

RAWAK
Malaysia
1076



Faculty of Computer Science and Information Technology

**DEVELOPMENT OF OLD THOMIANS' WEB-BASED
MEMBERSHIP DATABASE**

Khoo Boo Hiong

Bachelor of Computer Science with Honors
(Computational Science)
2014



DEVELOPMENT OF OLD THOMIANS' WEB-BASED MEMBERSHIP DATABASE

Khoo Boo Hiong

This project is submitted in partial fulfillment of the requirements for the degree of
Bachelor of Computer Science with Honours
(Computational Science)

Faculty of Computer Science and Information Technology
UNIVERSITI MALAYSIA SARAWAK

2014

UNIVERSITI MALAYSIA SARAWAK

THESIS STATUS ENDORSEMENT FORM

TITLE: **DEVELOPMENT OF OLD THOMIANS' WEB-BASED
MEMBERSHIP DATABASE**

ACADEMIC SESSION: 2013/2014

KHOO BOO HIONG

hereby agree that this Thesis* shall be kept at the Centre for Academic Information Services, Universiti Malaysia Sarawak, subject to the following terms and conditions:

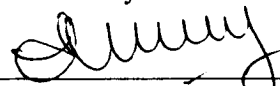
1. The Thesis is solely owned by Universiti Malaysia Sarawak
2. The Centre for Academic Information Services is given full rights to produce copies for educational purposes only
3. The Centre for Academic Information Services is given full rights to do digitization in order to develop local content database
4. The Centre for Academic Information Services is given full rights to produce copies of this Thesis as part of its exchange item program between Higher Learning Institutions [or for the purpose of interlibrary loan between HLI]
5. ** Please tick (√)

CONFIDENTIAL (Contains classified information bounded by the OFFICIAL SECRETS ACT 1972)

RESTRICTED (Contains restricted information as dictated by the body or organization where the research was conducted)

UNRESTRICTED

Validated by


(PROFESSOR ALVIN YEO WEE)


(KHOO BOO HIONG)

Permanent Address
No. 15E, Lorong Teku 21,
96000 Sibul,
Sarawak.

Date: 23/6/2014

Date: 23/6/2014

Note * Thesis refers to PhD, Master, and Bachelor Degree
** For Confidential or Restricted materials, please attach relevant documents from relevant organizations / authorities

ACKNOWLEDGEMENT

Firstly, I would like to express my deepest thanks to Universiti Malaysia Sarawak (UNIMAS), especially to my faculty, Faculty of Computer Science and Information Technology (FCSIT) for every support and effort in making sure that all the students will be able to take their final year project, which is one of the prerequisites for graduation.

I wish to express my sincere appreciation and deepest thanks to my project supervisor, Prof. Alvin W. Yeo for his continuous encouragement, guidance and support during these two semesters session 2013/2014. I am also glad that he's willing to help and provide me with ways to improve the project.

Last but not least, my special thanks to my family who were constantly advising and encouraging me during the difficult times in the period of implementation of this project. I would not have made it thus far without their support and encouragement. Not forgetting my friends and everyone, who have contributed in supporting my work and helping me during the final year project till its' completion.

Table of Contents

ACKNOWLEDGEMENT	I
LIST OF FIGURES	V
LIST OF TABLES.....	VII
ABSTRACT.....	VIII
ABSTRAK.....	IX
CHAPTER 1: INTRODUCTION	1
1.1 Introduction	1
1.2 Problem Statement	2
1.3 Objectives.....	2
1.4 Methodology	3
1.5 Scope	4
1.6 Significance of Project	4
1.7 Project Schedule.....	4
1.8 Expected Project Outcome	5
1.9 Project Outline.....	5
1.10 Summary	7
CHAPTER 2: BACKGROUND STUDY	8
2.1 General Background.....	8
2.1.1 Background of Alumni Association	8
2.1.2 Background of Current Old Thomians Alumni Association Web	9
2.2 Evaluation of Similar Systems	10
2.2.1 Sarawak Nanyang University Alumni Association Website	10
2.2.2 Assunta Alumni.com	12
2.2.3 The International School of Kuala Lumpur.....	14
2.2.4 SMJK Chung Ling Butterworth	16
2.2.5 SJK (C) Methodist, Sibul.....	17
2.2.6 Chung Hua Middle School No. 1 Alumni Association Kuching	19
2.3 Summary on the Background Study of Existing Systems.....	20
2.4 Summary	22
CHAPTER 3: REQUIREMENTS ANALYSIS AND DESIGN	23

