Hotel Front Office Information System for East Hotel

by

Mr. Tanuchai Vesaracharnont

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

MS (CIS)

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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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Project Title	Hotel Front Office Information System for East Hotel
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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.
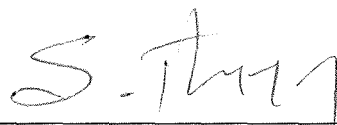
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ABSTRACT

This system, Hotel Reservation System, is developed from the manual system to be computerized for Front Office Department of East Hotel. The existing system in which processing, handling and filling are done manually cause many mistakes that are associated with manual operations. Then, the new proposed system is developed to eliminate all those problems.

The study is mainly focused on computerization of the Hotel Reservation Operation. The existing system is studied and analyzed. The new system is designed to solve and minimize the problem in the existing system and provide accurate and timely information to the top executives for making decisions.

The areas of the proposed system are room reservation, filling information such as guests' record, rooms' records, reservations' record, etc. and generating reports. This project consists of objectives and scope of the project, the company background, the existing business functions, the current problems and areas for improvement, the user requirements for the proposed system include system design, hardware and software requirement, security and control, system cost evaluation and comparison, etc.

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ACKNOWLEDGEMENTS

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1.1 Background of the Project

The East hotel is a middle size hotel. This hotel has 142 rooms. For the system that we use now, there are front officers to operate all processes that occurred when guests come in. Every steps of the process is a manual system.

An information system is an integration of system components, such as processes, data, networks and technology that helps to improve day to day operation and decision making processes.

The major operation of front officers in the reservation system are guest check in/out, special services and responsible for processing billing and payment and generate the daily report to accounting department.

Processes that occurred when the guest check in:

There are 2 types of guest's walk in guests and reservation guests. When the guests come in, front office will ask whether the person has a reservation. And check the name from the reservation list. It takes a long time and problems may occur if there is no guest name in the list. The front office should immediately search for a new available room for him.

Before the guest gets the room, he must fill the registration form. And then the front officer will ask for the planned length of stay and how to pay and write it on registration form.

Processes that occurred when the guest check out:

After the guest checks out from the hotel, front officer will collect all activities that are room rate and other charges for calculating the guest's payment. Payment is

usually made by cash or credit card. And the daily report must be prepared and sent to accounting department.

1.2 Objectives of the Project

The main objectives of this project is to design the reservation system for East Hotel, so the front officers can work more effectively and efficient. The new reservation system will be designed based on the changed environment. It will replace the existing system which cannot support the new environment.

To achieve these objectives, several tasks are conducted in this project. The tasks are as follows

    (1)   Studying the existing system of the hotel reservation system.

    (2)   Identifying the real problems and users.

    (3)   Establishing the hotel reservation system.

    (4)   Reducing the cost of paper storage.

    (5)   Comparing between new system and old system.

    (6)   Utilizing the use of database approach to generate efficient design and generate report.

    (7)   Designing the GUI – based reservation system to cover all requirements and preparation for the expansion of the system.

1.3 Scope of the Project

The scopes of the project is limited to the system of reservation, which starts from guest check in to the hotel through check out from the hotel and the information of guest and all information when guest stays at the hotel.

The lists of our scope are as below:

    (1)   Information when guest checking in

        (a)   Guest information.

(b)   Control available room for guest.

(c)   Room rate and planned length of stay.

(2)   Information when guest checks out

     (a)   Combine all service that guest used when he stays in the hotel.

     (b)   Calculating the final payment of guest.

     (c)   Keep information of the hotel

     (d)   Number of room.

     (e)   Type of room.

     (f)   Room rate.

     (g)   Discount rate.

(3)   Keeping information of reservation guest

     (a)   Name of reservation guest.

     (b)   Number of room to be reserved.

     (c)   Arrival date.

     (d)   Departure date.

(4)   Generate the daily report and month ending report to front Office department.

1.4   Deliverables

The deliverables for the project on Hotel Reservation Information System for East Hotel are as follows:

(1)   Room database

(2)   Reservation database

(3)   Designing user interface

(4)   System objective

(5)   Report

(6)   A software package

(7)   Input and output screen design

1.4.1 Input

(1)   Room information

(2)   Customer information

(3)   Reservation information

1.4.2 Output

(1)   Update room information

(2)   Update customer information

(3)   Update reservation information

(4)   Report

1.5   Project Plan

This project plan of East Hotel: Hotel Reservation Information System is given in

Figure 1.1.

No.	Task Name	Feb 1	Feb 2	Feb 3	Feb 4	Mar 1	Mar 2	Mar 3	Mar 4	Apr 1	Apr 2	Apr 3	Apr 4	May 1	May 2	May 3	May 4
I.	System Analysis																
1	Define the Objective and Scope																
2	Study the Existing System																
3	Identify the Existing Problems																
4	Studying the Existing Computer System																
5	Develop Context Diagram																
6	Develop Data Flow Diagram																
7	Cost & Benefit Analysis																
II.	System Design																
8	Graphic User Interface Design																
9	Report Design																
10	Database Design																
11	Network Design																
12	Program Design																
III.	System Implementation																
13	Coding																
14	Testing																
15	Hardware Installation																
16	Software Installation																
17	Conversion																

Figure 1.1. Project Plan for Front Office Information System for East Hotel.

II. THE EXISTING SYSTEM

2.1 Background of the Organization

East Hotel Company Limited has been established since 1976. This hotel is located in Chantaburi province. East Hotel has room capacity of 142 rooms, so it is a middle size hotel. The ground floor is hotel lobby, restaurant and coffee shop. In the second, there is a banquet hall that can serve 500 people and a nightclub. Finally, from the third floor to ninth floor are the hotel rooms. Especially on the fourth floor, there is a big swimming pool. Special services that are provided for guests are as follows:

(1) Room service, laundry and ironing service

(2) Telephone capable of connecting with internal & external telephone through the hotel private switch board

(3) Safe deposit service

The guests are Thai people and foreigners that come to do business at Chantaburi. The room rate of East hotel are as follows:

(1) Twin room rate   550 Baht

Room specification

The standard room has air conditioning, television with 12 channels from cable, two single beds, private bath and shower with hot/cold water.

(2) Suite room rate   825 Baht

Room specification

The suite room is of bigger size than standard room. This room has air conditioning, television with 12 channels from cable, refrigerator, two single beds, private bath and shower with hot/cold water

(3)   VIP room rate   1,300 Baht

Room specification

       The VIP room is of large size and more private and comfortable. This room has air conditioning, television with 12 channels from cable, two single beds, private bath and shower with hot/cold water.

(4)   VIP Deluxe room rate   1,700 Baht

Room specification

       The VIP Deluxe room has the largest size room in the hotel, more private and comfortable. This room has air conditioning, television with 12 channels from cable, sofa, two single beds, private bath and shower with hot/cold water.

2.2   Organization

       There are 7 departments under the Managing Director's control. They are Accounting Department, Marketing Department, Personnel Department, Front office Department, Housekeeping Department, Maintenance Department and F&B Department.

(1)   Front-office Department

       This department takes care of all activities about the reservation, check-in and check-out process.

