Online Capital Expenditure (CAPEX) and Budget Monitoring System for Supply and Distribution Department (SDD) of Petronas Dagangan Berhad (PDB)

By

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4480

Dissertation submitted in partial fulfillment of

The requirements for the

Bachelor of Technology (Hons)

(Information System)

October 2006

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CERTIFICATION OF APPROVAL

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A Project Dissertation submitted to the

Business Information System Programme

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Approved by

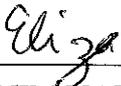_____

Ms Eliza Mazmee Mazlan

UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

October 2006

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.

AZNIM NADZRAH BTE MOHD AMIR

ACKNOWLEDGEMENT

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ABSTRACT

The purpose of this report is to present the progress report of the final year project, Online Capital Expenditure (CAPEX) and Budget Monitoring System and to detailed out the requirement for and to review, compare and analyze the study and work of other system that already exist in the market. The focus is more on the enhancement to be integrated to the current system and how the new mechanism is to be implemented. CAPEX is one of the processes in the budget life cycle. The information on CAPEX is useful for managers in order for them to make the right decision at the right time. If we look at the definition of CAPEX, it is a fund spent for the acquisition of a long-term asset. If we look at the investment context and perspective, CAPEX is defined as funds used by a company to acquire or upgrade physical assets such as property, industrial buildings, or equipment. The system is going to be developed for Supply and Distribution Department (SDD) and the focus is going on SDD long term assets. They acquire budget in order to run a project and buy a new equipment or machinery for the depot. There is a lot of process has to be taken into place in order to acquire the budget especially when we are talking about the manual system. All this kind of information need to be maintain as to monitor the performance of the company whether they create value for the business or not. Scope of study includes e-business, database management, software engineering, and system analysis and design.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Accounting is an important element in any kinds of organizations in the world. A good and efficient management of accounting will determine the success of the company. 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.

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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 CAPEX. It could be explain 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 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, CAPEX, 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.

1.2 PROBLEM STATEMENT

1.2.1 Problem Identification

As depicted in FIGURE 1 below, budget is consists of several processes which are budget preparation and budget utilization. All these processes starting from budget submission of budget proposals 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.

2) User tends to submit late even though when the date is due. It is hard to do compilation for the total SDD summary when not every depot submits their budget proposal on time.

3) It is a tedious job to keep track the 44 depots whether their proposal has submitted or not. Currently they are using emails and phone calls.

4) Compilation is from scratch where the budget coordinator has to print all the submission and start doing the compilation.

5) Human is prone to errors and mistakes to compile the spreadsheets from 44 locations across the region.

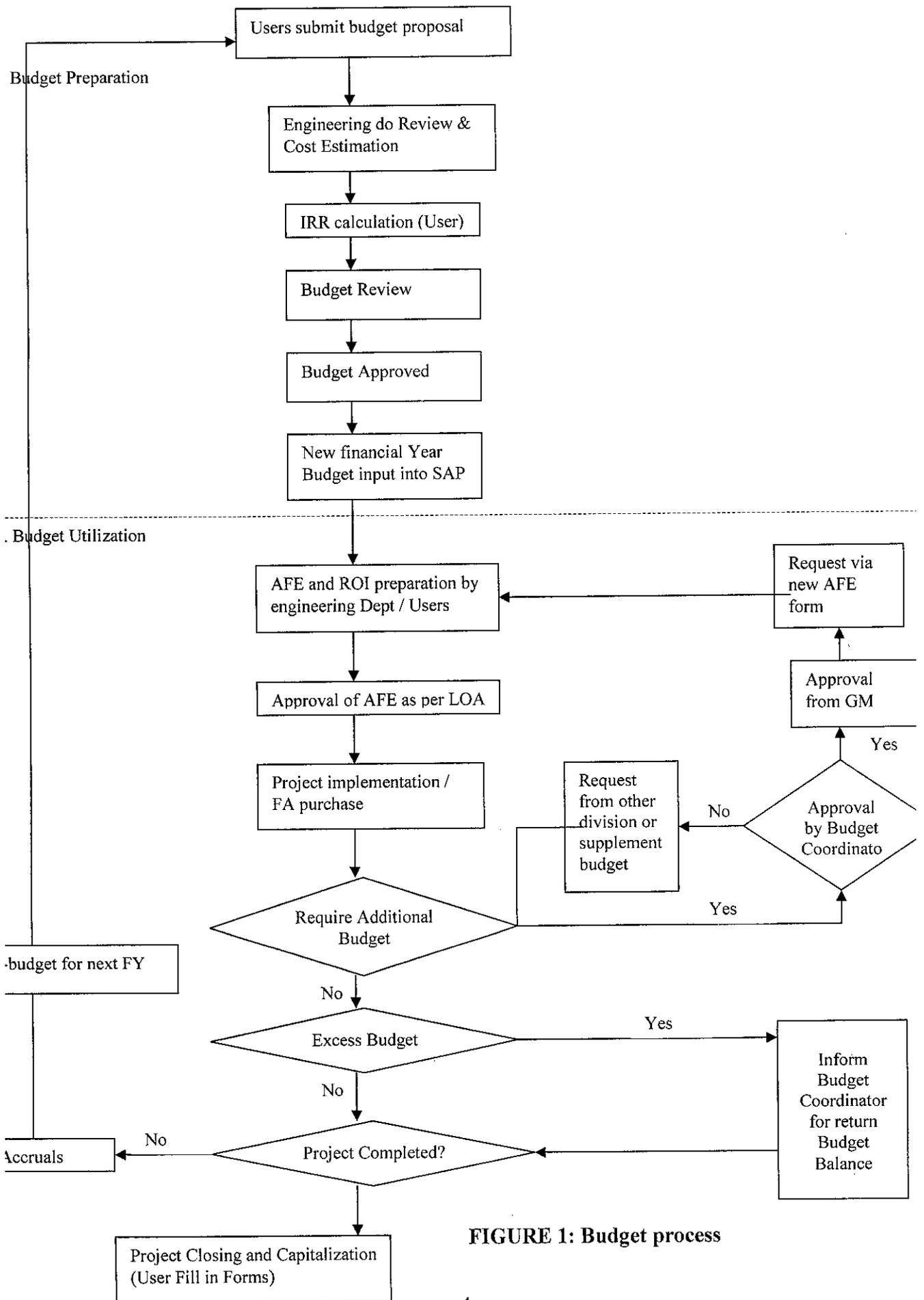6) SDD summary will become incomplete and inaccurate results.

Budget Preparation

Users submit budget proposal

Engineering do Review & Cost Estimation

IRR calculation (User)

Budget Review

Budget Approved

New financial Year Budget input into SAP

. Budget Utilization

AFE and ROI preparation by engineering Dept / Users

Approval of AFE as per LOA

Project implementation / FA purchase

Require Additional Budget

Request from other division or supplement budget

Approval by Budget Coordinato

Approval from GM

Request via new AFE form

-budget for next FY

Excess Budget

Inform Budget Coordinator for return Budget Balance

Accruals

Project Completed?

Project Closing and Capitalization (User Fill in Forms)

FIGURE 1: Budget process

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1.2.2 Significant of the Project

The system is develop in order to help SDD in terms of its communications side, management side, and operating daily routines so that the whole process can be more efficient and reliable.

The system also can help SDD by saving operation time, communication time and the cost of running the overall process. It can be cost in terms of money and time because time related to money.

In the system, we have three types of users, which are webmaster, viewer, and editor. As shown in TABLE 1 below for user group name or called the access type. This access type will determine the authorization control for manipulations of data such as view, edit, or add the data. As we can see, the manager in this case is the webmaster that has the authority for all three functions.

By having this type of control, user cannot simply view the data and make any changes or modify without having the permission to do so. The editor can only view and edit the data, which in this case, the editor would be the users from each depot and the viewer would be the management levels. The managers can view all other summary submitted but cannot even change or add any data.

Group Name	View	Edit	Add	Delete
Manager	Enabled	Enabled	Enabled	Enabled
Editor	Enabled	Enabled	Enabled	Disabled
Viewer	Enabled	Disabled	Disabled	Disabled

TABLE 1: Authorization Control

The idea is that, when the users submit the proposal, the webmaster can easily sees the data, and make any necessary changes. The role of webmaster is hold by the budget coordinator. Where they can freeze the submission from each depot when the date is due, make the approval for each submission, set the financial year, and view overall summary of SDD, and all kinds of administrative job that an authorized person should have for their system.

By automating the new CAPEX process flow, the current system becomes more systematic in term of its functionality and ability to assist the intended users, which are the webmaster, user, and the managers from every aspect such as save time, user friendliness, ease of use etc.

Managers have the authorization to view all depot summary details. They will use this information for planning, decision making, and study the trend of the budget based on the given result. Decision made on a timely manner because they do not have to wait for long time for user submission and compilation because it is now an automated system (auto-generated data).

As a whole, the implementation of this new automated system is crucial to improve performance for the company and helps the managers to make decisions.

1.3 OBJECTIVES AND SCOPE OF STUDY

1.3.1 Objectives

1) To develop a new financial tool system for Supply and Distribution Department (SDD), Petronas Dagangan Berhad (PDB) called the Online Capital Expenditure Information System (CAPEX).

2) To develop the system that meets the criteria of a functional and secure system that is efficient and reliable to the intended user.

1.3.2 Scope of Study

System Wise:

- Collecting data from various location - 44 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. As shown is table 1.

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 proposed budget. 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.

