Advanced Integrated Database System For Petronas Mitco Sdn Bhd

by

Suhrab Hussain Ghumro

Dissertation Report submitted in partial fulfillment of
the requirements for the
Bachelor of Technology (Hons)
(Business Information Technology)

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Universiti Teknologi PETRONAS
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CERTIFICATION OF APPROVAL

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Submitted to the
Information Technology/Information System Department
Universiti Teknologi PETRONAS
in partial fulfillment of the requirement for the
BACHELOR OF TECHNOLOGY (Hons)
(INFORMATION COMMUNICATION TECHNOLOGY)

Approved by,

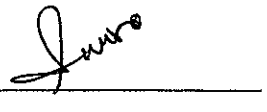
_____

(Ahmad Izuddin bt Zainal Alidin)

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
JANUARY 2007

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.



SUHRAB HUSSAIN GHUMRO

ABSTRACT

Trading Corporation advanced integrated database system is used for marketing and trading of petrochemicals and general merchandise. Trading is mostly done with third parties. Trading corporation is getting information from third parties in database system. Database system is used by different departments to keep track on business flow of trading corporation and to do financial analysis of information for future updates of trading.

This database system involves in different platform (Systems), different departments and different level of user involvement. So integration of database system is most important factor to produce the Business purpose Reports of marketing and trading of petrochemicals and general merchandises. Trading corporation is using SAP system and lotus Notes to keep track on information gathered from third parties and to produce Business purpose Reports for corporation use.The following paper shall present the background of study, problem statement and the objectives and scope of this study. Then the method to be used to achieve those objectives is explained where it examines the technical side of the project, in terms of software to be used, methodology that will suit the project's development as well as data collection techniques. Detail Explanation of Proposed system use case diagram, data flow diagram, SQL query Design, VB.net Report Design and User friendly Vb.Net interface. Further more at the end conclusion, recommendation, project limitation and project enhancement are also describe in detail for future updates of database system.

ACKNOWLEDGEMENT

All praise and gratitude is for Almighty Allah. For His Benevolence to give me strength to take up this project and complete it.

My utmost gratitude goes to my supervisor, Mr Ahmad Izuddin bt Zainal Alidin for his dedication and committed supervision. His guidance and advice helped me a lot in the development of this project. Thank you for your patience and having trust in me.

My sincere appreciation to All Universiti Teknologi PETRONAS (UTP), lectures of IT/IS Department who are currently participating this project. The completion of this project would have not been possible without the help and guidance of Mr Armayya Fitri Yusop, business Analyst in Petronas Mitco Sdn.Bhd . Finance Department.

Words may never be able to describe the amount of support and affection that my family and the someone very special to me.

Last but not the least all those who were directly or indirectly involved in making this project possible.

-THANK YOU-

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ABBREVIATIONS

IT – Information Technology

SAP- means *Systems, Applications, and Products in Data Processing*

UTP- Universiti Tecknolgi Petronas

RAID-Rapid Application Development

DFD-Data Flow Diagram

SQL-Structured Query Language

VB.Net-Visual Programming .Net

SVC-Sales VS Cost Report

FYP-Final Year Project

KLCC-Kula Lumpur City Center

MITCO – Malaysian International Trading Corporation

AOVD-Basic Chemicals Marketing and Trading Department

FAC-Fertilizers & Agrochemicals Department

MMDD-Methanol & derivatives Marketing & Trading

POL-Polymers division

GAP-Global Trading division

GIP- Industrial Products and Trading

GSI-Strategic Intervention & SMI/SME Business Development.

LDPE-low Density Poly-Ethylene

HDPE - High Density Poly-Ethylene

PP-Polypropylene

EDC-Ethylene Dichloride

PVC-Poly-Vinyl chloride

VCM-Vinyl Chloride Monomer

CHAPTER 1
INTRODUCTION

1.1 BACKGROUND OF STUDY

The term or expression **database** originated within the computer industry. Although its meaning has been broadened by popular use, even to include non-electronic databases. Database is a structured collection of records or data which is stored in a computer. So that retrieved record or data from database it become information that can be used to make decisions. There is a structural description (SCHEMA / TEMPEST) in database system which describes the objects and its relationship of objects in database system. There are a number of different ways of organizing a schema (database model, relational model, hierarchical model and network model).

There is lot of factor to consider in designing the database system security, Availability, Consistency, redundancy of data but the most important factor to be consider in database system in organization is to be integrations of database system with different platform and different department of organization and to produce the business purpose reports to do Financial Analysis of organization.

Trading Corporation advanced integrated database system is used for marketing and trading of petrochemicals and general merchandise. Trading is mostly done with third parties. Trading corporation is getting information from third parties in database system. Database system is used by different departments to keep track on business flow of trading corporation and to do financial analysis of information for future updates of

trading. So this database system involves in different platform (Systems), different departments and different level of user involvement. So integration of database system is most important factor to produce the Business purpose Reports of marketing and trading of petrochemicals and general merchandises. Trading corporation is using SAP system and lotus Notes [1] to keep track on information gathered from third parties and to produce Business purpose Reports for corporation use.

The original name for SAP was *German: Systeme, Anwendungen, Produkte*, German for "Systems Applications and Products." The original SAP idea was to provide customers with the ability to interact with a common corporate database for a comprehensive range of applications. Gradually, the applications have been assembled and today many corporations, including IBM and Microsoft, are using SAP products to run their own businesses. SAP applications, provide the capability to manage financial, asset, and cost accounting, production operations and materials, personnel, plants, and archived documents. The SAP system runs on a number of platforms including Windows 2000 and uses the client server model. The latest version of SAP R/3 includes a comprehensive Internet-enabled package. SAP has recently recast its product offerings under a comprehensive Web interface, called mySAP.com, and added new e-business applications, including customer relationship management (CRM) and supply chain management (SCM).

1.2 PROBLEM STATEMENT

The business flow of Trading Corporation is involved in different platform, different department and different level of user to produce the Management Reports. Trader will determine the viability of a trade through updating of costing sheet and once trade is concluded, trader will update sales and products cost information in TEMPSET. Operation department will arrange for documentation and proceed with loading and Sales invoices will be raised and forward to finances department. So based on sales invoice, Finance Department will extract sales information from TEMPSET into SAP. Operation / logistics department will update receipt of invoice for secondary cost in TEMPSET and forward the cost invoices to Finance department Finance Department will then extract information from TEMPSET relating to the cost invoices and after extraction from TEMPSET there are also information that is directly keyed into SAP.SVC report in SAP generated by Finance (FA) which is then download into LOTUS 123 version. Finance (MA) will upload SVC report into Lotus Approach and preparation of Management Reports.

TEMPSET to get information from Trader for sales , product cost and extract that information to SAP to generate Trading Reports because of some limitations they download information from SAP to Lotus 123 to generate Business purpose Trading Reports. So it is unnecessary effort and time to for the reformatting information in Lotus Approach and also too much time taken for reformatting activity. It has long turnaround time and it is also unstable system. User can not able to read any information from TEMPSET because it involves in different platforms (systems). It also involves the different departments and different level of user's involvement to manipulate the information to produce the Business purpose Trading Reports.

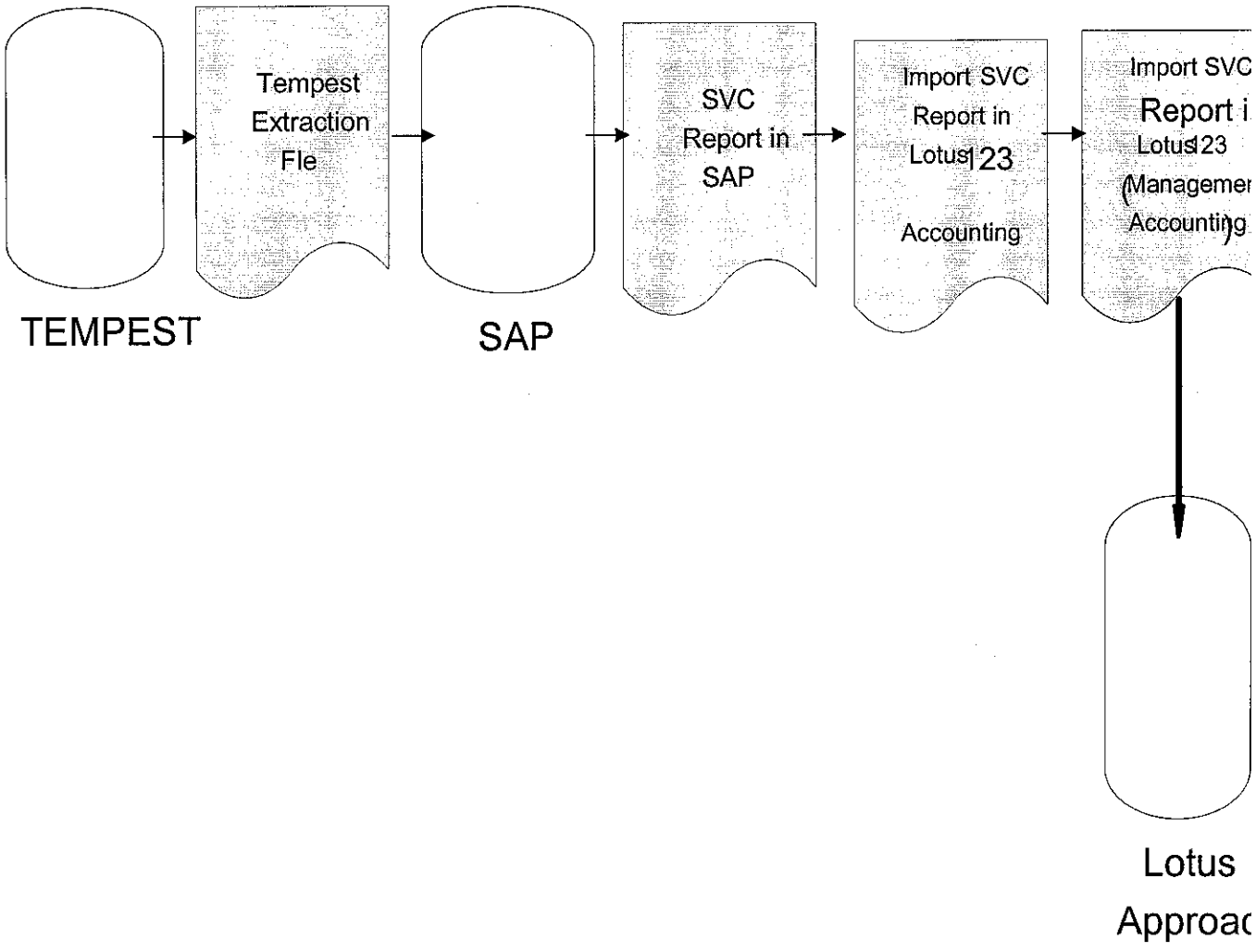


Figure 2.1 Problem statement

1.3 OBJECTIVES AND SCOPE OF STUDY

This project is aimed to come out with a user friendly Interface between SAP and different level of users. The objective of this project is to design user friendly interface for all departments and well integrated user interface for all different platforms (system) of trading corporation. The main purpose of this project is to well integration of SAP system with Microsoft Office for Business purpose use in Trading Corporation because Lotus 123 and Lotus Approach have some limitation to formatting Business purpose Reports.

User friendly interface is design to extract information directly from TEMPSET, and SAP to database system to produce the Trading Reports

- Graphic Capability for trending of past product prices,
- Drilldown ability to check on Products performances,
- Compute the average price/mt for each product.
- Comparisons of Actual VS Budget for each products
- Sales and product cost Performance by each Trader with Graphic Capability.

CHAPTER 2
LITERATURE REVIEW AND THEORY

2.1 INTRODUCTION

SAP the company was founded in Germany in 1972 by five ex-IBM engineers. SAP stands *for Systeme, Andwendungen, Produkte in der Datenverarbeitung* which - translated to English - means *Systems, Applications, Products in Data Processing.* Being incorporated in Germany, the full name of the parent company is SAP AG. It is located in Walldorf, Germany which is close to the beautiful town of Heidelberg. SAP has subsidiaries in over 50 countries around the world [1].

The SAP system is a collection of software that performs standard business functions for corporations. The system has become very popular because it provides a complete solution to standard business requirements such as manufacturing, accounting, financial management, and human resources. It incorporates the concepts of enterprise resource planning (ERP) and business process reengineering (BPR) into an integrated solution for business applications. [2]

SAP applications, built around their latest R/3 system, provide the capability to manage financial, asset, and cost accounting, production operations and materials, personnel, plants, and archived documents. The R/3 system runs on a number of platforms including Windows 2000 and uses the client/server model. The latest version of R/3 includes a comprehensive Internet-enabled package. [5]

SAP are maintaining and increasing their dominance over their competitors through a combination of [1]

- embracing the internet with mySAP.com
- extending their solutions with CRM to head off Siebel
- adding functionality to their industry solutions

2.1.1 Financials applications

The SAP Financials applications contain all of the functionality needed for enterprise-wide financial management. The modules within the Financials applications include the following: [2]

- Financial Accounting (FI)
  Provides a complete financial accounting solution, including income statements, balance sheets, journals, ledgers, and all areas of financial accounting.
- Enterprise Controlling (EC)
  Assists in controller tasks.
- Capital Investment Management (IM)
  Assists finance organizations in their capital investments and tracking.
- Controlling (CO)
  Assists the controller organization.
- Treasury (TR)
  Assists with transactions related to the U.S. Treasury.

2.1.2 Human Resources applications

The SAP Human Resources (HR) applications are designed to provide a fully functioning HR system. They include two primary modules: [2]

- Personnel Administration (PA)

Assists with all areas of personnel administration, including applicant tracking and personnel history.

- Personnel Development (PD)
  Assists with training and educational status of employees.

These systems handle all of the mundane HR tasks, such as personnel and payroll, and also a number of more esoteric HR functions, such as seminar and convention management.

