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PETROCHEMICALS PRODUCT INVENTORY SYSTEM

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4332

Project dissertation submitted in partial fulfilment of
the requirement for the
Bachelor of Technology (Hons)
(Business and Information System)

JANUARY 2008

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CERTIFICATION OF APPROVAL

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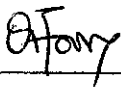
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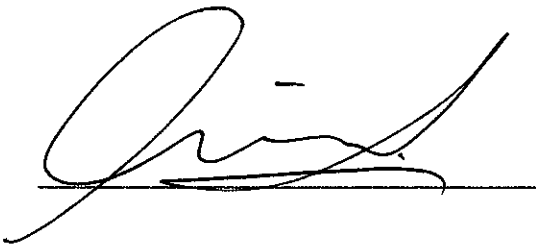


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CERTIFICATION OF ORIGINALITY

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.

A handwritten signature in black ink, appearing to be 'Naguib Mahfuz b. Ismail @ Ab Aziz', written over a horizontal line.

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ABSTRACT

The current implementation of traditional reporting is limited by the physical constraints of both time and space. Besides that, other concerns such as inadequate equipment and safety hazard of database handling are also deterring the effectiveness of the reporting process. An online reporting is aimed to provide an alternative approach in implementing automate database data into forecasting where staff can participate interactively and experience interactive online database system. Besides that, this project will also lift the limitations faced by the traditional compiling database work. The targeted user for this project ranges from staffs up to superintendents and managers. The reporting contents were constructed based on basic and simple online reporting that will provide users with the understanding of the database compilation. Meanwhile, the development of the online reporting system is using Microsoft Excel, Manage Engine OpUtils and the World Wide Web technology as the platform. Usability aspect of the system is also given priority in order to develop a user-friendly environment. RAD development methodology was followed in the development of the whole system that ensures effective design process takes place by giving users what they need. By integrating proven methodologies, interactive multimedia application and web technology, the online reporting provides a whole new level of reporting.

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ABBREVIATIONS

PDB	<u>Petronas</u> Dagangan Berhad
SDD	Supply and Distribution Division
LPD	Logistic and Planning Department
CAPEX	Capital Expenditure
OPEX	Operating Expenditure
OSS	Open Source Software

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Reporting is an important element in any kinds of organizations in the world. A good and efficient management of reporting will determine the success of the company. Example of reporting is monthly performance report. One of the elements in reporting is accounting. Now we look at the definition of budget. Budget is the translation of Strategies into Quantifiable Targets and Financial Terms. Back to 70ties and 80ties most of the transactions and documentations done manually. There was no computerizing system to assist users in preparing their budget. The manual system was not very efficient and safe. Data tend is inaccurate due to human parallax and leak of data security. Beside that, there is also issue on time where old manual system requires more time.

In business, time is just like money, every second is equal to thousand of Ringgits. The more time saving we made, the more money we get. With all the above issues highlighted, it shows that we really need a good system in order to have a competitive advantage over the competitors.

Budget, in general has two main categories. One is Operating Expenditure (OPEX) and the other one is Capital Expenditure (CAPEX). This project is focus on reporting that much explains in OPEX. It could be explained as expenditures incurred for projects or purchase of fixed assets or capital in a company. The expenditures of the projects capitalized and formed fixed assets of the company at the end of project completion. All of which are necessary to facilitate, maintain or increase company-earning capacity.

Examples of OPEX and CAPEX are:

- a) Equity Investment (not acquire for trading but rather for long-term strategic reasons) in other companies.
- b) Engineering Projects
- c) Acquisition of Fixed Assets and Intangible Assets
- d) Upgrading or improvement on existing Fixed Assets

From the examples, we can see that, OPEX, as a whole is huge and consist of a mass of data and it is scattered everywhere if we do not capture it and manage it well. Thus, such the management of the data is needed so that, once the data has been processed, it will became an information.

As a whole, when we have that information, we can apply it into many aspects so does the management side, or the financial planning side. After the information is processed, it becomes more detail, depth and valuable, called knowledge that can be share amongst organization and to outsiders.

PETRONAS Dagangan Berhad (PDB) is a domestic marketing arm company that support PETRONAS. They contribute about 70% of company profit domestically. Supply & Distribution Division is a division in PDB that support operations in PDB. They support a few Departments in PDB such as Retail Business Department (RBD), Lube Business

Department (LBD), Commercial Business Department (CBD) and Logistic Planning Department (LPD). Currently we are using manual system to prepare and keep the monthly performance report from every depot (PETRONAS operations workplace).

Generally, the current manual system is consists of two elements. These elements are monthly reports of Performance Report and Expenses Analysis. Monthly reports for these two elements must be submitted to our management monthly to ensure the system is working properly in order to prevent the problems that can disrupt depot system at all over Malaysia that contains PETRONAS operation, to monitor all incidents and events occur on that month and to allocate every depot superintendent with proper system in order to ease their reporting tasks.

The monthly report of depot system is about the status of all operation involved in monitoring and supporting the depot system such as the basic information, storage, manpower, general facilities, throughput, bunkering availability, and all these information can be add, edit, update, view, delete and print all those data and information. All these systems must always be in good condition because each of them serves important functionalities of the depot system.

About operations, monthly reports also must be submitted monthly on behalf of LPD to gather information regarding operation occur at every depot. This information will help LPD to monitor the situation at depots monthly to ensure the environment, people, assets and products in all depots are safe and protected. In the report, it will be recorded in term of case quantity, date and time, and some other calculation to calculate the total and other things. As we know, depots are the place that involves too many activities of the people inside them. The records of the report will include the quantity of the products, time, and superintendents' detail, level of HSE and also remark notes of annual leave, sick leave, *cuti ehsan* and the total of every leave made by all of the workers at every depot.

1.2 PROBLEM STATEMENT

As depicted in FIGURE 1 below, reporting is consists of several processes which are reporting preparation and reporting utilization. All these processes starting from report submission from users until project completion are done manually using the spreadsheet and send through emails.

Problems with the manual system are:

- 1) Need longer time in order to do the compilation since using spreadsheets, manual filing, and emails application. Compilation is from scratch where the budget coordinator has to print all the submission and start doing the compilation.
- 2) User tends to submit late even though when the date is due. Sometimes, there are depots that submit their Performance Report even 2-3 weeks late from the due date. What had become the major problems are there is no single rule about the submission of Performance Report by depot. It is hard to do compilation for the total SDD summary when not every depot submits their performance report on time. With the new system, webmaster can use restriction so that user cannot submit their Performance Report after the due date. What will happen if their monthly report did not processed by SDD is their requested budget would not be processed by the headquarters.
- 3) It is a tedious job to keep track the 37 depots whether their proposal has submitted or not. Currently they are using emails and phone calls. It's not only about the submission of the Performance Report, it will also relate with the problems that occur at each depot. With the manual system, human is prone to errors and mistakes to compile the spreadsheets from 37 locations across the region plus the problems that had occurs at each of the depots. Thus, SDD summary will become incomplete and inaccurate results.

- 4) Managers have a very big responsibility in order to make decisions for the company. In order for them to challenge with other competitors, they have to ensure all decision made are relevant and are the best. One of the most important things for managers to know is about the future of the company. Thus, managers have to make all the analyzing in order to determine what actions to be taken for the company.

After the assessment at PDB, I had concluded two major problem and weaknesses of the current system which are;

- Management faced difficulties in monitoring and updating the reports

At the meantime, the reports of the current month will be submitted to only one of the SDD staff monthly. However, with her hectic schedule, the report is not at ease to be checked on the day of submission. At the same time, she also faced difficulties in monitoring the reports such as the calculation has been solved or not through the traditional filing system.

