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FSKTM Presentation Management System for Postgraduate Study using Web Application (PHP)

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Abstract: The current system for arranging postgraduate presentation schedule is using Microsoft Excel. This method is lack of efficiency in terms of information displacement and recording purpose. The recording is using file system that is not online and only reside in one computer. Therefore, this project aimed to develop a web-based postgraduate presentation management system that can store data and retrieve data from online database. This way could change the data repository from computer local disk to online database. Data can be retrieved from online database. This system also provided error-checking to prevent error like assigning supervisor as panel or both panels are the same panel. To develop the web application, agile model methodology is used. Agile model is an iterative model. It helps developer to deliver a better-quality system that meet to user requirement after every iteration. The web application was developed by using Atom which is a free text editor built with HTML, CSS, and JavaScript integration. Also, the web application was developed on localhost server before publishing onto online server. Throughout this project, a web application was built for the faculty for presentation management purpose. This application could increase the efficiency of staff arranging postgraduate presentation timetable.

Keywords: Web-based, Postgraduate, Management System

1. Introduction

Postgraduate refers to university student who has hold a degree certificate and now is studying for a more advanced degree [1]. Normally, an active postgraduate would have presentation at the end of semester. The presentation would contribute a high percentage of mark to the overall result. Before presentation week starts, faculty staffs need to manage the presentation schedule and do some preparations to make sure all the presentations can go smoothly. However, if the presentation schedule were not being managed nicely, the presentation week would probably face a lot of problems like schedule clashed, arranging wrong panel or ineligible student into presentation schedule. Here, FSKTM postgraduate presentation management system was developed for faculty to ease the process of

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managing postgraduate presentation. FSKTM postgraduate presentation management system was developed for faculty use. Postgraduate presentation management system helps faculty staff to manage postgraduates' presentation easily. This system records the postgraduates' basic information, title proposed, supervisor and presentation schedule. Not only that, this system also able to track the assessment progress of postgraduate and shows the assessment that postgraduate have completed. The system is also equipped with login authentication to secure the confidential data stored in database. Only authorised person is given access right to the system. The application possesses the functionality such as login authentication, presentation schedule for each postgraduate student, arranging two panels for each presentation, recording title presented, result and providing application form.

2. Related Work

2.1 Programming Language

Programming language used is Preprocessor Hypertext (PHP), Structure Query Language (SQL) and JavaScript. PHP is a server-side scripting language that help programmer to develop dynamic website through database connection [2]. It is a good language to be used as proposed system needs to store and retrieve data from database. Next, SQL is a language that allow user to manipulate data in database by specifying the characteristic of data [3]. Data accessing speed of SQL is fast, large amounts of records can be retrieved from database in short time. JavaScript is scripting language that could run on server-side and client-side, mostly runs on client-side [4]. JavaScript provide interoperability feature. Many different types of programming language could work well with JavaScript and hence it has become a popular language.

2.2 Review Existing System

Three different existing system are reviewed, Celcat Timetabler, OpenSIS and Gibbon. Celcat Timetabler is a software the mainly focus on scheduling features. User can plan schedule easily and quickly. When there is error like one teacher present in two different classes at the same, it will display error to user. OpenSIS is an open-source student management system. It is a web-based system. OpenSIS provide many features that would meet to the requirement of a normal school. However, for university it might be less suitable as university perform more complex operation compared to primary and secondary school. The third system is Gibbon. It is an open-source online school platform. Same with OpenSIS, it provides most of the functionalities that could fulfil requirement of normal school. However, the design of Gibbon is less user friendly. User needs to spend quite a lot of time to get used to it.

2.3 Comparison between Existing System and Proposed System

Table 1 shows the comparison between three reviewed existing system and proposed system. There are some differences present among them.

Table 1: Comparison between Existing System and Proposed System

No	Item	Celcat Timetabler	OpenSIS	Gibbon	Proposed system
1	Operating system	Windows	Windows	Windows	Windows
2	Programming language	C#	Php	Php and jQuery	Php, SQL and JavaScript
3	Database	MySQL	PostgreSQL and MySQL	MySQL	MySQL
4	Login authentication	Yes	Yes	Yes	Yes

Table 1: (cont.)

