

## CHAPTER 4

### INFORMATION REQUIREMENTS ANALYSIS

This chapter presents the information requirements analysis. Firstly, the system requirements determination is implemented to collect business requirements. Then, all information collected from system requirements determination are used for developing the high-level data model in the step of Information Technology architecture.

Information Requirements Analysis is second stage of Wetherbe's four-stage model of IT planning as shown in Figure 4.1. Information requirements analysis is consisted of 2 key parts; system requirements determination and Information Technology architecture. The outcome of this stage is the high-level data model that is used as a development guild for Data Mart Developers during the design phase. Information requirements analysis is implemented to know the design scope of the Data Mart before resource allocation and project planning are implemented so that planners can correctly develop project planning and allocate resource.

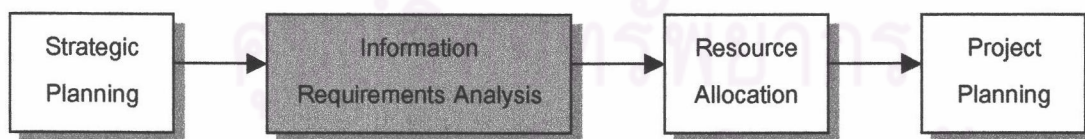


Figure 4.1: Information Requirement Analysis (the second stage of a basic four-stage model of IT planning) (Turban et al., 2002)

Firstly, system requirements determination is implemented to collect the current business requirements and future needs of employees and managers in each department

that are necessary to support their business analysis as well as the currently being used reports are collected to analyse and digest the format of each report. The Facts and Dimensions of all reports are collected and summarised in the Details Scope Matrix. The data in Details Scope Matrix and all requirements in this part are used for developing information technology architecture.

Secondly, information technology architecture is developed after system requirements determination is completed. In this part, the high-level data model is built. Facts and Dimensions in Details Scope Matrix as well as all requirements collected in system requirement determination are considered to build the high-level data model. The high-level data model shows the diagram of relationship between Fact and Dimensions and their descriptions.

#### **4.1 System Requirements Determination**

System requirements determination is the first step of information requirements analysis. It is implemented to gather business scope and requirements from users. In addition, the reports that are currently being used by employees and managers in each business department are collected to analyse and digest for developing the high level data model in next step, information technology architecture. System requirements determination takes 4 weeks for implementing started from 01/08/2002-30/08/2002.

There are many methods that can be used to determine system requirements, in this thesis, the interview is selected for implementing system requirements determination. Interview is consists of 6 basis steps; To determine the people for interviewing, prepare interview outline, schedule the interview, conduct the interview, document the interview, and summarise the business requirements and scopes. The project coordinators are the main persons to implement system requirements determination by supporting from IT-ONE 's

Data Mart developer (The details of IT-ONE staff is shown in CHAPTER 6, Resource allocation) The interview of the Data Mart is performed in the following steps.

#### 4.1.1 Determine the People for Interviewing

The people who are selected to interview should involve in using of the system and well know about concerned business processes and documents because the information from users is the most important factor to reach objective of the interview that is the correctly understanding of business requirements and scopes.

Generally the projects are not successful if the finished system can't provide user the expected system of users. Many projects have good IT experts but they were failed because IT experts did not know about the business requirements and what are really user needs. The preparation of interviewing should be suggested from IT experts to completely gather necessary information that is required for the Data Mart development. They also suggest on the contents of interview outline and what information should be collected from interviewing of business users.

In this thesis, the people who are selected to be interviewees consist of one business officer and one manager from each business departments of AAA Company. The business officers who are representatives should well know about business scopes and the reports that are currently being used in their departments. They should also well understand requirements of their colleagues and departments. The list of interview 's attendees is shown in Table 4.1.

Table 4.1: The list of interview's attendees

INTERVIEWERS	
Company	Position
1. AAA Company	Project Coordinator 1
2. AAA Company	Project Coordinator 2

## INTERVIEWEES

Department	Position
1. Pulp & Paper	Manager Marketing executive
2. Steel products	Manager Marketing executive
3. Industrial	Manager Marketing executive
4. Plastic and Chemical	Manager Marketing executive
5. Aluminum	Manager Marketing executive
6. Energy	Manager Marketing executive
7. Building Materials	Manager Marketing executive
8. Cement Business	Manager Marketing executive
9. International Sourcing	Manager Marketing executive
10. General Merchandise	Manager Marketing executive

#### 4.1.2 Prepare Interview Outline

Before conducting the interview, interview guide or checklist should be prepared so that sequence of interview is managed timely and efficiently. The interview outline must be consisted of title, date, time location of interview, name of interviewee and interviewer, objectives, agenda, and so on. The agenda of interview outline should be included introduction, overview of interview, summary of major point and closing.

Typical interview outline that used for walkthrough session of Data Mart Project is shown in Figure 4.2. The most important of this interview (walkthrough session) is list of the currently being used reports and business scopes and requirements of each department because this will be used to develop the Data Mart Model in the next step.

### Interview Outline

Title: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Location: \_\_\_\_\_

Interviewee: \_\_\_\_\_

Interviewers: \_\_\_\_\_

Objectives:

The objective of the interview is to understand the business scope and requirements of each department and collect to develop Data Mart Model.

Agenda:

Approximate time (minutes)

1. Introduction

( 10 min. )

- Introduce the objectives and overall of the Data Mart project.
- Introduce interview goals (e.g. focus on business scope and requirements, collecting the currently being used reports of each department)
- Introduce interview's team and roles
- Confirm time available

2. Overview of Interview

( 90 min. )

Topic 1: User's responsibilities

Topic 2: Objective of department

Topic 3: Business scope of department

- Interview guide of
  - Suppliers (number of suppliers, hierarchy of suppliers, categories of suppliers)
  - Products (number of products, hierarchy of products, categories of products, packages and grade of products)
  - Customers (number of customers, hierarchy of customers, categories of customers)
- Business practice ( direct, indirect, service)
- Report and analysis
  - Number of report
  - Reported name
  - Type of report
  - Source of data
  - Frequency of use report

- Departments requirement of analysis data	
Type of routine analysis	
Ad hoc analysis	
Topic 4: Collect existing report	
3. Summary of Major Points	( 10 min.)
4. Closing	( 10 min. )

Figure 4.2: interview outline  
(Adapted from Hoffer et al., 2002)

#### 4.1.3 Schedule The Interview

Project Coordinators should arrange the schedule of interview and send the official memorandum to attendees before interview date at least one week so that they can prepare the required information and arrange schedule of their work because some attendees may be busy, have meeting, have seminar, or be on the business trip. The memorandum should be advised the background and objectives of the interview, list of all attendee names/position/department/position, specific time and place of meeting. The agenda and topic of question with approximate time for each section of the interview should be informed to interviewees.

#### 4.1.4 Conduct The Interview

Walkthrough sessions are conducted to interview business users that are delegates of 10 business departments. Each walkthrough sessions takes about 2 hours to finish the interview.

#### 4.1.5 Document The Interview

After conducting the interview, the interview has been noted and sent to interviewees to accept the correction of information. The interview note from walkthrough session of the Data Mart should also identify as same details as interview outline; such as, date and time of interview, location of interview, attendees, etc. The format of interview note from walkthrough session of the Data Mart is shown in Appendix A.

#### 4.1.6 Summarise Business Requirements

According to walkthrough session, there are 2 key parts that are analysed to list Dimensions and Facts for developing the high-level data model in the next step; firstly the reports that are currently being used in each department and secondly the business scope and requirements of each department collected from the interviewees during the interview.

