

INFO312 Information Systems Development Project



U N I V E R S I T Y
o f
O T A G O
Te Whare Wānanga o Otāgo
N E W Z E A L A N D

and



**NEW ZEALAND CHINESE ASSOCIATION,
OTAGO & SOUTHLAND BRANCH (INC.)**
紐西蘭歐他咭修付崙華聯支會

Final Documentation

Group #3

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Prepared for Grant Dick in accordance with INFO312 project guidelines

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1. Glossary

The 'Definitions' section states the meanings of defined terms and its intended interpretation throughout the document. NOTE: Words in the singular include the plural and words in the plural include the singular.

"Applicant" - a person who is applying to become a member of the Otago Southland Chinese Association

"Black-box Testing" - a method of software testing which does not require the knowledge of the internal system structure

"Clients" - Gordon Wong and the Committee of the Otago Southland Chinese Association

"Functional Requirement" - A specific capability that the system can carry out when implemented.

"Lo-Fi Prototype" - this task requires a mock of what the system may look like for the clients and the developers to provide agreement on the design. The set of low-fi prototypes will demonstrate the flow of processes for the benefit of the developers. Each low fi prototype will have a clear, detailed description of what is happening at each stage.

"Member" - a person belonging to the Otago Southland Chinese Association and/or its Committee

"MoSCoW" - a prioritisation method used to decide which requirements must be completed first and which must come later or will not be completed at all

- M - Must have
- S - Should have (if possible)
- C - Could have (only if it doesn't affect the systems functionality)
- W - won't have (but is an option for the future)

"OSCA" - the Otago Southland Chinese Association

"PERT Chart" - illustrates task duration and dependency information and shows various nodes that represent events or milestones of the project which are linked by lines that signify individual tasks.

"Project group" - includes the:

- Project Manager & Usability Manager: Sean Braid,
- Requirements Manager & Documentation Manager: Kendall Chin,
- Quality Manager & Testing and Review Manager: Gary Lee,
- Data Manager & Coding Manager: Jill Mirandilla, and
- Project Planner & Software Configuration Manager: Hans To'o.

"Stakeholders" - include the:

- OSCA President: Linus Chin,
- OSCA member in charge of Website & Membership: Gordon Wong,
- OSCA Treasurer (Adult & Elderly): Wayne Chin,
- OSCA Treasurer (Membership & Socials): Hector Wong, and
- OSCA Youth Leader: Frances Wong

"Users" - Gordon Wong, applicants of OSCA and all other end-users of the system that have the requisite privileges.

2. Project Proposal

A. Group Members

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Student ID: 397706
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Hans To'o (tooha427)
Student ID: 298159
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I. Primary Roles

Project Manager: Sean Braid

Project Planner: Hans To'o

Requirements Manager: Kendall Chin

Data Manager: Jill Mirandilla

Quality Manager: Gary Lee

II. Secondary Roles

SCM Manager: Hans To'o

Coding Manager: Jill Mirandilla

Testing and Review Manager: Gary Lee

Documentation Manager: Kendall Chin

Usability Manager: Sean Braid

B. Project Information

I. OSCA Membership Database and Financial Web Application

i. Client Description

The Otago Southland Chinese Association (OSCA) is an incorporated society which aims to build the local Chinese community in Otago and Southland. OSCA has a Committee made up of select members who manage their financials and maintain their membership database.

They are looking to create a system which would allow the Committee to carry out their responsibilities more efficiently. This would also enable the Committee to hand over their roles easily without having an extensive induction for their successors.

ii. Problem Description

The OSCA website has a page for new members where they fill out fields on a Google Form. These details from the Form are then manually checked and transferred by a Committee member to the membership database which is currently a spreadsheet stored on Google Drive.

OSCA would like a system with increased usability, improved functionality and a more navigable database to manage their large and growing membership. The system would have an interactive interface that would allow them to enter new members, search for existing members and to use search results to send emails or text alerts.

They also want the system to have a separate finance and accounting tool where the user enters in payments or withdrawals. This data will then feed into a reporting mechanism that will summarise the transactions over a given time period. This feature should also link the transaction to an OSCA member so that if they make a payment towards their fees (e.g. for membership or basketball), then OSCA would have a record of their payment history and account balance.

iii. Stakeholders

OSCA President: Linus Chin

OSCA Treasurer (Adult & Elderly): Wayne Chin

- handles payments for the club, including membership fees etc.

OSCA Treasurer (Membership & Socials): Hector Wong

- handles payments for the club, including membership fees etc.

OSCA member in charge of Website & Membership: Gordon Wong

- handles the membership database system, adding new members, updating membership details etc.

OSCA Youth Leader: Frances Wong

- handles a lot of the physical membership forms and membership fees

iv. Solution

We are currently thinking of building a web-based system linked to the membership database which allows the users to add, edit, and search the member's details. In addition to this CRUD-based functionality, we also intend to implement a reporting tool that will refine and analyse transactional data. Due to the sensitive nature of the data already accumulated on the OSCA database, we will create our own database with characteristics suitable for our system requirements.

This web-based system will be separate to the existing website. The system should have two separate interfaces, one for the member-side and one for the administrator-side. The administrator will have access to both and will be able to create and assign the user accounts for both sections of the system.

At this stage in the Development Project, it is likely that we will be designing and building this system from scratch, albeit with some parallels drawn from the business processes their current system already has in place.

3. System Proposal

A. Introduction

The System Proposal is the second deliverable of the project to be reviewed and approved by the client. Its purpose is to introduce the concepts for a system that is designed to resolve certain problems faced by the client.

This document outlines the intended course of action for the proposed system and provides information of interest to the stakeholders of OSCA. It will serve a clear definition of the problems to address, the contextual background of the business and system, as well as the key requirements necessary for a deliverable project. These requirements have been formulated and refined from prior discussions with the client and will form the basis of the system to produce. Once signed by both the client and the project group, this document will represent a full and formal agreement between the parties as to the terms and requirements of the system.

This document and the overall project deals with highly sensitive information and as such should not be viewed by anyone except the project group, the stakeholders and the supervising staff from the University of Otago.

B. Background

This section is about describing the client's purpose and origins. It gives a brief overview of the client and the system they currently have in place to manage the processes which we propose to re-work. The stakeholders directly interacting with the system are also described below.

I. OSCA Background

Established in 1935, OSCA primarily promotes the welfare and needs of local Chinese within the Otago and Southland regions. In its long history there have been many cycles of committee membership.

As a culturally-focused entity of going concern for many families and friends, membership records are important for the future. OSCA values their members and would like to be able to keep a record of them for subsequent generations. The idea of developing a system for handling membership data and financial data was brought to OSCA by Kendall Chin, one of the project group members. She is also a member of the 2014-2015 OSCA Committee and was motivated to improve the way OSCA manages their membership database.

II. Current Systems

OSCA currently has a web-page for applicants wishing to join where they fill out text fields on a Google Form. These details from the form are then manually checked and transferred by a Committee member (usually Gordon Wong) to the membership database, which is currently maintained as a spreadsheet stored on Google Drive. There is currently no mechanism in place for recording a member's financial transactions.

III. The Users of the Current System

The client-side users of the current system are all the applicants willing to join OSCA's member base. As for the administration-side, Gordon Wong is usually the only person who enters the membership

data into the database. He currently transcribes the data directly from either a hard-copy of the membership form or from an e-mail sent when an applicant fills out the online Google Form.

Hector Wong and Wayne Chin handle the financial transactions of OSCA members. They currently do not have an electronic system of recording the transactions and no way of tracking who paid for what and why.

C. Problem Definition

The purpose of this section is to give the key problems identified by the client in their current system. These problem definitions are those which we intend to address with our proposed system. The current system problems are as listed below:

I. The current system has one and only allows one administrator

Currently there is only one administrator who has the access and knowledge to carry out the required maintenance on the membership database. This is a problem because if the administrator is away or decides to leave their position within the OSCA committee, there is currently no one else to take over their role.

II. The current membership details are entered into the database manually

It is not good practice to edit the database directly. It can be very easy to type wrong data in the wrong areas and the database may not have data verification or validation. So to avoid this, having a system to inject the data into the correct places and using forms to validate and verify the data before entering into the database would be helpful.

III. The financial details are only recorded in hard-copy

When handling data and information, it is important to keep a persistent and accurate record for future use. It is always useful to be able to go back and check the records if a problem occurs. With hard copies, data and information can be easily lost when it is recorded. It can also be difficult to easily locate the necessary paperwork. To avoid this, an electronic copy of the financial records can make it easier, not only to ensure consistent recording of information, but it makes it easier to search for specific financial records.

IV. There are no rollbacks to previous versions

It is important to keep previous versions of databases and records in case of any future events that may corrupt the data or the system is compromised. Without this, the data may be lost and will be unable to be restored.

D. Risk Definitions

This section identifies the potential risks to the business as a result of the development and/or implementation of the proposed system. We highlight and define the crucial risks below:

I. Changing business requirements

This risk may be due to a misunderstanding of certain requirements which can lead to unexpected delays of the project implementation. It is important to clarify with the client what specific requirements they need for the proposed system to avoid win-lose situations where the developers are satisfied with the project result but the stakeholders are not.

II. Weak Security

Since this project will be a web-based application, security measures are paramount to protect the data and the infrastructure from system corruption by malicious third parties. These threats could steal data or corrupt the database which could lead to data loss and further security breaches.

III. Obstacles preventing development team from completing required work

It's the time of the year where some students in this group are unable to show up to the project meeting. This is due to the fact that some group members had any commitments or unexpected events which is why they had to miss meetings. Rescheduling the meeting can be a solution to resolve this issue where this time all of the group members are able to show up to the meeting.