(2)   Marketing Department

       Marketing Department takes charge in marketing strategy. Its main responsibilities are making marketing plan of hotel.

(3) Personnel Department

Personnel Department is responsible for manpower management that is concerned about recruiting, keeping employee record, supporting payroll system, providing social welfare, provident fund and life insurance.

(4) Accounting Department

Its major responsibilities of Accounting Department are about controlling and recording all hotel accounting and cash flow of the hotel.

(5) Housekeeping Department

This department is responsible for the cleanliness and completeness of room and all areas in the hotel. The room will be made by maid and the others are except the room is responsible by cleaner.

(6) Maintenance Department

This department is responsible to fixes all equipment in the hotel both in the room and outside the room.

(7) Food and Beverage Department

This department is responsible about the food and beverage service to the guests both normal service and banquet.

The organization chart will be shown in Figure 2.1.

```
                        ┌─────────────┐
                        │  President  │
                        └──────┬──────┘
                               │
                        ┌──────┴──────┐
                        │   General   │
                        │   Manager   │
                        └──────┬──────┘
                               │
    ┌──────────┬──────────┬────┴─────┬──────────┬──────────┐
┌───┴────┐┌────┴────┐┌────┴────┐┌────┴────┐           ┌────┴─────┐
│Marketing││Personnel││Accounting││Housekeeping│        │Food &    │
│Department││Department││Department││Department│         │Beverage  │
└───┬────┘└─────────┘└─────────┘└─────────┘           │Department│
    │                                                  └──────────┘
┌───┴────┐                          ┌──────────┐
│Front office│                       │Maintenance│
│Department│                         │Department │
└────────┘                          └──────────┘
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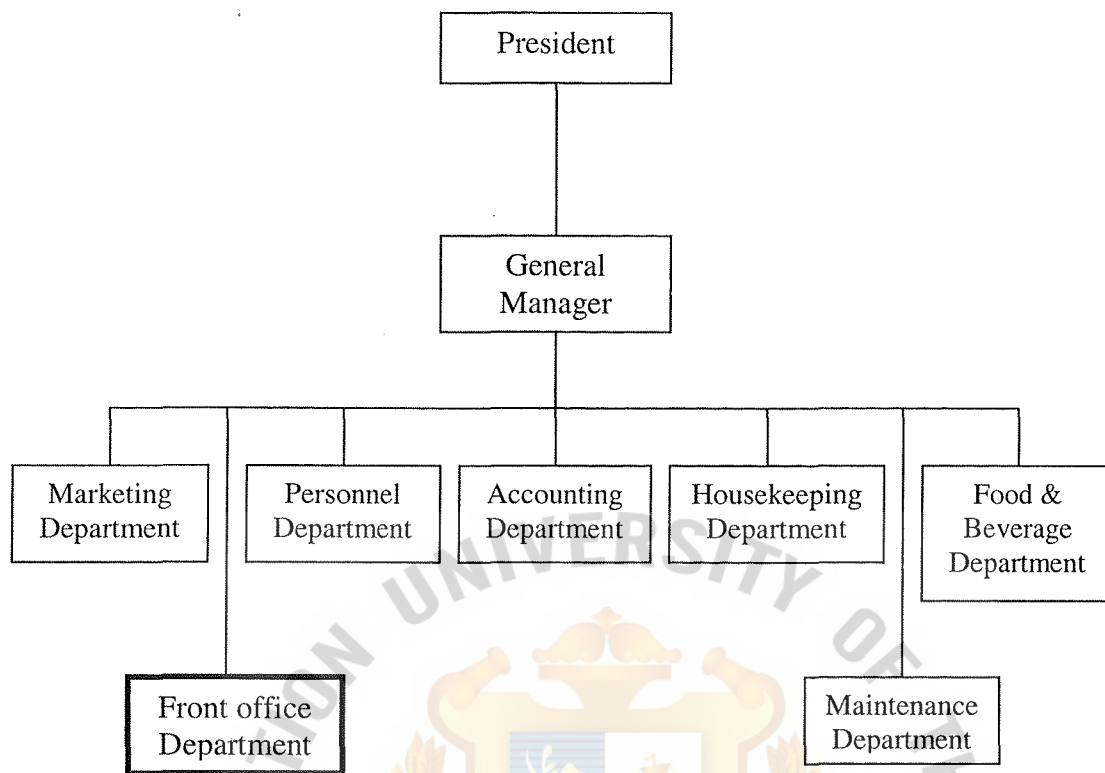
Figure 2.1. Organization Chart.

2.3   Current Problems and Areas for Improvements

Current Problems

After discussion and interview have been performed, with the personnel involved the current problems of the existing Hotel Reservation System can be identified as follows:

(1)   Inaccuracy and unavailability of information needed

If timely and accurate information cannot be provided to top management for decision making, then, the decision may be full of mistakes. With the current system, it is very difficult to support all information within the time. Sharing information with several users at the same time is impossible in the current system.

(2)   Too much paper work

Mostly, the information concerning employees are recorded on paper. The large volume of personnel can cause the company to waste space in keeping those papers. The work may be loaded at somebody's department in the process.

(3)   Repetitive work

Some work may be done repetitively which creates inaccurate information and some data are lost in the process.

(4)   Unsmooth workflow

The workflow may be interrupted when some personnel are not available at that time. Then, the work may be done inefficiently.

(5)   Not enough facility to support workflow

Due to the manual operation, all the work can be done very slowly. It is very difficult and takes more time in filing and searching for the information needed. There is no convenient equipment to increase speed of work.

(6)   Lack of security control

The existing system still does not have a good measure to make security control. The information can be damaged and lost easily.

(7)   Ineffective personnel

The personnel in the department seem to be sufficient but the productivity is quite low. So, it can cause the operation cost to be higher.

(8)   Human errors

Front Office staffs can make the mistake during recording guest' information or making reports. Poor handwriting can make big trouble.

Areas for Improvements

The existing Hotel Reservation System is still a manual system. It is not suitable in updating reservation and guest records. When people deal with a great deal of information, there is more chance to make errors.

Furthermore, the speed in processing is quite slow as well. It is very difficult to improve the consistency. Information and reports with errors can cause a lot of damage to the company.

Front Office Department needs to improve the inputting of information system, which will facilitate employees' performance, evaluation, planning and managing. The new way of inputting information should reduce the amount of paperwork in order to reduce the operating cost spent on storing and maintaining data.

Usually, the company has training programs, seminars, or projects several times a year. The filing of such information is still not good. It takes much time in finding some needed information. The filing system of the information should be considered.

