PETRONAS DAGANGAN BERHAD NOTIFICATION SYSTEM

By

Mohammad Fakrurradhi Hamthan
11272

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(Business Information System)

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Universiti Teknologi PETRONAS
Bandar Seri Iskandar
31750 Tronoh
Perak Darul Ridzuan

CERTIFICATION OF APPROVAL

PETRONAS Dagangan Berhad Notification System

By

Mohammad Fakrurradhi B. Hamthan

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Approved by,

_____

(Baharum Burhanudin)

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
May 2011

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 the acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or person.

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MOHAMMAD FAKRURRADHI HAMTHAN

ABSTRACT

As normal working life, workloads and deadline are something that cannot be separated. As part of world's leading company in oil and gas industry, PETRONAS Dagangan Berhad, or Dealer Management Unit, Retail and Sales Operation Department to be specific, face the same problems. The staff keeps missing the dateline as we speak and that will, at the end of the day become a huge problems to the department. It is in fact has been quite a major problems in the department ever since. These problems actually can be solved if the staffs are equipped with some notification system that tailored to their need.

After been through some of discussion and series on interviews, a system that specifically serves the purpose of assisting the staffs is now completed. It was being done by referring to some existing notification system architecture and the way its functions. The system, on the other hand has several improvement that can be made. The manager, Mr Izzudin however firmly believes that the system will be a useful help to the staffs and achieved the objective that have been set.

ACKNOWLEDGEMENT

It is a pleasure to thank those who made this dissertation possible such as my friends and family who gave me all the support I needed. Many thanks to my supervisor, Dr. Baharum Burhanudin who's encouraged, supervised and supported me right from the preliminary to the level where I manage to complete the system. I also want to express my gratitude to Dr. Rohani from Management and Humanities Department, Universiti Teknologi PETRONAS for suggesting this topic. Not to forget, the manager, staffs and personnel of Dealer Management Unit, Retail and Sales Operation Department, PETRONAS Dagangan Berhad whose have been a great help to me in completing this project. It has been a great experience developing this project and only God can repay you guys. God Bless.

Fakrurradhi Hamthan

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CHAPTER 1
INTRODUCTION

Background of Study

Notification system has become one of the essential elements to nowadays organization's business processes in order to gain competitive advantages. It has **been** applied as a decision support system in major area such as production, project management, aircraft management and also academic institution. Effective notification system not only can make the flow of works smoother but also can increase productivity.

There are a lot of types of notification system that available in the market but none of it suits my client's need which is Petronas Dagangan Berhad (PDB). They aim to have a system tailored to their needs but does not involve any cost since they did not have budget for such system. Another thing that I have studied throughout this project is how to actually use active database. I learned on how to create one and integrate the database with my system. My system need a database that have to be up to date with real time worlds and since I did not know much about database, I am very sure that this is one of the major field of study that I have explored while completing my project. As we all know, dealing with database is quite tricky. Even a very simple mistake can lead to a failure. Therefore, I have to possess a good knowledge about database from design stage until implementation stage.

I also looked into how to actually reduce the time taken for data retrieval. My system had to deal quite huge database and there is a lot of its functions deal with data storing and retrieval. Thus, it has become one of my main scopes of study on finding an algorithm to solve the problems. Also, I have been focusing on finding ways on how to ensure the quality of the database in term on data integrity, consistency and accuracy. It is all about these three features when we talk about good database.

My last field of study was on how to design a system according to client's specification.

For your information, I'm dealing with the staff of PDB in determining the system specification. It is like killing birds with two stone. I can learn about those technical aspects and knowledge when designing the system and its database until it implementation and I also can learn on how to deal with a client to design a database. It is indeed a rare experience that not everyone can get. I can practice my interpersonal skills that I have learned all this while and put it into real life situation. Based on the meetings that I have made with the staff, I have to admit that it is not as anyone would think. I also learned on how to design a system that is very useful and impressive in term on usability and navigation. It is including the interface, the button and the functions of the future system.

Problem Statement

I had a meeting with the manager, En. Izudin at the ASEANA Café, KLCC on 21st March 2011. Our first meeting is basically about determining system specification and identify the problems. Based on the meetings, I found that the main problem that faced by the staff in they kept missing the deadline and that has happened since few years back. According to Mr. Izudin, it is very important for them to meet the deadline because if they miss it, the task will become more and more and eventually becomes a burden to the staff.

As per date, everything was done manually. I mean they have to jot down all the important dates in their diary and often, they forget to check it. It is human to make mistake, but Mr. Izudin said that they cannot afford to keep repeating the same mistake over and over again because it will cost PETRONAS a lot of money. We are not talking about 10 or 15 dates but hundreds of different date and each of it have several things to do. There is a case when a staff has to handle 30 things in a date. Things like issuing offer letter, scheduling the site visit and so on can give the staff headache if there miss the deadline. He said that it will be very useful if they have a system that can serve the purpose as reminder for them. He believes by having the

system, they can at least meet most of the deadline and can focus on the task at hand. The system obviously can give a lot of benefit to the department such as increase productivity, reduce stress and so on.

They have tried several systems in the past but it seems that the system cannot solve the problems. Mr. Izudin really hopes that my system can solve the problems and looking forward to see the output soon.

