



Human Resource Information System for Mthai Estate Co., Ltd.

by

Ms. Nipaporn Chokesamerboon

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

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Project Title Human Resource Information System for Mthai Estate Co., Ltd.

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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

Nowadays, the information system provides the communication and analytical power that every organization needs for conducting trade and managing their businesses. The benefit of computerized system is to support management decision-making, which helps the firm gain strategic planning at low risk.

The purpose of this project is to design a new system that lead the company to have more opportunity to growth and expansion by the computerized system. The study of this project begins with the required definition and analysis of the existing system. The problems occurring from the existing system are inadequate to handle many volumes of inventory and there are too many errors in manual operations.

The new computerized system is developed by Delphi and Microsoft Access, in order to manage all tasks of the Human Resource Department, which are Leave and Attendance, Employee Information, Training Record, Benefit, Appraisal and Recruitment with accuracy, punctuality and effectiveness.

To apply the computerized system to business functions in terms of time, accuracy, and relevant information, the company would be able to increase sales, gain market share and compete with the other competitors.

ACKNOWLEDGEMENTS

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Furthermore, the writer also would like to grant her regards to all her instructors, who have been giving her not only the knowledge but also all the supports truly needed during her study.

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I. INTRODUCTION

1.1 Background of the Project

The purpose of this project is focused to study and analyze the Human Resource Information System which in its current existing system is simple and traditionally manual, of Mthai Estate Co., Ltd. The project will identify the requirements, solve the current problems and design a proper system for better performance and increase the effectiveness to administer employees' information.

The proposed system will provide more accuracy and efficiency to the system. All these are easier to manage the information and convenience for the administrator.

1.2 Objectives of the Project

- (1) To study and analyze the existing Human Resource Information System.
- (2) To identify the problems in the existing information system.
- (3) To analyze the problems, the causes and find out the solutions for those problems.
- (4) To design the computerized Human Resource Information System that is suitable and effective to the work process of the organization by reducing scattered paper work and shorten operating time.
- (5) To standardize the data management and transference system.

1.3 Scope of the Project

The Human Resource Information System of Mthai Estate Co., Ltd. involves gathering the related data of the recruitment process, the updates of training activities including the results and evaluations of each employee, and the work time checking for further year-end performance evaluation.

In the existing system, all mentioned affairs are handled by manual processes. The data in workflow is mostly kept in hard copy documents and its quantity will be dramatically increased from time to time which makes it more difficult in sorting and seeking the information. The department generated many human errors, which give negative consequences later.

The proposed system will offer the solution by implementing a computerized system. So the department will increase their efficiency in information management. The company also gets the benefits that can cut off the loss from human errors and damaged documents. The computerized system's scope will cover the managing of recruitment data, employee information, training activity record and work time checking.

1.4 Deliverables

The deliverables of the project are as following:

(1) Project and System Scope

We study the scope of project and system in order to gain more understanding towards the system and its boundary.

(2) Business Requirements

Business requirements are listed in order to build up the system to suit the users' work process and work environment.

(3) System Objectives

System objectives enable us to understand the goals of the system.

(4) Technology Requirements

Technology requirements are hardware and software specification of the system.

(5) Design Requirements

The design requirement indicates the proper design of the data flow, process and database.

(6) Design Specifications

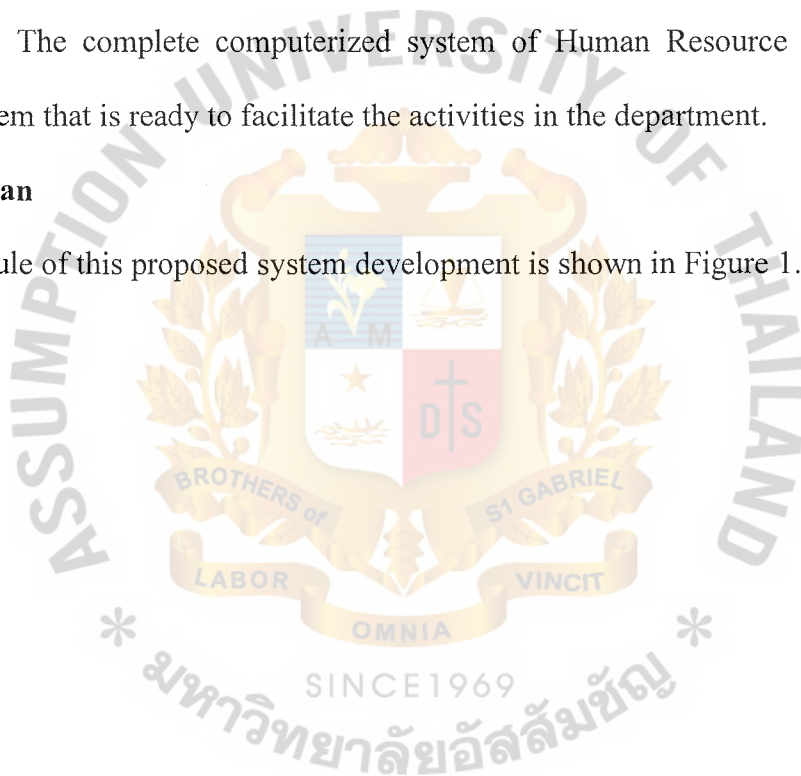
Design specifications yield process specification, which indicate the workflow of input and output of the process.

(7) Human Resource Information System

The complete computerized system of Human Resource Information System that is ready to facilitate the activities in the department.

1.5 Project Plan

The schedule of this proposed system development is shown in Figure 1.1.



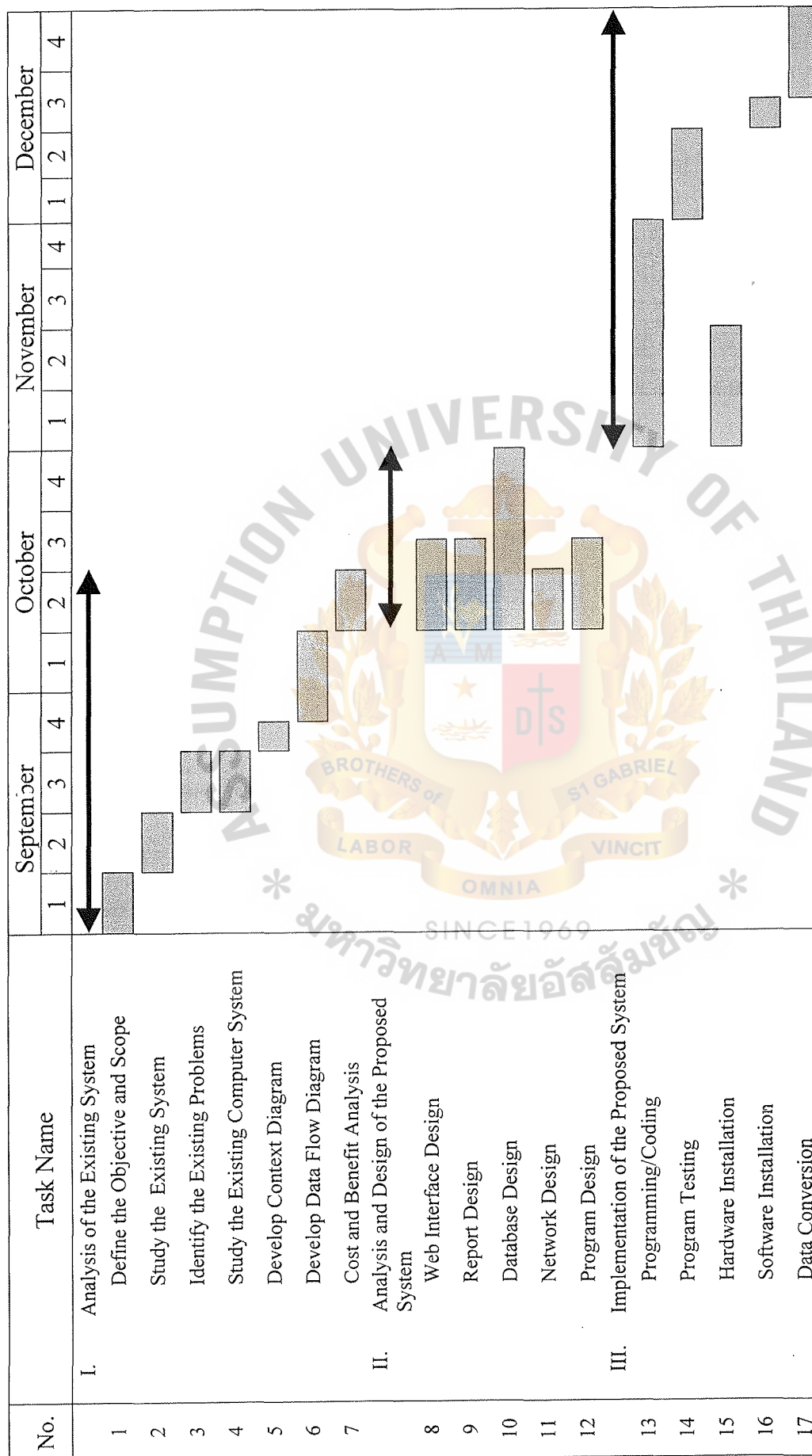


Figure 1.1. Project Plan of Human Resource Information System.

II. THE EXISTING SYSTEM

2.1 Background of the Business

Mthai Estate Co., Ltd. is a leading estate developer in Thailand. The company has over 25 years of experience in developing high-quality building projects with full attention to all details. Its projects emphasize good locations in the suburbs of Greater Bangkok, a rapidly growing area. Mthai Estate's main business operation is developing new land and residential units.

The company intends to continue to achieve this objective by:

- (1) Locating its developments in locations within Greater Bangkok which have the benefit of convenient road access to Central Bangkok.
- (2) Pricing its building competitively for the predominantly middle incomes sector, which it targets as potential purchasers.
- (3) Building high quality buildings which include communal recreational facilities and benefits from a comprehensive after-sale services.
- (4) Marketing and advertising aggressively to create strong name recognition for the company.
- (5) Designing developments and properties to meet the requirements of predominantly middle-income sector, which is targeted by being based on the company's own market research and sales experience.
- (6) Providing a reasonable profit to the shareholders of the company.
- (7) Providing its staff and workers with a safe and stimulating work environment that encourages personal-development and excellence in performance.

The organization chart will be shown in Figure 2.1.

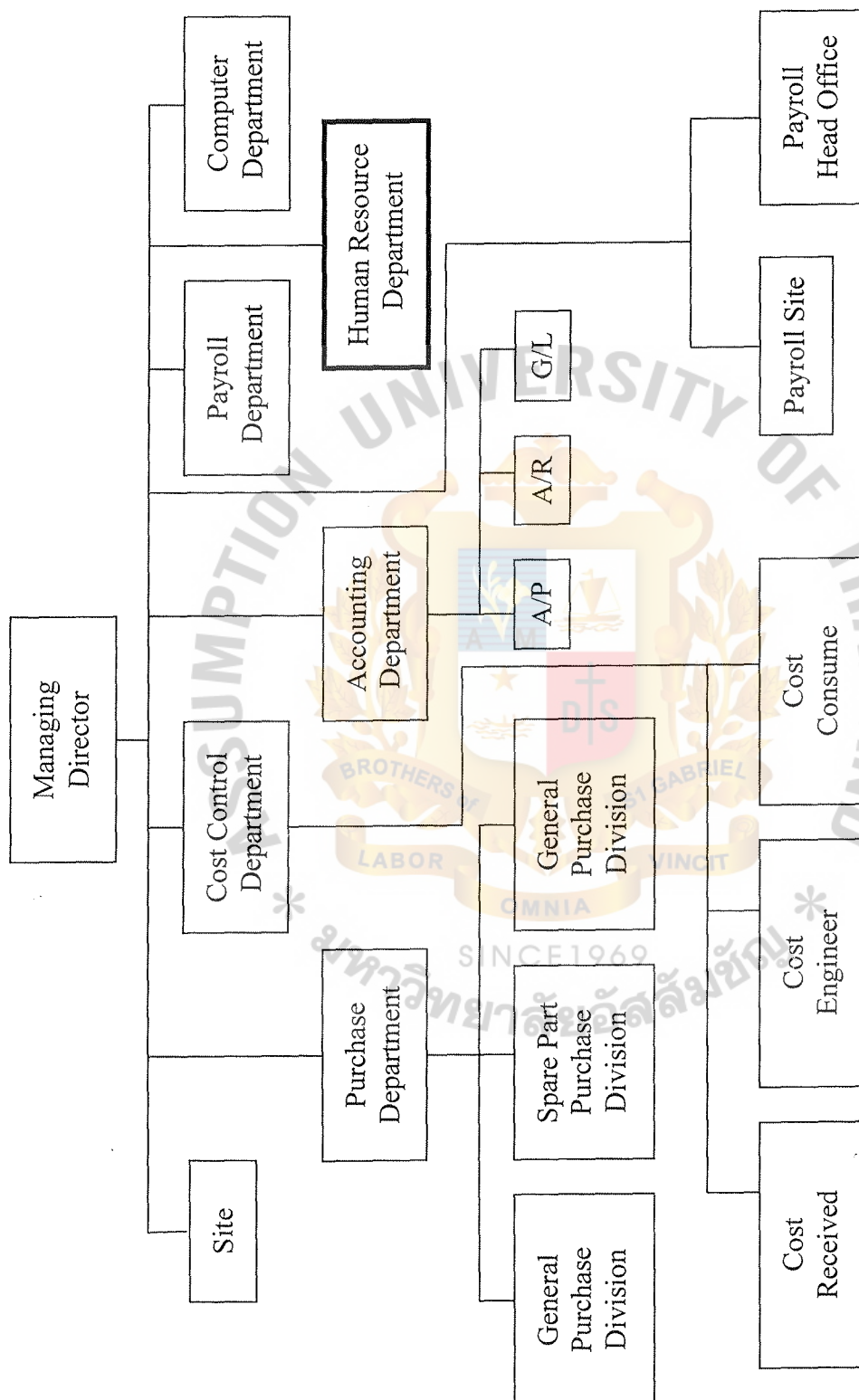


Figure 2.1. The Organization Chart of Mthai Estate Co., Ltd.

2.2 Analysis of Existing System and Business Functions

The organization comprises of 7 departments, which are Site, Purchase Department, Cost Control Department, Accounting Department, Payroll Department, Human Resource Department, and Computer Department.

- (1) Management level
- (2) Functional level which comprised of 7 departments i.e. Site, Purchase Department, Cost Control Department, Accounting Department, Payroll Department, Human Resource Department, and Computer Department.
- (3) Operational Level

Existing Human Resource Information System of Mthai Estate Co., Ltd.

Human Resource Department has to perform the following tasks:

- (1) Recruitment Management
- (2) Employee Information Management
- (3) Leave and Attendance Management
- (4) Benefit Plan Management
- (5) Appraisal Planning
- (6) Process Report

As long as any department have a job vacancy, they will send a job description to Human Resource department that is responsible to seek the qualified applicants, and also have to proceed the recruitment if there are no available proper applicants stored in database.

Each applicant submits the application form to the officer of Human Resource Department and he or she will have 2 stages of interview with a purpose to screen out for the prospective employees, firstly from the officer of Human Resource Department, and the final interview from representative of the relevant department. The data, which

is related to the interviewing process, is kept accordingly by humans in the pile of document.

Human Resource department collects each employees' information such as name, surname, address, education, work experience, etc. also including information of training experience along with the benefit information of each employee. The training records are kept for future reference, to help Human Resources Department make the decision regarding proper training program from Training Department that should be implemented and which employees need to be trained.

The training record of each employee indicates the history of training of a certain employee over a period of time. Human Resource officers have to keep the training data updated.

There are many advantages of gathering the employees' training information. The big point is to enhance the overall performance and productivity of the company's operation, which is based on employees' numerous skills in producing the work output. The company also intends to constantly provide the training courses to the employees in order to keep track of the technology change and utilize it in the production. The officers collect the manager's evaluation on each employee and analyze the proper training course for the employees.

Human Resource also checks the time attendance, leave and late of each employee. Those information can be collected from the daily time card system and the officer has to manually gather those information and put them together for generating monthly report. Leave information is given by the employees themselves.

The information mentioned earlier, that the Human Resources Department officers keep, can be used together to determine the appraisal plan.

The context data model includes the fundamental or independent entities that were previously discovered and their relationships. Figure 2.2 presents the context data model of the existing system by using an entity relationship diagram. And the data flow diagram level 0 will be shown in Figure 2.3 respectively.

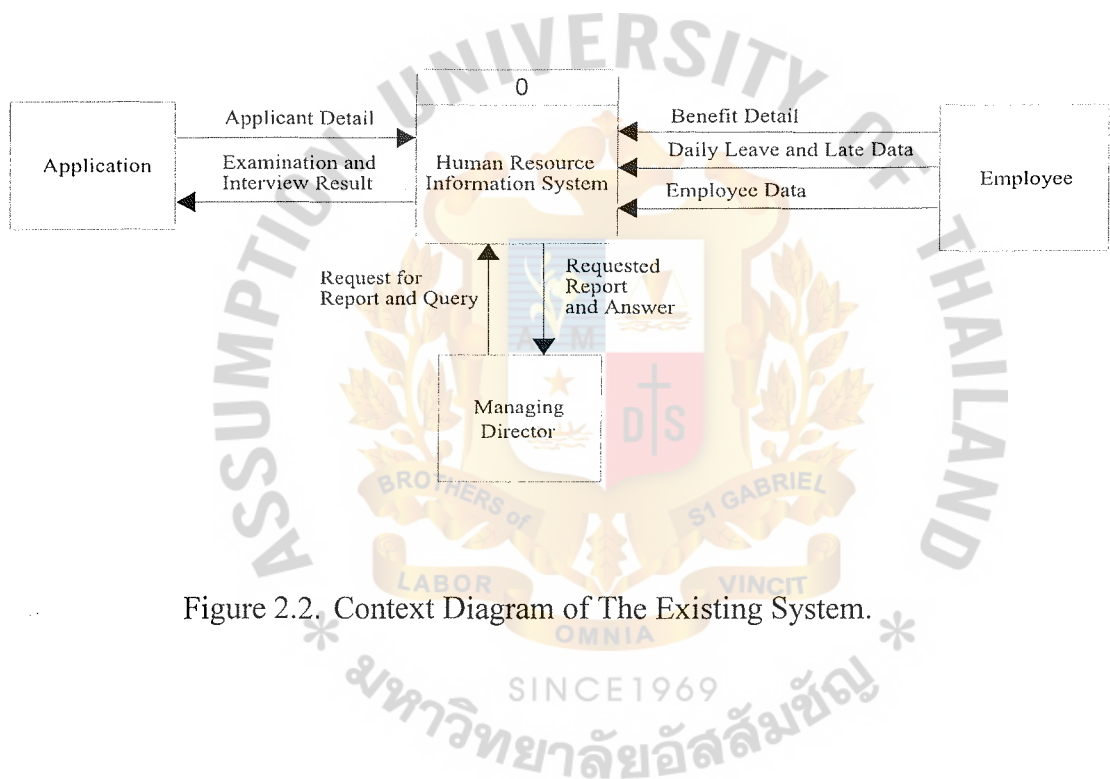


Figure 2.2. Context Diagram of The Existing System.

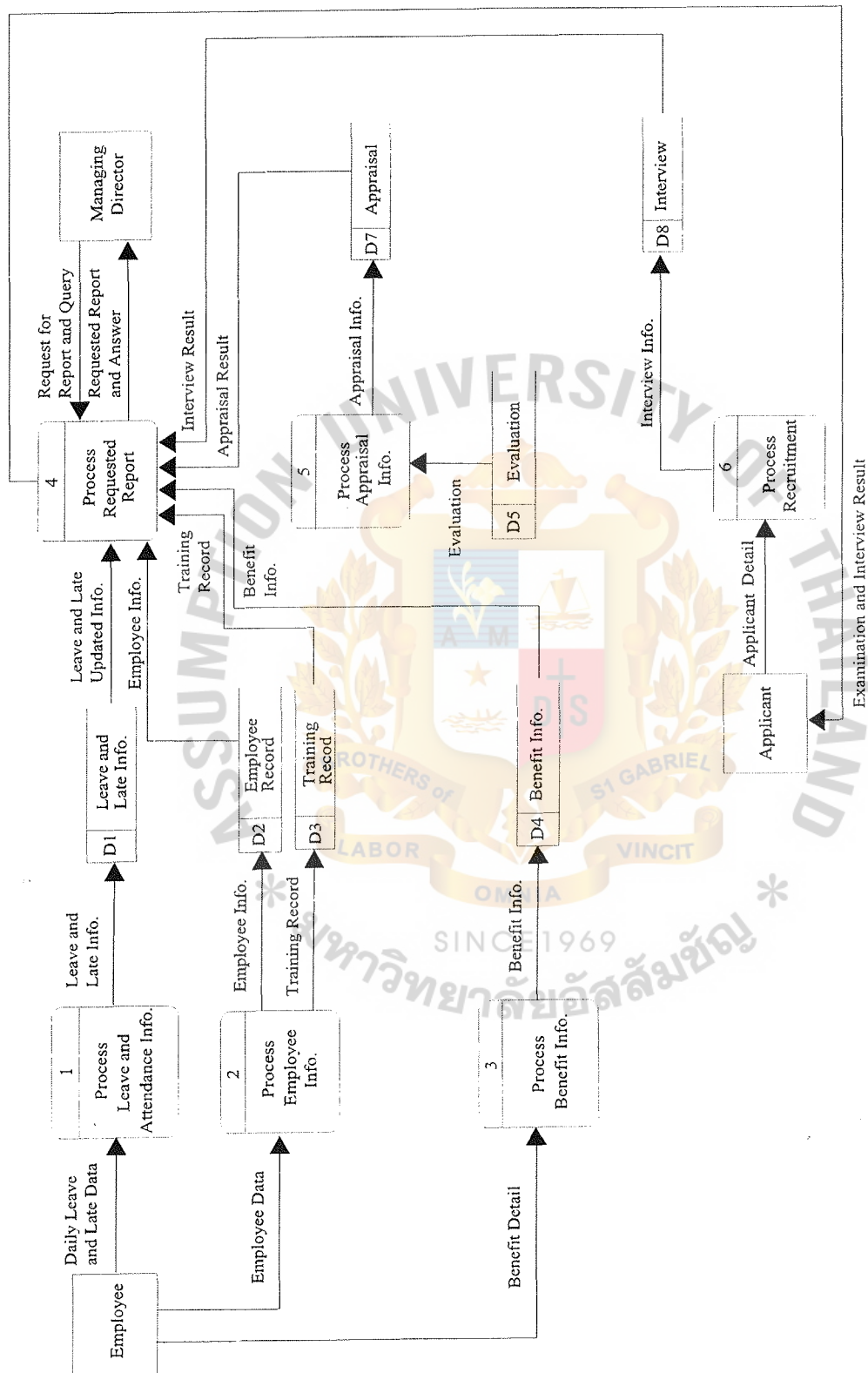


Figure 2.3. Data Flow Diagram Level 0 of The Existing System.

2.3 Current Problems of the Existing System and Area of Improvement

Although Mthai Estate Co., Ltd. has a computer department, the company still handles the activities operated under Human Resource Department and other manually.

According to the performance, we can list the problems occurred by implementing a manual system as the following:

- (1) Human errors and unorganized working process

Difficult to read handwriting, repeating works and overlapping responsibility create possibly wrong, not updated data.

- (2) Delay of work flow

With existing system, it definitely takes quite a bit of time to process the data into required information such as, input data from the document to computer system many times, and delay of data transfer between department.

- (3) Data Handling

The existing system generates huge amounts of papers, which finally leads to data handling problems. The officers of Human Resource Department are facing a difficult time looking up into those documents for a single data and how to organize the data properly. Over time, the document is damaged.

- (4) Data usage

The company has expanded with an increasing number of employees, so has the data. The department has to manage and schedule very well to try to meet with the demand of the data request, yet it is not good enough. Therefore, the process of implementing the computerized system will be a savior.

(5) Data controlling

Without proper data specification, the overall operation is generating unnecessarily excessive data and absolutely data redundant.

(6) Security

Security cannot be held effectively in this manner of the operation.



III. THE PROPOSED SYSTEM

3.1 User Requirement

User requirement is a set of necessary specifications that the new system must deliver to the organization in order to satisfy the users. We have gathered the user requirement as listed in the following section.

- (1) The system will perform effectively and correctly

The new system must be based on computers to handle the data and information regarding the employees submitted.

- (2) Providing correct data with high speed and perfect response service

The new system must provide responsiveness to the organization when asked for reports or answers to any particular query with better performance.

- (3) The system must provide updated and corrected information

The new system must organize the data more efficiently, eliminating the redundant data and provide the most up-to-date correct information.

- (4) The system must provide user friendly interface

The new system must have user friendly interface to interact with the users to ease up the activities.

- (5) The system must provide the useful information

The system must provide useful information in an organized format for the Human Resource department and Managing Director for future planning.

- (6) Security must be ensured

Security is an important issue, which must be concerned. The new system will be representing the usage of computerized method; it is a must that the security is ensured since the information will be reached easier and faster.

3.2 Candidate Solution

There are 3 solutions that we have to make decision; which is the best for this company by comparing their cost and benefit of its efficiency.

- (1) Outsourcing the proposed software from the specialist
- (2) Purchase the instant software package
- (3) Develop by Computer Department

The Candidate System Matrix and The Feasibility Analysis Matrix for Human Resource Information System will shown in Table 3.1. and Table 3.2.

Table 3.1. The Candidate System Matrix.

Characteristics	Candidate 1	Candidate 2	Candidate 3
Portion of System Computerized	The new human resource record system would be developed by the outsource company according to the users' requirements.	The new human resource record system would be Applying by the instant software	Research and develop by computer department to satisfy all users' requirements
Benefits	This solution can be implemented quickly because it is a tailor made solution. And it is also complete the other needed functions.	This solution can be implemented quickly because it is a purchased solution.	Fully supports user requirements in business processes for the company. Plus more efficient performance with Payroll Department and Training Department.
Servers and Workstations	Technically architecture dictates Pentium III, MS Windows Advanced Servers and Pentium III, MS Windows 2000 Professional. (Client/Server)	Pentium III 750 MHz, Windows 2000 Advanced Server. (Stand Alone)	Technically architecture dictates Pentium III, MS Windows Advanced Servers and Pentium III, MS Windows 2000 Professional. (Clients/Server)
Software Tools Needed	MS Visual Basic 6.0 can operate for customization and use MS SQL Server Version 7 as the database management system.	Soft PRO-T302S; the human resource system software package from SPC Computer Co., Ltd.	Delphi 6.0, and use MS Access 2000 as the database management system.
Application Software	Software package	Software package	Custom solution
Method of data processing	Clients/Server (method)	Stand Alone	Clients/Server (method)
Output Devices and Implications	-HP 1100 Laser Jet -EPSON LQ-2180 I Dot Matrix	-HP 1100 Laser Jet -EPSON LQ-2180 I Dot Matrix	-HP 1100 Laser Jet -EPSON LQ-2180 I Dot Matrix
Input Devices and Implications	Keyboard & Mouse	Keyboard & Mouse	Keyboard & Mouse
Storage Devices and Implications	Hard Disk SCSI 40 GB	Hard Disk SCSI 40 GB	Hard Disk SCSI 40 GB

Table 3.2. The Feasibility Analysis Matrix

Feasibility Criteria	Weight	Candidate 1	Candidate 2	Candidate 3
Operational Feasibility	20%	Almost requirements are met this software package which combine the tools together. It can support the Human Resource Record System.	This software package is supported only Human Resource Department. Moreover, it will not fully meet all requirements and it cannot modify the internal program. The human resource software is the legacy system-DOS, which is difficult to use than the Windows based system.	Using LAN, we can share the heavy load of processing tasks by separating work to the different computer. Fully supports user required functionality. It's possible to alter the source code of the program to fulfill users' requirement in the future
		Score: 100	Score: 60	Score: 100
Technical feasibility -Technology -Expertise	30%	-Easy Graphic User Interface and many options provided. -Providing full feature of object oriented programming. Require hardware specialist to set up the network and for the application. It requires a training and knowledge of database.	-Easy Graphic User Interface. -The software is the application that it cannot modify to meet further requirement in the future. The software company will set up the system and training class for the staff, also have the manual to support the usage.	-Easy Graphical User Interface. -Provide feature of object oriented programming. Require hardware specialist to set up the network and for the application. It requires a training and knowledge of database.
		Score: 80	Score: 60	Score: 100
Economic Feasibility -Cost of develop -Payback Period (discounted) -Detailed Calculations	40%	Approximately 1,713,300Baht Approximately 1 Year See Appendix H	Approximately 1,413,300 Baht Approximately 4 Years See Appendix H	Approximately 1,630,300 Baht Approximately 1 Year See Appendix H
		Score: 85	Score: 20	Score: 90
Schedule Feasibility	10%	About 3-5 Months	Less than 1 Month	About 3-5 Months
		Score: 90	Score: 100	Score: 95
Ranking	100%	87	48	95.5

In this project we choose the candidate solution 3 to develop the proposed system because of its flexibility, efficiency and it can also get the early payback period.

3.3 System Design

Accordingly, we have chosen the candidate solution 3 to develop as the proposed system. The system design will be described in this part.

The proposed system consists of 6 processes as follows:

- (1) Process Leave and Late Attendance Information
- (2) Process Employee Information
- (3) Process Benefit
- (4) Process Appraisal
- (5) Process Recruitment
- (6) Process Report

The Context Diagram of the Proposed System will show in Figure 3.1. And the Data Flow Diagram Level 0 of the Proposed System will show in Figure 3.2.

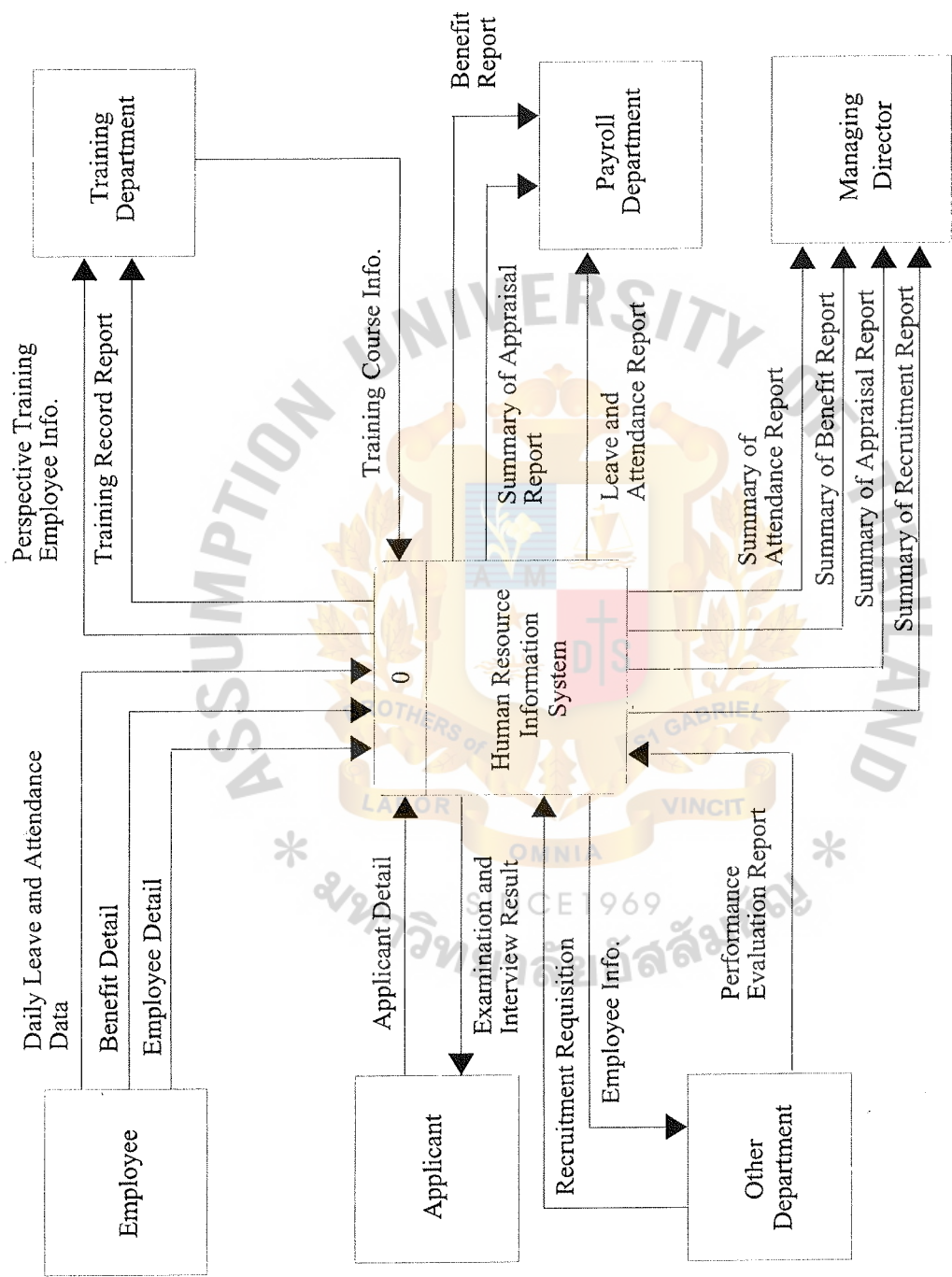


Figure 3.1. Context Diagram of The Proposed System.

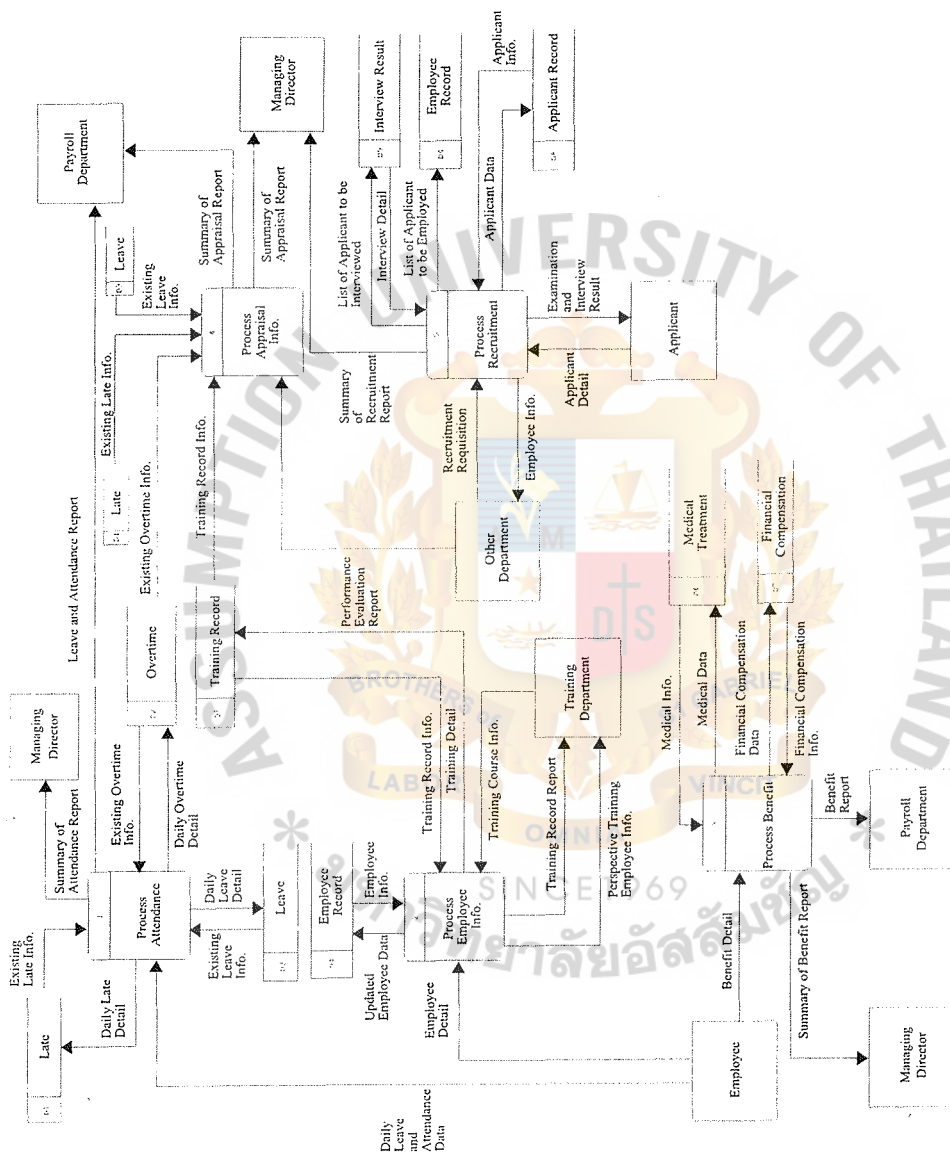


Figure 3.2. Data Flow Diagram of The Proposed System.

