



Faculty of Computer Science and Information Technology

SAS: STUDENT AWARDS SYSTEM

Nur Syazwani Atifah Binti Muhammad Farouk

Bachelor of Computer Science with Honors (Network Computing)

2019

UNIVERSITI MALAYSIA SARAWAK

THESIS STATUS ENDORSEMENT FORM

TITLE SAS – Student Awards System

ACADEMIC SESSION: 2019/2020

NUR SYAZWANI ATIFAH BINTI MUHAMMAD FAROUK
(CAPITAL LETTERS)

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

SyazwaniAtifah
(AUTHOR'S SIGNATURE)

Permanent Address
Kg Marakau,
Ranau, 89308,
Sabah

Date: 6/8/2020

Validated by

(SUPERVISOR'S SIGNATURE)
ASSOC PROF DR KARTINAH BINTI ZEN
Dean
Faculty of Computer Science and Information Technology
Universiti Malaysia Sarawak

Date: 6/8/2020

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

DECLARATION

I hereby declare that this project is my original work. I have not copied from any other student's work or any other sources except where due reference or acknowledgement is not made explicitly in the text, nor has any part had been written for me by any another person.

Syazwani Atifah

(NUR SYAZWANI ATIFAH MUHAMMAD FAROUK)

7 AUGUST 2020

SAS: STUDENT AWARDS SYSTEM

NUR SYAZWANI ATIFAH BINTI MUHAMMAD FAROUK

This project is submitted in partial fulfilment of the
requirements for the degree of
Bachelor of Computer Science with Honors (Network Computing)

Faculty of computer science and information technology

UNIVERSITI MALAYSIA SARAWAK

2019

SAS: STUDENT AWARDS SYSTEM

NUR SYAZWANI ATIFAH BINTI MUHAMMAD FAROUK

Projek ini merupakan salah satu keperluan untuk Ijazah Sarjana Muda Sains
Komputer dan Teknologi Maklumat (Pengkomputeran Rangkaian)

Fakulti Sains Komputer dan Teknologi Maklumat

UNIVERSITI MALAYSIA SARAWAK

2019

Acknowledgment

I would like to express my great appreciation to my supervisor, Dr. Kartinah Binti Zen, for her constructive advice, patient guidance, and supervision throughout my Final Year Project. Secondly, I would like to address special thanks to my Final Year Project coordinator, Professor Dr. Wang Yin Chai, who has provided useful guidelines during lectures.

Other than that, I would like to extend my thanks to my university, Universiti Malaysia Sarawak (UNIMAS), as well as my faculty, Faculty of Computer Science and Information Technology, for giving me this golden opportunity to do this Final Year Project. I am genuinely appreciated because I get to explore and gain valuable knowledge in the process of doing this project. I would like to thank BPPS and CITDS for their guidance on this project. I also would like to thank my friend and course mates for helping and supporting me in doing this project. Finally, I wish to express my deepest gratitude to my family, who support me mentally on completing this project.