Objectives

In conjunction with that, the main objective of this project is **to reduce the number of postponed task to 40 cases within 6 months after system deployment**. Apart from that, this project also aim to achieve these highlighted objectives as follows

- To design a system that can assist PDB's staff in executing their daily task.
- To feel the experience in designing a system that will be used in real world. (on-job environment)
- To come out with a way to overcome the data related problems.
- To create a user friendly interface that came with the system.
- To compare and benchmark the studies of this project with related works.

Scope of Study

As mentioned above, there are two main field of study that I have been focusing on for my system which are 1) Active database and 2) Designing effective client end system.

1) Real time database

   An Active Database is a database that includes an event driven architecture which can respond to conditions both inside and outside the database. Possible uses include security monitoring, alerting, statistics gathering and authorization. It is quite complicated in term of design and implementation

since active database usually very flexible especially when it comes to data manipulation.

2) Designing effective client end system

There are several attributes that my system has to follow before being categorized as effective client end system. Among of the attributes are navigation, interface design, usability and many more. It is not that easy to come out with one but also not too difficult. It will be quite easy if I get full understanding about the system as a whole especially in term of functions and layout/design.

Feasibility Study

- **Technology Feasibility**

  In term of technology, I strongly believe that this system is very suitable simply because I used a technology that already been used and easy to find in the market. The technologies are Microsoft Visual Basic programming suite software and a database programming software. I have decided to use Microsoft Access 2007 as the database and MySql to manipulate data. It is because that those are the easiest for me to understand and easy to integrate it with my system.

- **Economic Feasibility**

  From economy perspective, this project is very feasible since the cost involved is very little. I got the programming languages software for free from the lecturers. The only expenses that I used for this project is travelling cost between Tronoh and Kuala Lumpur whenever I have a meeting with PDB's staff to discuss about things that related to the system.

- **Operational/Organizational Feasibility**

  As mentioned above, this program will definitely give such huge impact on both company and staff. This was said by the manager and the workers themselves. They also said if this project is complete later on, they will use it throughout different department in PDB. So, I

strongly believe that this project is absolutely feasible to PDB generally and the personnel specifically in term of operational effectiveness.

- **Schedule Feasibility**

  Last feasibility aspect that I took into consideration is schedule. I personally confident that this project will complete within given period which is before September 2011. I am sure that there will be several problems emerge as the process goes by but I am quite confident that I can solve it before the due date.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

For this part, there are THREE main areas that I look into for my project which are notification system, active database and end user system architecture. These three aspects are the important field of study that I have to understand thoroughly before start developing the system.

2.2 Concept of Notification System

A modern **notification system** is a combination of software and hardware that provides a means of delivering a message to a set of recipients. For example, notification systems can send an e-mail when a new comment has been added to Facebook. The complexity of the notification system is often dependent on the types of messages that must be sent.

There are several features that will justify a notification system is actually a good one. According to Jones and Payne [1] there are 3 main criteria that a notification system has to fulfil before being categorized as a good one. The criteria are as follows:

a. **Opt in**- notification system is only as good as the contact data contained within. Uploading recipient data is not ideal, as data can be wrong or invalid. Therefore, notification systems with opt-in data collection can validate data in real time for all said errors and more. In other words, a good system should be able to capture only valid data and get rid of the false one.
b. **Escalation** - The criticality of an event might change before the event is finally resolved. Sometimes a small failure may trigger a chain of failures that can lead to events that require immediate attention. For example, a notification for a particular date somehow did not show as it suppose. It might create a chain reaction where the task will be legged and create another problems to the staff. Therefore, my system should be able to prompt user with appropriate message if they missed the deadline.

c. **Delivering**- The effective notification system should yield a clear and understandable result for the user. The message sent should not be cloudy, confusing and incomplete. As per plan, I intent to show the message or reminder in a pop up window but after some consultations, I found it is not suitable and feasible. Thus, I decided to display all the data in the new page using *GridView* function.

2.3 System design

There are three main important aspects [2] that I looked into when designing the system which are navigation, interface and usability.

a. **Navigation**- In term of navigation, the system is equipped with a button or any function that can make it easy to navigate between pages. Besides, the indicator or button is clearly visible. Since my system is not online based, the navigation is much smoother and things like time taken between page transitions should be close to zero.

b. **Interface**- The interface of the system is easy to understand, visible and feasible enough for user to use. It is not suitable if the interface used is too fancy or too plain. As per research, the interface is actually one of main important factors that can influence when using the system.

c. **Usability**. – It is the ease of use and learnability of a human-made object or in my case, the system that I developed. In other words, it can be defined as how long it will take for the staff to used my system and know all its functionality without guidance or manual. The shorter the time, the better it is.

2.4 Concept of Real Time Database

A **real-time database** is a processing system designed to handle workloads whose state is constantly changing [3]. This differs from traditional databases containing persistent data, mostly unaffected by time. For example, a system in process control changes very rapidly and dynamic. The data sent and stored is different in every transaction. Real time usually associated with real time processing. Real-time processing means that a transaction is processed fast enough for the result to come back and be acted on right away. Real-time databases are useful for accounting, banking, process control, reservation systems, and notification systems. As computers increase in power and can store more data, they are integrating themselves into our society and are employed in many applications

Real time database is actually a traditional database. The only different between these two is that real time database use an extension to give the additional power to yield reliable responses. It uses timing constraints that represent a certain range of values for which the data are valid. The range is called **temporal validity** [3]. A conventional database cannot work under these circumstances because the inconsistencies between the real world objects and the data that represents them are too severe for simple modifications. An effective system needs to be able to handle time-sensitive queries, return only temporally valid data, and support priority scheduling.

