Graduate Student Research Progress Evaluation System

By

Lee Mei Foong

Dissertation submitted in partial fulfilment of
the requirements for the
Bachelor of Technology (Hons)
(Business Information Systems)

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Universiti Teknologi PETRONAS
Bandar Seri Iskandar
31750 Tronoh
Perak Darul Ridzuan

CERTIFICATION OF APPROVAL

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A project dissertation submitted to the
Business Information System Programme
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in partial fulfillment of the requirement for the

BACHELOR OF TECHNOLOGY (Hons)
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Approved by,

…….
(Dr P. D. D Dominic)

UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

September 2012

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

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LEE MEI FOONG

ABSTRACT

The purpose of this research project is to improve and increase efficiency of the Universiti Teknologi PETRONAS (UTP) postgraduate assessment process. The problems that occurred in current conventional system are inappropriate criteria used for assessment and cumbersome of paper evaluation forms. These problems eventually lead to low efficiency of UTP Center for Graduate Studies business performance in long-term operation. Therefore, Graduate Student Research Progress Evaluation System is developed to improve the efficiency of postgraduate assessment process by automate the current manual process using document management system (DMS) and business process improvement (BPI) concept. Also, this research project reviewed and developed an electronic evaluation forms with appropriate assessment criteria. The project area is mainly focused on UTP postgraduate assessment process and Research Proposal Defense (RPD) evaluation form only. Several research papers were reviewed to analyse critical points of related research areas such as process automation, electronic form, DMS and BPI. Prototyping methodology is employed to develop the system prototype using Macromedia Dream Weaver, PHP programming language and MySQL. User acceptance survey, usability testing and interview are conducted to gather information and user requirements. The user acceptance survey result had shown positive feedback towards the adoption of proposed system. Majority of the users opt to have automated system and electronic forms. They hope to have a system that is high effectiveness and efficiency. In term of usability testing, the System Usability Scale (SUS) score shown 82.25% of the respondents agree that the system have met the aspects of effectiveness, efficiency and satisfaction in term of user interface and system functionality. Furthermore, a draft version of revised Research Proposal Defense (PRD) evaluation form criteria is obtained from the interview session with programme coordinator. Based on the survey results and interview findings, the Unified Modelling Language (UML) diagrams such as system flow, activity diagram, use case diagram and system architecture is identified.

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Last but not least, I thank the respondents that willing to spend time and effort on conducting the survey. I am grateful for their cooperation during the period of answering questionnaires. Finally, I am most grateful to my family for giving me the moral support and constant encouragement.

LIST OF FIGURES

Figure 1.1 Process Flow of Postgraduate Research Progress Evaluation Monitoring System

Figure 2.1: Design-Implement-Review-Improve (DIRI) Cycle

Figure 2.2: Integration of Web form components in three sub- sets

Figure 3.1: Prototyping methodology

Figure 4.1: Percent of respondents agree on current process of postgraduate research progress assessment is troublesome and inconvenience

Figure 4.2: Problems of current assessment process faced by users

Figure 4.3: Duration of evaluation results submission

Figure 4.4: Ways of managing evaluation forms

Figure 4.5: Percent of respondents agree on automate current manual process

Figure 4.6: Percent of respondents agree on electronic form

Figure 4.7: Level of significant on requirements towards proposed system

Figure 4.8: Level of satisfaction on system interface

Figure 4.9: Overview of Postgraduate Research Progress Monitoring System

Figure 4.10: Process Flow of Postgraduate Research Progress Evaluation Monitoring System

Figure 4.11: System Flow

Figure 4.12: Activity Diagram

Figure 4.13: Class Diagram

Figure 4.14: Use Case Diagram

Figure 4.15: Sequence Diagram for Main User

Figure 4.16: Sequence Diagram for Secondary User

Figure 4.17: System Architecture

Figure 4.18: Network Architecture

Figure 4.19: Index Page (Login)

Figure 4.20: Login Successful

Figure 4.21: Registration Page

Figure 4.22: Registration Successful Message

Figure 4.23: Forgot Password Page

Figure 4.24: New Password Sent Message

Figure 4.25: Home Page

Figure 4.26: Research Proposal Defense (Evaluation Form)

Figure 4.27: Alert Message for Empty Text Fields

Figure 4.28: Form Submission Error Message

Figure 4.29: Form Submission Successful Message

Figure 4.30: Browse by Assessment Code

Figure 4.31: Assessment Results Browse by Assessment Code

Figure 4.32: Browse by Student ID

Figure 4.33: Assessment Results Browse by Student ID

Figure 4.34: Browse by Year

Figure 4.35: Assessment Results Browse by Year

Figure 4.36: Assessment Results in List

Figure 4.37: Assessment Result in Graph

Figure 4.38: Logout

Figure 4.39: Login Request Message

LIST OF TABLES

Table 4.1: SUS score

ABBREVIATIONS AND NOMENCLATURES

GSRPES	Graduate Student Research Progress Evaluation System
UTP	Universiti Teknologi PETRONAS
CGS	Center for Graduate Studies
Msc	Master's degree
PhD	Doctor of Philosophy
RPD	Research Proposal Defense
RCS	Research Completion Seminar
RPR	Research Progress Report
OP	Oral Presentation
DMS	Document Management System
SOA	Service Oriented Architecture
PDF	Portable Document Format
BPI	Business Process Improvement
SUS	System Usability Scale
UML	Unified Modelling Language
DBMS	Database Management System
HTTP	Hypertext Transfer Protocol
ID	Identification
CIS	Computer Information Science
PHP	Hypertext Preprocessor
HTML	HyperText Markup Language
XML	Extensible Markup Language

TABLE OF CONTENT

CHAPTER 1: INTRODUCTION 1

1.1 Background of Study 1
1.2 Problem Statement 4
1.3 Objectives 5
1.4 Scope of Study 5
1.5 Project Relevancy 6
1.6 Feasibility Studies 6

CHAPTER 2: LITERATURE REVIEW. 8
2.1 Assessment Criteria 8
2.2 Electronic Forms 11
2.3 Integration of electronic forms and Document Management System (DMS) . . 13
2.4 Integration of electronic forms and Business Process Improvement (BPI) . . 14
2.5 Business Process Improvement (BPI) With Automate Process . . . 15

CHAPTER 3: METHODOLOGY 17
3.1 Research Methodology . . . 17
3.2 System Methodology 19
3.3 Project Activities 20
3.4 Tools 20

CHAPTER 4: RESULT AND DISCUSSION . . . 21
4.1 Data Gathering and Analysis . . . 21
4.2 Interview Findings 28
4.3 Unified Modelling Language (UML) Diagram . 33
4.4 Prototype 41

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS . 52

REFERENCES 53

APPENDIX 1 56

APPENDIX 2 63

APPENDIX 3 64

APPENDIX 4 66

APPENDIX 5 69

APPENDIX 6 70

CHAPTER 1
INTRODUCTION

1.1 Background of Study

Graduate studies or known as postgraduate is an advanced academic study with the requirement of a student must complete Bachelor's degree beforehand. Degrees that awarded for graduate studies include Master's degrees, Doctoral degrees, and other postgraduate qualifications such as graduate certificates and professional degrees.

Most of the higher learning institutions in local or overseas offer graduate studies programme. Universiti Teknologi PETRONAS (UTP) offer Master's degree (MSc) and Doctor of Philosophy (PhD) programme in a broad range of Engineering and Information Technology-related research fields. UTP postgraduate programme is manage by a department named Center for Graduate Studies. This department in charge of handling general conduct of university postgraduate programmes such as new student registration, manages research field application, arranges appointment with panel of examiners, scheduling student assessment session and consolidates evaluation results.

For UTP graduate studies programme, all graduate candidates by research mode are required to undertake several assessments within the allowed time given to a Panel of Evaluator. Only upon successful candidates can proceed with the proposed research work. Those who are unsuccessful will have to repeat the assessment within the allowable period after the first attempt. Failing the second attempt or failing to repeat within the allowable period may cause their candidacy to be terminated.

Postgraduate research progress monitoring system is categorised into three parts:

I. Research Proposal Defense (RPD)
II. Symposium and Research Progress Report
III. Research Completion Seminar (RCS)

Postgraduate research progress monitoring system is conducted by Panel of Evaluators that is nominated by the Head of Department (HOD) and approved by the Dean of Center for Graduate Studies Office. The members must be selected from related field of the proposed research work. The Panel of Evaluators consists of a minimum of three panel members: chairman (Dean/ HOD/ Senior Academic Staff with PhD qualification with Associate Professor status), main supervisor and external examiner from related field of research with minimum PhD qualification.

The main role of Panel of Evaluators is to evaluate the research progress of a graduate student. During the evaluation session, the Panel members use the evaluation form prepared by the Center for Graduate Studies Office to fill in marks and comments. After the evaluation session, the Chairman submits consolidated evaluation results to the programme coordinator and Center for Graduate Studies Office within one week of the evaluation date. Figure 1.1 below shows the process flow of monitoring system for graduate student by research mode.

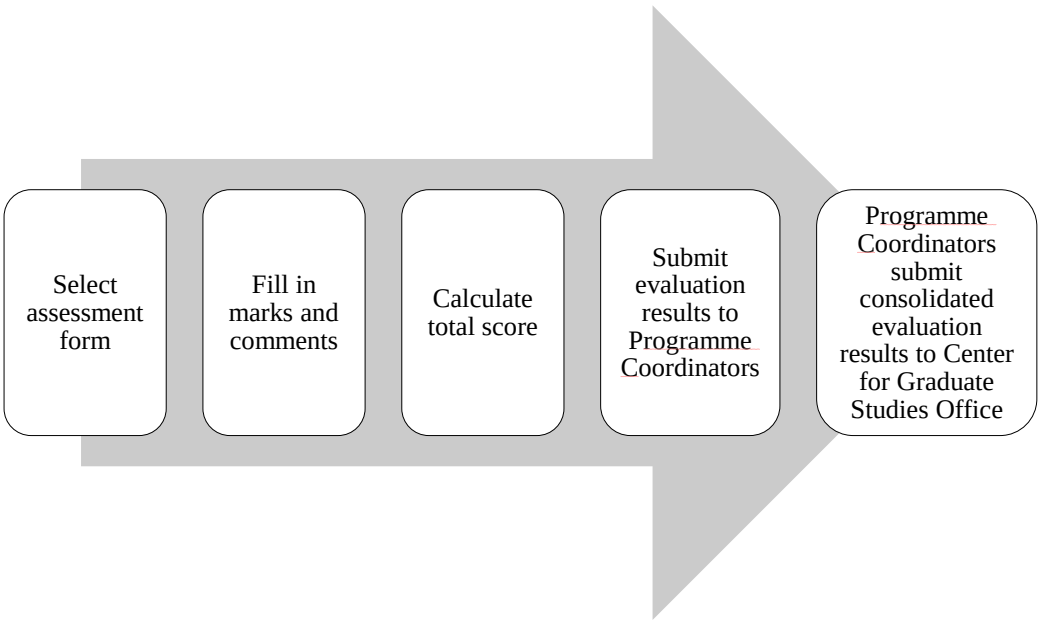


Figure 1.1 Process Flow of Postgraduate Research Progress Evaluation Monitoring System

There is several evaluation forms involved in the postgraduate research progress monitoring system. Each of the evaluation forms has its own assessment criteria to evaluate student performance. These forms are printed in different colour to easy differentiate. Refer to the sample of evaluation forms in APPENDIX 1.

The evaluation forms are as below:

I. Preliminary Candidature Assessment Form (UTP/CGS/52A)
II. Advance Candidature Assessment Form (UTP/CGS/52B)
III. Research Proposal Defense (Evaluation Form) (UTP/PGS/52C)
IV. Oral Presentation Evaluation Form (UTP/CGS/52D)
V. Research Completion Seminar (Evaluation Form) (UTP/PGS/52D)

1.2 Problem Statement

The main issue of current postgraduate research progress monitoring system is the assessment criteria. The criteria that were previously set are not applicable for assessment. It is irrelevant to the assessment objectives and panel of evaluators are having the difficulty in plotting marks on that particular criterion. These inappropriate criteria might affect the result of expected outcome. The assessment may not able to accurately identify the performance and standard of graduate student.

Take Research Progress Defense (RPD) as an example, RPD is a written description of a proposed scientific research to be conducted within the period of a candidate's graduate study. The purpose of RPD assessment is to evaluate candidate's proposed research progress viability and acceptability before being allowed to proceed with their research work. However, the RPD assessment has a criterion on evaluating the key milestone of research work. This criterion is totally irrelevant to the purpose of RPD assessment as it only measures the feasible of student proposed research. Evaluation on key deliverable of research work is not needed in RPD assessment.

Besides inappropriate assessment criteria, problems arise due to the assessment process involves paper form as the main source. Too many evaluation forms are used in this process has caused cumbersome for the users like student supervisor and programme coordinator. They face difficulties to store and manage the paper evaluation form. Also, hard to retrieve, index and search. They always tend to lose or misplace the forms.

Moreover, the current assessment process of submitting evaluation result is very time-consuming and troublesome. Panel of examiners are required to submit the consolidated results to programme coordinator and Center for Graduate Studies Office within one week of the evaluation date. Somehow, this process tends to take up more than a week time to complete.

Other minor problems that occurred in current process such as incorrect form used for assessment, fields in evaluation form are not filled up by panel, error-prone in total score calculation and so on. In fact, all of these problems eventually cause low efficiency of UTP Center for Graduate Studies business performance in long-term operation.

1.3 Objectives

The primary objective for this project is to improve and increase efficiency of postgraduate research progress evaluation process.

The secondary objectives of projects:

- To design a new evaluation forms with appropriate assessment criteria
- To develop a prototype that automates current process by using Document Management System (DMS) and Business Process Improvement (BPI) concept
- To build electronic evaluation forms

1.4 Scope of Study

The study area is confined to the geographical area of Universiti Teknologi PETRONAS, mainly focus on UTP Center for Graduate Studies postgraduate research progress evaluation process.

Main users of the system prototype are UTP lecturers that appointed as postgraduate programme coordinator, supervisor or panel of evaluator, staff from Center for Graduate Studies.

The system prototype develops on the Research Proposal Defense (RPD) evaluation form only.

1.5 Project Relevancy

The purpose of this project is to review and critically look for improvement of the postgraduate research progress evaluation process. The significance of this project towards UTP Center for Graduate Studies as below:

- Promote business performance improvement
- Increase staff productivity and time efficient
- Data is systematically store and manage
- Accurate and timely data can be obtained
- Data is usable for analysis and decision making

1.6 Feasibility Studies

1.6.1 Technical Feasibility

Technology used in this project:

Front end – PHP, HTML

Back end – Internet web browser, e.g. Internet Explorer

1.6.1.1 Familiarity with Technology

The main users of this system are UTP lecturers who are appointed as postgraduate programme coordinator, student supervisor or panel of examiners and staff of Center for Graduate Studies. They are a group of individual who is computer literate that have the knowledge and ability to operate a computer. Therefore, the risk of unfamiliarity is not high since the potential users are generally exposed to technology and have plenty hands-on experience using web-based system in daily life.

Likewise, the system developer is a final student pursuing Bachelor's degree of Technology in Business Information System has adequate technical background in developing web-based system and also familiarity in programming language such as PHP and HTML, XML.

1.6.2 Economic Feasibility

Economic feasibility is concerned with the cost effectiveness of the project. For this project, benefits are definitely outweighing the costs. This is an in-house project that requires no development or operating costs. There is no hardware tools needed to build this system. It only requires a computer with a web browser installed and connected to internet or intranet.

This system certainly brings a great advantage to the users in term of the tangible benefits. For instance, effectiveness of business process, improved of document management, accuracy and correctness of data quality, these are the benefits gained from this system.

1.6.3 Operational Feasibility

Operational analysis is concerned with the human, organizational and political aspects. For this project, it only involves issue of acceptability of users with this new developed system. Therefore, training workshop is inquired to organize before system launching. The purpose of training is to demonstrate the system to main users.

Moreover, in order to foster the acceptance of users towards this system, it is important to involve them in the process of the system development. User involvement is essential in feasibility studies, requirement gathering and prototype development to customize the system according to their needs.

1.6.4 Culture Feasibility

Culture analysis is measure by the organization environment factor. For this system, the main users are individuals who possess high education level and often expose to the use of technology. Thus, there is low level of conflict in accepting the use of new system application in their working procedure. On top of that, UTP as an institute of technology should have no issue on employing technology application in the business operation. In a nutshell, the development of this new system is not clashed with culture feasibility of the organization.

CHAPTER 2
LITERATURE REVIEW

2.1 Assessment Criteria

Assessment criteria are the evaluative description that used to judge the quality of work performed. It provides the framework for judgement or decision. In academic sector, assessment criteria play an important role to determine the standard of a student. It is a qualitative measurement used to describe how well a student is achieved based on the learning outcome in order to be awarded a particular grade.

According to the report of international working group on the quality assurance of student assessment (2008), there are several criteria for a good assessment. A good assessment must be stressed on carefully design of the format, especially in term of reliability and validity. The criteria that are assigned need to be able to show the achievement of specific objective or outcome. It has to be consistent and accurate which can measure the relevant of knowledge as well as skills and competences in relation to the learning outcomes. Also, the assessment must be review from time to time in order to ensure the compatibility of assessment with the rapid change of learning environment.

2.1.1 Importance of Assessment Criteria

The importance of assessment criteria serves on a number of aspects. In academic sector, the stakeholders for assessment criteria are student, lecturer, and institution.

For the student, criteria provide a source for the students to know what the requirements needed to score for an assessment. For instances, they can know the factors that will take into account for marking or assessment, the standards that they have to achieve on each criteria in order to be awarded a mark within a particular grade level. Student can understand or interpret these criteria beforehand so as to enable them to reach their maximum potential grade for their assessment (McDonald and Sansom, 1979).

For the lecturer or evaluator, criteria provide a clear guideline or benchmark for them to follow while performing assessment. It makes the marking of student work become transparent and fair. Mark and Susan (1998) discussed the use of assessment criteria is to ensure the consistency of marking. Consistency of standards in an assessment is important to assure the lecturers are accessing student based on the similar modules. It is to ensure the same criteria are used for every student and the students are aware on how it will be assessed. Without uniformity on assessment process, the quality and validity of the results derived from assessments of students will be questionable (Balla and Boyle, 1994).

For the institution, criteria act as a quality assurance mechanism. Assessment provides information upon students' progression and overall level. Information generated from the assessment such as mark or grade is a valuable tool for quality assurance and enhancement. It enables the institution to ensure that the appropriate standards are being met in accordance with the assessment framework.

2.1.2 Method to Improve Assessment Criteria

Improvement of existing assessment practice can be done by implementing a 'design-implement-review-improve' (DIRI) cycle (Figure 2.1). At the design stage, it focuses on the planning of designing the format of the assessment. This is the most crucial phrase in the cycle where it decides the best assessment practice and demonstrates a particular learning outcome accurately. After that implement the assessment designed. Testing is done on the appropriateness of the assessment by applying it to specific circumstances. Then review the result of testing to determine the application of this assessment practice and make suitable changes for improvement.

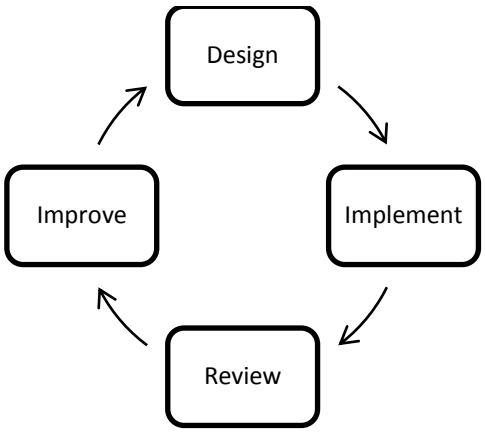


Figure 2.1: Design-Implement-Review-Improve (DIRI) Cycle

2.2 Electronic Form

Paper forms are the most common medium used in business activities. It is the critical elements that used to communicate between different parties, organization back end systems and business processes. It functions as data storage as well as communication tool for the business operation. However, many industries face the challenges from the manual process of data collection via the paper forms. And so, the rapid advancement of technology has changed the way the traditional way of business operates involving paper forms.

