



**Seminar Information System of  
Foundation for International Human Resource Development**

by

**Ms. Yok Rattanathan**

**A Final Report of the Three-Credit Course  
CS 6998 System Development Project**

**Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Master of Science  
in Computer Information Systems  
Assumption University**

**November 2002**

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Project Title	Seminar Information System of Foundation for International Human Resource Development
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Academic Year	November 10, 2002

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The Graduate School of Assumption University has approved this final report of the three-credit course, CS 6998 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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## ABSTRACT

The Foundation for International Human Resource Development (FIHRD) was one of the non-government organizations. The main activity is organizing training, hold seminars and forums to explore new ideas and new ways to increase awareness and knowledge among both public and private sector of the importance of human resource development.

The Seminar Information System was developed to improve the existing system. The emphasis is on the computerization of the information storage and retrieval system. While, the existing system is based on the manual system, most data are stored on paper, which require administrative staffs to maintain the system and also need more space to store the data. There are some general problems from the manual system, which are human error and poor data security. Considering these and many other problems, the new proposed system was developed to replace the manual system with the computerized system. It will increase efficiency in the work place, solve the problem of manual system and return value-added to the company. Finally, the major product of this proposed system is computerized that would enhance the Foundation's effectiveness in attaining its objective.

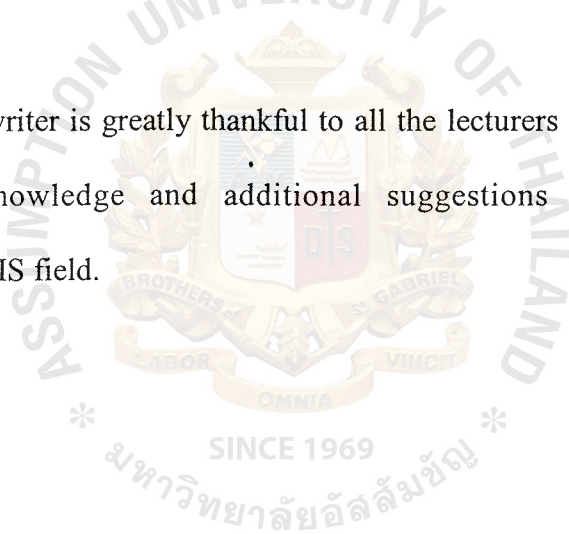
## ACKNOWLEDGEMENTS

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## TABLE OF CONTENTS

<u>Chapter</u>	<u>Page</u>
ABSTRACT	i
ACKNOWLEDGEMENT	ii
LIST OF FIGURES	v
LIST OF TABLES	viii
I. INTRODUCTION	
1.1 Background of the project	1
1.2 Objectives of the Project	2
1.3 Scope of the Project	3
1.4 Project Plan	4
II. THE EXISTING SYSTEM	5
2.1 Background of the Organization	5
2.2 Organization Structure	6
2.3 Overview of the Existing System	9
2.4 Current Problems and Area for Improvement	11
III. THE PROPOSED SYSTEM	13
3.1 User's Requirements	13
3.2 System Design	14
3.3 Hardware and Software Requirement	27
3.4 Cost and Benefit Analysis	32
3.5 Security and Control	41

<u>Chapter</u>	<u>Page</u>
IV. PROJECT IMPLEMENTATION	45
4.1 Overview of Project Implementation	45
4.2 Software Development	45
4.3 Hardware Installation	46
4.4 Personnel Training	46
4.5 Test Plan	46
4.6 Conversion	47
4.7 Documentation	47
V. CONCLUSIONS AND RECOMMENDATIONS	48
5.1 Conclusions	48
5.2 Recommendations	50
APPENDIX A DATA FLOW DIAGRAM	51
APPENDIX B PROCESS SPECIFICATION	64
APPENDIX C DATABASE DESIGN	71
APPENDIX D DATA DICTIONARY	81
APPENDIX E INPUT AND OUTPUT DESIGN	84
APPENDIX F ALTERNATIVE CANDIDATE SOLUTIONS	102
BIBLIOGRAPHY	

## LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1.1 Project Plan of the Seminar Information System	4
2.1 FIHRD Organization Chart	8
2.2 Context Level Data Flow Diagram of Existing System	10
3.1 Context Level Data Flow Diagram of the Proposed Seminar Information System	15
3.2 Functional Decomposition Diagram of the Proposed Seminar Information System	16
3.3 Level 0 Data Flow Diagram of the Proposed Seminar Information System	17
3.4 Level 1 Data Flow Diagram of Process 1 of the Proposed Seminar Information System	18
3.5 Level 1 Data Flow Diagram of Process 2 of the Proposed Seminar Information System	19
3.6 Level 1 Data Flow Diagram of Process 3 of the Proposed Seminar Information System	20
3.7 Level 1 Data Flow Diagram of Process 4 of the Proposed Seminar Information System	21
3.8 Level 1 Data Flow Diagram of Process 5 of the Proposed Seminar Information System	22
3.9 Context Level of Entity Relationship Diagram of the Proposed Seminar Information System	24
3.10 Key-based Attributed Entity Relationship Diagram of the Proposed Seminar Information System	25
3.11 Fully Attributed Entity Relationship Diagram of the Proposed Seminar Information System	26
3.12 Network Configuration of the Proposed Seminar Information System	31
3.13 Cost Comparison between the Manual and Computerized System	37



<u>Figure</u>	<u>Page</u>
3.14 Payback Period Graph	40
A.1 Context Level Data Flow Diagram of the Proposed Seminar Information System	51
A.2 Functional Decomposition Diagram of the Proposed Seminar Information System	52
A.3 Level 0 Data Flow Diagram of the Proposed Seminar Information System	53
A.4 Level 1 Data Flow Diagram of Process 1 of the Proposed Seminar Information System	54
A.5 Level 1 Data Flow Diagram of Process 2 of the Proposed Seminar Information System	55
A.6 Level 1 Data Flow Diagram of Process 3 of the Proposed Seminar Information System	56
A.7 Level 1 Data Flow Diagram of Process 4 of the Proposed Seminar Information System	57
A.8 Level 1 Data Flow Diagram of Process 5 of the Proposed Seminar Information System	58
A.9 Structure Chart of Process Seminar Program Information	59
A.10 Structure Chart of Process Mailing List	60
A.11 Structure Chart of Process Application	61
A.12 Structure Chart of Process Nametag	62
A.13 Structure Chart of Process Payment	63
C.1 Context Level of Entity Relationship Diagram of the Proposed Seminar Information System	71
C.2 Key-based Attributed Entity Relationship Diagram of the Proposed Seminar Information System	72
C.3 Fully Attribute Entity Relationship Diagram of the Proposed Seminar Information System	73

<u>Figure</u>	<u>Page</u>
E.1 Main Menu Screen	86
E.2 Login Screen	86
E.3 Update Seminar Program and List of Invited Participant Screen	87
E.4 Update Seminar Program and List of Participant Confirmation Screen	88
E.5 Update Seminar Program and List of Invited Speakers Screen	89
E.6 Update Seminar Program and List of Speakers Confirmation Screen	90
E.7 Update Seminar Program and List of Invited Sponsors Screen	91
E.8 Update Seminar Program and List of Sponsors Confirmation Screen	92
E.9 Update Participant Input Screen	93
E.10 Update Speakers Input Screen	94
E.11 Update Sponsors Input Screen	95
E.12 Sample Report of List of Participant by Seminar Program	97
E.13 Sample Report of List of Speaker by Seminar Program	98
E.14 Sample Report of List of Sponsor by Seminar Program	99
E.15 Sample Report of List of Program Confirmation Status by Participants	100
E.16 Sample Report of List of Program Confirmation Status by Sponsor	101
F.1 Payback Period Graph of Candidate 1	109
F.2 Payback Period Graph of Candidate 2	114
F.3 Payback Period Graph of Candidate 3	119

## LIST OF TABLES

<u>Table</u>	<u>Page</u>
3.1 The Hardware Specification for the Server	28
3.2 The Software Specification for the Server	25
3.3 The Hardware Specification for Each Client Machine	29
3.4 The Software Specification for Each Client Machine	29
3.5 Other Hardware Requirement	30
3.6 Manual System Cost Analysis, Baht	34
3.7 Five Years Accumulated Manual System Cost, Baht	34
3.8 Computerized System Cost Analysis, Baht	35
3.9 Five Years Accumulated Computerizes System Cost, Baht	36
3.10 The Comparison of the System Cost, Baht	36
3.11 Cumulative Net Cash Flow of the Proposed Seminar Information System	39
3.12 Payback Period Analysis	40
3.13 Net Present Value Analysis, Baht	42
5.1 The Degree of Achievement of The Proposed System	49
B.1 Process Specification of Process 1.1	64
B.2 Process Specification of Process 1.2	64
B.3 Process Specification of Process 1.3	65
B.4 Process Specification of Process 2.1	65
B.5 Process Specification of Process 2.2	66

<u>Table</u>	<u>Page</u>
B.6 Process Specification of Process 2.3	66
B.7 Process Specification of Process 3.1	67
B.8 Process Specification of Process 3.2	67
B.9 Process Specification of Process 3.3	68
B.10 Process Specification of Process 4.1	68
B.11 Process Specification of Process 4.2	69
B.12 Process Specification of Process 4.3	69
B.13 Process Specification of Process 5.1	70
B.14 Process Specification of Process 5.2	70
C.1 Structure of Seminar Program Table	74
C.2 Structure of Speaker Table	75
C.3 Structure of Participant Table	76
C.4 Structure of Sponsor Table	77
C.5 Structure of Participant Application Status Table	78
C.6 Structure of Speaker Application Status Table	79
C.7 Structure of Sponsor Application Status Table	80
D.1 Data Dictionary of Seminar Program Table	81
D.2 Data Dictionary of Speaker Table	81
D.3 Data Dictionary of Participant Table	82
D.4 Data Dictionary of Sponsor Table	81
D.5 Data Dictionary of Participant Application Status Table	82

<u>Table</u>	<u>Page</u>
D.6 Data Dictionary of Speaker Application Status Table	82
D.7 Data Dictionary of Sponsor Application Status Table	83
F.1 Completed Candidate Matrix	103
F.2 Feasibility Analysis matrix	105
F.3 Estimated Costs and Benefits of Alternative Candidate 1, Baht	106
F.4 Cumulative Net Cash Flow of the Candidate 1, Baht	108
F.5 Payback Period Analysis of Candidate 1	109
F.6 Net Present Value Analysis of Candidate 1, Baht	110
F.7 Estimated Costs and Benefits of Alternative Candidate 2, Baht	111
F.8 Cumulative Net Cash Flow of the Candidate 2, Baht	113
F.9 Payback Period Analysis of Candidate 2	114
F.10 Net Present Value Analysis of Candidate 2, Baht	115
F.11 Estimated Costs and Benefits of Alternative Candidate 3, baht	116
F.12 Cumulative Net Cash Flow of the Candidate 3, Baht	118
F.13 Payback Period Analysis of Candidate 3	119
F.14 Net Present Value Analysis of Candidate 3, Baht	120



## I. INTRODUCTION

### 1.1 Background of the Project

Foundation for International Human Resource Development (FIHRD) was established by a resolution of the Royal Thai cabinet. The main activity of the Foundation is organizing training, a seminar and forum to explore new ideas and new ways to increase awareness and knowledge among both public and private sectors of the importance of human resource development.

FIHRD established 4 years ago, has put effort on capacity building among GMS countries as evidenced by organizing International Forums call as follows:

- (1) Leadership Forums: Leadership Forum 1999 under the theme of “New Thinking and Strategy for Dealing with Economic Crisis”
- (2) Leadership Forum 2000 under the theme of “New Realities of the Global Economy in the 21st Century: Implications on Human Resource Development Strategies”
- (3) Leadership Forum 2001 under the theme of “The New Economy and the New Divide: Closing the Gap through Human Resource Development, Strategies and Action”
- (4) Leadership Forum 2002 under the theme of “Networking and Partnership”

And a lot of seminars such as “SMEs Toward Year 2000 Through Greater Mekong Sub-region Co-operation” held in Khon Kaen, “Trends in Agri-business Education and Research and Human Resource Development” held in Chiang Mai, Thai-China Forum, Thai-Cambodia Forum, Thai-Laos Forum., etc. However, the rapid expansion of the seminars, participants, donors and speakers have brought with it a number of problems related to its daily operation in terms of efficiency. The problems

of keeping participants and speakers' records and statistics term and using the records for evaluation are occurred. Redundant data, incompatibility of software, inability to access required data are evident. These are mainly due to lack of an information system at the administrative department.

The Foundation plans to setup the computerized system for Seminar Information System since established but it could not be started because of lacking team and personal group who can develop and implement the computerized system for the Foundation. The existing system is done manually and all processes are recorded in terms of document files. The Administrative division has done hard work in recording and using the information. It is necessary to setup a computerized system to facilitate their work. The new system is called Seminar Information System or SIS.

## **1.2 Objectives of the Project**

The project covers the major parts of Seminar Information System, which can be classified as follows:

- (1) To study the existing manual system of the Foundation.
- (2) To analyze the problem of the existing system and propose a solution to improve or resolve the problem of the existing system in terms of data consistency, accuracy, responsive and sharable information.
- (3) To design and implement the proposed computerized-base Seminar Information System to replace the manual system.
- (4) To reduce the processing time and paper cost by increasing the efficiency and effectiveness of the workflow, shortening the work process, and let computer do all routine jobs.

- (5) To generate a report for top management in a period of time or on demand at once.
- (6) To evaluate seminar that is useful for making decision for improving in the next seminar.

### **1.3 Scope of the Project**

The scope of project is specified in Seminar Information System, which can be classified as follows:

- (1) Study and analyze the existing system. Describe the background of the Foundation, existing function and current problems and then find the solution to improve the existing manual system.
- (2) Develop and implement the propose system. The major activity of this project are as follows:
  - (a) System Specification
  - (b) System Design
  - (c) Hardware and Software Requirement
  - (d) Security and Control
  - (e) Costs and Benefits Analysis
  - (f) System Implementation and Evaluation

### **1.4 Project Plan**

A project plan of the Seminar Information System is given in Figure 1.1.

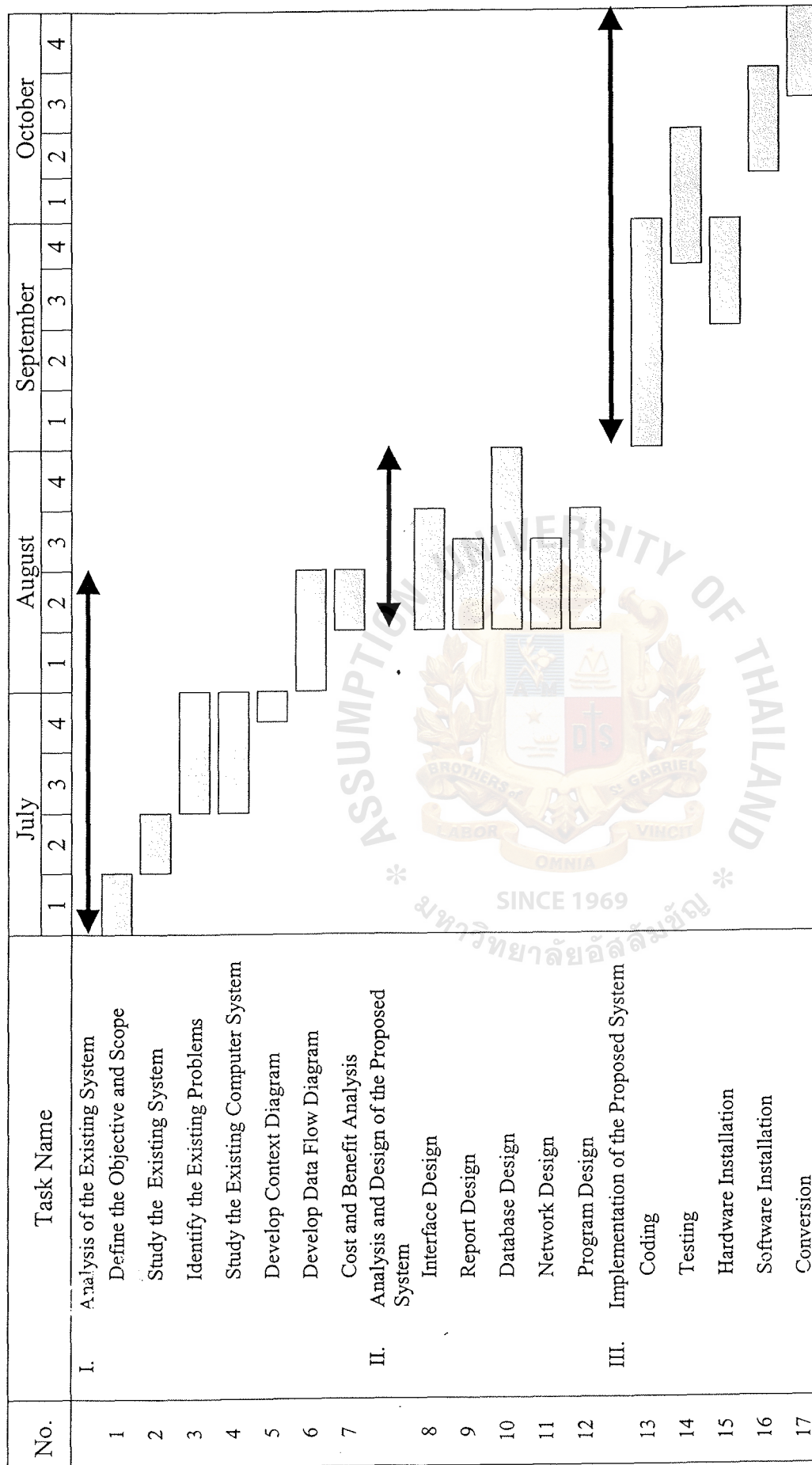


Figure 1.1.1. Project Plan of Seminar Information System.

## II. THE EXISTING SYSTEM

### 2.1 Background of the Foundation

Foundation for International Human Resource Development was established by a resolution of the Royal Thai cabinet in January 1997. The Foundation aims to improve the standard of human resource in the Greater Mekong Sub-region (GMS). An improved human resource pool will provide a strong basis for economic development and therefore an improved standard of living in the region. The main activity of the Foundation is organizing training, a seminar and forums to explore new ideas and new ways to increase awareness and knowledge among both public and private sector of the importance of human resource development.

GMS countries are undergoing rapid change as the result of process of globalization. As far as globalization is concerned, these countries must explore and try to increase their own opportunities as well as reduce negative impacts. The Foundation for International Human Resource Development, established 3 years ago, has put effort on capacity building among GMS countries as evidenced by organizing international Forums called Leadership Forums: Leadership Forum 1999 under the theme of “New Thinking and Strategy for Dealing with Economic Crisis”; Leadership Forum 2000 under the theme of “New Realities of the Global Economy in the 21st Century : Implications on Human Resource Development Strategies”; Leadership Forum 2001 under the theme of “The New Economy and the New Divide: Closing the Gap through Human Resource Development, Strategies and Action”; and Leadership Forum 2002 under the theme of “Rethinking of Globalization : Networking and Partnership” and other seminar such as “SMEs Toward Year 2000 Through Greater Mekong Sub-region Co-operation” held in Khon Kaen; “Trends in Agri-business Education and Research



and Human Resource Development” held in Chiang Mai, Thai – China Forum; Thai – Cambodia Forum., etc.

The Foundation’s principle objectives include:

- (1) To coordinate and cooperate with technologically advanced countries in promoting human resource development at various levels as a catalyst for progress in economic, social, environmental, managerial, technological and other areas in developing countries, especially those in the region.
- (2) To create a regional and international sphere of cooperation in human resource development guided by the founding principle of raising the standard of living in all countries concerned.
- (3) To create a high quality, high potential human resource base, thus building a strong foundation for national and regional development.
- (4) To establish a reputation for Thailand as a reliable human resource development center both within the region and internationally, thereby serving as a catalyst in bringing peace and prosperity to the region.
- (5) To conduct activities for the public benefit, both separately and in cooperation with donor countries and foundations.
- (6) To use the experiences gained by the Foundation to upgrade the quality and potential of human resources in Thailand.

## **2.2 Organization Structure**

The Foundation has 6 main departments, which are:

- (1) Administrative Department

The responsibilities of this department are organization management and handle the seminar organizing, such as participants, donors and

speakers record, inviting letter for participants and speakers and mailing process

(2) Executive Secretary and Foreign Affairs Department

The responsibilities of this department are secretarial work for executive management of the organization and also responsible for coordination with foreign countries.

(3) Finance Department

The responsibilities of this department are controlling company's finance, controlling budgets, controlling company cash flow.

(4) Research and Database Department

The responsibilities of this department are doing research and database collection and preparing seminar documentary.

(5) Personal Department

The responsibilities of this department are recruitment and human resource and salary chart.

(6) Public Relation Division

The responsibilities of this department are operating the public relation.

The Foundation's organization chart is shown in Figure 2.1 as follow as:

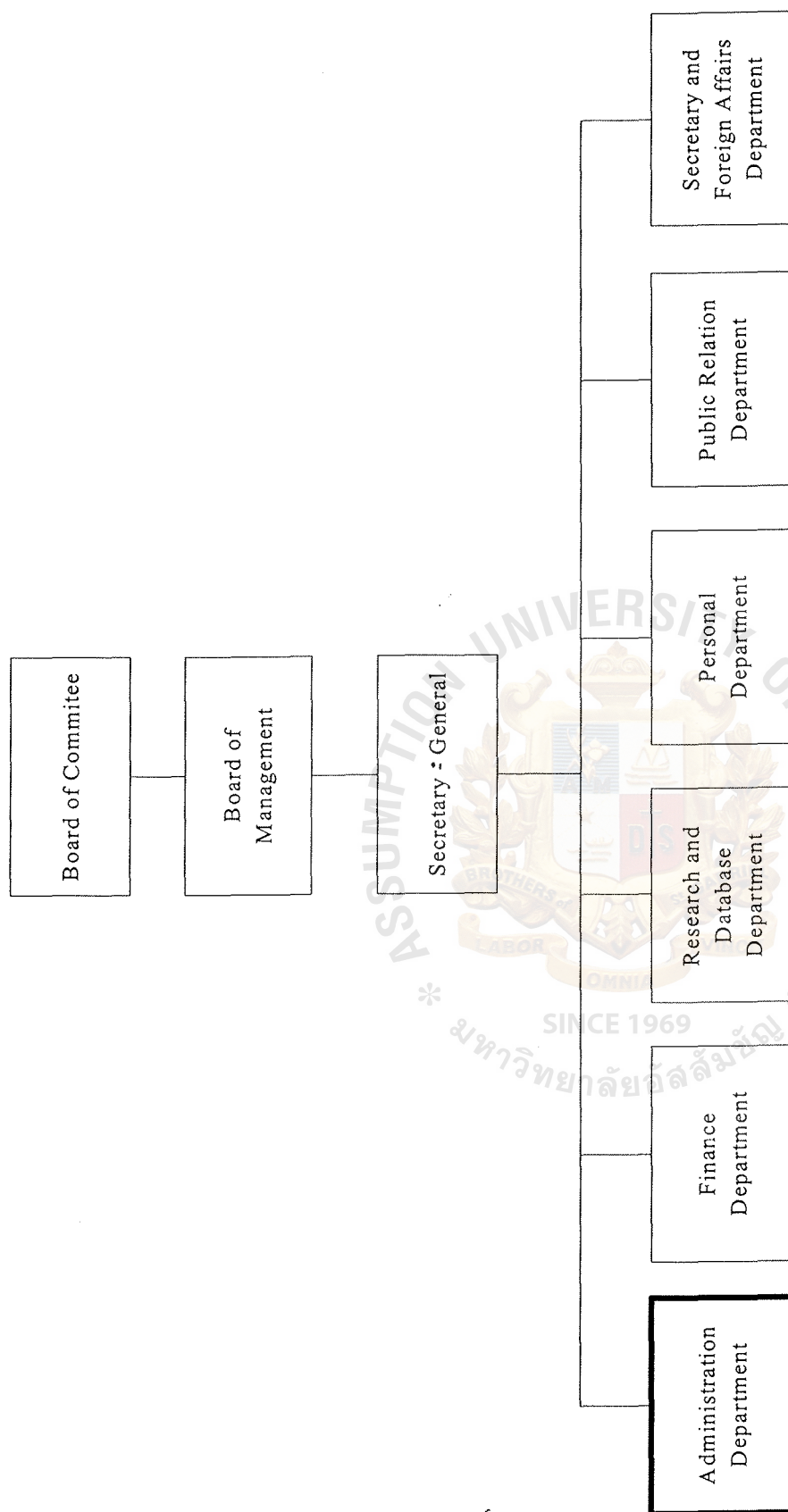


Figure 2.1. FIHRD Organization Chart.

### 2.3 Overview of the Existing System

The main activities of Administrative Department is to arrange the seminar, training and forum activities of the Foundation. Currently, Administrative Department arranges over 10 seminar programs per year. Due to the need to maintain information about participants such as name, address, seminar program, and other pertinent data related to seminar, based on manual system, in which the data are stored as hard copies in the separate files. The existing system uses only Microsoft office to assist in the storage of the database. It does not yet have a full set of information processing functions covering data entry, processing, user on line enquiry and flexible report production.

The process of the operation of the existing system: When the Administrative Department receive the details of the seminar, schedule for the forth-coming course, the expected speakers, expected sponsors and expected participants to attend the seminar, from the Board Committees, the process of recording all of data started. The Administrative Department is responsible in preparing the mailing list, invite letter, registration form for sending to the expected speakers, expected sponsor and expected participants either by mail, by person, by fax or by e-mail. The next process is checking the registration forms from the expected speakers and expected participants which reply whether to attend the seminar or not. For the sponsor, the registration form is used to reply whether they will accept to support the seminar or not. Then, the Administration Department prepares the name tag and table nametag for all attendance. These are all processes of the Administrative Department.

The context diagram is constructed to establish the initial project scope. It depicts the system as a whole in correlation with its environment that is the “external entities” involved. The context diagram of the existing system is shown in Figure 2.2.