When designing a system with real time database, the developer should consider how to represent valid time and how facts are associated with real-time system. Also, consider how to represent attribute values in the database so that process transactions and data consistency have no violations. It is to avoid an error occur when doing transaction or data manipulation on the database.

As for my case, when developing this system, it is very important to consider what the system should do when deadlines are not met. For example, on May 21st, 2011, issuance of appointment letter should be sent to 40 selected

candidates to become PETRONAS retailers but due to human error, the staffs miss the deadline. The effect could be devastating. There will be a lot of work legged behind and it will surely give a lot of stress to the staff, resulting in creating inharmonious working environment. To address issues of obsolete data, the **timestamp** can support transactions by providing clear time references

2.4 Literature Review Conclusion

As a conclusion, methods varies when it come to the main objective that we want to achieve at the end of the study. A lot of other ways have been tried in the past to satisfy customers' needs. Indeed many robust systems were developed after the experts discovered new knowledge and apparently it helps the developer to understand more while building the final product. Even though there are so many notification systems that available in the market, the dateline issues still happen. It represented that there is no content and lesson learnt inside the built system. For this project, i decided to integrate real time database with the system and use time stamping as the main solution to get rid of obsolete data.

CHAPTER 3
METHODOLOGY

For methodology used, I chose different methodology for different purpose. In term of building and delivering the system, I choose prototyping because analysis, design and implementation phases occur concurrently. This helped me save the time and allow me to modify the system without to redo it all over again in case of the client want to change their system requirement. Beside, prototyping allow me to quickly begin work on system prototype. Using prototyping, the prototype is actually will be part of the actual system that will be given to the client (PDB) later on and again it can save a lot of energy and resources. Another important reason on why I choose prototyping is because through prototyping, prototype is constantly reanalyzed, redesigned and re-implemented until system is complete. It can create flexibility that I need to deal with changes while developing the system later on.

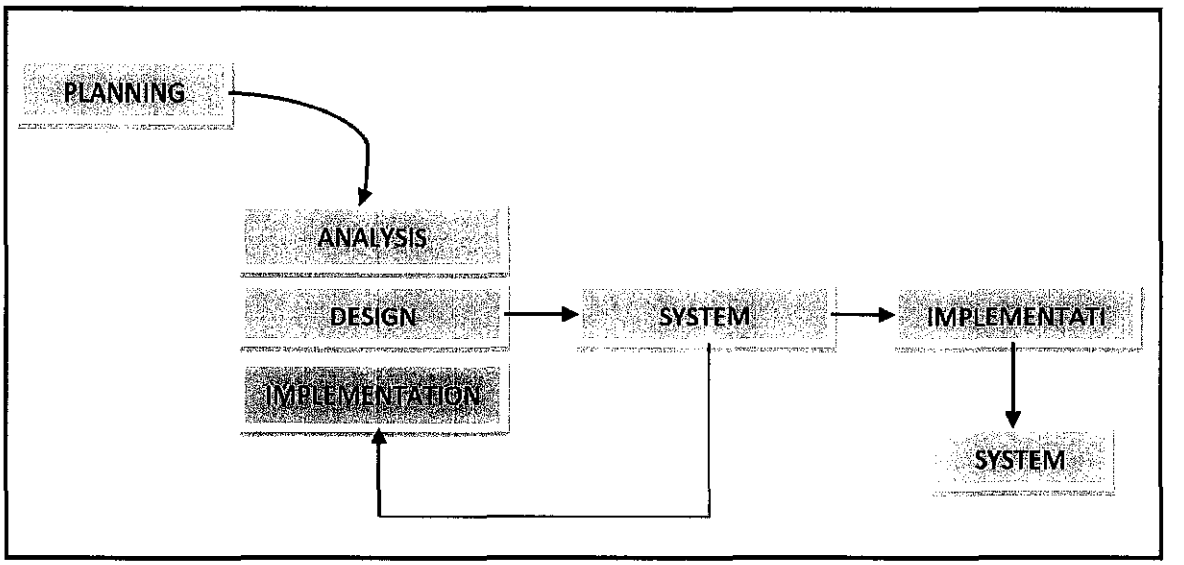

Figure 1: Illustration of prototyping methodology

I also used interview as prime methodology for requirement gathering. As I told earlier, my system deals with real life client and as client, their needs and requirement might change as time passed by. Therefore, **interview** will be a very useful technique that I can used to help me to be clearer with systems specification. Also, interview being used when asking or getting answer from the experts (lecturers or tutors) to solve the technical problems that I encountered while developing the system. It might not look like the actual interview but the concept is still the same. I ask a question and they answer it.

Aside from interviewing, I also used brainstorming in order to get a better idea on what the system should look like. The PDB's staff might not know about the technical term and stuff and I might not know their task that they have to handle. Therefore, a brainstorming session has been quite a useful platform where both me and the staffs can shared our knowledge and managed came out with the best solution.