The proposed system will deliver the following inputs and outputs.

Input

- (1) Application Forms
- (2) Interview Result
- (3) Benefit Petition
- (4) Employee Data
- (5) Training Details
- (6) Training Result
- (7) Attendance Checking Record
- (8) Leave Checking Record
- (9) Evaluation Details

Output

- (1) Attendance Report
- (2) Employee Information Report
- (3) Benefit Report
- (4) Appraisal Plan Report
- (5) Applicant Report

Database of the proposed system

- (1) Late – records daily late data of employee.
- (2) Overtime – records daily overtime data of employee.
- (3) Leave – records daily leave data of employee.
- (4) Employee Record – contains information of employee.
- (5) Training Record – concerns information of each trained employee.
- (6) Medical Treatment – keeps medical treatment record of employee.
- (7) Financial Compensation – keeps financial compensation of employee.

- (8) Appraisal Record – keeps appraisal information of each employee.
- (9) Evaluation – includes evaluation information by manager to each employee performance.
- (10) Applicant Record – obtains information of applicant.
- (11) Interview Result – keeps interview result of the applicant.
- (12) Recruitment – keeps information of proper applicant.

3.4 Hardware and Software Requirement

System Specification

The proposed system is responsible for handling and managing the data and activities held by the Human Resource Department to interact better internally and externally. The system specifications are as follows:

- (1) One Intranet server
- (2) Four Client Workstations
- (3) LAN with star topology
- (4) Client/Server Computing
- (5) Microsoft Windows 2000 Advanced Server as server operating system
- (6) Microsoft Windows 2000 Professional as client operating system
- (7) Delphi as a programming language of the system
- (8) UPS for electricity failure
- (9) Magnetic Time Card Machine

The Hardware and Network Configuration will show in Figure 3.3.

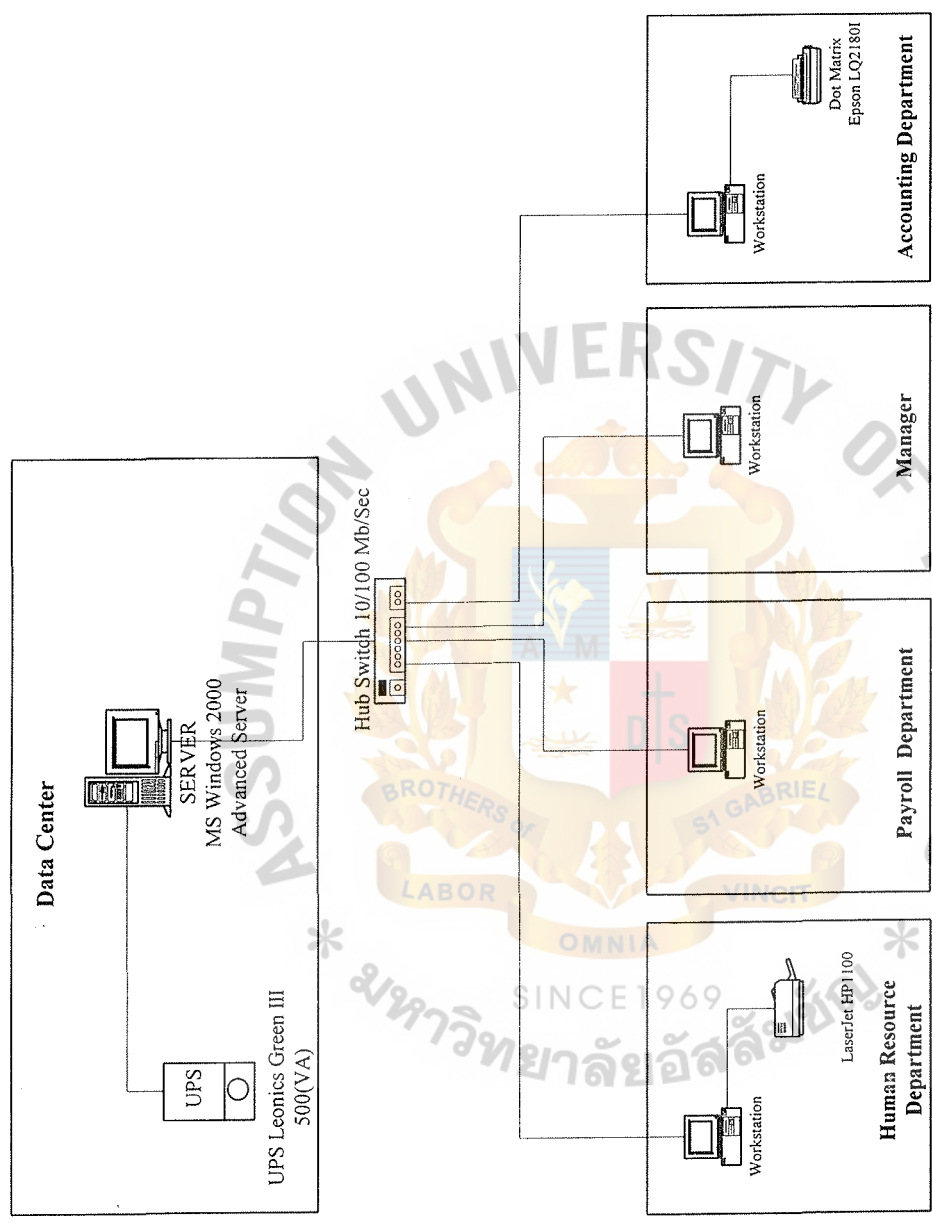


Figure 3.3. Hardware and Network Configuration.

Table 3.3. The Hardware Specification for Intranet Server.

Hardware	Specification
CPU	Pentium IV 1.5G, or higher
Cache	256 KB or higher
Memory	512 MB or higher
Hard Disk	SCSI 40 GB or higher
CD-ROM Drive	48X or higher
Floppy Drive	1.44 MB
Network Adapter	Ethernet 100-Base T
Display Adapter	SVGA card
Display	15" monitor
Printer	Dot Matrix and Laser
UPS	UPS Leonics Green III 500(VA)

Estimated Price = 152,000 Baht

Table 3.4. The Hardware Specification for Each Client Machine.

Hardware	Specification
CPU	Pentium III 750, or higher
Cache	256 KB or higher
Memory	128 MB or higher
Hard Disk	20 GB or higher
CD-ROM Drive	48X or higher
Floppy Drive	1.44 MB
Network Adapter	Ethernet 100-Base T
Display Adapter	SVGA card
Display	15" SVGA monitor
Network cable and equipment	UTP Cable, Switching Hub

Estimated Price = 148,300 Baht

Total Hardware Cost = 305,300 Baht (included Magnetic Time Card Machine)

Table 3.5. The Software Specification for Intranet Server.

Software	Specification
Operating System	Microsoft Windows 2000 Advanced Server
Application Server	Microsoft Active Server Pages
Database Server	Microsoft Access 2000
Anti-virus	Mcafee Virus Scan

Table 3.6. The Software Specification for Each Client Machine.

Software	Specification
Operating System	Microsoft Windows 2000 Professional
Web browser	Microsoft Internet Explorer 5.5 or higher
Application Software	Microsoft Office 2000 Professional Edition
Anti-virus	Mcafee Virus Scan

Table 3.7. The Software Specification for Each Client Machine.

Software	Specification
Development Tool	<ul style="list-style-type: none">- Delphi 6- Microsoft Visual Interdev

Total Software Cost = 211,000 Baht

3.5 Security and Controls of the Proposed System

Security is listed as one of the user requirements. The proposed system will cover many important areas of Human Resource Department, therefore it is required that security is conducted properly to prevent following incidents:

- (1) Unauthorized access to change the information in any form.
- (2) Virus from external elements.
- (3) The electronic damage which could cost tremendous information loss.

The prevention means are realized and they are as follows:

- (1) It is compulsory to pass the user ID and password checking before entering the system to prevent unauthorized access.
- (2) Installing the virus detection software.
- (3) Installing UPS to protect the information loss while electronic damage occurs.
- (4) Back up the system periodically

The system can keep records of log files whenever user access to the system. Therefore, when some unfavourables occur, it is impossible to go back and find out what is the problem.

3.6 Cost and Benefit Analysis

Cost Analysis

Types of cost to be taken into consideration are:

- (1) Development Cost

The starting cost of the organization to implement to proposed system, it is comprised of Hardware and Software cost including the cost of hiring system analyst and programmer.

(a) Hardware Cost	305,300 Baht
(b) Software Cost	211,000 Baht
(c) Personnel	
(d) System Analyst (40 hours @ 800 Baht)	32,000 Baht
(e) Programmer (90 hours @ 600 Baht)	54,000 Baht

(f) Training Cost 20,000 Baht

Total Development Costs 622,300 Baht

(2) Operating Cost

The monthly costs involved, for instance, salary for personnel officers, and system maintenance.

Maintenance Cost 8,000 Baht

(3) Others

Office equipment and office supplies are categorized in this section.

Miscellaneous 4,000 Baht

Total Projected Costs 634,300 Baht

Benefit Analysis

Tangible benefit

(1) Personnel

The existing system has 8 personnel officers to run and operate the Human Resource Department with the cost estimated monthly as 96,000 Baht(@12,000). The proposed system cuts down the personnel cost by hiring only 6 officers, which costs 72,000 monthly (@12,000). So in the first year, the proposed system can save the personnel cost up to 24,000 per month and the organization can save the personnel officers cost drastically in the following years.

Reduce cost of human labor

(12 @ 24,000 Baht/month) 288,000 Baht/year

(2) Operational

Reduce paper usage and stationary

(12 @ 5,000 Baht/month) 60,000 Baht/year

Reduce cost of overtime

(12 @ 7,000 Baht/month)

84,000 Baht/year

Total Annual Tangible Benefits

432,000 Baht

Intangible benefit

- (1) Reduce work load of personnel staff
- (2) Reduce the stressful environment
- (3) Improve response time
- (4) Improve the quality of the personnel work
- (5) Data is correct and up-to-date ready to service the routine and ad-hoc demand.
- (6) Data is well organized with less redundancy
- (7) Improve the decision making
- (8) The overall performance of the department satisfies the organization
- (9) Decrease the level of error

Cost Comparison

Comparing the cost of two systems, the current system and the proposed system are summarized and shown in Table 3.8. From the implementation of break-even analysis as shown in Figure 3.4. we have seen the different costs between two systems in full view. These represent the time when the benefit is equal to the investment cost. There is one factor that reflected cost; is time value of money. Some of the costs of a system will be accrued after implementation and the benefits of the new system will be accrued in the future; so that should be adjusted both costs and benefits to current baht. The break-even point is 1 year. From the point of 1 year onward, the new system will be more economical than the existing system because of labor savings and operating cost saving.

Table 3.8. Cost Comparison between the Existing System and Proposed System, Baht.

Cost Items	Years				
	1	2	3	4	5
<u>Existing System:</u>					
Staff (increase 5% per year)	1,152,000	1,209,600	1,270,080	1,333,584	1,400,263
Operating Cost (increase 5% per year)	108,000	113,400	119,070	125,024	131,275
Utility Cost (increase 5% per year)	60,000	63,000	66,150	69,458	72,930
Total Cost	1,320,000	1,386,000	1,455,300	1,528,065	1,604,468
Cumulative Cost	1,320,000	2,706,000	4,161,300	5,689,365	7,293,833
<u>Proposed System:</u>					
Hardware Cost	61,060	61,060	61,060	61,060	61,060
Software Cost	42,200	42,200	42,200	42,200	42,200
Implement Cost	21,200	21,200	21,200	21,200	21,200
Staff (increase 5% per year)	864,000	907,200	952,560	1,000,188	1,050,197
Operating Cost (increase 5% per year)	96,000	100,800	105,840	111,132	116,689
Utility Cost (increase 5% per year)	48,000	50,400	52,920	55,566	58,344
Total Cost	1,132,460	1,182,860	1,235,780	1,291,346	1,349,690
Cumulative Cost	1,132,460	2,315,320	3,551,100	4,842,446	6,192,136

Table 3.9. Cumulative Cost of the Existing System and Proposed System, Baht.

Year	Cumulative Existing Cost	Cumulative Proposed Cost
1	1,320,000.00	1,630,300.00
2	2,706,000.00	2,688,700.00
3	4,161,300.00	3,800,020.00
4	5,689,365.00	4,966,906.00
5	7,293,833.00	6,192,136.00

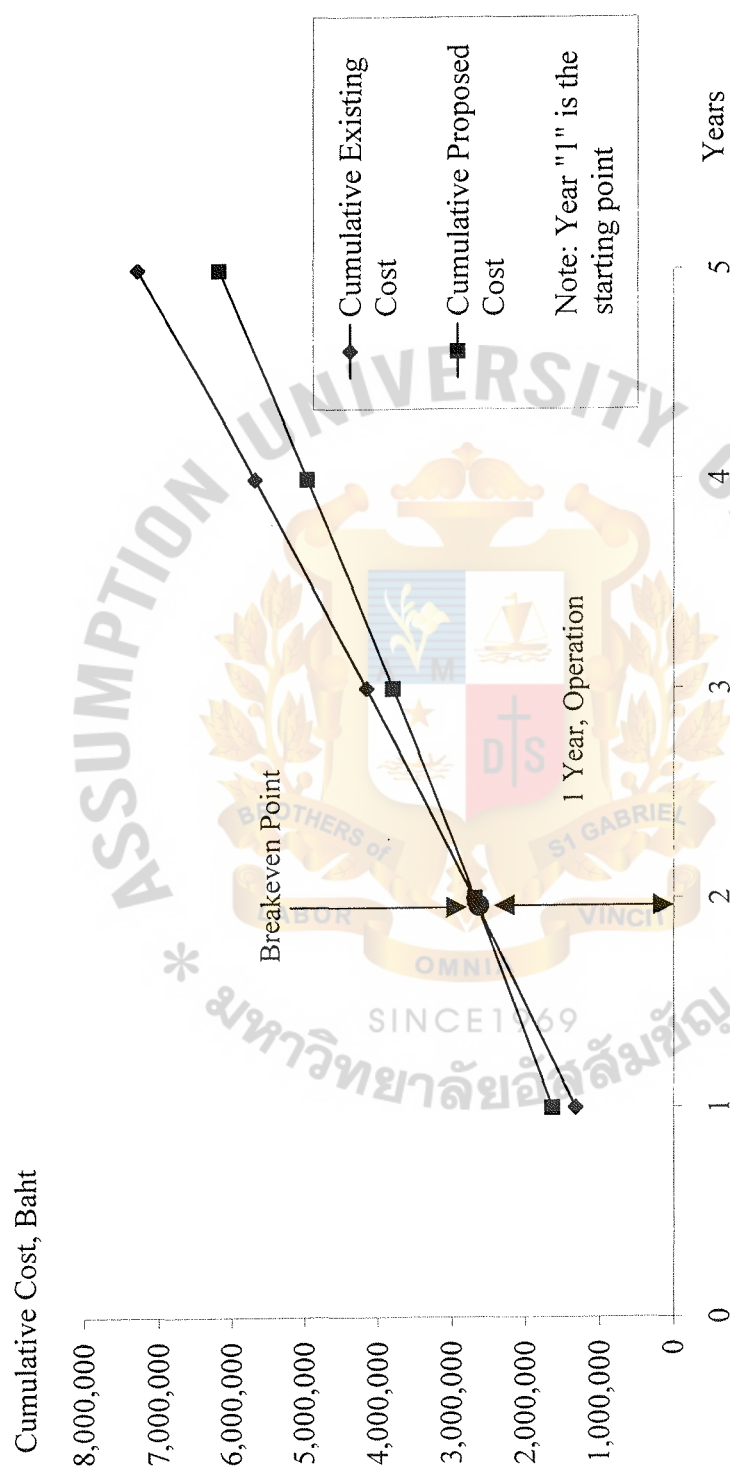


Figure 3.4. Break-even Chart Analysis.

Payback Analysis

The payback period is determined from original investment divided by annual net cash inflow as formula is shown below. The number of years or how much time will lapse before accrued benefits overtake accrued and continuing cost. After implementation, you will incur additional operating expenses that must be recovered.

$$\text{Number of years to payback} = \frac{\text{Original investment}}{\text{Annual net cash inflow}}$$

The payback period of the proposed system is 1 year. It will take about 1 year to pay back the initial investment. Figure 3.5.will show Payback Chart Analysis and payback period calculation will be shown in Table 3.10.

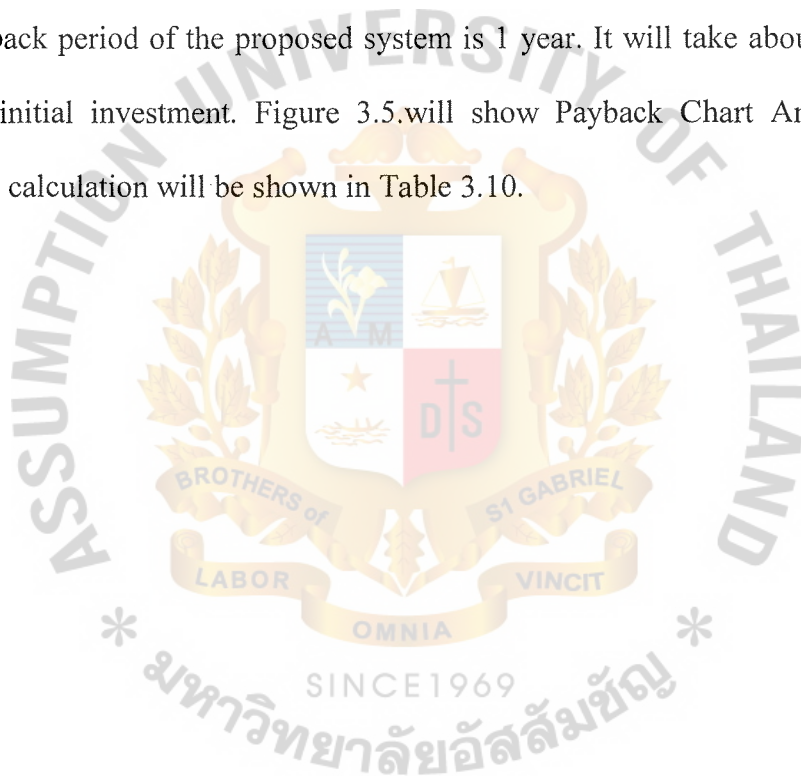


Table 3.10. Payback Analysis, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development cost:	-622,300					
Operation & maintenance cost:		-96,000	-100,800	-105,840	-111,132	-116,688
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted costs (adjusted to present value):	-622,300	-85,728	-80,337	-75,358	-70,679	-66,162
Cumulative time-adjusted costs over lifetime:	-622,300	-708,028	-788,365	-863,723	-934,402	-1,000,564
Benefits derived from operation of new system:	0	432,000	453,600	476,280	500,094	525,099
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted benefits (adjusted to present value):	0	385,776	361,519	339,111	318,060	297,731
Cumulative time-adjusted benefits over lifetime:	0	642,960	1,004,479	1,343,591	1,661,650	1,959,381
Cumulative life time-adjusted costs + benefits:	-622,300	-65,068	216,114	479,868	727,248	958,817

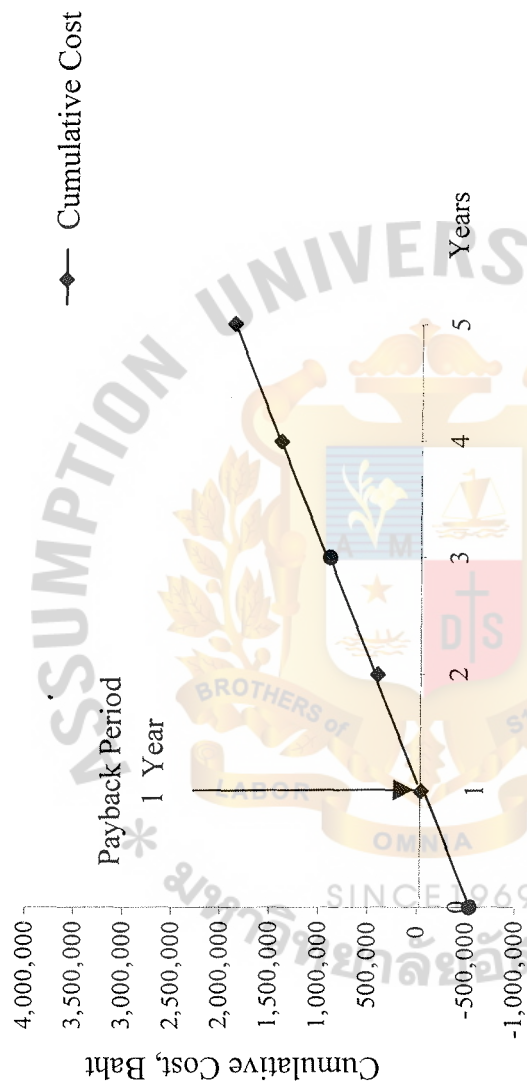


Figure 3.5. Payback Period for the Proposed System.

Net Present Value (NPV)

Net Present Value is a sophisticated capital budgeting technique, which is calculated by subtracting the project's initial investment cost from the present value of cash inflows discounted at a rate to the firm's cost of capital. The formula for net present value is:

$$\text{Net present value} = \text{Present value of expected cash flows} - \text{Initial investment cost}$$

The Net Present Value calculation will be shown in Table 3.11.

If NPV is more than zero, the project should be accepted. If NPV is less than zero, the project should be rejected. After NPV calculation, it is positively valued at 701,633 Baht and therefore, the proposed system should be accepted.

Table 3.11. Net Present Value Analysis, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Development cost:	-622,300						
Operation & maintenance cost:		-96,000	-100,800	-105,840	-111,132	-116,688	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual costs:	-622,300	-85,728	-80,337	-75,358	-70,679	-66,162	
Total present value of lifetime costs:							-1,000,564
Benefits derived from operation of new system	0	432,000	453,600	476,280	500,094	525,099	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual benefits:	0	385,776	361,519	339,111	318,060	297,731	
Total present value of lifetime benefits:							1,702,197
Net Present Value:							701,633

IV. PROJECT IMPLEMENTATION

4.1 Overview of Project Implementation

The implementation of the proposed system is initiated by surveying the current existing system. We identify tasks, data flows, and inmost predicaments in order to comprehend and eliminate these problems. Thereafter, we attain the project scope and objectives, then we are able to write down the user requirements accordingly.

The next step is to design the system. We define the candidate solutions and choose the best candidates based on the most remunerative one by committing cost-benefits analysis. Afterwards, we design the database, interface, and output as user requirements.

The last step, we construct and test the system prototype to find any possible difficulties and errors that might arise from the proposed system. We also need to train the users and the human resource department officers, to comprehend the newly installed test system. And if there is no problem found after running the production test to search for obstacles, we can officially inaugurate this new system to the department.

Overview of the project implementation is as follows:

- (1) System Analysis
- (2) System Design
- (3) System Implementation
 - (a) Program Coding
 - (b) Program Testing
 - (c) Program Training
 - (d) Program Conversion

4.2 System Analysis

In system analysis phase, we summarize in-depth underlying problems of the current existing manual system, and we use that information in preparing the project. We study the flow of the data along with the basic processes of the organization and we additionally obtain the user requirements.

4.3 System Design

At this phase, we choose the most remunerative one from available candidate solutions. Then, we proceed to design input, output and user interface to meet user requirements.

4.4 System Implementation

To complete the proposed system, we have to create a real program, which is compatible with the user requirements and given environment.

The tools that we select are Delphi and Microsoft Visual Interdev. Programmers create user-friendly interface by Delphi and make a linkage to the database. With flexibility features of Delphi, users can send queries, making reports, easily and effectively organizing the entirely information.

After creating a program, hardware, software and office components are put together to demonstrate the real coding environment and construct a prototype system. We run the test to check whether the proposed system is running smoothly with the entire environment.

4.4.1 Program Coding

As mentioned, we choose Delphi to be our interface and language controlling database.

We have to design an appropriate database structure to support the inclusive proposed system. Thereafter, we start program coding at each module of the system,

firstly, Leave and Attendance function, which is integrated with the time card system. We program this function in a way that the program can retrieve the employee's ID card information from the time card system daily. Then we finish programming in Employee Information, Benefit management, Training, Recruitment, and Report processing, then we proceed to merge each module into complete single application.

4.4.2 Program Testing

It's the time to demonstrate the testing procedure for analyzing and evaluating the overall performance of the system. We must commit the test thoroughly in order to obtain complete summary of the test program. The stages of testing are listed below.

(1) Sub Testing

Programmer conducts this test to look for any possible hidden bug of the program.

(a) Code testing

This test is demonstrated to check the program execution.

(b) Module testing

This test is demonstrated to check the performance of each module of the program.

(c) Specification testing

This test is demonstrated to check the module whether it covers the specification.

(2) System Testing

When we assemble every module of the program to function as a complete set, this test is demonstrated to check the system integrity.

(3) Special System Testing

The final test is conducted for optimum performance evaluation, we determine how the system performs under the peak load job circumstance, recovery test, storage test, human performance test.

4.4.3 Program Training

In order to maximize the overall performance after the inauguration of system, it is very important to ensure that users are sufficiently knowledgeable to manage the system. It is obligatory that users be familiar with the new system before operating full function. The training will last one-week so if there are any unexpected errors found, they can be resolved in time.

4.4.4 Program Conversion

Parallel conversion will be designed; it is the strategy where the existing system and the proposed system are implemented simultaneously for a certain period of time. This plan is organized and operated to ensure that the new system could be flawless by the time the organization deploys the new system to its full extent.

According to the fact that the existing is manual, it is not likely to be such an easy process in converting the existing system into a fully computerized one. The routine activities and personnel officers need to be well prepared, additionally, there might occur some unforeseen damage, so it is suggested to implement conversion plan.

The parallel conversion plan is estimated to take one month to complete before the new system can be fully deployed.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The Degree of Achievement of the proposed system compared with the existing system

Table 5.1. shows the comparison of usage time between existing manual system and computerized system. According to the table, each process that is handled by existing manual system is more time consuming than process which is handled by the computerized system. The completely computerized system can eliminate unnecessary steps in a process and because of its efficiency to reduce time consuming.

Table 5.1. The Degree of Achievement between the Proposed System and the Existing System.

Process	Existing System	Proposed System
Record Leave and Attendance	2 Hours	30 Minutes
Process Benefit Information	1 Hour	5 Seconds
Process Employee Information	45 Minutes	3 Minutes
Process Generate Report	50 Minutes	4 Seconds
Query	30 Minutes	2 Seconds

The existing manual system in Human Resource Department is becoming not likely to be practical and productive as the information has been swelling and even more complex than before. Human Resource Officers are having such a difficult time to go through the files in hard copy format looking for a particularly needed information. While the process takes a lot of time to complete, errors also arise easily.

Usually, the existing manual system is responsible in handling data of Employee information, Leave and Attendance information, Benefit information, Appraisal plan, Training information, and Report production. Each process is involved with an

enormous amount of paper. Human resource officers find it strenuous in keeping all this information up-to-date. Evidently, for instance, in processing employee information and training activities, the data must be accurate and current for proper data analysis in determining the appropriate training session.

The data of Leave and Attendance is dramatically increasing because of pulsate human errors from daily process that Human Resource officers have to manage data every single day. It is considerably inextricable to obtain few records out of big pile of papers organized in manual behavior in limited amount of time. With the perpetual problems, as mentioned, brings difficulty to processing report as required.

Introduced problems as mentioned above can be figured out by establishing the newly proposed system. With the hand of computerization, errors are finally eradicated and operating every function will be improved, comfortable and less troublesome. The proposed system can manage the bulk of data very well since the data will be kept in the database and users feel free to retrieve the data any time they wish.

Keeping the data up-to-date will be no longer a laborious task to do so. Users will find it easily and less time consuming in updating the data in the database through the user-friendly interface. To give an example, Leave and Attendance data are gathered everyday, the ability to retrieve data directly from the punching machine will cut off the excessive effort in collecting those data in existing manual system. Every function will be automated, therefore, data processing will have yielded very less response time, when compared to the existing manual system, which enables the highly effective overall performance to happen.

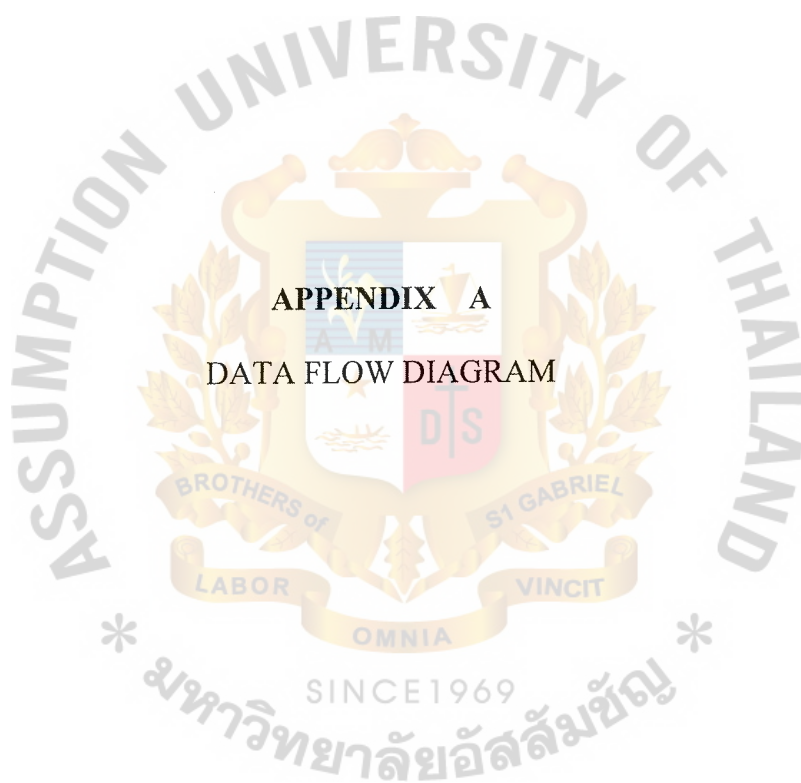
5.2 Recommendations

It takes time before Human Resource officers can be familiar and able to operate the new system smoothly so prior training is needed along with intensive monitoring in the very beginning of the new system. And as we designed the parallel conversion, it needs to keep conducting the manual system until the new system is running well all the whole operation.

The capable new system is able to utilize the information for periodic analysis, future reference and report. It is very easy and convenient to choose the proper employees that need to be trained, also proceed with the recruitment from proper applicants, which are stored in database and generate report as required.

In expectation that in the very near future, the company will expand and, to have the entire process running effectively at the bigger frame, the company should prepare the plan on increasing the computer usage. When the new system starts, partial financial information will be accessed to facilitate the work of Payroll Department at some level. Therefore, the company might consider constructing the wholly computerized payroll information system after Human Resource Information System is well organized. The company can also consider adopting a computerized system to the other department.

The company also has to take care of regarding the issue of system security in terms of authorization and electricity failure. The system must be highly secure, so the password authentication policy is motivated. Also consideration of the policy of system back up at an appropriate period of time.



APPENDIX A
DATA FLOW DIAGRAM

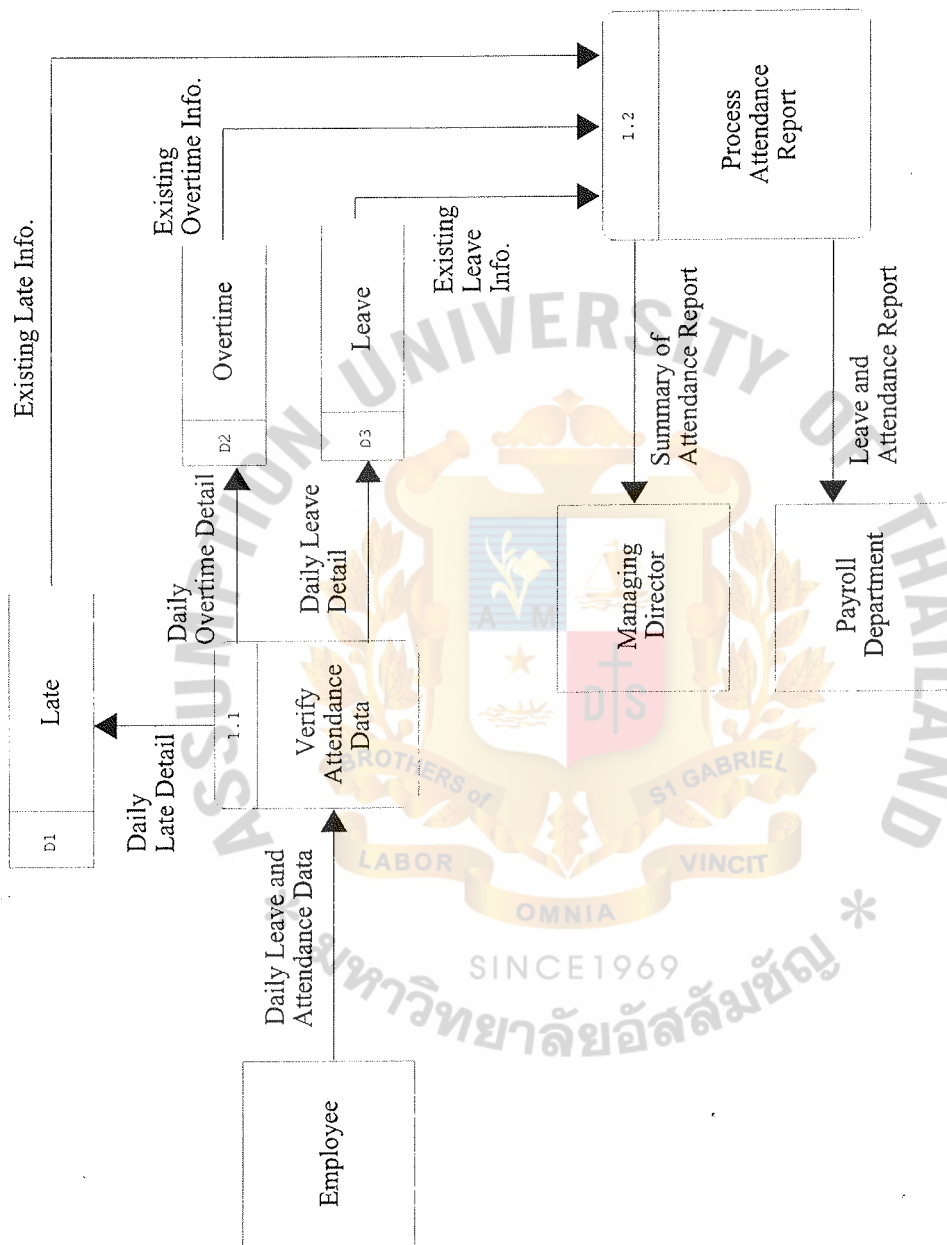


Figure A.1. Data Flow Diagram of Process Leave and Attendance.