New facilities, hardware and software, should be introduced to the Front Office Department. So, the front office staffs must learn to use them effectively. This can reduce the mistakes occurred from human errors and smooth the workflow as well. With the new tools, the security control will be better and guaranteed. The chance of losing data in the process will be decreased.

2.4 Existing Hotel Reservation System

The area under study of this project covers all functions of the reservation system that covers check in, check out and create summary report to accounting department. The existing business function of the reservation system are as follows:

(1) Collect information of all guests when they check in.

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(2)   Check available room for the guest and if they are reservation guests, front office will check the name from the reservation list.

(3)   Give the information about how many types of room, rooms rates and ask the guest for the planned length of stay and how to pay, by cash or credit card.

(4)   Check the information of guests and all activities that the guests use when they stay in the hotel, when the guests check out.

(5)   Calculate the payment that includes the room rate, other charges that have been occurred at hotel in the period that they stay such as laundry, food and beverage, telephone and etc..

The context diagram of the existing system is shown in Figure 2.2.
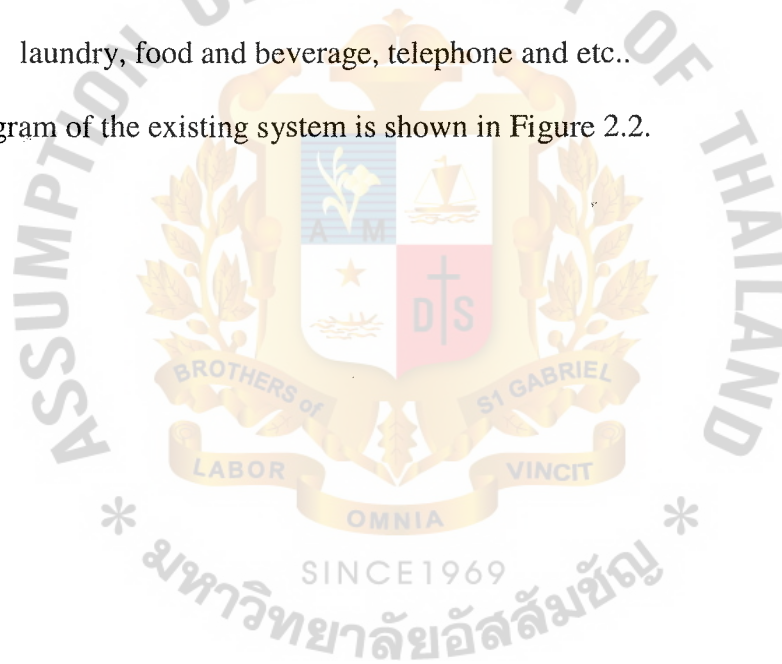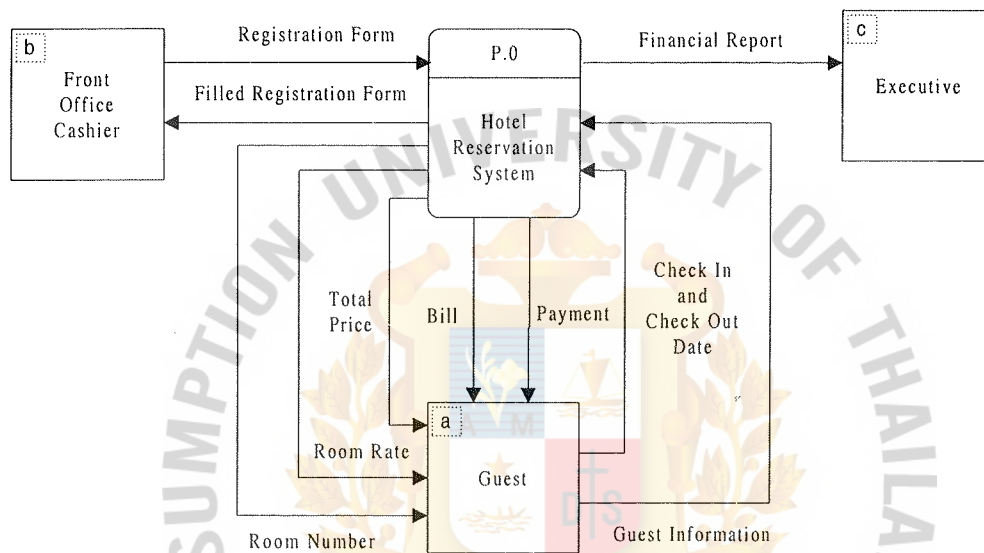
Figure 2.2.   Context Diagram of the Existing System.

III. THE PROPOSED SYSTEM

3.1 User Requirements

According to the analysis of the existing system, all the processes such as collecting information, storing information and producing reports are done manually, so that to jobs of the front officers have to be designed with a new system to be computerized. For example, if we ease the collection all of the information by using computer, it would be easy to input the data and it can automatically store data to the safe database.

For guests to reserve for rooms, they can contact front office in many ways such as telephone and fax. The front office can easily check for the room available by room type or room rate from the database of the hotel directly and tell the quests immediately. And when they arrive at the hotel, the front office can search for their reservation date and room type just in a minute. For calculating the room and other payments of the guest, it would be easier because the new system can retrieve all the payment information from the database. As easy as other functions, producing the report for executive management will be faster and on time for forecasting room sales and occupy and other reports needed. These information are very important for management both short term and long term plan.

3.2 System Design

The new system design of the project concern the functional areas of "Hotel Reservation", some repetitive tasks have been eliminated and because of the computerized system there are increasing productivity of work. The context diagram of the proposed system is shown in Figure 3.1, and the details of their processes are shown in Figure 3.2.

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Figure 3.1. Context Diagram of Hotel Front Office information System.

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The different between the existing system and the proposed system are described as follows:

(1)   The number of the departments involved manually.

In the existing system there were many departments involved manually such as Room Service, which has to submit all other expenses made by the guest like Food &Beverage expense, telephone expense, etc. to Front Office department before the guest wants to check out. Another expense of departments involved manually is Accounting Department that needs all the financial reports from Front office Department.

(2)   Process check room available.

In the existing system, the process of checking for room availability is taking a long time and there are a lot of chances for making mistakes. Now this process is turned to a computerized system so it takes less time and is more reliable and accurate.

(3)   The way reports are produced.

The existing system has problems when many departments need the reports at the same time. Due to the manual system, all person in the front office department have to write the reports manually; consequently, the reports have rough handwriting, and contain lots of mistake and take a long time. For the proposed system, computers have generated all reports. It is faster and highly accurate to produce. The details of the new proposed system can be seen in Figure 3.2. The main processes of the new proposed Hotel Reservation System could be divided into five processes.

(4)   Process input and store data.