2.1.3 Logistics applications

The SAP Logistics applications include SAP's most popular modules. Logistics was the first area of entry for SAP. This includes virtually every area of manufacturing, from the initial acquisition of raw materials to the delivery of finished goods. The modules in this area include the following products: [2]

- Materials Management (MM)
  Manages raw materials, inventory, and all aspects of goods manufacturing.
- Production Planning (PP)
  Offers sophisticated tools for planning large production environments.
- General Logistics (LO)
  Manages logistics for companies that require large-scale deployment of goods and resources.
- Sales and Distribution (SD)
  Manages the inventory and distribution of finished goods.
- Plant Maintenance (PM)
  Manages the resources required for large manufacturing plants.
- Quality Management (QM)
  Captures and maintains quality control for manufacturing environments.
- Project System (PS)
  Assists with the scheduling of project tasks and interdependencies between tasks.

2.2 Business Process Reengineering (BPR)

A systematic, disciplined improvement approach that critically examines, rethinks, and redesigns, and implements the redesigned mission-delivery processes to achieve dramatic improvements in performance in areas important to customers and other stakeholders. BPR is also referred to by such terms as business process improvement (BPI) or business process development, and business process redesign. While the term can be applied to incremental process improvement effort, it is more commonly and increasingly associated with dramatic or radical overhauls of existing business processes. [13]

The best way to map and improve the organization's procedures is to take a top down approach. That means:

- Starting with mission statements that define the purpose of the organization and describe what sets it apart from others in its sector or industry.
- Producing vision statements which define where the organization is going, to provide a clear picture of the desired future position.
- Build these into a clear business strategy thereby deriving the project objectives.
- Defining behaviors that will enable the organization to achieve its' aims.
- Producing key performance measures to track progress.
- Relating efficiency improvements to the culture of the organization
- Identifying initiatives that will improve performance. [14]

To be successful, business process reengineering projects need to be top down, taking in the complete organization, and the full end to end processes. It needs to be supported by tools that make processes easy to track and analyze [14].

"For our project BPR is some how concern to understand the current business flow of trading company and find the problem with current business flow of the trading corporation. as Business Process Redesign is "the analysis and design of workflows and processes within and between organizations" (Davenport & Short 1990). Teng et al. (1994) define BPR as "*the critical analysis and radical redesign of existing business processes to achieve breakthrough improvements in performance measures.*" . so for our project we have to rethink and redesign the business flow of trading corporation. This project is also involved different platform, different department and different level user. So we redesign the system or proposed the new system for them we have to consider above all factor to design the new system and also we have to keep track on the business of trading corporation."

2.3 Data Mining

Data Mining is the nontrivial extraction of implicit, previously unknown, and potentially useful information from data and the science of extracting useful information from large data sets or databases. Although it is usually used in relation to analysis of data, data mining, like artificial intelligence, is an umbrella term and is used with varied meaning in a wide range of contexts. It is usually associated with a business or other organization's need to identify trends. Data mining is also known as knowledge-discovery in databases (KDD) and is defined as the practice of automatically searching large stores of data for patterns. To do this, data mining uses computational techniques from statistics and pattern recognition [16].A classical example of data mining is its use in retail sales departments. If a store tracks the purchases of a customer and notices that a customer buys a lot of silk ties, the data mining system will make a correlation between that customer and silk ties. The sales department will look at that information and may begin direct mail marketing of silk

ties to that customer, or it may alternatively attempt to get the customer to buy a wider range of products. In this case, the data mining system used by the retail store discovered new information about the customer that was previously unknown to the company [16].

What Can Data Mining Do?

Data mining is still in its infancy; companies in a wide range of industries - including retail, finance, heath care, manufacturing transportation, and aerospace - are already using data mining tools and techniques to take advantage of historical data. By using pattern recognition technologies and statistical and mathematical techniques to sift through warehoused information, data mining helps analysts recognize significant facts, relationships, trends, patterns, exceptions and anomalies that might otherwise go unnoticed.

For businesses, data mining is used to discover patterns and relationships in the data in order to help make better business decisions. Data mining can help spot sales trends, develop smarter marketing campaigns, and accurately predict customer loyalty. Specific uses of data mining include:

- **Market segmentation** - Identify the common characteristics of customers who buy the same products from your company.
- **Customer churn** - Predict which customers are likely to leave your company and go to a competitor.
- **Fraud detection** - Identify which transactions are most likely to be fraudulent.
- **Direct marketing** - Identify which prospects should be included in a mailing list to obtain the highest response rate.
- **Interactive marketing** - Predict what each individual accessing a Web site is most likely interested in seeing.
- **Market basket analysis** - Understand what products or services are commonly purchased together; e.g., beer and diapers.
- **Trend analysis** - Reveal the difference between typical customers this month and last. [17].

CHAPTER 3
METHODOLOGY

3.1 SOFTWARE PROCESS MODEL

This Project uses the Rapid Application Development which includes a number of versions of the same system. At this stage the project has the initial version in which the SAP integration with Microsoft office.

Rapid Application Development is an iterative and incremental approach for system development. The system will be delivered incrementally over time. Now days mostly professional developer, and many traditional programmers are using this approach because it will increase effective communication, decrease development time, decrease costly mistakes, minimize sustaining engineering changes, to extend product lifetime by adding necessary features and eliminating redundant features early in the design.

Rapid Prototyping decreases development time by allowing corrections to a product to be made early in the process. By giving engineering, manufacturing, marketing, and purchasing a look at the System early in the design process, mistakes can be corrected and changes can be made while they are still inexpensive. Rapid Prototyping improves System development by enabling better communication in a concurrent engineering environment. [11].**Figure 3.1** [12] illustrates the phases involved in Rapid Application Development approach.

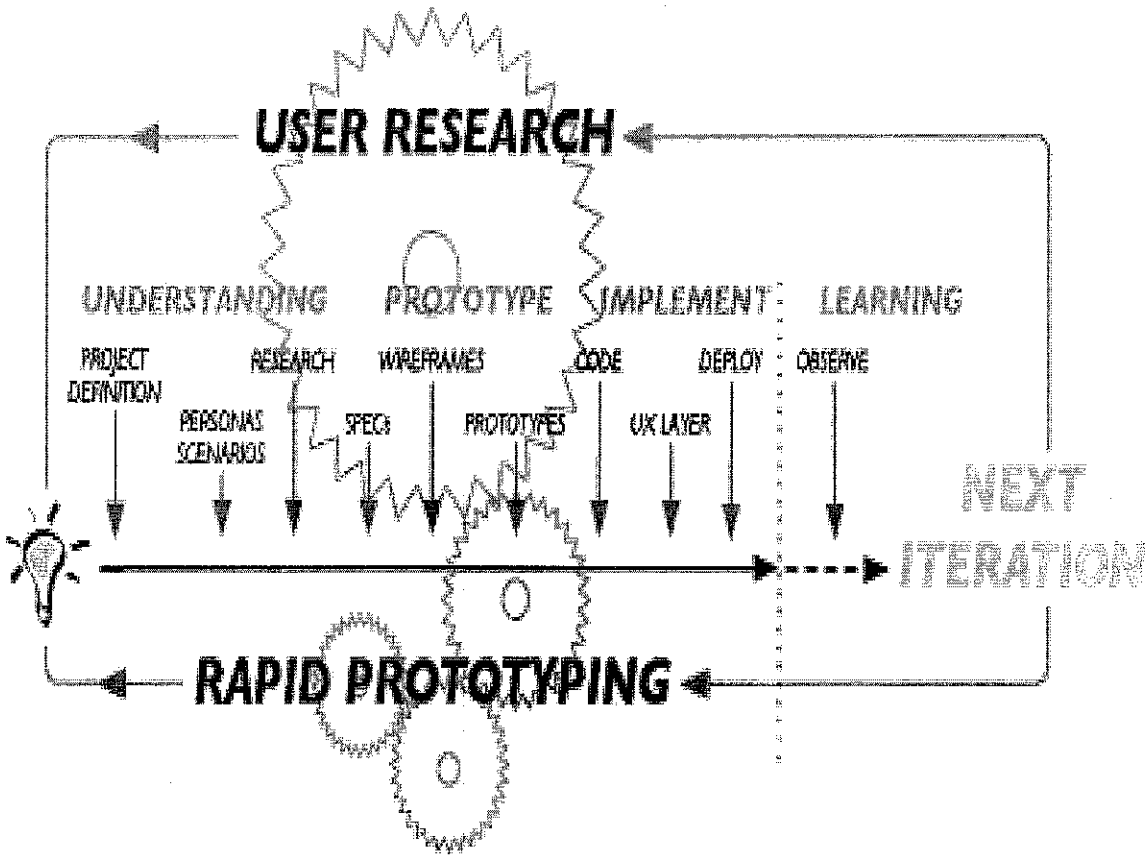


Figure 3.1: Phases involved in Rapid Application Development Approach [12]

3.1.1 Requirement Definition

In this stage, the problem statement need to be understood and analyzed carefully in order to have better understanding of the problem stated. In this project, most of the system requirements are gathered from various journals and articles that have been collected from the World Wide Web in the internet.

The journals and articles collected for the system requirement purpose mostly are regarding the importance of SAP System Integration with Microsoft Office to Produce the Business Purpose Reports for Trading Corporation.

This project is to be completed phase by phase and for the system architecture for this project, Rapid Application Development approach development model is chosen. This method is chosen due to its flexible allowances choice of system development methodology.

Traditional approach of system development methodology that needs to get the development model mostly correct in the early stage is possible as this project involves more than just one area of studies such as SAP System, Lotus Notes, Lotus Approaches and Microsoft Office.

3.1.2 System Architecture and Design

3.1.2.1 Use Case Diagram

The Use case diagram is used to "identify the primary elements and processes that form the system" (James, 2002). The developer wants to represent the functionalities of the system in a simplified and easily understandable manner to understand the functional aspects of the system at hand. While developing the use case diagram, significant characteristics in the system were discovered and this will further help with the design of the system.

The preliminary investigation conducted helped in the design of the system as the use case diagram shows and depicts what are the functionalities of the system. Each use case represents the functions available in the system to the administrator and the users of the integrated Database system.

As a conclusion, with the help of preliminary investigation that took place, user requirements were gathered and with the help of use case diagrams, the user requirements were finalized and they were defined and modeled which will lead to the proper development of the prototype of the system. The diagram is shown below.