- The recording and storing procedures are inefficient

The current recording system is using Excel whereby each data must be recorded and updated manually. The manual submitted reports are received by Marina, the only staff that manages the Performance Report and she has to update it to the system using Microsoft Excel. These reports are only kept in her computer with no other softcopy backup files. The hard copies of the monthly reports are placed in the Elba file for future references which has a very big risk if the file are corrupted during chaos or maybe the file can be missing. Due to this, the recording procedure is inefficient.

- Managers need longer time in order to decide action plan for the company in the future.

Although with the online reporting system, still it takes long time for the company in the decision making part. With the manual system, it is hard for managers to make a prediction plan for the company. They need to know exactly about all data that they received from all depots precisely. They need longer time before they can get summary of all performance reports. Thus, they themselves need to study all the summarize reports in order for them to predict or forecast action plan for the company.

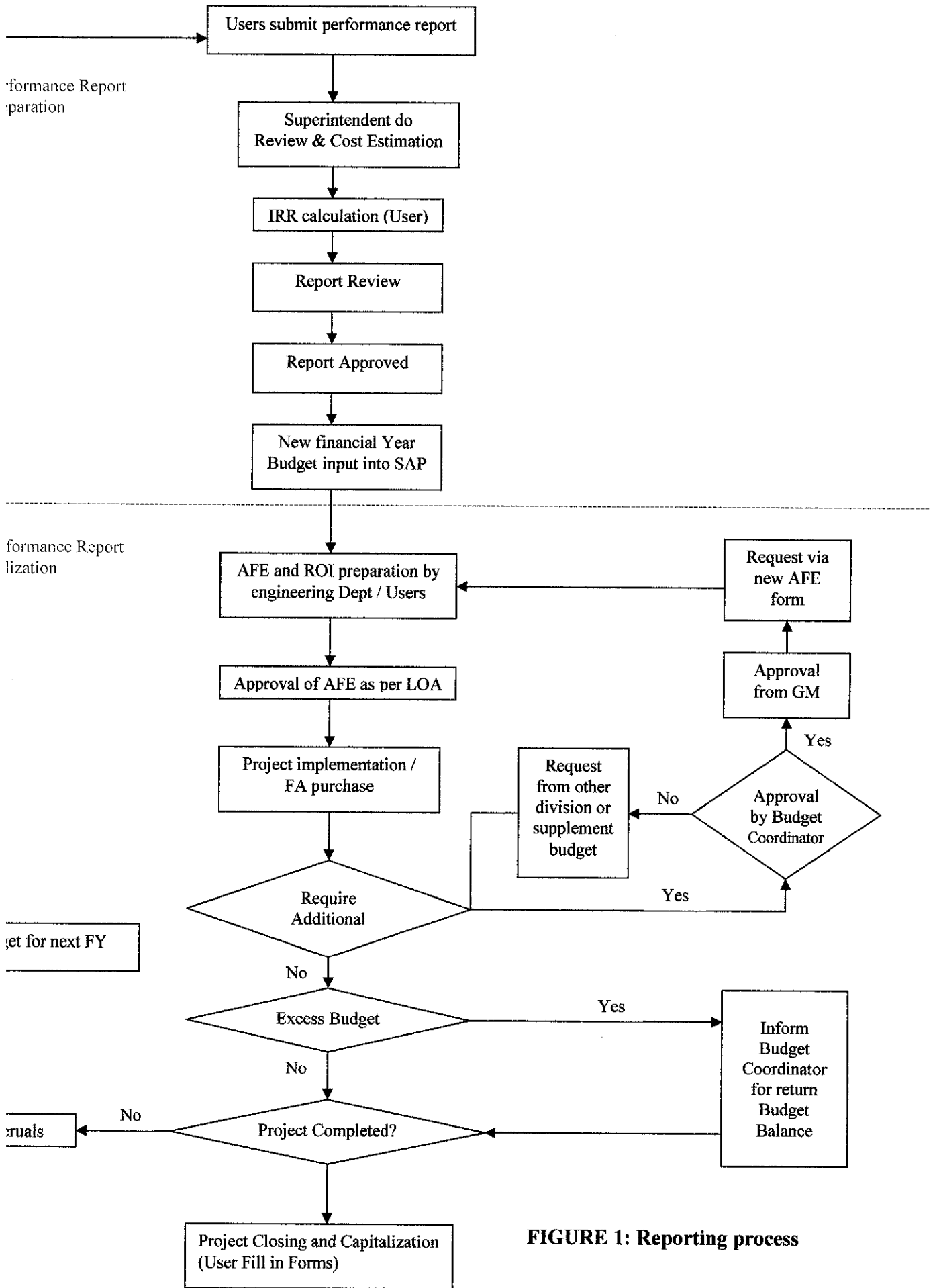


FIGURE 1: Reporting process

1.3 OBJECTIVES AND SCOPE OF STUDY

1.3.1 Objectives

- 1) To develop a new reporting tool system (an automate system), that can analyze the reporting data into summary called the Forecasting System for Supply & Distribution Division (SDD) at PETRONAS Dagangan Berhad (PDB).

- 2) To help managers doing a forecast system that can verify what action to be taken from consequences of the summary generated.

1.3.2 Scope of Study

System Wise:

- Collecting data from various location - 37 depots which comes from different installation and regions.
- Consolidating the input and generating informative output – flexible in producing summary compiled and generated automatically from user input.
- Reliable access control for better security - only user with username and password can access the system for authorization and it is base on levels whether the user is a manager, editor, and viewer.

Webmaster mode:

- Add new user by assigning username and password for them or delete existing user. User who is the responsible superintendent at each depot, to the viewer who is the managers at each region, and to other authorized webmaster. This is when the user has an access control according to their levels of authority.
- Submission Control - freeze user submissions that exceed the due date. Only the webmaster who can unfreeze the submission on a certain reasons that agreed by both parties (user and budget coordinator).
- Approval Management - budget coordinator is the one who is going to approved or reject the performance report. In this part the revised value of the budget is allocate by the webmaster. At each user's page, the status shows at the top most right of the page.
- View SDD summary for the current year and for the past previous years.
- They also can view individual depot summary details.
- Help menu for the webmaster to perform their particular task.

User mode:

- Submit performance report at the end of each month.
- View the summary based on the submitted values.
- Edit or change existing data for any changes or updates. At a certain date, they are not able to edit or add due to submission control.
- Help menu to assist new user on how to use the system.

CHAPTER 2

LITERATURE REVIEW AND THEORY

2.1 WHY INTERNET-BASED SOFTWARE IS THE FUTURE OF CORPORATE COMPUTING

Traditional desktop based software running or using your resources of your computer where it will used up all the space on your hard disk, the memory, the processor power etc. Your computer is a world unto itself. Not only that, the used of individual computer needs to do maintenance, upgrade, installations or even troubleshooting. We are not only talking about individual computers, but imagine a company that has many staff and many computers for each and everyone. Department of MIS then will have a headache when it comes to maintenance of the individual computers. In this case, organization has to purchase one copy of the software for every computer and include the upgrade of the operating system, of a new version of the software installed.

When we used the internet-based application, the program is access as a website. Normally, such application has the ability to connect with the database such as Microsoft Access, Oracle, Ms SQL server etc. The platform is the web browser itself. Each data is stored into the database and it is receive using the web browser, according to the user needs. The different between the traditional forms is the data centralized using the power of the technology. The database is stored at the remote location, the server instead of your individual computer, the local hard drive. You only require the web browser to view.

Internet-based application lowers the hard cost, long term cost, platform independence, location independence and up-to-date information and the information on the server can be protected.