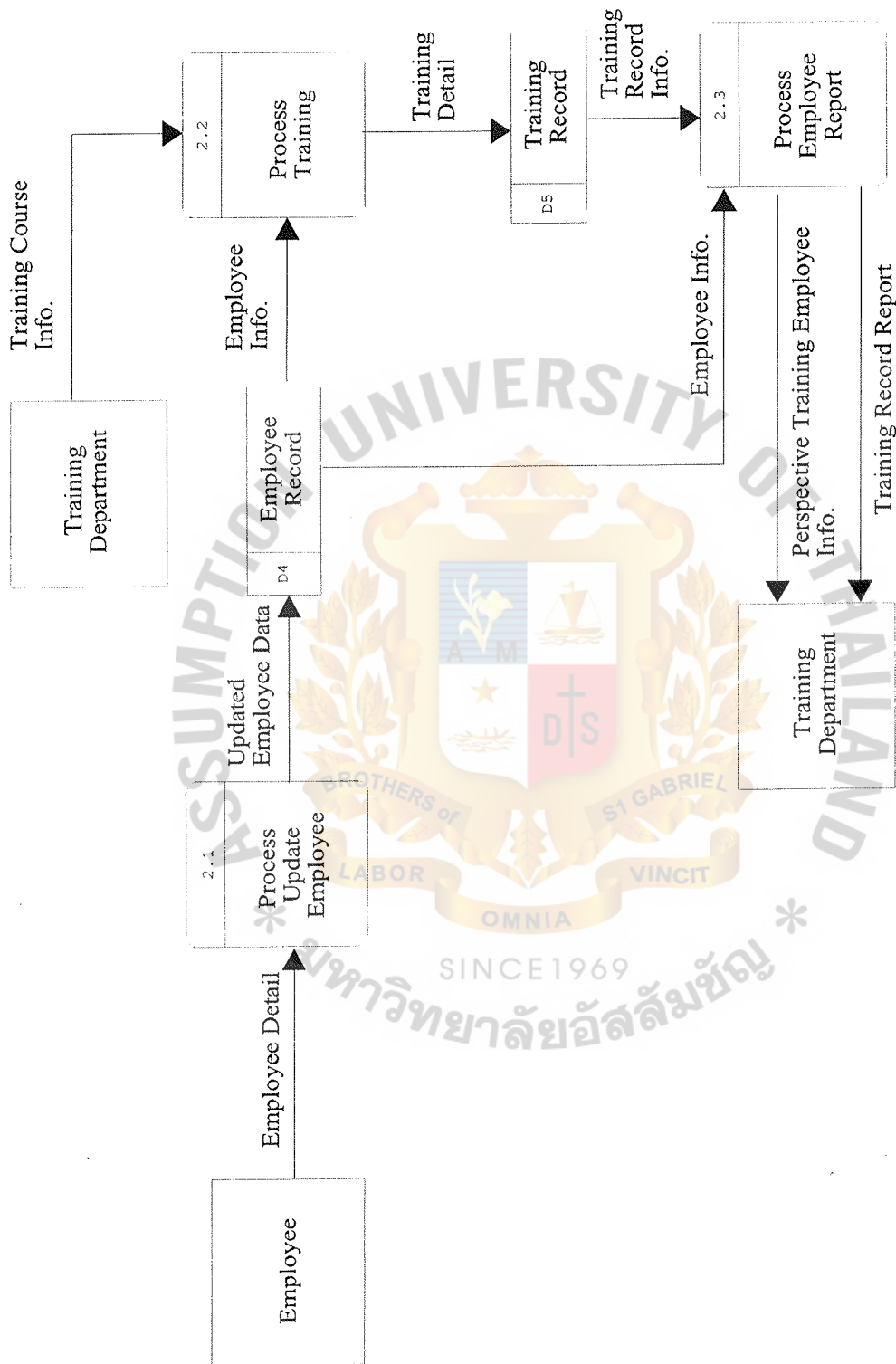


Figure A.2. Data Flow Diagram of Process Employee Information.

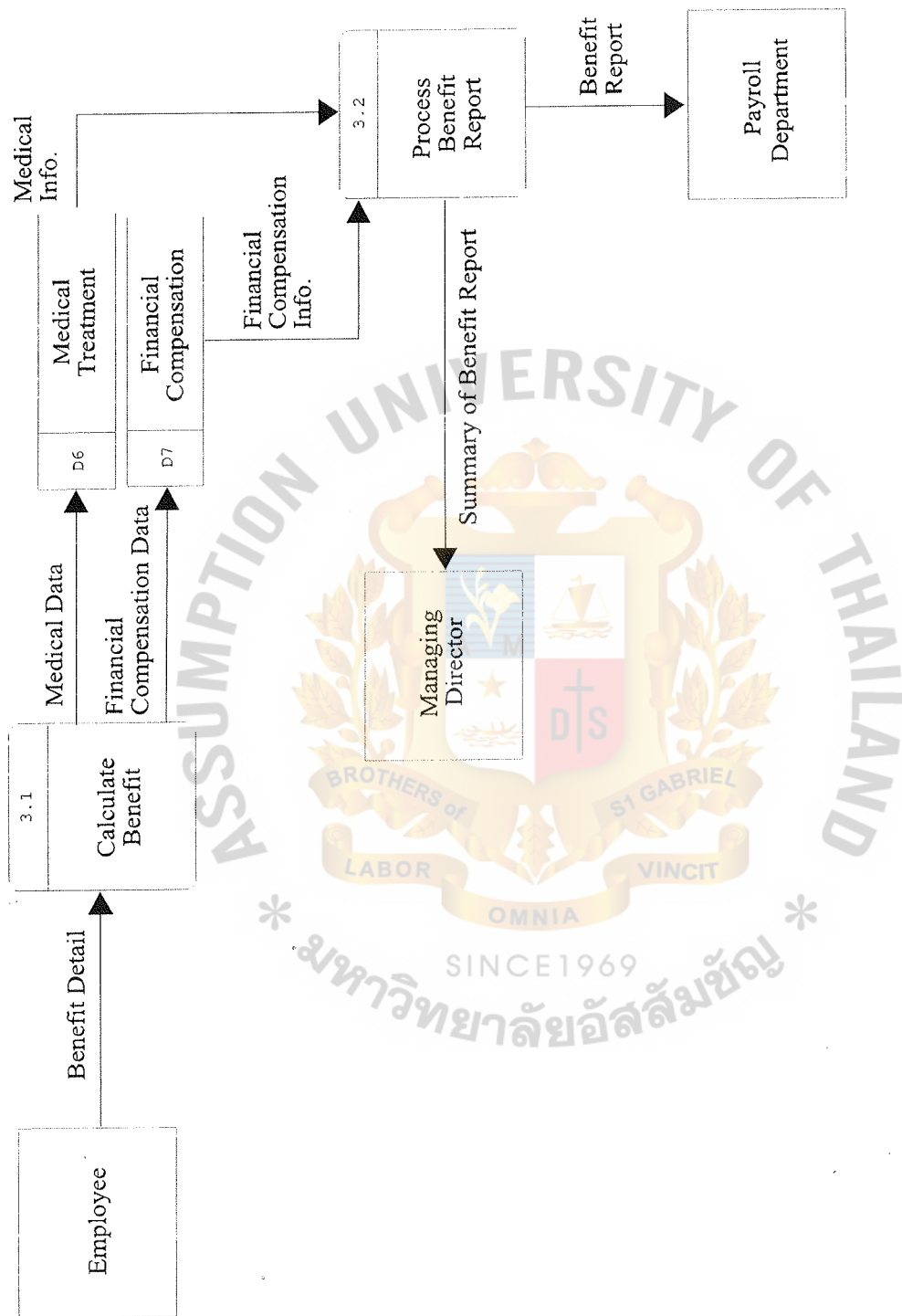


Figure A.3. Data Flow Diagram of Process Benefit Information.

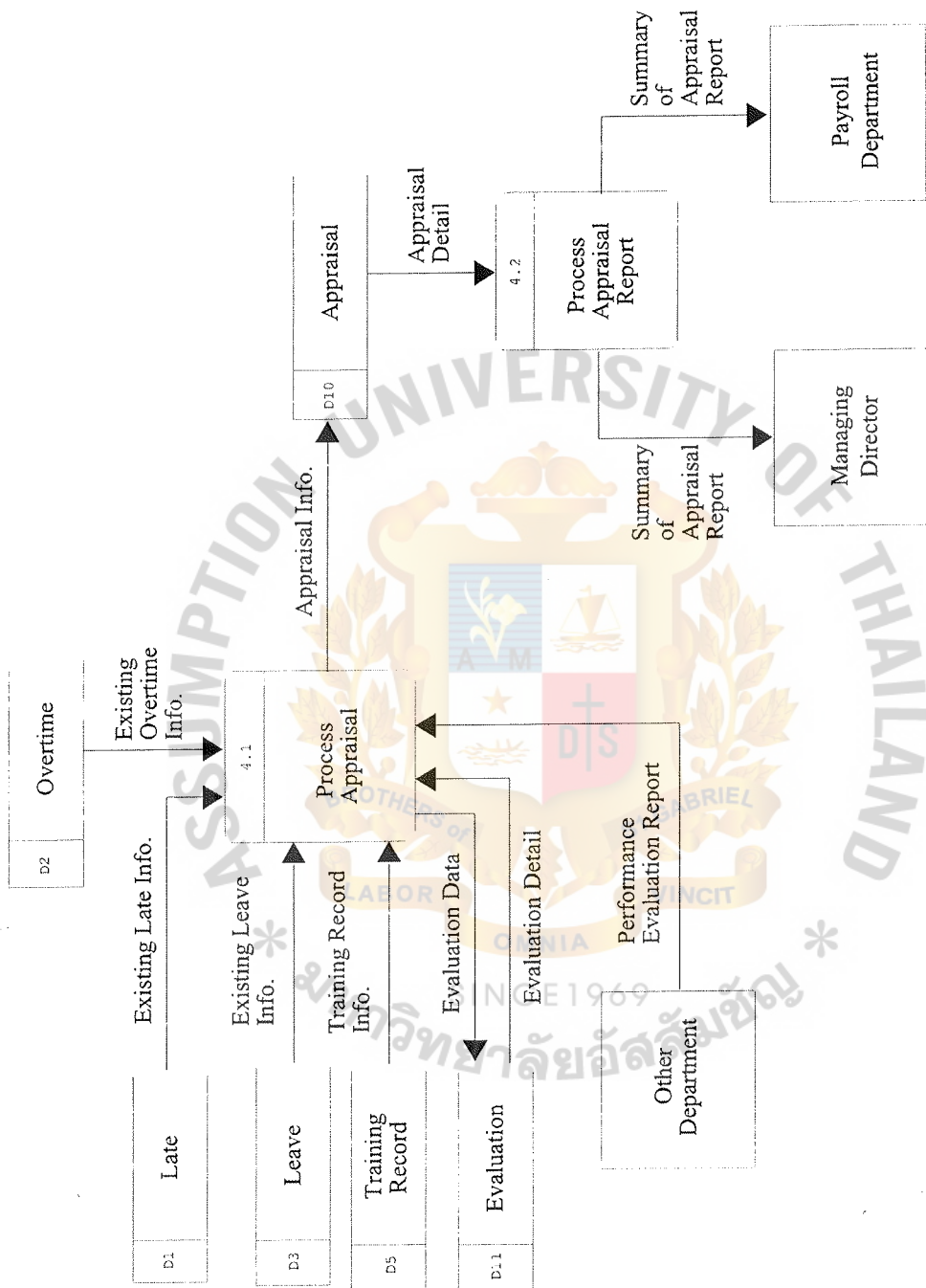


Figure A.4. Data Flow Diagram of Process Appraisal Information.

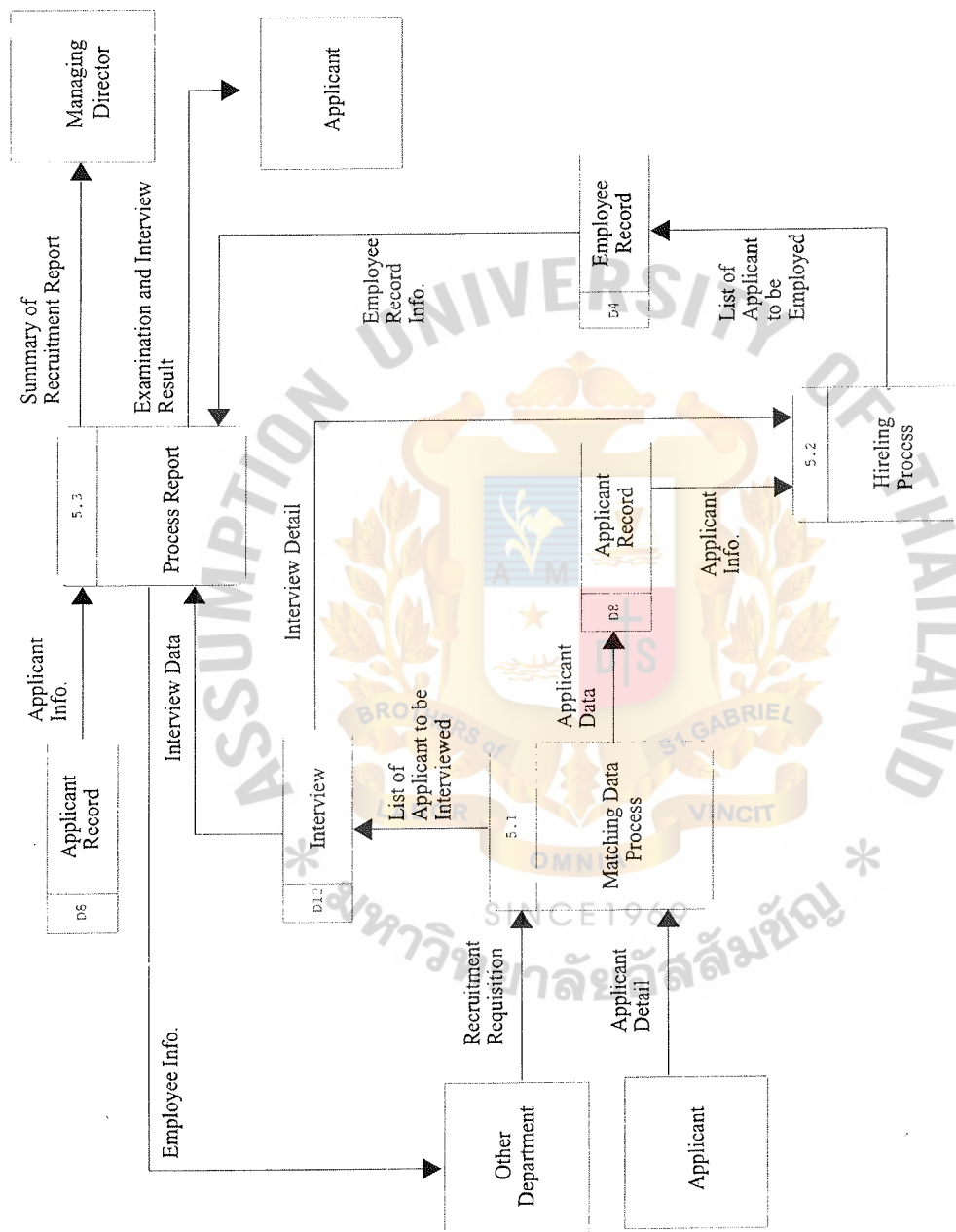


Figure A.5. Data Flow Diagram of Process Recruitment Information.



APPENDIX B
DATA DICTIONARY

Add employee record Data Flow

Location:

DFD of Update Employee File (0)

Source: Add New employee record (Process)

Dest: Employee Record (Data Store)

Added Applicant Record Data Flow

Location:

DFD of Update Applicant n Employee File (0)

Source: Write New Applicant Record to Employee (Process)

Dest: Employee Record (Data Store)

Applicant and Interview Info. Data Flow

Location:

DFD of Gather Data Entry (0)

Source: Enter Applicant Detail and Interview Data (Process)

Dest: Transform Function of Gather Data (Process)

Applicant and Interview Record to be stored Data Flow

Location:

DFD of Gather Data Entry (0)

Source: Transform Function of Gather Data (Process)

Dest: Store Applicant and Interview Result (Process)

Applicant Data Data Flow

Location:

DFD of Approval Update (0)

Source: Applicant Record (Data Store)

Dest: Read Applicant Detail (Process)

Applicant Detail Data Flow

Location:

DFD of Process Recruitment Info. (0)

Source: Applicant (External Entity)

Dest: Process Gather Date Entry (Process)

DFD of Gather Data Entry (0)

Source: Applicant (External Entity)

Dest: Enter Applicant Detail and Interview Data (Process)

DFD of Update Applicant n Employee File (0)

Source: Applicant Record (Data Store)

Dest: Read Applicant List (Process)

Applicant Info.

Data Flow

Location:

Context of Proposed System (CONTEXT)

Source: Applicant (External Entity)

Dest: Human Resource Record System (Process)

DFD of Proposed System (0)

Source: Process Recruitment (Process)

Dest: Applicant Record (Data Store)

DFD of Process Recruitment Info. (0)

Source: Process Gather Date Entry (Process)

Dest: Applicant Record (Data Store)

DFD of Approval Update (0)

Source: Read Applicant Detail (Process)

Dest: Transform Function of Approval (Process)

DFD of Proposed System (0)

Source: Applicant (External Entity)

Dest: Process Recruitment (Process)

Applicant Qualification and Interview Result

Data Flow

Location:

Context of Proposed System (CONTEXT)

Source: Human Resource Record System (Process)

Dest: Applicant (External Entity)

Applicant Record

Data Flow

Location:

DFD of Process Recruitment Info. (0)

Source: Applicant Record (Data Store)

Dest: Process Approval Update (Process)

Source: Applicant Record (Data Store)

Dest: Update Applicant File and Employee (Process)

DFD of Update Applicant n Employee File (0)

Source: Read Applicant List (Process)

Dest: Transaction Center of Update Files (Process)

Applicant Record to be Added

Data Flow

Location:

DFD of Update Applicant n Employee File (0)

Source: Process of Applicant Record Creation (Process)

Dest: Write New Applicant Record to Employee (Process)

Applicant Record to be Deleted

Data Flow

Location:

DFD of Update Applicant n Employee File (0)

Source: Process of Applicant Record Deletion (Process)

Dest: Delete Applicant Record (Process)

Applicant Record to be Stored Data Flow
 Location:
DFD of Approval Update (0)
 Source: Transform Function of Approval (Process)
 Dest: Store Recruitment Data (Process)

Applicant Record to be Updated Data Flow
 Location:
DFD of Update Applicant n Employee File (0)
 Source: Process of Applicant Record Updating (Process)
 Dest: Update Applicant Record to Employee (Process)

Appraisal Data Data Flow
 Location:
DFD of Process Appraisal Report (0)
 Source: Appraisal (Data Store)
 Dest: Read Appraisal Data (Process)

Appraisal Info. Data Flow
 Location:
DFD of Proposed System (0)
 Source: Process Appraisal Info. (Process)
 Dest: Appraisal (Data Store)
DFD of Process Appraisal Info. (0)
 Source: Appraisal (Data Store)
 Dest: Process Appraisal Report and Answer (Process)

Appraisal Record Data Flow
 Location:
DFD of Process Appraisal Report (0)
 Source: Read Appraisal Data (Process)
 Dest: Transaform Function of Process Report (Process)

Appraisal Result Data Flow
 Location:
DFD of Process Appraisal Info. (0)
 Source: Process Appraisal (Process)
 Dest: Appraisal (Data Store)

Appraisal Update Data Flow

Location:

DFD of Process Appraisal (0)

Source: Transform Function of Process Appraisal (Process)

Dest: Store Record (Process)

Approval Data Flow

Location:

DFD of Process Recruitment Info. (0)

Source: Managing Director or Related Manager (External Entity)

Dest: Process Approval Update (Process)

Approval Updated Detail Data Flow

Location:

DFD of Process Recruitment Info. (0)

Source: Process Approval Update (Process)

Dest: Recruitment (Data Store)

Benefit Detail Data Flow

Location:

DFD of Proposed System (0)

Source: Employee (External Entity)

Dest: Process Benefit (Process)

Benefit Record Data Flow

Location:

DFD of Process Benefit Info. (0)

Source: Financial Compensation (Data Store)

Dest: Process Benefit Report and Answer (Process)

Benefit Record to be Printed Data Flow

Location:

DFD of Process Benefit Report (0)

Source: Transform Function of Process Benefit Report (Process)

Dest: Print Benefit Report and Answer (Process)

Daily Attendance Info. Data Flow

Location:

DFD of Process Leave n Attendance (0)

Source: Employee (External Entity)

Dest: Process Record Daily Attendance (Process)

DFD of Process Attendance Checking (0)

Source: Employee (External Entity)

Dest: Read Daily Attendance (Process)

Daily Attendance Info. to be stored

Data Flow

Location:

DFD of Process Attendance Checking (0)

Source: Transform Function of Attendance Checking (Process)

Dest: Store Attendance Data (Process)

Daily Attendance Record

Data Flow

Location:

DFD of Process Attendance Checking (0)

Source: Read Daily Attendance (Process)

Dest: Transform Function of Attendance Checking (Process)

Daily Check Out Time

Data Flow

Location:

DFD of Process Leave n Attendance (0)

Source: Process Record Daily Attendance (Process)

Dest: Overtime (Data Store)

Daily Late Detail

Data Flow

Location:

DFD of Process Leave n Attendance (0)

Source: Process Record Daily Attendance (Process)

Dest: Late (Data Store)

Daily Late Info.

Data Flow

Location:

DFD of Proposed System (0)

Source: Process Record Leave and Attendance (Process)

Dest: Late (Data Store)

DFD of Process Leave n Attendance (0)

Source: Late (Data Store)

Dest: Process Leave and Attendance Report and Answer
(Process)

Daily Leave and Attendance Checking

Data Flow

Location:

DFD of Proposed System (0)

Source: Employee (External Entity)

Dest: Process Record Leave and Attendance (Process)

Daily Leave Info.

Data Flow

Location:

DFD of Proposed System (0)

Source: Process Record Leave and Attendance (Process)

Dest: Leave (Data Store)

DFD of Process Leave n Attendance (0)

Source: Leave (Data Store)

Dest: Process Leave and Attendance Report and Answer
(Process)

DFD of Process Leave Checking (0)

Source: Enter Leave Info. (Process)

Dest: Transform Function of Record Leave Info. (Process)

Daily Overtime Info.

Data Flow

Location:

DFD of Proposed System (0)

Source: Process Record Leave and Attendance (Process)

Dest: Overtime (Data Store)

Deleted Applicant Record

Data Flow

Location:

DFD of Update Applicant n Employee File (0)

Source: Delete Applicant Record (Process)

Dest: Applicant Record (Data Store)

Deleted employee record

Data Flow

Location:

DFD of Update Employee File (0)

Source: Delete employee record (Process)

Dest: Employee Record (Data Store)

Employee Data

Data Flow

Location:

DFD of Gather Employee Detail (0)

Source: Employee (External Entity)

Dest: Enter Employee Detail (Process)

DFD of Update Employee File (0)

Source: Employee Record (Data Store)

Dest: Read Employee Detail (Process)

DFD of Process Employee Report (0)

Source: Employee Record (Data Store)

Dest: Read Employee Data (Process)

Employee Detail

Data Flow

Location:

DFD of Proposed System (0)

Source: Employee (External Entity)

Dest: Process Employee Info. (Process)

DFD of Process Employee Info. (0)

Source: Employee (External Entity)

Dest: Process Employee Detail (Process)

DFD of Process Appraisal Report (0)

Source: Employee Record (Data Store)

Dest: Read Employee Info. (Process)

DFD of Update Applicant n Employee File (0)

Source: Employee Record (Data Store)

Dest: Read Employee List (Process)

Employee Info.

Data Flow

Location:

Context of Proposed System (CONTEXT)

Source: Employee (External Entity)

Dest: Human Resource Record System (Process)

Source: Human Resource Record System (Process)

Dest: Payroll Department (External Entity)

Source: Human Resource Record System (Process)

Dest: Other Department (External Entity)

DFD of Proposed System (0)

Source: Process Employee Info. (Process)

Dest: Employee Record (Data Store)

Source: Employee Record (Data Store)

Dest: Training Department (External Entity)

DFD of Process Employee Info. (0)

Source: Process Employee Detail (Process)

Dest: Employee Record (Data Store)

Source: Employee Record (Data Store)

Dest: Process Update Employee File (Process)

Source: Employee Record (Data Store)

Dest: Process Employee Report and Answer (Process)

Employee Late Record

Data Flow

Location:

DFD of Proposed System (0)

Source: Late (Data Store)

Dest: Payroll Department (External Entity)

Employee Leave Record

Data Flow

Location:

DFD of Proposed System (0)

Source: Leave (Data Store)

Dest: Payroll Department (External Entity)

Employee Overtime Record

Data Flow

Location:

DFD of Proposed System (0)

Source: Overtime (Data Store)

Dest: Payroll Department (External Entity)

Employee Record

Data Flow

Location:

DFD of Gather Employee Detail (0)

Source: Enter Employee Detail (Process)

Dest: Transform Function of Gather Detail (Process)

DFD of Update Employee File (0)

Source: Read Employee Detail (Process)

Dest: Transaction Center of Update Detail (Process)

DFD of Process Employee Report (0)

Source: Read Employee Data (Process)

Dest: Transform Function of Process Employee Report
(Process)

DFD of Process Appraisal Report (0)

Source: Read Employee Info. (Process)

Dest: Transform Function of Process Report (Process)

DFD of Update Applicant n Employee File (0)

Source: Read Employee List (Process)

Dest: Transaction Center of Update Files (Process)

Employee Record and if Requested Report and Answer

Data Flow

Location:

DFD of Process Employee Info. (0)

Source: Process Employee Report and Answer (Process)

Dest: Employee Info. Management Section (External Entity)

Employee Record to be Added

Data Flow

Location:

DFD of Update Employee File (0)

Source: Process to Add New employee record (Process)

Dest: Add New employee record (Process)

Employee Record to be Deleted

Data Flow

Location:

DFD of Update Employee File (0)

Source: Process to Delete employee record (Process)

Dest: Delete employee record (Process)

Employee Record to be Printed

Data Flow

Location:

DFD of Process Employee Report (0)

Source: Transform Function of Process Employee Report
(Process)

Dest: Print Employee Record and Answer (Process)

Employee Record to be Stored

Data Flow

Location:

DFD of Gather Employee Detail (0)

Source: Transform Function of Gather Detail (Process)

Dest: Store Employee Detail (Process)

Employee Record to be Updated

Data Flow

Location:

DFD of Update Employee File (0)

Source: Process to Update employee record (Process)

Dest: Updated employee record (Process)

Evaluation Info.

Data Flow

Location:

DFD of Process Appraisal (0)

Source: Evaluation (Data Store)

Dest: Read Evaluation Data (Process)

DFD of Process Appraisal Report (0)

Source: Evaluation (Data Store)

Dest: Read Evaluation Record (Process)

Evaluation Record

Data Flow

Location:

DFD of Process Appraisal (0)

Source: Read Evaluation Data (Process)

Dest: Transform Function of Process Appraisal (Process)

DFD of Process Appraisal Report (0)

Source: Read Evaluation Record (Process)

Dest: Transform Function of Process Report (Process)

Evaluation Result from Manager Dept.

Data Flow

Location:

DFD of Proposed System (0)

Source: Evaluation (Data Store)

Dest: Process Appraisal Info. (Process)

DFD of Process Appraisal Info. (0)

Source: Evaluation (Data Store)

Dest: Process Appraisal (Process)

Financial Compensation Detail

Data Flow

Location:

DFD of Process Financial Compensation (0)

Source: Employee (External Entity)

Dest: Enter Financial Compensation Record (Process)

Financial Compensation Entry

Data Flow

Location:

DFD of Process Benefit Info. (0)

Source: HR Officer (External Entity)

Dest: Process Financial Compensation (Process)

Financial Compensation Info.

Data Flow

Location:

DFD of Process Benefit Info. (0)

Source: Process Update Balance of Financial Compensation
(Process)

Dest: Financial Compensation (Data Store)

Source: Process Financial Compensation (Process)

Dest: Financial Compensation (Data Store)

DFD of Process Benefit Report (0)

Source: Financial Compensation (Data Store)

Dest: Read Financial Compensation Info. (Process)

DFD of Proposed System (0)

Source: Process Benefit (Process)

Dest: Financial Compensation (Data Store)

Financial Compensation Record

Data Flow

Location:

DFD of Process Financial Compensation (0)

Source: Enter Financial Compensation Record (Process)

Dest: Transform Function of Financial Compensation (Process)

DFD of Process Benefit Report (0)

Source: Read Financial Compensation Info. (Process)

Dest: Transform Function of Process Benefit Report (Process)

Financial Compensation to be Stored

Data Flow

Location:

DFD of Process Financial Compensation (0)

Source: Transform Function of Financial Compensation
(Process)

Dest: Store Financial Compensation (Process)

Financial Related Info. of Employee Data Flow

Location:

Context of Proposed System (CONTEXT)

Source: Payroll Department (External Entity)

Dest: Human Resource Record System (Process)

Interview Comment and Result Data Flow

Location:

DFD of Proposed System (0)

Source: Interviewer (External Entity)

Dest: Process Recruitment (Process)

Source: Process Recruitment (Process)

Dest: Managing Director (External Entity)

Interview Data Data Flow

Location:

DFD of Gather Data Entry (0)

Source: Interviewer (External Entity)

Dest: Enter Applicant Detail and Interview Data (Process)

DFD of Approval Update (0)

Source: Interview (Data Store)

Dest: Read Interview Result (Process)

Interview Detail Data Flow

Location:

DFD of Proposed System (0)

Source: Process Recruitment (Process)

Dest: Interview Result (Data Store)

Interview Info. Data Flow

Location:

DFD of Approval Update (0)

Source: Read Interview Result (Process)

Dest: Transform Function of Approval (Process)

Interview Result Detail Data Flow

Location:

DFD of Process Recruitment Info. (0)

Source: Process Gather Date Entry (Process)

Dest: Interview Result (Data Store)

Interview Result Info. Data Flow
Location:
 DFD of Process Recruitment Info. (0)
 Source: Interview Result (Data Store)
 Dest: Process Approval Update (Process)

Interviewer Comment Result Data Flow
Location:
 DFD of Process Recruitment Info. (0)
 Source: Interviewer (External Entity)
 Dest: Process Gather Date Entry (Process)

Late Info. Data Flow
Location:
 DFD of Process Appraisal Info. (0)
 Source: Late (Data Store)
 Dest: Process Appraisal (Process)
 DFD of Process Leave n Attendance Report (0)
 Source: Late (Data Store)
 Dest: Read Late File (Process)
 DFD of Process Appraisal (0)
 Source: Late (Data Store)
 Dest: Read Late Info. (Process)

Late Record Data Flow
Location:
 DFD of Process Leave n Attendance Report (0)
 Source: Read Late File (Process)
 Dest: Transform Function of Process Leave and Attendance Report (Process)
 DFD of Process Appraisal (0)
 Source: Read Late Info. (Process)
 Dest: Transform Function of Process Appraisal (Process)

Leave and Attendance Info. Data Flow
Location:
 Context of Proposed System (CONTEXT)
 Source: Human Resource Record System (Process)
 Dest: Payroll Department (External Entity)

Leave and Attendance Record and if Requested Report and Answer Data Flow
Location:
 DFD of Process Leave n Attendance (0)
 Source: Process Leave and Attendance Report and Answer

(Process)
 Dest: Payroll Department (External Entity)
 Source: Process Leave and Attendance Report and Answer
 (Process)
 Dest: Employee Info. Section (External Entity)

Leave and Attendance Record to be Printed Data Flow
 Location:

DFD of Process Leave n Attendance Report (0)
 Source: Transform Function of Process Leave and Attendance
 Report (Process)
 Dest: Print Leave and Attendance Report (Process)

Leave and Attendance Report Data Flow
 Location:

Context of Proposed System (CONTEXT)
 Source: Human Resource Record System (Process)
 Dest: Employee (External Entity)
DFD of Process Leave n Attendance (0)
 Source: Process Leave and Attendance Report and Answer
 (Process)
 Dest: Employee (External Entity)

Leave Info. Data Flow
 Location:

DFD of Process Leave n Attendance (0)
 Source: Process Leave Info. (Process)
 Dest: Leave (Data Store)
DFD of Process Appraisal Info. (0)
 Source: Leave (Data Store)
 Dest: Process Appraisal (Process)
DFD of Process Leave n Attendance Report (0)
 Source: Leave (Data Store)
 Dest: Read Leave File (Process)
DFD of Process Appraisal (0)
 Source: Leave (Data Store)
 Dest: Read Leave Info. (Process)

Leave Info. added by HR Officer Data Flow
 Location:

DFD of Process Leave n Attendance (0)
 Source: Human Resource Officer (External Entity)
 Dest: Process Leave Info. (Process)

Leave Record Data Flow

Location:

DFD of Process Leave n Attendance Report (0)

Source: Read Leave File (Process)

Dest: Transform Function of Process Leave and Attendance Report (Process)

DFD of Process Appraisal (0)

Source: Read Leave Info. (Process)

Dest: Transform Function of Process Appraisal (Process)

Leave Record to be stored Data Flow

Location:

DFD of Process Leave Checking (0)

Source: Transform Function of Record Leave Info. (Process)

Dest: Store Leave Info. (Process)

List of Applicant to be Employee Data Flow

Location:

DFD of Process Recruitment Info. (0)

Source: Update Applicant File and Employee (Process)

Dest: Employee Record (Data Store)

Medical Data Submission Data Flow

Location:

DFD of Process Collect Request (0)

Source: Employee (External Entity)

Dest: Enter Medical Info. (Process)

Medical Info. Data Flow

Location:

DFD of Proposed System (0)

Source: Process Benefit (Process)

Dest: Medical Treatment (Data Store)

DFD of Process Benefit Report (0)

Source: Medical Treatment (Data Store)

Dest: Read Medical Treatment Info. (Process)

Medical Record Data Flow

Location:

DFD of Process Collect Request (0)

Source: Enter Medical Info. (Process)

Dest: Transform Function of Collect Request (Process)

DFD of Process Benefit Report (0)

Source: Read Medical Treatment Info. (Process)

Dest: Transform Function of Process Benefit Report (Process)

Medical Record to be Stored

Data Flow

Location:

DFD of Process Collect Request (0)

Source: Transform Function of Collect Request (Process)

Dest: Store Medical Info. (Process)

Medical Treatment and Financial Compensation Data

Data Flow

Location:

DFD of Update Benefit Data (0)

Source: Financial Compensation (Data Store)

Dest: Read Financial Compensation Data (Process)

Medical Treatment and Financial Compensation Record

Data Flow

Location:

DFD of Update Benefit Data (0)

Source: Read Financial Compensation Data (Process)

Dest: Transaction Center of Update Benefit (Process)

Medical Treatment Data

Data Flow

Location:

DFD of Update Benefit Data (0)

Source: Medical Treatment (Data Store)

Dest: Read Medical Treatment Data (Process)

Medical Treatment Info.

Data Flow

Location:

DFD of Process Benefit Info. (0)

Source: Medical Treatment (Data Store)

Dest: Process Update Balance of Financial Compensation
(Process)

Source: Medical Treatment (Data Store)

Dest: Process Benefit Report and Answer (Process)

Medical Treatment Record

Data Flow

Location:

DFD of Process Benefit Info. (0)

Source: Process Collect Request (Process)

Dest: Medical Treatment (Data Store)

DFD of Update Benefit Data (0)

Source: Read Medical Treatment Data (Process)

Dest: Transaction Center of Update Benefit (Process)

Overtime Info.

Data Flow

Location:

DFD of Process Leave n Attendance (0)

Source: Overtime (Data Store)

Dest: Process Leave and Attendance Report and Answer
(Process)

DFD of Process Appraisal Info. (0)

Source: Overtime (Data Store)

Dest: Process Appraisal (Process)

DFD of Process Leave n Attendance Report (0)

Source: Overtime (Data Store)

Dest: Read Overtime File (Process)

DFD of Process Appraisal (0)

Source: Overtime (Data Store)

Dest: Read Overtime Data (Process)

Overtime Record

Data Flow

Location:

DFD of Process Leave n Attendance Report (0)

Source: Read Overtime File (Process)

Dest: Transform Function of Process Leave and Attendance
Report (Process)

DFD of Process Appraisal (0)

Source: Read Overtime Data (Process)

Dest: Transform Function of Process Appraisal (Process)

Perspective Training Employee Info.