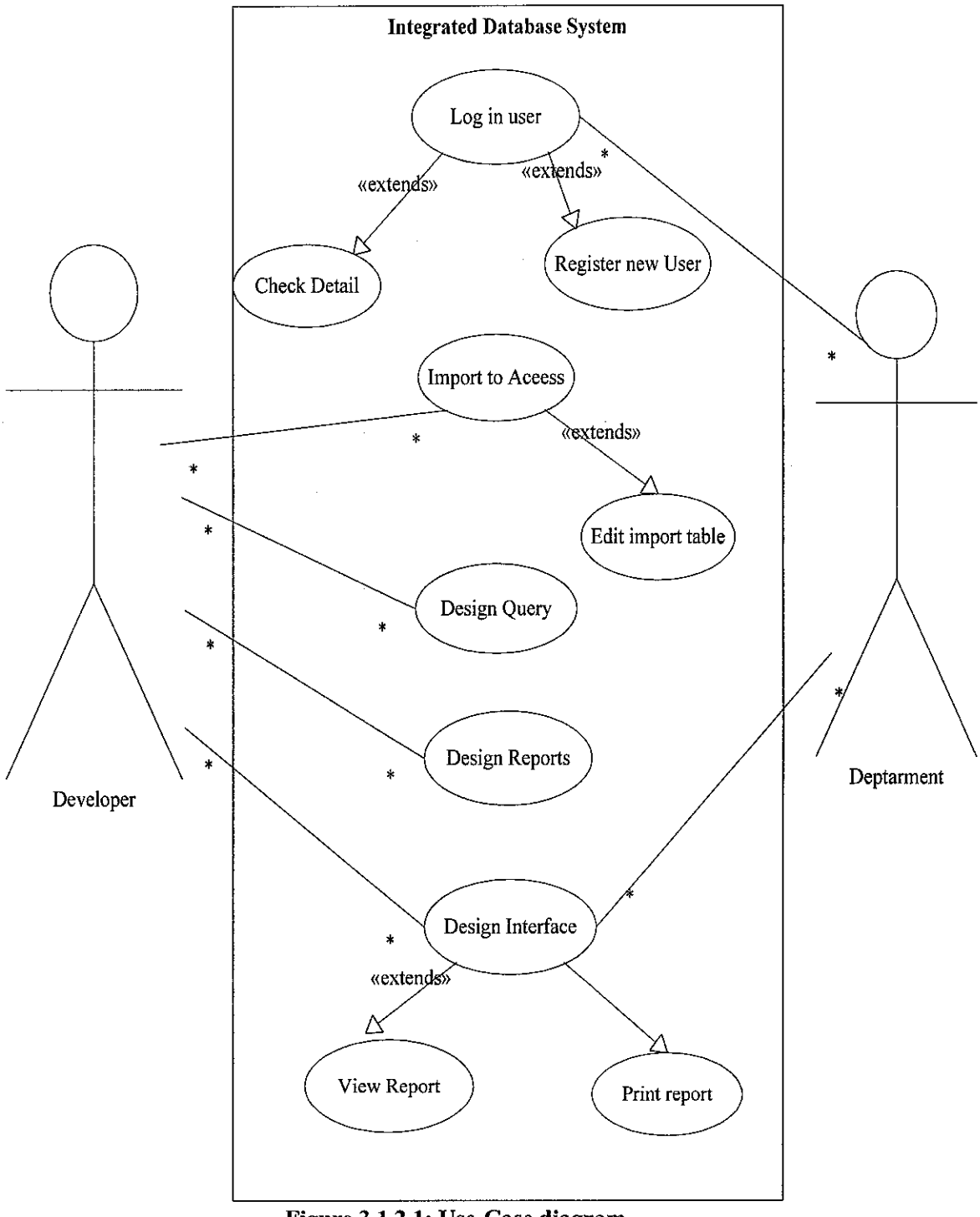
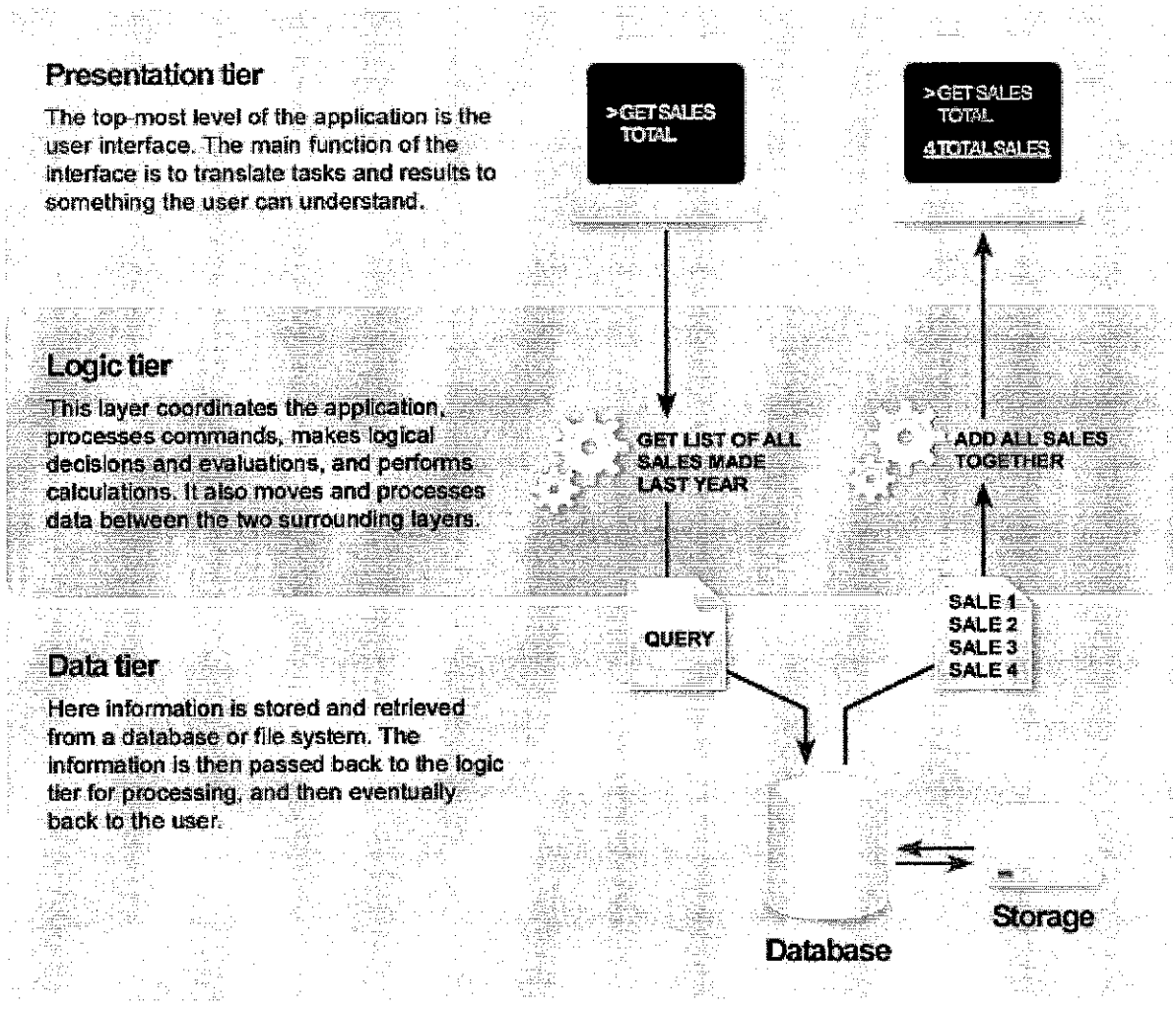


Figure 3.1.2.1: Use-Case diagram

3.1.2.2 Multi-Tier Distributed Database System Architecture

Multi-tier (sometimes called four-tier or *n*-tier) client/server applications take the partitioning of application services even further. They divide the business-rules tier into two collaborating tiers: one for business-rule processing that supports the user interface, and the other for business-rule processing that integrates and manipulates data. Multi-tier architecture is flexible about the placement and the presence of application servers. A small enterprise might choose to have the database server pull double-duty as the application server. As the enterprise grows, a separate server can take over as the application server. Multi-tier architecture supports change. You create your application from a set of independent components and distribute it across as many computers as it takes to get the job accomplished. Multi-tier applications, adapt easily to changing business conditions. Multi-tier architecture just might be the best solution for your current enterprise application needs.



3.1.2.1: Database physical Layer

Client/server applications use distributed processing. Among client/server possibilities, multi-tier applications give the fullest range of options for distributing application processing. Multi-tier architecture focuses on business objects. Business-rule logic is easily encapsulated in reusable classes. Those business object classes can be flexibly combined into pre-compiled components. The application can include or later substitute different user interfaces and back-end databases with minimal impact on the application's core business logic. Components can move from individual workstations to remote servers when the need arises. [15].

For the nature of trading corporation business flow in which is involved in different platform, different department and different level of users. So this database system will be used in disturbed database system for three different departments. A distributed database system, illustrated in Figure 3.1.2.2, is an environment in which data in two or more database instances is accessible as though this data were in a single instance. This access may be read-only, or it may permit updates to one or many instances. The referenced data may be real time, or it may be seconds, hours, or days old. Generally, the different database instances are housed on different server nodes. Database servers, a distributed database system usually includes application servers and clients. [18].

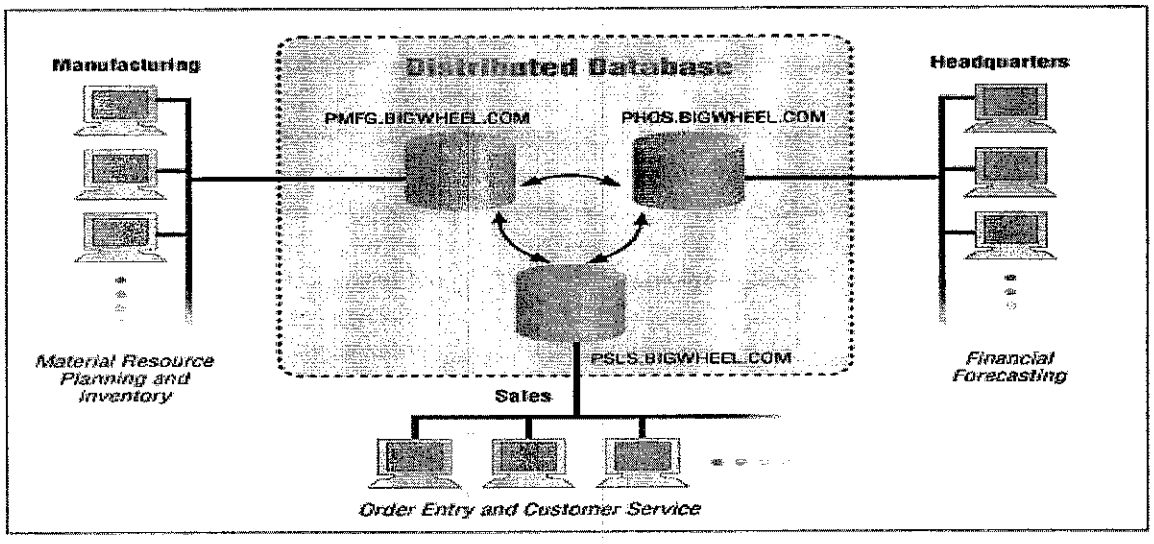


Figure 3.1.2.2: Multi-Tier Distributed Database System Architecture

3.1.2.3 Data Flow Diagram of Proposed system

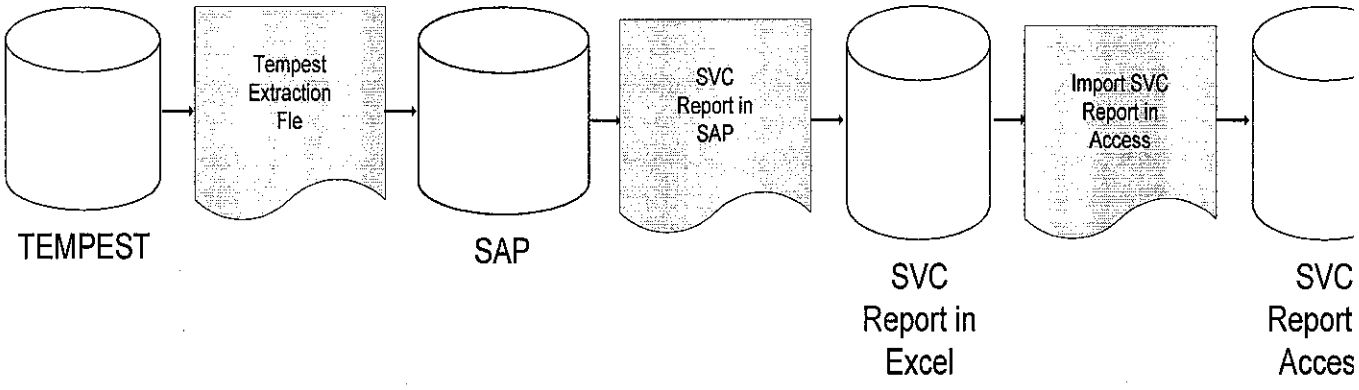


Figure 3.1.2.3 Data Flow Diagram

Tempest

- **Activity**

After a trade has been concluded the trader will key in the Down information in under the following Broad categories:-

- Trade
- Delivery
- Billing
- Payment

- **Information**

-Reasliesd Prices

-Customer/Supplier Information

-Credit limit

-Load Discharge port

-BL date

-Trader name

-Incoterms

-vessel name

-Qty-BL, invoiced

Tempest Extraction File

- **Activity**

After receiving invoices from operations, Financial Accounting Unit will identify the corresponding *"Extraction numbers"* from the *"Tempest extraction File"*.

SAP

- **Activity**

Financial Accounting Unit will then create a batch Process that allows the Extraction of data from *"Tempest Extraction File"* into SAP.

- **Information**

The information contained in SAP at this point would be those extracted from Tempest and those entered directly into SAP.

Sales VS Cost Reports in SAP

- **Information**

Contains both information originally Extracted from Tempest and those direct from SAP.

Sales VS Cost Reports in Excel

- **Information**

Contain information which is downloading from SAP .for further manipulation.

Import / link Sales VS Cost Reports in Microsoft Access

- **Information**

Import / Link Sales VS Cost Report from Microsoft Excel to Microsoft Access.

Sales VS Cost Reports in Microsoft Access

- **Activity**

After importing the Sales VS cost Report in Microsoft Access Database Developer will manipulate that information to generate the Business purpose Report. Database Developer will perform following action to manipulate the information.

- **Edit Table / information**
- **Design Query**
- **Design Standard Report Format**
- **Design User Friendly Interface**

- **Information**

Database Developer will design automated system for finance People to interact with Interface and view / print the business purpose Reports. Finance people will generate following product report

- **Pdt buss segment**
- **Total margin for each product**
- **Total Buss Segment Quantity**
- **Total Pdt Quantity**
- **Total from invoice No**
- **Check / add Supply & Demand**

3.2 Tools Required

3.2.1 Hardware Requirements

- Processor Pentium III or higher or any other vendor equivalent processor
- 128 MB or higher RAM
- Hard disk 120 GB
- Keyboard and mouse

3.2.2 Software Requirements

- Windows 2000 or XP (with service pack 1 and 2)
- Microsoft Excel
- Microsoft Access
- SAP system
-

3.2.3 Database Development

- Microsoft Access
- Oracle (future consideration)
- MySQL (future consideration)