3.1 Introduction	23
3.2 Specific Requirements.....	24
3.2.1 User Requirements	24
3.2.2 Functional Requirements.....	25
3.2.3 User Interface Requirements	26
3.3 Non-Functional Requirements	28
3.3.1 Safety or Security Requirements	28
3.3.2 Product Requirements.....	28
3.4 Database Design.....	29
3.4.1 Use Case Model.....	30
3.4.2 Sequence Diagram.....	32
3.4.3 Class Diagram.....	34
3.4.4 Entity Relationship Diagram	35
3.4.5 Activity Diagram	36
3.5 System Design.....	38
3.6 Summary	42
CHAPTER 4: IMPLEMENTATION	43
4.1 Introduction	43
4.2 Enhanced System Features.....	43
4.3 System Module.....	45
4.3.1 Website Location.....	45
4.3.2 Main Page and Profile Page.....	45
4.3.3 Login and Forget Password Page	46
4.3.4 News and Events Page.....	47
4.3.5 Magazine	50
4.3.6 Add Class Information.....	52
4.3.7 View Class Information Summary and Former Classmates.....	53
4.3.8 Donation Record.....	55
4.3.9 Member Search for Old Friends (Not Classmates)	57
4.3.10 Member Search for Classmates and Friends	58
4.3.11 Member Search for Teacher and Subject Taught	61
CHAPTER 5: SYSTEM TESTING.....	63

5.0 Introduction	63
5.1 Unit Testing.....	63
5.2 Integration Testing	65
5.3 Usability Testing	70
5.4 Functionality Testing.....	73
5.5 User Evaluation Respondents Analysis.....	75
5.6 Test Conclusion.....	77
CHAPTER 6: CONCLUSION AND FUTURE WORKS.....	78
6.0 Introduction	78
6.1 Achievements	78
6.2 Limitations	81
6.3 Future Work	82
6.4 Summary	83
REFERENCES	84
APPENDIX A.....	85
APPENDIX B	86

List of Figures

No.	Content	Page
1.	Figure 1.4: Object-Oriented Analysis and Design Methodology	3
2.	Figure 2.2.1: Sarawak Nanyang University Alumni Association Website	10
3.	Figure 2.2.2: Assunta Alumni.com	12
4.	Figure 2.2.3: The International School of Kuala Lumpur	14
5.	Figure 2.2.4: SMJK Chung Ling Butterworth	16
6.	Figure 2.2.5: SJK (C) Methodist, Sibul	17
7.	Figure 2.2.6: Chung Hua Middle School No. 1 Alumni Association Kuching	19
8.	Figure 3.4.1: Use Case Model of Old Thomians' Association website	30
9.	Figure 3.4.2a: Member sequence diagram	32
10.	Figure 3.4.2b: Admin Sequence Diagram	33
11.	Figure 3.4.3: Class Diagram	34
12.	Figure 3.4.4: Entity Relationship Diagram	35
13.	Figure 3.4.5: Activity Diagram	36
14.	Figure 3.5.1: Main Page of OTA Website in First Prototype	38
15.	Figure 3.5.2: Login page for members and admin	39
16.	Figure 3.5.3: Page to display membership details and the member profile	40
17.	Figure 3.5.4: Page to show details of Old Thomians that is searched by user	41
18.	Figure 4.3.2a: Main Page	45
19.	Figure 4.3.2b: Profile Page	46
20.	Figure 4.3.3a: User Login Page	46
21.	Figure 4.3.3b: Forget Password Page	47
22.	Figure 4.3.4a: Link to Upload News Page	47
23.	Figure 4.3.4b: Admin Upload News Details Page	48
24.	Figure 4.3.4c: View News Page	48
25.	Figure 4.3.4d: View News Details Page	49
26.	Figure 4.3.5a: Link to Add Magazine Page	50

