SD)

   f. User interface design

   g. System architecture design

   h. Prototyping development

*This section should include the key feature of your mid-fidelity prototype (screenshot and descriptive explanation).*

5. Conclusion

6. Team reflections on your system project

7. Reference (including in-text citation)

8. Appendix (if any)

**Note:**

The final report has a similar structure to the proposal especially in **point 1 to 3**, and it is acceptable to reuse material from the proposal. For example, if your market research perfectly covered all the relevant material then there is no need to update. More likely, you will need minor revisions to add new material you discovered during the project.

## 4. Teamwork

Teamwork is essential for this project. Please meet regularly with all your team members and ensure that everyone contributes towards the report (proposal and final report) and the

presentation. Please discuss with your tutor and lecturer if your team is facing any problems. There might be a peer review at the end of the semester to gauge your contribution to your respective teams. Despite good intentions and effort, it happens that some team members fail to take their role within the team seriously. If your team is experiencing such challenges, please follow this procedure:

1. Active members should make a significant effort to contact the slacking member(s) by all means; for example, e-mail, phone, locate him/her at lectures and tutorial, etc.

2. Maintain a paper trail of interactions between the team members and the slacking member (e.g., keep a proper log of communications and events), in order to substantiate the claim of "significant effort" mentioned in paragraph (a) above.

3. Contact the tutor and lecturer to report and discuss the team's problems in a meeting. You should do this early and not wait until the last minute. Bring all supporting evidence to the meeting. The lecturer will investigate the problem and take appropriate action. Please note that the lecturer will not mediate in all other cases (e.g., social incompatibility, skills mismatch, etc.).
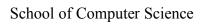
## 5. Reference

- Please cite all references at the end of your paper (both proposal and final report). You should include references to facts, figures and any other information that you obtained from various sources. References from relevant papers in the University Digital Library are preferred over Internet sources as Internet sources may not always be reliable.

- Whenever you quote, paraphrase, summarise or refer to ideas, facts, figures or findings from another source (e.g. research paper, book, website), you should cite the source, with appropriate formatting, in the sentence that mentions these ideas or figures. It is not sufficient to just provide a list of references at the end of your paper. The source that you use should be cited in the text of your paper, either in parentheses or as part of the text itself. We suggest the use of APA style for referencing.

- You are reminded that the University takes plagiarism infringements seriously. If the sources are not cited correctly, it may be deemed as plagiarism. Please note that your submission will be forwarded to an automated plagiarism checking system.

## 6. Grading Criteria

**Note**: please see **section 2 and 3** for detail.

| | Marks allocated |
|---|---|
| **Document** | |
| ▪ Brief overview of the project *(reuse from assignment 1-- project title, introduction / background, objectives, and requirements)*, no marks allocated for this section. | /00 |
| ▪ Data Flow Diagram *(1 only)* | /10 |
| ▪ Object Relationship Diagram *(1 only)* | /10 |
| ▪ Use Case Description *(1 or 2, to be decided by the group)* | /5 |
| ▪ Use Case Diagram *(1 only)* | /10 |
| ▪ Sequence Diagram *(1 or 2, to be decided by the group)* | /10 |
| ▪ User Interface and Interaction Design.<br><br>▪ Also, justify how your visual and interactive design support the business objectives, and evaluate the overall usability using usability criteria discussed in the lecture. | /15 |
| ▪ Brief overview of system architecture design | /5 |
| ▪ Prototyping. Provide the main screen-by-screen flow of your system. *(The same will be demonstrated orally in the prototype demonstration)* | /10 |
| ▪ Report presentation *(organization of the report, and interpretation of the models)* | /5 |
| ▪ Conclusion, references *(including in-text citations),* and appendix *(if any)* | /5 |
| ▪ Team reflections:<br><br>1) Brief profile of your team members (1paragraph)<br><br>2) In terms of communication and commitment to team works, how actively did your team engage in this project? (1 paragraph)<br><br>3) What are some of the positive things you could identify in this project? (1 paragraph) | /5 |

| | |
|---|---|
| 4) What are the limitations or constraints your team has experienced in this project? (1 paragraph) | |
| 5) How could members of your team relate the knowledge gained from this system project to their future education/career? (1 paragraph) | |
| **Demonstration** | |
| ▪ Prototype demonstration during tutorial in week 12 *(see section 2.2)*<br><br>*One or more members from a group should present (5-10 minutes) and Q&A (2 minutes, if any). Students may use PowerPoint Slides or other tools*<br><br><u>Presentation evaluation criteria includes:</u><br><br>   - Contents of presentation<br><br>   - Team communication during demonstration/presentation<br><br>   - Engaging the audience<br><br>   - Confidence and ability to convince<br><br>   - Q&A handling (if any) | /10 |
| **Total** | **100 (20%)** |