3.2.4 Development Tool

- .NET compact framework programming in Visual Basic.net
- SQL Programming

3.3 System Interface Design (Screen Shots)

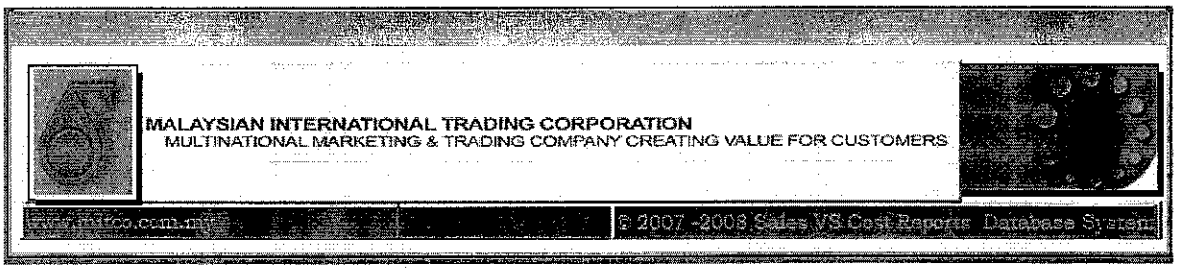


Figure 3.3.1 Welcome banner

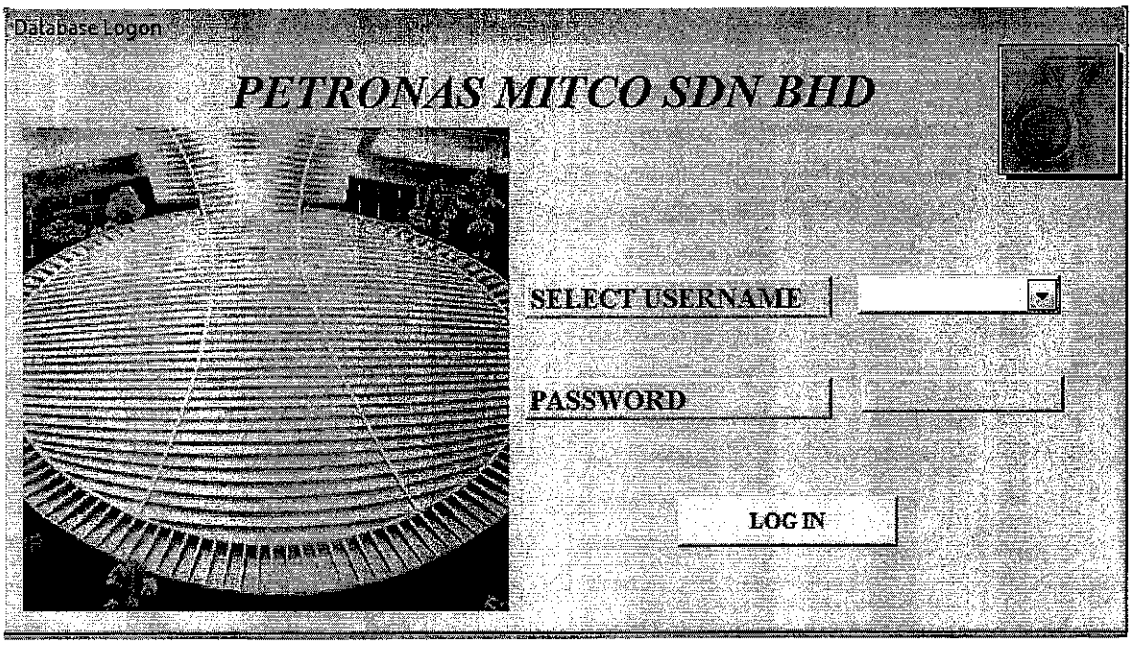


Figure 3.3.2 System Log in

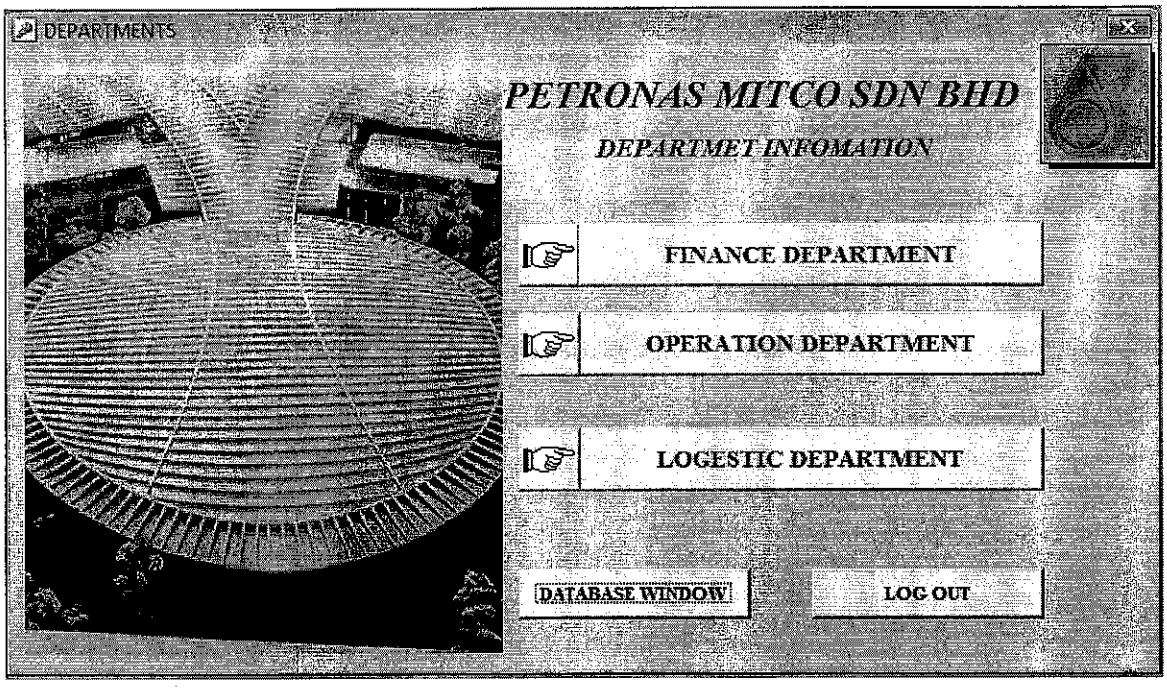


Figure 3.3.3 System Department information

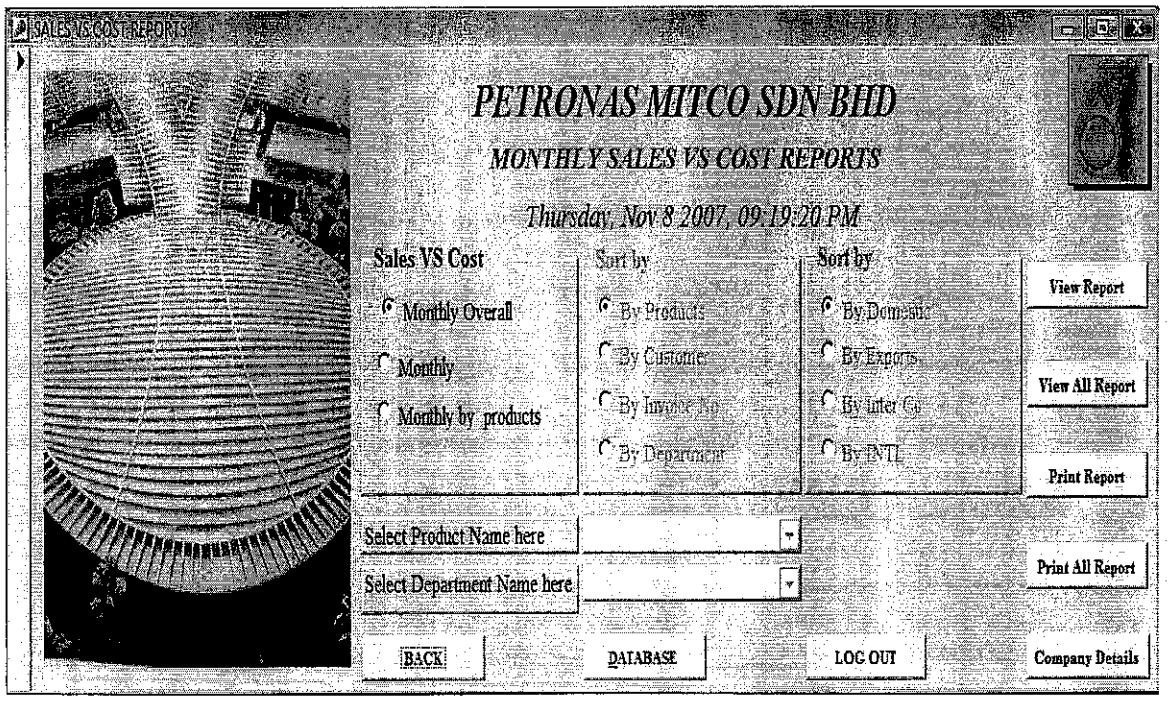


Figure 3.3.4 Monthly Overall

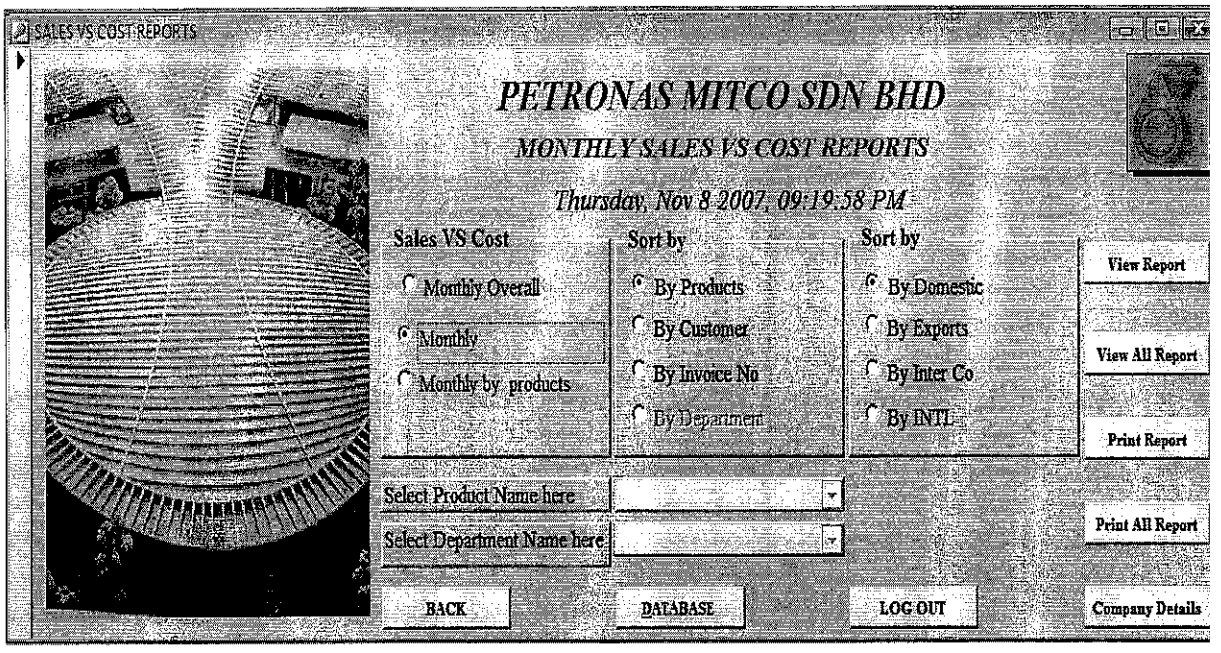


Figure 3.3.5 Monthly for all products

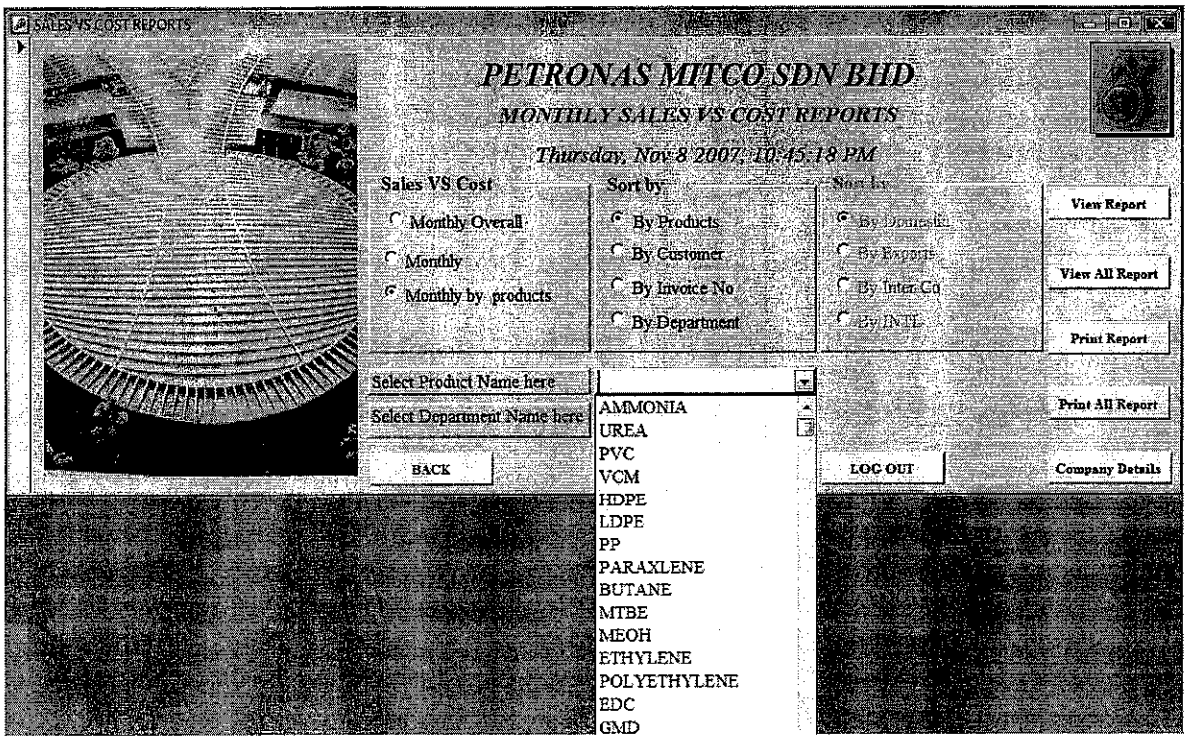


Figure 3.3.6 Monthly for individual products.