Firstly, all reports that are currently being used in each department, collected from business user during walkthrough session, are considered and digested to list Dimensions and Facts of each report. The list of reports is shown in Table 4.2. Then Dimensions and Facts of each report are summarised in Detailed Scope Matrix as shown in Appendix B. For example of Monthly Performance report of Cement Business Department (Ce-8) that was collected during walkthrough, it was found that provide information about Sales of cement products (Cement Grey Bag, Cement Grey Big Bag, Cement Grey Bulk, Cement Grey Clinker, Cement Grey Oil Well, Cement white Big Bag, Cement White Bulk, and others) of Cement Business Department (Department) by Month (Jan., Feb., March, Apr., May, ....., Dec) in year (2002, 2003, 2004, ....) and Sales were shown in term of turnover budget, turnover actual, Income budget, Income budget, Quantity budget, and Quantity actual.



From provided information on this report, Dimension of this report consists of Time (month and year), Sales organisation or sales area (Department), Product group (6 Product Hierarchies; for example, Cement, Cement Grey, Cement Grey Bag, Cement Grey Gag Type I, Cement Grey Bag Type I Brand Green Tiger, Cement Grey Bag Type I Brand Green Tiger with plastic wrap bag) (Cement is 1<sup>st</sup> hierarchy, Cement Grey is 2<sup>nd</sup> hierarchy, Cement Grey Bag is 3<sup>th</sup> hierarchy, Cement Grey Gag Type I is 4<sup>th</sup> hierarchy, Cement Grey Bag Type I Brand Green Tiger is 5<sup>th</sup> hierarchy, Cement Grey Bag Type I Brand Green Tiger with plastic wrap bag is 6<sup>th</sup> hierarchy) and Facts of this report consists of Actual Sales Turnover (Thai Baht, THB), Monthly Budget Sales Turnover (THB), Income Actual (THB), Income Budget (THB), Quantity Actual (Tonnes), Quantity Budget(Tonnes). After Dimensions and Facts of Monthly Performance report are listed. They are summarised in Details Scope Matrix. The other reports are done as same method.

Secondly, business scope and requirements of each department, collected by interviewing business users during walkthrough session, are considered to complete the list of Dimensions and Facts because Dimensions and Facts that collected from recently being used reports do not cover all business analytical requirements. Business scope and users requirements of each department covered Suppliers (number of suppliers, hierarchy of suppliers, categories of suppliers), Customer (number of customer, hierarchy of customer, categories of customer), product (number of products, hierarchy of products, categories of products, packages of products, and grade of products), Business practice (Import direct, Import indent, import services, export direct, export indent, and export services), Frequency of using report (yearly, quarterly, monthly, daily), and others.

Table 4.2: List of recently being used reports in each department of AAA Company

Department	Report Name
Pulp & Paper	Pp-1 : Sales Turnover Performance
	Pp-2 : Turnover by Product
	Pp-3 : Order Conclude by Product
	Pp-3.1 : Order Conclude by Customer
	Pp-4 : Order Conclude by Supplier
	Pa-5 : Concluded Qty vs. Shipped Qty by Product
	Pa-6 : Price Movement by Product
	Pa-7 : Sales Budget
	Pa-8 : Shipment Status
Plastic & Chemical	Pc-1 : Sales by Grade
	Pc-1.1 : Sales by Grade in specific country
	Pc-2 : Sales by Budget
	Pc-3 : Export Volume of specific product to specific country
	Pc-4 : Export Volume by customer
	Pc-5 : Sales Budget
	Pc-6 : Price Movement by Product
General Merchandise	Gm-1 : Sales Performance
	Gm-2 : Sales Performance of specific product in specific country
	Gm-3 : Sales Turnover Performance
	Gm-4 : Income Performance
	Gm-5 : Shipment Control
	Gm-6 : Sales Budget

Department	Report Name
Energy	En-1 : Import direct Control
	En-2 : Monthly Report to Business Division Manager - Sales Performance
	En-2.1 : Monthly Report to Business Division Manager - Market Trend
	En-3 : Sales Turnover Performance
	En-3.1 : Income Performance
	En-4 : Order Conclude & Forecast shipment
	En-5 : Pet coke Volume Shipped to specific plant/customer
	En-6 : Sales Budget
Building	Bu-1 : Sales Performance by Product
	Bu-1.1 : Sales Performance by country
	Bu-2 : Gypsum Sales Volume by country
	Bu-3 : Analytical Report
	Bu-4 : Monthly Sales Report to Supplier
	Bu-5 : Gypsum Board Export Sales
	Bu-6 : Monthly Export Sales Report by country by size
Industrial	In-1 : Spare Part Status Control
	In-1.1 : Sales Commission
	In-2 : Import Direct Control
	In-3 : Export Direct Control
	In-4 : Purchase Order Conclude
	In-5 : Sales Performance
	In-6 : Sales Performance of non-AAA Group products
	In-7 : Sales Performance of specific product in specific country
	In-8 : Sales Budget

Department	Report Name
International Sourcing	Is-1 : Monthly Sales Report
	Is-2 : Monthly Performance by customer
	Is-3 : Monthly Highlight
	Is-4 : Performance Margin Report
	Is-5 : Revenue Budget of Service Income
Steel products	Sp-1 : Overdue A/R Aging Analysis by AAA Group customer
	Sp-2 : Export Direct Control
	Sp-3 : Incoming Payment Control
	Sp-4 : Sales Budget
Aluminum	Al-1 : Sales/Stock Control
	Al-2 : Sales Performance
	Al-3 : Sales Performance of specific product by business practice
	Al-4 : Sales Performance (EBITDA)
	Al-5 : Sales Budget
Cement	Ce-1 : Export Direct Control
	Ce-2 : Export Cement Report
	Ce-3 : Cement Export Statistics
	Ce-4 : Estimated Cement shipment
	Ce-5 : Forecast Cement Shipment
	Ce-6 : Sales Potential for specific product
	Ce-7 : Order Concluded Report
	Ce-8 : Monthly Sales Performance
	Ce-9 : Top ten Cement Customers
	Ce-10 : Cement budget
	Ce-11 : Cement Export Statistic by region
	Ce-12 : A/R , Inventory Value by month
	Ce-13 : Monthly Report
	Ce-14 : Sales Budget

#### 4.1.7 Key Gaps and Issues

There are some key gaps and issues that were found from the system requirement determination as following below.

