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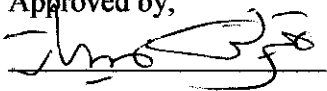
**Transportation Management System (within NAFAS fertilizer factory)**

By

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A project dissertation submitted to the  
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(BUSINESS INFORMATION SYSTEM)

Approved by,



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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.



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SAIFUL FITRI ZULKIFLI

## **ABSTRACT**

The main objective of this project is to develop a system which may help Small and Medium sized Business (SMB) company that can enhances their business activities. In enhancing business management, new small companies seem to have difficulties in organizing and controlling their activities. In this case focusing to a transportation company, the lack of new technologies to enhance their business activities become a major problem. Lots of transportation company operates their business manually without having any automated system.

In this case, the system will replace the manual system which has been used for a long time. It is known that manual system is not efficient and time consuming. Rather than that, it is also difficult to retrieve and organize all the data and the information for the company transaction. If new technologies replace the manual system, the business activities will be more efficient, productive, and reliable.

The study took place on certain areas which occur among the user and the working environment. Some existing systems have been studied for that purpose.

The prototyping methodology is used in order to develop this system. Prototyping has become the design technique of choice for many system designers and builders. It is a technique for quickly building a system because it is an iterative process involving a close working relationship between the designers and the users.

The finding of this project is that this system consists of a few functions which are security and user authentication function, business transaction function and generate report function.

As a conclusion, this system is really useful in helping the Small and Medium Sized business in controlling and managing their business activities. In addition, the objective to automate the manual system is achieved.

## **ACKNOWLEDGEMENT**

Completing a project on this title is a very intensive process and it takes the support and dedication of many people to make it possible. Above all, I would like to express my gratitude to the Lord Almighty for giving me the strength, wisdom and patient to complete this project on time.

My deepest gratitude goes to Mrs. Mazlina Mehat, Final Year Project (information System) Supervisor for all the guidance, advices, incentives and of course her patience which have given me the motivation and strength towards finishing this project.

Special credit goes to the management of Hayara Sdn. Bhd. and National Farmers Organization (NAFAS) Penang and Kedah for giving me the opportunity to done some research in their premises, plants and their working territories. Your full cooperation is very pleased and I hope that this system I built can make your business activities easier and efficient.

I must give thanks to my beloved parents whom had given me the inspiration to carry the project through the end. Not only this FYP project but their encouragement and support for me to come as far as I am now.

Lastly, this project would not be completed without acknowledging the contributions of my friends, for being helpful and committed throughout the project development. I could not mention anyone's name without slighting dozens others, so the cooperation that you give is so valuable for me in order completing this project.

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## **LIST OF ABBREVIATIONS**

SMB	Small and Medium Sized Business
IS	Information System
IT	Information Technology
TMS	Transportation Management System
NAFAS	National Farmers Organization Malaysia
ICT	Information Communication and Technology

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# CHAPTER 1

## INTRODUCTION

As the business activities grow rapidly in our country nowadays, the existence of a new business also increase. Among this business activities, Small and Medium-sized business (SMB) begin to step forward by implementing new technologies in their business in order to survive in the business competition.

SMB face enormous pressure to fully utilize Information System (IS) for competitiveness while on extremely tight budget. They have little room for error when purchasing and deploying IS. In fact, IS or Information Technology (IT) can become the strategic imperatives that makes or smash the business.

It is about ensuring that every ringgit invested in IS, every resources allocated and every software application in development or production is fully aligned towards the business goals. This approach must incorporate a strong commitment to quality and performance of the applications.

This thesis is all about producing a system for SMB. With the increasing usage of IS in business, SMB should not stick on manual system approach to organize and manage their business. Focusing only on transportation company who operates around fertilizer factory, it should be very useful for this company to adapt a newly automated system to used as their new competitive advantage to survive in the SMB.

## **1.1 Background of study**

The transportation industry in our country becomes more important from years to years. Many small companies already involved and evolved in this industry which provides a good profit. This project is mainly focusing on the transportation company who operates in the National Farmers Organization (NAFAS) fertilizer factory located in Butterworth (Penang) and Gurun (Kedah). NAFAS is the organization which is wholly owned by the Malaysia Ministry of Agriculture and who provides the subsidized fertilizer to all farmers in this country. A number of transportation companies have business transaction with NAFAS and they act as the transporter. The role of these transporters is to distribute the subsidized fertilizer to the authorized representatives and farmers around the country. Due to the increasing numbers in order and transaction, these transportation companies need an efficient and automated system to help them organize their business.