Project Activities

Phase 1: Planning and critical review of related works.

The problem has to be identified and study of project background which is on real time database that use in variety kind of system and applications need to be done. Work plan and Gantt chart were constructed at first place. A critical review was done in chosen the best type of notification system that can fit client's requirement the best as well as identify how to integrate future system with the database. Also, review was done on anticipating possible errors and problems that can occur in developing the system. That information was found from various sites on the internet especially from those who faced in before in their system's development process.

No.	Task	Start	Finish
1	**Planning**	January 2011	March 2011

	- Project Definition - Literature review - Data gathering	FYP I	FYP I
2	**Critical Analysis** - Selection - Client requirement - Real time database - System design	March 2011 FYP I	April 2011 FYP I
3	**Design and development** - Discussion - Use case diagram - Object diagram - Architecture and interface design	May 2011 FYP I and II	July 2011 FYP I and II
4	**Development, testing and evaluation** - Develop prototype - Testing and adaptation - Evaluation - Final dissertation and presentation	July 2011 FYP II	September 2011 FYP II

Table 1: Work plan of the project

Phase 2: System identification and requirement.

In this phase, several meetings have been arranged between the author and the client. The first meeting was on 21st March 2011 at the ASEANA Café and Bistro, KLCC. There are at least 4 meetings between them in future which the dates have yet to be specified. The main purpose of these meetings is to identify client's need and what are their expectations of the future system. Apart from that, the meetings also help the author to get better understanding on the problem faced by the staff and ways to overcome it. Also, all the works in determining the system's specification been done in this stage. This is the most important stage where the client make decision about what the future programs should look like and the author specify system's function and attributes.

Phase 3: Design and Coding development.

This is the most technical phase where I have to deal with all technical stuffs like coding and etc. This phase involves the modelling, designing and analysing the pattern or knowledge that gained during phase 2. A lot of diagrams took place during this stage. This is the most critical phase where the beginnings of system's development start.

Phase 4: Evaluation, testing and future enhancement

Results from the findings need to be evaluated. Testing part is involving the end user and external examiners. The system will be presented to the client from time to time to ensure that it follows their needs and requirement. Iterations of phase 2 and 3 may be necessary to introduce fix in the optimization mechanism before the final product or framework can be released. Continuous research and enhancements are applied in phase four. The deliverable of phase 4 would be the dissertation and prototype.

Tools Requirement

For the development and analysis part, these are tools or equipment required:

- Software
  - Microsoft Visual Basic 2008
  - Microsoft Access 2007

CHAPTER 4
RESULT AND DISCUSSION

It is believed that the existence of this system will:

a) Reduce number of dates that being missed
b) Increase working efficiencies among the staff
c) Assist the staff in carrying out their daily task

4.1 Data Gathering

As mentioned earlier, a meeting has been held between me and the staff. The meeting was last for almost two hours. The intention is to identify the problems and system's specification. The meeting begun with the staff presented their problem to me thoroughly. After being identified, they ask me for solution from developer point of view. They also proposed their own solution and we had long discussion finding out the best solution. From the meeting, we managed to identify the root of the problems and come with the details of the system including the interface, flow of the system and basic function.

4.2 Findings

From data gathered, I discover some of the problems that happen in the department all this while. I found that there is no centralized system to notify the employees when there are tasks need to be done in particular time. In fact, some the factors drive to this issue has been identified:

a. Miscommunication between employees.
b. Human error- employee forget the task
c. Budget and financial constraint.
d. Employees' perception about changes in doing work.
e. Some employees prefer to do the works in traditional way which is sticky notes and diaries.

4.3 Analysis Phase Deliverables

The analysis phase involves taking into consideration all the objectives outlined earlier in the planning phase and gather all the information to further proceed with the project. This phase is also where all the requirements are gathered and defined. Most of the requirements are defined in the details and information obtained from discussion with the Manager, Mr. Izzudin Abd Ghani and the staff, Mr. Azri Rizal Aznan. Apart from analyzing discussion, another method used to define requirements is by analysing the document given by the client. There are actually some documents that being given by the client to make it easier for me to understand better about problems faced and appropriate solution. The requirements determination step is the single most critical step to the entire System Development Life Cycle (SDLC).

Analysis on system design

After several months developing my systems, I managed to come out with a rough looks on how the system will looks like. The system is basically made up of THREE main interfaces. There are reasons why I keep the number of interfaces created limited. It is because my client wants to keep the system as simple as possible. They did not want the system be too fancy up to the extends that it will make it harder for the staff to used it. In this section I will briefly explain what is my system looks like and how exactly it will function. Below is the print screen of the system followed by the explanation respectively.

Interface 1:

Figure 2: The main page of the system

As can be seen, there are 3 main buttons created in the interface. These are basically the function that being requested by the client. The *summary report* button will direct user to another page that will be explain below. Same goes with *Enter Data* button which will allow user to perform another function created in the system.

For *View Notification* button, it has special function. Whenever a user click at the button, the system will prompt an output box that will list down the all the tasks that due within 2 days after the current date (Current date=date when user run the system).It will somehow enable the staff prepare some of document needed to get the job done. It also gives the staff extra time to prepare themselves and do arrange their work accordingly. However, the system will automatically produce an output box showing the list of task that due on the current date. It helps to remind the staff should they forget to see the notification manually. This is also one of the specification that personally asked by the staff.