No	Item	Celcat Timetabler	OpenSIS	Gibbon	Proposed system
5	Password hashing in database	Yes	Yes	Yes	Yes
6	Postgraduate module	No	No	No	Yes
7	Examiner module	No	Yes	Yes	Yes
8	Staff module	No	Yes	Yes	Yes
9	Parent module	No	Yes	Yes	No
10	Scheduling	Yes	Yes	Yes	Yes
11	View Statistic	No	No	No	Yes
12	Marking module	No	Yes	Yes	Yes
13	Deferment function	No	No	No	Yes
14	Assigning panel function	No	No	No	Yes

3. Methodology/Framework

Software development methodology set the steps we need to go through for develop a success system. Normally the steps in software development methodology are called as phases. The methodology used in this project is agile model.

Figure 1 shows the phases of agile model. There are six phases in agile mode which are analysis, design, implementation, testing, deployment, and maintenance. Every different phase undergoes different task and work to achieve the objective of the phase. Agile model is an iterative development cycle. By using agile model, software is improved progressively after every iteration [5]. The number of iterations in agile model is varying and it depends on the developer's decision. Meanwhile, developers can still make changes onto system after every iteration and hence it is a flexible methodology.

3.1 Agile Model

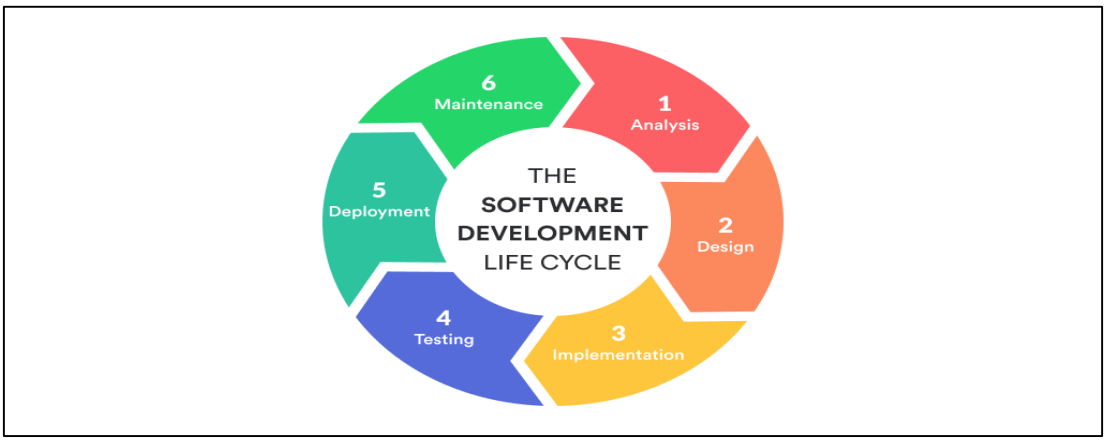

Figure 1: The sis phases in Agile Model

3.2 Requirement Analysis

Requirement analysis phase analyse user requirement and develop user requirement. It is an action of studying feasible functions repeatedly aims to build a set of complete requirements that meets to user expectations [6]. Therefore, stakeholder of system is involved in requirement analysis phase as they can provide the most accurate and direct user requirement. To collect user requirement, two different method of data collection have been carried out. The first data collection method is by interviewing. The second method is document reviewing.

Lastly, Gantt Chart is produced to estimate project overall time. This project is estimated to consume 222 days, starting from 28 August 2020 and end on 7 May 2021. Table 2 shows the project major milestone with deadline.

Table 2: Project Major Milestone

No	Major Milestone	Important Deadline
1	Requirement Analysis	12 December 2020
2	System Designing	1 January 2021
3	Implementation of Modules	30 April 2021
4	Testing	7 May 2021
5	Requirement Analysis	14 April 2021
6	System Designing	21 April 2021
7	Implementation of additional module functionality	3 June 2021
8	Testing	10 June 2021

3.3 Design

Designs are categorised into two aspects which are user interface design and implementation design. User interface design describes the look of interface presented to user. Wireframe is used to design user interface. It is the basic draft of visual presentation of system, defining how the system will be looked in a fast and understandable way. Next, implementation design will show the processes happen in system background. The diagrams provided for implementation design are data flow diagram, flowchart, and entity relationship diagram. These diagrams would work as a draft and guidance to developer at later phase.