## **1.2 Problem Statement**

### **1.2.1 Problem Identification**

It is been identified that many small transportation companies who deal with NAFAS using manual system. Starts from taking order and even storing data into the database, this manual system creates many difficulties such as data loss, difficulties in retrieving data, lack of security, time consuming and inefficient. The data loss problem usually occur when the clerk accidentally misplace the necessary documents regarding the business transaction. Sometimes, the clerk who is doing the transaction process mistakenly gave the lorry driver the document which supposedly to be kept by the company. This situation surely will produce problem to the company in retrieving the important document. The difficulties in retrieving data problem usually occur when NAFAS or authorized representative for farmers ask the necessary data from the transportation company. Looks for the data in manual system will take a lot of time because the clerk needs to flip through all of the files exist in the office. The lack of security in keeping the data also becomes a major problem to the company. Usually, all of the transactions activities are compiled after the office hour which is 5.00 pm everyday. During the office hour which starts from the morning, all the documents



regarding the transaction is placed in the table drawer located in front of the NAFAS factory where the clerk takes order. Sometimes, the clerk in charge is not available at his desk. Without locking the drawer, the document stored in the drawer can be easily taken by unauthorized people.

### **1.2.2 Significant of the project**

With the existence of this newly system, it overcome the entire problem faced by the companies as it decrease human error, increase data security and increase efficiency. The data stored in the database and all of the information can be retrieved easily. With efficient and effective system, the company may increase their production without having difficulties being interrupted by management problem.

## **1.3 Objective and scope of study**

### **1.3.1 Objectives and relevancy of the project**

The main objective of this project is to develop an automated system that can be used by the transportation companies which deal with NAFAS factory. In order to ensure the success of replacing the manual system which has been used by the company, the top management of the company needs to be aware of the importance of IS in organizing their business.

The next objective is that to increase the level of security in storing all the data and the information. Although it is not guarantee that this system will be protected from any kind of fraudulent, at least it can enhance the term 'data security' in the company. Other than that, the objective is to reduce data retrieval time by the user. Retrieving the data easily to give feedback for customers and NAFAS is very necessary in order to increase the efficiency and productivity of the company. This system will also help to reduce human error, regarding the data entry sales transaction and other business function that needs a person to input data.

Easy to say, this system is hoped to overcome the entire problem facing by the companies regarding the transportation management system.

The relevant of building this project is that it can be used by the transportation companies who served around NAFAS factory as stated above. The usage of this system among the companies will overcome lots of problem. Apart from that, it will help the companies to increase their productivity.

### **1.3.2 Feasibility within scope and timeframe**

This project was developed within the timeframe of 4 months. The risk for this project not to be complete is very low. This is because the familiarity with the technology to be used in this project is very high and the project size is moderate and not too large. Rather than that, the development cost to build this project is quite low. So, it is feasible to proceed with the project.

This system includes user authentication function, transaction function and generates report function. Under the security and authentication function, the user needs to input the password and the system will verify the user. The transactions functions include add transaction, search transaction, delete transaction and edit transaction. The last function is generating report which enable user to produce report in hard copy format.

As this is a standalone function, users can only one person at a time. Only one clerk required to operate this system including its database.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 System Development Life Cycle**

According to Dennis, Wixom and Tegarden (2002)

In many ways, building an information system is similar to building a house. First, the house (or the information system) starts with a basic idea. Second, this idea is transformed into a simple drawing that is shown to the customer and refined (often through several drawings, each improving on the other) until the customer agrees that the picture depicts what he or she wants. Third, a set of blueprints is designed that present much more detailed information about the house. Finally the house is built following the blueprints-and often with some changes and decision made by the customers as the house erected. (p.3)

The System Development Life Cycle (SDLC) has a similar set of four fundamentals phases: planning, analysis, design and implementation. Different projects may emphasize different parts of the SDLC or approach the SDLC phases in different ways, but all projects have elements of these four phases. Each phase is itself composed of a series of steps, which rely on techniques that produce deliverables. In this TMS development, although using prototype methodology, these four phases still include in the development life cycle. A methodology is a formalized approach to implementing the SDLC. There are many different system methodologies and each one is unique based on the order and focus it places on each SDLC phase.

## **2.2 SMB and Information System**

According to Mike New (2005)

Applications are key to any business; they support business processes which in turn, enable the company to run its business. With such a mission-critical need for high-quality software applications, it is often more effective for SMB's to work with vendor that can provide a managed services solution. (p.C16)

The key question is: how can SMBs take advantage of IS and its role in competitiveness and minimize the risks involved with IS investment and deployment? Leading companies are now taking a top-down, business metrics approach to IS and ensuring that it delivers a strong end user experience and is measured based on the line of business needs. This statement shows that no matter who develop or deploy a system in the SMB company, the system will surely return on benefits. The idea is with the business environment nowadays, SMB company such as transportation company, really need to acquire at least a small scale of automated system to enable them have the competitive advantage.