Nowadays, more and more organization is going to achieve paperless environment due to the inconvenience caused by paper forms. Lutteroth and Weber (2011) stated that paper forms have many disadvantages. Paper form is difficult to manage and it requires manual staff interaction even in a simple task. In contrast, electronic forms have many advantages. It can be transfer, store, complete, search and manage data more efficiently. As a result of that, many organizations are trying to move away from paper forms to electronic form technologies.

Managing and organizing paper documents have become the one of the issue in academic sector. University management often encounter a great deal of inconvenience with a large amount of various kinds of forms in administrative process. Gilani (2009) examined most of the universities currently facing obstacles in document management using paper based systems. Even though computer based systems are implemented in the business procedure, but still, these systems are paper based that involve physical paper existence. Physical paper that requires physical creation, storage, distribution and destruction caused cumbersome in the process of classifying multiple documents, searching and sorting. Hence, a paperless model for the university management system is presented by Gilani to overcome these problems. University of Virginia is the example of the university that uses electronic forms to reduce the size of its data entry operation.

An electronic form can be designed in an innovative and practical approach to assist user-friendly collection of accurate data in web environments. The purpose of this approach is to avoid users filling incorrect information which caused faulty input into the system.

Sadaghat (n.d) proposed to design a form that integrates all web-form components into small sets for collecting accurate pieces of information from users. Web-based electronic forms are composed of form components such as radio button, drop down menu, text box, check box and series of hyperlinks which connect all of the components to the relational database to display, update or store data from users.

The traditional way of designing form is to populate the page with forms components that work independent of each other. By integrating all of these independent components into small sets, they would be able to interact with each other within each set and also with other set that is in the same form or linked forms. Each set is designed to suit the collection pattern of related data and it contains type of components that assist to such data collection. And so the cross-validate of the relationship between pieces of information with the others would take place. The form is then shows only the certain components that are required to fill by users to prevent incorrect input into system. Hence it leads to better data management with accurate and consistent of collected information.

Figure 2.3 shows a set comprising three subsets of drop-down lists and radio buttons. Selecting one radio button in a sub-set will deactivate the operation of drop down lists belonging to other radio buttons.

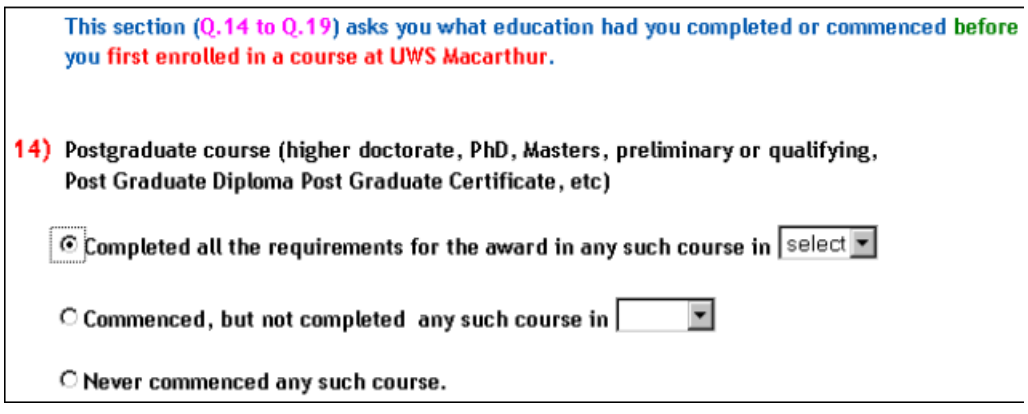


Figure 2.2: Integration of Web form components in three sub- sets

2.3 Integration of electronic forms and Document Management System (DMS)

Organizations are facing a hard time in managing and organizing the paper documents. The only way to overcome the use of paper is to employ an efficient electronic way (Cochrane, 2012). Document Management System (DMS) is a computer system used to store and manage electronic documents. Wikipedia defined Wikipedia defined DMS as a system that provides document storage, versioning, indexing, metadata, security and retrieval capabilities.

A proper document management system increases business operation efficiency. DMS offers many advantages to an organization. It provides electronic repository in such a way that all documents are centrally kept and manage at one particular location. This not only helps to reduce organization document storage space, issue of paper lost or misplaced can also be prevented.

Moreover, DMS eases the process of documents indexing and retrieval. Less time and effort would be spent on locating the document as they can be classified and searched within one centralized database. Not only that, DMS allows document distribution over the network. People can easily transfer and receive document within organization by using this system. Thus information can be freely share and inter-change from others in a short period of time.

DMS is recommended to overcome the problem of paper document management in university administration. A study conducted by Baban and Mokthar (2010) has shown positive feedback from University of Malaya students towards establishing a DMS in local universities. Electronic documents are suggested to build to replace paper documents in academic area. The survey result shown that 89% students interested to have a system to manage, retrieve and sharing documents in faculty. With implementation of DMS, it can eventually improve the efficiency of university business performance by reducing the time and costs for handling paper documents.

In term of DMS architecture, a research conducted by Li and Mao (2008) stated that university educational administration management system starts to shift the workflow to the electronic document by employing intelligent document technology. The purpose of this system is to raise the efficiency of operation and simplify the current paper based workflow.

However, forms are difficult to be integrated into the existing workflow due to low efficiency and poor expandability. An intelligent document technology is offered to make the document information interchanges become possible. Forms are set as the center element of system. Intelligent document technology is adopted to integrate data collecting, business process, subsystem applications and data storing.

2.4 Integration of electronic forms and Business Process Improvement (BPI)

More and more organization is moving from paper-based workflow to digital operation process. The main driver that urges the migration of paper processes to electronic alternatives is not because of the advancement of technology, but is the impact of business benefit itself. In today's competitive business environment, accomplishing of organization desired business goals requires a constant process of improvement in business operation, particularly in the document automation process.

Business Process Improvement (BPI) is the systematic approach that helps organization to reach its maximum potential by optimizing business processes in order to achieve more efficient result. The goal of BPI is to make drastic changes towards the organization structure. It is used to identify the requirements of to-be system to develop the prototype system using technology. Therefore, traditional business process which involve time, cost and manpower should be reviewed and re-examined in order to improve operation productivity and quality.

Madar (2004) examined the critical key to attain a successful document automation business process improvement is to apply an effective BPI methodology during the process of improvement. This structured approach can effectively help organization to reduce operations time and costs, improve productivity, and also facilitate improved customer service.

The BPI methodology is stated as below:

1. Identify and Select the Processes
2. Map the Processes
3. Redesign the Processes
4. Implement the Solution

Attappilly and Stark (2012) examined the process of integration between electronic forms and Business Process Improvement (BPI) can be achieved by using standards-based technologies and web-based delivery. An effective business processes required linkage of data captured from electronic forms with existing back end processes, application and databases. It required a solution that can automate and integrate forms and document-based processes with existing business processes.

2.5 Business Process Improvement (BPI) with Automate Process

Automate process involves using computer technology and software engineering to automate the manual process to operate more efficiently in lower cost. With today's advancement in technology, Business Process Improvement (BPI) can be easily achieved by automate business processes.

Implementing process automation offers significant opportunities for the business operation (James, 2008). The primary benefit is to improve performance efficiency. Manual process is transformed to work faster and low cost. And so it allows business to do more with less. Besides, by automating the business process, it eliminates manpower hand-on effort through the replacement of technology. Individual have more time to take on new or additional tasks and work more efficiently.

Moreover, the conventional manual process tends to be inconsistent and error-prone with the involvement of human being. Process automation makes the process reduced the risk of mistakes by employing computer technology to execute. The results obtained are consistent and reliable to assist in making decision. In fact, all of these benefits resulted in significant financial profits. It reduced costs, increase operation performance, shorter time and improved profits.

In higher education sector, automation process has become one of the valuable applications for business process improvement. Numbers of university is converted from manual process toward automated system.

Information and Communication Technology (ICT) is an effective tool for integrating and automating various activities of examination system at different administrative levels (Mohini and Amar, 2011). In their study, an Automated Integrated Examination System is proposed to replace the manual examination system in Indian universities. This manual examination system is facing many problems such as not announcing the examination results on time and accurately. This proposed automated system is aim to provide transparency, reliability, efficiency and effectiveness in university examination system by cutting down time and costs. Other than that, it also eliminates the geographical barriers and offers convenience with online service.

Texas A&M University has implemented an Automated Integrated University Examination System (Pinnell and Charles, 2000). The conclusion made towards the implementation of this automation process is the system was very effective. Student record and reporting system was improved greatly and the manual effort and time required to complete the registration process was greatly reduced. And also, the study has shown the student acceptance of the system was generally good.

CHAPTER 3
METHODOLOGY

3.1 Research Methodology

For this project, the research data is gathered through the combination of primary and secondary source:

1) User acceptance survey
2) Usability testing
3) Interview

3.1.1 User Acceptance Survey

User acceptance survey is carried out before the development of the system. The objective of this survey is to identify the factors that affect the acceptance of user towards a system. This survey must be conducted to the target group only as the questions asked are very important and useful for project. 20 respondents are selected to answer the close-ended questionnaires. The survey is done by face-to-face and paper-and-pencil method. It took approximately less than five minutes to complete the survey. (Refer to APPENDIX 3 for the sample of survey questionnaire)

Survey location: Universiti Teknologi PETRONAS (UTP)

Sample size: 20 respondents

Target group: postgraduate programme coordinators, supervisors, panel of examiners and staff of Center for Graduate Studies

3.1.2 Usability Testing

Usability testing is conducted after the system prototype is built. The objective is to gather user's viewpoint after they have tried on the system. Respondents are randomly picked to answer the questionnaires. Due to time constraint, only 10 respondents are selected from target group while the rest are randomly picked from the non-target group. The design of questionnaires is close-ended questions. The survey is conducted by online and paper-and-pencil method. It took approximately ten minutes to complete the survey. (Refer to APPENDIX 4 for the sample of survey questionnaire)

Survey location: Universiti Teknologi PETRONAS (UTP)

Sample size: 25 respondents

Target group: postgraduate programme coordinators, supervisors, panel of examiners and staff of Center for Graduate Studies

Non-target group: lecturers, students

3.1.3 Interview

Semi-structured type of interview session is conducted to gather user requirements and detailed information from the target group. The interview is carried out on one-to-one basis. Predefined questions were prepared for the interview session and respondent is allowed freedom to express their answer. (Refer to APPENDIX 5 for the interview outline)

Survey location: Universiti Teknologi PETRONAS (UTP)

Sample size: 3 respondents

Target group: postgraduate programme coordinator, supervisor, staff of Center for Graduate Student

3.2 System Methodology

This project is developed by using prototyping methodology. Prototyping model is an iterative process which gives emphasis in analysis, design, and implementation phases concurrently. All of these three phases are repeated in a cycle until the system prototype is fully completed then only implement it as a system.

The project is started with planning phrase where project value is determined and identifies the feasibilities. Follow by analysis, design, and implementation phrase of the proposed project to develop a system prototype with draft interface and features. Then the basic prototype is shows to the users to examine and review. From the feedbacks gathered, the prototype is reanalyse, redesign and re-implement with better features and functionalities. The same process is repeated until all of requirements are met. Lastly, the final prototype is implemented as a system. Figure 3.1 below shows the structure of prototyping methodology.

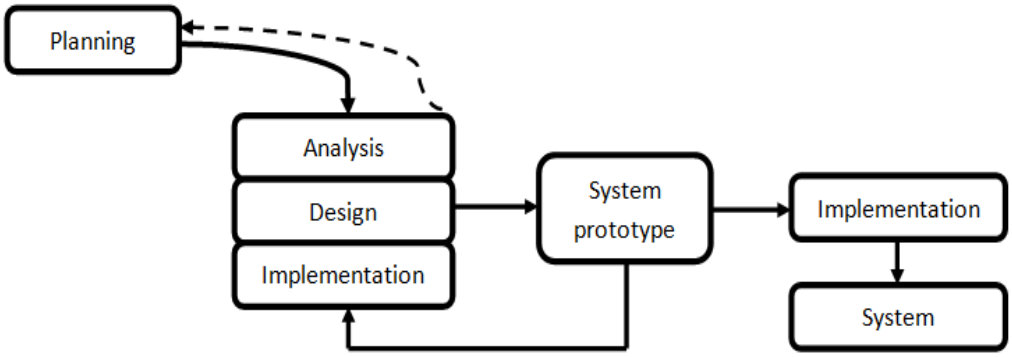


Figure 3.1: Prototyping methodology

3.3 Project Activities

The project consists of four main activities, which are planning, analysis, design, development and implement. The duration of project is 28 weeks, start from May to December 2012. Refer to the key milestone and gantt chart in APPENDIX 4.

3.4 Tools

- Hardware
- Acer Aspire S3
- Intel® Core™ i5 @ 1.60 GHz
- 4GB RAM
- 64-bit OS

- Software
- Adobe Dreamweaver CS3
- Xampp (Apache 2.4.3, MySQL 5.5.27, phpMyAdmin 3.5.2.2, PHP 5.4.7)

- Programming Language
- PHP
- HTML

CHAPTER 4
RESULT AND DISCUSSION

This chapter will discuss the result and findings from the research methodology discussed in Chapter 3. It will cover the quantitative data collected from user acceptance survey and usability testing presented in graph or chart, findings from interview, as well as the modelling from system methodology presented in diagrams.

4.1 Data Gathering and Analysis

4.1.1 User Acceptance Survey Result

User acceptance survey has been conducted to 20 respondents which consist of UTP postgraduate programme coordinators, supervisors, panel of examiners and staffs of Center for Graduate Studies. All of the respondents have high level of experience in using online system. Below is the results gathered from the survey.

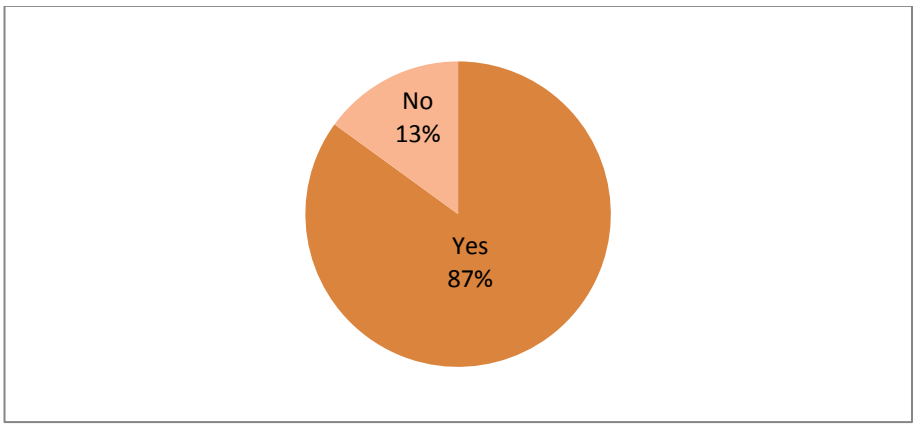


Figure 4.1: Percent of respondents agree on current process of postgraduate research progress assessment is troublesome and inconvenience

Figure 4.1 shows that majority of respondents found that the current process of postgraduate research progress assessment is troublesome and inconvenient. They think that too many forms are being used and hard to manage. Some of them lost or misplaced the forms (Figure 4.2).

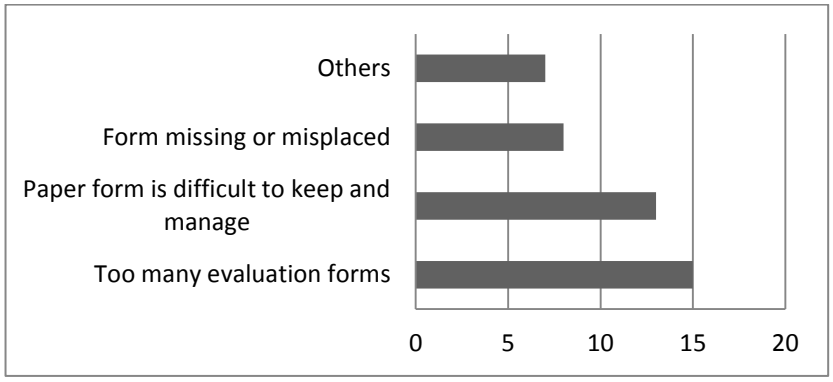


Figure 4.2: Problems of current assessment process faced by users

The other problem that is stated by staff from Center for Graduate Studies is incorrect form is being used during assessment session. Panel of examiners tend to use the wrong evaluation form to access student. Moreover, the total score of the marks is not being calculated by the panel. The field is left empty and some are even wrongly sum up. And also, the comment field in evaluation form is not filled up and the words written are hard to read due to poor hand-writing. All of these matters are important for the management to analyse the level of student performance and decision making.

In addition, postgraduate coordinator complained late submission of evaluation result from the panel of examiners. The panels are supposed to submit the consolidated results to the coordinator within a week of evaluation date. Somehow they took more than a week to do so. 48% of the respondents take a week time to submit the evaluation results to coordinators, 32% take one to three days and 20% of them take more than a week (Figure 4.3).

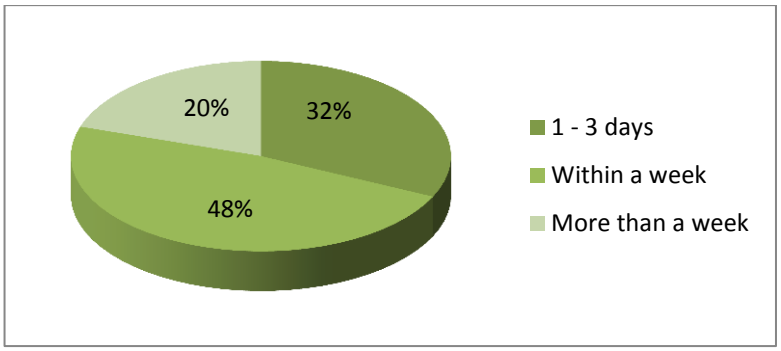


Figure 4.3: Duration of evaluation results submission

Based on Figure 4.4, it shows that majority of the supervisors or programme coordinators keep the evaluation forms by filing it for records. Beside than keeping the hardcopy, some panels also key in the data of assessment like marks and total score into Microsoft Excel. The excel file is stored in the computer as a backup in case they lost the paper evaluation form. Also, the excel file can be used for evaluation result submission to coordinator through e-mail. Some of the panels will throw away the paper evaluation form and choose to only keep the softcopy after the submission. This is because paper form is hard to manage and it is bothersome for them. Therefore, this indicates that the users opt to employ technology to assist them in the process. They will save the data into computer as a record instead of having physical paper.