In design phase, data flow diagram and entity relationship diagram are made. Data flow diagram describes all the processes or activities performed within the system [7]. Figure 2 shows the context diagram of system. Context diagram gives a basic view about data flow. Figure 3 shows the level 0 data flow diagram of system. Level 0 data flow diagram will provide a complete view about how data flow throughout the system and how the process will be taken. There are 9 processes involve which are login, register new user, enrol student, scheduling, create semester or venue, view statistic, post announcement, mark student assessment, and submit form. Four main external entities will be staff, examiner, external examiner, and postgraduate who will be interacting with the postgraduate presentation management system.

Figure 4 shows entity relationship diagram of system. Entity relationship diagram is most used in system design. Each table is represented by an entity and there are 12 entities involved in this system. Each of the entities is responsible to store corresponding data. Next, the data attribute and data types are stated in diagram with the length limit inside of the bracket. In the entity relationship diagram, each of the entities or tables has a primary key, the primary is shown in bold text to show that it is different from other field data. There are also a few foreign keys inside, and the foreign keys are in italic form.

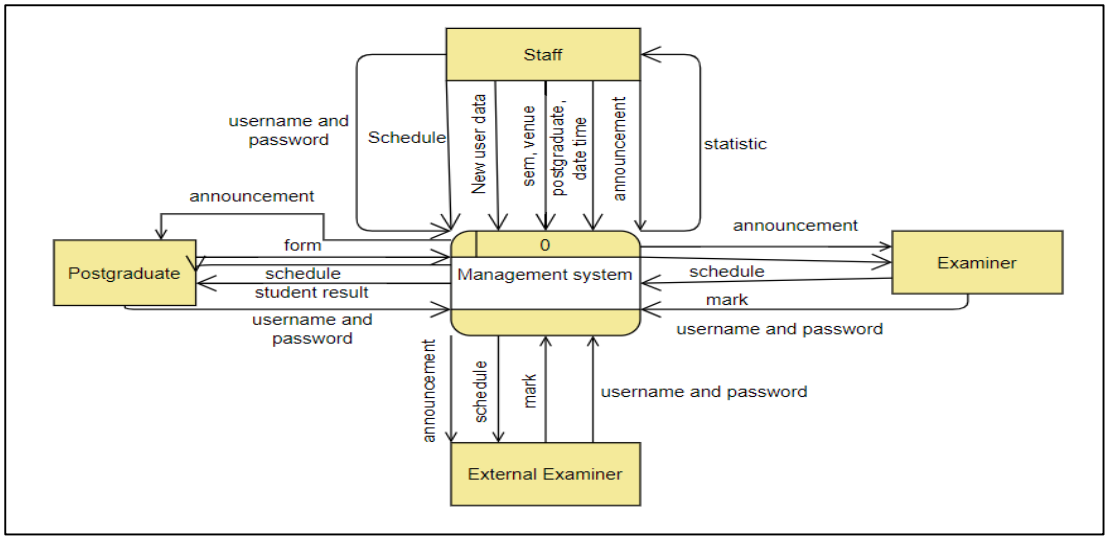

Figure 2: Context Diagram

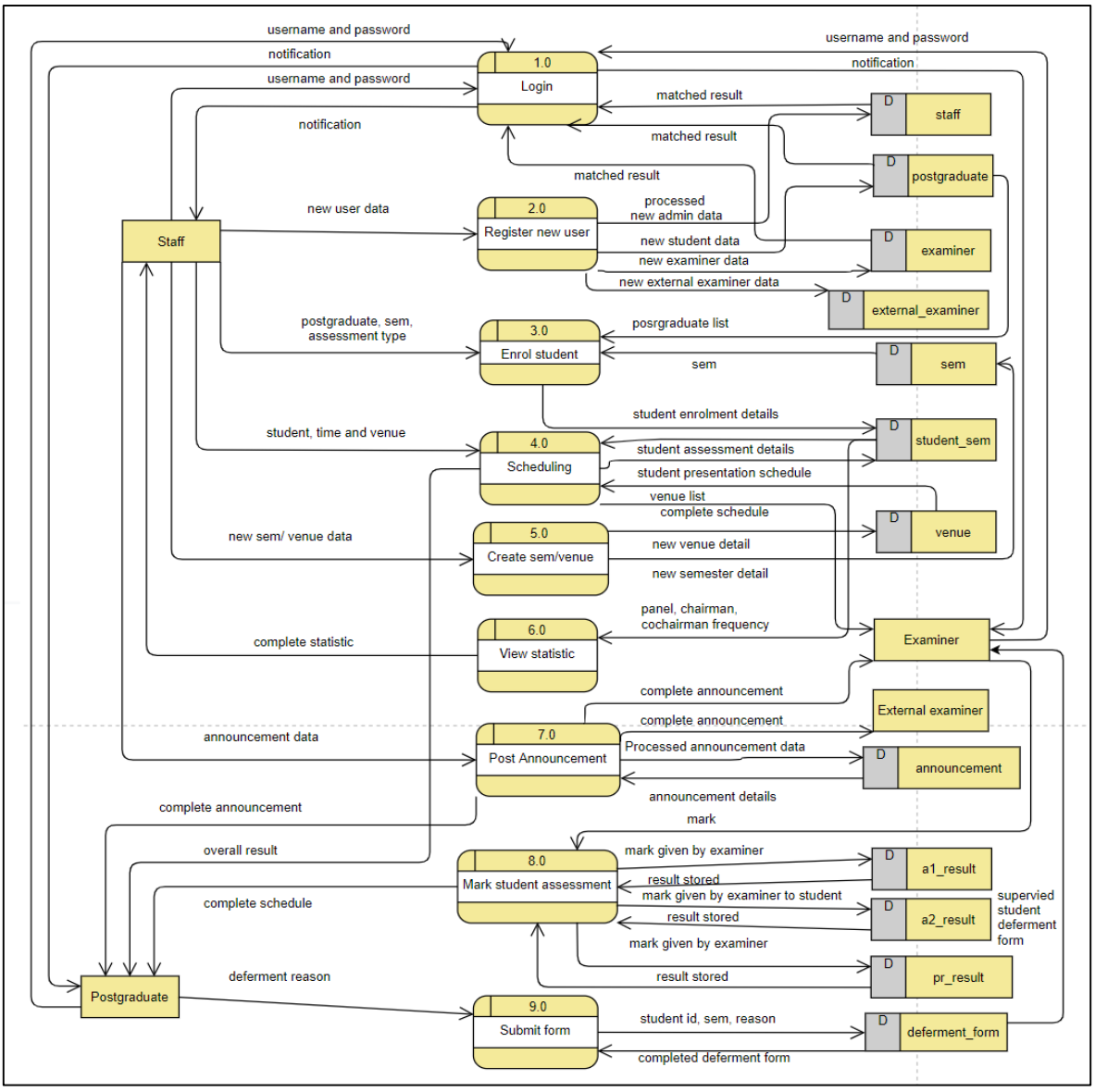