In the existing system the data are inputted and stored in paper in the file which have less security and is more unreliable and inaccurate. Now the inputting and storing process is computerized which can solve these problems.

The data flow diagram for all five processes can be seen in Figure 3.2. All of these five functional parts will be described as follows:

(1)   Update Room Available

(2)   Update Reservation Information

(3)   Update Guest Information

(4)   Check In

(5)   Check Out
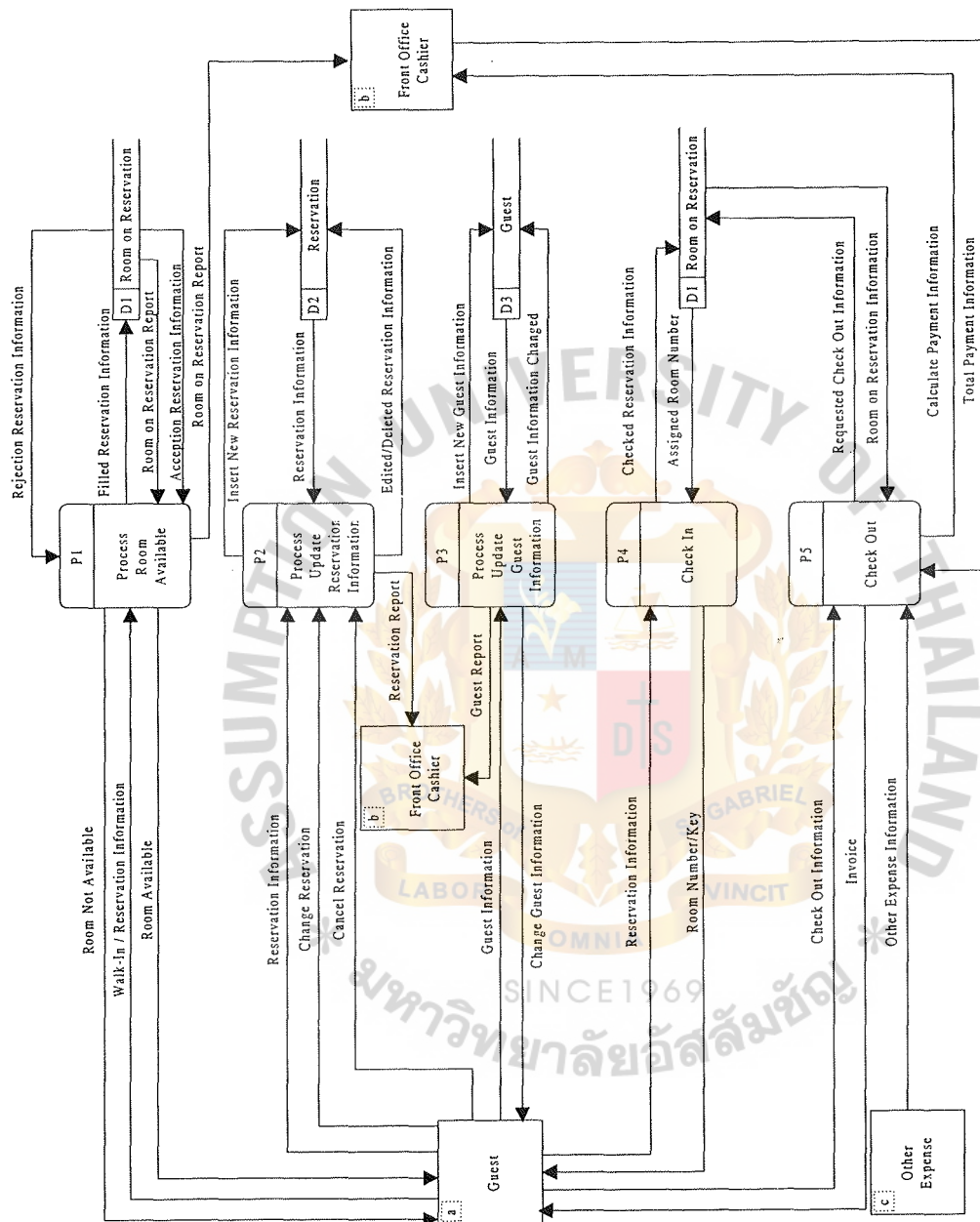
Figure 3.2. Data Flow Diagram Level 0 of the Proposed System.

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Process 1.0 Room Available.

For this process, there are four sub-processes, which are:

      1.1   Check Room Available

      1.2   Reject Reservation

      1.3   Accept Reservation

      1.4   Request for Report

The data flow diagram for this process can be seen in Figure B.2.

The process starts when a guest wants to reserve a room, the process must check for rooms availability. This process will check the room available by looking in to the reservation database. After checking in the reservation database, if the room is not available then the reservation rejection process will pass the reject message to the guest. But If the room is free then the accept message will be sent to the guest. Now if there are any requests for the room available report, there must be requested by Front Office Department to ask for the report and this report will take all the information from room reservation database and pass this report to the issuing report process to Front Office department.

Process 2.0 Update Reservation Information.

For this process there are four sub-processes which are:

      2.1   Create Reservation Information

      2.2   Edit Reservation Information

      2.3   Delete Reservation Information

      2.4   Generate Reservation Report

The data flow diagram for this process can be seen in Figure B.3.

The process starts when a guest knows that rooms are available, the guest must tell all the reservation information needed to create reservation information process and

keep all of them to reservation database. And if guest wants to change the reservation date, the process has to go back to the check room available process and come to update information process to change the reservation information. In case the guest just wants to cancel the reservation, the reservation information will be deleted in the delete reservation information process at reservation database. If there are any request for report about reservation in formation, there must be a requested by front office department to requests for report and this reports will take all information from reservation database and pass the report to issue report process and to front office department.

Process 3.0 Update Guest Information.

For this process, there are three sub-processes, which are:

      3.1   Create Guest Information

      3.2   Edit Guest Information

      3.3   Generate Guest Report

The data flow diagram for this process can be seen in Figure B.4.

The process starts when reservation information has already been inputted, now the guests have to give their personal information. First process, create guest information, guest must give their information to keep in guest database. If the guest wants to change information, the process must go to process update guest-information to change information at guest database. Next if there are any requests for report about guest information, it must be requested by front office department to request for report and this report will take all information from guest database and pass the report to issue report process and to the front office department.

Process 4.0 Check In Process.

For this process, there are two sup-processes, which are:

      4.1   Request for Check In

      4.2   Issued Room Number

The data flow diagram for this process can be seen in Figure B.5.

     The process starts when guests come to the hotel and have already reserved for the room. When they come in they just tell their name or their reservation information to the process check in, the process will check for the room number from room reservation database and passes room number to issued room number process and to the guest.

Process 5.0 Check Out Process.

For this process, there are four sub-processes, which are:

      3.1   Request for Check Out

      3.2   Calculate Guest Payment

      3.3   Print Invoice

      3.4   Issue Invoice

The data flow diagram for this process can be seen in Figure B.6.

     This process starts when guest wants to check out, first guests have to request for check out at process request for check out to send room number to room on reservation database in order to know all the information needed to calculate quest expense at calculate guest expense process. At this process other expense will need to calculate. After calculate guest expenses the invoice must be printed and issued to the guest.

<u>Application Architecture</u>