- ❑ The business scopes of each department are so diversified and different in nature since each department has different set of business flows, products, customers, suppliers, and others. The Data Mart as built to meet the objectives of serving all departments' requirement so all business scopes and users' requirements are standardised the analytical format to serve all departments. Every department has to take the "give-and-take" and mutually agree approach to build the standard format of the Data Mart model.
- ❑ SAP system does not contain all of the required data for developing Data Mart that can provide the users the business decision and appropriated analysis so additional external data is needed to complete data for developing the Data Mart. The project staffs have to find a standard way of storing and consolidating all these disparate data; for example, there are a number of data originated from self-maintained spread sheet format (Microsoft Excel) which is not standardised across the department.
- ❑ The currently being used reports of each department can be divided into 2 groups; analysis reports and tracking reports. The Data Mart can generate reports that are used as analysis reports; for example, Sales volume by month, Sales performance by customer, Monthly export by country and others but the Data Mart can't create the reports that are used for tracking; for example, forecast shipment, shipment control sheets, shipment status, and others. So after Data Mart has already finished development, business users still create tracking reports by themselves. The list of tracking reports is shown in Table 4.3

Table 4.3: Tracking reports of AAA Company

Tracking reports	Department									
	Cement Business	Building Products	Steel Products	Plastic & Chemical	Industrial Products	Aluminum	Pulp & Paper	Energy	General Merchandise	International Sourcing
Export Direct Control	X	X	X	X	X	X	X	X	X	X
Import Direct Control					X			X	X	
Estimate Shipment	X									
Forecast Shipment	X									
Sales Potential	X									
Income Payment Control			X							
Spare Part Status Control					X					
Shipment (Monthly)					X					
Commission (Monthly)					X					
Purchase Order Conclude					X					
Inquiry Weekly					X					
Sales/Stock Control						X				
Petroleum Coke Factory Shipment								X		
Shipment Control Sheet									X	
Shipment Status							X			

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## 4.2 Information Technology Architecture

Information Technology Architecture is the second step of Information Requirement Analysis. This step is implemented after system requirement determination has completed. The project coordinators used the completed list of Facts and Dimensions that were collected from system requirement determination to develop the high-level data model in this step. Information Technology architecture spent 4 weeks started from 02/09/2002 – 30/09/2002.

The high-level data model will be used as guidance for the Data Mart developers in design phase. After the Data Mart is completed, all Facts and Dimensions will be contained on Pivot Table Field List of Data Mart. Users can drag and drop Dimension and Fact from Pivot Table Field List to input the data for creating the required reports. To visualize the Facts and Dimension in the Pivot Table Field List, the Figure 4.3 shows the example of screen of Data Mart that is completely developed.

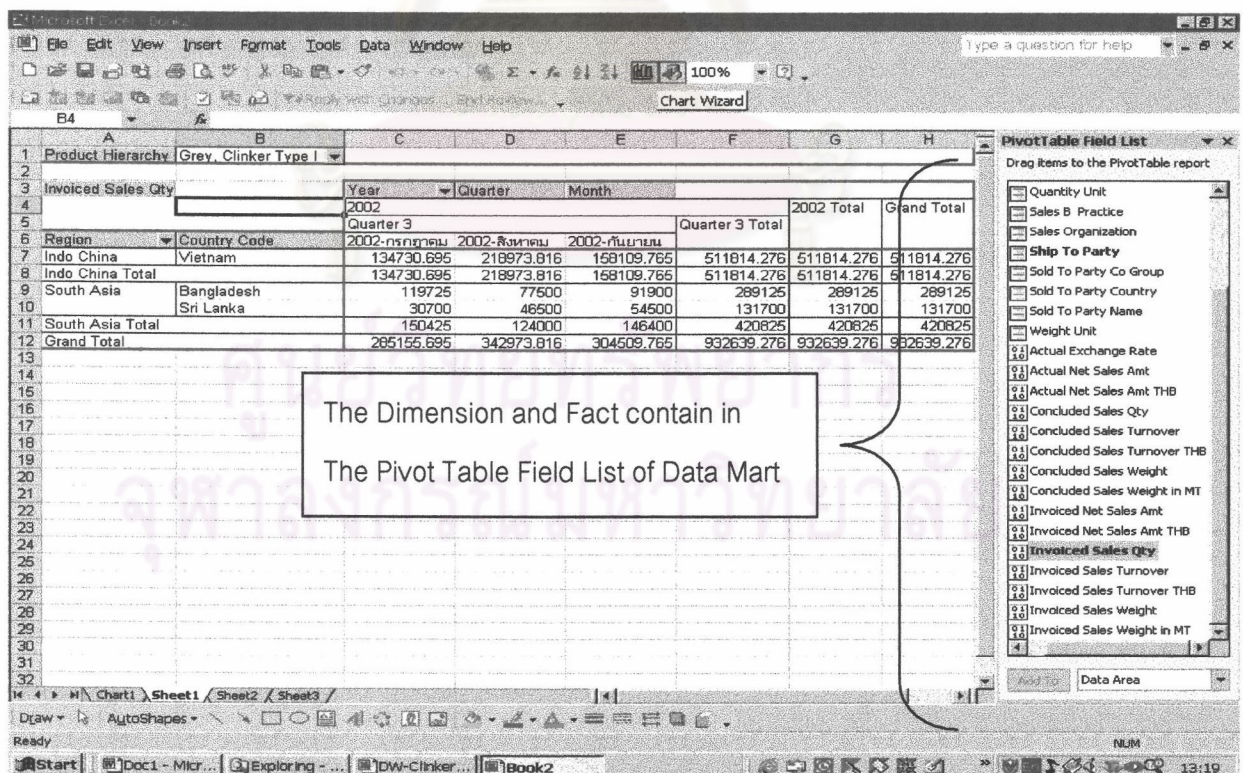


Figure 4.3: The Pivot Table Field List of Data Mart

#### 4.2.1 The Data Mart Model

The Data Mart Model in this thesis was referred to the Star Schema Model as shown in Figure 4.4. The model is developed by building a central fact structure and various dimension structures placed around the periphery resembles a star.

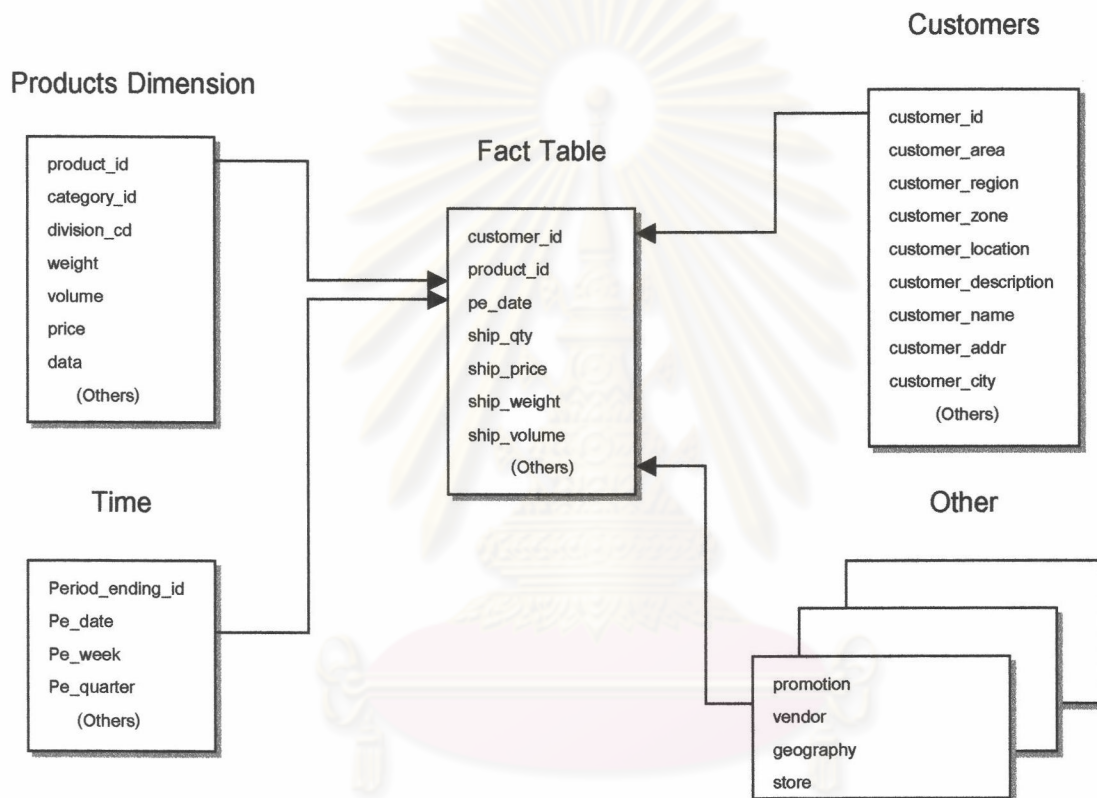


Figure 4.4: The Data Model of the business (Agosta, 2000)

Since the Data Mart Model has the key role to support the work of OLAP (On-Line Analytical Processing) Cube, the design of Data Mart Model should comply with the design of OLAP Cube. Each report that will be created by the Data Mart has different objectives and they also provide various and different analytical information to business users so The OLAP Cubes should be divided by the objectives of each report so that the use of the Data Mart is easy and it is less time to create the reports. The Data Mart for this company was



divided into four cubes; Sales cubes, Financial Cubes, Purchasing Cube, and Account Receivable Cube; as a result, the Data Mart Model also was divided into four groups complied with OLAP Cubes as shown in the following below.