Interface 2:

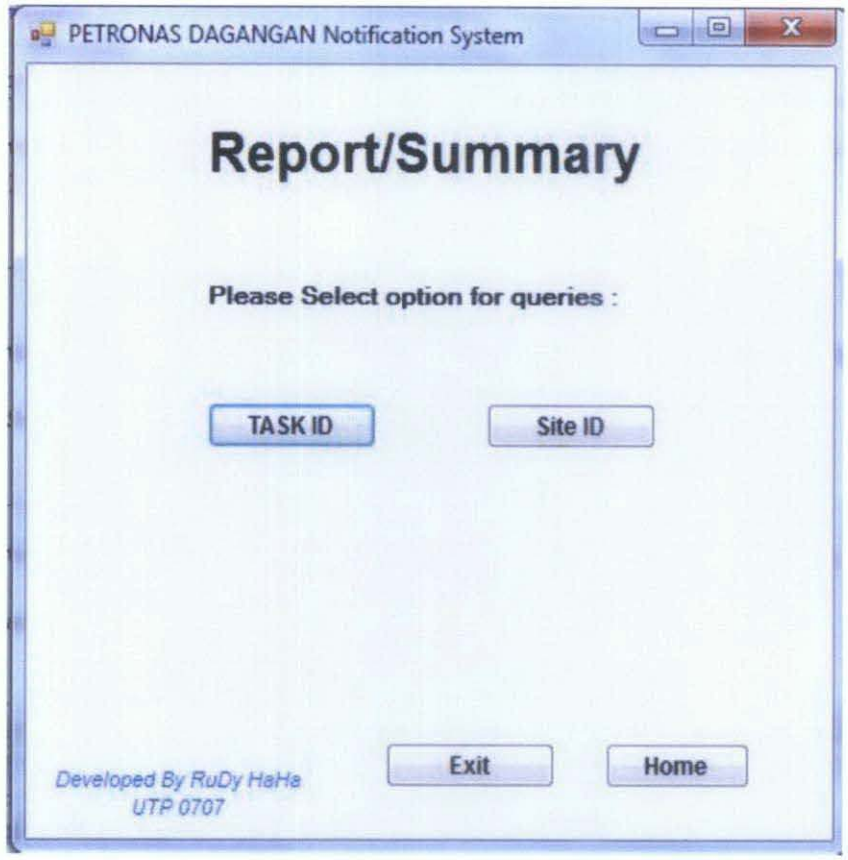

Figure 3: Report/Summary page

This is the second form in the system. As written on centre top of the interface, this page enable user to view notification for a particular dealer. There are two options for the user, they can choose either Task ID or Site ID for their queries. Each will led them to different pages. For your information, the staffs do keep a list of the dealer/distributor manually for reference purpose. In the database structure which will be discussed later in the section below, I made site ID as the primary key for the database because it is the only attribute that can distinguish one transaction from another.

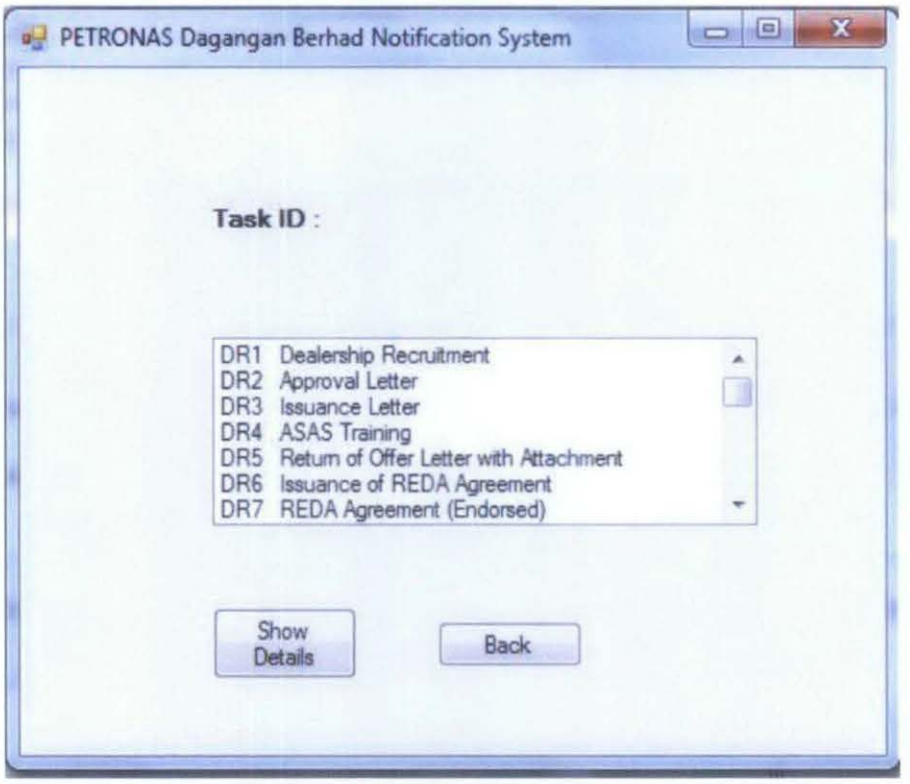

Figure 4: Task ID is being selected as the queries

This is the page the user will be directed if they choose Task ID as their queries. As you can see, the task involved is listed in the list box on the page. The user can simply choose which task that they want to see and the system will display the site IDs that associated with the selected Task ID as well as their due date as soon as they click button *Show Details.* The list later will be displayed on a new form in a grid view table for better representation.