27.	Figure 4.3.5b: Admin Upload Magazine Page	50
28.	Figure 4.3.5c: Member View List of Magazine Page	51
29.	Figure 4.3.5d: Display Magazine Page	51
30.	Figure 4.3.6a: Member Add Class Information Page	52
31.	Figure 4.3.6b: Add Class Details Page	52
32.	Figure 4.3.7a: Link to View Class Information Summary Page	53
33.	Figure 4.3.7b: Class Information Summary and Link to View Former Classmates Page	53
34.	Figure 4.3.7c: Former Classmates Page	54
35.	Figure 4.3.8a: Link to View and Record Donation Page	55
36.	Figure 4.3.8b: Record Donation and Link to View Record Page	55
37.	Figure 4.3.8c: Previous Donation Record Page	56
38.	Figure 4.3.8d: Member View Own Donation Record Page	56
39.	Figure 4.3.8e: Member Own Donation Record Page	56
40.	Figure 4.3.9a: Search Ex-Student or Friend Page	57
41.	Figure 4.3.9b: Search Result Page	57
42.	Figure 4.3.10a: Member's Profile Page	58
43.	Figure 4.3.10b: Member's Classrooms Summary and Link to View Classmates	58
44.	Figure 4.3.10c: Member's Former Classmates List with Link to Search Other Friends	59
45.	Figure 4.3.10d: Page to Search for Classmates or Friends	60
46.	Figure 4.3.10e: Search for Classmates or Friends Result	60
47.	Figure 4.3.11a: Member's Classrooms Summary and Link to Find Other Teachers	61
48.	Figure 4.3.11b: Page to Search for Teachers	61
49.	Figure 4.3.11c: Search for Teachers Result Page	62
50.	Figure 5.5: User Evaluation Respondents Analysis	75

List of Tables

No.	Content	Page
1.	Table 2.3: Comparison between selected existing systems	21
2.	Table 4.2: Enhanced System Features with Description	44
3.	Table 5.1: Unit Testing Summary	64
4.	Table 5.2a: Integration Testing News and Events	66
5.	Table 5.2b: Integration Testing Magazine	67
6.	Table 5.2c: Integration Testing Donation	68
7.	Table 5.2d: Integration Testing Search for Old Friends	69
8.	Table 5.3a: Usability Testing Summary	71
9.	Table 5.3b: Usability Testing Summary for Member 1	72
10.	Table 5.3c: Usability Testing Summary for Member 2	72
11.	Table 5.4: Functionality Testing Summary	74
12.	Table 5.5: User Evaluation Respond Summary	76
13.	Table 6.1: Objective Achievement Summary	79
14.	Table 6.2: Comparison of Features between Old Version and Newly Enhanced OTA Website	80

ABSTRACT

School alumni are comprises of former students or graduates of a school. The role of a typical school alumni are to assist their fellow graduates besides organizing social events, publish newsletters or magazines, and raise fund for their alma mater. In the past, the membership management of an organization was carried out manually using paper-based registration and sending letter or notification through mail. Unfortunately Old Thomians' Association, which is an organization that is made up of alumni of SMK St Thomas in Kuching, still does not possess such an application. A web based system has been developed with some added features such as password retrieval using email mechanism, recording donation, add classes and teachers information, searching for old friends and teachers, membership activator with the lists of paid and non-paid member, uploading news and magazines. All of these features were added to improve the current website. The methodology that was used in this project was the Object-Oriented Analysis and Design (OOAD). The system requirements were analyzed and then followed by the system design before the system development was being implemented. At the end of this project, a user testing session was carried out to get the user feedbacks to determine whether the project has achieved its objectives.

ABSTRAK

Alumni sekolah adalah bekas pelajar atau graduan sekolah. Peranan alumni sekolah adalah untuk membantu graduan rakan-rakan mereka selain menganjurkan acara-acara sosial, menerbitkan surat berita atau majalah, dan mengumpul dana untuk organisasi. Pada masa lalu, pengurusan keahlian sesebuah organisasi telah dilakukan secara manual melalui pendaftaran berasaskan kertas dan menghantar surat permohonan melalui pos. Namun, Persatuan Old Thomians yang merupakan sebuah organisasi yang terdiri daripada alumni SMK Saint Thomas di Kuching, masih tidak mempunyai apa-apa aplikasi untuk mengendalikan tugas ini. Satu sistem berasaskan web telah dibangunkan dengan penambahbaikan ciri-ciri seperti memperoleh kata laluan yang terlupa melalui email, merekod pendermaan, menambah maklumat kelas dan guru, mencari rakan lama dan guru, menukarkan taraf ahli-ahli mengikut pembayaran yuran, dan memuat naik berita serta majalah-majalah sekolah. Kesemua ciri-ciri tersebut telah ditambahkan ke sistem untuk menambahbaikan sistem yang sedia ada. Kaedah yang digunakan dalam projek ini ialah *Object-Oriented Analysis and Design (OOAD)*. Keperluan sistem telah dianalisis dan diikuti dengan rekaan sistem sebelum pembangunan sistem dijalankan. Pada penghujung projek ini, satu sesi pengujian sistem telah dijalankan untuk mendapatkan maklum balas daripada penguji sistem supaya dapat menentukan pencapaian projek ini.

