

Web-Based Coursework Assessment Submission System (CASS)

by

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Dissertation submitted in partial fulfillment of

the requirements for the

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(Business Information System)

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CERTIFICATION OF APPROVAL

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A project dissertation submitted to the
Business Information System Programme
Universiti Teknologi PETRONAS
in partial fulfillment of the requirement for the
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(BUSINESS INFORMATION SYSTEM)

Approved by,

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TRONOH, PERAK

July 2007

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.



MOHD SHAIFUL BAKRI BIN MAT ARSAB

ABSTRACT

This project focuses on the development of an automated system for Examination and Records Unit in Universiti Teknologi Petronas, which enables all lecturers, submit final examination marks and students coursework via a web-based system. Currently, lecturers need to submit coursework and final examination marks manually to the Examination and Records Unit. This new web based system helps lecturers to manage marks submission more efficiencies. It will be enhanced with the use of knowledge management capability applied in the sub-system of the system. Prelim evaluation suggests that this system is reliable and favorably accepted by lecturers.

ACKNOWLEDGEMENTS

In the name of Allah s.w.t, the most Gracious and the most Merciful

First and foremost, I would like to express gratefulness to the most merciful of Allah, the Almighty for His guidance and wisdom due to bestow on me for this precious opportunity to finish this project also to undergo all obstacles throughout the project together with the fulfillment of the my journey of obtaining a higher degree of education.

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Chapter 1

Introduction

1.1 Background of Study

Web-based Coursework Assessment Submission System (CASS) is a web-based application, where users can access it remotely at anytime around Universiti Teknologi Petronas (UTP) campus environment. Information Technology (IT) can enable great improvements and as a key that enabling technology, offers strategic opportunities and long-term competitive advantage. An essential element to IT implementation is ensuring that the right information is available at the right place and right time. IT has a proven track record in improving efficiency in many industries and organizations and will also impact on decision-making process.

Improvements in technology and management depend on as much upon the internal environment of the technology-using by the Academic Central Service (ACS) department as it does upon the technology and policies used to manage it. However, they have little control over their environments. In seeking to improve their performance and quality of services, they can best control the technologies they adopt and the practices they employ to manage their use.

The greatest strengths of technology today seem closely related to its potential to aid in academic environment and perhaps a more rational approach to decision-making. Should be realized that there are limits to this technology, though and not overestimate the potential. These very benefits, if not properly controlled or planned, which may result in misuse, unintended consequences and wasted resources.

1.2 Existing ACS Management System

From the research and observation that have been made, the Admission and Registration Unit is using SAP programming language to configure and monitor examination and records system in Universiti Teknologi Petronas. Actually, most systems under PETRONAS use SAP as a platform in developing systems and manage some tasks that always facing with high security level. SAP is very high cost development. Therefore, not many users can handle and use SAP programs because the high cost itself. Petronas have to spend more money if they want their staffs especially lecturers in UTP because cost of licensing. Just administrations in PETRONAS and UTP have their own id to login into SAP programs because they have full responsible to handle the systems. This is also one of reason why CASS can not apply and that why lecturers need to submit student's coursework and final mark manually to the Examination Unit.

The university was formerly known as The Institute of Technology Petronas (ITP) use Oracle system to handle and monitor examination and record system before they change into SAP program. Although SAP program is different from other programming language, Admission and Registration Unit is using the conventional methods and devices to apply their operations and management. They are using the communication tools and devices like computer, telephone and diskette to reach that purpose. Basically all these devices being implemented in their daily activities that consists of:

1.2.1 Examination Report

Staffs of ACS will accept the report that reported by the students in manually by using report form and record all the details on paper. This also happen when lecturers want to submit the coursework marks during study week where they need to submit it manually to the Examination and Records department.

1.2.2 Information and Data Transfer

Any of examination information or data which want to be transferred from one location to another will be done by using fax machine, telephone or internet. For instance, the final exam submission marks being transferred and derived were done through pendrive and diskette technology device whereby involve some problems to lecturers in doing their jobs.

1.3 Problem Statement

The use of certain conventional devices deemed is not relevant to certain circumstance. For instance, the pointed device of diskette has been used by lectures about ten years until today. Upon observation of management system and through interview session which conducted with Examination and Records Unit staffs, several problems through careful consideration and discussion were narrowed down whereby based on their relativity to the project. This is a problem in the current management system.

1.3.1 Manual Devices

Currently most lecturers use diskette or pendrive to submit coursework marks and final examination marks after finishing marking students' papers. If a lecturer has lost her device, this will give problem to her to search it back. The data in this device is very private and if someone found it, problem will come out.

1.3.2 Licensing user for SAP Login

Currently, it is almost 300 hundred of lecturers in UTP and based on information from ACS, it is difficult to give every lecturer with SAP user id each of them due to high cost.

1.4 Significant of Project

Based on the research and observation those have been made, the Coursework Assessment Submission System (CASS) is proposed to solve the identified problems. This system can make submission in easy way. With this system, manual submission of Final Examination Marks definitely can be improved. The manual system of using conventional device namely diskette and pendrive, anyway is not efficient nowadays because it will lead to ineffective submission. Besides that, some of data maybe corrupted. This proposed system can be an alternative to their existing submission technology. Finally, even though the system that we developed is only a prototype, it could be a reference for the actual system to be developed in the future.

This project is designed to increase the effectiveness of method for final examination marks submission from lecturers to the Examination and Records department. Through this proposed system, it will cater the problems in submission marking that commonly using the conventional method that seem quite not relevant with the growth of sophisticated technology today. The approach that will be used is to replace the existing method of submission that will contribute to the solution of time consuming. The interesting of this implemented technology in this system is to expose the Examination and Record department to the use of different technology in keeping and retrieving related data from database as well as to manage the proper management system. Due to that issue, it totally can help the lecturers to manage their duties implementation. Besides, it is potential to assist them in decision making process.

1.5 Objectives of Study

The objectives of this study are as follows:

- To solve an inefficient internal ACS course management system and weaknesses of application and conventional procedure.
- To design and develop a comprehensive of coursework marks and final examination scores assessment submission (CASS) system to improve the data availability and accessibility.

1.6 Scope of Study

The scope of study to be done in this project focus more on how to transfer the final examination marks from lecturer database into the main server at Examination and Record unit. It also focuses on research in the size, data access architecture, and data allocation of the CASS. The study also will be made on how to provide a tangible mechanism in the event of coordination process and to track the progress update for the marks conducted. All findings will be based on the information which gathered from the Examination and Records Unit in UTP, lecturers, articles, journals, reference books and the resources from internet. Basically the CASS is being modeled by using the Unified Modeling Language (UML) notation and related diagrams which developed by using the PHP application. Identifying all user roles that involved in the system also become as the main concern for this study. The study has to be completed within a time frame of fourteen weeks at the end of which a final report will be submitted to the Final Year Project committee of Universiti Teknologi PETRONAS.

Chapter 2

Literature Review

2.1 Electronic Performance Support System (EPSS)

The concept of Electronic Performance Support System (EPSS) is relatively new for most organizations and most definitions and usage of EPSS is fairly recent. EPSS movement began in 1991 with the arrival of Gloria Gery's book, *Electronic Performance Support Systems: How and Why to Remake Workplace through the Strategic Application of Technology* (Galagan, 1994). Since then EPSS has become a hot topic for organizational development and performance technology so as to training development. An EPSS is software or a software component that can help to improve performance (Miller, 2000); Bill Miller defines EPSS as an electronic support system in any computer software program component that improves employee performance by either:

- Reducing the complexity of number of steps required to perform a task (process simplification)
- Providing the performance information an employee needs to perform a task or
- Providing a decision support system that enables an employee to identify the action that is appropriate for a particular set of conditions.

From a systems point of view an EPSS is defined as a human activity system that is able to manipulate large amounts of task related information in order to provide both a problem solving capability as well as learning opportunities to augment human performance in a job task by providing information and concepts in either a linear or a non-linear way, as and when they are required by a user.

According to Beacham (1995) a distributed performance support system is an integrated and globally accessible collection of electronic tools that can be used (as and when required) at particular points of need (within a workgroup or an organization) in

order to improve human performance within a given job/task domain. This definition is distinguishing between 'stand-alone' support and 'distributed support' that could be realized through the used of computer network systems such as the Internet. From the definitions one can say than an EPSS is software or organizational tools available to provide continuous support for a given task in an integrated electronic environment where user can easily accessing it. It is structured to provide immediate access to information, guidance and assistance on-line.

2.2 Types and Components of an EPSS

The concept of EPSS is evolving and developing; it should contain hypermedia, hypertext, and multimedia or computer-based instruction components. Three basic types of EPSS are first software enhancement; making changes to an existing software environment, second navigational performance support system; uses existing software applications in combination with a custom program and third is integrated performance support system; software program that contains both performance support and business application functions. EPSS as a computer software program or component that improves employee performance, it should enable an employee to perform a task in less time, with fewer errors, with better result and with less training or external support. According to Ladd (1993) an EPSS typically includes the following components:

- *Tools*: the use of productivity software (word processing, spreadsheet, etc) used with templates and forms.
- *Information base*: an online reference information, hypertext online help facilities, statistic databases, multimedia databases and case history database.
- *Advisor*: an interactive expert system, cased-based reasoning system, or coaching facility that guides a user through performing procedures and making decisions.
- *Learning experience*: computer based training such as interactive tutorials, as well as multimedia training using simulation and scenarios.

The combination of all these components into a well designed system makes a powerful performance support system.

2.3 Web-Based Performance Support System (WPSS)

WPSS is a web version of EPSS that integrates tools, knowledge and learning experiences to improve performance and support users' access using web browser. WPSS is a web-based system that provides on-demand access to information, job aids, and context-sensitive training (Kilby, 1999). As the Internet, WPSSs uses TCP/IP and HTTP protocols to transport information from a central network application server to Web clients and back. The interface for the system could be the familiar unmodified Web browser, a Web browser customized with special features, or a unique Web application. Just as with EPSS, some WPSSs They will be designed so as to appear to be a single, though massive, application. Navigational features, visual design, and information organization will be uniformly applied. In other WPSSs, the components may be designed independently and only linked by a central manual application. Web-based performance support systems may be designed using existing or easily created performance enhancing components:

- Task Related Information Resources
- Knowledge Assets & Management System
- Productivity Software
- Web-Based Training

Most common web-based performance support system required to incorporate four types of services (Banerji, 1999):

- *Authoring services*: concerned with the adding and updating a variety of documents in the web pages. The environment provides appropriate tools for staff to edit and organize the information based on contents, semantics, exercises, bibliography, announcements, links and so on.
- *Information access and retrieval services*: related to multiple representations, navigation and search mechanisms for all document classes.
- *Communication and collaboration services*: include features such as group discussion, news, mailing list, and frequently ask questions (FAQs).
- *Management services*: concerned with the organization and storage of documents, documents' coherence and accesses right.

2.4 Moving to a Web-based Submission Environment for Marking Submission

In a way that is to change manual submission to the Web-based submission, appears to have failed to gain use and acceptance at the levels that were initially predicted. Nevertheless some progress has been made and most academic staff, even if not actually engaging in some form of Web-based submission is at least aware that these facilities exist. Of those actually engaged in Web-based delivery most are only providing supplementary course materials; even fewer are providing a direct online component that can be used instead of more traditional face-to-face or paper-based methods (as used for traditional distance education). Only a tiny minority provide complete units of study that can be undertaken entirely over the Web and not even all of these employ Web-based assessment.

One thing that has become clear to lecturer attempting to move assessable coursework to the Web is that it's a lot more difficult than it initially seems. Some very interesting approaches to online assessment have been devised, such as e-learning which simulates entire education information and sources online. However, the amount of work involved in developing a software tool of this nature and quality is daunting, and the market for it relatively specialized and small. There are thousands of such educational markets ready to be tapped, but the realities of economics may mean they are never adequately catered to.

Some of the more interesting developments in the field of Web-based coursework submission include role plays and simulations, portfolio creation, peer ranking, and problem solving activities. The potential value of these newer forms of innovative Web-based assessments will become more apparent as further research and studies are conducted.

Chapter 3

Methodology

3 Methodology and Project Tasks

Waterfall model is chosen as the methodology. Why I choose this model because the Waterfall model at each of every phase is cascading from one another. It is widely used for practical systems development. The five phases of waterfall model are followed closely to ensure a systematic approach to system development achieved. The core main phases are planning, requirement analysis and definition, system design, construction and integration and also testing and evaluation.

