



Account Payable System for
Packaging Materials Manufacturing Business

by

Ms. Lawan Lohapirat

A Final Report of the Six-Credit Course
CS 6998 - CS 6999 System Development Project

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
in Computer Information Systems
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Project Title	Account Payable System for Packaging Materials Manufacturing Business
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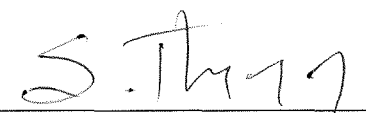
The Graduate School of Assumption University has approved this final report of the six-credit course, CS 6998 – CS 6999 System Development Project, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer Information Systems.

Approval Committee:



The seal of Assumption University of Thailand is a circular emblem. It features a central shield with a blue field containing a white lily and the letters 'A M', and a red field containing a white cross and the letters 'D S'. The shield is flanked by two golden lions. Above the shield is a crown. The shield is surrounded by a wreath of golden leaves. The words 'ASSUMPTION UNIVERSITY OF THAILAND' are written in a circular path around the shield. Below the shield is a banner with the Latin motto 'LABOR OMNIA VINCIT'. The year 'SINCE 1969' is also visible.

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July 21, 2002

ABSTRACT

The project is concerned with analysis and design of Account Payable System for Packaging Material Manufacturing Business with the main purpose of improving the operations of the business. In the existing manual system, data are mostly stored on paper, while some are kept in the Microsoft Excel and Word. For the financial system, the most significant objective is to manage the cash flow, budgeting and reporting to support decision making for the management.

The existing system operates manually and requires many staffs to maintain the data, which are often not up-to-date. The new computerized system is designed to remove all the problems that occurred in the existing system. The new system provides more expedition operation with less errors. It also provides more up-to-date and accurate data. Information can be shared and retrieved using online computerized system to reduce time, cost and redundancy.

ACKNOWLEDGEMENTS

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Secondly, it also gives a great sense of pleasure to thank the Administration of Packaging Material Manufacturing Business, for their timely assistance and information provided to her while carrying out the data collection required in her project. Sincere gratitude also goes to all the members of the MS(CIS) committee members for their advice.

Finally, she wishes to thank her family for all their support and prayers in helping her with her project. They have been a great source of encouragement for her throughout her study at Assumption University.

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I. INTRODUCTION

1.1 Background of the Project

At present businesses, have to follow certain specified policy. Each type of business has to calculate the budget and analyses all the business operations of their firms. Economic expansion causes fierce competition among all the businesses. Thus, executives have to plan on how to develop their companies to be more flexible and more cost conscious.

Currently the company still operates its business functions manually, leading to many problems such as: complex working systems, great time consumption, mistakes are caused by increased amount of information and more work, delayed generation of monthly reports, time consuming process of preparing documents using Microsoft Excel and Word, repetition of document number, etc.

1.2 Objectives of the Project

- (1) To study the existing system and find out the occurred problems and identify possible practical solutions to those problems.
- (2) To study the requirements of users and design a computerized system to meet such requirements.
- (3) To reduce the mistakes that may happen due to data entry.
- (4) To provide cross function in every system that will be useful for company's overall business especially Account Payable system.
- (5) To reduce redundancy of business operations and data.

1.3 Scope of the Project

The project will only cover major parts of the Account Payable that can be classified as follows.

- (1) Manage and maintain the supplier information, which will record and update all necessary information.
- (2) Generate invoice payment and print cheque payment, afford print report for Revenue Department such as P.N.D. 3 or 53
- (3) Application generates the account information for debit or credit such as account code, amount and so on.
- (4) Produce the reports such as outstanding statement, history creditor reports, and creditor analysis reports for decision making of financial manager.
- (5) Generate record for payment transaction to the bank when paying through media clearing or cheque clearing.

1.4 Deliverables

The deliverables of the Account payable system project are as follows.

- (1) The result of the study and analysis of the existing system.
- (2) The new design and application development, written in Delphi 5.
- (3) Screen layout and menu system for user interface.
- (4) Management information system used for decision making.
- (5) Layouts of the various output reports such as:
 - (a) Voucher of account payable.
 - (b) Voucher of payment.
 - (c) Creditor statement.
 - (d) Creditor analysis report.
 - (e) Account payable transaction report.
 - (f) Cheque transaction report.
 - (g) P.N.D 3 / 53.report.
 - (h) Withholding tax certificate.

1.5 Project Plan

This project plan is represented in terms of Gantt Chart as shown in Figure 1.1.



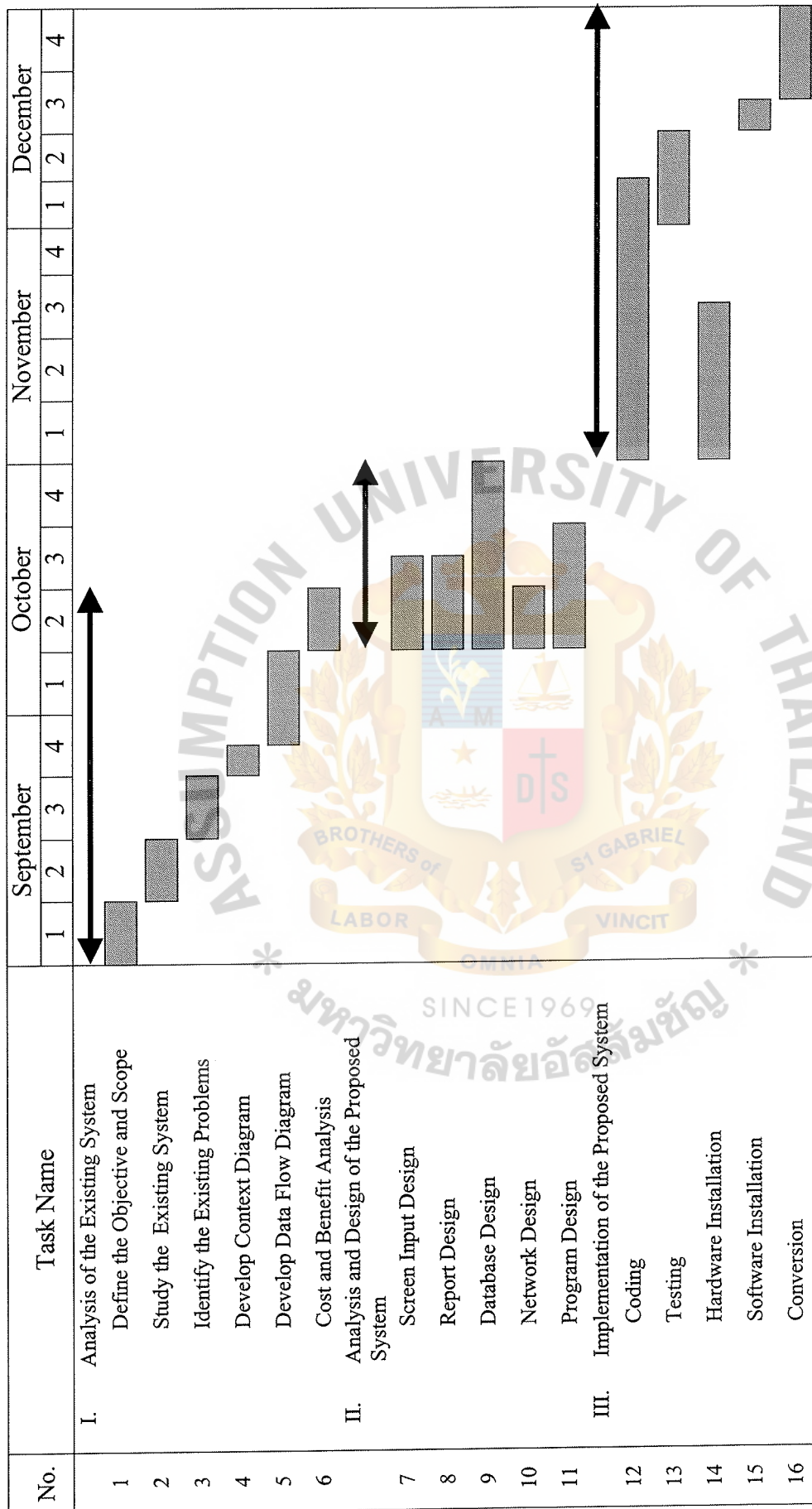


Figure 1.1. Project Plan of Account Payable System.

II. THE EXISTING SYSTEM

2.1 Background of the Organization

Packaging Materials Manufacturing Business (PMM) was established in October, 1996. The line of business is sales and manufacturing of packaging materials (mainly steel box called “STEELCON”). Recently in the field of packaging as part of physical distribution scene, problems have arisen from the viewpoint of environmental protection involving forests, recycling of natural resources, and treatment of wastes. STEELCON was born just in time to meet these global needs.

Figure 2.1 illustrates the basic structural organization of the company. It is organized into two departments.

(1) Administration Department

The responsibility is control of all business in the office, analysis report and planning to make products. The subordinates are as follows.

(a) Accounting Division

The division is responsible for planning the budget, control debtor and creditor statement, making the financial statement.

(b) General Division

The division is in charge of personnel management e.g., payroll of all staffs, evaluation of personnel performance.

(c) Marketing Division

The responsibility of this division includes planning to sell products, find the new marketing and procurement method to draw orders from customer.

(2) Factory Department

The department handles all products from production line, control the quality of products and the remaining products.

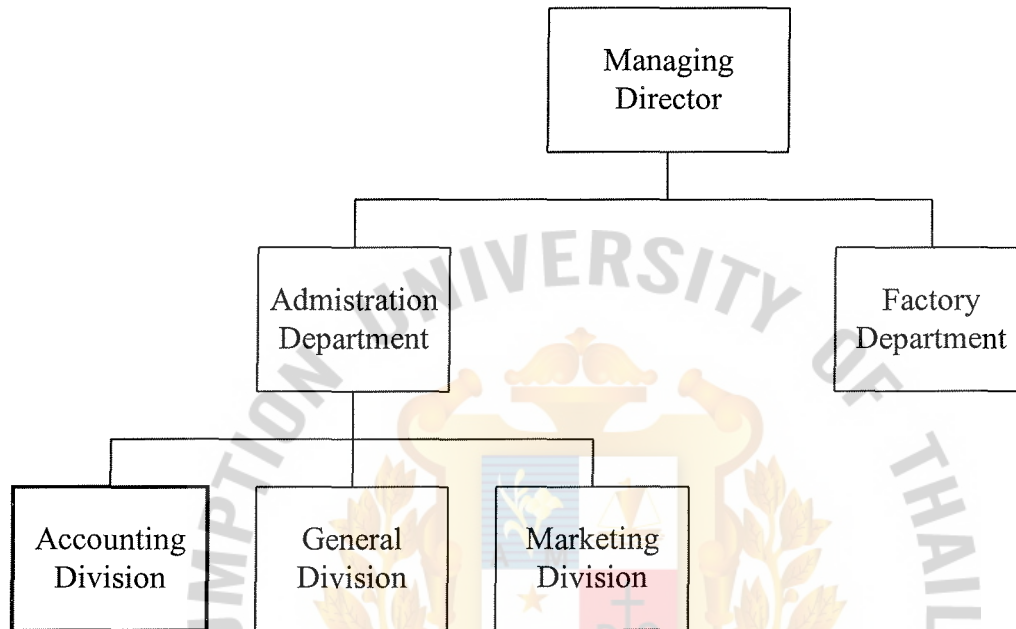


Figure 2.1. Organization Chart of the Packaging Materials Manufacturing Business.

2.2 Existing Business Functions

The nature of business requires several subcontractors to complete each stage of the project, which creates need for appropriate payment system. Furthermore, it needs several vendors to supply materials, equipment, accessories and spare parts to support its operations, which highlights a need for an efficient and effective account payable system to ensure that qualified suppliers are retained.

Presently, the system available for supporting payment cycle transactions is manually performed. It creates a problem of duplication or redundant information. The function of account payable system can be summarized as follows:

When the factory staffs detect the lack of stock, they create the purchase order and send to the accounting department. After that, the accounting staffs would check the correctness of data and make the purchase order using accounting department format. They sent the copy to factory department and supplier.

After the supplier sent product to factory department, the factory staffs would inspect that product and send the invoice to accounting department. The accounting staffs keep the invoice in the folder and at end of the day they collect the document and post to the general ledger. Other major functions of the accounting department include cheque collection and cheque clearing.

When suppliers come to collect the payment, accounting staffs have to check correctness of these relevant documents. If all documents are correct, accounting staffs can manually create withholding tax certificate to supplier.

At the end of month, PND. 3 / 53 Report must be created and sent to the Revenue Department.

2.3 Current Problems and Areas for Improvement

2.3.1 Current Problems

Several current and specific problems within the existing system can be identified as follows.

(a) High chance of mistake

For manual system, the accounting staffs have to check the document and collect data by themselves. Lack of supplier information and historical records of each individual supplier often leads to mistakes.

(b) Information is not up-to-date

Some operations are redundant because they are performed. This manual system causes an abundance of paperwork and some inconsistencies, and repetitions. This brings about incorrect information concerning the invoice and payment.

(c) Great time consumption in report generation

Manual verification and reconciliation to all the output reports must be done for any day. The reconciliation sets of summarized numbers are required to compare to those of last month's reports. The management needs to monitor and control the creditor analysis by using above sets of data.

(d) Inefficient reporting system.

Management does not receive reports on time, nor obtain enough reports. The output reports are not accurate so the company cannot rely on them and it is difficult to forecast and evaluate performance. No report schema is used for decision making in promptly. Therefore, the management requires a system, which is able to generate more efficient

reports or information such as Creditor Analysis Report, Cheque Conciliation Report for decision making.

2.3.2 Areas for Improvement

- (a) The computerized Account Payable System provides more reliable, timely and correct information for every concerned department, Factory, Accounting in order to make a decision.
- (b) The company can reduce human labor and human errors by using this new computerized system especially accounting staff. This new system allows them the flexibility they need to manage cash flow for payment and other criteria.
- (c) The improvement of the Account Payable System will prepare money for payment, document and report to related companies, which is correctly done by using computer-based system. The staffs prepare all the reports quickly and easily.

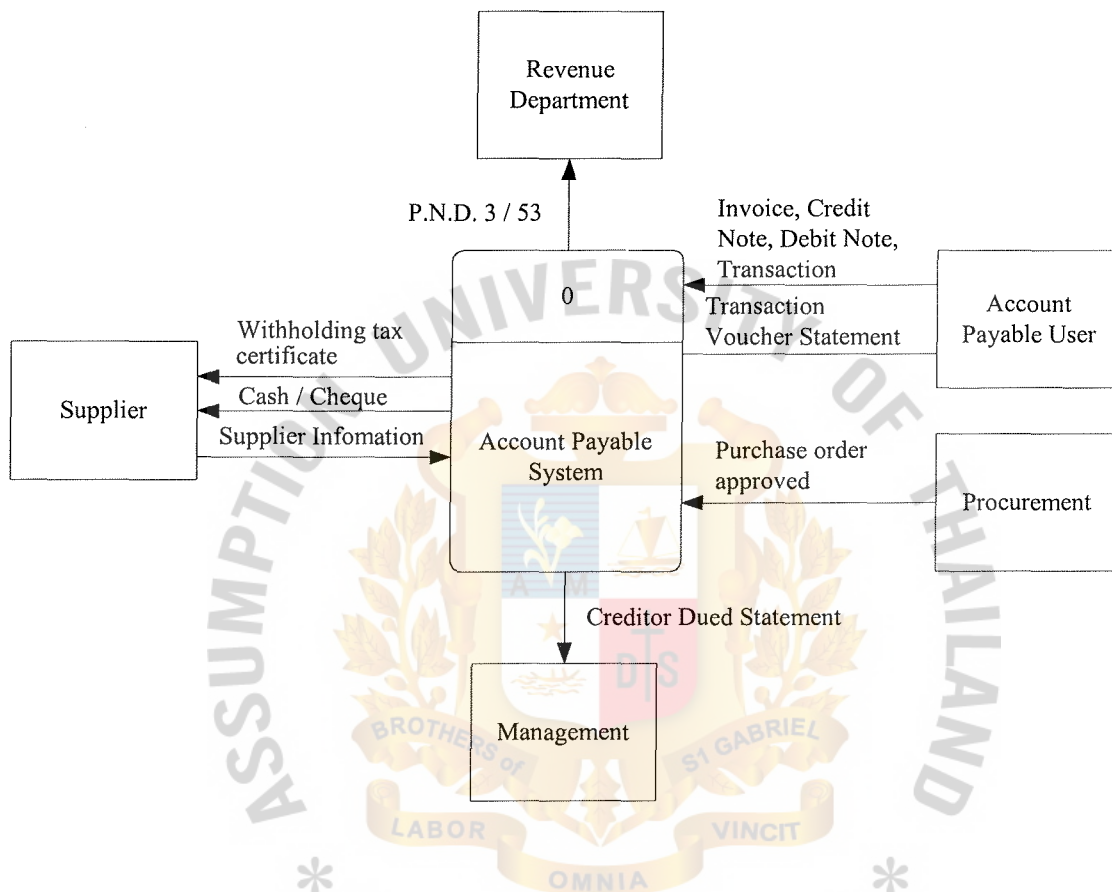


Figure 2.2. The Context Data Flow Diagram of Existing System.

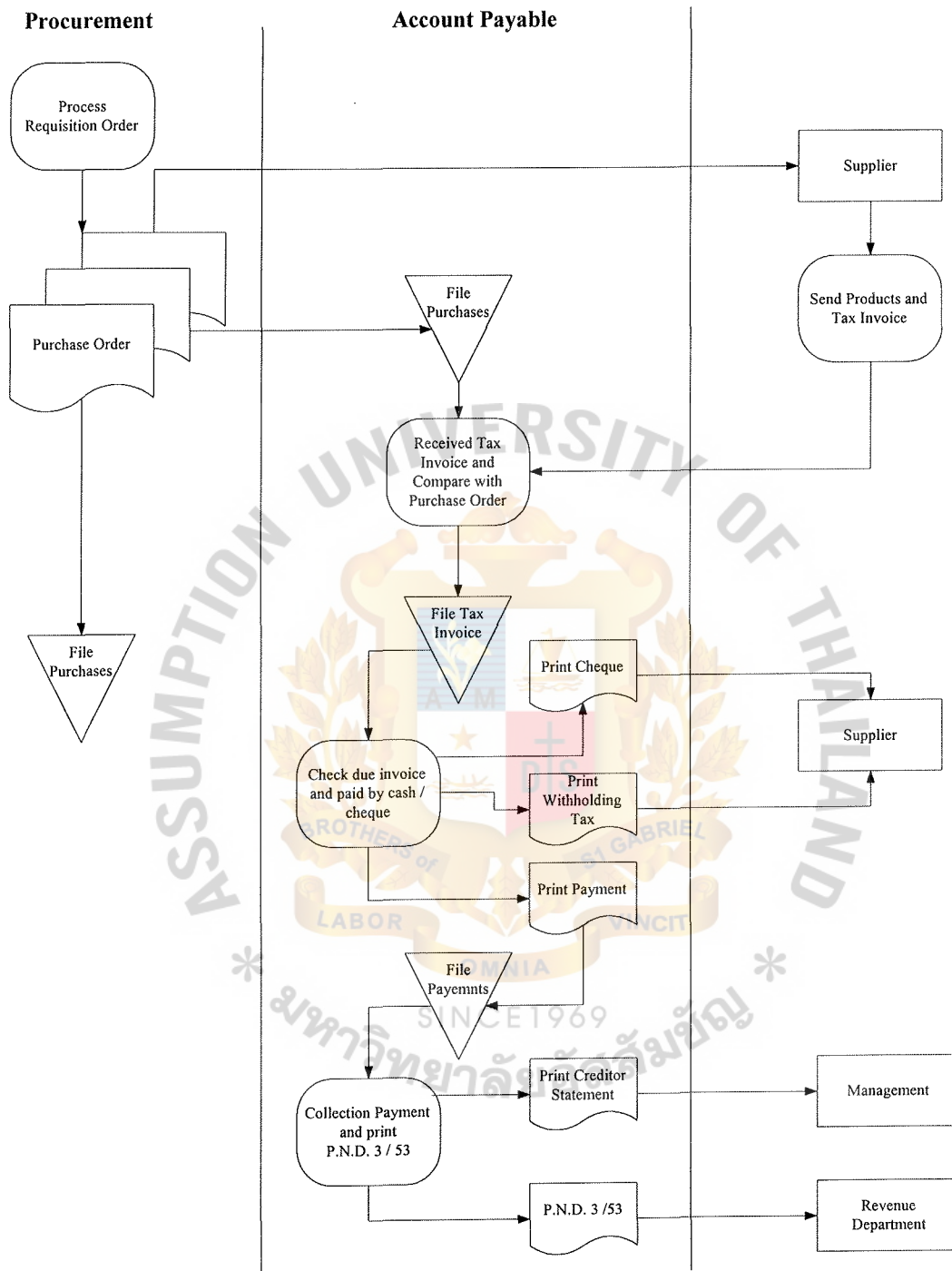


Figure 2.3. Operation Flow of Existing System.

III. THE PROPOSED SYSTEM

The proposed system will provide a computerized information system to replace the existing manual system.

3.1 User Requirements

After reviewing and evaluating the existing system, the user requirements are obtained from the user and the existing system. The existing system can serve the user requirements to some extent, but there are some requirements that the existing system still cannot serve, especially in the aspects of the report delivery time.

Users still need further development for more system functions as well as improvement including query capability and report production, database storage, security and so on. The user requirements can be classified into functional requirements and nonfunctional requirements.

Table 3.1. Types of Functional Requirements.

Requirement Type	Explanation
Mandatory	<ul style="list-style-type: none"> - Automatically calculate the withholding tax amount and get the data of supplier for print. - Must be able to modify the concerned information at all time. - Decrease the time in generating the analysis report. - Provide more accurate and up-to-date data. - Must be able to re-generate all reports, as needed by users.
Desirable	<ul style="list-style-type: none"> - Easy to understand and easy to use. - Default some common fields to accelerate the data input processes. - Can be accessed by many users on screen and multiple users can access the system database at the same time.
Nice to Have	<ul style="list-style-type: none"> - Be able to transfer the data for further processes. - Supporting team to solve the problem, if any.

Table 3.2. Types of Nonfunctional Requirements.

Requirement Type	Explanation
Performance	<ul style="list-style-type: none"> - Decrease the time in producing the report. - Default some common fields to accelerate the input processes.
Information	<ul style="list-style-type: none"> - Need to apply database concept for management plan. - Can be accessed by many users on screen.
Economy	<ul style="list-style-type: none"> - Reduce labor cost and staff. - Utilize the existing computer hardware.
Control (and Security)	<ul style="list-style-type: none"> - Full control of the computerized Account Payable System. - Reduce the human errors in calculating process. - Security and operation control should be provided for protecting data.
Efficiency	<ul style="list-style-type: none"> - Reduce the processes in generating analysis reports. - Simplify the process for each concerned system.
Service	<ul style="list-style-type: none"> - Be able to export data for further processing. - Be able to re-generate the report as needed. - User manual that is easy to follow step by step.

3.2 System Design

3.2.1 Proposed Functions

The proposed system uses a context diagram to illustrate on data flowing in and out of the system and the processing of the data.

The data flow diagram is used to present the proposed system step by step. The data flow diagram is a modeling tool that allows the user to picture the proposed system. In order to present the proposed system concept to the user and the management, the system must be converted into a concrete format, which is understandable. In structured analysis and design, a context diagram and a data flow diagram will be presented for discussion.

The computerized Account Payable System consists of the following processes.

(1) Master File Maintenance

This subsystem is responsible for the input of the bank and supplier information. When we have the purchase order, the accounting staffs will input the supplier information to create the withholding tax certificate such as supplier name, address, tax identify.

The accounting staffs will input the bank information for control cheque payment and reconcile the bank statement.

(2) Operation System

After receiving the invoice from the supplier, the accounting staffs will input the information of purchase order such as invoice document, invoice amount, due date for payment, term of payment, and so on.

The transaction automatically generates the account code used in generating a voucher slip.

When the due invoice have to be made payment, the accounting staff will effect payment by cash, cheque, and media clearing. Generated from information of supplier to print withholding tax certificate and P.N.D. 3 / 53 for Revenue Department.

For the cheque payment, the account staffs can define format print for all bank cheques and get the detail from transaction and master information. All of the functions of operation system can generate transaction voucher, payment voucher and automatic generate account to general leader transaction.

(3) Management Analysis

This process provides reconciliation and report for supplier and management to analyze that information, which comes from account payable information.

When bank sends the transaction reconciliation statement, manager would check the transaction movement which they have to know about the cash in bank and cash on hand.

The manager can print the creditor statement and analysis that come from the transaction and payment information.

3.2.2 Data Flow Diagrams

Data Flow Diagrams depict the flow of data through a system and the work or processing performed by the system. Data Flow Diagrams as represented in Appendix A.

3.2.3 Data Dictionary

Data dictionary describes the definition of each data and procedure in the data flow diagram. Data dictionary is represented in Appendix B.

3.2.4 Process Specification

The process specification provides further description of element-level processes as shown in Appendix C.

3.2.5 E-R Diagrams / Structure Chart Diagram

E-R Diagrams and Structure Chart Diagram show the relationship between entity. The E-R Diagrams and Structure Chart Diagram are represented in Appendix D.

3.2.6 Database Design

The Database Design shows the table name, the element name in each table, which is called attribute name, the column name, and shows which attributed name is the primary key or the constraint. Elements that fall into each table or that regularly combines with several other elements in many structures should be placed together into a structure record. Database Designs are shown in Appendix E.

3.2.7 User Interface Design / User Manual

The user interface designs are the design of the interface screens for the proposed system. The user interface design is represented in Appendix F.

3.2.8 Output Reports

The out put reports are the reports that are generated by the proposed system. The output reports are represented in Appendix G.

3.3 Hardware and Software Requirement

3.3.1 Hardware Requirements

The network configuration for Account Payable System is given in Figure 3.1.

The proposed system requires the following Hardware components.

- (1) Server 1 set
 - (a) HP tc3100
 - (b) CPU: Intel Pentium III, 1.26 GHz, FSB 133 MHz
 - (c) Cache: 256 KB L2 per processor
 - (d) Memory: 256 MB 133 MHz ECC SDRAM
 - (e) Hard Disk: 40 GB Ultra 3 10K Hot Swap
 - (f) VGA: 8 MB Video Memory
 - (g) CD Rom: 48 x
 - (h) Mouse / Keyboard: HP PS/2
 - (i) Monitor: HP 55 Color 15"
 - (j) Tape Drive: 20/40 Gigabyte Dlt Drive (Internal)
 - (k) SCSI Controller: Integrated Dual-channel Ultra3 SCSI
- (2) Workstation 5 sets
 - (a) CPU: Intel Celeron 1.2 GHz
 - (b) Mainboard: ASUS TUV4X
 - (c) Memory: 256 MB SDRAM
 - (d) Hard Disk: 20 GB 7,200 rpm
 - (e) VGA: Geforce 2 MX 200 with 32 MB
 - (f) Case: ATX Power Supply 400 Watt
 - (g) NIC: 3Com Fast Ethernet 10/100 Mbps
 - (h) Monitor: Philips 105E11 15"

- (i) OS: Microsoft Windows 98
- (j) Mouse / Keyboard: PS/2
- (3) Network Peripheral 1 set
 - (a) HUB: SMC-EZ6516TX 16 RJ-45 10/100 Mbps.
Dual Speed Switch, Uplink Port
 - (b) FAX Modem (External): Aztech UM9800-U (TQ)
56 KB V.90 (USB) (Include interface Line)
- (4) UPS for Server 2KVA: Power Station 2000 VA 1 set
- (5) UPS for PC 600VA: Power Start 600 VA 5 sets
- (6) Tape Media: 20/40 GB DDS/4 1 set
- (7) Printer
 - (a) HP 1200n Speed 14 ppm, RAM 8MB 1 set
 - (b) Epson LQ-2170I 1 set

3.3.2 Software Requirements

The Software will encompass the implementation of the following:

- (1) Microsoft Windows 2000 for Server OEM 1 set
- (2) Microsoft Windows 98 Thai or Me for Work station 5 sets
- (3) Microsoft Office 2000 1 set
- (4) Microsoft SQL Server 2000 and Delphi 5 (5 licenses) 1 set

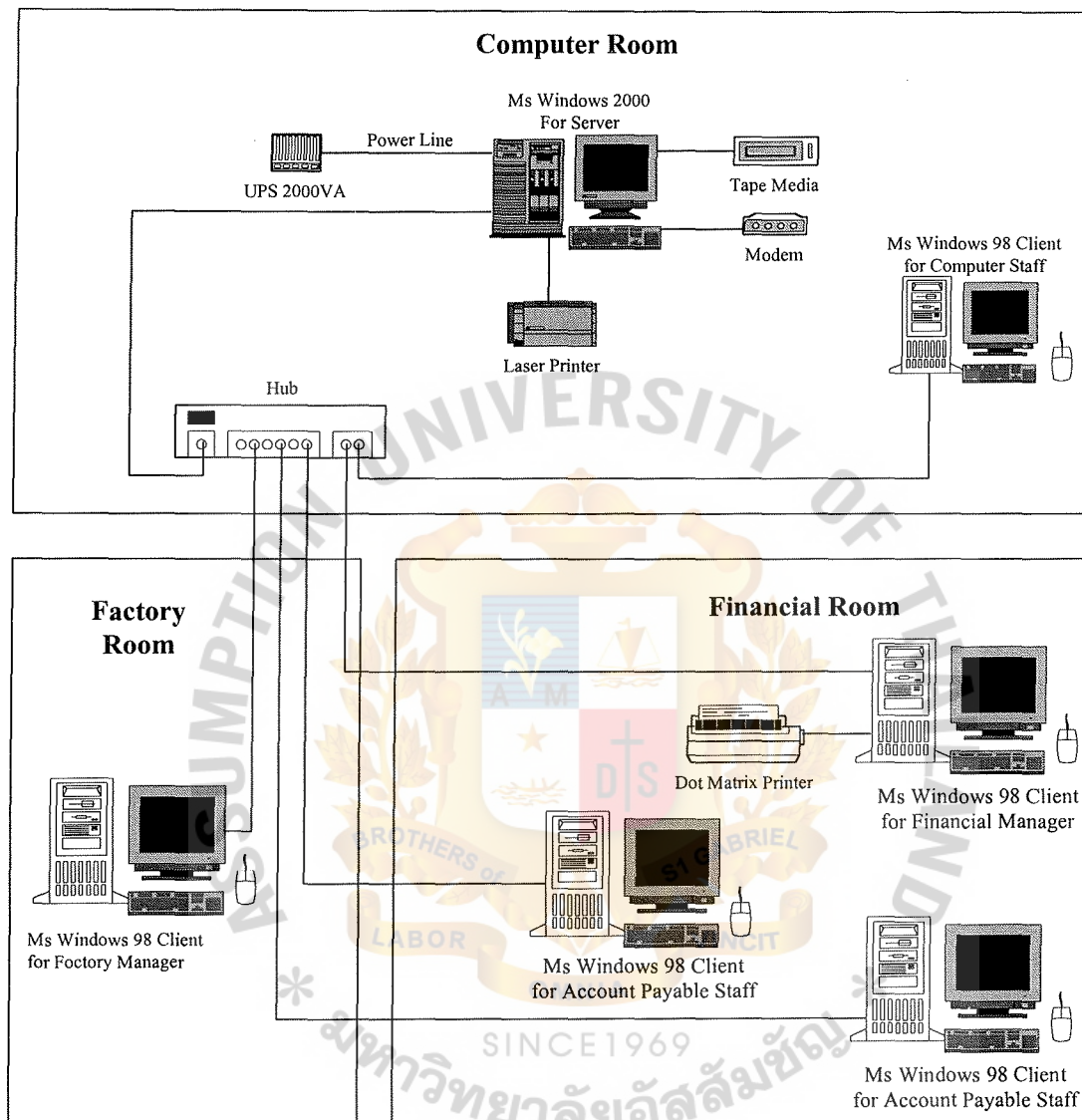


Figure 3.1. Network Architecture.

3.4 Security and Control

3.4.1 User-Oriented Access Control

- (1) The user identifiers (ID) and passwords are assigned to authorized persons.
When a user log in, the system asks for both a user ID and password.
- (2) The system allows a user to log in only if that user's ID is known to system and if the user knows the password associated with the system with that ID.
- (3) The user ID and password can determine the privileges accorded to the user.
A few users (such as manager and assistant manager) have supervisory or super user status that the system allows to read files and to perform functions modification and deletion.
- (4) The number of document must be generated according to the running number.

3.4.2 Physical Security

- (1) The failure of the main electricity supply causes interruption to the function of the computer facility or telecommunication network. UPS (Uninterruptible Power Supply) is used to supply power instead of the main electricity supply.
- (2) Special detectors combined with removal or extractor fans and filters in the computer room and surrounding area are installed in order to protect against smoke and gas.
- (3) To prevent an accident that may destroy the files during processing, backup is used to recover any destruction or error on files. So there must be backup tapes and backup copies should be created every time.
- (4) Data correction must be made immediately after errors on the data listing reports are found.

3.5 Cost / Benefit Analysis

Cost-Benefit analysis provides quantitative analysis for both, existing and proposed system, for the system owner to make a decision on the system development. Three techniques, Break-even, payback and net present value analysis, are used to analyze the proposed system.

3.5.1 Cost Analysis

(1) Cost of the existing system

At present, the existing system operates manually and most of the cost is cost of operating a system, which can be classified as fixed, and variable.

(a) Fixed Cost

Fixed costs occur at regular intervals but at relatively fixed rates. All staff salaries can be classified in this type of cost. Although salaries tend to rise the rise is gradual and tends not to change dramatically from month to month.

(b) Variable Cost

Variable costs occur in proportion to some usage factor. Cost of computer usage. Supplies and overhead cost, all of these are include in this kind of cost

All costs in the existing system will increase by 20% annually except the personnel cost that will increase by only 10% per annum. The detailed calculation of the existing system cost is shown in the following tables.

Table 3.3. Manual System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
Operating Cost					
Salary Cost					
Operation Manager 1 person @ 22,000	264,000	290,400	319,440	351,384	386,522
Senior Staff 3 persons @ 13,000	468,000	514,800	566,280	622,908	685,199
Staff 5 persons @ 8,500	510,000	561,000	617,100	678,810	712,751
Over Time Staff 3 persons	275,000	302,500	332,750	366,025	384,326
Bonus	101,000	111,100	122,210	134,431	141,153
Total Annual Salary Cost	1,618,000	1,779,800	1,957,780	2,153,558	2,309,951
Office Supplier & Miscellaneous Cost					
Stationary	9,000	9,900	10,890	11,979	13,177
Paper	15,000	16,500	18,150	19,965	21,962
Ribbon	15,000	16,500	18,150	19,965	21,962
Utilities	40,000	44,000	48,400	53,240	58,564
Miscellaneous	10,000	11,000	12,100	13,310	14,641
Total Annual Office Supplier & Miscellaneous Cost	89,000	97,900	107,690	118,459	130,305
Total Manual System Cost	1,707,000	1,877,700	2,065,470	2,272,017	2,440,255

Table 3.4. Five Years Accumulated Manual System Cost, Baht.

Year	Total Manual Cost	Accumulated Cost
1	1,707,000	1,707,000
2	1,877,700	3,584,700
3	2,065,470	5,650,170
4	2,272,017	7,922,187
5	2,440,255	10,362,442
Total	10,362,442	

(2) Cost of the proposed system

In developing the proposed system, there are two major costs – system development and system operation cost. These costs are expected to increase by 10 – 20 % annually.

(a) System Development Cost

This type of cost consists of hardware, software, people ware and implementation cost. The major hardware and software are server and client computer, UPS, operating system, application, and database management system software. All of these resources need to be acquired for the development of the proposed system.

People-ware cost is concerned about the salary of the development team, which is composed of system analyst, programmer, database specialist, network specialist, etc. Each personnel cost varies according to their involvement in the system development.

Implementation cost has two main factors – training cost and installation cost. Installation cost includes hardware and software configuration and installation.

(b) System Operation Cost

This cost consists of hardware and software maintenance cost, people-ware cost and offices supplies and miscellaneous costs.

Maintenance cost is based on the number of computers and software licenses used in its operation including the application license fee for the software package.

People were cost; there are two categories of personnel involved users and system administration. The main user for the proposed system is planning manager and staff. The system administrator includes programmer and database specialist to maintain the system.

Office supplies and miscellaneous cost will be reduced as a result of implementation of the proposed system.

Detailed calculations of each candidate solution cost are illustrated as follows:



Table 3.5. Cost Analysis of the Candidate 1, Baht.

Cost items	Years				
	1	2	3	4	5
Development Cost					
<u>Hardware Cost</u>					
Computer Server Cost	70,000	70,000	70,000	70,000	70,000
Computer Client Cost	23,000	23,000	23,000	23,000	23,000
Network Cost	2,112	2,112	2,112	2,112	2,112
Ups, Printer	15,970	15,970	15,970	15,970	15,970
Total Hardware Cost	111,082	111,082	111,082	111,082	111,082
<u>Maintenance Cost</u>					
Application Package 5 Users 1 Set	400,000	400,000	400,000	400,000	400,000
Maintenance Cost	0	200,000	200,000	200,000	200,000
Total Maintenance Cost	400,000	600,000	640,000	600,000	600,000
<u>Software Cost</u>					
MS Windows 98 for Client	6,450	6,450	6,450	6,450	6,450
MS Office 2000	6,550	6,550	6,550	6,550	6,550
Total Software Cost	13,000	13,000	13,000	13,000	13,000
<u>Implementation Cost</u>					
Basic Training Cost	27,000	0	0	0	0
Advanced Training Cost	54,000	0	0	0	0
Set up Cost	500,000				
Total Implementation Cost	581,000	0	0	0	0
Total Development Cost	1,105,082	724,082	724,082	724,082	724,082
Operating Cost					
<u>People-Ware Cost</u>					
Operation Manager 1 person	315,000	330,750	347,288	364,652	382,884
Programmer 2 persons	230,000	241,500	253,575	266,254	279,566
Database Administrator 1 person	384,000	403,200	423,360	444,528	466,754
Over Time Staff 2 persons	49,000	51,450	54,023	56,724	59,560
Bonus	101,000	106,050	111,353	116,920	122,766
Total Annual Salary Cost	1,079,000	1,132,950	1,189,598	1,249,077	1,311,531
<u>Office Supplier & Miscellaneous Cost</u>					
Stationary	7,000	7,700	8,470	9,317	10,249
Paper	8,000	8,800	9,680	10,648	11,713
Printer Toners	6,000	6,600	7,260	7,986	8,785
Ribbon	3,000	3,300	3,630	3,993	4,392
Miscellaneous	10,000	11,000	12,100	13,310	14,641
Total Annual Office Supplier & Miscellaneous Cost	34,000	37,400	41,140	45,254	49,779
Total Operation Cost	1,113,000	1,170,350	1,230,738	1,294,331	1,361,311
Total Computerized System Cost	2,218,082	1,894,432	1,954,820	2,018,413	2,085,393

Table 3.6. Cost Analysis of the Candidate 2, Baht.

Cost items	Years				
	1	2	3	4	5
Development Cost					
Hardware Cost					
Computer Server Cost	70,000	70,000	70,000	70,000	70,000
Computer Client Cost	23,000	23,000	23,000	23,000	23,000
Network Cost	2,112	2,112	2,112	2,112	2,112
Ups, Printer	15,970	15,970	15,970	15,970	15,970
Total Hardware Cost	111,082	111,082	111,082	111,082	111,082
Maintenance Cost					
Outsourcing Cost	180,000	180,000	180,000	180,000	180,000
Maintenance Cost	0	0	18,000	18,000	18,000
Total Maintenance Cost	180,000	180,000	198,000	198,000	198,000
Software Cost					
MS Windows 2000 for Server	12,750	12,750	12,750	12,750	12,750
MS Windows 98 for Client	6,450	6,450	6,450	6,450	6,450
MS Office 2000	6,550	6,550	6,550	6,550	6,550
MS SQL Server 2000 (5 Licenses)	17,200	17,200	17,200	17,200	17,200
Borland Delphi 5	11,600	11,600	11,600	11,600	11,600
Total Software Cost	54,550	54,550	54,550	54,550	54,550
Implementation Cost					
Basic Training Cost	27,000	0	0	0	0
Advanced Training Cost	54,000	0	0	0	0
Set up Cost	350,000				
Total Implementation Cost	431,000	0	0	0	0
Total Development Cost	776,632	345,632	363,632	363,632	363,632
Operating Cost					
People-Ware Cost					
Operation Manager 1 person	315,000	330,750	347,288	364,652	382,884
Computer Manager 1 person	288,000	302,400	317,520	333,396	350,066
Programmer 2 persons	216,000	226,800	238,140	250,047	262,549
Database Administrator 1 person	360,000	378,000	396,900	416,745	437,582
Over Time Staff 2 persons	49,000	51,450	54,023	56,724	59,560
Bonus	101,000	106,050	111,353	116,920	122,766
Total Annual Salary Cost	1,329,000	1,395,450	1,465,223	1,538,484	1,615,408
Office Supplier & Miscellaneous Cost					
Stationary	7,000	7,700	8,470	9,317	10,249
Paper	8,000	8,800	9,680	10,648	11,713
Printer Toners	6,000	6,600	7,260	7,986	8,785
Ribbon	3,000	3,300	3,630	3,993	4,392
Miscellaneous	10,000	11,000	12,100	13,310	14,641
Total Annual Office Supplier & Miscellaneous Cost	34,000	37,400	41,140	45,254	49,779
Total Operation Cost	1,363,000	1,432,850	1,506,363	1,583,738	1,665,187
Total Computerized System Cost	2,139,632	1,778,482	1,869,995	1,947,370	2,028,819

Table 3.7. Cost Analysis of the Candidate 3, Baht.

Cost items	Years				
	1	2	3	4	5
Development Cost					
<u>Hardware Cost</u>					
Computer Server Cost	70,000	70,000	70,000	70,000	70,000
Computer Client Cost	23,000	23,000	23,000	23,000	23,000
Network Cost	2,112	2,112	2,112	2,112	2,112
Ups, Printer	15,970	15,970	15,970	15,970	15,970
Total Hardware Cost	111,082	111,082	111,082	111,082	111,082
<u>Maintenance Cost</u>					
Application Package 5 Users 1 Set	0	0	0	0	0
Maintenance Cost	0	0	0	0	0
Total Maintenance Cost	0	0	0	0	0
<u>Software Cost</u>					
MS Windows 2000 for server	12,750	12,750	12,750	12,750	12,750
MS Windows 98 for Client	6,450	6,450	6,450	6,450	6,450
MS Office 2000	6,550	6,550	6,550	6,550	6,550
MS SQL Server 2000 (5 Licenses)	17,200	17,200	17,200	17,200	17,200
Borland Delphi 5	11,600	11,600	11,600	11,600	11,600
Total Software Cost	54,550	54,550	54,550	54,550	54,550
<u>Implementation Cost</u>					
Basic Training Cost	27,000	0	0	0	0
Advanced Training Cost	54,000	0	0	0	0
Set up Cost	180,000				
Total Implementation Cost	261,000	0	0	0	0
Total Development Cost	426,632	165,632	165,632	165,632	165,632
Operating Cost					
<u>People-Ware Cost</u>					
Operation Manager 1 person	315,000	330,750	347,288	364,652	382,884
Computer Manager 1 person	288,000	302,400	317,520	333,396	350,066
Programmer 2 persons	216,000	226,800	238,140	250,047	262,549
Database Administrator 1 person	360,000	378,000	396,900	416,745	437,582
Over Time Staff 2 persons	49,000	51,450	54,023	56,724	59,560
Bonus	101,000	106,050	111,353	116,920	122,766
Total Annual Salary Cost	1,329,000	1,395,450	1,465,223	1,538,484	1,615,408
<u>Office Supplier & Miscellaneous Cost</u>					
Stationary	7,000	7,700	8,470	9,317	10,249
Paper	8,000	8,800	9,680	10,648	11,713
Printer Toners	6,000	6,600	7,260	7,986	8,785
Ribbon	3,000	3,300	3,630	3,993	4,392
Miscellaneous	10,000	11,000	12,100	13,310	14,641
Total Annual Office Supplier & Miscellaneous Cost	34,000	37,400	41,140	45,254	49,779
Total Operation Cost	1,363,000	1,432,850	1,506,363	1,583,738	1,665,187
Total Computerized System Cost	1,789,632	1,598,482	1,671,995	1,749,370	1,830,819

Table 3.8. Five Years Accumulated of the Candidate 1, Baht.