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User mode:

- Submit budget proposal at the end of each year
- 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

In [1] stated that, 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 OPEN SOURCE SOFTWARE

As referred to [2] 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 PROCEDURE IDENTIFICATION

Iterative Incremental development was chose for the methodology of developing the system. Iterative and Incremental development is a software development process, as opposed to a more traditional waterfall model, shown in FIGURE 2 below.
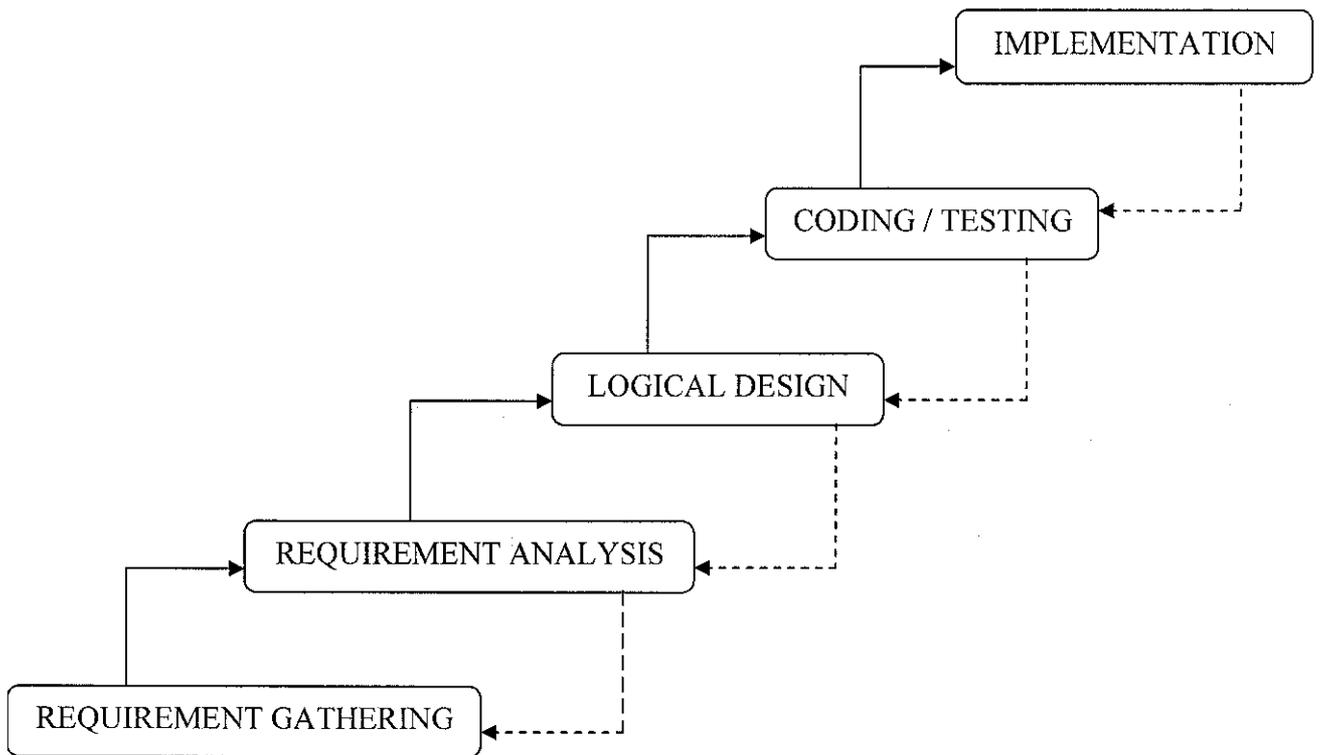
FIGURE 2: Iterative and Incremental Development

The basic idea behind iterative enhancement is that to develop the software system incrementally, and to take advantage of what being learn during the development of earlier, and incremental, deliverable versions of the system. Learning comes from both the development and use of the system, where possible.

Key steps in the process were to start with a simple implementation of a subset of the software requirements and iteratively enhance the evolving sequence of versions until the full system implemented. Design modifications made at each levels of iteration along with addition new functional capabilities.

3.1.1 Requirements Gathering

The first step take took place is the requirement gathering. At this stage, all the information concerning Capital Expenditure (CAPEX) is gathered. Interview session with the budget coordinator from SDD has been done to capture the current operations that she has to perform in order to implement CAPEX. This is when functional and non-functional requirement needs to taken into accounts. Manual forms, Authorization for Expenditure Form (AFE), Limits of Authority (LOA) that submitted by the users was provided by them.

3.1.2 Requirement analysis

The next iteration step is to analyze the requirements gathered. By looking at the form, we can see that there are three parts. Part A is for the user, Part B is the technical evaluation by engineering department, and Part C is for authorization and final approval process.

After the process of understanding and analyzing the data, the design of the interface and the database design can become much easier. The data itself can give some preview or ideas for creating the database relationship, such as recognizing the tables and the attributes inside it. One of the attribute in each table is the primary key of that table and the foreign key to the other table. This is for linking one table to another.

The process of gathering the data can also help us to understand the overall situation, thus giving us some ideas on creating and designing the user interface; this part is the most challenging part because we need to satisfy and meets the user requirement and preferences.

3.1.3 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.

3.1.3.1 Use Case Diagram

As depicted in FIGURE 3 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 Budget Coordinator and the normal user who uses the system. The Budget Coordinator 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 SDD's summary. They are the one who set the year for the new financial year of budget process.

The user is the one who submit the CAPEX proposal and have the authority to edit and view their 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 engineering department. 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.
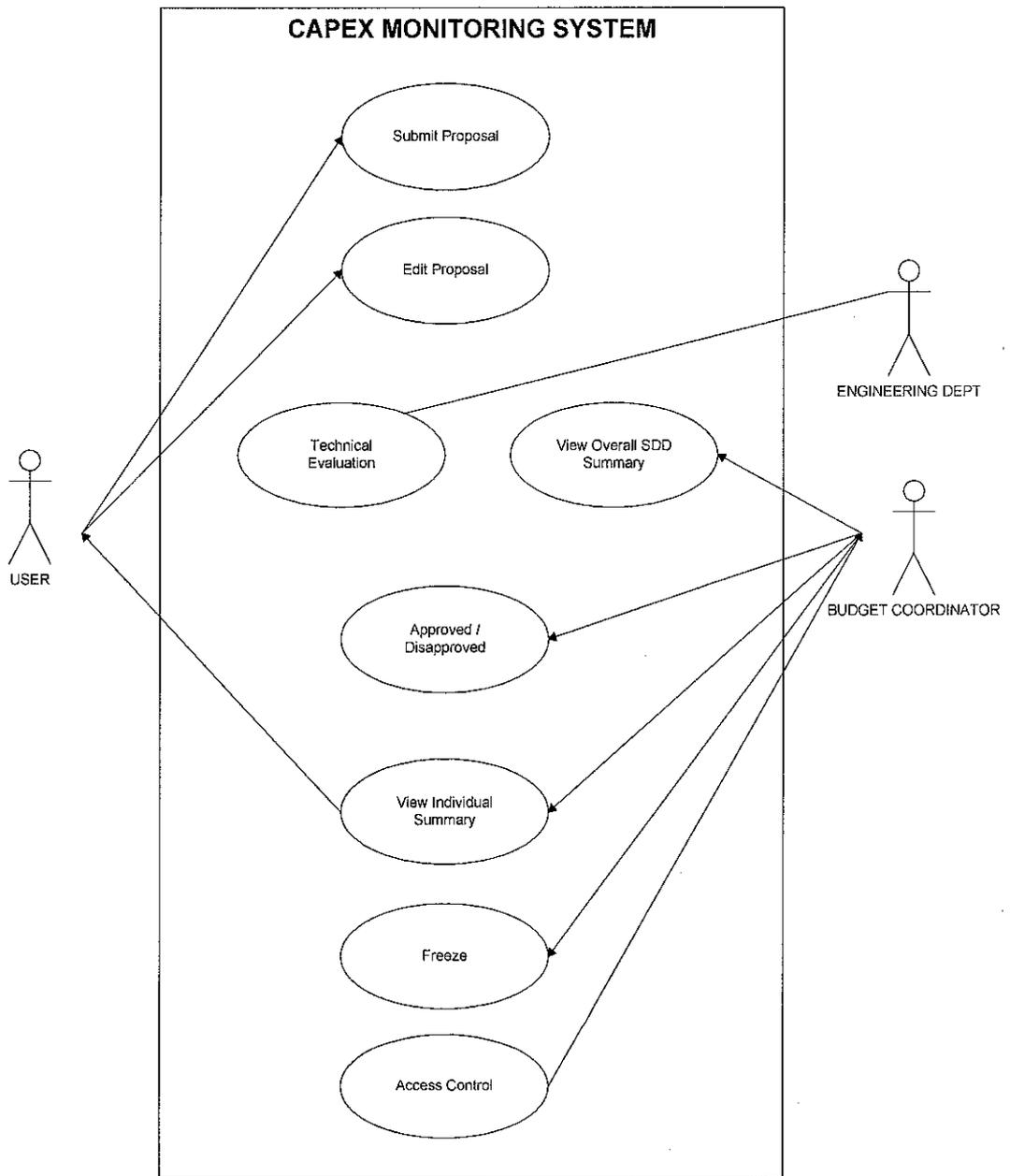
FIGURE 3: USE CASE DIAGRAM

3.1.3.2 Sequence Diagram

The sequence diagram that shows the sequence of each process based on their relationship amongst entities in online CAPEX as shown in FIGURE 4 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.