## **CHAPTER 3**

### **METHODOLOGY/PROJECT WORK**

#### **3.1 System Development Life Cycle**

In developing this project, a huge working relationship with user is very important. The prototyping approach is an iterative process involving a close working relationship between the designer and the users. There are several main reasons why this methodology is chosen which are:

- Encourages and requires active end-user participation
- Iteration accommodates end-users who tend to change their minds
- Endorses philosophy that end users will not know what they want until they see it
- Active model that end users can interact with
- Errors can be detected earlier
- Can increase creativity as it allows for quicker user feedback
- Accelerates several phases of the life cycle.

This is because a large numbers of small transportation company in our country do not know the required specification for the system. So, the use of the prototyping method can overcome any problem regarding modifying and alteration of the system.

A prototyping bases methodology performs the analysis, design and implementation phases concurrently and all three phases are performed repeatedly in a cycle until the system is completed. The basics analysis and design are performed and work immediately begins on a system prototype, a quick and dirty program that provides a minimal amount of features. This is shown to the users who provide comments which are used to re-analyze, redesign and re-implement a second prototype that provides a few more features. This process continues until the prototype provides enough functionality to be installed and used in the company. (Refer to figure 1.1)

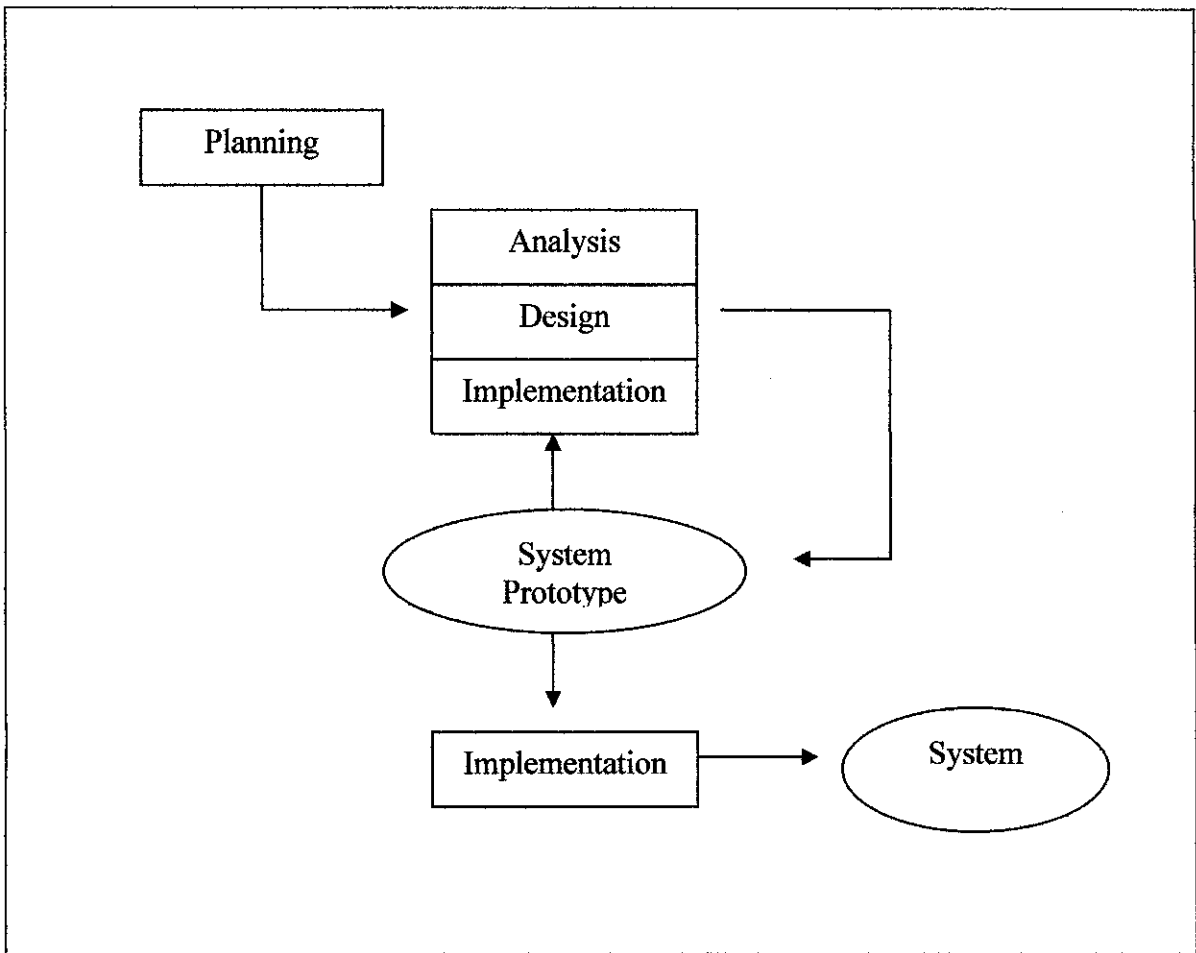


Figure 1.1 The prototyping development life cycle

### 3.1.1 Planning

The planning phase is the fundamental process of understanding why this system should be built. The steps taken are identifying business value, analyze feasibility and control the project. In analyzing feasibility, the first technique used is technical feasibility of the project, the extent to which the system can be successfully designed, developed and installed. The second element of feasibility analysis is to perform economic feasibility which identifies the financial cost and benefit associated with the project. The final technique used for feasibility analysis is to assess the organizational feasibility of the system, how well this system ultimately will be accepted by its users and incorporated into the ongoing operations of the organization.