Figure 3: Level 0 Data Flow Diagram

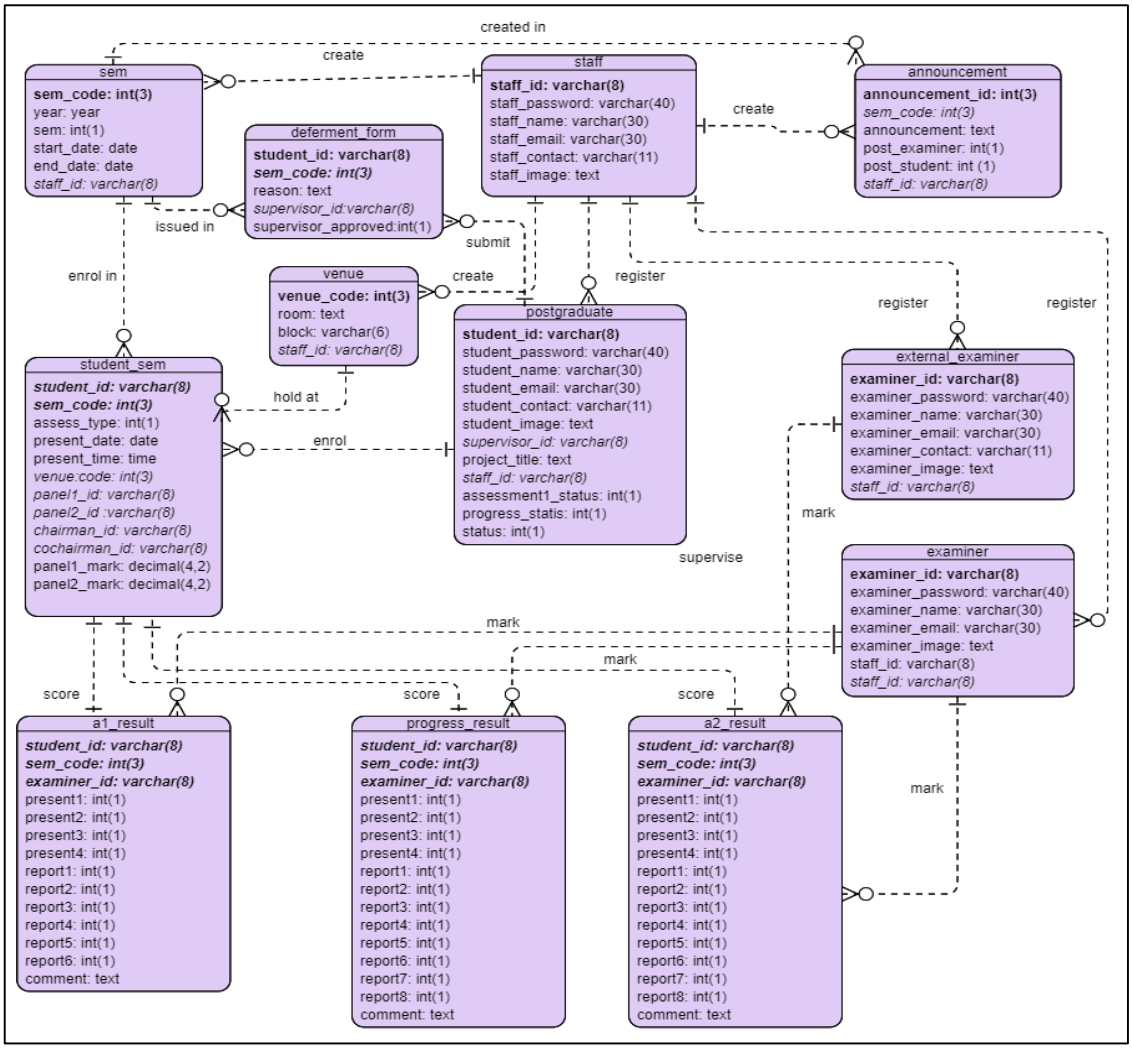

Figure 4: Entity Relationship Diagram

3.4 Implementation

Implementation phase is all about the work done to deliver the system. During implementation phase, developers are mainly focus on system coding part. They develop the system according to user requirement analysis and the wireframes. Apart from coding, detection of system error is also one of the parts of implementation phase. When developer found error occur, he would fix the code before moving to another part of coding.

3.5 Testing

The purpose of testing is to find defects and errors embedded within system, as well as ensuring the system functions as expected based on document made in requirement analysis phase. Once error is found, developer needs to fix the error and try running the system one time to ensure the error is completely fixed.

3.6 Deployment

During deployment phase, system is handed to customer. The system is installed and ran on customers' device. After that, customer start to use this system for their work or business.

3.7 Maintenance

Maintenance is the last phase in Agile model. Maintenance of system could be ranged delivering the ready software, updating the software and maintain the software [8]. Usually, developers would need to upgrade the system from time to time to make sure the system can run perfectly under all conditions.

4. Results and Discussion

4.1 System Implementation

Implementation of system is divided into two aspects, implementation of security models and implementation of modules. In this system, there are a few security models being implemented to increase the system security. These security models include session management, password encryption and strong password policy. Session management is used to prevent user pass-by login interface and enter the main system interface directly. Also, session management is used to manipulate user access level. Session is a variable that can be stored across multiple web pages [9]. Next, password encryption is used to convert the password from an original string into a meaningless 128-bit hash value. The password stored in database is also in the form of hash value to prevent unauthorized person access to the database and get the plain password. Next, strong password policy force the users to have a minimum strength of password. This will ensure the user password is not easily to be guess out by other users.

Apart from that, several modules are implemented in this system. These modules include login module, registration module, timetable scheduling module, announcement module, assessment marking module and deferment module. All the modules make up the basic functionalities of postgraduate presentation management system. Without any of the modules, the postgraduate presentation management system would be low efficient. Figure 5 shows the timetable scheduling module. Staff is involved in this module because staff needs to arrange the presentation timetable for every active postgraduate. Staff would need to input required data like postgraduate name, time, date, venue, and panels' name.