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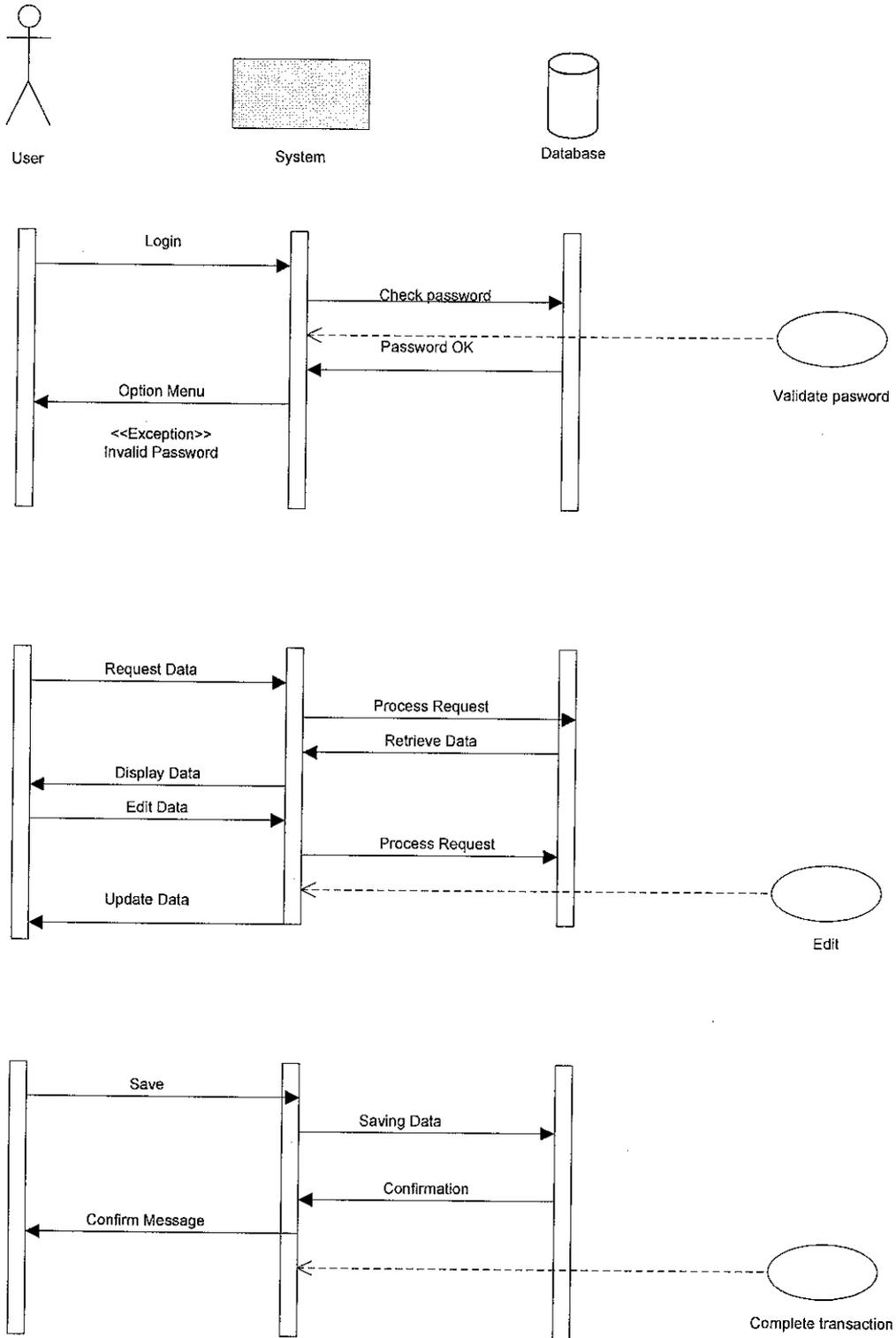
FIGURE 4: SEQUENCE DIAGRAM

3.1.3.3 Database Relationship Diagram

Lastly, we going to have the Database Relationship Diagram which to show all the tables that related to the CAPEX. FIGURE 5 below, shows the relationship amongst tables including the primary and foreign keys of each table and how they connected to each other.

We have 11 respective tables in the CAPEX database. These includes tables such as *main_capex, background, clarifications, op_project, engineering, cost_breakdown, cost* for the main tables and *user, cost_center, installation,* and *region,* are the secondary tables for CAPEX.

User table is for storing all the information of users, which includes the normal user and the webmaster. 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).

CLARIFICATIONS

PK	bg_ID
	main_criteria
	implications
	cost_benefits
	attachments

COST_CENTER

	cost_center
	loc_name
	region_ID
	install_ID

REGION

	region_ID
	region_name

INSTALLATION

	install_ID
	install_name

USER

	cost_center
	username
	password
	access

BACKGROUND

PK	bg_ID
	capex_ID
	location
	desc
	justification

MAIN_CAPEX

PK	capex_ID
	op_ID
	title
	type
	category
	status
	comments
	date
	time

OP_PROJECT

PK	op_ID
	op_name

COST

PK	cost_ID
	capex_ID
	intial_cost
	estimated_cost
	final_ROI

COST_BREAKDOWN

	cost_ID
	engine_ID
	item
	desc
	quantity
	unit
	total

ENGINEERING

PK	engine_ID
	capex_ID
	explanations
	durations

FIGURE 5: DATABASE RELATIONSHIP DIAGRAM

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3.1.4 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
<?php
        $server = '10.1.22.190';
        $user = 'pdb';
        $pass = 'aspire';
        $mydb = 'capex';
        $connect = mysql_connect($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, 10.1.22.190 for the server in HQ, they connected to the system and the database automatically.

3.1.5 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 is completely done, the system will be 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:// 10.1.22.190/capex/index.php.

3.2 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
• PHP • SQL • JavaScript • phpdev423 • phpMyAdmin 2.3.2 • Macromedia DreamWeaver	• Tape (for backup purposes) • Compaq Server in HQ • Permanent IP address (10.1.22.190) for the server

TABLE 2: Hardware and Software Used

As shown in TABLE 2, 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 Dream weaver 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 file where the SQL statement saved the data in a notepad file or in a Microsoft Excel format for backup purposes.

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 44 depots in order to make the database centralized. In this case, user will access the server using the permanent IP address: 10.1.22.190, given by I-Perintis Company.

CHAPTER 4

RESULT AND DISCUSSION

4.1 SYSTEM FUNCTIONALITY

Webmaster mode:

1. The first screenshot shows main page for SDD Online Database. The URL is for this website is http://10.1.22.190/main.php into the URL address to access SDD Online Information System.