IV. Project release delay

Since the development process of this project is expected to be done in six weeks, most of us group members have other projects to finish for other papers. This could conflict with the implementation of the prototype especially for the coding manager that has five papers to take on second semester. Sometimes if the prototype had lots of bugs, it may take a while to fix it which can be time consuming. This conflict could lead to project delay where project is submitted after the due date has past.

E. The Proposed System

This section sets out the actual system proposal for our Project group. It gives a high-level description of its intended functionality, the problems it seeks to resolve and the means by which the system intends to achieve them. Below is also identification of the main parties who will use the system as well as the constraints and assumptions under which this system will operate.

I. Overview

The proposed system is a web-based system linked to a membership database, which allows the users to add, edit, and search the member's details. In addition to this CRUD-based functionality we will implement a reporting tool that will refine and analyse transactional data. Due to the sensitive nature of the data already accumulated on the OSCA database, we will create our own database with characteristics suitable for our system requirements. The Web-based system will be separate to the existing system that is currently in use. The system will have one interface for the administrator-side.

Due to the fact that the client will not be receiving the finished prototype we have decided that it not suitable to build on the existing system and we will be creating a fully new working prototype but will be using the same principle ideas and business processes as their current system.

II. Constraints

OSCA membership is defined by two criteria: eligibility and payment.

To be an 'eligible' member of OSCA, the applicant must be of Chinese origin (i.e. by birth, descent, or de facto Chinese). 'Eligible' members are entitled to attend the New Zealand Chinese Association's Annual Easter Basketball Tournament and are able to apply for OSCA-provided scholarships and grants.

Eligibility is ultimately decided at the discretion of the OSCA Committee but if there is doubt of the applicant's origin then the applicant must provide evidence of nationality (e.g. through an attached birth certificate). Any applicant who is not of Chinese origin is an 'ineligible' member of OSCA and not privy to the benefits of an 'eligible' membership.

To be a 'current' member of OSCA, the applicant must have paid the membership fee and have it confirmed to have being paid by an administrator. An applicant who has not paid the fee upon applying or after becoming a member, will be a 'non-current' member of OSCA. All 'current' members will be offered discounted prices for OSCA-related events.

III. Users of the system

The main user of the system on the administration-side is Gordon Wong, who is also a member of the main group of stakeholders - the 2014-2015 Committee of OSCA. The client-side should be functional for applicants to use.

IV. Assumptions

1. The users will have a basic knowledge of computers and how to operate the system for their respective interface.
2. The data and information stored in the system by any user will be confidential and private.
3. When an administrator logs in, it is assumed that their username and password will be authenticated.
4. Users will have a device that is HTML5 compatible.

F. Requirements

Below is a list of the main system requirements to be satisfied during the development process. This sets out a measurable number of aspects the system can possess in order to achieve a minimum level of operability.

I. Functional Requirements

The functional requirements are to be sorted through MoSCoW analysis, listing each identified functional requirement in descending order of priority.

| Must Have |
|---|
| <ul style="list-style-type: none">• an applicant being able to insert their data into a form• an applicant being able to submit their application via a form on a website• a database able to store data transferred from a form on the website• an administrator being able to create, retrieve, update or delete member records• an administrator being able to record payments made by applicants/members• appropriate authentication and authorisation for database access |
| Should Have |
| <ul style="list-style-type: none">• a facility to verify that the data entered into the form are valid values• a facility to automatically confirm an applicant's eligibility criteria• a facility to record and sum a member's total payments over any given time period |

| Could Have |
|---|
| <ul style="list-style-type: none"> • a facility to automatically send e-mails and text messages to members • an administrator being able to filter records in the database according to set keywords • a facility to produce a report of a member's payment history |
| Want, but Won't Have |
| <ul style="list-style-type: none"> • a facility for applicants to make payments whilst making an application • a facility to verify an applicant's membership type • a member being able to login into a personal account • a member being able to review their payment history and membership status • a member being able to make online payments for goods and services • members to have a login system |

II. Non-Functional Requirements

| Performance requirements |
|--|
| <p><u>Availability</u></p> <ul style="list-style-type: none"> • The availability of the system should be at least 70%, considering the system will only be used when necessary. This system is not intended to be used for long periods of time each day. <p><u>Response time</u></p> <ul style="list-style-type: none"> • The time which the system should take to respond to a request or service should be within 3 seconds. <p><u>Scalability</u></p> <ul style="list-style-type: none"> • The system is working with a large amount of data, keeping record of historical and current information. Therefore, it will need to be able to accommodate for the increasing number of data to search through. |
| Compatibility requirements |
| <ul style="list-style-type: none"> • The system is web based and therefore will need to be rendered uniformly across all modern browsers, across their respective platforms. • The system will need to have compatibility with the latest version of Firefox. |

G. Acceptability

The purpose of this section is to show how our proposed system will met the client's requirements that have been requested. The following section will discuss the acceptability of our proposed system.

The system will be fully developed and acceptable when all of the following are true:

- All 'Must Have' functional requirements must be satisfied (refer to **section 8.1**)
- All non-functional requirements must be satisfied

H. Sign-off

The signatories below acknowledge that this document represents a full and formal agreement between the client and the project group. All signatories agree that:

- the problem and risk definitions sufficiently describe those faced by the clients,
- the proposed system will address the client's needs and the user's expectations as described, and
- the client will receive all documentation and related source code for the project at the conclusion of each deliverable.

Signed on behalf of the client:

Linus Chin _____ Date: _____

Signed by the project group:

Sean Braid _____ Date: _____

Kendall Chin _____ Date: _____

Gary Lee _____ Date: _____

Jill Mirandilla _____ Date: _____

Hans To'o _____ Date: _____

3. Project Plan

A. Work outline

This section outlines the tasks involved with the project as divided between the two phases. As Phase 1 focused on the administrator interface and Phase 2 on the client website, the functional requirements distributed via MoSCoW are spread across the iterations. The completion of Phase 1 should result in half of the 'Must Have' requirements satisfied, with Phase 2 finishing the baseline system. The aim is for both phases to incorporate as much of the 'Should Have' and non-functional requirements by the time the system is completed. The milestones for each iteration is set out below:

| Iteration | Prototype | Date |
|---------------------------|-----------------|---------------------------------|
| 1 st Iteration | Phase 1 | 21 st August 2015 |
| 2 nd Iteration | Phase 2 | 4 th September 2015 |
| 3 rd Iteration | Complete system | 18 th September 2015 |

I. 1st Iteration - Phase 1 Prototype

The Phase 1 Prototype will be a system that can be presented to the clients to use as database administrators. The priority is on the functional requirements which relate to the management of the database, rather than the web-based interface which will be accessed by applicants of OSCA. The requirements of this 1st iteration are set out below:

| Requirement | Definition |
|-----------------|---|
| Create Member | Database administrators will be provided with a facility to manually enter member details if necessary, for example if they receive applications via post. |
| Retrieve Member | A search function will be provided in the database GUI of the Member table, which will allow the database administrator to select specific members based on any criteria (e.g. ID, Name, Status). |
| Update Member | A database administrator will be able to select any member instance in the Member table and edit their details. The details of the Member will be displayed as a separate window, almost identical to the window for creating a new member. |
| Delete Member | Any member instance will be able to be deleted from the database, at the choice of the database administrator. The system should prompt the user with a warning message before they perform the deletion. |
| Login | To access the administrator interface, the user must provide their username and password for authentication in an initial login window. Successful login attempts will be granted access. |
| Performance | The main focus will be response time for the Phase 1 prototype, ensuring that the GUI will be respond in less than 3 seconds. This will be done by minimizing the GUI components and simplifying the prepared SQL statements that insert the data into the H2 database. |
| Compatibility | The Phase 1 Prototype should be able to function on all up-to-date Operating Systems, onwards from Windows 8.1, Mac OS X 10.9 and Ubuntu Linux 14.04LTS. |

II. 2nd Iteration – Phase 2 Prototype

The Phase 2 Prototype will incorporate the functional requirements necessary to implement the website for applicants of OSCA. Any aspects of Phase 1 not yet complete will be finished during this 2nd iteration. The relevant requirements are set out below:

| Requirement | Definition |
|---------------------------|--|
| Create Member application | An applicant should be able to create their own member record by filling out a JSP form on the website. This form should address all the necessary attributes for a member to be entered directly into the database. |
| Submit Member application | After filling out the details for an OSCA membership, the applicant should be able to submit their application to the database for approval by the administrator. The applicant should be directed to a page after submitting their application to confirm that their application has been received. |
| Store Member application | The submission of the member application should be directly stored to the H2 database if the details inserted by the applicant were valid values. |
| Accessibility | The system in both phases should be available at least 70%, particularly during peak usage. The system regardless should be able to handle all reasonable levels of usage at all times of the day. |
| Scalability | The database should be able to handle multiple operations and requests to the system, scaled appropriate to the expected level of data to be stored. |

III. 3rd Iteration – Completed System

The third iteration will be intended to complete any requirements unfinished from the two previous iterations. Any spare work capacity will go towards implementing any 'Should Have' requirements or further testing of 'Must Have' requirements.