2.2 FORECASTING / PREDICTION AS A COMPUTER-BASED SYSTEM THAT SUPPORT DECISION MAKING ACTIVITIES

Forecasting is the process of estimation in unknown situations. Prediction is a similar, but more general term, and usually refers to estimation of time series, cross-sectional or longitudinal data. In more recent years, forecasting has evolved into the practice of Demand Planning in every day business forecasting. The discipline of demand planning, also sometimes referred to as supply chain forecasting, embraces both statistical forecasting and consensus process. Large corporations invest heavily in this kind of activity to help focus attention on possible events, risks and business opportunities.

Through out of the years, researchers and technologists have built and investigated about the forecasting techniques. One term of them actually used to predict activities that support technological and managerial decision making by assisting in the organization of knowledge is Decision Support Systems (DSS). It has been used for approximately 40 years. Computerized decision support systems became practical with the development of minicomputers, timeshare operating systems and distributed computing.

In a technology field as diverse as DSS, chronicling history is neither neat nor linear. As technology evolved, new computerized decision support applications were developed and studied. Researchers used multiple frameworks to help build and understand these systems. Today, one can organize the history of DSS into the five broad DSS categories including communications-driven, data-driven, document driven, knowledge-driven and model-driven decision support systems. Managers are ultimately responsible for all decisions. They depend on the use of computerized systems and tools to survive the competitive business world. Decisions need to be made in real-time and targeted. The management-process made by them in organization to achieve their goals is using the resources that they have in their own organization.

The degree of success or productivity of the organizations is measured by those goals and resources within their organization. Managers acquired talent for decision making are accounted by their years of experience, intuition and creativity. The highly competitive commercial environment, has forced managers to consider computerized systems in the

decision-making. This is a starting point in explaining the origins of the various technology threads that are converging to provide integrated support for managers whether to work alone, in teams or in organization hierarchies to manage organizations and make more rational decisions. History is both a guide to future activity in this field and a record of the ideas and actions of those who have helped advance our thinking and practice. Historical facts can be sorted out and better understood, but more information gathering is necessary.

The study of DSS traces decision support applications and research studies related to model and data-oriented systems, management expert systems, multidimensional data analysis, query and reporting tools, online analytical processing (OLAP), Business Intelligence, group DSS, conferencing and groupware, document management, spatial DSS and Executive Information Systems as the technologies emerge, converge and diverge. All of these technologies have been used to support decision making. It is an applied discipline that uses knowledge and especially theory from other disciplines. For this reason, many DSS research questions have been examined because they were of concern to people who were building and using specific DSS. Hence, much of the broad DSS knowledge base provides generalizations and directions for building more effective DSS.

The reasons why do we need to computerize DSS were to speed up computations technologies. Technologies implemented would rather some how will improve communication other than increased the productivity. For the technical support part, it would give a good quality of maintaining and delivering supports to customers. Besides, the computerized DSS would enhance the data warehouse access. With this, the quality of the support would be never gone down under expectations. Computerized DSS also can overcome cognitive limits in processing and storage. Cognitive limits indicate an individual's problem-solving capability is limited when a wide range of diverse information and knowledge is required. Computerized systems enable people to quickly access vast amounts of information and improve group communication and coordination required to arrive at a decision. People may sometimes difficult to recall and use information.

Companies work in an unstable, rapidly changing economy. Difficulties appear in tracking numerous business operations. This situation had increased up the competition among organizations. Information systems department nowadays are too busy and cannot respond to management inquiries. These are the solid reasoning of why managers should have use DSS. Special analysis of profitability and efficiency is needed as well as the time information of every single task. New generation of managers had evolved. They are now comfortable with computing, high level of computer and Web literacy. Knowing that the technology could help them make intelligent business decision faster, there is no other reason on why they should not use those technologies. During year 1990, the business intelligence technologies industries grow steadily. Tools that used by managers to help them in making intelligent business decision are described as business intelligence and business analytics technologies. These are the utilizing analytical tools and database systems that support data warehouses, data mining, data visualization and online analytical processing.

Group Support Systems (GSS) is one of the business intelligence and analytics technologies. The main function is to improve work of groups with aid of information technologies. GSS is also known as collaborative computing systems, groupware and electronic meeting systems. *Groupsystems* and *Netmeeting* are an example of GSS. Normally, GSS runs over the Web. Applications such as video conferencing and audio conferencing are using GSS. Besides, GSS also implement the electronic brainstorming, voting online and also document sharing.

Enterprise Information System (EIS) also is business intelligence. It evolved from Executive Information Systems, combined with web technologies. The enterprise spans wholly and they have access to enterprise-wide information in many formats. They also have communication capabilities spanning for the entire organization. What is mean by Executive Information Systems is a software application that presents high level information about the performance of the organization to senior executives and managers. There are two specialized EIS such as Enterprise Resource Management (ERM) / Enterprise Resource Planning (ERP) and Supply Chain Management (SCM). ERM / ERP integrate within one organization, repetitive transaction processing systems such as, ordering, producing, packaging, costing, delivery, and billing. On the other hand, SCM

improves task within various segments of the supply chain including manufacturing and also human resource.

Knowledge Management System (KMS) is another business intelligence and analytics technologies. KMS is all about the knowledge accumulated in organization over time that can be used to solve identical or similar problems. Knowledge is organized and stored in a knowledge repository. When a problem has to be solved, the relevant knowledge can be found and extracted. Web technologies provide communication, collaboration, and storage to gathers knowledge before person leaves organization for example, the knowledge hub (intranet and internet enterprise information portal that provides employees uniform access to information including knowledge repositories, project management, collaboration spaces and technology).

Expert Systems on the other hand are also one of the applications in business technology. Experts in a specific field are required when a complex decision or problem are encountered. The more unstructured the problem, the more specialized and expensive the advice is needed. Mimics human-experts' problem-solving abilities explain the expertise that is transferred from the expert to a computer, called Artificial Intelligence (AI). This AI nowadays is widely used and makes lot of moneys out of it. Artificial Neural Networks then explain about the decisions that are based on partial, incomplete or inexact information. Neural networks or artificial neural networks (ANN), uses a pattern-recognition approach to problem-solving. An ANN learns patterns in data presented during training or experiences and can apply what it has learned to new cases. They have also Advanced Intelligent Decision Support Systems. It is a new AI technology that assists decision-makers such as generic algorithm, fuzzy logic and intelligent agents / *softbots*. Genetic algorithm is solving problems in an evolutionary way. It mimics the process of evolution and search for extremely good solution. Fuzzy logic approaches problems the way people do in order to handle imprecise nature of how human communicate information for example, "How *hot* is *hot*?" It uses mathematical way to assist decision-makers in solving problems with imprecise statements. Intelligent agents / *softbots* automate various tasks, increasing productivity and quality. This include Expert System and other intelligent components, they learn and perform humans routine tasks.

Hybrid Support Systems is also in the group of business intelligence and analytics technologies. The function is to have a successful solution of managerial problems where more than one support system is used. The problem-solver can employ several tools such as to use each tool independently to solve different aspects of the problem. It also uses several loosely integrated tools, then transferring the data from one tool to another for further processing. Besides, Hybrid Support Systems in the way use several tightly integrated tools such fuzzy neural networks to do its part in analytics technologies.

In the emerging technologies, the WWW has influenced many aspects of computer use, and therefore of DSS. Interconnectivity is available through the web has brought successful commercial implementation. Hence, the computerized system is needed for managerial decision support. The computerized support for managers is essential for the survival of the organization. Widely, DSS use data, models and possibly the knowledge for the solution of *semistructured* and *unstructured* problems. The business intelligence methods utilize both analytical tools and database systems that include data warehouses, data mining, online analytical processing and data visualization.