2. Option no 2: SDD Online CAPEX.

3. Click at the link SDD <u>Online CAPEX</u>
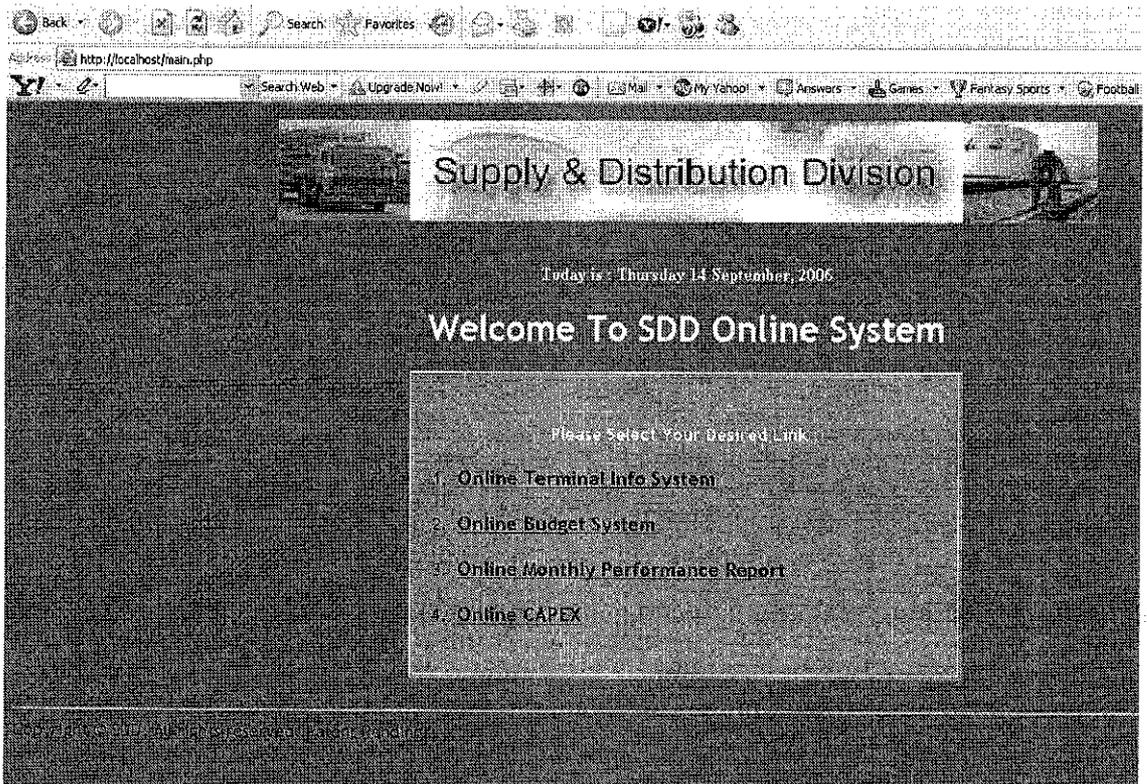
4. This the login page for user verification. The user will have to enter their respective username and password for user authentication process.
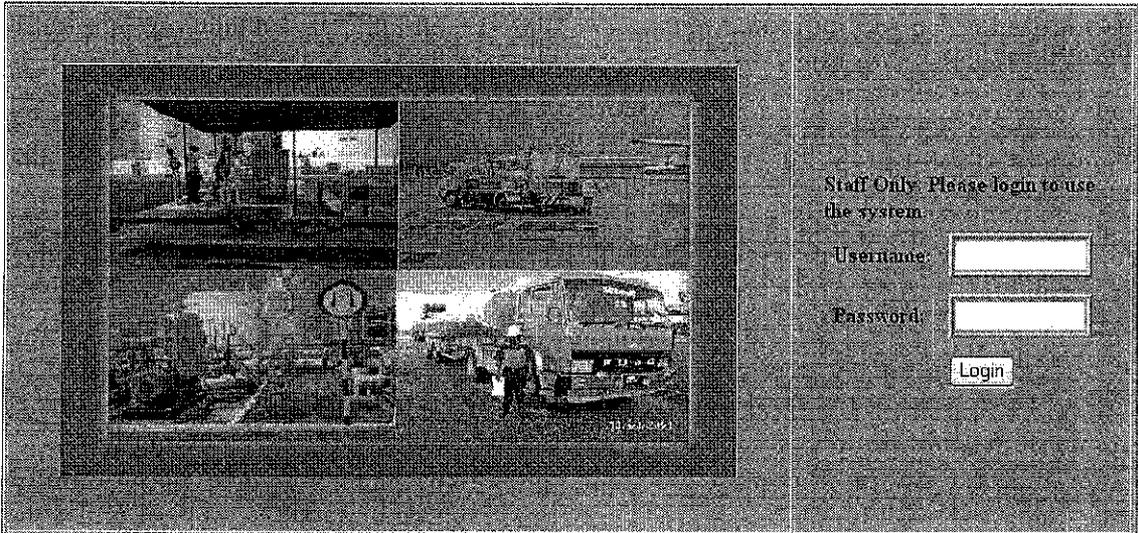
5. The error message will be prompt to the user, if the username and password not entered, invalid, or not exist in the database.
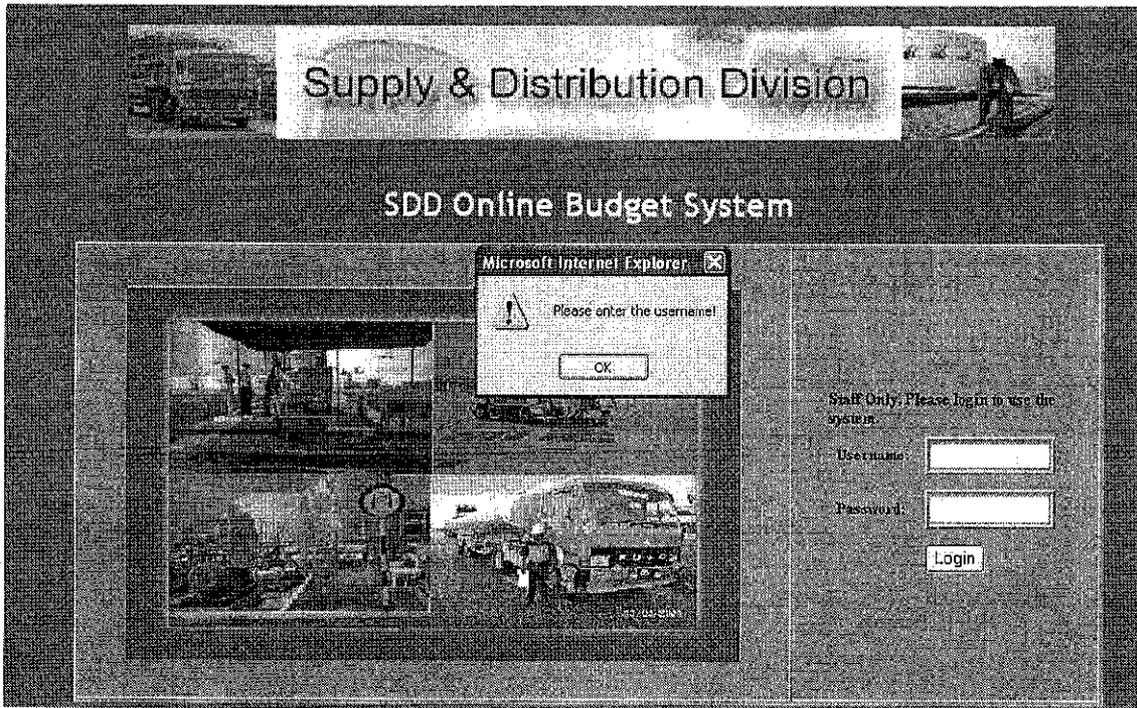
6. User enters their username and password.
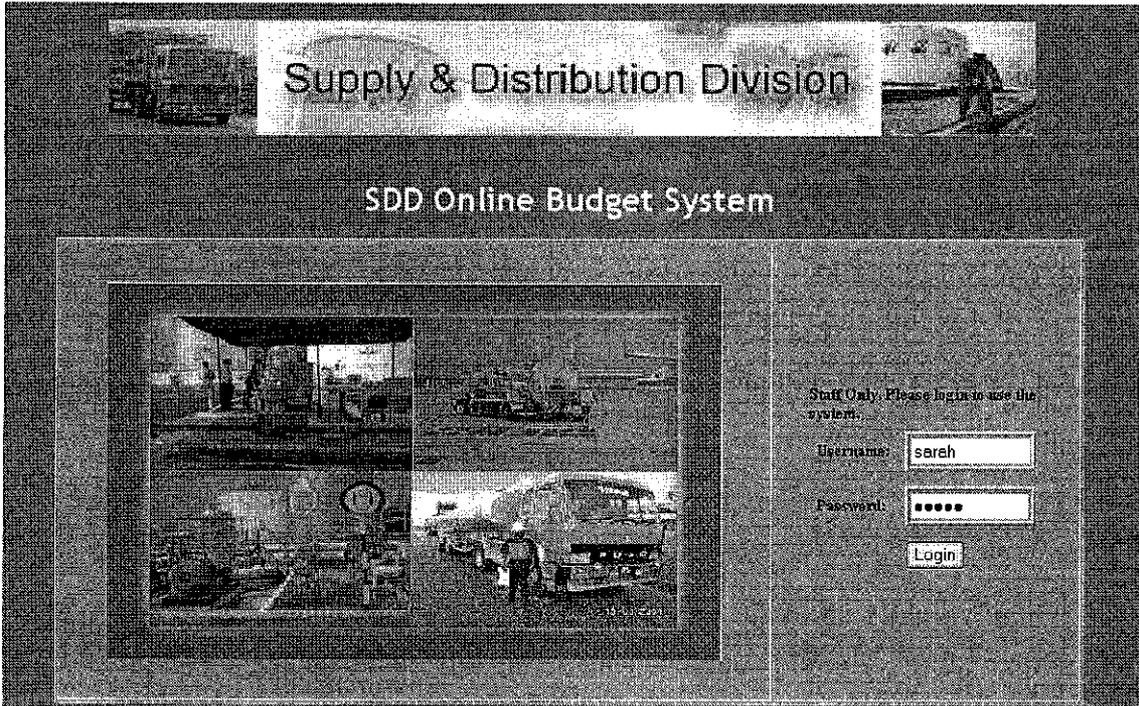
7. First you can see 4 menus at the top of the page. These menus are the standard menu throughout the webmaster's page. These are the menus:

   a. Home: This is the default page for webmaster where the startup page to choose desired links.
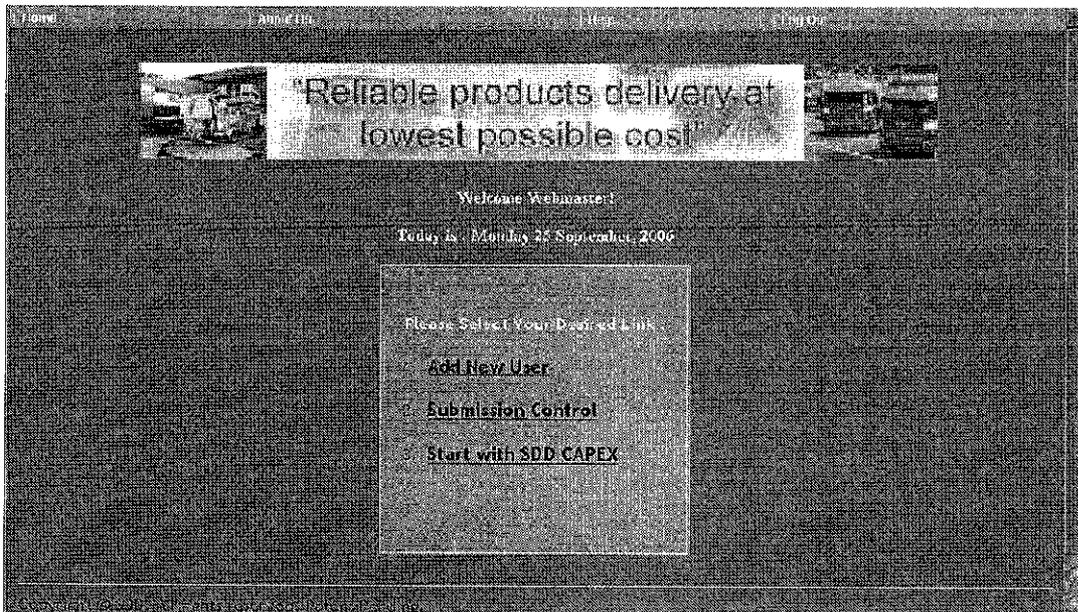
b. About Us : Some information on SDD manpower summary and overall
dimension