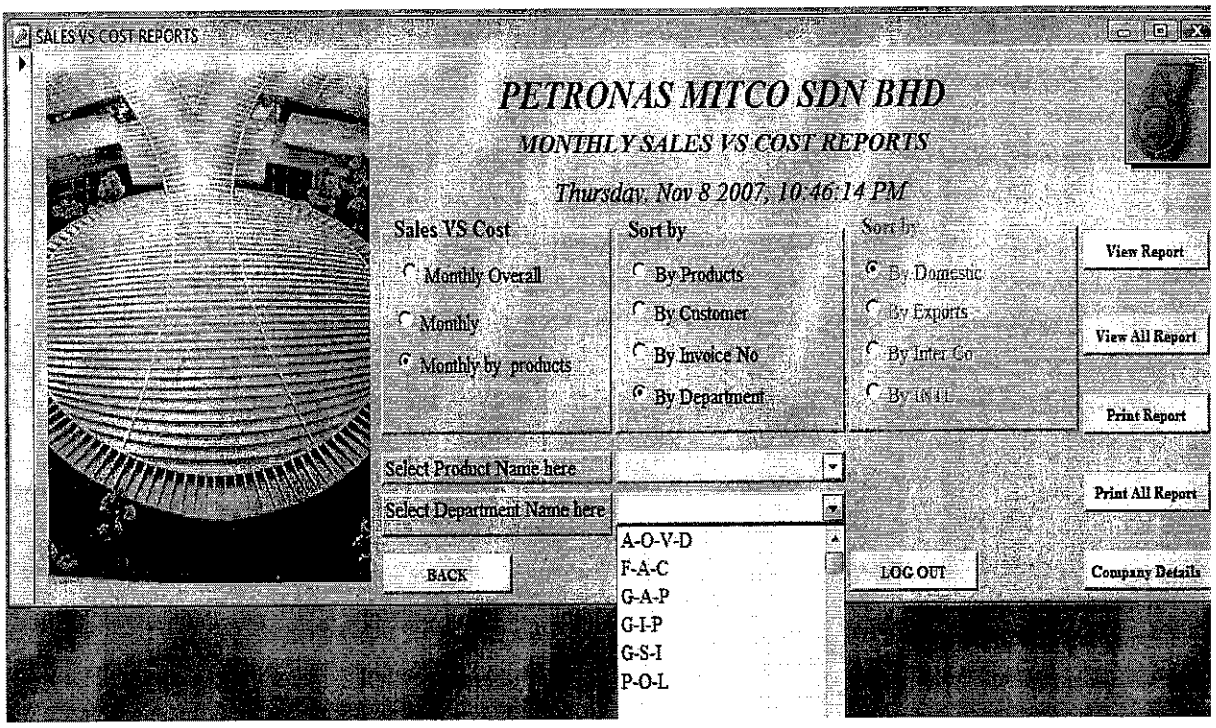


Figure 3.3.7 Monthly by departments

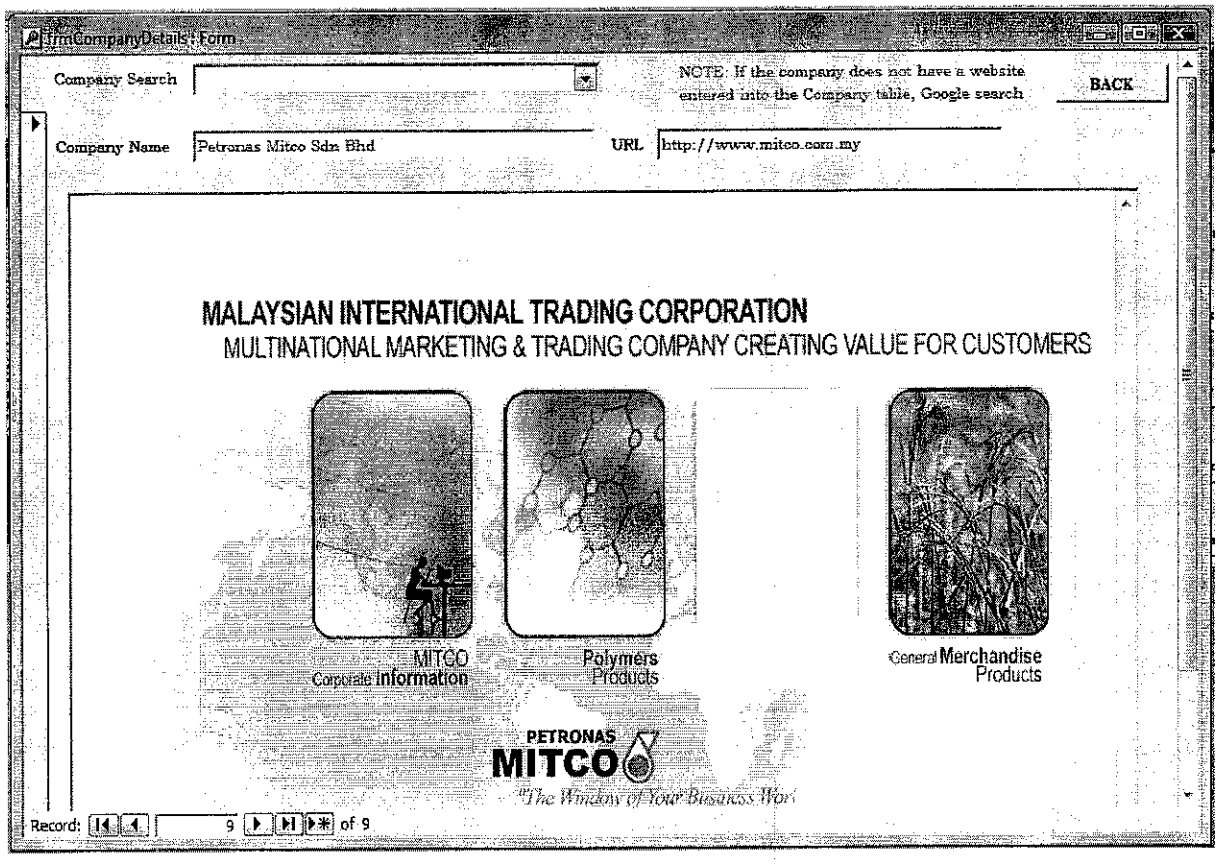


Figure 3.3.8 Company information

CHAPTER 4
RESULTS AND DISCUSSION

4.1 Introduction

.This system is to enhance the Trading Corporation database System for future and easy use of all staff with historical and updated future data. Integrated database will analyze the data Monthly overall and Monthly all products and Monthly for individual product by Products, Customer and Invoices No) by Export, Domestic, Inter Co and INTL for each product, It includes the Products PE , LDPE, LLDPE, HDPE , PP, Ethylene , EDC , PVC ,VCM , Ammonia ,Urea , GMD, Special Chemicals(butane), Benzene , Paraxylene , Methanol and MTBE and it also keep track on Monthly by each department

It is a challenge to design and develop automated database with easy future updates information for all products. This system has three part to design and develop which are to Produce the Reports Monthly overall by (Products, Customer and Invoices No) by Export, Domestic, Inter Co and INTL for each individual product and Monthly for all products overall (Products, Customer and Invoices No) by Export, Domestic, Inter Co and INTL for each product and also for Monthly by each department.

The concept behind the system was quite simple but it is very complicated, time consuming and have to keep track on each product monthly by products information, Monthly by customer information and monthly by invoice No information by Export, Domestic, Inter Co and INTL in integrated database. There are Eighteen Products to

design and develop the system and so **product ID** is primary Key to keep track on each product in database system.

One of the features of the system would be security. Some security features that would be implemented within the proposed system, which is the password to login; and this, would be given to the representative Department in trading corporation. This login will verify that only the right person would be able to upload and download information from system to produce business purpose Reports; which would further enhance the reliability and authenticity of advanced integrated database system.

4.2 System Design Discussion

Microsoft Access is very easy to import or link data from Excel and also easiest way to understand the flow of database system. Because it is consist of Tables, Queries (SQL programming), Forms (VB.NET Programming), Reports (VB.NET programming) and Web Page. This is exactly what we are looking for because we need to select data from Tables and to print the Reports and connect to interface to produce the business purpose Reports of Trading Corporation.

Products information will be downloading from SAP system to Microsoft Excel for further manipulation and import it into Microsoft Access to generate the business purpose reports for the trading corporation for each product with futures updated data. I have design standard template in Microsoft Excel for each Month to download data from SAP system and import it to Microsoft Access.

After Download data from SAP to Microsoft Excel for each products. Import all the tables into Microsoft Access for further manipulation on tables and to select the data

from tables and to generate the Reports for each product of monthly by products, customers and invoice No by Exports, Domestic, Inter Co and INTL. tow option are given to Import or to link the Tables into Microsoft Access. One sheet in Microsoft Excel is one table in Microsoft Access and coloum in Microsoft Excel is field in Microsoft Access. There are two tables (one import from Microsoft Excel and other is user define table contain information about the Products names, product Code and Regions (Exports, Domestic, Inter Co and INTL)) in Microsoft Access to work with and generate the business purpose reports for the trading corporation

For Further Manipulation on data in Microsoft Access

- Import Data from Microsoft Excel to Microsoft Access.
- Query Design (SQL programming)
  - Select Data from Table with given Criteria / condition
- Reports Design (VB.Net Form Design)
  - Display the Data which we select from Query
- Interface Design (VB.Net Programming)
  - Main Interface where lay user can easily interact with the system

4.2.1 Import Table from Microsoft Excel to Microsoft Access

- Select ***File Menu*** and Select ***Get External Data—IMPORT.***
- Or
- ***Right Click Mouse*** at Table (Main Interface) and Select ***IMPORT***
- This window will appears So Select **File of Type(Microsoft Excel)**

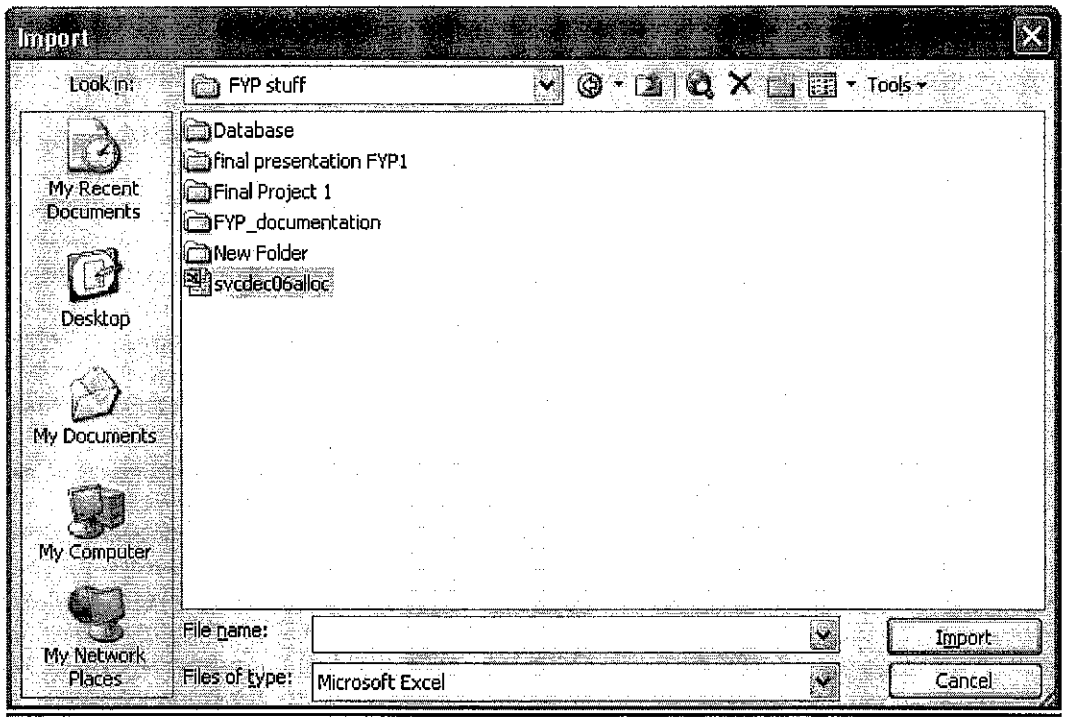


Figure 4.2.1.1 Import table 01

- Select the Ms. Excel Booklet and click on the ***IMPORT*** button
- It will take on this Window to Select the Excel Sheet.
- Give field name (coloum name) and Click **Next** button

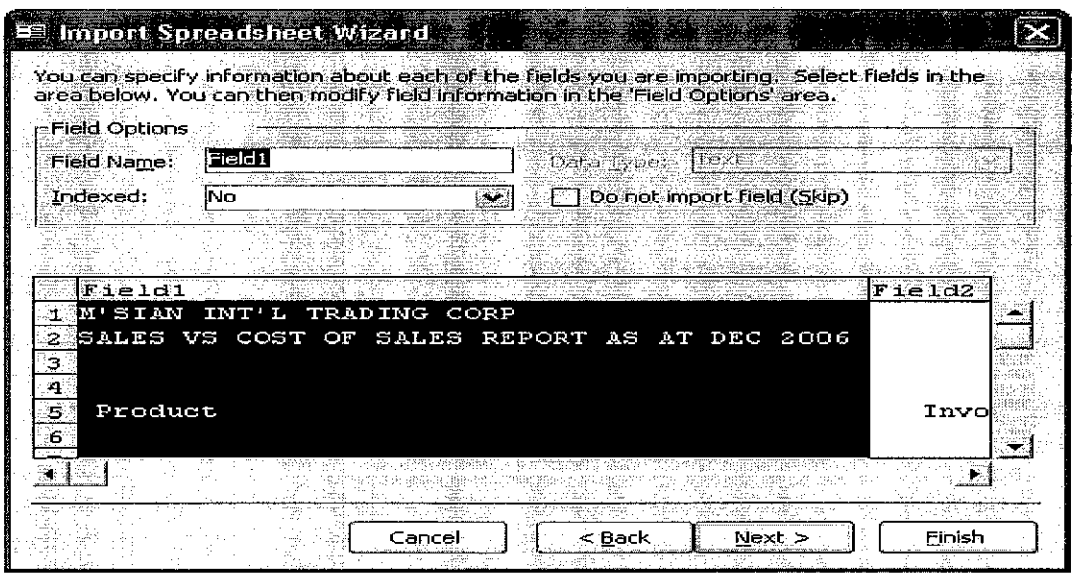


Figure 4.2.1.2 Import table 02

- It will take on this Window to set the Primary Key (Field1) for your table and Click Next Button.