#### 4.2.1.1 The Data Model of Sales Cube

The objectives of the reports that are created by Sales Cube:

- ❑ To measure sales performance (analysis of sales, expenses, cost, margin, budget, conclude, and others)
- ❑ To support planning and sales strategies

The example of analytic questions that the Sales Cube could be answered:

- ❑ How much sales and margin of Steel products in this first quarter?
- ❑ How many quantities Cement business department sold bagged cement for the South Asia customers in second half of 2003? And how many quantities for each customer?
- ❑ Where are they located? And what products do they buy from our company?
- ❑ How many tones of paper Pulps and Paper department buy from supplier A in March 2003?

##### 4.2.1.1.1 Sales Fact and Sales Dimension Diagram

The following diagram shows the Data Model of Sales Cubes. The Sales Fact is built in the center and Currency, Product, Sales Concluded Date, Sales Business Practice, Weight Unit, Quantity Unit, Payment Term, Sale Organisation, Ship- To Party, Inco Term, Sales Posting Date Dimension are placed around.

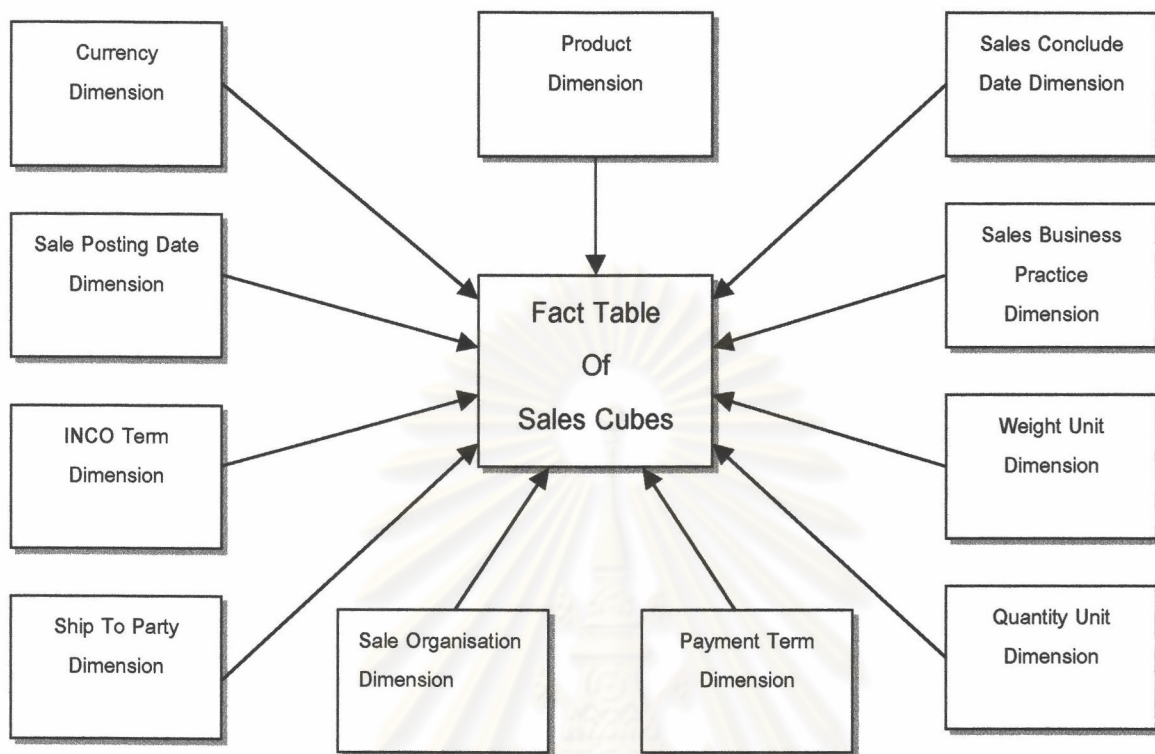


Figure 4.5: The Data Model of Sales Cube

#### 4.2.1.1.2 Sales Fact and Descriptions

The Sales Facts that are contained in Fact table of the Data Model of Sales Cube are shown in Table 4.4

Table 4.4: Sales Fact and Descriptions

Fact Name	Fact Description
Actual Sales Turnover	Records the Actual sales amount received from the customer for the sales invoice with base currency.
Estimated Sales Turnover	Records the Estimated sales amount received from the customer for the sales invoice.
Actual Net Sales	Records the Actual Net sales amount received from the customer

Fact Name	Fact Description
	for the sales invoice.
Actual Sales Quantity	Records the actual sales quantity send to customer for the sales invoice.
Actual Sales Weight	Records the actual item weight send to customer for the sales invoice.
Concluded Sales Turnover	Records the total sales amount for the sales order.
Concluded Quantity	Records the total sales quantity for the sales item ordered.
Concluded Weight	Records the total weight for the sales item ordered.
Actual Cash Discount	Record Actual Cash Discount
Actual Normal Discount	Record Actual Normal Discount
Actual Special Discount	Record Actual Special Discount
Actual Cost of Products	Record the actual cost of products / cost of services
Actual Packaging	Records the packaging incurred in invoice.
Actual Commission Exp	Records the sales commission expenses
Actual Rebate	Records the rebate amount
Actual Bank Guarantee	Records the bank guarantee amount
Actual Interest	Records the actual interest expenses.
Actual AWB/B/L Fee	Records the AWB/B/L Fee for the targeted financial month for the sales item in invoice.
Actual Port Charge	Records the port charge amount for the sales item in invoice.
Actual THC	Records the THC cargo handle amount for the sales for the sales item in invoice.
Actual Lift-On	Records the Lift-on/off amount for the targeted financial month for the sales item in invoice.
Actual Custom Fee	Records the custom fees for the sales item in invoice.
Actual Custom Clearance	Records the custom clearance fees for the sales item in invoice.
Actual Other Expenses	Records the other expenses amount in the invoice.
Actual Freight	Records the freight amount for the sales item in invoice.
Actual Inland	Records the inland transportation fees for the item in invoice.
Actual CFS/Stuff/Steve	Records the CFS/Stuff/leave for the targeted financial month for