Table of content

Acknowledgement.....5

Abstract.....16-17

Chapter 1: Introduction.....18-28

1.1 Introduction.....18-20

1.2 Problem Statement.....21

1.3 Objectives.....22

1.4 Methodologies.....23

1.5 Scope.....25

1.6 Significance of Project.....25

1.7 Project Schedule.....26

1.8 Expected Outcome.....27

1.9 Project Outline.....27-28

 1.9.1 Chapter 1: Introduction.....27

 1.9.2 Chapter 2: Literature Review.....27

 1.9.3 Chapter 3: Requirement Analysis and Design.28

 1.9.4 Chapter 4: Implementation and Testing.....28

 1.9.5 Chapter 5: Conclusion.....28

Summary29

Chapter 2: Literature Review.....30-48

2.1 Introduction.....30

2.2 Overview of Objectives.....31

2.3 Review on Similar Existing System.....	32-40
2.3.1 Student Awards Application System (University of Hong Kong).....	32
2.3.2 Student Award System (University of Maryland).....	35
2.3.3 Student Awards Management System (University of Regina).....	37
2.3.4 Comparison between Reviewed Existing System and Proposed System.....	40
2.4 Review of Tools and Technologies.....	42-47
2.4.1 Frontend Development.....	42-43
2.4.1.1 AngularJS.....	42
2.4.1.2 jQuery.....	43
2.4.2 Backend Development.....	44-47
2.4.2.1 MySQL.....	44
2.4.2.2 PHP Hypertext Pre-processor.....	45
2.4.2.3 Java Spring Boot.....	46
2.5 Summary.....	48
Chapter 3: Requirement Analysis and Design.....	49-83
3.1 Introduction.....	49
3.2 Agile Software Development Method	50-79
3.2.1 Planning	51
3.2.2 Designing	55
3.2.2.1 Context Diagram.....	56
3.2.2.2 Level 0 Diagram.....	57
3.2.2.3 Level 1 Diagram.....	58-62
3.2.2.4 Entity Relationship Diagram (ERD).....	63
3.2.2.5 Data Dictionary.....	64-67

3.2.2.6 Wireframe.....	68-79
3.2.3 Prototyping	80-81
3.2.3.1 Developing.....	80
3.2.3.2 Demonstrating.....	80
3.2.3.3 Refining	81
3.2.4 Testing	81
3.3 Implementation	82
3.4 Summary.....	82
Chapter 4: Implementation.....	83-100
4.1 Introduction.....	83
4.2 Installation and Configuration of System’s Components.....	83
4.2.1 ANGULAR JS.....	83–84
4.3 System Users.....	84-85
4.4 Common Function Among All Users.....	86
4.4.1 Login	86
4.4.2 Logout.....	86-87
4.5 User Interface of Faculty.....	87
4.5.1 Home Page.....	87
4.5.2 Student List Page.....	88-90
4.5.3 Nominated Students Page.....	90-92
4.6 User Interface of Student.....	92
4.6.1 Home Page.....	92
4.6.2 Student Details Page.....	93
4.6.3 Add Achievement Page.....	93-95

4.7 User Interface of BPPS.....	95
4.7.1 Home Page	95
4.7.2 Student List Page.....	95-99
4.7.3 Finalise Student Page.....	99-101
Chapter 5: Testing.....	102-115
5.1 Introduction	102
5.2 Functional Testing	102
5.2.1 Unit Testing.....	102-112
5.3 Non-Functional Testing.....	113
5.3.1 Usability Testing.....	113
5.3.1.1 System Functionality.....	114-115
5.4 Summary.....	115
Chapter 6: Future Work and Conclusion.....	116-117
6.1 Overview.....	116
6.2 Objective Achievements	116-117
6.3 Project Limitation.....	117
6.4 Future Work.....	117
6.5 Conclusion.....	117
References.....	118
Appendixes.....	121
Appendix A.....	121-126

List of Figures

<i>Figure 1.1:</i> Flow Chart.....	14
<i>Figure 1.2:</i> Agile Software Development Method (MacKay, 2019).....	23
<i>Figure 1.3:</i> Project Schedule.....	26
<i>Figure 2.1:</i> Student Portal HKU (Leung, 2019).....	33
<i>Figure 2.2:</i> Student Award System (University of Maryland, 2019).....	35
<i>Figure 2.3:</i> Student Award System, University of Maryland login page (University of Maryland, 2019).....	36
<i>Figure 2.4:</i> SAMS University of Regina (University of Regina, 2019).....	38
<i>Figure 2.5:</i> Student Awards Management System Login page (University of Regina, 2019)....	38
<i>Figure 2.6:</i> Percentages of library or framework usage on web project (Nolan, 2018).....	43
<i>Figure 2.7:</i> Percentages of JavaScript library or framework usage on project (Nolan, 2016)....	44
<i>Figure 2.8:</i> Top 5 databases 2017 ("DB-Engines Ranking ", 2017).....	45
<i>Figure 2.9:</i> Popularity of Top 10 Programming Language 2017 (Javid, 2017).....	46
<i>Figure 2.10:</i> Survey of application framework (Schlosser, H, & Rodrigo, 2018).....	47
<i>Figure 3.1:</i> Agile software development Method.....	50
<i>Figure 3.2:</i> Student Award Election Form.....	54
<i>Figure 3.3:</i> Context Diagram.....	56
<i>Figure 3.4:</i> Level 0 Diagram.....	57