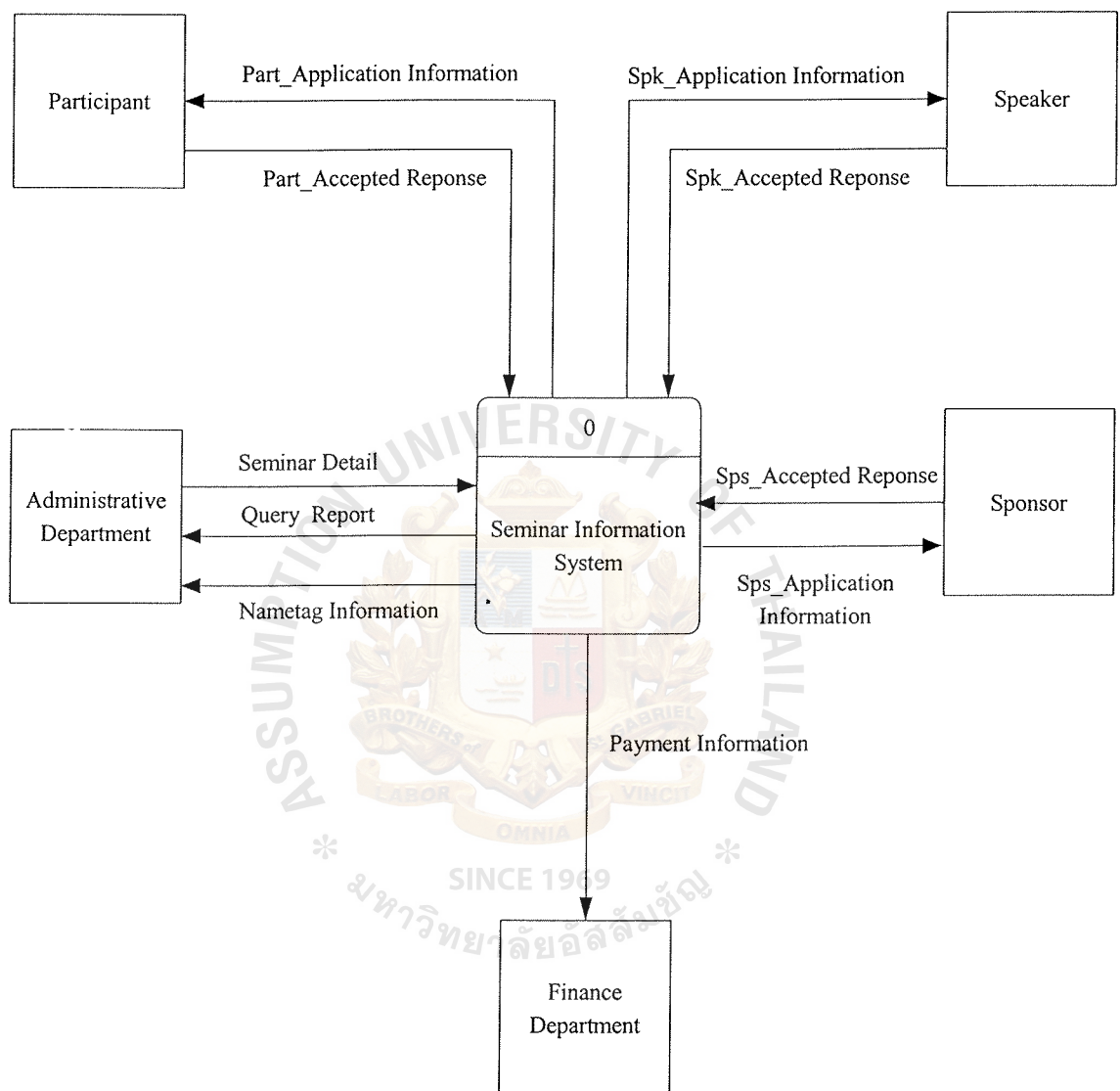


Figure 2.2. Context Diagram of the Existing System.



## 2.4 Current Problems and Areas for Improvement

The workflow process of administrative Department is more and more complex. The computerized system is setting up to reduce the problem. The process of the new system is faster and more comfortable for any related staff in the Foundation. Special attention is given to the interface between the system and user because the existing system is manual, the new system is users friendly with menu screen and users procedures are designed to suit the skill of users.

As the existing system is based on manual system, we can conclude and summarize the problems as below:

(1) Non-computerized system for maintaining information

This is leading to non-standardization in recording the seminar information, participants, sponsor and speakers for current and future.

(2) Documentary overwhelming.

After the seminar finished, the documents relate to the seminar such as list of participants, list of sponsor or list of speakers were kept unsuitably and inconveniently for use.

(3) Data Redundancy.

Since all data are kept with no standard, the problem of data redundancy occurred. There are already many data to keep and lots of duplicate data existing and that may affect the duplication of work. To reduce redundancy the effectiveness and efficiency of the workflow since all the reports and documents can be issued from one person instead of different people with the help of one good database system.

(4) Difficult for data checked, summarized and evaluated report

In the existing system, we kept manual recording, we still have a problem on using much time to gather and summarized data to make a report for top management. In addition, the evaluated report is useful for making decision for improving the next seminar.



### III. THE PROPOSED SYSTEM

This chapter displays the user requirement, proposed procedures, proposed function, proposed system requirements and economic cost comparison.

#### 3.1 User's Requirements

The user's requirement for the proposed system is the development of current seminar information system into computerized system. During the analysis of the existing system, the user requirements are stated as follows;

- (1) Data have been entered and processed through computerized system.
- (2) All documents can be printed and generated to computer without manual preparation. The computer should be able to print out participants invite list, participant on-going list, speakers list for each program, the program details list, invite letter, mailing list, name tag.
- (3) Users also require the system to generate correct and on-time reports.
- (4) Have an updating procedure.
- (5) Provide efficient security and control in entering data and prevent unauthorized rights in changing values in database.
- (6) User friendly; An easy-to-use interfaces commonly used such as interactive window-like screen, menu-driven, pop-up and pull-down menus will make the system easy to use and will not require much training.
- (7) Back-up and restore facility will be provided to ensure data consistency and validity all the time.
- (8) Maintainability of the system to accommodate future change and requirements.

## 3.2 System Design

System design details the system specifications that will deliver the functions identified during the system analysis. Their specifications should address the entire managerial, organizational and technological component of the system solution.

### (1) Data Flow Diagram (DFD)

The logical Data Flow Diagram (DFD) are the structure analysis and design tool that system analyst can use to understand the process of system and the movement of the data through the system.

Context Diagram is constructed to establish the initial project scope. It depicts the system as a whole in correlation with its environment that is the external entities. The context diagram of proposed system is given in Figure 3.1.

The functional decomposition diagram (FDD) is the act of breaking a system into its component subsystems, processes and sub-process. The FDD of the proposed system is given in Figure 3.2.

The higher levels of data flow diagram (DFD), which maps the subsystems, process and sub-processes that, are constructed following the FDD. The level 0 DFD and Level 1 DFD are shown in Figures 3.3. and 3.4.-3.8., respectively.

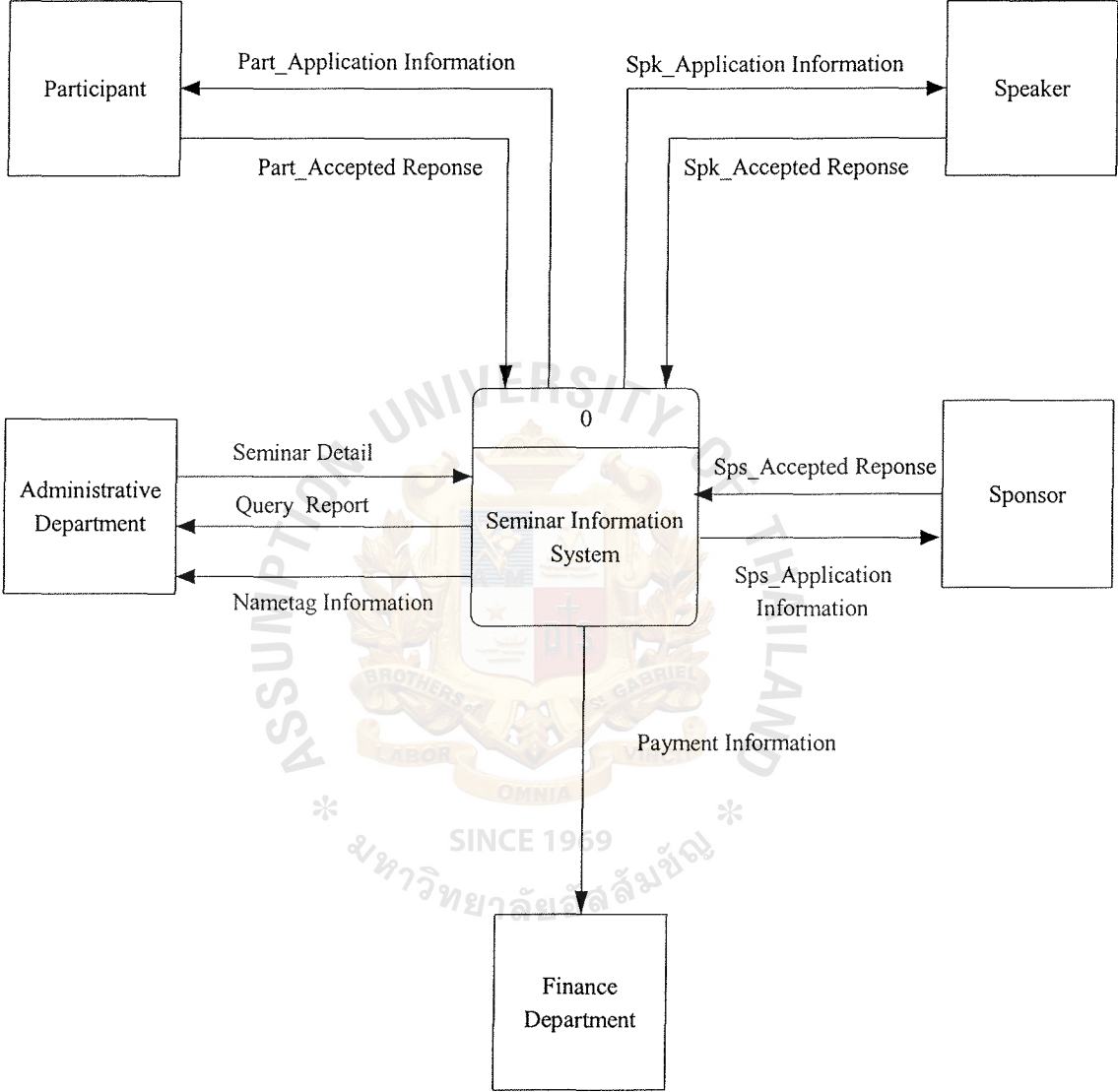


Figure 3.1. Context Diagram of the Proposed Seminar Information System.



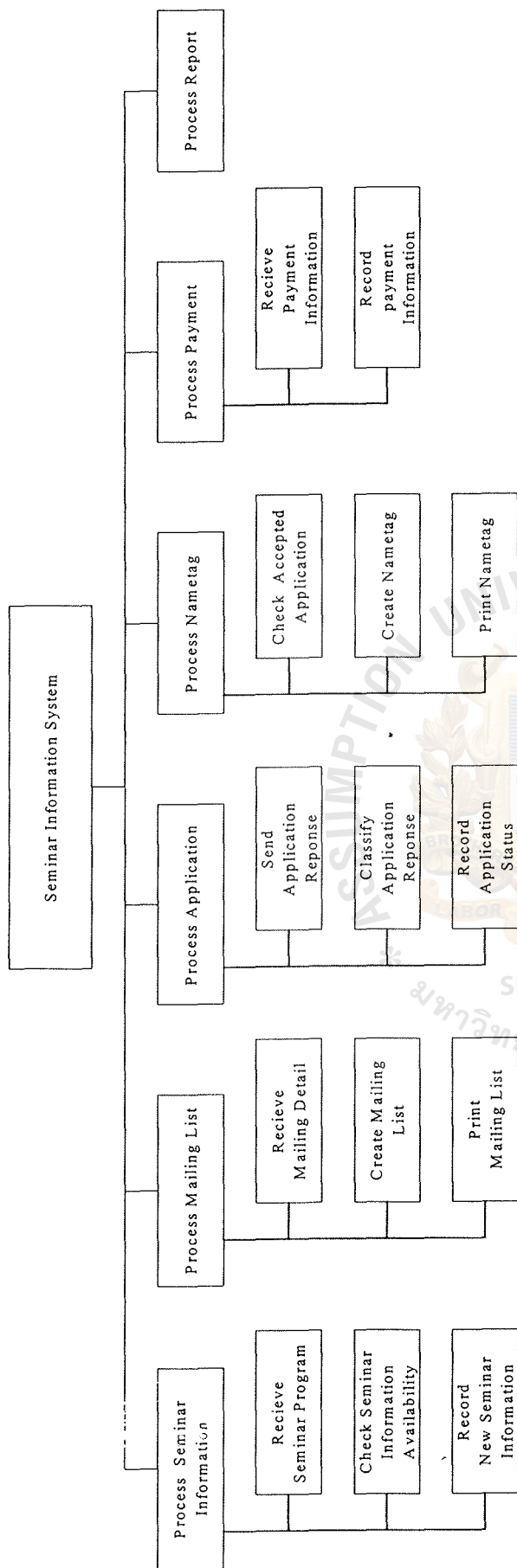


Figure 3.2. Functional Decomposition Diagram of the Proposed Seminar Information System.

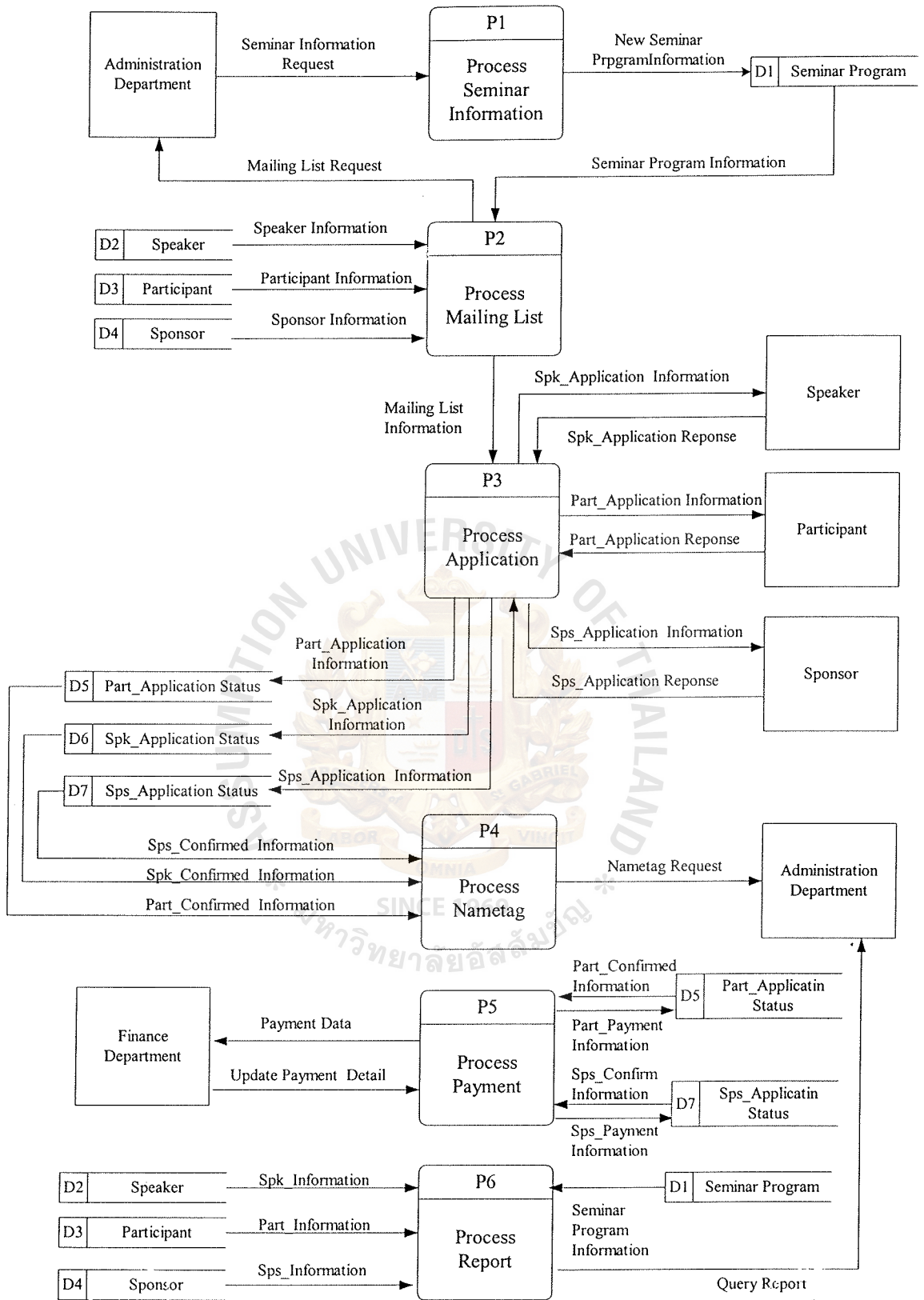


Figure 3.3. Level 0 Data Flow Diagram of Process 3 the Proposed Seminar Information System.

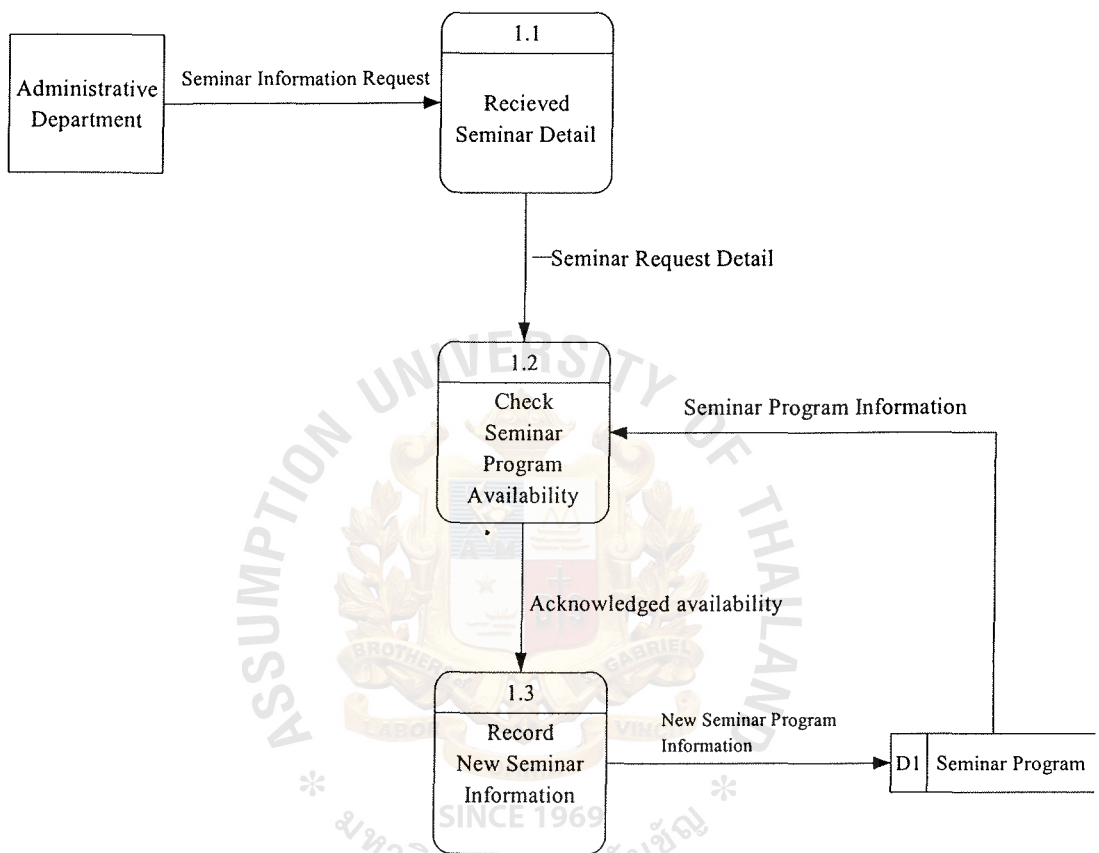


Figure 3.4. Level 1 Data Flow Diagram of Process 1 of the Proposed Seminar Information System.

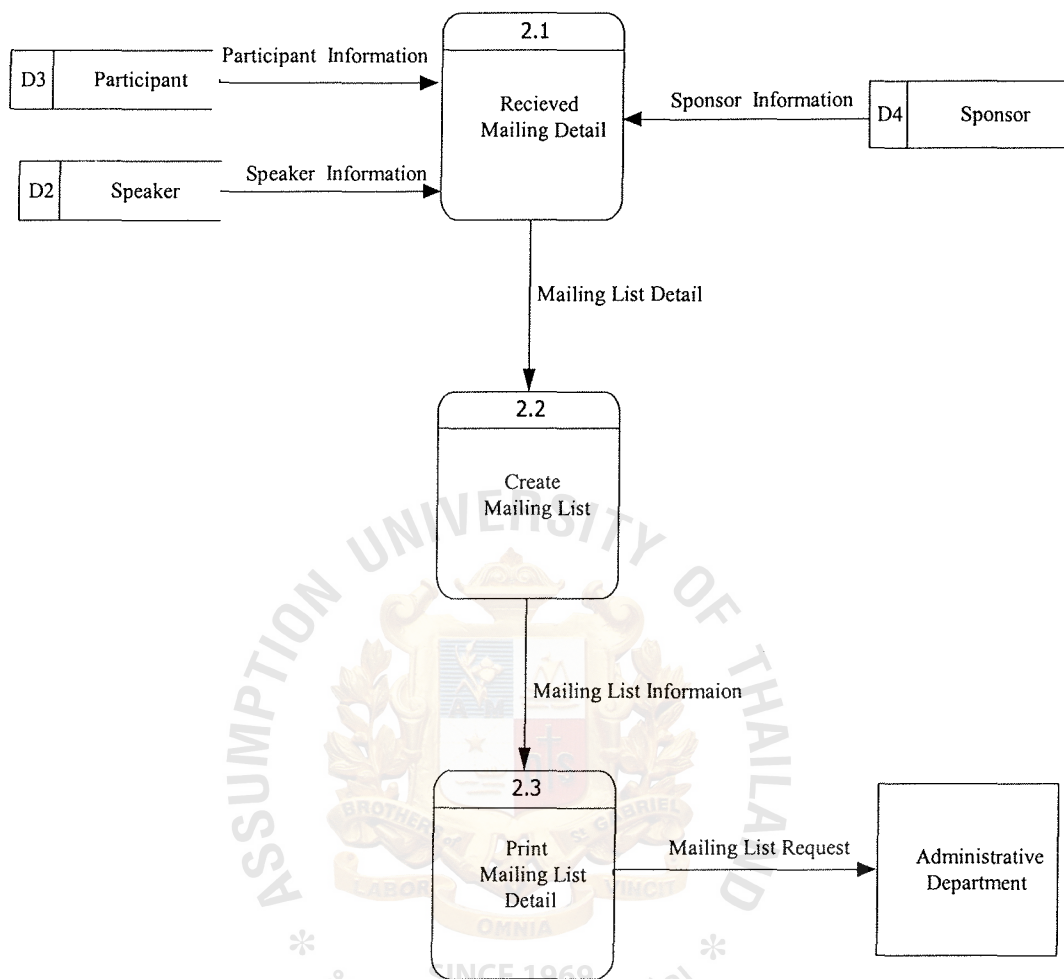


Figure 3.5. Level 1 Data Flow Diagram of Process 2 of the Proposed Seminar Information System.

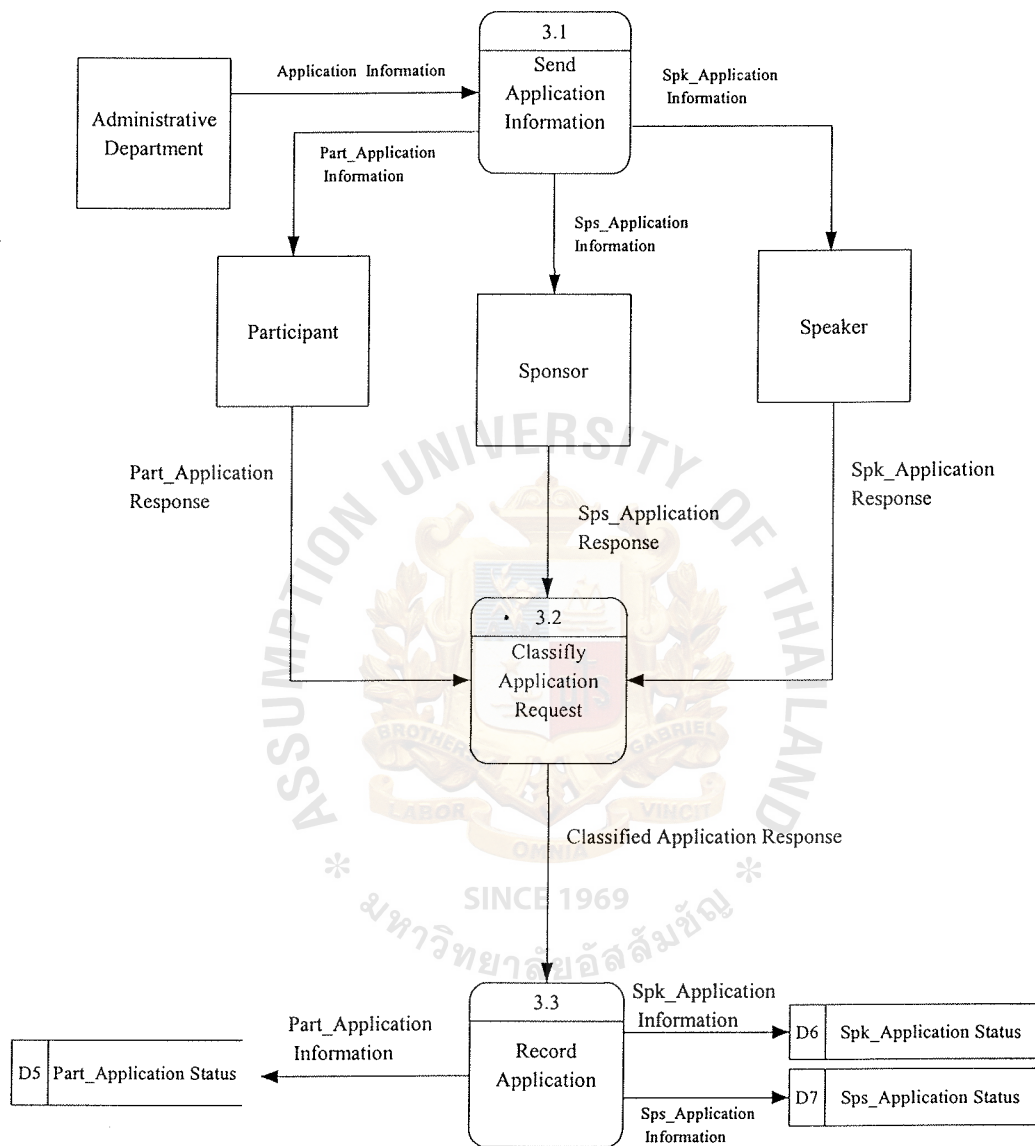


Figure 3.6. Level 1 Data Flow Diagram of the Process 3 of the Proposed System.