Fact Name	Fact Description
	the sales item in invoice.
Actual Tax Refund	Records the actual tax refund for the sales item in invoice.
Actual Sales Turnover THB	Records the Actual sales amount received from the customer for the sales invoice with base currency.
Estimated Sales Turnover THB	Records the Estimated sales amount received from the customer for the sales invoice.
Actual Net Sales THB	Records the Actual Net sales amount received from the customer for the sales invoice.
Concluded Sales Turnover THB	Records the total sales amount for the sales order.
Actual Cash Discount THB	Record Actual Cash Discount in Thai Baht
Actual Normal Discount THB	Record Actual Normal Discount in Thai Baht
Actual Special Discount THB	Record Actual Special Discount in Thai Baht
Actual Cost of Products THB	Record the actual cost of products / cost of services in Thai Baht
Actual Packaging THB	Records the packaging incurred in invoice in Thai Baht
Actual Commission Exp THB	Records the sales commission expenses in Thai Baht
Actual Rebate THB	Records the rebate amount in Thai Baht
Actual Bank Guarantee THB	Records the bank guarantee amount THB
Actual Interest THB	Records the actual interest expenses THB
Actual AWB/B/L Fee THB	Records the AWB/B/L Fee for the sales item in invoice (THB).
Actual Port Charge THB	Records the port charge amount for the sales item in invoice.
Actual THC THB	Records the THC cargo handle amount for the sales for the sales item in invoice.
Actual Lift-On THB	Records the Lift-on/off amount for the targeted financial month for the sales item in invoice.
Actual Custom Fee THB	Records the custom fees for the sales item in invoice.
Actual Custom Clearance THB	Records the custom clearance fees for the sales item in invoice.
Actual Other Expenses THB	Records the other expenses amount in the invoice.
Actual Freight THB	Records the freight amount for the sales item in invoice.
Actual Inland THB	Records the inland transportation fees for the item in invoice.
Actual CFS/Stuff/Steve THB	Records the CFS/Stuff/leave for the targeted financial month for

Fact Name	Fact Description
	the sales item in invoice.
Actual Tax Refund THB	Records the actual tax refund for the sales item in invoice.
Estimated Cash Discount	Record Estimated Cash Discount
Estimated Normal Discount	Record Estimated Normal Discount
Estimated Special Discount	Record Estimated Special Discount
Estimated Cost of Products	Record the Estimated cost of products / cost of services
Estimated Packaging	Records the packaging incurred in invoice
Estimated Commission Exp	Records the sales commission expenses
Estimated Rebate	Records the rebate amount
Estimated Bank Guarantee	Records the estimated bank guarantee amount
Estimated Interest	Records the Estimated interest expenses
Estimated AWB/B/L Fee	Records the AWB/B/L Fee for the sales item in invoice
Estimated Port Charge	Records the port charge amount for the sales item in invoice.
Estimated THC	Records the THC cargo handle amount for the sales for the sales item in invoice.
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Estimated Other Expenses	Records the other expenses amount in the invoice.
Estimated Freight	Records the freight amount for the sales item in invoice.
Estimated Inland	Records the inland transportation fees for the item in invoice.
Estimated CFS/Stuff/Steve	Records the CFS/Stuff/leave for the targeted financial month for the sales item in invoice.
Estimated Tax Refund	Records the Estimated tax refund for the sales item in invoice.
Estimated Cash Discount THB	Record Estimated Cash Discount in Thai Baht
Estimated Normal Discount THB	Record Estimated Normal Discount in Thai Baht
Estimated Special Discount THB	Record Estimated Special Discount in Thai Baht
Estimated Cost of Products THB	Record the Estimated cost of products / cost of services in Thai Baht

Fact Name	Fact Description
Estimated Packaging THB	Records the packaging incurred in invoice in Thai Baht
Estimated Commission Expense THB	Records the sales commission expenses in Thai Baht
Estimated Rebate THB	Records the rebate amount in Thai Baht
Estimated Interest THB	Records the Estimated interest expenses THB
Estimated AWB/B/L Fee THB	Records the AWB/B/L Fee for the sales item in invoice ( THB).
Estimated Port Charge THB	Records the port charge amount for the sales item in invoice.
Estimated THC THB	Records the THC cargo handle amount for the sales for the sales item in invoice.
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Estimated Custom Clearance THB	Records the custom clearance fees for the sales item in invoice.
Estimated Other Expenses THB	Records the other expenses amount in the invoice.
Estimated Freight THB	Records the freight amount for the sales item in invoice.
Estimated Inland THB	Records the inland transportation fees for the item in invoice.
Estimated CFS/Stuff/Steve THB	Records the CFS/Stuff/leave for the targeted financial month for the sales item in invoice.
Estimated Tax Refund THB	Records the Estimated tax refund for the sales item in invoice.

#### 4.2.1.1.3 Sales Dimension and Descriptions

The Sales Dimensions that are placed around Sales Fact table and their descriptions are shown in Table 4.5.

Table 4.5: Sales Dimension and Descriptions

Dimension Name	Dimension Description
Sales Posting Date	Contains the attributes associated with the sales posting date.
Sales Concluded Date	Contains the attributes associated with the sales concluded date (also known sales creation date).
Sold To Party	Represents the sold to party (customers) and all of the associated attributes.
Product	Contains information about product Hierarchy that SCT trade.
Sales Organization	The business group within the company and other organizational relationships which related to Sales.
Sales Business Practice	Business Practice performs by the business group within the company.
Weight Unit	Describes the unit of measurement for the weight in sales fact.
Quantity Unit	Describes the unit of measurement for the quantity in sales fact.
Payment Term	Describes the payment term for the quantity in sales fact.
INCO Term	Describes the Inco term (also known as the trade term) for the sales order.
Currency	Describes the document (sales order) currency.
Ship To Party	Represents the ship to party where the item is delivered

#### 4.2.1.1.4 Sales Dimension Details

The Sales Dimension Details are shown in Appendix C.

#### 4.2.1.2 The Data Model of Financial Cube

The objectives of the reports that are created by Financial Cube:

- ❑ To support planning and sales strategies at beginning of the month
- ❑ To provide information on the customer monthly growth
- ❑ To provide information on actual sales performance against budget

The example of analytic questions that the Financial Cube could be answered:

- ❑ What is the Sales Turnover this month?
- ❑ What is the Actual against Budget Sales Turnover of Cement Business Department? And what is the Cumulative?
- ❑ What is the Margin of Steel Product Department?
- ❑ What is the Variance of Actual Sales and Budget of Bagged Cement in Dec 2003?

##### 4.2.1.2.1 Financial Fact and Financial Dimension Diagram

The following diagram shows the Data Model of Financial Cubes. The Financial Fact is built in the center and Financial Time, Sold To Party, Product, Sale Organisation, Payment Term, Market Region, and Quantity Unit Dimension are placed around.