<u>Network Architecture</u>

The company applies Client/Server network architecture using Ethernet's Star Topology. The operating system that the company uses as network OS is Microsoft Windows NT Server. And all the clients OS is Microsoft Windows 98. The network configuration is shown in Figure 3.3.

From Figure 3.3, there is one server connected with four workstations. The computer server is located in the computer room of Front Office department. Two computers are in Front Office Cashier. The other two are in the computer room of Front Office department.

Moreover, the database server, instead of file server, is installed to store the data so that all database commands will be executed on this database server and returns only the result . The database servers generate much less network traffic.
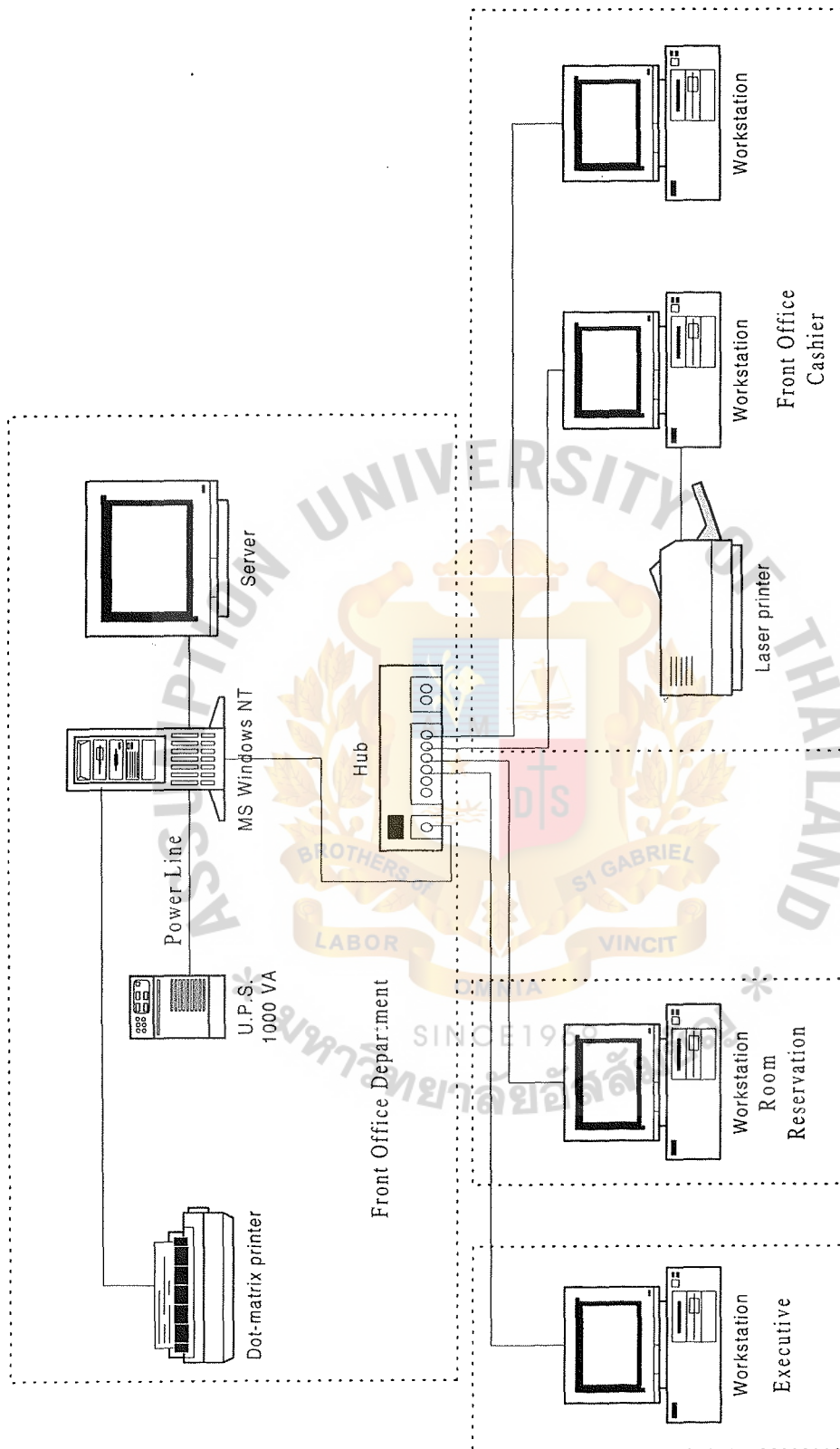
Figure 3.3. Network Configuration.

Data Architecture

The company uses RDBMS or Relational Database Management System (Microsoft SQL Server) as our database server that can control access and maintenance of the data stored. The feature of this system is that it can guarantee high security and integrity. The users can backup and recover the data easily.

Interface Architecture

Now that all the interface of new OS such as Microsoft Windows NT and Microsoft Windows 98 are all GUI or Graphic User Interface so it is easy for the user to communicate with applications in the computer.

Because of the Client/Server technology the interface of the system is on-line processing. It is easier to detect errors and correct those errors than batch processing which require more human interaction.

Process Architecture

The company chooses SDEs for Two-tier Clients/Server application composed of a client based programming language with build in SQL connectivity to database server of the company.

3.3   Hardware and Software Requirements

3.3.1 Hardware Requirement

    (1)   Computer for server   1 Unit

        (a)   Pentium III 800 MHz

        (b)   Memory 128 MB SDRAM

        (c)   Hard Disk 20 GB (UDMA)ATA100

        (d)   Floppy Disk Drive 1.44 MB

        (e)   VGA Card TNT2 16 MB

       (f)   Monitor 15"

(g) 50X CD ROM

(h) Mouse, Keyboard 108 Keys

(2) Computer for workstation   4 Units

 (a) Pentium III 600 MHz

 (b) Memory 64 MB SDRAM

 (c) Floppy Disk Drive 1.44 MB

 (d) Hard Disk 20 GB

 (e) VGA Card TNT2 16 MB

 (f) Monitor 15"

 (g) Mouse, Keyboard 108 keys

 (h) Printer   2 Units

  (1) Epson (Dot Matrix printer)

  (2) Hewlett Packard (Laser printer)

 (i) Scanner   1 Unit

 (j) Time recording machine for telephone   1 Unit

 (k) Network interface card   5 Units

  (1) Linksys NC100

 (l) Hub   1 Unit

  (1) Linksys 24 ports

 (m) UPS, 1000 VA   1 Unit

 (n) Category 5 UTP cable

 (o) RJ45 Connector   10 Units

3.3.2 Software Requirements

(1) Operating System

 (a) Microsoft Windows NT server 4.0

        (b)   Microsoft Windows 98

(2)   System Development Software

        (a)   Visual Basic for Application in Microsoft Office 2000

(3)   Document Preparation Software

        (a)   Visio 5.0 Professional

        (b)   Visible Analysis

(4)   System Software

        (a)   Microsoft Office 2000

3.4 Security and Control

Security and control are divided to three types as follows:

(1)   Operational security

(2)   Data security

(3)   User security

Operational Security

This type of security protects hardware and software from either intentional or inadvertent threats. At this level of security, three more securities can be classified as follows:

(1)   Password security

        (a)   Before entering system, the users need to login with their usernames and passwords. The usernames can identify the status of the users as to what data they can read, what data they can write or what data they can do both read and write. Unauthorized persons are not allowed to enter into the system. Mostly, the users are the Front Office staffs.

        (b)   The users should change their passwords frequently and do not let others know their passwords.

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(2) Hardware security

    (a) The computer should be turned off after use.

    (b) Always keep doors locked after use and restrict visitors' access to front office room.

    (c) UPS are used in order to smooth the system and prevent the damage occurring from electricity problems.

(3) Software security

    (a) Always keep the system programs in a safe place in order to protect from unauthorized access or modification.

Data Security

(1) Backup data everyday in order to prevent data loss and to make a recovery when data are damaged.

(2) Restrict accesses to certain data items such as read only data access.

(3) Security logs of all changes made to data items.

User Security

(1) Front Office staffs should be trained about the skill in using some hard ware in order to prevent human errors.

(2) Inform users to know the danger of computer viruses and the procedures to manage and prevent them.