Data Flow

Location:

Context of Proposed System (CONTEXT)

Source: Human Resource Record System (Process)

Dest: Training Department (External Entity)

Record to be Added

Data Flow

Location:

DFD of Update Benefit Data (0)

Source: Process to Add Benefit Record (Process)

Dest: Write New Benefit Record (Process)

Record to be Deleted

Data Flow

Location:

DFD of Update Benefit Data (0)

Source: Process to Delete Benefit Record (Process)

Dest: Delete Benefit Record (Process)

Record to be Printed	Data Flow
Location:	
<u>DFD of Process Appraisal Report</u> (0)	
Source:	Transaform Function of Process Report (Process)
Dest:	Print Appraisal Report and Answer (Process)

Record to be Updated	Data Flow
Location:	
<u>DFD of Update Benefit Data</u> (0)	
Source:	Process to Update Benefit Record (Process)
Dest:	Modify Benefit Record (Process)

Recruitment Data	Data Flow
Location:	
<u>DFD of Process Recruitment Report</u> (0)	
Source:	Recruitment (Data Store)
Dest:	Read Recruitment Data (Process)

Recruitment Detail	Data Flow
Location:	
<u>DFD of Update Applicant n Employee File</u> (0)	
Source:	Recruitment (Data Store)
Dest:	Read Recruitment Detail (Process)

Recruitment Info.	Data Flow
Location:	
<u>DFD of Process Recruitment Info.</u> (0)	
Source:	Recruitment (Data Store)
Dest:	Update Applicant File and Employee (Process)
Source:	Recruitment (Data Store)
Dest:	Process Recruitment Report and Answer (Process)

Recruitment Record	Data Flow
Location:	
<u>DFD of Update Applicant n Employee File</u> (0)	
Source:	Read Recruitment Detail (Process)
Dest:	Transaction Center of Update Files (Process)
<u>DFD of Process Recruitment Report</u> (0)	
Source:	Read Recruitment Data (Process)
Dest:	Transform Function of Process Report (Process)

Recruitment Record and if requested Report and Answer Data Flow
Location:

DFD of Process Recruitment Info. (0)

Source: Process Recruitment Report and Answer (Process)

Dest: HR Department (External Entity)

Recruitment Record to be Printed Data Flow
Location:

DFD of Process Recruitment Report (0)

Source: Transform Function of Process Report (Process)

Dest: Print Recruitment Report (Process)

Recruitment Request and Performance Evaluation Report Data Flow
Location:

Context of Proposed System (CONTEXT)

Source: Other Department (External Entity)

Dest: Human Resource Record System (Process)

Recruitment Result Data Flow
Location:

DFD of Proposed System (0)

Source: Process Recruitment (Process)

Dest: Recruitment (Data Store)

Request Benefit Submission Data Flow
Location:

DFD of Process Benefit Info. (0)

Source: Employee (External Entity)

Dest: Process Collect Request (Process)

Request for Report and Query Data Flow
Location:

Context of Proposed System (CONTEXT)

Source: Managing Director (External Entity)

Dest: Human Resource Record System (Process)

Requested Appraisal Report and Answer Data Flow
Location:

DFD of Process Appraisal Info. (0)

Source: Process Appraisal Report and Answer (Process)

Dest: Managing Director (External Entity)

Source: Process Appraisal Report and Answer (Process)

Dest: Payroll Department (External Entity)

Requested Attendance Report and Answer

Data Flow

Location:

DFD of Process Leave n Attendance (0)

Source: Process Leave and Attendance Report and Answer
(Process)

Dest: Managing Director (External Entity)

Requested Benefit Report and Answer

Data Flow

Location:

DFD of Process Benefit Info. (0)

Source: Process Benefit Report and Answer (Process)

Dest: Managing Director (External Entity)

Requested Employee Report and Answer

Data Flow

Location:

DFD of Process Employee Info. (0)

Source: Process Employee Report and Answer (Process)

Dest: Managing Director (External Entity)

Requested Recruitment Report and Answer

Data Flow

Location:

DFD of Process Recruitment Info. (0)

Source: Process Recruitment Report and Answer (Process)

Dest: Managing Director (External Entity)

Requested Report and Answer

Data Flow

Location:

Context of Proposed System (CONTEXT)

Source: Human Resource Record System (Process)

Dest: Managing Director (External Entity)

Salary Detail

Data Flow

Location:

DFD of Process Appraisal Info. (0)

Source: Employee Record (Data Store)

Dest: Process Appraisal Report and Answer (Process)

Salary Rate

Data Flow

Location:

DFD of Proposed System (0)

Source: Employee Record (Data Store)

Dest: Process Appraisal Info. (Process)

Salary Rate Change

Data Flow

Location:

DFD of Process Appraisal Info. (0)

Source: Process Appraisal (Process)

Dest: Employee Record (Data Store)

Store Applicant Record

Data Flow

Location:

DFD of Gather Data Entry (0)

Source: Store Applicant and Interview Result (Process)

Dest: Applicant Record (Data Store)

DFD of Approval Update (0)

Source: Store Recruitment Data (Process)

Dest: Recruitment (Data Store)

Store Interview Record

Data Flow

Location:

DFD of Gather Data Entry (0)

Source: Store Applicant and Interview Result (Process)

Dest: Interview Result (Data Store)

Stored Appraisal Record

Data Flow

Location:

DFD of Process Appraisal (0)

Source: Store Record (Process)

Dest: Appraisal (Data Store)

Source: Store Record (Process)

Dest: Employee Record (Data Store)

Stored Employee Record

Data Flow

Location:

DFD of Gather Employee Detail (0)

Source: Store Employee Detail (Process)

Dest: Employee Record (Data Store)

Stored Financial Compensation Record

Data Flow

Location:

DFD of Process Financial Compensation (0)

Source: Store Financial Compensation (Process)

Dest: Financial Compensation (Data Store)

Stored Late Record Data Flow
Location:

DFD of Process Attendance Checking (0)
Source: Store Attendance Data (Process)
Dest: Late (Data Store)

Stored Leave Record Data Flow
Location:

DFD of Process Leave Checking (0)
Source: Store Leave Info. (Process)
Dest: Leave (Data Store)

Stored Medical Record Data Flow
Location:

DFD of Process Collect Request (0)
Source: Store Medical Info. (Process)
Dest: Medical Treatment (Data Store)

Stored Overtime Record Data Flow
Location:

DFD of Process Attendance Checking (0)
Source: Store Attendance Data (Process)
Dest: Overtime (Data Store)

Training Course Info. Data Flow
Location:

Context of Proposed System (CONTEXT)
Source: Training Department (External Entity)
Dest: Human Resource Record System (Process)

Training Detail Data Flow
Location:

DFD of Proposed System (0)
Source: Process Employee Info. (Process)
Dest: Training Record (Data Store)

Training Info. Data Flow
Location:

DFD of Process Appraisal (0)
Source: Training Record (Data Store)
Dest: Read History Training Data (Process)

Training Record Data Flow
Location:
DFD of Process Appraisal (0)
Source: Read History Training Data (Process)
Dest: Transform Function of Process Appraisal (Process)

Training Record of Employee Data Flow
Location:
DFD of Process Appraisal Info. (0)
Source: Training Record (Data Store)
Dest: Process Appraisal (Process)

Transaction of Applicant Creation Data Flow
Location:
DFD of Update Applicant n Employee File (0)
Source: Transaction Center of Update Files (Process)
Dest: Process of Applicant Record Creation (Process)

Transaction of Applicant Deletion Data Flow
Location:
DFD of Update Applicant n Employee File (0)
Source: Transaction Center of Update Files (Process)
Dest: Process of Applicant Record Deletion (Process)

Transaction of Applicant Updating Data Flow
Location:
DFD of Update Applicant n Employee File (0)
Source: Transaction Center of Update Files (Process)
Dest: Process of Applicant Record Updating (Process)

Transaction of employee record Creation Data Flow
Location:
DFD of Update Employee File (0)
Source: Transaction Center of Update Detail (Process)
Dest: Process to Add New employee record (Process)

Transaction of employee record Deletion Data Flow
Location:
DFD of Update Employee File (0)
Source: Transaction Center of Update Detail (Process)
Dest: Process to Delete employee record (Process)

Transaction of employee record Updating Data Flow
Location:

DFD of Update Employee File (0)

Source: Transaction Center of Update Detail (Process)
Dest: Process to Update employee record (Process)

Transaction of Medical Treatment and Financial Compensation Creation Data Flow
Location:

DFD of Update Benefit Data (0)

Source: Transaction Center of Update Benefit (Process)
Dest: Process to Add Benefit Record (Process)

Transaction of Medical Treatment and Financial Compensation Deleting Data Flow
Location:

DFD of Update Benefit Data (0)

Source: Transaction Center of Update Benefit (Process)
Dest: Process to Delete Benefit Record (Process)

Transaction of Medical Treatment and Financial Compensation Updating Data Flow
Location:

DFD of Update Benefit Data (0)

Source: Transaction Center of Update Benefit (Process)
Dest: Process to Update Benefit Record (Process)

Update Employee Record Data Flow
Location:

DFD of Process Employee Info. (0)

Source: Process Update Employee File (Process)
Dest: Employee Record (Data Store)

DFD of Update Employee File (0)

Source: Updated employee record (Process)
Dest: Employee Record (Data Store)

Updated Applicant Record Data Flow
Location:

DFD of Update Applicant n Employee File (0)

Source: Update Applicant Record to Employee (Process)
Dest: Employee Record (Data Store)

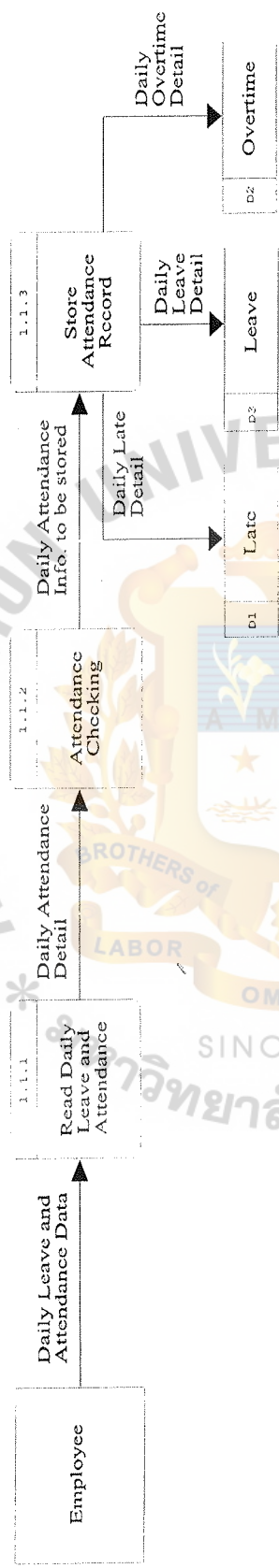


Figure C.1. Data Flow Diagram of Process Attendance Checking.

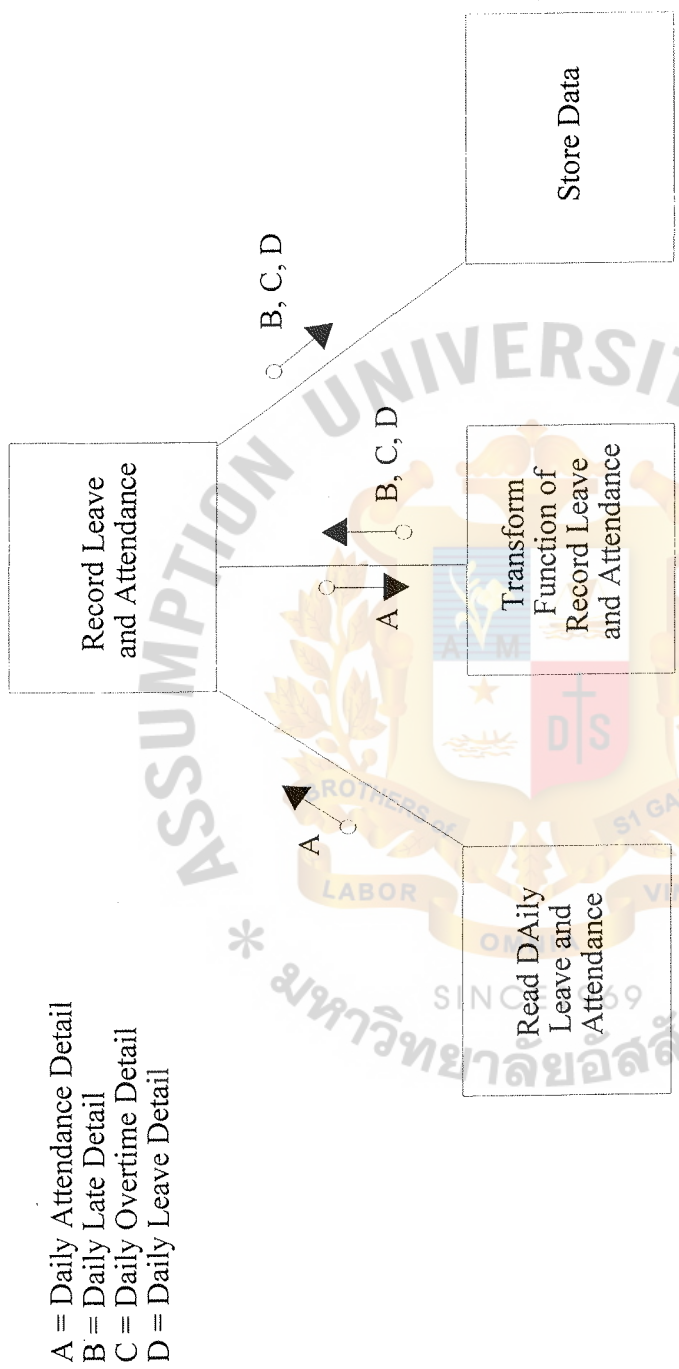


Figure C.2. Structure Chart of Process Attendance Checking.

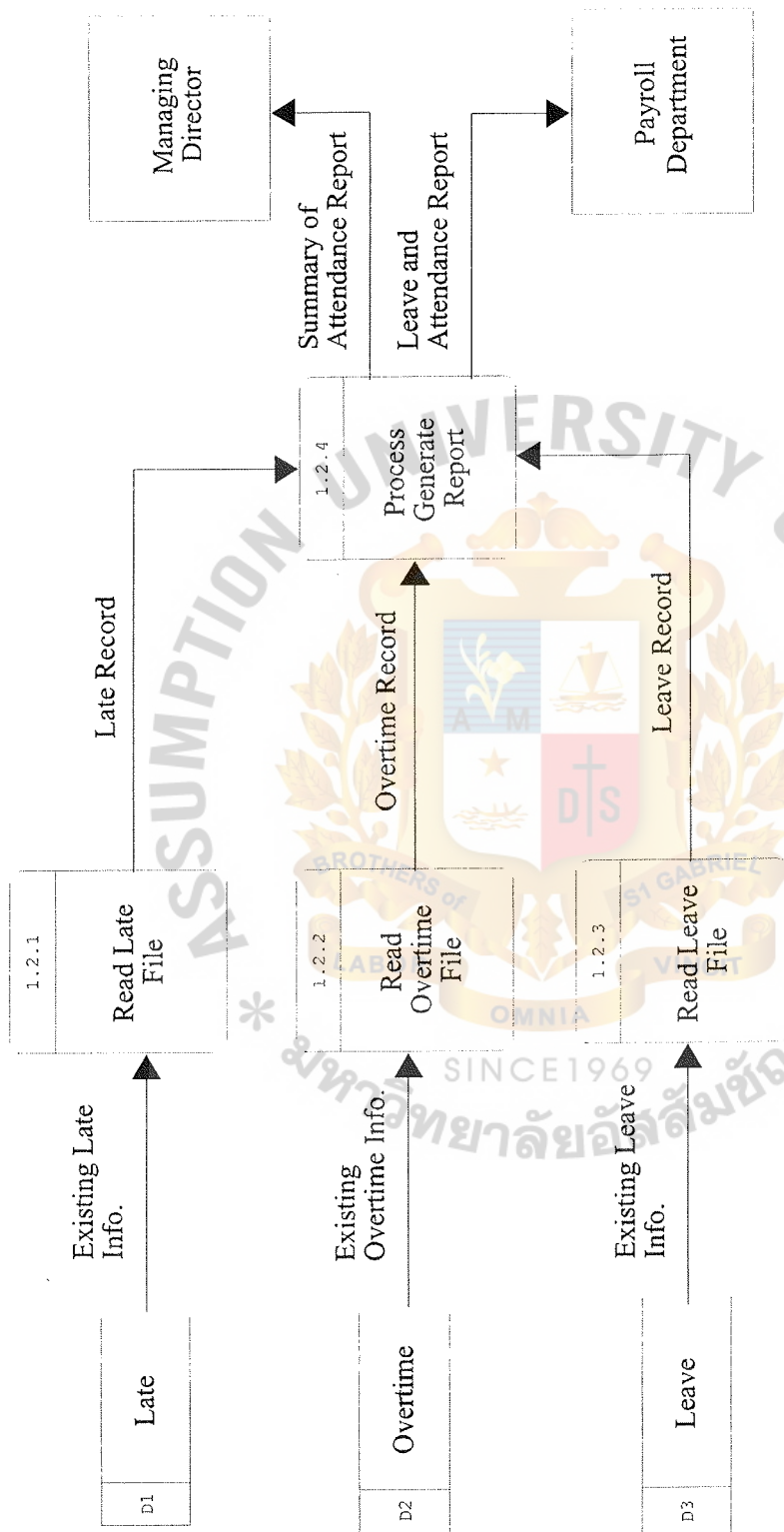
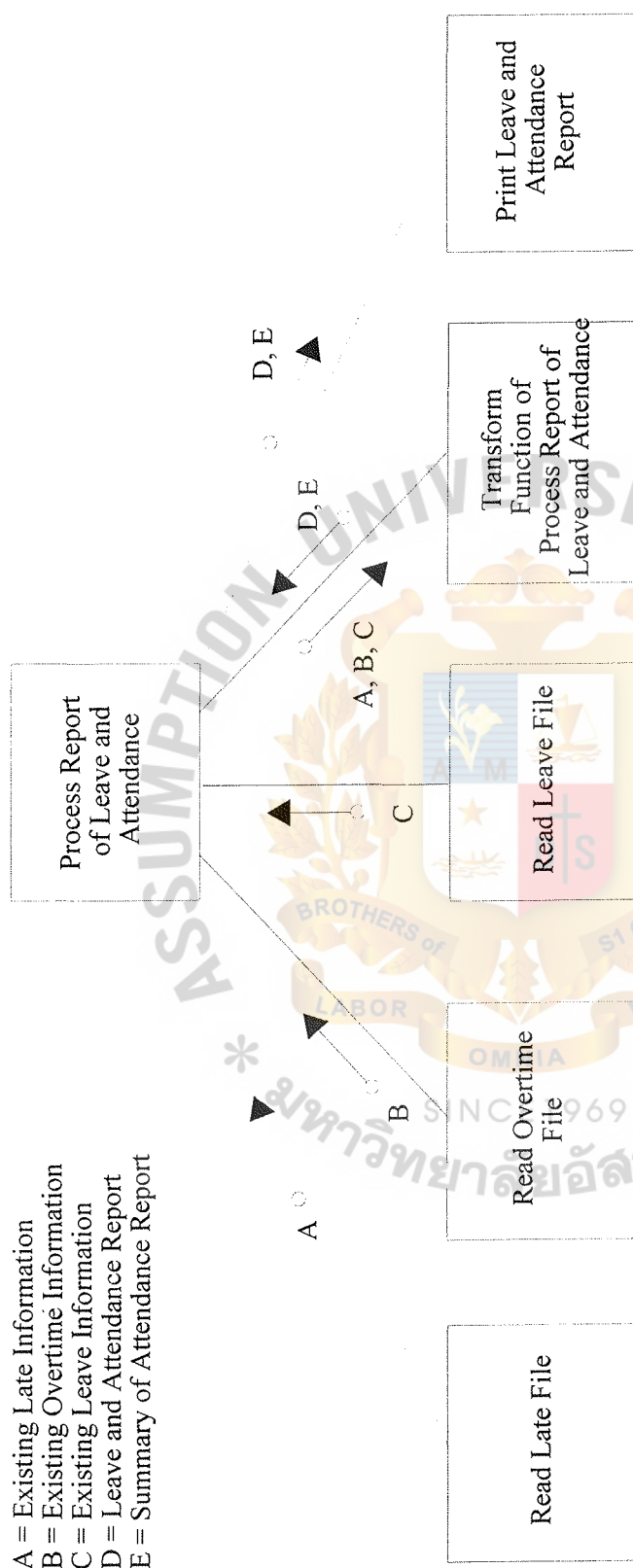
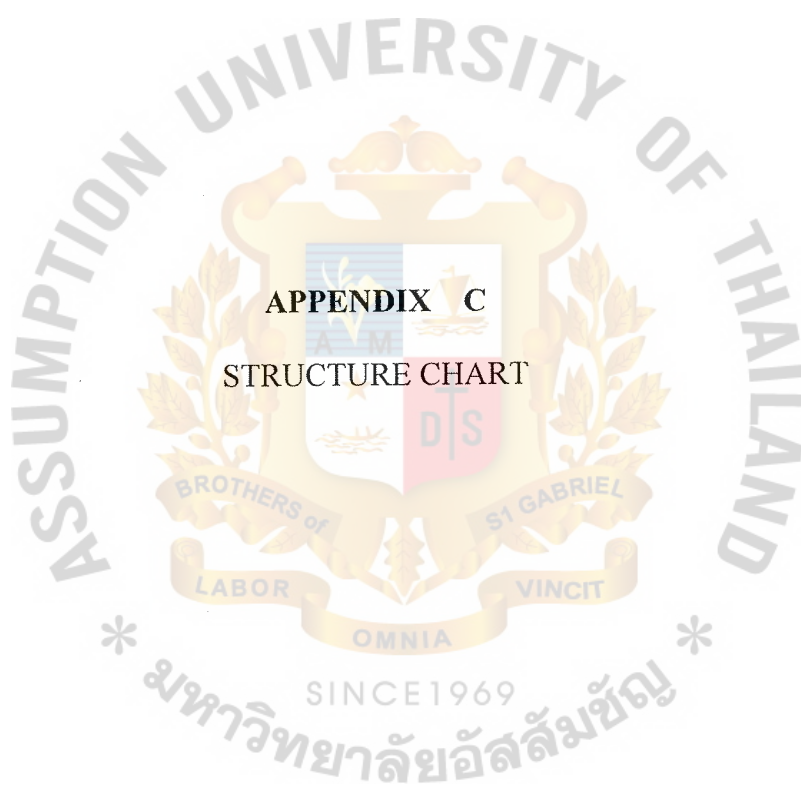


Figure C.3. Data Flow Diagram of Process Leave and Attendance Report.





APPENDIX C
STRUCTURE CHART

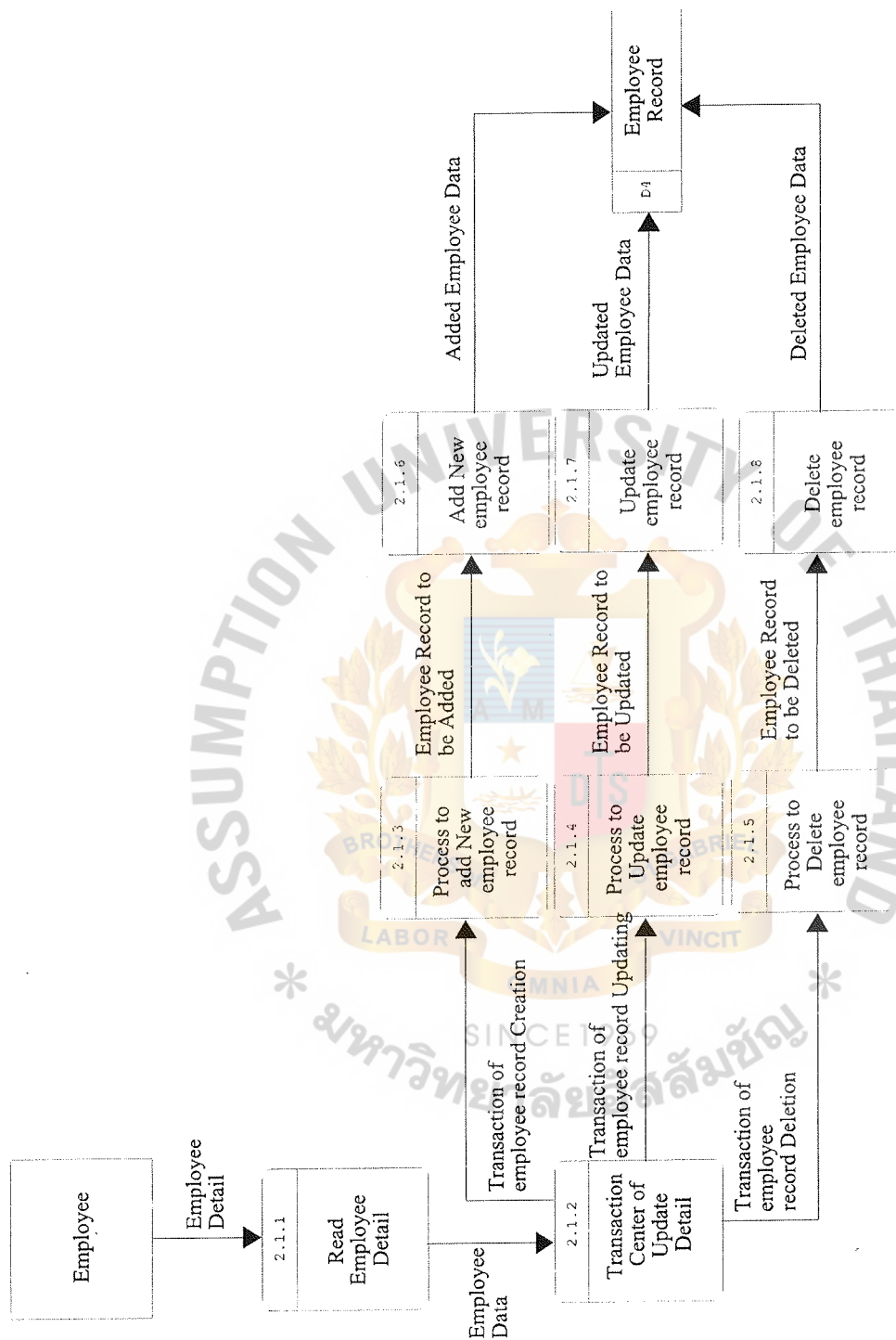


Figure C.5. Data Flow Diagram of Process Update Employee File.

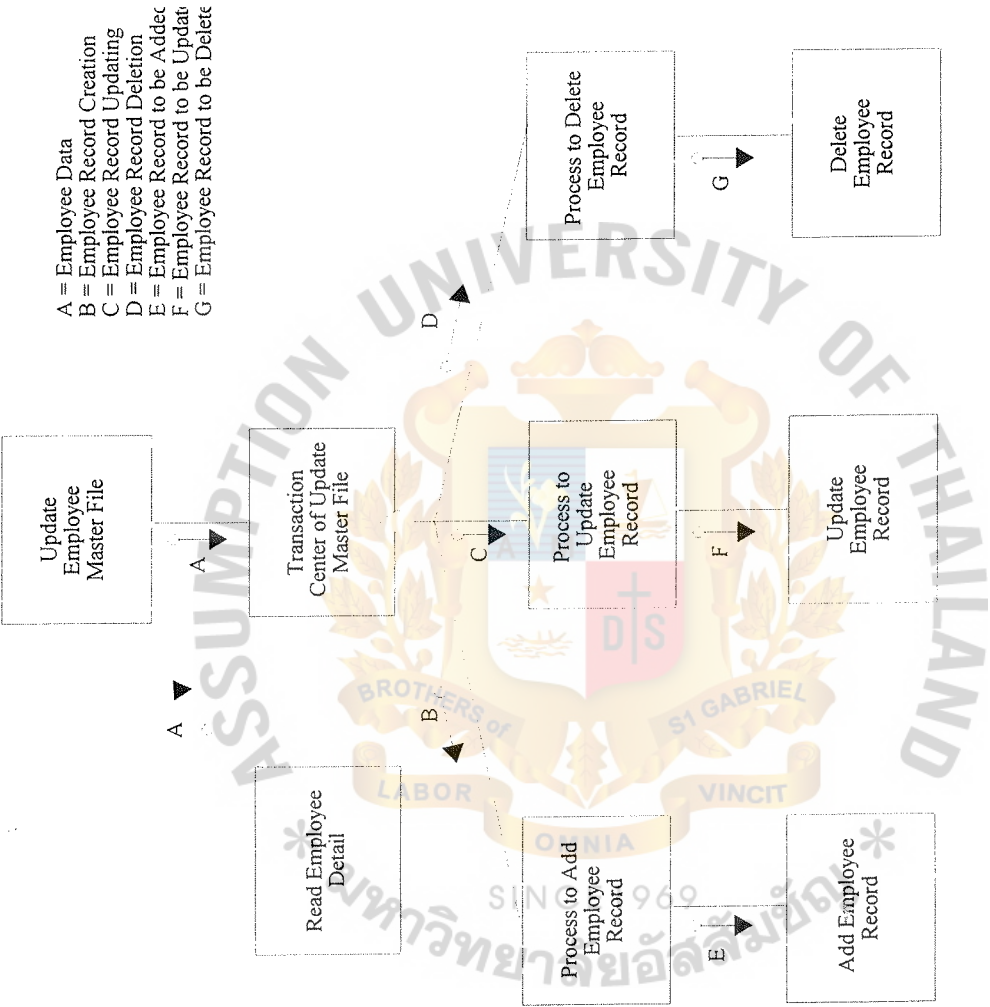


Figure C.6. Structure Chart of Process Update Employee File.

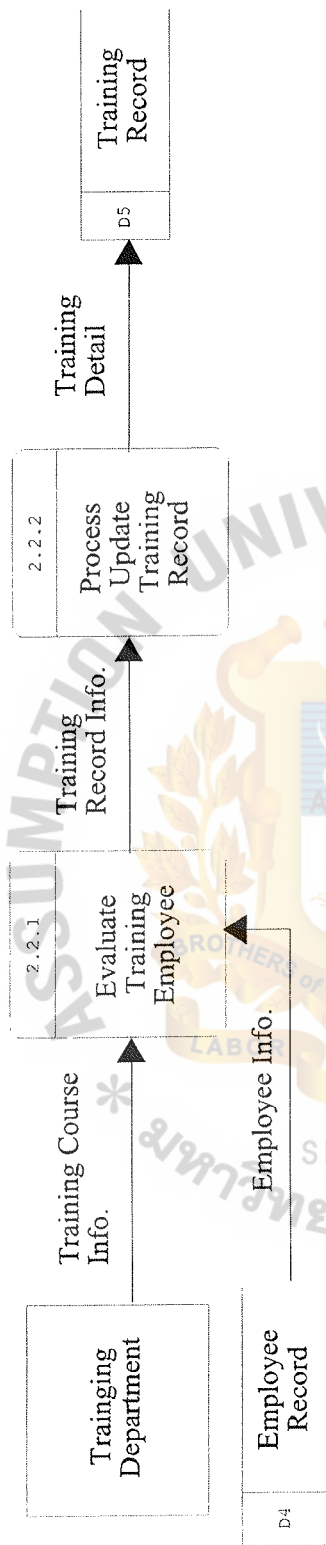


Figure C.7. Data Flow Diagram of Process Training Record.

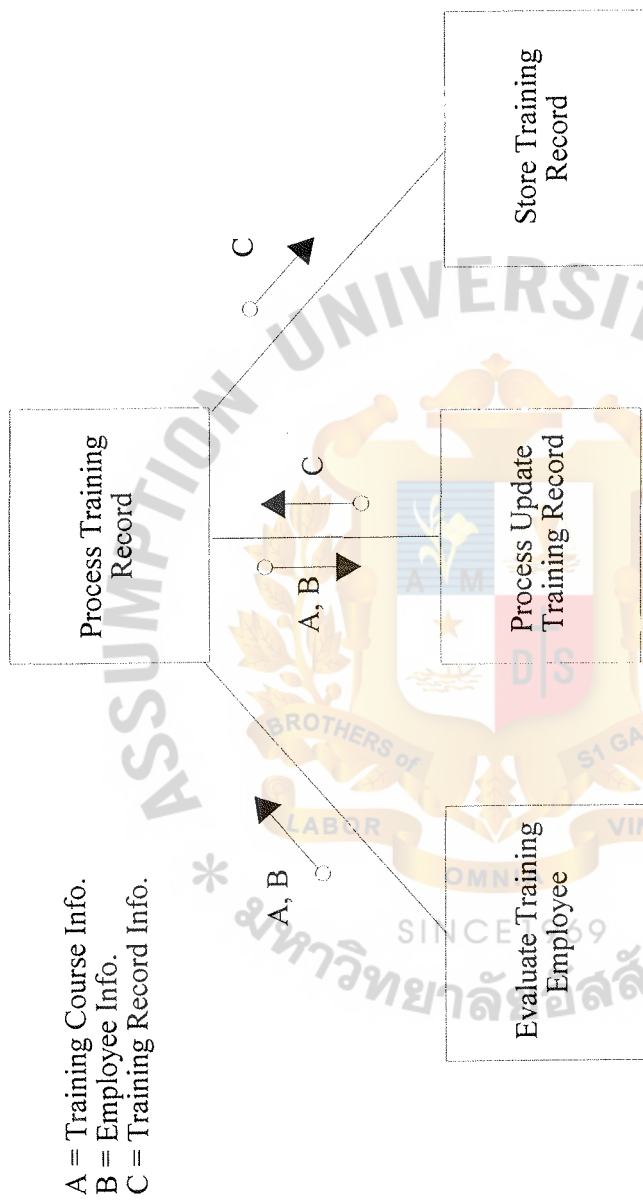


Figure C.8. Structure Chart of Process Training Record.



Figure C.9. Data Flow Diagram of Process Employee Report.

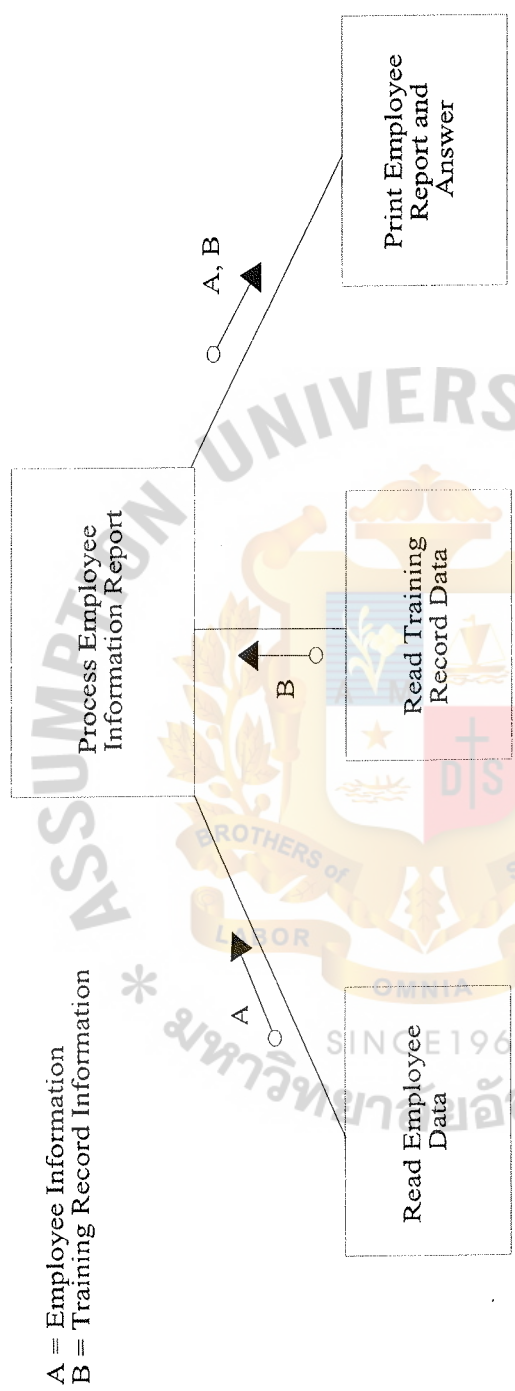


Figure C.10. Structure Chart of Process Employee Report.

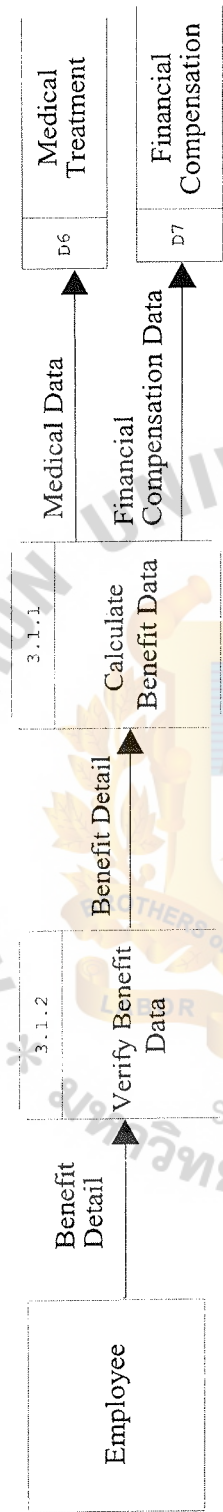


Figure C.1.1. Data Flow Diagram of Process Benefit.