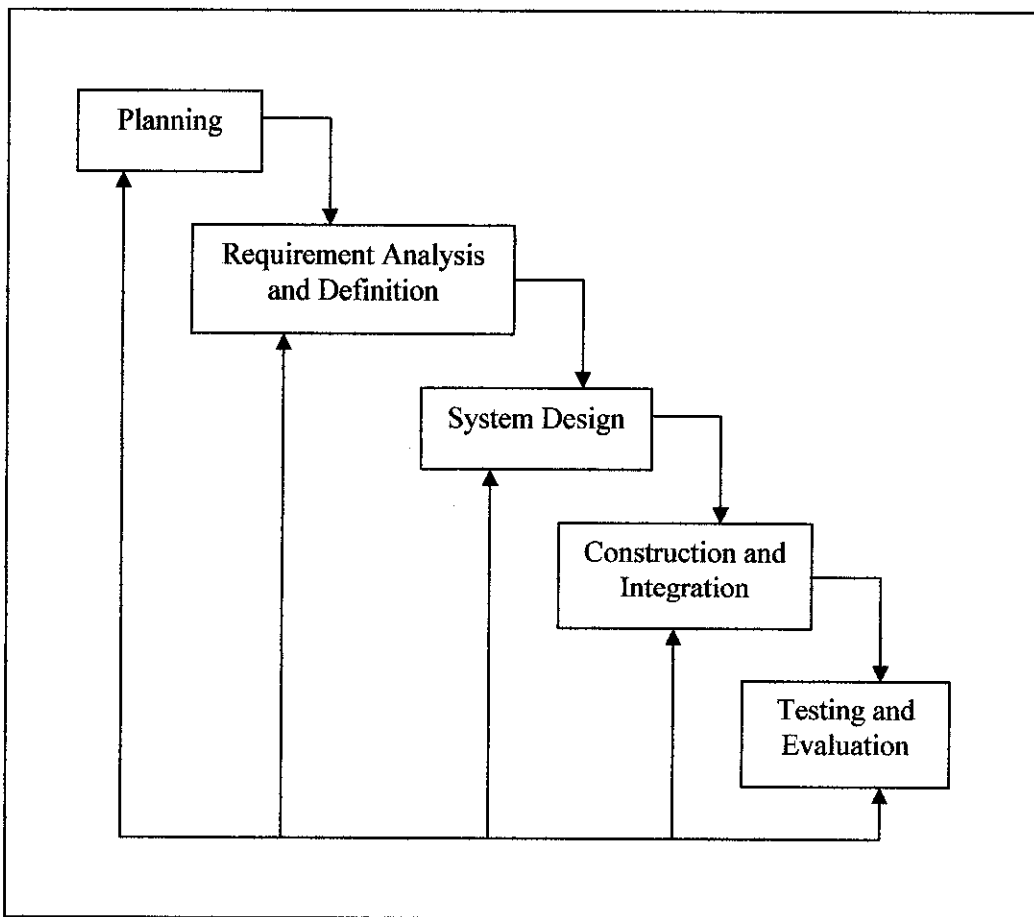


Figure 1: Project Life Cycle Model

3.1 Planning Phase

The system concept was developed to describe how the system will operate once it is implemented. Therefore, research for this project will be on the planning phase first. Furthermore, is to assess how the system will give an impact to end user while performing their daily tasks or activities. Moreover, it is vital to ensure that the system will provide the required capability on-time and within cost budget, project resources, schedules and tools. Through this step, I had clearly stated and defined the problems, opportunities and directives towards the development of the proposed system. The outcome of this task are problem statements, objectives as well as significant of the system being develop.

Based on the scope of statement, a detailed project of this phase will be on establishing the environment in which the system will function in as well as selecting the appropriate methods. The elementary platform and appropriate activities that will be conducted namely:

3.1.1 Develop System Architecture

This activity involves modeling the files and databases that store all the appropriate organization's data that is going to be used and also set up organizational structure purposely to manage the information resource.

The concept of a Web-Based Performance Support System is applied in the development of Web-Based Coursework Assessment Submission System. It allows the system to be accessed via the WWW environment. The CASS system is divided into two major modules, administration modules and lecturer module. All of these modules can be accessed through the Internet and Intranet, which makes a web browser as the medium between users and the system. Figure 1 shows the environment for the system. There are two main categories of users in the system, administrator and lecturer. Each has their level of access to the system. The administrator can update existing data and add new data to the system but only an authorized user can do this. For example, a lecturer can only access the lecturer's module and the same thing happens in other modules. User can change their password and personal detail.

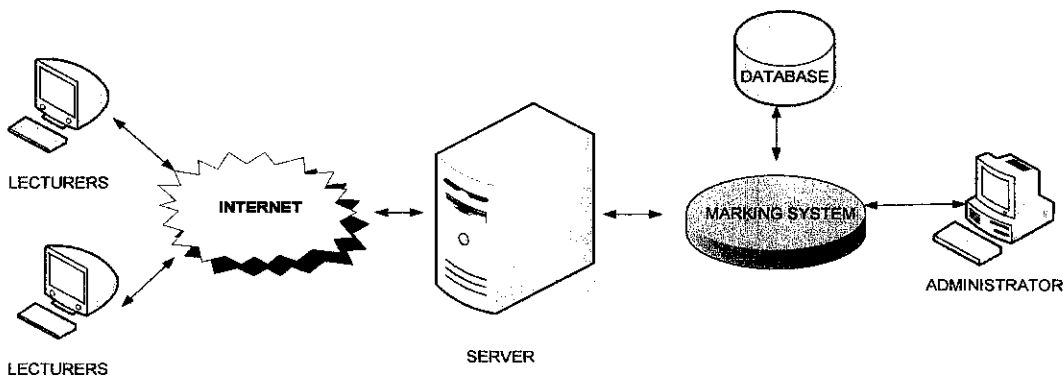


Figure 2: Coursework Assessment Submission System Architecture

Marking calculation formula is designed in an easy format so that the lecturer can change it easily. Lecturers will key in marks to be publish and to be put in the result calculation. The result being key in can be seen by lecturers and ACS staffs. The interface to assign new calculation formula will be easily modified by the lecturer so as the interface to assign percentage for each courses assessment marks

3.1.2 Design System Environment

This activity involves modeling the events that surround the system and determining specifically what the suitable technologies going to be used for developing purpose.

3.2 Requirement Analysis and Definition Phase

The system's goals, constraints and services are established by consultation with the system user at this phase. Essentially, the purpose of requirements analysis is to identify data, process and interface requirements for the users of the proposed system. The system was defined in more detail with regard to system inputs, processes, outputs, and interfaces. This definition process occurs at the functional level. The emphasis on this phase is in determining what functions must be performed rather than how to perform those functions.

An effective method for data gathering must be applied in order to be successful defining system requirements. Fact finding is the formal process of using research, interviews, questionnaires, sampling and other techniques to collect information pertaining to problems and requirement. Tools, such as data, process and object models were used to documents facts and conclusion will be drawn from documented facts. There are several fact finding methods that available for data gathering processes namely through a few sampling of existing documentations, forms and databases, research, questionnaires, prototyping and many more. The technique that was employed in data gathering process was doing the research on database security and its complement that can be attained at few search engines, relevant websites, books and especially journals. Another technique was performing some formal interviews with personnel and officer of Examination and Records Unit.

Use cases developed and used to describe the system functions from the right perspectives of end users and in the manner and terminology of their insight. Essentially, use case has proven to be an excellent technique to better understanding and document system requirements. Use cases are triggered by external user that called actor. Actors represent anything that needs to interact with the system for information exchange. The use cases that are related to this system are used to model functionality of the proposed system in order as starting point to identify the data entities or objects of the system.

3.2.1 Define and Model System Requirements

This activity involves identifying and modeling the necessary data that needed to develop the proposed system.

3.2.2 Define and Model Organization Rules

This activity involves identifying and modeling the organization's policies concerning to the system access and implementation.

3.2.3 Resolve Requirements Conflicts

This activity involves identifying and determining a proper solution towards any requirement inconsistencies and differences.

3.3 System Design Phase

The purpose of system design phase is to transform the requirement statements from the requirement analysis and definition phase into design specifications for construction purpose. It involves identifying and describing the basis software system abstractions to ensure completeness, usability, reliability, performance and quality of product. Hardware or software requirements will be determined in this phase. The system architecture will be produced on the whole.

In this phase, the data models and process models that were initially created during requirements and definition phase were analyzed in detail. System users were involved in this activity to help address data and process issues. The key inputs to the tasks were the facts, recommendations and opinions that were solicited from various sources.

I am working closely with the system users to develop input, output and dialogue specifications. For interface and dialogue design, I have considered such factors as terminal familiarity, possible errors and misunderstanding that the end users may encounter. Furthermore, I was trying to make it easy for the end users to understand what the screen is going to display at any given time.

3.3.1 Object Orientation and UML

This project will use the Object Orientation Methodology to develop the Coursework Assessment Submission System (CASS). The techniques and notations involved will be based on Unified Modeling Language (UML). The CASS will be developed and modeled using UML notation and diagrams. These diagrams include:

- Class diagrams
- Object diagrams
- Use case diagram
 - ✓ functions provided by the system to external entities
- Sequence diagram
 - ✓ dynamic structure of the system
- Component diagrams
 - ✓ Organization of the dependencies between different implementation components

3.3.2 Use Cases

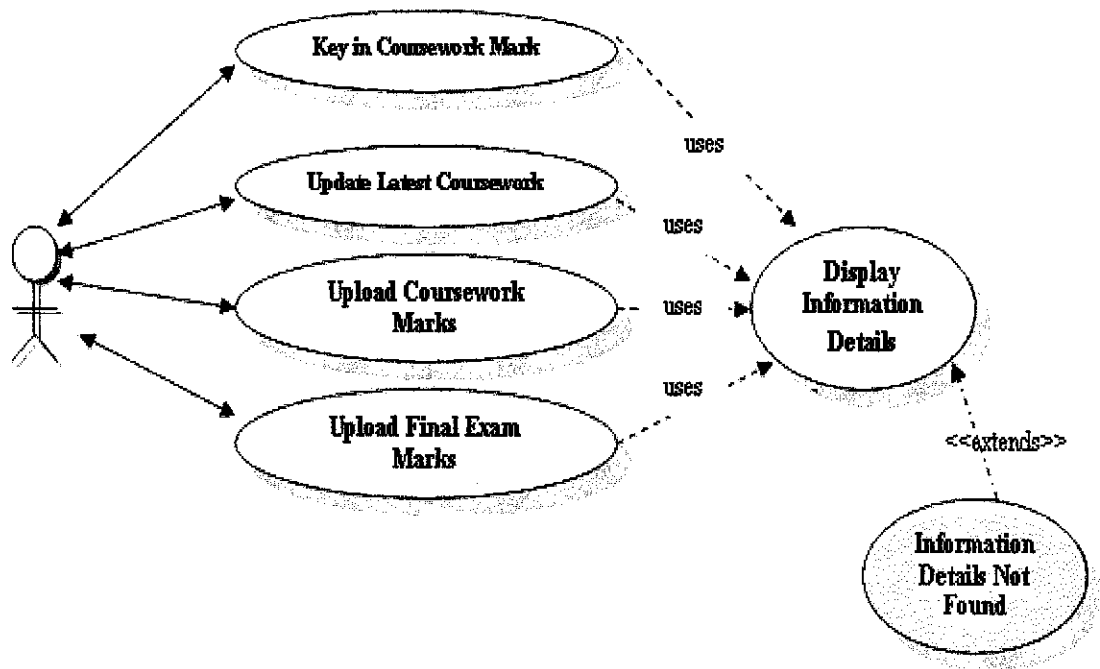


Figure 3: Use Case Diagrams for System Functionality

- Key in Students Coursework Marks
- Update Latest Coursework Marks
- Upload Coursework Marks
- Upload Final Examination Marks

3.3.2.1 Key in Students Coursework Marks

Describe the process where lecturers can key in prelim marks from students achievement and performance in class such as quizzes marks, tests marks, reports marks, group projects marks and presentation marks.

3.3.2.2 Update Latest Coursework Marks

Describe the process where lecturers need to update all student achievement in class by calculating marks refer to the coursework percentage from a course.

3.3.2.3 Upload Coursework Marks

Describe the process where lecturers will submit all student final coursework marks by uploading to the Exam Unit Office server via CASS system.

3.3.2.4 Upload Final Examination Marks

Describe the process where lecturers will submit all student final examination marks by uploading to the Exam Unit Office server via CASS system. Lecturers need student Exam Id to key in the exam marks.