B. Critical Path Method

The critical path of a project shows the path of tasks with zero "slack time", or the shortest time it will take for the project to be completed. This path connects all the tasks considered to be 'critical tasks' for project completion. These tasks are listed below:

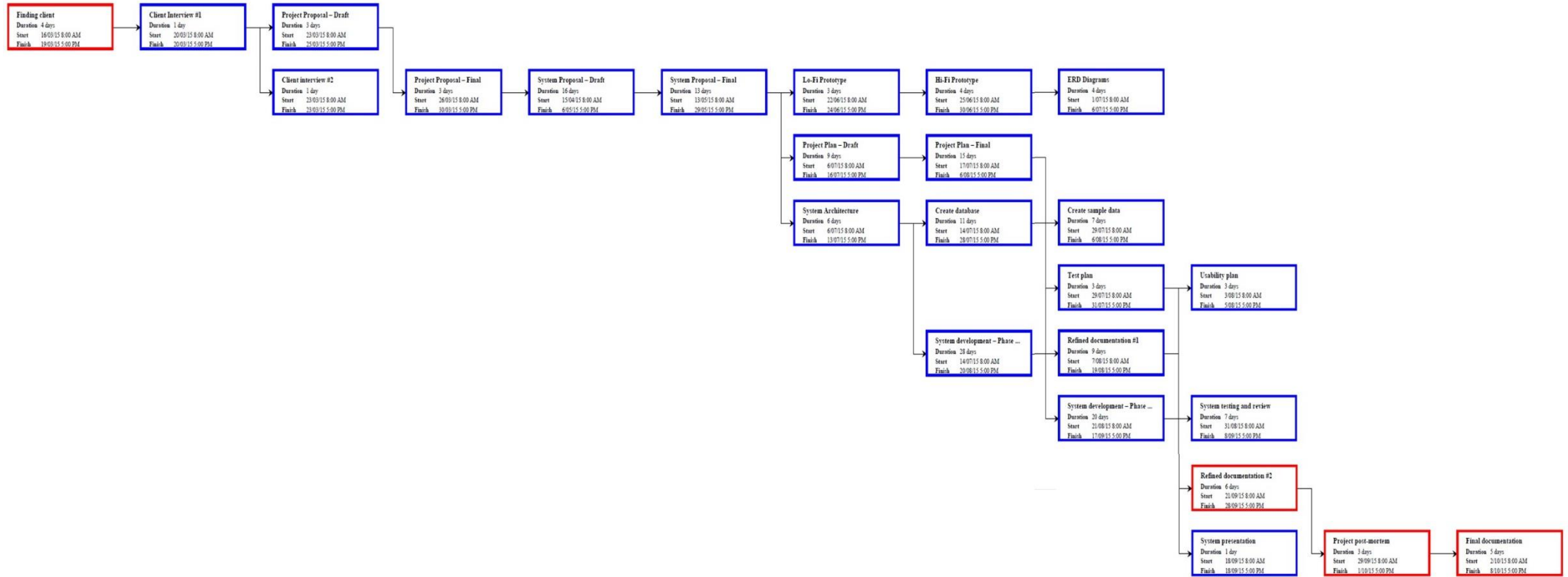
| Task ID | Task Description | Duration | Dependencies |
|---------|--------------------------|----------|--------------|
| T1 | Finding client | 4 days | |
| T22 | Refined documentation #2 | 6 days | T19 |
| T24 | Project post-mortem | 3 days | T22 |
| T25 | Final documentation | 5 days | T24 |

C. PERT Chart

This section shows the list of tasks for the system, their expected duration and respective dependencies. These are then illustrated in a PERT chart, which links the tasks according to their dependencies, displaying information about their completion times. The order of tasks to be performed is shown by the direction of the arrows connecting each task.

| Task ID | Task Description | Duration | Dependencies |
|---------|--|----------|--------------|
| T1 | Finding client | 4 days | |
| T2 | Client interview #1 | 1 day | T1 |
| T3 | Project Proposal – Draft | 3 days | T2 |
| T4 | Client interview #2 | 1 day | T2 |
| T5 | Project Proposal – Final | 3 days | T3 |
| T6 | System Proposal – Draft | 16 days | T5 |
| T7 | System Proposal – Final | 13 days | T6 |
| T8 | Lo-Fi Prototype | 3 days | T7 |
| T9 | Hi-Fi Prototype | 4 days | T8 |
| T10 | ERD Diagrams | 4 days | T9 |
| T11 | Project Plan – Draft | 9 days | T7 |
| T12 | Project Plan – Final | 15 days | T11 |
| T13 | System Architecture | 6 days | T7 |
| T14 | Create database | 11 days | T13 |
| T15 | Create sample data | 7 days | T14 |
| T16 | Test plan | 3 days | T14 |
| T17 | Usability plan | 3 days | T16 |
| T18 | System development – Phase 1 Prototype | 28 days | T13 |
| T19 | Refined documentation #1 | 9 days | T12 |
| T20 | System development – Phase 2 Prototype | 20 days | T18 |
| T21 | System testing and review | 7 days | T16 |
| T22 | Refined documentation #2 | 6 days | T19 |
| T23 | System presentation | 1 day | T20 |
| T24 | Project post-mortem | 3 days | T22 |
| T25 | Final documentation | 5 days | T24 |

The PERT chart for these tasks is displayed below:



D. Schedule of tasks

Below is the schedule of tasks required for the project. It states whom has the primary responsibility for that task, as well as an estimated measure of the level of effort required per task (in hours). The dates for each task are also included.

| Task Description | Responsibility | Optimistic Effort Estimate | Realistic Effort Estimate | Pessimistic Effort Estimate | Effort Estimate | Planned Start Date | Planned Finish Date |
|------------------------------|------------------------------|----------------------------------|---------------------------------|-----------------------------------|--------------------|-----------------------|------------------------|
| ONGOING TASKS | | | | | | | |
| Project meetings | Group | 20 | 40 | 50 | 38.3 | 16/3/15 | 9/10/15 |
| Meeting with Supervisor | Group | 10 | 15 | 30 | 16.7 | 16/3/15 | 9/10/15 |
| Meeting with Client | Group | 5 | 20 | 35 | 20.0 | 16/3/15 | 9/10/15 |
| Weekly journal entries | Group | 5 | 10 | 12 | 9.5 | 16/3/15 | 9/10/15 |
| PRE-DEVELOPMENT TASKS | | | | | | | |
| Project Proposal | Kendall Chin/Hans To'o | 15 | 20 | 25 | 20.0 | 23/3/15 | 25/3/15 |
| Project Proposal Review | Group | 1 | 3 | 4 | 2.8 | 26/3/15 | 30/3/15 |
| System Proposal | Kendall Chin/Hans To'o | 20 | 25 | 30 | 25.0 | 15/4/15 | 6/5/15 |
| System Proposal Review | Group | 1 | 2 | 3 | 2.0 | 13/5/15 | 29/5/15 |
| Interface Prototypes | Kendall Chin/Jill Mirandilla | 5 | 9 | 12 | 8.8 | 22/6/15 | 30/6/15 |
| ERD Design | Hans To'o/Jill Mirandilla | 3 | 6 | 8 | 5.8 | 1/7/15 | 6/7/15 |
| Project Plan | Hans To'o | 20 | 25 | 30 | 25.0 | 6/7/15 | 16/7/15 |
| Project Plan Review | Group | 1 | 2 | 3 | 2.0 | 17/7/15 | 6/8/15 |
| Database creation | Sean Braid/Gary Lee | 1 | 3 | 4 | 2.8 | 14/7/15 | 28/7/15 |
| Sample data | Jill Mirandilla | 10 | 17 | 20 | 16.3 | 29/7/15 | 6/8/15 |
| Test Plan | Gary Lee/Jill Mirandilla | 5 | 8 | 10 | 7.8 | 29/7/15 | 31/7/15 |
| Test Plan Review | Group | 4 | 5 | 8 | 5.3 | 6//15 | 1/8/15 |
| System Architecture | Gary Lee | 3 | 8 | 9 | 7.3 | 1/7/15 | 6/7/15 |
| System Architecture Review | Group | 4 | 5 | 8 | 5.3 | 6/7/15 | 13/7/15 |
| Usability Plan | Sean Braid/Hans To'o | 9 | 10 | 16 | 10.8 | 3/8/15 | 4/8/15 |
| Usability Plan Review | Group | 3 | 8 | 9 | 7.3 | 4/8/15 | 7/8/15 |
| PHASE 1 PROTOTYPE | | | | | | | |
| Create Member | Sean Braid/Gary Lee | 5 | 8 | 9 | 7.67 | 13/7/15 | 17/7/15 |
| Retrieve Member | Sean Braid/Gary Lee | 4 | 6 | 8 | 6.00 | 13/7/15 | 17/7/15 |

| | | | | | | | |
|---------------------------|------------------------------|------------|------------|------------|---------------|----------------|----------------|
| Update Member | Sean Braid/Gary Lee | 3 | 5 | 7 | 5.00 | 13/7/15 | 17/7/15 |
| Delete Member | Sean Braid/Gary Lee | 3 | 4 | 7 | 4.33 | 13/7/15 | 17/7/15 |
| Login | Gary Lee | 5 | 7 | 9 | 7.00 | 20/7/15 | 24/7/15 |
| Performance | Kendall Chin | 4 | 6 | 8 | 6.00 | 31/7/15 | 4/8/15 |
| Compatibility | Kendall Chin | 3 | 5 | 7 | 5.00 | 31/7/15 | 4/8/15 |
| Requirements checklist | Group | 1 | 2 | 3 | 2.00 | 5/8/15 | 14/8/15 |
| Integration testing | Gary Lee/Jill Mirandilla | 1 | 2 | 3 | 2.00 | 5/8/15 | 17/8/15 |
| Test reporting | Gary Lee/Jill Mirandilla | 2 | 4 | 6 | 4.00 | 5/8/15 | 21/8/15 |
| Usability reporting | Gary Lee | 2 | 4 | 6 | 4.00 | 5/8/15 | 21/8/15 |
| Phase 1 SCM | Sean Braid/Hans To'o | 3 | 5 | 7 | 5.00 | 13/7/15 | 21/8/15 |
| PHASE 2 PROTOTYPE | | | | | | | |
| Create Member application | Jill Mirandilla/Kendall Chin | 5 | 8 | 9 | 7.67 | 21/8/15 | 29/8/15 |
| Submit Member application | Jill Mirandilla/Kendall Chin | 3 | 5 | 7 | 5.00 | 24/8/15 | 31/7/15 |
| Store Member application | Jill Mirandilla/Kendall Chin | 3 | 5 | 7 | 5.00 | 25/8/15 | 1/9/15 |
| Accessibility | Kendall Chin | 4 | 6 | 8 | 6.00 | 1/9/15 | 5/9/15 |
| Scalability | Kendall Chin | 3 | 5 | 7 | 5.00 | 1/9/15 | 5/9/15 |
| Requirements checklist | Group | 1 | 2 | 3 | 2.00 | 6/9/15 | 12/9/15 |
| Integration testing | Gary Lee/Jill Mirandilla | 1 | 2 | 3 | 2.00 | 21/8/15 | 14/9/15 |
| Test reporting | Gary Lee/Jill Mirandilla | 2 | 4 | 6 | 4.00 | 21/8/15 | 14/9/15 |
| Usability reporting | Gary Lee | 2 | 4 | 6 | 4.00 | 21/8/15 | 14/9/15 |
| Phase 2 SCM | Sean Braid/Hans To'o | 3 | 5 | 7 | 5.00 | 21/8/15 | 17/9/15 |
| POST-MORTEM TASKS | | | | | | | |
| Final Test Report | Gary Lee/Jill Mirandilla | 5 | 10 | 15 | 10.00 | 21/9/15 | 8/10/15 |
| Final Usability Report | Gary Lee | 5 | 10 | 15 | 10.00 | 21/9/15 | 8/10/15 |
| Final System Architecture | Hans To'o | 5 | 10 | 15 | 10.00 | 21/9/15 | 8/10/15 |
| Project Post-Mortem | Group | 5 | 9 | 13 | 9.00 | 29/9/15 | 8/10/15 |
| TOTAL | | 228 | 384 | 527 | 381.47 | 16/3/15 | 8/10/15 |