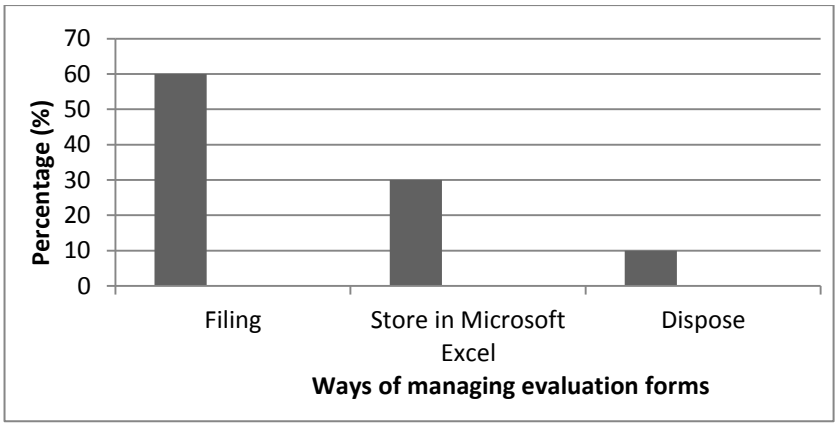


Figure 4.4: Ways of managing evaluation forms

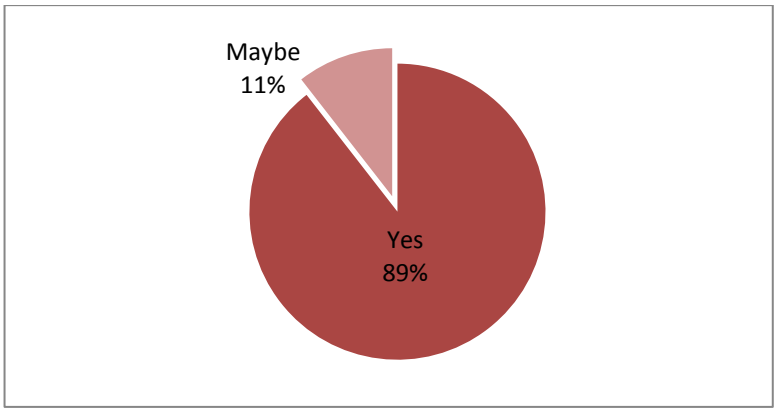


Figure 4.5: Percent of respondents agree on automate current manual process

Figure 4.5 shows that most of the respondents support to the idea replacing manual processes with automation technology. They said that conventional manual process can be improved with the help of technology. Yet, two respondents stated unclear viewpoint in this survey with the reason of they depend on the usability of the system. They will opt of automated system if only the output is highly reliable and functional.

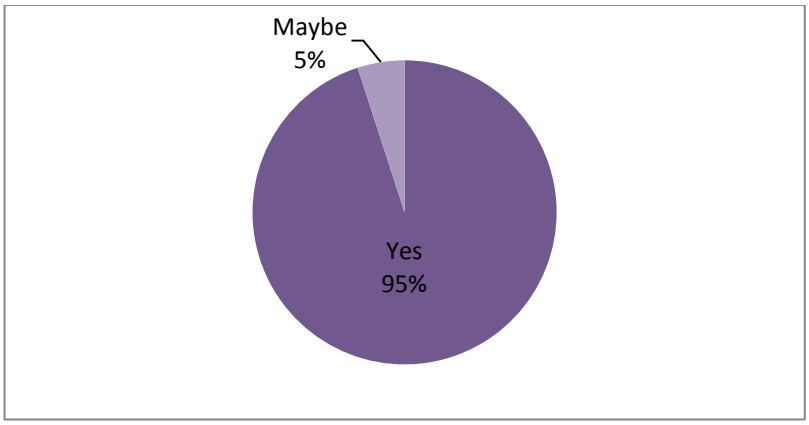


Figure 4.6: Percent of respondents agree on electronic form

Figure 4.6 shows that majority of respondents agree to replace paper form with electronic form. They claimed that paper form is cumbersome and hard to manage. It would be a good approach to eliminate paper form in the assessment process. However one respondent said that he is not sure whether to support this approach because electronic form requires computer and internet connection to perform. His concern is about the inconveniency of involving computer in the process and technical issue such as internet down.

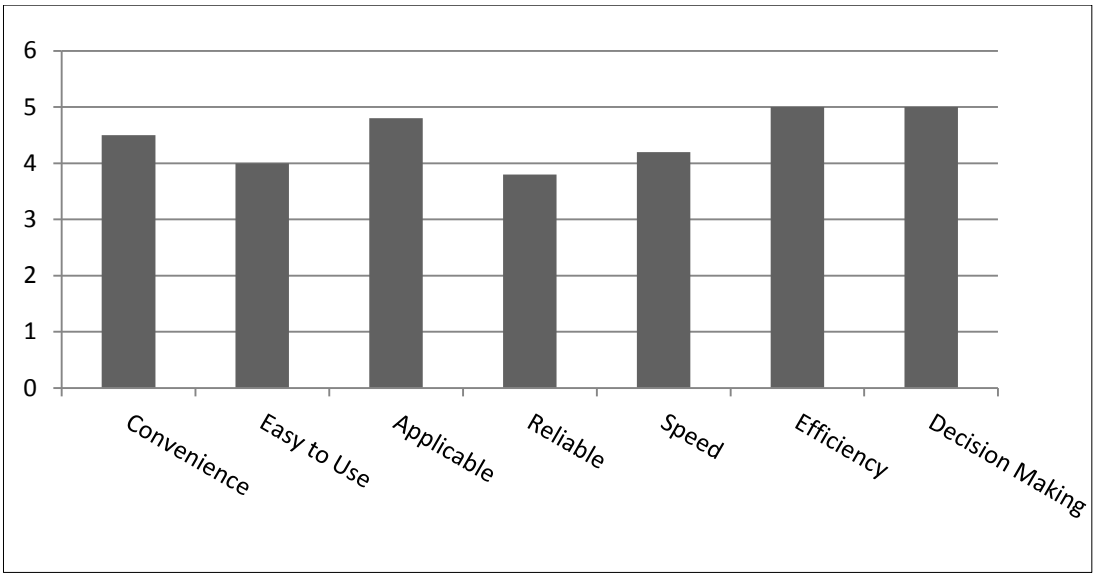


Figure 4.7: Level of significant on requirements towards proposed system

Based on the figure above, I discovered that respondents have high requirements on accepting the implementation of proposed system. They wished to have a system that is applicable to use and help to increase efficiency. The system must also be able to provide convenience to daily tasks, generate reliable and high quality data to assist them in decision making. Nevertheless, the system has to be user friendly and easy to use. They also want the system to have high speed of completion in order to assist them to work faster.

In the nutshell, based on the user acceptance survey, I can conclude that users have positive feedback towards the acceptance of proposed system. The users are facing problems in current postgraduate research progress evaluation process. They have difficulty in storing the paper evaluation forms and issue in late submission of evaluation results. Majority of the users opt to have automated system and electronic forms. They hope to have a system that provides high effectiveness and efficiency.

4.1.2 Usability Testing Result

Usability testing survey is conducted in two parts: general overview and System Usability Scale (SUS). 25 respondents were asked to evaluate the physical appearance of the web application as well as usability and functionality of the system.

4.1.2.1 General Overview

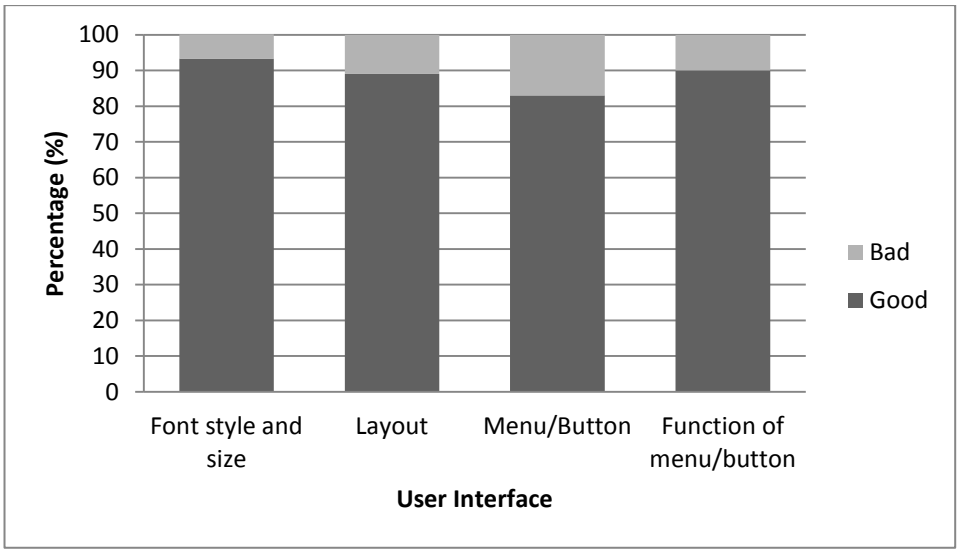


Figure 4.8: Level of satisfaction on system interface

Based on the survey result, majority of the responses towards the feel and look of system is positive. The respondents agree that the font style and size used in the system is easy to read. Also, they are satisfied with the layout of the system. Somehow, 11% of the respondents think that the layout is not attractive enough. The home page is too simple and colour is plain. Whereas for the menu items and buttons, respondents think that they were well organized and functions were easy to find. They can immediately understand the function of each menu item. Only a small portion of the respondents are not satisfied with the menu. They expect to have menu bar on every page of the system. Overall, the respondents are satisfied with the general overview of the system.

4.1.2.2 System Usability Scale (SUS)

Another part of usability testing is measured by using system usability scale (SUS). SUS is used provide the result and measurement of the system usability from the respondents after they evaluated the system. According to Wikipedia, there several different aspects to measure usability:

- effectiveness (can users meet their objectives)
- efficiency (how much effort and resource is used to meet those objectives)
- satisfaction (was the experience satisfactory)

To calculate the SUS score, first sum the score rate of each question range from 0 to 4. For items in odd number (1, 3, 5, 7, 9) the score rate is the scale position minus 1. For items in even number (2, 4, 6, 8, 10) the score rate is 5 minus the scale position. After that, multiply the sum of the scores by 2.5 to obtain the overall value of SUS. SUS scores have a range of 0 to 100. Score above 50 is categorised as a good system.

Below table shows the SUS score of usability testing.

	Questions	**Score Rate**
1	I think that I would like to use this system frequently.	3.8 – 1 = 2.8
2	I found the system unnecessarily complex.	5 – 2.2 = 2.8
3	I thought the system was easy to use.	4.5 – 1 = 3.5
4	I think that I would need the support of a technical person to be able to use this system.	5 – 0.8 = 4.2
5	I found the various functions in this system were well integrated.	3.4 – 1 = 2.4
6	I thought there was too much inconsistency in this system.	5 – 1.3 = 3.7
7	I would imagine that most people would learn to use this system very quickly.	4.5 – 1= 3.5
8	I found the system very cumbersome to use.	5 – 0.5 = 4.5
9	I felt very confident using the system.	3.5 – 1 = 2.5
10	I needed to learn a lot of things before I could get going with this system.	5 – 0.8 = 4.2
	Total	**34.1**
SUS Score = 34.1 * 2.5 = 85.25		

Table 4.1: SUS score

Based on the table above, the SUS score for this usability testing is 85.25 out of 100, which mean more than 85% of the respondents think that Graduate Student Research Progress Evaluation System have met the aspects of effectiveness, efficiency and satisfaction in term of user interface as well as system functionality.

4.2 Interview Findings

Interview objectives:

- To gather user's background information (job scope, tasks)
- To gather information on the current process flow
- To gather any related documents
- To gather user requirements for system development

4.2.1 Interview with staff of Center for Graduate Student

Interviewee: Zulkarnain Jahidi B Nordin

Position: Executive, Center for Graduate Student

Date and Time: 11th June 2012, 11am

Summary of interview findings:

- Role of Center for Graduate Student is to consolidate evaluation results for records and announce to the candidates. The information of evaluation results such as total score, grade and comments from panel are important for the Dean or management to monitor student performance.

- Postgraduate research progress monitoring system is categorised into three parts: Research Proposal Defense (RPD), Symposium and Research Progress Report and Research Completion Seminar (RCS). Each of the assessment is conducted using evaluation forms. There are total 5 types of evaluation forms used for assessment. Figure 4.7 below shows the overview of monitoring system with type of assessments and evaluation forms.

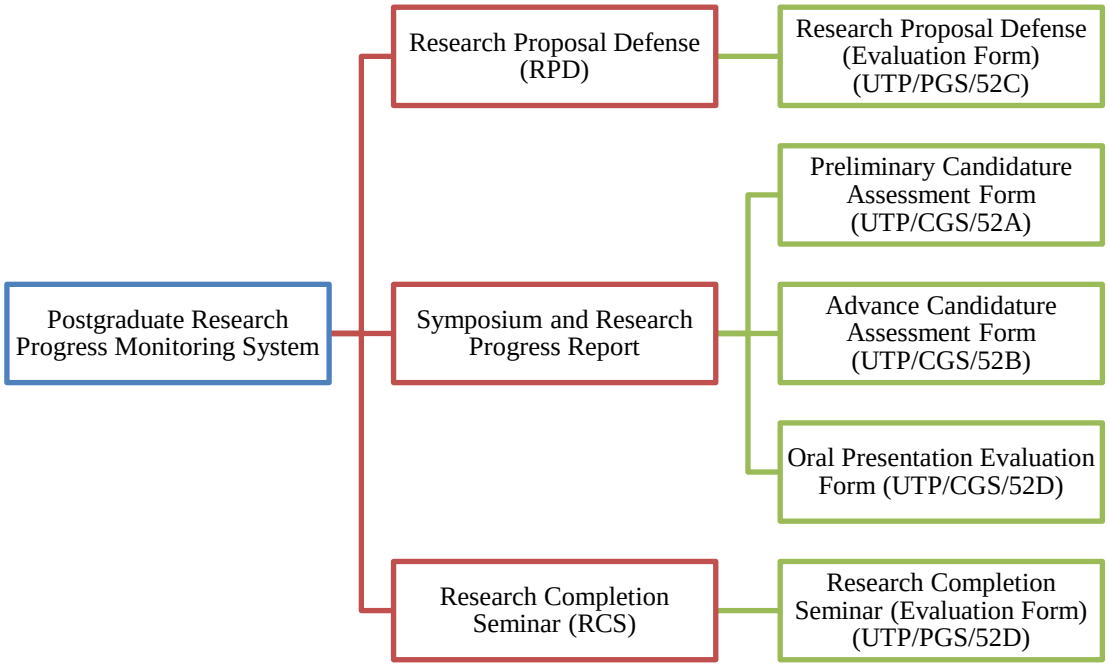


Figure 4.9: Overview of Postgraduate Research Progress Monitoring System

- Problems faced in current process:
  - Incorrect evaluation form is used for assessment
  - Total score is not calculated
  - Wrong calculation of total score
  - Comment session is not filled
  - Poor hand-writing in evaluation form

- Expectation from the proposed system:
  - Immediate evaluation result can be obtained after assessment
  - Help to manage student records and evaluation result

4.2.2 Interview with student supervisor or panel of examiners

Interviewee: Dr. Dhanapal Durai Dominic

Position: Associate Professor, Computer Information Science (CIS) department

Date and Time: 18th July 2012, 4pm

Summary of interview findings:

- Role of supervisor or panel of examiners is to evaluate student based on the assessment criteria in the evaluation form. Evaluation form is provided for panel to fill in the marks and comments during the assessment session. After the evaluation session, they need to calculate the total score and then submit to programme coordinator.

- Problem faced in current process: Assessment criteria of postgraduate research progress evaluation are inappropriate to the assessment objectives

- Review on the assessment criteria of Research Proposal Defense (Evaluation Form) (UTP/PGS/52C)

- Result of RPD review (Refer to APPENDIX 6 for sample of RPD draft):
    1. Increase 10 marks for 'Literature Review' - literature review is the main criteria to assess candidate research progress
    2. Shift 'Objective' after 'Problem Statement' - Research question from the problem statement lead to the objective(s) of the study
    3. Take off 'Key Milestone' - key milestone is not a criteria to assess candidate research progress

- However, the result is only a proposed criterion. The precise assessment criteria amendment need to be discussed among the Examination Committee and Senate and endorsed by Dean of Center for Graduate Studies. Refer to APPENDIX 6 for the draft of revised RPD evaluation form.

4.2.3 Interview with postgraduate programme coordinator

Interviewee: Dr. Low Tang Jung

Position: Senior Lecturer, Computer Information Science (CIS) department

Date and Time: 20th July 2012, 10am

Summary of interview findings:

- Role of a programme coordinator is to collect evaluation forms and consolidate evaluation results from the panel of examiners, and submit to Center for Graduate Studies Office within a week of the evaluation date.

- Problem faced in the current process: time-consuming in submitting consolidated evaluation result. The submission process took more than a week to complete. Supervisor or panel of examiner tend to forget and submit late to the programme coordinator. Dr Low as the programme coordinator of CIS department usually will send an email to remind the supervisor or panel to submit the evaluation result and form to him. After all of the evaluation results and forms are collected, the programme coordinator will consolidate it and pass to the Center of Graduate Studies office.

- The assessment process is conducted in manual way. No technology is involved except the panel use email service to submit the evaluation results in Mircosoft Excel to programme coordinator.

- Before the assessment start, panel of examiners need to select the correct evaluation form and bring it to the assessment session. They use the evaluation form to evaluate student by filling in marks and comments. After the assessment session, the panel will calculate the total score and submit to the programme coordinator. Then, programme coordinator consolidates department evaluation results and submits to Center for Graduate Studies Office within one week of the evaluation date.

- The process flow of postgraduate research progress evaluation monitoring system for programme coordinator and supervisor or panel is shown in Figure 4.10 below.

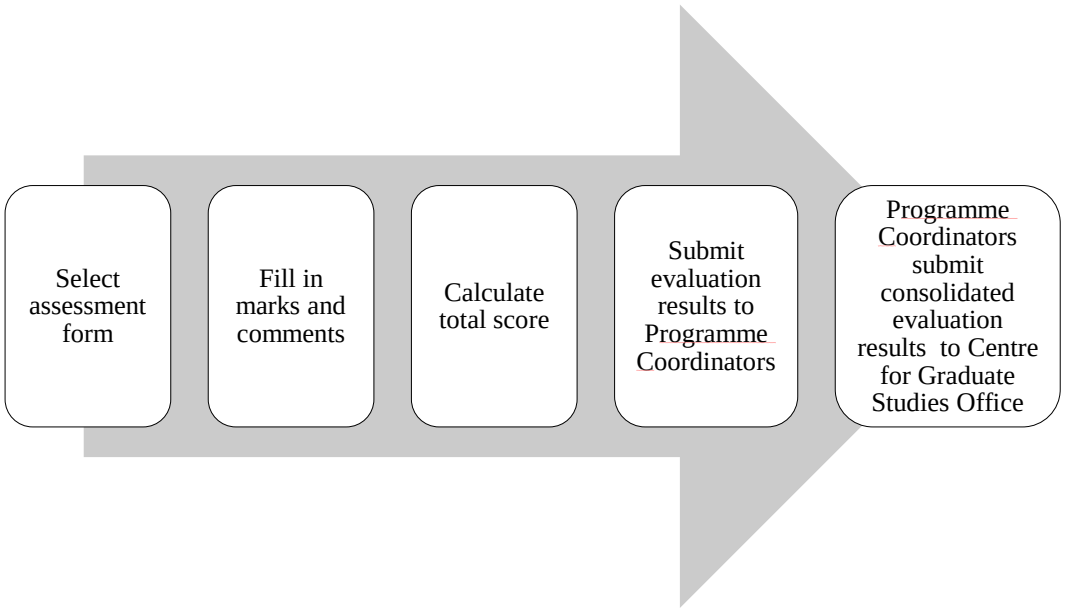


Figure 4.10: Process Flow of Postgraduate Research Progress Evaluation Monitoring System