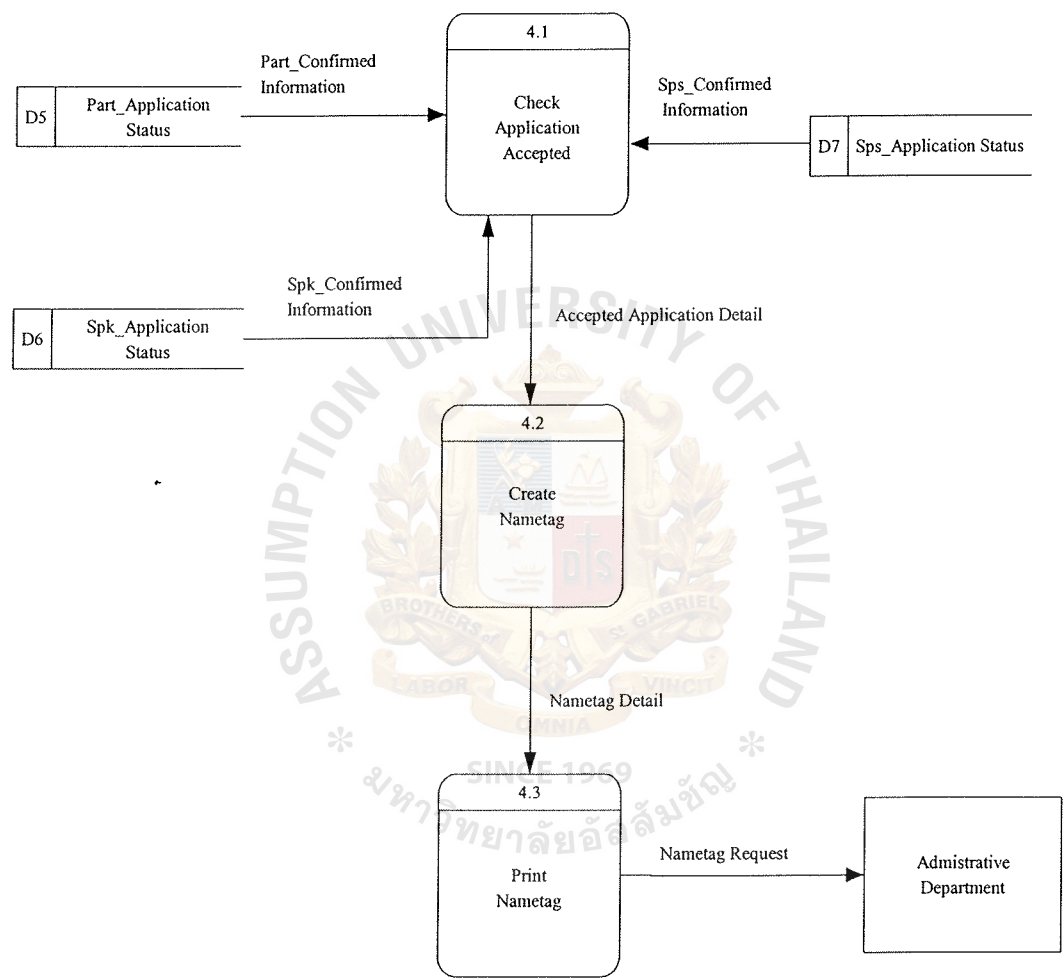


Figure 3.7. Level 1 Data Flow Diagram of Process 4 of the Proposed System.



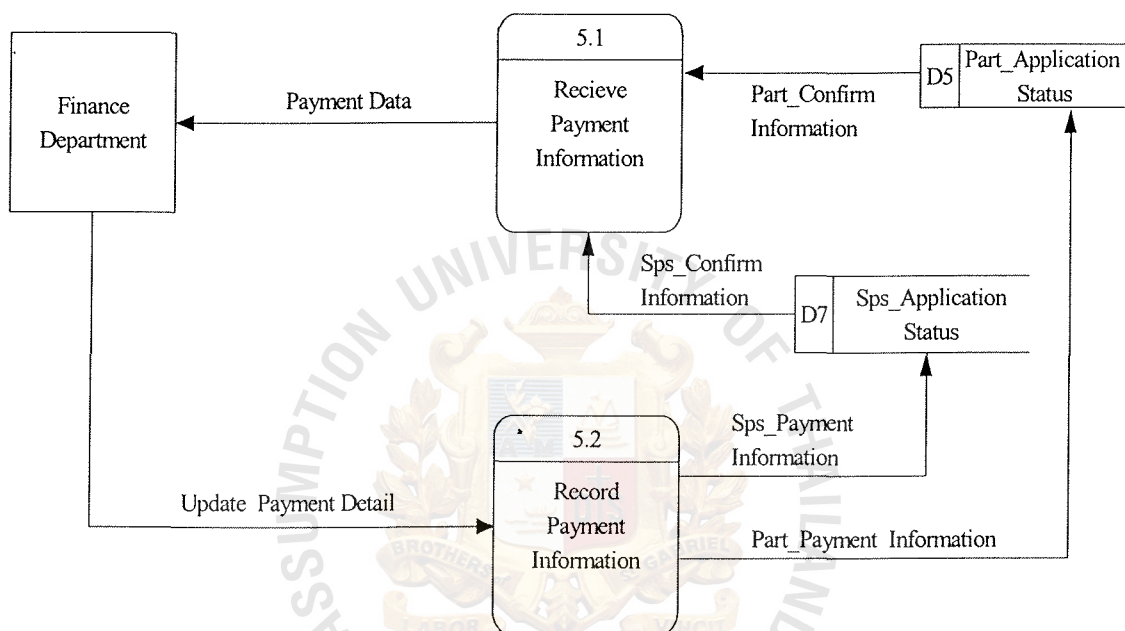


Figure 3.8. Level 1 Data Flow Diagram of Process 5 of the Proposed System.

To understand in detail of each process in data flow diagram listed in Appendix A, process specification is created in Appendix B

(2) Entity Relation Diagram (ERD)

An ERD data model is the technique used in organizing and documenting a system data. Data modeling, which is called database modeling is usually a database implementation.

The ERD of the proposed system is shown in Figures 3.9. - 3.11. as follows:

- (a) A context level of entity relationship diagram (Figure 3.9.)
- (b) A key-based attributed relationship diagram (Figure 3.10.)
- (c) A fully attributed relationship diagram (Figure 3.11.)

The database Design and data dictionary, are the figures and tables that describe the details of each entity and attribute in ERD, are shown in Appendices C and D respectively.

(3) Input and Output Design

The input screens of the system are in many forms for the various purposes and the outputs generated by the proposed system are shown in Appendix E.

(4) Network Design

The network configuration of the proposed system is shown in Figure 3.12.

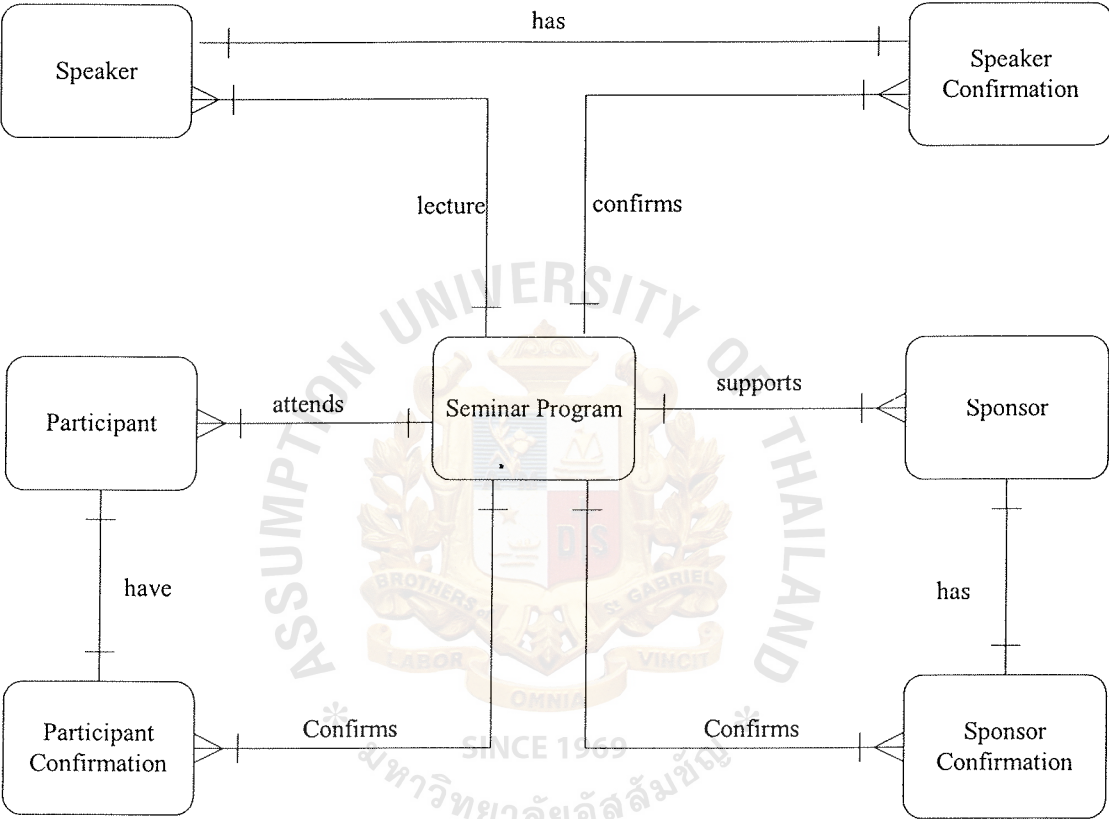


Figure 3.9. Context ERD of the Proposed Seminar Information System.

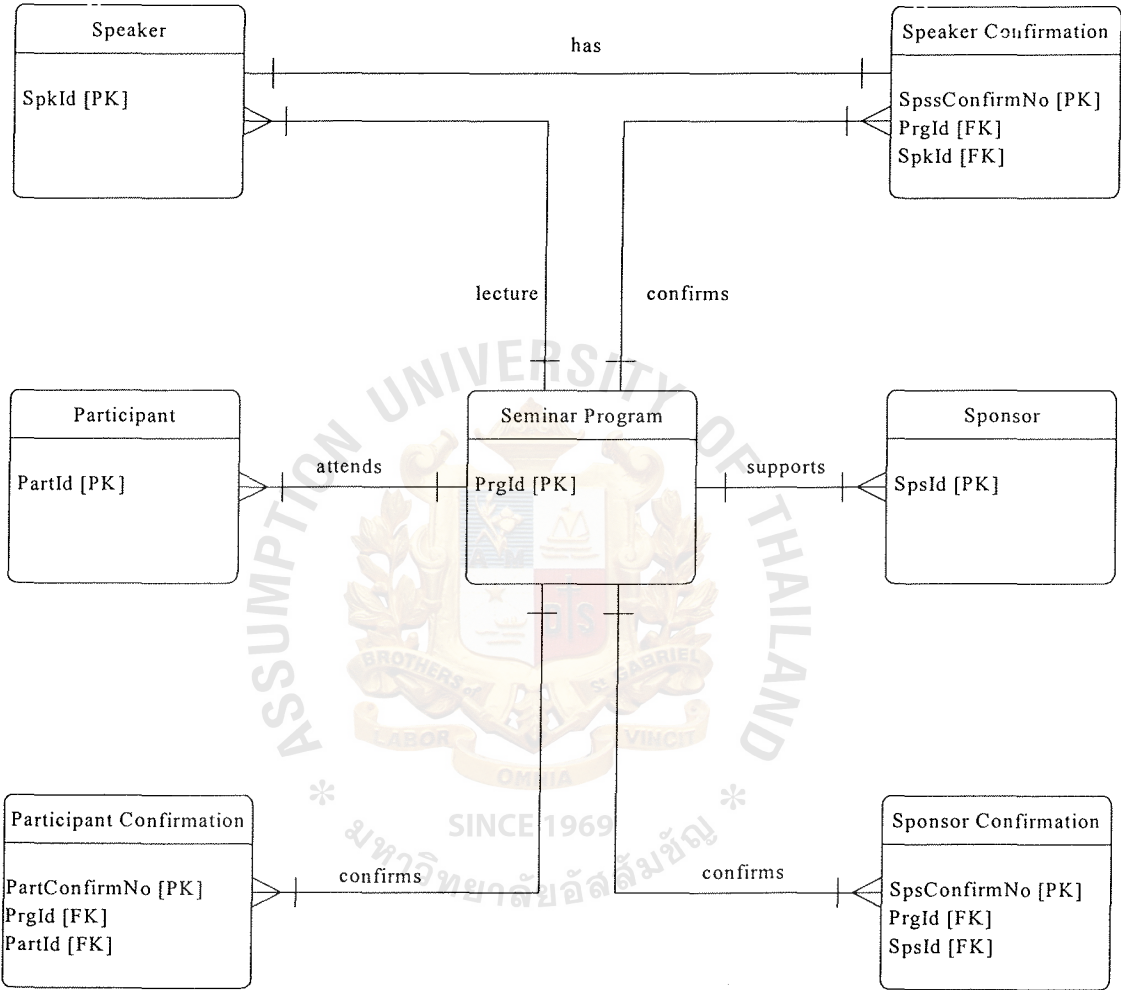


Figure 3.10. Key-Based ERD of the Proposed Seminar Information System.

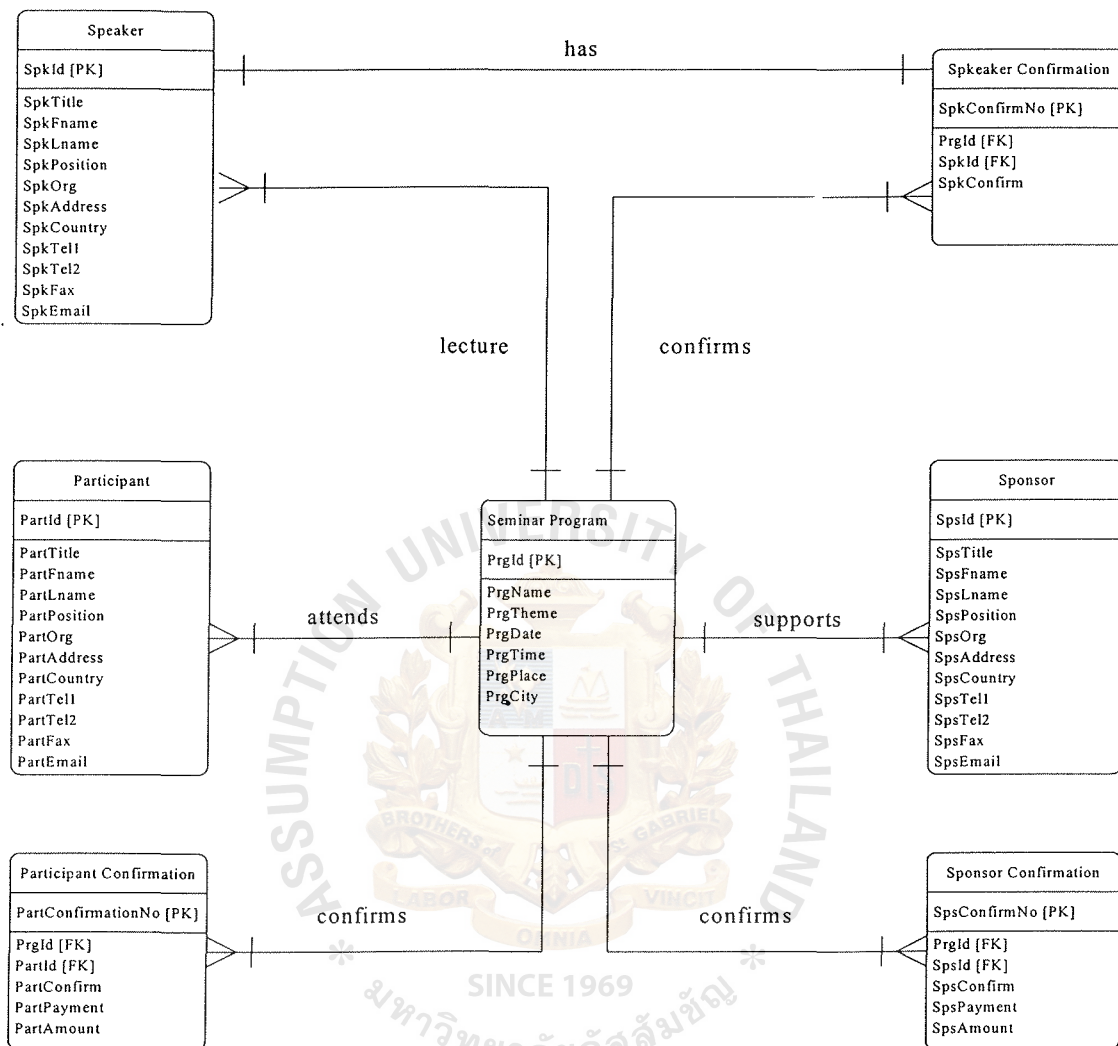


Figure 3.11. Fully Attributed ERD of the Proposed Seminar Information System.

### 3.3 Hardware and Software Requirement

The appropriate hardware and software specification will save costs in implementing a new project. The cost of hardware and software has to be calculated because it is an important factor in deciding to change to the new system. We need to know the amount to be paid and payback period. By comparing the cost of existing system and new system, it will help us to make the decision.

In this project, we focus on the network system. We will change from the stand alone PC to be a network system in order to use computers more efficiently. As the data are kept in the form of database, the information can be shared.

The propose network system is the Local Area Network (LAN). There are several reasons to support this system.

- (a) As the connection of the computers is in the office building only, the LAN system is the most suitable solution.
- (b) The information (resources) can be shared between workstations which includes hardware, software, or even data. Therefore, it reduces some costs.
- (c) The error rate is less in network system.

With 4 clients machine and 1 server computer, the star topology is the best choice of connection. The server manages the transmission of data and messages between the other clients. By using Ethernet 10BaseT (UTP medium) and Hub in connection in the star topology, it saves cost. This can connect server, clients, printers, and scanner together. The connection of LAN can be viewed in Figure 3.12. The hardware and software specification for server are shown in Tables 3.1 and 3.2, respectively and the hardware and software specification for each client machine are shown in Tables 3.3. and 3.4, respectively

Table 3.1. The Hardware Specification for 1 Server Computer.

Hardware	Specification
CPU	Intel Pentium IV Processor 1.4 GHz
Cache	1 GB
Memory	256 MB 100 MHz SD RAM
Hard Disk	40 GB
Floppy Drive	1.44 MB
CD-Rom Drive	52 X
Network Adapter	3Com 10/100 Mbps
Display Adapter	SVGA Card
Display Scéen	17” SVGA monitor
Keyboard	USB Internet Keyboard (104-key)
Mouse	Internet Scroll Mouse
UPS	UPS 1000 VA

Table 3.2. The Software Specification for the server.

Software	Specification
Operating System	Microsoft Window NT Server4.0
Database Software	Microsoft SQL Server
Application Software	Microsoft Office2000 Professional Edition Outsourcing Application Program



Table 3.3. The Hardware Specification for Each Client Machine.

Hardware	Specification
CPU	Intel Pentium III Processor 1.0 GHz
Cache	256 KB
Memory	64 MB 100 MHz SD RAM
Hard Disk	20 GB
Floppy Drive	1.44 MB
CD-Rom Drive	52 X
Network Adapter	3Com 10/100 Ethernet NIC
Display Adapter	SVGA Card
Display Screen	17” monitor
Keyboard	USB Internet Keyboard (104-key)
Mouse	Internet Scroll Mouse
UPS	UPS 1000 VA

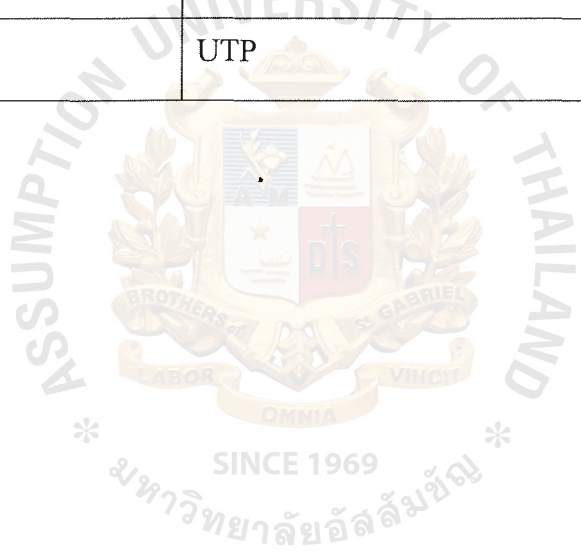
Table 3.4. The Software Specification for Each Client Machine.

Software	Specification
Operating System	Microsoft Window 98
Application Software	Microsoft Office2000 Professional Edition Outsourcing Application Program

Other important hardware required for the proposed system is switch, network printer and cable. The specification of this hardware is shown in the Table 3.5.

Table 3.5. Other Hardware Specification.

Hardware	Specification
Printer	HP LASERJET 4050
Scanner	HP SCANJET
UPS	LEONICS OA4
HUB switch	100 M bit
Cable	UTP



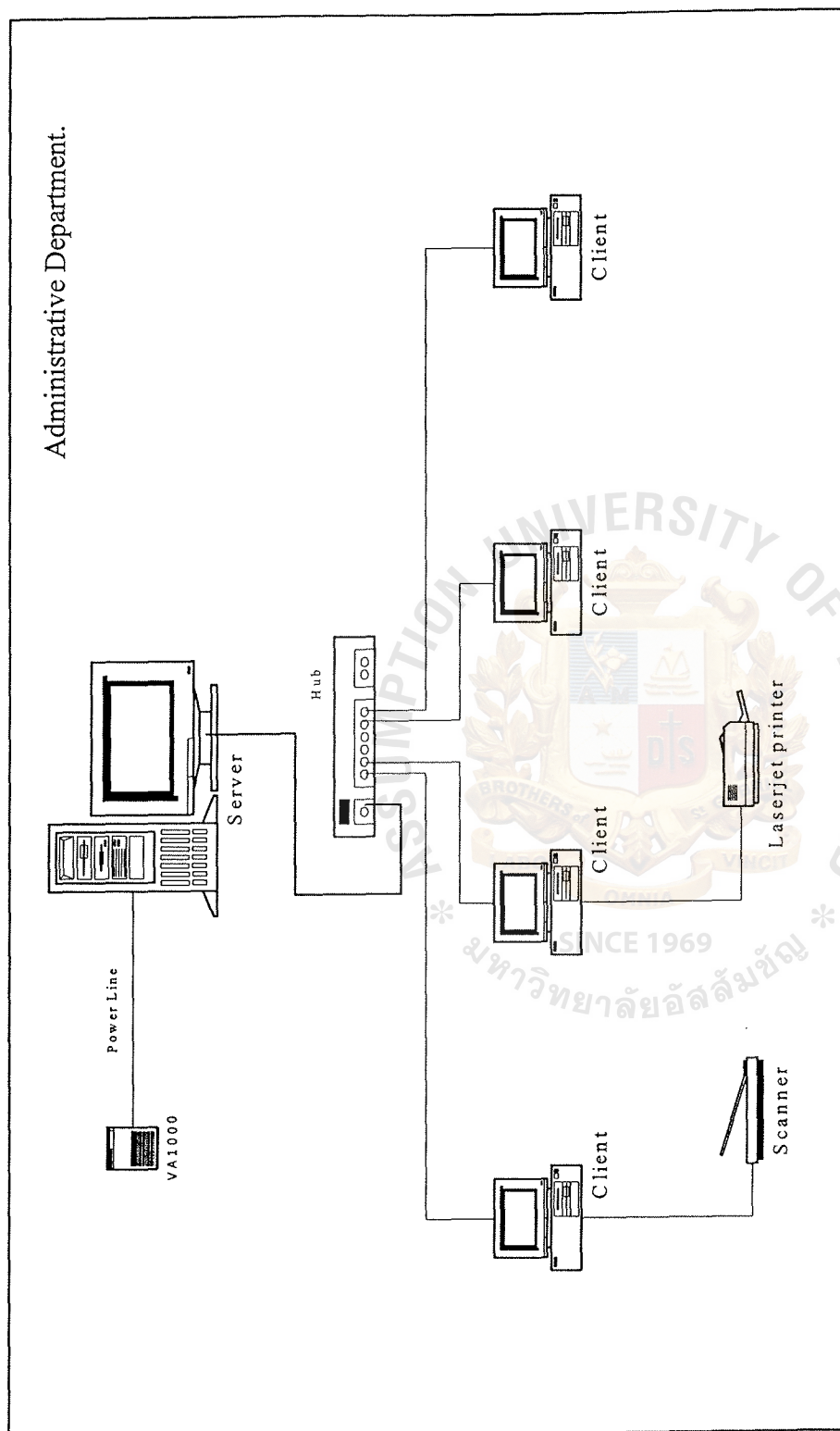


Figure 3.12. The Hardware Configuration of Foundation for International Human Resource Development at the Administrative Department.

### 3.4 Cost-Benefit Analysis

Cost and Benefit analysis is an economic feasibility analysis method. It is widely used as the tool to judge whether the project is worthwhile to construct or not.

#### (1) Benefit Analysis

The proposed system can provide both tangible benefit and intangible benefit as follows.

##### (a) Tangible Benefit:

It is derived in terms of monthly or annual saving or profit gained from the system and the unit will be in Thai Baht, resources or time saved. The proposed system provides tangible benefits such as to reduce the expense of worker, office supplies and miscellaneous cost.

##### (b) Intangible Benefit:

It is difficult to quantify intangible benefits in terms of numerical amount because they are normally implied as opportunities instead. Intangible benefits derive from the proposed computerized system can be identified as the following:

- (1) To increase employee productivity by shortening the processing time and minimizing the complexity, which enable the employees to handle large volumes of service.
- (2) To increase customer share and customer retention through customer satisfaction from an effective computerized system.
- (3) To enable the company to better management, meet and respond to customer needs in timely manner, in which it is leading a high demand of service.

- (4) To sustain competitive advantage through an effective computerized system according to an ability to address the customers' preferences and priorities.

(2) Cost Analysis

Cost of the system falls into 2 categories; development and operating costs.

System development costs are usually one time cost occurring when the system is being implemented. These costs normally consist of hardware and software development cost, training cost and etc.

Unlike system development cost, the system operating cost will occur after the system has been implemented and tend to recur throughout the lifetime of the system. Examples are employee salary, officer supply and maintenance cost.

Cost analysis for the manual and computerized system are given in the following table.