**Feasibility Analysis:**

<b>Technical feasibility (risky)</b>	<b>Economic feasibility (excellent)</b>	<b>Organizational feasibility (excellent)</b>
Familiarity with the application (low)	Intangible cost and benefits:	The upper level of management encouraging the company to move from manual system to automated system.
Familiarity with technology (low)	Improved customer satisfaction	
Project size (moderate)	Possible increased sales as other customers start to look company with efficient system.	

Table 3.1: Feasibility Analysis of the transportation companies

### **3.1.2 System Analysis**

System analysis is the process of gathering information about the current system (which is manual system), identifying its strengths and problems and analyzing them to produce a concept for the new system. There are a few steps taken in the analysis phases which is:

#### **Understanding the current system (manual system):**

- Review documentation – the behavioral and structural models for the sales and receive transactions, rent and any other systems which interact with TMS is reviewed.

#### **Identifying improvement**

- Problem analysis – working with operation staff and customers to identify a basic set of features for the TMS.
- Technology analysis – a list of innovative system technologies developed.

#### **Developing TMS concept**

- Developing behavioral and structural models – behavioral and structural models for TMS is developed.

### **3.1.3 System Design**

The design phase decides how the system will operate, in terms of the hardware, software and network infrastructure; the user interface, forms and reports; and the specific programs, databases and files that will be needed.

#### ***System Flow***

Even though we are familiar with an automated system and other management application, Transportation Management system (TMS) is considered as a new application among Small and medium sized business company which focusing on transportation and delivery of fertilizers. It helped energize the consumers, and hence the transportation industry, to varying degrees.



A session begins when the user key in username and password and when the TMS accept the password, user can login to the system. The session ends when requested by the user after some transaction have been made and save into the system.

Transportation Management System include: forms and menus. A menu presents the user with a choice of options and the transitions to another forms based upon the user selection. A form defines an interaction that collects values for each of the fields in the form. Each field and button may specify a prompt, the expected input and evaluation rules. The form then can be submitted to a server and can be saved.

### ***Hardware and software specification***

The project needs accurate tools to develop the system. The tools are divided into two categories, software and hardware (minimum). For software, the system required:

- Windows XP Professional
- VB.Net
- Microsoft Access 2000

For hardware, the system required:

- Intel Celeron 2.0 GHz, 256mb of RAM
- 20 Gigabyte of hard disk drive.

### **3.1.4 System Implementation**

Implementation phase is the final phase in this system development life cycle, which the system is actually built. The first step in implementation is system construction, during which this system is built and tested to ensure it performs as designed. There are a few tests that need to be run before this system is completely installed or publish. The tests that need to be run are unit testing, integration testing, system testing and acceptance testing. Unit tests focus on a single unit – the class. Integration tests assess whether a set of classes that must work together do so without error. System tests are usually conducted by the systems analyst to ensure that all the classes work together without error. The final test is acceptance test which is done primarily by the users.

## **CHAPTER 4**

### **RESULTS AND DISCUSSION**

#### **4.1 Results and Discussion**

This is the critical and the most important part in the project. All the research work and product are presented in this section. Both research and prototype must meet the requirements to fulfill the objectives of the project. The expected end result of this project is to ensure the working system that can be used to replace the manual system. The application is expected to take full advantage of Microsoft Visual Basic.Net as one of the most popular system development tools. The system also can be used as a template for future use by developers in order to produce another system which including more functionality and usage. Basically, there are three major functions in this system.

##### **4.1.1 User Authentication Function**

There are only one way of restricting access to documents by asking for a username and password. If the people who are allowed to access the system are widely dispersed, or the server administrator needs to be able to control access on an individual basis, it is possible to require a username and password before being allowed access to a document. This is called user authentication.

Almost every enterprise application is equipped by a user authentication. Conventional way of user authentication is by prompting unique password. While authentication does allow resources to be restricted to particular users, there are still potential security issues related like unauthorized access, unknown users, and hacking. The figures on the next page depict the login screen and the error message box that will appear if unauthorized user attempts to enter the system.