2.3 OPEN SOURCE SOFTWARE

History of open software and free software stated that, sharing source code and ideas is fundamental to freedom of speech. It was designed to ensure that the source code would remain openly available to all. It is free because the term was to tell that anyone could modify the software.

Open source software (OSS) is crucial as it can stimulate people's creativity and innovations in developing or making internet application or web based application. IBM believes that, OSS can make use of a worldwide community of developers to improve their product and services. Currently over 67% of web servers, run OSS called Apache.

Apache has provided functions that really help the beginner user to use the OSS in order to develop a very simple online application. Together with apache service is the phpMyAdmin that can integrates the database application with the source code.

CHAPTER 3

METHODOLOGY

3.1 Logical Design

Apart from that, for the logical Design, Use Case Modeling, Entity Relationship Diagram, Sequence Diagram, and Database Relationship diagram needed to define the logical Design of the system.

3.1.1 Use Case Diagram

As depicted in FIGURE 2 each use case represents the actions perform by the actor. All the use case will recite inside the system boundary. In this case, the actor would be the Depot Manager and the normal user who uses the system. The Depot Manager have same functions as the normal user, such as add, edit and delete but they have some specialty and can perform specific functions such as approval management, submission control, add new user, and view summary. They are the one who set the year for the new financial year of performance stuff.

The webmaster is the one who have the authority to edit and view individual summary based on their input. The authorized user with the username and password can access the website. Normally the user would be the respective Superintendent in each depot. Next actor is the forecast planner. They are the one whose going to do technical evaluations based on the user's submission. Their responsibilities is the give brief supporting explanation for the project, itemized and perform cost breakdown, estimate the final cost, final ROI and the estimated duration for the project.

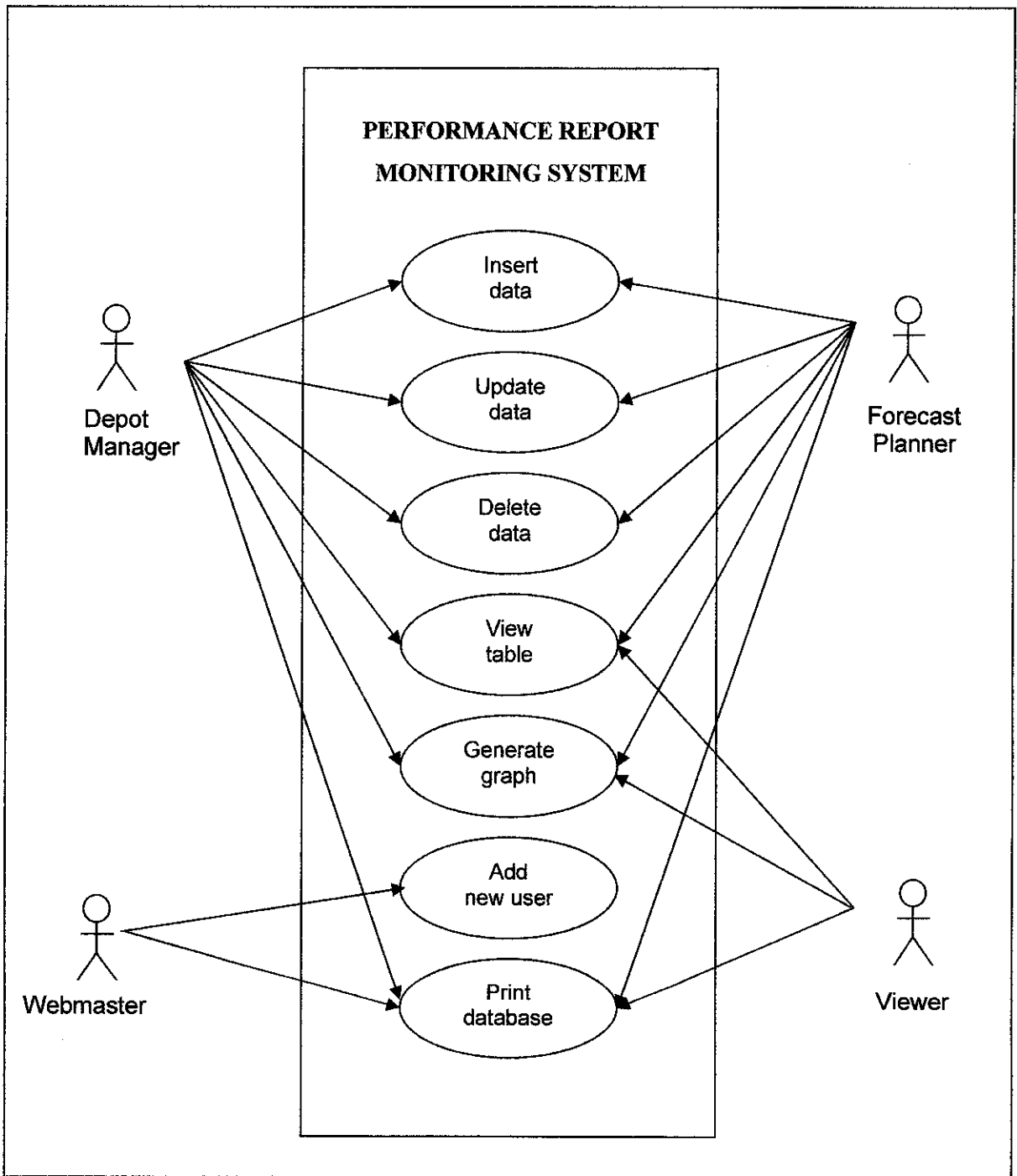


FIGURE 2: USE CASE DIAGRAM

3.1.2 Sequence Diagram

The sequence diagram that shows the sequence of each process based on their relationship amongst entities in SDD Online Monthly Performance Report as shown in FIGURE 3 below. In this diagram shows which actor performs which task. The diagram also shows how the system works in three parts, which are by validating the password; edit the data and confirmation on the updates. The main character involves is the user, the system and database.

The first part is validating the password. The process that took place is that user login into the system by providing the username and password. After that, the system will check on the password whether it is tally with the username. This is when the system connects to the database and does searching by using the repetition and selections operations. After the database checked line by line and found the correct data, the system responds to the user's request, and the user can now enters the system. If there is an exception when the username and password is not tally, then the system will display an error message to alert the user on invalid data.

Same process goes to the manipulation of data. Once user has submitted the proposal, they can display and edit the existing data for any changes or update as needed. The user request to display the data based on some criteria provided by the user, the system will response to the request by searching the database line by line based on the criteria given.

When they satisfied with their submission, they can save the data. A confirmation message will be prompt to the user to reconfirm on the submission. Then we have the complete transaction for the system.