(1) Cost of Manual System

Table 3.6. Manual System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
<u>Fixed Cost</u>					
Typewriter 2 units @ 7,000	2,800.00	2,800.00	2,800.00	2,800.00	2,800.00
Calculators 2 units @ 800	320.00	320.00	320.00	320.00	320.00
Total Fixed Cost	3,120.00	3,120.00	3,120.00	3,120.00	3,120.00
<u>Operation Cost</u>					
Salary Cost:					
Manager 1 person @ 23,000	23,000.00	25,300.00	27,830.00	30,613.00	33,674.30
Staffs 3 person @ 12,000	36,000.00	39,600.00	43,560.00	47,916.00	52,707.60
Total Monthly Salary Cost	59,000.00	64,900.00	71,390.00	78,529.00	86,381.90
Total Annual Salary Cost	708,000.00	778,800.00	856,680.00	942,348.00	1,036,582.80
Office Supplies and Miscellaneous Cost:					
Stationary Per Annual	10,000.00	11,000.00	12,100.00	13,310.00	14,641.00
Paper Per Annual	5,500.00	6,050.00	6,655.00	7,320.50	8,052.55
Utility Per Annual	12,000.00	13,200.00	14,520.00	15,972.00	17,569.20
Miscellaneous Per Annual	10,000.00	11,000.00	12,100.00	13,310.00	14,641.00
Total Annual Office Supplies & Miscellaneous Cost	37,500.00	41,250.00	45,375.00	49,912.50	54,903.75
Total Annual Operation Cost	745,500.00	820,050.00	902,055.00	992,260.50	1,091,486.55
Total Manual System Cost	748,620.00	823,170.00	905,175.00	995,380.50	1,094,606.55

Table 3.7. Five Years Accumulated Manual System Cost, Baht.

Year	Total Manual System Cost	Accumulated Cost
1	748,620.00	748,620.00
2	823,170.00	1,571,790.00
3	905,175.00	2,476,965.00
4	995,380.50	3,472,345.50
5	1,094,606.55	4,566,952.05
Total	4,566,952.05	-

## (2) Cost of Computerized System

Table 3.8. Computerized System Cost Analysis, Baht.

Cost items		Years				
		1	2	3	4	5
<b>Fixed Cost</b>						
Hardware Cost:						
Computer Server Cost	1 unit @ 50,000	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Client Machine Cost	4 units @ 30,000	24,000.00	24,000.00	24,000.00	24,000.00	24,000.00
Printer	1 unit @ 20,000	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00
UPS 1000 VA	1 unit @ 2,800	560.00	560.00	560.00	560.00	560.00
Total Hardware Cost		38,560.00	38,560.00	38,560.00	38,560.00	38,560.00
Software Cost:						
Window NT Server	1 unit @ 20,000	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00
MS SQL Server	1 unit @ 18,000	3,600.00	3,600.00	3,600.00	3,600.00	3,600.00
MS Office 2000	4 unit @ 15,000	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00
Network Cost		8,000.00	8,000.00	8,000.00	8,000.00	8,000.00
Total Software Cost		27,600.00	27,600.00	27,600.00	27,600.00	27,600.00
Implementation Cost:						
Software Development Cost		50,000.00	-	-	-	-
Total implementation Cost		50,000.00	-	-	-	-
Maintenance Cost		-	25,000.00	27,500.00	30,250.00	33,275.00
Total Fixed Cost		116,160.00	91,160.00	93,660.00	96,410.00	99,435.00
<b>Operation Cost</b>						
Salary Cost:						
Manager	1 person @ 23,000	23,000.00	25,300.00	27,830.00	30,613.00	33,674.30
Staffs	2 person @ 12,000	24,000.00	26,400.00	29,040.00	31,944.00	35,138.40
Total Monthly Salary Cost		47,000.00	51,700.00	56,870.00	62,557.00	68,812.70
Total Annual Salary Cost		564,000.00	620,400.00	682,440.00	750,684.00	825,752.40



Table 3.8. Computerized System Cost Analysis, Baht (continued).

Cost items		Years				
		1	2	3	4	5
Office Supplies and Miscellaneous Cost:						
Stationary	Per Annual	8,000.00	8,800.00	9,680.00	10,648.00	11,712.80
Paper	Per Annual	7,500.00	8,250.00	9,075.00	9,982.50	10,980.75
Utility	Per Annual	8,000.00	8,800.00	9,680.00	10,648.00	11,712.80
Miscellaneous	Per Annual	6,000.00	6,600.00	7,260.00	7,986.00	8,784.60
Total Annual Office Supplies & Miscellaneous Cost		29,500.00	32,450.00	35,695.00	39,264.50	43,190.95
Total Annual Operation Cost		593,500.00	652,850.00	718,135.00	789,948.50	868,943.35
Total Computerized System Cost		709,660.00	744,010.00	811,795.00	886,358.50	968,378.35

Table 3.9. Five Years Accumulated Computerized System Cost, Baht.

Year	Total Computerized System Cost	Accumulated Cost
1	709,660.00	709,660.00
2	744,010.00	1,453,670.00
3	811,795.00	2,265,465.00
4	886,358.50	3,151,823.50
5	968,378.35	4,120,201.85
Total	4,120,201.85	-

(3) Cost Comparison between the Manual and Computerized System

Table 3.10. The Comparison of the System Cost, Baht.

Year	Accumulated Existing Cost	Accumulated Proposed Cost
1	748,620.00	809,660.00
2	1,571,790.00	1,453,670.00
3	2,476,965.00	2,265,465.00
4	3,472,345.50	3,151,823.50
5	4,556,952.05	4,120,201.85

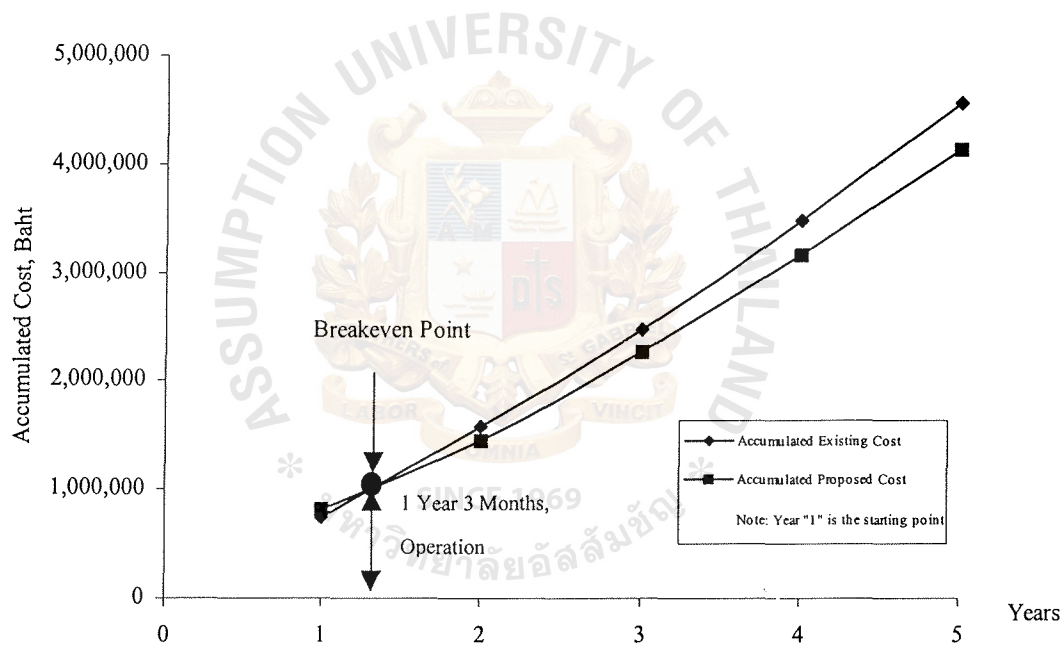


Figure 3.10. Cost Comparison between Manual System and Computerized System.

(3) Financial Analysis

The Following cost items required, as shown in Table 3.11.

Investment Cost:

Hardware cost	192,800	Baht
Software cost	138,000	Baht
Software Development Cost	50,000	Baht
Total Investment Cost	<u>380,800</u>	Baht

Annual Operating Cost:

People-ware cost	564,000	Baht
Office Supplies & Miscellaneous cost	29,500	Baht
Maintenance Cost	25,000	Baht
Total Annual Operating Cost	<u>618,500</u>	Baht

Annual Cost:

The formula of annual cost of the Computerized system is

$$\begin{aligned} \text{Annual Cost} &= (\text{Investment Cost/Estimated System Life}) + \\ &\quad \text{Annual Operation Cost} \\ &= (380,800/5) + 618,500 \\ &= 694,660 \text{ Baht} \end{aligned}$$

Saving

Staff (for 1 staff per year)	144,000	Baht
Office Supplies & Miscellaneous	8,000	Baht
Opportunity cost & Intangible Benefit (i.e. shorten processing time, increase business volume etc.)	1,100,000	Baht
Total Saving	1,252,000	Baht

Table 3.11. Cumulative net cash flow of the Proposed Seminar Information System, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development Cost	380,000.00					
Operation & Maintenance cost		618,500.00	680,350.00	748,385.00	823,223.50	905,545.85
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time adjusted costs (adjusted to present value)	380,000.00	562,216.50	561,969.10	562,037.14	562,261.65	562,343.97
Cumulative time-adjusted costs over life time	380,000.00	942,216.50	1,504,185.60	2,066,222.74	2,628,484.39	3,190,828.36
Benefits derived from operation of new system	-	1,252,000.00	1,377,200.00	1,514,920.00	1,666,412.00	1,833,053.20
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time adjusted benefits (adjusted to present value)	-	1,138,068.00	1,137,567.20	1,137,704.92	1,138,159.40	1,138,326.04
Cumulative time-adjusted benefits over life time	-	1,138,068.00	2,275,635.20	3,413,340.12	4,551,499.52	5,689,825.55
Cumulative lifetime-adjusted costs + benefits	-380,000.00	195,851.50	771,449.60	1,347,117.39	1,923,015.13	2,498,997.19
Cumulative net cash flow		195,851.50	967,301.10	2,314,418.49	4,237,433.62	6,736,430.81

From the data given in Table 3.11, the result of each method of the feasibility analysis are as following:

(1) Payback period = 2 years

Initial Investment = 380,800 Baht

Table F.13. Payback Period Analysis, Baht.

Year	Net cash flow	Cumulative Net cash flow
1	195,051.50	195,051.50
2	770,649.60	<b>965,701.10</b>
3	1,346,317.39	2,312,018.49
4	1,922,215.13	4,234,233.62
5	2,498,197.19	6,732,430.81

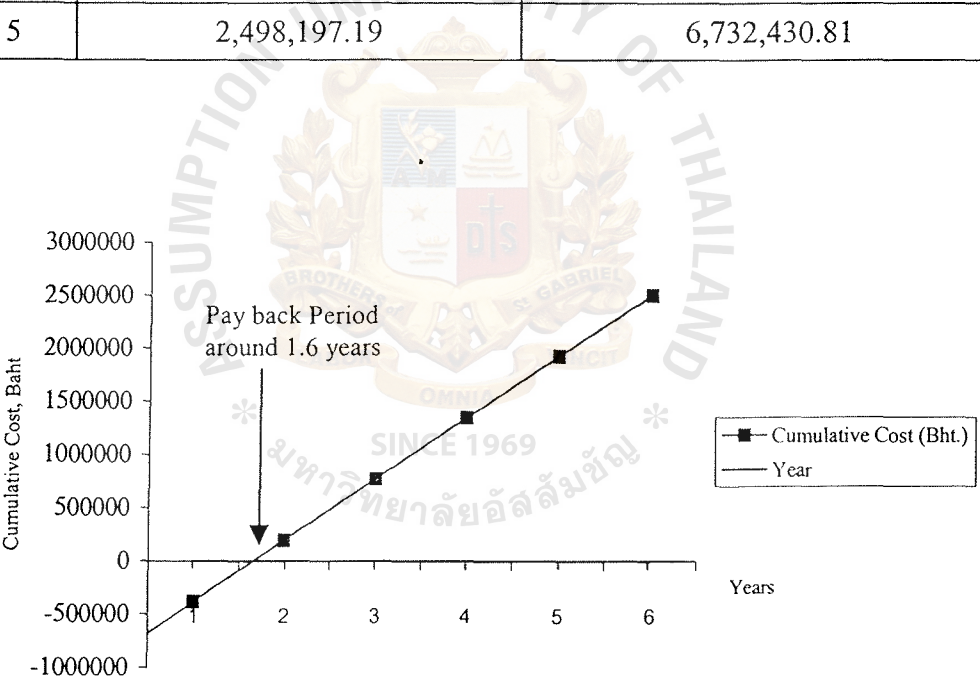


Figure 3.14. Payback Period Graph.

The payback period is defined as the expected number of years required recovering the initial investment. The shorter payback period, the greater is the project's liquidity. From the calculation above, the meaning is the proposed system requires 2 years to recover the initial investment.

(2) Net Present Value (NPV)

The NPV required, as shown in Table 3.13.



Table 3.13. Net Present Value Analysis, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Development cost:	- 380,800.00						
Operation & maintenance cost:		195,051.50	770,649.60	1,346,317.39	1,922,215.13	2,498,197.19	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual costs:	- 380,800.00	174,180.99	614,207.73	958,577.98	1,222,528.82	1,416,477.81	
Total present value of lifetime costs:							4,005,173.33
Benefits derived from operation of new system:	0	1,252,000.00	1,377,200.00	1,514,920.00	1,666,412.00	1,833,053.20	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual benefits:	0	1,118,036.00	1,097,628.40	1,078,623.04	1,059,838.03	1,039,341.16	
Total present value of lifetime benefits:							5,393,466.64
Net Present Value:							9,398,639.97



### 3.5 Security and Control

As all information has to be kept secret, the system has to provide security for the information. It must be protected from unauthorized persons or intrusion. The security control is the one of the most important considerations in designing the proposed system.

#### (1) Security of Data

In this area, it is concerned about accessing and sharing of data which includes reading, writing, executing, updating, adding, and deleting of data.

The control should include:

- (a) Setting the accessing security level for each department to access the company's database.
- (b) Using the password to protect unauthorized access.
- (c) The software should verify the change in data records.
- (d) Back up information at the end of each day.

#### (2) Physical Security of Equipment

The security can also protect and control the physical equipment. The physical equipment can support the flow of day-to-day data. As the data are the assets of the organization, it must be protected and managed.

- (a) Using an uninterruptible power supply (UPS) in order to ensure that the computer keep working if the electricity fails.
- (b) Using password for accessing each computer.
- (c) Keeping track of each printed material. It should have a printer record.
- (d) Training only in the area in which they are responsible. Do not teach the entire system.

#### (3) Protection of Integrity of System and Data

The protection should include the accessing of the system and system failure. Data must always be correct.

- (a) The data must be protected by using the backup tools.
- (b) The maintenance of the system should be done by authorized person only.

(4) Virus Protection

The Proposed system plan includes access, virus detection and a recovery plan in case of infection. Access control that users should be encourage to not transfer disks between home and office. Never use a disk on a system until that disk has been checked for virus. Virus detection making sure that a virus is found before it can infect the computer system.



## **IV. PROJECT IMPLEMENTATION**

### **4.1 Overview of project Implementation**

System implementation is the conversion processes from a current manual system to the new computerized information system. The final design should be evaluated first by the users and management teams to make sure that the new computerized system can meet the requirements and objectives, and then the other remaining process will be performed. It is expected that the system implementation would take approximately six weeks. The duration may vary depending on the readiness of the staffs to use the new system. The process of System Implementation are:

- (1) Software development
- (2) Hardware installation
- (3) Personnel training
- (4) Test Plan
- (5) Conversion
- (6) Documentation

### **4.2 Software Development**

Using Microsoft Access as DBMS develops the Seminar Information System, the computerized system is developed based on user friendly and the capability in making report. The system allows user to add, edit and delete the data and also search for desired data. In order to generate reports, the system will join tables in database file and make the calculation in the required filed based on user and management requirements.

### **4.3 Hardware Installation**

In order to establish the computerized system, the Foundation requires new file server to be installed according to its specification and cost-benefit analysis section in chapter 3.

### **4.4 Personnel Training**

User training is an important process in the system implementation. The objective of training is to make users understand, be familiar and able to use the program correctly and efficiently. The training course should include computer concepts, functions of hardware and software, function of proposed system and how to use the system properly and efficiently. However, in the case of the Proposed Seminar Information System, no official training course is set up. As a result, the system users must learn by themselves or “on the job training” because the proposed system will be developed and designed in the way they can easily learn by themselves. To ensure seamless transition, however, the system administrator will be advisor during this period.

### **4.5 Test Plan**

After the program has been designed and installed, module testing, program testing and system are required to ensure that the new system is free from errors and can work well with the other systems in the Foundation.

Module testing would help to check errors in program module. It can detect errors in coding and errors in logic. After finishing all module testing, program testing is used to check the program to verify the way the system works and to check whether each module can work together or not. System testing is checked whether the proposed system can share data or work with the other manual system properly. When finishing all testing, the testing document plans and testing results should be made so when the computer has

to do the testing again in the future, programmers can use these plans and results to do the testing again. Moreover, Security and Recovery testing is tested to ensure that the system can protect unauthorized users from access into the system. If failure happens to the database, the system should be able to recover those data.

The effective testing of the program does not guarantee system reliability. Therefore, the test case should include the Input Validation, Functionality, and Access Control.

#### **4.6 Conversion**

Conversion is the process of changing from a manual system to a new proposed system. The conversion process is set up based on the replacing concept. The users have to key in the data into the database, and then install the program for the system.

#### **4.7 Documentation**

Documentation of the proposed system is separated into 2 documents. First is the quick user manual guide, which describes how to access and use the program, how to correct the problems and how to use interface screens. The second is the flow of the system and data dictionary. Both documents can help the users whenever they need or get the problem when using the program and also can help programmer to develop and maintain the system.

## V. CONCLUSIONS AND RECOMMENDATION

### 5.1 Conclusions

The proposed Seminar Information System for the Administrative Department, the Foundation for International Human Resource Development (FIHRD) is the first step towards computerization. The system can be further improved to account for additional user requirements evolving over a period of time.

The new system is developed to provide seminar information, keep table and produce various types of reports. The screens are designed according to users requirements for ease of use and understandability.

The new system design will have more advantages than the existing system in the following ways:

- (1) The new system design is more practical because of the elimination of certain forms and the modification of other existing forms that are ineffective, unsuitable, or redundant.
- (2) The new system design is more economical because it provides more information for adjusting the appropriate cost and for monitoring performance.
- (3) The new system design is more efficient because it improves accuracy and timeliness of information. It will help in making better decisions of more effective management.
- (4) The new system design is more flexible because of the structure design, so it is easy to maintain and expand the system for future growth.
- (5) The new system design provides accurate data statistical analysis for the future.

The system is implemented using Microsoft Access 2000 for client-server. The system provides information sharing among users in the Department whenever users want to update the same record simultaneously, only the last user can do it. Up-to-date reports can be produced in time and users in the seminar center will be able to work more effectively as they will be able to search for training information faster. This is different from the existing system, which is the PC standalone basis. The new system will save time and provide the impetus for more activities with in the division.

Table 5.1 shows the time performance on each process of the proposed system compared with the existing system. It shows that each process of the proposed system performs less time than each process of the existing system which has to operate many work steps in manual system. So, it can be concluded that the proposed system is more efficient and effective than the existing system.

Table 5.1. The Degree of Achievement of the Proposed System.

Process	Existing System	Proposed System
Seminar Information System	20 mins	10 mins
Mailing List Process	2 hrs	10 mins
Application Process	1 hr	20 mins
Nametag Process	2 hrs	10 mins
Payment Process	30 mins	5 mins
Report Process	2 hrs.	5 mins



## 5.2 Recommendations

The system was implemented primarily to assist users in their daily operation. The emphasis is thus placed on the care aspects of the seminar functions, which basically involved interaction within both inside and outside the department. The extensions are expected to include the following functions:

- (1) After the proposed Seminar Information System has been implemented, the Foundation should continuously monitor the working process and feedback from the customers and users to this system to ensure that it meet all users and customer requirements.
- (2) The new system should be able to link to other systems so that it can get and share various information from and to other sources.
- (3) Connection to the accounting department for auditing business revenue.
- (4) The system evaluation process should be made every year (or specific time) to realize whether the systems worth doing.

**APPENDIX A**  
**DATA FLOW DIAGRAM**



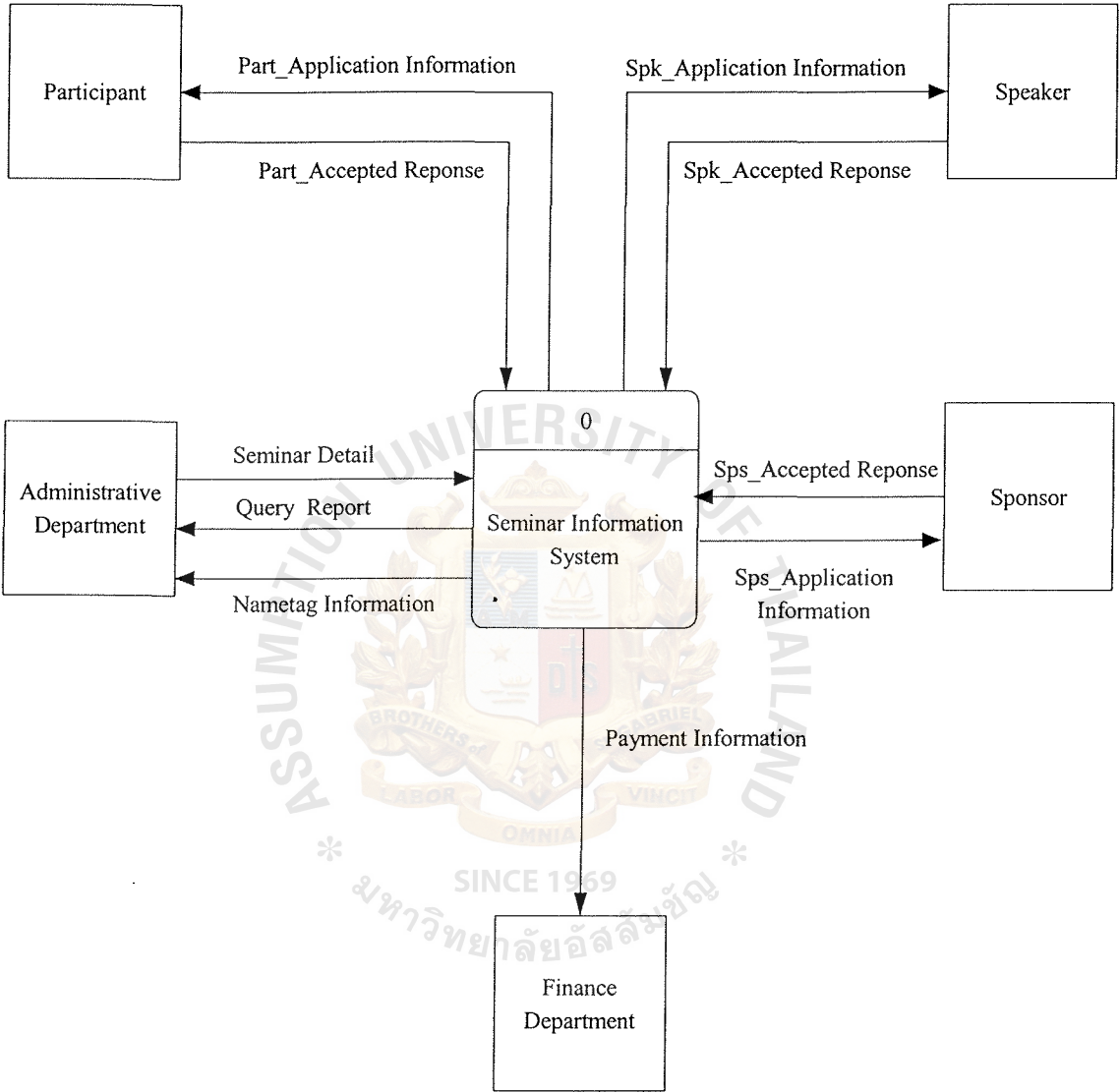


Figure A.1. Context Diagram of the Existing System.

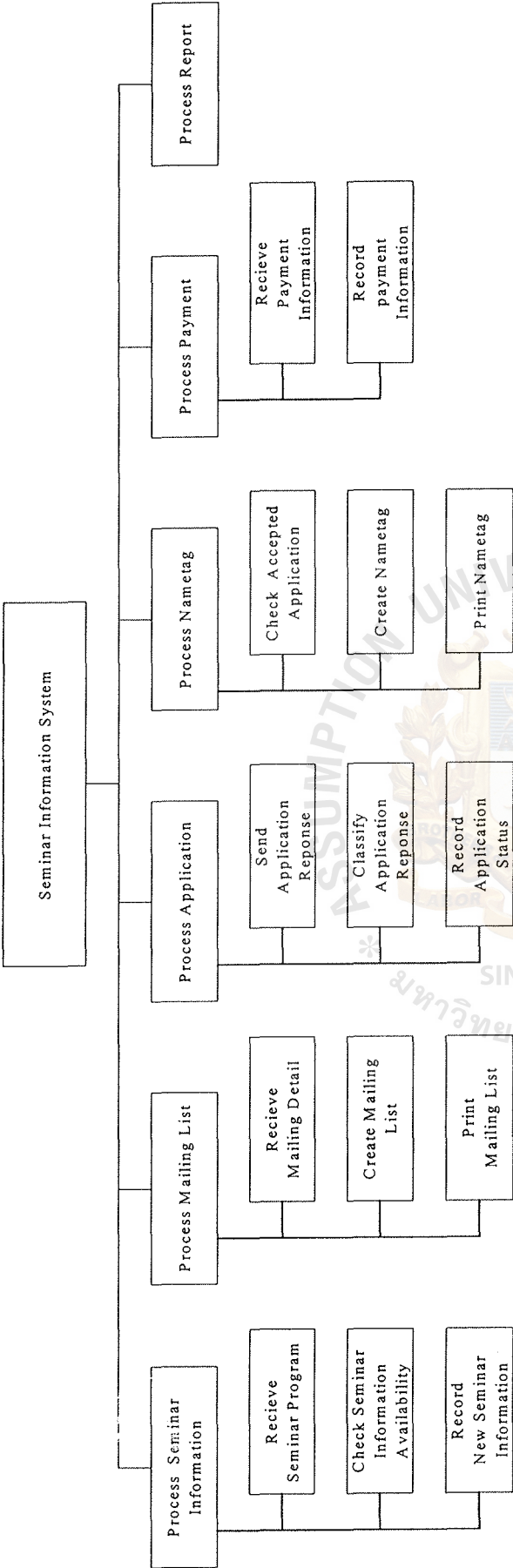


Figure A.2. Functional Decomposition Diagram of the Proposed Seminar Information System.