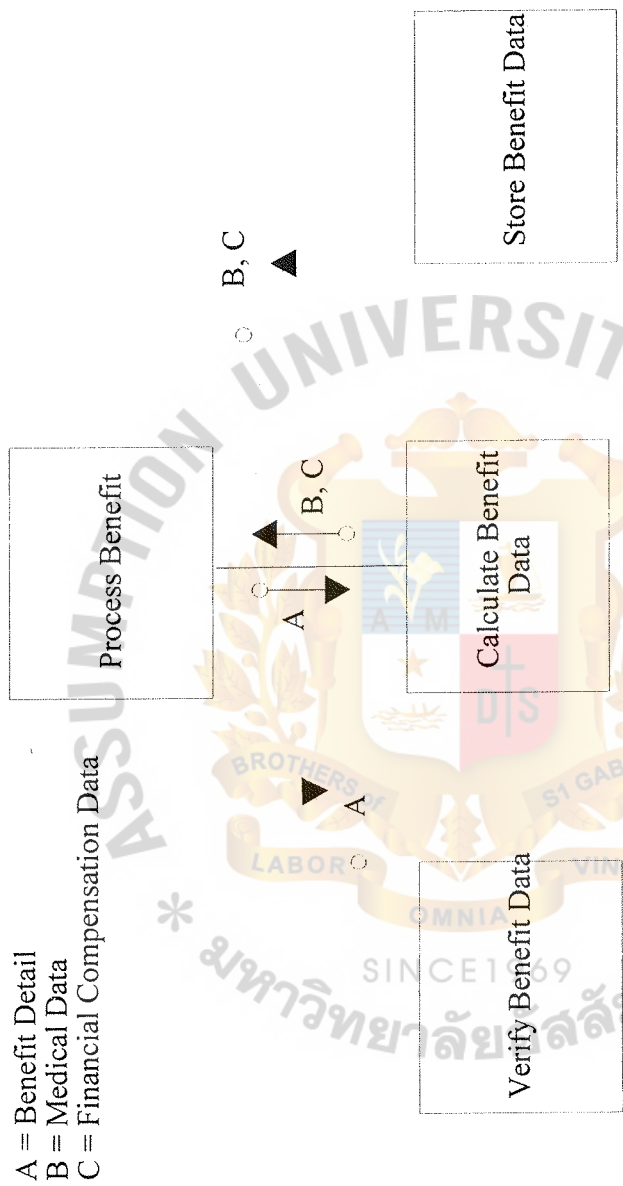


Figure C.12. Structure Chart of Process Benefit.

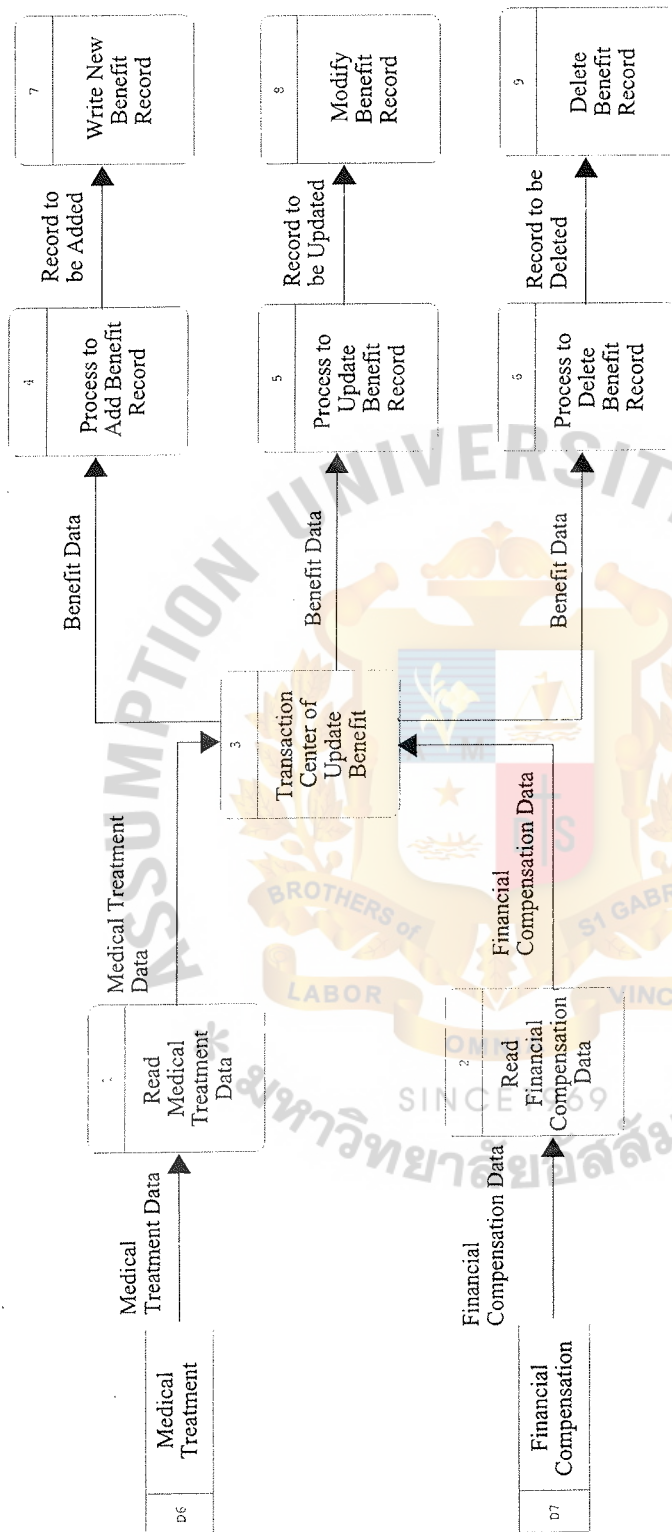


Figure C.13. Data Flow Diagram of Process Update Benefit Data.

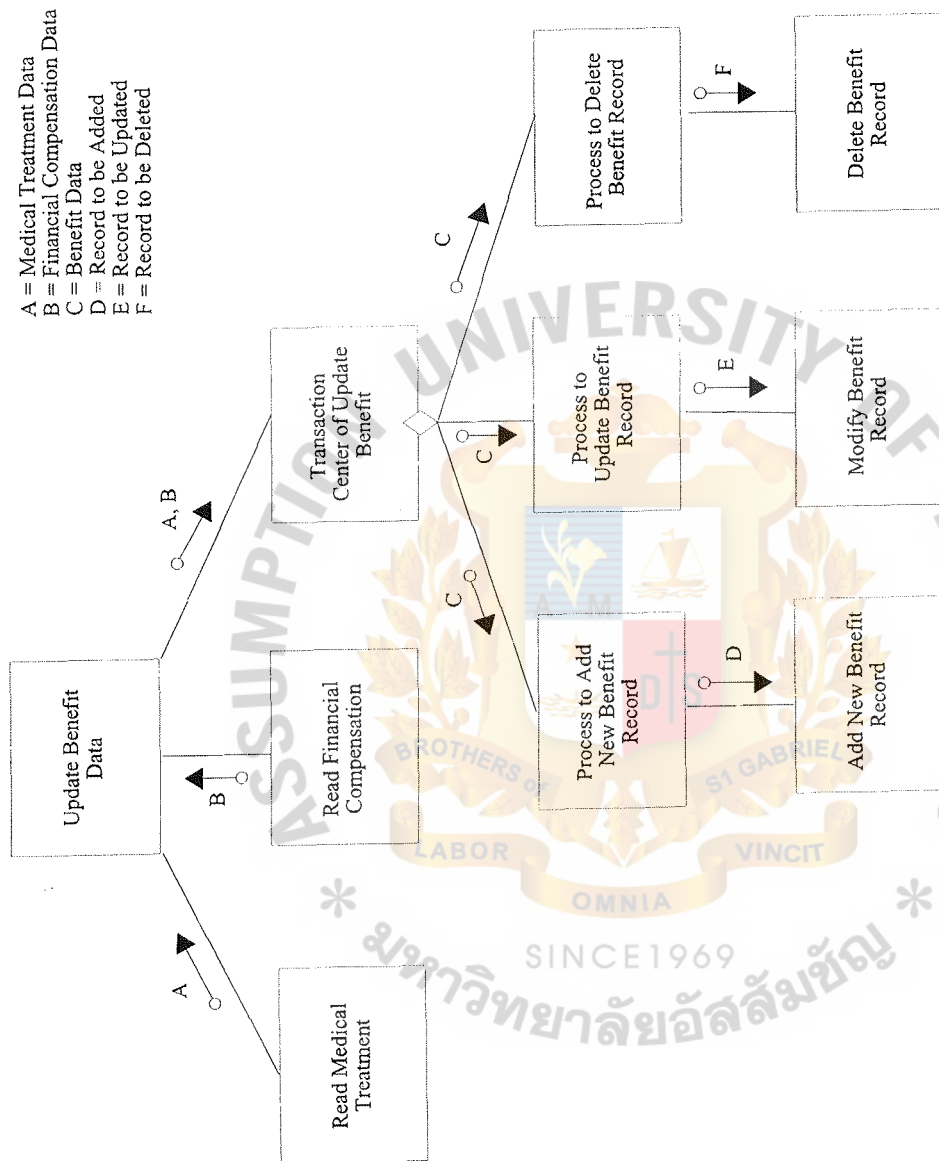


Figure C.14. Structure Chart of Process Update Benefit Data.



Figure C.15. Data Flow Diagram of Process Benefit Report.

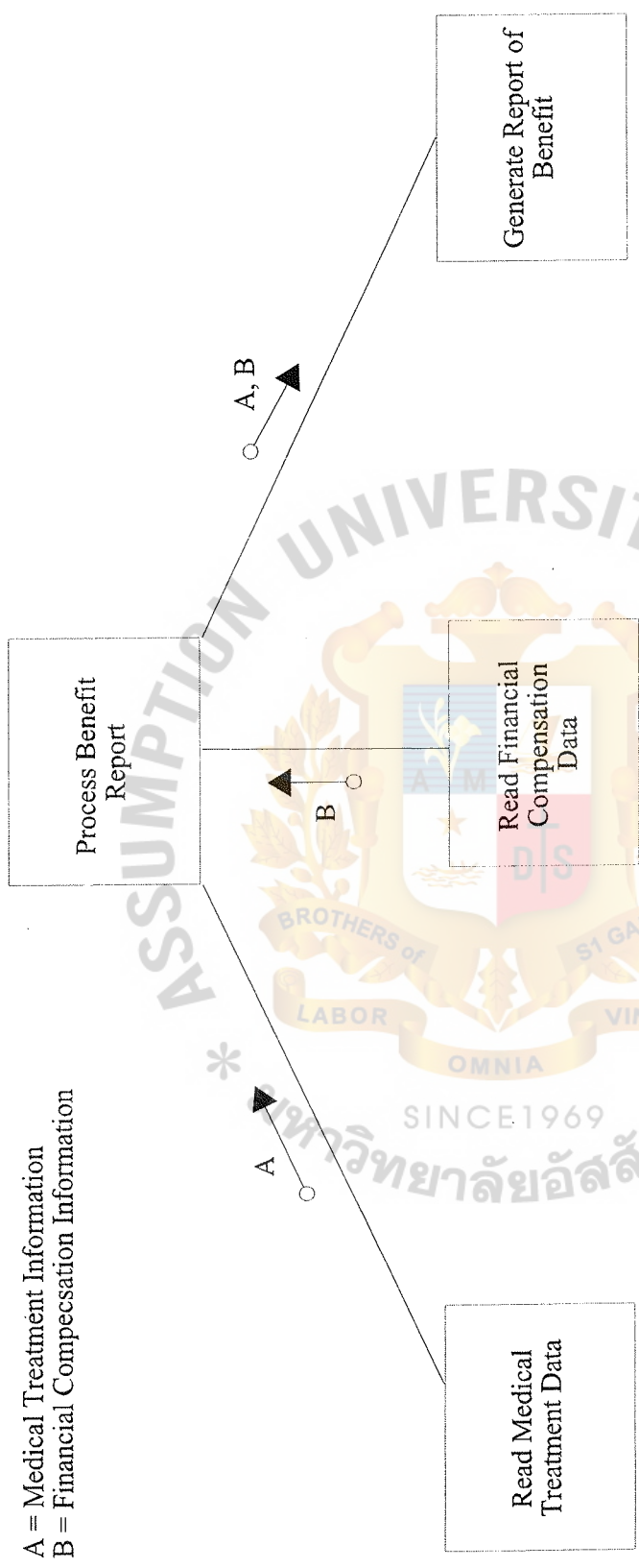


Figure C.16. Structure Chart of Process Benefit Report.

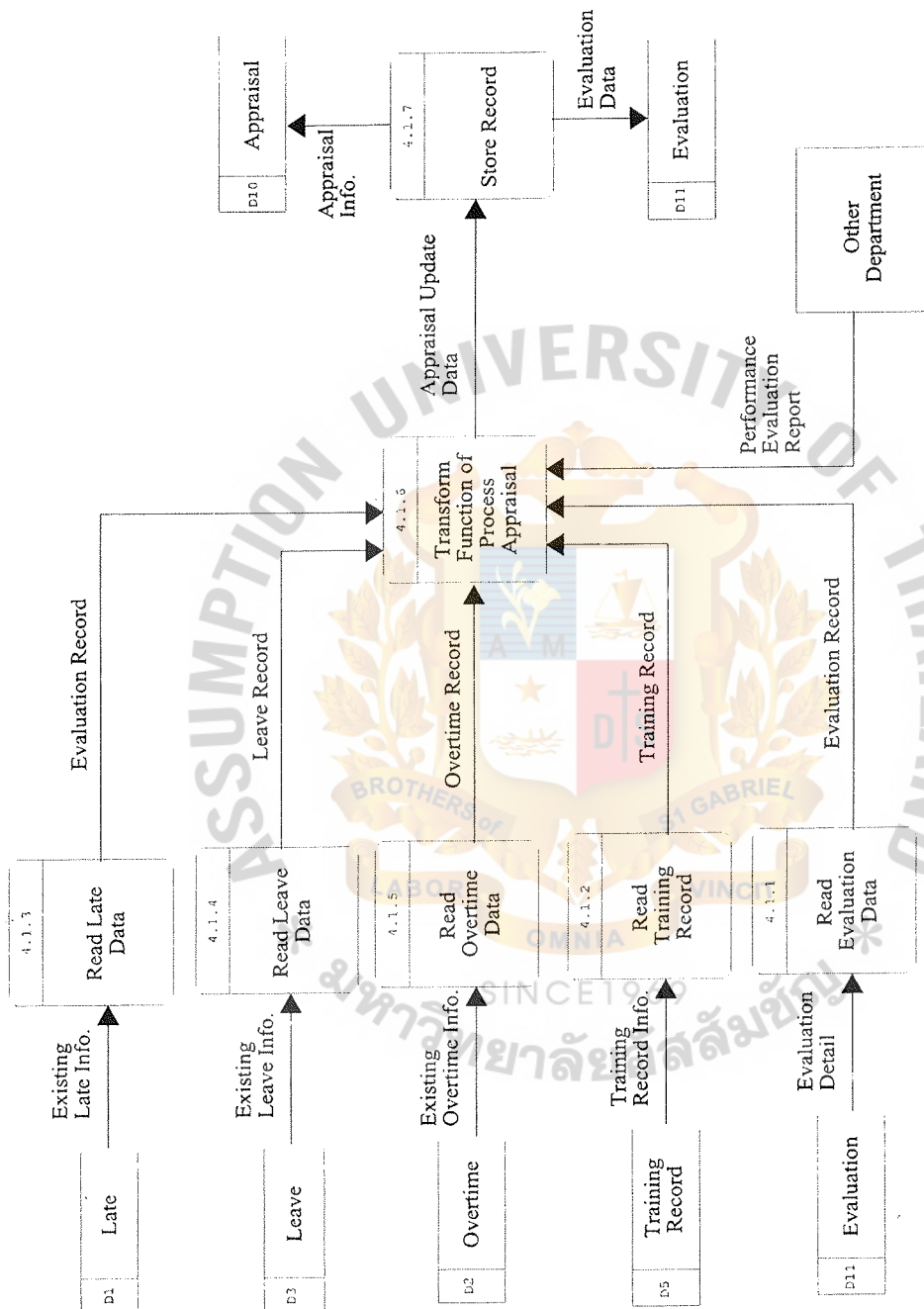


Figure C.17. Data Flow Diagram of Process Appraisal.

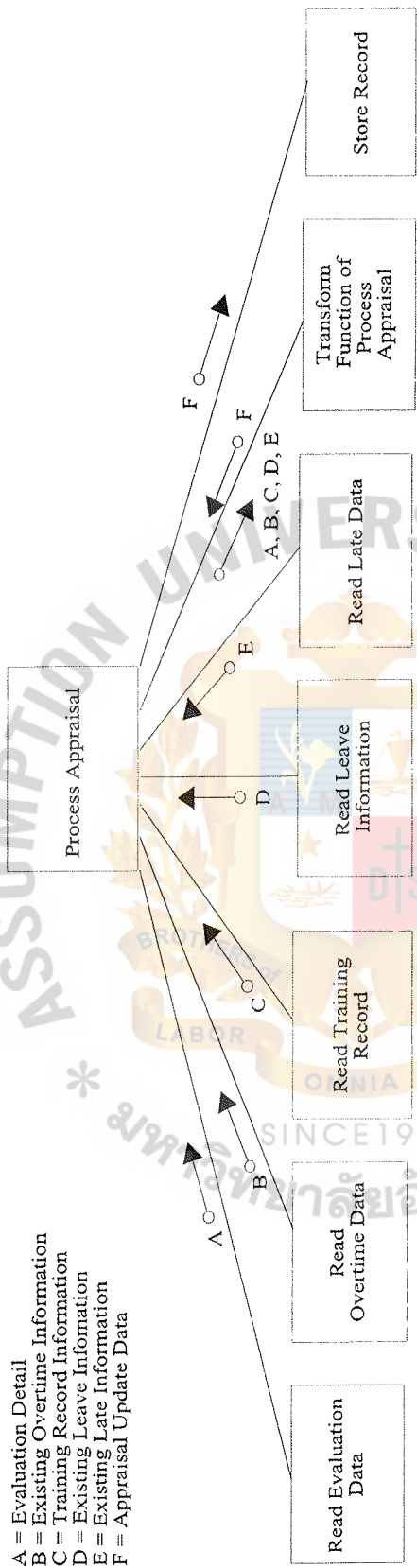


Figure C.18. Structure Chart of Process Appraisal.

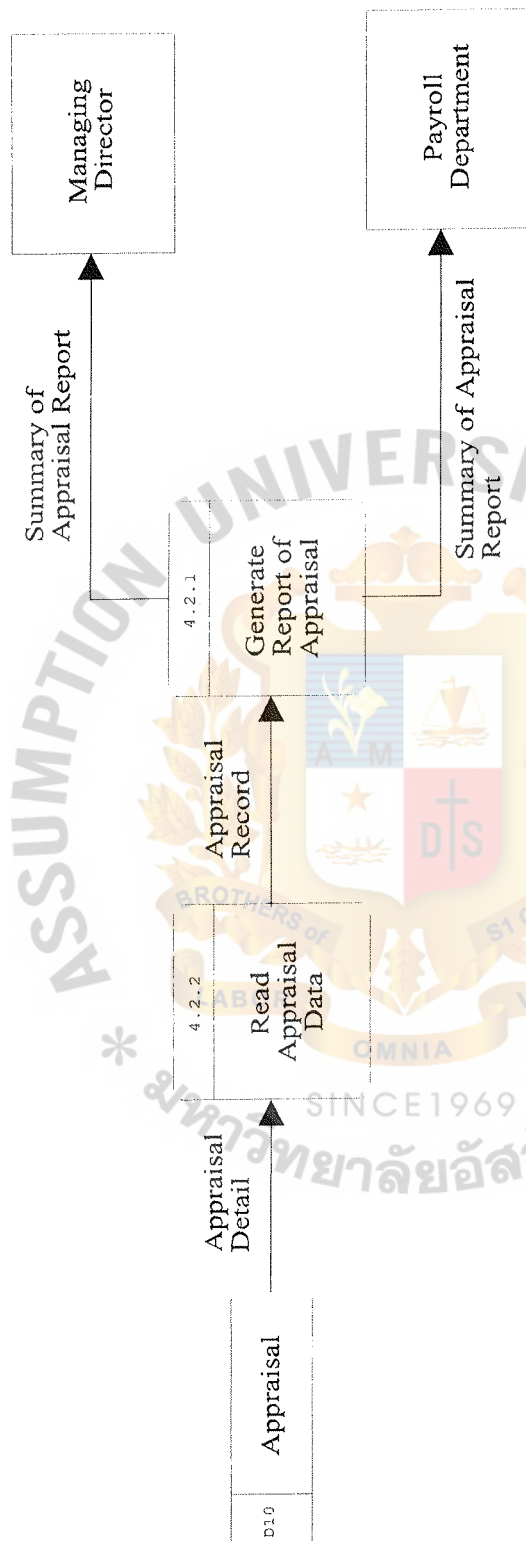


Figure C.19. Data Flow Diagram of Process Appraisal Report.

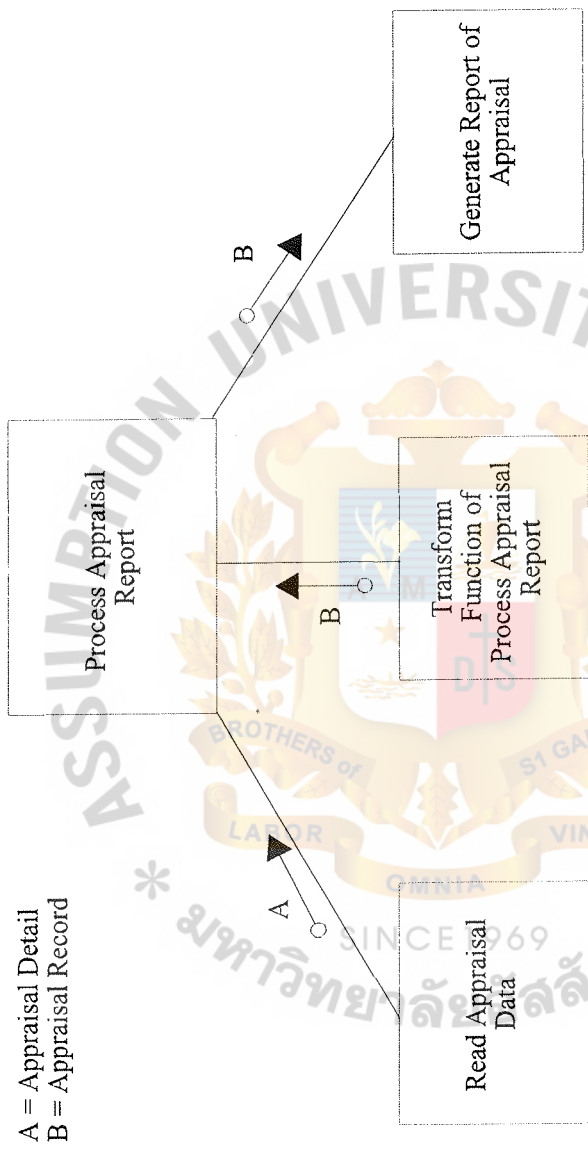


Figure C.20. Structure Chart of Process Appraisal Report.

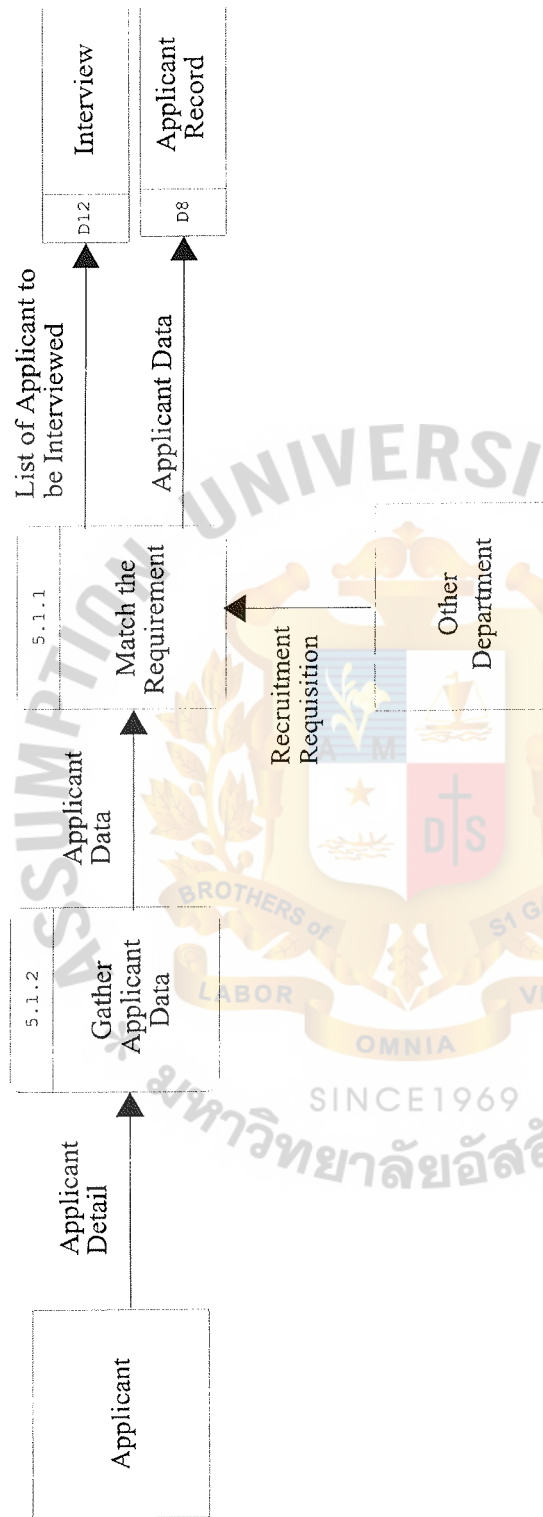


Figure C.21. Data Flow Diagram of Process Match Recruitment Requirement.

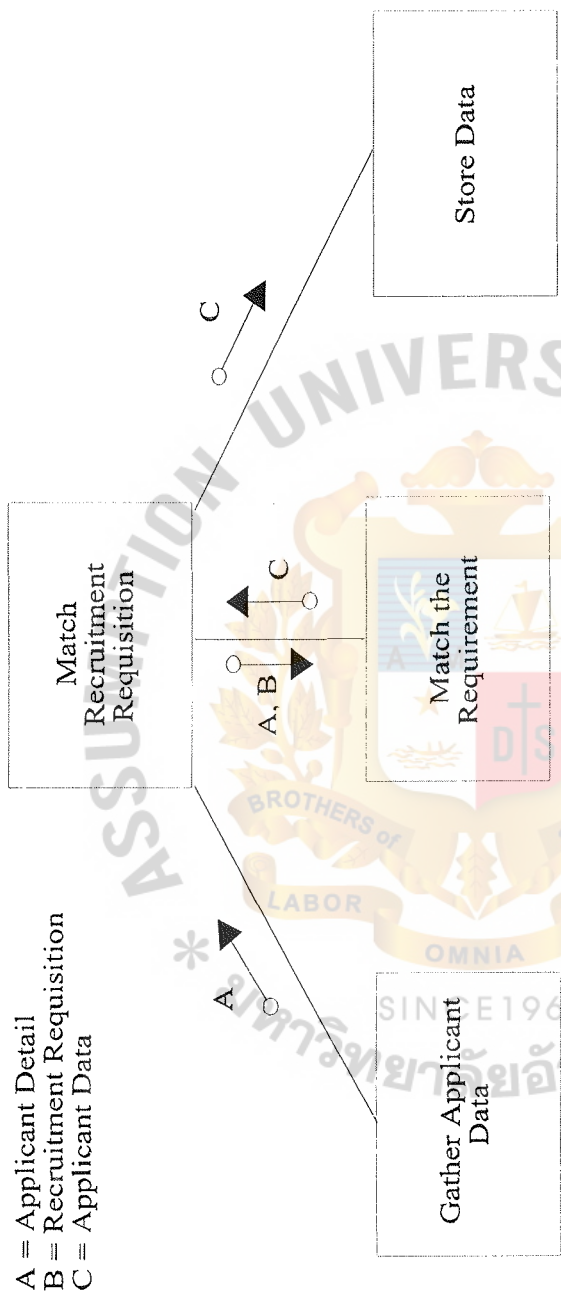


Figure C.22. Structure Chart of Match Recruitment Requisition.

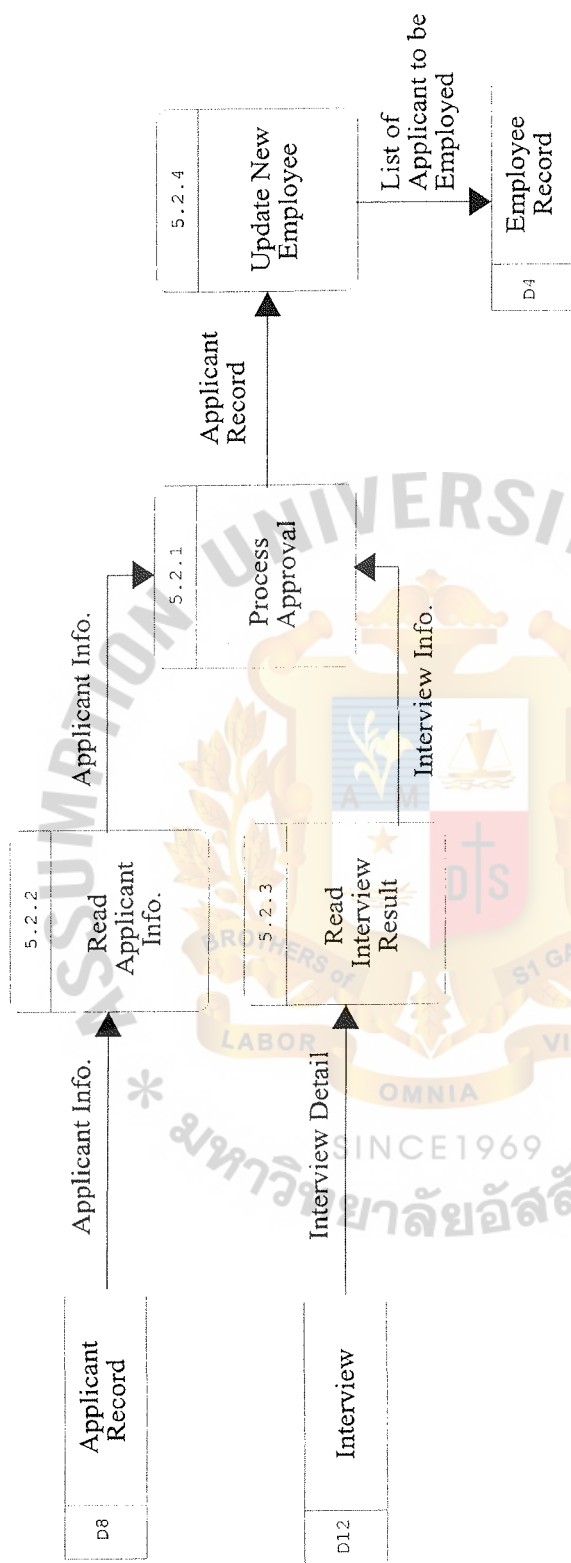


Figure C.23. Data Flow Diagram of Process Approval Update.

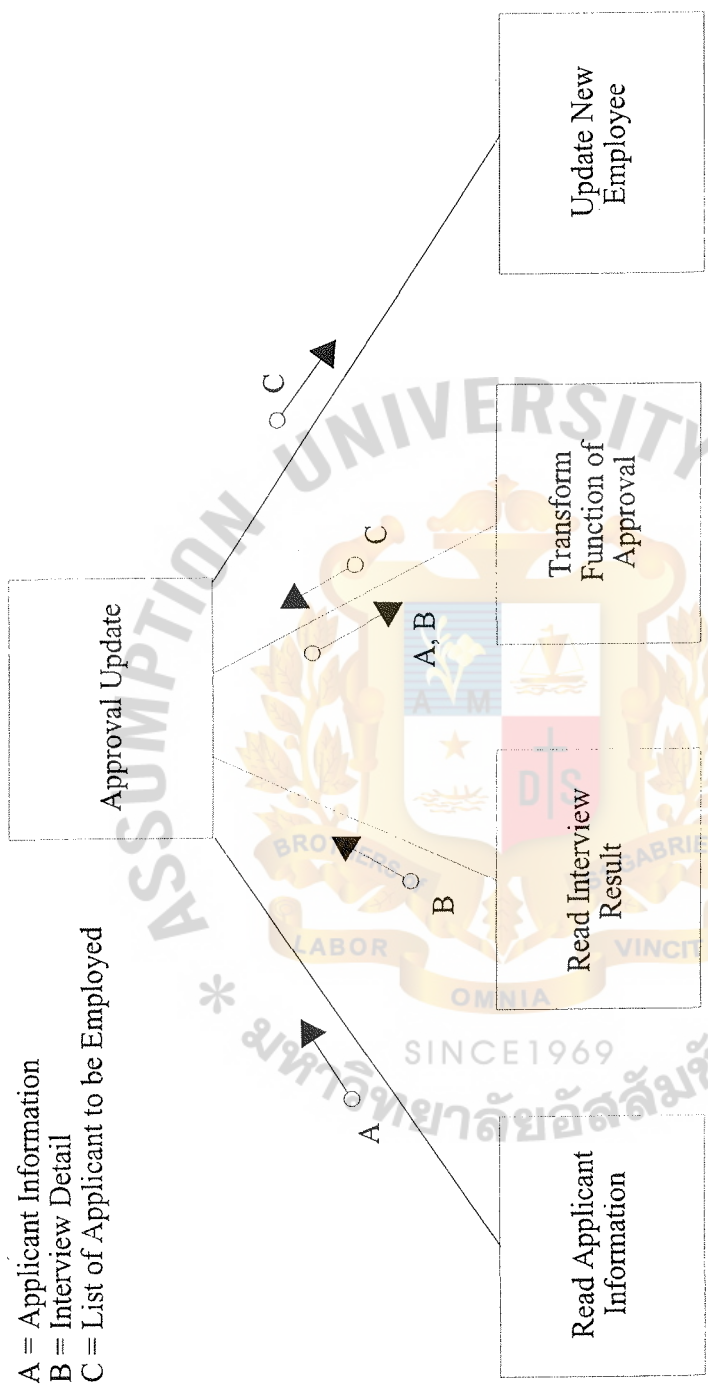


Figure C.24. Structure Chart of Process Approval Update.

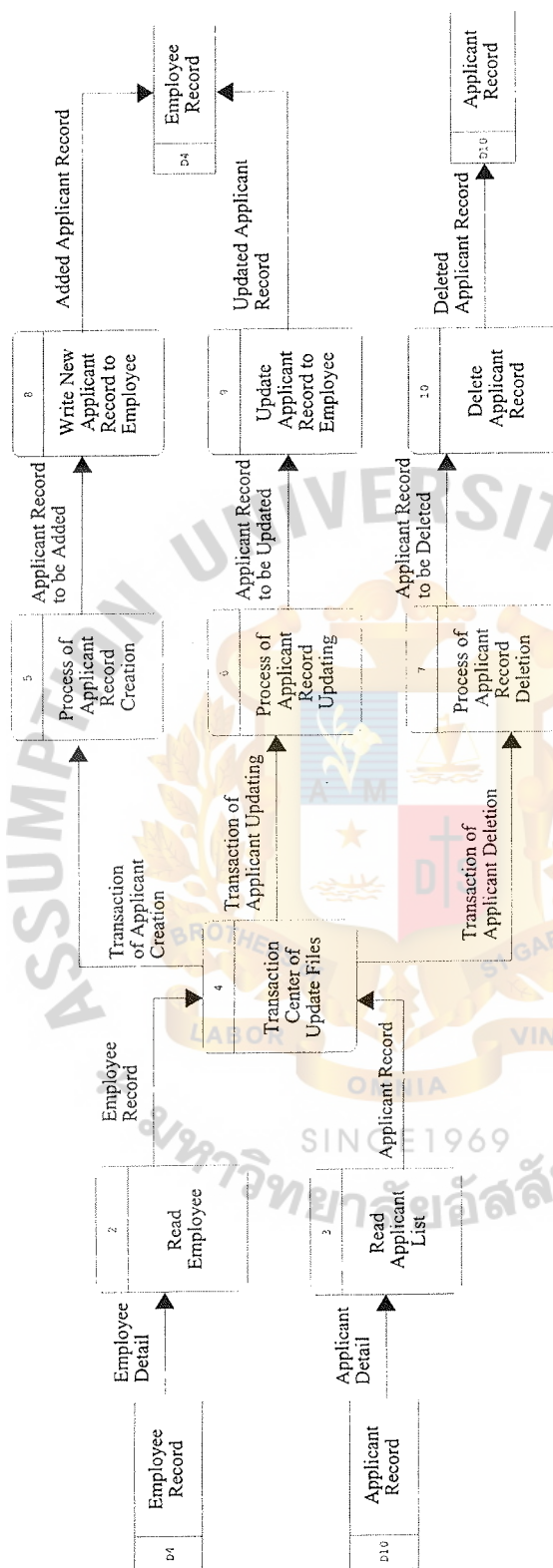


Figure C.25. Data Flow Diagram of Process Update Applicant and Employee File.