3.5 Cost and Benefit Analysis

East hotel uses more transaction processing when guests arrive at front office until assigned a room key that is a high cost in the existing system. So in the new proposed system we will solve this problem by using the computer system to manage organization, data collection input data and creates report. To compare cost benefits of this proposed system, we need more resources such as hardware, software,

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implementation cost, training course for our employees. In the long term, we will get higher benefits than the costs.

3.5.1 Cost Analysis

The Cost of Hardware and Software:

The cost of new system consists of the development cost and projected annual operating cost.

Development Cost

Personnel:			Baht
(1)	System Analyst	(1 month)	60,000
(2)	System Designer	(1 month)	60,000
(3)	Programmer	(1 month)	50,000
(4)	Network Specialist	(1 month)	30,000
Total cost of building system			200,000

Hardware and Software:			Baht
(1)	Pentium III 800 MHz for server	(1 unit)	50,000
(2)	Pentium III 600 MHz for workstation	(4 units)	120,000
(3)	Dot Matrix Printer	(1 unit)	20,000
(4)	Laser Printer	(1 unit)	30,000
(5)	Hub (Linksys 24 ports)	(1 unit)	25,000
(6)	Network Interface Card (Linksys NC100)	(5 units)	5,000
(7)	UTP Cable		2,000
(8)	UPS, 1000 VA	(1 unit)	8,000
(9)	RJ45 Connector	(10 units)	500

Hardware and Software:		Baht
(10) Microsoft Windows NT Server	(1 unit)	20,000
(11) Microsoft Windows 98 (Thai Edition)	(4 units)	20,000
(12) Microsoft Office 2000 (Thai Edition)	(4 units)	78,000
(13) Hardware Installation		30,000
(14) Software Installation and Training		30,000
Total cost of installing the system		638,500

Project Annual Operating Cost (First Year)		
(1) Maintenance Service for Hardware		30,000
(2) Maintenance Service for Software		9,000
(3) Computer Accessories and Supplies		5,000
Total Operating and Maintaining Cost		44,000
Total Cost of the Proposed System		682,500

3.5.2 Benefit Analysis

The benefits for a new computerized system can be divided into tangible benefits and intangible benefits.

Tangible Benefits:

This kind of benefit is measurable advantage in value (Baht). After implementation of the new system for East Hotel, we will get benefits as follows:

(1) Saving on additional employees (yearly basis). The computerized system reduces the cost of hiring new employees.

Cost saving for 3 additional staff	(7,500/month*12)
Total cost saving for 3 additional staffs per year	= 270,000 Baht

(2) Reduce bulk of paper 60%

Cost Saving (5,000/month*12*.60)	= 36,000 Baht

Total Tangible Cost Saving (yearly)   216,000 Baht
>unt)

Intangible Benefit:

For the hotel front office system of East Hotel, it will get intangible benefits as follows:

(1)   To provide new customer service; it makes customers more comfortable and high impression of this service.

(2)   To forecast and improve management planning activities.

(3)   High level security of data.

(4)   Increase job satisfaction for employees by eliminating tedious task.

(5)   To get more current and accurate information for operation and management levels for future plans.

(6)   Easy for organization technology expansion plan in the future.

You can see the detail in Table 3.1. The payback period is shown in Figure 3.4.

Table 3.1. Payback Analysis for Proposed System, Baht.

Cost Items	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Development cost:	-638,500	-	-	-	-	-
Operation & maintenance cost: (10% increase)	0	-34,000	-37,400	-41,140	-45,254	-49,779
Discount factor for 12%:	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted cost (adjusted to present value):	-638,500	-30,362	-29,808	-29,292	-28,782	-28,225
Cumulative time-adjusted cost over life time:	-638,500	-668,862	-698,670	-727,961	-756,743	-784,968
Benefits derived from operation of new system: (10% increase)	0	306,000	336,600	370,260	407,286	448,015
Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567
Time-adjusted benefits (adjusted to present value):	0	273,258	268,270	263,625	259,034	254,024
Cumulative time-adjusted benefit over life time:		273,258	541,528	805,153	1,064,187	1,318,211
Cumulative time-adjusted cost-benefits:	-638,500	-395,604	-157,142	77,192	307,444	533,244
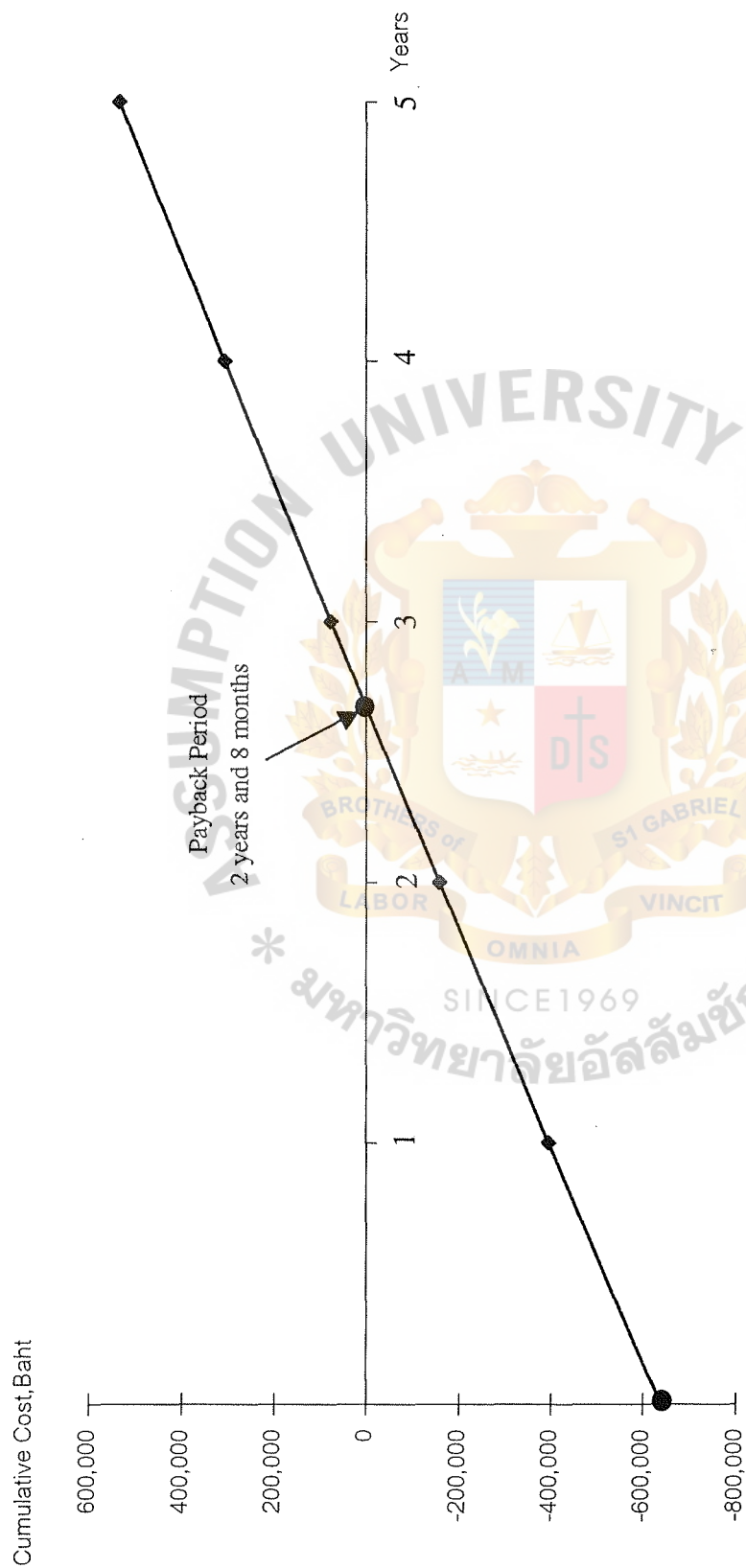
Figure 3.4. Payback Period Graph.

Cumulative Cost, Baht

600,000
400,000
200,000
0
-200,000
-400,000
-600,000
-800,000

1   2   3   4   5   Years

Payback Period
2 years and 8 months

Table 3.2. Cost of Existing System, Baht.

Cost Items	Year 1	Year 2	Year 3	Year 4	Year 5
Personnel:(8% increase)					
1 Front OfficeManager (12,000/month)	144,000	155,520	167,962	181,399	195,910
6 Front Office Officers (7,500/month)	540,000	583,200	629,856	680,244	734,664
3 Front Office Cashier (7,500/month)	270,000	291,600	314,928	340,122	367,332
Office Equipement:(10% increase)					
Paper	60,000	66,000	72,600	79,860	87,846
Stationery	6,000	6,600	7,260	7,986	8,785
Utility Cost(10% increase)	60,000	66,000	72,600	79,860	87,846