Year	Total Candidate 1 Cost	Accumulated Cost
1	2,218,082	2,218,082
2	1,894,432	4,112,514
3	1,954,820	6,067,334
4	2,018,413	8,085,747
5	2,085,393	10,171,140
Total	10,171,140	

Table 3.9. Five Years Accumulated of the Candidate 2, Baht.

Year	Total Candidate 2 Cost	Accumulated Cost
1	2,139,632	2,139,632
2	1,778,482	3,918,114
3	1,869,995	5,788,109
4	1,947,370	7,735,479
5	2,028,819	9,764,298
Total	9,764,298	

Table 3.10. Five Years Accumulated of the Candidate 3, Baht.

Year	Total Candidate 3 Cost	Accumulated Cost
1	1,789,632	1,789,632
2	1,598,482	3,388,114
3	1,671,995	5,060,109
4	1,749,370	6,809,479
5	1,830,819	8,640,298
Total	8,640,298	

(3) Comparison of System Cost

After the system cost of both existing and proposed system has been identified, this information can be used to construct the system cost comparison table to evaluate the cost saving from implementing each proposed system. The figures are summarized in Table 3.11.

Table 3.11. Comparison of Accumulated Cost of the Existing System and the Three Candidate Systems, Baht.

Year	Accumulated Cost of Existing System	Accumulated Cost of Candidate 1	Accumulated Cost of Candidate 2	Accumulated Cost of Candidate 3
1	1,707,000	2,218,082	2,139,632	1,789,632
2	3,584,700	4,112,514	3,918,114	3,388,114
3	5,650,170	6,067,334	5,788,109	5,060,109
4	7,922,187	8,085,747	7,735,479	6,809,479
5	10,362,442	10,171,140	9,764,298	8,640,298

3.5.2 Benefit Analysis

Benefits are classified into two main categories: tangible and intangible. The proposed system provides the benefits, which are defined as follows:

(1) Tangible Benefits

Tangible benefits are those that can be easily quantified. They are measured in terms of annual savings when comparing computerized system with a manual system. The summarized benefits of manual and three candidates are illustrated as follows:

Table 3.12. Summarized Benefits of Manual and Candidate 1 System, Baht.

Benefits items	year 1	year 2	year 3	year 4	year 5
Annual salary cost saving	539,000	646,850	768,183	904,481	998,420
Annual Office Supplier & Miscellaneous saving	55,000	60,500	66,550	73,205	80,526
Total Benefits of Computerized System Candidate 1	594,000	707,350	834,733	977,686	1,078,945

Table 3.13. Summarized Benefits of Manual and Candidate 2 System, Baht.

Benefits items	year 1	year 2	year 3	year 4	year 5
Annual salary cost saving	289,000	384,350	492,558	615,074	694,543
Annual Office Supplier & Miscellaneous saving	55,000	60,500	66,550	73,205	80,526
Total Benefits of Computerized System Candidate 2	344,000	444,850	559,108	688,279	775,069

Table 3.14. Summarized Benefits of Manual and Candidate 3 System, Baht.

Benefits items	year 1	year 2	year 3	year 4	year 5
Annual salary cost saving	289,000	384,350	492,558	615,074	694,543
Annual Office Supplier & Miscellaneous saving	55,000	60,500	66,550	73,205	80,526
Total Benefits of Computerized System Candidate 3	344,000	444,850	559,108	688,279	775,069

(2) Intangible Benefits

The proposed system is expected to increase the efficiency of the production and planning tasks. By using the new computerized system, it not only provides more timely information but more accurate information as well.

3.5.3 Breakeven Analysis

Breakeven Analysis is the regular form of cost comparison. Comparing the cost of the proposed system and the cost of the existing system to determine the point that the costs of the both systems become equal. Normally cost of the proposed system will be highest at the first year because of installation of new hardware and software. The proposed system costs will drop rapidly after the system has been implemented. And another system; cost of existing system, will increase every year. The major factor, which affects the existing system, is employee salary because it is a fixed cost.

Cost comparison of the existing system and each candidate system are shown previously, The figure of the break even-point of each candidate are shown as follows:



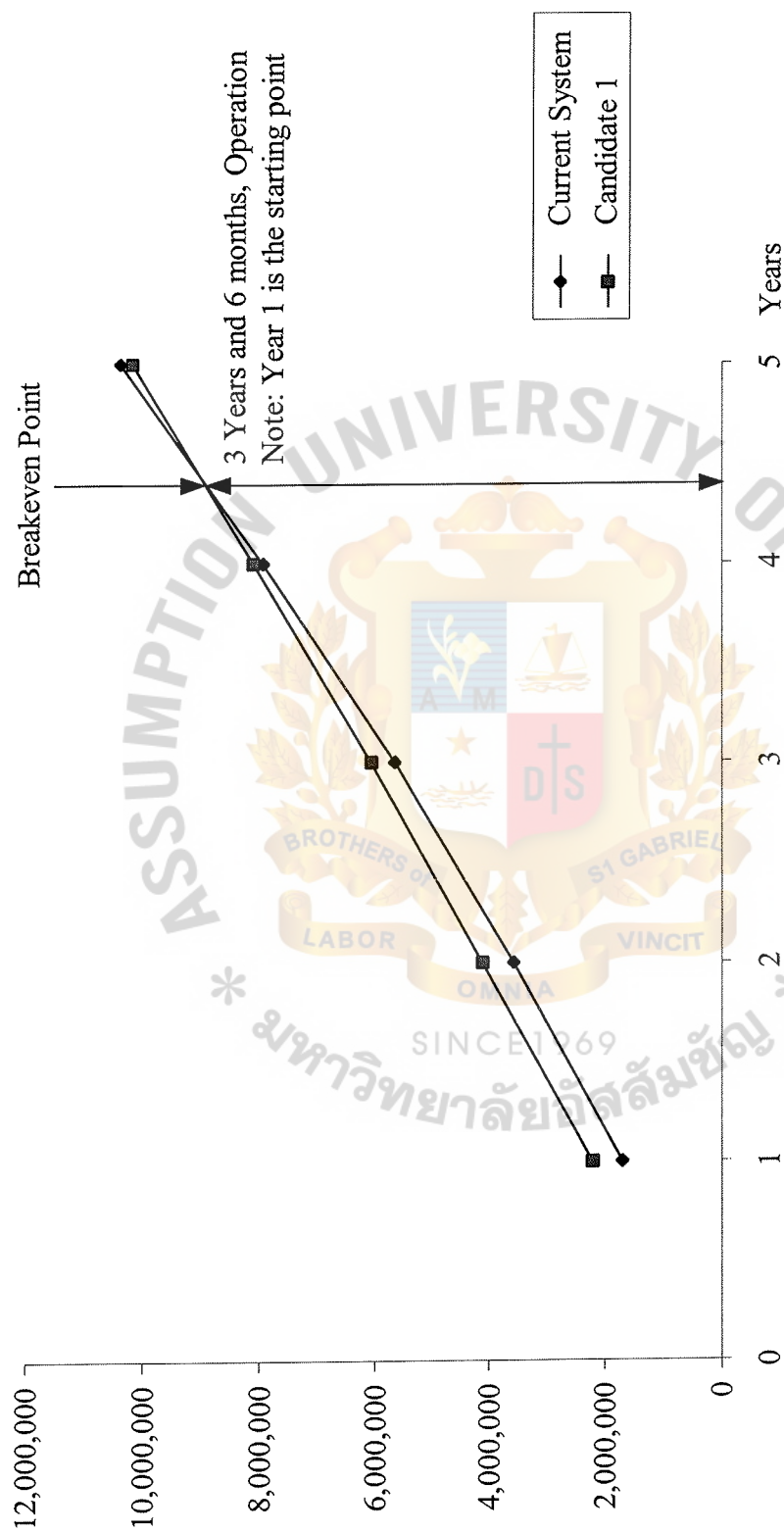


Figure 3.2. Break-even Analysis of Current System and Candidate 1.

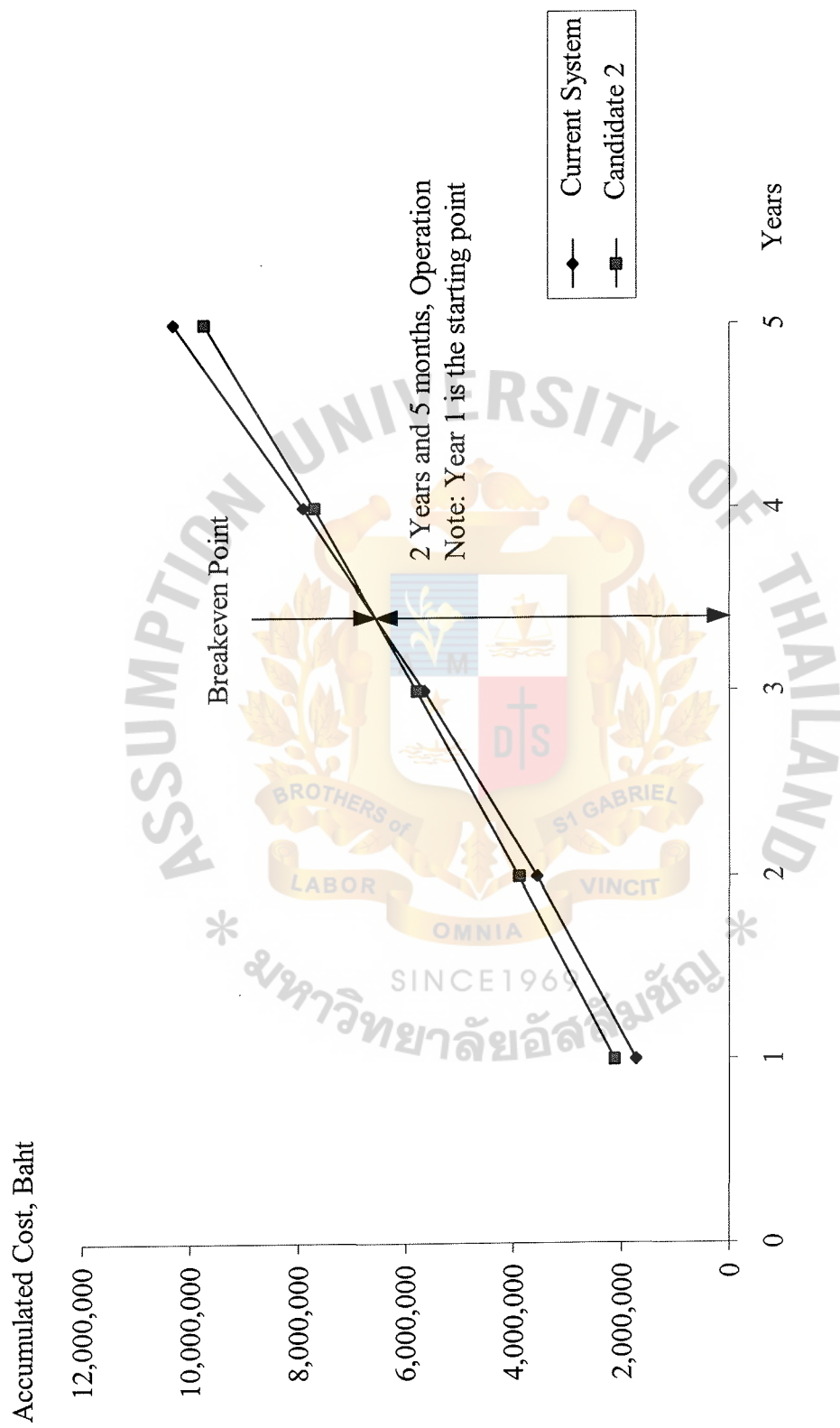


Figure 3.3. Break-even Analysis of Current System and Candidate 2.

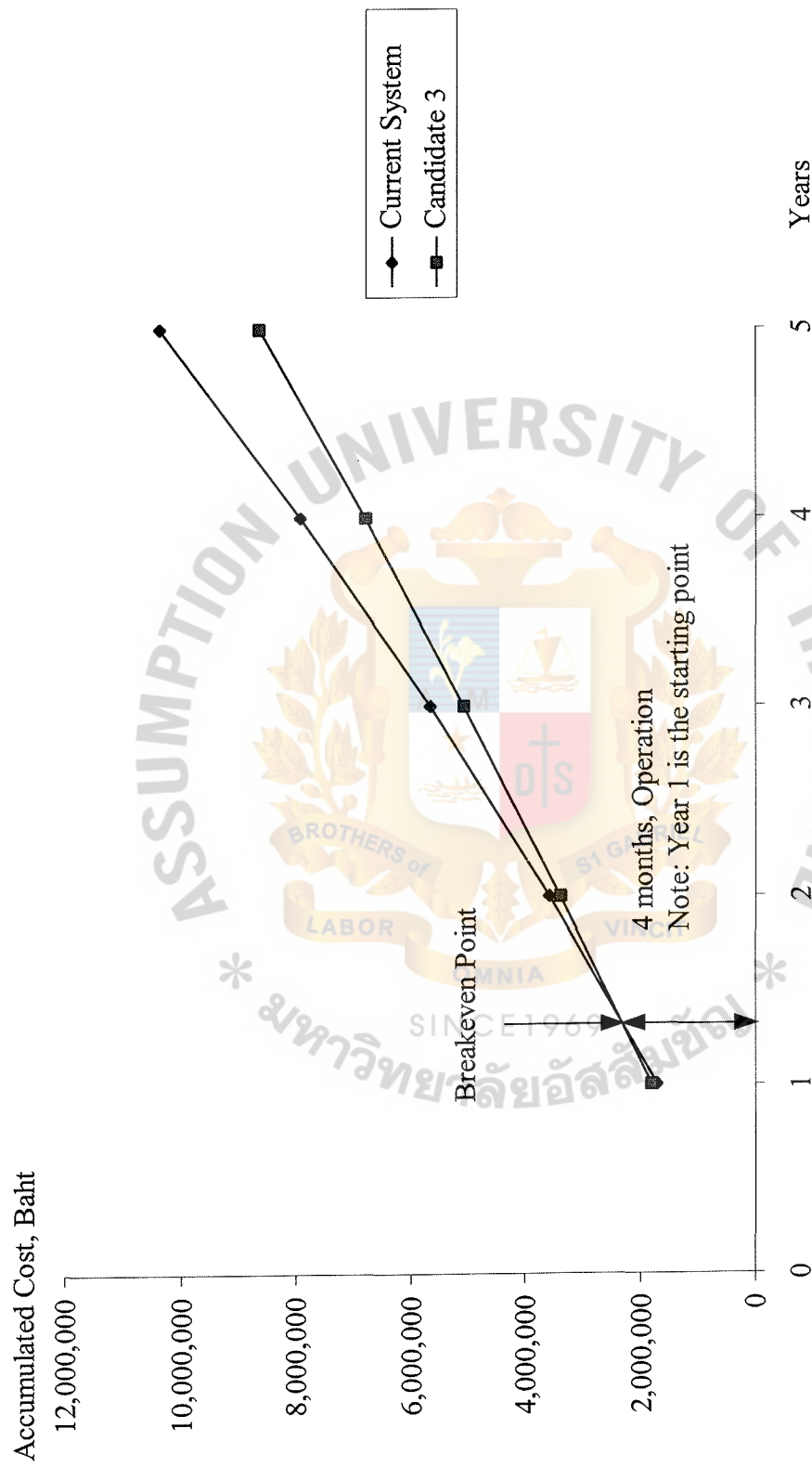


Figure 3.4. Break-even Analysis of Current System and Candidate 3

3.5.4 Payback Period

The payback period is the simple and popular methodology to measure the performance of the benefit, which accumulates earnings sufficient to cover the investment. Payback period is defined as the point in time when initial investment costs equal investment. Payback period is defined as the point in time when initial investment costs are recovered completely and the proposed system saving begin. The discounted payback must consist of the time value of money to adjust future money to be the current value actually called present value.

Table 3.15. Payback Analysis for the Candidate 1, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development Cost:	-1,105,082					
Operation & Maintenance cost:		-1,113,000	-1,170,350	-1,230,738	-1,294,331	-1,361,311
Discount factors for 10%:	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209
Time-adjusted costs (adjusted to present value):	-1,105,082	-1,011,828	-967,177	-924,653	-884,028	-845,238
Cumulative time-adjusted costs over lifetime:	-1,105,082	-2,116,910	-3,084,088	-4,008,741	-4,892,769	-5,738,007
Benefits derived from operation of new system:	0	1,500,000	2,000,000	2,500,000	3,000,000	3,500,000
Discount factors for 10%:	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209
Time-adjusted benefits (current of present value):	0	1,363,650	1,652,800	1,878,250	2,049,000	2,173,150
Cumulative time-adjusted benefits over lifetime:	0	1,363,650	3,016,450	4,894,700	6,943,700	9,116,850
Cumulative lifetime time-adjusted costs + benefits:	-1,105,082	-753,260	-67,638	885,959	2,050,931	3,378,843

Table 3.16. Payback Analysis for the Candidate 2, Baht.

Cost Item	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development Cost:	-776,632					
Operation & Maintenance cost:		-1,363,000	-1,432,850	-1,506,363	-1,583,738	-1,665,187
Discount factors for 10%:	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209
Time-adjusted costs (adjusted to present value):	-776,632	-1,239,103	-1,184,107	-1,131,730	-1,081,693	-1,033,915
Cumulative time-adjusted costs over lifetime:	-776,632	-2,015,735	-3,199,843	-4,331,573	-5,413,265	-6,447,180
Benefits derived from operation of new system:	0	1,500,000	2,000,000	2,500,000	3,000,000	3,500,000
Discount factors for 10%:	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209
Time-adjusted benefits (current of present value):	0	1,363,650	1,652,800	1,878,250	2,049,000	2,173,150
Cumulative time-adjusted benefits over lifetime:	0	1,363,650	3,016,450	4,894,700	6,943,700	9,116,850
Cumulative lifetime time-adjusted costs + benefits:	-776,632	-652,085	-183,393	563,127	1,530,435	2,669,670

Table 3.17. Payback Analysis for the Candidate 3, Baht.

Cost Item	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development Cost:	-426,632					
Operation & Maintenance cost:		-1,363,000	-1,432,850	-1,506,363	-1,583,738	-1,665,187
Discount factors for 10%:	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209
Time-adjusted costs (adjusted to present value):	-426,632	-1,239,103	-1,184,107	-1,131,730	-1,081,693	-1,033,915
Cumulative time-adjusted costs over lifetime:	-426,632	-1,665,735	-2,849,843	-3,981,573	-5,063,265	-6,097,180
Benefits derived from operation of new system:	0	1,500,000	2,000,000	2,500,000	3,000,000	3,500,000
Discount factors for 10%:	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209
Time-adjusted benefits (current of present value):	0	1,363,650	1,652,800	1,878,250	2,049,000	2,173,150
Cumulative time-adjusted benefits over lifetime:	0	1,363,650	3,016,450	4,894,700	6,943,700	9,116,850
Cumulative lifetime time-adjusted costs + benefits:	-426,632	-302,085	166,607	913,127	1,880,435	3,019,670

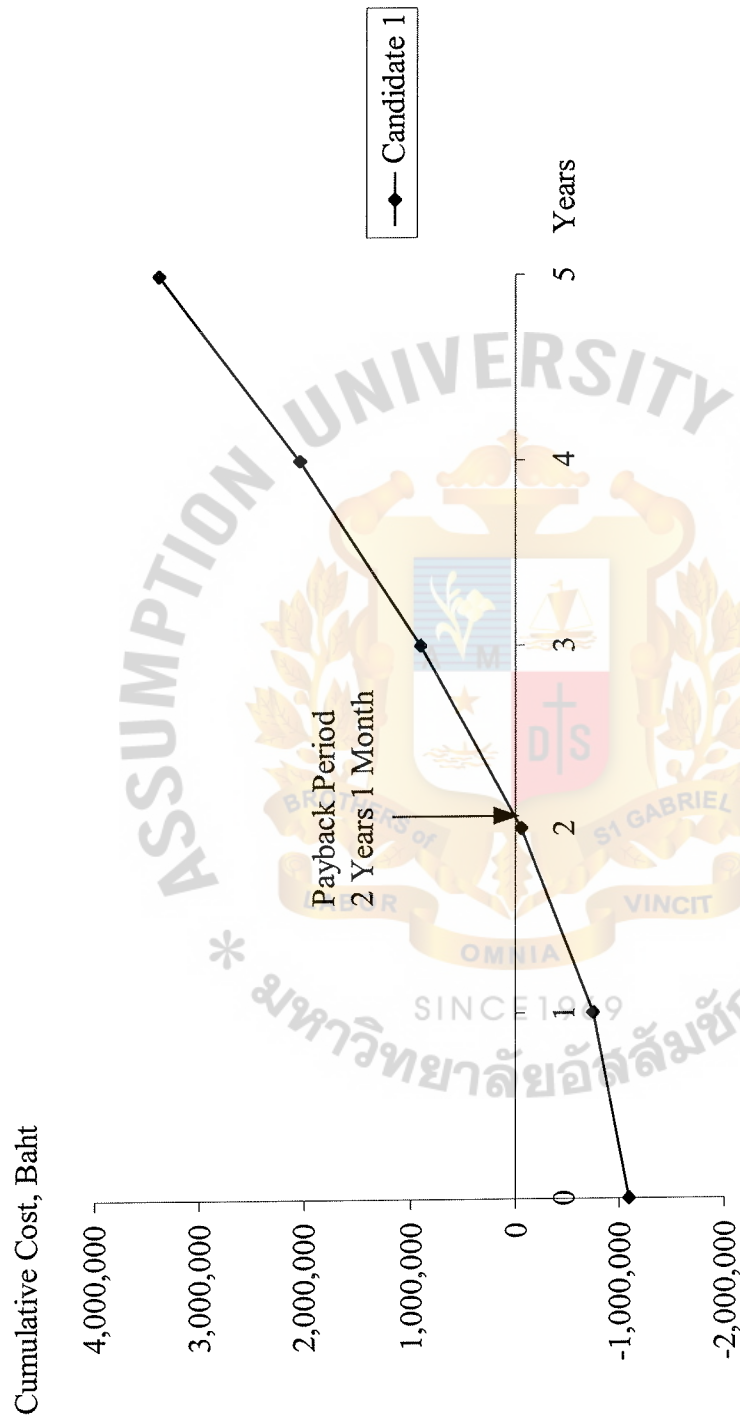


Figure 3.5. Payback Analysis of Candidate 1.

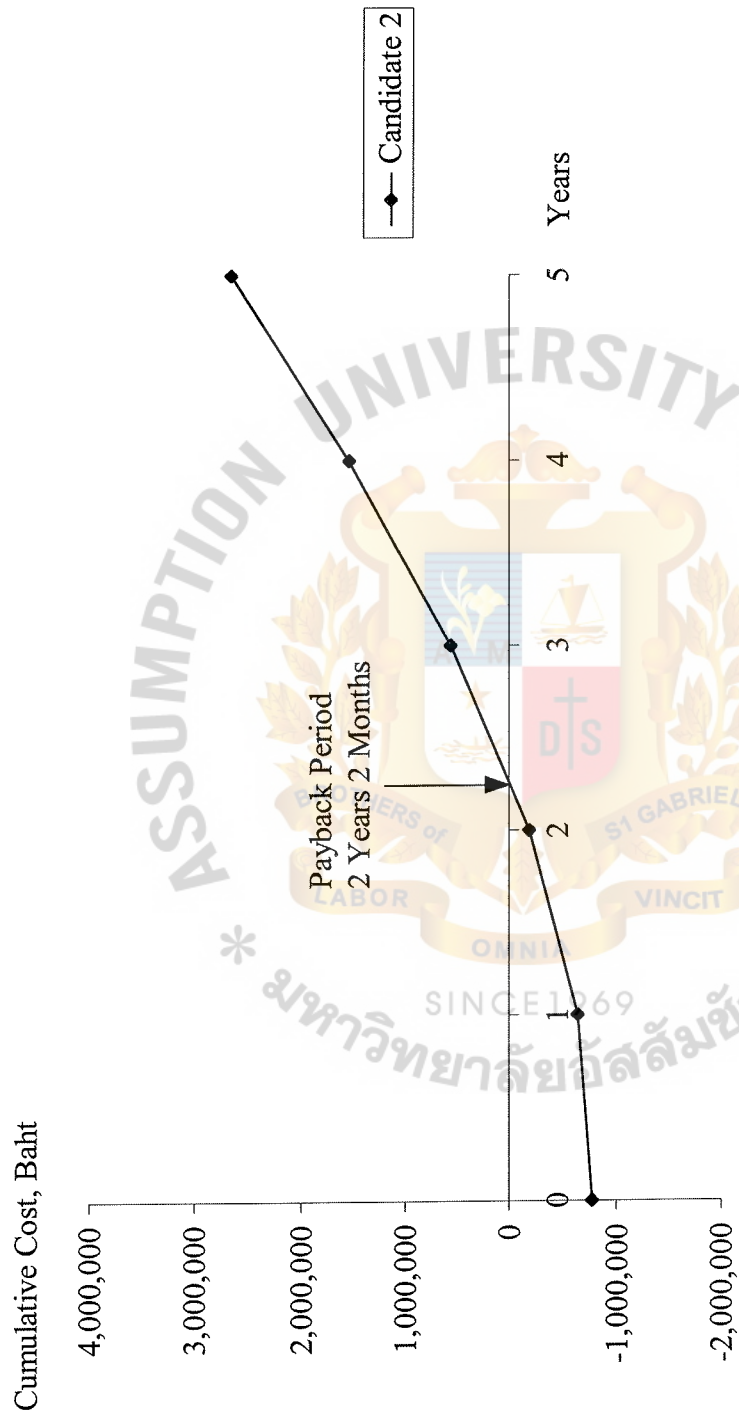


Figure 3.6. Payback Analysis of Candidate 2.

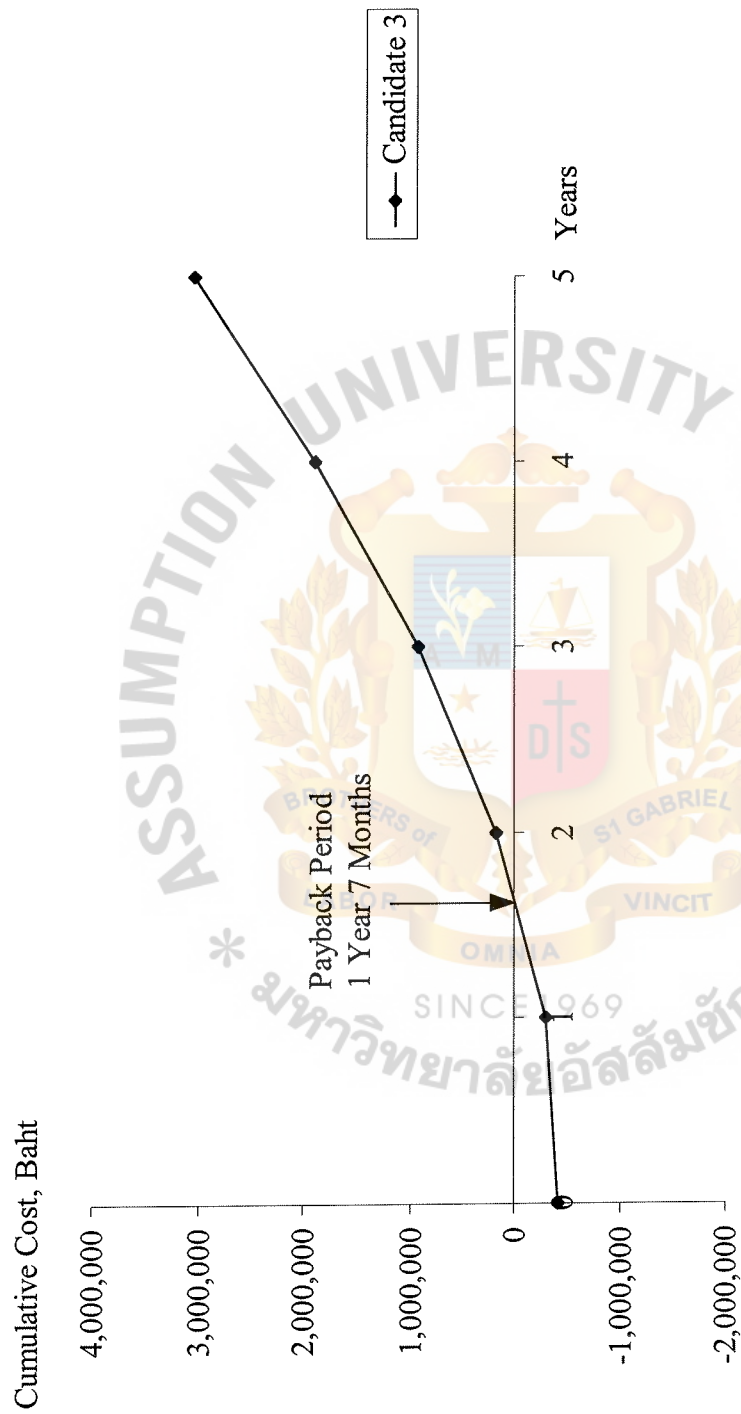


Figure 3.7. Payback Analysis of Candidate 3.

3.5.5 Net present Value

Net present value analysis is the discounted cash flow approach for evaluating the most effective investment alternatives. The cash flow includes both cash inflows and outflows from the system implementation.

The calculation results will be used for ranking the investment alternatives. The decision will be based on the net present value. Whichever alternative gives the highest net present value, that alternative will be selected.

From the calculation results, the analysis indicates that net present values of all candidates are positive. However, candidate 3 gives net present value of 3,019,670 Baht, which is the highest value among all alternatives. The detailed calculation of net present value analysis for each candidate is shown in the following:

Table 3.18. Net Present Value Analysis of the Candidate 1, Baht.

Cost flow description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Development Cost:	-1,105,082						
Operation & Maintenance cost:		-1,113,000	-1,170,350	-1,230,738	-1,294,331	-1,361,311	
Discount factors for 10%:	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209	
Present value of annual costs:	-1,105,082	-1,011,828	-967,177	-924,653	-884,028	-845,238	0
Total present value of lifetime costs:							-5,738,007
Benefits derived from operation of new system:	0	1,500,000	2,000,000	2,500,000	3,000,000	3,500,000	3,500,000
Discount factors for 10%:	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209	0.6209
Present value of annual benefits:	0	1,363,650	1,652,800	1,878,250	2,049,000	2,173,150	
Total present value of lifetime benefits:							9,116,850
NET PRESENT VALUE OF THIS ALTERNATIVE:							3,378,843

Table 3.19. Net Present Value Analysis of the Candidate 2, Baht.

Cost flow description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Development Cost:	-776,632						
Operation & Maintenance cost:		-1,363,000	-1,432,850	-1,506,363	-1,583,738	-1,665,187	
Discount factors for 10%:	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209	
Present value of annual costs:	-776,632	-1,239,103	-1,184,107	-1,131,730	-1,081,693	-1,033,915	0
Total present value of lifetime costs:							-6,447,180
Benefits derived from operation of new system:	0	1,500,000	2,000,000	2,500,000	3,000,000	3,500,000	3,500,000
Discount factors for 10%:	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209	0.6209
Present value of annual benefits:	0	1,363,650	1,652,800	1,878,250	2,049,000	2,173,150	
Total present value of lifetime benefits:							9,116,850
NET PRESENT VALUE OF THIS ALTERNATIVE:							2,669,670

Table 3.20. Net Present Value Analysis of the Candidate 3, Baht.

Cost flow description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Development Cost:	-426,632						
Operation & Maintenance cost:		-1,363,000	-1,432,850	-1,506,363	-1,583,738	-1,665,187	
Discount factors for 10%:	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209	
Present value of annual costs:	-426,632	-1,239,103	-1,184,107	-1,131,730	-1,081,693	-1,033,915	0
Total present value of lifetime costs:							-6,097,180
Benefits derived from operation of new system:	0	1,500,000	2,000,000	2,500,000	3,000,000	3,500,000	3,500,000
Discount factors for 10%:	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209	0.6209
Present value of annual benefits:	0	1,363,650	1,652,800	1,878,250	2,049,000	2,173,150	
Total present value of lifetime benefits:							9,116,850
NET PRESENT VALUE OF THIS ALTERNATIVE:							3,019,670

3.6 Candidate Solution Analysis

Each solution has its own application development tools and database management system (DBMS) shown as follows:

(1) Candidate 1: Visual C++ and Oracle 8.0

Class 2000 Accounting System is a software package, which is developed by using visual C++ and using Oracle as a DBMS. This package can run on both Windows and Unix server.

(2) Candidate 2: Borland Delphi 5 and MS SQL Server 2000

Borland Delphi 5 is used for application development, because of its rapid application development (RAD) environment and ease of use. MS SQL Server 2000 is chosen as a DBMS, because it is a standard DBMS for windows platform. The proposed application will be developed by outsource company.

(3) Candidate 3: Borland Delphi 5 and MS SQL Server 2000

The reason for choosing Borland Delphi 5 and MS SQL Server 2000 is the same as described in Candidate 2. The different point is in-house system analyst and programmers will develop the proposed system.

After alternatives are identified, each candidate solution needs to be analyzed in more details. Candidate system matrix is used for this purpose and shown in Table 3.21.

Table 3.21. Candidate Systems Matrix.

Characteristics	Candidate 1	Candidate 2	Candidate 3
<u>Portion of System Computerized</u> Brief descriptions of that portion of the system that would be computerized in this candidate.	Class 2000 Accounting System software package from oracle would be purchased and customized to satisfy all company financials functionality.	Hiring the outsource company to analyze and develop the new system.	Use the in-house IT staffs to analyze and develop the new system.
<u>Benefits</u> Brief description of the business benefits that would be realized for this candidate.	This solution can be implemented quickly because it is a purchased solution.	Fully supports user required business processes.	Same as candidate 2. With more efficient in dealing with user for any additional requirements.
<u>Servers and Workstations</u> A description of the servers and workstations needed to support this candidate.	MS Windows 2000 with 2 Boxes, 2 CPUs in each box, RAM 1, 1.5 GB. Or Unix with 1 Box, 2 CPUs, RAM 2 GB.	HP tc3100 CPU Intel PIII 1.26 GHz, FSB 133 MHz, Mem. 256 MB 133 MHz, Hard Disk 40 GB.	Same as candidate 2.
<u>Software Tools Needed</u> Software tools needed to design and build the candidate (e.g., database management system, emulators, operating systems, languages, etc.). Not generally applicable if applications software packages are to be purchased.	Visual C++ for customization of package to provide report writing and integration.	Borland Delphi 5 to code programs and report.	Same as candidate 2.
<u>Application Software</u> A description of the software to be purchased, built, accessed, or some combination of these techniques.	Package Solution	Custom Solution	Same as candidate 2.
<u>Method of Data Processing</u> Generally some combination of: on-line, batch, deferred batch, remote batch, and real-time.	Client/Server	Same as candidate 1.	Same as candidate 1.
<u>Output Devices and Implications</u> A description of output devices that would be used, special output requirements (e.g., network, preprinted forms, etc.) and output considerations (e.g., timing constraints)	(1) HP LaserJet 21000. (2) Epson LQ-2170i.	Same as candidate 1.	Same as candidate 1.
<u>Input Device and Implications</u> A description of input methods to be used, input devices (e.g., keyboard, mouse, etc.) special input requirements (e.g., new or revised forms from which data would be input), and input considerations (e.g., timing of actual inputs).	Keyboard and mouse	Same as candidate 1.	Same as candidate 1.
<u>Storage Devices and Implications</u> Brief description of what data would be stored, what data would be accessed from existing stores, what storage media would be used, how much storage capacity would be needed, and how data would be organized.	Oracle DBMS with 2 HD 45 and 90 GB. (HD 99 GB for Unix platform)	MS SQL Server DBMS with 80 GB arrayed capability.	Same as candidate 2.

3.7 Feasibility Analysis

Once alternative candidates are identified, the feasibility of each candidate is then analyzed. The following are the four criteria for evaluating the feasibility of each solution.

(1) Operational feasibility

It measures whether the candidate solution fulfills the user's requirements or not and to what degree. Candidate 3 can satisfy user requirements better than other solutions, because in-house developer can easily identify and understand the user problems.

(2) Technical feasibility

It measures the practicality of the candidate solution. It determines whether the company has the necessary technology, technical resources and expertise in using the candidate solution or not. From this point of view, Candidate 2 is the most suitable, because the outsourcing company always has the expert in many fields to develop the proposed system for the customer.

(3) Economic feasibility

It identifies whether the solution is cost-effective or not. Cost benefit analysis techniques is applied for this purpose. Candidate 3 gives the best result for this point of view.

(4) Schedule feasibility

It indicates whether the solution can be designed and implemented within an acceptable period or not. Candidate 1 takes 120 days or 4 months to develop and implement the new system. Although, Candidate 3 takes

only 3 months, but for the in-house developer, they are too busy to finish it in time.

After all feasibility criteria are evaluated, the weight of each criterion must be identified for evaluating the candidate solution. Candidate 3 is the most suitable alternative for the proposed system, because cost and development time are acceptable. The analysis results are shown in Table 3.22.



Table 3.22. Candidate Systems Matrix.

Feasibility Criteria	Weight	Candidate 1	Candidate 2	Candidate 3
<p><u>Operational Feasibility</u> Functionality. A description of to what degree the candidate would benefit the organization and how well the system would work.</p> <p><u>Political</u>. A description of how well received this solution would be from both user management, user, and organization perspective.</p>	30%	<p>Some current business processes would have to be modified to take advantage of software functionality</p> <p>Score : 60</p>	<p>Fully supports user required functionality.</p> <p>Score : 95</p>	<p>In-house analysts are more fully and immediately support user required functionality compare with the outsource company's analysts for the following :-</p> <ul style="list-style-type: none"> - Having better understanding in current application system. - Having better relationship with the user. <p>Score 100</p>
<p><u>Technical Feasibility</u> <u>Technology</u>. An assessment of the maturity, availability (or ability to acquire), and desirability of the computer technology needed to support this candidate.</p> <p><u>Expertise</u>. An assessment of the technical expertise needed to develop, operate, and maintain the candidate system..</p>	30%	<p>Class 2000 Accounting system software is a new product of Oracle. It has only been of the market for a few years and now has only few companies in Thailand are using it. So, the maturity of product is a risk and company charges and additional monthly fee for technical support.</p> <p>Required to hire or train Visual C++ and Oracle expertise to perform modifications for integration requirements.</p> <p>Score : 55</p>	<p>Although all applications will be written by outsourcing programmers, company needs to hire some programmers with a little knowledge of Delphi and MS SQL Server to maintain the new system. These programmers are much cheaper than the expert one.</p> <p>MS SQL Server is a mature technology based on version number. Moreover, it easy to fine an expertise to take cares the company database.</p> <p>Score : 90</p>	<p>Although current IT staff have good understanding in company system but to develop the whole new system with the new computer language, all IT staffs must be trained at least 6 months for Delphi.</p> <p>MS SQL Server will become a company standard according to the company board's policy. But, all IT staffs must also be trained at least 1 course for MS SQL Server.</p> <p>Score 85</p>
<p><u>Economic Feasibility</u> Cost to develop : Payback Period (discounted) : Net present value : Detailed calculations :</p>	30%	<p>Approximately 1,105,082 Approximately 25 months Approximately 3,378,843 See section 3.5</p> <p>Score : 50</p>	<p>Approximately 776,632 Approximately 28 months Approximately 2,669,670 See section 3.5</p> <p>Score : 85</p>	<p>Approximately 426,632 Approximately 19 months Approximately 3,019,670 See section 3.5</p> <p>Score 90</p>
<p><u>Schedule Feasibility</u> An assessment of how long the solution will take to design and implement.</p>	10%	<p>2 months</p> <p>Score : 95</p>	<p>6 months</p> <p>Score : 80</p>	<p>4 months</p> <p>Score: 85</p>
Ranking	100%	59	89	91

IV. PROJECT IMPLEMENTATION

4.1 Code and Process Specification

The system is divided into many modules according to the data flow diagram. The details of each module present the input, process, output and data flows.

The system will be applied in two-tiered Client/Server, using Microsoft SQL Server version 2000 as database for storing data at the server with the Microsoft Windows 2000 and the client using Delphi version 5.0 for Graphic User Interface with the Windows 98 or up. The Client/Server are communicated by ODBC.

The process specification will present process number, process name and details of each process.

There are 26 process specifications used in the new system as follows:

- (1) Process 1.1.1. Create Bank Information
- (2) Process 1.1.2. Update Bank Information
- (3) Process 1.1.3. Delete Bank Information
- (4) Process 1.1.4. Report Bank Information
- (5) Process 1.2.1. Create Supplier Information
- (6) Process 1.2.2. Update Supplier Information
- (7) Process 1.2.3. Delete Supplier Information
- (8) Process 1.2.4. Report Supplier Information
- (9) Process 2.1.1. Create Invoice, Credit Note, Debit Note
- (10) Process 2.1.2. Update Invoice, Credit Note, Debit Note
- (11) Process 2.1.3. Delete Invoice, Credit Note, Debit Note
- (12) Process 2.1.4. Generate Voucher
- (13) Process 2.2.1. Payment by Cash

- (14) Process 2.2.2. Payment by Cheque
- (15) Process 2.2.3. Payment by Media clearing
- (16) Process 2.2.4. Generate Voucher Payment
- (17) Process 2.3.1. Generate W/H Tax Certificate
- (18) Process 2.3.2. Generate P.N.D. 3 / 53
- (19) Process 2.3.3. Generate Cheque for Payment
- (20) Process 2.3.4. Generate All of Transaction Report
- (21) Process 3.1.1. Clearing Cheque Payment
- (22) Process 3.1.2. Process Cheque Reconcile
- (23) Process 3.1.3. Generate Report Summary Cheque
- (24) Process 3.2.1. Generate Creditor Statement
- (25) Process 3.2.2. Generate Creditor Analysis Report
- (26) Process 3.2.3. Generate Creditor Due Statement

4.2 Hardware and Software Acquisition and Installation

The company needs to acquire new hardware and software for the proposed system. The acquired hardware is server computer and a number of client computers, because the core function is running on another computer platform. Regarding software acquisition, the required server software is application and database server. For the client computer, all software that needs development tools must be preinstalled.

4.3 Testing

Testing is the process of executing all or some part of the system in order to discover any errors. Testing of specific programs, subsystems and the total system is essential for quality assurance of software. It is done in order to turn up any existing problems with programs and their interfaces before the system is actually used.

Typically, testing is carried out by means of a bottom-up fashion, which can be described as follows:

(1) Program Testing.

The programmer follows each step in the program specification to check whether the routine works can be carried out as they are written. The valid and invalid tested data are created and input to the system. Then the program is run in order to test all possible situations that might occur in the future.

(2) Link Testing.

This step is done to see if the programs, which are interdependent, can actually work together as planned.

(3) System Testing.

When link tests are satisfactorily concluded the system, as a complete entity must be tested. The objective of entire system testing is to ensure that the users are able to input the data properly and the overall system flow can work properly. In other words, the test is carried out to ensure that the entire system functions as a whole.

4.4 Implementation

Implementation is a process of assuring that the information system is operational and then involving well-trained users in its operation. The actual implementation will follow the project schedule as a guideline, however, additional factors that arise in the normal course of the project evolution should be considered. The term must establish plans that phase in deliverables in a reasonable manner. In a large system project, the primary role of the analyst is overseeing implementation by correctly estimating the

time needed, and then supervising the installation of equipment for a traditional system, training of users and converting files and a database to the new system.