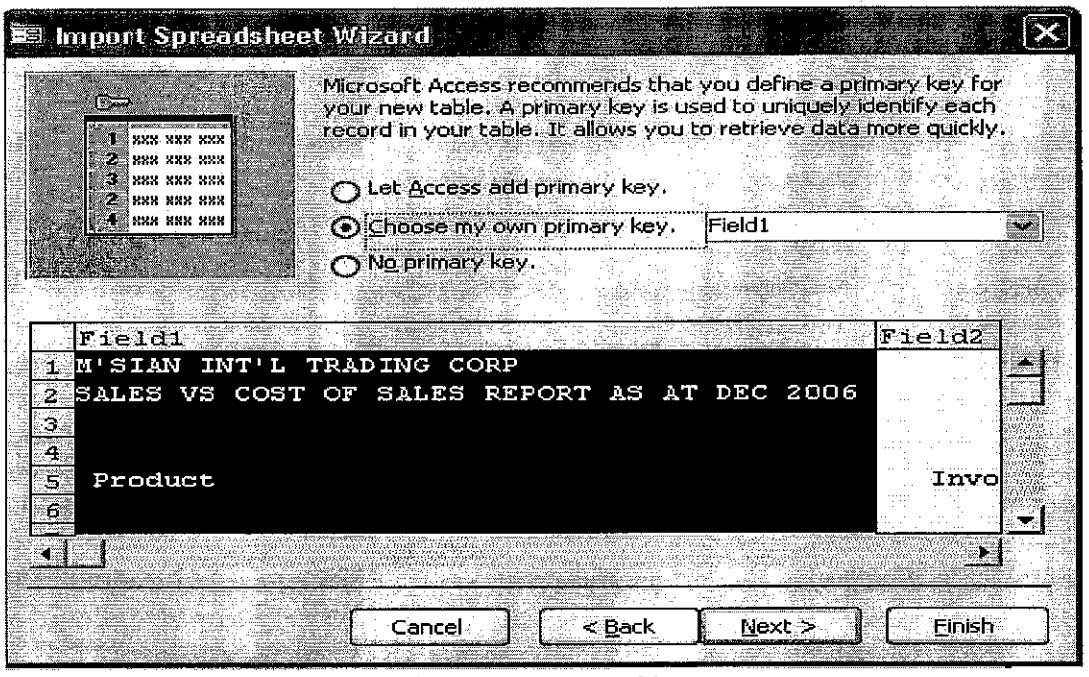


Figure 4.2.1.3 Import table 03

- Give table name and Click **Finish** button.

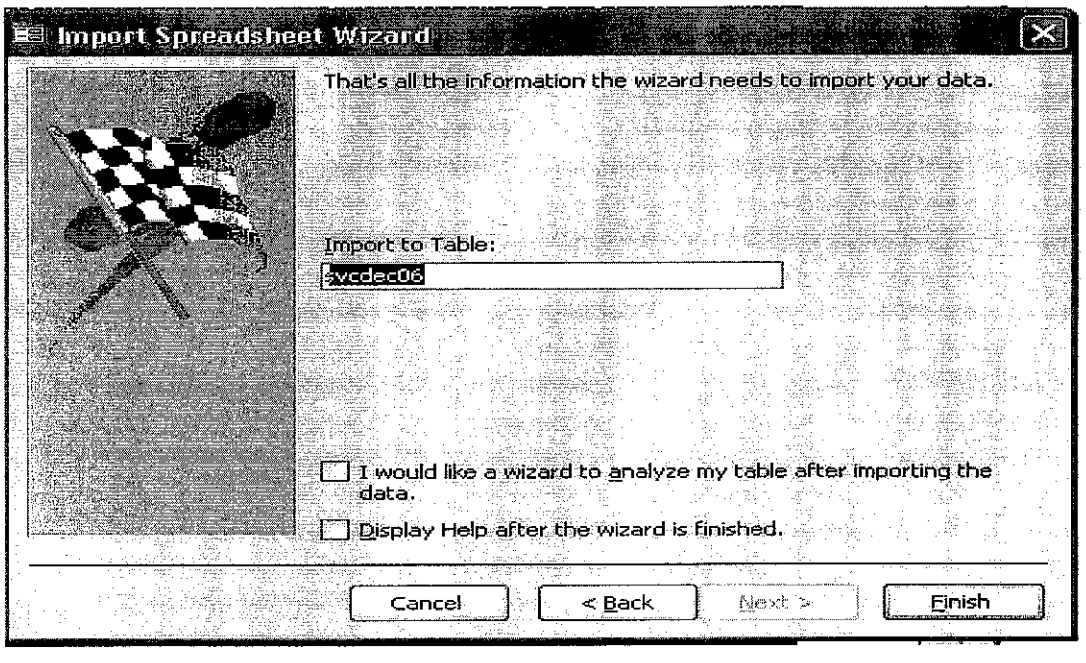


Figure 4.2.1.4 Import table 04

- One sheet in Microsoft Excel is One Table in Ms Access so we have nine (9) Sheets in Excel Template. It will have nine (9) table in Ms Access
- Fallow the Instruction of IMPORT SPREADSHEET WIZARD given above

4.2.2 Query Design

In Query section this is where to select the table and select the data from tables with given criteria or conditions. There are two tables (one import/link from Microsoft Excel and other is user define table contain information about the products names, product code, department code, department names of (Exports, Domestic, Inter Co and INTL)) and User Log information in Microsoft Access to work with and to generate the business purpose reports for the trading corporation and Authorized user allow to access data from database system.

In Microsoft Access Query section select the design view for select and Manipulate data from tables given. It will goes on figure 4.2.1 query design view

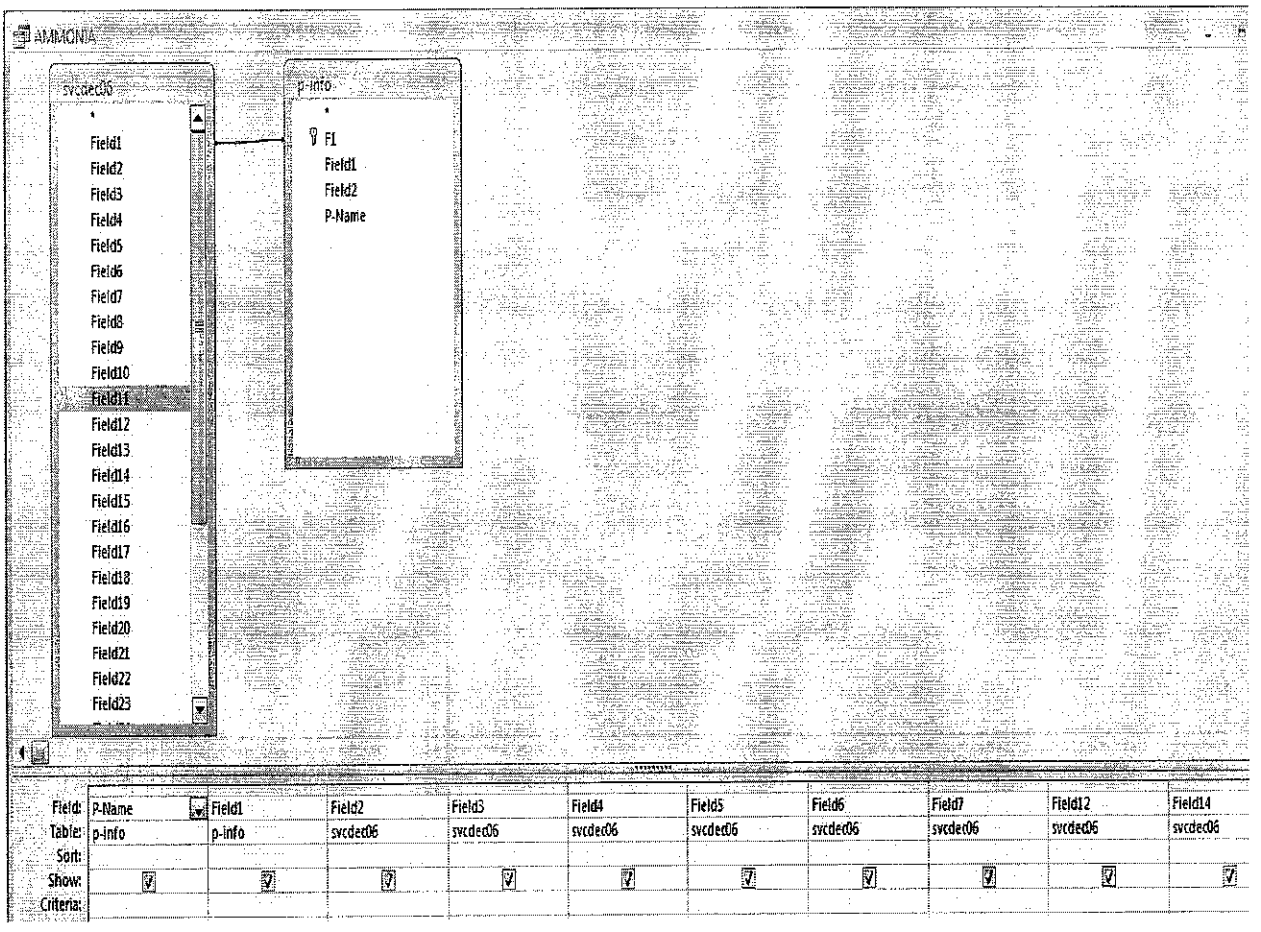


Figure 4.2.2.1: Query Design view

There are two types of Queries one selection queries and other Manipulation Queries.. First selection Queries where we give the criteria and select the data from the table and Second Manipulation Queries where we manipulate the data / tables and to get expected results. We are using both quires to select data from tables and also Manipulate from same tables to find the Monthly Margin for each product. In figure 4.2.1 two tables are connected with **Product Code (Svcdec2006.F1→P.info.F1)**. So product Code is primary key **(Svcdec2006.F1→P.info.F1)** in given tables to connect both to select coloums from both for generates the business purpose reports. There are 21 different queries design from given tables to generate reports on these queries which are monthly overall information.

Monthly by (Exports, Domestic, Inter Co and INTL) for each product,(Propylene , LDPE, , HDPE , PP, Ethylene , Polyethylene, EDC , PVC ,VCM , Ammonia ,Urea , GMD, Special Chemicals(butane), Benzene , Paraxylene , Methanol and MTBE.).

Monthly by (Exports, Domestic, Inter Co and INTL) for individual product,(Propylene , LDPE, , HDPE , PP, Ethylene , Polyethylene, EDC , PVC ,VCM , Ammonia ,Urea , GMD, Special Chemicals(butane), Benzene , Paraxylene , Methanol and MTBE.).

Monthly Overall by department (Basic Chemicals Marketing and Trading Department (AOVD), Fertilizers & Agrochemicals Department (FAC),Methanol & derivatives Marketing & Trading (MMDD), Polymers division (POL), Global Trading division (GAP), Industrial Products and Trading (GIP), strategic Intervention & SMI/SME Business Development(GSI)).

To calculate the monthly margin formula if given

Monthly Margin = (((Sales-Cost) - other services) + service Fee)

From Table Monthly Margin Formula:-

(((((((Field12 – Field 22) + Field28) + Field29) + Field30) + Field31) + Field22) + Field33)