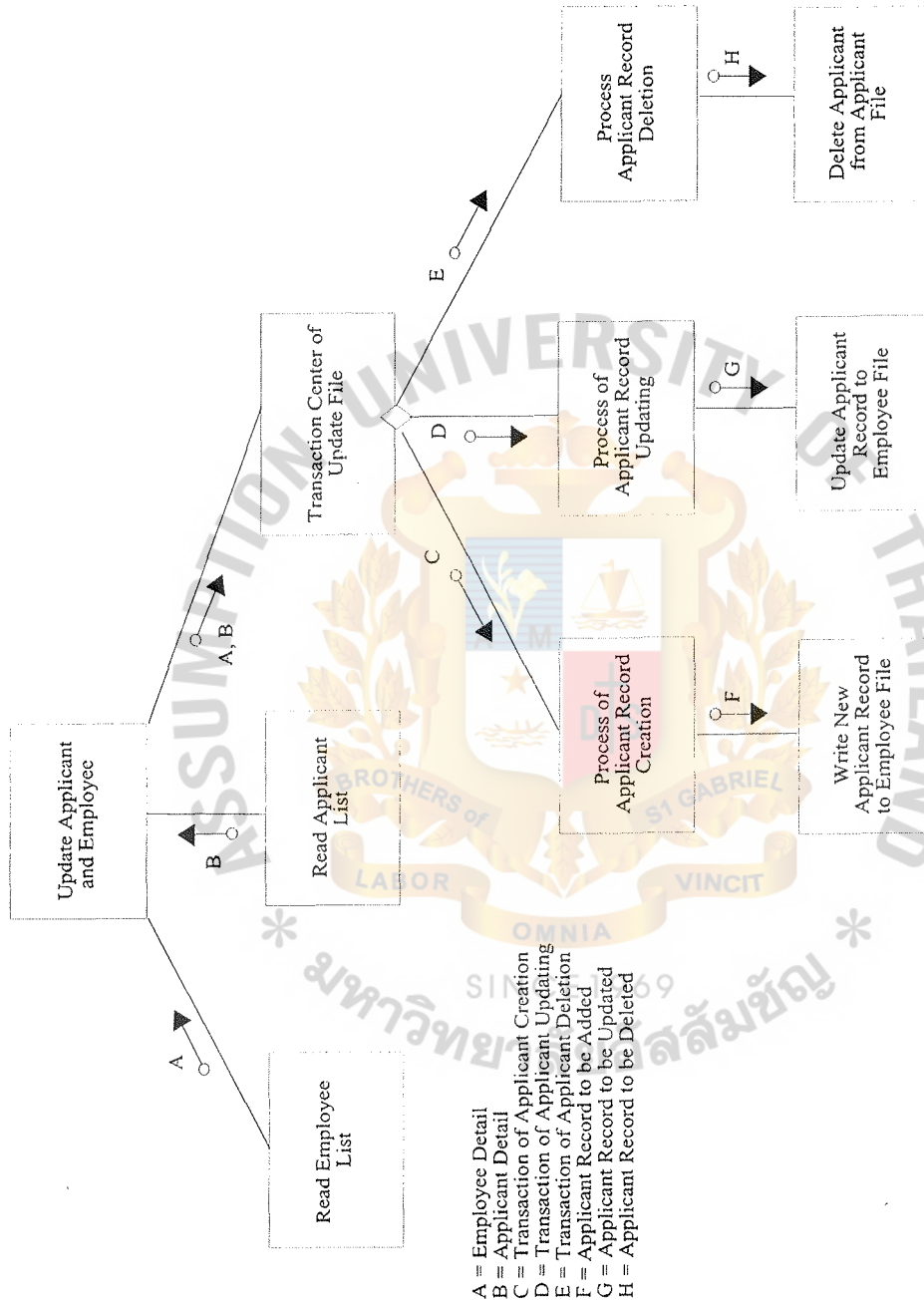


Figure C.26. Structure Chart of Process Update Applicant and Employee File.

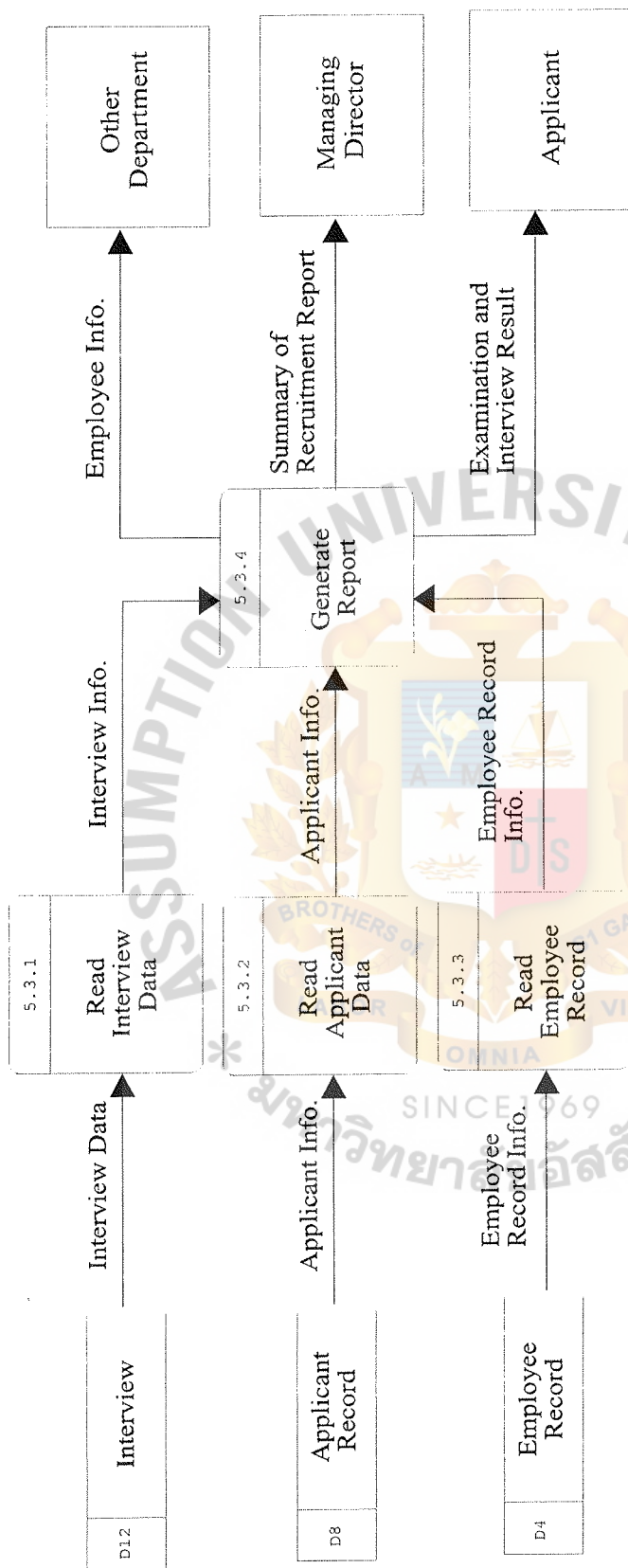


Figure C.27. Data Flow Diagram of Process Recruitment Report.

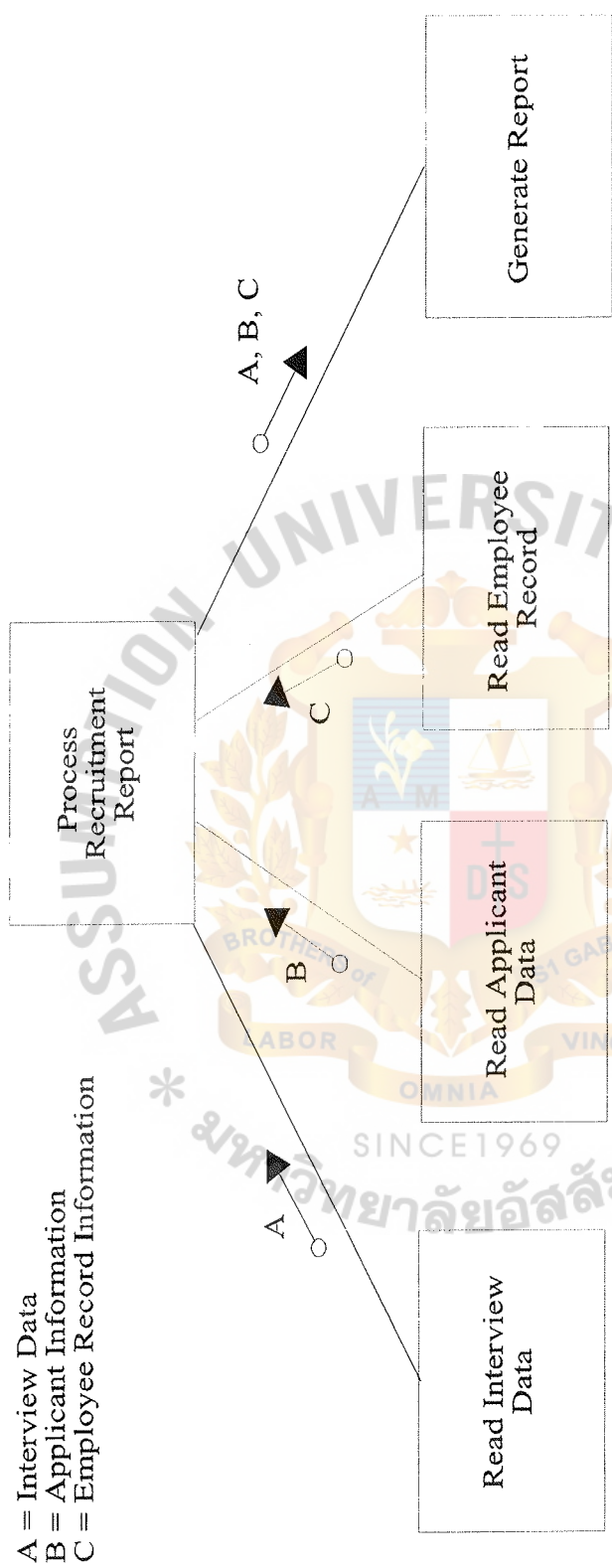


Figure C.28. Structure Chart of Process Recruitment Report.



APPENDIX D
PROCESS SPECIFICATION

Human Resource Record System

Process

Description:

Context Diagram of the Proposed System

Process No.: 0

Location:

Context of Proposed System (CONTEXT)

Input Flows:

Employee Info.

Financial Related Info. of Employee

Applicant Info.

Training Course Info.

Request for Report and Query

Recruitment Request and Performance Evaluation Report

Output Flows:

Leave and Attendance Info.

Employee Info.

Applicant Qualification and Interview Result

Perspective Training Employee Info.

Requested Report and Answer

Employee Info.

Leave and Attendance Report

Enter Financial Compensation Record

Process

Process No.: 1

Location:

DFD of Process Financial Compensation (0)

Input Flows:

Financial Compensation Detail

Output Flows:

Financial Compensation Record

Enter Leave Info.

Process

Process No.: 1

Location:

DFD of Process Leave Checking (0)

Output Flows:

Daily Leave Info.

Process Appraisal

Process

Process No.: 1

Location:

DFD of Process Appraisal Info. (0)

Input Flows:

Late Info.

Overtime Info.

Leave Info.

Training Record of Employee
Evaluation Result from Manager Dept.
Output Flows:
Appraisal Result
Salary Rate Change

Process Collect Request Process

Process No.: 1

Location:

DFD of Process Benefit Info. (0)

Input Flows:

Request Benefit Submission

Output Flows:

Medical Treatment Record

Process Employee Detail Process

Process No.: 1

Location:

DFD of Process Employee Info. (0)

Input Flows:

Employee Detail

Output Flows:

Employee Info.

Process Gather Date Entry

Process

Process No.: 1

Location:

DFD of Process Recruitment Info. (0)

Input Flows:

Applicant Detail

Interviewer Comment Result

Output Flows:

Applicant Info.

Interview Result Detail

Process Record Leave and Attendance Process

Description:

To gathering daily information of leave and attendance from the time card system and leave letter for evaluation and report.

Process No.: 1

Location:

DFD of Proposed System (0)

Input Flows:

Daily Leave and Attendance Checking

Output Flows:

Daily Late Info.

Daily Overtime Info.

Daily Leave Info.

Process Record Daily Attendance Process

Process No.: 1

Location:

DFD of Process Leave n Attendance (0)

Input Flows:
Daily Attendance Info.
Output Flows:
Daily Late Detail
Daily Check Out Time

Enter Employee Detail Process

Process No.: 1

Location:

DFD of Gather Employee Detail (0)

Input Flows:
Employee Data
Output Flows:
Employee Record

Read Applicant Detail Process

Process No.: 1

Location:

DFD of Approval Update (0)

Input Flows:
Applicant Data
Output Flows:
Applicant Info.

Read Employee Detail Process

Process No.: 1

Location:

DFD of Update Employee File (0)

Input Flows:
Employee Data
Output Flows:
Employee Record

Read Evaluation Data Process

Process No.: 1

Location:

DFD of Process Appraisal (0)

Input Flows:
Evaluation Info.
Output Flows:

Evaluation Record

Read Employee Data

Process

Process No.: 1

Location:

DFD of Process Employee Report (0)

Input Flows:

Employee Data

Output Flows:

Employee Record

Read Late File

Process

Process No.: 1

Location:

DFD of Process Leave n Attendance Report (0)

Input Flows:

Late Info.

Output Flows:

Late Record

Read Medical Treatment Info.

Process

Process No.: 1

Location:

DFD of Process Benefit Report (0)

Input Flows:

Medical Info.

Output Flows:

Medical Record

Read Recruitment Detail

Process

Process No.: 1

Location:

DFD of Update Applicant n Employee File (0)

Input Flows:

Recruitment Detail

Output Flows:

Recruitment Record

Read Recruitment Data

Process

Process No.: 1

Location:

DFD of Process Recruitment Report (0)

Input Flows:

Recruitment Data

Output Flows:
Recruitment Record

Read Medical Treatment Data Process

Process No.: 1

Location:

DFD of Update Benefit Data (0)

Input Flows:

Medical Treatment Data

Output Flows:

Medical Treatment Record

Read Daily Attendance Process

Process No.: 1

Location:

DFD of Process Attendance Checking (0)

Input Flows:

Daily Attendance Info.

Output Flows:

Daily Attendance Record

Read Appraisal Data Process

Process No.: 1

Location:

DFD of Process Appraisal Report (0)

Input Flows:

Appraisal Data

Output Flows:

Appraisal Record

Enter Medical Info. Process

Process No.: 1

Location:

DFD of Process Collect Request (0)

Input Flows:

Medical Data Submission

Output Flows:

Medical Record

Enter Applicant Detail and Interview Data Process

Process No.: 1

Location:

DFD of Gather Data Entry (0)

Input Flows:

Applicant Detail
Interview Data
Output Flows:
Applicant and Interview Info.

Process Leave Info. Process
Process No.: 2
Location:
DFD of Process Leave n Attendance (0)
Input Flows:
Leave Info. added by HR Officer
Output Flows:
Leave Info.

Read Employee List Process
Process No.: 2
Location:
DFD of Update Applicant n Employee File (0)
Input Flows:
Employee Detail
Output Flows:
Employee Record

Read Overtime Data Process
Process No.: 2
Location:
DFD of Process Appraisal (0)
Input Flows:
Overtime Info.
Output Flows:
Overtime Record

Read Interview Result Process
Process No.: 2
Location:
DFD of Approval Update (0)
Input Flows:
Interview Data
Output Flows:
Interview Info.

Read Financial Compensation Info. Process
Process No.: 2
Location:

<p>DFD of Process Benefit Report (0)</p> <p>Input Flows: Financial Compensation Info.</p> <p>Output Flows: Financial Compensation Record</p>	
<p>Transaction Center of Update Detail</p> <p>Process No.: 2</p> <p>Location:</p> <p>DFD of Update Employee File (0)</p> <p>Input Flows: Employee Record</p> <p>Output Flows: Transaction of employee record Updating Transaction of employee record Creation Transaction of employee record Deletion</p>	<p>Process</p>
<p>Transform Function of Attendance Checking</p> <p>Process No.: 2</p> <p>Location:</p> <p>DFD of Process Attendance Checking (0)</p> <p>Input Flows: Daily Attendance Record</p> <p>Output Flows: Daily Attendance Info. to be stored</p>	<p>Process</p>
<p>Transform Function of Financial Compensation</p> <p>Process No.: 2</p> <p>Location:</p> <p>DFD of Process Financial Compensation (0)</p> <p>Input Flows: Financial Compensation Record</p> <p>Output Flows: Financial Compensation to be Stored</p>	<p>Process</p>
<p>Transform Function of Gather Detail</p> <p>Process No.: 2</p> <p>Location:</p> <p>DFD of Gather Employee Detail (0)</p> <p>Input Flows: Employee Record</p> <p>Output Flows: Employee Record to be Stored</p>	<p>Process</p>
<p>Transform Function of Process Employee Report</p> <p>Process No.: 2</p>	<p>Process</p>

Location:

DFD of Process Employee Report (0)

Input Flows:

Employee Record

Output Flows:

Employee Record to be Printed

Transform Function of Record Leave Info.

Process

Process No.: 2

Location:

DFD of Process Leave Checking (0)

Input Flows:

Daily Leave Info.

Output Flows:

Leave Record to be stored

Transform Function of Process Report

Process

Process No.: 2

Location:

DFD of Process Recruitment Report (0)

Input Flows:

Recruitment Record

Output Flows:

Recruitment Record to be Printed

Transform Function of Gather Data

Process

Process No.: 2

Location:

DFD of Gather Data Entry (0)

Input Flows:

Applicant and Interview Info.

Output Flows:

Applicant and Interview Record to be stored

Transform Function of Collect Request

Process

Process No.: 2

Location:

DFD of Process Collect Request (0)

Input Flows:

Medical Record

Output Flows:

Medical Record to be Stored

Read Financial Compensation Data Process

Process No.: 2

Location:

DFD of Update Benefit Data (0)

Input Flows:

Medical Treatment and Financial Compensation Data

Output Flows:

Medical Treatment and Financial Compensation Record

Read Employee Info. Process

Process No.: 2

Location:

DFD of Process Appraisal Report (0)

Input Flows:

Employee Detail

Output Flows:

Employee Record

Process Employee Info. Process

Description:

Manage information of employee including related information.

Process No.: 2

Location:

DFD of Proposed System (0)

Input Flows:

Employee Detail

Output Flows:

Employee Info.

Training Detail

Process Financial Compensation Process

Process No.: 2

Location:

DFD of Process Benefit Info. (0)

Input Flows:

Financial Compensation Entry

Output Flows:

Financial Compensation Info.

Process Update Employee File Process

Process No.: 2

Location:

DFD of Process Employee Info. (0)

Input Flows:

Employee Info.

Output Flows:
Update Employee Record

Process Approval Update Process

Process No.: 2

Location:

DFD of Process Recruitment Info. (0)

Input Flows:

Applicant Record

Interview Result Info.

Approval

Output Flows:

Approval Updated Detail

Read Overtime File Process

Process No.: 2

Location:

DFD of Process Leave n Attendance Report (0)

Input Flows:

Overtime Info.

Output Flows:

Overtime Record

Process Appraisal Report and Answer Process

Process No.: 2

Location:

DFD of Process Appraisal Info. (0)

Input Flows:

Appraisal Info.

Salary Detail

Output Flows:

Requested Appraisal Report and Answer

Requested Appraisal Report and Answer

Store Medical Info. Process

Process No.: 3

Location:

DFD of Process Collect Request (0)

Input Flows:

Medical Record to be Stored

Output Flows:

Stored Medical Record

Update Applicant File and Employee	Process
Process No.: 3	
Location:	
DFD of Process Recruitment Info. (0)	
Input Flows:	
Recruitment Info.	
Applicant Record	
Output Flows:	
List of Applicant to be Employee	

Transform Function of Process Benefit Report	Process
Process No.: 3	
Location:	
DFD of Process Benefit Report (0)	
Input Flows:	
Medical Record	
Financial Compensation Record	
Output Flows:	
Benefit Record to be Printed	

Store Leave Info.	Process
Process No.: 3	
Location:	
DFD of Process Leave Checking (0)	
Input Flows:	
Leave Record to be stored	
Output Flows:	
Stored Leave Record	

Transaction Center of Update Benefit	Process
Process No.: 3	
Location:	
DFD of Update Benefit Data (0)	
Input Flows:	
Medical Treatment Record	
Medical Treatment and Financial Compensation Record	
Output Flows:	
Transaction of Medical Treatment and Financial Compensation	
Updating	Transaction of Medical Treatment and Financial Compensation
Creation	Transaction of Medical Treatment and Financial Compensation
Deleting	Transaction of Medical Treatment and Financial Compensation
Transform Function of Approval	Process
Process No.: 3	
Location:	

DFD of Approval Update (0)

Input Flows:
Applicant Info.
Interview Info.
Output Flows:
Applicant Record to be Stored

Read Leave File Process
Process No.: 3
Location:

DFD of Process Leave n Attendance Report (0)

Input Flows:
Leave Info.
Output Flows:
Leave Record

Read History Training Data Process
Process No.: 3
Location:

DFD of Process Appraisal (0)

Input Flows:
Training Info.
Output Flows:
Training Record

Read Evaluation Record Process
Process No.: 3
Location:

DFD of Process Appraisal Report (0)

Input Flows:
Evaluation Info.
Output Flows:
Evaluation Record

Process Employee Report and Answer Process
Process No.: 3
Location:

DFD of Process Employee Info. (0)

Input Flows:
Employee Info.
Output Flows:
Requested Employee Report and Answer
Employee Record and if Requested Report and Answer

Process to Add New employee record

Process

Process No.: 3

Location:

DFD of Update Employee File (0)

Input Flows:

Transaction of employee record Création

Output Flows:

Employee Record to be Added

Process Benefit

Process

Description:

To collect information involved with medical benefit and updating information of each employee's financial compensation.

Process No.: 3

Location:

DFD of Proposed System (0)

Input Flows:

Benefit Detail

Output Flows:

Medical Info.

Financial Compensation Info.

Store Applicant and Interview Result

Process

Process No.: 3

Location:

DFD of Gather Data Entry (0)

Input Flows:

Applicant and Interview Record to be stored

Output Flows:

Store Applicant Record

Store Interview Record

Store Attendance Data

Process

Process No.: 3

Location:

DFD of Process Attendance Checking (0)

Input Flows:

Daily Attendance Info. to be stored

Output Flows:

Stored Late Record

Stored Overtime Record

Store Financial Compensation

Process

Process No.: 3

Location:

	<u>DFD of Process Financial Compensation (0)</u> Input Flows: Financial Compensation to be Stored Output Flows: Stored Financial Compensation Record	
Store Employee Detail		Process
Process No.: 3		
Location:		
	<u>DFD of Gather Employee Detail (0)</u> Input Flows: Employee Record to be Stored Output Flows: Stored Employee Record	
Read Applicant List		Process
Process No.: 3		
Location:		
	<u>DFD of Update Applicant n Employee File (0)</u> Input Flows: Applicant Detail Output Flows: Applicant Record	
Process Leave and Attendance Report and Answer		Process
Process No.: 3		
Location:		
	<u>DFD of Process Leave n Attendance (0)</u> Input Flows: Daily Leave Info. Daily Late Info. Overtime Info. Output Flows: Leave and Attendance Record and if Requested Report and Answer Requested Attendance Report and Answer Leave and Attendance Record and if Requested Report and Answer Leave and Attendance Report	
Process Update Balance of Financial Compensation		Process
Process No.: 3		
Location:		
	<u>DFD of Process Benefit Info. (0)</u> Input Flows:	

Medical Treatment Info.
Output Flows:
Financial Compensation Info.

Print Recruitment Report Process
Process No.: 3
Location:
DFD of Process Recruitment Report (0)
Input Flows:
Recruitment Record to be Printed

Print Employee Record and Answer Process
Process No.: 3
Location:
DFD of Process Employee Report (0)
Input Flows:
Employee Record to be Printed

Process to Add Benefit Record Process
Process No.: 4
Location:
DFD of Update Benefit Data (0)
Input Flows:
Transaction of Medical Treatment and Financial Compensation
Creation
Output Flows:
Record to be Added

Process Benefit Report and Answer Process
Process No.: 4
Location:
DFD of Process Benefit Info. (0)
Input Flows:
Benefit Record
Medical Treatment Info.
Output Flows:
Requested Benefit Report and Answer

Process to Update employee record Process
Process No.: 4
Location:
DFD of Update Employee File (0)
Input Flows:
Transaction of employee record Updating
Output Flows:
Employee Record to be Updated

Store Recruitment Data	Process
Process No.: 4	
Location:	
DFD of Approval Update (0)	
Input Flows:	
Applicant Record to be Stored	
Output Flows:	
Store Applicant Record	

Transform Function of Process Leave and Attendance Report	Process
Process No.: 4	
Location:	
DFD of Process Leave n Attendance Report (0)	
Input Flows:	
Overtime Record	
Late Record	
Leave Record	
Output Flows:	
Leave and Attendance Record to be Printed	

Transform Function of Process Report	Process
Process No.: 4	
Location:	
DFD of Process Appraisal Report (0)	
Input Flows:	
Employee Record	
Appraisal Record	
Evaluation Record	
Output Flows:	
Record to be Printed	

Transaction Center of Update Files	Process
Process No.: 4	
Location:	
DFD of Update Applicant n Employee File (0)	
Input Flows:	
Employee Record	
Recruitment Record	
Applicant Record	
Output Flows:	
Transaction of Applicant Creation	
Transaction of Applicant Updating	
Transaction of Applicant Deletion	

Process

Location:

Input Flows:

Recruitment Info.

Output Flows:

Recruitment Record and if requested Report and Answer

Requested Recruitment Report and Answer

Process

Location:

Input Flows:

Salary Rate

Evaluation Result from Manager Dept.

Output Flows:

Appraisal Info.

Process

Location:

Input Flows:

Leave Info.

Output Flows:

Leave Record

Process

Location:

Input Flows:

Benefit Record to be Printed

Process

Location:

Input Flows:

Leave and Attendance Record to be Printed

Process to Delete employee record
Process No.: 5
Location:
 DFD of Update Employee File (0)
 Input Flows:
 Transaction of employee record Deletion
 Output Flows:
 Employee Record to be Deleted

Read Late Info.
Process No.: 5
Location:
 DFD of Process Appraisal (0)
 Input Flows:
 Late Info.
 Output Flows:
 Late Record

Process to Update Benefit Record
Process No.: 5
Location:
 DFD of Update Benefit Data (0)
 Input Flows:
 Transaction of Medical Treatment and Financial Compensation
Updating
 Output Flows:
 Record to be Updated

Process Recruitment
Process No.: 5
Location:
 DFD of Proposed System (0)
 Input Flows:
 Interview Comment and Result
 Applicant Info.
 Output Flows:
 Applicant Info.
 Interview Comment and Result
 Interview Detail
 Recruitment Result

Process of Applicant Record Creation
Process No.: 5
Location:
 DFD of Update Applicant n Employee File (0)

Input Flows:
Transaction of Applicant Creation
Output Flows:
Applicant Record to be Added

Print Appraisal Report and Answer Process

Process No.: 5

Location:

DFD of Process Appraisal Report (0)

Input Flows:
Record to be Printed

Transform Function of Process Appraisal Process

Process No.: 6

Location:

DFD of Process Appraisal (0)

Input Flows:
Training Record
Overtime Record
Evaluation Record
Leave Record
Late Record
Output Flows:
Appraisal Update

Process to Delete Benefit Record

Process No.: 6

Location:

DFD of Update Benefit Data (0)

Input Flows:
Transaction of Medical Treatment and Financial Compensation

Deleting

Output Flows:
Record to be Deleted

Process of Applicant Record Updating Process

Process No.: 6

Location:

DFD of Update Applicant n Employee File (0)

Input Flows:
Transaction of Applicant Updating
Output Flows:
Applicant Record to be Updated

Add New employee record Process
Process No.: 6
Location:
DFD of Update Employee File (0)
Input Flows:
Employee Record to be Added
Output Flows:
Add employee record

Store Record Process
Process No.: 7
Location:
DFD of Process Appraisal (0)
Input Flows:
Appraisal Update
Output Flows:
Stored Appraisal Record
Stored Appraisal Record

Updated employee record Process
Process No.: 7
Location:
DFD of Update Employee File (0)
Input Flows:
Employee Record to be Updated
Output Flows:
Update Employee Record

Write New Benefit Record Process
Process No.: 7
Location:
DFD of Update Benefit Data (0)
Input Flows:
Record to be Added

Process of Applicant Record Deletion Process
Process No.: 7
Location:
DFD of Update Applicant n Employee File (0)
Input Flows:
Transaction of Applicant Deletion
Output Flows:
Applicant Record to be Deleted

Modify Benefit Record Process
Process No.: 8
Location:
DFD of Update Benefit Data (0)
Input Flows:
Record to be Updated

Write New Applicant Record to Employee Process
Process No.: 8
Location:
DFD of Update Applicant n Employee File (0)
Input Flows:
Applicant Record to be Added
Output Flows:
Added Applicant Record

Delete employee record Process
Process No.: 8
Location:
DFD of Update Employee File (0)
Input Flows:
Employee Record to be Deleted
Output Flows:
Deleted employee record

Update Applicant Record to Employee Process
Process No.: 9
Location:
DFD of Update Applicant n Employee File (0)
Input Flows:
Applicant Record to be Updated
Output Flows:
Updated Applicant Record

Delete Benefit Record Process
Process No.: 9
Location:
DFD of Update Benefit Data (0)
Input Flows:
Record to be Deleted

Delete Applicant Record

Process

Process No.: 10

Location:

DFD of Update Applicant n Employee File (0)

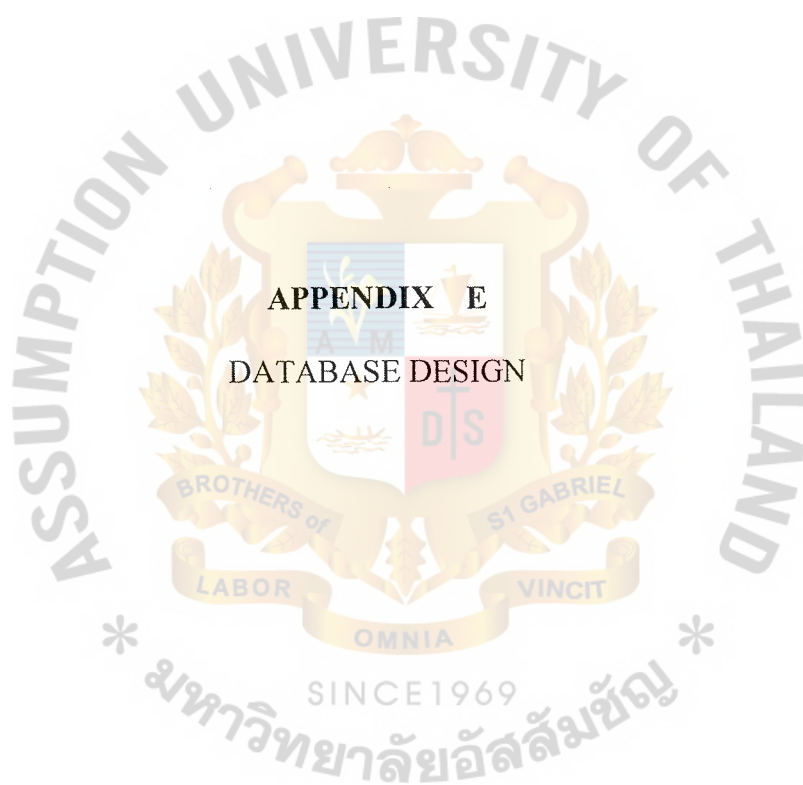
Input Flows:

Applicant Record to be Deleted

Output Flows:

Deleted Applicant Record





APPENDIX E
DATABASE DESIGN

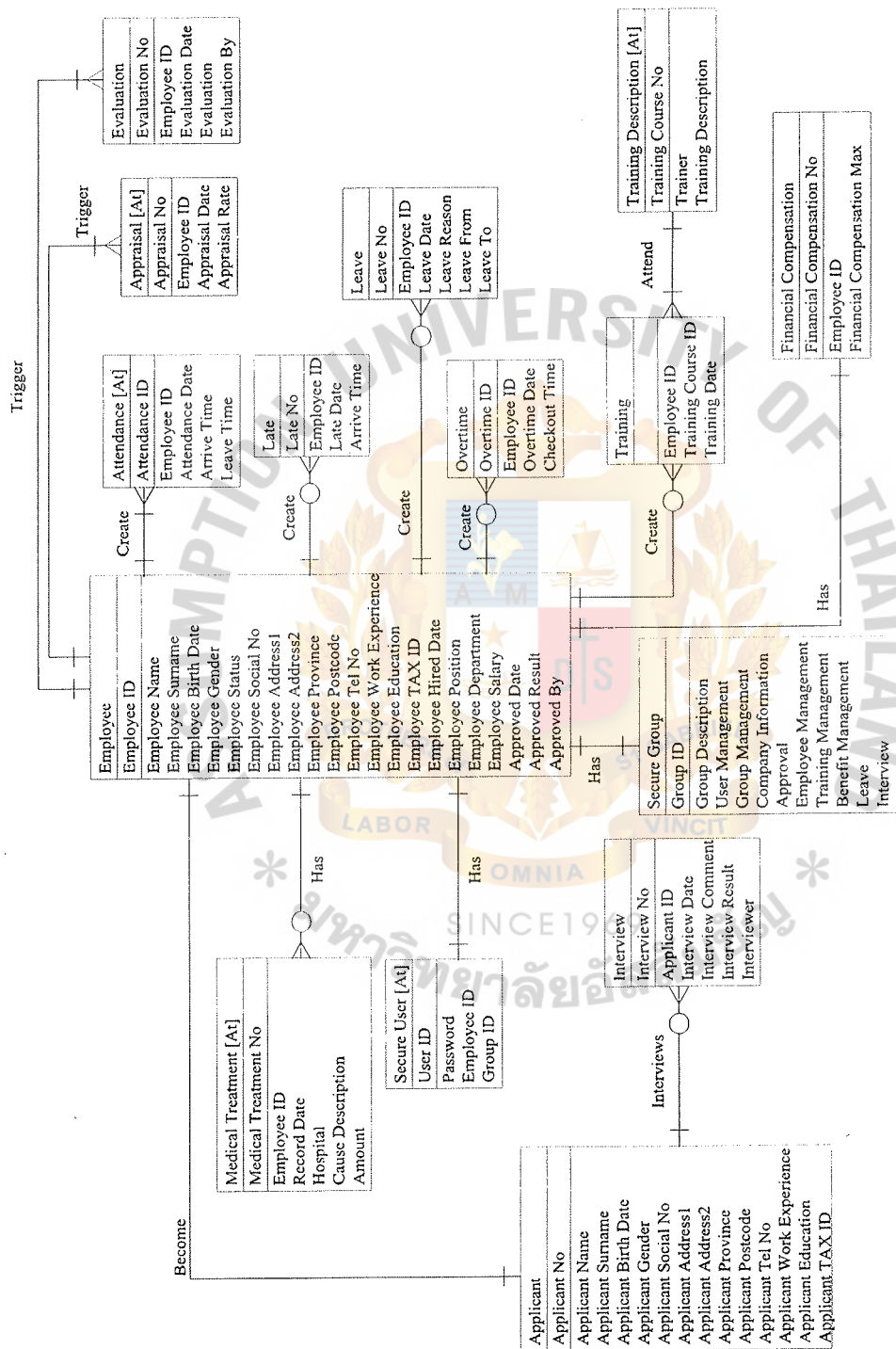


Figure E.1. Entity Relationship Diagram.