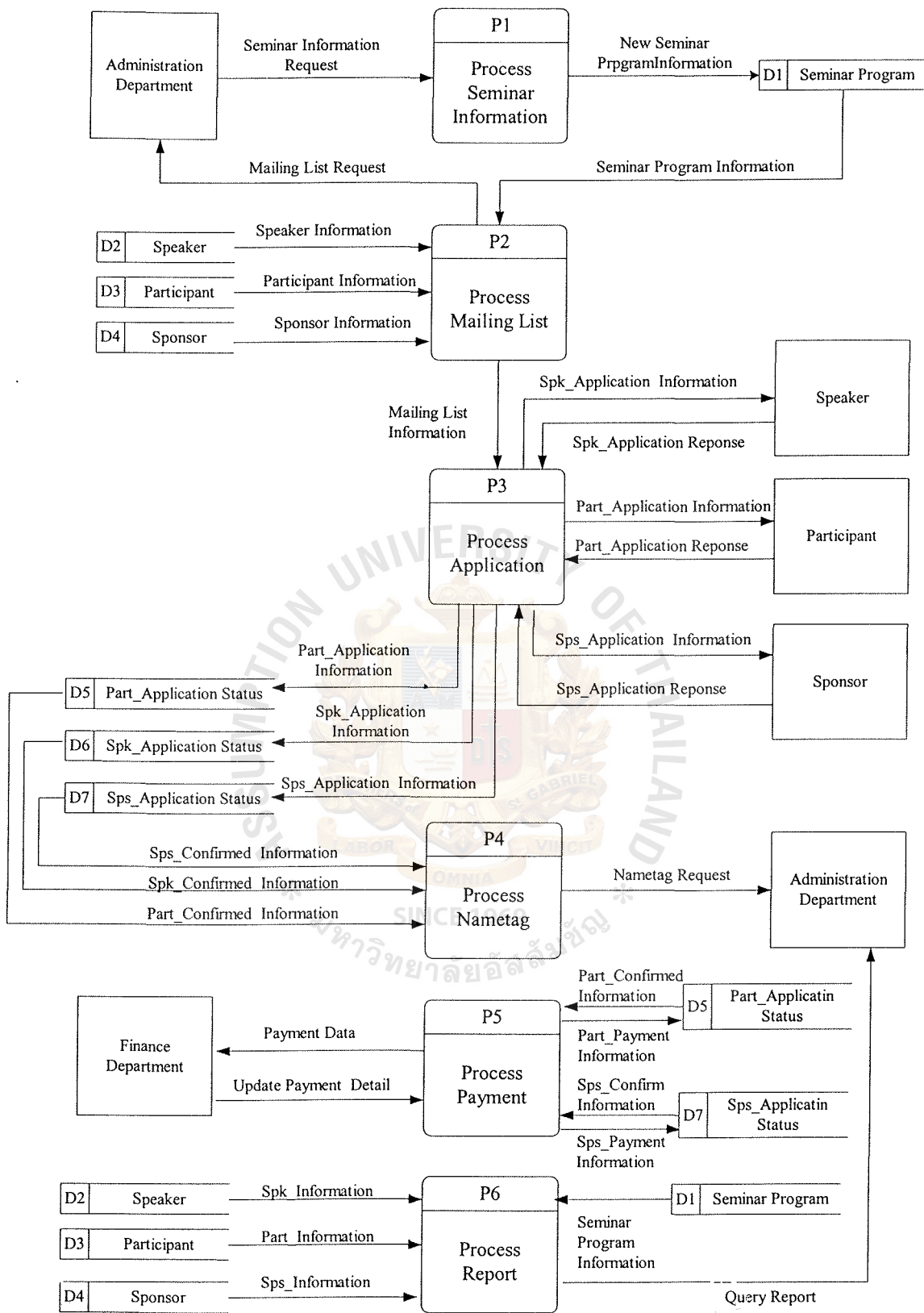


Figure A.3. Level 0 Data Flow Diagram of Process 3 the Proposed Seminar Information System.

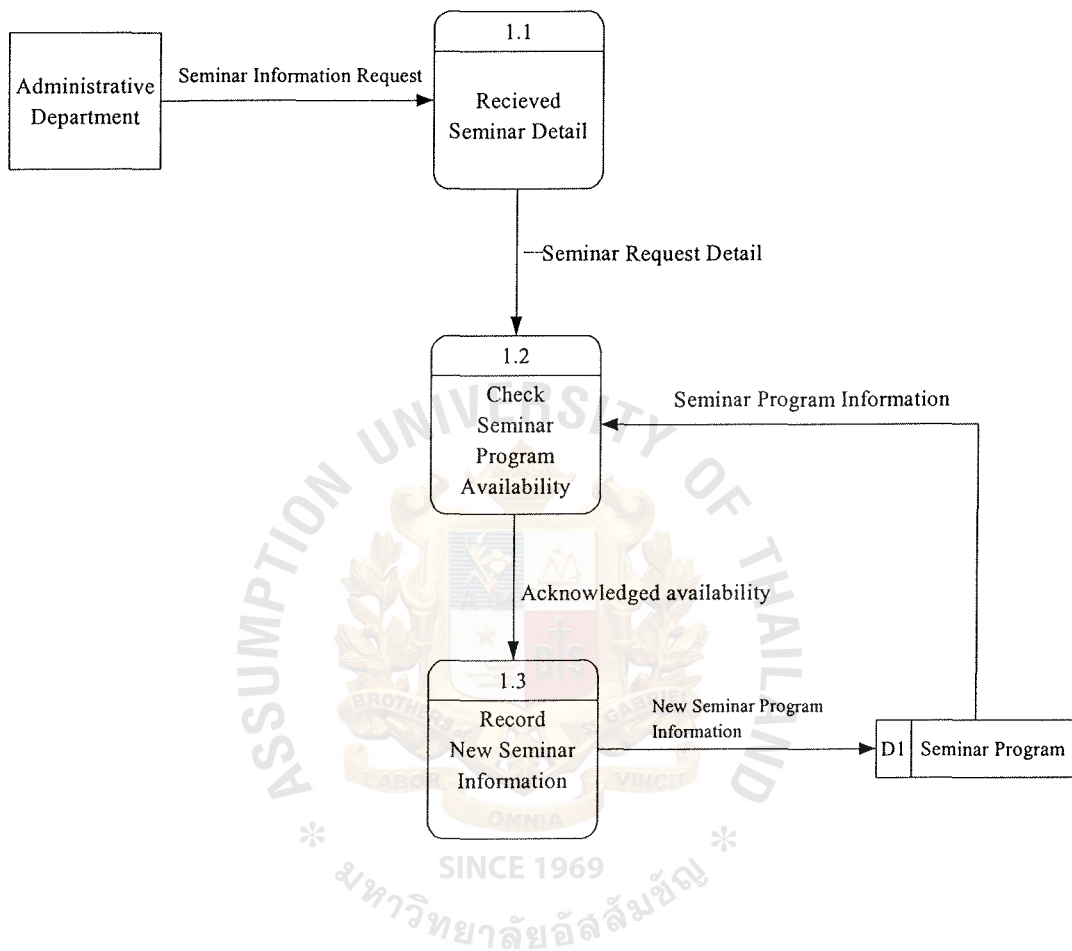


Figure A.4. Level 1 Data Flow Diagram of Process 1 of the Proposed Seminar Information System.

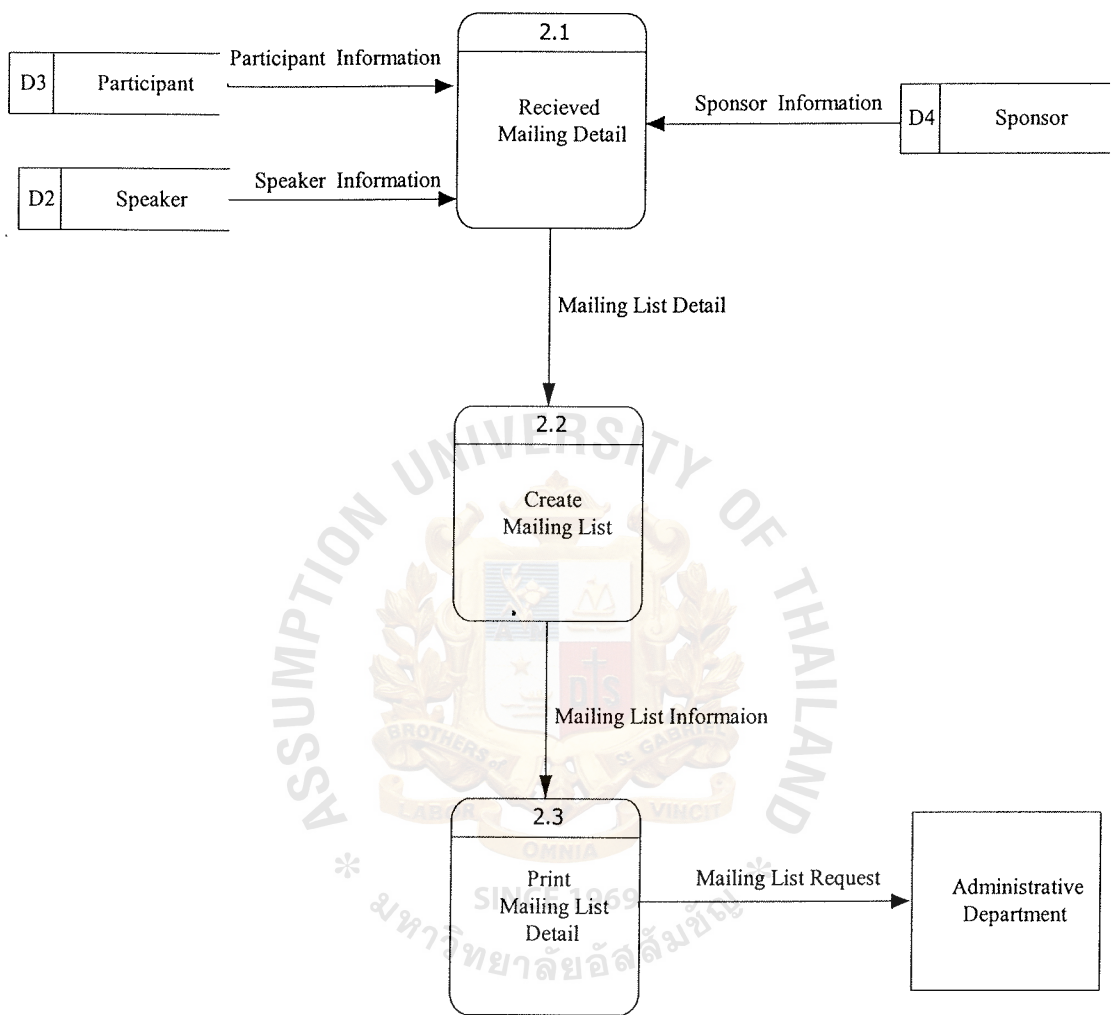


Figure A.5. Level 1 Data Flow Diagram of Process the Propose 2 of the Proposed System.



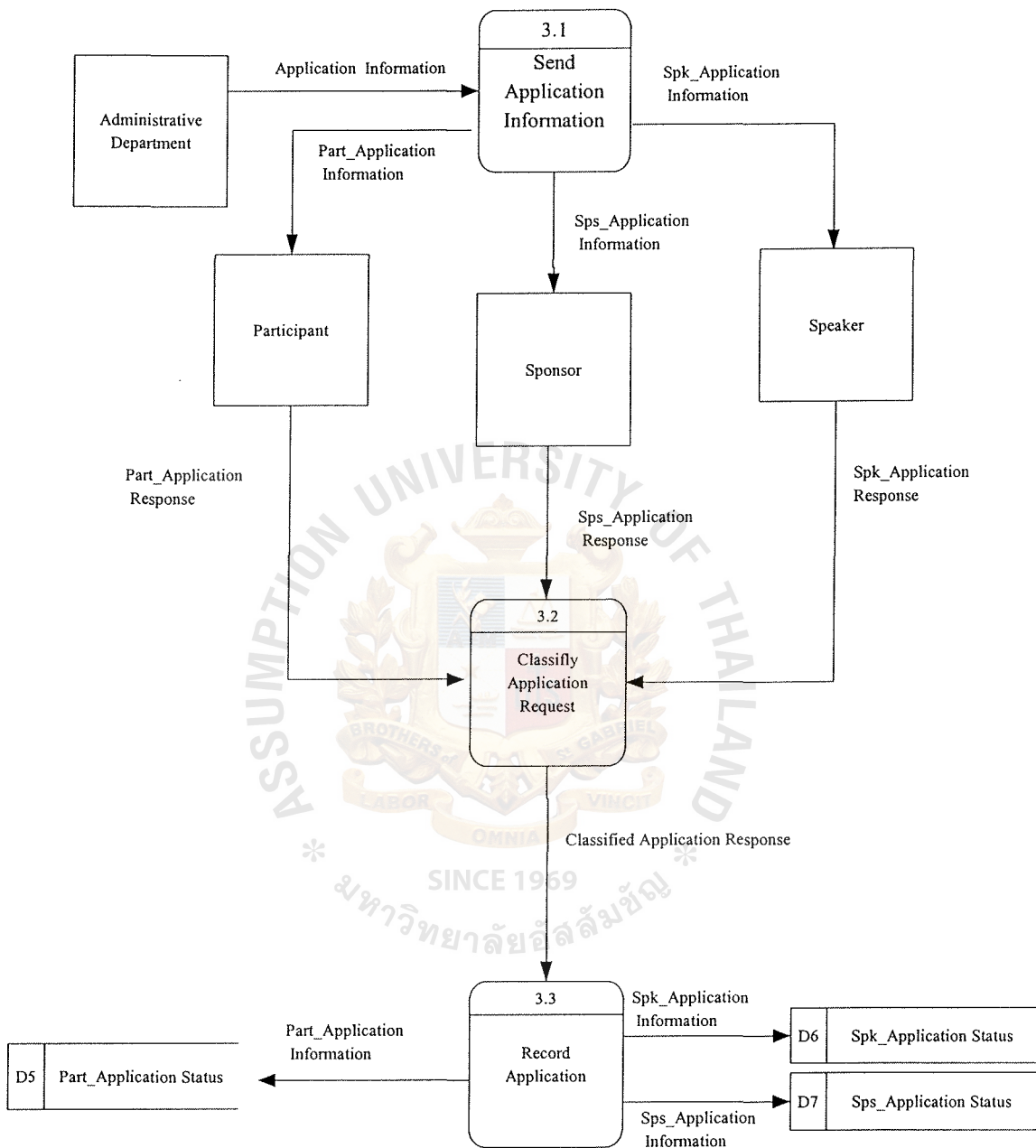


Figure A.6. Level 1 Data Flow Diagram of the Process 3 of the Proposed System.

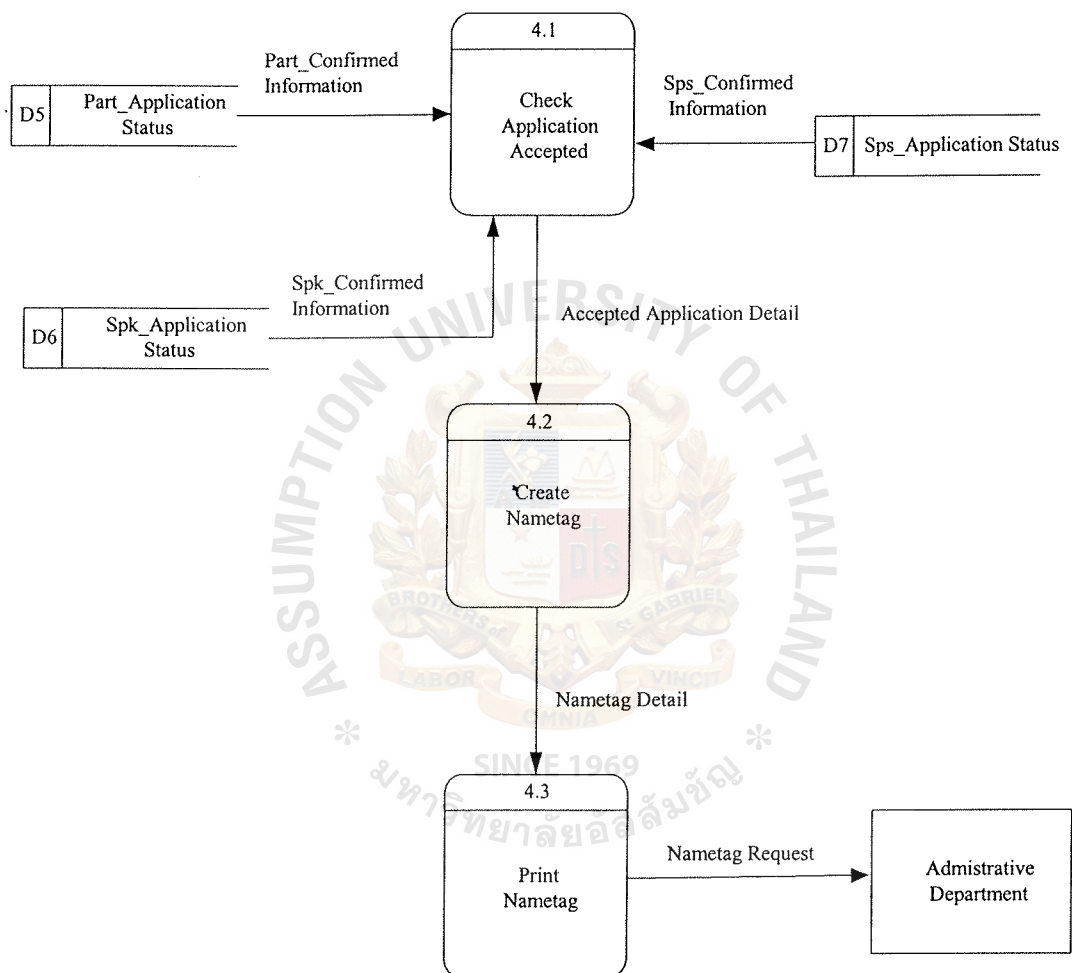


Figure A.7. Level 1 Data Flow Diagram of Process 4 of the Proposed System.

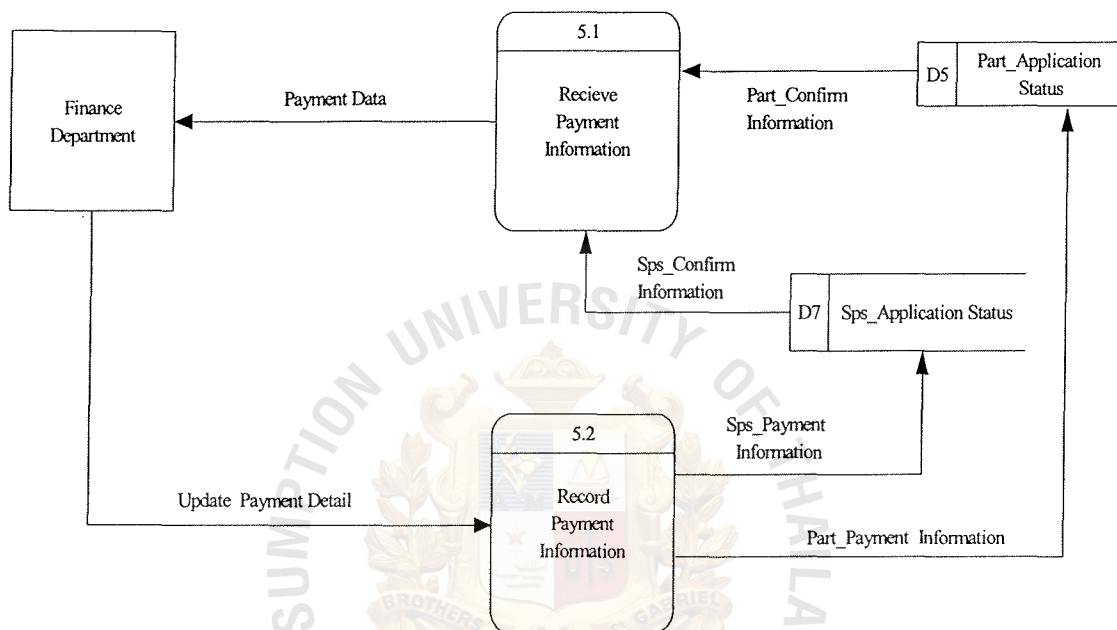


Figure A.8. Level 1 Data Flow Diagram of Process 5 of the Proposed System.

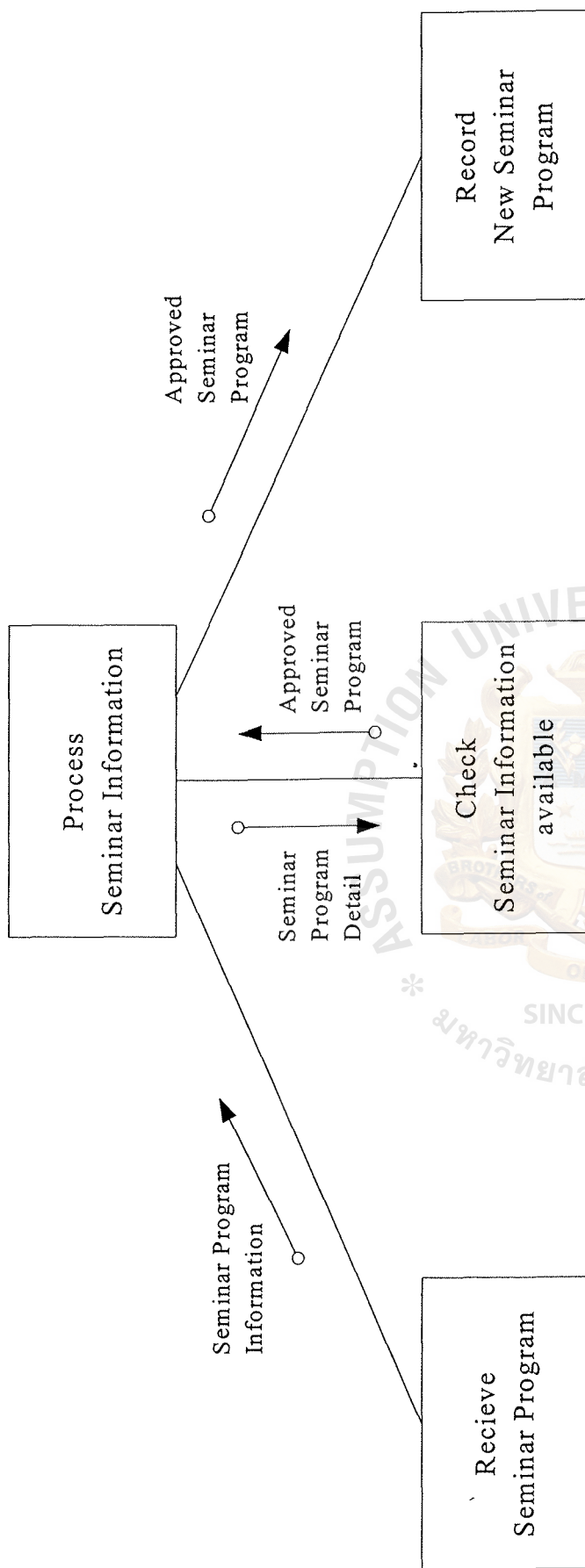


Figure A.9. Structure Chart of Process Seminar Program Information.

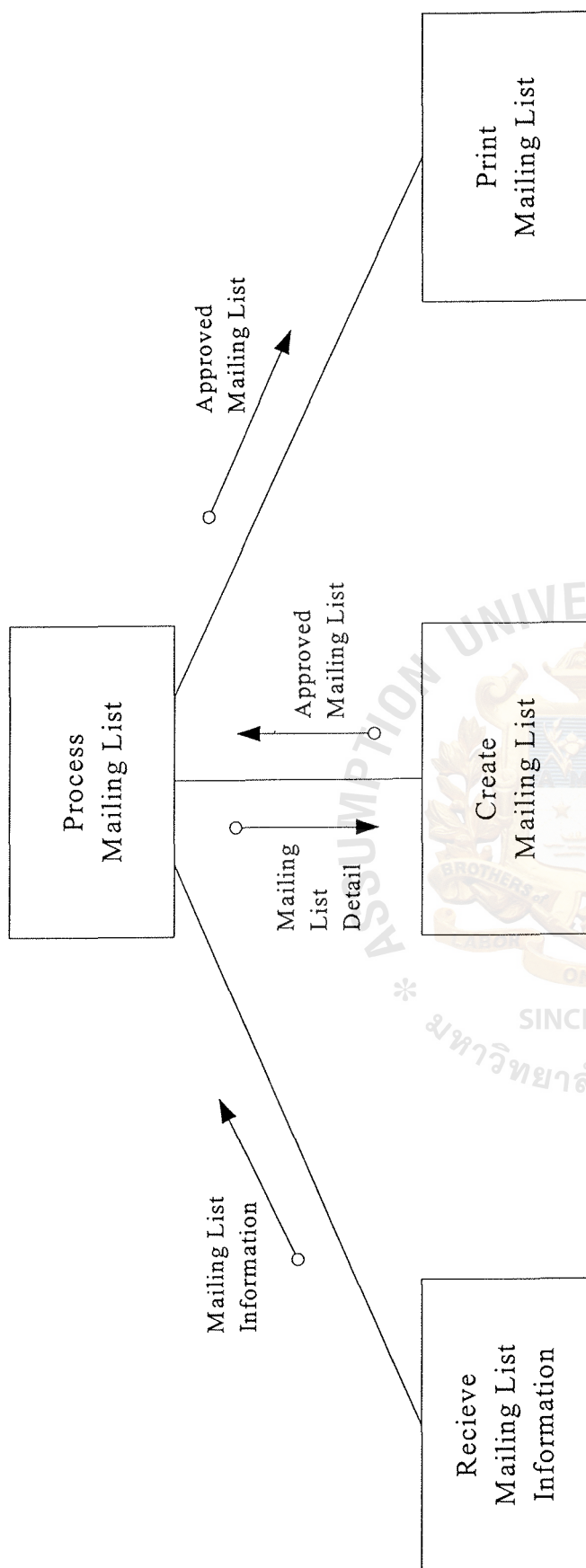


Figure A.10. Structure Chart of Process Mailing List.