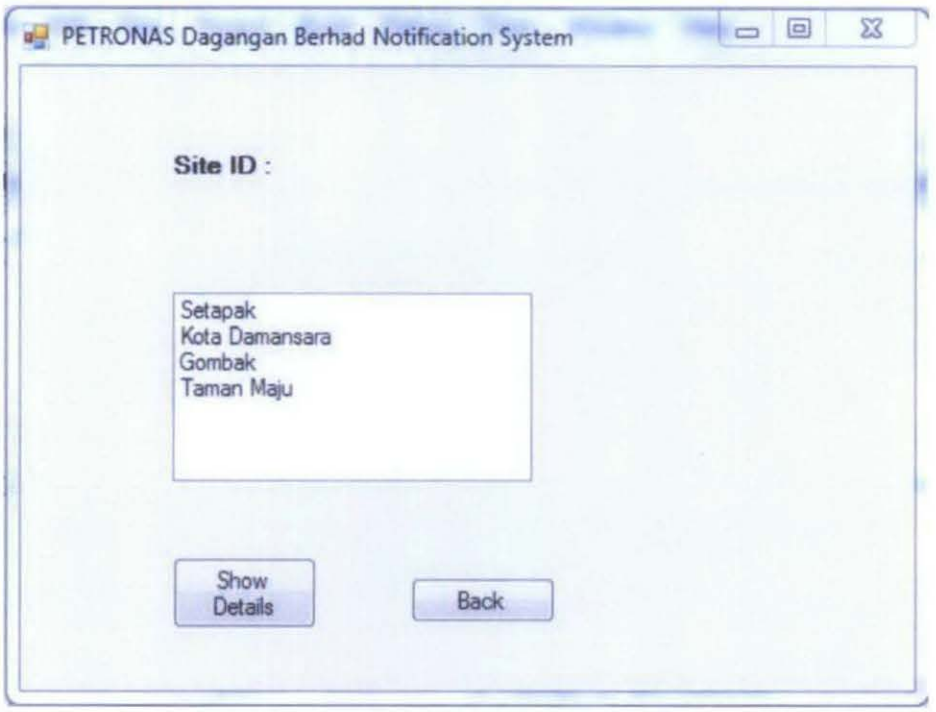

Figure 5: Site ID is being selected as the queries

On the other hand, this is the page where user will be directed if they choose Site ID as their queries. Once selected and user click button *Show Details,* the system will prompt the task that yet to be done with that associate with the selected ID. The main purpose of this particular page is enable the staff to view the history of a particular Site ID, meaning that they can view which transaction that they had so far with that Site ID up until current date. The staff said that it will make it easier for them to retrace back the transactions and update their records.

Interface 3

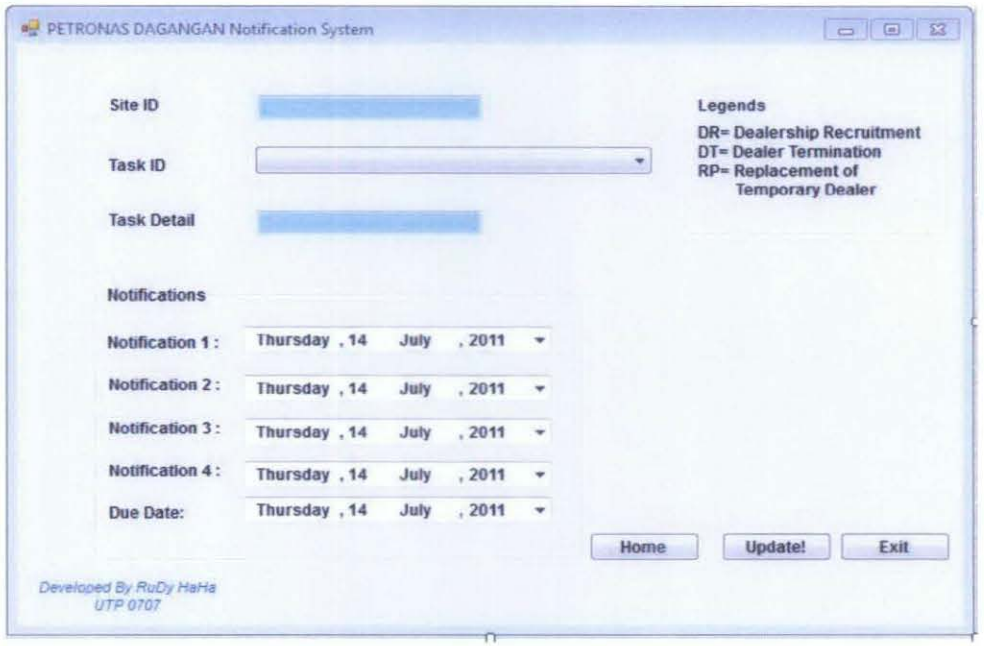

Figure 6: Enter data page

This is the last interface created in the system which is also the most important one. This is where the staff enter the all the transactions that they want to reminded by the system. At first, they asked me to put up to 10 dates for a particular task but after reviewing it and discuss with the staff, I managed to reduce it to 5 dates only. Note that the date is based on real time date, therefore the date that has passed will be disable by the system in order to avoid any error. Also, the staff decided to limit the transactions to the most crucial one because according to them, if they were to list down all the transactions, it will be very tedious because there are like hundreds of them.