4. System Architecture

A. Lo-Fi Prototypes

Displayed below are 6 Lo-Fi mock-ups of the system interface. The Lo-Fi prototypes related to Phase 1 are shown here:

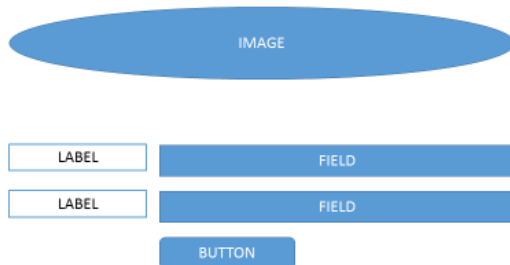


Figure 1 - Login

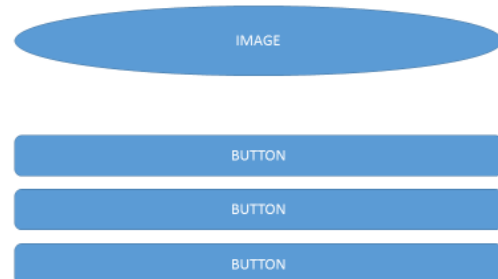


Figure 2 - Menu

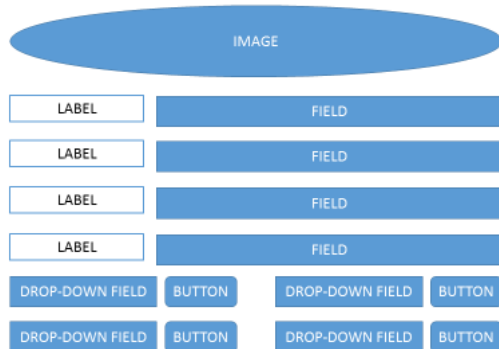


Figure 3 – Member Form

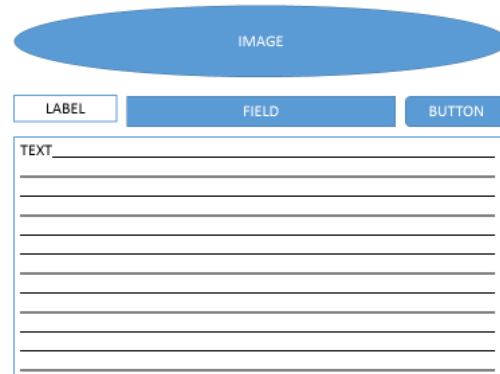


Figure 4 - Database

The Lo-Fi Prototypes for Phase 2's web pages are illustrated below:



Figure 5 - Home Page

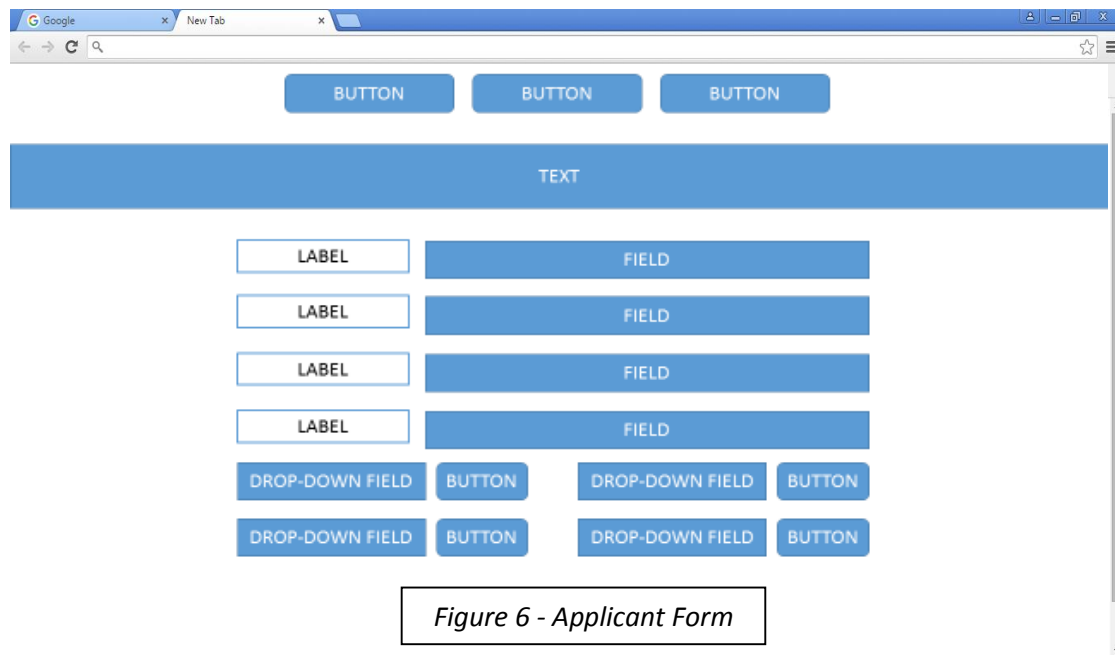


Figure 6 - Applicant Form

B. Development Frameworks and Tools

This section outlines the various technologies to be utilised in the proposed system. The majority of these resources have been provided by the University of Otago, through their own software licences and computer hardware. Each group member has also used their own computers and software for documentation and development when necessary.

I. Components

Almost the entirety of the system was built using Netbeans IDE 8.0, which provided the platform to compile and run the system prototypes. The Phase 1 Prototype's desktop GUI was built using Swing components, whilst the Phase 2 Prototype's web pages utilised JSPs and Servlets conjunctively (with CSS included for styling).

For the membership database, we used H2 as the relational database engine for the Phase 1 Prototype and Tomcat for the Phase 2 Prototype web server. The database would be connected to by the applications through JDBC.

II. Languages

Java was the main programming language used during system development, as it was the most familiar to the group and was compatible with Netbeans. The manipulation of the data in the database however was coded with SQL, which would be sent as prepared statements in the database connection from either the Phase 1 or Phase 2 Prototype.

C. Data Model

To design the structure of the data to be stored in the database, Oracle SQL Data Modeler was utilised to create the ERD for the data model. The design we based our database upon is reflected below:

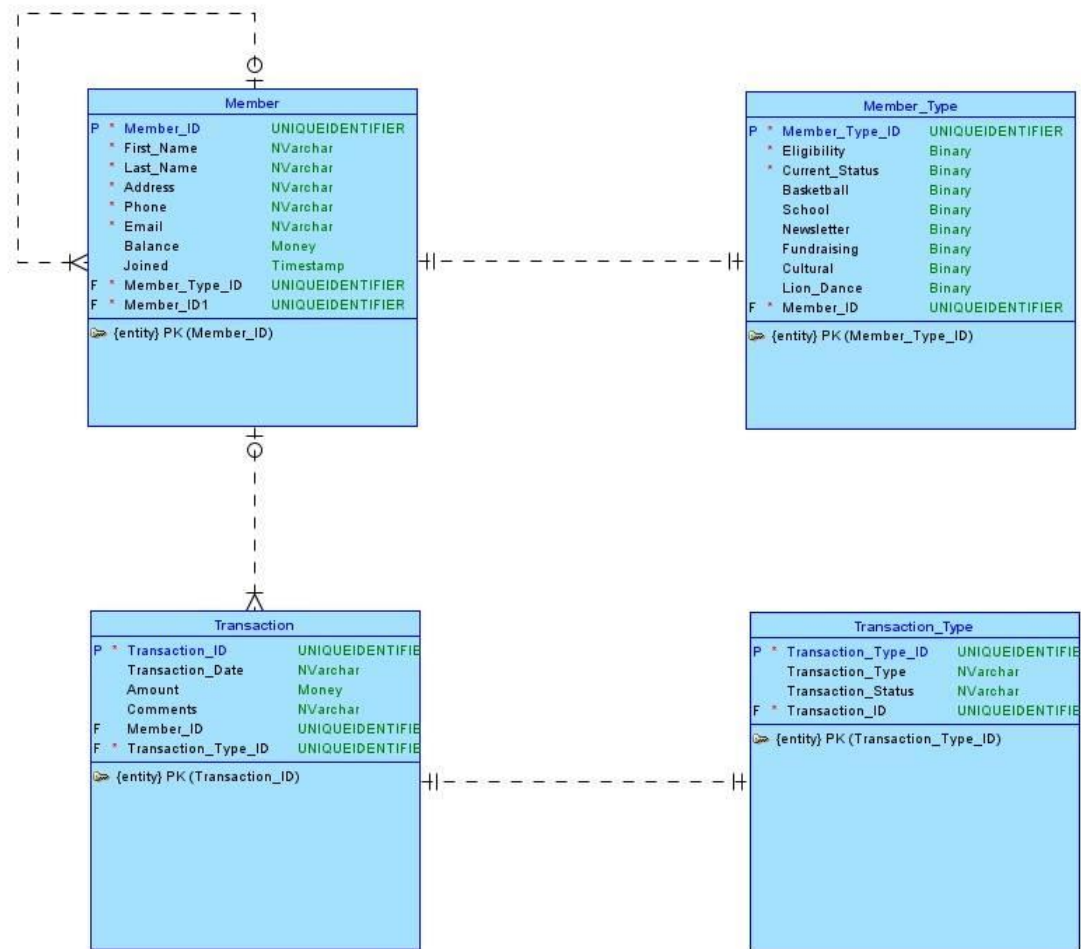


Figure 7 - Database ERD

D. Software Configuration Management

We used GitBucket to manage the different versions of our project as we progressed through development. As a distributed version control system, we were able to work simultaneously as a group on different aspects of the system and then push to GitBucket where changes would be merged together. A total of 278 commits were made over the lifespan of the project.

5. Test Plan

The purpose of this document is to help ensure that the development team produce the system to a high standard. This is done by running multiple tests and applying criteria for the tests. The system is required to meet all of the 'Must Have' requirements as listed in the in the System Proposal. The developers of the system have undertaken Black-box Testing to make sure the requirements have been met.

A. Test Cases and Outcomes

| Case | Pass Criteria | Outcome (Pass/Fail) | Issue | Solution |
|-----------------------|--|---------------------|---|---|
| PHASE 1 PROTOTYPE | | | | |
| Login Dialog | | | | |
| Login button | Administrator will be directed to the main panel if their login details are correct. | Fail | Incorrect details returns a console error | Catch failed authentication with a dialog message |
| Main Dialog | | | | |
| Add new member button | Opens dialog to allow administrator to enter details for a new member. | Pass | | |
| View members button | Opens dialog to display members | Pass | | |
| View payments button | Opens dialog to display payments | Pass | | |
| Exit button | Exits the system. | Pass | | |
| Add New Member Dialog | | | | |

| | | | | |
|---|---|------|--|--|
| Text inputs | Ensure the Administrator can enter text into the text input fields | Pass | | |
| Add sibling button | Open a new dialog to allow admin to enter details of the member's sibling. | Pass | | |
| Add partner button | Open a new dialog to allow admin to enter details of the member's partner. | Pass | | |
| Add children button | Open a new dialog to allow admin to enter details of the member's child. | Pass | | |
| Save | Will take the details entered and create a new member object and add member to the database. It should also close the dialog. | Pass | | |
| Refresh button | Will display and add the family members to the correct boxes displayed. | Pass | | |
| Subscription drop down list | Ensure the Administrator can click to see the other options and select one for the member | Pass | | |
| Siblings, partner, and children results display | Ensure the boxes display the member's siblings, | Pass | | |

| | | | | |
|----------------------------|---|------|--------------------------------------|--|
| | partner, and children appropriately. | | | |
| Activity radio boxes | Ensure that the radio boxes are able to be selected, and that the corresponding activity is added to the member's details when added. | Pass | | |
| Eligibility drop down list | Ensure the Administrator can see the options for eligibility and be able to choose the appropriate one for the member. | Pass | | |
| Cancel button | Closes the Add New Member dialog. | Pass | | |
| View Member Dialog | | | | |
| Search by ID | Updates list to display the member with the ID input from the Administrator. | Fail | No output shown if ID does not exist | Dialog message should be initiated informing the user that the ID does not exist |
| Search Category | Ensures the Administrator can see all of the options in the drop down list and that the results display box is updated to show the corresponding members. | Pass | | |

| | | | | |
|-----------------------------|---|------|---|--|
| Search by Status | Ensures the Administrator can see all of the options in the drop down list and that the results display box is updated to show the corresponding members. | Fail | No mechanism for catching incorrect status values | Constraint in place for correct Status values |
| Results list | Allows administrator to highlight/select the member to edit/delete. | Pass | | |
| Edit button | Opens a dialog of the member's profile to allow the administrator to make changes. | Pass | | |
| Delete button | Opens an alert box to check if the administrator is sure they want to delete the selected member. | Pass | | |
| Cancel button | Closes the view members dialog. | Fail | No warning box regarding any unsaved changes | Warning provision before cancelling |
| View Payments Dialog | | | | |
| Search by ID | Ensures the Administrator can input a payment ID and that the results display box is updated to show the corresponding payment. | Fail | No output shown if ID does not exist | Dialog message should be initiated informing the user that the ID does not exist |

| | | | | |
|--------------------------|--|------|--|-------------------------------------|
| Results list | Allows administrator to highlight/select the payment to edit/delete. | Pass | | |
| Cancel button | Closes the view payments dialog. | Fail | No warning box regarding any unsaved changes | Warning provision before cancelling |
| PHASE 2 PROTOTYPE | | | | |
| Home Page | | | | |
| Navigation bar | Links redirect to the corresponding pages | Pass | | |
| Membership Page | | | | |
| Text inputs | Ensure the Applicant can enter text into the text input fields | Pass | | |
| Add sibling button | Open a new form to enter details of the member's sibling. | Pass | | |
| Add partner button | Open a new form to enter details of the member's partner. | Pass | | |
| Add children button | Open a new form to enter details of the member's child. | Pass | | |
| Save | Will take the details entered and create a new member object and add | Pass | | |

| | | | | |
|----------------|---|------|--|--|
| | member to the database. It should also redirect to a submission page. | | | |
| Refresh button | Will display and add the family members to the correct boxes displayed. | Pass | | |

6. User Documentation

A. Scenarios

Scenarios have been created to help ensure that the system will perform well for different users. The following scenarios are supposed to re-create real situations:

I. Scenario #1

A student new to Dunedin was given a brochure at the OUSA Clubs and Societies day. He decided to join OSCA using the online form. He is HSFY and is looking to make new friends and join the social basketball team.

II. Scenario #2

A family who has just moved to Dunedin and is looking to be involved in the Chinese community in Dunedin. They saw a performance of the OSCA Lion Dance Troupe at a school fair, and would like to get their own kids involved. They have entered their details into the membership form online for their family.

III. Scenario #3

A single adult has moved to Dunedin from Wellington. In Wellington they were very involved with the Wellington branch of the New Zealand Chinese Association (NZCA). Now that they are living in Dunedin they want to become part of the OSCA committee and be involved with coaching Basketball.

IV. Scenario #4

The administrator wants to go through and do the following tasks:

- Check the pending membership applications and check with any new payments to see if they have completed their membership.
- Add any new members who have entered their membership details on paper.
- Record any recent payments
- Change any details of members they have requested editing.

B. Sample Data and Scenario Walk-through

I. Scenario #1

Step 1 - Blake is a Chinese student that wants to join OSCA through online form



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MEMBERSHIP

Member

Contact Details:

First Name: Blake

Last Name: Lu

Address: 34 Crawford St

Phone: 023452233

Email: blakelu@gmail.com

Are you Chinese: Yes

Activities involved:

☒ Basketball

☐ Chinese School

☐ Newsletter

☐ Social

☐ Fundraising

☐ Cultural

☐ Other

Subscription:

Student - \$5

Submit

Step 2 - His membership was successfully submitted



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MEMBERSHIP SUBMIT

Thank you for submitting your membership to Otago Southland Chinese Association.

Step 3 - His details are now submitted in the database

| SELECT * FROM MEMBERS; | | | | | | | | | | | | |
|------------------------|-----------|------------|----------------|-------------|-------------------|--------------|-----------------|------------------------------|---|--------------------|--------|-------------|
| ID | FIRSTNAME | LASTNAME | ADDRESS | PHONENUMBER | EMAIL | PARTNERSNAME | SIBLINGSNAME | CATAGORIES | SUBSCRIPTION | CHILD | STATUS | ELIGIBILITY |
| 1071884 | William | Mirandilla | jfkadjfs | 36534536 | | null | [Jill, Meow] | [Basketball, Chinese School] | Family (Parents and children under 21) - \$20 | null | C | No |
| 1316091 | Jeddy | Teddy | fasdfjkiasdj | | | Buddy Holly | [Elvis, Barbie] | [Basketball, Social] | family | [Spencer, Brendon] | P | Yes |
| 1449101 | Blake | Lu | 34 Crawford St | 023452233 | blakelu@gmail.com | null | [] | [Basketball] | student | [] | P | Yes |

Step 4 - We can also see his details on the administrator-side of the system

The screenshot shows a web application window titled "Membership Report". It features a search bar with the text "Search by ID:" and a "Search" button. Below the search bar are two dropdown menus labeled "Category:" and "Status:". At the bottom of the window, there is a table listing member details. The table has columns for ID, Name, Address, Phone #, Email, Participation, and Subscription Type. The first row shows a member with ID 1449101, Name Blake Lu, Address 34 Crawford St, Phone # 023452233, Email blakelu@gmail.com, Participation [Basketball], and Subscription Type student.

| ID | Name | Address | Phone # | Email | Participation | Subscription Type |
|---------|------------|----------------|-----------|-------------------|--|-------------------------------|
| 1449101 | Blake Lu | 34 Crawford St | 023452233 | blakelu@gmail.com | [Basketball] | student |
| 1657024 | Hans Too | jfkasjdf | 43532425 | | [Basketball, Cultural] | Family (Parents and children) |
| 2257352 | James Reid | jfaklsdjf | | | [Basketball, Chinese School, Newsletter, Social] | family |

Step 5 - Now we are going to make a payment for his membership by clicking the 'Payment' button at the bottom

The screenshot shows a web application window titled "Make Payment". It features a logo for the New Zealand Chinese Association, Otago & Southland Branch (Inc.) at the top left. Below the logo, there is a form with fields for Payment ID, Member ID, Amount \$, Description, Date Paid, and Date Recorded. The Payment ID field is filled with 8649522, Member ID with 1449101, Amount \$ with 5.00, Description with Membership payment, Date Paid with 9/10/2015, and Date Recorded with 9/10/2015. At the bottom of the form, there are two buttons: "Save" and "Close".