AmountData Element

Medical Treatment::Amount

Data element attributes

Domain: Int

Storage Type: Undefined

Location:

Attributive Entity --> Medical Treatment

Applicant Address1Data Element

Applicant::Applicant Address1

Data element attributes

Domain: VarChar

Storage Type: Undefined

Location:

Entity --> Applicant

Applicant Address2Data Element

Applicant::Applicant Address2

Data element attributes

Domain: VarChar

Storage Type: Undefined

Location:

Entity --> Applicant

Applicant Birth DateData Element

Applicant::Applicant Birth Date

Data element attributes

Domain: Date

Storage Type: Undefined

Location:

Entity --> Applicant

Applicant EducationData Element

Applicant::Applicant Education

Data element attributes

Domain: VarChar

Storage Type: Undefined

Location:

Entity --> Applicant

Applicant GenderData Element

Applicant::Applicant Gender

Data element attributes

Domain: VarChar

Storage Type: Undefined

Location:

Entity -->	Applicant	
Applicant ID		Data Element
Interview::Applicant ID		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Entity -->	Interview	
Applicant ID		Data Element
Recruitment::Applicant ID		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Entity -->	Recruitment	
Applicant Name		Data Element
Applicant::Applicant Name		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Entity -->	Applicant	
Applicant No		Data Element
Applicant::Applicant No		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Entity -->	Applicant	
Applicant Postcode		Data Element
Applicant::Applicant Postcode		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Entity -->	Applicant	
Applicant Province		Data Element
Applicant::Applicant Province		
Data element attributes		

Domain: VarChar
Storage Type: Undefined
Location:
Entity --> Applicant
Applicant Social No Data Element
Applicant::Applicant Social No
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Entity --> Applicant

Applicant Surname Data Element
Applicant::Applicant Surname
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Entity --> Applicant

Applicant TAX ID Data Element
Applicant::Applicant TAX ID
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Entity --> Applicant

Applicant Tel No Data Element
Applicant::Applicant Tel No
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Entity --> Applicant

Applicant Work Experience Data Element
Applicant::Applicant Work Experience
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Entity --> Applicant

Appraisal DateData Element

Appraisal::Appraisal Date

Data element attributes

Domain:Date

Storage Type:Undefined

Location:

Attributive Entity -->Appraisal

Appraisal NoData Element

Appraisal::Appraisal No

Data element attributes

Domain:VarChar

Storage Type:Undefined

Location:

Attributive Entity -->Appraisal

Appraisal RateData Element

Appraisal::Appraisal Rate

Data element attributes

Domain:Date

Storage Type:Undefined

Location:

Attributive Entity -->Appraisal

ApprovalData Element

Secure Group::Approval

Data element attributes

Domain:VarChar

Storage Type:Undefined

Location:

Entity -->Secure Group

Approved ByData Element

Recruitment::Approved By

Data element attributes

Domain:VarChar

Storage Type:Undefined

Location:

Entity -->Recruitment

Approved DateData Element

Recruitment::Approved Date

Data element attributes

Domain:Date

Storage Type:Undefined

Location:

Entity -->	Recruitment	
Approved Result		Data Element
Recruitment:: <u>Approved Result</u>		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Entity -->	Recruitment	
Arrive Time		Data Element
Attendance:: <u>Arrive Time</u>		
Data element attributes		
Domain:	Time	
Storage Type:	Undefined	
Location:		
Attributive Entity -->	Attendance	
Arrive Time		Data Element
Late:: <u>Arrive Time</u>		
Data element attributes		
Domain:	Date	
Storage Type:	Undefined	
Location:		
Entity -->	Late	
Attendance Date		Data Element
Attendance:: <u>Attendance Date</u>		
Data element attributes		
Domain:	Date	
Storage Type:	Undefined	
Location:		
Attributive Entity -->	Attendance	
Attendance ID		Data Element
Attendance:: <u>Attendance ID</u>		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Attributive Entity -->	Attendance	
Benefit Management		Data Element
Secure Group:: <u>Benefit Management</u>		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	

Location:
Entity --> Secure Group

Cause Description Data Element
Medical Treatment::Cause Description
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity --> Medical Treatment

Checkout Time Data Element
Overtime::Checkout Time
Data element attributes
Domain: Time
Storage Type: Undefined
Location:
Entity --> Overtime

Company Information Data Element
Secure Group::Company Information
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Entity --> Secure Group
Create Data Element

Date Data Element
Location:
Data Element --> Applicant::Applicant Birth Date
Data Element --> Appraisal::Appraisal Date
Data Element --> Appraisal::Appraisal Rate
Data Element --> Employee::Employee Birth Date
Data Element --> Employee::Employee Hired Date
Data Element --> Evaluation::Evaluation Date
Data Element --> Interview::Interview Date
Data Element --> Late::Late Date
Data Element --> Late::Arrive Time
Data Element --> Leave::Leave Date
Data Element --> Leave::Leave From
Data Element --> Leave::Leave To
Data Element --> Medical Treatment::Record Date
Data Element --> Medical Treatment::Hospital
Data Element --> Overtime::Overtime Date

Data Element --> Recruitment::Approved Date
Data Element --> Training::Training Date
Data Element --> Attendance::Attendance Date

Employee Address1 Data Element
Employee::Employee Address1
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity --> Employee

Employee Address2 Data Element
Employee::Employee Address2
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity --> Employee

Employee Birth Date Data Element
Employee::Employee Birth Date
Data element attributes
Domain: Date
Storage Type: Undefined
Location:
Attributive Entity --> Employee

Employee Department Data Element
Employee::Employee Department
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity --> Employee

Employee Education Data Element
Employee::Employee Education
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity --> Employee

Employee Gender Data Element
Employee::Employee Gender
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity --> Employee

Employee Hired Date Data Element
Employee::Employee Hired Date
Data element attributes
Domain: Date
Storage Type: Undefined
Location:
Attributive Entity --> Employee

Employee ID Data Element
Appraisal::Employee ID
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity --> Appraisal

Employee ID Data Element
Attendance::Employee ID
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity --> Attendance

Employee ID Data Element
Employee::Employee ID
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity --> Employee

Employee ID Data Element
Evaluation::Employee ID
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:

Entity -->	Evaluation
Employee ID	Data Element
Financial Compensation::Employee ID	
Data element attributes	
Domain:	VarChar
Storage Type:	Undefined
Location:	
Attributive Entity -->	Financial Compensation
Employee ID	Data Element
Late::Employee ID	
Data element attributes	
Domain:	VarChar
Storage Type:	Undefined
Location:	
Entity -->	Late
Employee ID	Data Element
Leave::Employee ID	
Data element attributes	
Domain:	VarChar
Storage Type:	Undefined
Location:	
Entity -->	Leave
Employee ID	Data Element
Medical Treatment::Employee ID	
Data element attributes	
Domain:	VarChar
Storage Type:	Undefined
Location:	
Attributive Entity -->	Medical Treatment
Employee ID	Data Element
Overtime::Employee ID	
Data element attributes	
Domain:	VarChar
Storage Type:	Undefined
Location:	
Entity -->	Overtime
Employee ID	Data Element
Secure User::Employee ID	
Data element attributes	

Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Associative Entity -->	Secure User	
Employee ID		Data Element
Training::Employee ID		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Associative Entity -->	Training	

Employee Management		Data Element
Secure Group::Employee Management		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Entity -->	Secure Group	

Employee Name		Data Element
Employee::Employee Name		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Attributive Entity -->	Employee	

Employee Position		Data Element
Employee::Employee Position		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Attributive Entity -->	Employee	
Employee Postcode		Data Element
Employee::Employee Postcode		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Attributive Entity -->	Employee	

Employee Province Data Element

Employee::Employee Province
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity -->

Employee

Employee Salary Data Element

Employee::Employee Salary
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity -->

Employee

Employee Social No Data Element

Employee::Employee Social No
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity -->

Employee

Employee Status Data Element

Employee::Employee Status
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity -->

Employee

Employee Surname Data Element

Employee::Employee Surname
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity -->

Employee

Employee TAX ID Data Element

Employee::Employee TAX ID
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:

Attributive Entity -->	Employee	
Employee Tel No		Data Element
Employee:: <u>Employee Tel No</u>		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Attributive Entity -->	Employee	
Employee Work Experience		Data Element
Employee:: <u>Employee Work Experience</u>		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Attributive Entity -->	Employee	
Evaluation		Data Element
Evaluation:: <u>Evaluation</u>		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Entity -->	Evaluation	
Evaluation By		Data Element
Evaluation:: <u>Evaluation By</u>		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Entity -->	Evaluation	
Evaluation Date		Data Element
Evaluation:: <u>Evaluation Date</u>		
Data element attributes		
Domain:	Date	
Storage Type:	Undefined	
Location:		
Entity -->	Evaluation	
Evaluation No		Data Element
Evaluation:: <u>Evaluation No</u>		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	

Location:		
Entity -->	Evaluation	
<hr/>		
Financial Compensation Max		Data Element
Financial Compensation::	<u>Financial Compensation Max</u>	
Data element attributes		
Domain:	Int	
Storage Type:	Undefined	
Location:		
Attributive Entity -->	Financial Compensation	
<hr/>		
Financial Compensation No		Data Element
Financial Compensation::	<u>Financial Compensation No</u>	
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Attributive Entity -->	Financial Compensation	
<hr/>		
Group Description		Data Element
Secure Group::	<u>Group Description</u>	
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Entity -->	Secure Group	
Group ID		Data Element
Secure Group::	<u>Group ID</u>	
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Entity -->	Secure Group	
<hr/>		
Group ID		Data Element
Secure User::	<u>Group ID</u>	
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Associative Entity -->	Secure User	
<hr/>		

Group Management Data Element
Secure Group::Group Management
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Entity --> Secure Group

Hospital Data Element
Medical Treatment::Hospital
Data element attributes
Domain: Date
Storage Type: Undefined
Location:
Attributive Entity --> Medical Treatment
Int Data Element
Location:
Data Element --> Financial Compensation::Financial Compensation
Max Data Element --> Medical Treatment::Amount

Interview Data Element
Secure Group::Interview
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Entity --> Secure Group

Interview Comment Data Element
Interview::Interview Comment
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Entity --> Interview

Interview Date Data Element
Interview::Interview Date
Data element attributes
Domain: Date
Storage Type: Undefined
Location:
Entity --> Interview

Interview No	Data Element
Interview:: <u>Interview No</u>	
Data element attributes	
Domain:	VarChar
Storage Type:	Undefined
Location:	
Entity -->	Interview
<hr/>	
Interview Result	Data Element
Interview:: <u>Interview Result</u>	
Data element attributes	
Domain:	VarChar
Storage Type:	Undefined
Location:	
Entity -->	Interview
<hr/>	
Interviewer	Data Element
Interview:: <u>Interviewer</u>	
Data element attributes	
Domain:	VarChar
Storage Type:	Undefined
Location:	
Entity -->	Interview
<hr/>	
Late Date	Data Element
Late:: <u>Late Date</u>	
Data element attributes	
Domain:	Date
Storage Type:	Undefined
Location:	
Entity -->	Late
Late No	Data Element
Late:: <u>Late No</u>	
Data element attributes	
Domain:	VarChar
Storage Type:	Undefined
Location:	
Entity -->	Late
<hr/>	
Leave	Data Element
Secure Group:: <u>Leave</u>	
Data element attributes	
Domain:	VarChar
Storage Type:	Undefined
Location:	

Entity --> Secure Group

Leave Date Data Element

Leave::Leave Date

Data element attributes

Domain: Date

Storage Type: Undefined

Location:

Entity --> Leave

Leave From Data Element

Leave::Leave From

Data element attributes

Domain: Date

Storage Type: Undefined

Location:

Entity --> Leave

Leave No Data Element

Leave::Leave No

Data element attributes

Domain: VarChar

Storage Type: Undefined

Location:

Entity --> Leave

Leave Reason Data Element

Leave::Leave Reason

Data element attributes

Domain: VarChar

Storage Type: Undefined

Location:

Entity --> Leave

Leave Time Data Element

Attendance::Leave Time

Data element attributes

Domain: Time

Storage Type: Undefined

Location:

Attributive Entity --> Attendance

Leave To

Data Element

Leave::Leave To

Data element attributes

Domain:Date

Storage Type:Undefined

Location:

Entity -->Leave

Medical Treatment No

Medical Treatment::Medical Treatment No

Data element attributes

Domain:VarChar

Storage Type:Undefined

Location:

Attributive Entity -->Medical Treatment

Overtime Date

Data Element

Overtime::Overtime Date

Data element attributes

Domain:Date

Storage Type:Undefined

Location:

Entity -->Overtime

Overtime ID

Data Element

Overtime::Overtime ID

Data element attributes

Domain:VarChar

Storage Type:Undefined

Location:

Entity -->Overtime

Password

Data Element

Secure User::Password

Data element attributes

Domain:VarChar

Storage Type:Undefined

Location:

Associative Entity -->Secure User

Record Date

Data Element

Medical Treatment::Record Date

Data element attributes

Domain:Date

Storage Type:Undefined

Location:

Attributive Entity -->Medical Treatment

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Recruitment No. Data Element
Recruitment::Recruitment No.

Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Entity --> Recruitment

Time Data Element

Location:
Data Element --> Overtime::Checkout Time
Data Element --> Attendance::Arrive Time
Data Element --> Attendance::Leave Time

Trainer Data Element

Training Description::Trainer
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity --> Training Description

Training Course ID Data Element

Training::Training Course ID
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Associative Entity --> Training

Training Course No Data Element

Training Description::Training Course No
Data element attributes
Domain: VarChar
Storage Type: Undefined
Location:
Attributive Entity --> Training Description

Training Date Data Element

Training::Training Date
Data element attributes
Domain: Date
Storage Type: Undefined
Location:

Associative Entity -->	Training	
<hr/>		
Training Description		Data Element
Training Description::Training Description		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Attributive Entity -->	Training Description	
Training Management		Data Element
Secure Group::Training Management		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Entity -->	Secure Group	
<hr/>		
User ID		Data Element
Secure User::User ID		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Associative Entity -->	Secure User	
<hr/>		
User Management		Data Element
Secure Group::User Management		
Data element attributes		
Domain:	VarChar	
Storage Type:	Undefined	
Location:		
Entity -->	Secure Group	
<hr/>		
VarChar		Data Element
Location:		
Data Element -->	Applicant::Applicant No	
Data Element -->	Applicant::Applicant Name	
Data Element -->	Applicant::Applicant Surname	
Data Element -->	Applicant::Applicant Gender	
Data Element -->	Applicant::Applicant Social No	
Data Element -->	Applicant::Applicant Address1	
Data Element -->	Applicant::Applicant Address2	
Data Element -->	Applicant::Applicant Province	
Data Element -->	Applicant::Applicant Postcode	
Data Element -->	Applicant::Applicant Tel No	

Data Element -->	<u>Applicant::Applicant Work Experience</u>
Data Element -->	<u>Applicant::Applicant Education</u>
Data Element -->	<u>Applicant::Applicant TAX ID</u>
Data Element -->	<u>Appraisal::Appraisal No</u>
Data Element -->	<u>Appraisal::Employee ID</u>
Data Element -->	<u>Employee::Employee ID</u>
Data Element -->	<u>Employee::Employee Name</u>
Data Element -->	<u>Employee::Employee Surname</u>
Data Element -->	<u>Employee::Employee Gender</u>
Data Element -->	<u>Employee::Employee Status</u>
Data Element -->	<u>Employee::Employee Social No</u>
Data Element -->	<u>Employee::Employee Address1</u>
Data Element -->	<u>Employee::Employee Address2</u>
Data Element -->	<u>Employee::Employee Province</u>
Data Element -->	<u>Employee::Employee Postcode</u>
Data Element -->	<u>Employee::Employee Tel No</u>
Data Element -->	<u>Employee::Employee Work Experience</u>
Data Element -->	<u>Employee::Employee Education</u>
Data Element -->	<u>Employee::Employee TAX ID</u>
Data Element -->	<u>Employee::Employee Position</u>
Data Element -->	<u>Employee::Employee Department</u>
Data Element -->	<u>Employee::Employee Salary</u>
Data Element -->	<u>Evaluation::Evaluation No</u>
Data Element -->	<u>Evaluation::Employee ID</u>
Data Element -->	<u>Evaluation::Evaluation</u>
Data Element -->	<u>Evaluation::Evaluation By</u>
Data Element -->	<u>Financial Compensation::Financial Compensation</u>
	<u>No</u>
Data Element -->	<u>Financial Compensation::Employee ID</u>
Data Element -->	<u>Interview::Interview No</u>
Data Element -->	<u>Interview::Applicant ID</u>
Data Element -->	<u>Interview::Interview Comment</u>
Data Element -->	<u>Interview::Interview Result</u>
Data Element -->	<u>Late::Late No</u>
Data Element -->	<u>Late::Employee ID</u>
Data Element -->	<u>Leave::Leave No</u>
Data Element -->	<u>Leave::Employee ID</u>
Data Element -->	<u>Leave::Leave Reason</u>
Data Element -->	<u>Medical Treatment::Medical Treatment No</u>
Data Element -->	<u>Medical Treatment::Employee ID</u>
Data Element -->	<u>Medical Treatment::Cause Description</u>
Data Element -->	<u>Overtime::Overtime ID</u>
Data Element -->	<u>Overtime::Employee ID</u>
Data Element -->	<u>Recruitment::Recruitment No.</u>
Data Element -->	<u>Recruitment::Applicant ID</u>
Data Element -->	<u>Recruitment::Approved Result</u>
Data Element -->	<u>Recruitment::Approved By</u>
Data Element -->	<u>Secure Group::Group ID</u>
Data Element -->	<u>Secure Group::Group Description</u>

Data Element -->	<u>Secure Group::User Management</u>
Data Element -->	<u>Secure Group::Group Management</u>
Data Element -->	<u>Secure Group::Company Information</u>
Data Element -->	<u>Secure Group::Approval</u>
Data Element -->	<u>Secure Group::Employee Management</u>
Data Element -->	<u>Secure Group::Training Management</u>
Data Element -->	<u>Secure Group::Benefit Management</u>
Data Element -->	<u>Secure Group::Leave</u>
Data Element -->	<u>Secure Group::Interview</u>
Data Element -->	<u>Secure User::User ID</u>
Data Element -->	<u>Secure User::Password</u>
Data Element -->	<u>Secure User::Employee ID</u>
Data Element -->	<u>Secure User::Group ID</u>
Data Element -->	<u>Training::Employee ID</u>
Data Element -->	<u>Training::Training Course ID</u>
Data Element -->	<u>Training Description::Training Course No</u>
Data Element -->	<u>Training Description::Trainer</u>
Data Element -->	<u>Training Description::Training Description</u>
Data Element -->	<u>Attendance::Attendance ID</u>
Data Element -->	<u>Attendance::Employee ID</u>
Data Element -->	<u>Interview::Interviewer</u>



Table E.1. Applicant.

Field Name	Type	Size
Applicant No	Text	8
Applicant Name	Text	15
Applicant Surname	Text	25
Applicant Birth Date	Date/Time	8
Applicant Gender	Text	1
Applicant Address 1	Text	13
Applicant Address 2	Text	50
Applicant Province	Text	50
Applicant Postcode	Text	50
Applicant Tel No	Text	50
Applicant Work Experience	Text	15
Applicant Education	Text	50
Applicant TAX ID	Text	20

Table E.2. Appraisal.

Field Name	Type	Size
AppraisalNo	Long Integer	4
Employee ID	Text	7
AppraisalDate	Date/Time	8
AppraisalRate	Long Integer	4

Table E.3. Attendance.

Field Name	Type	Size
Attendance ID	Long Integer	4
Employee ID	Text	7
Attendance Date	Date/Time	8
Arrive Time	Date/Time	8
Leave Time	Date/Time	8

Table E.4. Employee.

Field Name	Type	Size
Employee ID	Text	7
Employee Name	Text	15
Employee Surname	Text	25
Employee Birth Date	Date/Time	8
Employee Gender	Text	1
Employee Status	Text	10
Employee Social No	Text	13
Employee Address 1	Text	200
Employee Address 2	Text	200
Employee Province	Text	50
Employee Postcode	Text	5
Employee Tel No	Text	15
Employee Work Experience	Text	50
Employee Education	Text	50
Employee TAX ID	Text	20
Employee Hired Date	Date/Time	8
Employee Position	Text	15
Employee Department	Text	15
Employee Salary	Currency	8

Table E.5. Evaluation.

Field Name	Type	Size
Evaluation No	Long Integer	4
Employee ID	Text	7
Evaluation Date	Date/Time	8
Evaluation	Text	255
Evaluation by	Text	50

Table E.6. Financial Compensation.

Field Name	Type	Size
Financial Compensation No	Text	10
Employee ID	Text	7
Financial Compensation Max	Currency	4

Table E.7. Interview.

Field Name	Type	Size
Interview No	Long Integer	4
Applicant ID	Text	8
Interview Date	Date/Time	8
Interview Comment	Text	255
Interviewer	Text	7
Interview Result	Yes/No	1

Table E.8. Late.

Field Name	Type	Size
Late No	Long Integer	4
Employee ID	Text	7
Late Date	Date/Time	8
Arrive Time	Date/Time	8

Table E.9. Leave.

Field Name	Type	Size
Leave No	Long Integer	4
Employee ID	Text	7
Leave Date	Date/Time	8
Leave Reason	Text	200
Leave From	Date/Time	8
Leave To	Date/Time	8

Table E.10. Medical Treatment.

Field Name	Type	Size
Medical Treatment No	Long Integer	4
Employee ID	Text	7
Record Date	Date/Time	8
Hospital	Text	15
Cause Description	Text	50
Amount	Currency	8

Table E.11. Overtime.

Field Name	Type	Size
Overtime ID	Long Integer	4
Employee ID	Text	7
Overtime Date	Date/Time	8
Checkout Time	Date/Time	8

Table E.12. Recruitment.

Field Name	Type	Size
Recruitment No	Text	7
Applicant No	Text	8
Approved Date	Date/Time	8
Approved Result	Yes/No	1
Approved by	Text	8

Table E.13. Secure Group.

Field Name	Type	Size
Group ID	Text	50
GroupDesc	Text	255
UserMgt	Yes/No	1
GroupMgt	Yes/No	1
CpnInfo	Yes/No	1
Approval	Yes/No	1
EpmMgt	Yes/No	1
TrainingMgt	Yes/No	1
BenefitMgt	Yes/No	1
Leaving	Yes/No	1
Interview	Yes/No	1

Table E.14. Secure User.

Field Name	Type	Size
UserID	Text	8
Password	Text	50
Employee ID	Text	7
Group ID	Text	8

Table E.15. tblCpnConfig (Table of Company Configuration).

Field Name	Type	Size
cpnName	Text	25
cpnDesc	Text	200
cpnAddr 1	Text	50
cpnAddr 2	Text	50
cpnPhone	Text	15
cpnFax	Text	15
cpnEmail	Text	50
cpnArrvTime	Date/Time	8
cpnLveTime	Date/Time	8
cpnMinApsRate	Long Integer	4
cpnMaxApsRate	Long Integer	4

Table E.16. Training.

Field Name	Type	Size
Employee ID	Text	7
Training Course ID	Text	10
Training Date	Date/Time	8

Table E.17. Training Description.

Field Name	Type	Size
Training Course No	Text	10
Trainer	Text	50
Training Description	Text	50



APPENDIX F
OUTPUT DESIGN

<p><i>Mthai Estate</i></p> <p><i>Attendance Report</i></p> <p><i>March, 2002</i></p>			
<p><i>Employee ID:</i> 1001</p> <p><i>Name:</i> Worakorn Kuruwongwattana</p> <p><i>Leave:</i> 3 Days</p>			
<i>Date</i>	<i>Reason</i>	<i>From</i>	<i>To</i>
15/3/2002	ธุระส่วนตัว	18/3/2002	20/3/2002
<i>OverTime:</i>	1:15 Hour(s)		
	<i>Date</i>	<i>Checkout Time</i>	
	4/3/2002	18:30	
	5/3/2002	17:45	
<i>Late Time:</i>	1:15 Hour(s)		
	<i>Date</i>	<i>Checkout Time</i>	
	1/3/2002	8:40	
	12/3/2002	8:35	

Figure F.1. Attendance Report.

<div>Mthai Estate</div> <div>Employee Information Report</div> <div>March, 2002</div>											
		<div>Employee ID</div> 1001									
<div>Name</div>	Worakorn Kuruwongwattan	<div>Social No</div>	125402251								
<div>Birth Date</div>	7/1/1980	<div>Gender</div>	Male								
		<div>Status</div>	Single								
<div>Address</div> <div>125 Moo.5 Bangkhen</div> <div>Khwang Ladyao</div> <div>Province</div> Bangkok <div>Post Code</div> 10110 <div>Telephone</div> 02-7745859											
<div>Work Experience</div> <div>1 year at TTN Group as system administrator</div> <div>Education</div> <div>Adv. Diploma</div> <div>Hired Date</div> 15/1/2000 <div>TAX ID</div> 10245584210 <div>Position</div> Programmer <div>Department</div> HR <div>Salary</div> 25,000											
<div>Training Record</div> <table><tr><th>Course ID</th><th>Description</th><th>Trainer</th><th>Training</th></tr><tr><td>1001</td><td>English Basic1</td><td>Mark J. Mayer</td><td>25/1/2002</td></tr></table>				Course ID	Description	Trainer	Training	1001	English Basic1	Mark J. Mayer	25/1/2002
Course ID	Description	Trainer	Training								
1001	English Basic1	Mark J. Mayer	25/1/2002								

Figure F.2. Employee Information Report.

<i>Mthai Estate</i>			
<i>Benefit Information Report</i>			
<i>March, 2002</i>			
<i>Employee ID:</i> 1001			
<i>Name:</i> Worakorn Kuruwongwattana			
<i>MAX Financial Compensation:</i> 25,000			
<i>Medical Treatment details</i>			
<i>Record</i>	<i>Hospital</i>	<i>Cause description</i>	<i>Amount</i>
1/3/2002	รพ.เปาโล	ผ่าตัดไส้ติ่ง	15,000.00
22/3/2002	รพ.เปาโล	ไขหวัด	250.00
<i>Total Medical</i>			<u>15,250.00</u>
<i>Financial Compensation Credit Balance</i>			<u>9,750.00</u>

Figure F.3. Benefit Information Report.

<i>Mthai Estate</i> <i>Appraisal Plan Report</i> <i>March, 2002</i>				
<i>ID</i>	<i>Name – Surname</i> ★		<i>Salary</i>	<i>Department</i>
1001	Worakorn	Kuruwongwattana	25,000	HR
1002	Titipong	Aramsee	30,000	Accounting

Figure F.4. Appraisal Plan Report.

Mthai Estate

Applicant Information Report

March, 2002

Applicant No:1

Name:สุปรียา ไอรยรวงศ์

Social No:1254022478

Birth Date:1/12/1960

Gender:Female

Address:102 ถ.แจ้งวัฒนะ ต.ปากเกร็ด
อ.ปากเกร็ด จ.นนทบุรี 11120

Telephone No:02-9609658

Work Experience:
1 ปี ที่ บ.ไทยการ์เมนต์

Education:นิติศาสตรบัณฑิต

TAX ID:15245584448

Interview Date:10/10/2000

Comment:Good vision in organization

☒Result

☐Approved

Approved Date:

Approved by:

Figure F.5. Applicant Information Report.

Mthai Estate

Executive Report
(Summary Report for Management)

Attendance Report (Jan-Mar 2002)

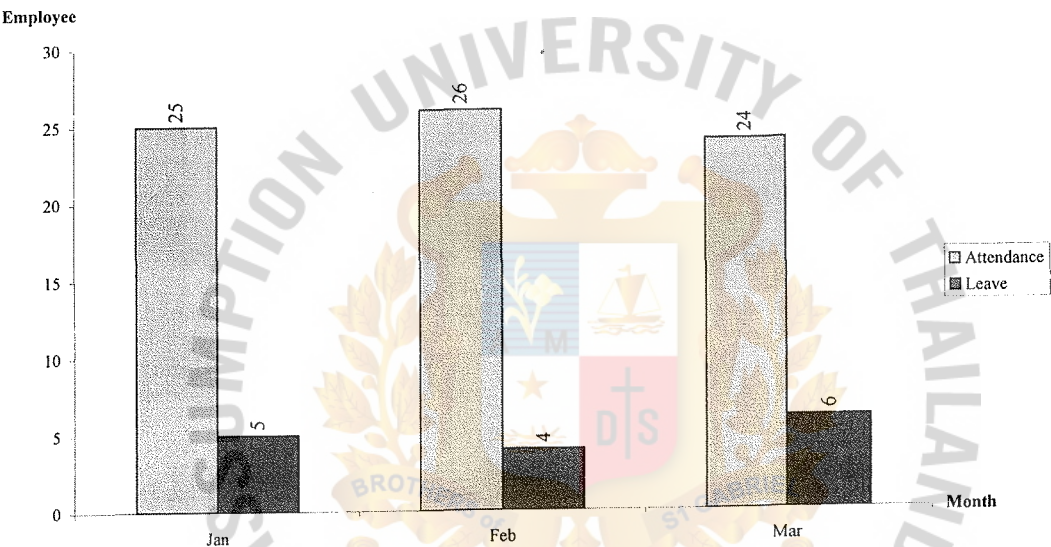


Figure F.6. Summary of Attendance Report.

Mthai Estate

Executive Report
(Summary Report for Management)

Benefit Report (Jan-Mar 2002)

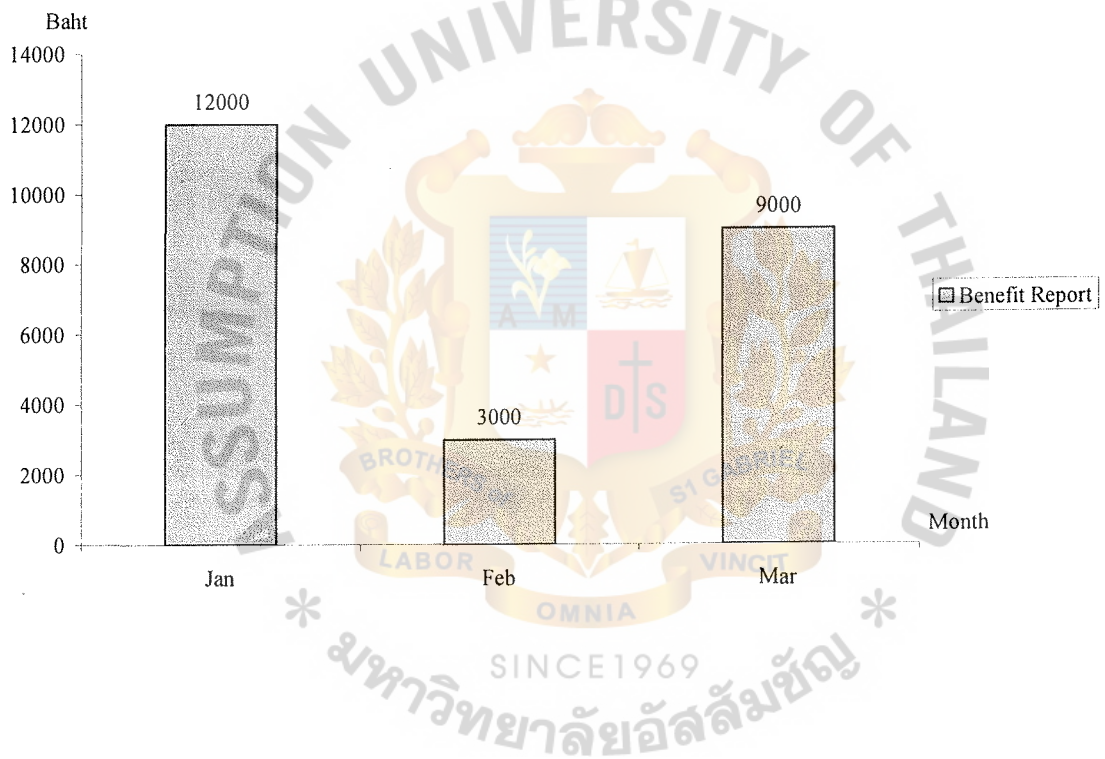


Figure F.7. Summary of Benefit Report.

Mthai Estate

Executive Report
(Summary Report for Management)

Appraisal Report (Jan-Mar 2002)

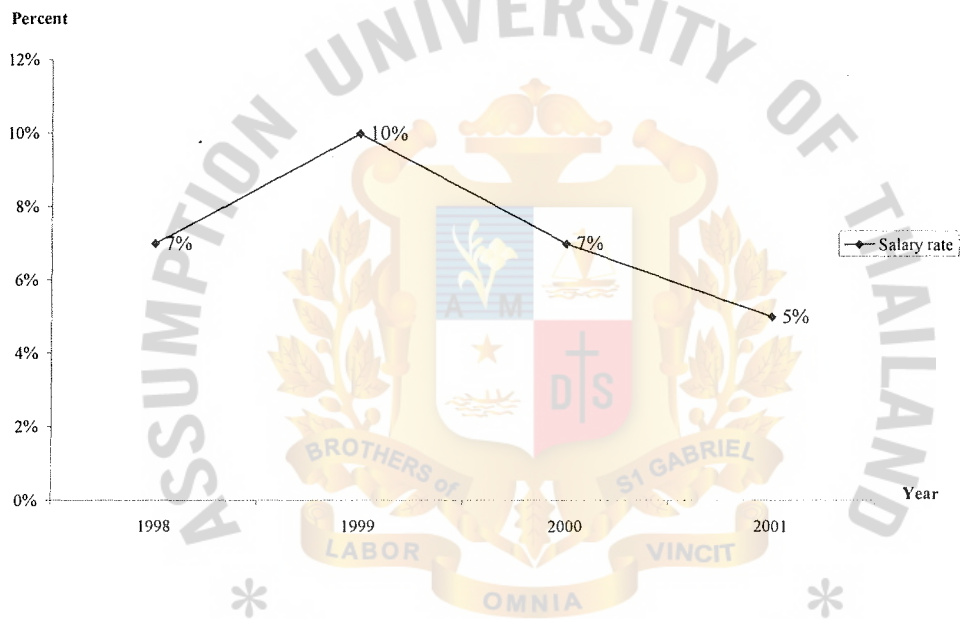


Figure F.8. Summary of Appraisal Report.

Mthai Estate

Executive Report
(Summary Report for Management)

Recruitment Report (Jan-Mar 2002)

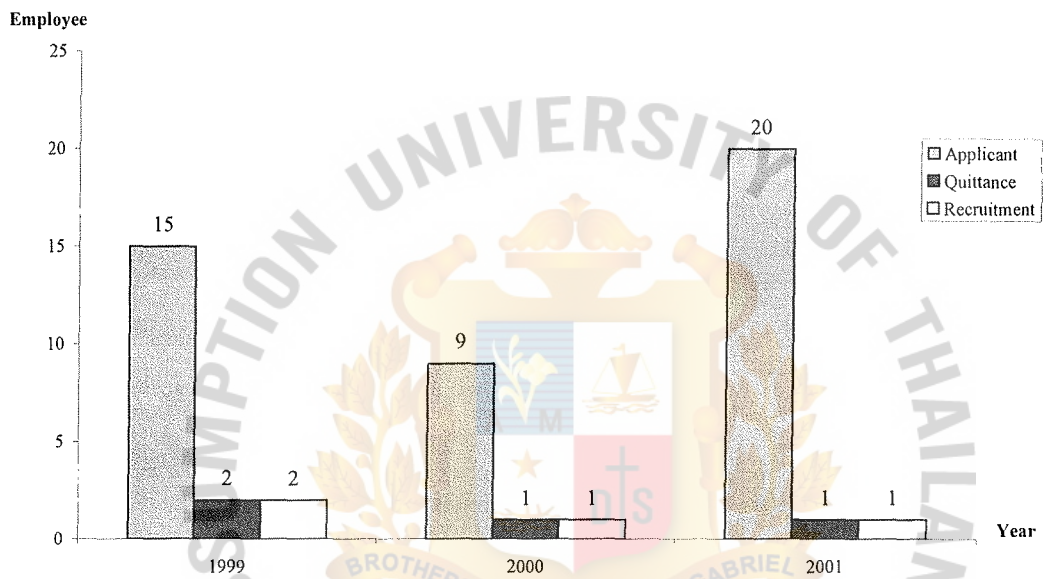


Figure F.9.1. Summary of Recruitment Report.