c. SDD Network Facilities

d. SDD Value Proposition

e. Help: Step by step guidelines on how to navigate through the system.
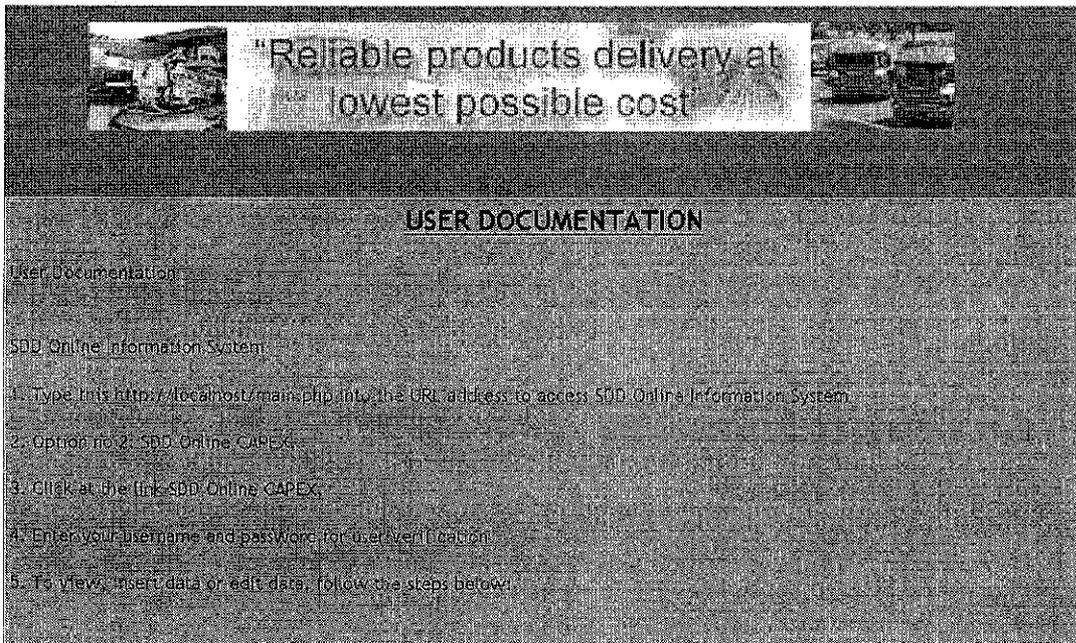
f. Logout: Log out from the system. Logout menu will return to the default page, which is the login page.

8. Webmaster has 3 choices whether to add new user, submission control, and start with SDD CAPEX, which is shown in the screenshot below.
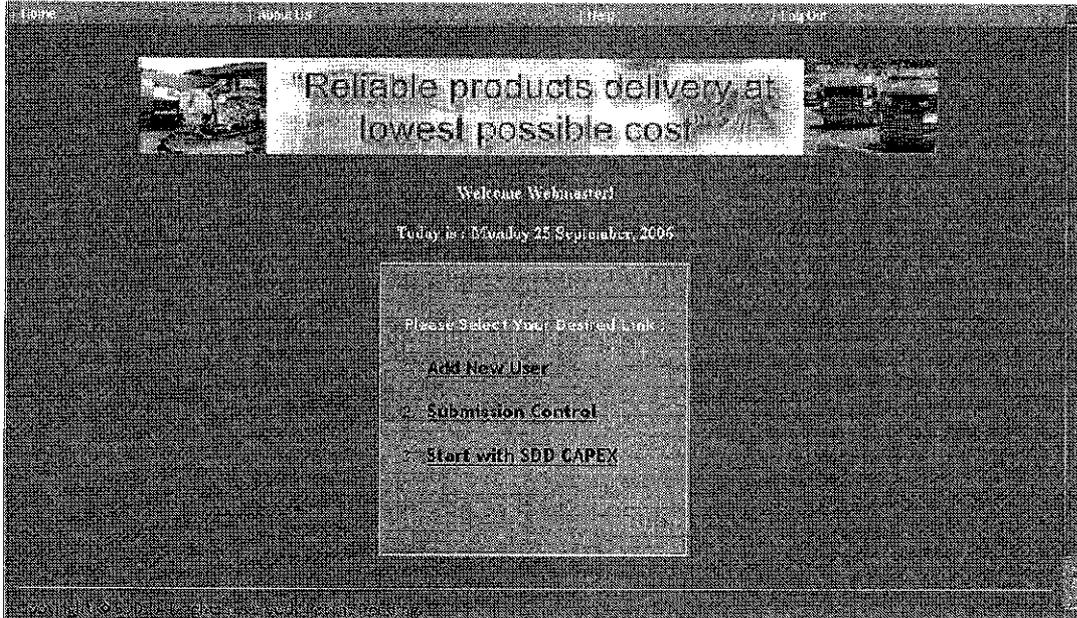
a. Add New User - To add new user and assign their username and password for user's authentication.
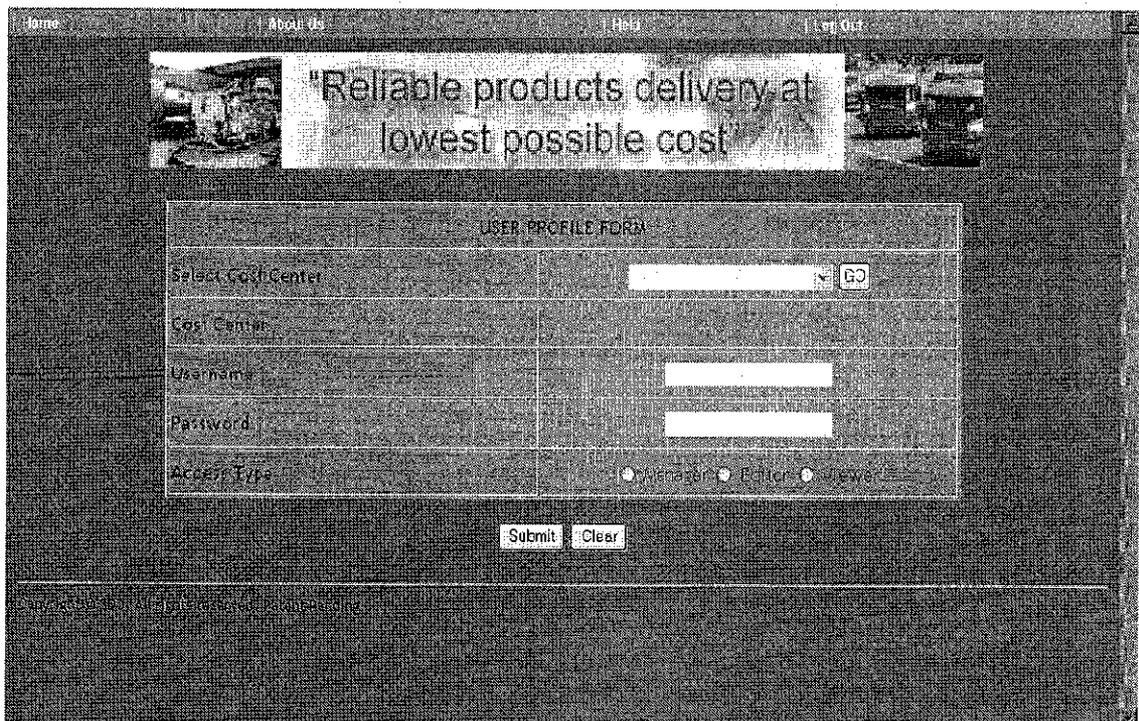
i. First, select the cost center as stated at the left side of the label. The user based on their location (depot). Webmaster will choose the respective location for the user.
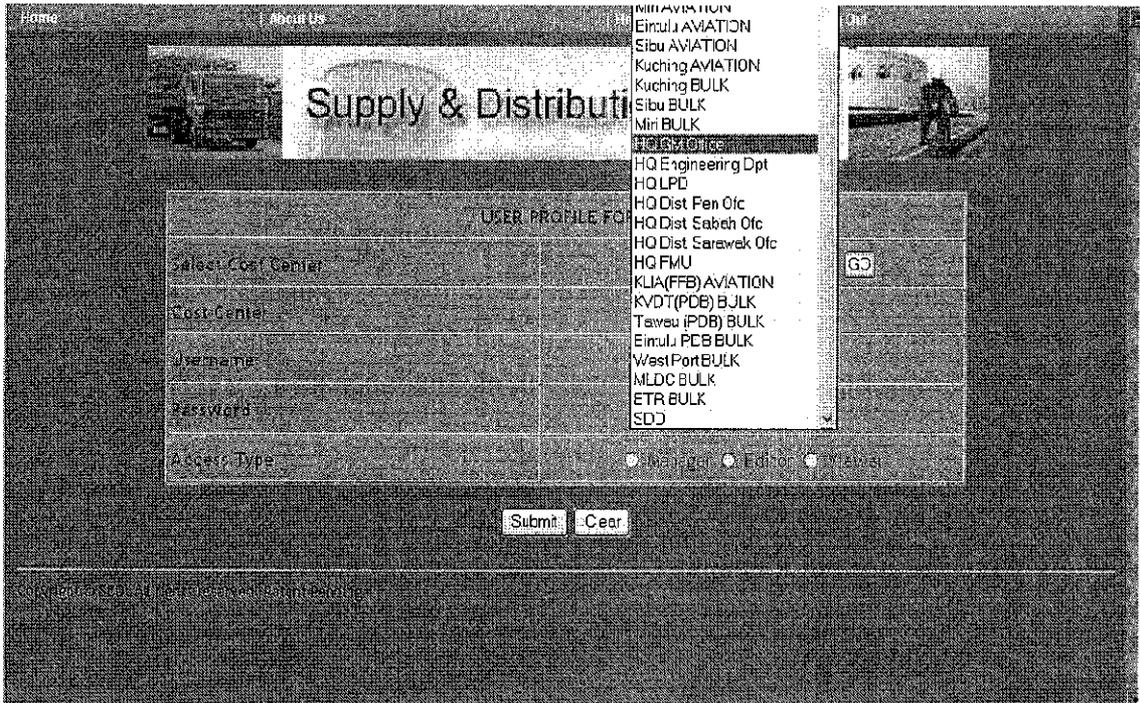
ii. Click the GO button. The selected cost center will appear in the following field, which shown at the cost center row. In this case, HQ GM Office after the webmaster has selected the cost center
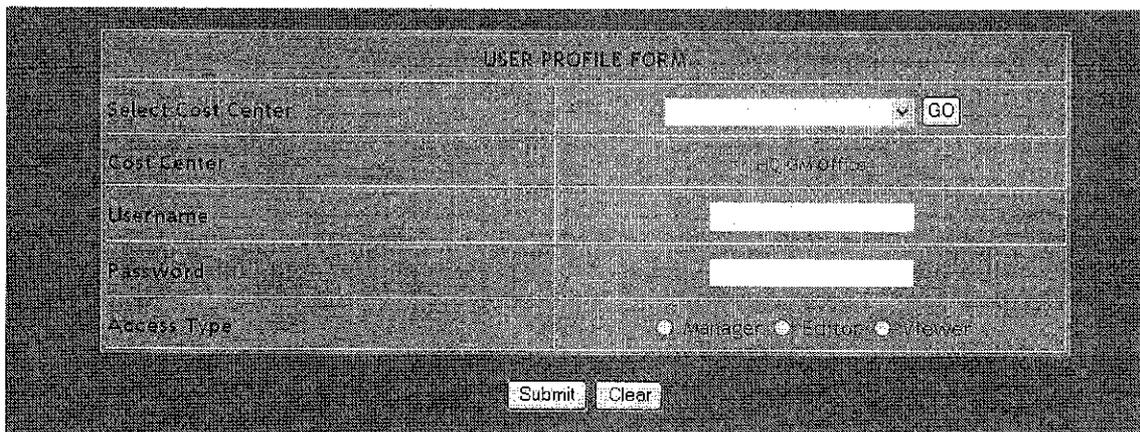
iii.   Type the username and password into the respective text fields. The username and password and the access type given to individual superintendent that is responsible for the depot. The access type for the user is whether they are the manager, editor, or the viewer. After the webmaster confirm and satisfied with the verifications, they can click the button submit or clear/ reset the submission and follow back the first instruction for assigning user and their authentication