4.3 Unified Modelling Language (UML) Diagrams

4.3.1 System Flow

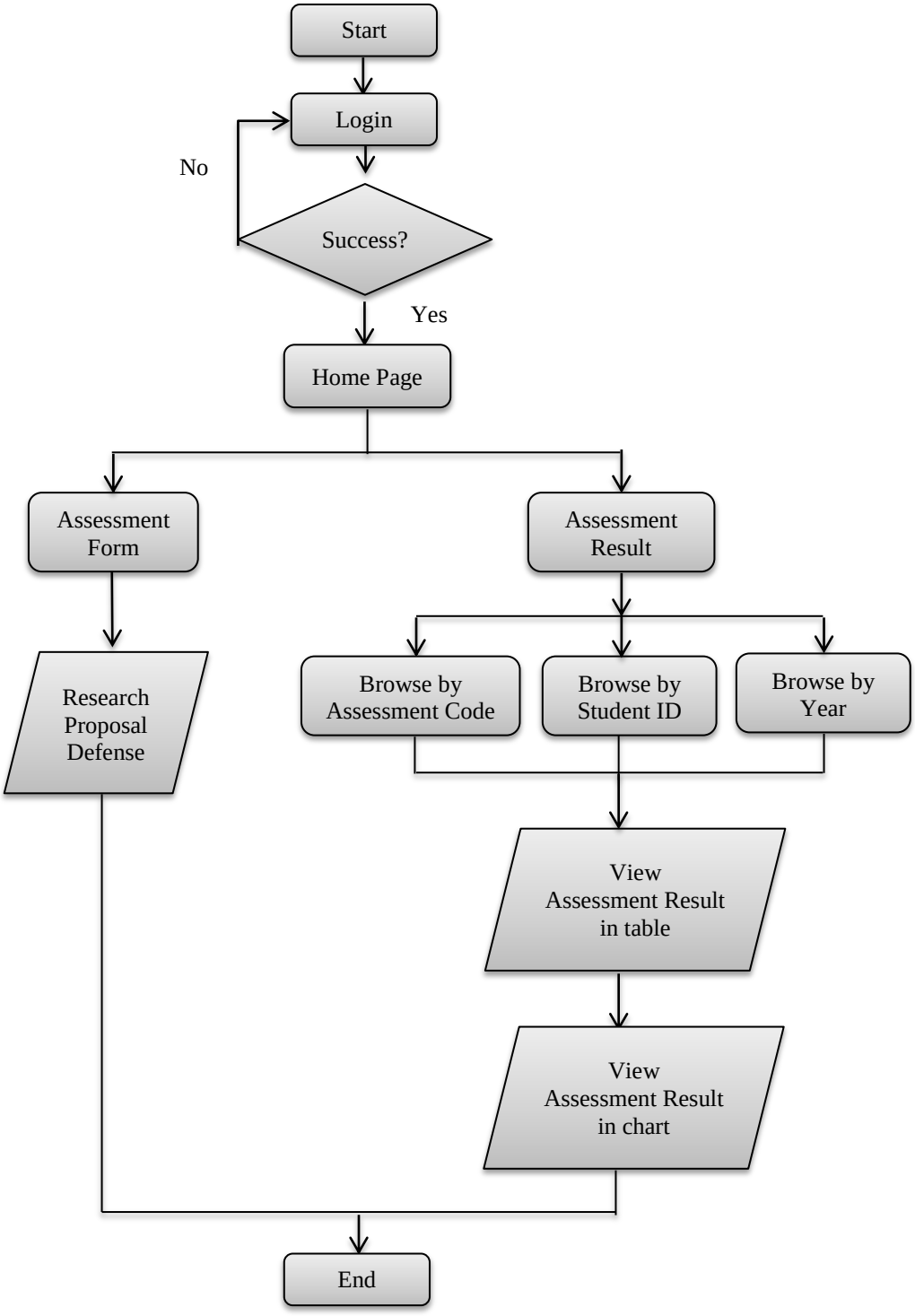


Figure 4.11: System Flow

4.3.2 Activity Diagram

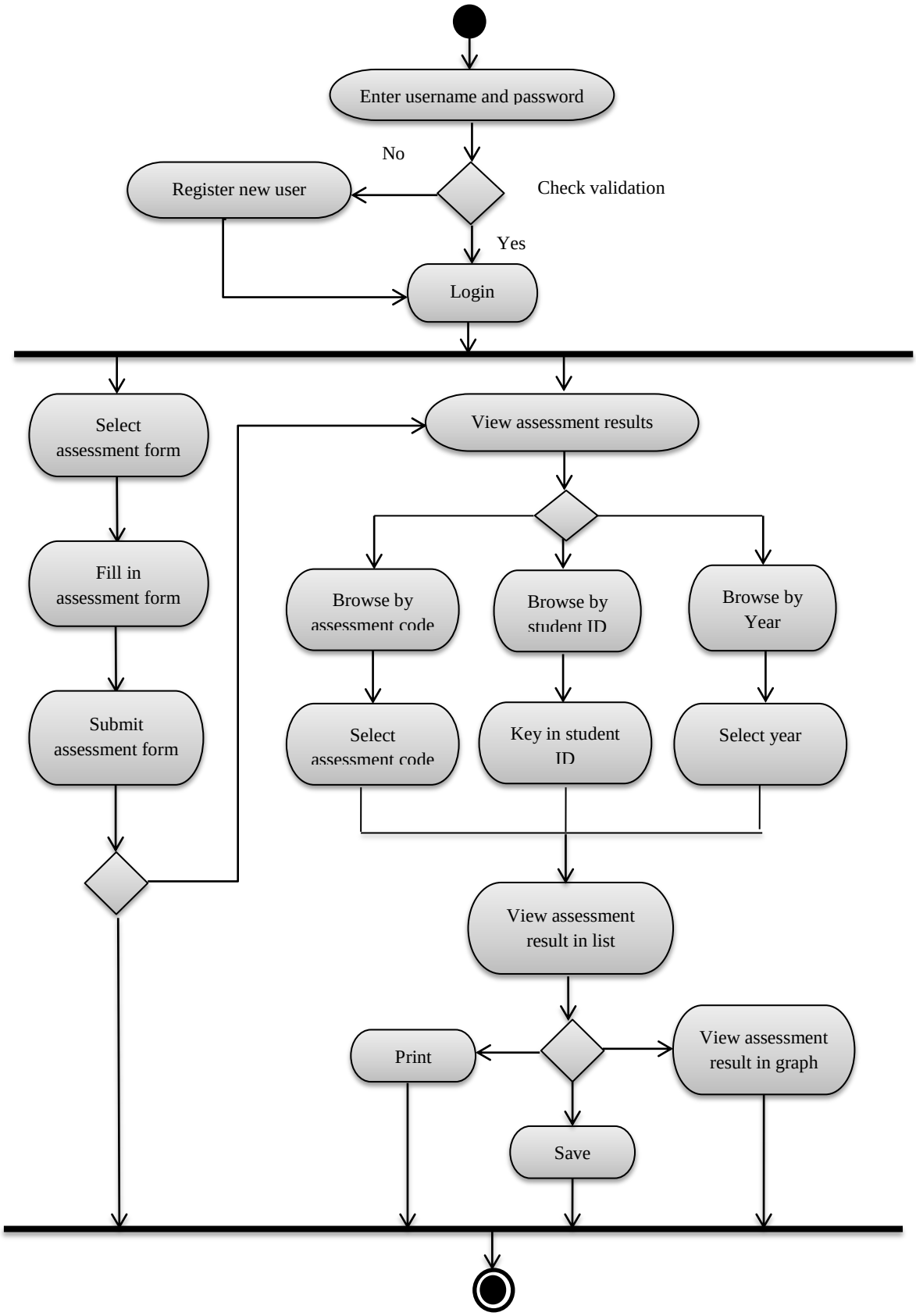


Figure 4.12: Activity Diagram

4.3.3 Class Diagram

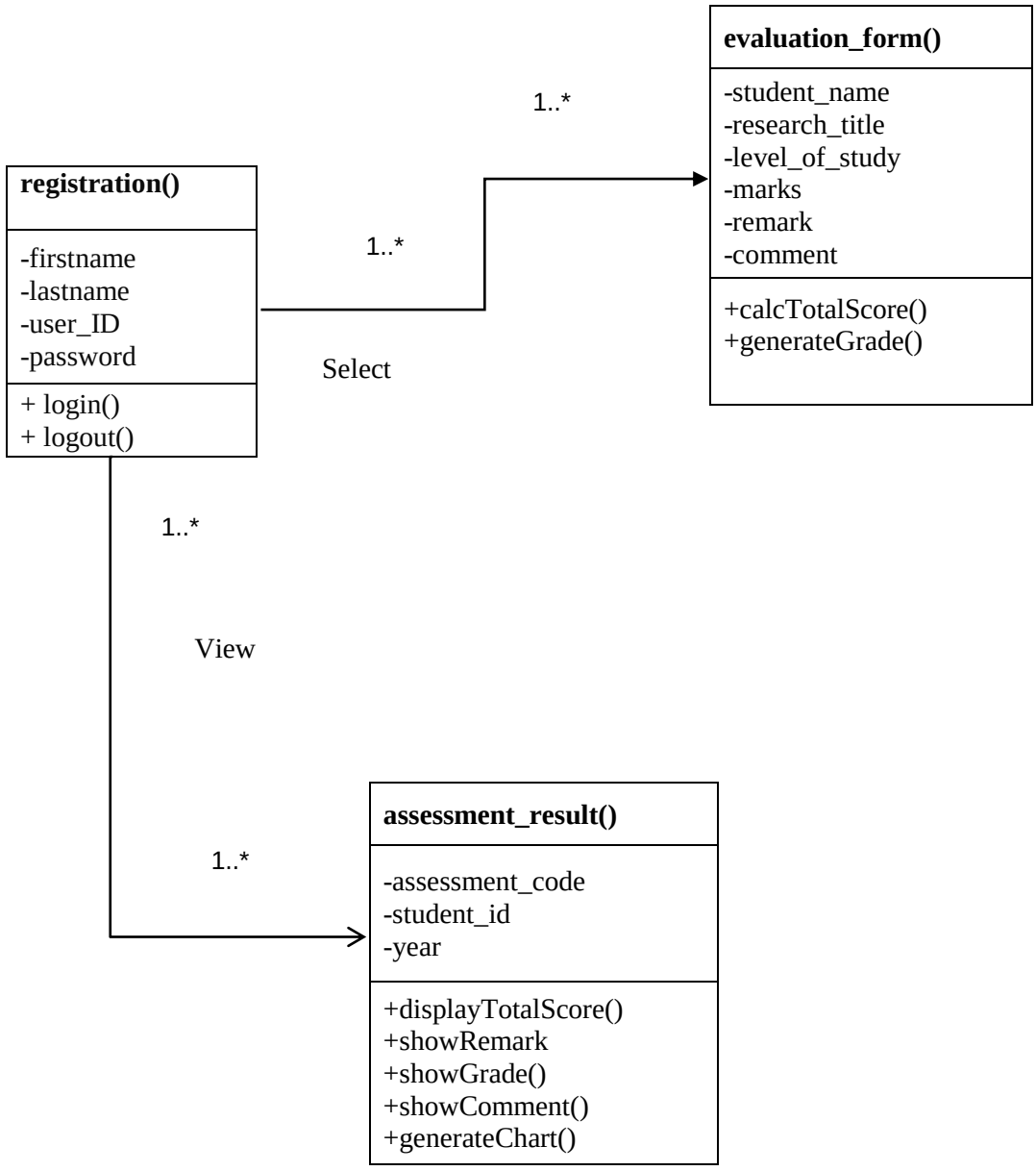


Figure 4.13: Class Diagram

4.3.4 Use Case Diagram

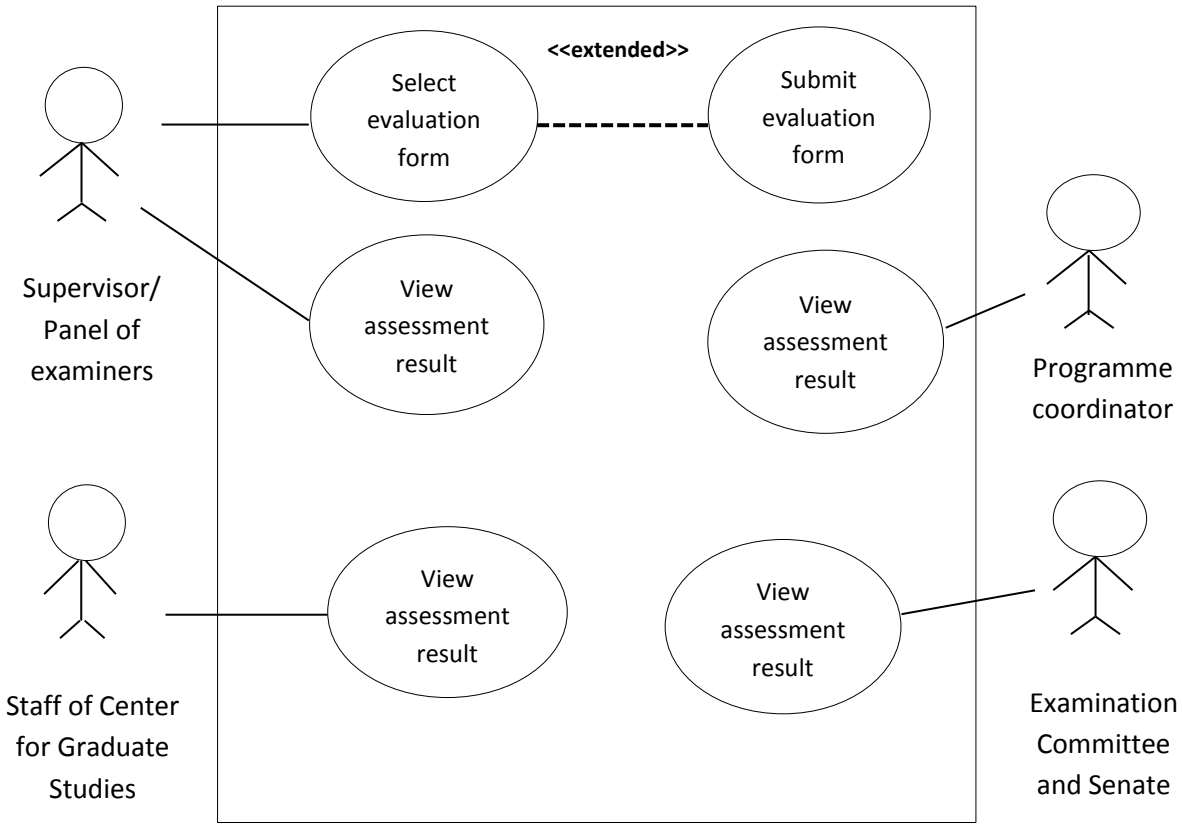


Figure 4.14: Use Case Diagram

Figure 4.14 above defines interaction between actors and system. There are four actors in this system: Supervisor or Panel of examiners, Programme Coordinators, Staff of Center for Graduate Studies, Examination Committee and Senate. Supervisor or Panel of examiners can select evaluation form and view assessment results from the system. After select the evaluation form, they can fill in and submit the form to the system. While the others actor (Programme Coordinators, Staff of Center for Graduate Studies, Examination Committee and Senate) is only allow to view assessment results.

4.3.5 Sequence Diagram

Sequence diagram is an interaction diagram shows how processes operate with one another and in what order. There are two types of user in this system: main and secondary user. Main user is Supervisor or Panel of examiners who use this system to perform assessment. While the secondary actors such as Programme Coordinators, Staff of Center for Graduate Studies, Examination Committee and Senate only use this system to view assessment results. The figures below show the sequence diagram for both main and secondary user.