Mthai Estate

*Executive Report
(Summary Report for Management)*

Employee Turnover Report (Jan-Mar 2002)

**Annualized Employee Turnover Rate
(Regular, Full -Time Employees)**

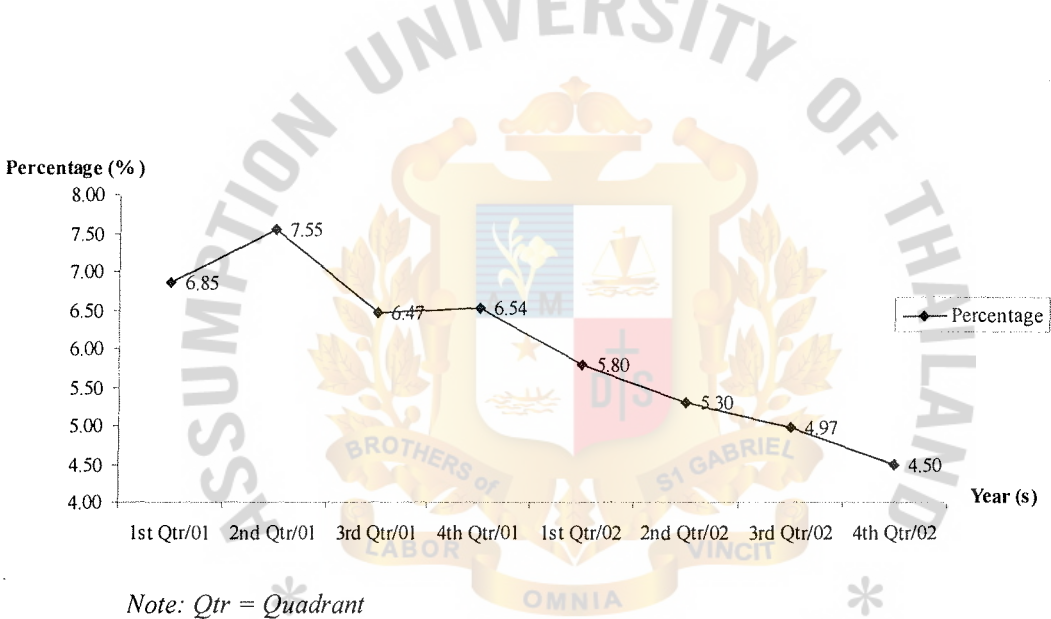


Figure F.9.2. Summary of Employee Turnover Rate Report.



APPENDIX G
INTERFACE DESIGN

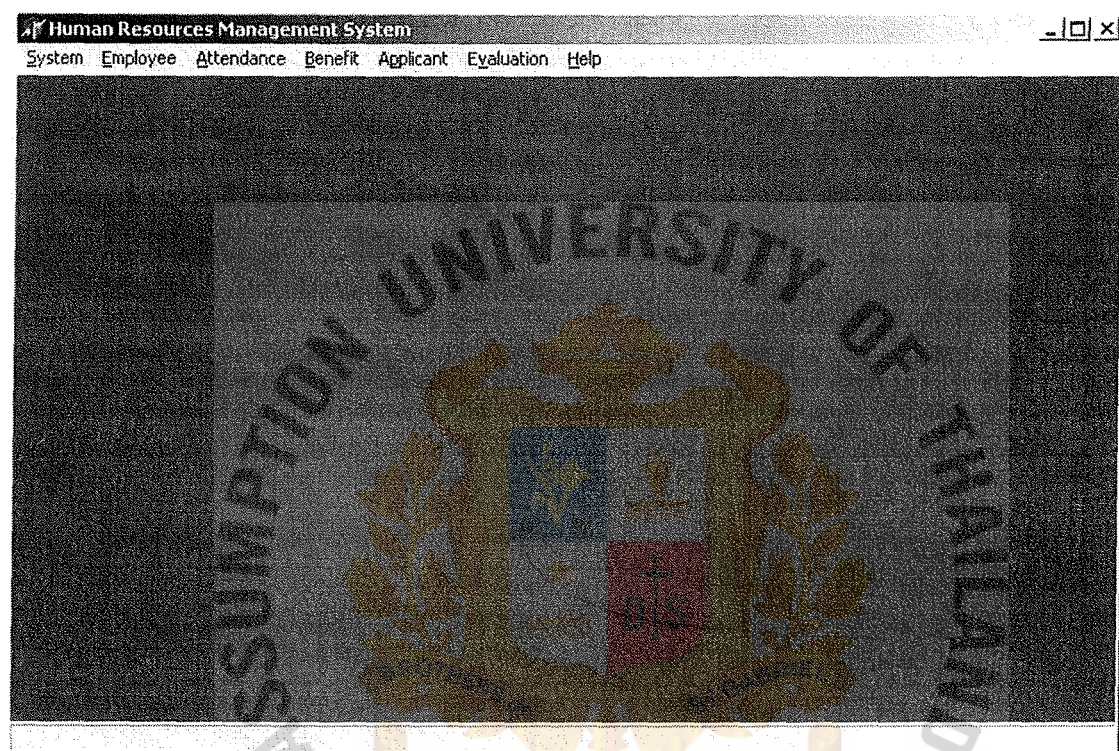


Figure G.1. Main Page.

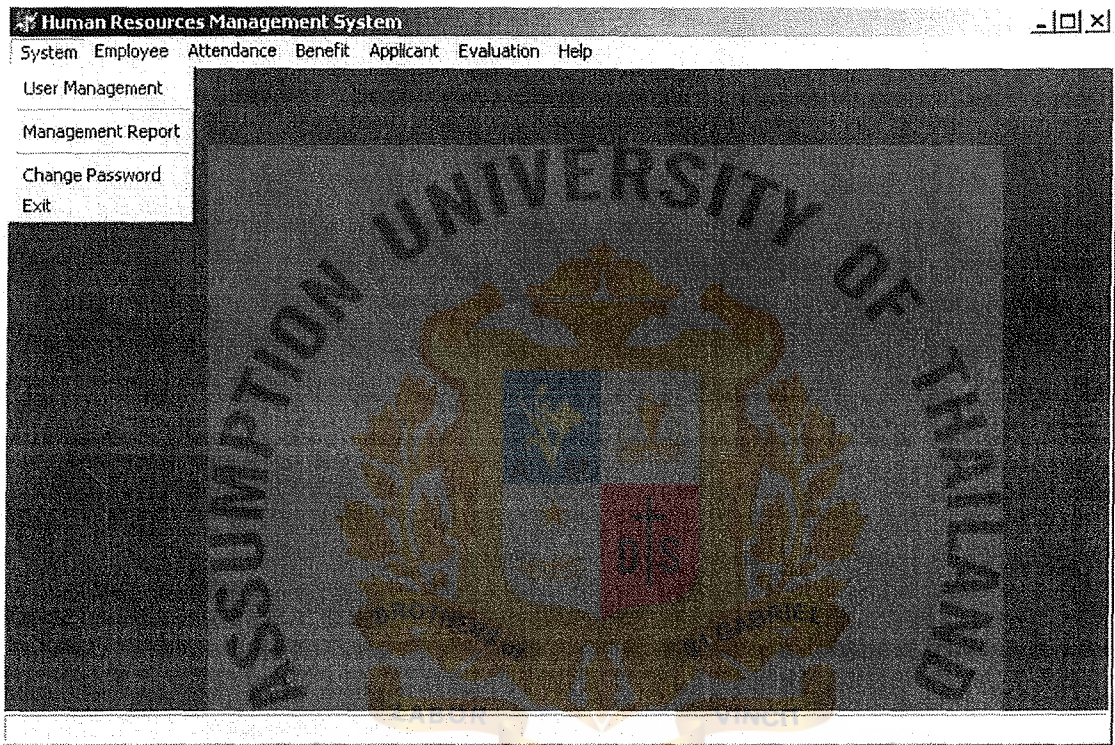


Figure G.2. System Menu.

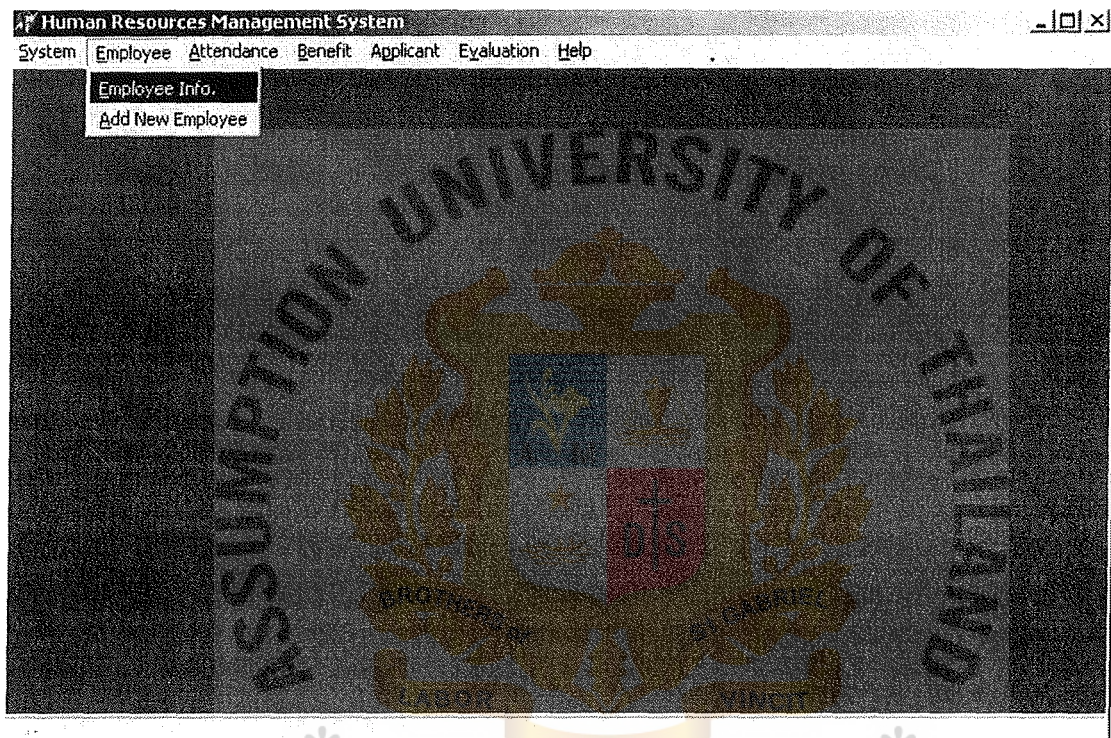


Figure G.3. Employee Menu.

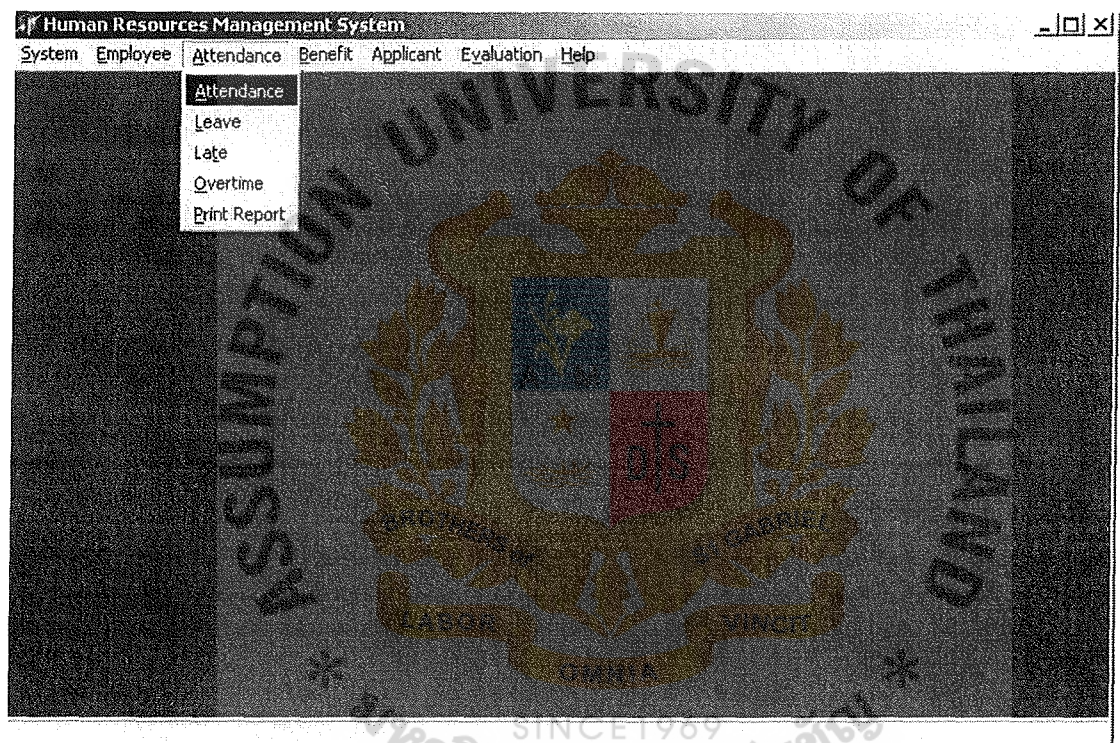


Figure G.4. Attendance Menu.

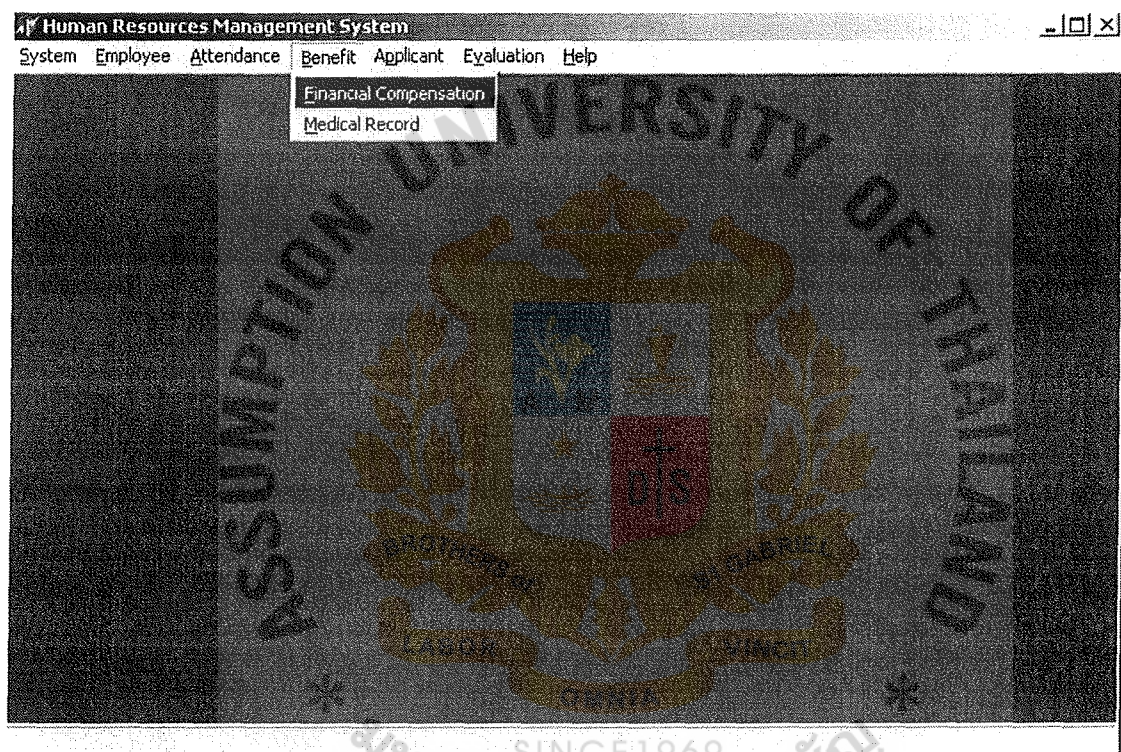


Figure G.5. Benefit Menu.

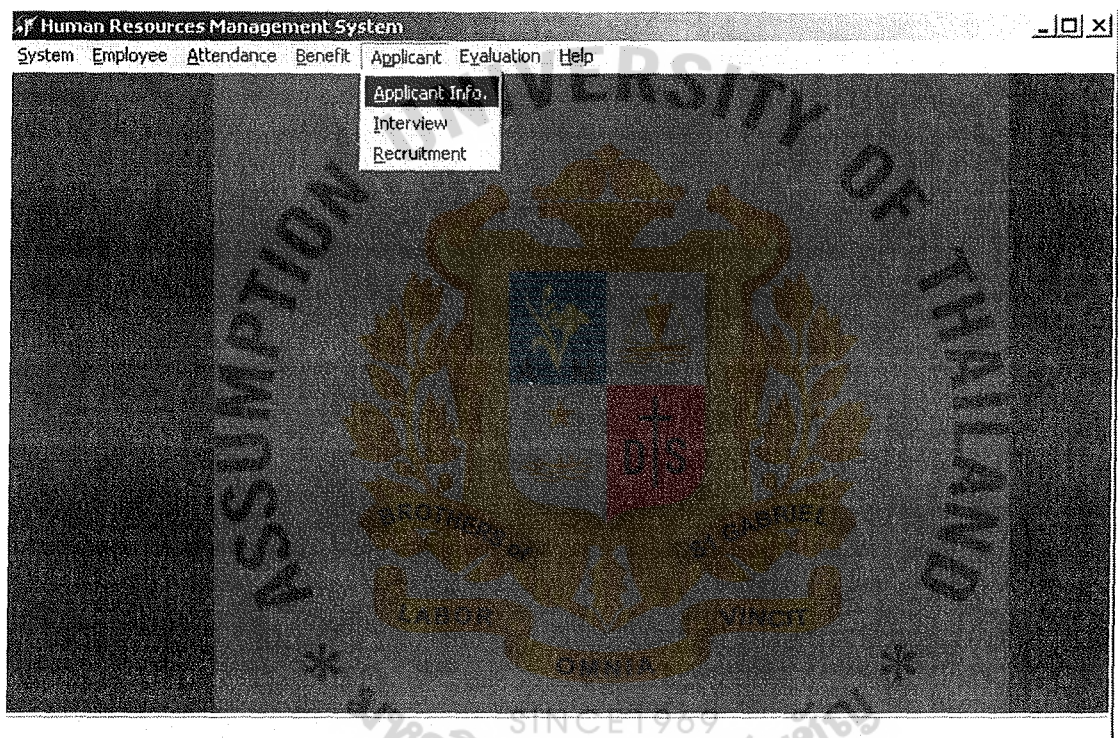
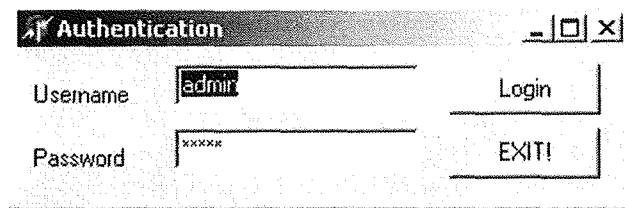


Figure G.6. Applicant Menu.



Figure G.7. Appraisal Menu.

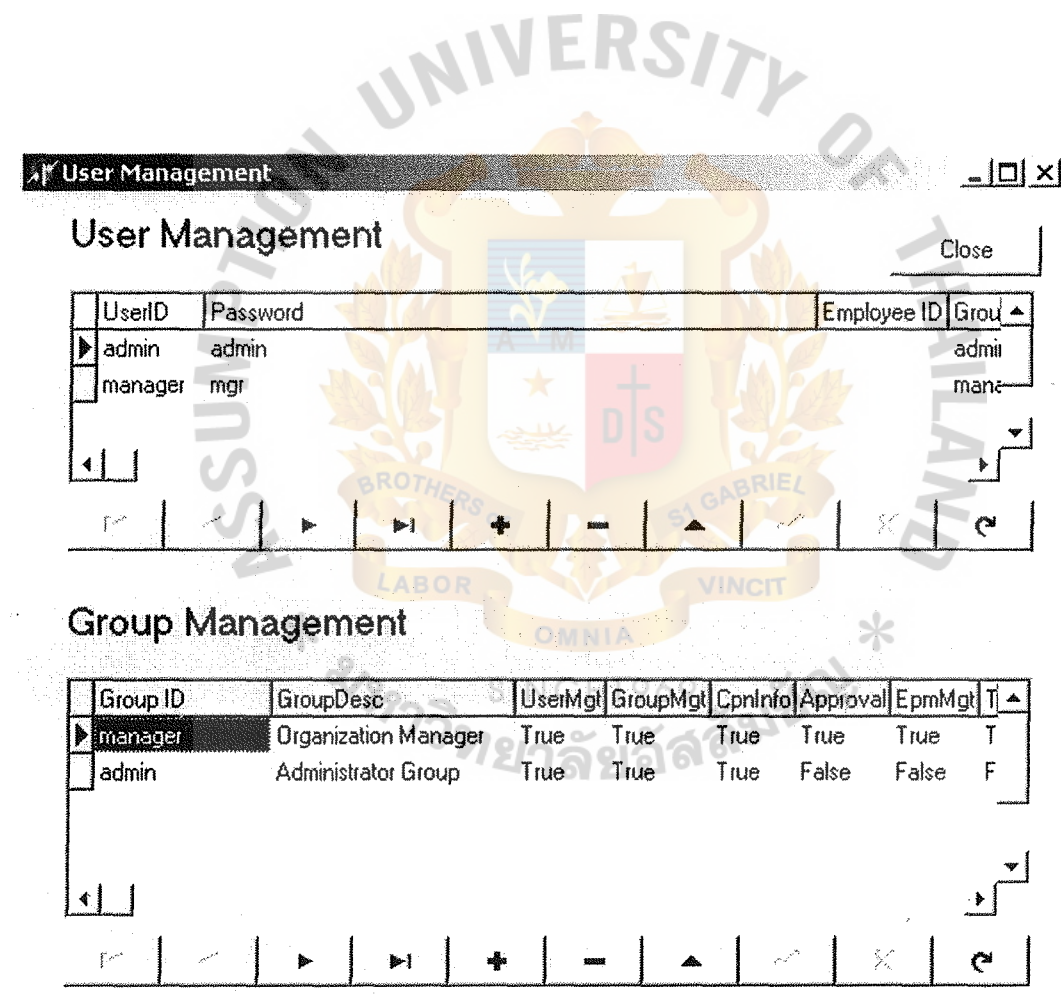


Authentication

Username: Login

Password: EXIT!

Figure G.8. Authentication Page.



User Management Close

UserID	Password	Employee ID	Group
admin	admin		admin
manager	mgr		manager

Group Management

Group ID	GroupDesc	UserMgt	GroupMgt	CpnInfo	Approval	EpmMgt	T
manager	Organization Manager	True	True	True	True	True	T
admin	Administrator Group	True	True	True	False	False	F

Figure G.9. User Management Page.

Change Password		
Old Password	<input type="password" value="XXXXX"/>	OK
New Password	<input type="password" value="XXXXX"/>	Cancel
Retype Again	<input type="password" value="XXXXX"/>	

Figure G.10. Change Password Page.

Employee Information		
Personal Information <div> <div>Employee ID <input type="text" value="1001"/></div> <div> <div>Name <input type="text" value="Worakorn"/></div> <div>Surname <input type="text" value="Kuruwongwattana"/></div> </div> <div> <div>Birthdate <input type="text" value="21/10/ 2522"/></div> <div>Gender <input checked="" type="radio"/> Male <input type="radio"/> Female</div> </div> <div> <div>Status <input type="text" value="Single"/></div> <div>Social ID <input type="text" value="1254022515"/></div> </div> </div>		<input type="button" value="Update"/> <input type="button" value="Search"/> <input type="button" value="Add"/> <input type="button" value="Close"/> <input type="button" value="Delete"/> <input type="button" value="Report"/>
Contact Information <div> <div>Address <input type="text" value="125 Moo. 5 Bangkhen"/></div> <div>Province <input type="text" value="Bangkok"/></div> </div> <div> <div>Post Code <input type="text" value="10110"/></div> <div>Telephone <input type="text" value="02-7745859"/></div> </div>		
Experience Information <div> <div>Working Experience <input type="text" value="1 year at TTN Group as system administrator"/></div> <div>Education <input type="text" value="Adv. Diploma"/></div> </div>		
Work Information <div> <div>Tax ID <input type="text" value="10245584210"/></div> <div>Hired Date <input type="text" value="3/11/ 2542"/></div> </div> <div> <div>Position <input type="text" value="Programmer"/></div> <div>Department <input type="text" value="HR"/></div> </div> <div> <div>Salary <input type="text" value="25000"/></div> </div>		
<div> <input type="button" value="Previous"/> <input type="button" value="Next"/> </div>		<input type="button" value="Training Info"/>

Figure G.11. Employee Information Page.

Add Employee Information

Add
Close

Personal Information

Employee ID

Name
Surname

Birthdate
2/2 / 2545
Gender
Male
Female

Status
Single
Social ID

Contact Information

Address
Province
Post Code
Telephone

Experience Information

Working Experience
Education

Work Information

Tax ID
Hired Date
2/2 / 2545

Position
Department

Salary

Figure G.12. Employee Information Page – Add Page.

Personal Search

Search following these information

Search

Close

Personal Information

Employee ID

Name

Surname

Birthdate

2 / 2 / 2545

Gender

Male

Female

Status

Single

Social ID

Contact Information

Address

Province

Post Code

Telephone

Experience Information

Working Experience

Education

Work Information

Tax ID

Hired Date

2 / 2 / 2545

Position

Department

Salary

Figure G.13. Employee Information Page - Search Page.

Attendance

Daily Attendance Checking

☒ Date

☐ Employee ID

Attendance ID	Employee ID	Attendance Date	Arrive Time
4	1001	23/1/2002	30/12/1899 8:3

Close

Figure G.14. Attendance Information Page

(Attendance Information and Search).

Late

Late Person checking

☒ Date
23/01/ 2545

☐ Employee ID

Late No	Employee ID	Late Date	Arrive Time
2	1001	23/1/2002	30/12/1899 8:3

Close

Figure G.15. Late Information Page
(Late Information and Search).

Overtime checking

Overtime checking

Date

24/01/ 2545

Search

Employee ID

Overtime ID	Employee ID	Overtime Date	Checkout Time
2	1001	24/1/2002	30/12/1899 18:30

Close

Figure G.16. Overtime Information Page
(Overtime Information and Search).

LeaveInfo

Leaving Information

Leave No

Employee ID Date

Name Surname

Leave Form To

☐ Sick
☐ Business
☐ Annual
☒ Other

Figure G.17. Leave Information Page
(Leave Information and Search).

Medical Treatment [X]

Medical Treatment No.: []

Employee ID: [1001] Search []

Name: [Worakorn] Surname: [Kuruwongwattana]

Date: [10/9 / 3087] Hospital: [รพ. เปาโล]

Cause Description: [ผ่าตัดไส้ติ่ง]

Amount: [15000]

[Add] [Delete] [Update] [Close]

Figure G.18. Medical Information Page.

Financial Compensation

Employee ID

1001

Search

FC No

1001

Name

Worakorn

Surname

Kuruwongwattana

Amount of FC

25000

Medical Treatment No	Employee ID	Record Date	Hospital	Cause
1	1001	10/9/2001	รพ. เปาโล	ผ่าตัด
2	1001	12/9/2001	รพ. เปาโล	ไข้หวัด

Balance

9750.00

Print

Add

Delete

Update

Close

Figure G.19. Financial Compensation Page.

Applicant Search

Search following information

Search

Close

Personal Information

Applicant ID

Name

Surname

Birthdate

2/2 / 2545

Gender

☐ Male
☐ Female

Social ID

Contact Information

Address

Province

Post Code

Telephone

Experience Information

Working Experience

Education

Figure G.21. Applicant Information Page – Search Page.

Interview [minimize] [maximize] [close]

Enter Applicant ID

Applicant Brief Information

Name	<input type="text" value="สุปรีญา"/>	Surname	<input type="text" value="ไธรรารวงค์"/>
Education	<input type="text" value="นิติศาสตรบัณฑิต"/>		
Work Exp.	<input type="text" value="1 ปี ที่ บ. ไทยการ์เมนต์"/>		

Interview Result

Comment

☐ Interview Result

Figure G.22. Interview Page
(Comment and Interview Result).

Recuitment and Approval

Enter Applicant ID

1

Search

Applicant Brief Information

Name

สุปธิญา

Surname

ไธรรวรงค์

Education

นิติศาสตรบัณฑิต

Work Exp.

1 ปี ที่ บ. ไทยการ์เม้นต์

Interview Result

Comment

30/7 / 2543

Good vision in organization

☒ Interview Result

Approval

APPROVE

CANCEL

Figure G.23. Recruitment Page.

Training Record

Employee ID

1001

Name

Worakorn

Surname

Kuruwongwattana

Training Record

	Employee ID	Training Course ID	Training Date
▶	1001	1001	14/11/1458

▶

▶

▶

+

-

▲

▼

↺

↻

Search

Close

Figure G.24. Training Record Page.

Evaluation [minimize] [maximize] [close]

Employee ID

Name Surname

Date

Evaluation

By

↶

↷

▶

◀

+

-

▲

↶

✕

↻

↶

↷

▶

◀

Figure G.25. Evaluation Information Page.

Mthai Estate

Leave Letter

Please fill in this form

Date	
Employee ID	
Date of leave	
Reason of leave	
Period of leave	to

Clear Submit

Done Internet

Figure G.28. Web Page of Online Leave Letter.

Mthai Estate

Medical Treatment Petition

Please fill in this form

Employee ID	
Date	
Place of treatment	
Symptom	
Expense	

Clear Submit

Done Internet

Figure G.29. Web Page of Online Medical Treatment Petition.

APPENDIX H
FINANCIAL ANALYSIS OF EACH CANDIDATE SOLUTION



Table H.1. Estimated Costs and Benefits for Candidate Solution 1, Baht.

Cost Items	Years				
	1	2	3	4	5
<u>Existing System:</u>					
Staff (increase 5% per year)	1,152,000	1,209,600	1,270,080	1,333,584	1,400,263
Operating Cost (increase 5% per year)	108,000	113,400	119,070	125,024	131,275
Utility Cost (increase 5% per year)	60,000	63,000	66,150	69,458	72,930
Total Cost	1,320,000	1,386,000	1,455,300	1,528,065	1,604,468
Cumulative Cost	1,320,000	2,706,000	4,161,300	5,689,365	7,293,833
<u>Proposed System:</u>					
Hardware Cost	61,060	61,060	61,060	61,060	61,060
Software Development Cost	80,000	80,000	80,000	80,000	80,000
Maintenance Cost	0	20,000	20,000	20,000	20,000
Staff (increase 5% per year)	864,000	907,200	952,560	1,000,188	1,050,197
Operating Cost (increase 5% per year)	96,000	100,800	105,840	111,132	116,689
Utility Cost (increase 5% per year)	48,000	50,400	52,920	55,566	58,344
Total Cost	1,149,060	1,219,460	1,272,380	1,327,946	1,386,290
Cumulative Cost	1,149,060	2,368,520	3,640,900	4,968,846	6,355,136

Table H.2. Payback Analysis of Candidate Solution 1, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development cost:	-400,000					
Operation & maintenance cost:		-116,000	-121,800	-127,890	-134,284	-140,998
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted costs (adjusted to present value):	-400,000	-103,588	-97,074	-91,057	-85,404	-79,945
Cumulative time-adjusted costs over lifetime:	-400,000	-503,588	-600,662	-691,719	-777,123	-857,068
Benefits derived from operation of new system:	0	432,000	453,600	476,280	500,094	525,099
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted benefits (adjusted to present value):	0	385,776	361,519	339,111	318,060	297,731
Cumulative time-adjusted benefits over lifetime:	0	642,960	1,004,479	1,343,591	1,661,650	1,959,381
Cumulative life time-adjusted costs + benefits:	-622,300	139,372	403,817	651,872	884,527	1,102,313

Table H.3. Net Present Value Analysis of Candidate Solution 1, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Development cost:	-400,000						
Operation & maintenance cost:		-116,000	-121,800	-127,890	-134,284	-140,998	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual costs:	-400,000	-103,588	-97,074	-91,057	-85,404	-79,945	
Total present value of lifetime costs:							-1,000,564
Benefits derived from operation of new system	0	432,000	453,600	476,280	500,094	525,099	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual benefits:	0	385,776	361,519	339,111	318,060	297,731	
Total present value of lifetime benefits:							1,702,197
Net Present Value:							701,633

Table H.4. Estimated Costs and Benefits for Candidate Solution 2, Baht.

Cost Items	Years				
	1	2	3	4	5
Existing System:					
Staff (increase 5% per year)	1,152,000	1,209,600	1,270,080	1,333,584	1,400,263
Operating Cost (increase 5% per year)	108,000	113,400	119,070	125,024	131,275
Utility Cost (increase 5% per year)	60,000	63,000	66,150	69,458	72,930
Total Cost	1,320,000	1,386,000	1,455,300	1,528,065	1,604,468
Cumulative Cost	1,320,000	2,706,000	4,161,300	5,689,365	7,293,833
Proposed System:					
Hardware Cost	61,060	61,060	61,060	61,060	61,060
Software Development Cost	20,000	20,000	20,000	20,000	20,000
Maintenance Cost	0	20,000	20,000	20,000	20,000
Staff (increase 5% per year)	864,000	907,200	952,560	1,000,188	1,050,197
Operating Cost (increase 5% per year)	96,000	100,800	105,840	111,132	116,689
Utility Cost (increase 5% per year)	48,000	50,400	52,920	55,566	58,344
Total Cost	1,089,060	1,159,460	1,212,380	1,267,946	1,326,290
Cumulative Cost	1,089,060	2,248,520	3,460,900	4,728,846	6,055,136

Table H.5. Payback Analysis of Candidate Solution 2, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development cost:	-100,000					
Operation & maintenance cost:		-96,000	-100,800	-105,840	-111,132	-116,688
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted costs (adjusted to present value):	-100,000	-85,728	-80,337	-75,358	-70,679	-66,162
Cumulative time-adjusted costs over lifetime:	-100,000	-185,728	-266,065	-341,423	-412,102	-478,264
Benefits derived from operation of new system:	0	432,000	453,600	476,280	500,094	525,099
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted benefits (adjusted to present value):	0	385,776	361,519	339,111	318,060	297,731
Cumulative time-adjusted benefits over lifetime:	0	642,960	1,004,479	1,343,591	1,661,650	1,959,381
Cumulative life time-adjusted costs + benefits:	-100,000	457,232	738,414	1,002,168	1,249,548	1,481,117

Table H.6. Net Present Value Analysis of Candidate Solution 2, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Development cost:	-400,000						
Operation & maintenance cost:		-116,000	-121,800	-127,890	-134,284	-140,998	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual costs:	-400,000	-103,588	-97,074	-91,057	-85,404	-79,945	
Total present value of lifetime costs:							-1,000,564
Benefits derived from operation of new system:	0	432,000	453,600	476,280	500,094	525,099	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual benefits:	0	385,776	361,519	339,111	318,060	297,731	
Total present value of lifetime benefits:							1,702,197
Net Present Value:							701,633

Table H.7. Estimated Costs and Benefits for Candidate Solution 3, Baht.

Cost Items	Years				
	1	2	3	4	5
<u>Existing System:</u>					
Staff (increase 5% per year)	1,152,000	1,209,600	1,270,080	1,333,584	1,400,263
Operating Cost (increase 5% per year)	108,000	113,400	119,070	125,024	131,275
Utility Cost (increase 5% per year)	60,000	63,000	66,150	69,458	72,930
Total Cost	1,320,000	1,386,000	1,455,300	1,528,065	1,604,468
Cumulative Cost	1,320,000	2,706,000	4,161,300	5,689,365	7,293,833
<u>Proposed System:</u>					
Hardware Cost	61,060	61,060	61,060	61,060	61,060
Software Cost	42,200	42,200	42,200	42,200	42,200
Implement Cost	21,200	21,200	21,200	21,200	21,200
Staff (increase 5% per year)	864,000	907,200	952,560	1,000,188	1,050,197
Operating Cost (increase 5% per year)	96,000	100,800	105,840	111,132	116,689
Utility Cost (increase 5% per year)	48,000	50,400	52,920	55,566	58,344
Total Cost	1,132,460	1,182,860	1,235,780	1,291,346	1,349,690
Cumulative Cost	1,132,460	2,315,320	3,551,100	4,842,446	6,192,136

Table H.8. Payback Analysis, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development cost:	-622,300					
Operation & maintenance cost:		-96,000	-100,800	-105,840	-111,132	-116,688
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted costs (adjusted to present value):	-622,300	-85,728	-80,337	-75,358	-70,679	-66,162
Cumulative time-adjusted costs over lifetime:	-622,300	-708,028	-788,365	-863,723	-934,402	-1,000,564
Benefits derived from operation of new system:	0	432,000	453,600	476,280	500,094	525,099
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted benefits (adjusted to present value):	0	385,776	361,519	339,111	318,060	297,731
Cumulative time-adjusted benefits over lifetime:	0	642,960	1,004,479	1,343,591	1,661,650	1,959,381
Cumulative life time-adjusted costs + benefits:	-622,300	-65,068	216,114	479,868	727,248	958,817

Table H.9. Net Present Value Analysis, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Development cost:	-622,300						
Operation & maintenance cost:		-96,000	-100,800	-105,840	-111,132	-116,688	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual costs:	-622,300	-85,728	-80,337	-75,358	-70,679	-66,162	
Total present value of lifetime costs:							-1,000,564
Benefits derived from operation of new system	0	432,000	453,600	476,280	500,094	525,099	
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	
Present value of annual benefits:	0	385,776	361,519	339,111	318,060	297,731	
Total present value of lifetime benefits:							1,702,197
Net Present Value:							701,633

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