# 7. Appendix

## Case Study 1

## Video Game Rental Web-System

**Background Information**

Gamifi is an innovative video game rental company that wants to reshape the video game market by letting its members to rent video games allowing them to save money and try out new games at the same time without having to spend big amount of money in purchasing games. Your team has been hired as IT consultants by Gamifi to analyse and design a new web-based system that will allow Gamifi to carry out its business online and make it convenient for its customers to rent video games through its new web-system.

In your initial meeting with the Project Sponsor at Gamifi the following project details were agreed on:

> Scope: Web-based system for Video game rentals.
> Timeline: A timeline of 5 months was agreed on for the project.
> Cost: A budget of $250,000 has been allocated towards the implementation.

This case represents a proposal for a new web-based system for a video-game rental for Gamifi. The new system should be able to handle to the following business functions. The Video Game Rental Web-system must keep track of all video game rentals. Information is maintained both about title of each video game and the individual copies of each game. Video game titles maintain information about title, game publisher, and game rating. Individual copies maintain copy number, edition, publication year, serial number, rental status (whether it is in stock or loaned out), and date due back in.

Gamifi also keeps track of information of its members. There are several types of members, each with different privileges. There are Premium members, Regular members, and Concession members. Basic information about all member is name, address, and telephone number. For Premium members, additional information maintained is special requests, elite points. For regular members, information such as regular reward tier is maintained. For concession members, student ID, school name, concession reward tier.

Gamifi also keeps information about Game loans. A game loan is an abstract object. A loan occurs when a member visits a Gamifi store and picks a game/or games from the store catalog to check out. Over time a member can have many loans. A loan can have many video game copies associated with it. (And a physical copy of the video game can be on many loans over a period of time. Information about past loans is kept in the database.) So, in this case, an association class should probably be created for loaned video games.

If a member wants a video game that is already checked out and no other stock is available, the member can put that title on reserve. This is another class that does not represent a concrete object. Each reservation is for only one title and one member. Information such as date

reserved, priority, and date fulfilled is maintained. When a video game is fulfilled, the system associates it with the loan on which it was checked out.

Members also have access to Gamifi's information directory to search for video game titles and to see whether a particular video game is available. A member can also reserve a title if all copies are checked out. When members bring a video game back to the store to return, a store clerk checks out the video games on a loan. Clerks also check video games in. The video games can also be returned by dropping in the return slot, in those instances the store clerks check in the video games. Stocking clerks keep track of the arrival of new game releases that arrive to the store.

The managers in the store have their own responsibilities. They will print reports of video game titles by category. They also like to see (online) all overdue games rented out to members. When video game copies get damaged or destroyed, managers delete information about game copies from the system. Additionally, managers of the stores also like to see what video games are on put on reserve by members.

Your job as IT Consultants on this project is to design and propose a web-based system that satisfies the project objectives. This includes but not limited to:

- Requirements gathering
- Project scoping
- Developing project plan
- Modelling and designing the new system
- Developing medium-fidelity prototype
- Developing system implementation plan
- Other deliverables that are specified by the client/sponsor
- Presenting prototype to client

If you find potential new requirements to be considered for this Video Game Rental Web-System, feel free to add them as "assumptions" in the documents where you list all the requirements of the system and employ them in your analysis, modelling, design and project report wherever necessary. Furthermore, inform the client about your information needs for covering complex business context in your design and development of the system prototype.