(1) User Training.

This is an important part of implementation, since the users must be able to run the whole system without the intervention of the analyst. The analyst has to consider who needs to be trained, who will train them, objectives of training, methods of instruction to be used, sites, materials and time.

(2) System Administration Training.

System administration must be trained in the technical aspects of the proposed system.

4.5 Site and Data Preparation

All the sites that concern the proposed system should be prepared before the implementation. For data preparation, every concerning user must be well prepared as well.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The proposed system is developed to improve the performance of the financial system. Since the existing system is a manual system, which causes many problems, the computerized system is developed to increase the accuracy of the information and reduce the time in processing the information.

In the existing system, the users operate the payment manually, They have faced problems such as supplier information is not up-to-date, time consuming in doing the analysis report, and the most important factor is: payment is incorrect. All these problems lead to the company strategy level problem, which means that the top management is using the wrong information in making decisions. So the users need the computerized system to provide a timely, correct and reliable system.

The proposed system will provide the computerized information system instead of the manual system. It can also reduce the workload of manpower with the computerized system. The operation can meet user requirements such as provide reports more timely and accurate, correct information, security and operation control for protecting data, etc. Furthermore, with the new computerized system, company can control the due payment and reduce the incorrect transactions.

Table 5.1 illustrates the comparison of time between the proposed system and the existing system in the Account Payable process.

Table 5.1. Table of Achievement of Proposed System.

Process	The Existing System	The Proposed System
Invoice Transaction Entry	15 minutes / 1 transaction	2 minutes / 1 transaction
Payment Transaction Entry	30 minutes / 1 transaction	3 minutes / 1 transaction
Collection General Ledger	1 hour / transaction on day	3 minutes / transaction on day
Cheque Reconcile and Cheque Report	1 hour / 1 bank information	5 minutes / 1 bank information
Creditor Statement	2 hours / 1 supplier	2 minutes / 1 supplier
Creditor Analysis Report	1 day / 1 report	5 minutes / 1 report

The proposed system uses less time in all processes than the existing system.

- (1) Invoice Transaction Entry and Payment Transaction Entry.

The proposed system has retrieved the information from database to display on screen for users to choose the information. The master file can be reused and does not need to re-key in and it can help to correct data.

- (2) Collection General Ledger.

The proposed system collects automatically the data for generating account which users can set up in the master file.

- (3) Cheque Reconciliation and Cheque Report.

The proposed system searches data in many transactions by using the payment type and retrieving on screen. The proposed system keeps the data in database, so user can be easy to check the data and it can help to print correct data.

(4) Creditor Statement and Creditor Analysis Report.

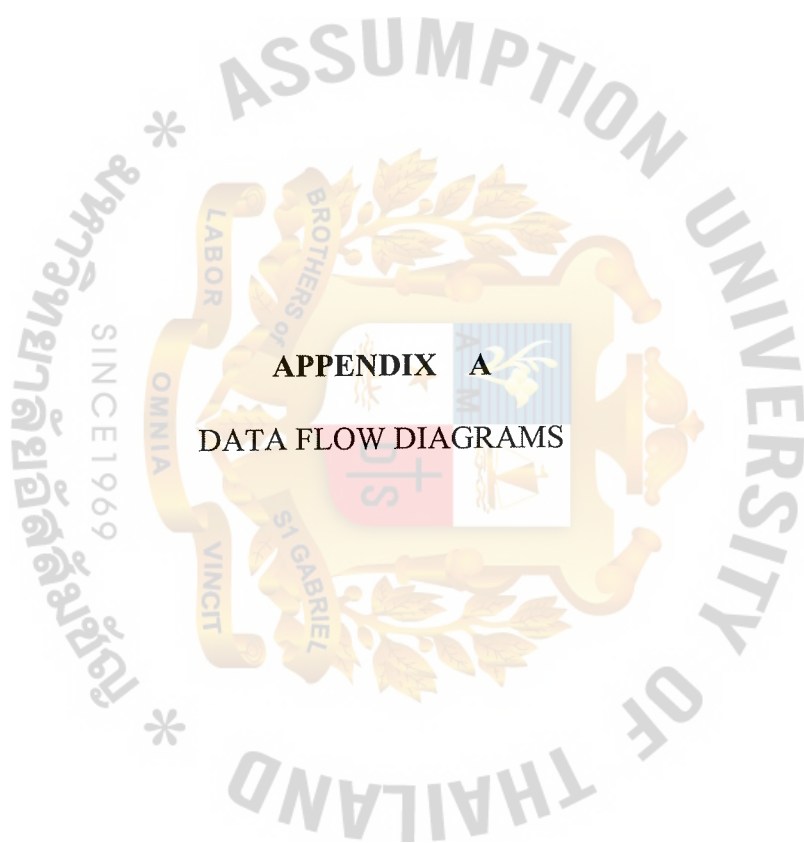
The proposed system creates report and query by using the scope of the desired key to generate. All data are kept in database, they are easy and less time to collect the report generating.

5.2 Recommendations

The Account Payable System has been developed to be one of the strategic methods of the company to gain competitive advantages over the competitors. This system not only assists the company to correct the information but also increases the capacity to manage the cash flow. The system is created purposely to increase supplier satisfaction. Such a system would help the company to reduce paper work, processing time, and human labor.

The system should be further developed to cover other business functions of the company such as Factory Department, which requires the Material Resource Planning (MRP) and Purchase order system to be computerized. This would help the company to reduce much of the operation costs in the long run. The Account Payable system developed here is considered to be part of the future system. The expansion of the development will be functional without double-checking some works in the system.

This project is the beginning of a complete computerized system of the company. There are still various proposals that must go on. For the next phrase, a link to the bank's computer system needs to be set up to automate the payment. The system should set up the network system for transfer of the money to bank automatically in order to reduce the time and link with other systems in order to reduce the process such as send purchase order to supplier via internet.



APPENDIX A
DATA FLOW DIAGRAMS

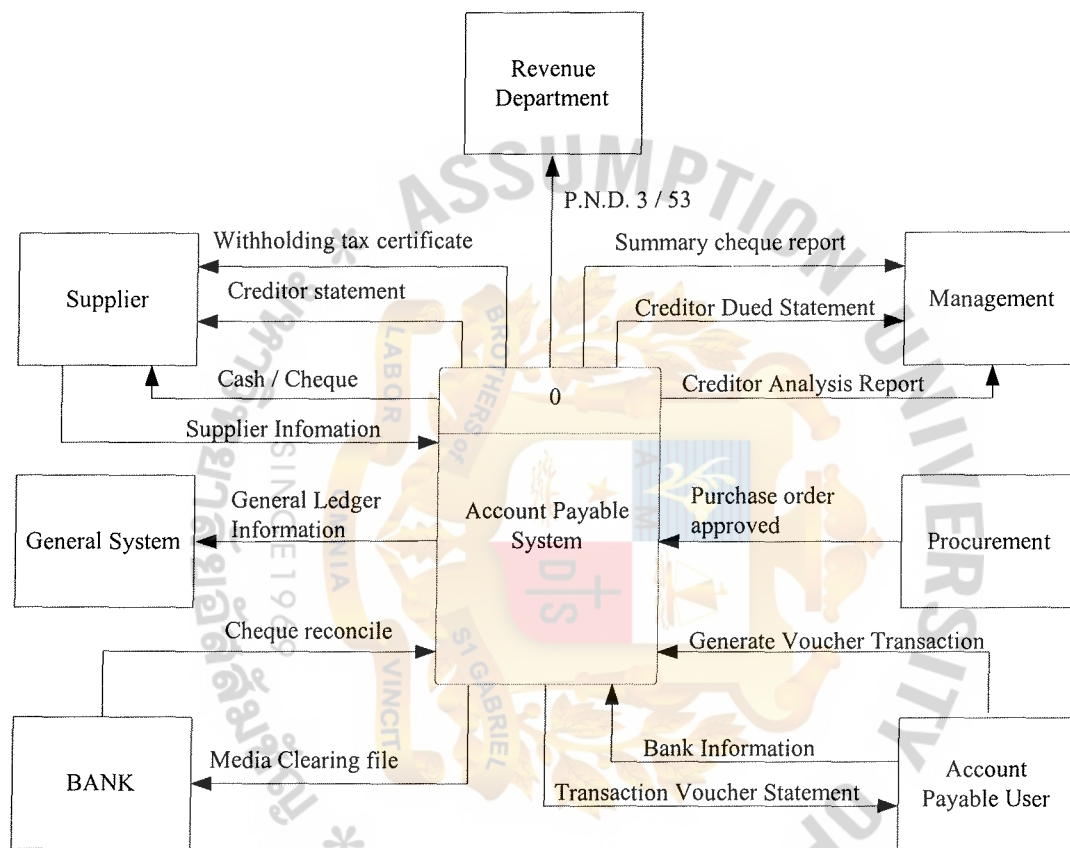


Figure A.1. The Context Data Flow Diagram of Proposed System.

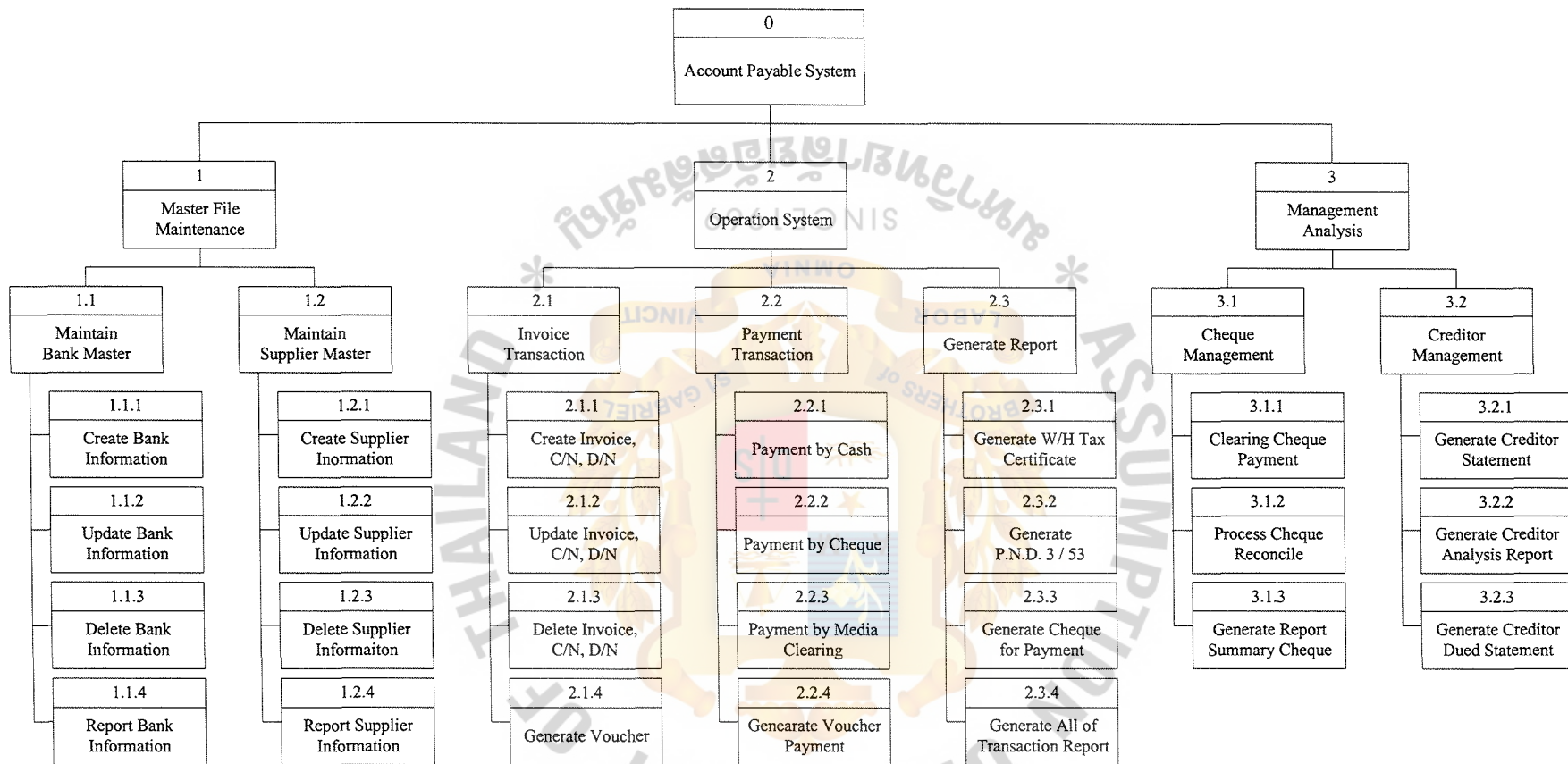


Figure A.2. The Decomposition Diagram.

Figure A.3. Level 0 Data Flow Diagram of Packaging Materials Manufacturing Business.

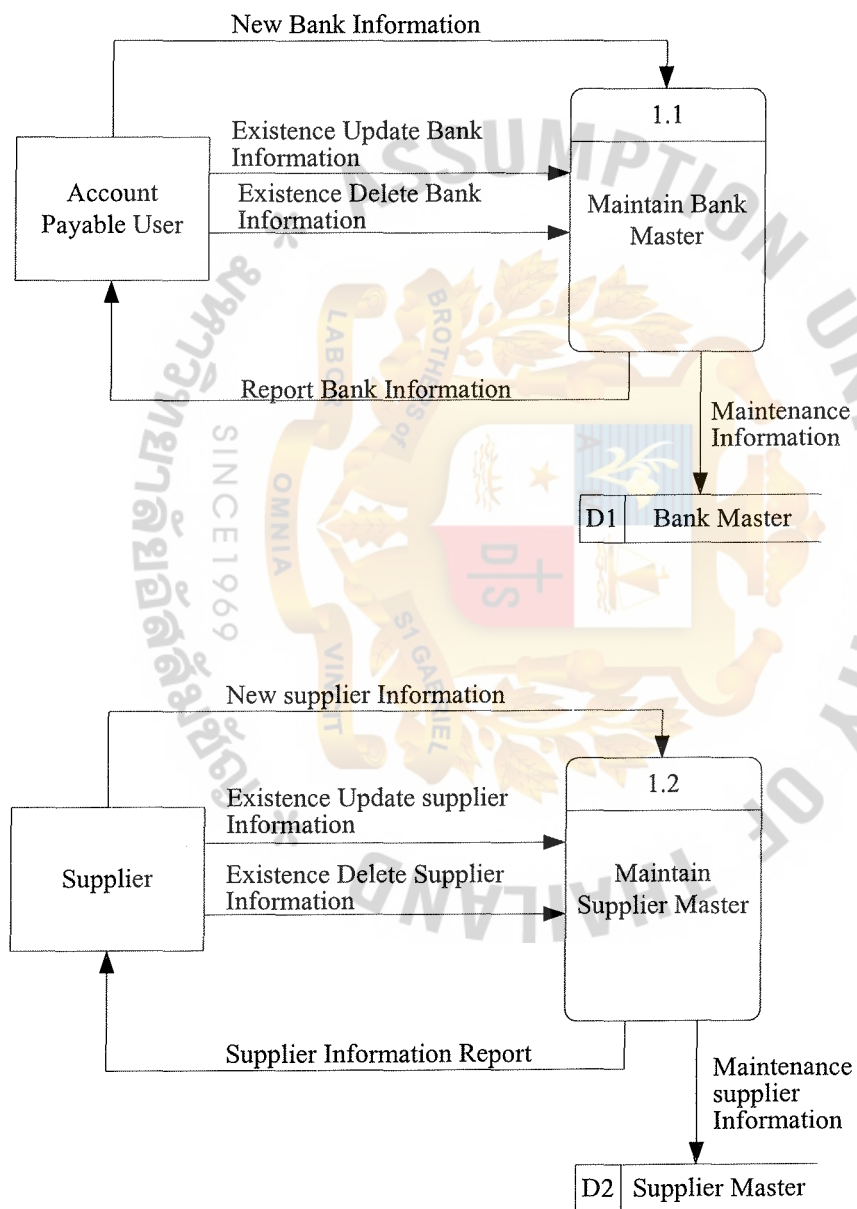


Figure A.4. Level 1 of Master File Maintenance.

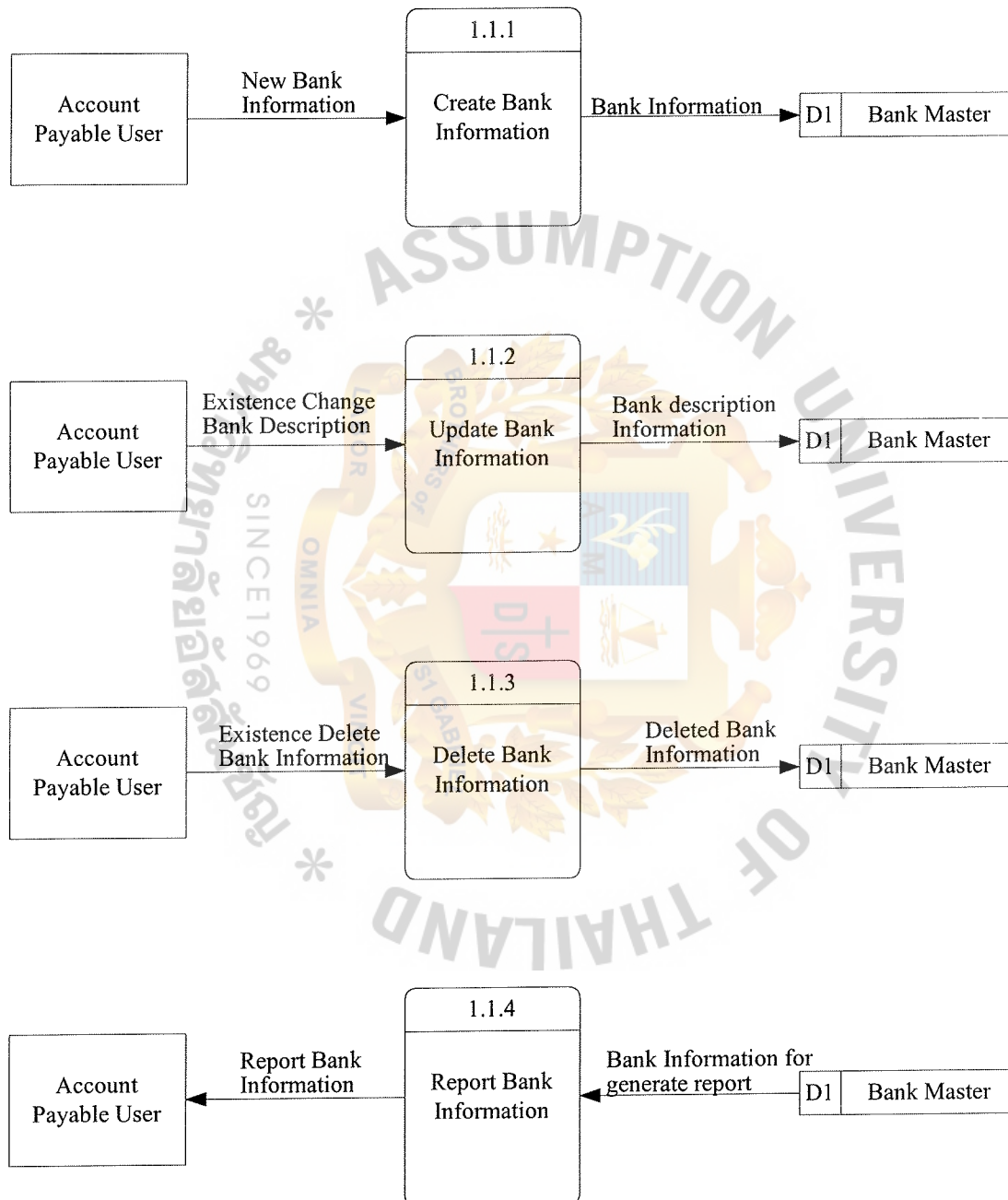


Figure A.5. Level 2 of Bank Master.

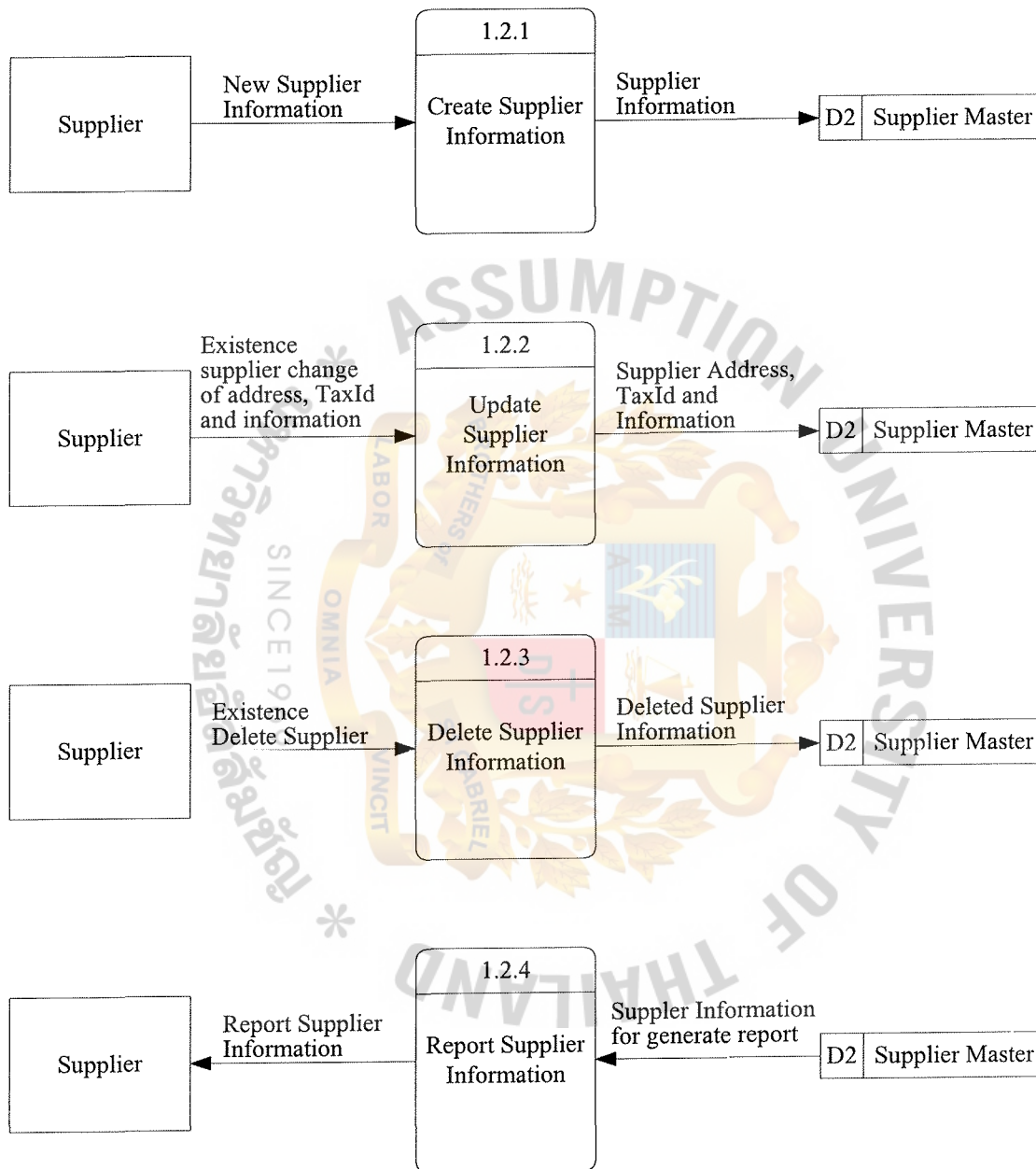


Figure A.6. Level 2 of Supplier Master.

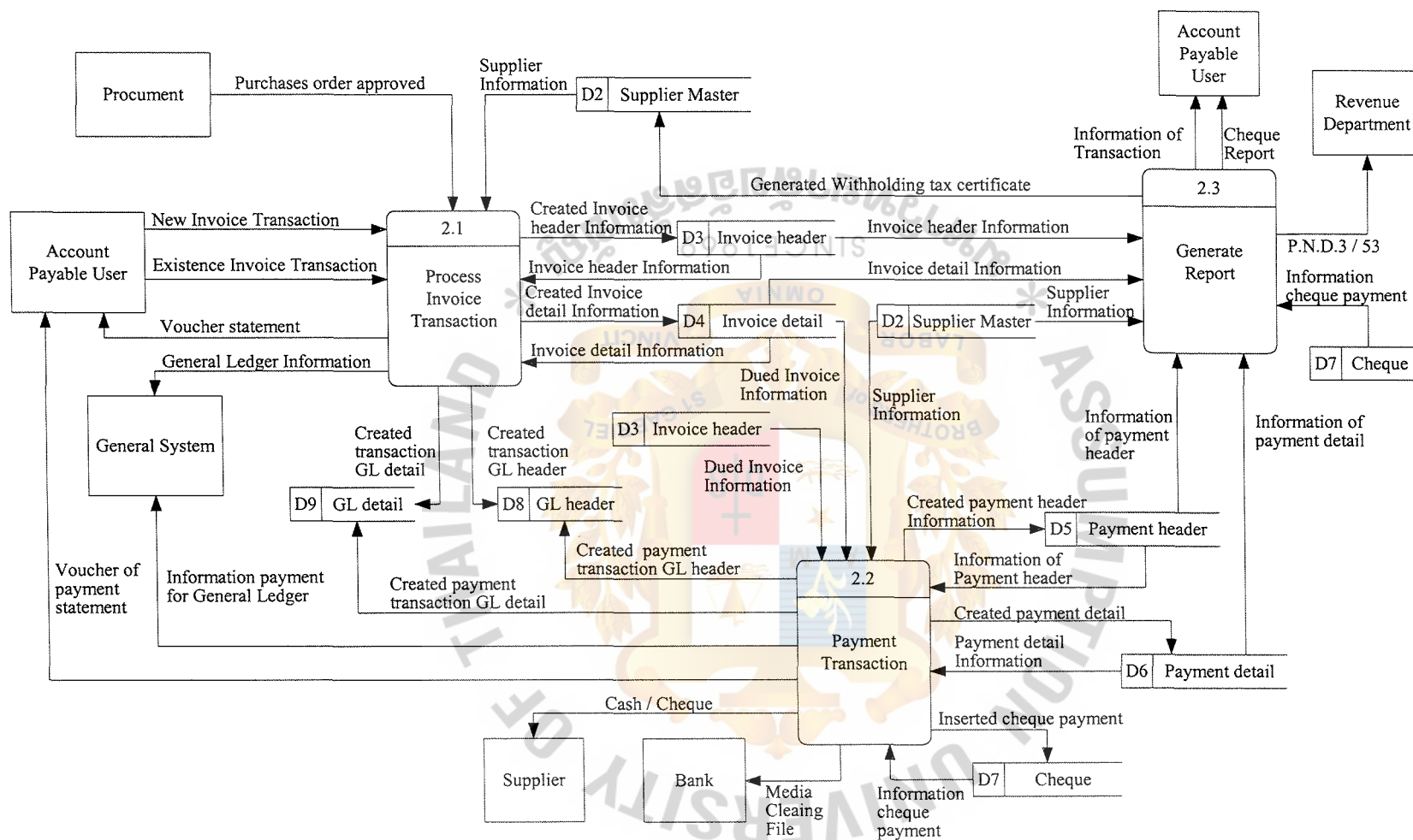


Figure A.7. Level 1 of Operation System.

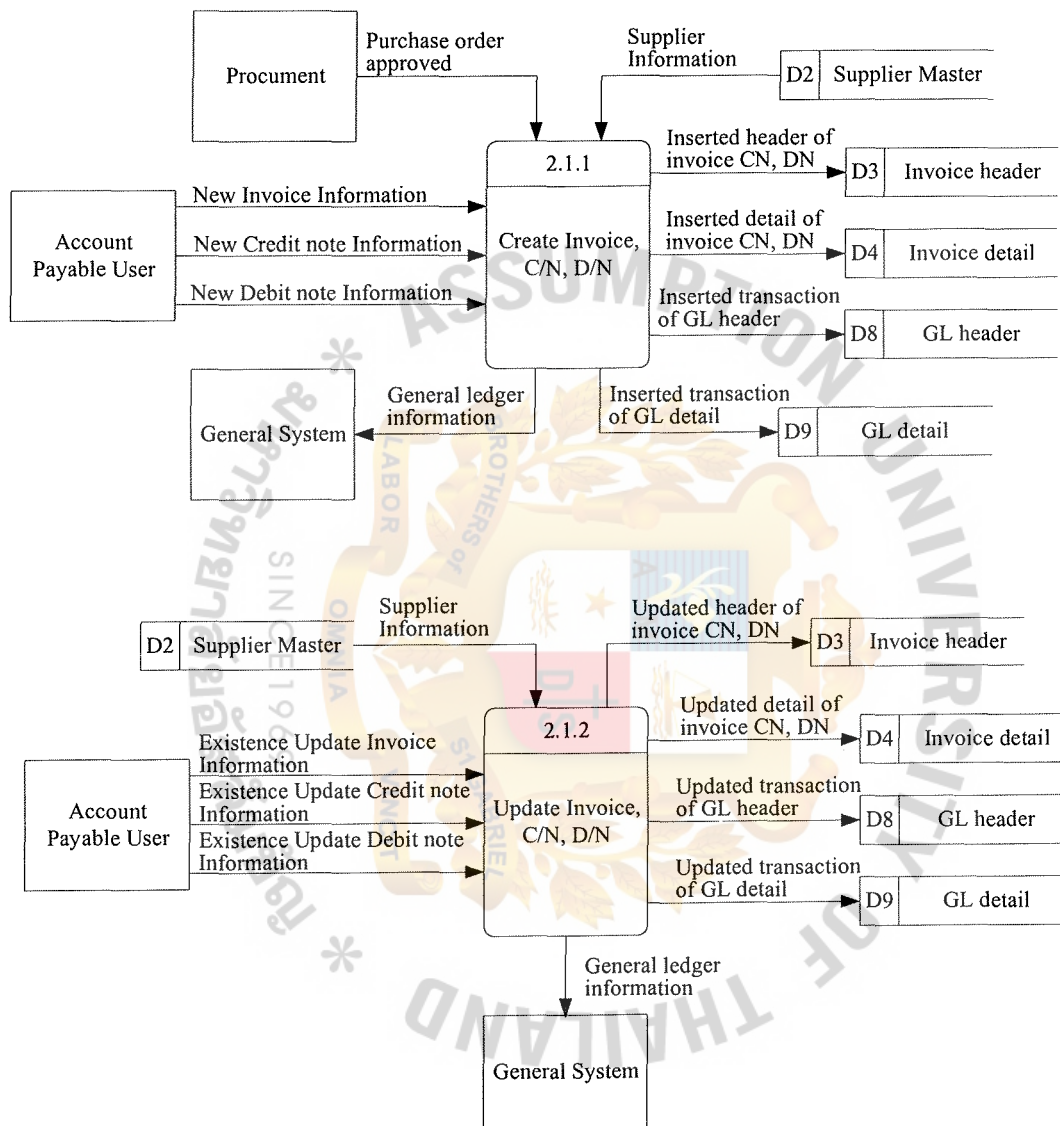


Figure A.8. Level 2 of Invoice Transaction.

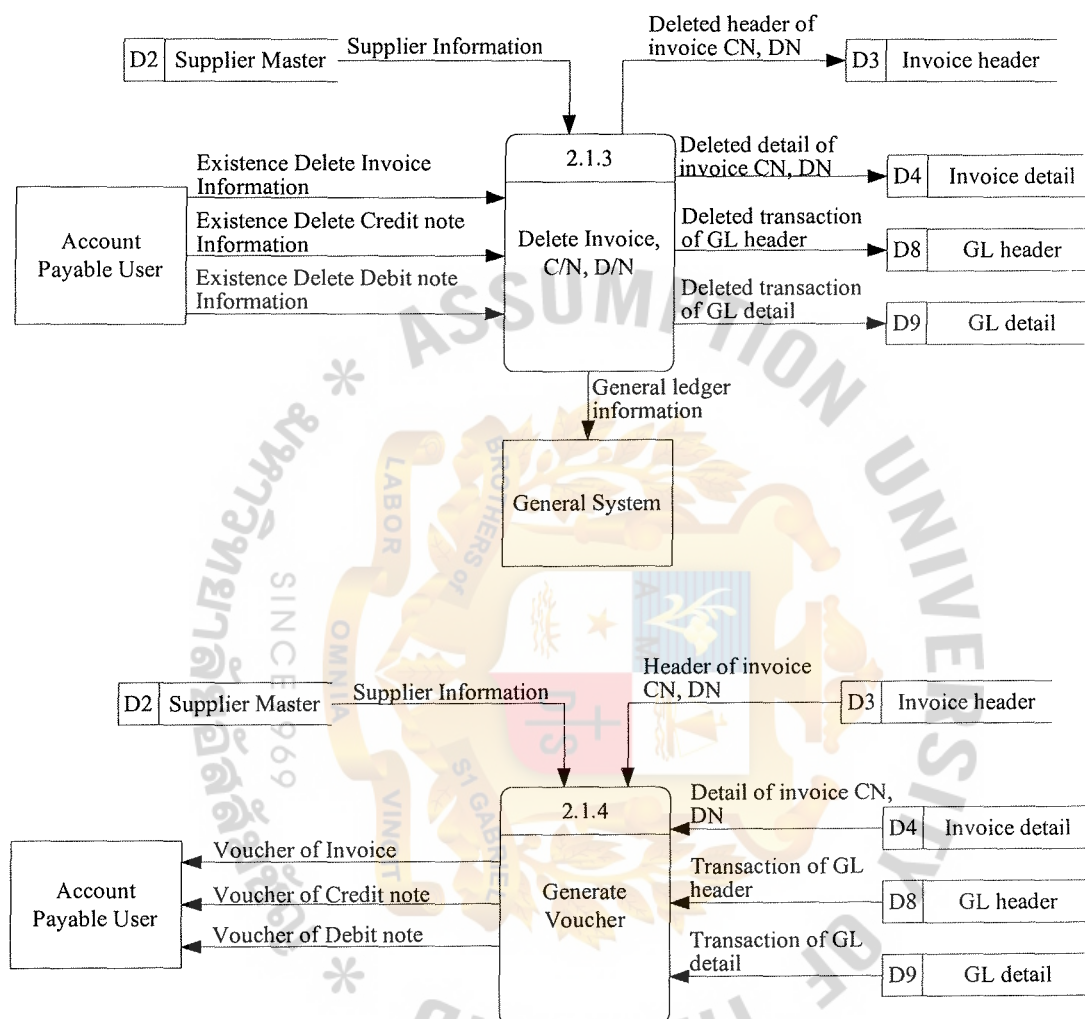


Figure A.9. Level 2 of Invoice Transaction.

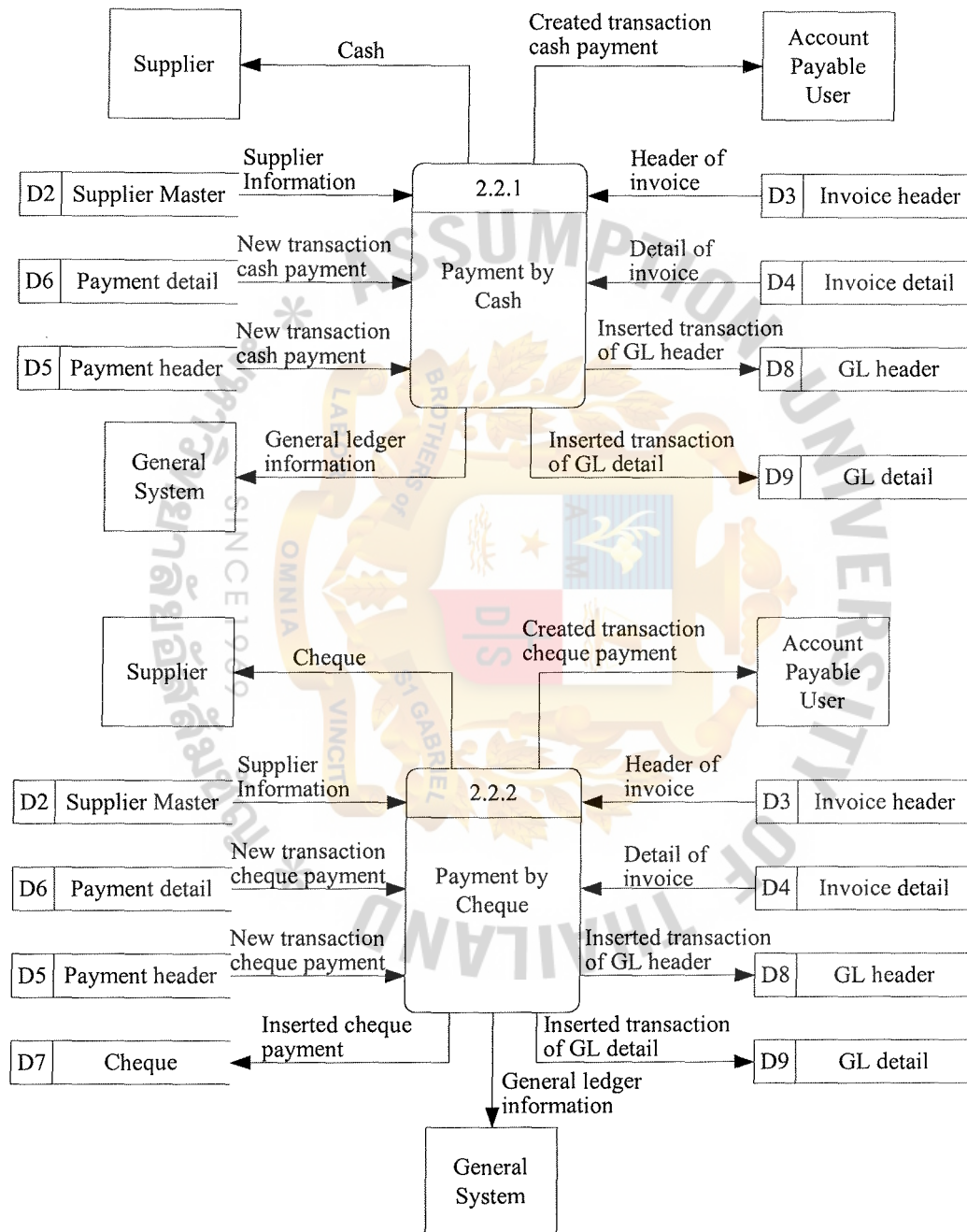


Figure A.10. Level 2 of Payment Transaction.

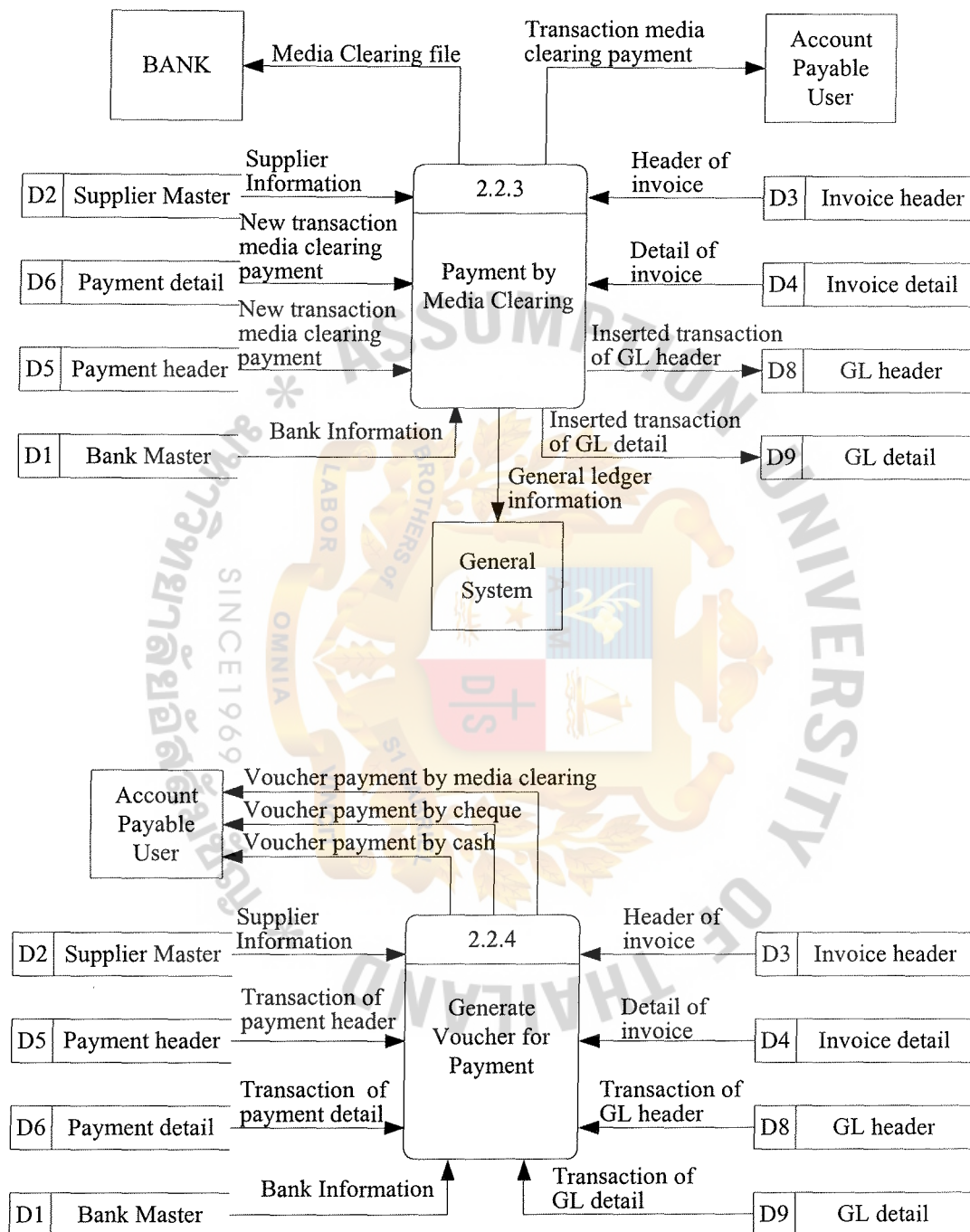


Figure A.11. Level 2 of Payment Transaction.

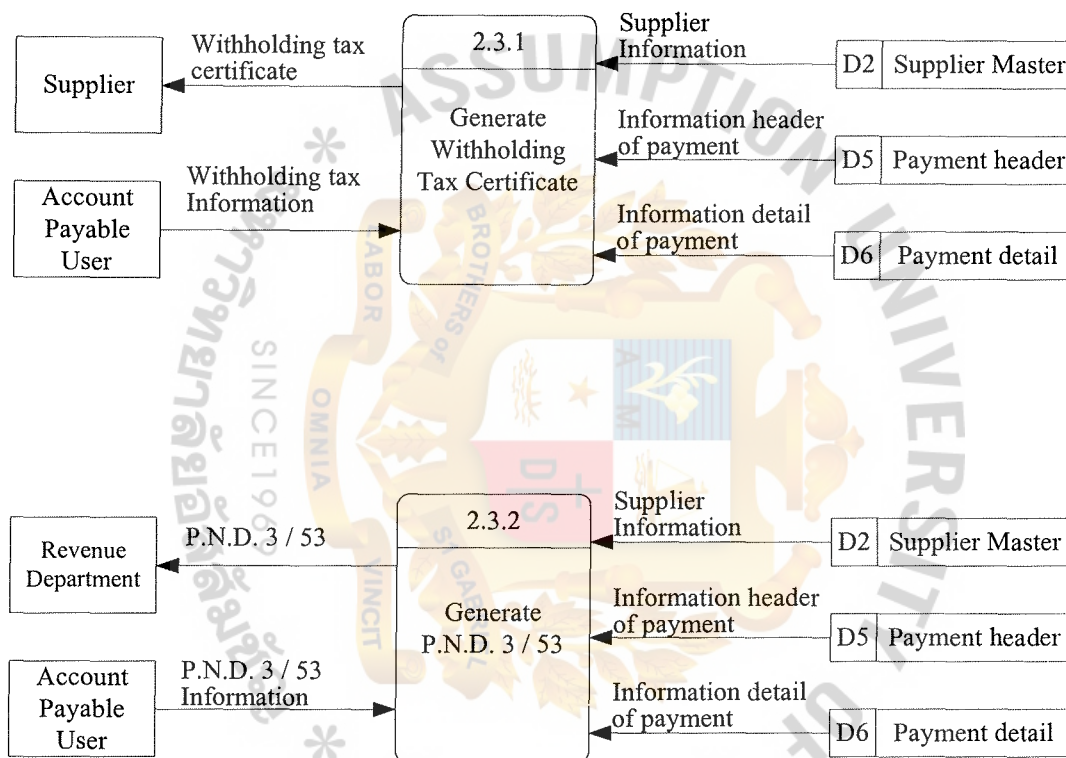


Figure A.12. Level 2 of Generate Report.