3.3.3 Structural Environment and System Requirements

The CASS will operate on a lecturers' computer device in a campus environment. The CASS will also be developed by using the MySQL databases. The minimum of system requirement for computer device as follows:

- Device Type: Lecturer Computer
- Operating System: Windows XP Professional Edition
- Internet Browser: Internet Explorer
- Network: Local Area Network (LAN)

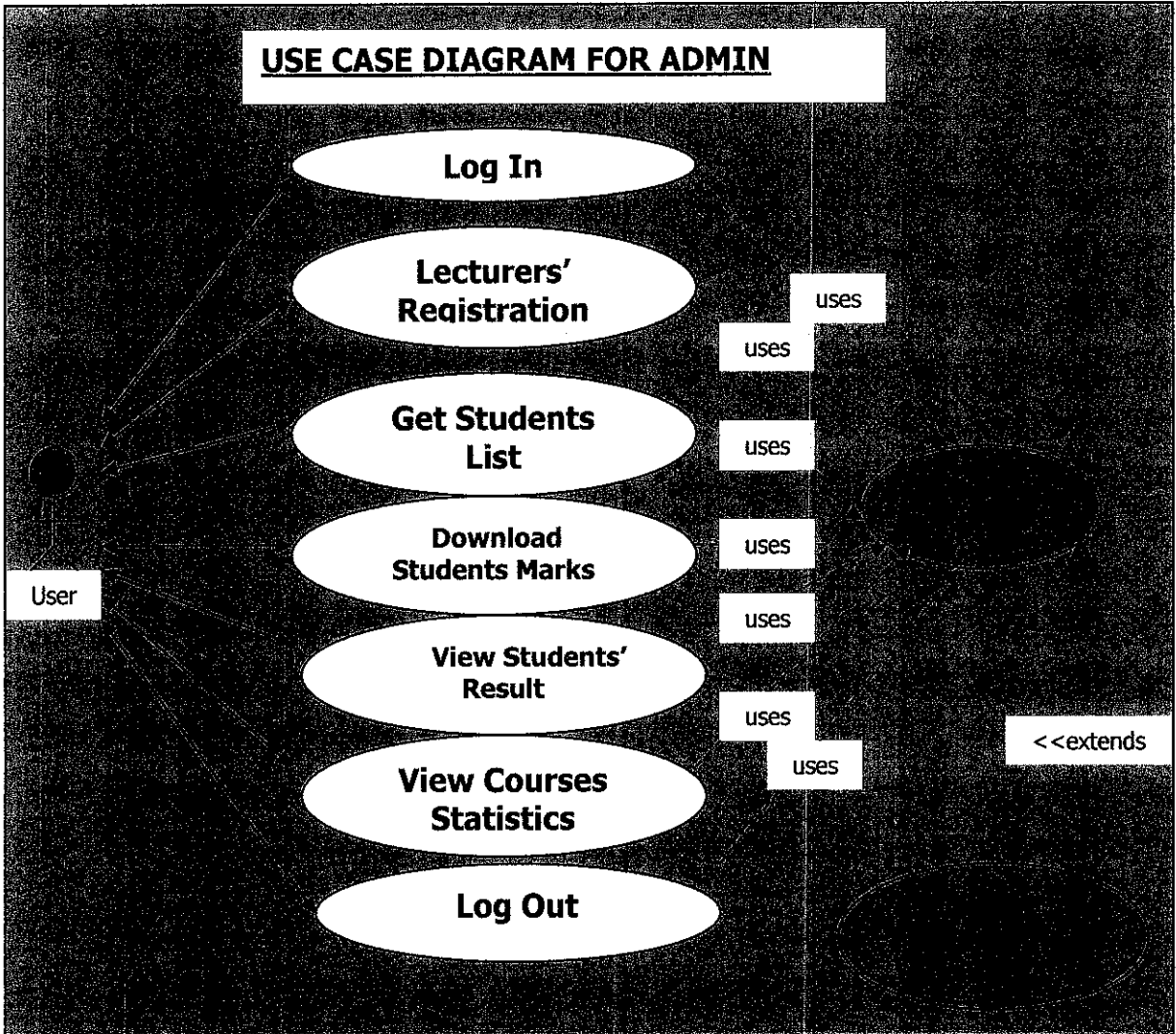


Figure 4: Use Case Diagrams for Administration System Functionality

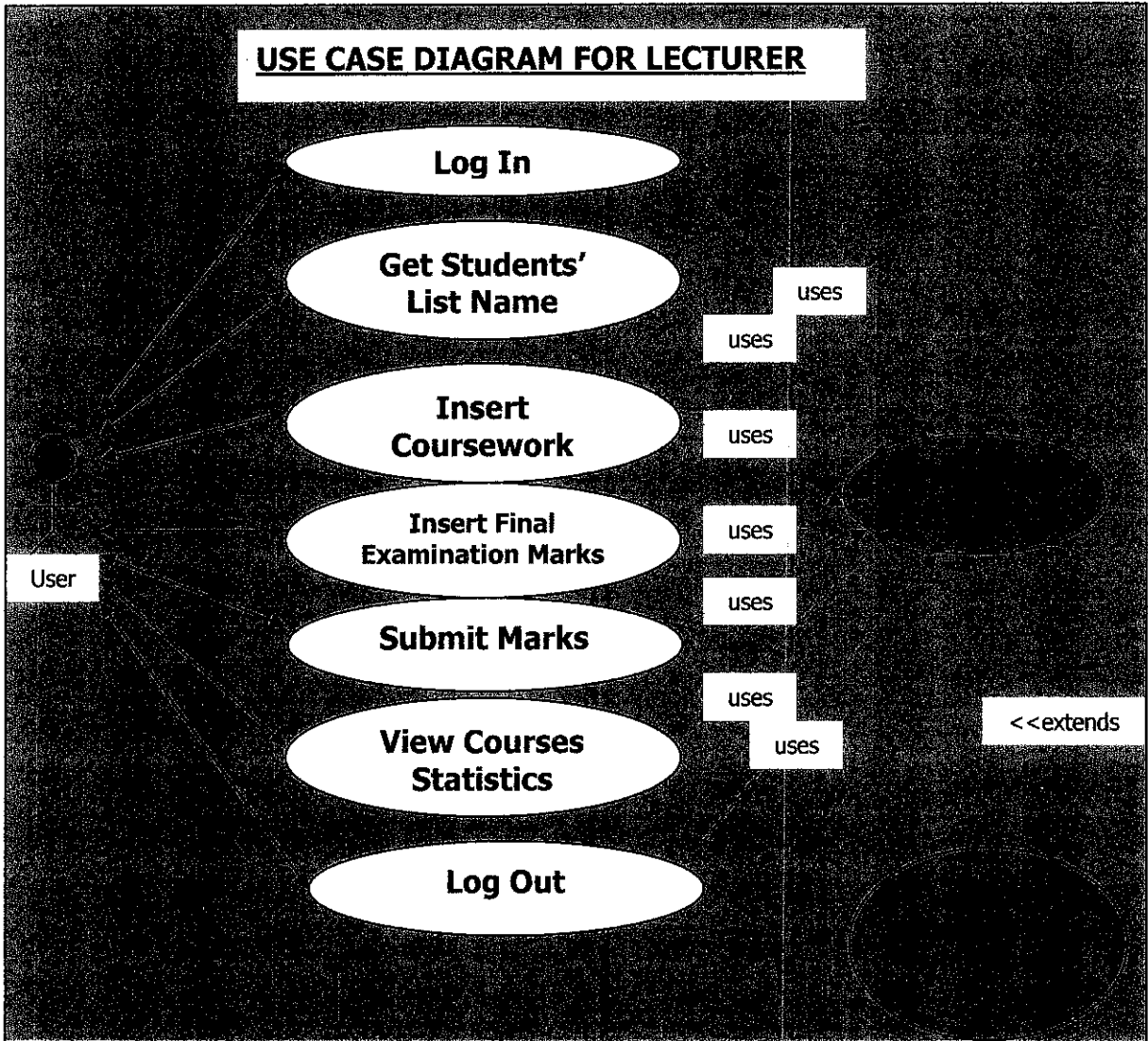


Figure 5: Use Case Diagrams for Lecturer System Functionality

3.3.4 Identifying Classes

The classes to be used to develop the CASS were identified based on the data perspective. This is due to the data has a dominant characteristic of the CASS system. The initial classes for the CASS are:

- Lecturer
- Student
- Admin

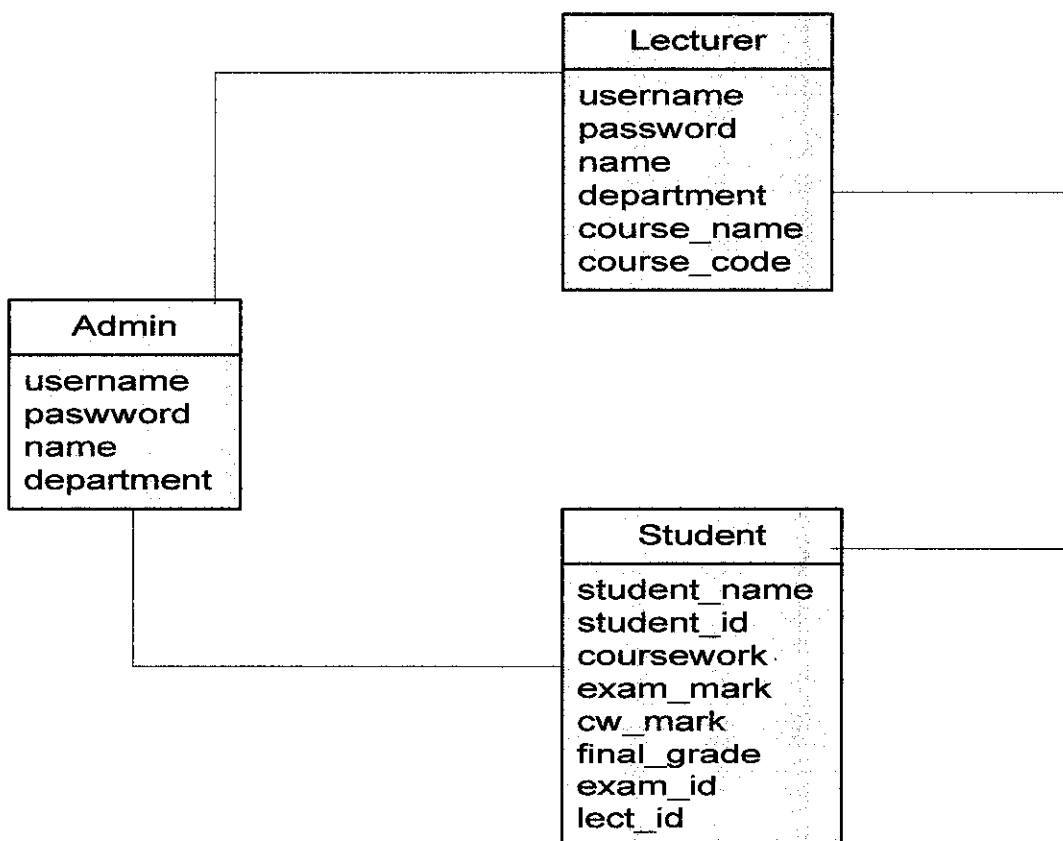


Figure 6: Coursework Assessment Submission System (CASS) database diagram

3.3.5 CASS Design Findings

3.3.5.1 CASS Design

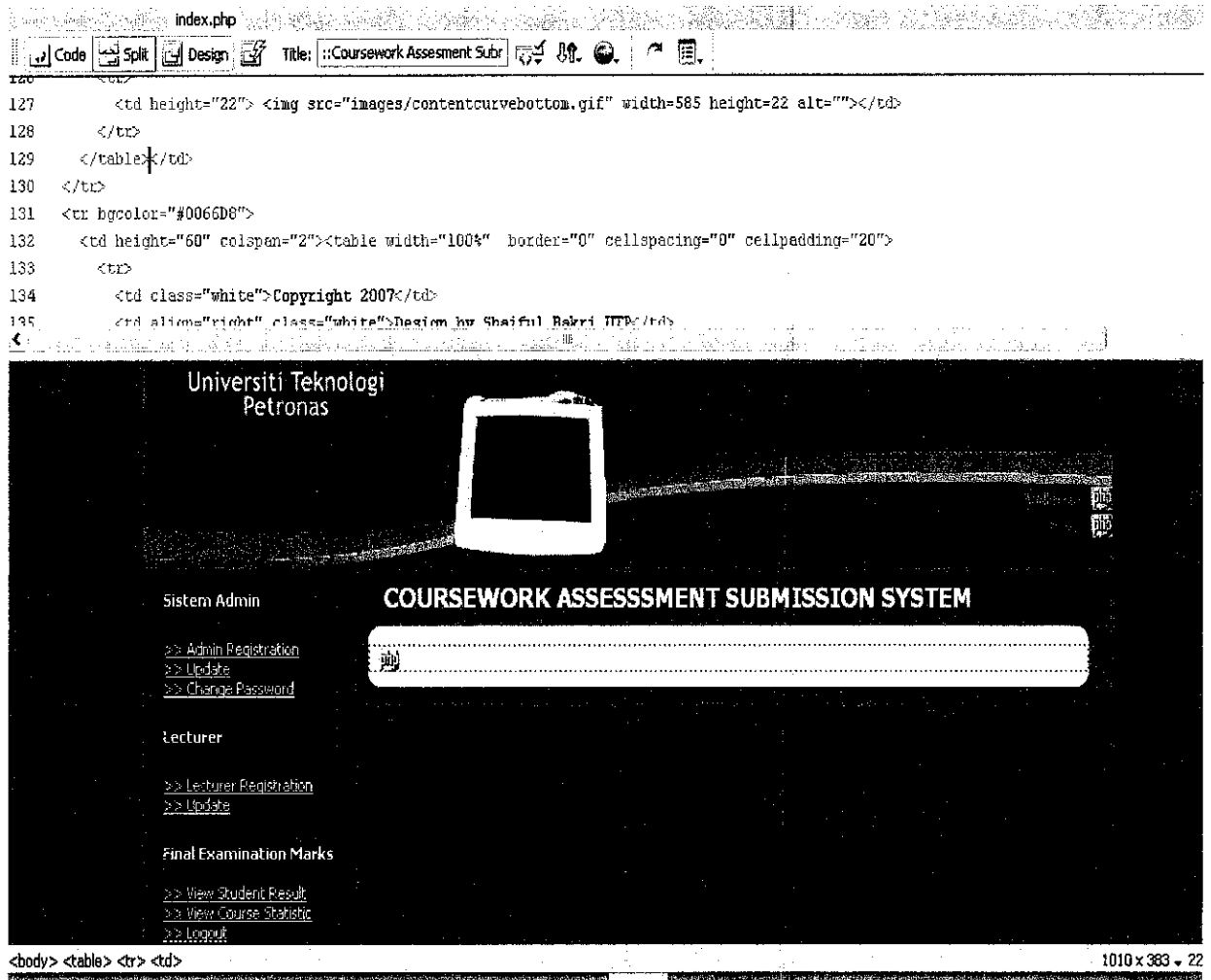


Figure 7: Design Web Interface Using Macromedia Dreamweaver 8

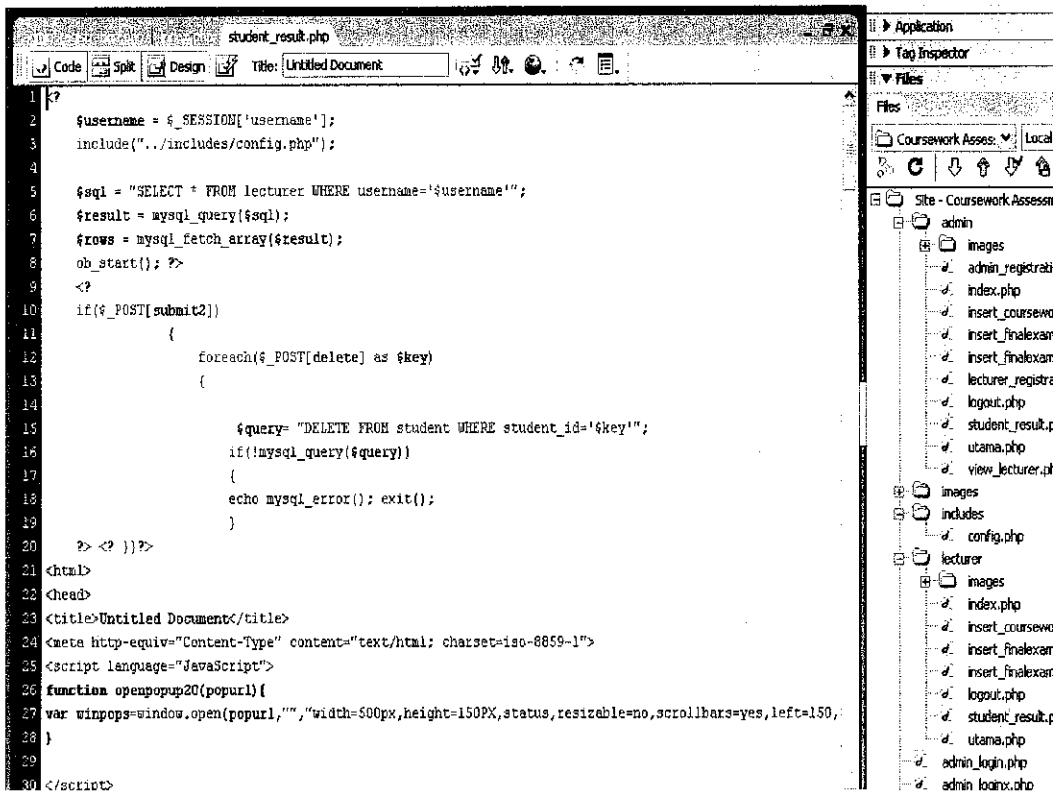


Figure 8: Create Php, Class Files, Databases Connection

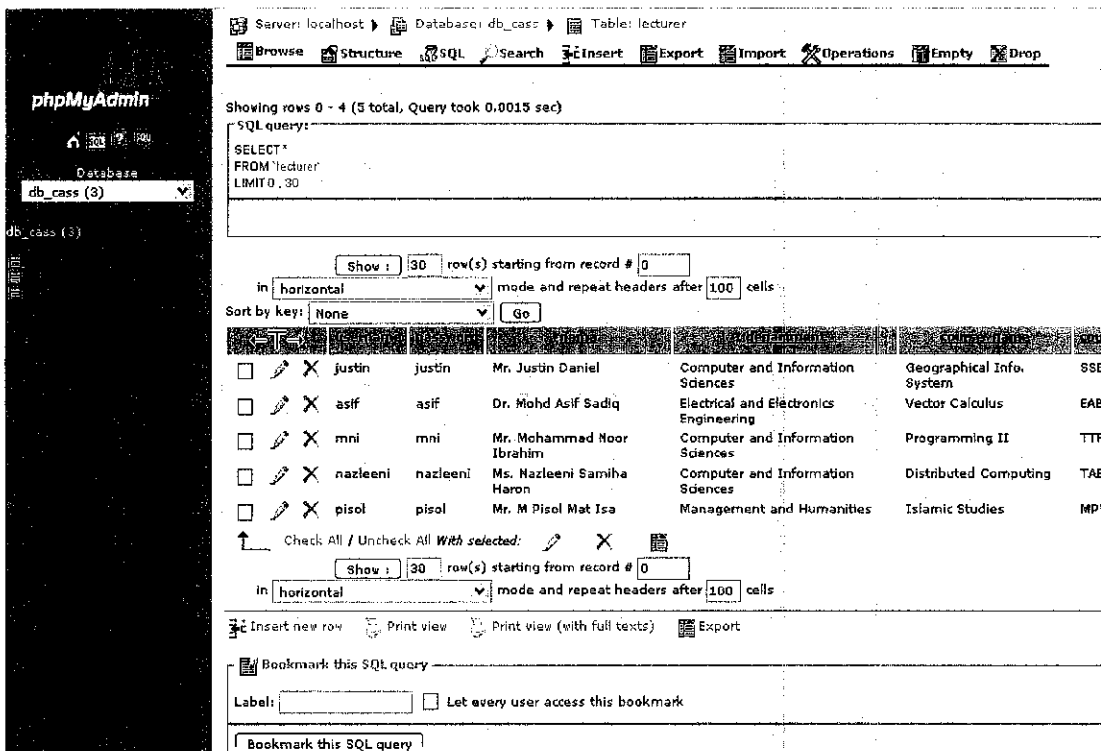


Figure 9: Database Interface using Phpmyadmin for table db_cass

3.3.6 System Design in Details

3.3.6.1 System Compatibility and Portability

Strengthening the support to final marks submission standard system, make the whole data structure of Web-based Coursework Assessment Submission System greatly standardize. Exchanging data with a system which also follows final marks submission standard system will be very easy. This will be consummated in order to study the compatibility between this final examination mark submission system and other systems. CASS has a natural advantage in the using in cross-platform, after adopted a large number of PHP components in the design and implement. When choosing develop environment, adopt Apache with excellent performance and middleware technology as application server, have laid the foundation for distributed deployment in the future; Dividing the implement levels and modules clearly in the system, has guaranteed to software reusing furthest, have given full play to the utility of module technology; All above ensure the portability of this system.

3.3.6.2 Security Control

Because the protocols used in WebPages transmitting in the network is open TCP/IP protocol, its opening will cause serious underlying danger to systematic security control and system management. In order to solve this problem, the system has record cryptographic keys including user's personal information and logging IP information for each user at the same time while carrying on the normal hookup among WebPages. When accessing WebPages directly without logging in with personal password or browsing time out, there will be no correct cryptographic keys to be checked, causing system warning automatically and no proper WebPages content. The system still supports to expansion interface of encrypting information transmission with the more reliable encrypting algorithm.

3.4 Construction and Integration Phase

The objective of the construction and integration phase is to convert the deliverables of the system design phase into a complete system. This phase contains activities for building the system, testing the system, to ensure the system functional processes satisfy and meet the user requirements. At the end of this phase, the system will be ready for the activities of the integration and testing.

Programming is generally recognized as a major aspect of the construction phase. The primary inputs for this activity are the technical design statement, plan for programming development, and test data developed during the system design.

In integration phase, individual program units or programs are integrated as a complete system to ensure that the software requirements have been met successfully.

3.5 Testing and Evaluation Phase

In system testing and evaluation, individual program units or programs that have been integrated into a complete system will be tested to avoid any possibilities of system failure. Testing will be conducted during this phase. Testing must not be deferred until after the entire program has been written. There are three levels of testing implementation namely the stub testing, unit testing, and system testing. Stub testing is the test whereby performed on individual events or modules of a program. While unit testing is a test whereby all events and modules that have been coded and stub subsequently tested for a program which tested as an integration unit. Whereas system testing is performed to ensure the application program written and tested in isolation will work properly whenever they are integrated into the final system.

Chapter 4

Results and Discussion

Results and findings from this project were collected from the three stages of the Coursework Assessment Submission System (CASS). There are the CASS planning, design, and implementation stages.

4.1 CASS Planning Findings

4.1.1 Organizational Database Strategy and Policies

During the period of CASS planning, an organizational plan and guidelines were identified. The Examination and Records Department would use the moderate database merely for coursework and final examination marks assessment from SAP system. This is due to the Admission and Registrations enforces appropriate rules and has jurisdiction within the Examination and Records unit merely. Therefore, only certain tables and records frequently have been used by the Exam Unit staffs, which will be stored on the provided database. This is also involves of storing all records of registered course, exam id, students' coursework, and any other else of related.

4.1.2 Information Architecture

The information architecture has two components. Each of the components will have a single database. All these databases or information will be kept and stored in different sets of data, according to the elements of information. Ideally, the main database was located in Examination and Records Department, the next second database is located in Lecturer Department. For this CASS project purpose, the scope of implementation will merely be applied on Examination and Records Department, which will contain a specific database element with related working area. For that purpose, Apache Server being implemented to run the system of CASS with integration of PHP element to ensure its functionality can be used simultaneously by lecturers at each course with their computers.

4.2 CASS Design Findings

4.2.1 Data Allocation of CASS

In principle, data will merely be allocated to a main site namely at Examination and Records Office with a backup server to standby if any unexpected occurrence happen. The CASS will be using the selective replication strategy regarding the placement of data. This strategy is a combination of fragmentation, replication, and centralization. Some data are fragmented to achieve the high locality of reference. Otherwise, the data items are centralized as usual. This is commonly used such strategy because of its flexibility.

4.2.1.1 Fragmentation on the CASS Data Access

Fragmentation is used for the data allocation purpose on the CASS database. This strategy partitions the main database into disjoint fragments, with each fragment assigned to one main site. If data items are located at the site of device application whereby being used frequently, locality reference is high. As there is no replication, storage costs are low. Similarly with reliability and availability are low too, despite they are higher than in a centralized case, as the failure of a site results in the less of merely that site's data. Performance supposes to be good and communications is low.