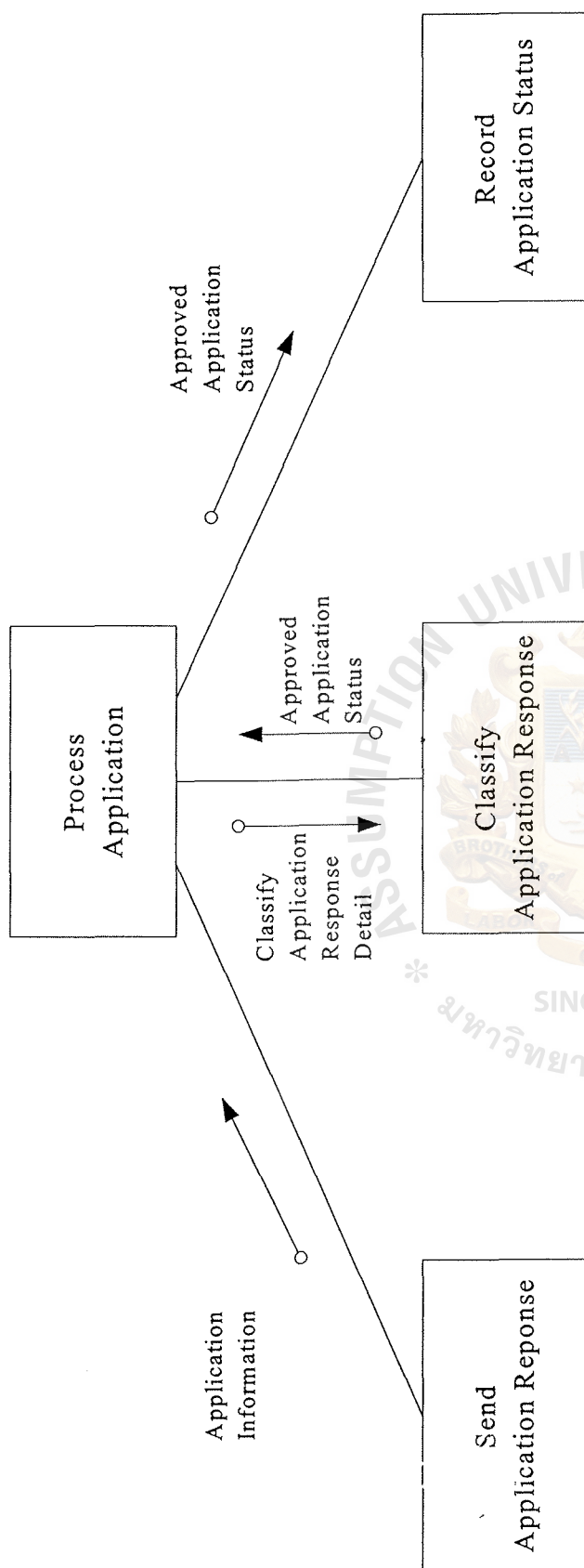


Figure A.11. Structure Chart of Process Application.

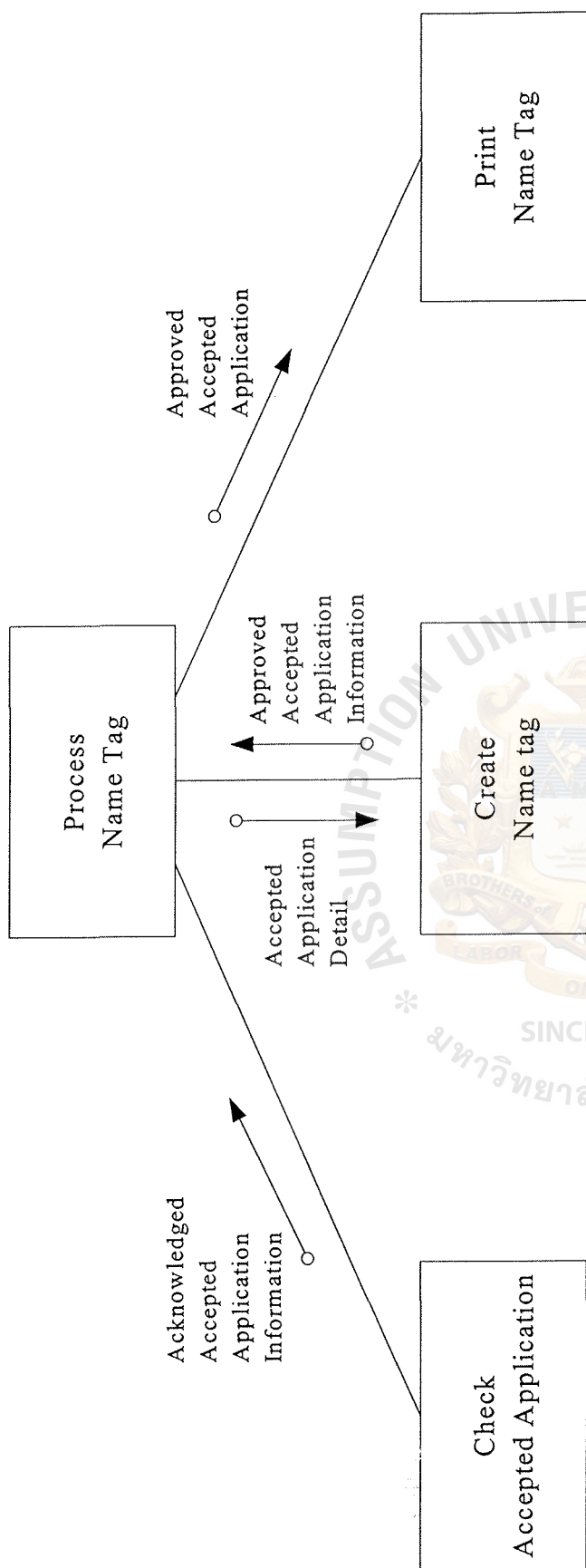


Figure A.12. Structure Chart of Process Name Tag.



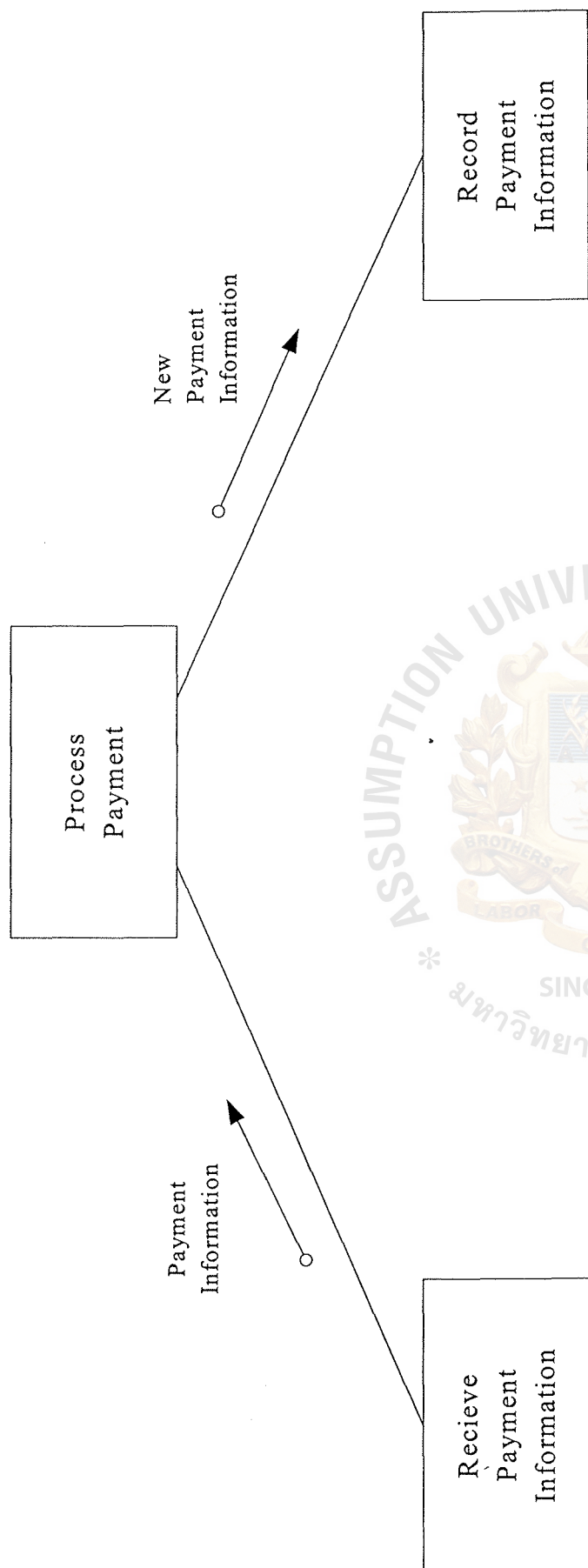


Figure A.13. Structure Chart of Process Payment.



**APPENDIX B**  
**PROCESS SPECIFICATION**

Table B.1. Process Specification of Process 1.1.

Data Item	Description
Process Name:	Received Seminar Detail
Data In:	Seminar Information Request
Data Out:	Seminar Request Detail
Process:	(1) Receive detail of seminar information which request from Board Committee (2) Send the detail of seminar information to check process
Attachment:	Administrative Department

Table B.2. Process Specification of Process 1.2.

Data Item	Description
Process Name:	Check Seminar Program Availability
Data In:	Seminar Program Information
Data Out:	Acknowledged Availability
Process:	(1) Received the seminar detail (2) Check the availability of seminar program have or have not in the database
Attachment:	Data Store D1 (Seminar Program)

Table B.3. Process Specification of Process 1.3.

Data Item	Description
Process Name:	Record New Seminar Information
Data In:	Acknowledged Availability
Data Out:	New Seminar Program Information
Process:	(1) Record the new seminar information into the database (2) Update seminar information into the database
Attachment:	Data Store D1 (Seminar Program)

Table B.4. Process Specification of Process 2.1.

Data Item	Description
Process Name:	Received Mailing Detail
Data In:	(1) Participant Information (2) Speaker Information
Data Out:	Mailing List Detail
Process:	(1) Receive the participant information from database (2) Receive the speaker information from database (3) Receive the sponsor information from database
Attachment:	(1) Data Store D2 (Speaker) (2) Data Store D3 (Participant) (3) Data Store D4 (Sponsor)

Table B.5. Process Specification of Process 2.2.

Data Item	Description
Process Name:	Create Mailing List
Data In:	Mailing List Detail
Data Out:	Mailing List Information
Process:	(1) Received the detail of mailing list of participants, speakers and sponsors (2) Create the mailing list of participants, speakers and sponsors
Attachment:	-

Table B.6. Process Specification of Process 2.3.

Data Item	Description
Process Name:	Print Mailing List Detail
Data In:	Mailing List Information
Data Out:	Mailing List Request
Process:	Print the mailing list of participants, speakers and sponsors to send the invite letter and application form
Attachment:	Administrative Department

Table B.7. Process Specification of Process 3.1.

Data Item	Description
Process Name:	Send Application Information
Data In:	Application Information
Data Out:	(1) Part_Application Information (2) Spk_ Application Information (3) Sps_ Application Information
Process:	Send the invite letter and application form to of participants, speakers and sponsors
Attachment:	(1) Participant (2) Sponsor (3) Speaker

Table B.8. Process Specification of Process 3.2

Data Item	Description
Process Name:	Classify Application Request
Data In:	(1) Part_Application Response (2) Spk_ Application Response (3) Sps_ Application Response
Data Out:	Classify Application Responses
Process:	(1) Received the application responses form from participants, speakers and sponsors (2) Classify application form to attend or not attend from participants, speakers and sponsors
Attachment:	(4) Participant (5) Sponsor (6) Speaker

Table B.9. Process Specification of Process 3.3.

Data Item	Description
Process Name:	Record Application
Data In:	Classify Application Reponses
Data Out:	(1) Part_Application Information (2) Spk_Application Information (3) Sps_Application Information
Process:	Record the application detail that participants, speakers and sponsors attend or not attend into the database
Attachment:	(1) Data Store D5 (Part_Application Status) (2) Data Store D6 (Spk_Application Status) (3) Data Store D7 (Sps_Application Status)

Table B.10. Process Specification of Process 4.1.

Data Item	Description
Process Name:	Check Application Accepted
Data In:	(1) Part_Confirmed Information (2) Spk_Confirmed Information (3) Sps_Confirmed Information
Data Out:	Accepted Application Detail
Process:	Check in the database which accept application and reject application
Attachment:	(1) Part_Application Status (2) Spk_Application Status (3) Sps_Application Status



Table B.11. Process Specification of Process 4.2.

Data Item	Description
Process Name:	Create Nametag
Data In:	Accepted Application Detail
Data Out:	Nametag Detail
Process:	Create the nametag for participant, speaker and sponsor who attend the seminar
Attachment:	-

Table B.12. Process Specification of Process 4.3.

Data Item	Description
Process Name:	Print Nametag
Data In:	Nametag Detail
Data Out:	Nametag Request
Process:	Produce the nametag for participant, speaker and sponsor who attend the seminar
Attachment:	Administrative Department

Table B.13. Process Specification of Process 5.1.

Data Item	Description
Process Name:	Receive Payment Information
Data In:	(1) Part_Confirmed Information (2) Sps_Confirmed Information
Data Out:	Payment Data
Process:	(1) Get the payment information about the participants who must pay the fee for seminar (2) Get the payment information about the sponsors who must donate the money for seminar
Attachment:	(1) Data Store D5 (Part_Application Status) (2) Data Store D7 (Sps_Application Status) (3) Finance Department

Table B.14. Process Specification of Process 5.2.

Data Item	Description
Process Name:	Record Payment Information
Data In:	Update Payment Detail
Data Out:	(1) Part_Payment Information (2) Sps_Payment Information
Process:	Update the payment information who pay the money already into the database
Attachment:	(4) Data Store D5 (Part_Application Status) (5) Data Store D7 (Sps_Application Status) (6) Finance Department



**APPENDIX C**  
**DATABASE DESIGN**

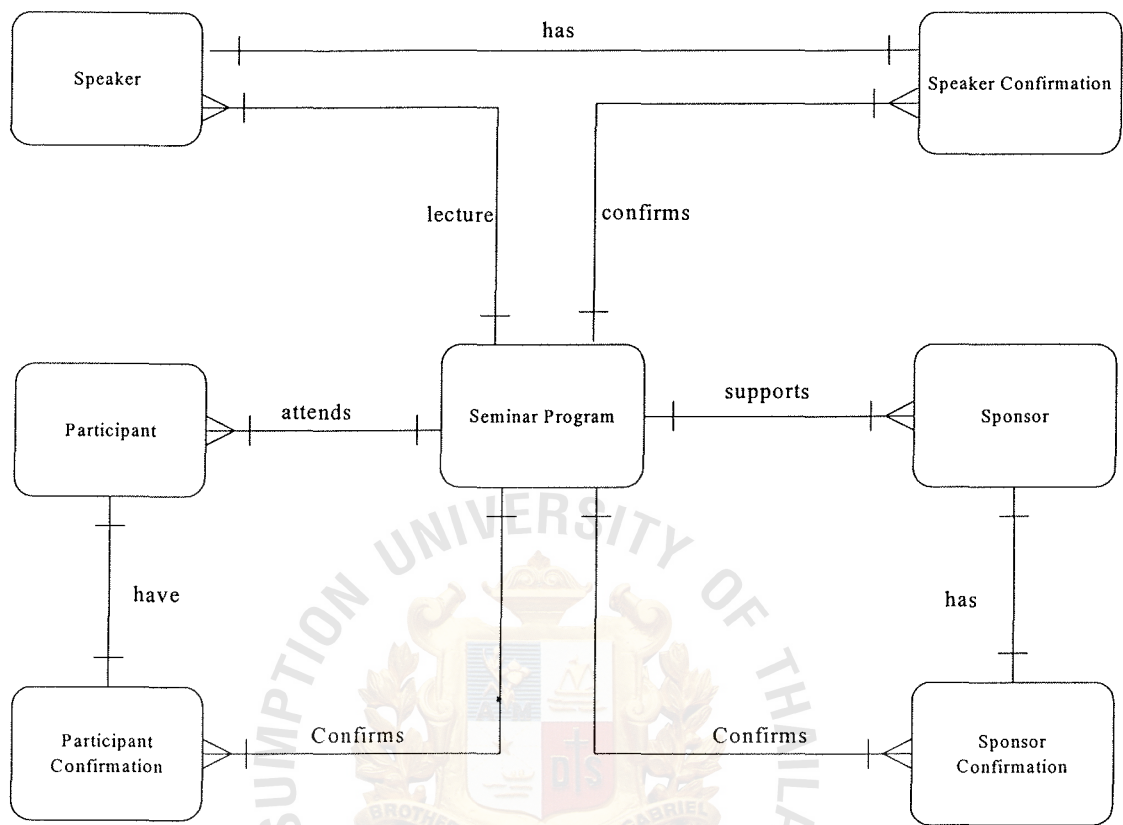


Figure C.1. Context ERD of the Proposed Seminar Information System.

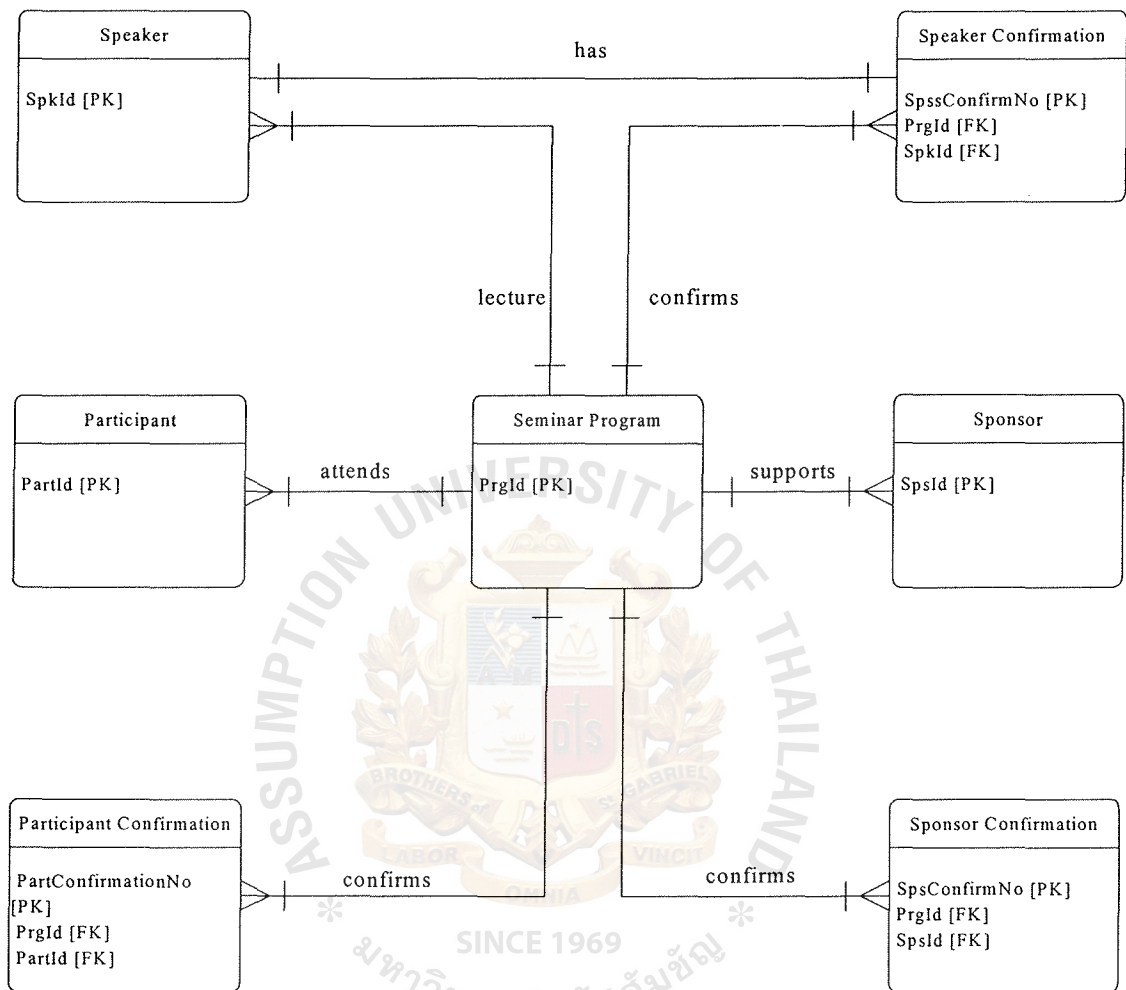


Figure C.2. Key-Based ERD of the Proposed Seminar Information System.

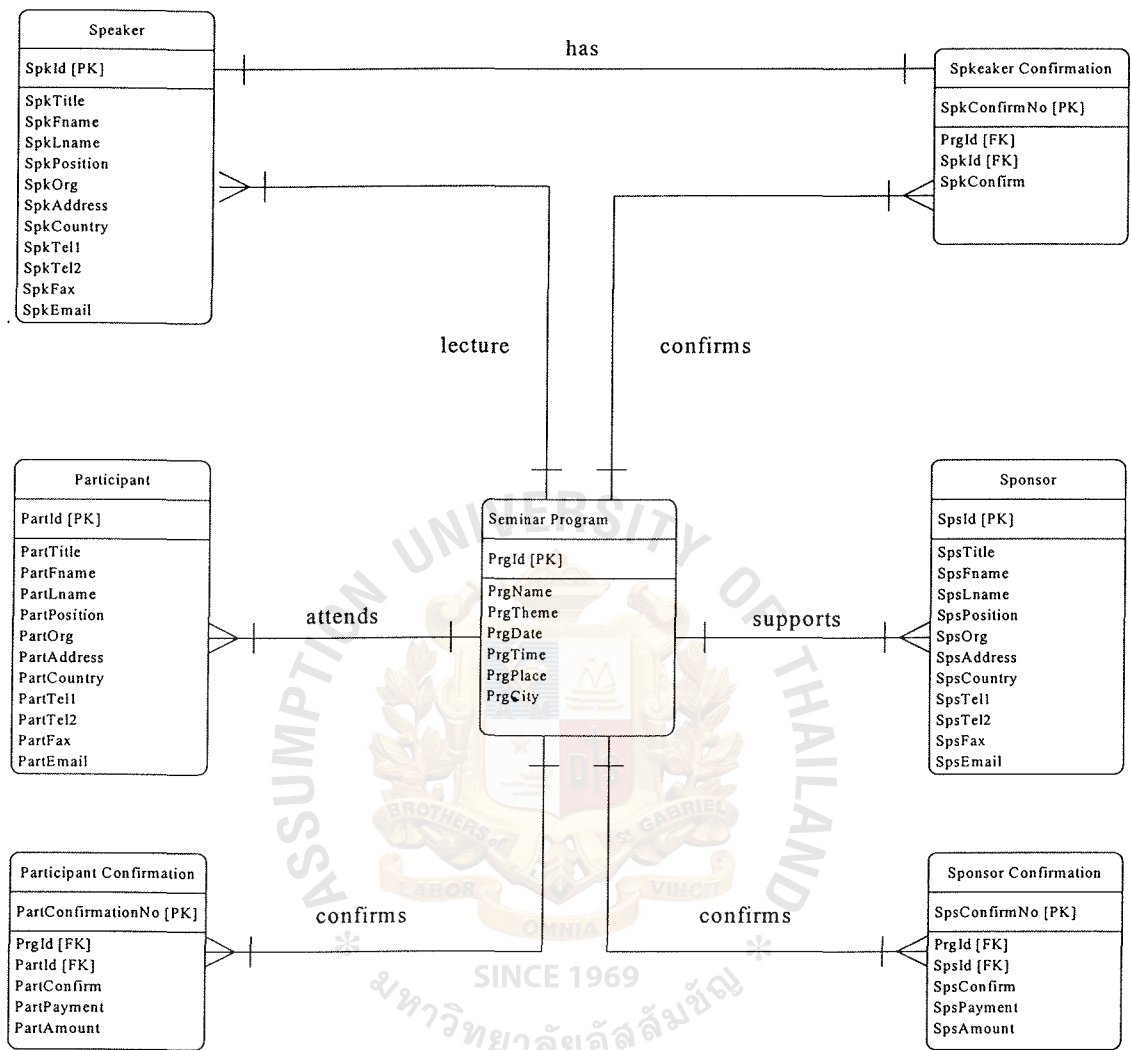


Figure C.3. Fully Attributed ERD of the Proposed Seminar Information System.

Table C.1. Structure of Seminar Program Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	PrgId	Int (5)	Y	Y		Participant Application Status, Speaker Application Status, Sponsor Application Status		Primary Key
2	PrgName	Varchar (50)						Attribute
3	PrgTheme	Varchar (20)						Attribute
4	PrgDate	Varchar (10)						Attribute
5	PrgTime	Varchar (10)						Attribute
6	PrgPlace	Varchar (20)						Attribute
7	Prgcity	Varchar (20)						Attribute



Table C.2. Structure of Speaker Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	SpkId	Int (5)	Y	Y		Speaker Application Status		Primary Key
2	SpkTitle	Varchar (20)						Attribute
3	SpkFname	Varchar (20)						Attribute
4	SpkLname	Varchar (20)						Attribute
5	SpkPosition	Varchar (20)						Attribute
6	SpkOrg	Varchar (20)						Attribute
7	SpkAddress	Varchar (20)						Attribute
8	SpkCountry	Varchar (10)						Attribute
9	SpkTel1	Int (10)						Attribute
10	SpkTel2	Int (10)						Attribute
11	SpkFax	Int (10)						Attribute
12	SpkEmail	Varchar (20)						Attribute

Table C.3. Structure of Participant Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	PartId	Int (5)	Y	Y		Participant Application Status		Primary Key
2	PartTitle	Varchar (20)						Attribute
3	PartFname	Varchar (20)						Attribute
4	PartLname	Varchar (20)						Attribute
5	PartPosition	Varchar (20)						Attribute
6	PartOrg	Varchar (20)						Attribute
7	PartAddress	Varchar (20)						Attribute
8	PartCountry	Varchar (10)						Attribute
9	PartTel1	Int (10)						Attribute
10	PartTel2	Int (10)						Attribute
11	PartFax	Int (10)						Attribute
12	PartEmail	Varchar (20)						Attribute

Table C.4. Structure of Sponsor Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	SpsId	Int (5)	Y	Y		Participant Application Status		Primary Key
2	SpsTitle	Varchar (20)						Attribute
3	SpsFname	Varchar (20)						Attribute
4	SpsLname	Varchar (20)						Attribute
5	SpsPosition	Varchar (20)						Attribute
6	SpsOrg	Varchar (20)						Attribute
7	SpsAddress	Varchar (20)						Attribute
8	SpsCountry	Varchar (10)						Attribute
9	SpsTel1	Int (10)						Attribute
10	SpsTel2	Int (10)						Attribute
11	SpsFax	Int (10)						Attribute
12	SpsEmail	Varchar (20)						Attribute

Table C.5. Structure of Participant Application Status Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	PartConfirmNo	Int (5)	Y	Y				Primary Key
2	PrgId	Varchar (20)						Foreign Key
3	PartId	Varchar (20)						Foreign Key
4	PartConfirm	Varchar (20)						Attribute
5	PartPayment	Varchar (20)						Attribute
6	PartAmount	Decimal (15,2)						Attribute

Table C.6. Structure of Speaker Application Status Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	SpkConfirmNo	Int (5)	Y	Y				Primary Key
2	PrgId	Varchar (20)						Foreign Key
3	SpkId	Varchar (20)						Foreign Key
4	SpkConfirm	Varchar (20)						Attribute

Table C.7. Structure of sponsor Application Status Table.