Then, as soon as the staff click button *Update,* there will be a pop-up window asking the staff whether they really want to save the transaction or not. Once clicked, all attributes in the form will cleared for the next transaction.

As precautions, I also put an error checking functions in every interface and action that need input from user. It mainly because I want to reduce the error produced in the database to minimum. By doing that, it is not just increase user's feasibility but also their easiness in using the system. The little the

effort needed for the staff to use the system, the better it is. This is however not the final system. The system will be altered as I'm being informed by the staff that they might be a little bit of modification needed on the system.

Analysis on system flow.

Figure 2 show how basically the system will works. This flowchart shows what the input are, process, sub-process, and output involved.

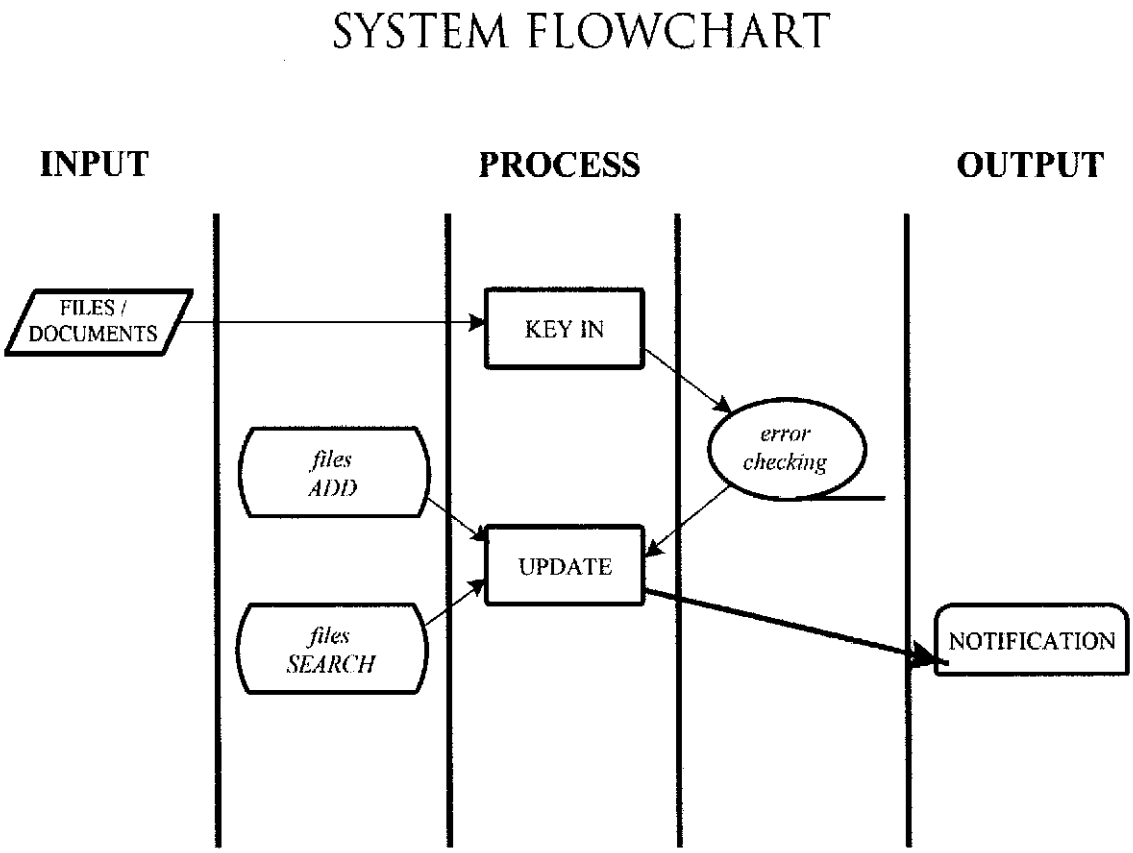

Figure 7: flowchart of the proposed system

As can be seen above, I developed the system and do everything I can to minimize user's effort and memory to learn everything about the system. In other words, I manage to came out with an interface that are feasible and ergonomics enough for user to use. The crucial part of my system is database manipulation especially in entering and retrieving data. Managing active is

not an easy task, the queries part to be specific. Therefore, it would be great if the interface is just simple and easy to use. Beside, designing an effective user interface is also one of my research areas and I implemented it while designing the system.

According to the flowchart, there user only have to key in data into the system. As explained before, I tried to minimize user involvement in the system. The details of how every features work have been explained in the section above.

Analysis on discussion done.