4.2.1.2 Replication at Backup Server

Replication being performed in a backup server, which have the contain snapshots of the main database in a main server. A snapshot is a copy of data at a given time, whereby the copies will be updated periodically and definitely they will always be up to date.

4.2.1.3 Centralized at Examination and Records Unit

For this first version of implementation, basically this system will merely be implemented with centralization in Exam Unit Office. There, everything will keep and store whereby contain the complete tables, records, and fields.

4.2.2 Data and Referential Integrity

4.2.2.1 Object Identifiers

Each table in the CASS database has a primary key to ensure that, there is no two records in a table have the similar primary key value. So it will be able to call merely one referred data element to gain the necessary data that requested.

4.2.2.2 Domain Integrity

Appropriate controls were designed to ensure that, there is no fields takes on a value that is outside of the range of legal values.

4.3 CASS Implementation

4.3.1 Backup and Recovery

The CASS will definitely use a backup and recovery features in MySQL where is a database construct that enables PHP and Apache to work together to access and display data. Apache is quite powerful and can accomplish virtually any task as a Webmaster. The Recovery Manager is a component of MySQL that provides a tightly integrated method of creating, managing, restoring, and recovering the MySQL database backups.

4.3.2 Access Level

Access to the CASS, lecturers will be given with a unique and valid username and password. In principle, there is two category of access level, namely full access level, which will be granted to system administrator, whereas the limited access level of user will be granted to the lecturers. They have merely a specified set of privileges designated by the database administrator.

Chapter 5

Conclusion and Recommendations

5.1 Summary

Based on the final prototype for CASSS system overview using secure PHP development, basically it has been done and completed successfully running intranet and internet around UTP campus via local network. This system can be divided into two groups namely group of user that using the web-based application namely lecturers and also a group of user that using same application whereby consist of system administrator at Examination and Records Unit.

5.2 Project Achievement

In principle, the system application has been developed first in a web-based part. To ensure the support of system implementation, so the development of database has been done to allow the appropriate data to be stored and access by the system. After the issue of web-based and database development have been solved, such as database connection from web-based and certain operation to keep the record and data which placed in database, thus network security application next to be developed. This is the strategy to accelerate of developing such application due to that development quite tough if compared to the desktop application whereby there is several issue need to be considered namely like small memory size, limited display, processing speed which is slow and whereas.

After the system testing being performed, the more confidence that the system has meet the objectives with fully assigned to shift the record marks process and data access can be applied via online. This will help the lecturers to record or access the system effectively without perform the conventional or common existing method of procedure.

On the other hands, security in delivering data via online application also meets the target and can be successfully implemented. The synchronization process has successfully been done by the system application whereby the data information storing can be performed despite there is no internet connection while the application being used on that time. The advantage of this system due to it able to recover and solve the repetition of task even the implementation of time can be reduced. The special features of security that being used totally may upgrade the security element whereby the data will be encrypted first before it send to the database.

5.3 System Weaknesses

With any given project, there will always be some limitations and constraints, time issue, resources, knowledge, technology or any other else related whereby no matter what reasons are, there will always need to be room and took into account for improvement purpose. Based on the testing, evaluation, and observation that performed on the system, there is a few weaknesses that have been found. The main weakness is system uptime whereby it is quite slow to access the database. The next identified problem is that the symmetry key which is used in security purpose for encryption and decryption is hardcode-oriented whereby the security might be in trouble if brute force attack successfully be performed on the encrypted data.

5.4 System Improvement Recommendations

Refer to the discovered weaknesses there is several recommendation that can be used to suggest in order getting the better solution for the system implementation. Uptime problem can be solved by using specific driver upon certain database to provide connection support from system application to such database. The second problem might be able to solve by using dynamic key for a session without implementation of hardcode in programming part. In addition, to ensure the high security level, the use of non-symmetric key can be applied to ensure the strong security equipped.

5.5 Conclusion

In conclusion, the project has managed to fulfill its objectives. This system will provide more advantages to the lecturers and Exam Unit if it can be used and implemented wholly in their working area. However, this developed system is merely a prototype and definitely the improvement must be performed to yield the actual result of real application. Hopefully, this system will become impetus to the technology shifting for Universiti Teknologi Petronas especially for Examination and Records Unit in the future.