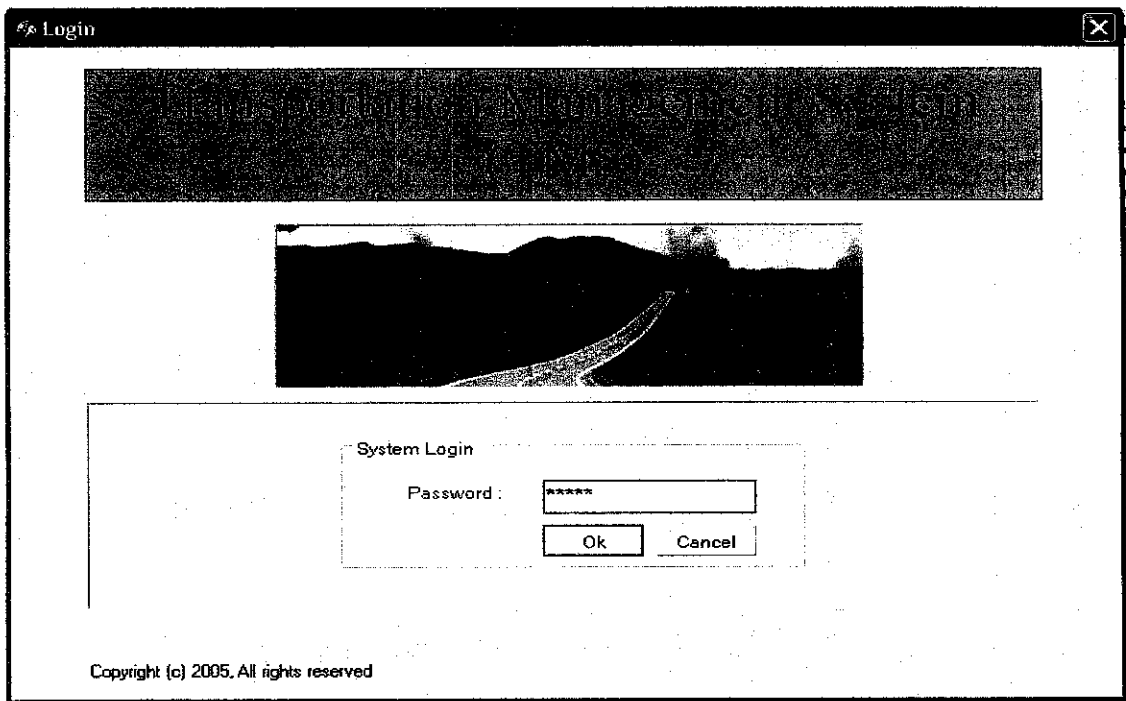


Figure 4.1 Login Screen

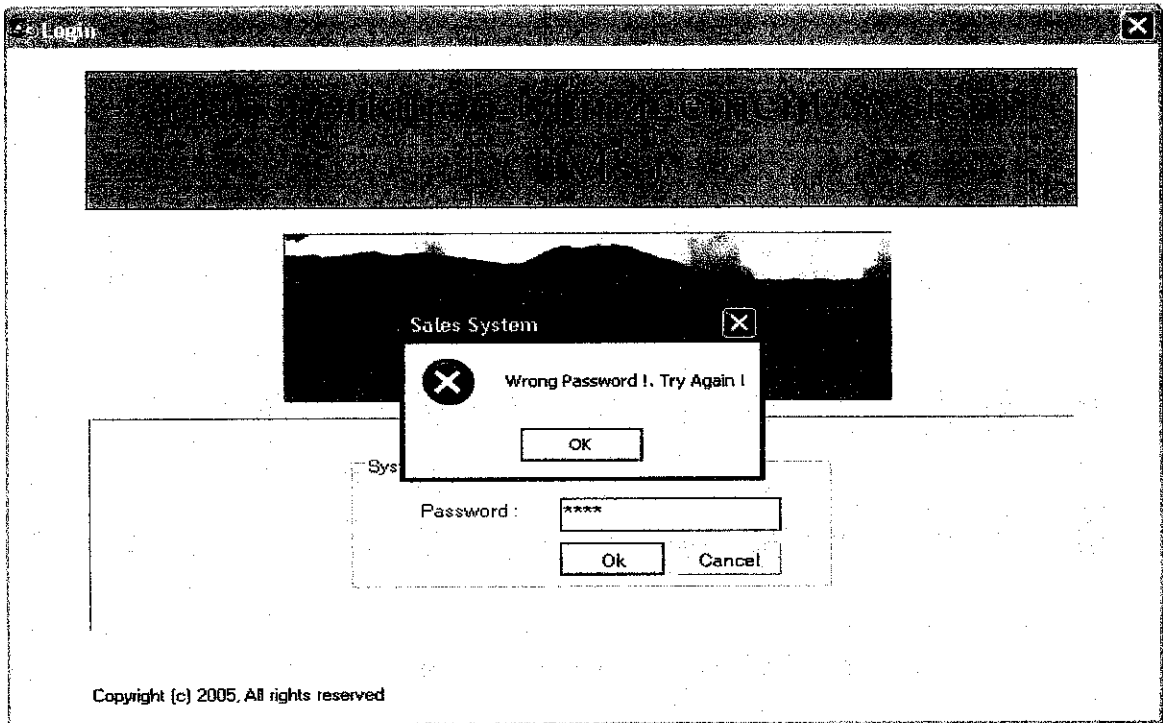


Figure 4.2 Message box informed that wrong password have been keyed in

### 4.1.2 Transaction Function

The transaction functions include new data entry transaction, find transaction, delete transaction and edit transaction. In the new data entry transaction form, it requires input such as customer name, driver name, type of product, date of delivery, quantity, price and total price. The users need to fill the forms before it can be saved into the database.

**Data Entry Delivery Transaction**

Customer Name :  Driver Name :

Product Name / Type Transaction :

Date of Delivery :

Quantity :  tonne

Unit Price :  per/tonne

Total : RM

Customer Name	Product Name / Type T...	Quantity	Unit Price	Total
PETRONAS	UREA N40	35	\$65.00	\$2,275.00

Figure 4.3 Data entry transaction form

By using find transaction function, the user can search for the entered data. Under this function, user needs to key in the necessary word and select the category whether it is customer name, driver name or product name. After clicking the 'Search' button, all the results will be displayed. If the database is empty or necessary data is not found, an error

message box prompt to inform on the problem will appear. If the user want to review all of the transaction, he need to click the 'Refresh' button and all the transaction will appear in the data grid format.

Customer Name	Driver Name	Product Name	Date of Tran	Quantity	Unit Price	Total
BAJA ANGKUT	Salleh Bajuri	Baja Compound 15/20/10	12/8/2005	30	90	2700
CERIA KENDALI	Azahari Ahmad	Muriate of Potash (MOP)	12/10/2005	25	70	1750
HAYARA SDN. BHD.	Abd. Halim Baharom	Ammonium Sulphate NH <sub>4</sub> SO <sub>4</sub>	12/2/2005	45	80	3600
PETRONAS	Abd. Shukor Md. Ali	UREA N40	12/12/2005	40	75	3000

Find Data :

Order by :

Navigation: << < > >>

Refresh

Find Cancel

Figure 4.4 Find transaction form

**Delete Transaction**

**Delete Data Sales Transaction**

Customer Name : BAJA ANGKUT      Driver Name : Bakhtiar

Product Name / Type Transaction : Baja Compound 350010

Date of Transaction : 12/ 8/2005

Quantity : 50      tonne

Unit Price : 50      per/tonne

Total : RM 2750

Delete      Cancel

Figure 4.5 Delete data transaction form

Under the delete transaction function, user is may delete the data in the system database. User needs to select the customer name and all transaction related to authorized representative of farmers is retrieved. If the user wants to delete the selected transaction, he can do so by clicking the 'Delete' button.