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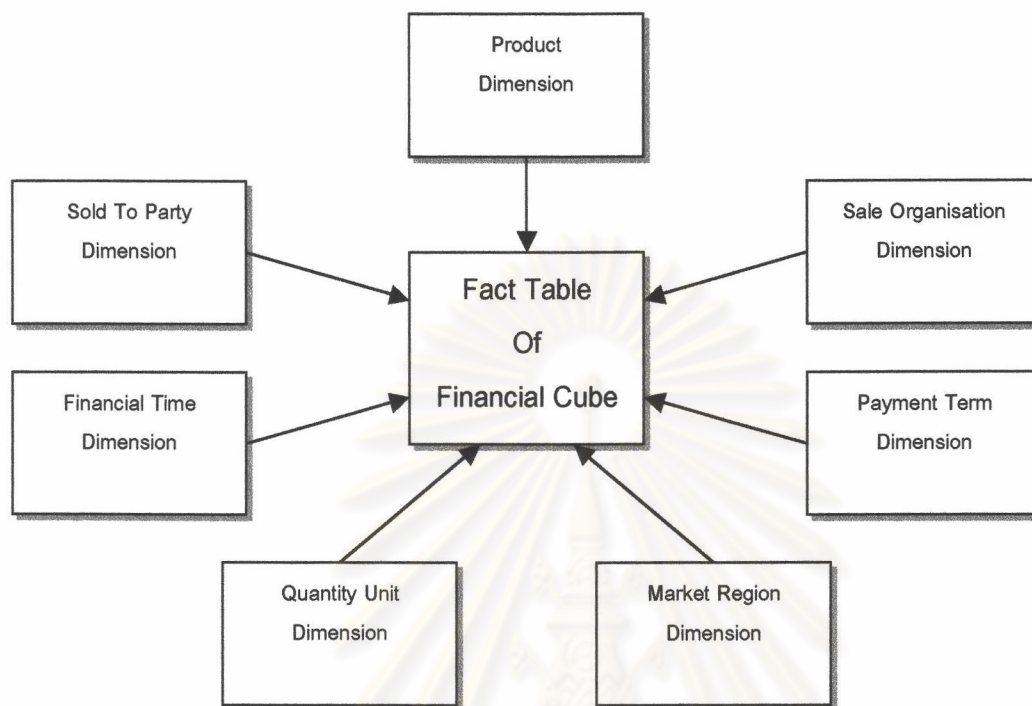


Figure 4.6: The Data Model of Financial Cube

#### 4.2.1.2.2 Financial Fact and Descriptions

The Financial Facts that are contained in Fact table of the Data Model of Financial Cube are shown in Table 4.6

Table 4.6: The Financial Fact and Descriptions

Measure Name	Measure Description
Actual Sales Turnover THB	Records the Actual Sales Amount for the current month (in THB)
Budget Sales Turnover THB	Records the Budget Sales Amount for the current month (in THB).
Actual Income THB	Records the Actual Income Amount for the current month (in THB).
Budget Income THB	Records the Budget Income Amount for the current month

Measure Name	Measure Description
	(in THB).
Actual Sales Turnover YTD THB	Records the Year-to-Date Actual Sales Amount (in THB).
Budget Sales Turnover YTD THB	Records the Year-to-Date Budget Sales Amount (in THB).
Actual Income Amt YTD THB	Records the Year-to-Date Actual Income Amount (in THB).
Budget Income Amt YTD THB	Records the Year-to-Date Budget income amount (in THB).
Actual Cost Of Good Sold THB	Records the Actual Cost of Good Sold amount for the current month (in THB).
Budget Cost Of Good Sold THB	Records the Budget Cost of Good Sold Amount for the current month (in THB).
Actual Selling Expenses THB	Records the Actual Selling Expenses Amount for the current month (in THB).
Budget Selling Expenses THB	Records the Budget Selling Expenses Amount for current month (in THB).
Actual Delivery Expenses THB	Records the Actual Delivery Expenses Amount for the current month (in THB).
Forecast Sales Turnover THB	Records Forecast Sales Amount for the current month (in THB).
Forecast Income THB	Records the Forecast Sales Income Amount for the current month (in THB).
Forecast Sales Turnover YTD THB	Records the Year-to-Date for the Forecast Amount Turnover (in THB).
Forecast Income Turnover YTD THB	Records the Year-to-Date for the Forecast Income Turnover (in THB).
Actual Net Sales THB	Records the commissions for the Import Indent (in THB).
Budget Delivery Expenses THB	Records the Budget Delivery Expenses Amount for the current month (in THB).
Actual Sales Amount	Records the Actual Sales Amount for the current month (in Base Currency).

Measure Name	Measure Description
Budget Sales Amount	Records the Budget Sales Amount for the current month (in Base Currency).
Actual Income Amount	Records the Actual Income Amount for the current month (in Base Currency).
Budget Income Amount	Records the Budget Income Amount for the current month (in Base Currency).
Actual Sales Turnover YTD	Records the Year-to-Date Actual Sales Amount (in Base Currency).
Budget Sales Turnover YTD	Records the Year-to-Date Budget Sales Amount (in Base Currency).
Actual Income YTD	Records the Year-to-Date Actual Income Amount (in Base Currency).
Budget Income YTD	Records the Year-to-Date Budget income amount (in Base Currency).
Actual Cost Of Good Sold	Records the Actual Cost of Good Sold amount for the current month (in Base Currency).
Budget Cost Of Good Sold	Records the Budget Cost of Good Sold Amount for the current month (in Base Currency).
Actual Selling Expenses	Records the Actual Selling Expenses Amount for the current month (in Base Currency).
Budget Selling Expenses	Records the Budget Selling Expenses Amount for current month (in Base Currency).
Actual Delivery Expenses	Records the Actual Delivery Expenses Amount for the current month (in Base Currency).
Budget Delivery Expenses	Records the Budget Delivery Expenses Amount for the current month (in Base Currency).
Variance Actual Sales Turnover THB	$(\text{Actual Sales Amount THB} - \text{Budget Sales Amount THB}) / \text{Budget Sales Amount THB}$
Variance Income Amount THB	$(\text{Actual Income Amount THB} - \text{Budget Income Amount THB}) / \text{Budget Income Amount THB}$

Measure Name	Measure Description
	THB) / Budget Income Amount THB
Variance Sales Turnover YTD THB	(Actual Sales Amount YTD THB – Budget Sales Amount YTD THB) / Budget Sales Amount YTD THB
Variance Income Amount YTD THB	(Actual Income Amount YTD THB – Budget Income Amount YTD THB) / Budget Income Amount YTD THB
Variance Actual Cost OF Good Sold THB	(Actual COST OF GOOD SOLD THB – Budget COST OF GOOD SOLD THB) / Budget COST OF GOOD SOLD THB
Variance Selling Expenses THB	(Actual Selling Expenses THB – Budget Selling Expenses THB) / Budget Selling Expenses THB
Variance Delivery Expenses THB	(Actual Delivery Expenses THB – Budget Delivery Expenses THB) / Budget Delivery Expenses THB
Margin CUR	Records the current month: Actual Income Amount THB / Actual Sales Amount THB
Margin YTD	Records the Year-to-Date: Actual Income Amount YTD THB / Actual Sales Amount YTD THB
Actual Sales Quantity	Records the Actual Quantity for the current month
Budget Sales Quantity	Records Budget Quantity for the current month
Actual Quantity YTD	Records the Year-to-Date Actual Quantity
Budget Quantity YTD	Records the Year-to-Date Budget Quantity
Forecast Sales Quantity	Records the Forecast Sales Quantity for the current month
Forecast Sales Turnover	Records Forecast Sales Turnover Amount for the current month (in Base Currency)
Forecast Sales Income	Records the Forecast Sales Income Amount for the current month (in Base Currency)
Variance Forecast Sales Turnover	Actual Sales Amount - Forecast Sales Amount / Forecast Amount)
Forecast Sales Turnover YTD	Records the Year-to-Date for the Forecast Amount Turnover (in Base Currency).
Forecast Income Turnover YTD	Records the Year-to-Date for the Forecast Income

Measure Name	Measure Description
	Turnover (in Base Currency).
Actual Net Sales	Records the commissions for the Import Indent (in Base Currency).
Unit price (THB)	Records the Sales Turnover Amount in Baht / Quantity
Unit Price (USD)	Records the Sales Turnover Amount in USD/ Quantity
Budget Margin	Budget Income / Budget Sales Amount
Budget Income per unit	Budget Income / Quantity

#### 4.2.1.2.3 Financial Dimensions and Descriptions

The Financial Dimensions that are placed around Financial Fact table and their descriptions are shown in Table 4.7.