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APPENDICES

Appendix 1-1

- Gantt Chart – Project Schedule

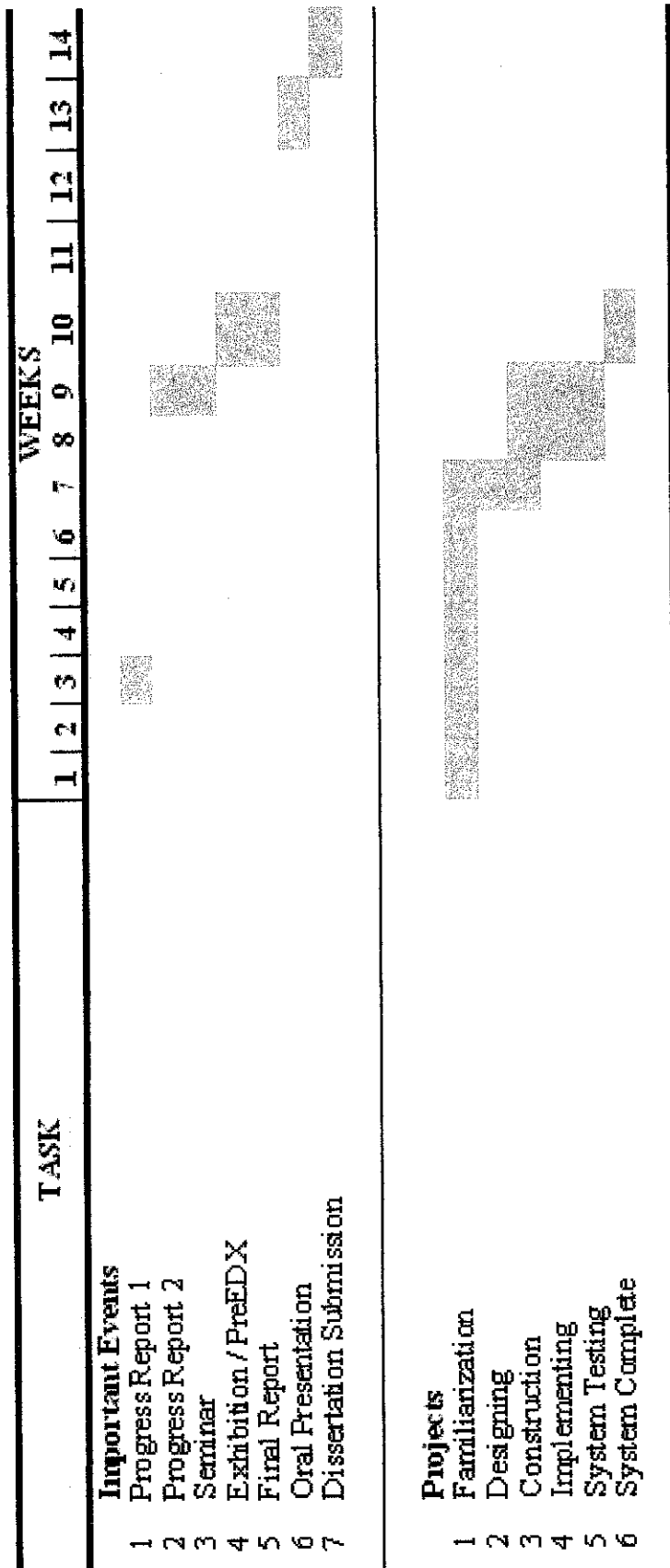


Figure 1-1-1: Project Schedule Gantt Chart

Appendix 1-2

- Screenshots

CASS Web Address: <http://163.0.1.11/cass/>

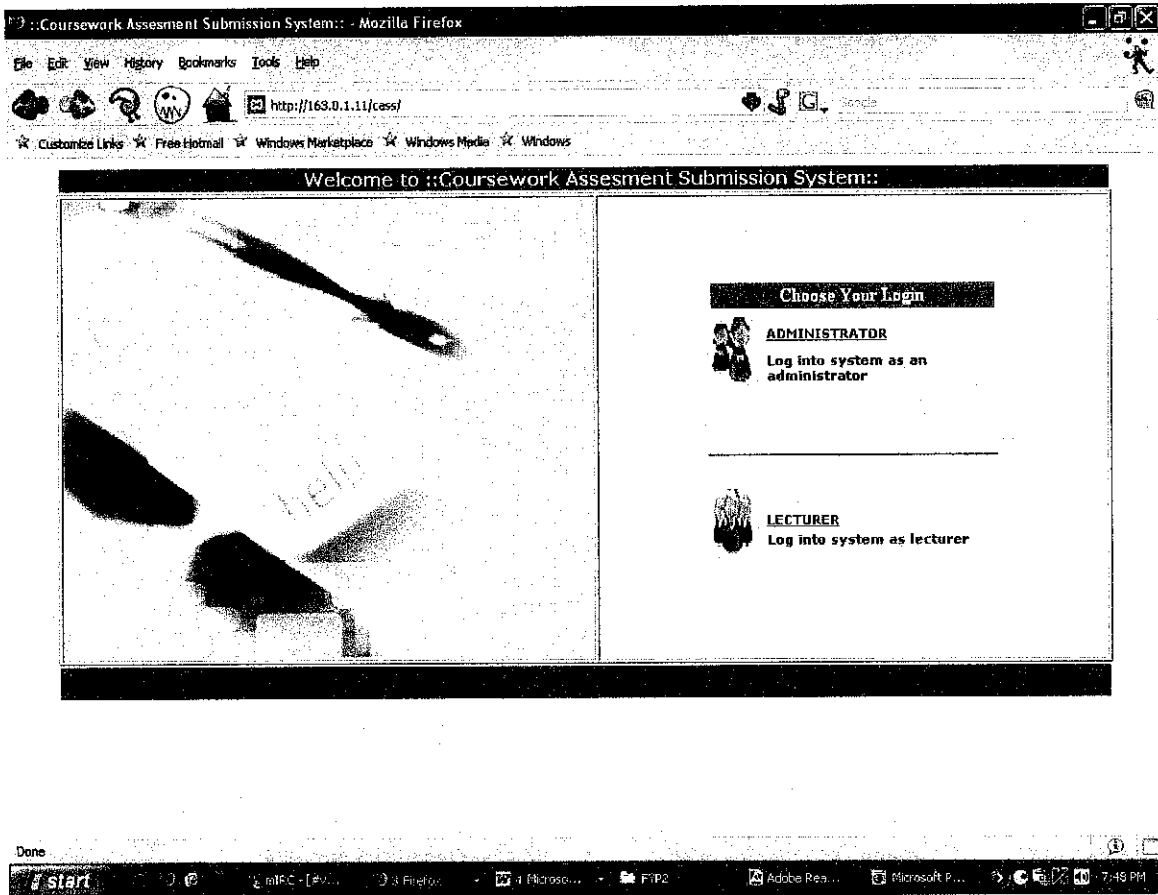


Figure 1-2-1: Login Page for Administrator and Lecturer

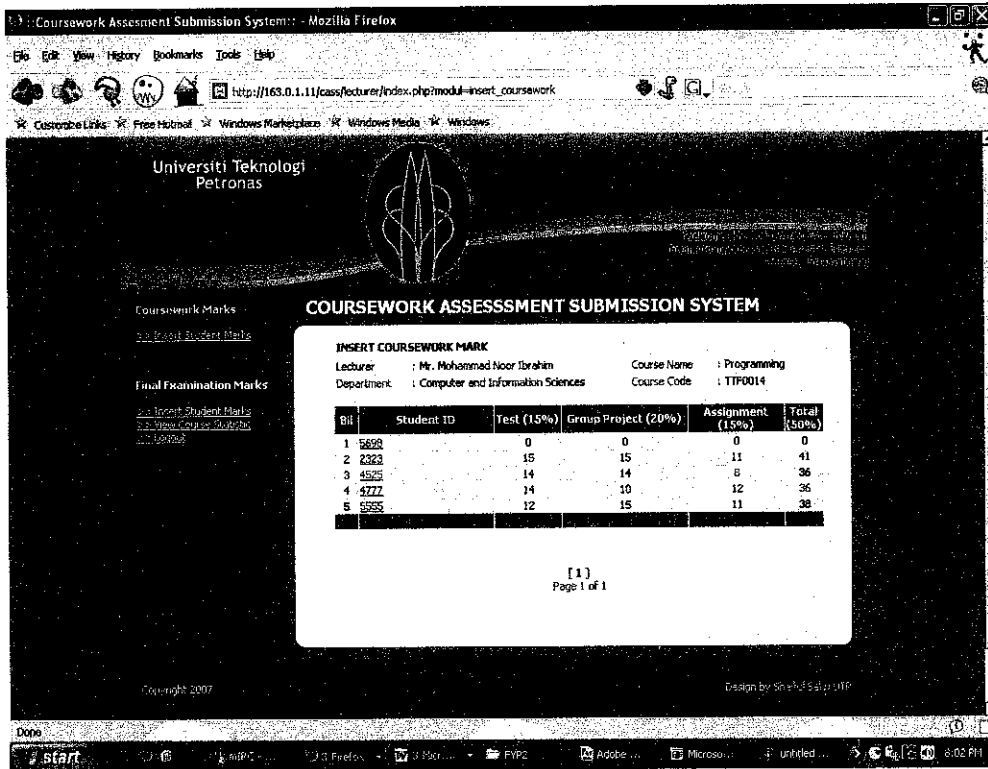


Figure 1-2-2: Coursework Mark web based Form

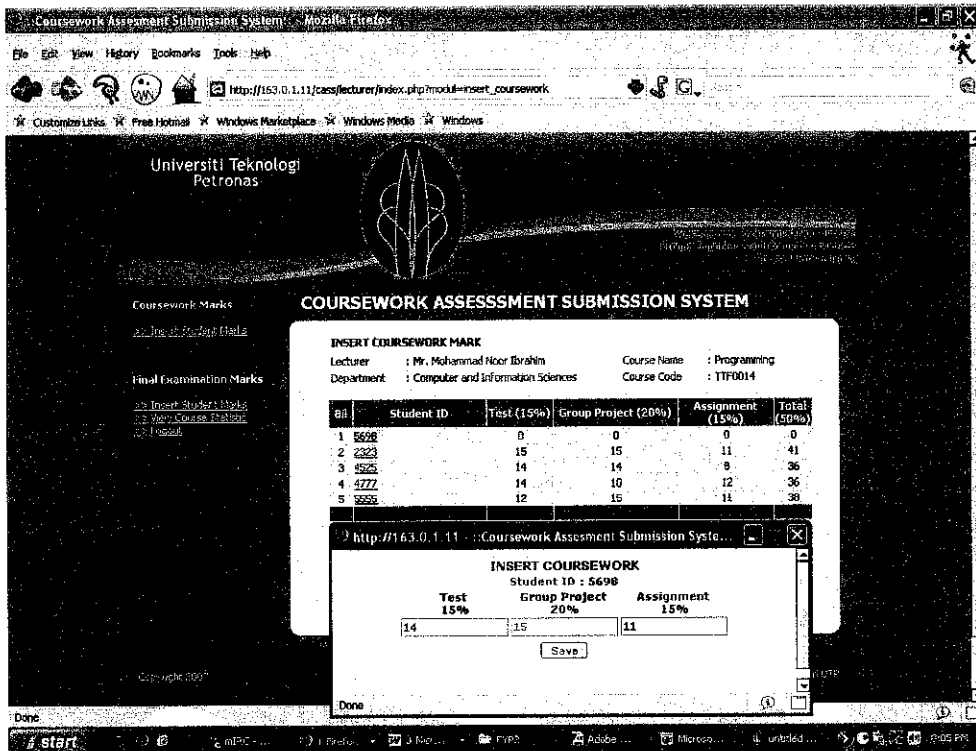


Figure 1-2-3: Insert Students' Coursework Marks

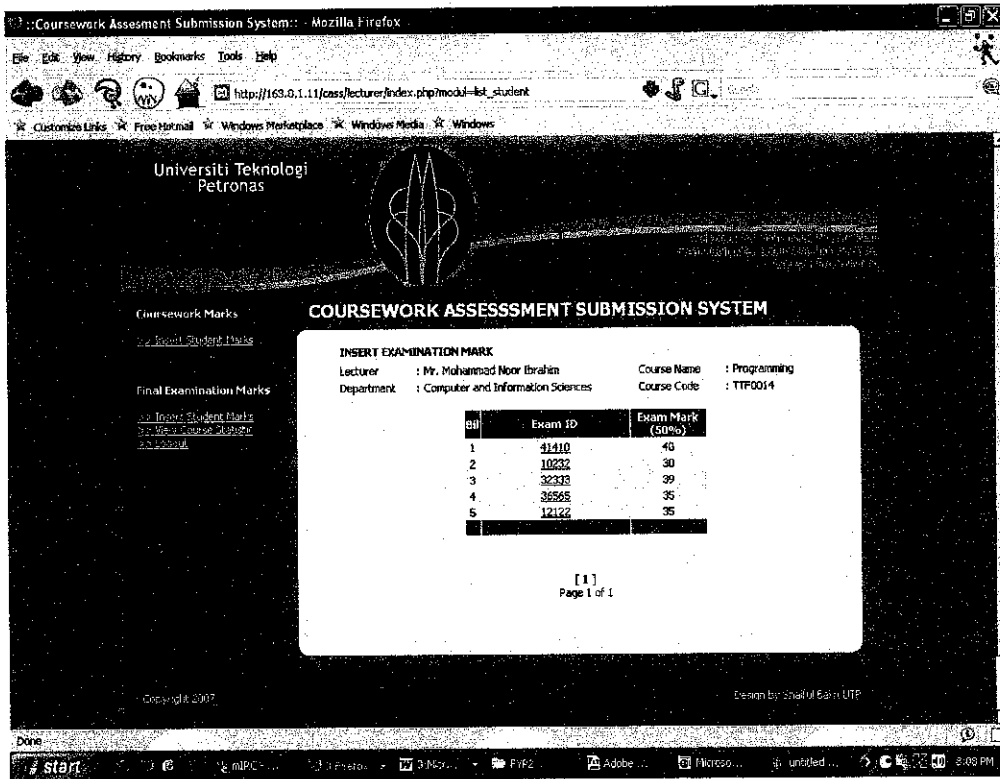


Figure 1-2-4: Final Examination Mark web based Form