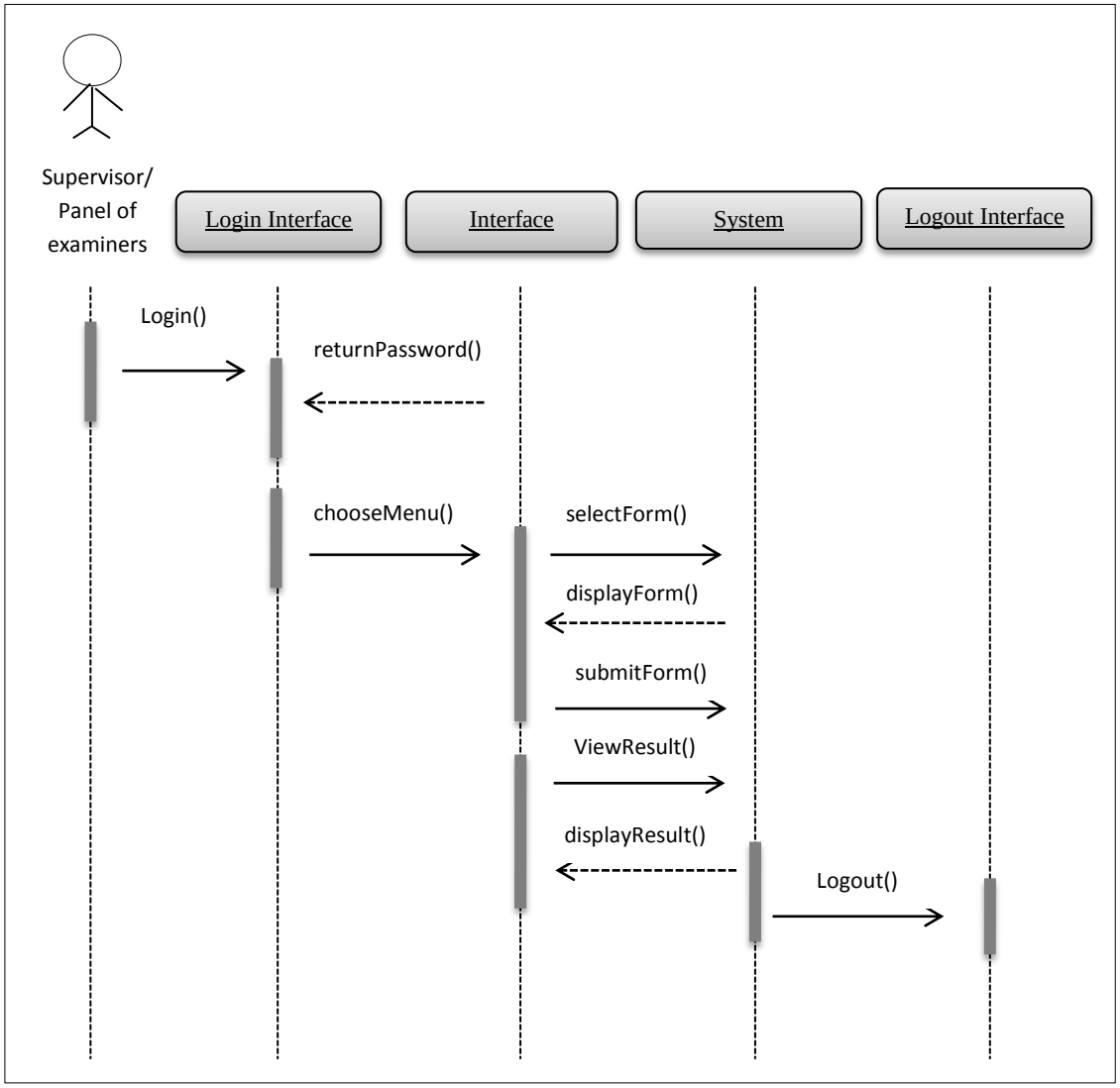


Figure 4.15: Sequence Diagram for Main User

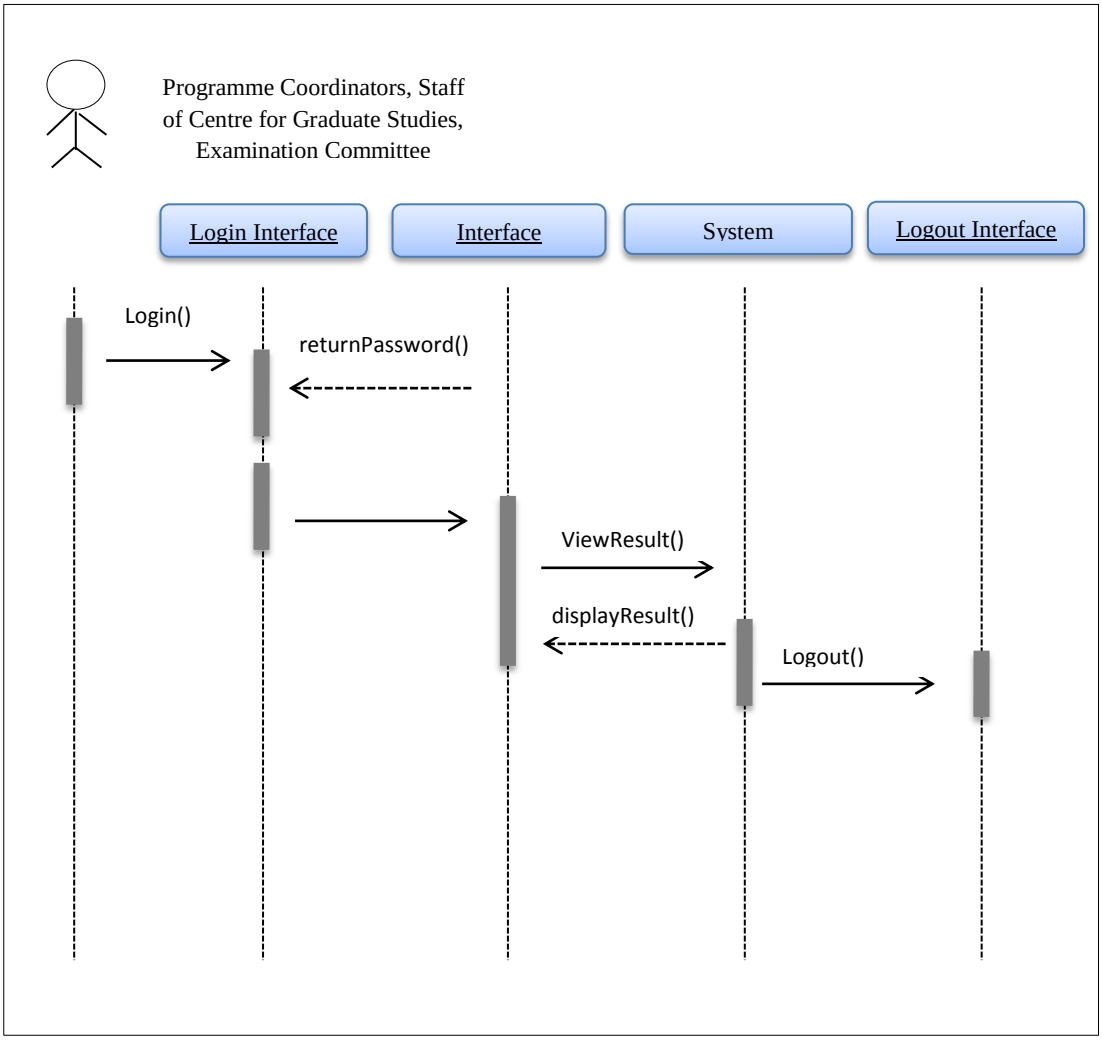


Figure 4.16: Sequence Diagram for Secondary User

4.3.6 System Architecture

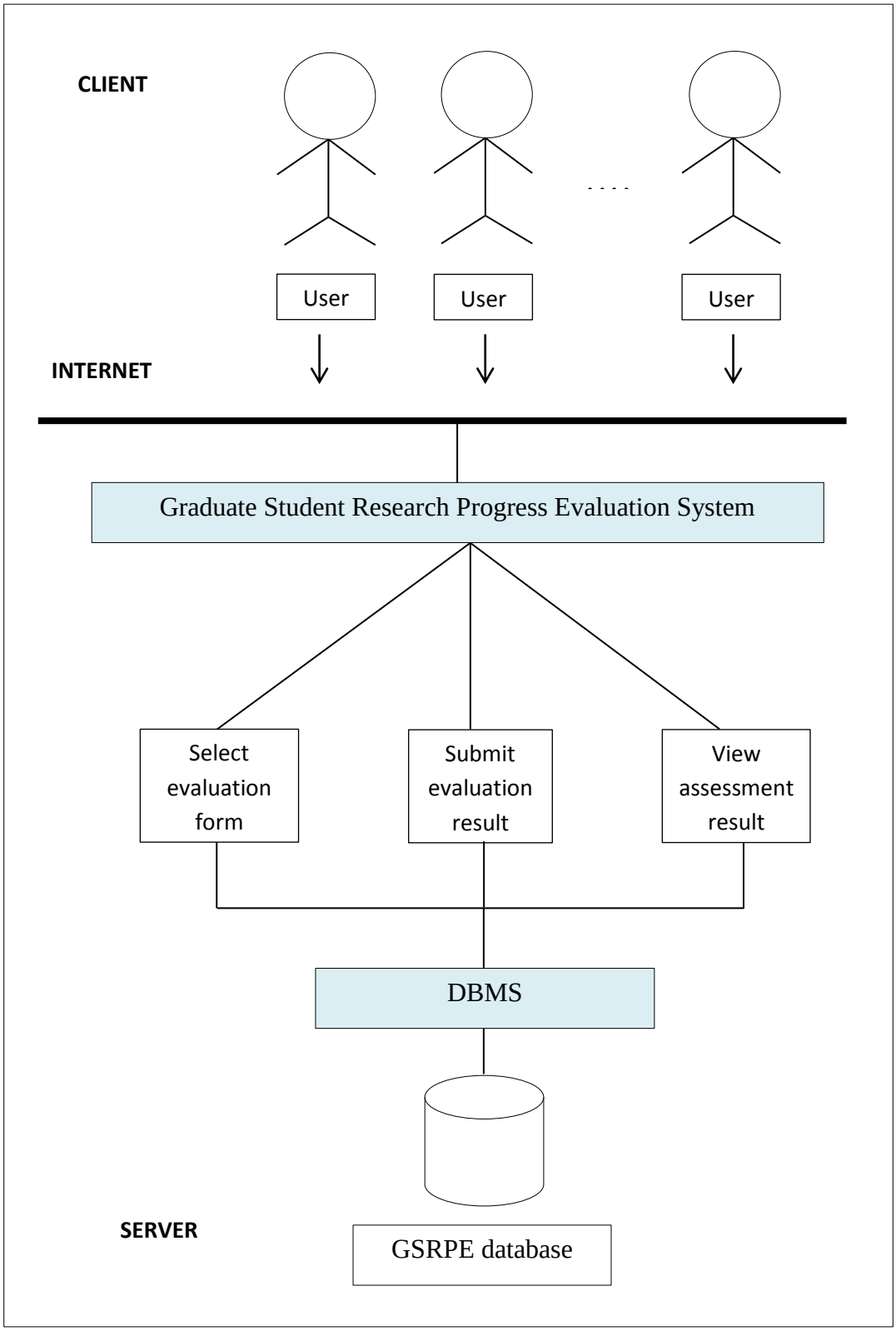


Figure 4.17: System Architecture

4.3.7 Network Architecture

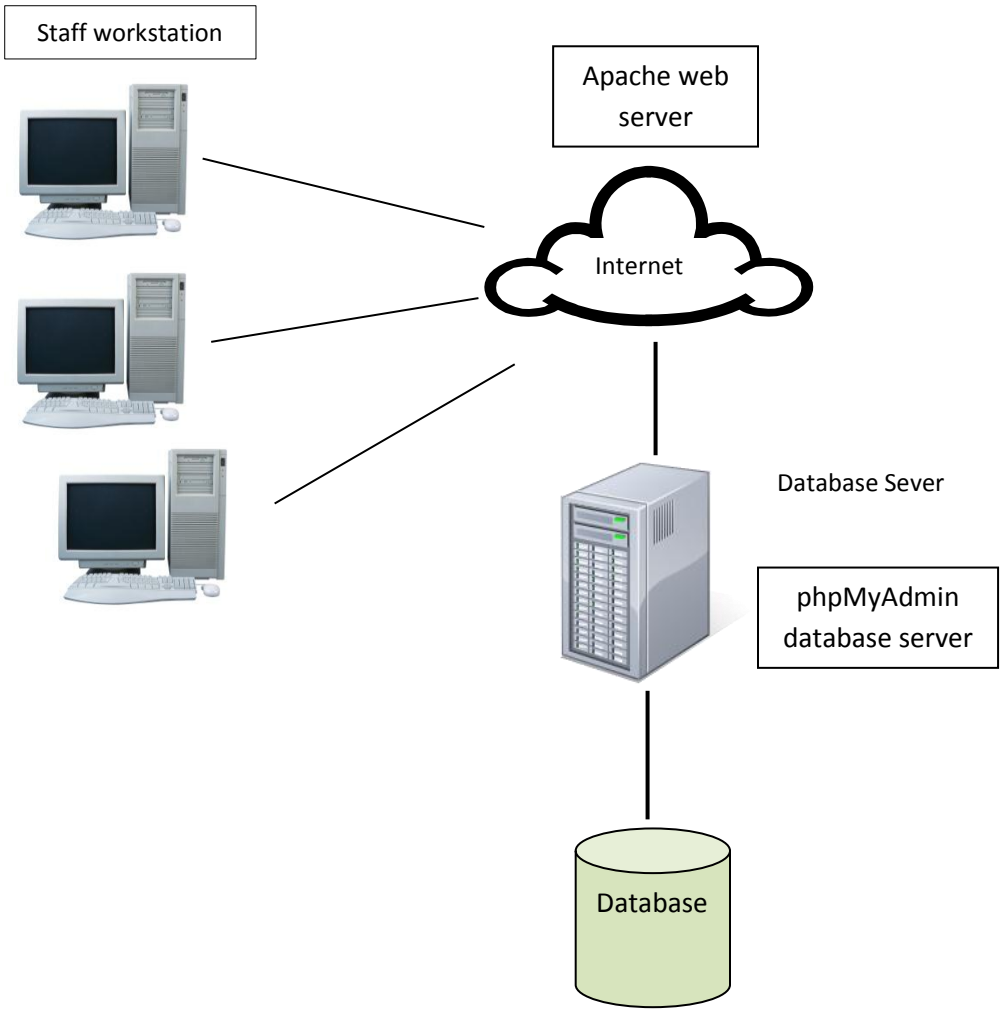


Figure 4.18: Network Architecture

Figure 4.17 and 4.18 show the architectures of Graduate Student Research Progress Evaluation System. There are three important components in developing the system: client, server and database. Client–server model is used as the system architecture. Service requester, known as client is user's computer with web browser installed such as Internet Explorer. For web server, Apache HTTP server is used to provide connection to the internet. phpMyAdmin is the database server to store user registration and assessment results.

4.4 Prototype

Figure below shows the front page of Graduate Student Research Progress Evaluation System. This is the page where user can login to enter the system by key in login ID and password. For new user, he/she can register as a user through the 'New User?' link (Figure 4.21). If the user has forgotten the password, he/she can apply new password thru 'Forget Password?'(Figure 4.23).

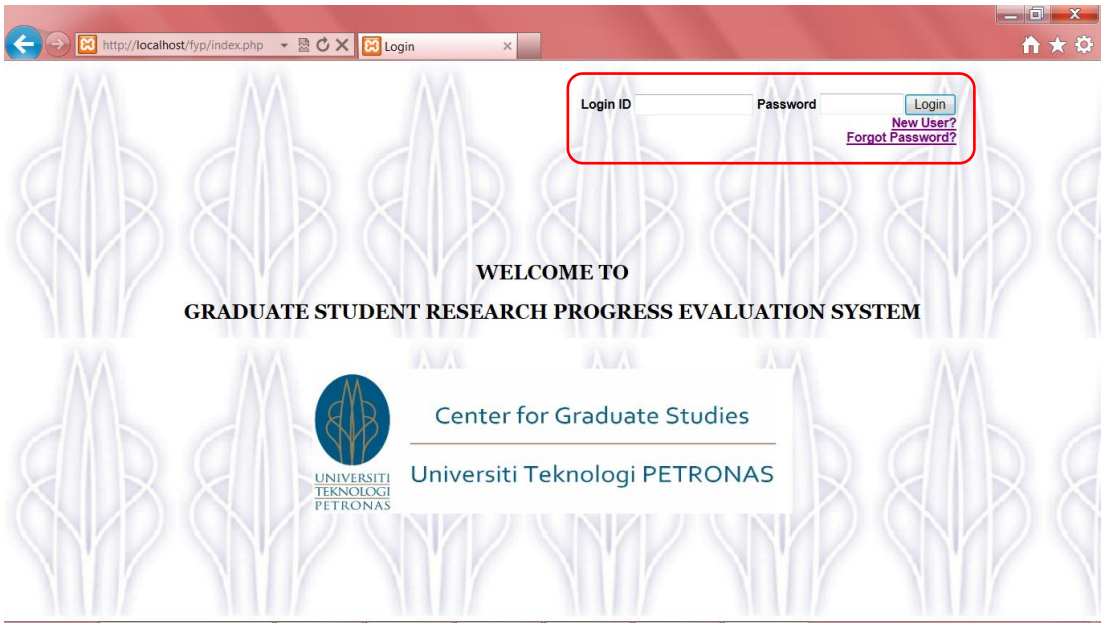


Figure 4.19: Index Page (Login)

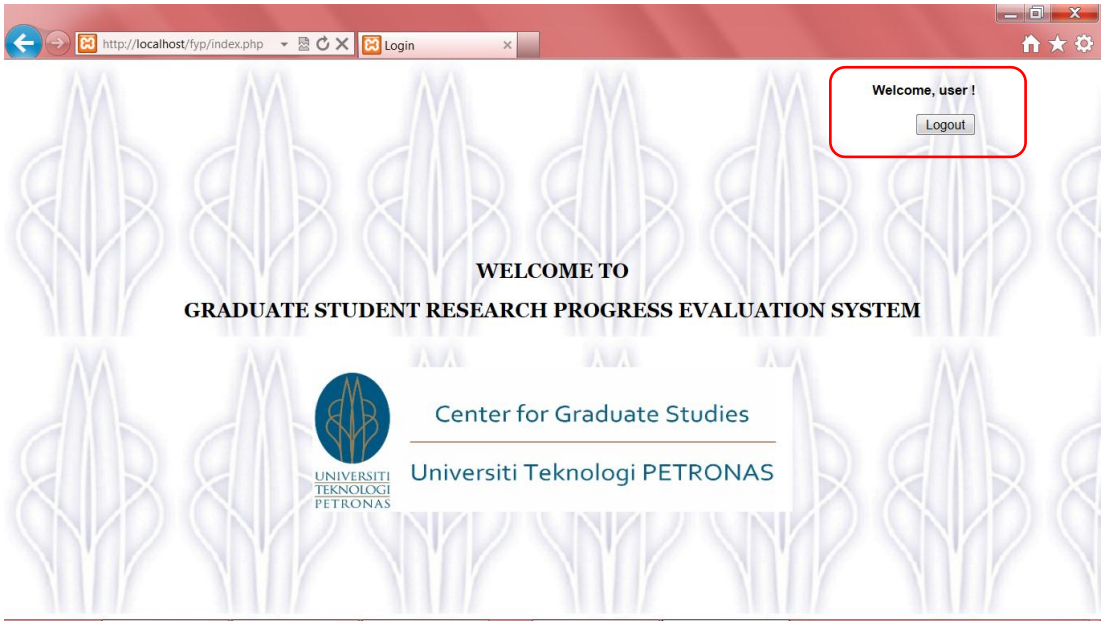


Figure 4.20: Login Successful

Figure below shows the registration page for a new user. He/she can register as a user by fill in the fields (first name, last name, login ID, password) and submit the form. After the registration is successful, the registration page will direct to login page. The new registered user can login the system by key in login ID and password.

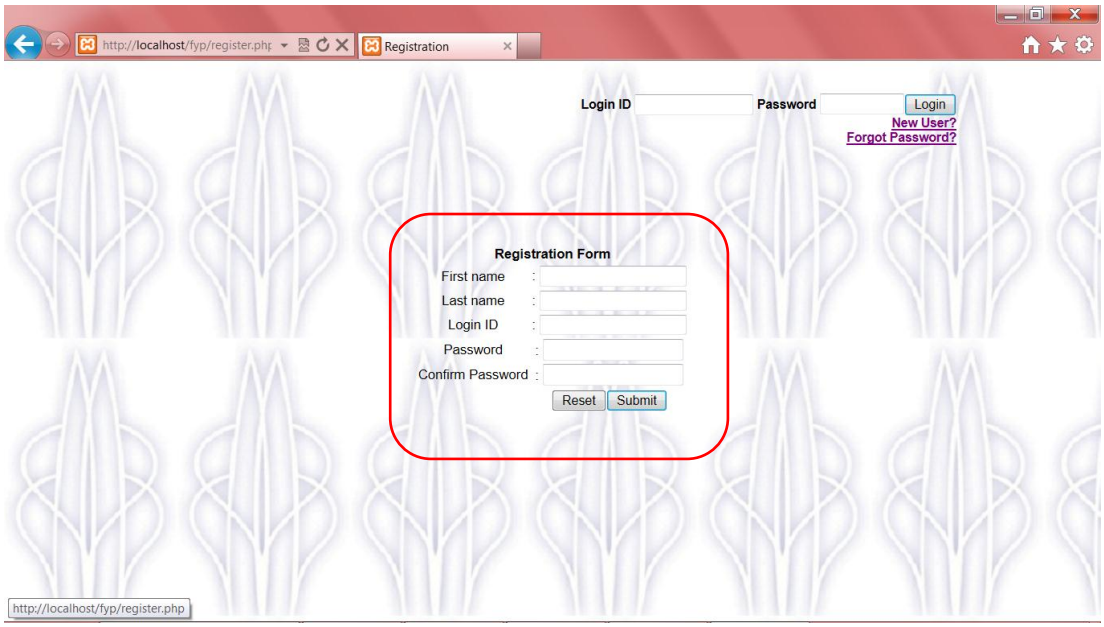


Figure 4.21: Registration Page

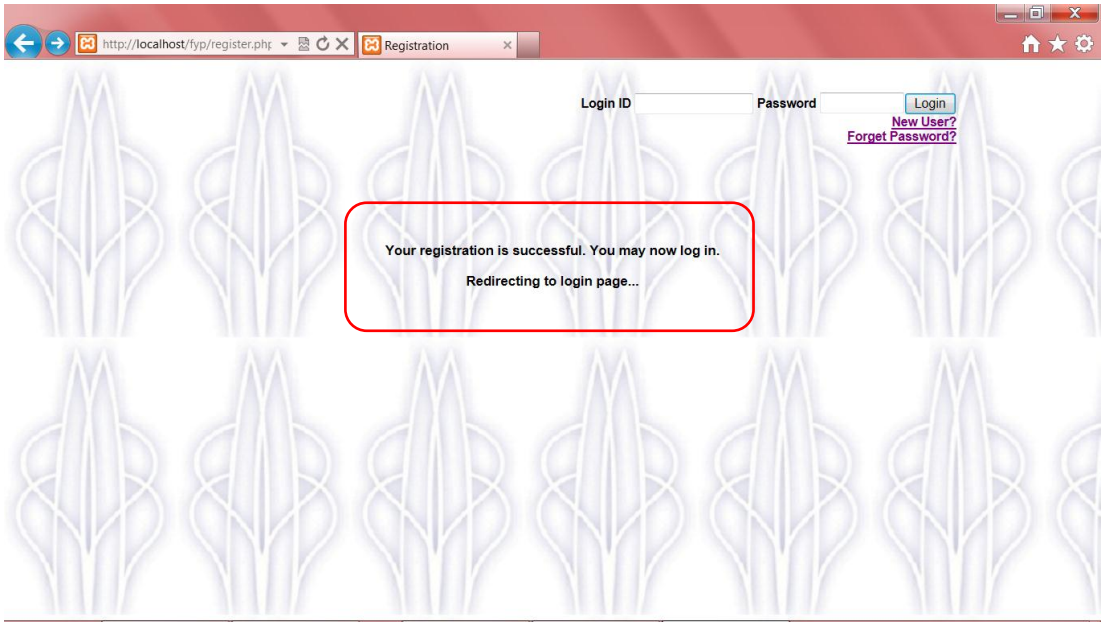


Figure 4.22: Registration Successful Message

If the user have forgotten password, he/she can apply for a new password by key in the email address. Then, an email with the new password will be send to the user email address. Figure below shows the forget password page.