No.	Field Name	Field Type	Index	Unique	Nullable	Foreign Key to Table	Check	Key Type
1	SpsConfirmNo	Int (5)	Y	Y				Primary Key
2	PrgId	Varchar (20)						Foreign Key
3	SpsId	Varchar (20)						Foreign Key
4	SpsConfirm	Varchar (20)						Attribute
5	SpsPayment	Varchar (20)						Attribute
6	SpsAmount	Decimal (15,2)						Attribute

**APPENDIX D**  
**DATA DICTIONARY**



Table D.1. Data Dictionary of Seminar Program Table.

Field Name	Meaning
PrgId	Seminar program Identification Number
PrgName	Seminar program name
PrgTheme	Concept of seminar program
PrgDate	Duration of seminar program
PrgTime	Opened time and closed time of seminar program
PrgPlace	Place to hold the seminar
PrgCity	City

Table D.2. Data Dictionary of Speaker Table.

Field Name	Meaning
SpkId	Speaker Identification Number
SpkTitle	Title of speaker name
SpkFname	Speaker's first name
SpkLname	Speaker's last name
SpkPosition	Speaker's position
SpkOrg	Speaker's organization
SpkAddress	Speaker's contact address
SpkCountry	Speaker's country
SpkTel1	Speaker's telephone number1
SpkTel2	Speaker's telephone number2
SpkFax	Speaker's fax number
SpkEmail	Speaker's email



Table D.3. Data Dictionary of Participant Table.

Field Name	Meaning
PartId	Participant Identification Number
PartTitle	Title of participant name
PartFname	Participant's first name
PartLname	Participant's last name
PartPosition	Participant's position
PartOrg	Participant's organization
PartAddress	Participant's contact address
PartCountry	Participant's country
PartTel1	Participant's telephone number1
PartTel2	Participant's telephone number2
PartFax	Participant's fax number
PartEmail	Participant's email

Table D.4. Data Dictionary of Sponsor Table.

Field Name	Meaning
SpsId	Sponsor Identification Number
SpsTitle	Title of sponsor name
SpsFname	Sponsor's first name
SpsLname	Sponsor's last name
SpsPosition	Sponsor's position
SpsOrg	Sponsor's organization
SpsAddress	Sponsor's contact address
SpsCountry	Sponsor's country
SpsTel1	Sponsor's telephone number1
SpsTel2	Sponsor's telephone number2
SpsFax	Sponsor's fax number
SpsEmail	Sponsor's email



**APPENDIX E**  
**INPUT AND OUTPUT DESIGN**

Table D.5. Data Dictionary of Participant Application Status Table.

Field Name	Meaning
PartConfirmNo	The Automatic Number of confirmation of participant to attend the seminar
PrgId	Seminar program Identification Number
PartId	Participant Identification Number
PartConfirm	The confirmation of participant to attend the seminar
PartPayment	The payment information that participant will pay money already or not yet
PartAmount	The money that participant paid for the seminar program

Table D.6. Data Dictionary of Speaker Application Status Table.

Field Name	Meaning
SpkConfirmNo	The Automatic Number of confirmation of speaker to attend the seminar
PrgId	Seminar program Identification Number
SpkId	Speaker Identification Number
SpkConfirm	The confirmation of speaker to attend the seminar

Table D.7. Data Dictionary of Sponsor Application Status Table.

Field Name	Meaning
SpsConfirmNo	The Automatic Number of confirmation of sponsor to attend the seminar
PrgId	Seminar program Identification Number
SpsId	Sponsor Identification Number
SpsConfirm	The confirmation of sponsor to attend the seminar
SpsPayment	The payment information that sponsor donate money already or not yet
SpsAmount	The money that sponsor donate for the seminar program

## INPUT AND OUTPUT DESIGN

### E.1 Input Design

Input design serve as important goal to capture and get the data into a format suitable for the computer. Because inputs originate with system users, human factors play a significant role in input. Consequently, input process should be as simple as possible and designed to reduce the possibility of incorrect data being entered.

Having an advance in computer technology, Screen display forms can duplicate the appearance of almost any paper-based form. Most applications data capture involves the use of source documents and screen display forms. Thus, its design must be easy for the system users to complete and should facilitate rapid data entry.

Concerning to project requirement-system requirements, user requirements and hardware and software requirement-the screen display forms have a graphic looking appearance by using Graphic Use Interface (GUI) to make easy for data entry.

GUI controls for input design used in the Seminar Information System are as following.

#### (1) Text Box

It is the most common control used for input of data. The text box consists of a rectangular shaped box that is usually accompanied by a caption. This control requires the user to type the data inside the box. A text box can allow for single and multiple lines of data characters to be enter. When a text box contains multiple line of data, scrolling features are also normally included.

A text box is the most suitable used when the input data values are unlimited in scope and the system analyst is unable to provide the system users with a meaningful list of values from which they can select.

## (2) Radio button

It provides the user with an easy way to quickly identify and select a particular value from a value set. A radio button consists of small circle and an associated textual description that corresponds to the value choice. Radio buttons also offer the advantage of allowing the user the flexibility of selecting via the keyboard or mouse.

Radio buttons are most appropriately used cases where a user may be expected to input data that have a limited predefined set of mutually exclusive values.

## (3) Combination Box (Combo Box)

A combo box combines the capabilities of a text box and list box. It gives the user the flexibility entering a data item's value (as with a text box) or selecting its value from a list (as with a list box)

A combo box is most appropriately used in those cases where limited screen space is available and it is desirable to provide the user with the option for selecting a value from a list or typing a value that or may not appear as an option in the list.

The following figures are the simple of input screen display forms designed for the Seminar Information System.



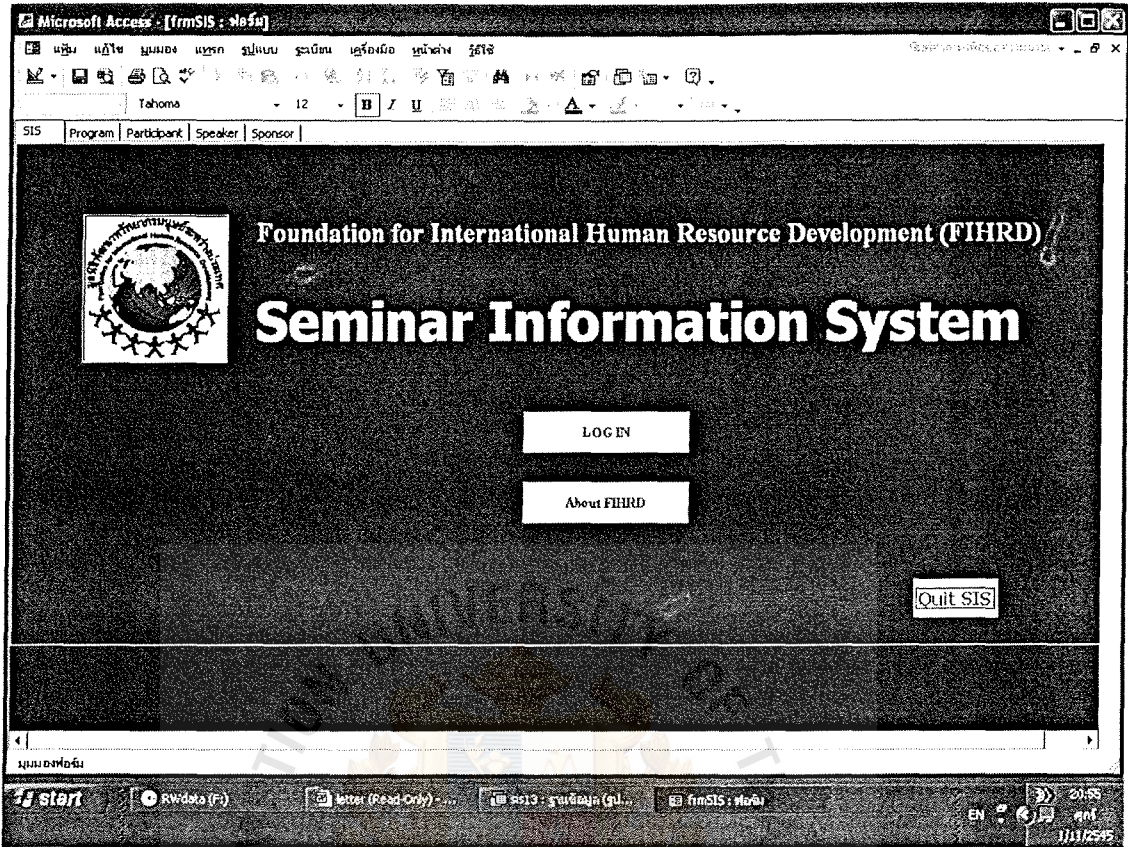


Figure E.1. Main Menu Screen.

**Log In** [X]

Please enter Username and Password

Username

Password

Figure E.2. Log in Screen.

Microsoft Access

frmSIS : โปรแกรม

SIS Program Participant Speaker Sponsor

input part of program name for search  Add New Program Delete this Record

ProgramName LF1999 Date 24-26 February 1999

Theme New Thinking and Strategies for Dealing with the Economic Crisis Time 09.00-17.00

Place The Imperial Queen's Park Hotel City Bangkok

WebSite

รายงานผู้ได้รับเชิญ | รายงานผู้ตอบรับการเข้าร่วม | speaker ที่ถูกเชิญ | Speaker ที่ตอบรับ | รายละเอียดผู้ตอบรับเป็นsponsor | รายละเอียดผู้ตอบรับเป็นSponsor

Select participant	Confirm	Payment Status	Payment Amount	Name
Alar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	\$0.00	Mr. Alan Leber
Javi	<input type="checkbox"/>	<input type="checkbox"/>	\$0.00	Mr. Java Torregrossa
Suk	<input type="checkbox"/>	<input type="checkbox"/>	\$0.00	Dr. Suki logic
Don	<input type="checkbox"/>	<input type="checkbox"/>		ดร. Don Vamont Marktheonmunt

รายงานผู้ได้รับเชิญ

start

EN 20:12 1/11/2545

Figure E.3. Update Seminar Program and List of Invited Participants Screen.





Microsoft Access

frmSIS : โปรแกรม

SIS Program Participant Speaker Sponsor

Input part of program name for search  Add New Program Delete this Record

ProgramName LF1999 Date 24-26 February 1999

Theme New Thinking and Strategies for Dealing with the Economic Crisis Time 09.00-17.00

Place The Imperial Queen's Park Hotel City Bangkok

Web Site

รายละเอียดโปรแกรม | รายละเอียดการเข้าร่วมประชุม | รายละเอียดวิทยากร | รายละเอียดผู้สนับสนุน | รายละเอียดผู้จัดเป็น Sponsor

PrgID	SpkID	SpkConfirm	SpkTitle	SpkFname	SpkLastname
LF1999	Korn	<input checked="" type="checkbox"/>	H.E. Mr.	Korn	Dabbaransi
LF1999	Yann	<input checked="" type="checkbox"/>	Mr.	Yann	Duval
LF1999	Damrong	<input type="checkbox"/>	Mr.	Damrong	Samart
*		<input type="checkbox"/>			

จำนวน: 14 | 1 | 2 | 3

start

ss13 : รายละเอียด (สป...)

frmSIS : โปรแกรม

screen - Microsoft Word

20:13

1/11/2545

Figure E.5. Update Seminar Program and List of Invited Speakers Screen.

Microsoft Access

frmSIS - โปรแกรม

SIS Program Participant Speaker Sponsor

input part of program name for search  Add New Program Delete this Record

ProgramName LF1999 Date 24-26 February 1999

Theme New Thinking and Strategies for Dealing with the Economic Crisis Time 09.00-17.00

Place The Imperial Queen's Park Hotel City Bangkok

WebSite

รายละเอียดโปรแกรม | รายละเอียดของโปรแกรม | speaker ที่ถูกเชิญ | Speaker ที่ตอบรับ | รายละเอียดผู้ตอบรับเป็นsponsor | รายละเอียดผู้ตอบรับเป็นSponsor

ProgID	SpkID	SpkConfirm	SpkTitle	SpkFname	SpkLastname
LF1999	Korn	<input checked="" type="checkbox"/>	H.E. Mr.	Korn	Dabbaransi
LF1999	Yann	<input checked="" type="checkbox"/>	Mr.	Yann	Duval
*		<input type="checkbox"/>			

แสดง: 1 ถึง 2 จาก 2

start

EN 20:14 1/11/2545

Figure E.6. Update Seminar Program and List of Speakers Confirmation Screen.

Microsoft Access

frmSIS : Menu

SIS Program Participant Speaker Sponsor

Input part of program name for search  Add New Program Delete this Record

ProgramName LF1999 Date 24-26 February 1999

Theme New Thinking and Strategies for Dealing with the Economic Crisis Time 09.00-17.00

Place The Imperial Queen's Park Hotel City Bangkok

WebSite

ท่านเป็นผู้ได้รับเชิญ | ท่านเป็นผู้ตอบรับการเข้าร่วมงาน | speaker ที่ถูกเชิญ | speaker ที่ตอบรับ | ท่านเป็นผู้ถูกเสนอเป็นsponsor | ท่านเป็นผู้ที่ตอบรับเป็นSponsor |

PrgrID	SpsID	SpsConfirm	SpsAmount	SpsFname	SpsLname
LF1999	Kittipong	<input type="checkbox"/>	\$0.00	Mr. Kittipong	Tasook
LF1999	Pupimol	<input type="checkbox"/>	\$0.00	Mr. Pupimol	SongSiri
*		<input type="checkbox"/>			

จำนวน: 14 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 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775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 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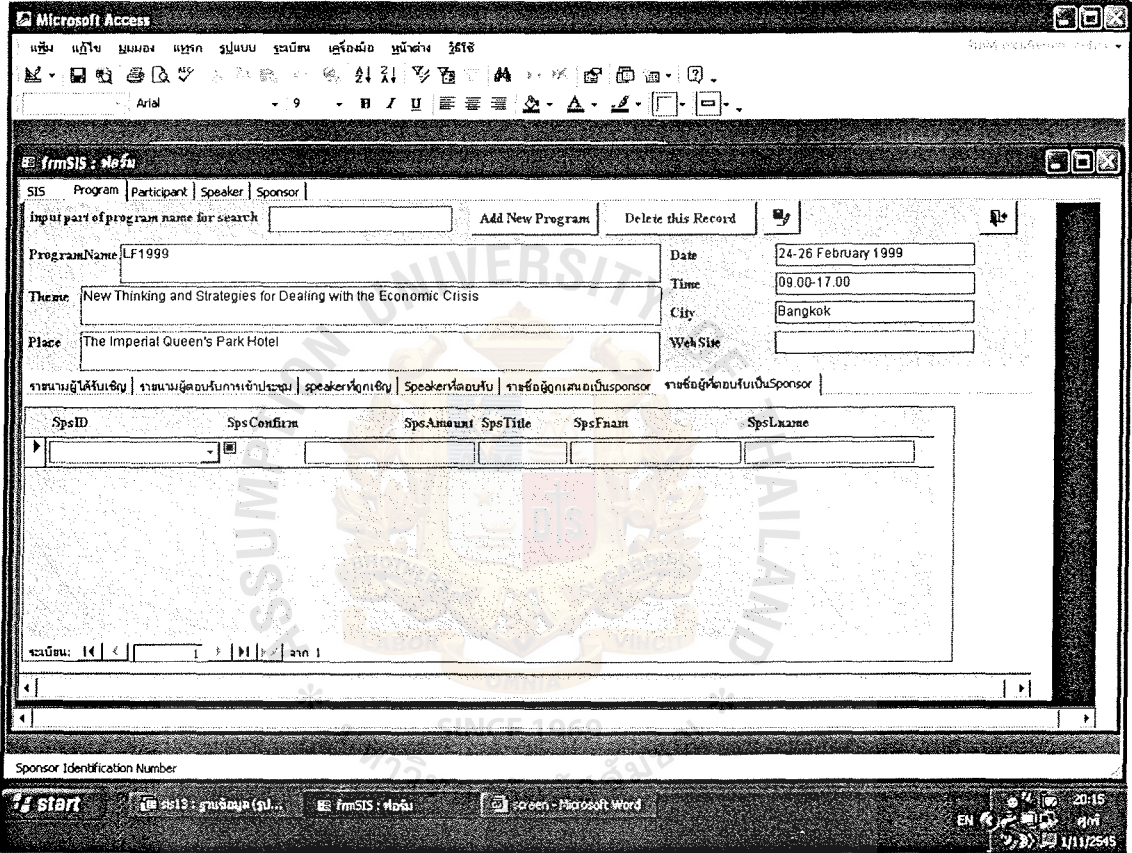


Figure E.8. Update Seminar Program and List of Sponsors Confirmation Screen.

Microsoft Access

frmSIS : Webu

SIS | Program | Participant | Speaker | Sponsor

Input part of First Name for searching

PartTitle: Mr. PartFName: Alan PartLName: Leber

PartPosition: Second Secretary (Development) PartOrg: Canadian Embassy

PartAddress: 990 Abdulrahim Place, 15th Fl, Rama IV BKK 10500

PartCountry: CANADA

PartEmail:

PartTel1: PartTel2: 02-636-0540 PartFax: 02-636-0569

PrgID	PartID	PartConfirm	PartPayment	PartAmount	PrgName	Date / City
LF	Ala	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	\$0.00	LF1999	24-26 February 1999 Bangkok
LF	Ala	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	\$2,000.00	LF2000	15-17 February 2000 Bangkok

Seminar program identification number

start

2513 : ฐานข้อมูล (ดู...)

frmSIS : Webu

Document1 - Microsoft...

20:10

11/11/2545

Figure E.9. Update Participant Input Screen.

Microsoft Access

frmSIS : ชื่อผู้

SIS | Program | Participant | Speaker | Sponsor

Input Parts of name

SpkTitle:  SpkFName:  SpkLastname:

SpkPosition:  SpkOrg:

SpkAddress:

SpkCountry:

SpkEmail:

SpkTel1:

SpkTel2:

SpkFax:

โปรแกรมที่ใช้ในการเรียน | โปรแกรมที่ใช้ในการสอน

PrgID	SpkConfirm	PrgName	PrgDate	PrgCity
LF1999	<input checked="" type="checkbox"/>	LF1999	24-26 February 1999	Bangkok
LF2000	<input type="checkbox"/>	LF2000	15-17 February 2000	Bangkok
*	<input type="checkbox"/>			

Title of speaker name

start

EN 20:05 1/11/2545

Figure E.10. Update Speakers Input Screen.



Microsoft Access

frmSIS : สปส

SIS | Program | Participant | Speaker | Sponsor

type part of Name to find

SpsTitle  SpsFname Kittipong SpsLname Tasook

SpsPosition  SpsOrg

SpsAddress  SpsTel1

SpsCountry  SpsTel2

SpsEmail  SpsFax

โปรแกรมที่สนใจให้เป็น Sponsor โปรแกรมที่สนใจเข้าร่วมเป็น Sponsor

PrgID	SpsConfirm	SpsAmount	*PrgName	Date / City
LF1999	<input type="checkbox"/>	฿0.00	LF1999	24-26 February 1999 Bangkok
LF2000	<input checked="" type="checkbox"/>	฿0.00	LF2000	15-17 February 2000 Bangkok

ระเบียน: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 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2621 262

## E.2 Output Design

Outputs, the most visible component of a working information system, are the justification for the system. System users need output that can present accurate information and effectiveness. There are two types of computer outputs, which are internal outputs and external outputs.

External outputs leave the system to trigger actions on the part of their recipients or confirm actions to their recipients. Most external outputs are created as preprinted forms that are designed and duplicated by Forms Company for use on computer printers.

Internal output will stay inside the system to support the system's users and managers. These outputs can fulfill management reporting and decision support requirements. System users generate report from this information directly, which save their time a lot.

The general principles, which are important for output design, should be concerned as follows:

- (1) Computer outputs should be simple to read and interpret.
- (2) The timing of computer outputs is important.
- (3) The distribution of computer outputs must be sufficient to assist all relevant system users.

However, with the Seminar Information System itself, it will not generate the external output to the customer but do generate only the internal output to the system users and managers for reporting and supporting the decision-making requirement.

Below are samples of input designed for the Seminar Information System.





## List of Participant

**Program Name** LF2000

**Date** 15-17 February 2000

**Time** 09.00-17.00

**Place** The Imperial Queen's Park Hotel

**City** Bangkok

Name			Position	Organization
Mr.	Alan	Leber	Second Secretary (Development)	Canadian Embassy
Mr.	Alan	Leber	Second Secretary (Development)	Canadian Embassy
Mr.	John	Torregrossa	Economic & Commercial Counsellor	French Embassy, Economic Department
Ms	Zimmiskey	Zhang	Commercial Counselor	The Embassy of Sweden

Figure E.12. Sample Report of List of Participants by Seminar Program.



## List of Speakers

**Program Name** LF2001

**Date** 14-16 March 2001

**PrgTime** 09.00-17.00

**Place** The Imperial Queen's Park Hotel

**City** Bangkok

Name		Position	Organization
H.E.	Korn Dabbaransi	Deputy Prime Ministry	Office of the Prime Minister
Mr.	Kiat Bingban	Manaing Director	
Mr.	Somjai Suksamae	Deputy Governor (Development)	Industrial Estate Authority of Thailand



Figure E.13. Sample Report of List of Speakers by Seminar Program.



## List of Sponsors

**Name** LF2001

**Date** 14-16 March 2001

**Time** 09.00-17.00

**Place** The Imperial Queen's Park Hotel

**City** Bangkok

Name		Position	SpsOrg
Mr	Amorn	Juphannachart Operations Officer	World Bank
Mr	Karn	Termchaiwong Cordinaotr	Child Rights Asianet, Faculty of Law
Mr	Leigh	Scott-Kemmis Managing Director	DBM Thailand
Ms	Satosh	Chasunaga Assistant to Representative	Japan Overseas Development Corporation
Ms	Satosh	Chasunaga Assistant to Representative	Japan Overseas Development Corporation
Mr	Sawanee	Kongsakul General Manage	STP&I Public Co.Ltd
Mr	Sein	Cinyin EC Membe	Managing Director,Supreme Enterprise Ltd

Figure E.14. Sample Report of List of Sponsors by Seminar Program.



## Program Confirmation Status by Participants Report

<b>Name</b>	LF2001		
<b>Date</b>	14-16 March 2001		
<b>Place</b>	The Imperial Queen's Park Hotel		
	<b>Time</b>	09.00-17.00	
	<b>City</b>	Bangkok	
<b>Name</b>	<b>Position</b>	<b>Organization</b>	<b>Confirm Status</b> <b>Payment Status</b> <b>Amount</b>
Dr. Kingfha	Sintuwong	Chief of Data Processing Unit Department of Agricultural Extension	<input checked="" type="checkbox"/> <input type="checkbox"/> ฿0.00
Dr. Klavin	Levenson	Ambassador The Australian Embassy	<input checked="" type="checkbox"/> <input type="checkbox"/> ฿0.00
Mr. Alan	Leber	Second Secretary (Development) Canadian Embassy	<input checked="" type="checkbox"/> <input type="checkbox"/> ฿0.00
Mr. John	Torregrossa	Economic & Commercial Counsellor French Embassy, Economic Department	<input checked="" type="checkbox"/> <input type="checkbox"/> ฿0.00

Figure E.15. Sample Report of List of Program Confirmation Status by Participants.



## Program Confirmation status By Sponsors Report

Name		LF2002				
Date		19-21 October 2002				
Place		The Imperial Queen's Park Hotel				
		Time	09.00-17.00			
		City	Bangkok			
Name		Position	Organization	Confirmation Status	Amount	
Mr	Anoosorn	Chantapan	Vice President	Bangkok Bank	<input checked="" type="checkbox"/>	\$0.00
Mr	Jirapong	Cutthichaiya	Policy and Plan Analyst	Ministry of Agriculture&Cooperative	<input checked="" type="checkbox"/>	\$0.00
Mr	Karn	Termchaiwong	Cordinaotr	Child Rights Asianet, Faculty of Law	<input checked="" type="checkbox"/>	

Figure E.16. Sample Report of List of Program Confirmation Status by Sponsor.

**APPENDIX F**  
**ALTERNATIVE CANDIDATE SOLUTIONS**



## ALTERNATIVE CANDIDATE SOLUTIONS

In the design system, we identify 3 possible alternative candidate solutions to the manager for making decision. In order to support the decision making, the comparisons of 3 candidate are in the tabular matrix. They comprise of

- (1) Completed Candidate Matrix (Table F.1.), which the characteristics of each candidate is show.
- (2) Feasibility Matrix (in Table F.2.), that is viewed each candidate based on 4 feasibility criteria as follows:
  - (a) Operational feasibility
  - (b) Technical feasibility
  - (c) Economic feasibility
  - (d) Schedule feasibility

### F.1 Completed Candidate Matrix

In order to obtain an effective Seminar Information System, the alternative candidate solutions of the business requirements defined during the system analysis are identified. The amount of information describing the characteristics of any one-candidate solution may become overwhelming. A matrix is a useful tools for effectively capturing, organizing and communication the characteristics for candidate solutions. Three candidate solution of the proposed system are demonstrated by using a completed candidate matrix as shown in Table F.1.

Table F.1. Completed Candidate Matrix.

Characteristics	Candidate 1	Candidate 2	Candidate 3
Portion of system computerized	The outsource program development will be developed to satisfy the business requirments	Hire freelance Program for programming the system according to analyzed system proposal	The program development would be built by in-house IT according to the business requirments.
Benefits	This solution may takes the longest time to be implemented as the outsource company might has to study the structure of the existing system and company before developing the new system	Fully support user required business process for the company	Fully support user required business process for the company
Servers and Workstations	Technically architecture dictates Pentium IV, Window NT Server and Pentium III, MS Windows 98 (Clients)	Same as Candidate 1	Same as Candidate 1
Software Tools Needed	MS Visual Basic 6.0 can operate for customization and use MS Access as the database management system	MS Access	Ms Access
Application Software	Custom Solution	Custom Solution	Custom Solution
Method of Data Processing	Client / Server	Client / Server	Client / Server
Output Devices and Implications	Laser Printer (Network Printer)	Laser Printer (Network Printer)	Laser Printer (Network Printer)
Input device and Implications	Keyboard & Mouse	Keyboard & Mouse	Keyboard & Mouse
Storage Device and Implications	MS SQL Server DBMS with 40 GB	Same as Candidate 1.	Same as Candidate 1.



## F.2 Feasibility Analysis Matrix

The second matrix that is considered complements the candidate system matrix with an analysis and ranking of the candidate system – feasibility analysis matrix. It is shown in F.2, the columns of the matrix correspond to the same candidate solutions as show in Table F.1, whereas the rows contain the feasibility assessment notes for each candidate.

The feasibility analysis is performed on each individual candidate without regard to the feasibility of other candidates in order to evaluate the alternative candidate solution according to their economic, operational, technical, and schedule feasibility.

After complete the feasibility analysis, we decide to select the candidate 3 because it produce better result than other candidates. The main purpose of this target system is to fully support the user required functionality and system owner satisfaction.