iv.   Click Submit to save the data.

v.   Click Cancel to cancel the submission.

vi.   Click 'Home' menu at the top of the page, to go back or go to the main menu.

b. Submission Control: This function is able to controls user's submission. Every time the date is due, webmaster will have the authority to freeze their submission by disabling the button add and edit at their respective page. Therefore, there will be no more submission from user after the due date and the webmaster can do compilation on time. Nevertheless, the user have some explanation and exception, the webmaster can even unfreeze the button.
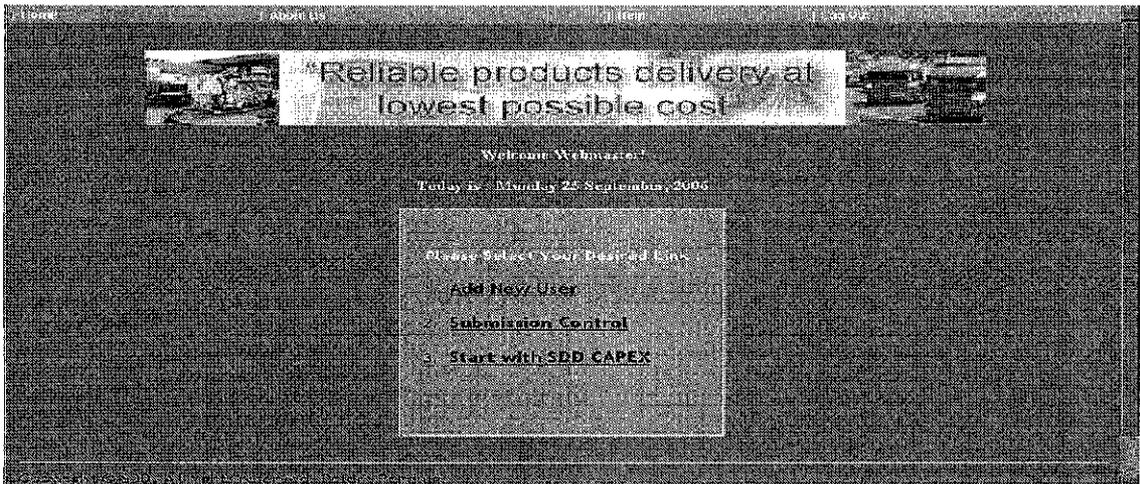

i. Click Freeze to stop the submission from user or
ii. Click Unfreeze to cancel the submission control.
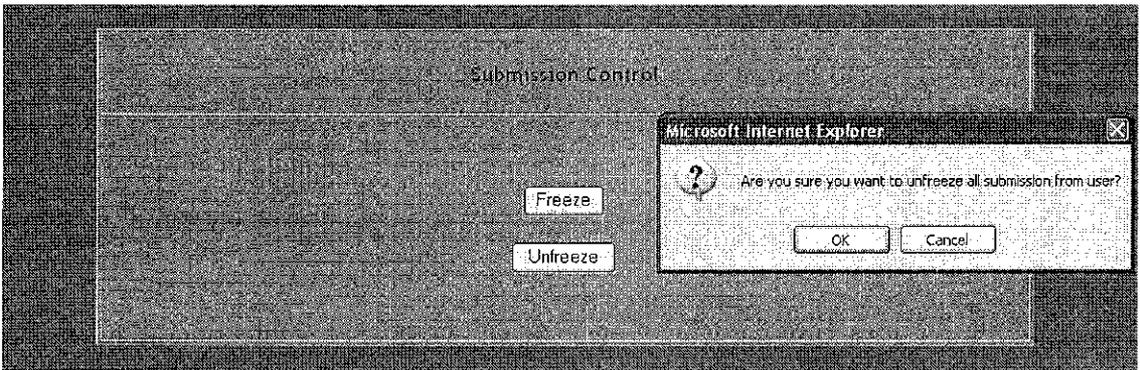iii. Click 'Home' menu at the top of the page, to go back or go to the main menu.
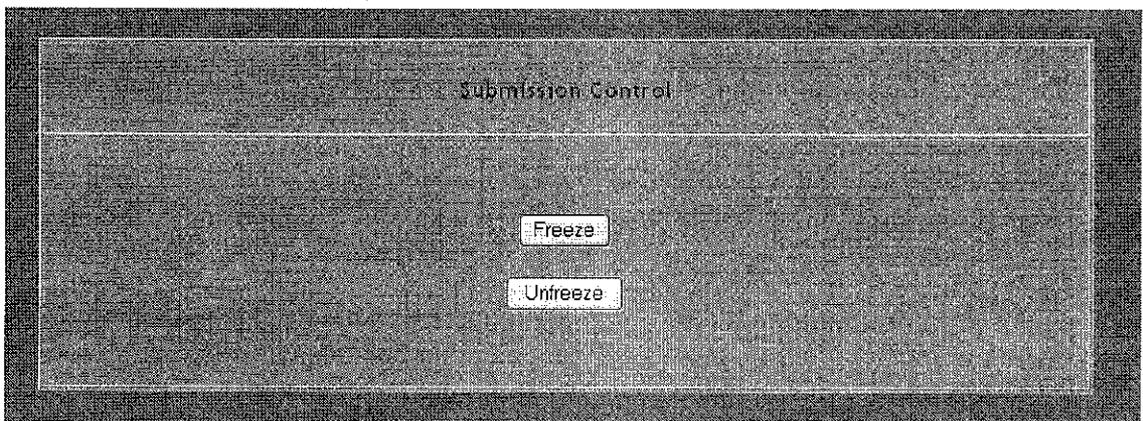
iv. The confirmation message will be prompt to the webmaster in order to reconfirm on the submission control for the user. These 2 interfaces show the respective message for freeze and unfreeze the submission.
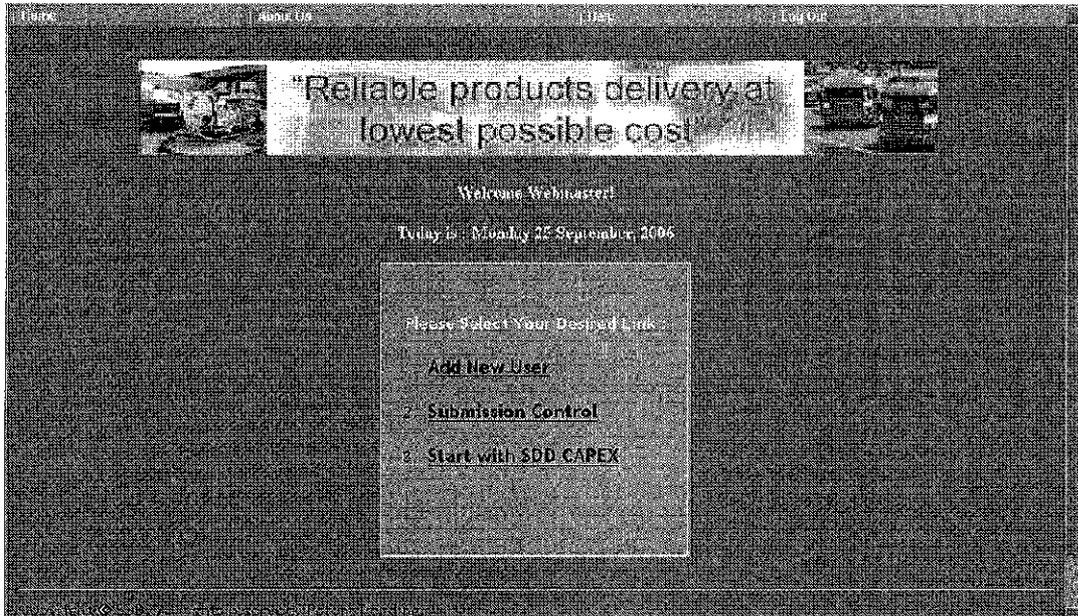
- To freeze the submission
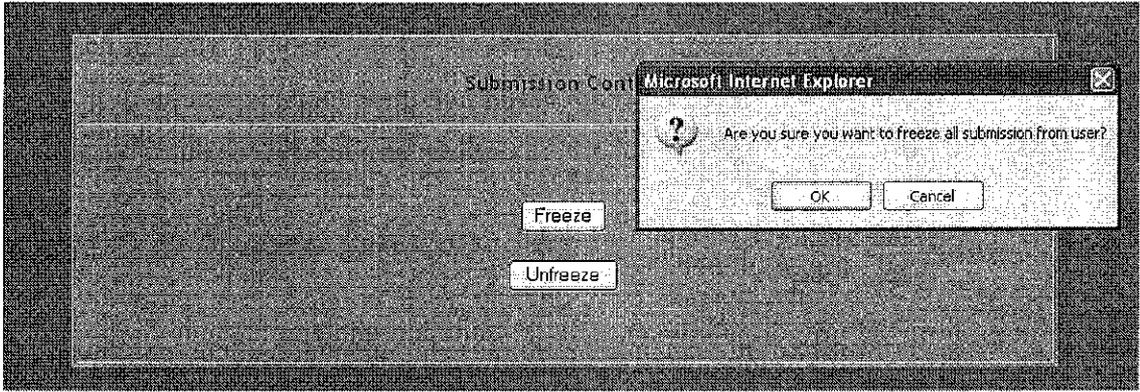
- To unfreeze submission