<i>Figure 3.5: Level 1 Diagram (Login)</i>	58
<i>Figure 3.6: Level 1 Diagram (Students List)</i>	59
<i>Figure 3.7: Level 1 Diagram (Supporting Documents)</i>	60
<i>Figure 3.8: Level 1 Diagram (Nomination)</i>	61
<i>Figure 3.9: Level 1 Diagram (Final Result)</i>	62
<i>Figure 3.10: Entity Relationship Diagram (ERD)</i>	63
<i>Figure 3.11: Login Page (Faculty: Dean/Deputy Dean/Program Coordinator)</i>	69
<i>Figure 3.12: Students List by CGPA</i>	69
<i>Figure 3.13: Students Details</i>	70
<i>Figure 3.14: Student Achievements & Supporting Documents</i>	71
<i>Figure 3.15: Nominated Students</i>	71
<i>Figure 3.16: Login (Students)</i>	72
<i>Figure 3.17: Student Details</i>	73
<i>Figure 3.18: Students Achievement & Supporting Documents</i>	73
<i>Figure 3.19: Login (BPPS)</i>	74
<i>Figure 3.20: Menu (BPPS)</i>	75
<i>Figure 3.21: Students List by Awards Category</i>	76
<i>Figure 3.22: Students List by Faculties</i>	76

<i>Figure 3.23: All Students List</i>	77
<i>Figure 3.24: Student Details View</i>	77
<i>Figure 3.25: View Student Achievements & Supporting Documents</i>	78
<i>Figure 3.26: Finalise Students</i>	79
<i>Figure 3.27: Final Result</i>	79
<i>Figure 4.1: Angular JS official website</i>	84
<i>Figure 4.2: User Login Page</i>	86
<i>Figure 4.3: User Logout button</i>	87
<i>Figure 4.4: UNIMAS Official Website</i>	87
<i>Figure 4.5: Faculty Site - Home Page</i>	87
<i>Figure 4.6: Faculty Site - Students List Page</i>	88
<i>Figure 4.7: Faculty Site - Action Button</i>	88
<i>Figure 4.8: Faculty Site - View and Verify Student Achievements</i>	89
<i>Figure 4.9: Faculty Site - View Student Details</i>	89
<i>Figure 4.10: Faculty Site - Nominate Student</i>	90
<i>Figure 4.11: Faculty Site - Nominated Students List</i>	90
<i>Figure 4.12: Faculty Site - Action Button</i>	91
<i>Figure 4.13: Faculty Site - View Student Achievements</i>	91
<i>Figure 4.14: Faculty Site - View Student Details</i>	92

<i>Figure 4.15: Student - Home Page.....</i>	<i>92</i>
<i>Figure 4.16: Student – Student Details Page.....</i>	<i>93</i>
<i>Figure 4.17: Student - Add achievement Page.....</i>	<i>94</i>
<i>Figure 4.18: Add achievement Page - Action Button.....</i>	<i>94</i>
<i>Figure 4.19: Add Achievement Page - Upload Documents.....</i>	<i>95</i>
<i>Figure 4.20: BPPS – Home Page.....</i>	<i>95</i>
<i>Figure 4.21: BPPS - Student List by Category Page.....</i>	<i>96</i>
<i>Figure 4.22: BPPS - Student List by Category Page.....</i>	<i>96</i>
<i>Figure 4.23: BPPS - Student List by Faculty Page.....</i>	<i>96</i>
<i>Figure 4.24: BPPS - Student List by Faculty Page.....</i>	<i>97</i>
<i>Figure 4.25: BPPS - All Student List Page.....</i>	<i>97</i>
<i>Figure 4.26: BPPS - Action Button.....</i>	<i>97</i>
<i>Figure 4.27: BPPS - View Student Achievements.....</i>	<i>98</i>
<i>Figure 4.28: BPPS - View Student Details.....</i>	<i>98</i>
<i>Figure 4.29: BPPS - Finalise Student.....</i>	<i>99</i>
<i>Figure 4.30: BPPS - Finalized Student List.....</i>	<i>99</i>
<i>Figure 4.31: BPPS - Action Button.....</i>	<i>100</i>
<i>Figure 4.32: BPPS - View Student Achievement.....</i>	<i>100</i>
<i>Figure 4.33: BPPS - View Student Detail.....</i>	<i>101</i>