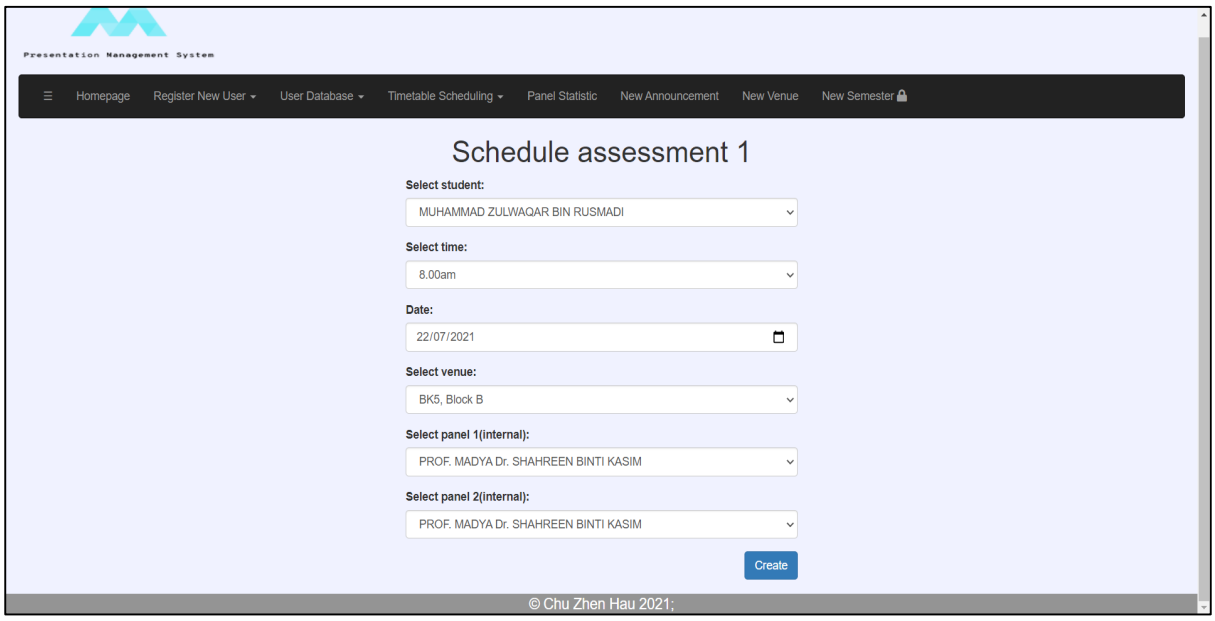

Figure 5: Timetable Scheduling Module

Next is assessment marking module. This module is for internal examiner and external examiner to mark postgraduates' assessment. Figure 6 shows the postgraduate selection interface for examiner.

Examiner selects the postgraduate he would like to mark and enter the evaluation sheet interface. Figure 7 shows the assessment 1 evaluation sheet. This interface is shown after examiner select postgraduate to mark. In evaluation sheet interface, examiners are forced to fill in all the marking field to complete the evaluation.