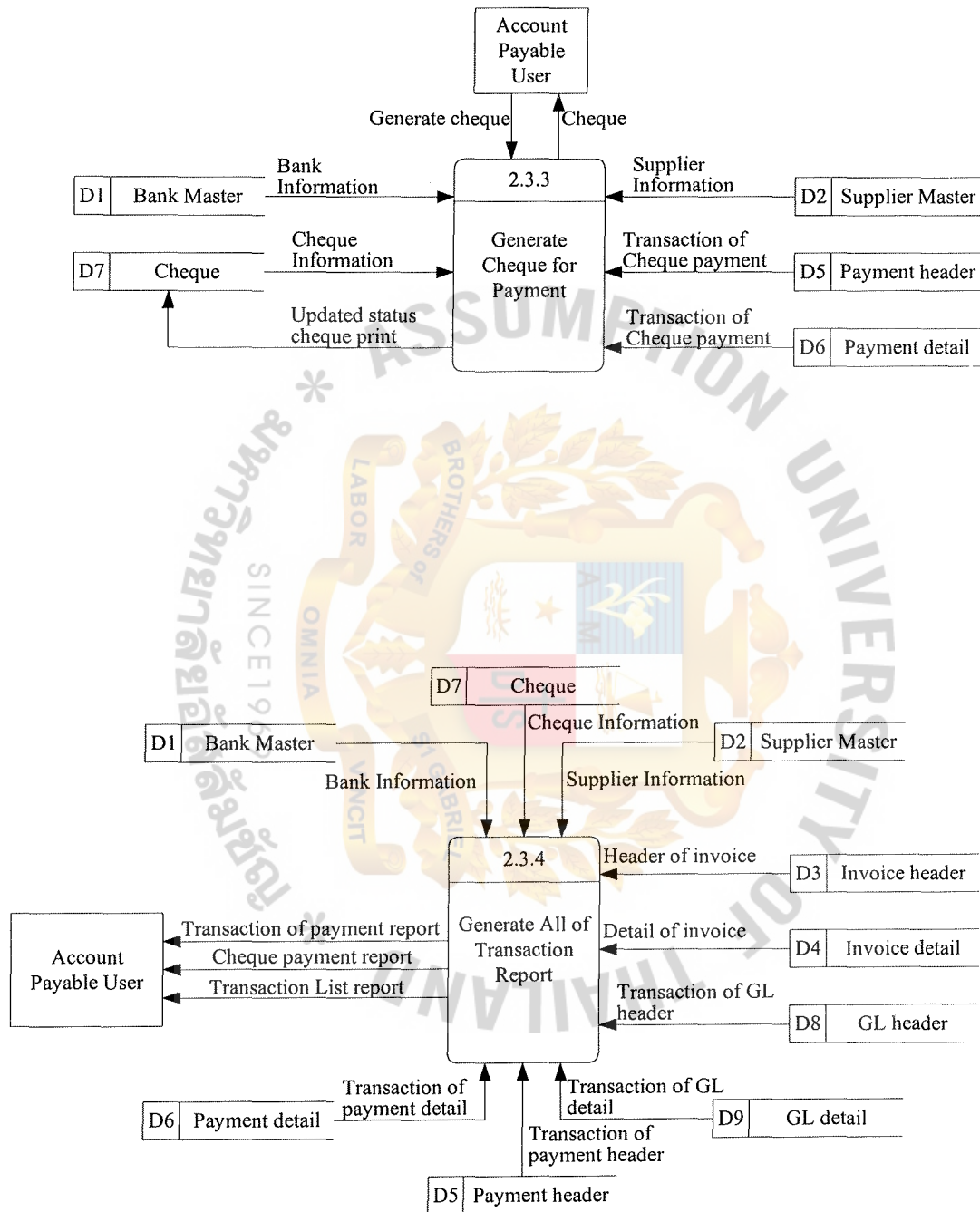


Figure A.13. Level 2 of Payment Transaction.

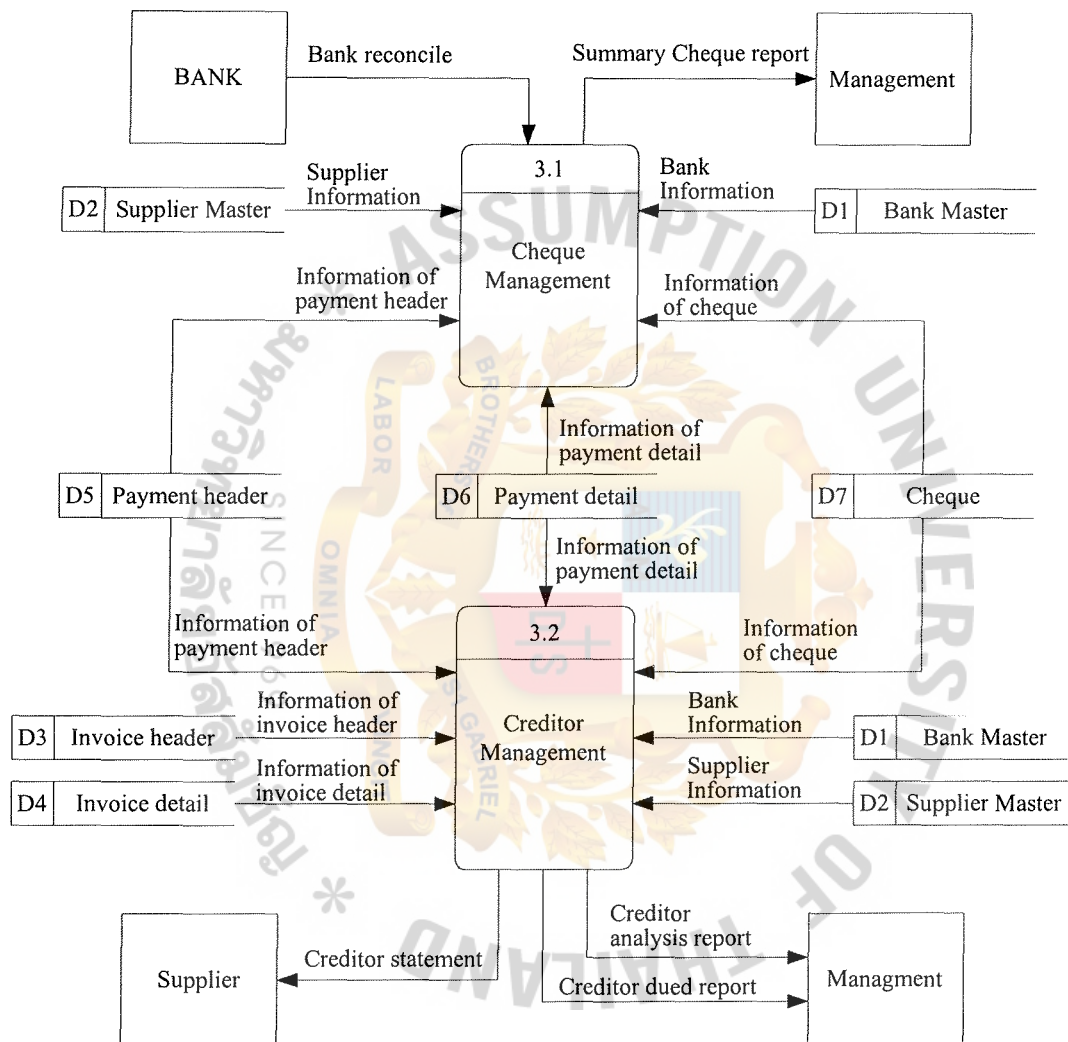


Figure A.14. Level 1 of Management Analysis.

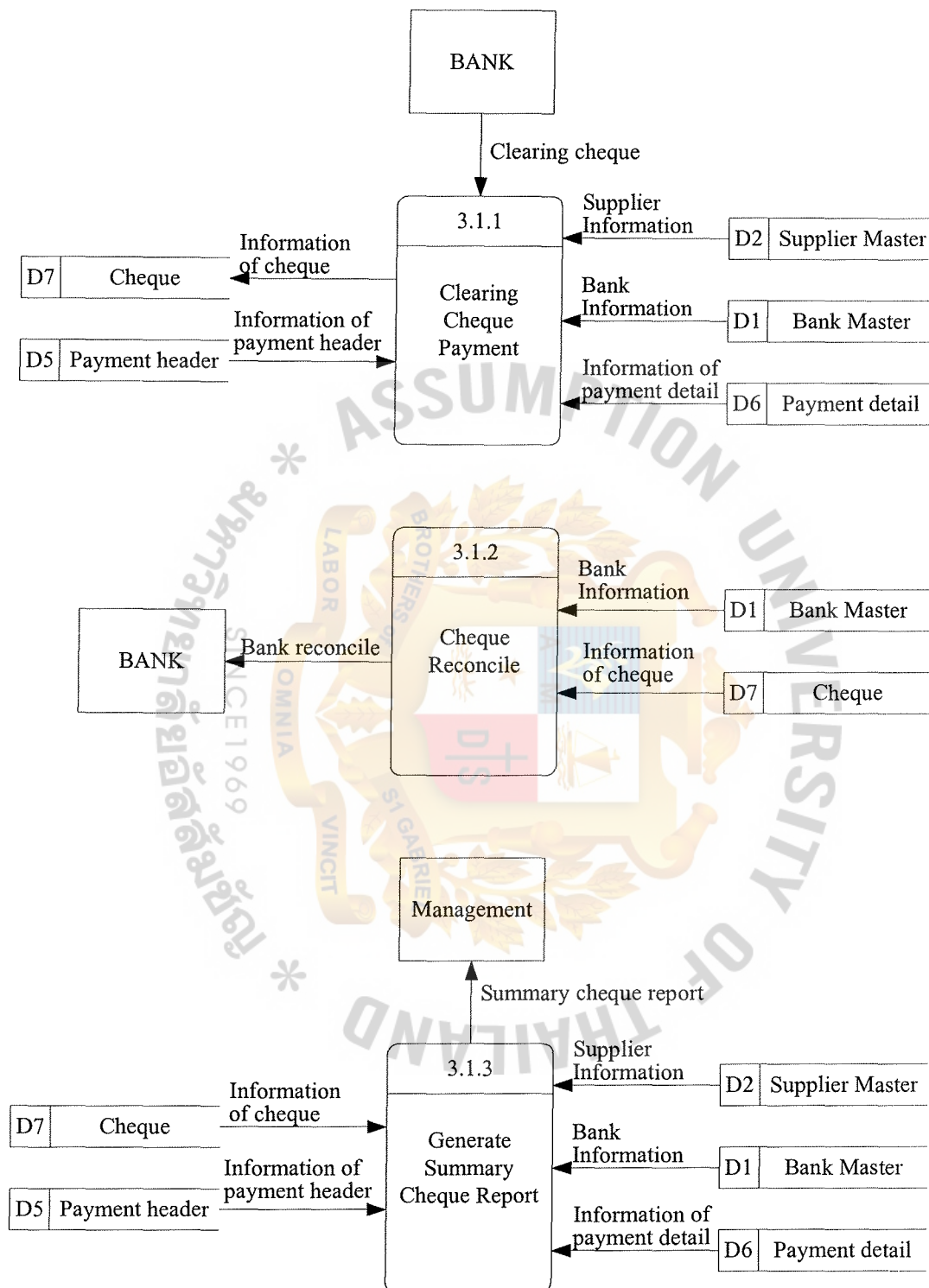


Figure A.15. Level 2 of Cheque Management.

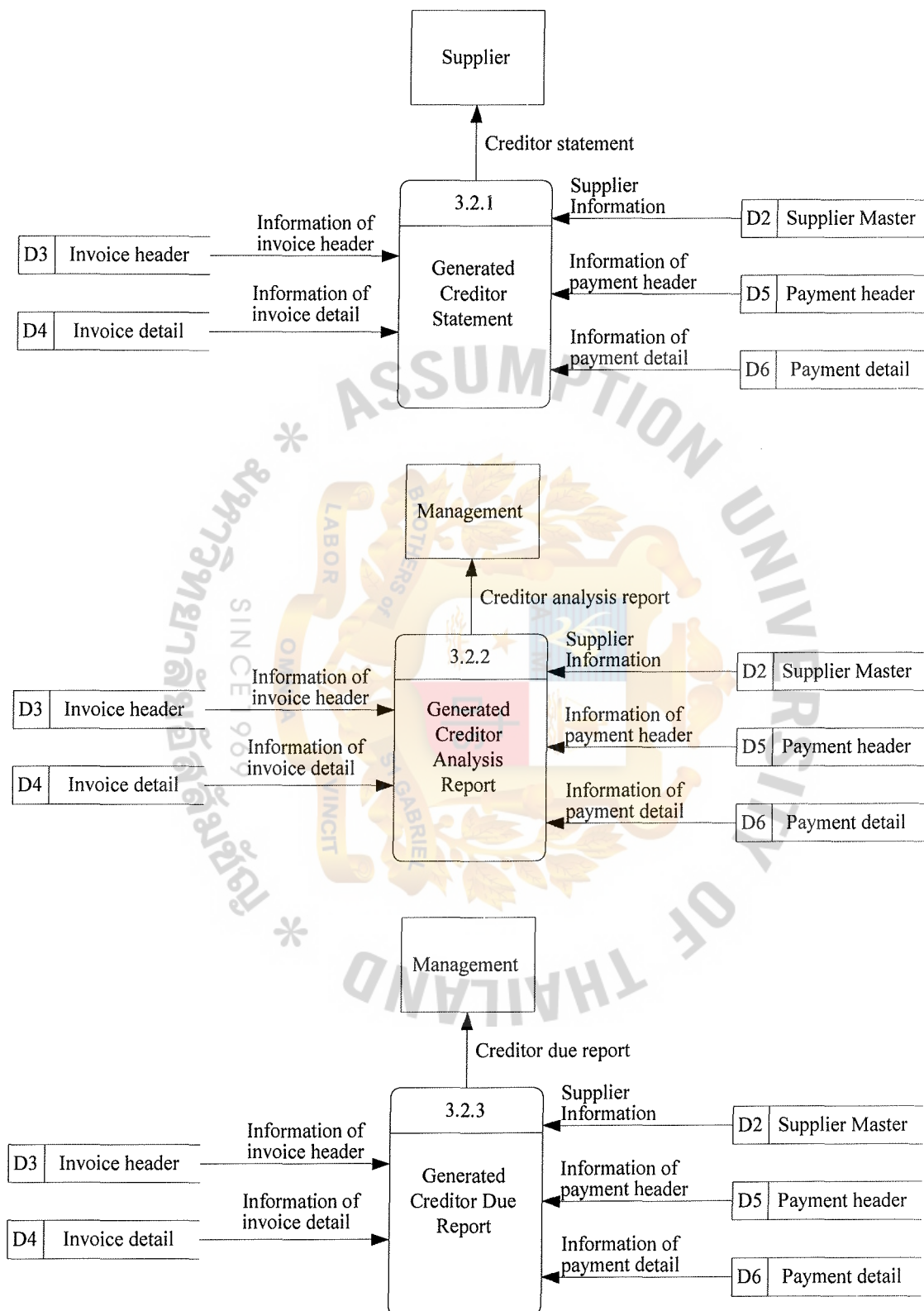
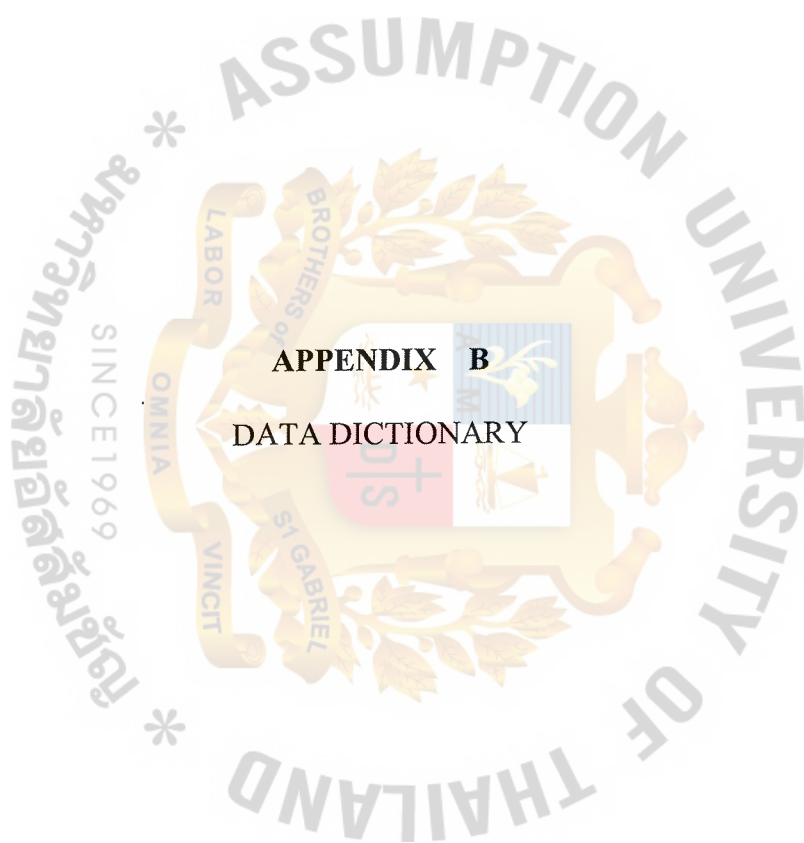


Figure A.16. Level 2 of Creditor Management.



APPENDIX B

DATA DICTIONARY

Table B.1. Data Dictionary of Bank Master Table.

Field Name	Meaning
BankCode	Identify the Bank Code
BankAcc	Account number of Bank
BankClass	Type of Bank
AcctCode	General Account Code
BalAmount	Balance amount of Bank
CreateBy	Create user of this record
CreateOn	Create date of this record
UpdateBy	Last update user of this record
UpdateOn	Last update date of this record

Table B.2. Data Dictionary of Supplier Master Table.

Field Name	Meaning
SuppCode	Identify the Supplier Code
SuppName	Identify the Supplier Name
SuppAddr1	Supplier address line 1
SuppAddr2	Supplier address line 2
SuppAddr3	Supplier address line 3
SuppAddr4	Supplier address line 4
PostalCode	Supplier postal code
Country	Country of supplier
PhoneNum	Phone number
FaxNum	Fax number
Payterm	Payment term
PayMethod	Payment method
CurrCode	Currency Code
TaxId	Identify the Tax number
ContractName	Contract name
APAcct	Payable account code for general ledger
PurchaseAcct	Purchase account code for general ledger
CreditAcct	Credit Note account code for general ledger
Remark	Remark
CreateBy	Create user of this record
CreateOn	Create date of this record
UpdateBy	Last update user of this record
UpdateOn	Last update date of this record

Table B.3. Data Dictionary of Invoice Header Table.

Field Name	Meaning
SuppCode	Identify the Supplier Code
ReferenceNo	Invoice / Credit Note / Debit Note number
TranDate	Date of transaction
Voucherno	Identify the voucher number
TranType	Transaction type
TranStatus	Transaction status
PayTerm	Payment term
PayMethod	Payment method
DueDate	Payment due date
CurrCode	Currency Code
TranCurAmt	Transaction amount by currency
TranAmt	Transaction amount by baht currency
ExRate	Exchange rate
VatFlag	Identify VAT flag
VatRate	Rate of VAT
VatCurAmt	Vat amount by currency
VatAmt	Vat amount by baht currency
PayCurAmt	Payment amount by currency
PayAmt	Payment amount by baht currency
PayDate	Payment date
CreateBy	Create user of this record
CreateOn	Create date of this record
UpdateBy	Last update user of this record
UpdateOn	Last update date of this record

Table B.4. Data Dictionary of Invoice Detail Table.

Field Name	Meaning
Voucherno	Identify the voucher number
VoucherSeq	Sequence number of voucher
TranStatus	Transaction status
TranCurAmt	Transaction amount by currency
TranAmt	Transaction amount by baht currency
ExRate	Exchange rate
VatFlag	Identify VAT flag
VatRate	Rate of VAT
VatCurAmt	Vat amount by currency
VatAmt	Vat amount by baht currency
CreateBy	Create user of this record
CreateOn	Create date of this record
UpdateBy	Last update user of this record
UpdateOn	Last update date of this record

Table B.5. Data Dictionary of Payment Header Table.

Field Name	Meaning
PayNo	Number of payment
SuppCode	Identify the Supplier Code
PayDate	Date of payment
Voucherno	Identify the voucher number
PayStatus	Payment status
CurrCode	Currency Code
PayMethod	Payment method
ChequeNum	Payment cheque number
BankCode	Identify of bank code
BankAct	Account number for supplier bank
PayCurAmt	Payment amount by currency
PayAmt	Payment amount by baht currency
ExRate	Exchange rate
Remark	Remark
WHTypeNo	Type of withholding tax
WHTypeDesc	Description of withholding tax
WHCalAmt	Calculate amount for withholding tax
WHPercent	Percentage for calculate withholding tax
WHAmt	Withholding tax amount
CreateBy	Create user of this record
CreateOn	Create date of this record
UpdateBy	Last update user of this record
UpdateOn	Last update date of this record

Table B.6. Data Dictionary of Payment Details Table.

Field Name	Meaning
PayNo	Number of payment
ReferenceNo	Invoice / Credit Note / Debit Note number
TranCurAmt	Transaction amount by currency
TranAmt	Transaction amount by baht currency
PayCurAmt	Payment amount by currency
PayAmt	Payment amount by baht currency
CreateBy	Create user of this record
CreateOn	Create date of this record
UpdateBy	Last update user of this record
UpdateOn	Last update date of this record

Table B.7. Data Dictionary of Cheque Table.

Field Name	Meaning
Voucherno	Identify the voucher number
ChequeNum	Payment cheque number
BankCode	Identify the bank code
ChequeDate	Cheque date of payment
ChequeStatus	Cheque Status
Payto	Identify the name of payment
CurrCode	Currency Code
ExRate	Exchange rate
ChequeCurAmt	Cheque amount by currency
ChequeAmt	Cheque amount by baht currency
CreateBy	Create user of this record
CreateOn	Create date of this record
UpdateBy	Last update user of this record
UpdateOn	Last update date of this record

Table B.8. Data Dictionary of General Ledger Header Table.

Field Name	Meaning
BhdVoucherno	Identify the voucher number
BhdVoucherDate	Voucher date
BhdCurrCode	Currency Code
BhdExRate	Exchange rate
BhdStatus	Status of general ledger
BhdRemark	Remark
CreateBy	Create user of this record
CreateOn	Create date of this record
UpdateBy	Last update user of this record
UpdateOn	Last update date of this record

Table B.9. Data Dictionary of General Ledger Details Table.

Field Name	Meaning
BdtVoucherno	Identify the voucher number
BdtSeqno	Sequence of voucherno
BdtActCode	Account code for general ledger
BdtDptCode	Department for general ledger
BdtNature	Nature for general ledger
BdtCurAmt	Transaction amount by currency
BdtAmt	Transaction amount by baht currency
BdtRemark	Remark
CreateBy	Create user of this record
CreateOn	Create date of this record
UpdateBy	Last update user of this record
UpdateOn	Last update date of this record





APPENDIX C
PROCESS SPECIFICATION

Table C.1. Process Specification of Process 1.1.1.

Items	Description
Process Name:	Create Bank Information
Data In:	Bank information
Data Out:	Bank record
Process:	(1) Get necessary bank data such as bank code, bank name, branch name, bank account number etc. (2) Validate bank information. (3) If not correct, display error message. (4) If correct, record the bank data into company bank database.
Attachment:	- Data store bank

Table C.2. Process Specification of Process 1.1.2.

Items	Description
Process Name:	Update Bank Information
Data In:	Bank description, Bank account code
Data Out:	Bank record
Process:	(1) Input bank code to retrieve the existing data from database. (2) Modify and validate bank information. (3) If not correct, display error message. (4) If correct, update data into company bank database.
Attachment:	- Data store bank

Table C.3. Process Specification of Process 1.1.3.

Items	Description
Process Name:	Delete Bank Information
Data In:	Bank code
Data Out:	Bank record
Process:	(1) Input bank code to retrieve the existing data from database. (2) Verify bank information. (3) Delete bank record from database
Attachment:	- Data store bank

Table C.4. Process Specification of Process 1.1.4.

Items	Description
Process Name:	Generate Report Bank Information
Data In:	Bank code
Data Out:	Bank code, Bank name, Branch name and Bank description.
Process:	(1) Input bank code to retrieve the existing data from database. (2) Bank information report will be printed out.
Attachment:	- Data store bank

Table C.5. Process Specification of Process 1.2.1.

Items	Description
Process Name:	Create Supplier Information
Data In:	Supplier information
Data Out:	Supplier record
Process:	(1) Get necessary supplier data such as supplier code, supplier name, address, contract name etc. (2) Validate supplier information. (3) If not correct, display error message. (4) If correct, record the supplier data into company supplier database.
Attachment:	- Data store supplier

Table C.6. Process Specification of Process 1.2.2.

Items	Description
Process Name:	Update Supplier Information
Data In:	Supplier name, Supplier address, Supplier Tax identification.
Data Out:	Supplier record
Process:	(1) Input supplier code to retrieve the existing data from database. (2) Modify and validate supplier information. (3) If not correct, display error message. (4) If correct, update data into company supplier database.
Attachment:	- Data store supplier

Table C.7. Process Specification of Process 1.2.3.

Items	Description
Process Name:	Delete Supplier Information
Data In:	Supplier code
Data Out:	Supplier record
Process:	(1) Input supplier code to retrieve the existing data from database. (2) Verify supplier information. (3) Delete supplier record from database
Attachment:	- Data store supplier

Table C.8. Process Specification of Process 1.2.4.

Items	Description
Process Name:	Generate Report Supplier Information
Data In:	Supplier code
Data Out:	Supplier code, Supplier name, Address, Tax identification.
Process:	(1) Input supplier code to retrieve the existing data from database. (2) Supplier information report will be printed out.
Attachment:	- Data store supplier

Table C.9. Process Specification of Process 2.1.1.

Items	Description
Process Name:	Create Invoice, Credit note, Debit note
Data In:	Information of Invoice, Credit note, Debit note
Data Out:	Invoice, Credit note, Debit note record
Process:	<ol style="list-style-type: none"> (1) Get necessary data such as invoice number, supplier name, invoice amount, type of transaction, transaction date etc. (2) If transaction type is invoice, define the transaction type to "IV" and validate invoice information. (3) If transaction type is credit note, define the transaction type to "CN" and validate credit note information. (4) If transaction type is debit note, define the transaction type to "DN" and validate debit note information. (5) Generate the running of voucher number. (6) Calculate vat amount from invoice amount multiply vat rate. (7) Generate the account transaction for general ledger (8) If not correct, display error message. (9) If correct, record the invoice, credit note, debit note data into company invoice database.
Attachment:	<ul style="list-style-type: none"> - Data store invoice header - Data store invoice detail - Data store GL header - Data store GL detail

Table C.10. Process Specification of Process 2.1.2.

Items	Description
Process Name:	Update Invoice, Credit note, Debit note
Data In:	Invoice, Credit note, Debit note information.
Data Out:	Invoice, Credit note, Debit note record
Process:	<ol style="list-style-type: none"> (1) Input invoice number, credit note number, debit note number to retrieve the existing data from database. (2) Modify and validate the data transaction. (3) Generate the account transaction for general ledger (4) If not correct, display error message. (5) If correct, update invoice, credit note, and debit note data into company invoice database.
Attachment:	<ul style="list-style-type: none"> - Data store invoice header - Data store invoice detail - Data store GL header - Data store GL detail

Table C.11. Process Specification of Process 2.1.3.

Items	Description
Process Name:	Delete Invoice, Credit note, Debit note
Data In:	Invoice, Credit note, Debit note information.
Data Out:	Invoice, Credit note, Debit note record
Process:	(1) Input invoice number, credit note number, debit note number to retrieve the existing data from database. (2) Verify data transaction. (3) Update status 'D' into invoice from database.
Attachment:	- Data store invoice header - Data store GL header

Table C.12. Process Specification of Process 2.1.4.

Items	Description
Process Name:	Generate Voucher
Data In:	Invoice, Credit note, Debit note information.
Data Out:	Invoice, Credit note, Debit note Voucher
Process:	(1) Input invoice number, credit note number, debit note number to retrieve the existing data from database. (2) Data transaction voucher will be print out.
Attachment:	- Data store invoice header - Data store invoice detail - Data store GL header - Data store GL detail

Table C.13. Process Specification of Process 2.2.1.

Items	Description
Process Name:	Process Payment by Cash
Data In:	Information of payment
Data Out:	Payment record
Process:	<ol style="list-style-type: none"> (1) Get necessary data such as payment date, supplier code, invoice number, credit note number, debit note number, payment amount etc. (2) Retrieve data from invoice, supplier. (3) Generate the running of voucher number. (4) Calculate amount and outstanding amount from invoice. (5) Calculate withholding tax amount. (6) If the payment amount more than outstanding amount, display warning message the payment has overpay. (7) Generate the account transaction for general ledger (8) Update status 'S' into invoice from database. (9) If correct, record the payment data into company payment database.
Attachment:	<ul style="list-style-type: none"> - Data store invoice header - Data store payment header - Data store payment detail - Data store GL header - Data store GL detail

Table C.14. Process Specification of Process 2.2.2.

Items	Description
Process Name:	Process Payment by Cheque
Data In:	Information of payment
Data Out:	Payment record
Process:	<ol style="list-style-type: none"> (1) Get necessary data such as payment date, supplier code, invoice number, credit note number, debit note number, payment amount, cheque amount, cheque date, bank cheque etc. (2) Retrieve data from invoice, supplier. (3) Generate the running of voucher number. (4) Calculate amount and outstanding amount from invoice. (5) Calculate withholding tax amount. (6) If the payment amount more than outstanding amount, display warning message the payment has overpay. (7) Generate the account transaction for general ledger (8) Update status 'S' into invoice from database. (9) If correct, record the payment data into company payment database.
Attachment:	<ul style="list-style-type: none"> - Data store invoice header - Data store payment header - Data store payment detail - Data store cheque - Data store GL header - Data store GL detail

Table C.15. Process Specification of Process 2.2.3.

Items	Description
Process Name:	Process Payment by Media clearing
Data In:	Information of payment
Data Out:	Payment record
Process:	<ol style="list-style-type: none"> (1) Get necessary data such as payment date, supplier code, invoice number, credit note number, debit note number, payment amount, supplier bank code, supplier bank account number etc. (2) Retrieve data from invoice, supplier, and bank. (3) Generate the running of voucher number. (4) Calculate amount and outstanding amount from invoice. (5) Calculate withholding tax amount. (6) If the payment amount more than outstanding amount, display warning message the payment has overpay. (7) Generate the account transaction for general ledger (8) Update status 'S' into invoice from database. (9) If correct, record the payment data into company payment database.
Attachment:	<ul style="list-style-type: none"> - Data store invoice header - Data store payment header - Data store payment detail - Data store GL header - Data store GL detail

Table C.16. Process Specification of Process 2.2.4.

Items	Description
Process Name:	Generate Voucher for Payment
Data In:	Information of payment
Data Out:	Payment Voucher
Process:	<ol style="list-style-type: none"> (1) Input payment number to retrieve the existing data from database. (2) Data payment voucher will be print out.
Attachment:	<ul style="list-style-type: none"> - Data store invoice header - Data store invoice detail - Data store payment header - Data store payment detail - Data store GL header - Data store GL detail

Table C.17. Process Specification of Process 2.3.1.

Items	Description
Process Name:	Generate Withholding tax certificate
Data In:	Information of payment
Data Out:	Withholding tax certificate
Process:	(1) Input payment number to retrieve the existing data from database. (2) Retrieve data from supplier information. (3) Data withholding tax will be print out.
Attachment:	- Data store payment header - Data store payment detail

Table C.18. Process Specification of Process 2.3.2.

Items	Description
Process Name:	Generate P.N.D. 3 / 53
Data In:	Information of payment
Data Out:	P.N.D. 3 / 53
Process:	(1) Input payment number to retrieve the existing data from database. (2) Retrieve data from supplier information. (3) Data withholding tax will be print out.
Attachment:	- Data store payment header - Data store payment detail

Table C.19. Process Specification of Process 2.3.3.

Items	Description
Process Name:	Generate cheque for payment
Data In:	Information of payment
Data Out:	Cheque
Process:	(1) Input payment number to retrieve the existing data from database. (2) Retrieve data from supplier information. (3) Cheque payment will be printing out. (4) Update status 'P' into cheque from database.
Attachment:	- Data store payment header - Data store payment detail - Data store cheque

Table C.20. Process Specification of Process 2.3.4.

Items	Description
Process Name:	Generate all of transaction report
Data In:	Information of invoice and payment
Data Out:	Transaction list, Report of transaction payment, Report of cheque payment.
Process:	<ol style="list-style-type: none"> (1) Select transaction type for retrieve the existing data from database. (2) Input range of voucher number for print out the report. (3) Data transaction will be print out.
Attachment:	<ul style="list-style-type: none"> - Data store invoice header - Data store invoice detail - Data store payment header - Data store payment detail - Data store cheque - Data store GL header - Data store GL detail

Table C.21. Process Specification of Process 3.1.1.

Items	Description
Process Name:	Process Clearing cheque payment
Data In:	Information of cheque payment
Data Out:	Cheque clearing
Process:	<ol style="list-style-type: none"> (1) Input cheque number to retrieve the existing data from database. (2) Retrieve data from payment information. (3) Validate cheque payment information. (4) If not correct, display error message. (5) If correct, update status 'C' into cheque record from database
Attachment:	<ul style="list-style-type: none"> - Data store payment header - Data store payment detail - Data store cheque

Table C.22. Process Specification of Process 3.1.2.

Items	Description
Process Name:	Process cheque reconcile
Data In:	Information of cheque
Data Out:	Cheque reconcile
Process:	(1) Input period of date for reconcile and retrieve data under period of date from cheque information. (2) If cheque is reconcile, update status 'R' into cheque record from database
Attachment:	- Data store cheque

Table C.23. Process Specification of Process 3.1.3.

Items	Description
Process Name:	Generate Summary cheque report
Data In:	Information of cheque
Data Out:	Cheque record
Process:	(1) Input cheque range or supplier range and retrieve data under selection from cheque information. (2) Summary cheque will be printed out.
Attachment:	- Data store cheque - Data store payment header - Data store payment detail

Table C.24. Process Specification of Process 3.2.1.

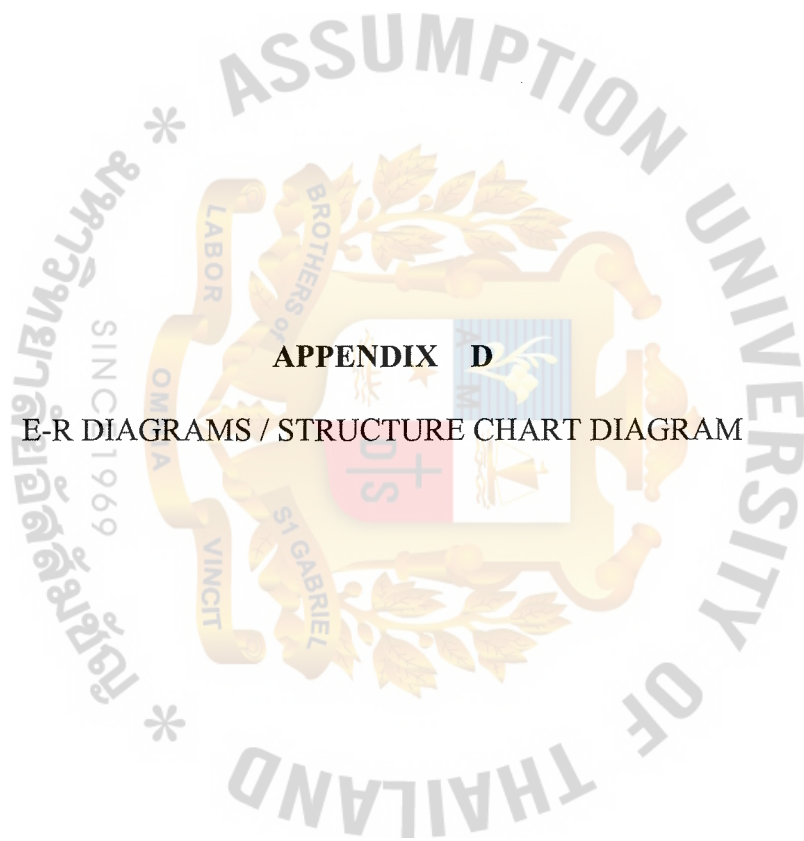
Items	Description
Process Name:	Generate Creditor statement
Data In:	Supplier code
Data Out:	Creditor statement
Process:	(1) Input supplier code to retrieve data the existing data from database. (2) Creditor statement will be printed out.
Attachment:	- Data store invoice header - Data store invoice detail - Data store payment header - Data store payment detail

Table C.25. Process Specification of Process 3.2.2.

Items	Description
Process Name:	Generate Creditor analysis report
Data In:	Supplier code
Data Out:	Creditor analysis report
Process:	(1) Input supplier code to retrieve data the existing data from database. (2) Creditor analysis report will be printed out.
Attachment:	- Data store invoice header - Data store invoice detail - Data store payment header - Data store payment detail

Table C.26. Process Specification of Process 3.2.3.

Items	Description
Process Name:	Generate Creditor due report
Data In:	Supplier code
Data Out:	Creditor due report
Process:	(1) Input supplier code to retrieve data the existing data from database. (2) Creditor due report will be printed out.
Attachment:	- Data store invoice header - Data store invoice detail



APPENDIX D

E-R DIAGRAMS / STRUCTURE CHART DIAGRAM

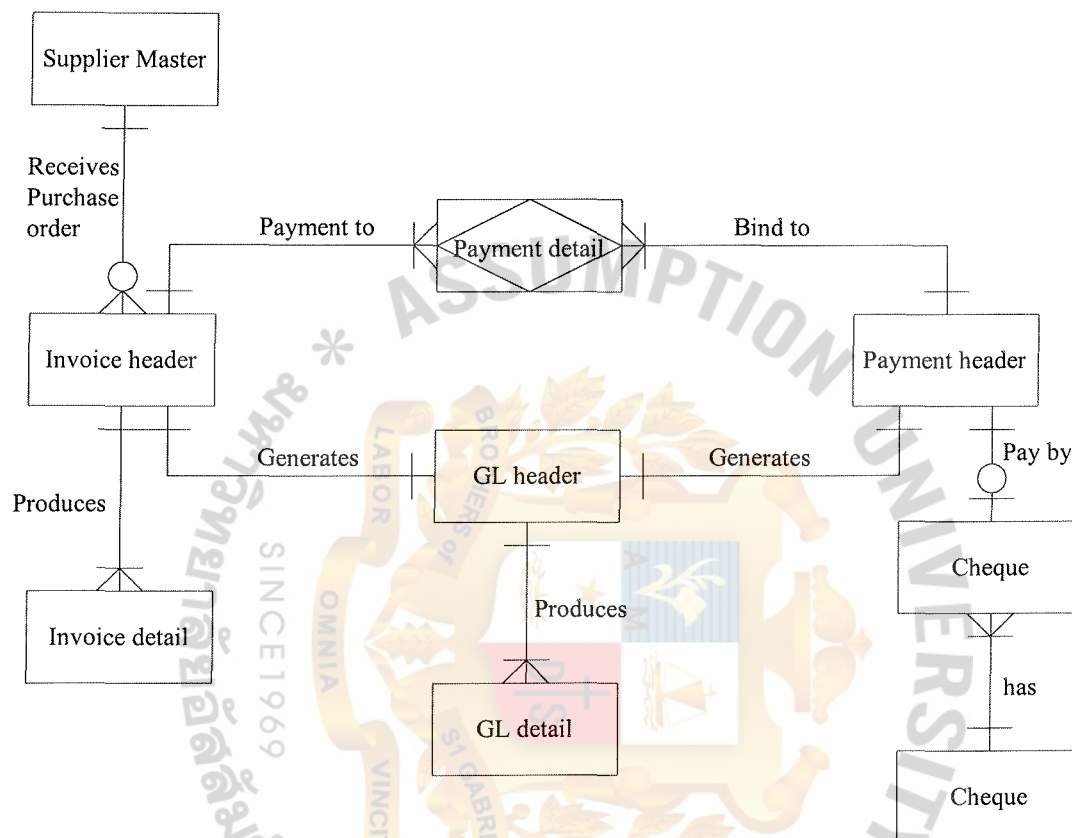


Figure D.1. ER Diagram of Context Data Model.

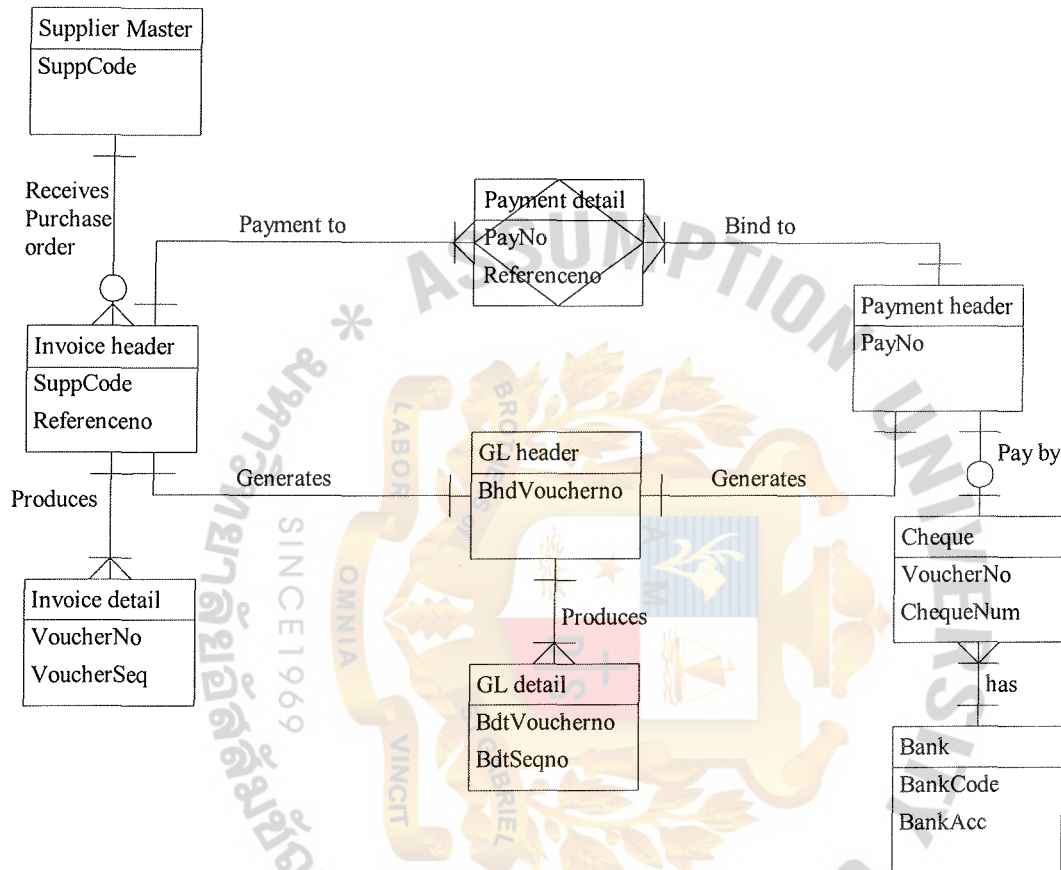


Figure D.2. ER Diagram of Key-Based Data Model.