List of tables

<i>Table 2.1:</i> Comparison between reviewed existing system and proposed system.....	31
<i>Table 3.1:</i> Interview Question and Answer.....	53
<i>Table 3.2:</i> Data Dictionary for User Table.....	65
<i>Table 3.3:</i> Data Dictionary for Student Table.....	66
<i>Table 3.4:</i> Data Dictionary for Achievement Table.....	67
<i>Table 3.5:</i> Data Dictionary for Awards Table.....	67
<i>Table 3.6:</i> Data Dictionary for Nominate Table.....	68
<i>Table 3.7:</i> Data Dictionary for Result Table.....	68
<i>Table 4.2:</i> Summary of Functions for each type of User.....	85
<i>Table 5.1:</i> Test Case for Faculty Login Module.....	104
<i>Table 5.2:</i> Test Case for Faculty Manage Student Module.....	105
<i>Table 5.3:</i> Test Case for Faculty Logout Module.....	106
<i>Table 5.4:</i> Test Case for BPPS Login Module.....	107
<i>Table 5.5:</i> Test Case for BPPS Manage Student Module.....	108
<i>Table 5.6:</i> Test Case for BPPS Logout Module.....	109
<i>Table 5.7:</i> Test Case for Student Login Module.....	110
<i>Table 5.8:</i> Test Case for Student Manage Student Module.....	111
<i>Table 5.9:</i> Test Case for Student Logout Module.....	112

Table 5.10: Summary of ease of each system functionality for Student Awards System.....113

Table 5.11: Summary of impressiveness of user interface design for SAS.....114

Table 6.1: List of objectives and achievements.....115

Abstract

Every year during UNIMAS convocation, students who have achieve great achievement throughout their studies will receive awards. These awards are “Anugerah Diraja”, “Anugerah Canselor” and “Anugerah Pro-Canselor”. However, the manual selection nowadays is tedious and may prone to misjudgement, even though the rubrics are followed. To ensure a smooth selection and to ease the process, a system called Student Awards System (SAS) is built to filter students with great achievement and to allow student to fill in form online. With all the features provided, the proposed system will be able to ease the process of filtering students from each faculty since the process will be done online.

Abstrak

Setiap tahun semasa konvokesyen UNIMAS, pelajar yang mendapat pencapaian cemerlang sepanjang pengajian mereka akan menerima anugerah. Anugerah ini adalah “Anugerah Diraja”, “Anugerah Canselor”, dan “Anugerah Pro-Canselor”. Walau bagaimanapun, pemilihan secara manual adalah rumit dan terdedah kepada pemarkahan yang salah, walaupun rubrik diikuti. Untuk memastikan pemilihan yang lancar dan memudahkan, Sistem yang dipanggil Sistem Anugerah Pelajar (SAS) dibina untuk menapis pelajar yang mendapat pencapaian yang cemerlang dan membenarkan pelajar mengisi boring secara atas talian. Dengan ciri-ciri yang disediakan, sistem ini akan memudahkan proses penapisan pelajar daripada setiap fakulti kerana proses tersebut boleh dilakukan secara automatik dan atas talian.

CHAPTER 1: INTRODUCTION

1.1 Introduction

Every year UNIMAS will hold a convocation event for students who have completed their studies. At this event students who have achieved great achievement throughout their studies will receive awards. These awards are “Anugerah Diraja”, “Anugerah Canselor” and “Anugerah Pro-Canselor”. For the “Anugerah Diraja” one (1) bumiputera student and one (1) non-bumiputera student will receive the award and for the “Anugerah Canselor” and “Anugerah Pro-Canselor” only one student will receive each award.