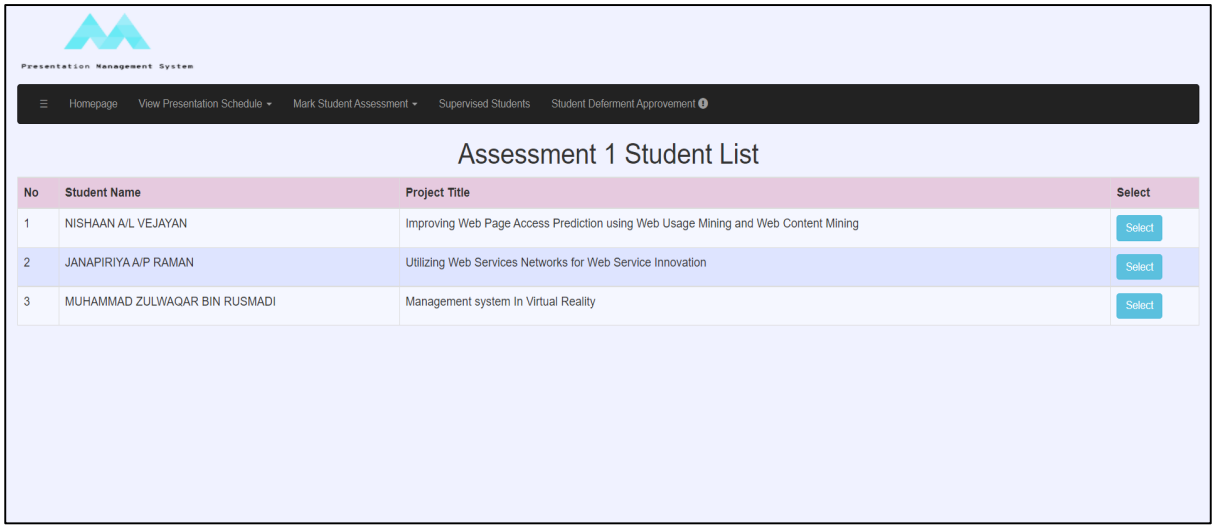

Figure 6: Postgraduate Selection Interface

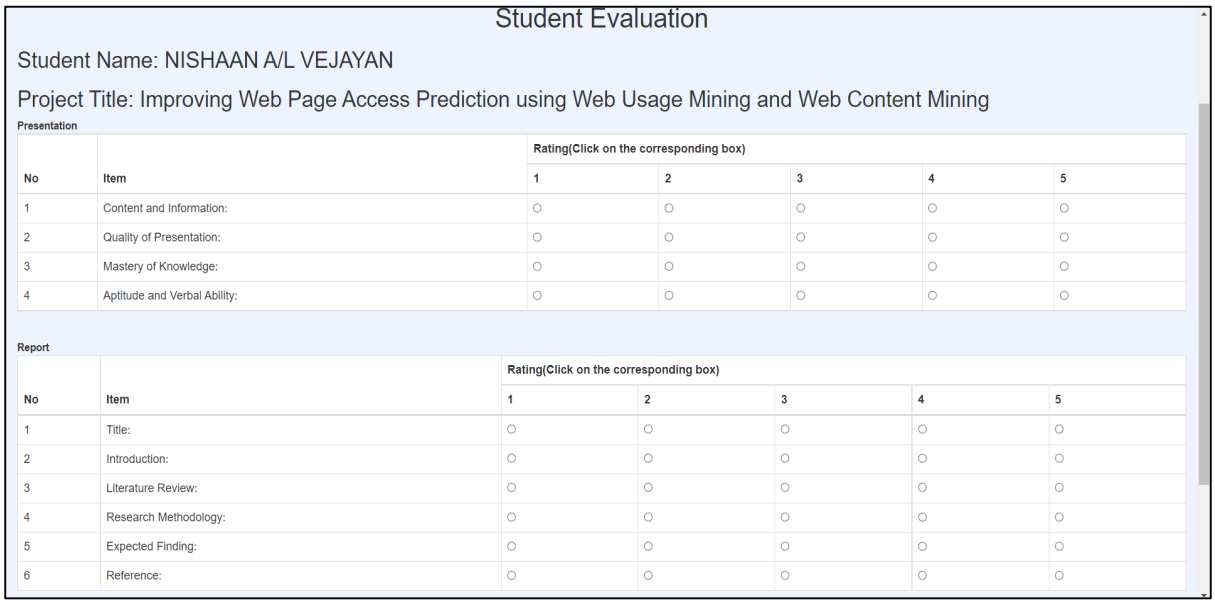

Figure 7: Assessment 1 Evaluation Sheet

Figure 8 shows the view result interface. This interface is for postgraduate to view the result he obtains in the specific semester. Before view the result, postgraduate needs to select the semester and click on "view" button. Then, the corresponding semester assessment result is shown.