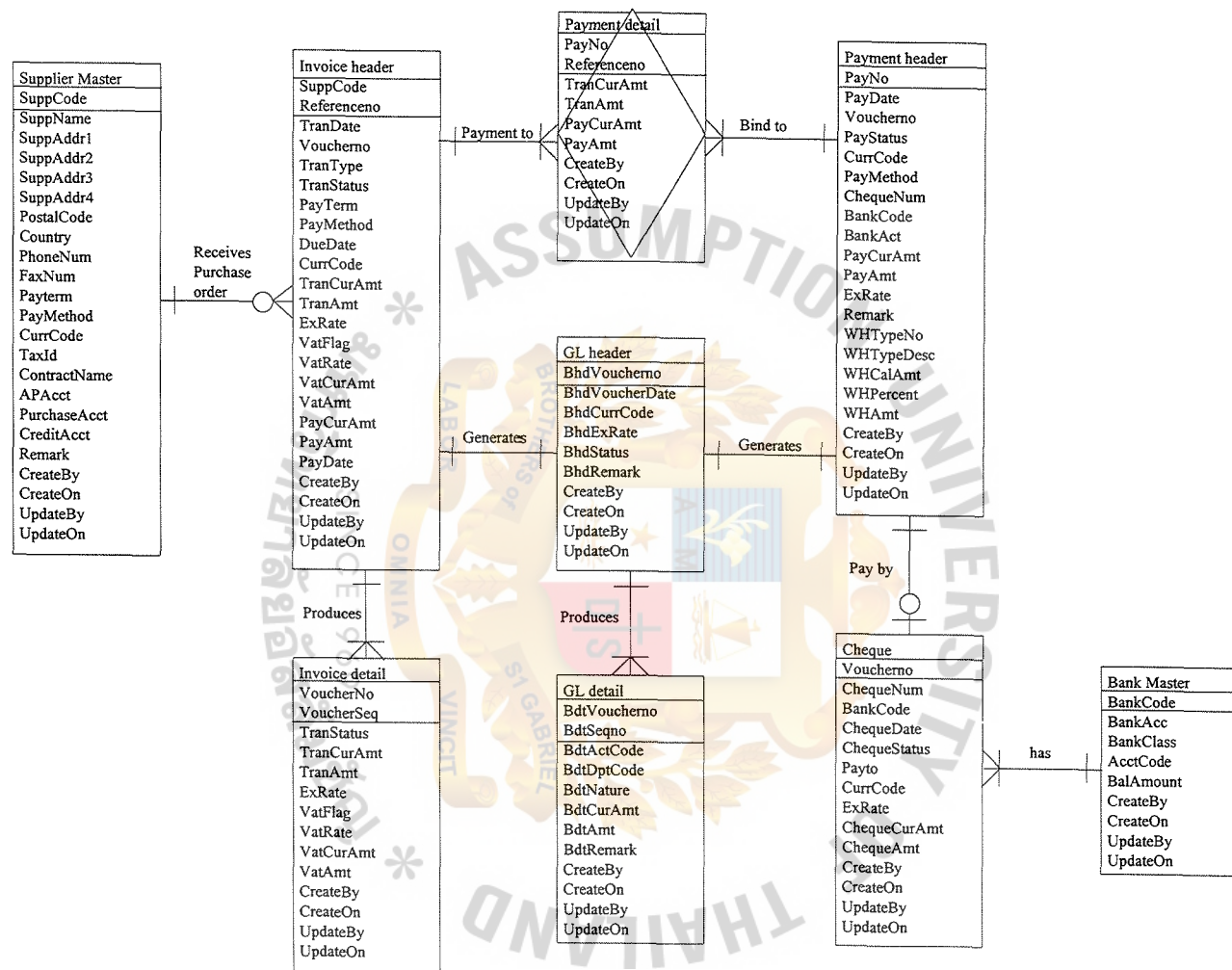


Figure D.3. ER Diagram of Fully-attributed Data Mode.

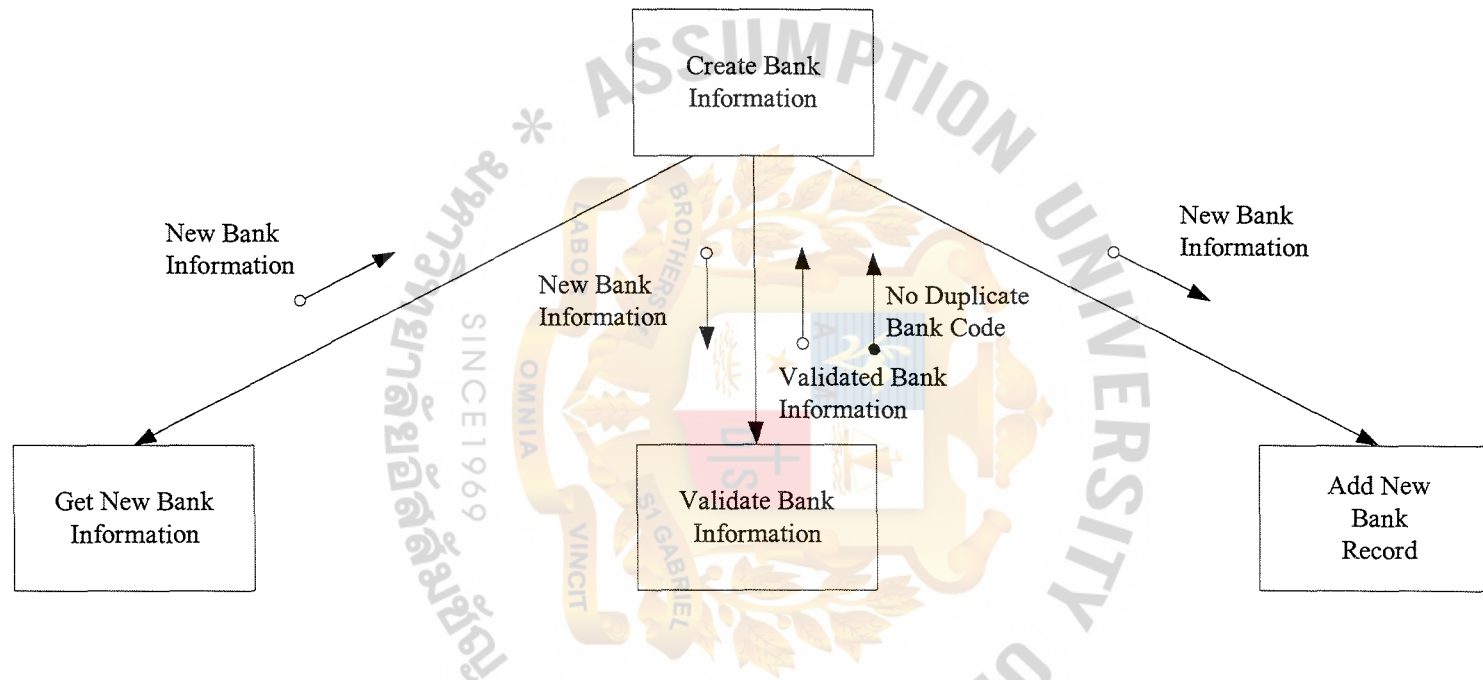


Figure D.4. Structure Chart of Create Bank Information.

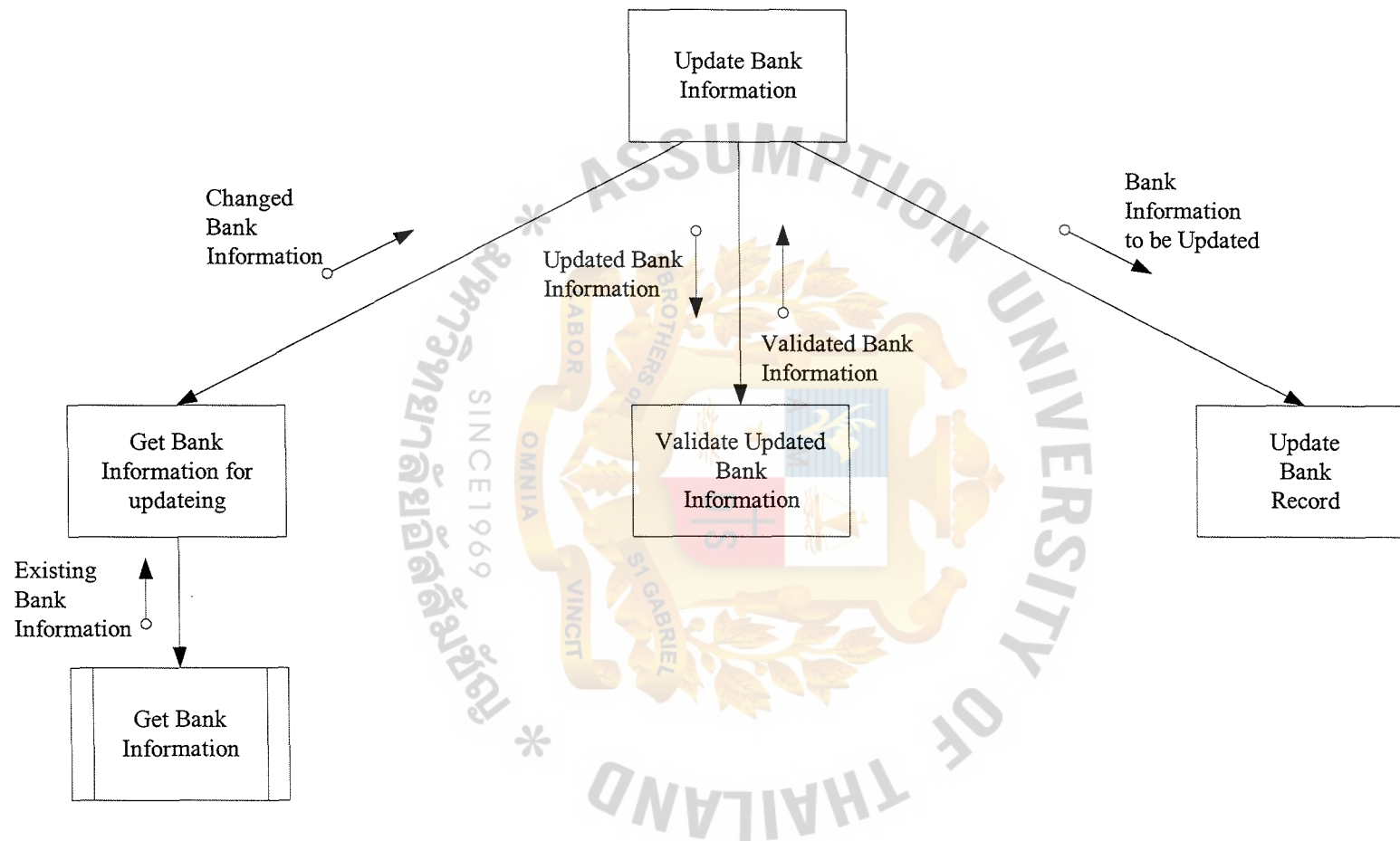


Figure D.5. Structure Chart of Update Bank Information.

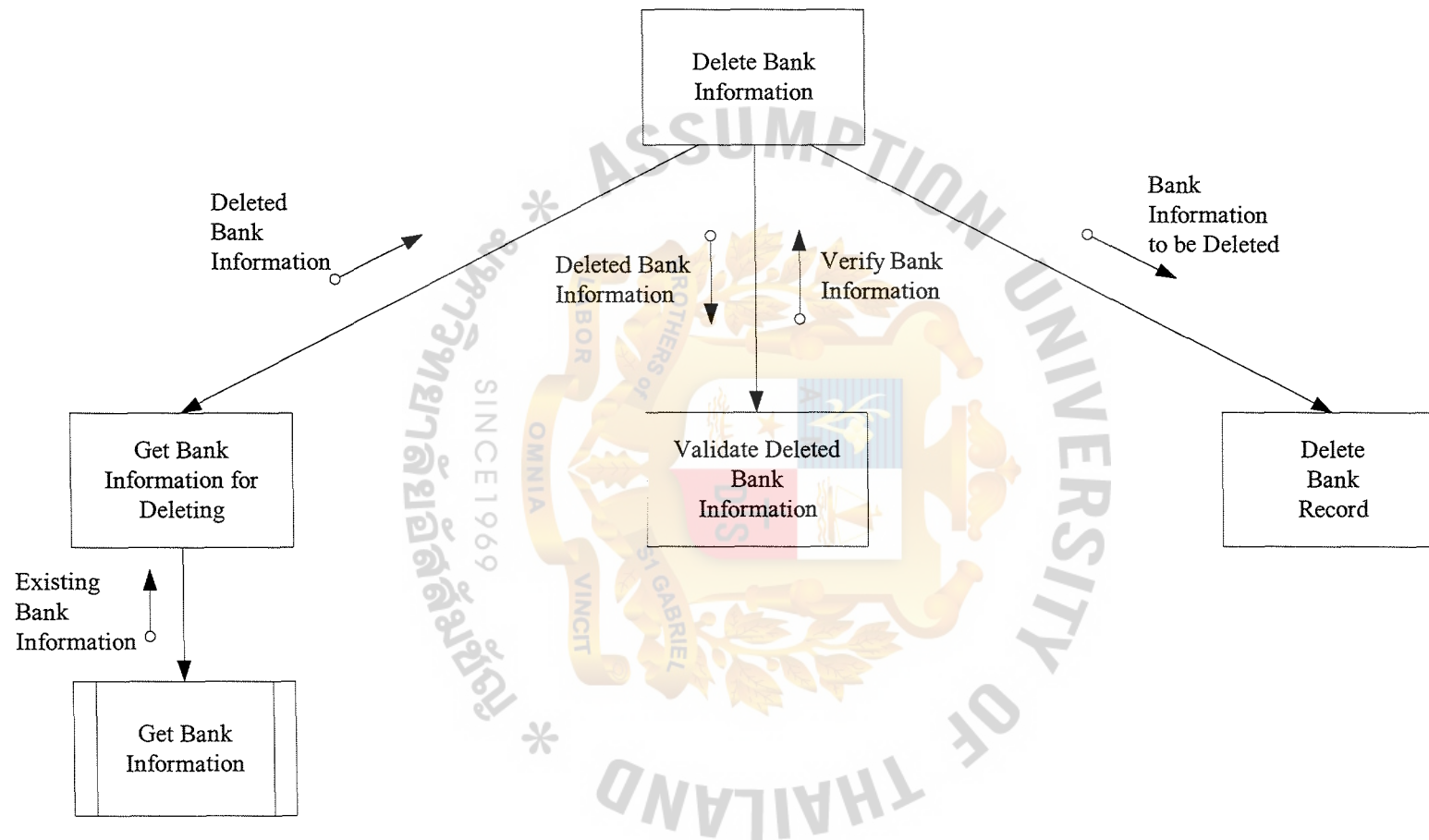


Figure D.6. Structure Chart of Delete Bank Information.

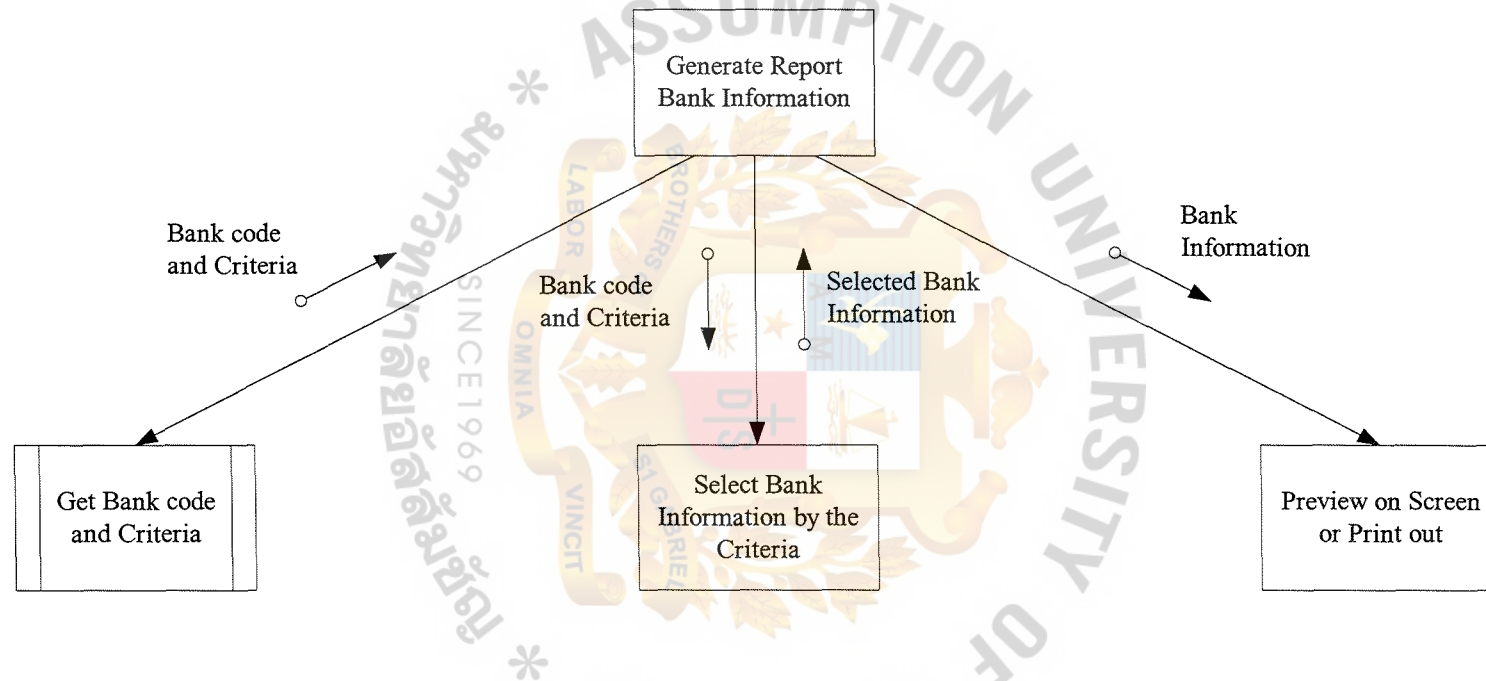


Figure D.7. Structure Chart of Generate Report Bank Information.

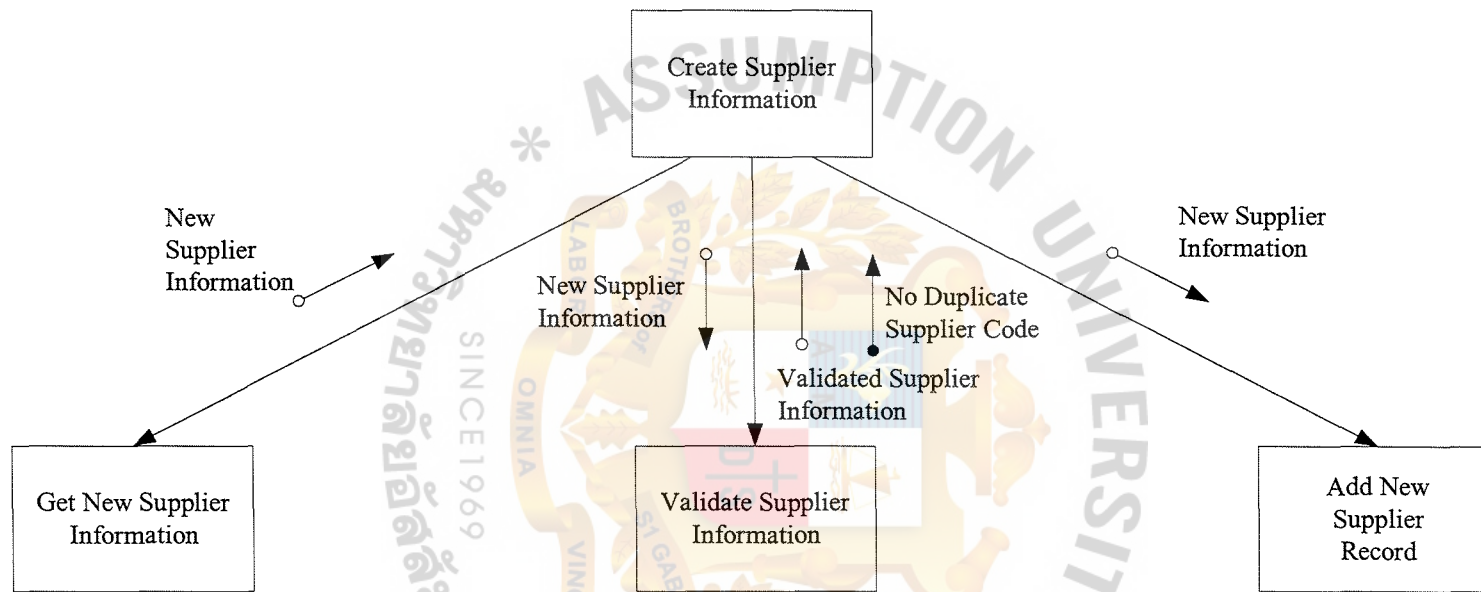


Figure D.8. Structure Chart of Create Supplier Information.

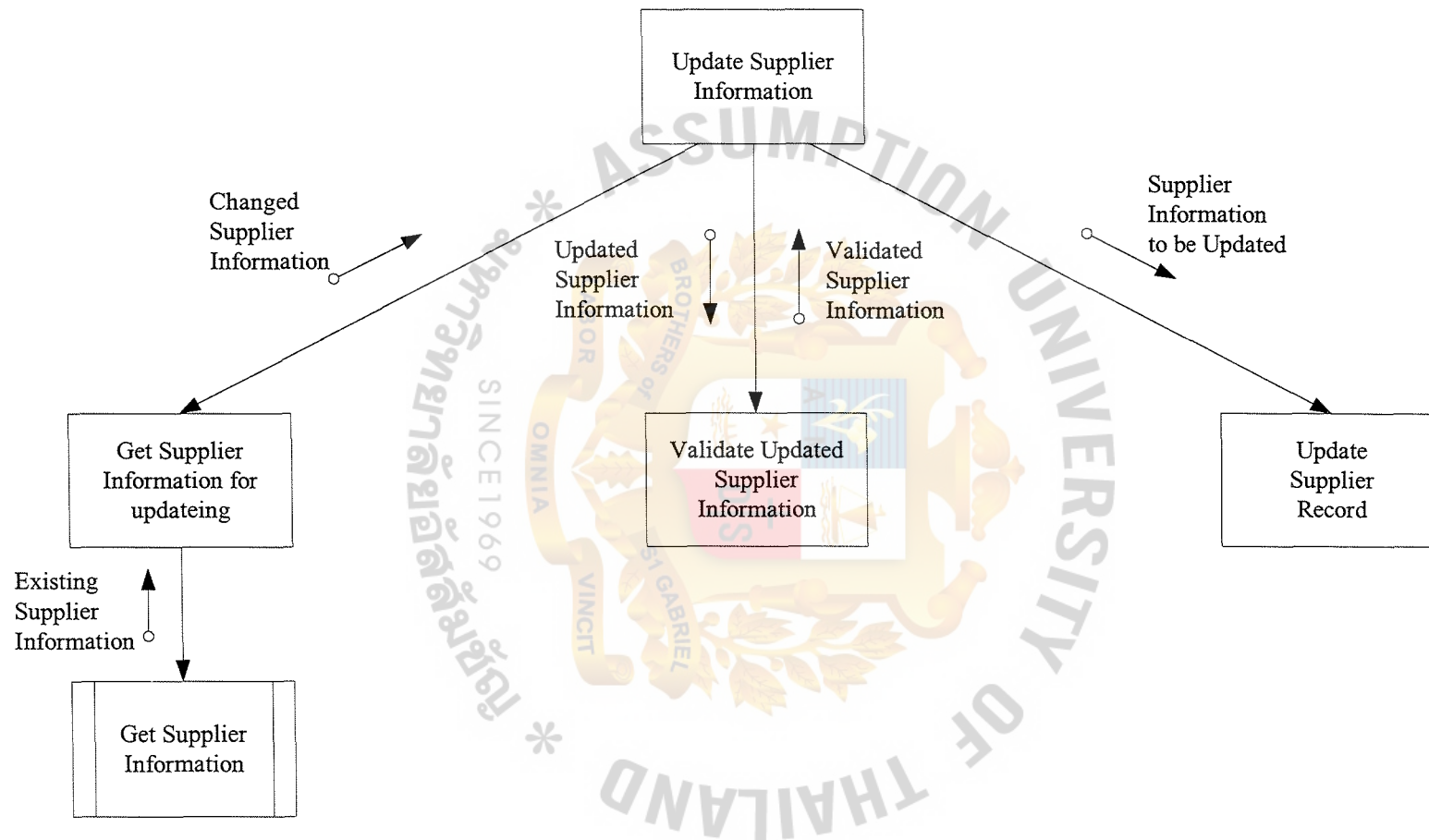


Figure D.9. Structure Chart of Update Supplier Information.

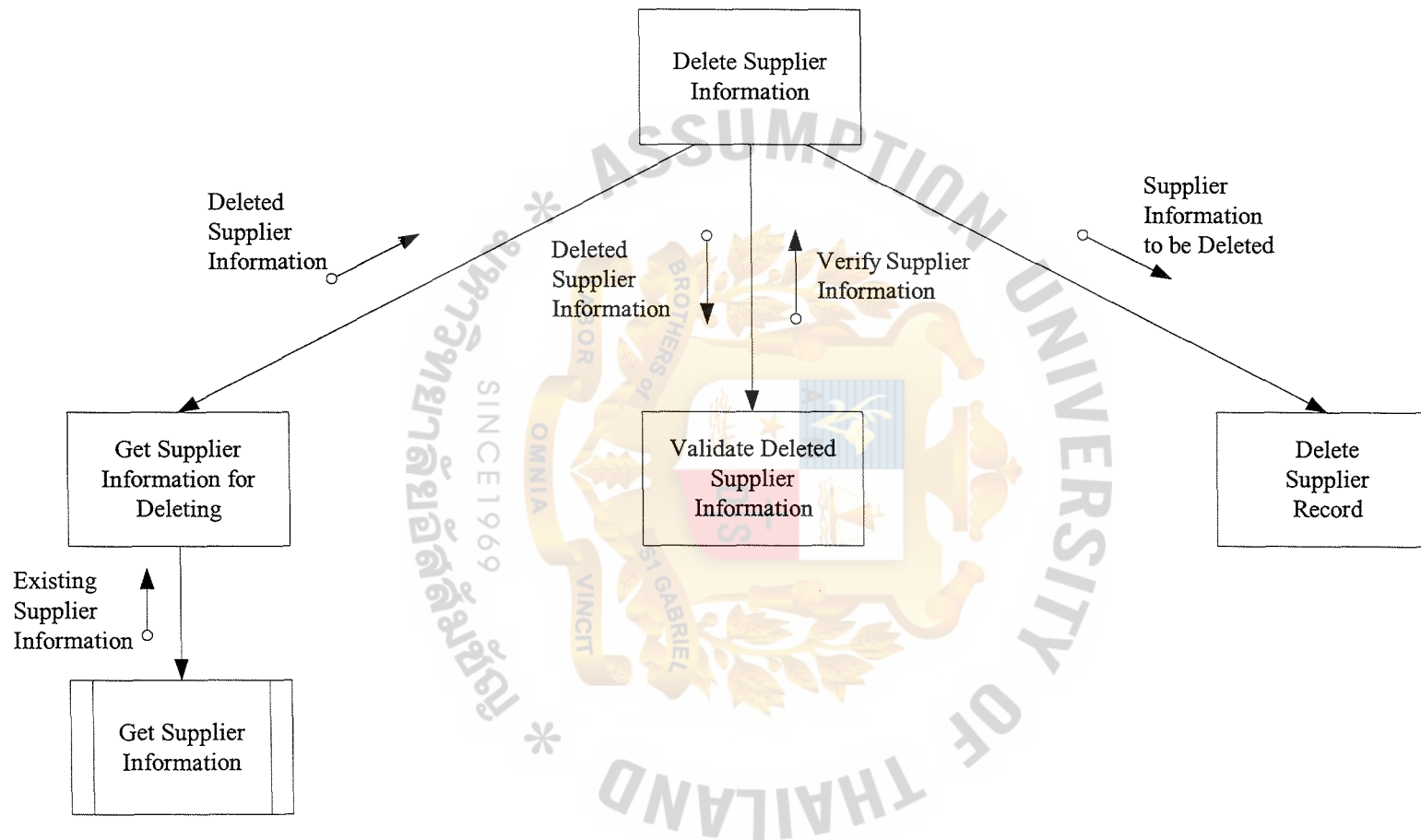


Figure D.10. Structure Chart of Delete Supplier Information.

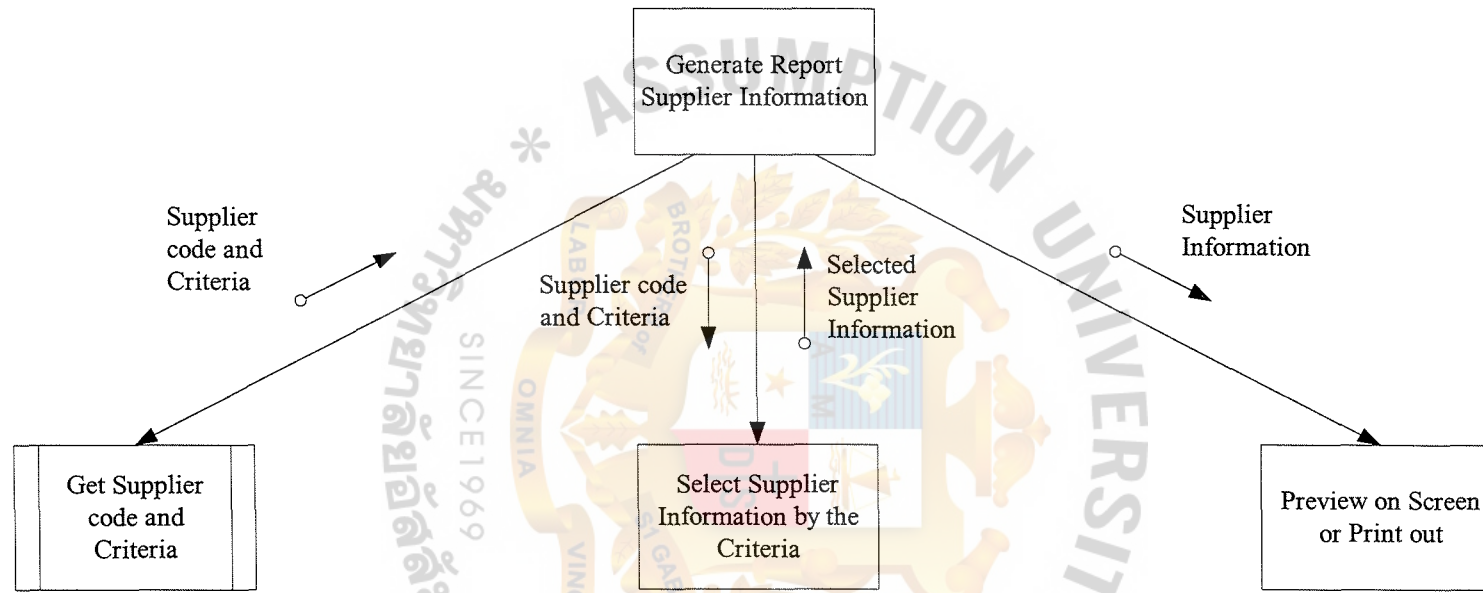


Figure D.11. Structure Chart of Generate Report Supplier Information.

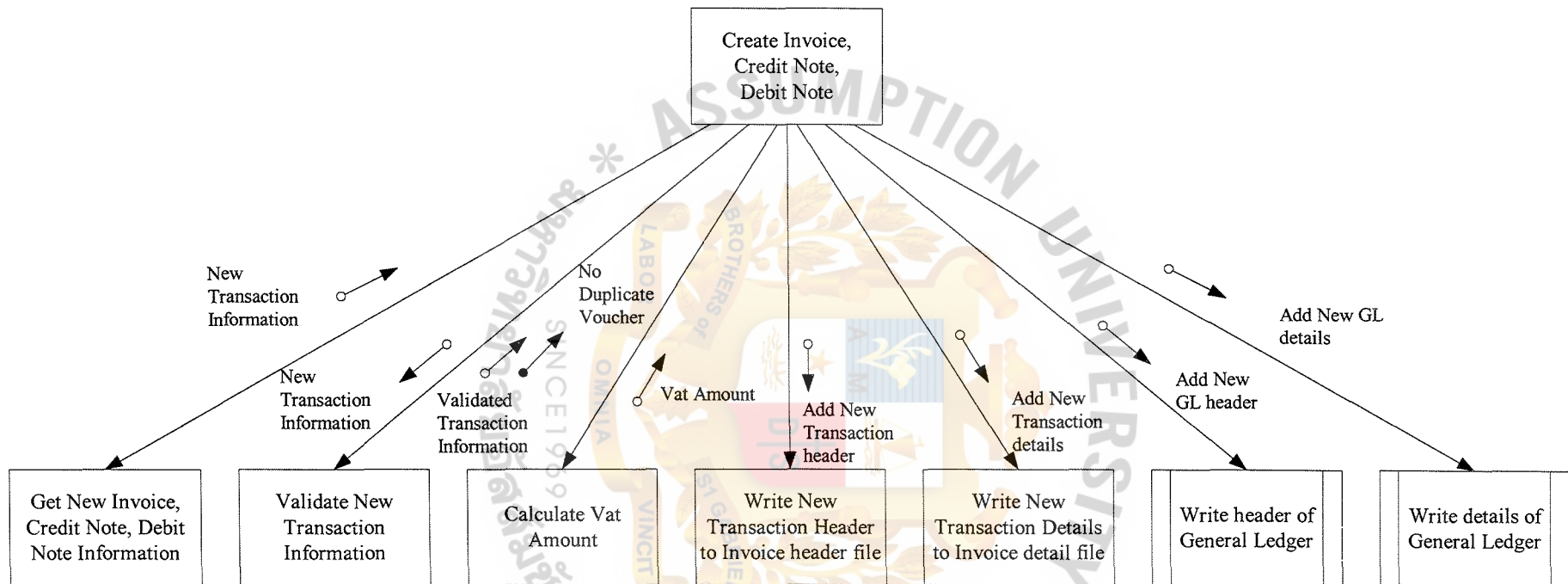


Figure D.12. Structure Chart of Create Invoice, Credit Note, Debit Note.

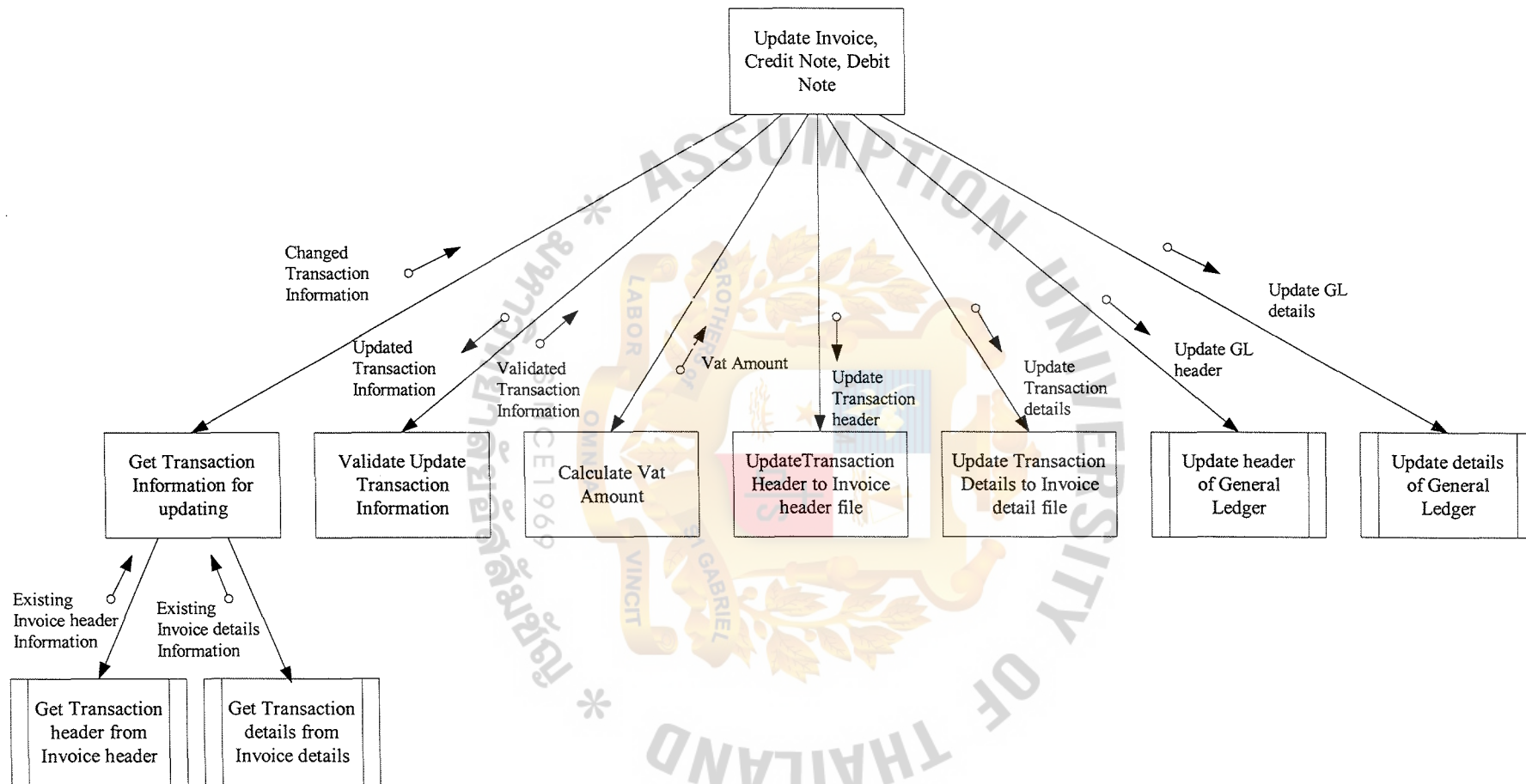


Figure D.13. Structure Chart of Update Invoice, Credit Note, Debit Note.

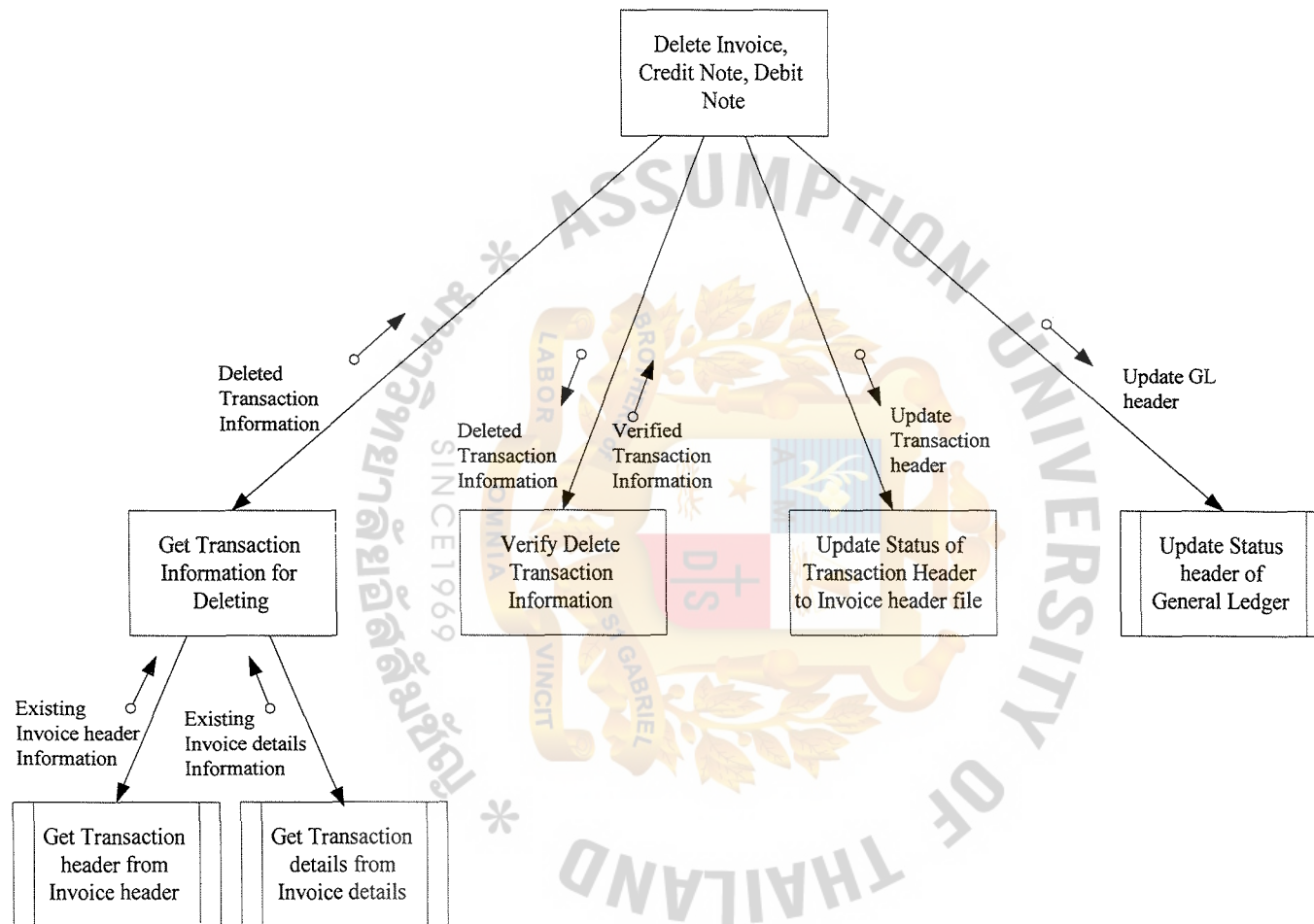


Figure D.14. Structure Chart of Delete Invoice, Credit Note, Debit Note.