c. Start with SDD CAPEX – this link webmaster to start with the main CAPEX operation.

i. This is SDD CAPEX Request Form. User will have this when they want to submit their CAPEX proposal.

- **PART A : Background**

- The continuation of the request form of PART A Background

- PART B: Technical Evaluation by Engineering Department They will revise the cost for the project, and calculates the ROI.

- PART C: Authorization and Final Approval The webmaster will determine the status for the project and approved by the GM of SDD.

SUPPLY AND DISTRIBUTION DIVISION
CAPEX REQUEST FORM

Requestor :	MOHD SHAHFREE MODH YUSOF
Dept/Depot :	PRAI BULK DEPOT
Capex Title :	NEW 12" MARINE LOADING ARM & PIPELINE MODIFICATIONS FOR COMMON-LINE (MOGAS+ADO)
Type :	○ Normal ○ Normal
Capex Category :	○ New Project ○ Operational Project ○ Fixed Assets ○ IT

| PART A: Background | PART B : Technical Evaluation Dept (Except for IT Equipment) | PART C : Authorization & Final Approval |

Status :   ○ Proceed   ○ Rejected   ○ Defered

Comments :

9. SDD Summary: The data is compiling from headquarters, Peninsular, Sabah and Sarawak and based on the installation

SDD Summary

Click Here to Refresh

| SDD | HQ | Region | Installation |

SDD CAPEX FY 05/06 SUMMARY

No	Category	Accruals	Initial Approved Budget FY05/06	Anticipated Payment for FY 05/06	AFE drawdown FY 05/06	BUDGET STATUS
A	PROJECT	0	0	0	0	0
B	OP UPG BULK	0	0	0	0	0
	OP UPG JV	0	0	0	0	0
	OP UPG AVIATION	0	0	0	0	0
	OP UPG LPG	0	0	0	0	0
C	FIXED ASSET	0	0	0	0	0
	Total	0	0	0	0	0

10. Depots Summary Details: Webmaster's can choose individual location by selecting the major categories whether it is from headquarters, Peninsular, Sabah and Sarawak.
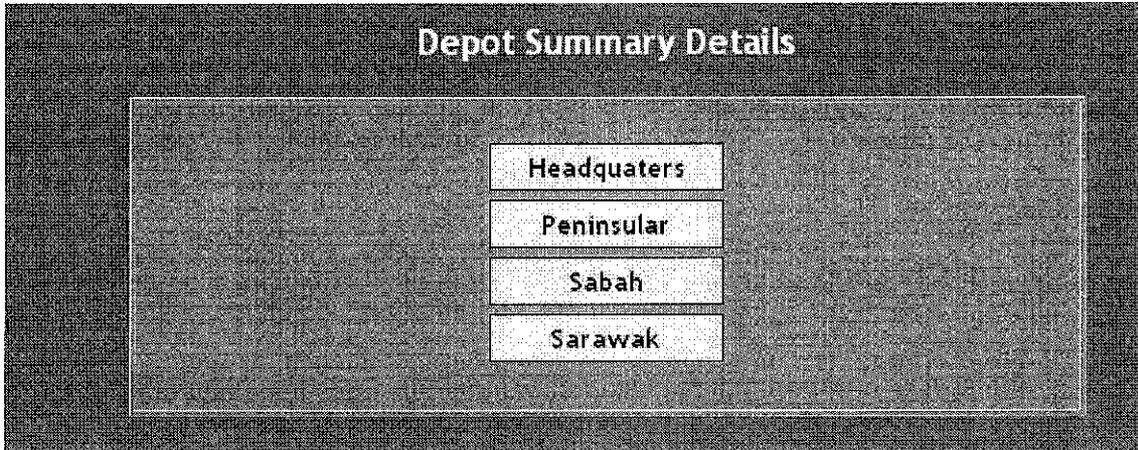
a.   This screenshot shows each location in the Headquarters tab. In this case, their have 7 locations.
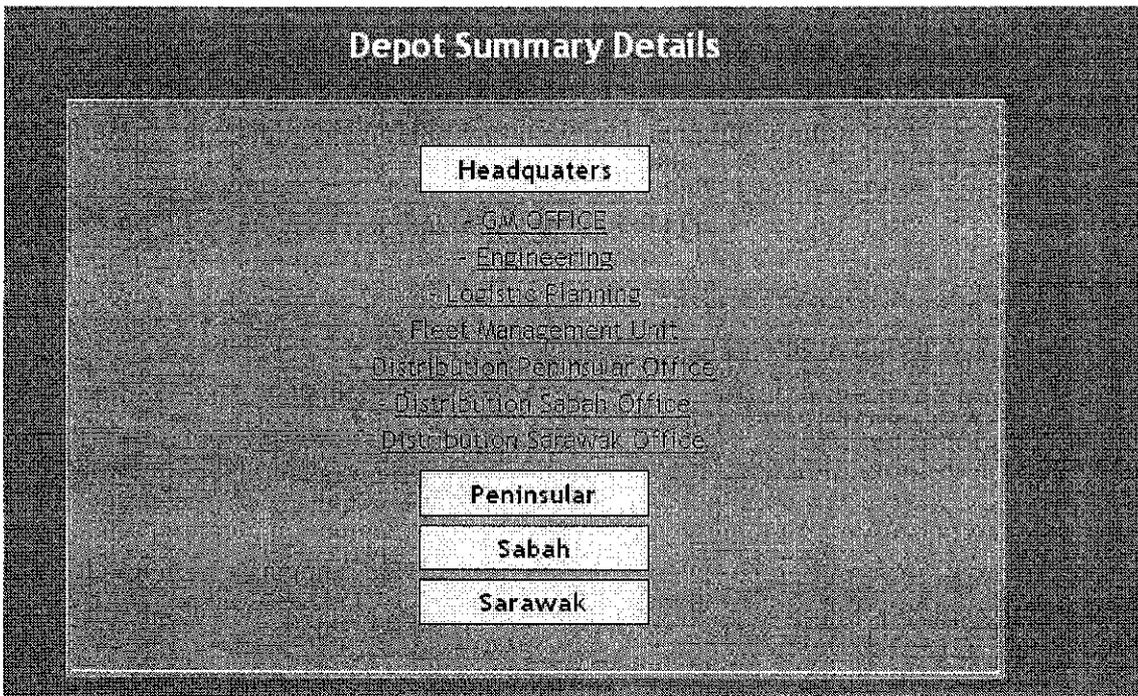
b. For this screenshot, it shows the tab for Sabah Region. In Sabah, we have 3 installations, which are Bulk terminal, LPG Bottling Plant and Aviation Terminal. Each installation has its own location (Terminal).