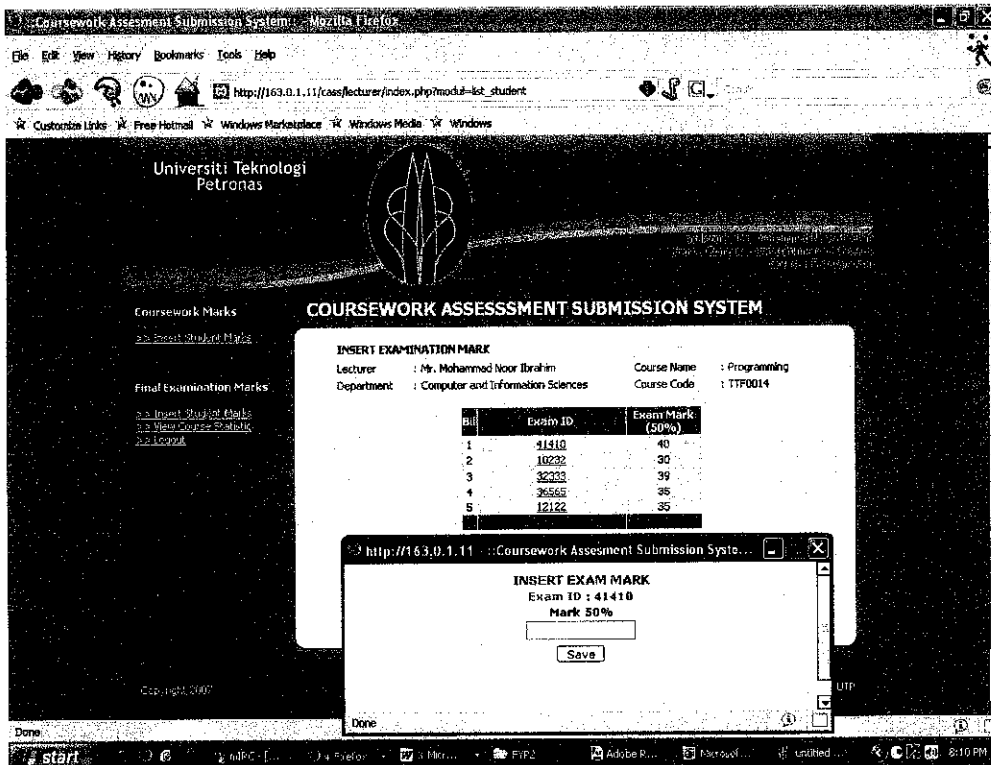


Figure 1-2-5: Insert Students' Final Examination Marks

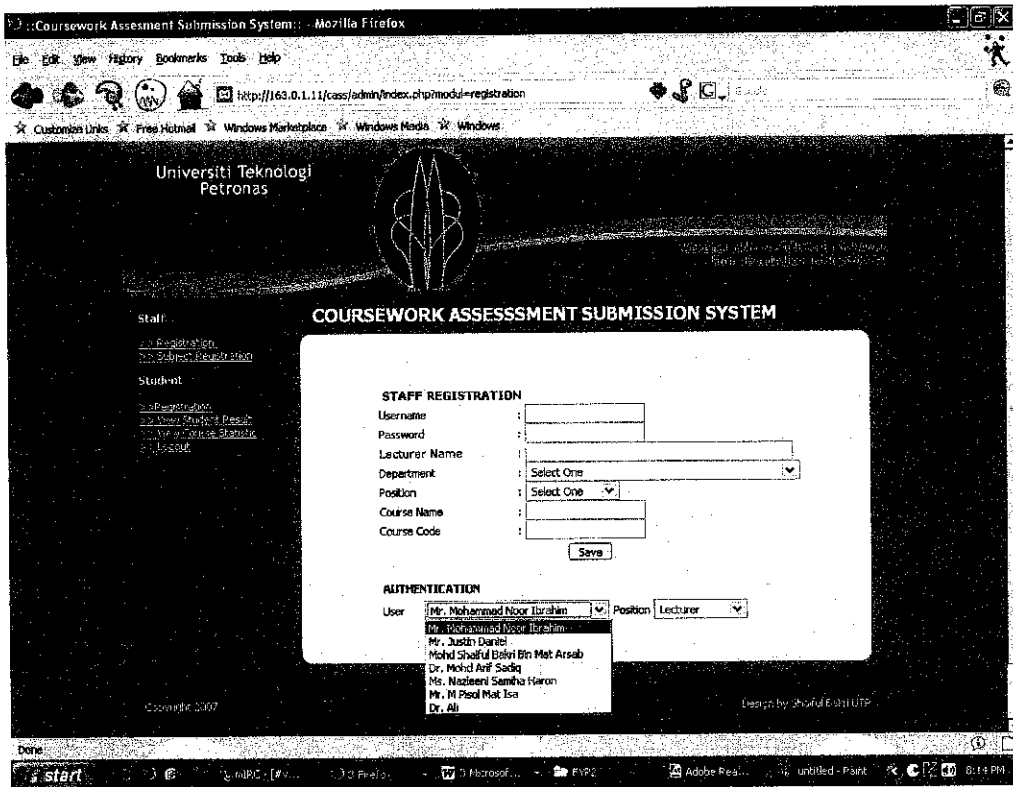


Figure 1-2-6: Lecturers' Registration and Authentication Function

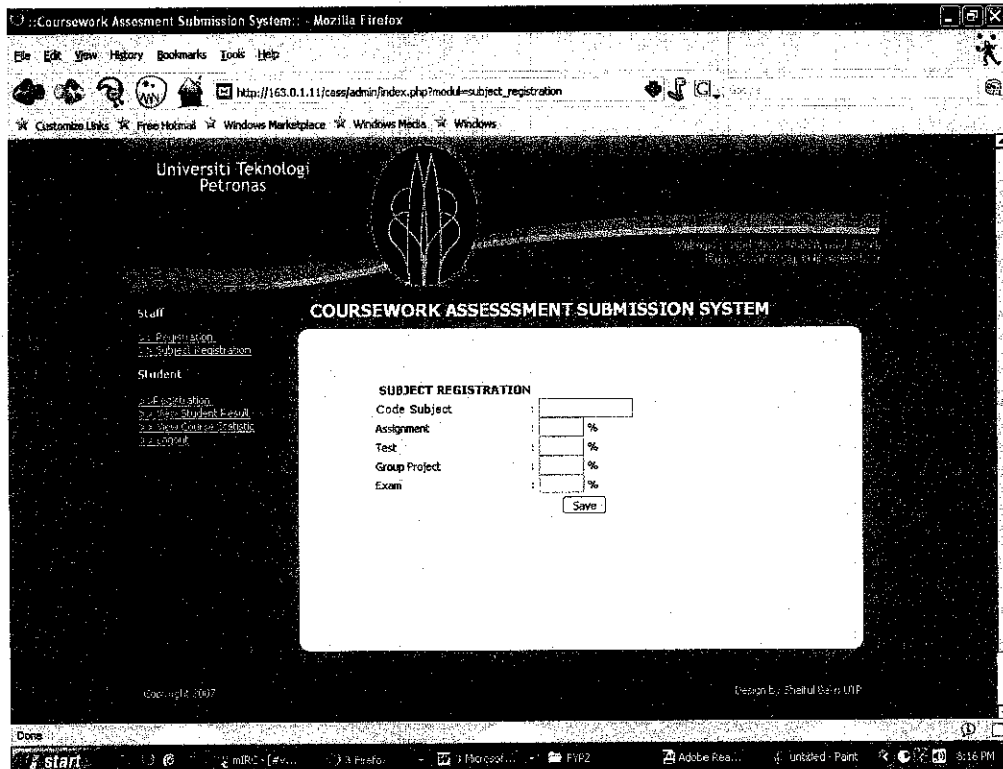


Figure 1-2-7: Course / Subject Registration

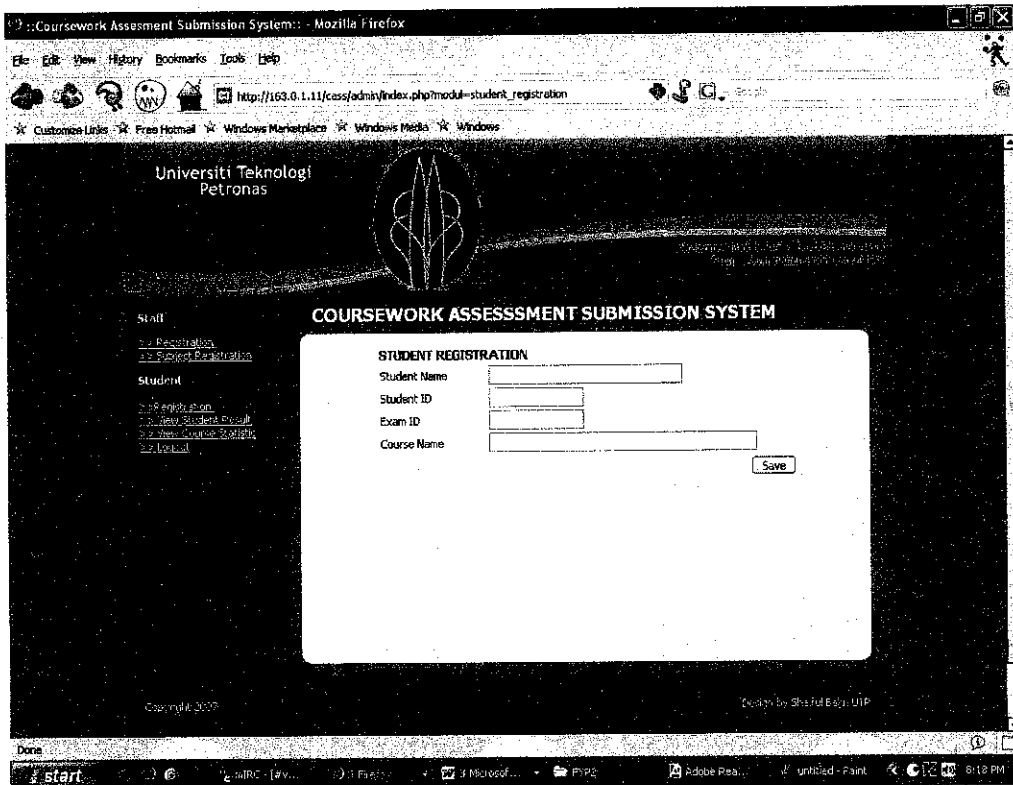


Figure 1-2-8: Students' Registration

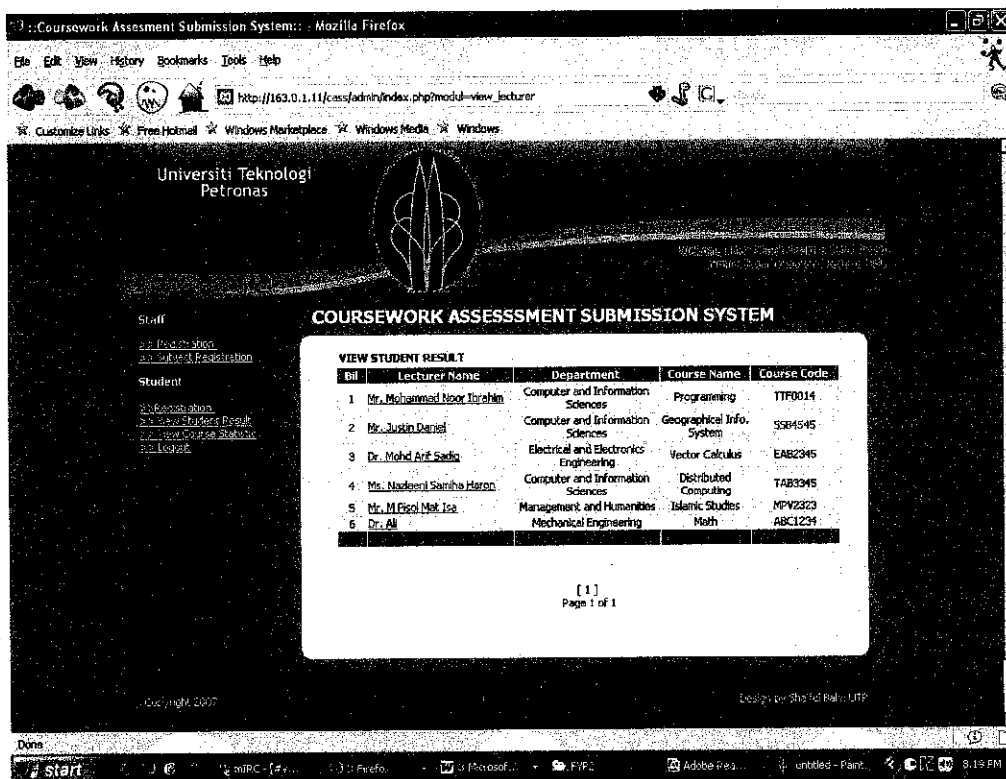


Figure 1-2-9: List of Lecturers' Name and Courses' Name

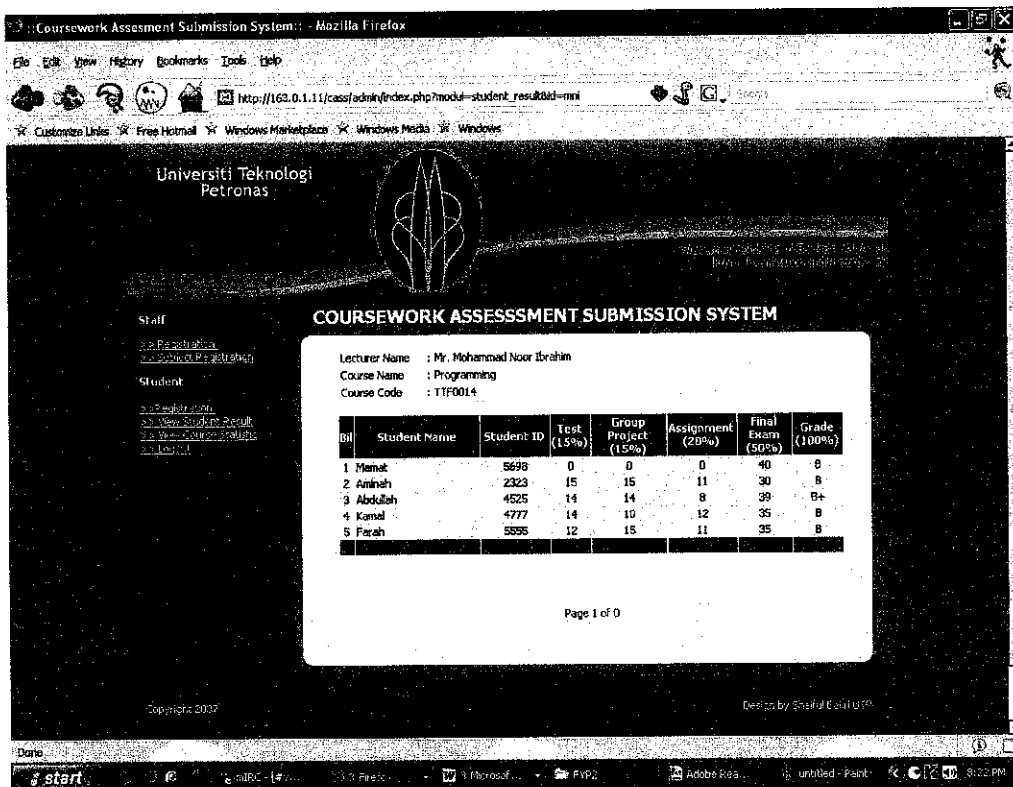


Figure 1-2-10: View Students' Result

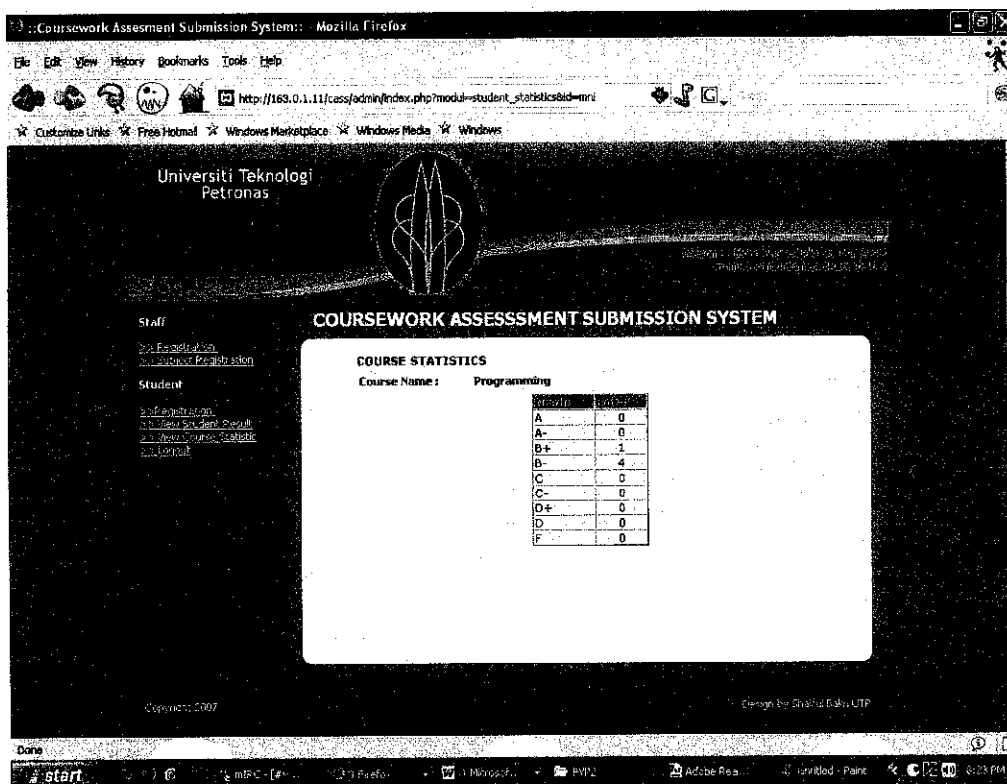
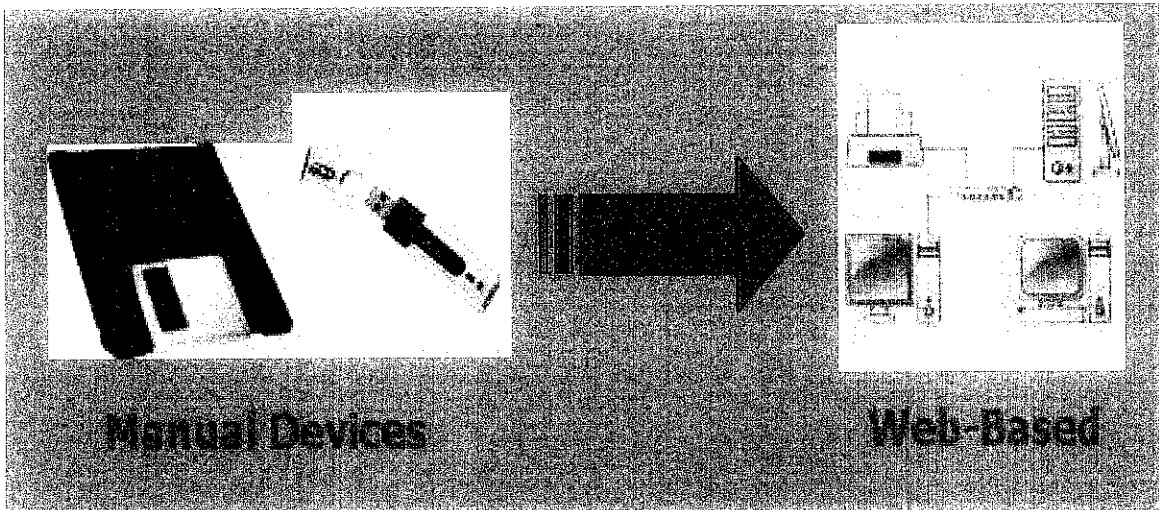