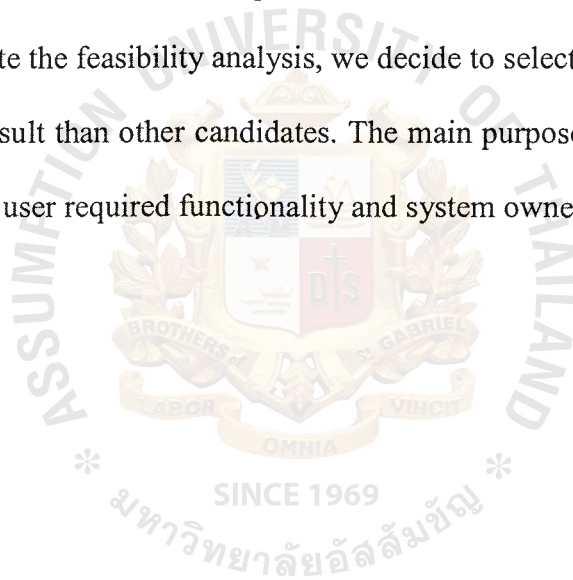


Table F.2. Feasibility Analysis Matrix.

Feasibility Criteria	Wt.	Candidate 1	Candidate 2	Candidate 3
Operational Feasibility	20%	Fully supports user requirement functionality Score: 100	Fully supports user requirement functionality Score: 100	Fully supports user requirement functionality Score: 100
Technical Feasibility	20%	The outsource company is well know and has expertise in developing this kind of system Score: 82	MS Access is a common database application. By using MS Access, the system and training cost is decreased Scored: 90	MS Access is a common database application. By using MS Access, the system and training cost is decreased Scored: 90
Economic Feasibility <ul style="list-style-type: none"> <li>- Cost to develop</li> <li>- Payback period</li> <li>- Net present value</li> <li>- Detailed calculations</li> </ul>	30%	Approximately Baht 530,800 Approximately 2 years Approximately Baht 8,707,889.97 See Appendix F Score: 70	Approximately Baht 330,800 Approximately 3 years Approximately Baht 6,063,271.21 See Appendix F Score: 40	Approximately Baht 380,800 Approximately 2 years Approximately Baht 9,398,639.97 See Appendix F Score: 90
Schedule Feasibility	30%	5-6 months Score: 70	3-4 months Score: 80	1-2 months Score: 90
Ranking	100%	79	74	92

Table F.3. Estimated Costs and Benefits of Alternative Candidate 1, Baht.

Cost items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Hardware Cost:</b>						
Computer Server Cost 1 @ 50,000	50,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Client Machine Cost 4 @ 30,000	120,000.00	24,000.00	24,000.00	24,000.00	24,000.00	24,000.00
Printer 1 @ 20,000	20,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00
UPS 1000 VA 1 @ 2,800	2,800.00	560	560	560	560	560
<b>Software Cost:</b>						
Window NT Server 1 @ 20,000	20,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00
MS SQL Server 1 @ 18,000	18,000.00	3,600.00	3,600.00	3,600.00	3,600.00	3,600.00
MS Office 2000 4 @ 15,000	60,000.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00
Network Cost	40,000.00	8,000.00	8,000.00	8,000.00	8,000.00	8,000.00
<b>Services:</b>						
Program Development 200,000.00	200,000.00	-	-	-	-	-
Support fee		50,000.00	55,000.00	60,500.00	66,550.00	73,205.00
Maintenance Cost		25,000.00	27,500.00	30,250.00	33,275.00	36,602.50
<b>Total Fixed Cost</b>	<b>530,800.00</b>	<b>141,160.00</b>	<b>148,660.00</b>	<b>156,910.00</b>	<b>165,985.00</b>	<b>175,967.50</b>
<b>Operation Cost:</b>						
Salary – Manager 1 @ 23,000		276,000.00	303,600.00	333,960.00	367,356.00	404,091.60
Salary - Staffs 2 person @ 12,000		288,000.00	316,800.00	348,480.00	383,328.00	421,660.80
Stationary per annual		8,000.00	8,800.00	9,680.00	10,648.00	11,712.80
Paper per annual		7,500.00	8,250.00	9,075.00	9,982.50	10,980.75
Utility per annual		8,000.00	8,800.00	9,680.00	10,648.00	11,712.80
Miscellaneous per annual		6,000.00	6,600.00	7,260.00	7,986.00	8,784.60
<b>Total Operation Cost</b>		<b>593,500.00</b>	<b>652,850.00</b>	<b>718,135.00</b>	<b>789,948.50</b>	<b>868,943.35</b>
<b>Total Cost:</b>	<b>530,800.00</b>	<b>734,660.00</b>	<b>801,510.00</b>	<b>875,045.00</b>	<b>955,933.50</b>	<b>1,044,910.85</b>
<b>Benefits</b>						
1. Saving Salary		144,000.00	158,400.00	174,240.00	191,664.00	210,830.40
2. Reduce Office Supplies & Miscellaneous		8,000.00	8,800.00	9,680.00	10,648.00	11,712.80
3. Opportunity cost & Intangible Benefit		1,100,000.00	1,210,000.00	1,331,000.00	1,464,100.00	1,610,510.00
<b>Total Benefit:</b>		<b>1,252,000.00</b>	<b>1,377,200.00</b>	<b>1,514,920.00</b>	<b>1,666,412.00</b>	<b>1,833,053.20</b>

The following items are costs and benefits shown in Table F.3.

Investment Cost:

Hardware cost	192,800	Baht
Software cost	138,000	Baht
Software Development Cost	200,000	Baht
Total Investment Cost	<u>530,800</u>	Baht

Annual Operating Cost:

Staff Salary cost	564,000	Baht
Office Supplies & Miscellaneous cost	29,500	Baht
Maintenance Cost	25,000	Baht
Total Annual Operating Cost	<u>618,500</u>	Baht

Annual Cost: The formula of annual cost of the Computerized system is

$$\begin{aligned}
 \text{Annual Cost} &= (\text{Investment Cost/Estimated System Life}) + \\
 &\quad \text{Annual Operation Cost)} \\
 &= (530,800/5) + 618,500 \\
 &= 172,160 + 618,500 \\
 &= 790,660 \text{ Baht}
 \end{aligned}$$

Saving

Staff (for 1 staff per year)	144,000	Baht
Office Supplies & Miscellaneous	8,000	Baht
Opportunity cost & Intangible Benefit (i.e. shorten processing time, increase business volume etc.)	1,100,000	Baht
Total Saving	1,252,000	Baht

The Table F.4 is detailed the cumulative time-adjusted costs and benefits and the cumulative net cash flow of the candidate 1.

Table F.4. Cumulative Net Cash Flow of Candidate 1, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development Cost	530,800.00					
Operation & Maintenance cost		618,500.00	680,350.00	748,385.00	823,223.50	905,545.85
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time adjusted costs (adjusted to present value)	530,800.00	562,216.50	561,969.10	562,037.14	562,261.65	562,343.97
Cumulative time-adjusted costs over life time	530,800.00	1,093,016.50	1,654,985.60	2,217,022.74	2,779,284.39	3,341,628.36
Benefits derived from operation of new system	-	1,252,000.00	1,377,200.00	1,514,920.00	1,666,412.00	1,833,053.20
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time adjusted benefits (adjusted to present value)	-	1,138,068.00	1,137,567.20	1,137,704.92	1,138,159.40	1,138,326.04
Cumulative time-adjusted benefits over life time	-	1,138,068.00	2,275,635.20	3,413,340.12	4,551,499.52	5,689,825.55
Cumulative lifetime-adjusted costs + benefits	-530,800.00	45,051.50	620,649.60	1,196,317.39	1,772,215.13	2,348,197.19
Cumulative net cash flow		45,051.50	665,701.10	1,862,018.49	3,634,233.62	5,982,430.81

From the data given in Table F.4, the result of each method of the feasibility analysis are as following:

(1) Payback period = 2 years

Initial Investment = 530,800 Baht

Table F.5. Cost Comparison Analysis, Baht.

Year	Accumulated Manual Cost	Accumulated Computerized Cost
0	-530,800	-
1	45,051.50	45,051.50
2	620,649.60	665,701.10
3	1,196,317.39	1,862,018.49
4	1,772,215.13	3,634,233.62
5	2,348,197.19	5,982,430.81

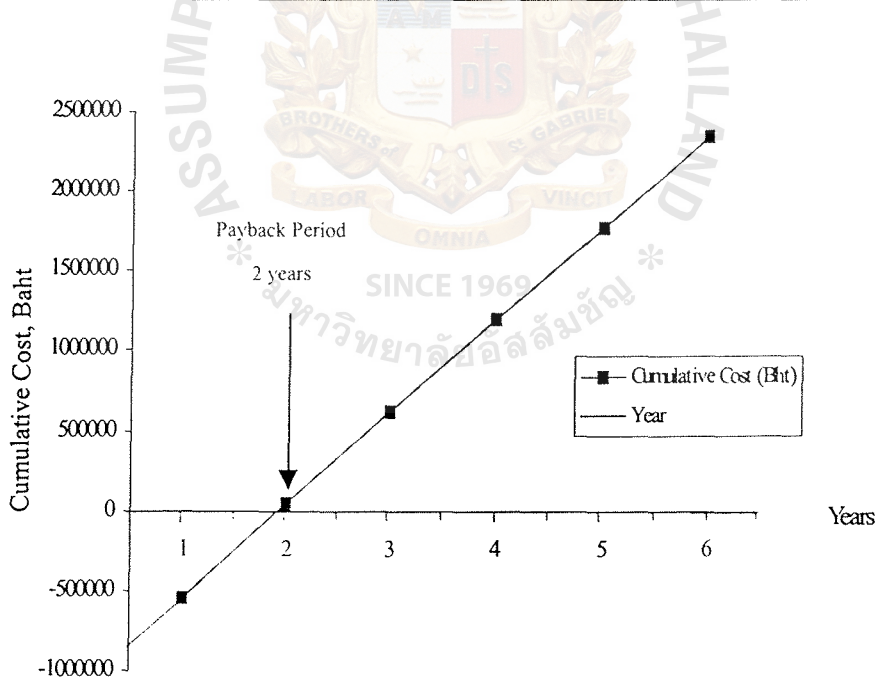


Figure F.1. Payback Period Graph of Candidate 1.

Table F.6. Net Present Value Analysis of Candidate 1, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Development cost:	- 530,800.00						
Operation & maintenance cost:		45,051.50	620,649.60	1,196,317.39	1,772,215.13	2,348,197.19	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual costs:	- 530,800.00	40,230.99	494,657.73	851,777.98	1,127,128.82	1,331,427.81	
Total present value of lifetime costs:							3,314,423.33
Benefits derived from operation of new system:	0	1,252,000.00	1,377,200.00	1,514,920.00	1,666,412.00	1,833,053.20	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual benefits:	0	1,118,036.00	1,097,628.40	1,078,623.04	1,059,838.03	1,039,341.16	
Total present value of lifetime benefits:							5,393,466.64
Net Present Value:							8,707,889.97



Table F.7. Estimated Costs and Benefits of Alternative Candidate 2, Baht.

Cost items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Hardware Cost:						
Computer Server Cost 1 @ 50,000	50,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Client Machine Cost 4 @ 30,000	120,000.00	24,000.00	24,000.00	24,000.00	24,000.00	24,000.00
Printer 1 @ 20,000	20,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00
UPS 1000 VA 1 @ 2,800	2,800.00	560	560	560	560	560
Software Cost:						
Window NT Server 1 @ 20,000	20,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00
MS SQL Server 1 @ 18,000	18,000.00	3,600.00	3,600.00	3,600.00	3,600.00	3,600.00
MS Office 2000 4 @ 15,000	60,000.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00
Network Cost	40,000.00	8,000.00	8,000.00	8,000.00	8,000.00	8,000.00
Services:						
Freelance Programmer salary		180,000.00	180,000.00	180,000.00	180,000.00	180,000.00
Maintenance Cost		25,000.00	27,500.00	30,250.00	33,275.00	36,602.50
Total Fixed Cost	330,800.00	271,160.00	273,660.00	276,410.00	279,435.00	282,762.50
Operation Cost:						
Salary – Manager 1 @ 23,000		276,000.00	303,600.00	333,960.00	367,356.00	404,091.60
Salary - Staffs 2 person @ 12,000		288,000.00	316,800.00	348,480.00	383,328.00	421,660.80
Stationary per annual		8,000.00	8,800.00	9,680.00	10,648.00	11,712.80
Paper per annual		7,500.00	8,250.00	9,075.00	9,982.50	10,980.75
Utility per annual		8,000.00	8,800.00	9,680.00	10,648.00	11,712.80
Miscellaneous per annual		6,000.00	6,600.00	7,260.00	7,986.00	8,784.60
Total Operation Cost		593,500.00	652,850.00	718,135.00	789,948.50	868,943.35
<b>Total Cost :</b>	330,800.00	864,660.00	926,510.00	994,545.00	1,069,383.50	1,151,705.85
Benefits						
1. Reduce Office Supplies & Miscellaneous		8,000.00	8,800.00	9,680.00	10,648.00	11,712.80
2. Opportunity cost & Intangible Benefit		1,100,000.00	1,210,000.00	1,331,000.00	1,464,100.00	1,610,510.00
<b>Total Benefit :</b>		1,108,000.00	1,218,800.00	1,340,680.00	1,474,748.00	1,622,222.80



The following items are costs and benefits shown in Table F.7.

Investment Cost:

Hardware cost	192,800	Baht
Software cost	138,000	Baht
Total Investment Cost	<u>330,800</u>	Baht

Annual Operating Cost:

Staff Salary cost	564,000	Baht
Freelance programmer salary cost	180,000	Baht
Office Supplies & Miscellaneous cost	29,500	Baht
Maintenance Cost	25,000	Baht
Total Annual Operating Cost	<u>798,500</u>	Baht

Annual Cost: The formula of annual cost of the Computerized system is

$$\begin{aligned}
 \text{Annual Cost} &= (\text{Investment Cost/Estimated System Life}) + \\
 &\quad \text{Annual Operation Cost)} \\
 &= (330,800/5) + 798,500 \\
 &= 864,660 \text{ Baht}
 \end{aligned}$$

Saving

Office Supplies & Miscellaneous	8,000	Baht
Opportunity cost & Intangible Benefit (i.e. shorten processing time, increase business volume etc.)	1,100,000	Baht
Total Saving	1,108,000	Baht

The Table F.8 is detailed the cumulative time-adjusted costs and benefits and the cumulative net cash flow of the candidate 2.

Table F.8. Cumulative Net Cash Flow of Candidate 2, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development Cost	330,800.00					
Operation & Maintenance cost		798,500.00	878,350.00	966,185.00	1,062,803.50	1,169,083.85
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time adjusted costs (adjusted to present value)	330,800.00	725,836.50	725,517.10	725,604.94	725,894.79	726,001.07
Cumulative time-adjusted costs over life time	330,800.00	1,056,636.50	1,782,153.60	2,507,758.54	3,233,653.33	3,959,654.40
Benefits derived from operation of new system	-	1,108,000.00	1,218,800.00	1,340,680.00	1,474,748.00	1,622,222.80
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time adjusted benefits (adjusted to present value)	-	1,007,172.00	1,006,728.80	1,006,850.68	1,007,252.88	1,007,400.36
Cumulative time-adjusted benefits over life time	-	1,007,172.00	2,013,900.80	3,020,751.48	4,028,004.36	5,035,404.72
Cumulative lifetime-adjusted costs + benefits	-330,800.00	-49,464.50	231,747.20	512,992.95	794,351.04	1,075,750.33
Cumulative net cash flow		-49,464.50	182,282.70	695,275.65	1,489,626.68	2,565,377.01

From the data given in Table F.8, the result of each method of the feasibility analysis are as following:

(1) Payback period = 3 years

Initial Investment = 330,800 Baht

Table F.9. Payback Period Analysis.

Year	Accumulated Manual Cost	Accumulated Computerized Cost
0	-330,800	-
1	-49,464.50	-49,464.50
2	231,747.20	182,282.70
3	512,992.95	695,275.65
4	794,351.04	1,489,626.68
5	1,075,750.33	2,565,377.01

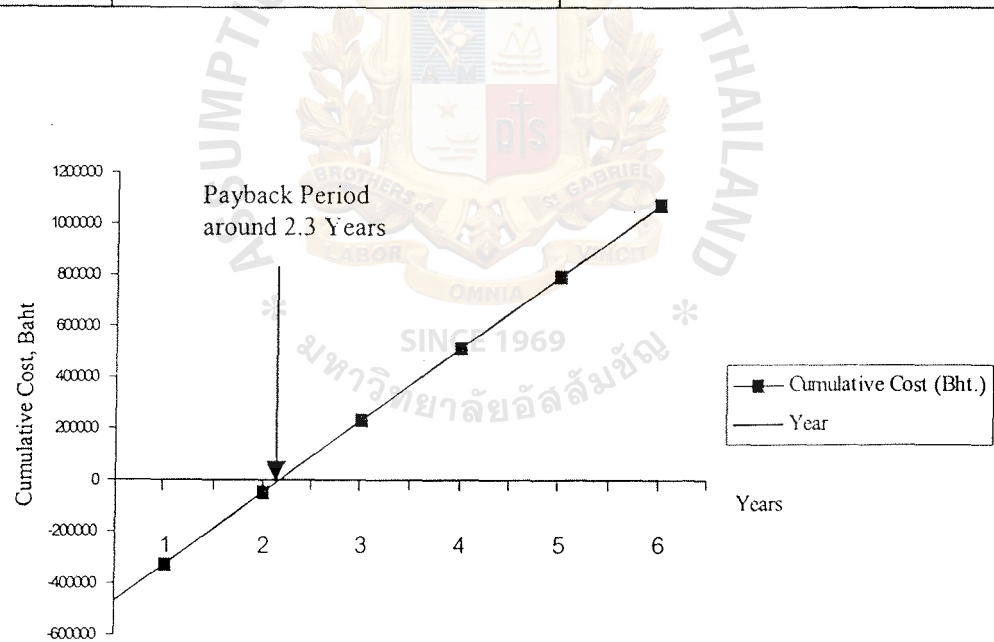


Figure F.2. Payback Period Graph of Candidate 2.

Table F.10. Net Present Value Analysis of Candidate 2, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Development cost:	- 330,800.00						
Operation & maintenance cost:		-49,464.50	231,747.20	512,992.95	794,351.04	1,075,750.33	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual costs:	- 330,800.00	- 44,171.80	184,702.52	365,250.98	505,207.26	609,950.44	
Total present value of lifetime costs:							1,290,139.40
Benefits derived from operation of new system:	0	1,108,000.00	1,218,800.00	1,340,680.00	1,474,748.00	1,622,222.80	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual benefits:	0	989,444.00	971,383.60	954,564.16	937,939.73	919,800.33	
Total present value of lifetime benefits:							4,773,131.82
Net Present Value:							6,063,271.21

Table F.11. Estimated Costs and Benefits of Alternative Candidate 3, Baht.

Cost items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Hardware Cost:</b>						
Computer Server Cost 1 @ 50,000	50,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Client Machine Cost 4 @ 30,000	120,000.00	24,000.00	24,000.00	24,000.00	24,000.00	24,000.00
Printer 1 @ 20,000	20,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00
UPS 1000 VA 1 @ 2,800	2,800.00	560	560	560	560	560
<b>Software Cost:</b>						
Window NT Server 1 @ 20,000	20,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00
MS SQL Server 1 @ 18,000	18,000.00	3,600.00	3,600.00	3,600.00	3,600.00	3,600.00
MS Office 2000 4 @ 15,000	60,000.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00
Network Cost	40,000.00	8,000.00	8,000.00	8,000.00	8,000.00	8,000.00
<b>Implementation Cost:</b>						
Software Development	50,000.00	50,000.00				
Maintenance Cost			25,000.00	27,500.00	30,250.00	33,275.00
<b>Total Fixed Cost</b>	<b>380,800.00</b>	<b>116,160.00</b>	<b>91,160.00</b>	<b>93,660.00</b>	<b>96,410.00</b>	<b>99,435.00</b>
<b>Operation Cost:</b>						
Salary – Manager 1 @ 23,000		276,000.00	303,600.00	333,960.00	367,356.00	404,091.60
Salary - Staffs 2 person @ 12,000		288,000.00	316,800.00	348,480.00	383,328.00	421,660.80
Stationary per annual		8,000.00	8,800.00	9,680.00	10,648.00	11,712.80
Paper per annual		7,500.00	8,250.00	9,075.00	9,982.50	10,980.75
Utility per annual		8,000.00	8,800.00	9,680.00	10,648.00	11,712.80
Miscellaneous per annual		6,000.00	6,600.00	7,260.00	7,986.00	8,784.60
<b>Total Operation Cost</b>		<b>593,500.00</b>	<b>652,850.00</b>	<b>718,135.00</b>	<b>789,948.50</b>	<b>868,943.35</b>
<b>Total Cost :</b>	<b>330,800.00</b>	<b>709,660.00</b>	<b>744,010.00</b>	<b>811,795.00</b>	<b>886,358.50</b>	<b>968,378.35</b>
<b>Benefits</b>						
1. Reduce Staff		144,000.00	158,400.00	174,240.00	191,664.00	210,830.40
1. Reduce Office Supplies & Miscellaneous		8,000.00	8,800.00	9,680.00	10,648.00	11,712.80
2. Opportunity cost & Intangible Benefit		1,100,000.00	1,210,000.00	1,331,000.00	1,464,100.00	1,610,510.00
<b>Total Benefit :</b>		<b>1,252,000.00</b>	<b>1,377,200.00</b>	<b>1,514,920.00</b>	<b>1,666,412.00</b>	<b>1,833,053.20</b>

The following items are costs and benefits shown in Table F.11.

Investment Cost:

Hardware cost	192,800	Baht
Software cost	138,000	Baht
Software Development Cost	50,000	Baht
Total Investment Cost	<u>380,800</u>	Baht

Annual Operating Cost:

People-ware cost	564,000	Baht
Office Supplies & Miscellaneous cost	29,500	Baht
Maintenance Cost	25,000	Baht
Total Annual Operating Cost	<u>618,500</u>	Baht

Annual Cost:

The formula of annual cost of the Computerized system is

$$\begin{aligned} \text{Annual Cost} &= (\text{Investment Cost/Estimated System Life}) + \\ &\quad \text{Annual Operation Cost)} \\ &= (380,800/5) + 618,500 = 694,660 \text{ Baht} \end{aligned}$$

Saving:

Staff (for 1 staff per year)	144,000	Baht
Office Supplies & Miscellaneous	8,000	Baht
Opportunity cost & Intangible Benefit (i.e. shorten processing time, increase business volume etc.)	1,100,000	Baht
Total Saving	1,252,000	Baht

The Table F.12 is detailed the cumulative time-adjusted costs and benefits and the cumulative net cash flow of the candidate 3.



Table F.12 Cumulative Net Cash Flow of Candidate 3, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development Cost	380,800.00					
Operation & Maintenance cost		618,500.00	680,350.00	748,385.00	823,223.50	905,545.85
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time adjusted costs (adjusted to present value)	380,800.00	562,216.50	561,969.10	562,037.14	562,261.65	562,343.97
Cumulative time-adjusted costs over life time	380,800.00	943,016.50	1,504,985.60	2,067,022.74	2,629,284.39	3,191,628.36
Benefits derived from operation of new system	-	1,252,000.00	1,377,200.00	1,514,920.00	1,666,412.00	1,833,053.20
Discount factor for 10%	1.000	0.909	0.826	0.751	0.683	0.621
Time adjusted benefits (adjusted to present value)	-	1,138,068.00	1,137,567.20	1,137,704.92	1,138,159.40	1,138,326.04
Cumulative time-adjusted benefits over life time	-	1,138,068.00	2,275,635.20	3,413,340.12	4,551,499.52	5,689,825.55
Cumulative lifetime-adjusted costs + benefits	-380,800.00	195,051.50	770,649.60	1,346,317.39	1,922,215.13	2,498,197.19
Cumulative net cash flow		195,051.50	965,701.10	2,312,018.49	4,234,233.62	6,732,430.81

From the data given in Table F.12, the result of each method of the feasibility analysis are as following:

(1) Payback period = 2 years

Initial Investment = 380,800 Baht

Table F.13. Payback Period Analysis, Baht.

Year	Net cash flow	Cumulative Net cash flow
0	-380,800.00	-
1	195,051.50	195,051.50
2	770,649.60	<b>965,701.10</b>
3	1,346,317.39	2,312,018.49
4	1,922,215.13	4,234,233.62
5	2,498,197.19	6,732,430.81

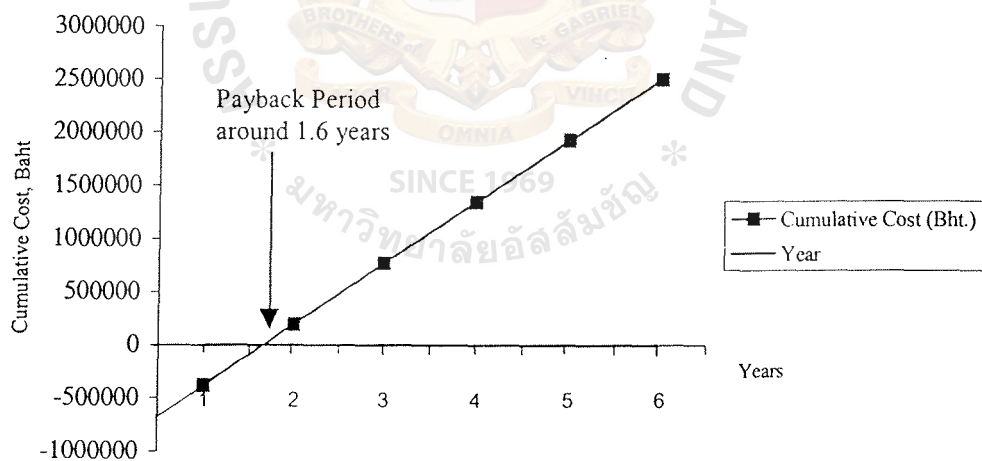


Figure F.3. Payback Period Graph of Candidate 3.



Table F.14. Net Present Value Analysis of Candidate 3, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Development cost:	- 380,800.00						
Operation & maintenance cost:		195,051.50	770,649.60	1,346,317.39	1,922,215.13	2,498,197.19	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual costs:	- 380,800.00	174,180.99	614,207.73	958,577.98	1,222,528.82	1,416,477.81	
Total present value of lifetime costs:							4,005,173.33
Benefits derived from operation of new system:	0	1,252,000.00	1,377,200.00	1,514,920.00	1,666,412.00	1,833,053.20	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual benefits:	0	1,118,036.00	1,097,628.40	1,078,623.04	1,059,838.03	1,039,341.16	
Total present value of lifetime benefits:							5,393,466.64
Net Present Value:							9,398,639.97

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