Discussion is the most common and direct method to gather information.. Below is the interview report produced consequent to the interview process itself:

Person Interviewed: Mr. Izudin Abd Ghani, Manager, Dealer Management Unit,Retail Sales and Operations Department, PETRONAS Dagangan Sdn. Bhd.

Interviewer: Mohammad Fakrurradhi Hamthan

Date and Place: 21st March 2011, ASEANA Café in KLCC

Purpose: to obtain better understanding on the current problems and the requirements for new system to be developed.

Summary of Interview:

Functional requirement is what the developer wants for a system to do and perform. The system should be able to follow the guides and advise from the users. Users have a little idea of what a system could attain for them. The strong relationship between the developer and the user is recommended in order to achieve both mutual understanding. Both parties have another party's

contact for communication purposes. The information obtained from the discussion has been explained in previous section.

Another important that both parties managed to come out with is the schedule of next meeting. Tentatively, next meeting will take place somewhere in early July and Mr. Izudin expect that he will be able to see at least the prototype of the system. Any inquiries or doubt will be answered through phone and emails. In fact, we have been exchanging emails all this while to settle some problems like the system specifications and desired interface.

Then, from the meeting, we did discuss about intellectual property and ownership issue. Both parties agreed that the ownership of the idea will belong to PETRONAS Dagangan Sdn. Bhd but the intellectual property will go to UTP and the developer. This is important since the developments involve outside party and will be useful if the system is going to be commercialized late on. If the system were to be sold in the market, the developer will get payment in term of royalty.

Other than things listed above, the client also specify some of the requirement that they want the system to meet. The requirements are listed as below:

i. The system should be able to handle huge amount of database. For example, a site_ID could involve with a lot of transaction and the problem with previous system is that it will hang and up to the extend where the user must forcedly close the system and start the process from the beginning. It will be troublesome if user enters a lot of data and they have to do it all over again.

ii. The notification must be clear and understandable. Therefore, the client request me to equipped every interface with legend to show which site_ID stand for which site and what task_ID represent particular task. So, I instead of try to compress everything into a pop up window, I can simply display site_ID with correspondent task_ID to make it tidier.

iii. "Enter data" function should be the main process. This is why actually this system being developed at the first place. The process must be clear and error checking must be done in every data transaction to maintain data integrity. Another things requested by the client is that number of task should be

flexible. They said that every site did not have same numbers of transaction. Some may involve only one or two transaction, some may involve a lot. Therefore, the client want the task can be added up to 10 task for a site_ID.

Usability test

As can be seen, I developed a system for a real customer and it is important to ensure that my customer is happy with the way I designed the system. In order to verify that, I've arranged meetings with the staff. The meetings were smooth. Basically what I did in the meeting is presenting the progress on the development of the system to the staff, Mr. Azri to be specific and ask him about the improvements that can be made to the system. The last meeting were on 5th August 2011 and it was held in KLCC, Kuala Lumpur.

CHAPTER 5
CONCLUSION AND FUTURE WORKS

This project highlights the important of notification system in managing organization's daily task. Problems and appropriate solution has been identified. They system will be simple and easy to learn. I strongly believe that this system will actually help the staff in managing their work and keep them alert. As being said by the manager, he personally thinks that the system will help his subordinates to increase their productivity and meet the Key Performance Indicator (KPI)

In line with the objective, both parties which is me and the manager agreed that the existence can help them in carrying out daily task and they may achieve the objective that have been set within targeted time period.

5.1 Future research

Future research includes further refinement of the system and development of another version of this system which is equipped with more functions. It should make the system more efficient and offer even better guidance to the staff.

5.2 Limitation

As per observation, I found that my system do have some limitation. The most obvious one is that I did not include the update and editing function in my system. For example, the staffs want to do some modifications on the task that they had entered and they cannot do that with my system. Reason being is that first, it is off my knowledge on programming since it is too complex and the second one is that time constraint. I am a full time student and I do have other commitments for other subjects. Therefore, I found it difficult to complete that particular function within the time given.

Next, I found that my system looks too dull and unattractive. I mean when user run the program, it will look plain and simple. Still, as the manager said, it's the system's function that matter the most, other can wait. So that is exactly I did, focusing on the functions of the system.

5.3 Recommendation

There are several recommendations that I want to suggest to the staff. Among that are:

a) They might want to go and hired some certified programmer to finish whatever functions that are not available in the current version of system. I have my limitation in programming knowledge and given the numbers of commitment that I had, I can say it is quite impossible for me to complete the system according to what the staff want.

b) They have to avoid putting too many task and job in a system. Based on my observation, the staff tried to put as many function as possible to the system and it might not feasible and suitable to the staff. Although it seem it is but it will be complicated when they used it later on. Rules of thumb, always keep your system prompt and understandable and that exactly what I did with the system.

REFERENCES

1. Martin K. Jones and Eugenia B. Payne, (1995), "Advance notification system and method", Global Research Inc. pp. 81-90
2. Russel, Gary P. (1997), "System architecture – an extensive review", Unisys Corporation.
3. Paton, Norman W; Díaz, Oscar (1999). "Active database systems". *ACM Computing Surveys* (NY, USA: ACM) **31** (1): 63–103
4. G.K Gupta,"Introduction to Data Mining with Case Studies",Prentice Hall of India,2006,pp.69-71

APPENDIX