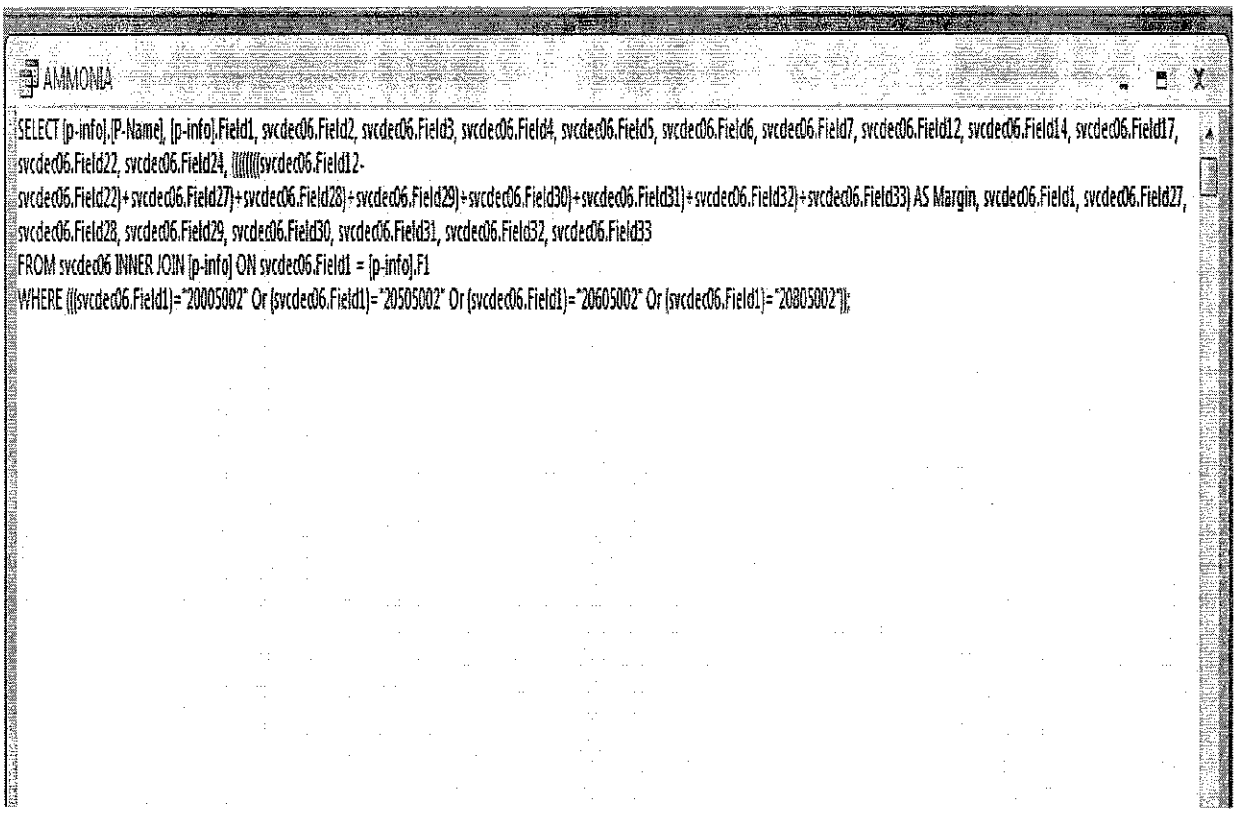


Figure 4.2.2.2: Query SQL Design View

AMMONIA

p-info.Field	Field2	Field3	Field4	Field5	Field6	Field7	Field12	Field14	Field17	Field22	Field24	Mar
EXPORTS	3101061490	0	04.11.2006	3101061490	MARMAN	Philippines	(256,033.36)	(70,059.75)	0	0	0	-2
EXPORTS	5101060561DN	0	28.11.2006	3101061490	MARMAN	Philippines	256,033.36	70,059.75	0	0	0	2
INTER CO.	3101061634	12,021.37	09.12.2006	3101061634	MITCO LABUAI	Malaysia	9,887,695.38	2,775,493.44	12,021.37	9,844,869.27	2,763,472.08	4282
INTER CO.	3101061635	3,000.00	09.12.2006	3101061635	MITCO LABUAI	Malaysia	2,467,530.00	692,640.00	3,000.00	2,456,842.50	689,640.00	
EXPORTS	3101061640	748.01	02.12.2006	3101061640	UNIQUE GAS &	Thailand	622,650.71	172,790.54	748.01	622,650.71	172,790.54	
DOMESTIC	3101061644	504.67	03.12.2006	3101061644	TEKNOGAS (M	Malaysia	492,538.92	137,446.33	504.67	492,538.92	137,446.33	
DOMESTIC	3101061653	128.28	30.11.2006	3101061653	TEKNOGAS (M	Malaysia	123,070.62	33,936.47	128.28	123,104.54	33,936.47	502.2
DOMESTIC	3101061654	143.00	30.11.2006	3101061654	TEKNOGAS (M	Malaysia	137,192.85	37,830.65	143.00	137,230.68	37,830.65	559.5
EXPORTS	3101061668	1,462.23	11.12.2006	3101061668	UNIQUE GAS &	Thailand	1,203,327.18	337,776.05	1,462.23	1,203,327.19	337,776.06	
EXPORTS	3101061680	742.32	13.12.2006	3101061680	UNIQUE GAS &	Thailand	656,490.13	185,580.25	742.32	656,490.13	185,580.25	
INTER CO.	3101061683	7,500.00	16.12.2006	3101061683	MITCO LABUAI	Malaysia	6,386,439.04	1,797,225.00	7,500.00	6,359,787.79	1,789,725.00	
INTER CO.	3101061710	7,519.89	16.12.2006	3101061710	MITCO LABUAI	Malaysia	6,403,371.61	1,801,990.04	7,519.89	6,376,649.70	1,794,470.16	2672
DOMESTIC	310106A023	57.48	18.12.2006	310106A023	FED FERT.	Malaysia	58,093.00	16,270.29	57.48	58,093.00	16,270.29	
EXPORTS	310106A595	800.45	28.12.2006	310106A595	MARMAN	Philippines	761,824.97	215,600.67	800.45	761,824.96	215,600.67	5656.
*												

Figure 4.2.2.3: Query Output

4.2.3 Reports Design

In Reports Section we can connect the data from Queries to design the report. There were two options to design the reports. One Select Table in *Data-Record- Source* from *Properties window* which you want to get data from table. Second you can create own Report by using Toolbox given there on interface. Report header contains the heading for report example; - Logo, Motto, address, contact num, date, time etc. Report Page Header must contain the heading of the Report we can use Label from Toolbox to give the heading in report OR use the field from table. Detail Section is to design the Report body so drag all the fields of this section. Page Footer has count the page numbers and get current Date and Time form PC.

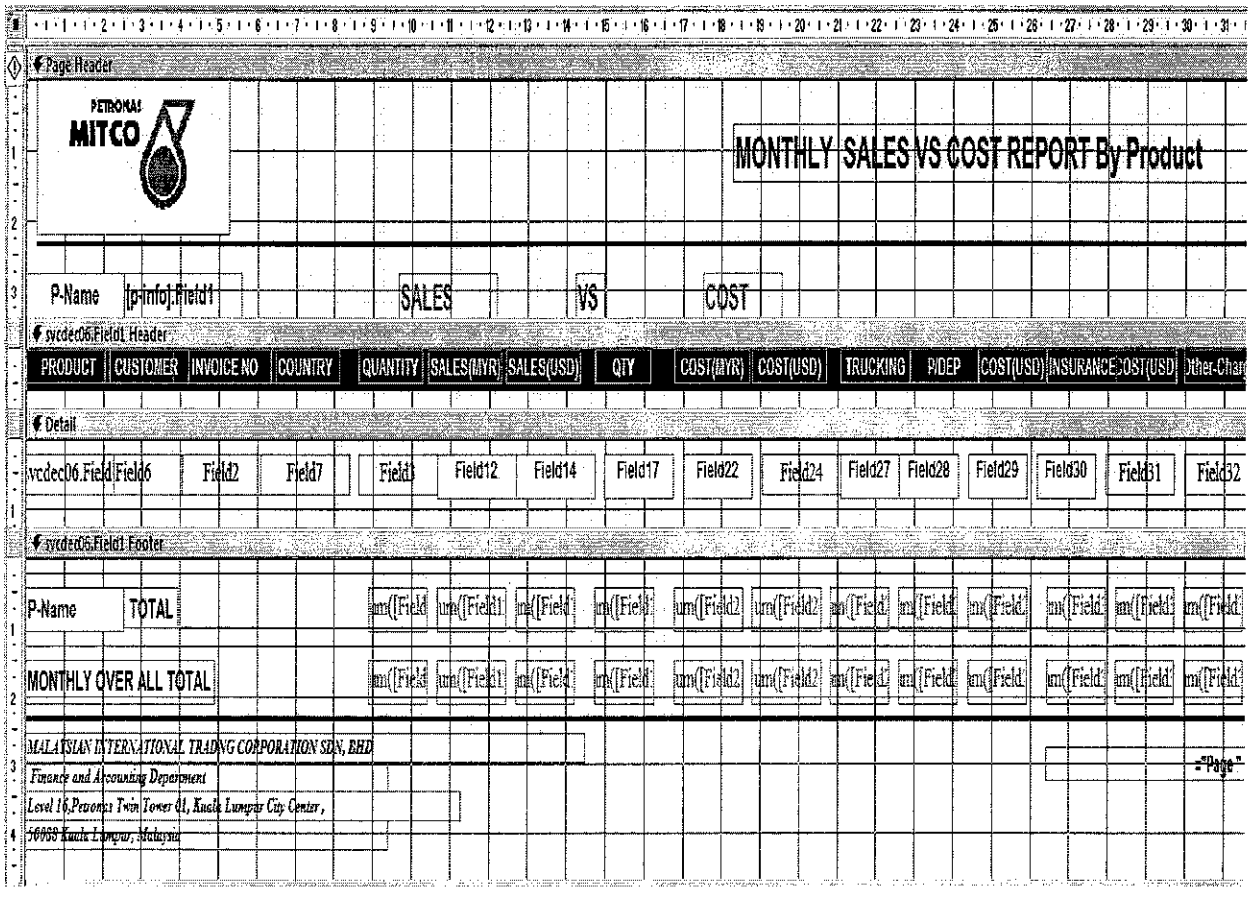


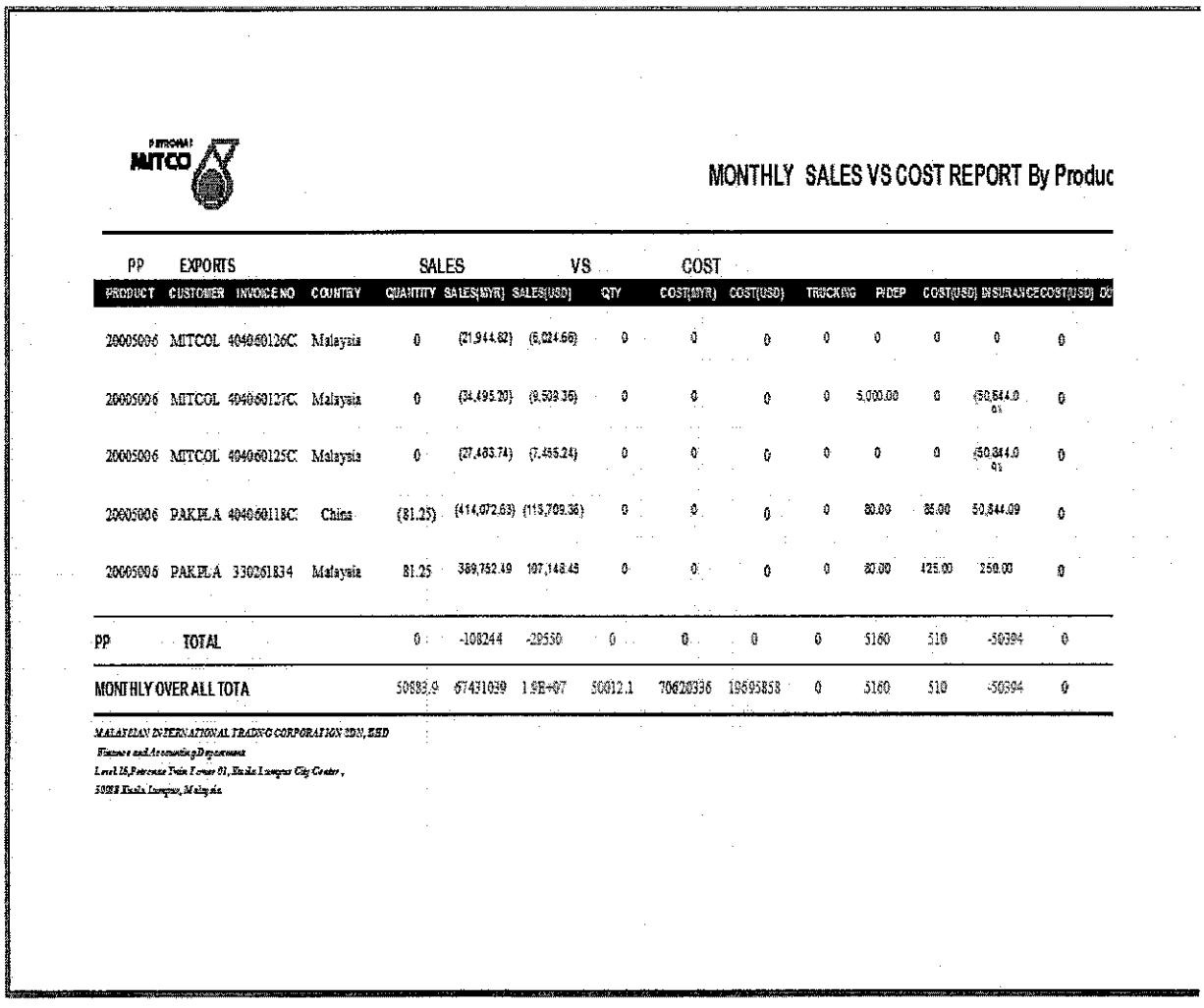
Figure 4.2.3.1: Report Design Interface

After Selecting Table in *Data-Record- Source.* Design the report on corporation requirements by selecting the Field list which field you want to drag on Report to design. This is the standard reports format for each Petronas Mitco products. **Monthly Overall**

Monthly by(each product, by customer, by invoice no) by (Exports, Domestic, Inter Co and INTL) **for each product,**(Propylene , LDPE, , HDPE , PP, Ethylene , Polyethylene, EDC , PVC ,VCM , Ammonia ,Urea , GMD, Special Chemicals(butane), Benzene , Paraxylene , Methanol and MTBE.) business purpose Reports for the trading corporation. In footer section we are calculating the Sum for each products and Running Sum for overall data.

Monthly by(each product, by customer, by invoice no) by (Exports, Domestic, Inter Co and INTL) **for individual product,**(Propylene , LDPE, , HDPE , PP, Ethylene , Polyethylene, EDC , PVC ,VCM , Ammonia ,Urea , GMD, Special Chemicals(butane), Benzene , Paraxylene , Methanol and MTBE.) business purpose Reports for the trading corporation. In footer section we are calculating the Sum for each products and Running Sum for overall data.

Monthly Overall by **department** (Basic Chemicals Marketing and Trading Department (AOVD), Fertilizers & Agrochemicals Department (FAC), Methanol & derivatives Marketing & Trading (MMDD), Polymers division (POL), Global Trading division (GAP), Industrial Products and Trading (GIP), strategic Intervention & SMI/SME Business Development(GSI)) business purpose Reports for the trading corporation. In footer section we are calculating the Sum for each products and Running Sum for overall data.



MONTHLY SALES VS COST REPORT By Produc

PP EXPORTS SALES VS COST

PRODUCT	CUSTOMER	INVOICE NO	COUNTRY	QUANTITY	SALES(MYR)	SALES(USD)	QTY	COST(MYR)	COST(USD)	TRUCKING	PHDEP	COST(USD)	INSURANCE	COST(USD)	OC
20005006	MITCOL	404060126C	Malaysia	0	(21,944.82)	(6,024.66)	0	0	0	0	0	0	0	0	
20005006	MITCOL	4040601270	Malaysia	0	(34,495.20)	(9,508.35)	0	0	0	0	5,000.00	0	(50,844.0	0	
20005006	MITCOL	4040601250	Malaysia	0	(27,483.74)	(7,495.24)	0	0	0	0	0	0	(50,844.0	0	
20005006	PAKPLA	4040601180	China	(81.25)	(414,072.63)	(113,709.36)	0	0	0	0	80.00	85.00	50,844.09	0	
20005006	PAKPLA	3302618340	Malaysia	81.25	389,752.49	107,148.48	0	0	0	0	80.00	425.00	250.00	0	
PP	TOTAL			0	-108244	-29550	0	0	0	0	5160	510	-50394	0	
MONTHLY OVER ALL TOTA				50883.9	67431039	1.9E+07	50012.1	70620336	19695858	0	5160	510	-50394	0	

MALAYSIAN INTERNATIONAL TRADING CORPORATION SDN. BHD
Finance and Accounting Department
Level 16, Petronas Twin Tower 01, Kuala Lumpur City Center,
50088 Kuala Lumpur, Malaysia

Figure 4.2.3.2: Report design Output

4.2.4 Interface Design

In Form section it provides the Main Interface for new user to Access information from system. For the interface I tried to give a balance look to the main form. For this purpose my supervisor often gave me pointers to enhance the aesthetic sense of my project, as the saying goes 'first impression is the last impression'. The color selection for the forms was left to me, so for this I chose cool colors, which are pleasant to the

eyes of the user. The main objective of interface is to be user friendly where new user can easily understand the flow of the database system. User can understand at first look at interface what to do here. User interface must be easy to navigate by lay users. User can understand where to go. It must be easy to understand by non-technical users.