If the user intends to edit the data he had entered, he can use the edit transaction function. Under this function, user needs to select the authorized representative name and all the data regarding to that representative is retrieved. If the user wants to edit one of the attribute, he can modify the data in the appropriate textbox or combo box. Then the data will be save in the database when the user click the 'Edit' button. (Refer to figure 4.6)

**Edit Transaction**

**Edit Data Sales Transaction**

Customer Name : CERIA KENDALI      Driver Name : Azahari Ahmad

Product Name / Type Transaction : Muriate of Potash (MOP)

Date of Transaction : 12/10/2005

Quantity : 25 tonne

Unit Price : 70 per/tonne

Total : RM 1750

Edit      Cancel

Figure 4.6 Edit data form

#### 4.1.3 Generate Report Function

Report is very important in order to store the data in hardcopy. This system enables the user to generate report based on all the transaction that has been made. It will produce a report from the customer transaction table located in the database. (Refer to figure 4.7)

Transportation Management System (within NAFAS factory) Application [Report Transaction]

File View Windows Tools Help

MainReport

BAJA ANGKUT  
 CERIA KENDALI  
 HAYARA SDN. BHD  
 PETRONAS

**Sales Transaction** Tuesday, 13 December, 2005

Customer Name	Driver Name	Product Name	Quantity	Unit Price	Total
BAJA ANGKUT	Salikh Bajun	Baja Compound 15/20/10	30	\$90.00	\$2,700.00
			<b>Grand Total</b>		<b>\$2,700.00</b>
CERIA KENDALI	Azizari Ahmad	Muriate of Potash (MOP)	25	\$70.00	\$1,750.00
			<b>Grand Total</b>		<b>\$1,750.00</b>
HAYARA SDN. BHD.	Abd. Halim Baharom	Ammonium Sulphate NH <sub>4</sub> SO <sub>4</sub>	25	\$80.00	\$2,000.00
			<b>Grand Total</b>		<b>\$3,600.00</b>
PETRONAS	Abd. Saizun Md. AB	UREA N40	20	\$75.00	\$3,000.00
			<b>Grand Total</b>		<b>\$3,000.00</b>

Current Page No: 1 Total Page No: 1 Zoom Factor: 100%

Transportation Management System (within NAFAS factory) Application EPUL Tuesday, December 13, 2005 9:05:54 AM

Figure 4.7 Generate Report form

#### 4.2.1 Input Validation

All the data entered into the system needs to be validated using completeness checks, and numerical checks to ensure its accuracy. Input validation can take many forms. Ideally, system should not accept data that fails any important validation check to prevent invalid information from entering the system. The figures on the next page show two example consequences from invalid data input.