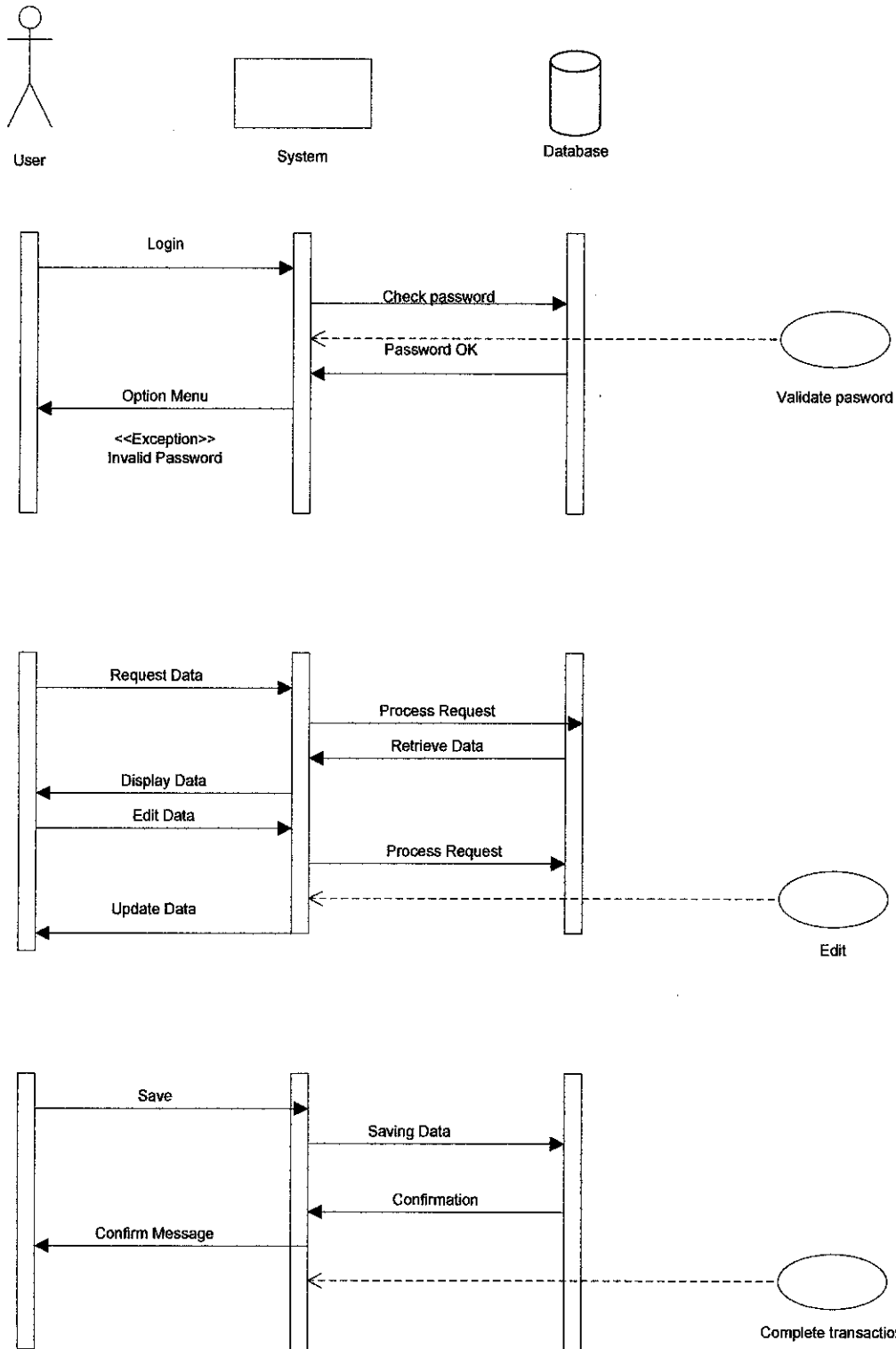


FIGURE 3: SEQUENCE DIAGRAM

3.1.3 Database Relationship Diagram

Lastly, we going to have the Database Relationship Diagram which to show all the tables that related to the Performance Report. FIGURE 4 below, shows the relationship amongst tables including the primary and foreign keys of each table and how they connected to each other.

After making the changes about the project, we have eleven respective tables in the Performance Report database. These include tables such as *basic_information*, *photo*, *product*, *product_type*, *user*, *installation*, *mail*, *region*, *daily_transaction*, *forecast* and *cost_center*.

Basic_information table is for storing all the information of users, which includes the normal user and the webmaster, also the information of depots, regions and products. In this table field such as the user's username and password and what is the user's access to the website (Manager, Editor, and Viewer). Then we have *cost_center*, where the user is located, for example, Pulau Langkawi or the depot (plant), in which *region* (Peninsular, Sabah and Sarawak) and from which installation (Bulk, LPG and Aviation).