Total	1,080,000	1,168,920	1,265,206	1,369,471	1,482,383
Total Cumulative Cost	1,080,000	2,248,920	3,514,126	4,883,597	6,365,980

Table 3.3. Cost of Proposed System, Baht.

Cost Items	Year 1	Year 2	Year 3	Year 4	Year 5
Personnel:					
1 Front Office Manager (12,000/month)8% increase	144,000	155,520	167,962	181,399	195,910
3 Front Office Officers (7,500/month)8% increase	270,000	291,600	314,928	340,122	367,332
3 Front Office Cashiers (7,500/month)8% increase	270,000	291,600	314,928	340,122	367,332
Implementation Cost	200,000	0	0	0	0
Hardware:					
1 Computer Server	10,000	10,000	10,000	10,000	10,000
4 Workstations	24,000	24,000	24,000	24,000	24,000
2 Printers	10,000	10,000	10,000	10,000	10,000
1 UPS, 1000 VA	1,600	1,600	1,600	1,600	1,600
Other Equipments	8,100	8,100	8,100	8,100	8,100
Hardware Installation	30,000	0	0	0	0
Hardware Maintenance(10% increase)	0	20,000	22,000	24,200	26,620
Computer Supplies(10% increase)	5,000	5,500	6,050	6,655	7,321
Software:					
Software	23,600	23,600	23,600	23,600	23,600
Software Installation & Training	30,000	0	0	0	0
Software Maintenance(10% increase)	0	9,000	9,900	10,890	11,979
Office Equipement :					
Paper (reduce60%) and (10% increase every year)	24,000	26,400	29,040	31,944	35,138
Stationery (10% increase)	12,000	13,200	14,520	15,972	17,569
Other Expense (10% increase)	25,000	27,500	30,250	33,275	36,603
Utility Cost increase 30% from existing and 10% every year	78,000	85,800	94,380	103,818	114,200
Total	1,165,300	1,003,420	1,081,258	1,165,697	1,257,304
Total Cumulative Cost	1,165,300	2,168,720	3,249,978	4,415,675	5,672,978

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Table 3.4. The Comparison of the Cumulative Cost between Proposed System
and Existing System, Baht.

Year	Existing System Cost	Proposed System Cost
1	1,080,000	1,165,300
2	2,248,920	2,168,720
3	3,514,126	3,249,978
4	4,883,597	4,415,675
5	6,365,980	5,664,978

The cost of the existing system is shown in Table 3.2 and the cost of the proposed system is given in Table 3.3. Using break-even analysis, which is shown in Table 3.4 and Figure 3.5., it will express that within two years the cost of the new system would reach the trade-off point and therefore the proposed system will become more economical to operate than the existing system.

Return on Investment (ROI) Analysis

This ROI analysis shows a percentage rate that measures the relationship between the amount of business obtained back from an investment and the amount invested. The ROI for this project is calculated as follows:

$$ROI = (\text{Estimated lifetime benefits} - \text{Estimated lifetime costs}) / \text{Estimated lifetime costs}$$

Estimated lifetime benefits = 1,318,211

Estimated lifetime costs = 784,968

Therefore, ROI = (1,318,211-784,968)/784,968
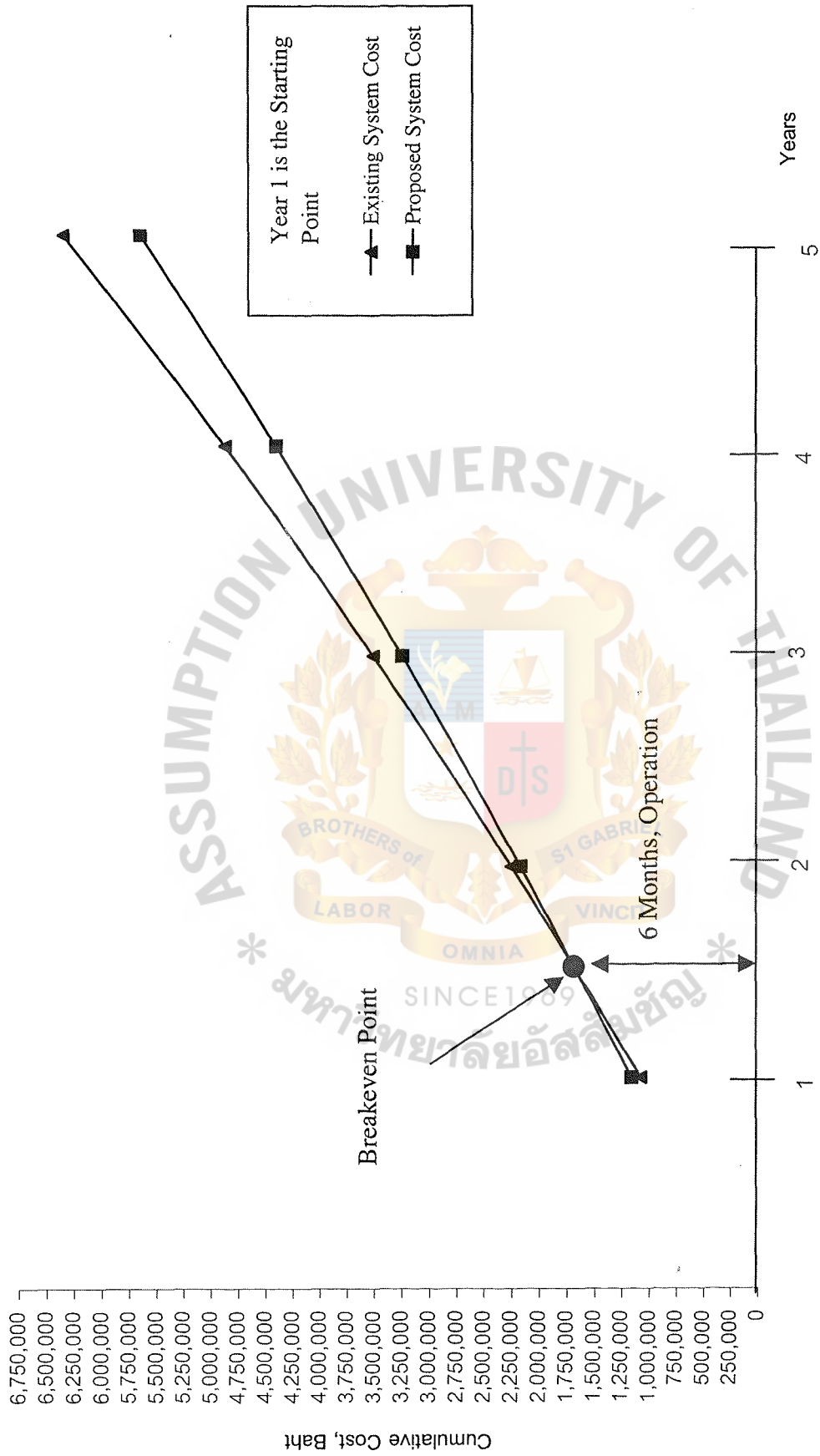
= 0.679 x 100 = 68%

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Figure 3.5. Cost Comparison between Existing System and Proposed System.

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IV. PROJECT IMPLEMENTATION

4.1 Programming the System

The new proposed system is developed by using Microsoft Visual Basic for Application in Microsoft Access, which provides many facilities and is easy to use it that can be applied for the requirement of users. There are tools for developing queries, screen templates and reports.

During system implementation, a new database designed will be built and tested, the input and output are constructed and the new programs will be written by using Microsoft Visual Basic for Application in Microsoft Access. Programmers must write and test all the programs carefully in which a few months may be required for these activities.

The system can be divided into parts as follows:

(1)   Room

    (a)   Room on Reservation Record: It deals with the information about rooms that have already been reserved by guests. This system provides one main function.

        (1)   Data inquiries: It is used for checking which rooms are available.

    (b)   Room Record: It deals with all information about rooms. This system provides three main functions.

        (1)   Data entry: It is used for recording information of rooms such as room type or floor. The source of data comes from front office manager.

(2) Data correction: It is used for data modification about room information.

(3) Data inquiry: It is used for checking information about room.

(c) Room Type Record: It deals with all information about the type of room.

This system provides three main functions.

(a) Data entry: It is used for recording information about room type such as price per type. The source of information comes from front office manager.

(b) Data correction: It is used for editing information of room type. For example, there is a policy to change the price of suit room type from 1,000 to 1,500 Baht.

(c) Data inquiry: It is used for checking information about room type.

(2) Reservation

(a) Reservation Record: It deals with the reservation information made by guests. The system provides three main functions.