Figure 1-2-11: View Course Statistic

Appendix 1-3

- Idea of Technology Conversion



Appendix 1-4

- Selected Programming Codes

Index.php

```
<?
//session_name('YourUserInfo');
session_start();

$username = $_SESSION['username'];
if($username=="") {
Header("Location: ../index.php");
} else {
include("../includes/config.php");
$sql = "SELECT * FROM staff WHERE username='".$username'";
$result = mysql_query($sql);
$rows = mysql_fetch_array($result);
ob_start();
?>
<html>
<head>
<title>::Coursework Assessment Submission System::</title>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
<script language="JavaScript" type="text/JavaScript">
<!--

function MM_preloadImages() { //v3.0
var d=document; if(d.images){ if(!d.MM_p) d.MM_p=new Array();
var i,j=d.MM_p.length,a=MM_preloadImages.arguments; for(i=0; i<a.length; i++)
if (a[i].indexOf("#")!=0){ d.MM_p[j]=new Image; d.MM_p[j++].src=a[i];}}
}
//-->
</script>

<style type="text/css">
<!--
body, td, input, select {
font-size: 11px;
font-family: Tahoma;
}

h1 {
font-size: 18px;
font-family: Tahoma;
color:#FFFFFF;
font-weight:bold;
padding:0px;
margin:0px;
}

.white{
color:#FFFFFF;
}

-->
</style>
</head>
<body style="margin:0px; background-color:#4F9FFF ">
<table width="775" height="100%" border="0" cellpadding="0" cellspacing="0" align="center">
<tr>
<td height="154" colspan="2"><table width="775" border=0 cellpadding=0 cellspacing=0>
<tr>
<td width="227" rowspan="2" valign="top" background="images/topcurve1.gif"> </td>
<td width="163" rowspan=2></td>
<td width="385" height="77" align="right" valign="top" background="images/topbg.gif">&nbsp;</td>
</tr>
<tr>
</tr>
</tr>
</table>
</td>
</tr>
</table>
```

```

        <td width="385" height="77" background="images/topcurve2.gif"><div align="right">Welcome : <? echo Srows
['name'];?><br>
        From : <? echo Srows ['department'];?><br>
        </div></td>
    </tr>
</table></td>
</tr>
<tr>
<td width="171" align="center" valign="top" background="images/sidebg.gif"><br> <table width="140" border="0"
cellspacing="0" cellpadding="0">
    <tr>
        <td class="white"><p><strong>Staff</strong></p>
        <p><a href="index.php?modul=registration" class="white">&gt;&gt; Registration </a><br><a
href="index.php?modul=subject_registration" class="white">&gt;&gt; Subject Registration </a>
        </p>
        <p><strong>Student</strong><br>
        <br>
        <a href="index.php?modul=student_registration" class="white">&gt;&gt;Registration </a><br>
        <a href="index.php?modul=view_lecturer" class="white">&gt;&gt; View Student Result</a><br>
        <a href="index.php?modul=view_statistics" class="white">&gt;&gt; View Course Statistic</a><br>
        <a href="logout.php" class="white">&gt;&gt; Logout</a> </p></td>
    </tr>
</table>
<p>&nbsp;</p></td>
<td width="604" valign="top" bgcolor="#4F9FFF"><table height="100%" border=0 cellpadding=0 cellspacing=0>
    <tr>
        <td width="775" height="36" style="padding-left:22px;"><h1>COURSEWORK ASSESSMENT SUBMISSION
SYSTEM </h1></td>
    </tr>
    <tr>
        <td height="13"></td>
    </tr>
    <tr>
        <td><table width="585" height="100%" border="0" cellpadding="0" cellspacing="0">
            <tr>
                <td width="9"></td>
                <td valign="top" bgcolor="#FFFFFF" style="padding-left:8px;"><?
                //Selamat datang and jkkk?modul=statistik
                if($_GET[modul]=="view_lecturer"){
                    include("view_lecturer.php");
                }
                elseif($_GET[modul]=="utama"){
                    include("utama.php");
                }
                elseif($_GET[modul]=="subject_registration"){
                    include("subject_registration.php");
                }
                elseif($_GET[modul]=="registration"){
                    include("lecturer_registration.php");
                }
                elseif($_GET[modul]=="add_finalexam"){
                    include("insert_finalexam1.php");
                }
                elseif($_GET[modul]=="student_result"){
                    include("student_result.php");
                }
                elseif($_GET[modul]=="student_registration"){
                    include("student_registration.php");
                }
                elseif($_GET[modul]=="view_statistics"){
                    include("view_statistics.php");
                }
                elseif($_GET[modul]=="student_statistics"){
                    include("graf_result_student.php");
                }
            }
        }></td>
    </tr>
</table> </td>
</tr>

```

Subject registration.php

```
<?
    //$username = $_SESSION['username'];
    include("../includes/config.php");

    //$sql = "SELECT * FROM lecturer WHERE username='$username'";
    //$result = mysql_query($sql);
    //$rows = mysql_fetch_array($result);
    ob_start(); ?>
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
<link href="../forAll.css" rel="stylesheet" type="text/css">
<title>Untitled Document</title>
</head>

<body>
<BR><BR><BR>
<form method="POST">
<table width="75%" border="0" align="center">
  <tr>
    <td class="forTexts"><strong>SUBJECT REGISTRATION</strong></td>
  </tr>
</table>
<table width="75%" border="0" align="center" cellpadding="0" cellspacing="0">
  <tr class="forTexts">
    <td width="37%" class="forTexts">Code Subject </td>
    <td width="2%"></td>
    <td width="61%"><input name="subject_code" type="text" size="15"></td>
  </tr>
  <tr class="forTexts">
    <td>Assignment</td>
    <td></td>
    <td><input name="assignment" type="text" size="5">
    % </td>
  </tr>
  <tr class="forTexts">
    <td>Test</td>
    <td></td>
    <td><input name="test" type="text" size="5">
    % </td>
  </tr>
  <tr class="forTexts">
    <td>Group Project </td>
    <td></td>
    <td><input name="gproject" type="text" size="5">
    % </td>
  </tr>
  <tr class="forTexts">
    <td>Exam </td>
    <td></td>
    <td><input name="exam" type="text" size="5">
    % </td>
  </tr>
</table>
<table width="70%" border="0" align="center">
  <tr>
    <td><div align="center">
      <input type="submit" name="Submit" value="Save">
    </div></td>
  </tr>
</table>
</form>
</body>
</html>
<?
if($_POST[Submit] == "Save")
```


Insert coursework.php

```
<?
    $username = $_SESSION['username'];
    include("../includes/config.php");

    $sql = "SELECT * FROM lecturer WHERE username='$username'";
    $result = mysql_query($sql);
    $rows = mysql_fetch_array($result);
    ob_start(); ?>
    <?
    if($_POST[submit2])
        {
            foreach($_POST[delete] as $key)
            {
                $query= "DELETE FROM student WHERE student_id='$key'";
                if(!mysql_query($query))
                {
                    echo mysql_error(); exit();
                }
            }
        }
    ?>
<?php

$filename = "index.php?modul=insert_coursework";
$option = array (5, 10, 25, 50, 100, 200);
$default = 20;
$action = $_SERVER['PHP_SELF'];
$num=1;

$opt_cnt = count ($option);

$go = $_GET['go'];
if ($go == "") {
    $go = $default;
}
elseif (!in_array ($go, $option)) {
    $go = $default;
}
elseif (!is_numeric ($go)) {
    $go = $default;
}
$no1 = $go;
$limit = "0, $no1";
$count = 1;

$off_sql = mysql_query ("SELECT student_name,student_id,coursework,cw_grade FROM student WHERE lect_id = '$username'")
or die ("Error in query: $off_sql".mysql_error());
$off_pag = ceil (mysql_num_rows($off_sql) / $no1);

$off = $_GET['offset'];
if (get_magic_quotes_gpc() == 0) {
    $off = addslashes ($off);
}
if (!is_numeric ($off)) {
    $off = 1;
}
if ($off > $off_pag) {
    $off = 1;
}

if ($off == "1") {
    $limit = "0, $no1";
}
elseif ($off <> "") {
    for ($num = 0; $num <= ($off - 1) * $no1; $num ++) {
```

```

$e = 0 + $num;
$limit = "$e, $nol";
$count = $e + 1;
}
} ?>
<table width="90%" border="0" align="center">
<tr>
<td width="16%" class="forTexts">Lecturer</td>
<td></td>
<td width="45%"><?php echo $rows['nama'];?><input type="hidden" name="lect_id" value="<?php echo
$rows['id_lecturer'];?>"></td>
<td width="18%">Course Name </td>
<td></td>
<td width="21%"><?php echo $rows['course_name'];?></td>
</tr>
<tr>
<td>Department</td>
<td></td>
<td><?php echo $rows['department'];?></td>
<td>Course Code </td>
<td></td>
<td><?php echo $rows['course_code'];?></td>
</tr>
</table>
<form name="checkbox" method="post" action="index.php?modul=insert_coursework" onSubmit="return validate();">
<table width="60%" border="0" cellspacing="0" align="center">
<tr bgcolor="#FFFFFF">
<td class="forTexts"><div align="center"><font size="2"><b>STUDENT INFORMATION </b></font></div></td>
</tr>
</table>
<table width="90%" border="0" cellspacing="1" align="center">
<tr align="center" class="forTexts">
<td width="22%"><div align="center"><strong>Student Name </strong></div></td>
<td width="13%"><div align="center"><strong>Student ID </strong></div></td>
<td width="14%"><div align="center"><strong>Mark (50%) </strong></div></td>
<td width="6%"><div align="center"><strong>Grade</strong></div></td>
</tr>
<tr align="center" class="forTexts">
<td class="forTexts"><input name="student_name" type="text" class="forTexts" size="35"> </td>
<td align="center" class="forTexts"><input name="student_id" class="forTexts" type="text" size="15" maxlength="12"
align="middle"></td>
<td class="forTexts"><input name="mark" type="text" class="forTexts" size="16" maxlength="6"></td>
<td class="forTexts"><input name="grade" type="text" class="forTexts" size="8" maxlength="2"></td>
</tr>
</table>
<table width="90%" border="0" align="center">
<tr>
<td align="right"><input type="hidden" name="lect_id" value="<?php echo $rows['username'];?>">
<input type="submit" name="submit" class="forButton" value="Save" onClick="return validateform ()"></td>
</tr>
</table>
<br>
<?
if($_POST[submit]=="Save"){
    $sql = "INSERT INTO student (lect_id,student_name,student_id,coursework,cw_grade)
VALUES
($_POST[lect_id],$_POST[student_name],$_POST[student_id],$_POST[mark],$_POST[grade])";
    $result = mysql_query($sql);
    //header('Location: index.php?modul=profil_permohonan');
}
?>
<table width="90%" border="0" cellspacing="1" align="center" bordercolor="#FFFFFF">
<tr align="center" bgcolor="#318FFF" class="forTexts">
<td width="4%"><div align="center"><font color="#FFFFFF"><b>Bil</b></font></div></td>
<td width="32%"><div align="center"><font color="#FFFFFF"><strong>Student Name </strong></font></div></td>
<td width="21%"><div align="center"><font color="#FFFFFF"><strong>Student ID </strong></font></div></td>

```