Chapter 1: Introduction

1.1 Introduction

SMK St Thomas or St Thomas' Secondary School is a secondary school for boys (and girls for Form 6) in the city of Kuching, Sarawak in Malaysia. It is the oldest school in Sarawak, and the fourth oldest in Malaysia. All students of St. Thomas are called Thomians. Despite being labeled as a national secondary school, the school is actually a mission school. The school alumni are known as Old Thomians.

The idea for Old Thomians' Association (OTA) was mooted by Kong Yu Siung in 1949 in the first edition of the Thomian magazine, in the light that the Old Boys Club had changed its name to the Union Club and would no longer be exclusively an old boy's club.

Objectives of OTA are:

- to strengthen the bond between the old boys and the school
- to assist present students in scholastic, social and sporting activities
- to assist the advance of the school
- to assist Thomians to obtain employment

1.2 Problem Statement

St Thomas School is 165 years old. The school has many students however no attempt has been made to create a database of the students. There is a need to capture information, as knowledge preservation as well as from the alumni, able to inform them of new events, record donations, as well as have an updated resource for Old Thomians to keep in touch.

Therefore, a membership management system that is able to serve these purposes is needed in order to counter the problem.

1.3 Objectives

The objectives of this project were:

1. To include and improve the membership management into the existing website
2. Develop the alumni membership system and database:
 - Design and implement
 - Populate with data from the school
 - Develop emailing mechanism and donation information
 - Evaluate and compare with existing Old Thomians' website
3. To develop the Old Thomians' class information database into existing website with search mechanisms for classmates and teachers
4. Set up magazine management and honoured Thomians section

1.5 Scope

1. The main target user for this enhanced system is the school alumni (Old Thomians) of SMK St Thomas.
2. The membership management will only record certain information about the members such as email, contact number, school information, information about the class they were in, current occupation details and permanent address.
3. Donation and membership fees are collected through manual bank-in.

1.6 Significance of Project

The significance of this project is that the members of the Old Thomians or school alumni will be able to get to know about events that are being held in the school. Members can also use this enhanced system to search and look for their former classmates or friends' details by using the newly added database. Besides, the newly enhanced system is able to collect membership fees and donation thus increases the funding for the school and organization.

1.7 Project Schedule

This project is a one year project which is starting from Semester 1, 2013/2014 until Semester 2, 2013/2014.

1.8 Expected Project Outcome

The expected project outcome will be a better functionality of the website which includes membership management and database to preserve the valuable information of the school alumni.

1.9 Project Outline

A general description of each chapter is given below to give readers a better understanding of this report.

Chapter 1:

An introduction to illustrate the overview of the project. This chapter includes introduction to the project, problem statements, objectives of the project, methodology, scope of the project, significance of the project, and expected outcome of the enhanced system.

Chapter 2:

A background study which is focus on the literature review for existing Old Thomians' Association website. This chapter started with the introduction of literature review and followed by reviewing of existing OTA website and features of it that can be used enhance the OTA website. It also includes the comparison and drawbacks of reviewed system, features that should be included in the enhanced system and conclusion of this chapter.

Chapter 3:

Requirements analysis and design which describing the analysis of logical design and requirement needed in the enhanced system. This chapter includes the feature of the enhanced system, the architecture design, database and the administrator features. System specification is collection of all design.

Chapter 4:

Implementation which emphasize on the physical implementation of the system on the real environment and the features will be tested to make sure those function work properly and the enhanced system meets its goal.

Chapter 5:

The purpose of this phase is to deploy and enable operations of newly enhanced system in the production environment. Few testing phases will be conducted such as unit testing, integration testing, usability testing and functional testing.