Table 4.7: Financial Dimensions and Descriptions

Dimension Name	Dimension Description
Financial Time	Contains the attributes associated with date.
Sold-To Party	Represents the customers and all of the associated attributes.
Product	Contains information about products that SCT trade (sell and buy).
Sales Organization	The business group within the company and other organizational relationships which relates to Sales.
Sales Business Practice	Business Practice performs by all business groups within the company.
Market Region	Describes the sales / market area for the sales force.
Quantity Unit	Describes the unit of measurement for the quantity in financial fact

#### 4.2.1.2.4 Financial Dimension Details

The financial dimension details are shown in Appendix C.

#### 4.2.1.3 The Data Model of Purchasing Cube

The objectives of the reports that are created by Purchasing Cube:

- ❑ To measure purchasing volume
- ❑ To keep track for the purchasing

The example of analytic questions that the Sales Cube could be answered:

- ❑ Who are the suppliers? And where are they located?
- ❑ Which geography area of supplier provided with the most materials?
- ❑ What is Steel Products Department buying from the supplier A and how we pay to the supplier?
- ❑ How much volume Cement Business Department buys Bagged Cement over the last 3 months? Or in Jan and March 2003?

##### 4.2.1.3.1 Purchasing Fact and Purchasing Dimension

The following diagram shows the Data Model of Purchasing Cubes. The Purchasing Fact is built in the center and Purchasing Business Practice, Supplier, Payment Term, Weight Unit, Currency, Purchasing Organisation, Trade Term, Quantity Unit, Factory, Product, and Purchase Date Dimension are placed around.

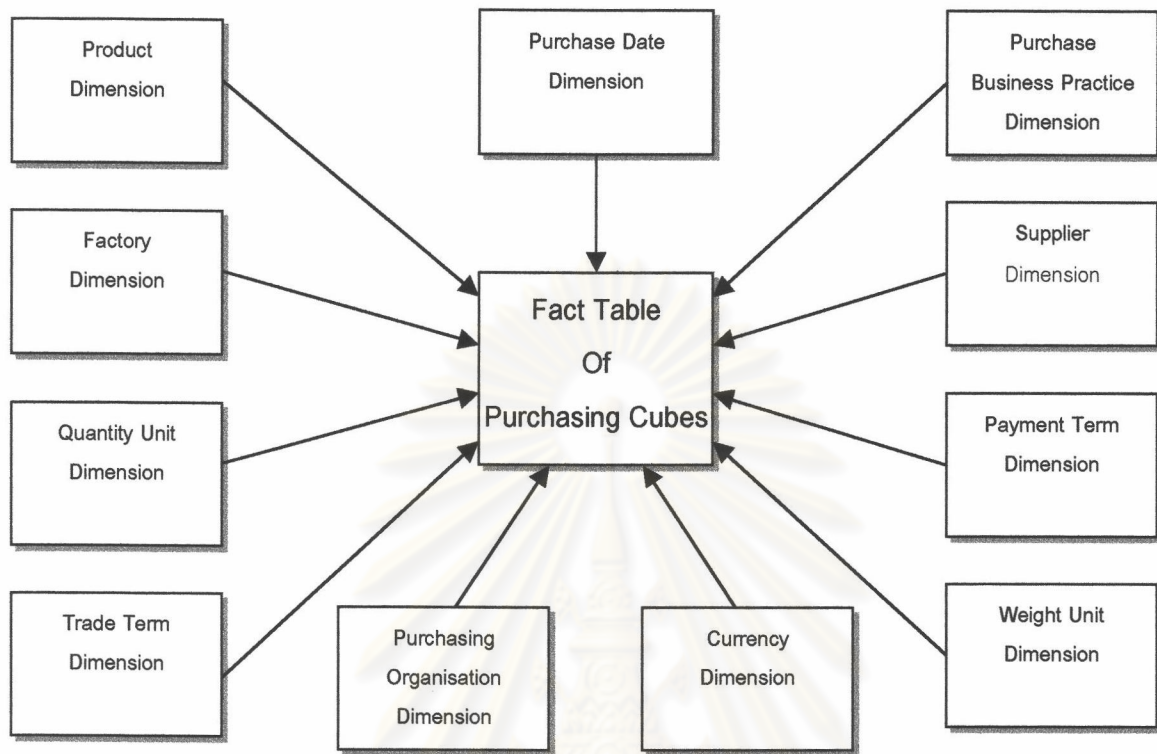


Figure 4.7: The Data Model of Purchasing Cube

#### 4.2.1.3.2 Purchasing Fact and Descriptions

The Purchasing Facts that are contained in Fact table of the Data Model are shown in Table 4.8.

Table 4.8: Purchasing Fact and Description

Measure Name	Measures Description
Purchase Amount	Records the Purchasing amount in USD or THB.
Purchase Quantity	Records the quantity of the purchase item.
Purchase weight	Records the weight of the purchase item.

#### 4.2.1.3.3 Purchasing Dimension and Descriptions

The Purchasing Dimensions that are placed around Sales Fact table and their descriptions are shown in Table 4.9.

Table 4.9: Purchasing Dimension and Descriptions

Dimension Name	Dimension Description
Purchase Date	Contains the attributes associated with the date of that purchasing.
Supplier	Represents the suppliers and all of the associated attributes.
Product	Contains information about products that AAA trade (to the lowest level).
Purchase Organization	The business group within the company and other organizational relationships which relates to Purchasing.
Business practice	Business Practice performs by the business group within the company.
Quantity Unit	Describes the unit of measurement for the product quantity.
INCO Term	Describe the type of trading (CIF, FOB & C&F).
Payment Term	Identify the term of payment (credit, L/C, BE).
Factory	Identify the factory that manufacture the products
Currency	Describes the document currency
Weight Unit	Describes the unit of measurement for the purchase product weight.

#### 4.2.1.3.4 Purchasing Dimension Details

The purchasing dimension details are shown in Appendix C.



#### 4.2.1.4 The Data Model of Account Receivable (A/R) Cube

The objectives of the reports that are created by Account Receivable (A/R) Cube:

- To measure account receivable amount

The example of analytic questions that the Account Receivable (A/R) Cube could be answered:

- How much amount of account receivable with a specific customer over due date 1-30 days? 31-60 days? 61-90 days? >90 days?
- Which behavior of payment with a specific customer? In due? Over due?

##### 4.2.1.4.1 A/R Fact and A/R Dimension

The following diagram shows the Data Model of Account Receivable Cubes. The Account Receivable Fact is built in the center and Product, Sold To, A/R Due Date, Over Due Period, Organisation Dimensions are placed around.