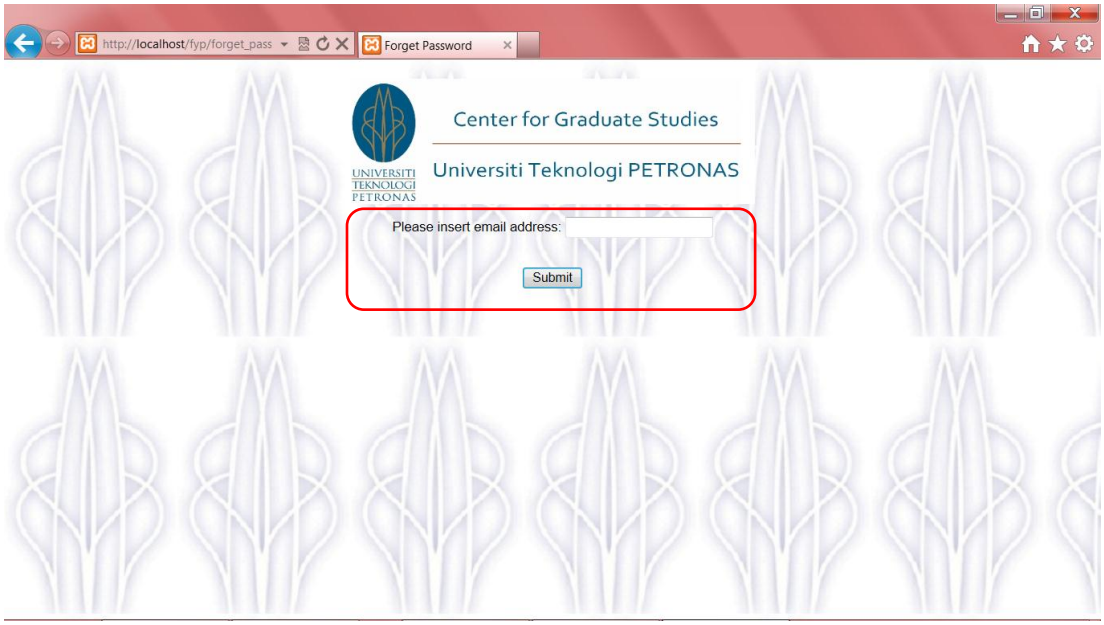


Figure 4.23: Forgot Password Page

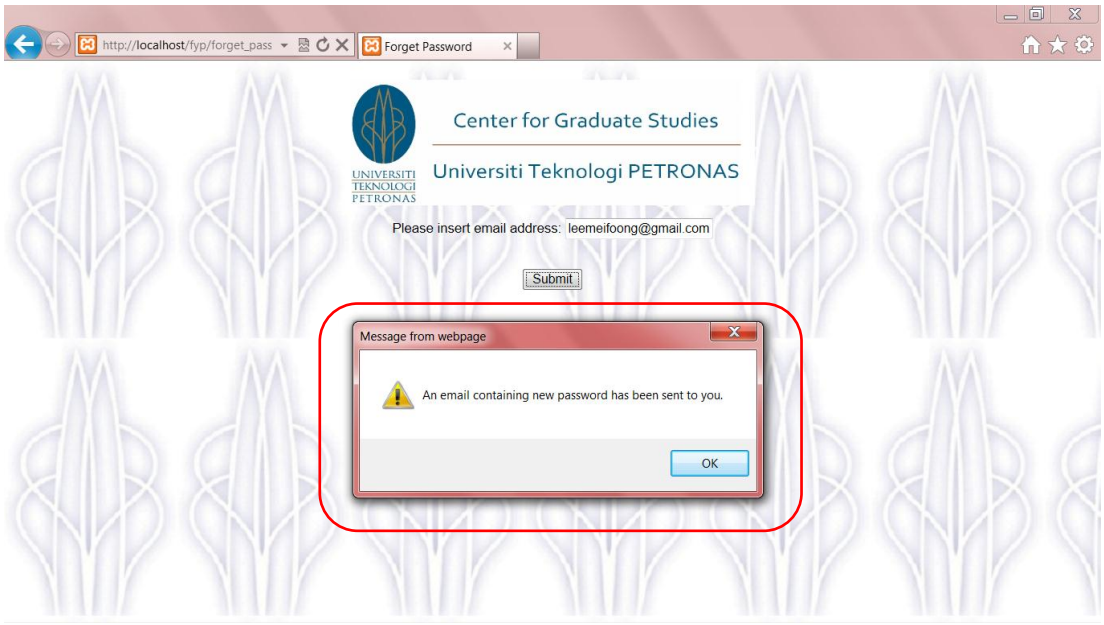


Figure 4.24: New Password Sent Message

After user has successfully login to the system, he/she will direct to the home page. This is the first page where user found table of contents to the other page of the site. For this system, users choose either to perform assessment or view assessment result.

To perform an assessment, user need to click on the evaluation form name to open the form (Figure 4.26). There are several text fields in the form e.g. Candidate's ID, name, research title, level of study, marks, total score, grade and comment and four buttons which is home, calculate, reset and submit. The 'Home' button is situated on top right of the page. This button is used to direct user back to the home page. The 'Calculate' and 'Reset' button is situated in the form. The 'Calculate' button is used to calculate the total score of marks that is inserted in the form. The 'Grade' field will automatically generate after the total score is calculated. The last button 'Submit' is used to update the text field's data into database. The text fields with * symbol is indicate required fields to fill in before click on the submit button. If an empty text field is submitted, an alert message shown in Figure 4.27 will be prompted to remind user to fill in the text field. At the same time, the page will lead to an error massage page (Figure 4.28). User need to click on 'Back' button in order to return to the form page to fill in the empty text field. If the form is successfully submitted, a message page will be shown as Figure 4.29.

User can view assessment result in three ways: browse by assessment code (Figure 4.30), student ID (Figure 4.32) or year (Figure 4.34).

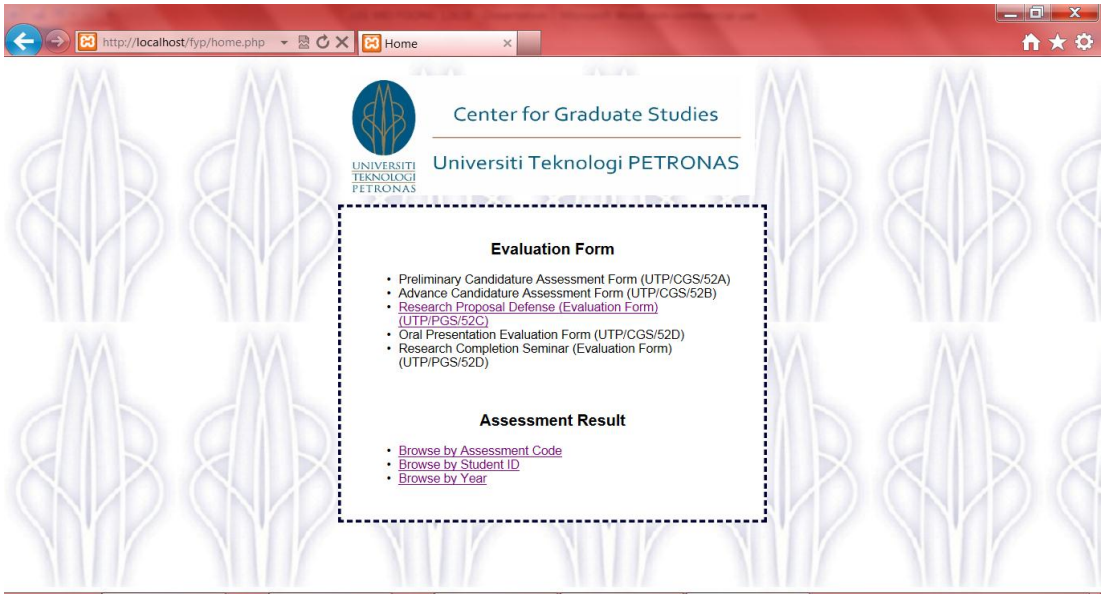


Figure 4.25: Home Page

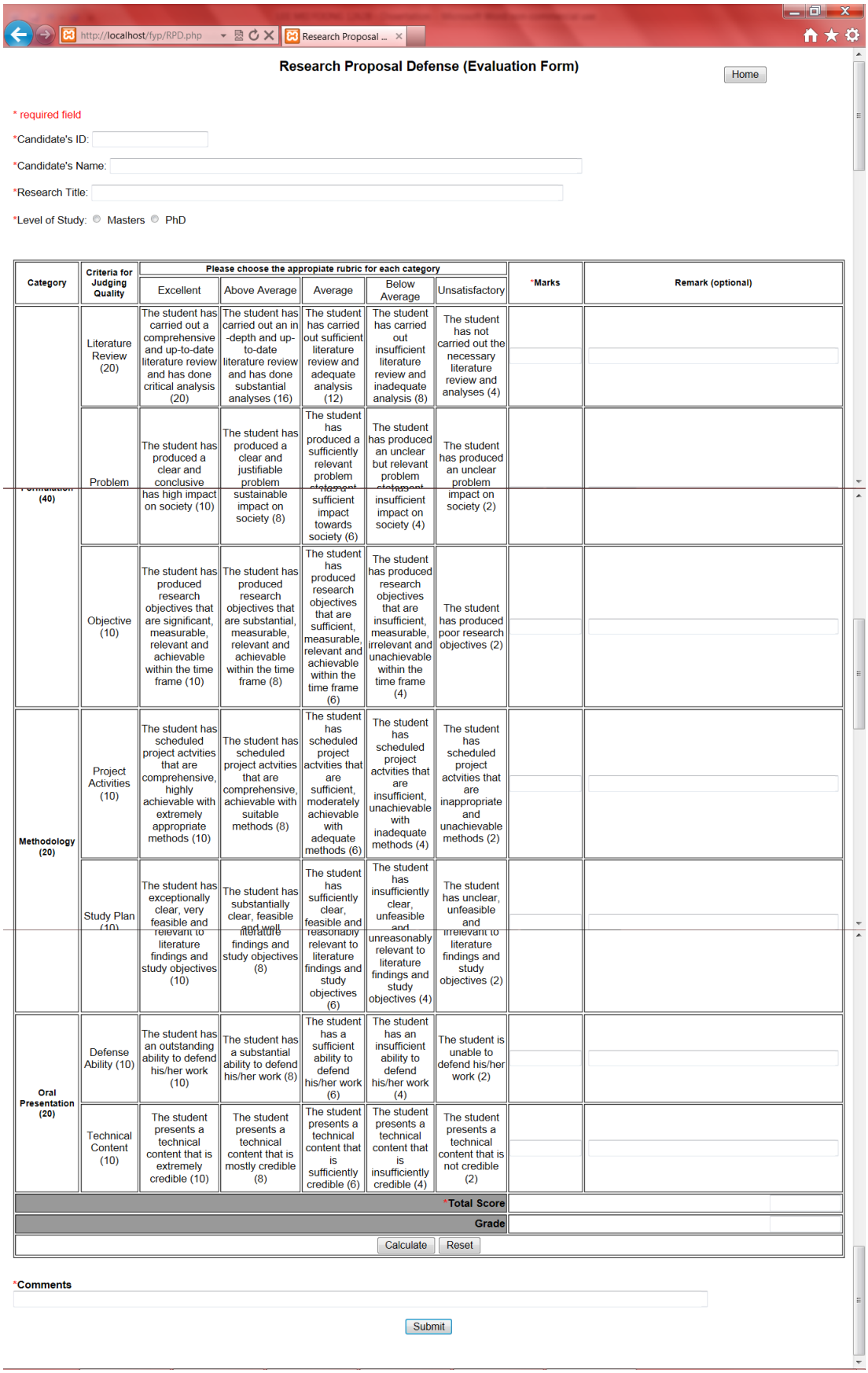


Figure 4.26: Research Proposal Defense (Evaluation Form)

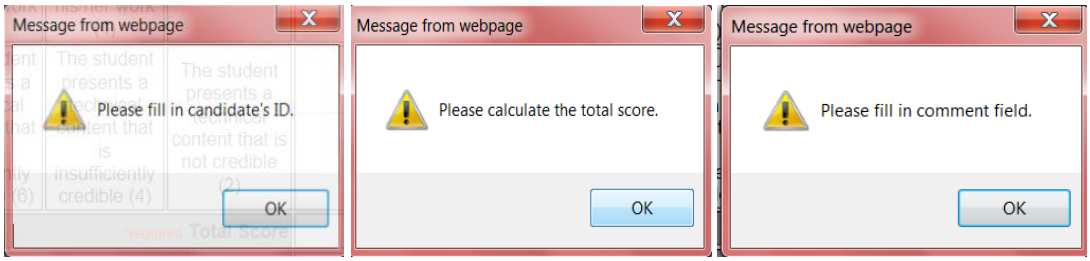


Figure 4.27: Alert Message for Empty Text Fields

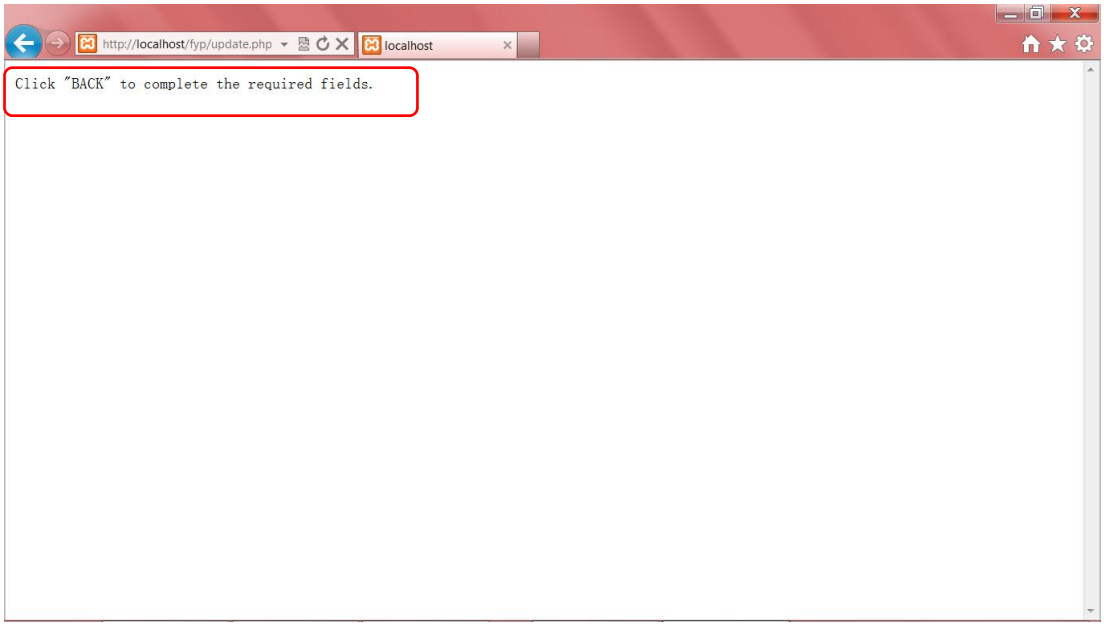


Figure 4.28: Form Submission Error Message

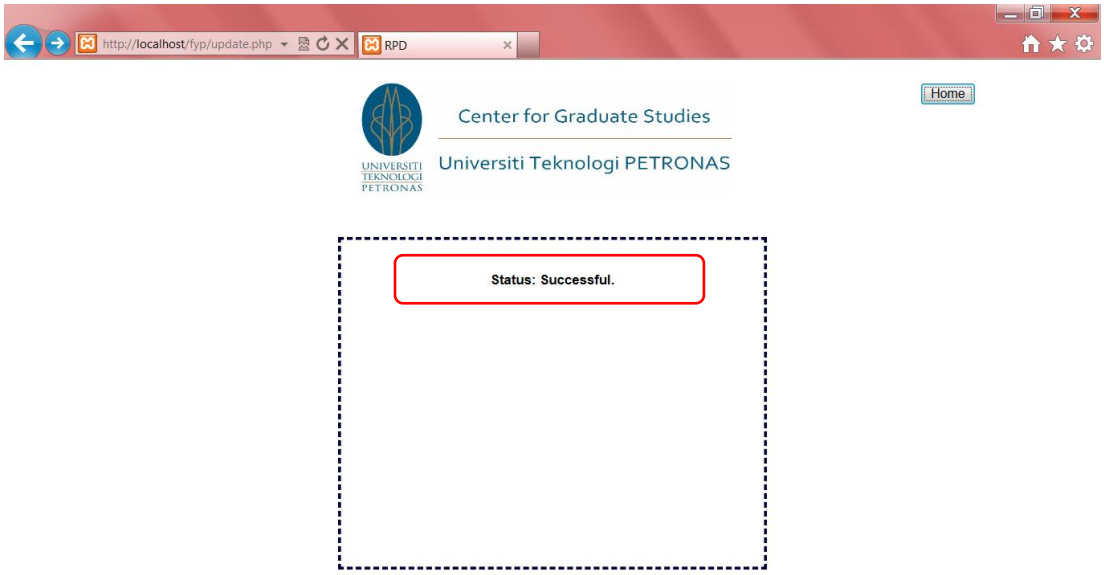


Figure 4.29: Form Submission Successful Message

If user chooses to view the assessment results by assessment code, he/she need to select the code of assessment. There are five assessment codes in this system: Research Progress Report (RPR) – Preliminary or Advance, Oral Presentation (OP), Research Proposal Defense (RPD) and Research Completion Seminar (RCS). The assessment result will be displayed according to the code that is selected by user. Sample of assessment results for Research Proposal Defense (RPD) is shown in Figure 4.31.