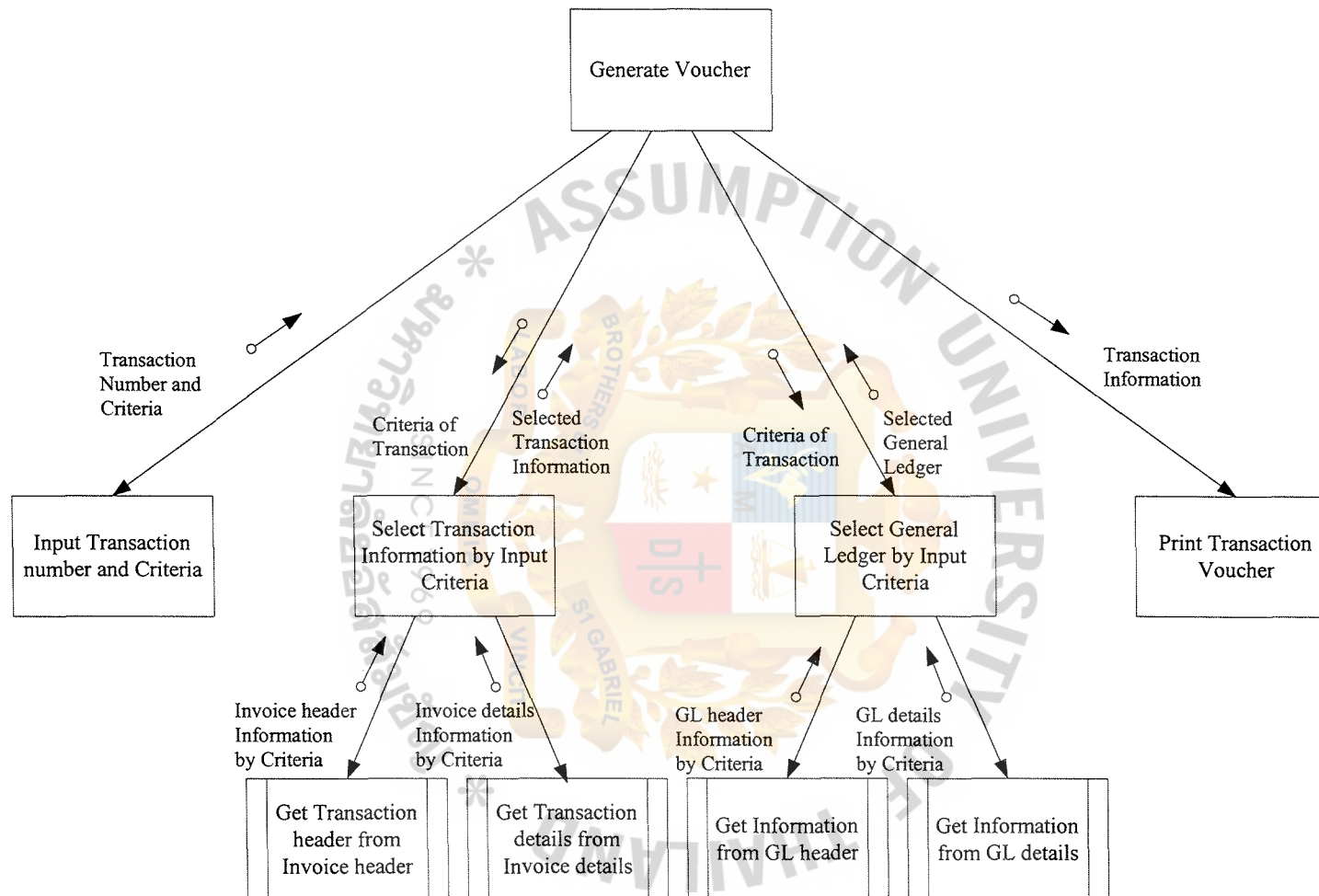


Figure D.15. Structure Chart of Generate Voucher.

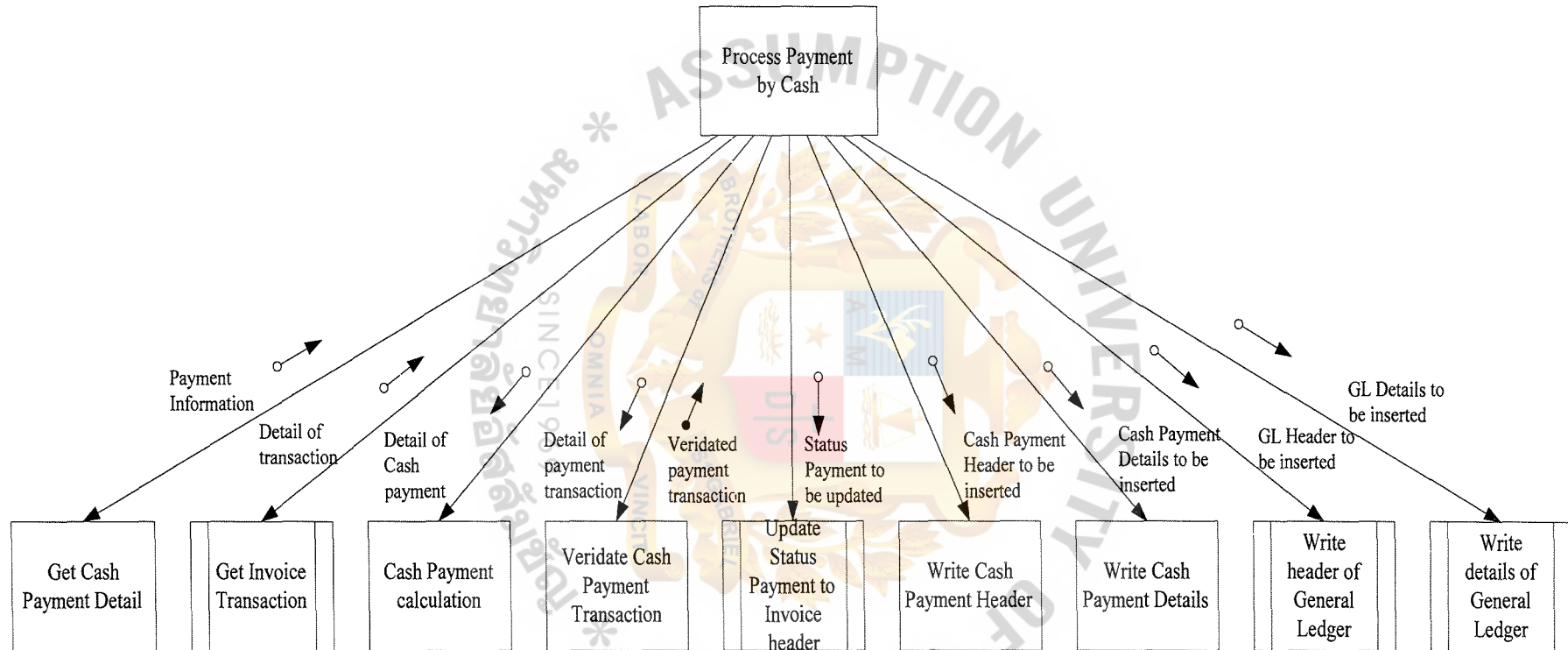


Figure D.16. Structure Chart of Process Payment by Cash.

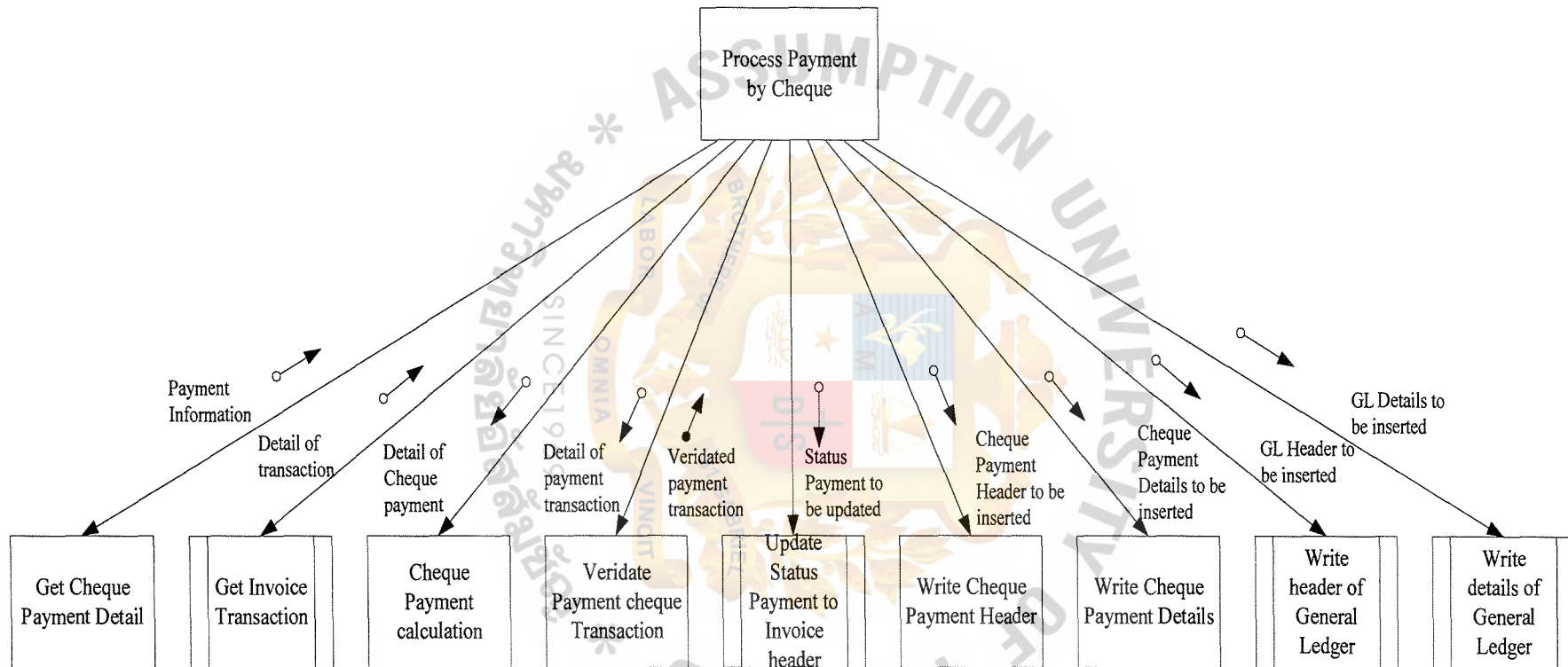


Figure D.17. Structure Chart of Process Payment by Cheque.

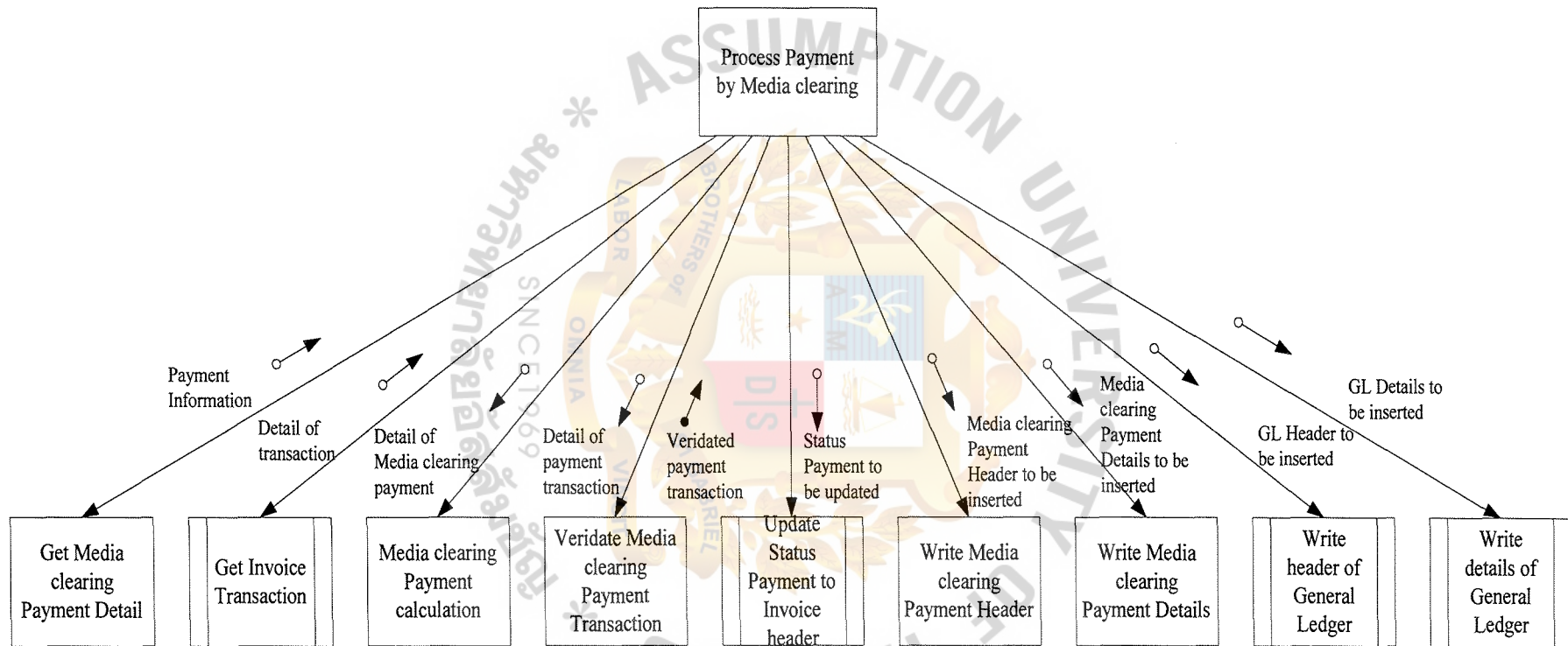


Figure D.18. Structure Chart of Process Payment by Media Clearing.

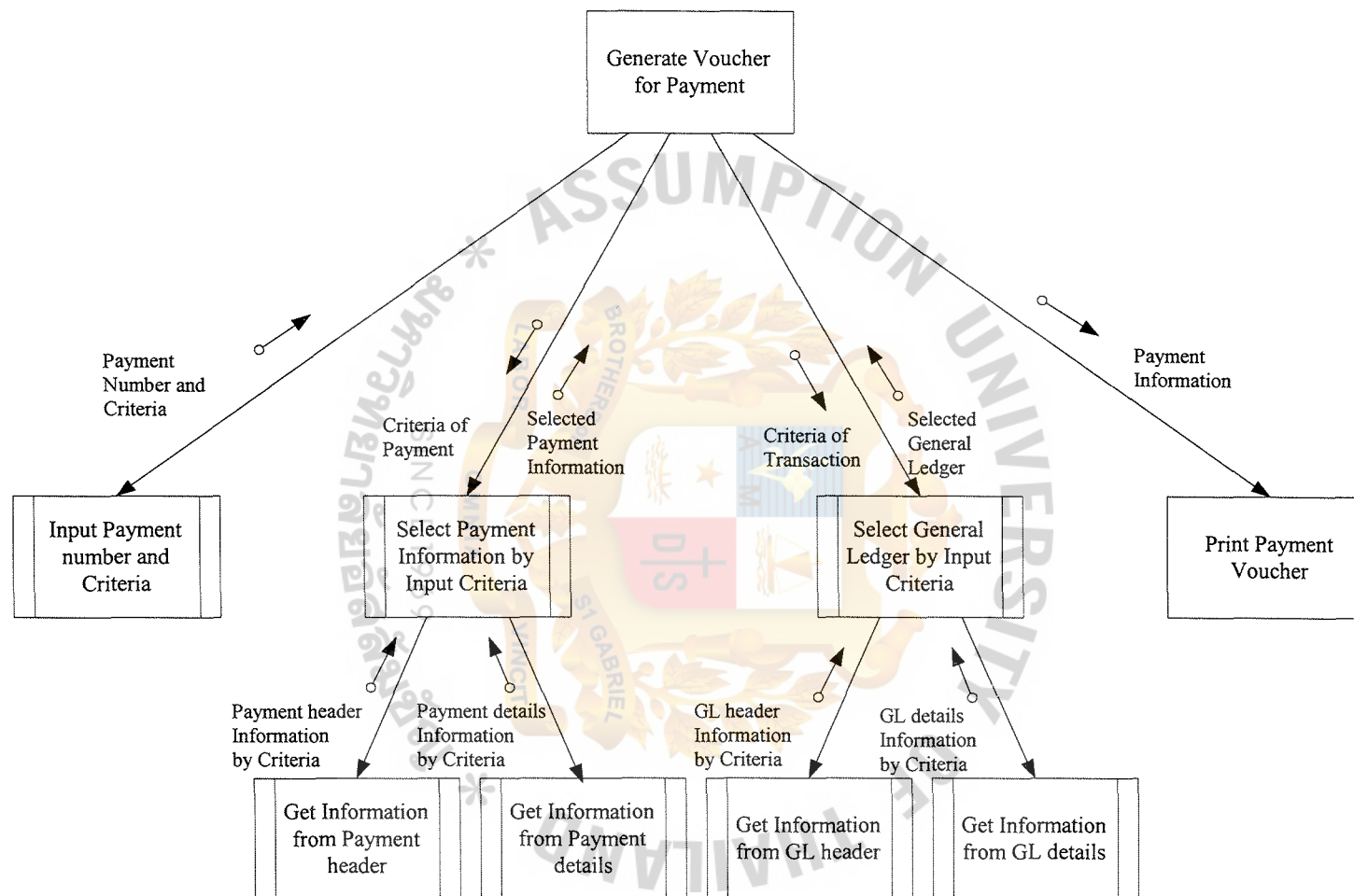


Figure D.19. Structure Chart of Process Generate Voucher for Payment.

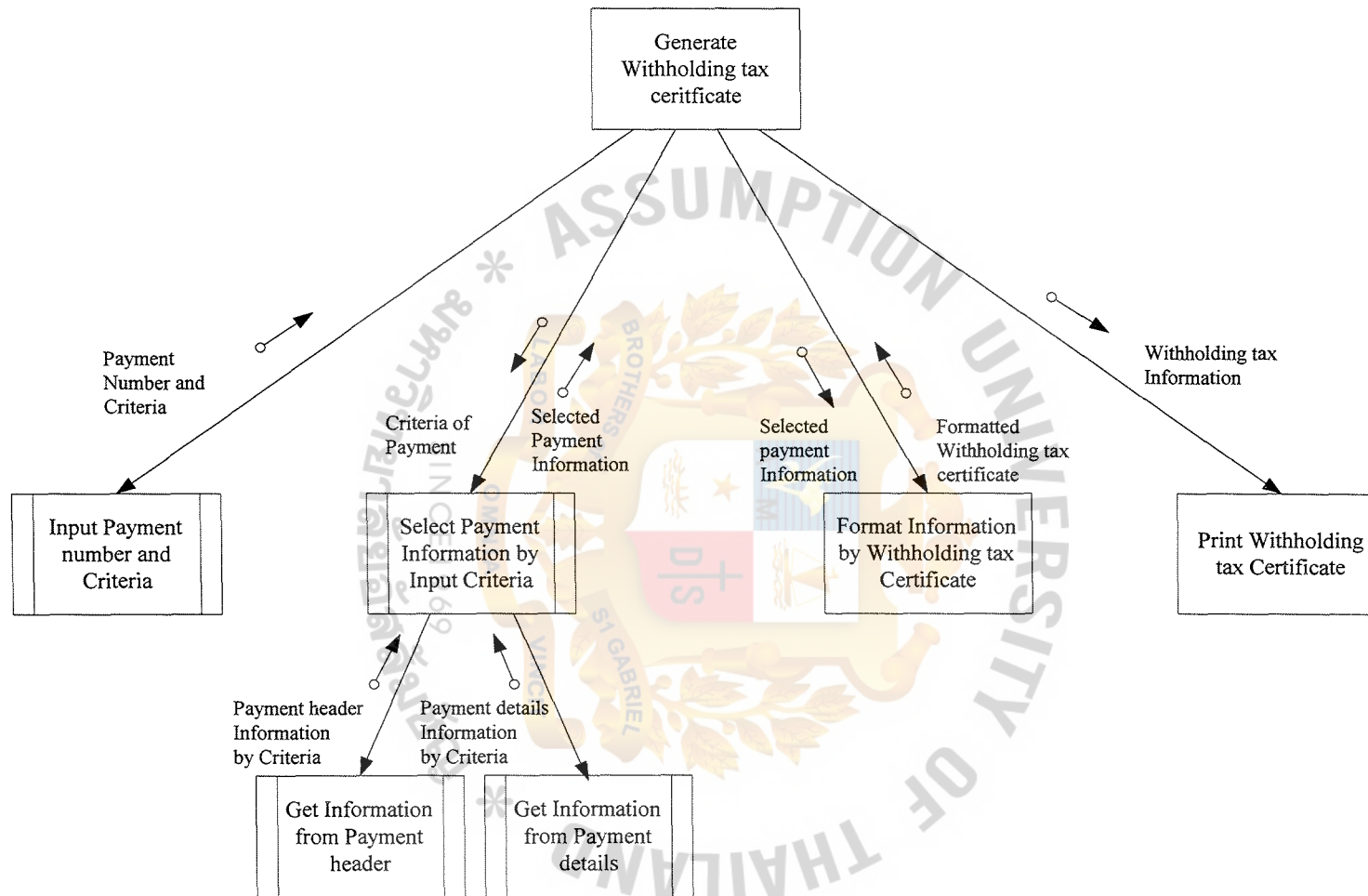


Figure D.20. Structure Chart of Process Generate Withholding tax certificate.

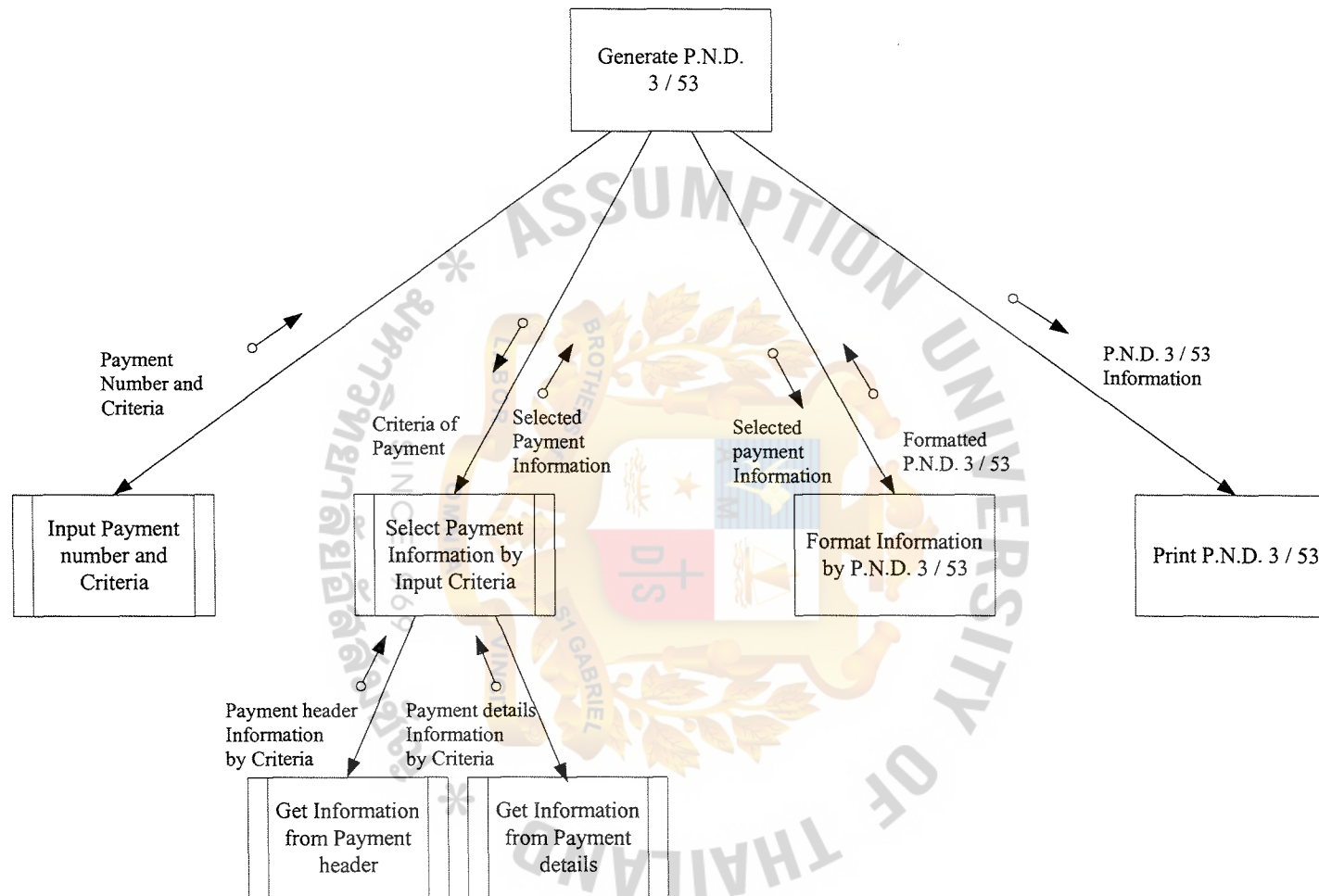


Figure D.21. Structure Chart of Process Generate P.N.D. 3 / 53.

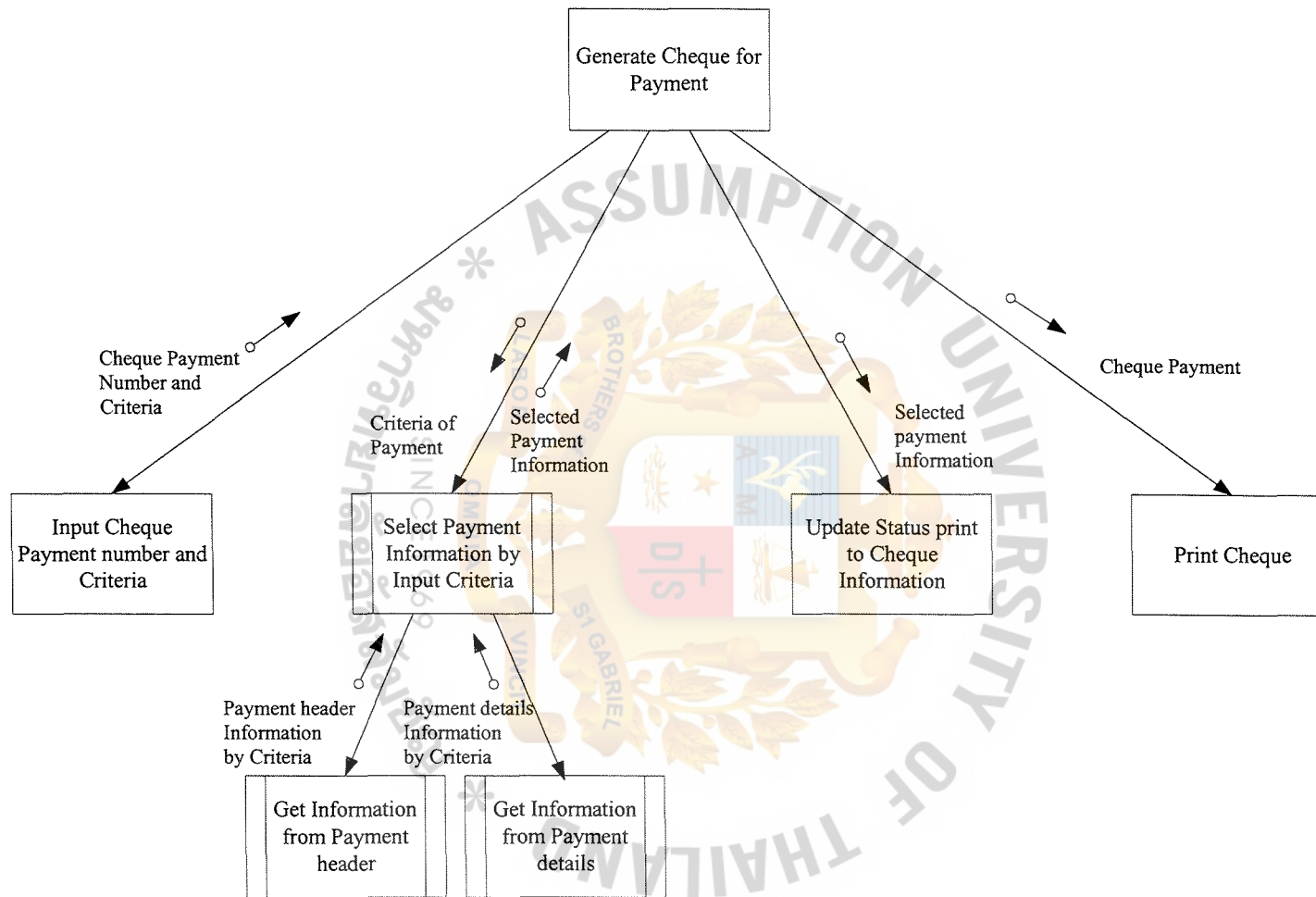


Figure D.22. Structure Chart of Process Generate Cheque for Payment.

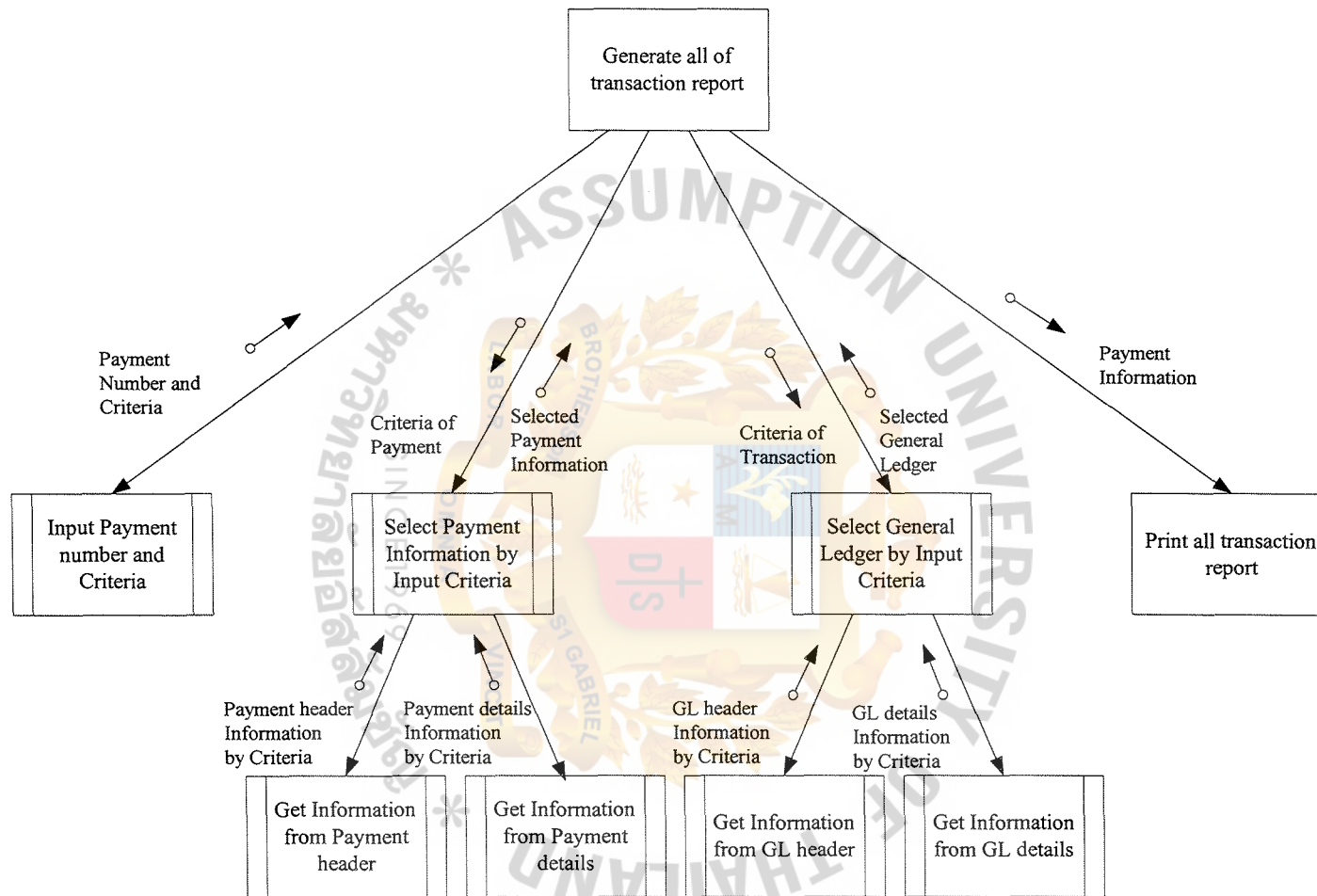


Figure D.23. Structure Chart of Process Generate all of transaction report.

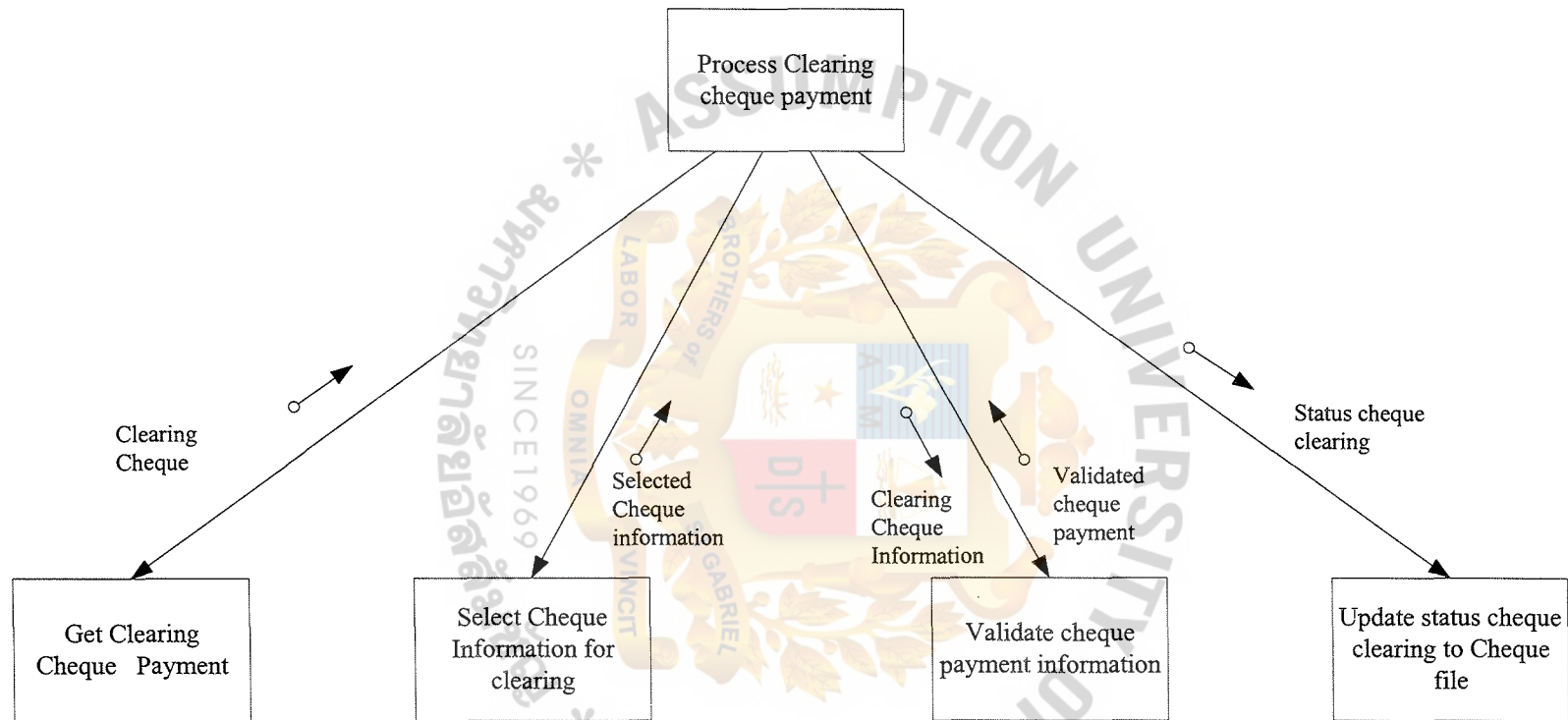


Figure D.24. Structure Chart of Process Clearing Cheque Payment.

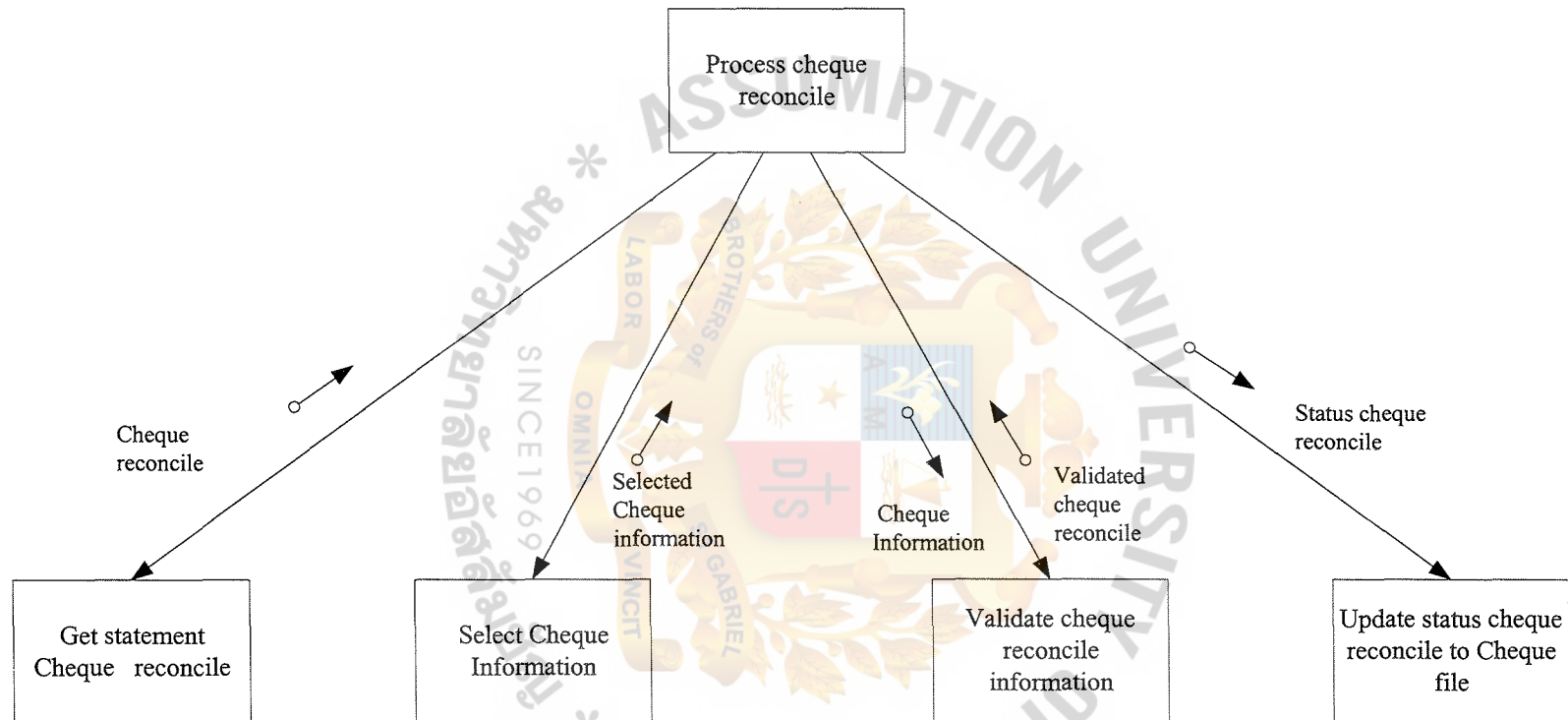


Figure D.25. Structure Chart of Process Cheque Reconciles.

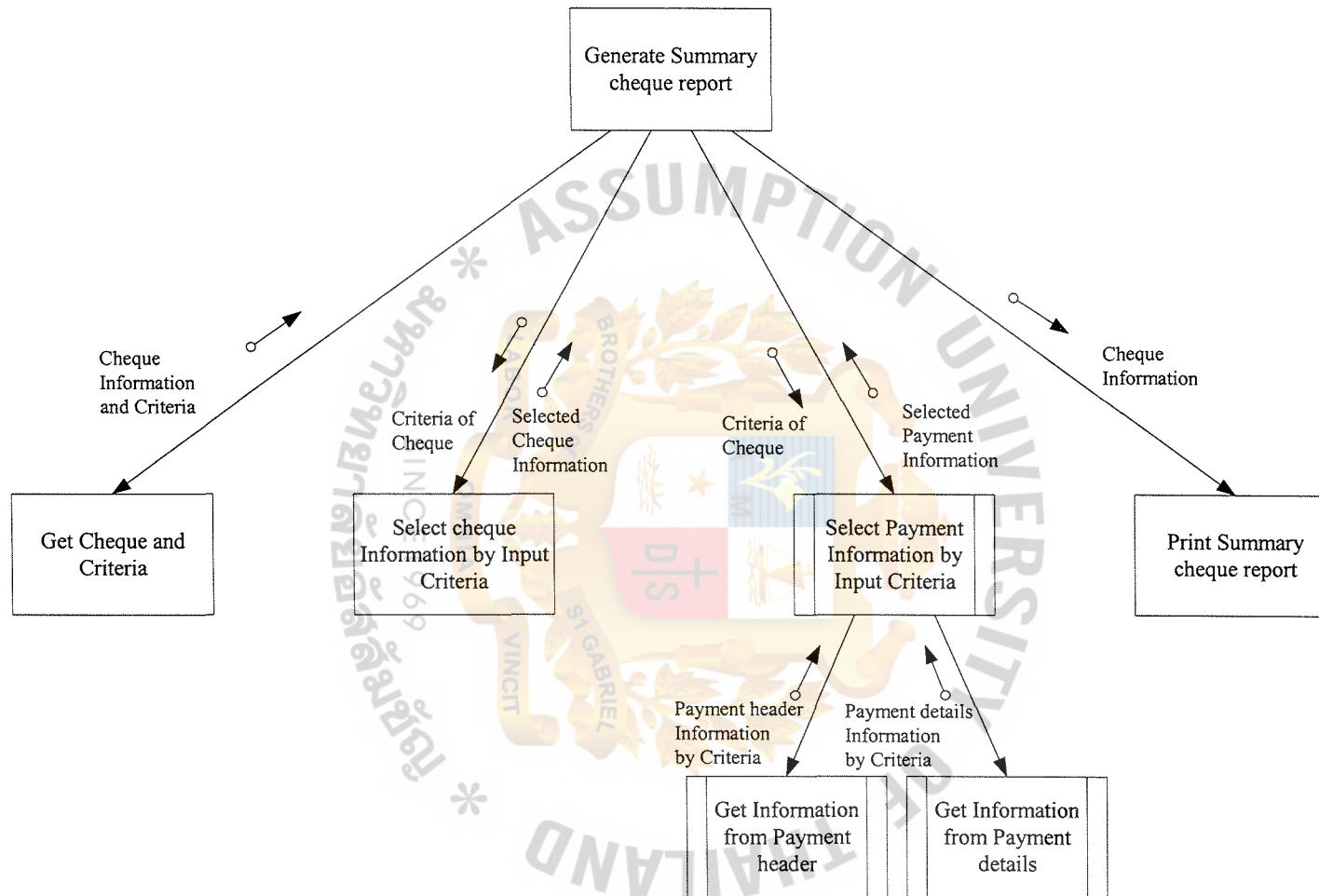


Figure D.26. Structure Chart of Generate Summary Cheque Report.