Chapter 6:

Conclusion and future works which is about the conclusion and future enhancement of the enhanced system. In this chapter, the constraints and the error collected during implementation phase and testing phase will be highlighted. The successes of the project also are highlighted. There is also an overall conclusion about the project.

1.10 Summary

This chapter gives an overview for the project which includes the problem statement, objectives, methodology, scope, significance of project, expected project outcome, and the project outline. The purpose of this project was to enhance the website of OTA in order to include a membership management system and database to store Old Thomians' class information which were absent from the existing website. The features such as emailing mechanism, recording donation and membership fees from members were added into the system. The system was expected to improve the relationships between students and the association in addition to the better communication between members of the OTA.

Chapter 2: Background Study

2.1 General Background

This section emphasizes on the general background study on existing systems, and the evaluation on the system itself.

2.1.1 Background of Alumni Association

An alumni association is an association of graduates or, more broadly, of former students (alumni). Alumni of universities, colleges, schools (especially independent schools), fraternities, and sororities often form groups with alumni from the same organization. These associations often organize social events, publish newsletters or magazines, and raise funds for the organization. Many provide a variety of benefits and services that help alumni maintain connections to their educational institution and fellow graduates (Job-Hunt.org, 2008).

Additionally, such groups often support new alumni, and provide a forum to form new friendships and business relationships with people of similar background.

Alumni associations are mainly organized around universities or departments of universities, but may also be organized among students that studied in a certain country. In the past, they were often considered to be the university's or school's old boy society (or old boys network). Today, alumni associations involve graduates of all age groups and demographics (Job-Hunt.org, 2008).

2.1.2 Background of Current Old Thomians Alumni Association Web

The current Old Thomians' Association web has a few features. St Thomas Alumni web is a system used for all graduate students in the school to find their previous old friends and getting to know recent activities in the school. Through the system, users can view all background history of the formation of the school. There is a news tab for administrator to upload the latest news so that users can view the news through there.

In the Old Thomians' list, user can search their old friends or classmates by choosing the year started enter the school, year end the school, sport house, name or state. The system will show related name list based on what user wants to search for. In the gallery section, there is a collection of different photo albums. User can view photos by selecting the album. The magazine tab enables user to see the published magazine lists as every year the school will published yearly school magazine.

Contact information are also listed out in the system so that for any enquiries, user can call the administrator for help or through the email. Google map makes user easier to search the St Thomas school location.

All the features mentioned above are currently for a user to enter the Old Thomians' Association website. It enables user to search for information through the system likes search old friends, find school background, see news, view photo gallery and find location through Google Map.

2.2 Evaluation of Similar Systems

2.2.1 Sarawak Nanyang University Alumni Association Website



Figure 2.2.1: Sarawak Nanyang University Alumni Association Website (sarawaknanyang.getmybusinessonline.com.my, 2010)

This is the Nanyang University Alumni Association website which covers all Sarawak areas. Basically, the system contains the following features:

- i. Background
- ii. Gallery
- iii. Formation of Federation
- iv. Location Branches
- v. Magazines
- vi. News
- vii. Alumni Lists
- viii. Contact Information

A list of tabs is below the title which includes important features for users to search information about the Nanyang University. First tab of the system is Nanyang University background information which lists out history of the university formed, brief introduction of the university, university creator, university mission and vision, past principles lists and the slogan.

The second feature is gallery which is categorized into three categories. All photos are stored in gallery. Another feature is the formation of federation in Sarawak. The field analysis past former director, current former director and some stories likes meetings, donation, visiting and celebration record. Another feature in the system is Magazine. Users can view the previous published magazine information through here.

Furthermore, News is also a feature in the system. It listed out recent activity which had been conducted with the date mentioned. All members names are recorded into the system and user can search for their old friends' information. The user can also view the contact information to find the administrator if he or she has the problem to search the information.

2.2.2 Assunta Alumni.com



Figure 2.2.2: Assunta Alumni.com (www.assuntaalumni.com, 2011)

Assunta Alumni.com is SMK Assunta, Petaling Jaya school alumni web. Information regarding school and all alumni lists are recorded into the system. The features of Assunta Alumni.com is analyzed as below:

- i. register, sign in or sign out
- ii. news
- iii. background
- iv. activity
- v. contact us

On the right top of Assunta Alumni.com, by providing email address, user can join into the SMK Assunta School Alumni system. User can directly sign in with the email address once they are registered. The features are listed on the left hand side