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Make Payment

Payment ID: 8649522

Member ID: 1449101

Amount \$: 5.00

Description: Membership payment

Date Paid: 9/10/2015

Date Recorded: 9/10/2015

Save Close

Step 6 - After saving his membership payment, we can keep track of any payments made for this system

The screenshot shows a web application window titled "Payment ID". It features a logo for the New Zealand Chinese Association, Otago & Southland Branch (Inc.) at the top left. Below the logo, there is a search bar with the text "Payment ID:" and a "Search" button. Below the search bar, there is a table listing payment details. The table has columns for Payment ID, Member ID, Amount, Description, and Date Paid. The first row shows a payment with ID 1936220, Member ID 9850031, Amount 6.03, Description Cap, and Date Paid 9/10/2015. The second row shows a payment with ID 2799031, Member ID 4263732, Amount 5.0, Description Coffee Mug, and Date Paid 9/10/2015. The third row shows a payment with ID 7449725, Member ID 9850031, Amount 5.9, Description Tshirt, and Date Paid 9/10/2015. The fourth row shows a payment with ID 8649522, Member ID 1449101, Amount 5.0, Description Membership payment, and Date Paid 9/10/2015.

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Payment ID: Search

| Payment ID | Member ID | Amount | Description | Date Paid |
|------------|-----------|--------|--------------------|-----------|
| 1936220 | 9850031 | 6.03 | Cap | 9/10/2015 |
| 2799031 | 4263732 | 5.0 | Coffee Mug | 9/10/2015 |
| 7449725 | 9850031 | 5.9 | Tshirt | 9/10/2015 |
| 8649522 | 1449101 | 5.0 | Membership payment | 9/10/2015 |

Step 7 - Also we can edit his details if needed. This time we're going to edit his membership status from 'Pending' (P) to 'Complete' (C)



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ID: 1449101

First Name: Blake

Last Name: Lu

Email: blakelu@gmail.com

Address: 34 Crawford St

Phone: 023452233

Status: C

Partner: [Add Partner](#)

Sibling: [Add Sibling](#)

Children: [Add Children](#)

Subscription: Student - \$5

Siblings

Partner

Children

Refresh

☐ Social

☐ Fundraising

☒ Basketball

☐ School

☐ Newsletter

☐ Cultural

Are you Chinese? Yes

Save

Cancel

II. Scenario #2

Step 1 - The Chang family signed up on OSCA through online form

MEMBERSHIP

Member

Contact Details:
First Name: John
Last Name: Chang
Address: 8 Abbey Road
Phone: 027845231
Email: nikechang@yahoo.com
Are you Chinese: Yes

Activities involved:
☐ Basketball
☐ Chinese School
☐ Newsletter
☒ Social
☐ Fundraising
☒ Cultural
☐ Other

Subscription:
Family (Parents and children under 21) - \$20
Partner: Yes No
Siblings: Yes No
Children: Yes No

Partner

Contact Details:
First Name: Michelle
Last Name: Chang
Address: 8 Abbey Road
Phone: 027345413
Email: hellechang@gmail.com
Are you Chinese: Yes

Activities involved:
☐ Basketball
☒ Chinese School
☐ Newsletter
☒ Social
☐ Fundraising
☐ Cultural
☐ Other

Child 1

Contact Details:
First Name: Michael
Last Name: Chang
Address: 8 Abbey Road
Phone: 021353132
Email: mhaelchang@gmail.com
Are you Chinese: Yes

Activities involved:
☐ Basketball
☒ Chinese School
☐ Newsletter
☒ Social
☐ Fundraising
☐ Cultural
☐ Other

Child 2

Contact Details:
First Name: Frank
Last Name: Chang
Address: 8 Abbey Road
Phone: 0201245423
Email: frankchang@gmail.com
Are you Chinese: Yes

Activities involved:
☐ Basketball
☒ Chinese School
☐ Newsletter
☒ Social
☐ Fundraising
☐ Cultural
☐ Other

Submit

Step 2 - John Chang signed up as a family with his wife, Michelle and their children Michael and Frank. As soon as their membership details has been successfully submitted, we can actually see in the database that John's partner, Michelle is on the PARTNERSNAME column while Michelle's membership detail has John as her partner. Their child, Michael and Frank also appears on their CHILD column. Michael has Frank as his SIBLINGSNAME while Frank has Michael as his SIBLINGSNAME. Therefore we can see that every partner, child, and siblings can also be a member of the association as long as they are signed up as a family with their parents

```
SELECT FirstName, LastName, PartnersName, SiblingsName, Child, Status FROM MEMBERS where lastname = 'Chang';
```

| FIRSTNAME | LASTNAME | PARTNERSNAME | SIBLINGSNAME | CHILD | STATUS |
|-----------|----------|----------------|--------------|------------------|--------|
| Frank | Chang | null | [Michael] | null | P |
| John | Chang | Michelle Chang | [] | [Michael, Frank] | P |
| Michelle | Chang | John Chang | null | [Michael, Frank] | P |
| Michael | Chang | null | [Frank] | null | P |

(4 rows, 0 ms)

III. Scenario #3

Step 1 - Alex Burris is a single adult that came to Dunedin from Wellington to live and wants to be a part of OSCA committee to be involved with Basketball coaching. Before he went to Dunedin, he was a member of NZCA in Wellington. He signed up to be a member through online form

| HOME | MEMBERSHIP | ABOUT |
|---|--|---|
| MEMBERSHIP | | |
| Member | | |
| Contact Details: First Name: Alex Last Name: Burris Address: 45 Wasabi Rd Phone: 0234623541 Email: alexburris@gmail.com Are you Chinese: Yes ▾ | Activities involved: <input checked="" type="checkbox"/> Basketball <input type="checkbox"/> Chinese School <input type="checkbox"/> Newsletter <input type="checkbox"/> Social <input type="checkbox"/> Fundraising <input type="checkbox"/> Cultural <input checked="" type="checkbox"/> Other | Subscription: Single Adult - \$10 |
| Submit | | |

Step 2 - Administrator's privilege - Check for pending membership applications. Any administrator can see that Blake's membership details have been successfully submitted. However, his membership status is still marked as 'P' for 'Pending' since he hasn't paid his membership when he signed up through an online form

| SELECT * FROM MEMBERS; | | | | | | | | | | | | |
|------------------------|-----------|------------|----------------|-------------|-------------------|--------------|-----------------|------------------------------|---|--------------------|--------|-------------|
| ID | FIRSTNAME | LASTNAME | ADDRESS | PHONENUMBER | EMAIL | PARTNERSNAME | SIBLINGSNAME | CATAGORIES | SUBSCRIPTION | CHILD | STATUS | ELIGIBILITY |
| 1071884 | William | Mirandilla | jfkadjfs | 36534536 | | null | [Jill, Meow] | [Basketball, Chinese School] | Family (Parents and children under 21) - \$20 | null | C | No |
| 1316091 | Jeddy | Teddy | fasdfjkiasdj | | | Buddy Holly | [Elvis, Barbie] | [Basketball, Social] | family | [Spencer, Brendon] | P | Yes |
| 1449101 | Blake | Lu | 34 Crawford St | 023452233 | blakelu@gmail.com | null | [] | [Basketball] | student | [] | P | Yes |

Step 3 - Apparently the administrator just received a payment made by Blake through their bank account. It shows that Blake paid \$5.00 for his membership fee in order to process his membership subscription with OSCA

| Membership Report | |
|--|----------------------|
| Search by ID: | <input type="text"/> |
| Category: | <input type="text"/> |
| Status: | <input type="text"/> |
| Search | |
| ID: 1449101 Name: Blake Lu Address: 34 Crawford St Phone #: 023452233 Email: blakelu@gmail.com Participation: [Basketball] Subscription Type: student | |
| ID: 1657024 Name: Hans Too Address: jfkasjdf Phone #: 43532425 Email: Participation: [Basketball, Cultural] Subscription Type: Family (Parents and childre | |
| ID: 2257352 Name: James Reid Address: jfaklsdjf Phone #: Email: Participation: [Basketball, Chinese School, Newsletter, Social] Subscription Type: family | |

Step 4 - The administrator will make a payment for Blake's membership by selecting Blake's membership details on the 'Membership Report' dialog and clicking the 'Payment' button at the bottom



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Make Payment

Payment ID: 8649522

Member ID: 1449101

Amount \$: 5.00

Description: Membership payment

Date Paid: 9/10/2015

Date Recorded: 9/10/2015

Save Close

Step 5 - After the administrator saves Blake's payment, the administrator can now keep track of any payments made for this system



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Payment ID: Search

| |
|---|
| Payment ID: 1936220 Member ID: 9850031 Amount: 6.03 Description: Cap Date Paid: 9/10/2015 |
| Payment ID: 2799031 Member ID: 4263732 Amount: 5.0 Description: Coffee Mug Date Paid: 9/10/2015 |
| Payment ID: 7449725 Member ID: 9850031 Amount: 5.9 Description: Tshirt Date Paid: 9/10/2015 |
| Payment ID: 8649522 Member ID: 1449101 Amount: 5.0 Description: Membership payment Date Paid: 9/10/2015 |

Step 6 - The administrator can also edit his membership details if needed. This time the administrator will change Blake's membership status from 'Pending' (P) to 'Complete' (C)



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ID: 1449101

First Name: Blake

Last Name: Lu

Email: blakelu@gmail.com

Address: 34 Crawford St

Phone: 023452233

Status: C

Partner: [Add Partner](#)

Sibling: [Add Sibling](#)

Children: [Add Children](#)

Subscription: Student - \$5

Siblings

Partner

Children

Refresh

☐ Social

☐ Fundraising

☒ Basketball

☐ School

☐ Newsletter

☐ Cultural

Are you Chinese? Yes

SaveCancel

IV. Scenario #4

Step 1 - Administrator adding new members that signed up through paper onto the system. Ringo Starr is a single adult that signed up as an OSCA member through paper forms when he attended a cultural event for OSCA. When he signed up as a member he already paid his subscription fee during the cultural event. Now that the administrator has Ringo's membership details he will process Ringo's membership by entering his details onto the system.