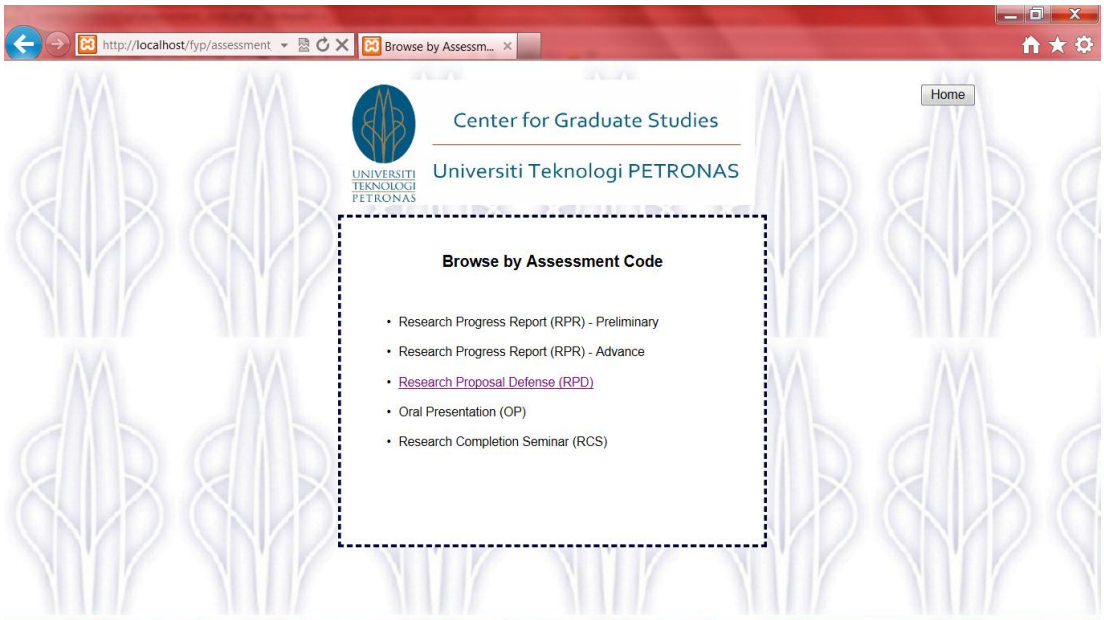
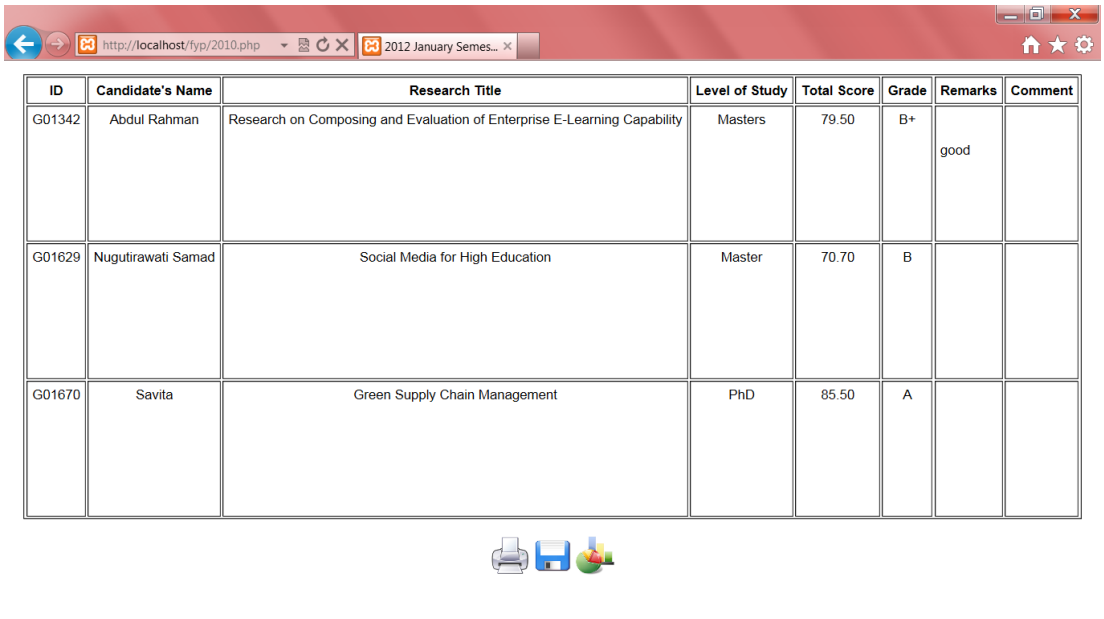


Figure 4.30: Browse by Assessment Code



ID	Candidate's Name	Research Title	Level of Study	Total Score	Grade	Remarks	Comment
G01342	Abdul Rahman	Research on Composing and Evaluation of Enterprise E-Learning Capability	Masters	79.50	B+	good	
G01629	Nugutirawati Samad	Social Media for High Education	Master	70.70	B		
G01670	Savita	Green Supply Chain Management	PhD	85.50	A		

Figure 4.31: Assessment Results Browse by Assessment Code

If user chooses to view the assessment results by student ID, he/she need to key in the student ID and click on 'Submit' button. The assessment result will be displayed based on the particular student ID that is inserted into the system. Sample of assessment results for student ID G02100 is shown in Figure 4.33.

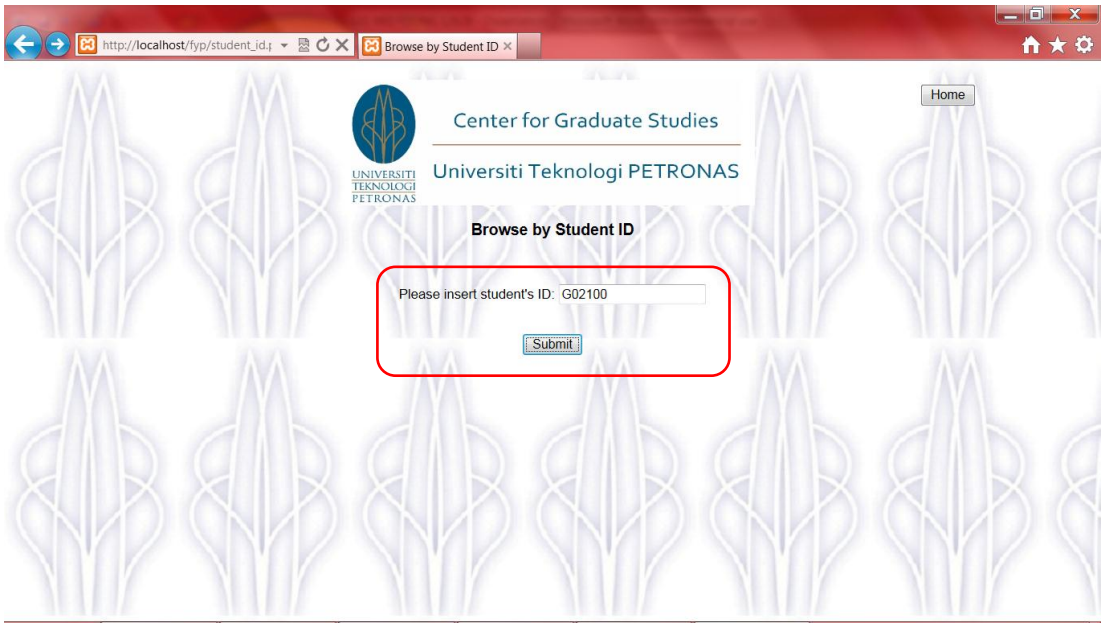
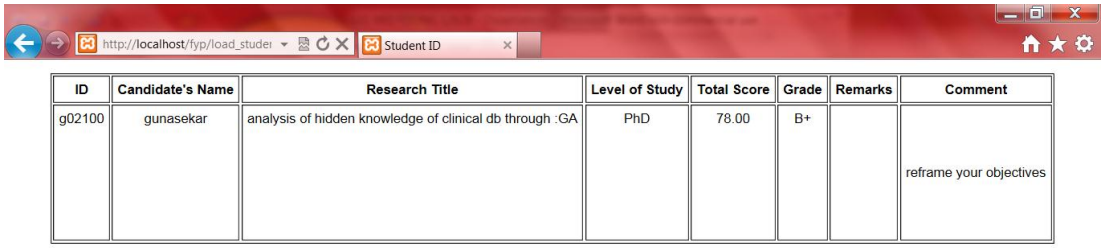


Figure 4.32: Browse by Student ID



ID	Candidate's Name	Research Title	Level of Study	Total Score	Grade	Remarks	Comment
g02100	gunasekar	analysis of hidden knowledge of clinical db through :GA	PhD	78.00	B+		reframe your objectives

Figure 4.33: Assessment Results Browse by Student ID

If user chooses to view the assessment results by year of assessment, he/she need to select the semester/year of assessment. The assessment result will be displayed according to the semester/year that is selected by user. Sample of assessment results for 2012 September Semester is shown in Figure 4.35.

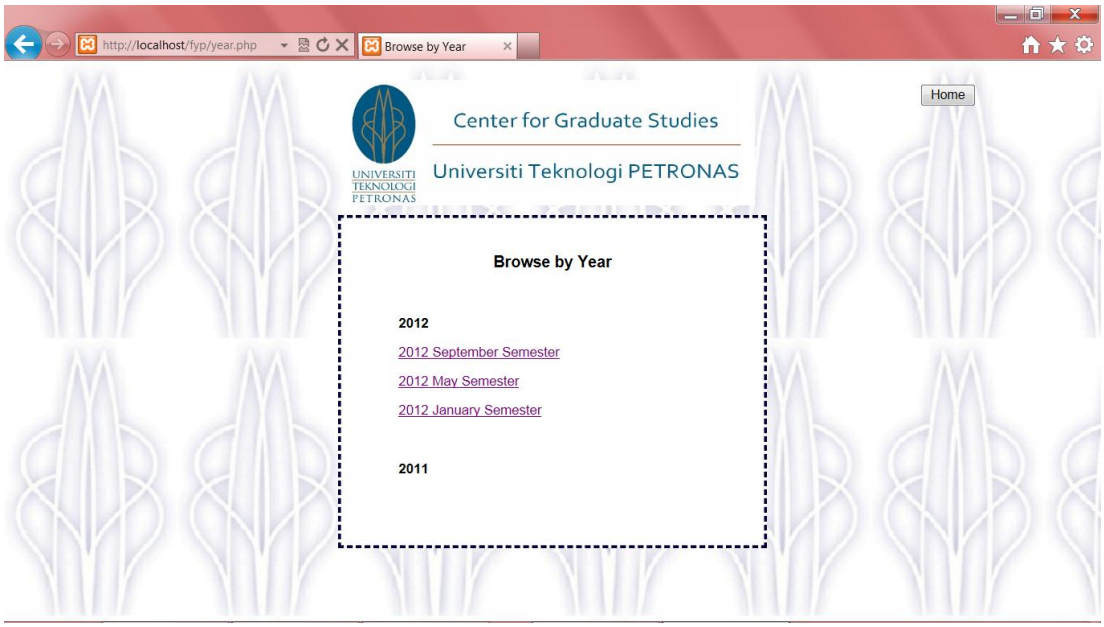
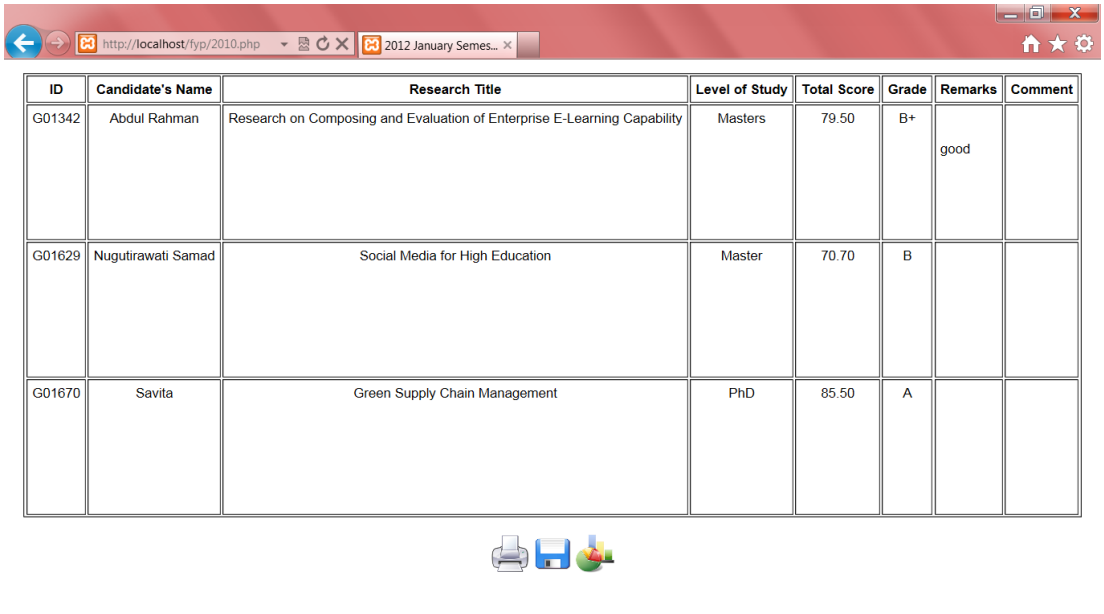


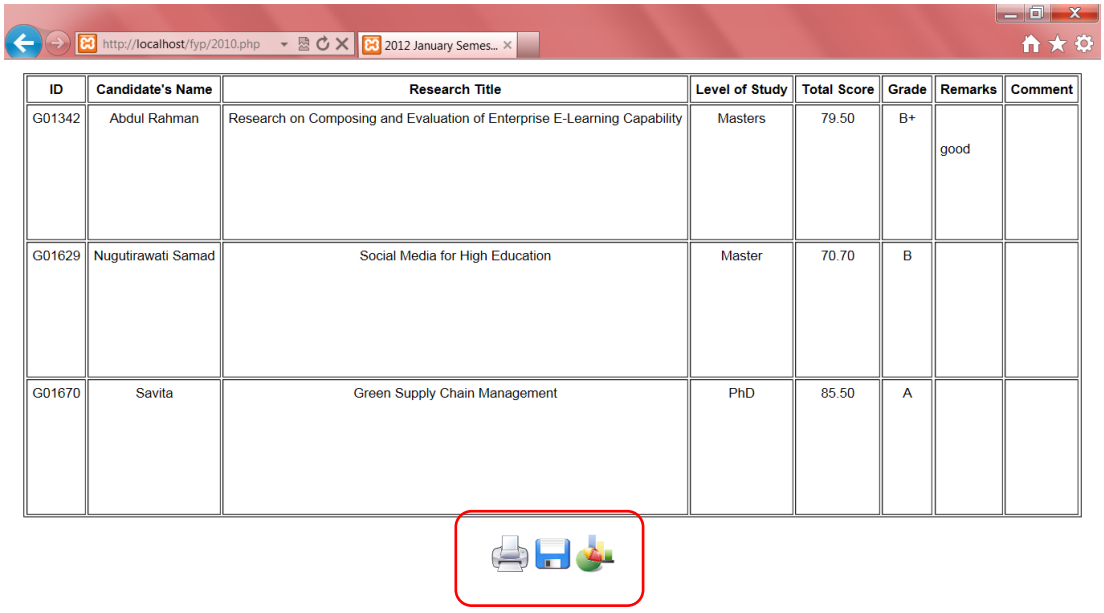
Figure 4.34: Browse by Year



ID	Candidate's Name	Research Title	Level of Study	Total Score	Grade	Remarks	Comment
G01342	Abdul Rahman	Research on Composing and Evaluation of Enterprise E-Learning Capability	Masters	79.50	B+	good	
G01629	Nugutirawati Samad	Social Media for High Education	Master	70.70	B		
G01670	Savita	Green Supply Chain Management	PhD	85.50	A		

Figure 4.35: Assessment Results Browse by Year

Assessment results can be displayed in two ways: list or graph. Figure 4.36 shows the list of assessment results where the information is arranged in an ordered structure. The information that is display in the list is candidate's ID, name, research title, level of study, total score, grade, remarks and comment. On the bottom of the list of assessment results, there are three icons: print, save and graph. User can print and save the assessment results and also view total score and grade in graph format (Figure 3.7).



ID	Candidate's Name	Research Title	Level of Study	Total Score	Grade	Remarks	Comment
G01342	Abdul Rahman	Research on Composing and Evaluation of Enterprise E-Learning Capability	Masters	79.50	B+	good	
G01629	Nugutirawati Samad	Social Media for High Education	Master	70.70	B		
G01670	Savita	Green Supply Chain Management	PhD	85.50	A		

Figure 4.36: Assessment Results in List

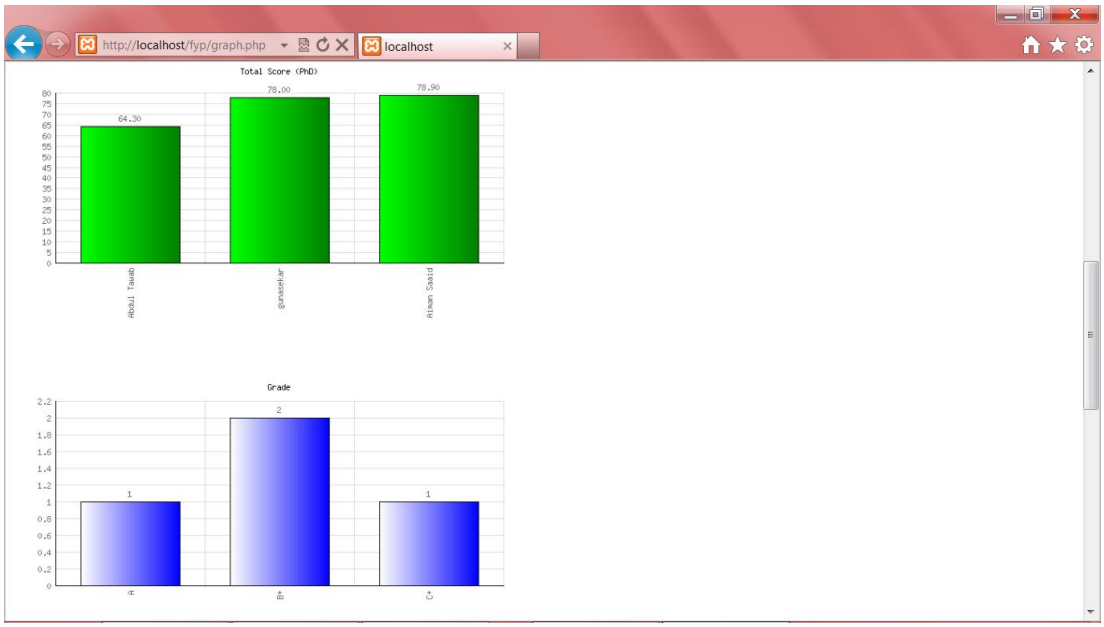


Figure 4.37: Assessment Result in Graph

To logout the system, user needs to return to login page and click on ‘Logout’ button.

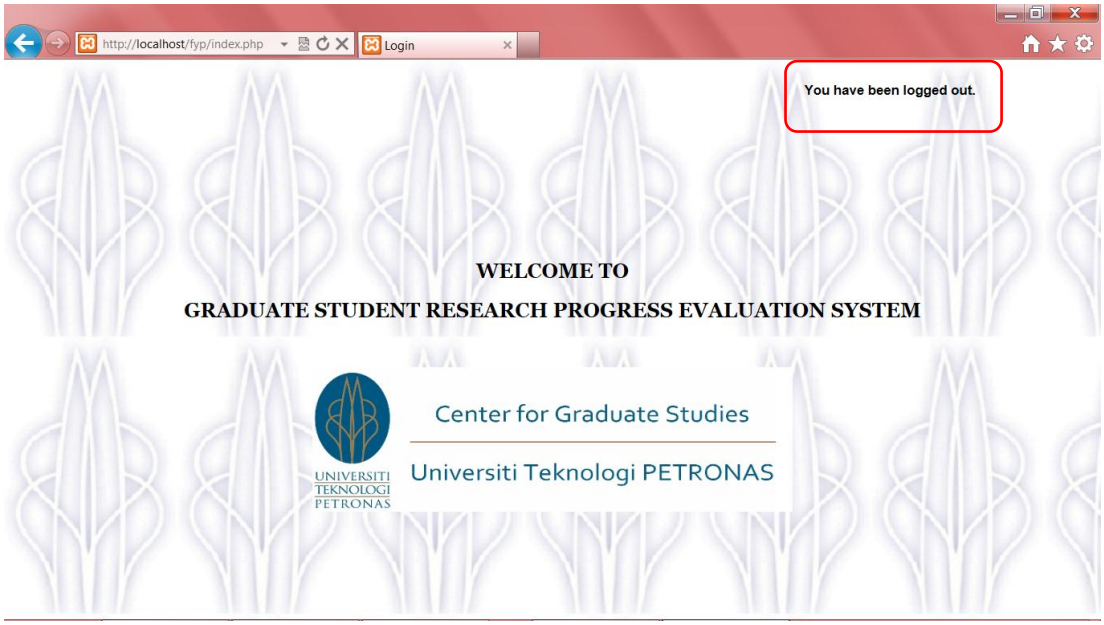


Figure 4.38: Logout

If a user is not logged in, he/she is not allowed to access any page of the system. Whenever the user is trying to access the system without login, a message as shown in Figure 4.39 will display to ask the user to log in and then the page will direct to the login page.