Every year, each faculty are requested to nominate four (4) best students to receive these awards. Only one (1) student will be selected for each award. In the existing process, the nomination from each faculty is still done manually. The faculty first will select manually from all of the students' list to filter those with Cumulative Grade Point Average (CGPA) above 3.50. Then, the faculty will contact those students by email to fill in forms and submit their support documents. Faculty then allocate marks to each student based on the rubric given by BPPS. These tasks are tedious and may be prone to misjudgement, even though the rubrics are followed. The best four (4) students' names with details of their marks will be sent to “Bahagian Pengajian Prasiswazah” (BPPS). Upon receiving the students' names from every faculty, then BPPS will combine all nominations, which is by average 40 nominations and filter the best to be brought to the top management meeting. The names of all best students will be judged by their CGPA in academics and merits in all activities during their studies in UNIMAS.

To ensure a smooth selection and to ease the process, a system called Student Awards System (SAS) is built. SAS (Student Awards System) is an online platform that will analyse and calculate the student's achievement merits or marks. Whereas, the names of four (4) students with highest marks from each faculty will be sent to the BPPS to be filtered to receive awards during convocation. The system will extract data from UNIMAS existing database then it will compare and filter the students who get cumulative pointers above 3.50.

Furthermore, this system will ease the process of filtering students from each faculty since the process will be done online where, students can fill in the form and upload required documents for lecturer reference in the system. The system will then analyse and calculate merit points for each of the students based on the rubrics. After that, the system will be filtered four (4) students with best marks and submit the names to coordinator which is BPPS.