**New Delivery Transaction**

**Data Entry Delivery Transaction**

Customer Name :  Driver Name :

Product Name / Type Transaction :

Date of Delivery : 12/12/2005

Quantity :  tonne

Unit Price :  per/tonne

Total : RM

Customer Name	Unit Price	Total

**TMS**

**X** Customer Name Must Be Filled !

OK

Save Cancel

Figure 4.8 Message box informed that customer name need to be filled

**New Delivery Transaction**

**Data Entry Delivery Transaction**

Customer Name :  Driver Name :

Product Name / Type Transaction :

Date of Delivery :

Quantity :  tonne

Unit Price :  per/tonne

Total : RM

Customer Name	Unit Price	Total

**Error**

Unit Price Must Be Numeric !

Figure 4.9 Message box informed that input must be in numeric character.

## **CHAPTER 5**

### **CONCLUSIONS AND RECOMMENDATION**

#### **5.1 Conclusion**

As a conclusion, the relevancy of developing this project is that it can be used by the transportation companies who operate with NAFAS factory. The objective to produce a management system for this small transportation company is achieved. Author had completed the research on how the process flow of a manual system and found a lot of weaknesses and those weaknesses can be fixed with this newly Transportation Management System. In understanding the steps taken during the system development, phases, author have gain knowledge and a lot of experience

It is found that many Small and medium size company are reluctant to move from the traditional system into automated system. Although it only affect a couple of companies and a very few of people realized the important of Information System, this research give a lot of benefits not only to them, but to the industry itself.

## **5.2 Recommendation**

Although this Transportation Management System (TMS) already exist, but in the field of SMB it is very new. Many functions for other type of transportation that run in this NAFAS factory environment still cannot be analyze for automated purpose and it cannot be put in this system. It is recommended that in the future, there will be developers that can overcome this problem such as how to break the barrier of people who reluctant to accept technology. This TMS surely need to be enhancing so that it can include more functions such as connect to internet or other firm or companies. A lot of research must be done in the future in order to ensure the full use of TMS and its benefits.

Even though the author had managed to develop the prototype, it will be much better if the prototype can be implemented in the NAFAS factory working environment so that any other weaknesses can be found and fix. The system can be upgraded to online system where Oracle9i and MySQL server can be the option for the database server.

The security features of this system also need to be enhancing so that the security of the database is guaranteed in the future.