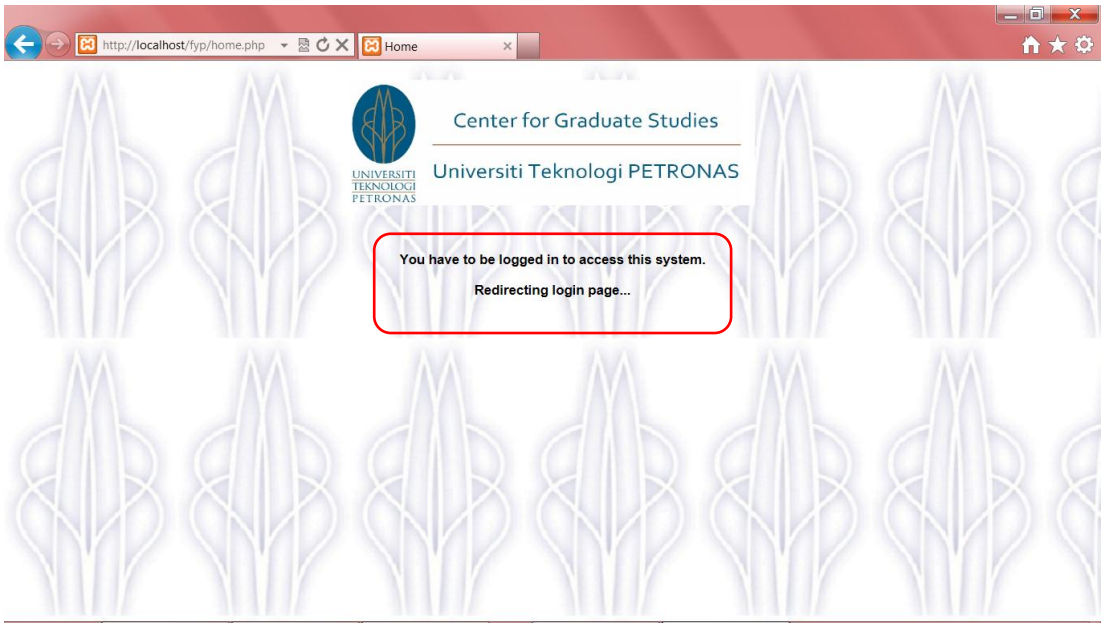


Figure 4.39: Login Request Message

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APPENDIX 1

Sample of Evaluation Forms

UNIVERSITI TEKNOLOGI PETRONAS

Centre for Graduate Studies
Universiti Teknologi PETRONAS

UTP/CGS/52A
for Supervisor

(PRELIMINARY CANDIDATURE)

Candidate's Name:							
Research Title:		**Level of Study:**	**Masters**		**PhD**		

Category	Criteria for Judging Quality	Please select (tick) the appropriate rubric for each category						
		Excellent	**Above Average**	**Average**	**Below Average**	**Unsatisfactory**	**Marks**	**Remark**
Problem Formulation (50)	Literature review (20)	The student has carried out a comprehensive and up-to-date literature review and has done critical analysis (20)	The student has carried out an in-depth and up-to-date literature review and has done substantial analyses (16)	The student has carried out sufficient literature review and adequate analysis (12)	The student has carried out insufficient literature review and inadequate analysis (8)	The student has not carried out the necessary literature review and analyses (4)	/20	
	Objective (15)	The student has produced research objectives that are significant, measurable, relevant and achievable within the time frame (15)	The student has produced research objectives that are substantial, measurable, relevant and achievable within the time frame (12)	The student has produced research objectives that are sufficient, measurable, relevant and achievable within the time frame (9)	The student has produced research objectives that are insufficient, measurable, irrelevant and unachievable within the time frame (6)	The student has produced poor research objectives (3)	/15	
	Problem Statement (15)	The student has produced a clear and conclusive problem statement that is rational and has high impact on society (15)	The student has produced a clear and justifiable problem statement that is rational and has a substantial impact on society (12)	The student has produced a sufficiently relevant problem statement that is rational and has a sufficient impact towards society (9)	The student has produced an unclear but relevant problem statement that is irrational and has insufficient impact on society (6)	The student has produced an unclear problem statement that is irrelevant and has no impact on society (3)	/15	
Methodology (30)	Project Activities (10)	The student has scheduled project activities that are comprehensive, highly achievable with extremely appropriate methods (10)	The student has scheduled project activities that are comprehensive, achievable with suitable methods (8)	The student has scheduled project activities that are sufficient, moderately achievable with adequate methods (6)	The student has scheduled project activities that are insufficient, unachievable with inadequate methods (4)	The student has scheduled project activities that are inappropriate and unachievable (2)	/10	

1

UNIVERSITI TEKNOLOGI PETRONAS

Centre for Graduate Studies
Universiti Teknologi PETRONAS

UTP/CGS/52B
for Supervisor

(ADVANCE CANDIDATURE)

Candidate's Name:		Level of Study:	Masters		PhD	
Research Title:						

Category		Criteria for Judging Quality	Please select (tick) the appropriate rubric for each category						
			Excellent	Above Average	Average	Below Average	Unsatisfactory	Marks	Remark
1. Current Semester Progress (30)	a.	Research activities (10)	The student has carried out comprehensive research activities (10)	The student has carried out substantial research activities (8)	The student has carried out sufficient research activities (6)	The student has carried out insufficient research activities (4)	The student has carried out very little research activities (2)	/10	
	b.	Attainment of overall research objectives (10)	The student has made excellent progress on the research objectives (10)	The student has made substantial progress on the research objectives (8)	The student has made sufficient progress on the research objectives (6)	The student has made insufficient progress on the research objectives (4)	The student has made no progress towards the research objectives (2)	/10	
	c.	Improvement of research-related skills and knowledge (10)	The student shows exceptional development in the related skills and knowledge (10)	The student shows substantial development in the related skills and knowledge (8)	The student shows sufficient development in the related skills and knowledge (6)	The student shows insufficient development in the related skills and knowledge (4)	The student shows no development in the related skills and knowledge (2)	/10	
2. Attitude and Commitment (15)	a.	Potential for completion (5)	The student's potential for completion is excellent (5)	The student's potential for completion is substantial (4)	The student's potential for completion is sufficient (3)	The student's potential for completion is insufficient (2)	The student's potential for completion is nil (1)	/5	
	b.	Key Milestone (5)	The student has made excellent progress, in excess of the milestones (5)	The student has made substantial progress, in line with the milestones (4)	The student has made sufficient progress in line with the milestones (3)	The student has made insufficient progress and is behind the milestones (2)	The student has made no progress and is far behind the milestones (1)	/5	
	c.	Interest and enthusiasm (5)	The student demonstrates extreme interest and commitment in the research project activities (5)	The student demonstrates substantial interest and commitment in the research project activities (4)	The student demonstrates sufficient interest and commitment in the research project activities (3)	The student demonstrates insufficient interest and commitment in the research project activities (2)	The student has not demonstrated interest and commitment in the research project activities (1)	/5	

UNIVERSITI TEKNOLOGI PETRONAS

Centre for Graduate Studies
Universiti Teknologi PETRONAS

UTP/CGS/52C

RESEARCH PROPOSAL DEFENSE (EVALUATION FORM)

Candidate's Name:							
Research Title:		Level of Study:	Masters		PhD		

Category	Criteria for Judging Quality	Please choose the appropriate rubric for each category						
		Excellent	Above Average	Average	Below Average	Unsatisfactory	Marks	Remark
Problem Formulation (30)	Literature review (10)	The student has carried out a comprehensive and up-to-date literature review and has done critical analysis (10)	The student has carried out an in-depth and up-to-date literature review and has done substantial analyses (8)	The student has carried out sufficient literature review and adequate analysis (6)	The student has carried out insufficient literature review and inadequate analysis (4)	The student has not carried out the necessary literature review and analyses (2)		
	Objective (10)	The student has produced research objectives that are significant, measurable, relevant and achievable within the time frame (10)	The student has produced research objectives that are substantial, measurable, relevant and achievable within the time frame (8)	The student has produced research objectives that are sufficient, measurable, relevant and achievable within the time frame (6)	The student has produced research objectives that are insufficient, measurable, irrelevant and unachievable within the time frame (4)	The student has produced poor research objectives (2)		
	Problem Statement (10)	The student has produced a clear and conclusive problem statement that is rational and has high impact on society (10)	The student has produced a clear and justifiable problem statement that is rational and has a substantial impact on society (8)	The student has produced a sufficiently relevant problem statement that is rational and has a sufficient impact towards society (6)	The student has produced an unclear but relevant problem statement that is irrational and has insufficient impact on society (4)	The student has produced an unclear problem statement that is irrelevant and has no impact on society (2)		

1

UTP/CGS/52D

Centre for Graduate Studies
Universiti Teknologi PETRONAS

ORAL PRESENTATION EVALUATION FORM

Candidate's Name:		Level of Study:	Masters		PhD	
Research Title:						

Category	Criteria for Judging Quality	Please choose the appropriate rubric for each category					Marks	Remarks
		Excellent	Above Average	Average	Below Average	Unsatisfactory		
Problem Formulation (30)	Literature review (10)	The student has carried out a comprehensive and up-to-date literature review and has done critical analysis. (10)	The student has carried out an in-depth and up-to-date literature review and has done substantial analysis. (8)	The student has carried out sufficient literature review and adequate analysis. (6)	The student has carried out insufficient literature review and inadequate analysis. (4)	The student has not carried out necessary literature review and analysis. (2)		
	Objective (10)	The student has produced research objectives that are significant, measurable, relevant and achievable within the time frame (10)	The student has produced research objectives that are substantial, measurable, relevant and achievable within the time frame (8)	The student has produced research objectives that are sufficient, measurable, relevant and achievable within the time frame (6)	The student has produced research objectives that are insufficient, immeasurable, irrelevant and unachievable within the time frame (4)	The student has produced poor research objectives (2)		
	Problem Statement (10)	The student has produced an extremely relevant problem statement that is rational and has high impact on society. (10)	The student has produced a substantially relevant problem statement that is rational and has substantial impact on society. (8)	The student has produced a sufficiently relevant problem statement that is rational and has sufficient impact on society. (6)	The student has produced an insufficiently relevant problem statement that is irrational and has insufficient impact on society. (4)	The student has produced a problem statement that is irrelevant and has no impact on society. (2)		
Methodology (30)	Project Activities (10)	The student has scheduled project activities that are comprehensive, highly achievable with extremely appropriate methods (10)	The student has scheduled project activities that are comprehensive, achievable with suitable methods (8)	The student has scheduled project activities that are sufficient, moderately achievable with adequate methods (6)	The student has scheduled project activities that are insufficient, unachievable with inadequate methods (4)	The student has scheduled project activities that are inappropriate and unachievable (2)		
	Key Milestones (10)	The student has identified milestones that are highly achievable, very satisfactory and extremely relevant to the objectives. (10)	The student has identified milestones that are mostly achievable and relevant to the objectives. (8)	The student has identified milestones that are sufficiently achievable and adequately relevant to the objectives. (6)	The student has identified milestones that are insufficiently achievable and inadequately relevant to the objectives. (4)	The student has identified milestones that are unachievable and irrelevant to the objectives or has identified no milestones. (2)		
	Study Plan (10)	The student has exceptionally clear, very feasible and extremely structured study plans (10)	The student has substantially clear, feasible and well structured study plans (8)	The student has sufficiently clear, feasible and adequately structured study plans (6)	The student has insufficiently clear, unfeasible and inadequately structured study plans (4)	The student has unclear, unfeasible and unstructured study plans (2)		

1

APPENDIX 2

Key Milestone and Gantt Chart

Activities \ Date	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14-24	Week 25	Week 26	Week 27
PLANNNING																	
1- Identify Problem and Solution																	
2- Feasibility Analysis																	
Title selection and proposal																	
ANALYSIS																	
1- Requirements gathering																	
2- Structural and Behaviour Modelling																	
External Proposal																	
DESIGN																	
1- System design																	
2- Architecture and interface design																	
3- Database design																	
4- Network design																	
Interim report																	
DEVELOPMENT & IMPLEMENTATION																	
1- Coding																	
2- Testing and Modification																	
Pre-Sedex																	
Dissertation																	
Viva Presentation																	

APPENDIX 3

User Acceptance Survey

This survey is designed to identify the factors that affect the acceptance of user towards a system. The questions in this survey are specifically related to an implementation of Graduate Student Research Progress Evaluation System in Universiti Teknologi PETRONAS.

Do you find the current process of postgraduate assessment is troublesome and inconvenient?

- ○ Yes
- ○ No

What are the problems that you face in the current assessment evaluation process?

- ☐ Paper form is difficult to store and manage
- ☐ Forms missing or misplaced
- ☐ Too many evaluation forms
- ☐ Inappropriate criteria in evaluation form
- ☐ Other: _____

How do you manage student's evaluation forms?

- ○ Filing
- ○ Store in Microsoft Excel
- ○ Throw away
- ○ Other: _____

On average, how much time does it take to submit consolidated evaluation results.

- ○ 1-3 days
- ○ Within a week
- ○ More than a week

Do you think manual process need to be automated?

- Yes
- No

Do you think paper forms need to be replaced by electronic evaluation forms?

- Yes
- No

How significant are the following in influencing your acceptance when implementing proposed system in UTP?

Rate order 1 - 5. 1 being Very Insignificant, 5 being Very Significant

	1	2	3	4	5
Convenience					
Easy to use					
Applicable					
Provide reliable data					
Speed of completion					
Efficiency					
Help in decision making					

Comment

APPENDIX 4

Usability Testing Survey

The objective of this questionnaire is to determine the level of usability of the Graduate Student Research Progress Evaluation System. Respondents are requested to complete this survey after using the system.

General Overview

Easy to read (both font style and size)?

	1	2	3	4	5	
Very Difficult	○	○	○	○	○	Very Easy

How did you find the layout of the site?

	1	2	3	4	5	
Very Bad	○	○	○	○	○	Very Good

The menu items were well organized and functions were easy to find.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I immediately understood the function of each menu item.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

My overall impression of the prototype is:

	1	2	3	4	5	
Very Bad	○	○	○	○	○	Very Good

System Usability Scale (SUS)

1. I think that I would like to use this system frequently.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

2. I found the system unnecessarily complex.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

3. I thought the system was easy to use.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

4. I think that I would need the support of a technical person to be able to use this system.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

5. I found the various functions in this system were well integrated.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

6. I thought there was too much inconsistency in this system.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

7. I would imagine that most people would learn to use this system very quickly.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

8. I found the system very cumbersome to use.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

9. I felt very confident using the system.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

10. I needed to learn a lot of things before I could get going with this system.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

APPENDIX 5

Interview Outline

<table>
<tr><td>Interviewer:</td><td>Interviewee:</td></tr>
<tr><td colspan="2">Appointment Details</td></tr>
<tr><td colspan="2">Date:
Time:
Venue:</td></tr>
<tr><td colspan="2">Objectives</td></tr>
<tr><td colspan="2">• To gather user's background information (job scope, tasks)
• To gather information on the current process flow
• To gather any related documents
• To gather user requirements for system development</td></tr>
<tr><td colspan="2">Agenda & Estimated Time</td></tr>
<tr><td>Introduction
Background of project research
Question and Answer:
Problems/challenges
Proposed solution</td><td>2 minute
5 minutes
20 minutes</td></tr>
<tr><td colspan="2">Questions:</td></tr>
<tr><td colspan="2">1. What is your position and job role?
2. Can you briefly explain the process flow of postgraduate assessment?
3. What do you think about current process?
4. Do you face any problems/challenges?
5. Do you keep the evaluation forms? For how long?
6. If no, please state reason.
7. Do you think it is a good approach to automate the current manual process?
8. What do you expect the proposed system can do?
9. Any comment or recommendation for the project research?</td></tr>
</table>

APPENDIX 6

Draft of Revised Research Proposed Defense (RPD) Evaluation Form

UTP/CGS/52C

Centre for Graduate Studies
Universiti Teknologi PETRONAS

RESEARCH PROPOSAL DEFENSE (EVALUATION FORM)

Candidate's Name:		Student ID:		Level of Study:	Masters		PhD	
Research Title:								

Category	Criteria for Judging Quality	Please choose the appropriate rubric for each category					Marks	Remark
		Excellent	Above Average	Average	Below Average	Unsatisfactory		
Problem Formulation (30)	Literature review (20)	The student has carried out a comprehensive and up-to-date literature review and has done critical analysis (20)	The student has carried out an in-depth and up-to-date literature review and has done substantial analyses (16)	The student has carried out sufficient literature review and adequate analysis (12)	The student has carried out insufficient literature review and inadequate analysis (8)	The student has not carried out the necessary literature review and analyses (4)		
	Problem Statement (10)	The student has produced a clear and conclusive problem statement that is rational and has high impact on society (10)	The student has produced a clear and justifiable problem statement that is rational and has a substantial impact on society (8)	The student has produced a sufficiently relevant problem statement that is rational and has a sufficient impact towards society (6)	The student has produced an unclear but relevant problem statement that is irrational and has insufficient impact on society (4)	The student has produced an unclear problem statement that is irrelevant and has no impact on society (2)		

	Objective (10)	The student has produced research objectives that are significant, measurable, relevant and achievable within the time frame (10)	The student has produced research objectives that are substantial, measurable, relevant and achievable within the time frame (8)	The student has produced research objectives that are sufficient, measurable, relevant and achievable within the time frame (6)	The student has produced research objectives that are insufficient, measurable, irrelevant and unachievable within the time frame (4)	The student has produced poor research objectives (2)		
Methodology (30)	Project Activities (10)	The student has scheduled project activities that are comprehensive, highly achievable with extremely appropriate methods (10)	The student has scheduled project activities that are comprehensive, achievable with suitable methods (8)	The student has scheduled project activities that are sufficient, moderately achievable with adequate methods (6)	The student has scheduled project activities that are insufficient, unachievable with inadequate methods (4)	The student has scheduled project activities that are inappropriate and unachievable (2)		
	Study Plan (10)	The student has exceptionally clear, very feasible and extremely structured study plans (10)	The student has substantially clear, feasible and well structured study plans (8)	The student has sufficiently clear, feasible and adequately structured study plans (6)	The student has insufficiently clear, unfeasible and inadequately structured study plans (4)	The student has unclear, unfeasible and unstructured study plans (2)		
Preliminary Analysis (20)	Proof of Concept (10)	The student has proof of concept that is highly established and extremely viable (10)	The student has proof of concept that substantially established and viable (8)	The student has proof of concept that is sufficient established and adequately viable (6)	The student has proof of concept that is insufficiently established and inadequately viable (4)	The student has proof of concept that is not established and unviable (2)		

	Preliminary Results (10)	The student has preliminary results that are critically analyzed, thoroughly discussed and extremely relevant to literature findings and study objectives. (10)	The student has preliminary results that are substantially analyzed, well discussed and relevant to literature findings and study objectives. (8)	The student has preliminary results that are sufficiently analyzed, adequately discussed and reasonably relevant to literature findings and study objectives. (6)	The student has preliminary results that are insufficiently analyzed, inadequately discussed and unreasonably relevant to literature findings and study objectives (4)	The student has preliminary results that are unanalyzed, poorly discussed and irrelevant to literature findings and study objectives (2)		
Oral Presentation (20)	Defense Ability (10)	The student has an outstanding ability to defend his/her work. (10)	The student has a substantial ability to defend his/her work. (8)	The student has a sufficient ability to defend his/her work. (6)	The student has an insufficient ability to defend his/her work. (4)	The student is unable to defend his/her work. (2)		
	Technical Content (10)	The student presents a technical content that is extremely credible. (10)	The student presents a technical content that is mostly credible. (8)	The student presents a technical content that is sufficiently credible. (6)	The student presents a technical content that is insufficiently credible. (4)	The student presents a technical content that is not credible. (2)		
						TOTAL SCORE		

Recommendation by Panel:

☐ Outstanding – The student has an excellent research proposal and may continue research without any concern

☐ Meet Requirement – The student has a good research proposal and may continue research with minor concern

☐ Below Requirement – The research proposal needs major modifications. The revised proposal must be resubmitted to the panel within the time allocated

☐ Fail – The research proposal is rejected. The panel proposes termination of candidacy

Comments: _____

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UTP GRADING SCHEME	
Score Range	**Grade**
85 – 100	A
80 – 84.9	A-
75 – 79.9	B+
65 – 74.9	B
55 – 64.9	C+
50 – 54.9	C
45 – 49.9	D+
40 – 44.9	D
0 – 39.9	F

Signature

Examiner's Name: .....

Date: .....