# Case Study 2

## Vision (Eye) Clinic Web-System

### Background Information

Vision Clinic is a private specialist provider of ophthalmology in Australia that specialises in laser vision correction, cataracts surgeries, glaucoma, cornea and retina surgeries. The clinic was established in 1980 with a goal to provide world-class services to it patients and a holistic approach to eye care. Since then, the number of patients and team at the clinic has grown overtime and one of the biggest challenges has been processing patient administration. The management at Vision clinic have decided to consult experts to help them find a solution to their current problems. Your team of IT Consultants have been brought in to analyze and design a new web-based system that will help Vision Clinic make their current business processes more efficient and eliminate some of the manual paperwork in maintaining patient records. This system does not keep any medical records. It only processes patient administration.

In your initial meeting with the management at Vision Clinic the following project details were agreed on:

> Scope: Web-based system for Patient Administration for Vision Clinic.
> Timeline: A timeline of 3 months was agreed on for the project.
> Cost: A budget of $75,000 has been allocated towards the implementation.

This case represents a proposal for a new web-based system for a patient administration for Vision Clinic. The clinic currently operates with three specialist ophthalmologists and several assistance nurses to help with day to day operations and surgical procedures. Each patient has a record with his or her name, date of birth, gender, date of first visit, and date of last visit. Patient records are grouped together under a household. A household has attributes such as name of head of household, address, and telephone number. Each household is also associated with an insurance carrier record. The insurance carrier record contains name of insurance company, address, billing contact person, and telephone number.

In the clinic, each clinical staff member also has a record that tracks who works with a patient (ophthalmologist, clinic nurse, lab technician). Because the system focuses on patient administration records, only minimal information is kept about each clinical staff member, such as name, address, and telephone number. Information is maintained about each clinic visit, such as date, insurance copay amount (amount paid by the patient), paid code, and amount actually paid. Each visit is for a single patient, but, of course, a patient will have many office visits in the system. During each visit, more than one clinical staff member may be involved in doing a procedure. For example, the lab technician, the ophthalmologist, and the nurse may all be involved in a single visit. In fact, some ophthalmologists are specialists in such things as Cataract surgery or Lasik eye correction, and in some occasions if the situation is complex it may even have multiple specialist ophthalmologists involved with a single patient. For each clinical staff member that does a procedure in a visit combination (many-to-many), detailed information is kept about the procedure. This information includes the type of procedure, a

description, the eye involved, the copay amount, the total charge, the amount paid, and the amount the insurance company denied.

Finally, the system also keeps track of invoices. There are two types of invoices: invoices to insurance companies and invoices to heads of household. Both types of invoices are fairly similar, listing each visit, the procedures involved, the patient copay amount, and the total due. Obviously, the totals for the insurance company are different from the patient amounts owed. Even though an invoice is a report (when printed), it also maintains some information such as date sent, total amount, amount already paid, amount due and the total received, date received, and total denied. (Insurance companies do not always pay all they are billed.)

The receptionist at the clinic keeps track of patient and head-of-household information, and will enter this information in the system. The receptionist will also keep track of office visits by the patients. Patient information is also entered and maintained by the office business manager. In addition, the business manager maintains the information about the clinic staff.

The business manager also prints the invoices. Patient invoices are printed monthly and sent to the head of household. Insurance invoices are printed weekly. When the invoices are printed, the business manager double-checks a few invoices against information in the system to make sure it is being aggregated correctly. He/she also enters the payment information when it is received.

The clinical staff at Vision Clinic are also responsible for entering information about the eye procedures they perform. The business manager also prints an overdue invoice report that shows heads of household who are behind on their payments. Sometimes the ophthalmologists like to see a list of the procedures they performed during a week or month, and they can request that report.

Your job as IT Consultants on this project is to design and propose a web-based system that satisfies the project objectives. This includes but not limited to:

- Requirements gathering
- Project scoping
- Developing project plan
- Modelling and designing the new system
- Developing medium-fidelity prototype
- Developing system implementation plan
- Other deliverables that are specified by the client/sponsor
- Presenting prototype to client

If you find potential new requirements to be considered for this Vision (Eye) Clinic Web-System, feel free to add them as "assumptions" in the documents where you list all the requirements of the system and employ them in your analysis, modelling, design and project report wherever necessary. Furthermore, inform the client about your information needs for covering complex business context in your design and development of the system prototype.