Depot Summary Details

Headquaters

Peninsular

Sabah

LPG Bottling Plant
Sepangar Bay

Aviation Terminal
Kota Kinabalu
Sandakan

Bulk Terminal
Sepangar Bay
Labuan
Sandakan
Tawau(PDB)

Sarawak
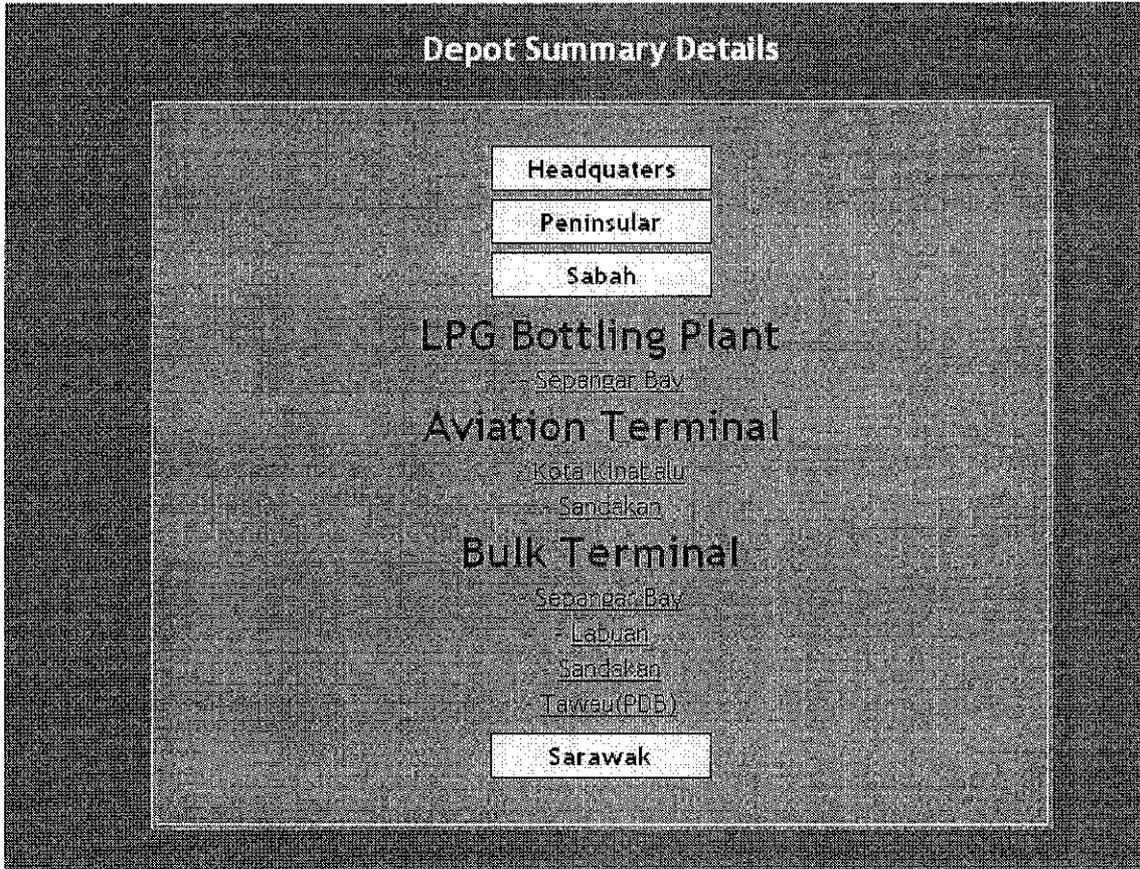
4.2 DISCUSSIONS

The experience of developing three modules for SDD has been a big opportunity and a great chance for me to enhance and sharpen my skills in developing dynamic website applications. The experience and the knowledge do help me in the process of developing the fourth module for SDD, which is online CAPEX.

4.2.1 Database Management

One of the findings is that, when we deal with database management, it requires a lot of work and sometimes the tedious one. We need to maintain consistency and integrity of the database since these data is crucial and important to the department that deals with budget and their CAPEX for a project and this means dealing with thousands and millions of ringgit (MYR).

To make sure the consistency and the integrity of the database, maintenance and housekeeping the database is crucial. This is to ensure minimum number of data redundancy, normalized table, and the accuracy of the data.

4.2.2 User Requirement

When you deal with user, it is hard to satisfy their requirement. Sometimes, their requirement is unclear of, not adequate and involves technical evaluations. Therefore, before developing the website, research and study on user, and their requirement are crucial for any project development that involves our client.

In user requirement, we have two types, which are functional and non-functional requirement. This also includes the user's preferences on their interface for the website and this is not specific to one person. It includes the webmaster, the managerial levels, and the normal user.

4.2.2.1 Functional User Requirement

The functional requirement is resulted from the analysis of the manual and filing form and the day-to-day operation that took place during CAPEX. From this study, the user divided into 2 categories, which are the webmaster and the normal user.

Webmaster:
- √   Add new user
- √   Submission Control
- √   Approval Management
- √   View SDD Overall Summary
- √   Webmaster Documentations – Help Menu (Webmaster Mode)

Normal User:
- √   Add & Submit new proposal
- √   Edit the existing proposal
- √   View the summary of their location
- √   User Documentations – Help Menu (User Mode)

As for the system, they wanted the normal process (filing and manual process) to be online web-based application. The system is able to do as follows:

- √ Collect all data from 44 depots
- √ Generate SDD Summary
- √ Authorization Control

4.2.2.2 Non - Functional User Requirement

While the non-functional requirement that needs to give attention is to ensure the reliability of the database, consistency, accuracy, robustness, and the database integrity that we can promise for the system. These criteria has to be monitored at each process of system development, during the interface design, database development, testing and implementation phase so that the standardization and consistency are maintain throughout the whole process.

4.2.3 Backup and Recovery

For further discussion, I had explored more functionality that the database tools can provides. Everyday in business expose to all kinds of risk, threads.

Inevitably, databases are damaged or lost because of some system problem that caused by human errors, hardware failure, incorrect or invalid data, programs error, computer viruses, network failures, conflicting transactions, or even natural catastrophes.

We can also have all kinds of database failure such as application failure, incorrect data, system failure, media failure, instance failure, or even database destruction. The examples to this failure such as damage to disk storage devices, file system failure, OS failure, or database destroyed and cannot read.

In HQ, KLCC, they already have some recovery facility restoring the database after a loss or damage caused by power interruption or natural disaster. The tape recites in the server and when blackout of electricity, it will automatically save all the data that recite in the server.

As for the storage and the capacity of the hard disk or other means of backup and storage purposes, 300MB is required for storing the files and the database. The database has the backup services for exporting the data into .sql file or .txt. The data is stored using SQL statement for creating and inserting the data.

4.2.4 User's Feedback

During the brand council meeting, I am so lucky to demonstrate some parts of the system to the managers from all over region. They gave us positive feedbacks on layout and the functionality of the system. They were so impressed with the work and the effort that we put into because they know that the system is for them.

However, they also suggest some additional requirement and some important functionality from their point of view. This is because the requirement gathering is only from one party in HQ, the budget coordinator and the users in HQ. There is also still some improvement and enhancement needed for the system so that best fit the user requirement specification.

CONCLUSION AND RECOMMENDATION

The system is design to improve the process of generating CAPEX by automating it. To ensure that the system really help those intended users, the system must be reliable anytime the user is required to access the database and will give the user the latest and updated values automatically.

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.

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.

BIBLIOGRAPHY

1. John Wiley & Sons.Inc, "System Analysis & Design (An Object Oriented Approach with UML), Alan Dennis, Barbara Haley Wixom and David Tegarden.

2. Pearson Education Limited, "Software Engineering" 7th Edition, Ian Sommerville.

3. H.M Deitel, P.J Deitel, A.B Goldberg (2004) "Internet & World Wide Web, How to Program".

4. Thomas Connolly, Carolyn Begg (2003) "Database System, A Practical Approach To Design, Implementation And Management".

5. Daniel G. Riordan, Steven E. Pauley (1999) "Technical Report Writing Today 7th Edition.

6. Addison-Wesley, Craig S. Mullins(2004), "Database Administration; A complete Guide to Practices and Procedures".

REFERENCES

[1] Ian Lurie, The Written Word, Inc. Spreading Out : Why Internet- Based Software is the future of corporate computing – December 31, 1998

[2] Parliamentary Office of Science and Technology (Postnote).Open Source Software – Number 242 June 2005

[3] Supply & Distribution Division (SDD) OPEX 2005/06

[4] Supply & Distribution Division (SDD) CAPEX Request Form

[5] SDD CAPEX FY 05/06 Summary

[6] SDD CAPEX Process Flow

[7] Limits of Authority (LOA) Principles Form

[8] SDD Authorization For Expenditure (AFE) Form 2004 & 2005

[9] SDD Project Creation Form 2004

[10]   Previous Modules Documentations

       a. Online Terminal Information Systems

       b. Online Budget System

       c. Online Monthly Performance Report

[11] Advice and Support from:

Name	Position
En. Mohd Azmir Hisham Bin Zabidi	Manager, Network Optimization
En. Hafis Bin Sahak	Executive/ Logistic Planning Department
Ms. Sarah Binti Abdul Rahman	Executive
En. Lokman Bin Noh	Executive

LIST OF FIGURES

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ABBREVIATIONS

PDB	Petronas Dagangan Berhad
SDD	Supply and Distribution Division
LPD	Logistic and Planning Department
CAPEX	Capital Expenditure
OPEX	Operating Expenditure
LOA	Limits of Authority
AFE	Authorization for Expenditure
IRR	Internal Rate of Return
ROI	Return On Investment
OSS	Open Source Software