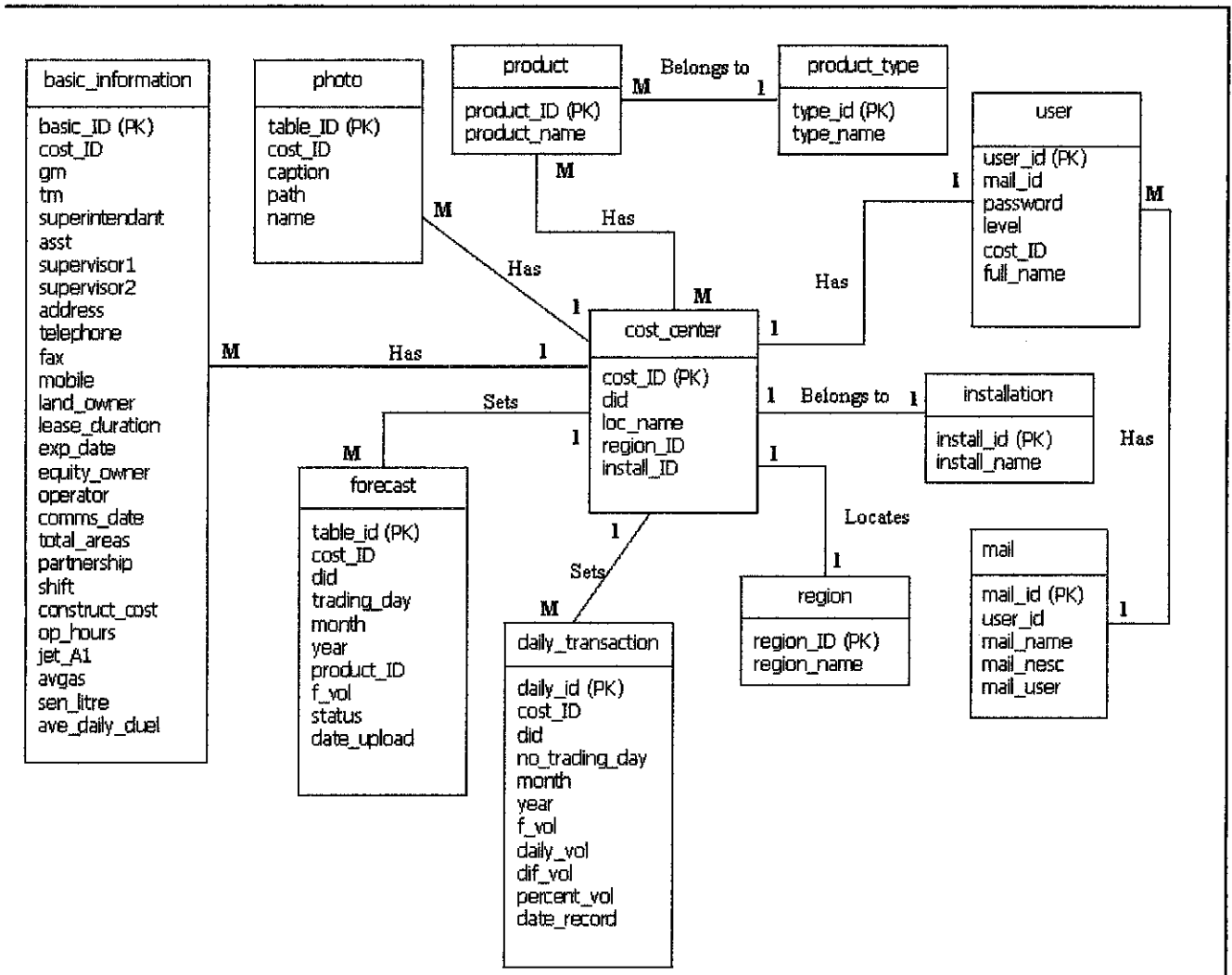
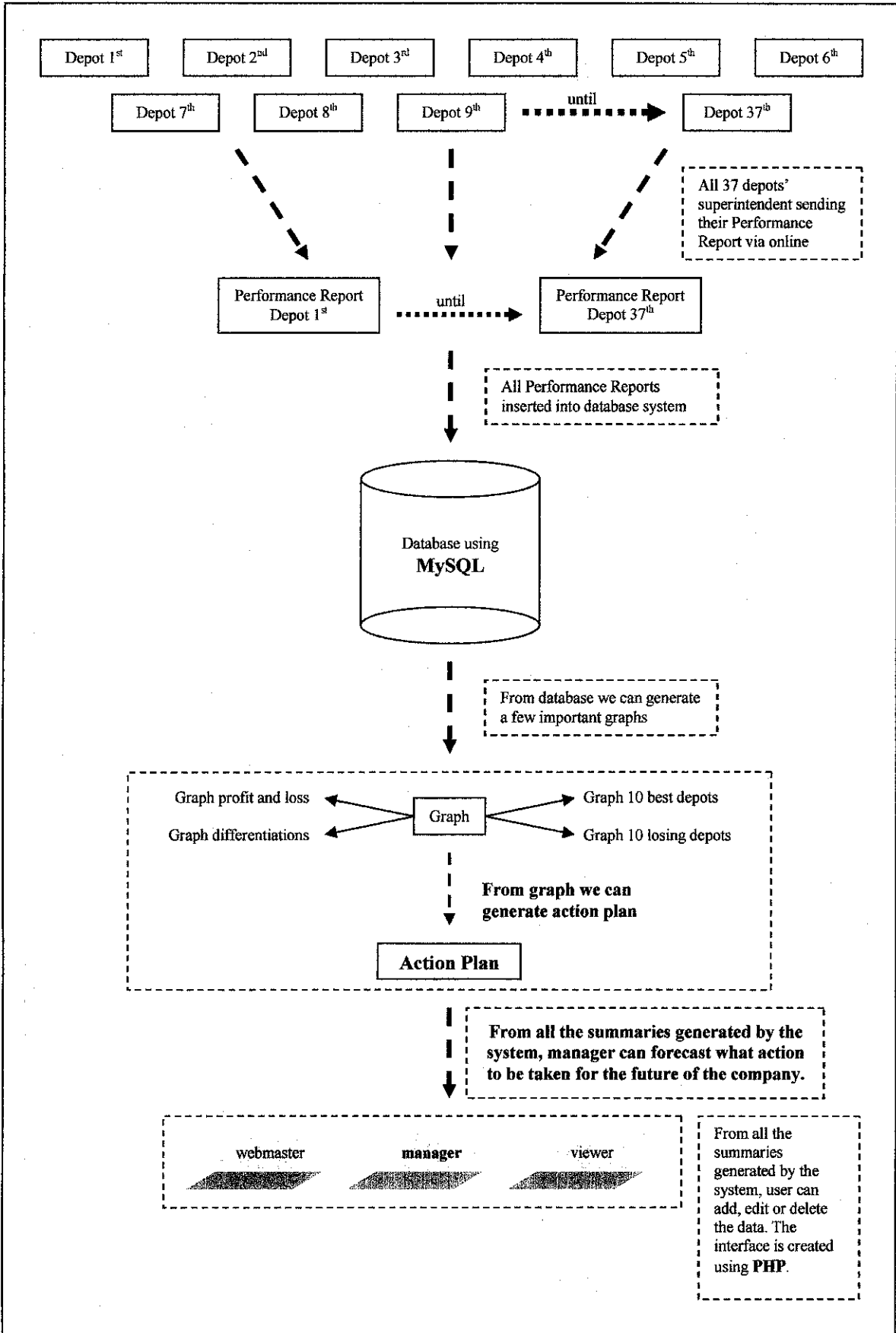


FIGURE 4: DATABASE RELATIONSHIP DIAGRAM

3.2 System Architecture



3.3 Coding and Testing

The next step is for Coding and programming the functionality of the system. To connect between the interface and the database, we need to establish a connection. This is when php, JavaScript, and SQL statement took place. PHP and JavaScript language is use for coding the functions and the interface while SQL is the language that is going to connect the application and the database.

```
<?php
    $server = 'xxx . x . xx . xxx';
    $user = 'root';
    $pass = ' ';
    $mydb = 'sdd_reporting';
    $connect = mysql_connect($server, $user, $pass);
?>
```

After the coding phase, comes the testing of the application. Testing starts with the development of a test plan that defines a series of tests. We need testing throughout the whole process of the system development life cycle (SDLC) and continuously as the system evolve.

This is when we implement the User Acceptance Test (UAT) to evaluate the functionality and the integrity of the system. This is will assigned to the current user, the engineers and the budget coordinator. After the UAT, the use will give feedback through emails and phone calls.

The superintendent from all over region, Peninsular, Sabah and Sarawak connected to the Petronet in HQ, KLCC, and by having the permanent IP address, xxx . x . xx . xxx for the server in HQ, they connected to the system and the database automatically.

3.4 Implementation

Lastly, the implementation phase is when the system is in use. Only authorized user that has the username and password assigned by the webmaster can access the system. The user is consisting of the normal user, the engineers and the budget coordinator.

After the project completely complete, the system will transferred to the server in HQ, KLCC and users from all over Peninsular, Sabah and Sarawak can access the system by having the URL link `http://xxx . x . xx . xxx/sdd_reporting/index.php`. In order to make the URL appear uniformly, server configuration has been modified in `httpd.conf` file in the Apache folder. The internet protocol, `xxx . x . xx . xxx` has changed to `sddserver`. Therefore, the new URL link is `http://sddserver/sdd_reporting/index.php`.

3.5 TOOLS USED

For the project development, we need tools to such as the programming languages, the database, and the platform that will connect the interface and the database. The tools needed for designing the interface and the database that based on user requirement. This is the most important part in any project development. Our objective in this stage is to get user's approval and in the end, user's satisfaction of the final product.

Software	Hardware
<ul style="list-style-type: none">• PHP• SQL• JavaScript• phpdev423• phpMyAdmin 2.3.2• Macromedia DreamWeaver	<ul style="list-style-type: none">• Tape (for backup purposes)• Compaq Server in HQ• Permanent IP address (xxx . x . xx . xxx) for the server

TABLE 1: Hardware and Software Used

As shown in TABLE 1, for the programming language, PHP, JavaScript, and SQL, the open source software needed to codes and program the functions, design the interface and to make the connections between the interface and the database. The powerful software that provides these kinds of languages is Macromedia Dreamweaver MX. It provides the visual layout tools, application development features, and code-editing support. It is the powerful tools because it can be use with the server technology for building a strong internet application.

As for the platform, phpdev423 that provides Apache Services needed. It provides a foundation for open, collaborative software development projects by supplying hardware, communication, and business infrastructure.

Phpdev also provides database application, which is phpMyAdmin 2.3.2. The software manages the database according to the fields and records by having the primary key and foreign key as accordance to the database design. Simply, we just name the database, the tables, and specify how many fields and records. It also provides authorization control so that only authorized person can access the database. The setting for username and password is set in the configuration files. phpMyAdmin also provides functions such as database statistic, the structure for the database, searching data, and drop the database on certain reasons.