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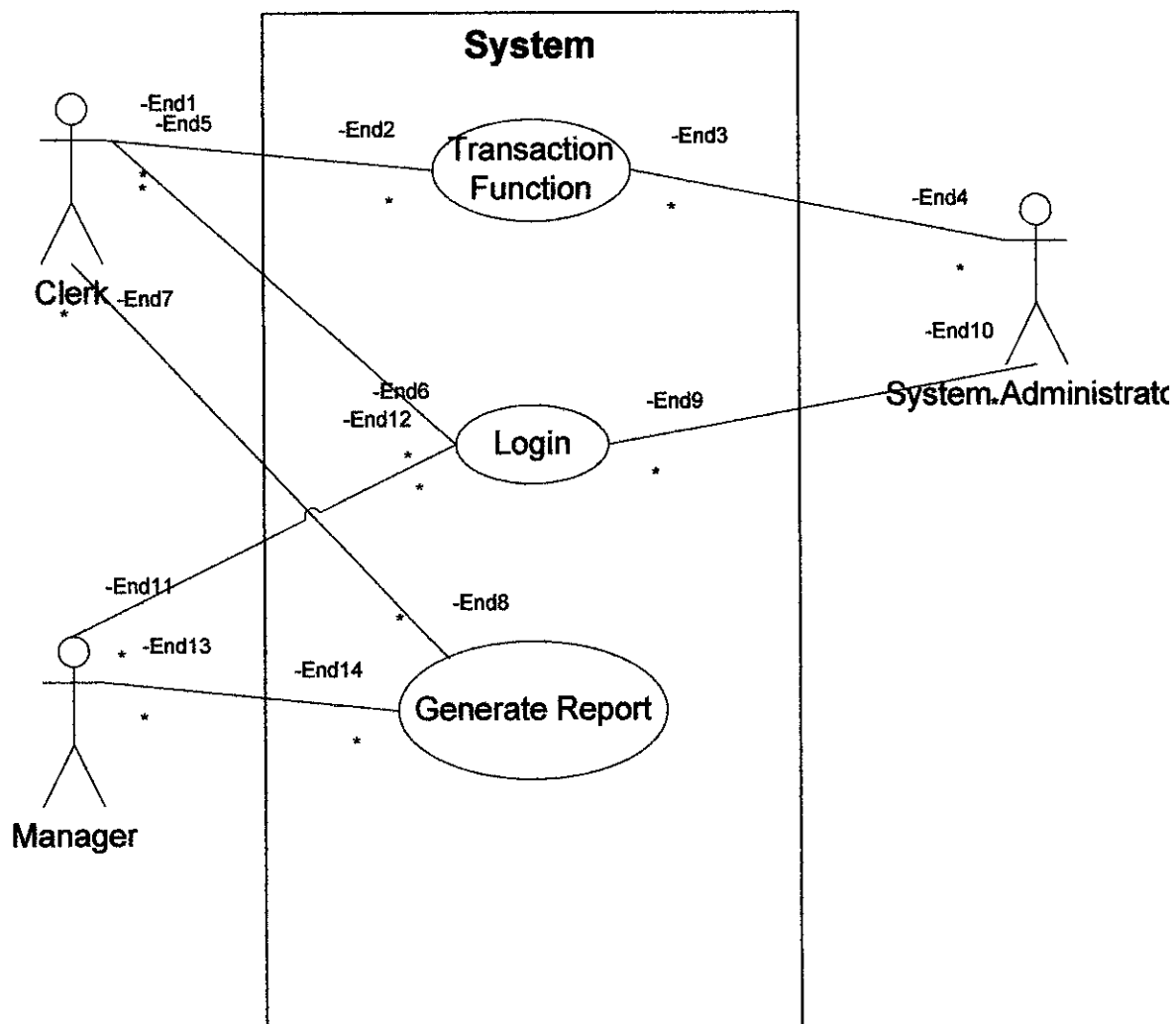
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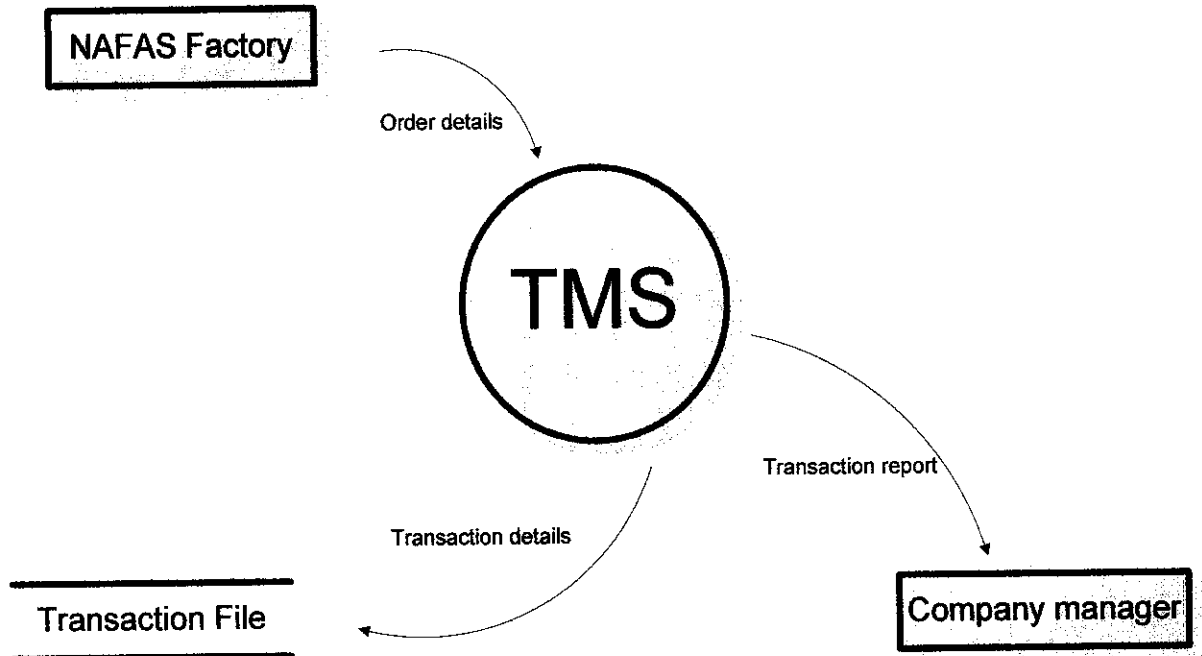
# **APPENDICES**







DFD level 1 (context diagram)



DFD level 2