**NEW ZEALAND CHINESE ASSOCIATION,
OTAGO & SOUTHLAND BRANCH (INC.)**
紐西蘭歐他咭修付崙華聯支會

ID: 5926061

First Name: Ringo

Last Name: Starr

Email: ringostarr@gmail.com

Address: 56 Penny Lane

Phone: 0234641244

Status: C

Partner:

Sibling:

Children:

Subscription:

Single Adult - \$10

Siblings

Partner

Children

☐ Social

☒ Fundraising

☐ Basketball

☒ School

☐ Newsletter

☐ Cultural

Are you Chinese?

No

Step 2 - Changing membership details. Lucy is a finance student and a member of OSCA. She participates in 'Fundraising' and 'Basketball'. Since she has moved into a new flat from 7 Stafford Rd to 7 Hyde St she emailed OSCA to have her home address changed.

Membership Report

Search by ID:

Category:

Status:

Search

| | | | | | | |
|-------------|--------------------------|------------------------|---------------------|---------------------------|---|---|
| ID: 1071884 | Name: William Mirandilla | Address: jfkadjfjls | Phone #: 36534536 | Email: | Participation: [Basketball, Chinese School] | Subscription Type: Family (Pa |
| ID: 1316091 | Name: Jeddy Teddy | Address: fasdfjklasdj | Phone #: | Email: | Participation: [Basketball, Social] | Subscription Type: family [Status: P [Eligibility: Yes |
| ID: 1596801 | Name: Buddy Holly | Address: jfklsdjfjk | Phone #: 54323452 | Email: | Participation: [Basketball, Social, Fundraising] | Subscription Type: family [Status |
| ID: 1657024 | Name: Hans Too | Address: jfkasjdf | Phone #: 43532425 | Email: | Participation: [Basketball, Cultural] | Subscription Type: Family (Parents and childre |
| ID: 2257352 | Name: James Reid | Address: jfklsdjf | Phone #: | Email: | Participation: [Basketball, Chinese School, Newsletter, Social] | Subscription Type: family [S |
| ID: 2562530 | Name: Paul McCartney | Address: fasdfasd | Phone #: 54235324 | Email: | Participation: [Fundraising, Basketball] | Subscription Type: Student - \$5 [Sta |
| ID: 2775832 | Name: Ryan Campion | Address: fjaksdfjk | Phone #: 45234523 | Email: | Participation: [Basketball, Social] | Subscription Type: student [Status: P [Eligi |
| ID: 2873118 | Name: Goby McCullum | Address: fjkadsfjk | Phone #: 43534656 | Email: | Participation: [Basketball, Chinese School, Newsletter] | Subscription Type: |
| ID: 2991015 | Name: Elvis Presley | Address: jkldafjkas | Phone #: 5235243 | Email: | Participation: [Chinese School, Social, Cultural] | Subscription Type: family [Sta |
| ID: 3020197 | Name: Goby McCullum | Address: 2 Alva St | Phone #: 3452345 | Email: | Participation: [Social, Fundraising, Cultural] | Subscription Type: family [Status |
| ID: 3149593 | Name: Spencer Smith | Address: jkdfjaskldfj | Phone #: 25435234 | Email: | Participation: [Chinese School, Fundraising] | Subscription Type: family [Sta |
| ID: 3713348 | Name: Nadine Lustre | Address: kadjfalksdf | Phone #: 5634532453 | Email: | Participation: [Basketball, Newsletter, Social] | Subscription Type: family [|
| ID: 4263732 | Name: Gary Lee | Address: afksdjfkfads | Phone #: 023423434 | Email: garylee@gmail.com | Participation: [Fundraising, Basketball] | Subscription Type |
| ID: 4499591 | Name: Kendall Chin | Address: akdfjklasd | Phone #: 52345563 | Email: | Participation: [Basketball, Chinese School] | Subscription Type: Family (Pare |
| ID: 4880758 | Name: Tom Reid | Address: kfjakldfj | Phone #: 23452345 | Email: tomcat@gmail.com | Participation: [Basketball, Chinese School, Newsletter] | Subsc |
| ID: 4941682 | Name: John Lennon | Address: dkjfsafa | Phone #: 2544325 | Email: jlennon@gmail.com | Participation: [Fundraising, Basketball] | Subscription Type: S |
| ID: 5157663 | Name: Goby Loby | Address: jfkdsdjaf | Phone #: | Email: | Participation: [] | Subscription Type: student [Status: P [Eligibility: Yes |
| ID: 5422478 | Name: Selena Gomez | Address: jaklsdfja | Phone #: 34536354 | Email: | Participation: [Basketball, Chinese School, Newsletter] | Subscription Type: F |
| ID: 5496436 | Name: Lucy Liu | Address: 7 Stafford Rd | Phone #: 023463412 | Email: lucy.liu@gmail.com | Participation: [Fundraising, Basketball] | Subscription Type |

Step 3 - Administrator changing Lucy's address to 7 Hyde St

| | | | |
|---|--------------------|--|--|
|  | | NEW ZEALAND CHINESE ASSOCIATION, OTAGO & SOUTHLAND BRANCH (INC.) 紐西蘭歐他哈修付崙華聯支會 | |
| ID: | 5496436 | | |
| First Name: | Lucy | | |
| Last Name: | Liu | | |
| Email: | lucy.liu@gmail.com | | |
| Address: | 7 Hyde St | | |
| Phone: | 023463412 | | |
| Status: | C | | |

Step 4 - Lucy's current address after the administrator made some changes

Membership Report

Search by ID:

Search

Category:

Status:

ID: 1071884 |Name: William Mirandilla |Address: jfkadjfs |Phone #: 36534536 |Email: |Participation: [Basketball, Chinese School] |Subscription Type: Family (Pa

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ID: 5422478 |Name: Selena Gomez |Address: jaklsdfja |Phone #: 34536354 |Email: |Participation: [Basketball, Chinese School, Newsletter] |Subscription Type: F

ID: 5496436 |Name: Lucy Liu |Address: 7 Hyde St |Phone #: 023463412 |Email: lucy.liu@gmail.com |Participation: [Fundraising, Basketball] |Subscription Type: St

ID: 5547349 |Name: Sean Braid |Address: kadjfkasj |Phone #: 25452344 |Email: seanbraid@gmail.com |Participation: [Basketball, Chinese School, Social, New

7. Project Post-Mortem

This section covers analysis of the system prototype after its completion. It intends to evaluate the whole project from the group's collective point of view – what were the successes, the failures, and pieces of advice for future groups participating in similar projects.

A. Post-Mortem Process

This document was created through initial data collection and reflection. It focused on highlighting what the project had set out to achieve and whether those objectives were in fact met. We measured these by evaluating the technologies we opted to use, the prototypes that were produced and the documentation surrounding the project scheduling and quality assurance.

B. Project Evaluation

The evaluation method was performed through group collaboration, assessing together whether specific aspects of the system, its documentation or team functions were successful or not. The group's post-mortem assessment is laid out below.

I. Group Roles and Expertise

This subsection covers each member's perspective on their respective roles, what areas were challenging and what had gone well.

i. Project Manager – Sean Braid

Overall I am pleased with the completed product, it meets the set requirements and was delivered on time. Several issues happened within the development time with group members not showing up to scheduled meetings and at some points not having a full understanding on what we are actually creating.

I think I failed as Project Manager to keep the group on task during meetings, as some members were working whilst others were on Facebook. In a future role as Project Manager, I would like to have more of an impact as a leader and make sure meeting times are efficient as possible, as "time is money".

A way to improve this product would be to have it as a fully web based system that had mobile access and a payment facility. I am happy to have the project as a desktop and web-based application as it had fit the requirements set by the client and we already had a similar framework that was completed in a previous project, which made the project's completion faster and less complicated. I was also pleased with the team I was placed with as we all seemed to gel together nicely. This project has taught me that organization, and strong effective communication is extremely important in software development as well as monitoring group progress.

ii. Project Planner – Hans To'o

Being a part of the group as Project Planner has been a challenging but rewarding experience. The lessons learnt in working on a project from start to finish has revealed to me the importance of building sound estimates and schedules for the group to follow.

As my first full systems project, not completing the initial planning phase as thoroughly as hoped had created more pressure on group members to deliver on the expected deadlines. A well-considered Project Plan would have been able to keep group members disciplined with work, and allow for a clear division of tasks and responsibilities.

Of course in practice it may have proven futile in attempting to project a full project schedule without having even participated in one before, however the mere exercise itself would have been

invaluable in trying to engage in best practice and setting a tone of good habits. Nevertheless the exposure to the planning principles has been a fruitful experience which I have thoroughly enjoyed.

iii. Requirements Manager – Kendall Chin

Our team was successful in being able to fulfil all of the 'Must-Have' functional requirements.