Besides that, phpMyAdmin provides special function such as importing and exporting data into .SQL (dot SQL) file where the SQL statement saved the data in a notepad file or in a Microsoft Excel format for backup purposes.

As for the forecasting part, the system can assist manager in order to help them predict what action to be taken for the company development plan. The system is a tool to help managers to solve problems, expand the expertise of business advisors, and providing problem-solving answers throughout an enterprise. Forecasting steps are described by building a set of data captured from the performance report and rules that can precisely describe even the most complicated process. It is a full feature development environment based on responding to user needs, combined with the latest software and hardware

technologies. It is a practical, proven approach to capturing expertise in the system, which provides forecasting assistance on the site. Actual predictions for manager are provided when they need them. Emulating one-on-one consultations with managers at HQ, the systems can deliver situation-specific answers and help online with troubleshooting, technical support and diagnostics. It can automate routine tasks and help superintendents to handle their depots' operations. Beside that, it can capture valuable knowledge and problem-solving for the respective depots. This system also provides individualized attention from managers at HQ to superintendents that can build up the relationship between them. The most important thing for the business to success is the relationship between the managers and their employees. The stronger the relationship between them, the more powerful their business is going to be.

As for the hardware in HQ, SDD provides a backup tape for any recovery control. Compaq server in HQ is use to store the database, and all the files for every 37 depots in order to make the database centralized. In this case, user will access the server using the permanent IP address: xxx . x . xx . xxx, given by I-Perintis Company.

CHAPTER 4

RESULTS AND DISCUSSIONS

After all the changes have been made, I have redesigned a system that I would not use the exponential smoothing technique. But still the system is design to improve the process of generating reporting system by automating it. It is to ensure that the system really help those intended users and the system itself must be reliable at anytime for the user in order for them to access the database and give the user the latest and updated values automatically. This means that the system is actually not doing the forecast part but managing the forecast value that has been determined by the forecast planner.

This system addresses the problem of time consuming especially in filling the form through spreadsheets and emails submission, to counter the late submission problem and to get the current and updated values from the user and budget coordinator. The mission is to cut down some processes so that the amount of errors can be reduce the when generating the summary or the final budget compilation. User and Budget Coordinator can still communicate with each other regardless of using phone call or sending emails. User can give some feedback in terms of the system functionality and user friendliness. The feedback can also be a comment, new ideas that can help the improvement and the enhancement for the system in the future.

With the addition of the forecasting part, management have no problem to distribute a company's most valuable asset which is expert knowledge, to the people that need it, through powerful interactive web-enabled expert systems. It can solve a numerous of problems and assist in common-to-crucial decision-making by making the employees more capable and productive. By helping user to forecast the action plan for the company, it also can assure regulatory fulfillment and provide the "*brains*" for organization on the Web. Other than assisting managers in forecasting processes, the system can automate superintendents with most exact answers. With this, it can develop new profit streams with advisory products while identifying the cross-selling opportunities for the company. By chance, the system will monitor and document the forecasting processes. It also can perform background filtering and analyze data streams,

at the same time as predict the problems before they happen. On the other words, system can cut maintenance costs by automating the tasks and provide future plan for superintendents that usually done manually by managers at any organizations.

This system is intended to help managers do a better job of anticipating, and hence a better job of managing uncertainty, by using effective forecasting More research, modification, and enhancement in this area been conducted in generating new techniques and designing the best solutions for the problems stated above. These to ensure that ideas can be integrate into the exact system.

One of the weaknesses that have been recognized is that this system is not fully integrated with one database. Other weaknesses may be found in the implementation part. Although the system is not fully complete yet, it is there for me to say it is easy to use by any level of user. The users of the system will just go to the destination of page by just clicking less than 3 clicks. The user also can export the data from database into excel format. The project is still at the designing and testing stage. Improvements will be made whenever needed.

The implementation of this system requires some technical and theoretical skills. The researcher needs some economic and business knowledge to design the system prototype better. All the processes have to be done in series so that the flow of the system is well defined.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

As for the conclusion, this system can be use stage by stage for the company. The system will be run on APACHE server which is stable for the open source products. The reason for using open source software is because it is free and readily available and mostly since the researcher has broader knowledge in and has experience in developing and using the platforms. This system can be used either in company server or local machine. While the system is still in progress, it will be upgrade stage by stage in order to make it complete as I changed my previous forecasting project to this system.

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APPENDIXES

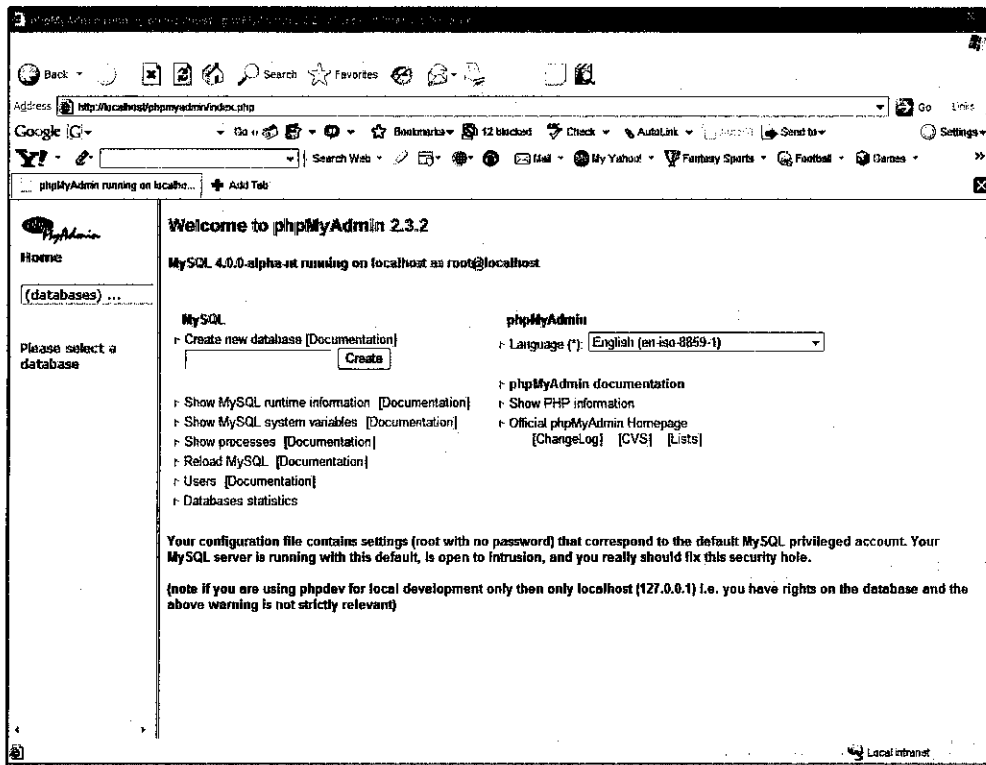


Image 1: phpMyAdmin page to create database for users.



Image 2: Front page of the system.

Logout

admin

Supply and Distribution Division

AM Depot: [Bulk Depot](#) | [LPG Bottling Plant](#) | [Aviation Depot](#) | [Contact Info](#) | [Add New Depot](#)

All Depot List

Total Depot: 32
 Bulk Depot: 15
 LPG Bottling Plant: 7
 Aviation Depot: 10

Sort by: Cost ID

#	Cost ID	Region	Depot Name	Edit	Delete
1.	4201000	Peninsular	Subang AVIATION		X
2.	4204000	Peninsular	Port Klang LPG		X
3.	4212000	Peninsular	KVDT(PDB) BULK		X
4.	4214000	Peninsular	West Port BULK		X
5.	4301000	Peninsular	Bayan Lepas AVIATION		X
6.	4302000	Peninsular	Pulau Langkawi AVIATION		X
7.	4303000	Peninsular	Prai LPG		X
8.	4304000	Peninsular	Prai BULK		X
9.	4305000	Peninsular	Pulau Langkawi BULK		X
10.	4401000	Peninsular	Senai AVIATION		X
11.	4403000	Peninsular	Pasir Gudang BULK		X
12.	4408000	Peninsular	Melaka LPG		X
13.	4409000	Peninsular	Melaka BULK		X
14.	4501000	Peninsular	Kerteh AVIATION		X

Local Intranet

Image 3: All depots page.