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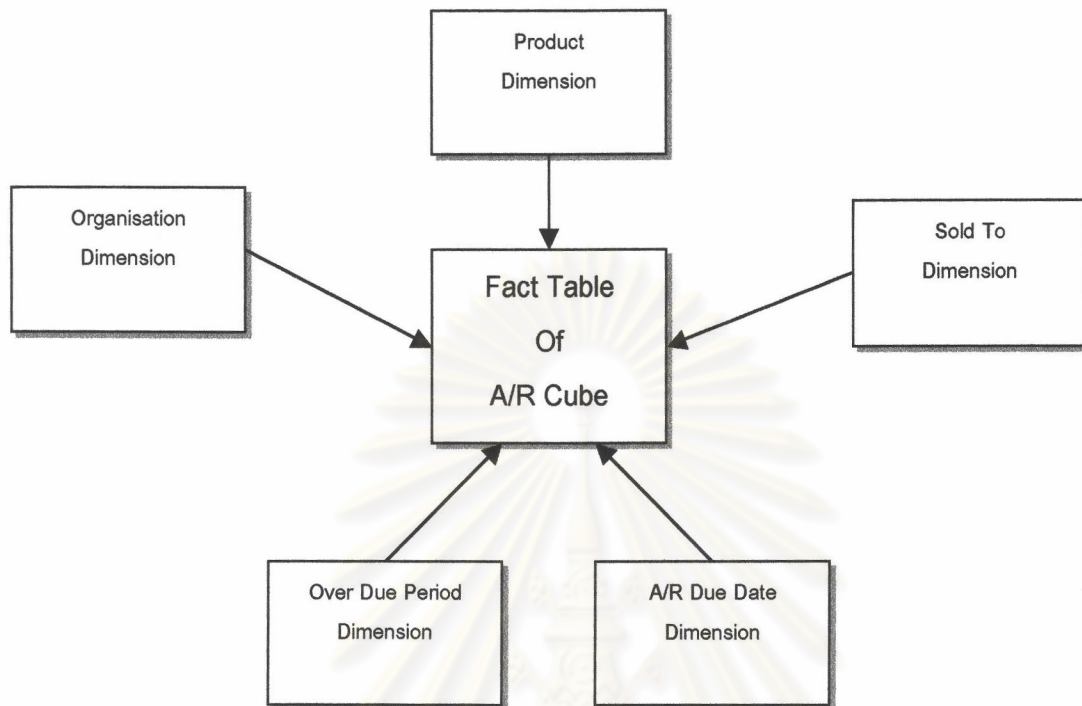


Figure 4.8: The Data Model of Account Receivable Cube

#### 4.2.1.4.2 A/R Facts and Descriptions

The A/R Facts that are contained in Fact table of the Data Model are shown in Table 4.10.

Table 4.10: A/R Facts and Descriptions

Measure Name	Fact Description
Account Receivable Amount	Records the Actual Account Receivable amount for the sales invoice.
Account Receivable Plan Amount	Records the Plan Account Receivable amount for the sales invoice.

#### 4.2.1.4.3 A/R Dimensions and Descriptions

The Purchasing Dimensions that are placed around Sales Fact table and their descriptions are shown in Table 4.11.

Table 4.11: A/R Dimensions and Descriptions

Dimension Name	Dimension Description
A/R Due Date	Contains the attributes associated with the Account Receivable Due Date.
Sold to Party	Represents the customers and all of the associated attributes.
Sales Organisation	The business group within the company and other organisational relationships.
Product	Contains information about products that AAA trade.
Over Due Period	Describe the over due period for the AR amount in AR fact.

#### 4.2.1.4.4 A/R Dimension Details

The A/R Dimension Details are shown in Appendix C.

#### 4.2.2 The Match of Reports and OLAP Cube

In the Table 4.12 shows the matrix, which matches the currently being, used reports of each department to the OLAP cubes, which will be built to address these analytic requirements. Not all of the following reports will be resolved by the OLAP cubes as some reports are tracking reports. Those with "X" are fulfilled by the respective cubes.

Table 4.12: List of recently being used reports in each Department of AAA Company

Department	Report Name	Sales Cube	Financial Cube	Purchasing Cube	A/R Cube	Not Included
Pulp & Paper	Pp-1 : Sales Turnover Performance		X			
	Pp-2 : Turnover by Product	X				
	Pp-3 : Order Conclude by Product	X				
	Pp-3.1 : Order Conclude by Customer	X				
	Pp-4 : Order Conclude by Supplier			X		
	Pa-5 : Concluded Qty vs. Shipped Qty by Product	X				
	Pa-6 : Price Movement by Product					X
	Pa-7 : Sales Budget					X
	Pa-8 : Shipment Status					X
Plastic & Chemical	Pc-1 : Sales by Grade	X				
	Pc-1.1 : Sales by Grade in specific country	X				
	Pc-2 : Sales by Budget		X			
	Pc-3 : Export Volume of specific product to specific country	X				
	Pc-4 : Export Volume by customer	X				
	Pc-5 : Sales Budget		X			
	Pc-6 : Price Movement by Product					X
General Merchandise	Gm-1 : Sales Performance		X			
	Gm-2 : Sales Performance of specific product in specific country		X			
	Gm-3 : Sales Turnover Performance		X			
	Gm-4 : Income Performance		X			
	Gm-5 : Shipment Control					X
	Gm-6 : Sales Budget		X			

Department	Report Name	Sales Cube	Financial Cube	Purchasing Cube	A/R Cube	Not Included
Energy	En-1 : Import direct Control					X
	En-2 : Monthly Report to Business Division Manager - Sales Performance		X			
	En-2.1 : Monthly Report to Business Division Manager - Market Trend					X
	En-3 : Sales Turnover Performance		X			
	En-3.1 : Income Performance		X			
	En-4 : Order Conclude & Forecast shipment					X
	En-5 : Pet coke Volume Shipped to specific plant/customer	X				
	En-6 : Sales Budget					X
Building	Bu-1 : Sales Performance by Product		X			
	Bu-1.1 : Sales Performance by country		X			
	Bu-2 : Gypsum Sales Volume by country	X				
	Bu-3 : Analytical Report		X			
	Bu-4 : Monthly Sales Report to Supplier		X			
	Bu-5 : Gypsum Board Export Sales		X			
	Bu-6 : Monthly Export Sales Report by country by size	X				
Industrial	In-1 : Spare Part Status Control					X
	In-1.1 : Sales Commission		X			
	In-2 : Import Direct Control					X
	In-3 : Export Direct Control					X
	In-4 : Purchase Order Conclude			X		
	In-5 : Sales Performance		X			
	In-6 : Sales Performance of non-AAA Group products		X			
	In-7 : Sales Performance of specific product in specific country		X			
	In-8 : Sales Budget		X			

Department	Report Name	Sales Cube	Financial Cube	Purchasing Cube	A/R Cube	Not included
International Sourcing	Is-1 : Monthly Sales Report		X			
	Is-2 : Monthly Performance by customer		X			
	Is-3 : Monthly Highlight		X			
	Is-4 : Performance Margin Report				X	
	Is-5 : Revenue Budget of Service Income					X
Steel products	Sp-1 : Overdue A/R Aging Analysis by AAA Group customer				X	
	Sp-2 : Export Direct Control					X
	Sp-3 : Incoming Payment Control					X
	Sp-4 : Sales Budget		X			
Aluminum	Al-1 : Sales/Stock Control					X
	Al-2 : Sales Performance		X			
	Al-3 : Sales Performance of specific product by business practice		X			
	Al-4 : Sales Performance (EBITDA)		X			
	Al-5 : Sales Budget		X			
Cement	Ce-1 : Export Direct Control					X
	Ce-2 : Export Cement Report					X
	Ce-3 : Cement Export Statistics		X			
	Ce-4 : Estimated Cement shipment					X
	Ce-5 : Forecast Cement Shipment					X
	Ce-6 : Sales Potential for specific product					X
	Ce-7 : Order Concluded Report					X
	Ce-8 : Monthly Sales Performance		X			
	Ce-9 : Top ten Cement Customers	X				
	Ce-10 : Cement budget		X			
	Ce-11 : Cement Export Statistic by region		X			
	Ce-12 : A/R , Inventory Value by month				X	
	Ce-13 : Monthly Report		X			
	Ce-14 : Sales Budget					X