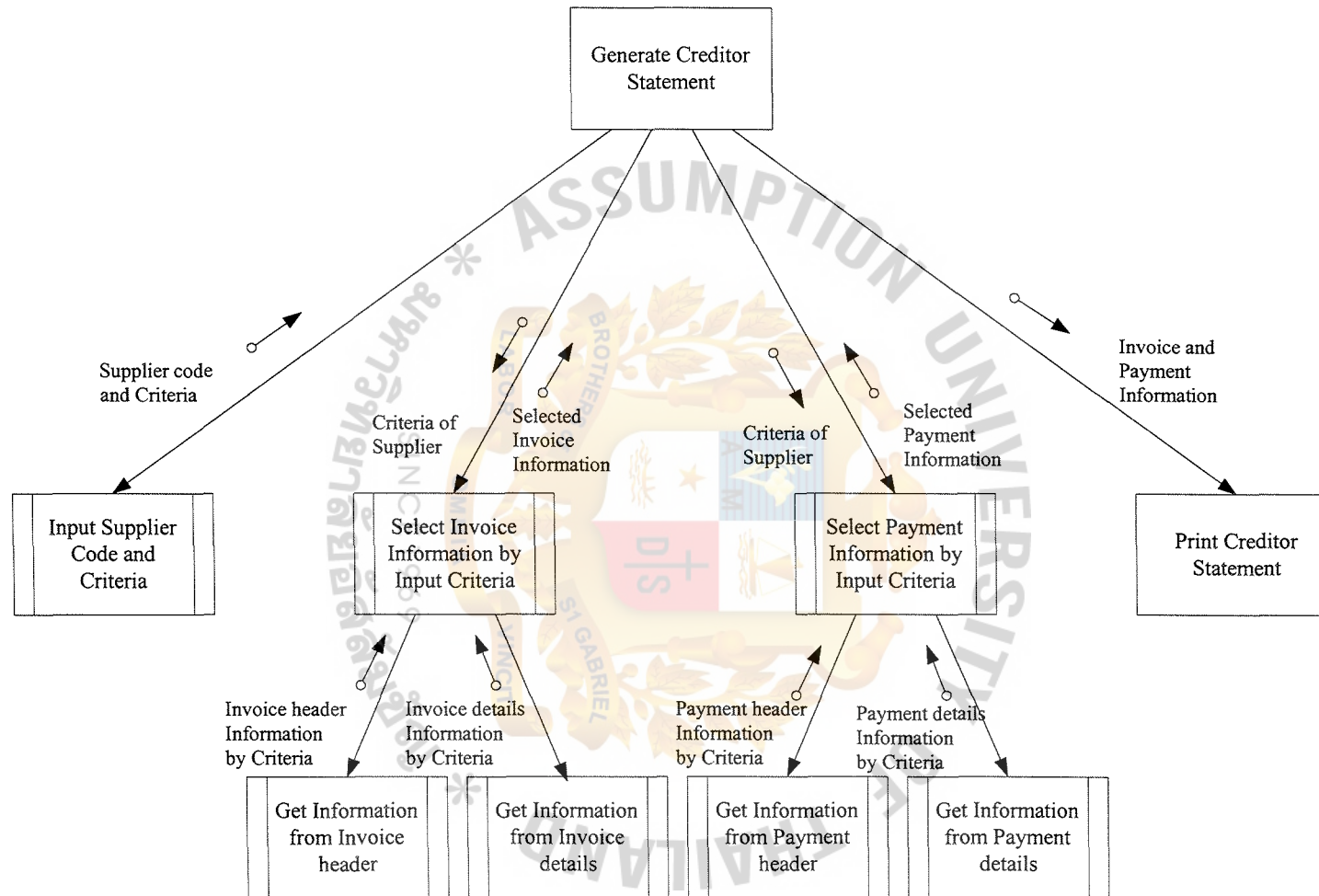


Figure D.27. Structure Chart of Generate Creditor Statement.

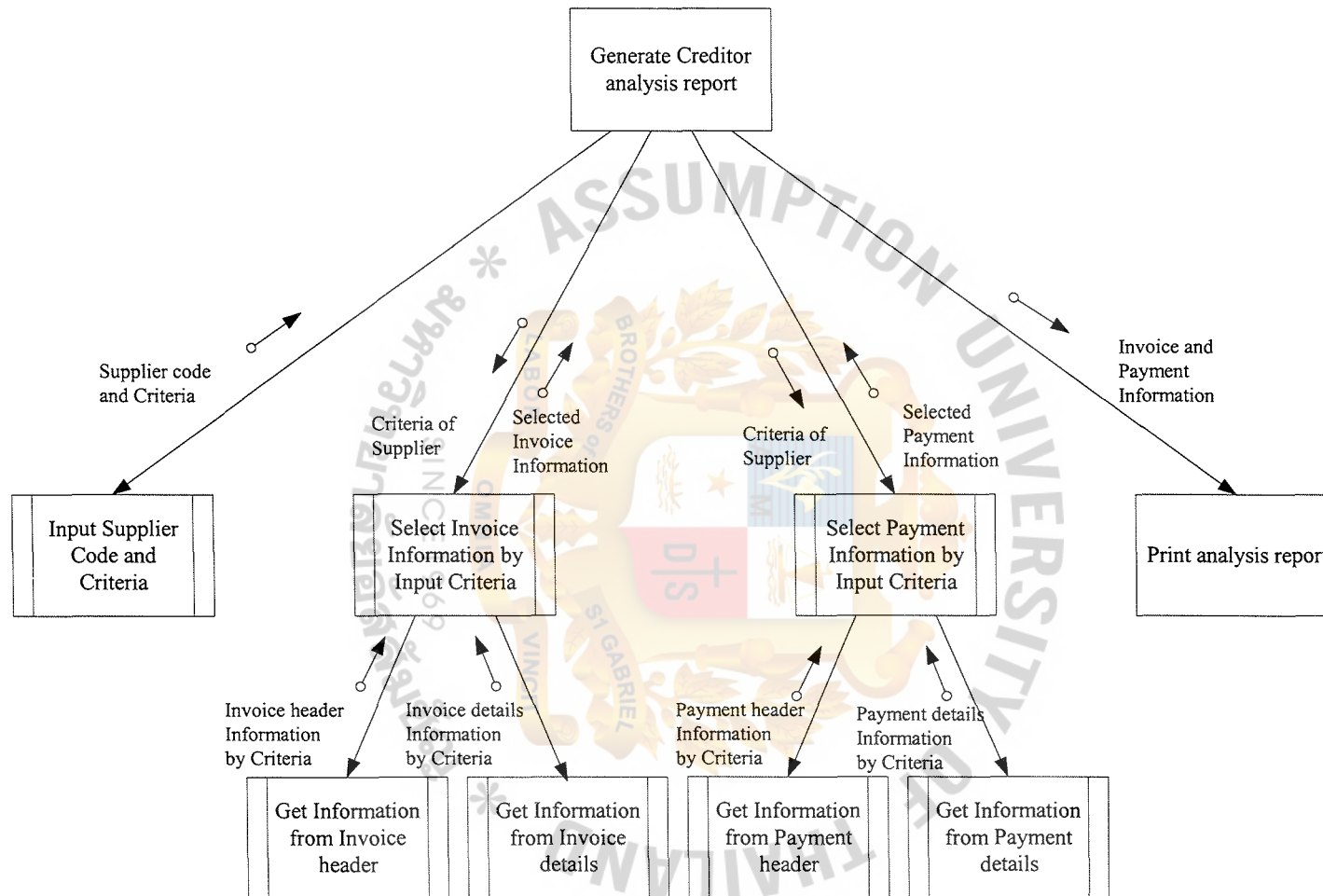


Figure D.28. Structure Chart of Generate Creditor Analysis Report.

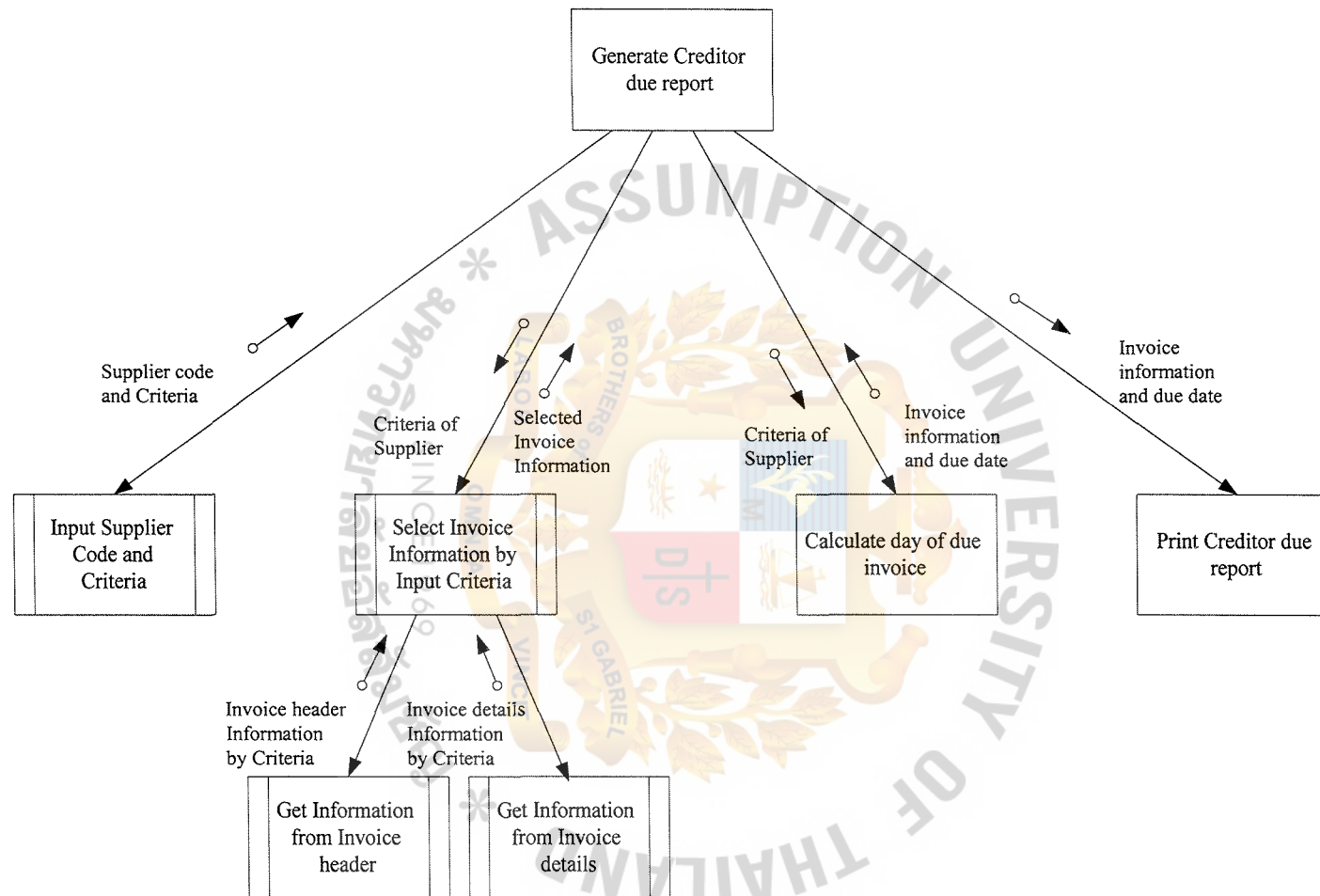


Figure D.29. Structure Chart of Generate Creditor Due Report.



APPENDIX E

DATABASE DESIGN

Table E.1. Structure of Bank Master Table.

No.	Field Name	Field Type	Key Type	Null	Check
1	BankCode	Varchar (5)	Primary Key	N	
2	BankAcc	Varchar (15)	Primary Key	N	
3	BankClass	Varchar (1)	Attribute	N	
4	AcctCode	Varchar (10)	Attribute	N	
5	BalAmount	Decimal (18,2)	Attribute	N	0.00
6	CreateBy	Varchar (8)	Attribute	N	
7	CreateOn	Datetime	Attribute	N	Now()
8	UpdateBy	Varchar (8)	Attribute	N	
9	UpdateOn	Datetime	Attribute	N	Now()



Table E.2. Structure of Supplier Master Table.

No.	Field Name	Field Type	Key Type	Null	Check
1	SuppCode	Varchar (10)	Primary Key	N	
2	SuppName	Varchar (60)	Attribute	N	
3	SuppAddr1	Varchar (40)	Attribute	Y	
4	SuppAddr2	Varchar (40)	Attribute	Y	
5	SuppAddr3	Varchar (40)	Attribute	Y	
6	SuppAddr4	Varchar (40)	Attribute	Y	
7	PostalCode	Varchar (10)	Attribute	Y	
8	Country	Varchar (10)	Attribute	Y	
9	PhoneNum	Varchar (15)	Attribute	Y	
10	FaxNum	Varchar (15)	Attribute	Y	
11	Payterm	Varchar (5)	Attribute	Y	
12	PayMethod	Varchar (5)	Attribute	Y	
13	CurrCode	Varchar (3)	Attribute	N	
14	TaxId	Varchar (20)	Attribute	Y	
15	ContractName	Varchar (40)	Attribute	Y	
16	APAcct	Varchar (10)	Attribute	Y	
17	PurchaseAcct	Varchar (10)	Attribute	Y	
18	CreditAcct	Varchar (10)	Attribute	Y	
19	Remark	Varchar (10)	Attribute	Y	
20	CreateBy	Varchar (8)	Attribute	N	
21	CreateOn	Datetime	Attribute	N	Now()
22	UpdateBy	Varchar (8)	Attribute	N	
23	UpdateOn	Datetime	Attribute	N	Now()

Table E.3. Structure of Invoice Header Table.

No.	Field Name	Field Type	Key Type	Null	Check
1	SuppCode	Varchar (10)	Primary Key	N	
2	ReferenceNo	Varchar (20)	Primary Key	N	
3	TranDate	Date	Attribute	N	
4	Voucherno	Varchar (16)	Index Key	N	
5	TranType	Varchar (2)	Attribute	N	
6	TranStatus	Varchar (1)	Attribute	N	
7	PayTerm	Varchar (5)	Attribute	Y	
8	PayMethod	Varchar (5)	Attribute	Y	
9	DueDate	Date	Attribute	Y	
10	CurrCode	Varchar (3)	Attribute	N	
11	TranCurAmt	Decimal (18,2)	Attribute	N	0.00
12	TranAmt	Decimal (18,2)	Attribute	N	0.00
13	ExRate	Decimal (8,6)	Attribute	N	1.00
14	VatFlag	Varchar (1)	Attribute	N	
15	VatRate	Decimal (5,2)	Attribute	N	0.00
16	VatCurAmt	Decimal (18,2)	Attribute	N	0.00
17	VatAmt	Decimal (18,2)	Attribute	N	0.00
18	PayCurAmt	Decimal (18,2)	Attribute	N	0.00
19	PayAmt	Decimal (18,2)	Attribute	N	0.00
20	PayDate	Date	Attribute	Y	
21	CreateBy	Varchar (8)	Attribute	N	
22	CreateOn	Datetime	Attribute	N	Now()
23	UpdateBy	Varchar (8)	Attribute	N	
24	UpdateOn	Datetime	Attribute	N	Now()

Table E.4. Structure of Invoice Detail Table.

No.	Field Name	Field Type	Key Type	Null	Check
1	Voucherno	Varchar (16)	Primary Key	N	
2	VoucherSeq	Decimal (2,0)	Primary Key	N	
3	TranStatus	Varchar (1)	Attribute	N	
4	TranCurAmt	Decimal (18,2)	Attribute	N	0.00
5	TranAmt	Decimal (18,2)	Attribute	N	0.00
6	ExRate	Decimal (8,6)	Attribute	N	1.00
7	VatFlag	Varchar (1)	Attribute	N	
8	VatRate	Decimal (2)	Attribute	N	0.00
9	VatCurAmt	Decimal (18,2)	Attribute	N	0.00
10	VatAmt	Decimal (18,2)	Attribute	N	0.00
11	CreateBy	Varchar (8)	Attribute	N	
12	CreateOn	Datetime	Attribute	N	Now()
13	UpdateBy	Varchar (8)	Attribute	N	
14	UpdateOn	Datetime	Attribute	N	Now()

Table E.5. Structure of Payment Header Table.

No.	Field Name	Field Type	Key Type	Null	Check
1	PayNo	Varchar (11)	Primary Key	N	
2	SuppCode	Varchar (10)	Attribute	N	
3	PayDate	Date	Attribute	N	
4	Voucherno	Varchar (16)	Index	N	
5	PayStatus	Varchar (1)	Attribute	N	
6	CurrCode	Varchar(3)	Attribute	N	
7	PayMethod	Varchar (5)	Attribute	Y	
8	ChequeNum	Varchar (15)	Attribute	Y	
9	BankCode	Varchar (5)	Attribute	Y	
10	BankAct	Varchar (15)	Attribute	Y	
11	PayCurAmt	Decimal (18,2)	Attribute	N	0.00
12	PayAmt	Decimal (18,2)	Attribute	N	0.00
13	ExRate	Decimal (8,6)	Attribute	N	1.00
14	Remark	Varchar (40)	Attribute	Y	
15	WHTypeNo	Varchar (3)	Attribute	Y	
16	WHTypeDesc	Varchar (40)	Attribute	Y	
17	WHCalAmt	Decimal (18,6)	Attribute	N	0.00
18	WHPercent	Decimal (18,6)	Attribute	N	0.00
19	WHAmt	Decimal (18,6)	Attribute	N	0.00
20	CreateBy	Varchar (8)	Attribute	N	
21	CreateOn	Datetime	Attribute	N	Now()
22	UpdateBy	Varchar (8)	Attribute	N	
23	UpdateOn	Datetime	Attribute	N	Now()

Table E.6. Structure of Payment Details Table.

No.	Field Name	Field Type	Key Type	Null	Check
1	PayNo	Varchar (11)	Primary Key	N	
2	Referenceno	Varchar (20)	Primary Key	N	
3	TranCurAmt	Decimal (18,2)	Attribute	N	0.00
4	TranAmt	Decimal (18,2)	Attribute	N	0.00
5	PayCurAmt	Decimal (18,2)	Attribute	N	0.00
6	PayAmt	Decimal (18,2)	Attribute	N	0.00
7	CreateBy	Varchar (8)	Attribute	N	
8	CreateOn	Datetime	Attribute	N	Now()
9	UpdateBy	Varchar (8)	Attribute	N	
10	UpdateOn	Datetime	Attribute	N	Now()

Table E.7. Structure of Cheque Table.

No.	Field Name	Field Type	Key Type	Null	Check
1	VoucherNo	Varchar (16)	Primary Key	N	
2	ChequeNum	Varchar (15)	Index	N	
3	BankCode	Varchar (5)	Index	N	
4	ChequeDate	Date	Attribute	N	
5	ChequeStatus	Varchar (1)	Attribute	N	
6	Payto	Varchar (50)	Attribute	N	
7	CurrCode	Varchar (3)	Attribute	N	
8	ExRate	Decimal (8,6)	Attribute	N	1.00
9	ChequeCurAmt	Decimal (18,2)	Attribute	N	0.00
10	ChequeAmt	Decimal (18,2)	Attribute	N	0.00
11	CreateBy	Varchar (8)	Attribute	N	
12	CreateOn	Datetime	Attribute	N	Now()
13	UpdateBy	Varchar (8)	Attribute	N	
14	UpdateOn	Datetime	Attribute	N	Now()

Table E.8. Structure of General Ledger Header Table.

No.	Field Name	Field Type	Key Type	Null	Check
1	BhdVoucherNo	Varchar (16)	Primary Key	N	
2	BhdVchDate	Date	Attribute	N	
3	BhdCurrCode	Varchar (3)	Attribute	N	
4	BhdExRate	Decimal (8,6)	Attribute	N	1.00
5	BhdStatus	Varchar (1)	Attribute	N	
6	BhdRemark	Varchar (40)	Attribute	Y	
7	CreateBy	Varchar (8)	Attribute	N	
8	CreateOn	Datetime	Attribute	N	Now()
9	UpdateBy	Varchar (8)	Attribute	N	
10	UpdateOn	Datetime	Attribute	N	Now()

Table E.9. Structure of General Ledger Details Table.

No.	Field Name	Field Type	Key Type	Null	Check
1	BdtVoucherNo	Varchar (16)	Primary Key	N	
2	BdtSeqno	Decimal (5,0)	Primary Key	N	
3	BdtActCode	Varchar (10)	Attribute	N	
4	BdtDptCode	Varchar (5)	Attribute	N	
5	BdtNature	Varchar (1)	Attribute	N	In 'D', 'C'
6	BdtCurAmt	Decimal (18,2)	Attribute	N	0.00
7	BdtAmt	Decimal (18,2)	Attribute	N	0.00
8	BdtRemark	Varchar (40)	Attribute	Y	
9	CreateBy	Varchar (8)	Attribute	N	
10	CreateOn	Datetime	Attribute	N	Now()
11	UpdateBy	Varchar (8)	Attribute	N	
12	UpdateOn	Datetime	Attribute	N	Now()



APPENDIX F

USER INTERFACE DESIGN / USER MANUAL

USER INTERFACE DESIGN

Starting with PMM Business

Upon activation of the PMM Business System, the user has 2 chances is to enter an authorized User Identity and Password. If input were incorrect after 3 types, the program will be automatically terminated.

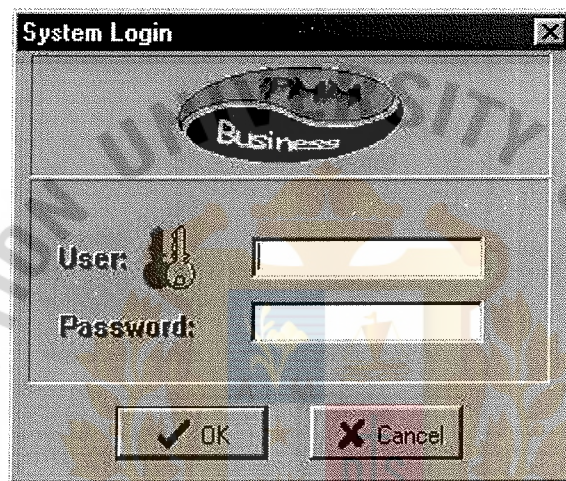


Figure F.1. System Login.

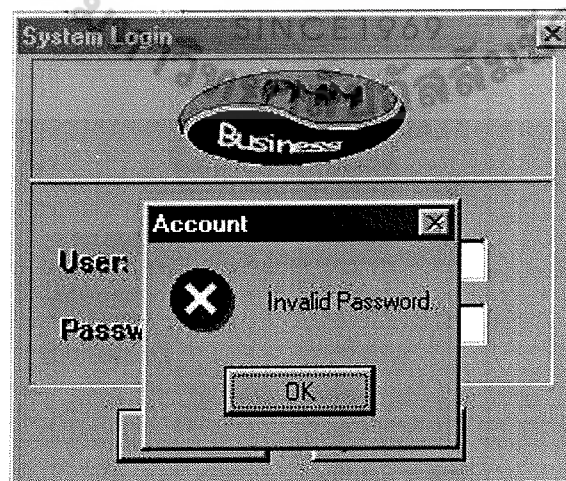


Figure F.2. System Login Error.

Main Menu



Figure F.3. Main Menu.



Icon for Account Receivable Programs.



Icon for Account Payable Programs.



Icon for General Ledger Programs.



Icon for Exit Program.

Starting with Account Payable.

After click Account Payable icon. The windows should be look like the following:

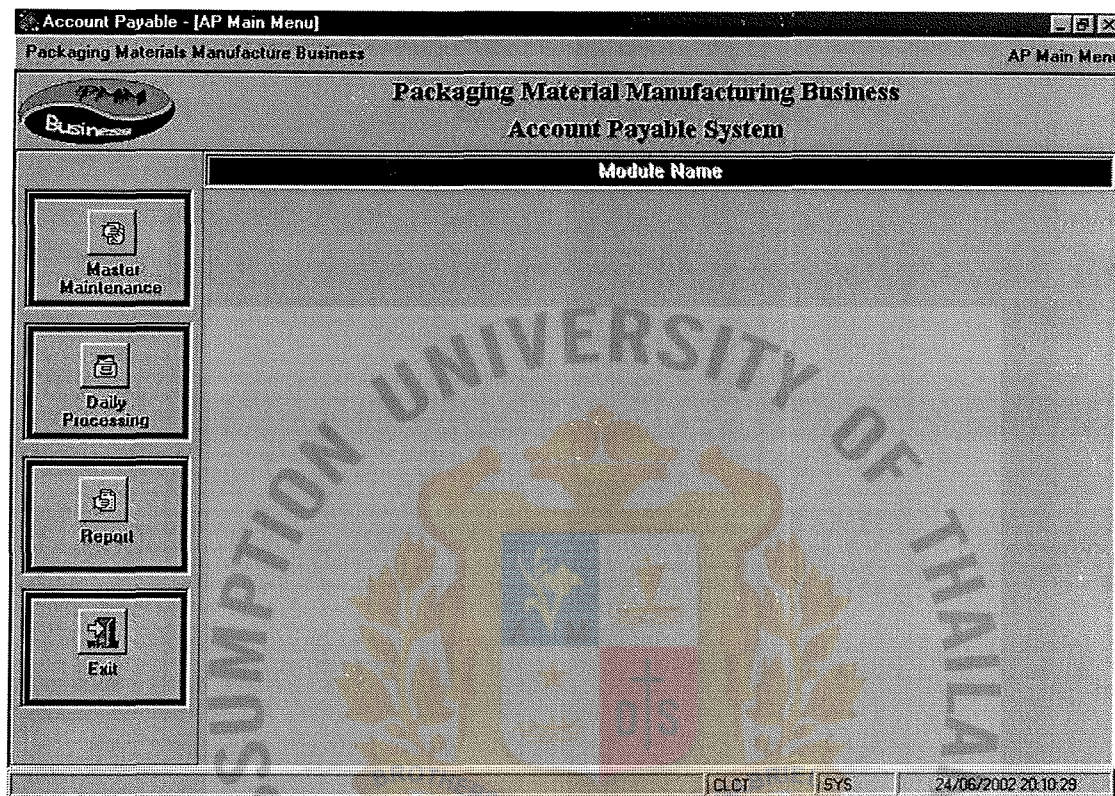


Figure F.4. Account Payable Menu.



Icon for Master Maintenance Menu.



Icon for Daily Processing Menu.



Icon for Report Menu.



Icon for Return to Main Menu.

Master Maintenance Menu

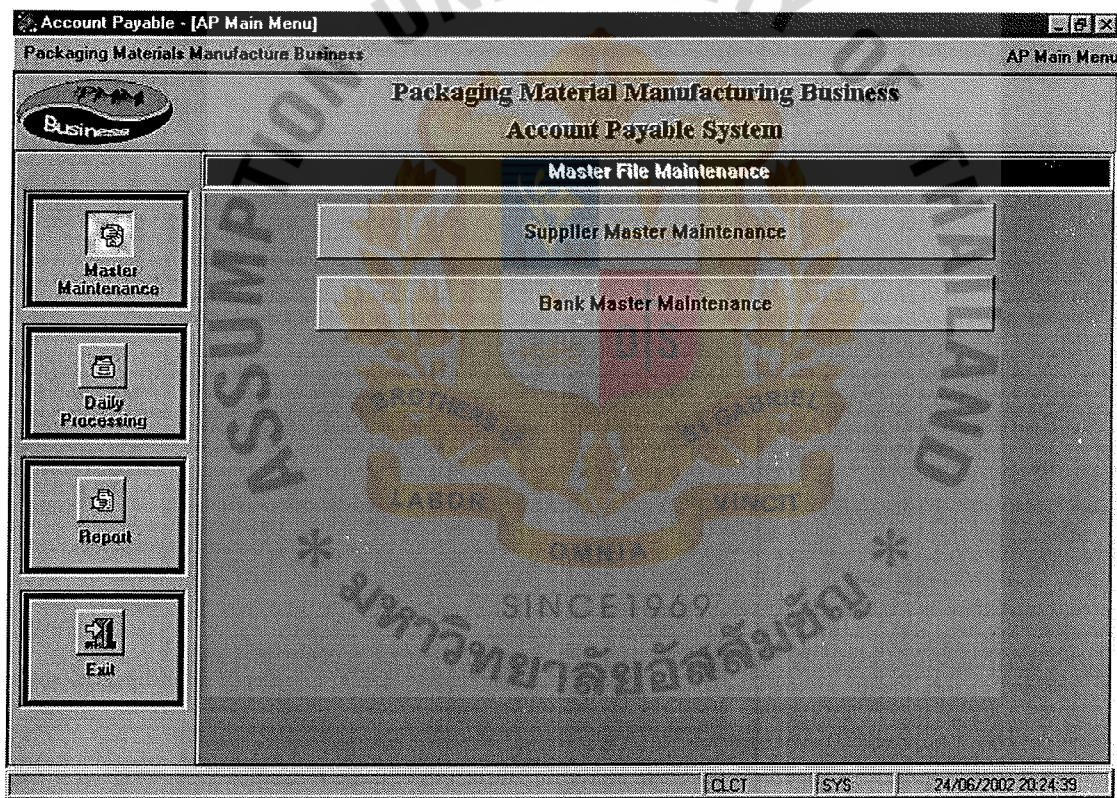


Figure F.5. Master Maintenance Menu.

Program Options

Account Payable - [Bank Master Maintenance]

Packaging Materials Manufacture Business

Bank Master Maintenance

Bank Code	Bank Name	Bank Account	Balance Amount
01	THE BANK OF TOKYO-MITSUBISHI	102-2-545101-5	100,000.00
02	THE METROPOLITAN BANK, LTD.	112-4-59852-0	150,000.00
03	BANGKOK BANK	201-0-14541-4	100,000.00
06	SAKURA BANK, LTD.	SATHORN BRANCH	
07	ASIA BANK, LTD.	HUAMARK	
08	CITI BANK, LTD.	SATHORN NORTH	
09	SIAM COMMERCIAL BANK PUBLIC C	SAM HONG	
11	KRUNG THAI BANK PUBLIC CO., LTD	BANGMAKEKARD	
12	BANK OF AYUDHYA PULIC CO., LTD	SAM HONG	

CLCT SYS 25/06/2002 14:55:52

Figure F.6. Account Payable Main Form.

- (1) Insert button to add new record.
- (2) Modify button to update the existing record.
- (3) Delete button to delete the existing record.
- (4) Find button to find the desired key of record.
- (5) Find Next button to find next record.
- (6) Print Menu button to print the report.
- (7) Close button to close the current program.

Insert button



To create the data, then click at insert button. A blank input form of the selected.

Modify button



After selection of the program function, a list of the existing records in the data file will be displayed in sequence of record key. When you retrieve data for modify. The windows will show current data at cursor.

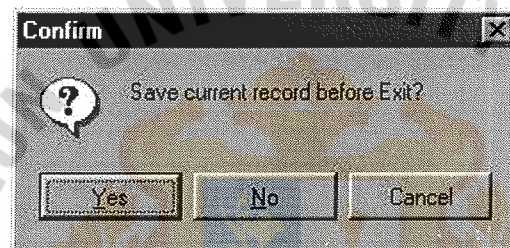


Figure F.7. Account Payable Confirmation Form.

After entering data into the form, a click of the OK button or the Cancel button will activate the confirmation screen. Click the Yes button if current data is to be saved; click the No button to Cancel the selection and turn back to the Insert window for modification of data; or click the Cancel button to exit program function.

Delete button



To delete data, position the cursor line to the data to be deleted; then click at Delete button to signify the deletion.

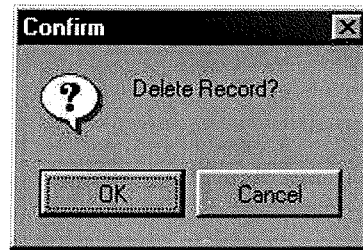


Figure F.8. Account Payable Delete Confirmation Form.

A confirms screen will appear; click the OK button if deletion of the row of data is to be activated; or click the Cancel button to cancel the deletion.

Find button 

To find data by clicking at Find button; a Located field value screen will appear as follows:

A dialog box titled "Locate Field Value". It has a "Field Value" text box at the top. Below it is a "Search Type" section with a "Case-sensitive" checkbox and three radio buttons: "Exact Match", "Partial Match at Beginning" (which is selected), and "Partial Match Anywhere". At the bottom is a "Fields" section with a dropdown menu currently showing "Bank Code". At the very bottom are three buttons: "First", "Next", and "Cancel" (with an 'X' icon).

Figure F.9. Account Payable Locate Filed Value Form.

- (1) Enter the data in Field value to be searched.
- (2) Select Search Type check box.

- (a) Case Sensitive means to search sensitive with small case and big case.
- (b) Exact match means to search by same character as enter in field value.
- (c) Partial match at beginning mean to search by beginning characters of the field value.
- (d) Partial matches anywhere means to search by any groups of characters in the field value.

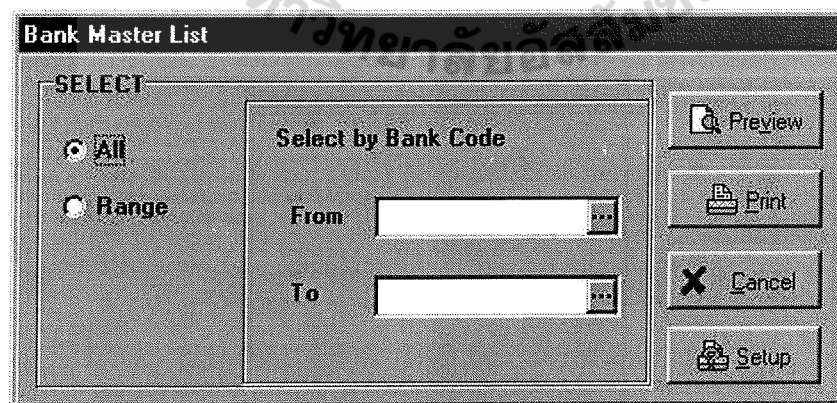
(3) Field is value to be search.

Find Next button 

Using the find button will or will not locate the entered field value, a click on the Fine Next button will locate the next record to the field value in the same table. Click of the Find Next button will search sequentially for selected field in the associated table, from the top of the table.

Print button 

Used to print out the data. User can use the Print buttons in the Print Preview window. User can print a selected range, a selected sheet, or your entire sheet.



The image shows a dialog box titled "Bank Master List". It has a "SELECT" section on the left with two radio buttons: "All" (selected) and "Range". In the center, there is a "Select by Bank Code" section with "From" and "To" labels, each followed by a text input field and a small menu icon (three dots). On the right side, there are four buttons: "Preview" (with a magnifying glass icon), "Print" (with a printer icon), "Cancel" (with an 'X' icon), and "Setup" (with a gear icon).

Figure F.10. Account Payable Print Form.

Supplier Master Maintenance

This program is designed for user to create, update and delete supplier information.

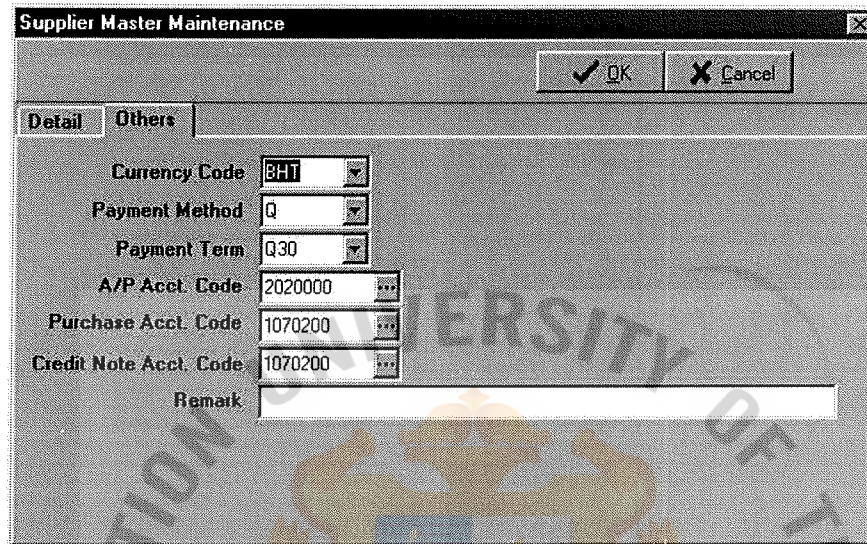
Supplier Code		0001
Supplier Name		WORLD ASIA OPERATION CO.,LTD.
Address		73 SUKHUMVIT RD., T. PAKNAM, MUANG, SAMUTPRAKARN
Country	THA	Postal Code
Telephone	3842623,7539101	Fax
Tax ID. /ID. Card No.	3271087237	<input checked="" type="radio"/> Tax ID. <input type="radio"/> ID. Card No.

Figure F.11. Supplier Master Maintenance Detail Form.

Field Definition

Supplier Code	:	Setting code of supplier.
Supplier Name	:	Input supplier name.
Address	:	Input supplier address.
Country	:	Input supplier country.
Postal Code	:	Input supplier postal code.
Telephone	:	Input the telephone number of supplier.
Fax	:	Input the Fax number of supplier.
Tax ID.	:	Input supplier tax identification.

Option Box : Choose Tax Id. When the supplier is company.
Choose Id Card No. When the supplier is person.



Supplier Master Maintenance

Detail Others

Currency Code BHT

Payment Method Q

Payment Term Q30

A/P Acct. Code 2020000

Purchase Acct. Code 1070200

Credit Note Acct. Code 1070200

Remark

OK Cancel

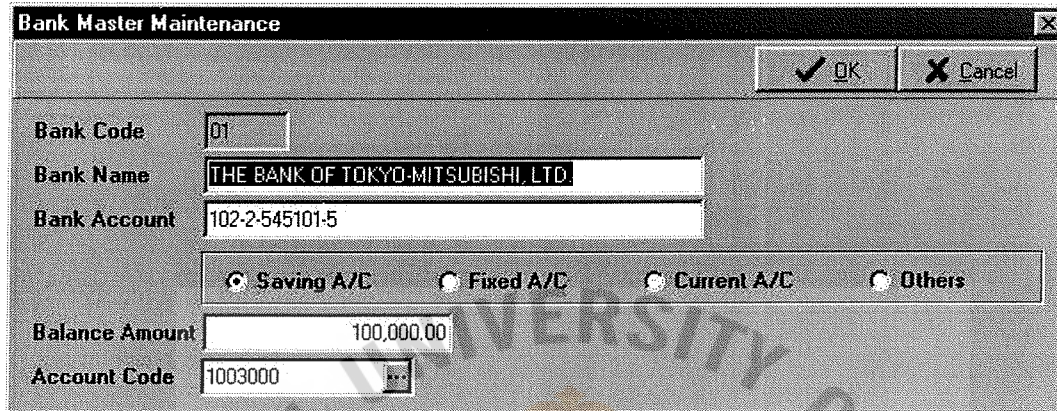
Figure F.12. Supplier Master Maintenance Other Form.

Field Definition

- Currency Code : setting code of supplier.
- Payment Method : method of supplier payment.
- Payment Term : term of supplier payment.
- A/P Acct. Code : account code for account payable.
- Purchase Acct. : account code for purchase account.
- Credit Note Acct : account code for credit note account.

Bank Master Maintenance

This program is designed for user to create, update and delete bank information.



The image shows a screenshot of a 'Bank Master Maintenance' dialog box. It has a title bar with a close button. Inside, there are several input fields and a group box for account type. The fields are: 'Bank Code' with value '01', 'Bank Name' with value 'THE BANK OF TOKYO-MITSUBISHI, LTD.', 'Bank Account' with value '102-2-545101-5', 'Balance Amount' with value '100,000.00', and 'Account Code' with value '1003000'. The 'Account Type' group box has four radio buttons: 'Saving A/C' (selected), 'Fixed A/C', 'Current A/C', and 'Others'. At the top right are 'OK' and 'Cancel' buttons.

Bank Code	01
Bank Name	THE BANK OF TOKYO-MITSUBISHI, LTD.
Bank Account	102-2-545101-5
Account Type	<input checked="" type="radio"/> Saving A/C <input type="radio"/> Fixed A/C <input type="radio"/> Current A/C <input type="radio"/> Others
Balance Amount	100,000.00
Account Code	1003000

Figure F.13. Bank Master Maintenance Form.

Field Definition

- Bank Code : Setting code of bank.
- Bank Name : Setting name of bank.
- Bank Account : for bank account number.
- Bank Type : choose type, which contain this bank account.
- Balance Amount : for amount of bank account balance.
- Account Code : account code for this bank account.

Daily Processing Menu

The day-to-day operations for the Accounts Payable system include recording and maintaining transaction all information, printing of transactional information.

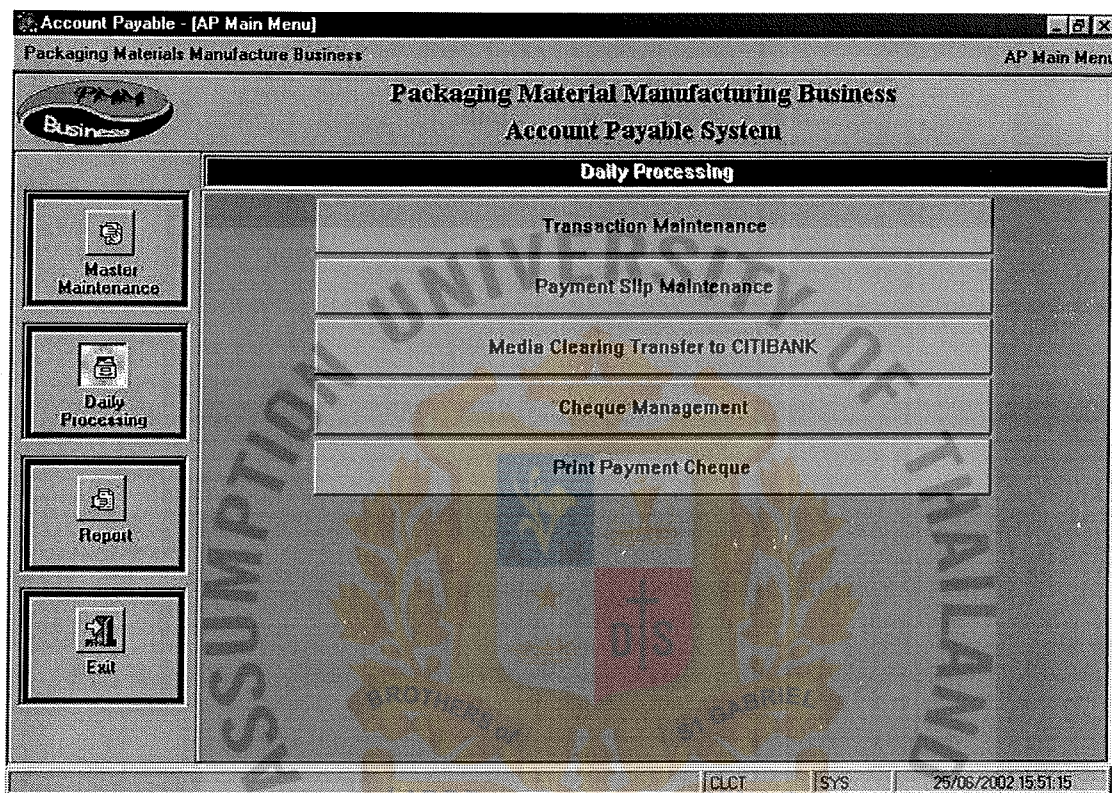


Figure F.14. Account Payable Daily Processing Menu.

Transaction Maintenance

This program is designed for user to input accounting transaction. Transaction has three types.

- (1) Invoice transaction
- (2) Debit Note transaction
- (3) Credit Note transaction

Voucher No.	Register Date	Invoice No.	Supplier Code	Supplier Name
PV/2002-06/00001	25/06/2002	001IVA	0001	WORLD ASIA OPERATION CO.,LTD.
PV/2002-06/00002	25/06/2002	IV001/02	0011	A.C.T. MARKETING LTD.,PART.

Figure F.15. Transaction Maintenance Main Form.

Invoice Transaction Maintenance

OK Cancel

Voucher Type: PV Trans. Date: 05/06/2002 Voucher No.: PV/2002-06/00001

Supplier Code: 0001 WORLD ASIA OPERATION

Credit Term: Q30 30 Days PAY CHEQUE AFTER INV. 30 DAYS

Invoice No.: 001IVA Due Date: 25/07/2002 Invoice Amount: 7,490.00

Currency Code: BHT Exchange Rate: 1.000000 Base Amount: 7,490.00

Description: Purchase of Material VAT %: 7 Val Doc. No.: 001IVA

+ Insert - Modify - Delete Find Find Next Adjust

Dpt.	Account	Account Name/Particular	Dr./Cr.	Cur. Amount	Base Amount	Job No.
001	1070200	SHOW ROOM SUPPLIES	D	7,000.00	7,000.00	
001	1150000	PROVISIONAL VAT	D	490.00	490.00	
001	2020000	ACCOUNTS PAYABLE-TRADE	C	7,490.00	7,490.00	

Total 0.00 0.00

Figure F.16. Invoice Transaction Maintenance Header Form.