Logout

admin

Supply and Distribution Division

Trusted Delivery At Effective Cost

DEPOT INFORMATION : Subang AVIATION (Choose other depot)


Basic Information | [Forecast](#) | [Daily Transaction](#) | [Graph](#) | [Forum](#) | [Mail](#)

Basic Information

Supervisor	M Isa Othman
Asst Supervisor	
Supervisor	M.Shah Jaafar
Supervisor 2	
Address	Petrones Dagangan Bhd., Sultan Abd. Aziz Airport, Terminal 1, 47200 Subang, Selangor
Telephone	03-78461733/ 7847/3726
Fax Number	03-78461687
Melaka Number	019-2762766
Land Ownership	MAB
Land Lease Agreement	Land Lease Agreement
Entry Date	Land Lease Agreement
Total Area	329531 Sq.Feet
Current Area Used	Rm2.5 Million
Operating Hours	16 Hours Daily
Service No	EV2509/2000
Operating Data	4.13

Depot Name: Subang AVIATION
 Depot Cost ID: 4201000
 Installation Type: AVIATION
 Region: Peninsular

Total: 1 image(s) found.



You can upload maximum 5 images.
 (File types allowed: .jpg/.jpeg/.gif/.png/.bmp)

Print Page | Edit Information

Image 4: Basic information page.

| Logout |

admin

DEPOT INFORMATION : Subang AVIATION (Choose other depot)

[Basic Information](#)
[Forecast](#)
[Daily Transaction](#)
[Graph](#)
[Forum](#)
[Mail](#)

Storage Information

Depot Name: Subang AVIATION
 Depot Cost ID: 4201000
 Installation Type: AVIATION
 Region: Peninsular

[Add New Forecast](#)

Month and Year	Trading Days	Product	Forecast Volume	Status	Date Uploaded	Update	Delete
May 2009	27	Kerosene	1,500	Confirmed	24-03-2008	<input type="checkbox"/>	<input type="checkbox"/>
			1				
June 2008	22	Fuel Oil	2,500	Confirmed	24-03-2008	<input type="checkbox"/>	<input type="checkbox"/>
			1				
April 2008	19	50KGLWC	3,000	Not confirmed yet	20-03-2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
			25				
		2	28,000				
Grand Total :			4	82,000			

Local intranet

Image 5: Forecast function.

| Logout |

admin

DEPOT INFORMATION : Subang AVIATION (Choose other depot)

[Basic Information](#)
[Forecast](#)
[Daily Transaction](#)
[Graph](#)
[Forum](#)
[Mail](#)

Choose category:

Nota:

Reminder (90 days)

Immediate Action (60 days)

Warning (30 days)

Expired

CBD

Month & Year	Product	Trading days	No. Days have filled	No. Days not filled	Days	Status	View Details
April 2008	Methanol	25					

[Print Page](#)
[Back](#)

Local intranet

Image 6: Daily transaction function.

| Logout |

Main Page
 Users
 Inventory Page 2009

You're logged in as **admin**

DEPOT INFORMATION : Subang AVIATION (Choose other depot) Supply and Distribution Division
Trusted Delivery At Effective Cost

[Basic Information](#)
[Forecast](#)
[Daily Transaction](#)
[Graph](#)
[Forum](#)
[Mail](#)

Graphs

Depot Name: Subang AVIATION
Depot Cost ID: 4201000
Installation Type: AVIATION
Region: Peninsular

Forecast Graph for Subang AVIATION

Fuel Type	Quantity (KL)	Percentage (%)
Kerosene	1,500	5%
Fuel Oil	2,900	8%
50KG LWG	3,000	8%
Methanol	25,000	78%

Print Done

http://localhost/pls/2depot_details.php?page=45&cost_id=42010000 Local intranet

Image 7: Graph function.

| Logout |

Main Page
 Users
 Inventory Page 2009

You're logged in as **admin**

DEPOT INFORMATION : Subang AVIATION (Choose other depot)

[Basic Information](#)
[Forecast](#)
[Daily Transaction](#)
[Graph](#)
[Forum](#)
[Mail](#)

Forum

01-01-2009 09:00:12
Post 1st Forum by Admin - Replies: 0
[Back to Main Forum](#)

Print Page

Page 1 of 1 - 100.00 KB Attached

Local intranet

Image 8: Forum page.

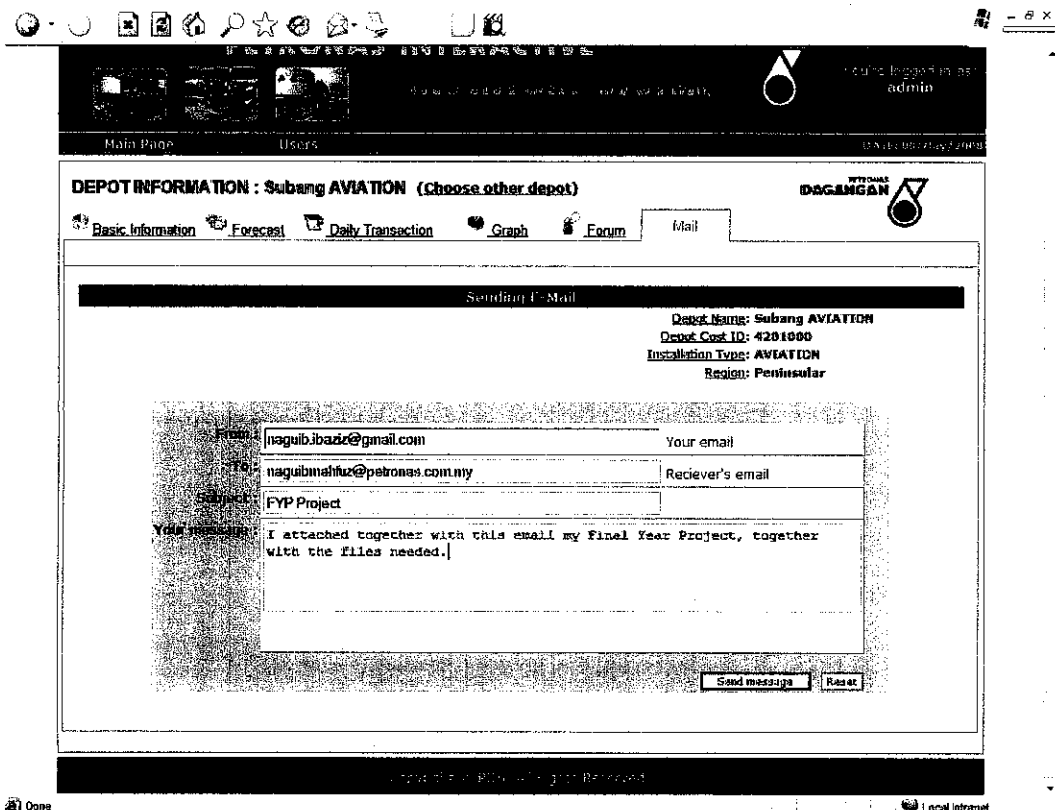


Image 9: Mail function.