The screen design and color that will be choose is considering the user environment which is attractive and welcoming. The screen will be developed using the appropriate fonts, font colors, background colors, images, and many more. Main part of project in Microsoft Access was to design user friendly interface which is easy to navigate and easy to understand by all user. I have done a lot of user interface testability from different user from different departments of Petronas Mitco Sdn Bhd. The main objective of database is zero programming in future update for system because the users of database are chemical Background they don't have idea of programming. That way I have use the simple the way to design the interface for this system. I did not make it complicated for users

Finally I have to connect all Reports (**Monthly Overall** ,Monthly by(each product, by customer, by invoice no) by (Exports, Domestic, Inter Co and INTL) for **each product**,(Propylene , LDPE, , HDPE , PP, Ethylene , Polyethylene, EDC , PVC ,VCM , Ammonia ,Urea , GMD, Special Chemicals(butane), Benzene , Paraxylene , Methanol and MTBE.) ,Monthly by(each product, by customer, by invoice no) by (Exports, Domestic, Inter Co and INTL) for **individual product**,(Propylene , LDPE, , HDPE , PP, Ethylene , Polyethylene, EDC , PVC ,VCM , Ammonia ,Urea , GMD, Special Chemicals(butane), Benzene , Paraxylene , Methanol and MTBE.) and Monthly Overall by **department** (Basic Chemicals Marketing and Trading Department (AOVD), Fertilizers & Agrochemicals Department (FAC), Methanol & derivatives Marketing & Trading (MMDD), Polymers division (POL), Global Trading division (GAP), Industrial Products and Trading (GIP), strategic Intervention & SMI/SME Business Development(GSI)) to Main Interface.

Main Interface functions are included log in function will authorized user can log in the database if unauthorized user trying guesses the password after three guesses the database will close and message will display to be authorize to conform with Administrator for help.

Select department functions where user can select the department of Petronas Mitco and it will also connect with new Report form to view and print reports. View Report function will help user to view selected reports from database system and View all function will help user to view all selected reports from database system. Print Report function will help user to print selected reports from database system and Print Report function will help user to print all selected reports from database system. Back button is used for navigational purpose and to go back to previous Department information Form. Display Database Window function i will display tables of database system and it will also close the form. Log Out function will Log out the User from database and also close the Database system.

4.3 Results of User Testing

After all development process is finished and the product is completed, this system needs to be evaluated by the user. The details about the testing and evaluation .The users have been divided into two groups as Section 4.3.1 shows the testing done by Non Technical Users but have basic knowledge of Database systems, Section 4.3.2 deals with end user of database system from Petronas Mitco Sdn Bhd, Finance Department having their say about the system output.

4.3.1 Group 1 –Non-technical Users but have basic knowledge of Database

As the aim of the research to determine the faults or worst case of the system, in order to review the flaws, thus questionnaires were handed out to the tyro users. Data gathered from the feedback of the system's users that was compiled, analyzed and summarized to justify the over all performance of the system. Results from the attempted data collection techniques, namely, questionnaires (Appendix 1) will serve to determine the user satisfaction and the effectiveness of the usability of the system.

Although the use of knowledge based techniques tends to promote higher intelligibility (and accuracy) output, it is possible that knowledge based techniques embedded in the system and find out that system is defective or incomplete. However a general questionnaire was handed out in order to learn the user's opinion about the general accuracy of the output. Questionnaires (as attached in the appendix -1) were handed out to 5 Non-technical users to evaluate the database system performance. It may not be clear to know that every user has their perception and understanding to use the system. Each user was asked to try at least four Reports to be View.

The data collected from the users was as follows, zero instances of the database Reports view were rate not at all accurate. Two instances were somewhat accurate. Twelve instances were rated as accurate. The data was then calculated into percentages and then a pie chart was formed for a more graphical view of the findings of user evaluation.

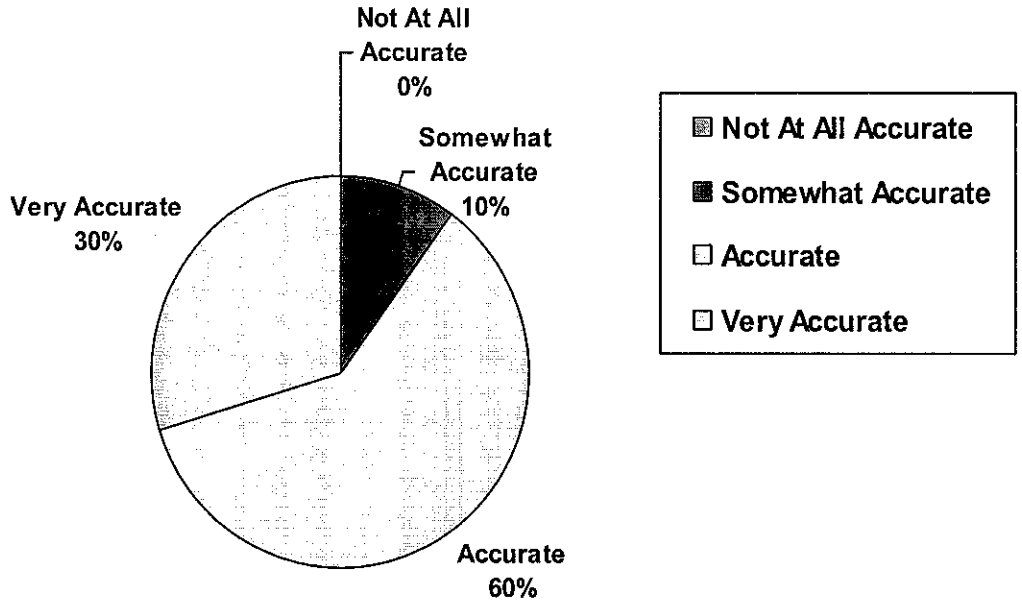


Figure 4.3.1: Results of evaluation

Looking from the pie chart all the users rated it as accurate and none rated it as inaccurate. There was no failure database report view as all the reports have been tested before being added in the database system. Overall performance of system is good enough to produce report from database system and interface was also friendly most of user view about the system.

4.3.2 Group 2 – Human judges

A Human judge was appointed to evaluate the output. For this task the prototype of database system was send to end user of database system from Petronas Mitco Sdn

Bhd, Finance Department to evaluate the output on 28 August 2007 in KLCC Malaysia.

. Then the each user output was scored as the output was checked for Database system overall performance, accuracy and to get the view about the system content, function, design and business purpose Reports of Trading Corporation. The scoring was done on the following levels:

- Scoring done at the level of 1-5 scale

i. 1- failure
ii. 2- partly accurate
iii. 3- accurate
iv. 4- satisfactory
v. 5- good

The results were then plotted using Microsoft excels and a bar chart was derived, as shown in Figure 4.2.

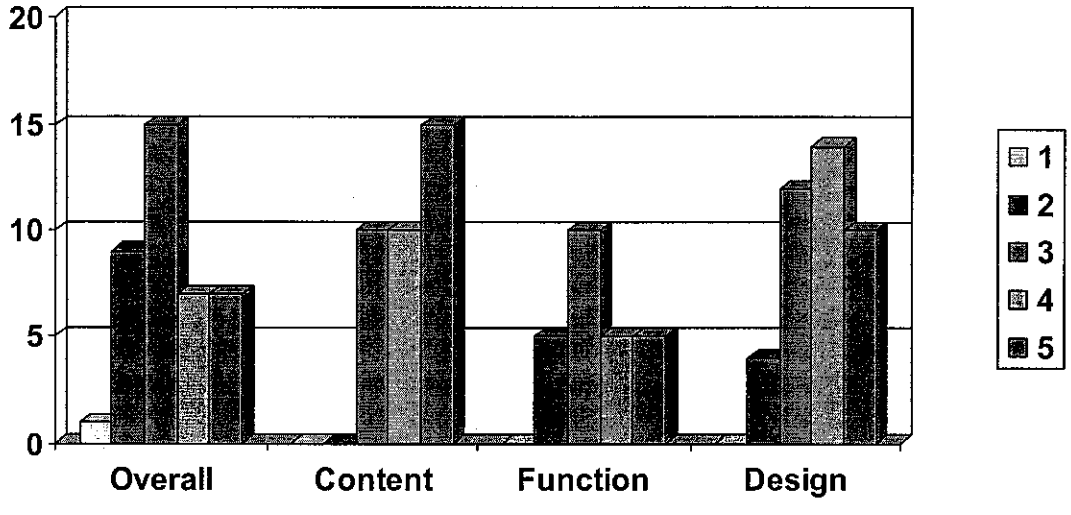


Figure 4.3.2: Evaluation score from human judges

Over all the system output was fine .Most of end User find that database system overall quite good and the information (Business purpose Reports) found is sufficient. Overall performance of system is good enough to produce reports from database system and interface was also friendly most of user view about the system. However, in terms of function and design, the rating of database system is fairly rated, which means there are some features in this areas that are not fulfilled or can be improved. Some of respondents said that the designs are poor where human computer interactions are not perceivable.

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4.4 Conclusion for Testing

In this stage also, all the interactive components and elements will be integrated with the functions as well as the navigations in order to produce a complete functional system after finished the development process. The first part of the project that is the first semester of FYP will be dedicated in planning, analyzing, designing and developing the system itself. By the second semester, the workable product should 'Go-Live' for a 6-8 months testing period where it will be put on real working Environment so that any limitation and errors could be detected and improvised .

It can be clearly analyzed that that users gained confidence in the system and thought of it to be reliable and practical; at the same time, efficient and effective. This is seen through the representation of the pie charts in terms of time required to execute the queries. The end users have had their word on the output.

CHAPTOR 5
CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This final year project needs a very rough study to ensure that it is completed on time and achieve its objectives because the implementation of database system, wireless and virtual reality application will need precision and full attention to make every element to be integrated into a whole system. To make the project a success, it is recommended more research and findings are conducted, and also references to IT expertise. Also it is important to develop a system to stay realistic to match the author's capabilities and expertise. However, with the support from the author's supervisor and lectures from the information technology department, it is hoped that the project will be a success.

As for the conclusion, the finding and results of this study are yet to be obtained at the end of the research in a months' time. The information needs to be thoroughly revised to make sure that the study will achieve its objectives. Other important thing is to determine the fact, whether the proposed system would produce the required ripples in the lake. The scale of the project has to be carefully analyzed and to commensurate with the system developer's programming skills.

The aim of the research is to analyze the functions and roles that would be played by SAP Integration with Microsoft Office in terms of improved performance of database system. Data gathered from the feedback of system's stakeholders is compiled, analyzed and summarized to justify the feasibility of implementing the proposed system

to ensure that the system's goals is met which the current system is unable to achieve. Results from all attempted data collection from this research are served to fulfill user requirements and used as a basis to measure the effectiveness and usability of the system.

5.2 Recommendations

After much researching and stages of developing the database system prototype. It is still many things to be developed and solved, but it is not wrong to make recommendations for future references. The development had been progressing quite smoothly. A tight schedule had to be plan to ensure that the development can finish before the expected due date.

It is recommended that the developer will stick clearly to the project's objectives to avoid unnecessary circumstances. It is also recommended that after the finish product had been launch, or after the test had been carried out, all the critics and complain will be taken seriously into consideration.

With the advancement of latest technology, both in knowledge sharing and communication devices, perhaps in the near future, a new mechanism can be used for promoting database systems.

5.3 Project Limitations

In the process of importing the table in the data base system there were many ambiguities, few of them have been resolved, others still have to be addressed, and e.g. coloum in Microsoft Excel is Field in the Microsoft Access so it is bit hard to understand for new users in the system.

Some time after importing the table in database system it might disconnect the relationship of tables in query section. Results we might did not get the product name, region information and department from the database system Report. So for that just keep track on that query section of database system and open these queries in design view and drag/connect the Primary key of one table to other table **(Svcdec2006.F1→P.info.F1)**.

5.4 Project Enhancement

The present work in no way can be termed as complete. A number of enhancements and refinements are possible. During the research more stress was on functionality.

The project could be enhanced in the following ways. There can be improvement in the database for weekly, quarterly and yearly Reports can be generated from system and keep track on information price forecast and customer information for every year on ach product. There can be improvements in the importing data from direct SAP system to this database system. No more use of the Microsoft Excel in between SAP system and this database system.

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Appendix 1 – Questionnaire

Advance Integrated Database system (Business Application) Questionnaire.

I am currently in the testing phase of my final year project which is based on developing a **Advance Integrated Database system** based on generating Business purpose application for trading Corporation. In order to come up with a satisfactory database system, I need appropriate feedback through this questionnaire. Through this system I am planning to provide basics for further enhancement in the world of database system related to business Application.

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1) First translation

Not at all Accurate	Somewhat Accurate	Accurate	Very Accurate

2) Second translation

Not at all Accurate	Somewhat Accurate	Accurate	Very Accurate

3) Third translation

Not at all Accurate	Somewhat Accurate	Accurate	Very Accurate

4) Fourth translation

Not at all Accurate	Somewhat Accurate	Accurate	Very Accurate

**********THANK YOU**********

All information from this survey is confidential and will be used for my research purpose only. It will not be distributed or sold to any groups, organizations or individuals. Your cooperation is highly appreciated.