Invoice Transaction Maintenance

Header Entry

- (1) Select Voucher Type of Account Payable only and input the transaction date with in the financial period.
- (2) Select the Supplier Code, after selected supplier name, Credit Term, Currency Code and Exchange Rate will show automatically and can modify.
- (3) If select new Currency Code the Exchange Rate will change up to Currency Code, that change and base amount will recalculate by new Exchange rate.
- (4) Input the Invoice Number.
- (5) Input the account detail that transfer to general ledger.

After finished entry data at header part. Click at Insert / Modify buttons below to maintain detail part.

Invoice Transaction Maintenance

OK Cancel

Act. Code 1070200 SHOW ROOM SUPPLIES

Description Purchase of Material

Posting Nature Debit

Amount 7,000.00

Figure F.17. Invoice Transaction Maintenance Detail Form.

Detail Entry

- (1) Select the Account Code, Account Name will automatically show.
- (2) Input Description.
- (3) Select Posting Nature has 2 types, Debit and Credit.
- (4) Input the Amount.

Debit Note Maintenance

Voucher Type: PV Trans. Date: 25/06/2002 Voucher No.: PV/2002-06/00003
 Supplier Code: 0001 Supplier Name: WORLD ASIA OPERATION CO.,LTD.
 Credit Term: Q30 30 Days PAY CHEQUE AFTER INV.30 DAYS
 Debit Note No.: DN001/02 Due Date: 25/07/2002 Debit Note Amount: 481.50
 Currency Code: BHT Exchange Rate: 1.000000 Base Amount: 481.50
 Description: For adjust the price list VAT %: 7 % Vat Doc. No.: DN001/02

+ Insert ▲ Modify - Delete 🔍 Find 🔍 Find Next ⚙ Adjust

Dpt.	Account	Account Name/Particular	Dr./Cr.	Cur. Amount	Base Amount	Job No.
001	1070200	SHOW ROOM SUPPLIES	D	450.00	450.00	
001	1150000	PROVISIONAL VAT	D	31.50	31.50	
▶ 001	2020000	ACCOUNTS PAYABLE-TRADE	C	481.50	481.50	

Total 0.00 0.00

Figure F.18. Debit Note Transaction Maintenance Header Form.

Debit Note Transaction Maintenance

Header Entry

- (1) Select Voucher Type of Account Payable only and input the transaction date with in the financial period.
- (2) Select the Supplier Code, after selected supplier name, Credit Term, Currency Code and Exchange Rate will show automatically and can modify.
- (3) If select new Currency Code the Exchange Rate will change up to Currency Code, that change and base amount will recalculate by new Exchange rate.
- (4) Input the Debit Note Number.
- (5) Input the account detail that transfer to general ledger.

Invoice Transaction Maintenance

Act. Code: 2020000 ACCOUNTS PAYABLE-TRADE
 Description: For adjust the price list
 Posting Nature: Credit
 Amount: 481.50

OK Cancel

Figure F.19. Debit Note Transaction Maintenance Detail Form.

Detail Entry

- (1) Select the Account Code, Account Name will automatically show.
- (2) Input Description.
- (3) Select Posting Nature has 2 types, Debit and Credit.
- (4) Input the Amount.

Credit Note Maintenance

✓ OK ✗ Cancel

Voucher Type: PV Trans. Date: 25/06/2002 Voucher No.: PV/2002-06/00004

Supplier Code: 0011 A.C.T. MARKETING LTD. PART

Credit Term: Q45 45 Days PAY CHEQUE AFTER INV. 45 DAYS

Credit Note No.: CN/02/06/01 Due Date: 09/08/2002 Credit Note Amount: 400.00

Currency Code: BHT Exchange Rate: 1.000000 Base Amount: 400.00

Description: Credit note for sales promotion VAT %: % Vat Doc. No.:

+ Insert ▲ Modify - Delete ▼ End ... Find Next ⚙ Adjust

Dpt.	Account	Account Name/Particular	Dr./Cr.	Cur. Amount	Base Amount	Job No.
001	2020000	ACCOUNTS PAYABLE-TRADE	D	400.00	400.00	
001	1070200	SHOW ROOM SUPPLIES	C	400.00	400.00	

Total 0.00 0.00

Figure F.20. Credit Note Transaction Maintenance Header Form.

Credit Note Transaction Maintenance

Header Entry

- (1) Select Voucher Type of Account Payable only and input the transaction date with in the financial period.
- (2) Select the Supplier Code, after selected supplier name, Credit Term, Currency Code and Exchange Rate will show automatically and can modify.
- (3) If select new Currency Code the Exchange Rate will change up to Currency Code, that change and base amount will recalculate by new Exchange rate.
- (4) Input the Credit Note Number.
- (5) Input the account detail that transfer to general ledger.

Act. Code	1070200	SHOW ROOM SUPPLIES
Description	Credit note for sales promotion	
Posting Nature	Credit	
Amount	400.00	

Figure F.21. Debit Note Transaction Maintenance Detail Form.

Detail Entry

- (1) Select the Account Code, Account Name will automatically show.
- (2) Input Description.
- (3) Select Posting Nature has 2 types, Debit and Credit.
- (4) Input the Amount.

Payment Slip Maintenance

This program is designed for user to create payment slip by cash or cheque or media clearing.

Payment No.	Date	Voucher No.	Supplier Code	Supplier Name
02/06-00001	26/06/2002	AP/2002-06/00001	0001	WORLD ASIA OPERATION CO.,LTD.
02/06-00002	26/06/2002	AP/2002-06/00002	0011	A.C.T. MARKETING LTD.,PART.

Figure F.22. Payment Slip Maintenance Main Form.

Payment Slip Maintenance

Payment No. : 02/06-00001 Date : 26/06/2002 Voucher Type : AP Voucher No. : AP/2002-06/00001

Supplier Code : 0001 Name : WORLD ASIA OPERATION CO., LTD.

Address : 73 SUKHUMVIT RD., T. PAKNAM,
MUANG, SAMUTPRAKARN

Description : Payment by cash

Transaction Payment | Payment by | G/L Transaction Input

+ Insert ▲ Modify - Delete ✓ End ... Find Next ✓ Confirm

☐ Input Withholding TAX

Ref. No.	Issued Date	Due Date	Curr. Outstanding Amt.	Settled Amount	Ex. Rate	Curr. Ex. Rate	Base Amount	W/
001IVA	25/06/2002	25/07/2002	00.00	7,490.00	1.000000	1.000000	7,490.00	
DN001/02	25/06/2002	25/07/2002	00.00	481.50	1.000000	1.000000	481.50	

Total 7,971.50 0.00

Figure F.23. Payment Slip Transaction Payment Form.

Detail of Payment Slip Transaction

- (1) Payment Number will automatically running.
- (2) Input payment date.
- (3) Select the voucher type.
- (4) Select Supplier code.
- (5) After select supplier code, supplier information will automatically shown.

The screenshot shows a 'Payment Detail' window with a 'Pay' tab selected. The window contains the following fields and values:

Reference No.	DN001/02	
Issued Date	25/06/2002	
Due Date	25/07/2002	
Curr. Outstanding Amt	0.00	Exchange Rate
Settled Amount	481.50	Base Amount
		1.000000
		481.50

Buttons: OK, Cancel

Figure F.24. Payment Slip Transaction Detail Form.

- (6) Select the Reference number (Invoice number).
- (7) Input settled amounts that can less than or equal total amount of invoice.
- (8) Click OK Button when finish or Cancel button when you want to abort this task.

Withholding TAX

Under section 3 tredecim of Revenue Code

W/H Calc. Amount: 7000

Withholding TAX: 3 % Withholding Amount: 210.00

Withholding Type: 008 ...

Others

W/H Calc. Amount:

Withholding TAX: % Withholding Amount:

Withholding Type: ...

Figure F.25. Withholding Tax Detail Form.

- (9) Input withholding tax calculate amount.
- (10) Input withholding tax percentage withholding amount automatically calculates.
- (11) Select the withholding Type.

Payment Slip Maintenance

Payment No. : 02/06-00001 Date : 26/06/2002 Voucher Type : AP Voucher No. : AP/2002-06/00001

Supplier Code : 0001 Name : WORLD ASIA OPERATION CO.,LTD.

Address : 73 SUKHUMVIT RD., T. PAKNAM,
MUANG, SAMUTPRAKARN

Description : Payment by cash

Transaction Payment Payment by G/L Transaction Input

Payment Information

Pay By : ☒ Cash ☐ Cheque ☐ Media Clearing

Ex. Rate : 1.000000 Cash Amount : 7761.50

Misc. Discount :

Bank Charge : 0

W/H Amount : 210.00 BHT 210.00 BHT

Settled Amount : 7,971.50 BHT 7,971.50 BHT

Exchange Gain/Loss : 0.00 BHT

Overpay Amount : 0.00 BHT 0.00 BHT

G/L Transaction Input

Figure F.26. Cash Payment Detail Form.

- (1) Input Exchange rate.
- (2) Input miscellaneous discount.
- (3) Input bank charge.
- (4) Program automatically calculates cash amount (settled amount – withholding tax – miscellaneous – bank charge).

Payment Slip Maintenance

Payment No. : 02/06-00001 Date : 26/06/2002 Voucher Type : AP Voucher No. : AP/2002-06/00001

Supplier Code : 0001 Name : WORLD ASIA OPERATION CO.,LTD.

Address : 73 SUKHUMVIT RD., T. PAKNAM,
MUANG, SAMUTPRABHARN

Description : Payment by cash

Transaction Payment Payment by G/L Transaction Input

Payment Information

Pay By : ☐ Cash ☒ Cheque ☐ Media Clearing

Ex. Rate : 1.000000 Cheque Amount : 7,761.50

Misc. Discount : Bank Charge : 0

Chq No. : 4501450 W/H Amount : 210.00 BHT 210.00 BHT

Date : 26/06/2002 Settled Amount : 7,971.50 BHT 7,971.50 BHT

Bank Code : 02 Exchange Gain/Loss : 0.00 BHT 0.00 BHT

Overpay Amount : 0.00 BHT 0.00 BHT

G/L Transaction Input

Figure F.27. Cheque Payment Detail Form.

- (1) Input Exchange rate.
- (2) Input miscellaneous discount.
- (3) Input bank charge.
- (4) Input cheque number, cheque date and bank cheque.
- (5) Program automatically calculates amount (settled amount – withholding tax – miscellaneous – bank charge).

Payment Slip Maintenance

Payment No. : 02/06-00001 Date : 26/06/2002 Voucher Type : AP Voucher No. : AP/2002-06/00001

Supplier Code : 0001 Name : WORLD ASIA OPERATION CO., LTD.

Address : 73 SUKHUMVIT RD., T. PAKNAM,
MUANG, SAMUTPRAKARN

Description : Payment by cash

Transaction Payment : Payment by G/L Transaction Input

Payment Information

Pay By : ☐ Cash ☐ Cheque ☒ Media Clearing

Ex. Rate : 1.000000 Media Clearing Type :

Misc. Discount : Media Clearing Amount : 7,761.50

Bank Charge : 0

Bank Code : 06 W/H Amount : 210.00 BHT 210.00 BHT

Account No. : 145647890 Settled Amount : 7,971.50 BHT 7,971.50 BHT

Account Name : WORLD ASIA OPERATION CO., LTD. Exchange Gain/Loss : 0.00 BHT 0.00 BHT

Date : 26/06/2002 Overpay Amount : 0.00 BHT 0.00 BHT

G/L Transaction Input

Figure F.28. Media Clearing Payment Detail Form.

- (1) Input Exchange rate.
- (2) Input miscellaneous discount.
- (3) Input bank charge.
- (4) Input bank code, account number and date for payment.
- (5) Input media clearing type.
- (6) Program automatically calculates amount (settled amount – withholding tax – miscellaneous – bank charge).

Payment Slip Maintenance

Payment No. : 02/06-00001 Date : 26/06/2002 Voucher Type : AP Voucher No. : AP/2002-06/00001

Supplier Code : 0001 Name : WORLD ASIA OPERATION CO.,LTD.

Address : 73 SUKHUMVIT RD., T. PAKNAM,
MUANG, SAMUTPRAKARN

Description : Payment by cash

Transaction Payment | Payment by | G/L Transaction Input

+ Insert ▲ Modify - Delete ▼ Find ... Find Next [X] Close

Account	Account Name/Particular	Dr. / Cr.	Cur. Amount	Base Amount
2020000	ACCOUNTS PAYABLE-TRADE	D	7,971.50	7,971.50
1004530	GENERAL DEPOSITS (KRUNGSRI BANK)	C	7,761.50	7,761.50
2110030	WITHHOLDING INCOME TAX	C	210.00	210.00

Running Total 0.00 0.00

Figure F.29. General Ledger Transaction Form.

Transaction Record	
<input checked="" type="button" value="OK"/> <input type="button" value="Cancel"/>	
Account Code	2020000
Account Name	ACCOUNTS PAYABLE-TRADE
Description	Payment by cash
Dr./Cr.	Debit
Curr. Amount	7,971.50
Base Amount	7,971.50

Figure F.30. General Ledger Detail Form.

- (1) Select Account Code then account name will show automatically.
- (2) Description can modify.
- (3) Select the account nature 2 types debit or credit.

Media Clearing Transfer

This program is designed for user to export media clearing information to text file.

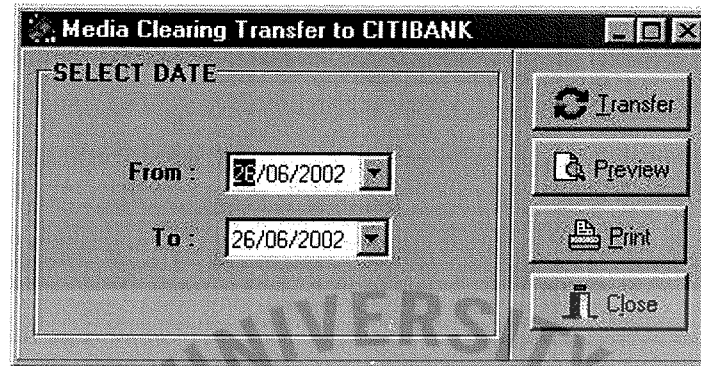
A dialog box titled "Media Clearing Transfer to CITIBANK". It contains a "SELECT DATE" section with "From" and "To" date pickers, both set to "26/06/2002". On the right side, there are four buttons: "Transfer" (with a circular arrow icon), "Preview" (with a magnifying glass icon), "Print" (with a printer icon), and "Close" (with a door icon).

Figure F.31. Media Clearing Transfer Form.

Program option

- (1) Transfer button to transfer record
- (2) Preview button to preview existing data.
- (3) Print button to print existing data.

After click transfer button the program will show the following.

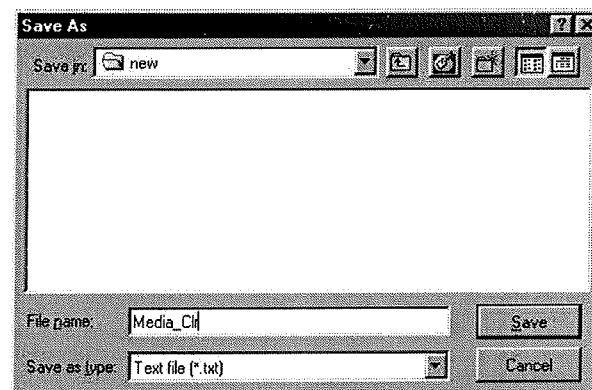
A "Save As" dialog box. The "Save in" field shows a folder icon and the text "new". Below this is a large empty rectangular area. At the bottom, the "File name" field contains "Media_Ci" and the "Save as type" dropdown menu is set to "Text file (*.txt)". There are "Save" and "Cancel" buttons on the right.

Figure F.32. Media Clearing Save Form.

Cheque Management

This program is designed for user to manage cheque transaction.

Type	Matured Date	Cheque No.	Cheque Date	Payee Name	Base Amount
<input type="checkbox"/>		0651996	20/03/2002	APOLLO (THAILAND) CO.,LTD.	19,987.60
<input type="checkbox"/>		0651998	20/03/2002	AUTOFLEXIBLE ENGINEERING CO.,LTD.	7,118.50
<input type="checkbox"/>		451045678	27/06/2002	A.C.T. MARKETING LTD.,PART.	26,000.00

Figure F.33. Cheque Management Form.

- (1) Select bank code for control cheque.
- (2) Select the option for select data (Cheque type, Sort By, Managed)
- (3) Check before the cheque number, which cheque mature.

Print Payment Cheque

This program is designed for user to print payment cheque.

Print Payment Cheque

Payee Type
☒ Creditor ☐ Debtor ☐ Other...

Language
☒ English ☐ Local

Detail

Creditor / Debtor : 0011 A.C.T. MARKETING LTD.,PART.

Payee Name : A.C.T. MARKETING LTD.,PART.

Reference No. : 02/06-00002

Bank Code : BBL

Cheque No. : 451045678

Cheque Date : 27/06/2002

Cheque Amount : 26,000.00

Amount in words : (Twenty Six Thousand Baht Only.)

Print Option

Bearer Cheque : ☒ Yes ☐ No

Crossed Cheque : ☒ Yes ☐ No

Detail of Crossed Cheque : NONE

Preview Print Close

Figure F.34. Print Payment Cheque Form.

Program option:

- (1) Select payee type for supplier or customer.
- (2) Select language to printing.
- (3) Select the supplier or customer code then name will show automatically.
- (4) Select reference number for print cheque then cheque information will show automatically.
- (5) User input the option for print cheque.

Report Menu

The programs under this category are all for report printing. Each program is specifically designed for presenting the information in the Accounts Payable for accounting and management evaluations.

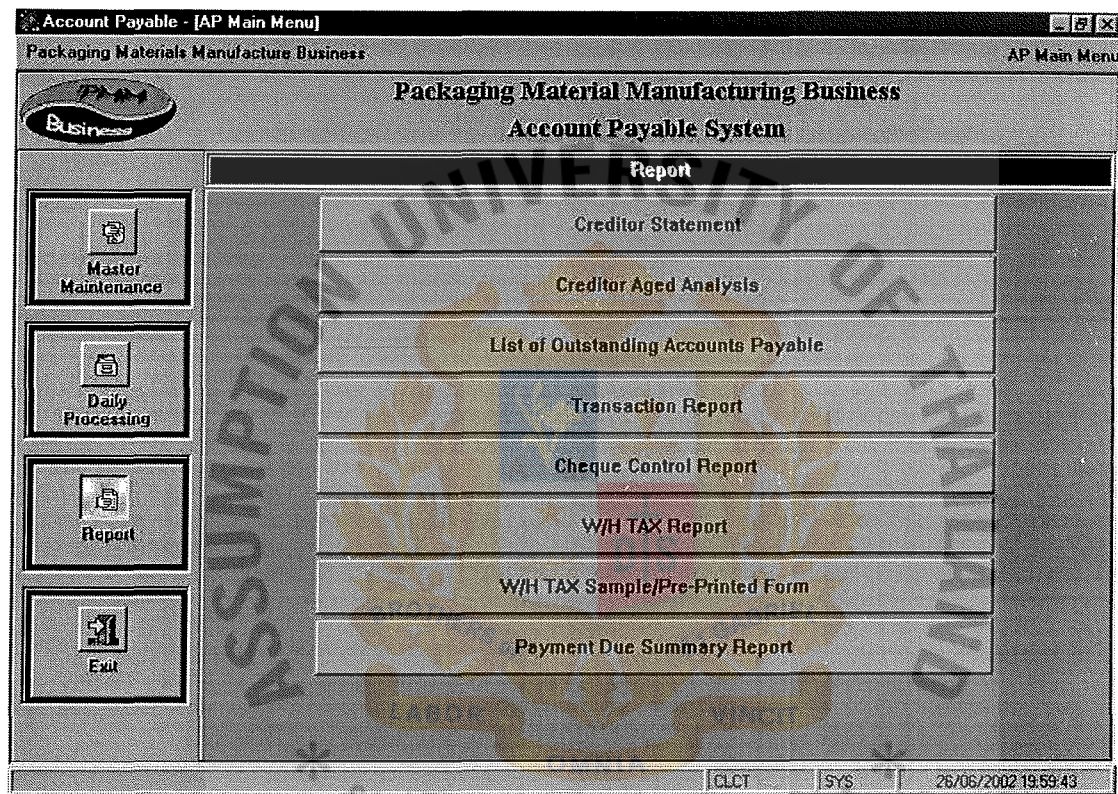


Figure F.35. Report Menu.



Packaging Materials Manufacture Business

Account Payable

Voucher No. : PV/2002-06/00005

Date : 26/06/2002

Supplier Code : 0003 K.S.QUALITY GROUP CO.,LTD.

Invoice No. : INV02/06/05401

Due Date : 26/07/2002

Currency Amount : 9,095.00 BHT

Trans. Date : 26/06/2002

Ex. Rate : 1.000000

Base Amount : 9,095.00 BHT

Description : Purchase for material PO order number 87

Acct. Code	Account Description/Particular	Dr./Cr.	Currency Amount	Base Amount
1070200	SHOW ROOM SUPPLIES Purchase for material PO order number 87	Dr	8,500.00	8,500.00
1150000	PROVISIONAL VAT Purchase for material PO order number 87	Dr	595.00	595.00
2020000	ACCOUNTS PAYABLE-TRADE Purchase for material PO order number 87	Cr	9,095.00	9,095.00
Total			0.00	0.00

Prepared By :	Checked By :	Approved By :

Figure G.1. Report of Invoice Transaction Voucher.

Packaging Materials Manufacture Business

Account Payable

Voucher No. : PV/2002-06/00006

Date : 26/06/2002

Supplier Code : 0012 AAA MACHINERY AND TOOLS CO., LTD.

Debit Note No. : DN 45/0212

Due Date : 25/08/2002

Currency Amount : 481.50 BHT

Trans. Date : 26/06/2002

Ext. Rate : 1.000000

Base Amount : 481.50 BHT

Description : Add price

Acct Code	Account Description/Particular	Dr./Cr.	Currency Amount	Base Amount
1070200	SHOW ROOM SUPPLIES Add price	Dr	450.00	450.00
1150000	PROVISIONAL VAT Add price	Dr	31.50	31.50
2020000	ACCOUNTS PAYABLE-TRADE Add price	Cr	481.50	481.50
Total			0.00	0.00

Prepared By :	Checked By :	Approved By :

Figure G.2. Report of Debit Note Transaction Voucher.

Packaging Materials Manufacture Business

Account Payable

Voucher No. : PW/2002-06/00006

Date : 26/06/2002

Supplier Code : 0012 A.A.A.MACHINERY AND TOOLS CO.,LTD.

Debit Note No. : DN 45/0212

Due Date : 25/06/2002

Currency Amount : 481.50 BHT

Trans. Date : 26/06/2002

Ex. Rate : 1.000000

Base Amount : 481.50 BHT

Description : Add price

Acct Code	Account Description/Particular	Dr./Cr.	Currency Amount	Base Amount
1070200	SHOW ROOM SUPPLIES Add price	Dr	450.00	450.00
1150000	PROVISIONAL VAT Add price	Dr	31.50	31.50
2020000	ACCOUNTS PAYABLE-TRADE Add price	Cr	481.50	481.50
Total			0.00	0.00

Prepared By :	Checked By :	Approved By :

Figure G.3. Report of Credit Note Transaction Voucher.

Packaging Materials Manufacture Business

Bangpoo Industrial Estate,
Rattana 1 Road,
Moo 4, Tambol Praksa,
Amphur Muang, Samutprakarn

Payment No : 02/06-00001
Page : 1

Payment

Pay To : WORLD ASIA OPERATION CO., LTD.
Address : 73 SUKHUMMIT RD., T. PAKNAM,
MUANG, SAMUTPRAKARN

Pay by Media Clearing

Date : 26/06/2002

Acct. Code	Account Description / Particular	Dr. / Cr.	Currency Amount	Base Amount
2020000	ACCOUNTS PAYABLE-TRADE Payment by cash	Dr.	7,971.50	7,971.50
1004530	GENERAL DEPOSITS (KRUNGSRI BANK) Payment by cash	Cr.	7,761.50	7,761.50
2110030	WITHHOLDING INCOME TAX Payment by cash	Cr.	210.00	210.00
Total			0.00	0.00

No.	Reference No.	Issued Date	Due Date	Settled Curr. Amount (BHT)	Settled Base Amount	W.H. TAX Amount (1)	W.H. TAX Amount (2)	Net Amount
1	0011VA	25/08/2002	25/07/2002	7,490.00	7,490.00	TAX	-	-
2	DN001A02	25/08/2002	25/07/2002	491.50	491.50	TAX	-	-
Total Amount				7,971.50	7,971.50	210.00	0.00	7,761.50

BANK ACCOUNT CODE : 145847890

BANK CODE : 08

RECEIVED DATE :

APPROVED DATE :

RECEIVED BY :

APPROVED BY :

PREPARED BY :

CHECKED BY :

Figure G.4. Report of Payment Voucher.

Packaging Materials Manufacture Business

26/08/2002
20:26

Media Clearing Transfer Report

Date between : 24/08/2002 - 26/07/2002

NO. VENDOR	NAME	BANK	BANK BRANCH	A/C NO.	AMOUNT BEFORE TAX	AMOUNT AFTER TAX
1 0001	WORLD ASIA OPERATION CO.,LTD.	SAKIR	SATHORN BRANCH	00145647890	7,871.50	7,761.50
Media Clearing Transaction				1 Items	7,871.50	7,761.50
				Total Amount	7,871.50	7,761.50

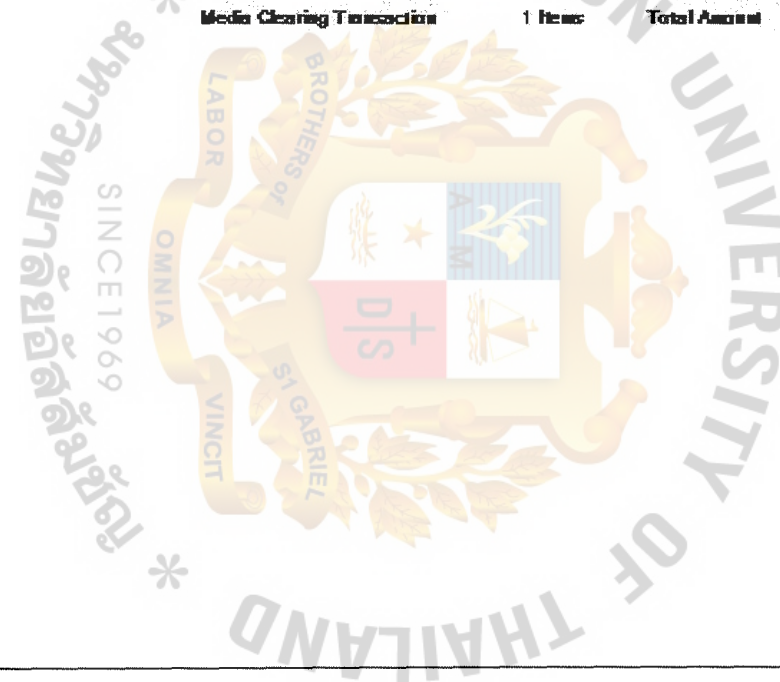


Figure G.5. Media Clearing Transfer Report.

Packaging Materials Manufacture Business

28/08/2002
20:35

Creditor Statement

Base Currency : BHT

As of June 28, 2002

Creditor Code : 0001 WORLD ASIA OPERATION CO.,LTD.
73 SUKHUMVIT RD., T. PAKNAM,
MUANG, SAMUTPRAKARN

Type	Trans.	Date Due	Date	Reference No.	PARTICULARS	Foreign Currency	Trans. Amount	Payment Amt.	Curr/ Ex. Rate	Base Currency	Trans. Amount	Payment Amt.	Balance B/F
N	25/08/2002	25/07/2002	001MA		Purchase of Material		7,490.00	7,490.00	BHT/ 1.000000		7,490.00	7,490.00	0.00Cr
DN	25/08/2002	25/07/2002	DN001/02		For adjust the price list		491.50	491.50	BHT/ 1.000000		491.50	491.50	0.00Cr

Currency	BHT
Amount	0.00

***** Aged by Invoice Date *****

Base	0 - 30 Days	31 - 60 Days	61 - 90 Days	91 - 120 Days	Over 120 Days	Deposit	Overpay	Credit Note	Change on Total
Amount	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Outstanding									0.00

END OF REPORT

Remark : N = Invoice, DN = Debit Note, CN = Credit Note, DP = Deposit

Page : 1

Figure G.6. Creditor Statement Report.

Packaging Materials Manufacture Business

26/06/2002

20.40

Creditor Aged Analysis

Base Currency : BHT

Creditor Code From 0001 To Y007

Up to June 26, 2002 (**** Aged by Invoice Date ****)

Currency : BHT

Creditor Code & Name

Department Code & Name

		0-30 Days	31-60 Days	61-90 Days	91-120 Days	Over 120 Days	C/S Amount	Deposit	Credit term	Overpay Amt. (BHT)	Actual C/S Amt.
0001	WORLD ASIA OPERATION CO., LTD.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30 Days	0.00	0.00
0003	K.S. QUALITY GROUP CO., LTD.	9,095.00	0.00	0.00	0.00	0.00	9,095.00	0.00	30 Days	0.00	0.00
0011	A.C.T. MARKETING LTD., PART.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45 Days	0.00	0.00
0012	A A A MACHINERY AND TOOLS CO., LTD.	491.50	0.00	0.00	0.00	0.00	491.50	0.00	60 Days	400.00	400.00
		491.50	0.00	0.00	0.00	0.00	491.50	0.00	0.00	0.00	491.50
	Grand Total	9,576.50	0.00	0.00	0.00	0.00	9,576.50	0.00	400.00	0.00	9,176.50

Figure G.7. Creditor Aged Analysis Report.

Packaging Materials Manufacture Business

26/08/2002
2042

List of Outstanding Accounts Payable

Base Currency : BHT

Creditor Code : 0001 - Y007
For the month of June 2002

Creditor Code & Name Reference No.	Type	Contact No.	Trans. Date	Due Date	Beginning Balance	Buy of this month	Pay out	Ending Balance
0001	WORLD ASIA OPERATION CO.,LTD.							
001WA	IV		25/08/2002	25/07/2002	0.00	7,490.00	7,490.00	0.00
DN001/02	DN		25/08/2002	25/07/2002	0.00	491.50	491.50	0.00
Creditor Total					0.00	7,971.50	7,971.50	0.00
0003	K.S.QUALITY GROUP CO.,LTD.							
M02/08/05401	IV		28/08/2002	28/07/2002	0.00	9,085.00	0.00	9,085.00
Creditor Total					0.00	9,085.00	0.00	9,085.00
0011	A.C.T. MARKETING LTD.,PART.							
CN/02/08/01	CN		25/08/2002	08/08/2002	0.00	-400.00	0.00	-400.00
M001/02	IV		25/08/2002	08/08/2002	0.00	26,750.00	26,750.00	0.00
Creditor Total					0.00	26,350.00	26,750.00	-400.00
0012	A.A.A.MACHINERY AND TOOLS CO.,LTD.							
DN 45/0212	DN		28/08/2002	25/08/2002	0.00	491.50	0.00	491.50
Creditor Total					0.00	491.50	0.00	491.50
Grand Total					0.00	43,898.00	34,721.50	9,176.50

Figure G.8. List of Outstanding Account Payable Report.

Packaging Materials Manufacture Business

26/06/2002
20:45

TRANSACTION LIST

BY CREDITOR

Voucher No. : PW/2002-06/00001 - PW/2002-06/00003

Creditor Code & Name		Date	Voucher No.	Type	Curr. Code	Ex. Rate	Curr. Amount	Base Currency Code : BHT	
Document								Base Amount	Status
0001	WORLD ASIA OPERATION CO.,LTD.								
001IVA		25/06/2002	PW/2002-06/00001	IV	BHT	1.000000	7,490.00	7,490.00	S
001	1070200	SHOW ROOM SUPPLIES			BHT		7,000.00	7,000.00	Dr.
001	1150000	PROVISIONAL VAT			BHT		490.00	490.00	Dr.
001	2020000	ACCOUNTS PAYABLE-TRADE			BHT		7,490.00	7,490.00	Cr.
DN001/02		25/06/2002	PW/2002-06/00003	DN	BHT	1.000000	481.50	481.50	S
001	1070200	SHOW ROOM SUPPLIES			BHT		450.00	450.00	Dr.
001	1150000	PROVISIONAL VAT			BHT		31.50	31.50	Dr.
001	2020000	ACCOUNTS PAYABLE-TRADE			BHT		481.50	481.50	Cr.
							Total Debits	7,971.50	
							Total Credits	7,971.50	
0011	A.C.T. MARKETING LTD.,PART.								
IV001/02		25/06/2002	PW/2002-06/00002	IV	BHT	1.000000	26,750.00	26,750.00	S
001	1070200	SHOW ROOM SUPPLIES			BHT		25,000.00	25,000.00	Dr.
001	1150000	PROVISIONAL VAT			BHT		1,750.00	1,750.00	Dr.
001	2020000	ACCOUNTS PAYABLE-TRADE			BHT		26,750.00	26,750.00	Cr.
							Total Debits	26,750.00	
							Total Credits	26,750.00	
							Grand Total Debits	34,721.50	
							Grand Total Credits	34,721.50	

Figure G.9. Transaction List Report.

Packaging Materials Manufacture Business

26/06/2002
20:49

Payment Cheque Report									
Ledger Payee Code : 0011 - A019									
Payee Code & Name	Cheque No.	BK. Code	Issued Date	Voucher No.	Chq. Date	Curr. Amount	Curr. Code	Ex. Rate	Pay To Base Amount
0011	A.C.T. MARKETING LTD.,PART.								V
	451045678	03	26/06/2002	AP/2002-06/00002	27/06/2002	26,000.00	BHT	1.000000	26,000.00
									26,000.00

Figure G.10. Payment Cheque Report.

Packaging Materials Manufacture Business

รายงานภาษีหัก ณ ที่จ่าย

ใบต่อ ภ.ง.ด. 53

เลขประจำตัวผู้เสียภาษี

3578415469

สำหรับเดือน

มิถุนายน 2545

ลำดับ ที่	ชื่อ/ที่อยู่ ผู้รับเงิน ได้พึงประเมิน	เลขประจำตัว ผู้เสีย ภาษีอากร	ว/ค/ป ที่จ่าย	ประเภทเงินได้ ที่จ่าย (*)	อัตรากา ร้อยละ	จำนวนเงิน ที่จ่าย ในครั้ง นี้	จำนวนเงินภาษีที่ หักและนำส่ง ในครั้ง นี้	เงื่อนไข (**)
1	A.C.T. MARKETING LTD. PART. 13 SOI CHANG THONG, THADINDAENG ROAD., OMDEJCHAOPHAYA, KLONGSAN, BANGKOK 10600	3102837451	26/06/2545	ค่าจ้างทำของ	3.00	25,000.00	750.00	(1)
2	WORLD ASIA OPERATION CO., LTD. 73 SUKHUMVIT RD., T. PAKNAM, MUANG, SAMUTPRAKARN 10270	3271087237	26/06/2545	ค่าจ้างทำของ	3.00	7,000.00	210.00	(1)
รวมยอดเงินได้และภาษีนำส่ง						32,000.00	960.00	

หมายเหตุ

* ให้ระบุว่าเป็นค่าอะไร เช่น ค่าเช่าอาคาร ค่าสอบบัญชี ค่าออกแบบ ค่าก่อสร้างโรงเรียน ค่าซื้อเครื่องพิมพ์ดีด
ค่าซื้อพืชผลทางการเกษตร (ยางพารา มันสำปะหลัง ปอ ข้าว ฯลฯ) ค่าจ้างทำของ ค่าจ้างโฆษณา ดอกเบี้ยเงินฝาก
ดอกเบี้ยตัวเงิน เงินปันผล เงินส่วนแบ่งของกำไร รางวัลในการประกวด การแข่งขัน การชิงโชค ฯลฯ

ลงชื่อ.....ผู้จ่ายเงิน

ตำแหน่ง.....

ยืนยันวันที่.....เดือน.....พ.ศ.....

** เงื่อนไขการหักภาษี ณ ที่จ่าย ให้กรอก ดังนี้ - หัก ณ ที่จ่าย กรอก 1 - ออกภาษีให้ กรอก 2

Figure G.11. P.N.D. 3 / 53 Report.

หนังสือรับรองการหักภาษี ณ ที่จ่าย ตามมาตรา 50 ทวิ แห่งประมวลรัษฎากร

1. ชื่อและที่อยู่ / ของผู้มีหน้าที่หักภาษี ณ ที่จ่าย
Packaging Materials Manufacture Business
Bangpoo Industrail Estate,
Rattana 1 Road, Moo 4, Tambol Praksa,
Amphur Muang, Samutprakarn

2. ชื่อและที่อยู่ ของผู้ถูกหักภาษี ณ ที่จ่าย
A.C.T. MARKETING LTD., PART.
13 Soi Chang Thong, Thadindaeng Road.,
Somdejchaophaya, Klongsan, Bangkok.

เลขประจำตัวผู้เสียภาษีอากรของผู้หักภาษี ณ ที่จ่าย

เลขประจำตัวผู้เสียภาษีอากรของผู้ถูกหักภาษี ณ ที่จ่าย

3 5 7 8 4 1 5 4 6 9

3 1 0 2 8 3 7 4 5 1

ประเภทเงินได้ที่จ่าย	วันเดือนปี หรือปีภาษีที่จ่าย	จำนวนเงินที่จ่าย	ภาษีที่หักและ นำส่งไว้
1. เงินเดือน ค่าจ้าง เบี้ยเลี้ยง โบนัส ฯลฯ ตามมาตรา 40 (1)			
2. ค่าธรรมเนียม ค่านายหน้า ฯลฯ ตามมาตรา 40 (2)			
3. ค่าแห่งลิขสิทธิ์ ฯลฯ ตามมาตรา 40 (3)			
4. (1) ค่าดอกเบี้ย ฯลฯ ตามมาตรา 40 (4)(ก)			
(2) เงินปันผล เงินส่วนแบ่งกำไร ฯลฯ ตามมาตรา 40 (4)(ข)			
5. การจ่ายเงินได้ที่ต้องหักภาษี ณ ที่จ่ายตามคำสั่งกรมสรรพากร ที่ ออกตาม มาตรา 3 เตรส เช่น ค่าซื้อพืชผลทางการเกษตร (ยาง พารา มันสำปะหลัง ปอ ข้าว ฯลฯ) รางวัลในการประกวด การ แข่งขัน การชิงโชค ร้องเพลง ค่าแสดงภาพยนตร์ ดนตรี รับจ้าง ทำของ วิชาชีพอิสระ ค่าบริการ ค่าเช่า ค่าโฆษณา ฯลฯ	26/06/2545	25,000.00	750.00
6. อื่น ๆ (ระบุ)			
รวมเงินที่จ่ายและภาษีที่หักนำส่ง		25,000.00	750.00

รวมเงินภาษีที่หักนำส่ง (ตัวอักษร) (เจ็ดร้อยห้าสิบบาทถ้วน)

ลำดับที่ ในแบบ ☐ (1) ภ.ง.ด. 1ก. ☐ (2) ภ.ง.ด. 1ก.(พิเศษ) ☐ (3) ภ.ง.ด. 2 ☐ (4) ภ.ง.ด. 2ก.
☐ (5) ภ.ง.ด. 3. ☐ (6) ภ.ง.ด. 3ก. ☐ (7) ภ.ง.ด. 53

ผู้จ่ายเงิน ☐ (1) หักภาษี ณ ที่จ่าย ☐ (2) ออกภาษีให้ตลอดไป ☐ (3) ออกภาษีให้ครั้งเดียว
☐ (4) อื่นๆ ระบุ.....

☐ ในปีนี้ได้ถูกหักเงินส่งเข้ากองทุน ซึ่งมีสิทธิหักลดหย่อนได้

☐ เงินสะสมจ่ายเข้ากองทุนสำรองเลี้ยงชีพตามใบอนุญาตเลขที่ 18/2533 จำนวนเงิน.....บาท
 เงินสมทบเข้ากองทุนประกันสังคมตามกฎหมายว่าด้วยประกันสังคม จำนวนเงิน.....บาท

ขอรับรองว่าข้อความและตัวเลขดังกล่าวข้างต้นถูกต้องตรงกับความจริงทุกประการ

ลงชื่อ.....ผู้มีหน้าที่หักภาษี ณ ที่จ่าย

...../...../.....

(วันเดือนปี ที่ออกหนังสือรับรอง ฯ)

Figure G.12. Withholding Tax Certificate.

Packaging Materials Manufacture Business

26/06/2002
21:02

Payment Due Summary Report

Date : 24/06/2002 - 31/08/2002

Due Date	Creditor Code & Name	Reference No.	Voucher No.	Type	Date	Tran. Amount
26/07/2002	0003	K.S.QUALITY GROUP CO.,LTD. IV02/06/05401	PV/2002-06/00005	IV	26/06/2002	9,095.00
			Total of 26/07/2002	1 Items		9,095.00
09/08/2002	0011	A.C.T. MARKETING LTD.,PART. CN/02/06/01	PV/2002-06/00004	CN	25/06/2002	-400.00
			Total of 09/08/2002	1 Items		-400.00
25/08/2002	0012	A.A.A.MACHINERY AND TOOLS CO.,LTD. DN 45/0212	PV/2002-06/00006	DN	26/06/2002	481.50
			Total of 25/08/2002	1 Items		481.50
			Grand Total			9,176.50



Figure G.13. Payment Due Summary Report.

BIBLIOGRAPHY

English References

1. Booth, Joseph D. Delphi Client/Server Developer's Guide. The United States of America: M&T Books, 1997.
2. Date, C. J. An Introduction to Database Systems, Sixth Edition. The United States of America: Addison-Wesley Publishing, 1994.
3. Whitten, Jeffrey L., Lonnie D. Bentley, and Kevin C. Dittman. Systems Analysis and Design Methods, Fifth Edition. The United States of America: Irwin McGraw-Hill, 2000.
4. Cantu, Marco. Mastering Delphi 5. The United States of America: SYBEX Inc., 1999.
5. Lucas, Henry C., Jr., The Analysis, Design, and Implementation of Information Systems, Fourth Edition. The United States of America: McGraw-Hill, 1992.
6. McGehee, Brad M., Rob Kraft, Matthew Shepker, Eric Wilson, Simon Gallagher, and Tibor Karaszi. Using Microsoft SQL Server 7.0. The United States of America: Que Corporation., 1999.
7. Laudon, Kenneth C. and Jane Price Laudon. Management Information System: A Contemporary Perspective. NY: Macmillan, 1988.
8. Garcia, Marilina S. (Frohock), Jamie Reding, Edward Whalen, and Steve Adrien DeLuca. Microsoft SQL Server 2000 Administrator's Companion. The United States of America: Microsoft Press, 2000.
9. Connolly, Thomas H. and Carolyn E. Begg. Database Systems, Second Edition. England. Addison Wesley Longman Ltd., 1998.

Thai References

1. กมลมาศ กำจรกิจการ. คู่มือ Borland Delphi 5 ฉบับสมบูรณ์. กรุงเทพมหานคร: บริษัท โปรวิชั่น จำกัด, 2543.
2. บัณฑิต จามรฤติ. การใช้งานฐานข้อมูลเชิงสัมพันธ์ Microsoft SQL Server. กรุงเทพมหานคร: บริษัท ว.เพชรสกุล จำกัด, 2541.
3. สัจจะ จรัสรุ่งรวิธร และ จักรพงษ์ สุขประเสริฐ. เริ่มต้นอย่างมืออาชีพด้วย Delphi 5 ฉบับสมบูรณ์. กรุงเทพมหานคร: สำนักพิมพ์ อินโฟเพรส, 2543.