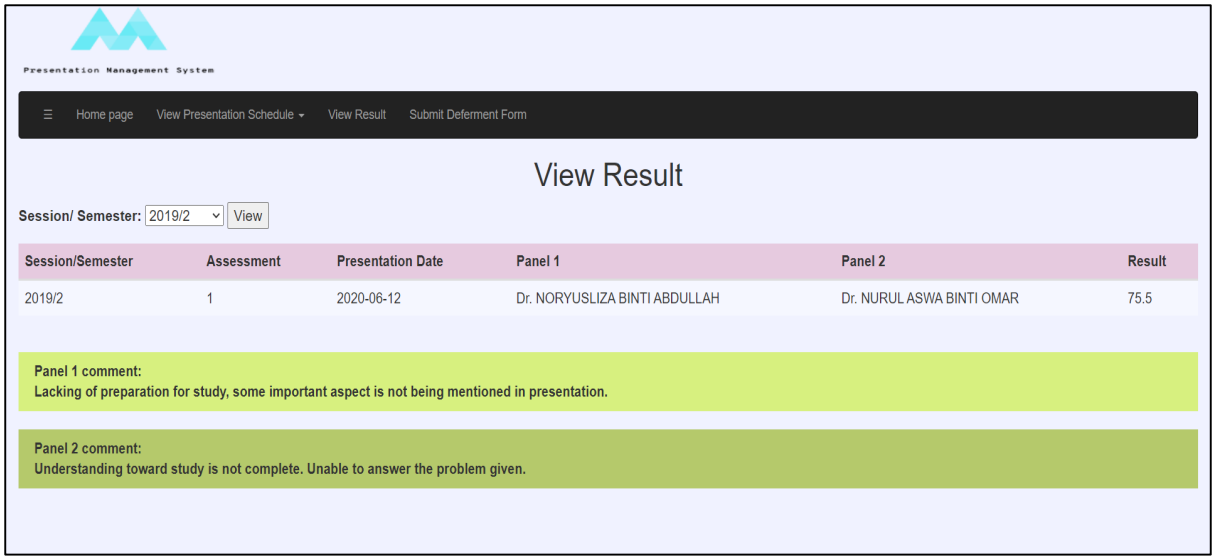

Figure 8: View Result Interface

4.2 System Testing

System testing is not only an important task during system development process, but also before and after development process [10]. Table 2 shows the functional test. Four different modules are tested against the functional test. Check list shows how the system is expected to be ran and the result shows the actual result come out from the system. All the result are pass means the system developed can work without error.

Table 2: Functional Test

No	Functional Test	Expected Result	Result
1	Login and Registration Modules		
i	Username or password is left empty	Display “Please fill out this field”.	Pass
ii	Login username or password is wrong.	Error message does not specify which input is wrong, just show fail to login.	Pass
iii	New password length shorter than 8 characters.	Display “Please lengthen to 8 characters or more”.	Pass
iv	Email format is wrong	Display “invalid email”	Pass
2	Scheduling Module		
i	Dropdown list is left empty	Display “Please select an item”.	Pass
ii	Text input field is left empty	Display “Please fill out this field”.	Pass
iii	Allow staff to create new timetable	Staff can create new timetable	Pass
iv	Allow staff to update old timetable	Staff can update timetable successfully	Pass
v	Allow staff to delete old timetable when clicking on trash icon	Staff can delete timetable successfully	Pass

Table 2: (cont.)

No	Functional Test	Expected Result	Result
3	Marking Module		
i	Radio button for marking left blank.	Display "Please select one of these options".	Pass
ii	Comment text area left blank. Error message shows "required field".	Display "Please fill out this field".	Pass
iii	Panel is allowed to view marked evaluation sheet.	Panel can view marked evaluation sheet but not edit it.	Pass
iv	Student can view result after mark is released.	Student can view result after select session/semester	Pass
4	Logout		
i	After clicking "logout" button, user is logged out.	User cannot go back to main interface, need to login again.	Pass

5. Conclusion

All three objectives of UTHM Postgraduate Presentation Management System have been achieved. The first objective is design postgraduate presentation management system based on web-based system. The system has been designed using Cascading Style Sheets (CSS) and bootstrap. With the help of bootstrap, the user interface appears to be more responsive. The second objective is developing postgraduate presentation management system which could successfully store data and retrieve data from database. We have developed the system by using bracket which is an open-source editor. The third objective is to implement alpha and beta testing on the developed postgraduate presentation management system to ensure the system can run without error. All the testing made shows that this system has passed all the test with the actual result constant with the expected results set.

Besides, there are some possible improvements can be made upon system. For example, adding site map module, adding panel nomination module, and migrating postgraduate module into mobile platform. Site map could navigate user to the exact location of presentation venue. Panel nomination module enables postgraduate to nominate examiner who is expert in the study field to become presentation panel. For the migration of postgraduate module into mobile platform because the postgraduate only has light and little operations, it is more convenience if the postgraduate can access to the system using mobile phone.

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