In future I would take more time and effort into ensuring that all of the requirements were known to the entire team as there were a couple of requirements that were forgotten about during the development stage and were a little bit rushed to be added in.

I would change my approach by creating a checklist of the requirements and tasks that needed to be completed in order to have successful requirements elicitation.

iv. Data Manager – Jill Mirandilla

As the Data Manager, I am pleased with the overall project.

We used H2 for our project database and it performed well for the needs of our project as it provided an easy to use environment. Unfortunately it is a local database and therefore we had different data in each database when testing from different computers.

Whenever the membership details are entered into the database, it checks for any constraints to see if the data is recorded correctly. It also checks to see if the Member's partner, children, or siblings are recorded either in the Partner, Children or Siblings column. This also occurs where the administrator adds members on the server-side. When the administrator records the payment details made from a member, the date and amount is entered in the correct format.

v. Quality Assurance Manager – Gary Lee

The client seemed to be quite happy with product. It had all the 'Must Have' requirements fulfilled and it seemed quite reasonable to make it from scratch as the requirements were not overly demanding. One problem with the finished solution was that it could have been fully web-based as it would have made it easier to fix bugs. As it currently stands, for the system to be modified or fixed it requires one of the group or another is a professional programmer. The interface also lacks the ability for the client to customise and configure it to their liking.

vi. SCM Manager – Hans To'o

Version Control of this scale has not been experienced by any of the group members before, so it was a daunting challenge that in the end produced mixed results as the Manager of Software Configuration Management. Initial issues were had with privileges to personal accounts with Git and GitHub, as not all group members could properly access the resource via that system.

We eventually resorted to granted privileges from the University of Otago for a GitBucket account, that enabled us to all have equivalent privileges to the project system. The value of using GitBucket was its distributed nature which allowed changes to be merged after multiple users would access and edit at the same time. A total of 278 commits had been over the course of the project. Although it was an immense challenge ensuring no system progress had been lost or corrupted, it was a rewarding wake-up call to the importance of good SCM practice in systems development.

vii. Coding Manager – Jill Mirandilla

As the Coding Manager, I am pleased with the project's implementation. The group implemented the phases of the project together as a team and met all the 'Must Have' requirements. I had split the task into two phases where the Quality Assurance Manager and the Project Manager worked on

the server-side of the project whilst the Requirements Manager and I worked on the client-side of the project.

Despite the successful implementation, there were some features with the project that we could not fix due to time constraints. For instance, whenever the member adds their partner, child, or siblings, he or she has to click the 'Refresh' button each time they register their family. I would want to improve those features if we still had the chance to update our project. Overall though, I am very happy with the project implementation that we have done for OSCA.

viii. Testing and Review Manager – Gary Lee

The application meets all the 'Must Have' requirements mentioned in the System Proposal. We tested mainly the relations of family subscriptions as each member had to be connected to one another; this had to be done for both the desktop application and the client-side website. The 'View Members' and 'Payments' interface could have been more polished but the 'Editing and Adding Payments or Members' works and is reflected and updated. A problem for adding Siblings, Partners and Children is that every time you added one of these instances you had to click the 'Refresh' button, which at times can be tedious depending on how much you are adding. The authentication also had a bug when a user tried to login with an incorrect username, giving a console error rather than a message in the application.

ix. Documentation Manager – Kendall Chin

The User Documentation successfully provides a great outline of how the system works and how the users operate the system.

In future I would take more time and effort into making sure all of the documentation is up to date and ensure that it is being completed within the deadlines, instead of leaving it to the last minute.

I would change my approach by creating checklists of tasks that needed to be completed for the different documents.

x. Usability Manager – Sean Braid

As the Usability Manager I am pleased with the overall project. From a usability perspective the project functions as it should with a reasonable speed. In future I would like to see the project automatically sign into a database instead of having to manually open another application before running the system. With the web-based phase, I would like to see a pop-up window or a tidier method of adding Children, Partners or Siblings instead of adding more input fields to the web-page as it ended up quite messy.

II. Methodology

Our methodology ended up being a combination of a sequential and incremental waterfall approach. The project was sequential in the fact that the system faced full integration at the end, with each component built separately to full fidelity and scope. An incremental waterfall was also present as we treated each phase as sub-projects, which was incrementally built across all of its respective components.

This methodology was effective in that it suited the two-phase structure of our system, allowing the entire project workload to be spread across multiple components that effectively operated independently of each other.

The main limitation of this method however was the sunk cost of time and effort involved in re-iterating through the waterfall. Often iterations were brought about through unexpected changes in

requirements, which meant some progress in certain components had to be re-structured or scrapped.

In hindsight, consideration of the Sprint methodology should have been made at the beginning of the project. Regular meetings and revision of requirements would have saved a lot of time and prevented miscommunication over certain expectations of the system between group members. This was somewhat present with our regular iterations in our custom waterfall approach, however these sprints would have had to be more planned and deliberate, setting definitive deadlines and measurable goals to reach.

III. Frameworks and Tools

The resources utilised for the project were heavily influenced by INFO221 technologies, as we as a group had viewed them as capable tools for satisfying our functional requirements. They were also familiar to every group member so it was thought that the learning curve would be spent less on grasping the basics.

Reflecting on our choices it would have to be said that more time could have been invested in assessing other web-based technologies, instead of resorting to a mixed system that retained desktop functionality. There was a multitude of open-source tools at our disposal that had we delved into further may have proved more efficient by providing more boilerplate code for the basic skeleton of the system.

Despite the reliability of the H2 database, Swing GUI components and JSP/Servlets web pages, there was a growing popularity in more scalable web servers such as MySQL and NoSQL which could have served our non-functional requirements more effectively. HTML5 is also a popular tool that was not considered at length in the beginning of the project.

The biggest trouble we had with the familiar technologies was using them in the new Student Desktop environment. These resources failed to transition smoothly and we spent a large amount of time meddling with setup code in order to have the application run error-free with a successful database connection. The time saved from avoiding this pre-development issue could have given us more flexibility in development and documentation.

IV. Project Successes

i. Group Dynamic

The success of the project was built upon the team dynamic our group had formed. Every member of the group was co-operative, agreeable and reasonable. The flexibility that everyone showed with each other's demands meant that we were able to avoid any stoppages in our progress due to disagreement.

ii. Division of Tasks

For our project schedule, we attempted to evenly distribute the tasks and their estimated effort evenly amongst all group members. Despite this separate responsibility, we were all conscious of the functional requirements and were willing to assist each other in achieving our objectives wherever necessary.

iii. Client Relationship

Our group had an active and transparent relationship with our client. Their needs were communicated to us clearly and concisely, which allowed us to grasp a good picture of what they were wanting early. Their feedback for questions or the project's progress was frequent and constructive, we were able to adjust our approach to changing requirements quickly and correctly.

No conflict between stakeholders had ever arisen during the process, meaning that a Win-win scenario was practically automatic throughout the project.

V. Project Failures

i. Requirements Elicitation

Although we had a responsive client who could clarify any requirements or their expectations on specific functionality, it would have saved us that effort and time involved if we had ran a more thorough elicitation exercise with the client, determining a clear picture of the system they had in mind and the certain requirements which were either crucial or negligible in the scheme of the project.

ii. Coding Style and Structure

Given that we decided to design and build our system from scratch, we ended up spending a number of hours on programming development which could have been reduced if we had certain boilerplate components pre-constructed for us.

Although the design and build philosophy allowed us to be more bespoke with our coding, the timeframe that we had to customise the system to fit all our desires and the stakeholder's interests did not allow for that to be fully fleshed out. As a result, our code for the system overall was not always in accordance with best practice and this at times brought in unnecessary errors from lacking the attention to detail.

iii. Project Integration

When assessing our final prototype, our biggest issue was with the delivery of the system in essentially two distinct phases. Given the technologies that we had opted for it had seemed appropriate to rely on a desktop and web-based system, however if we had reassessed the available tools then it may have swayed our project towards a fully integrated web-based system. As a single implemented unit, the system would have been far easier to maintain and to also present to the client as a portable, updatable application.

C. Lessons and Recommendations

The biggest lesson learnt for each of the group members was managing our time and various commitments throughout the lifespan of the project. It was learnt seemingly the hard way that planning the project and setting realistic, measurable deadlines are crucial to keeping a project on target. Given that the project was also heavily self-directed, finding the energy to commit effort and time to self-imposed hours naturally meant a slower than normal pace for all of the group.

In light of this it would be recommended that the planning of the project be made as prospective as possible, to allow for deadlines to be set and to have the group committed to these formally in a Project Plan. Although the lack of experience limits the realistic nature of these deadlines, in the correct methodology they can be appropriately updated and reviewed to keep the group disciplined and self-aware.

The other major lesson learnt by the group was the need to assess the available technologies for the project's requirements in detail. We all agreed that we had not invested sufficient research into what frameworks and tools were otherwise appropriate for our client's needs. Had we made thorough enquiries, we could have been able to use an off-the-shelf the solution that satisfied what the client was looking for the whole time. The concern of this was losing the hands-on nature of the design and build exercise, but in retrospect a lot of time could have been gained back from having structural code already produced and ready to go for the base system.

It would then be our recommendation that a committed amount of time and effort be invested into deciding what technologies will be best for the system's implementation. This will allow clarification with the client of what their system expectations are with reference to the kind of outcomes that any off-the-shelf solution could offer. Despite the expense involved with this pre-development exercise, it will prove all the more worthwhile before a commitment to the approach is made.

D. Conclusion

Group 3 has thoroughly enjoyed the INFO312 project this year, it has been a valuable experience for everyone going into the workplace after their degrees. From day one the project has exposed our group to the life cycle of systems development, from planning, analysis, design, development and even testing. The practical skills honed through interpersonal interactions and teamwork has built our knowledge base as young, budding IT professionals for the future.