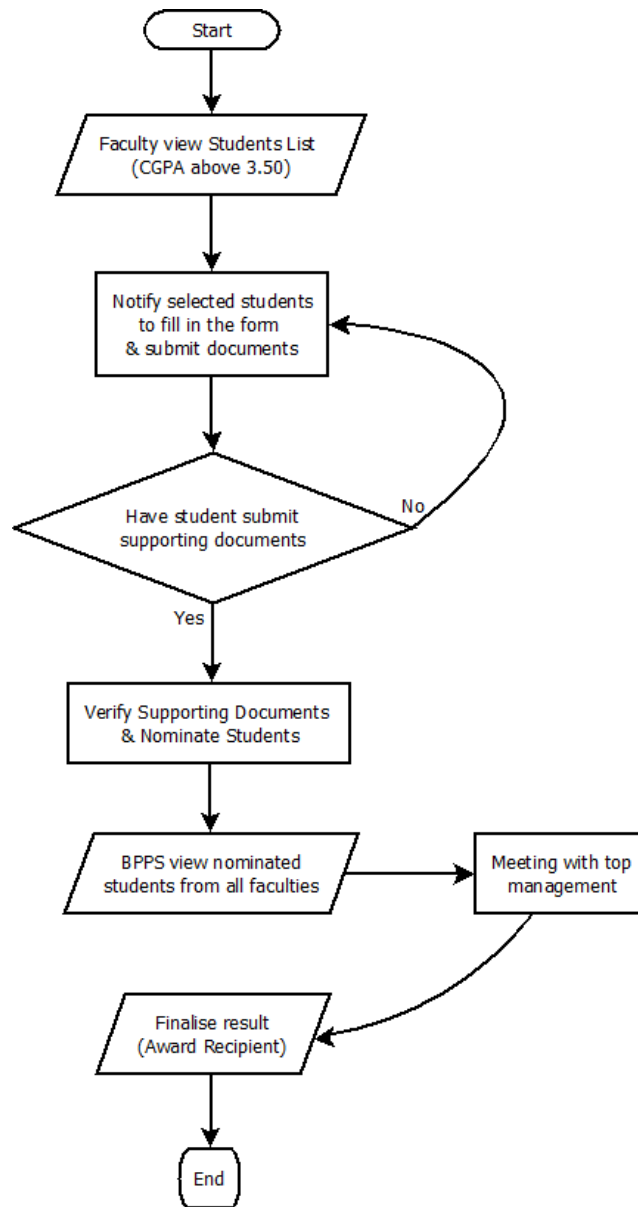


Figure 1.1: Flow Chart

Figure 1.1 shows the flow chart of the proposed project. Firstly, the faculty can view list of students who achieve Cumulative Grade Point Accumulated (CGPA) 3.5 above. Then, the faculty will notify the selected students to fill in the form and submit supporting documents. After that, faculty will verify student's achievement and nominate them for each type of awards. Then, the nominated students from all faculty will be combine for BPPS to bring the names to top management meeting. After it is finalised, BPPS will then need to update final result in the system.

1.2 Problem Statement

Every year each faculties need to nominate four (4) best students to be filtered to receive the awards (“Anugerah Diraja”, “Anugerah Canselor”, “Anugerah Pro-Canselor”). At this moment, the selection process in each faculty is done manually by the panels who are the Dean, Deputy Dean, and Program Coordinator in each faculty. The faculty first will select manually from all of the students’ list to filter those with CGPA above 3.50. Then, the faculty will contact those students by email to fill in forms and submit their support documents. Students will have to fill in the form and submit supporting documents to the faculty by hand or by email. Then panels from respective faculties will verify and give marks accordingly. They need to verify and calculate marks for many students and choose only the best four (4).

At BPPS, they will receive all nominations from all faculties. Later, they will prepare the data, which are sorting the student’s marks, arrange the evidence in students’ achievements and activities, and verify the marks. All of these data will be brought to the management meeting. The challenges come when panels need to critically compare the student’s achievements and activities, when few students who have high achievements.

Hence, the existing manual system nowadays is very time consuming and can become a burden to the involved parties as they have to filter so many students.

1.3 Objectives

The main objectives of this project is to design and develop an online platform for lecturers, students and BPPS to filter out best student who will received awards (“Anugerah Diraja”, “Anugerah Canselor”, Anugerah Pro-Canselor”) during convocation.

The other objectives of this project are:

- i. To provide a platform for students to fill in forms and upload required supporting documents.
- ii. To provide a platform for faculty to check and compare student’s achievement.
- iii. To design a platform that will calculate and give merit points to filter best students in each faculty.
- iv. To design a platform that will compare and list out best students that are received from all faculties for BPPS to choose best’s student who will receive award (“Anugerah Diraja”, “Anugerah Canselor”, Anugerah Pro-Canselor”).

1.4 Methodologies

Agile Software Development Methodology is chosen as the methodology of the development of this project as it allows fast development and able to adapt to change easily (MacKay, 2019). According to a research by Project Management Institute (2015), 65% completed their projects on time. This methodology consists of 4 main stages, which is planning, designing, prototyping and testing.

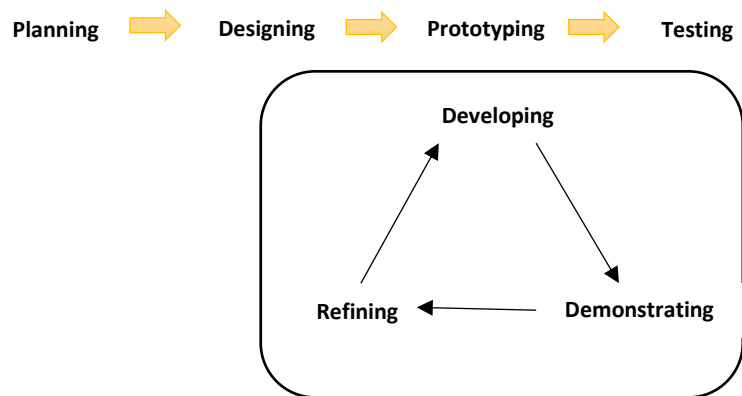


Figure 1.2: Agile Software Development Method (MacKay, 2019)

i) Planning

In this stage, planning is about researching the requirement. It start from requirement elicitation which collects user requirements through interview from the project shareholder who is the BPPS. The data collected from users will be analysed through reports.