(1) Data entry: It is used for recording the reservation information of guests. The source of information comes from guests.

(2) Data correction: It is used for modifying reservation information when guests want to change their reservation date.

(3) Data inquiry: It is used for checking the reservation information of guests.

(3) Guest

(a) Guest Record: It deals with the personal information of guests. The system provides three main functions.

(1) Data entry: It is used for recording the personal information of guests. The source of information comes from guests.

(2) Data correction: It is used for modifying personal information when guests want to change their personal information.

(3) Data inquiry: It is used for searching some information of guests. For example, the address of guests for sending information.

(4) Check In

(a) Room on Reservation Record: It deals with the information about rooms that have already been reserved by guests. This system provides one main function.

(1) Data inquiries: It is used for checking which rooms are available.

(5) Check Out

(a) Room on Reservation Record: It deals with the information about rooms that have already been reserved by guests. This system provides one main function.

(1) Data inquiries: It is used for checking which rooms are available.

(b) Report

This part will produce the reports depending on the user requirements.

4.2 Testing the System

After programming, we need to test the whole system. The test is to ensure that all programs are free of errors. There are steps of the test as follows:

(1) Sub testing

This test is performed on individual modules, whether they are main program, subroutine, block or paragraph. There will be a test on every path through the programs. The test cases are developed to result in executing every instruction in the program, or module.

(2) Unit testing

This is a test whereby all the modules that have been coded and stub tested are tested as an integrated unit.

(3) System testing

This is a test that ensures that application programs written in isolation work properly when they are integrated into the total system.

(4) Special system testing

This can be called peak load testing. This test is to determine whether the system can handle the volume of activities that might occur when the system is at the peak of its processing demand.

4.3 Installing the System

After all programs in the systems have been tested and passed as a whole, the next phase is to convert the old system to the new system. The new system will be installed for the test version and the system starts to be tested.

There are three activities needed to be done in converting to the new system.

(1) To prepare the conversion plan

(2) To make training plan

(3) To install database

Conversion Plan

For preparing conversion plan, one strategy, called parallel conversion, is used. It means that the old and new systems are operated together for some period of time. This is done to ensure that all majors in the new system have been solved before the old system is discarded. The final cut over may be gradual, as portion of the new system deemed adequate.

As to the existing system of this company is still using a manual system, some unexpected problems may occur if we change the existing system into the computerized system immediately. This strategy reduces the high risk of damage occurring during sudden conversion because the existing system and the new proposed system are both executed at the same time.

In fact, this strategy is time-consuming, costly and require additional personnel. The benefits and results of the complete system after completing the changeover is much more than from those using the old system. The estimated time for completing the conversion plan is about one month.

In order to ensure that the new proposed system can perform its entire works successfully, the system analysts may perform the checklist with business end users. The form looks like the form in Figure 4.1.

```
┌─────────────────────────────────────────────────────────────────────────┐
│ Administrative Data                                                       │
│ Application/Module:_____               │
│ Date/Time of test:_____                │
│ User in charge:_____                   │
│ Staff in charge:_____                  │
│ Technical Data                                                            │
│ Resource Needed                 Location            Availability          │
│  1.  Test transaction           _____          _____            │
│  2.  Master files/database      _____          _____            │
│  3.  Operator instruction       _____          _____            │
│  4.  Special media/forms        _____          _____            │
│  5.  Acceptance criteria        _____          _____            │
│  6.  Input support personnel    _____          _____            │
│  7.  Output support personnel   _____          _____            │
│  8.  Backup recovery plan       _____          _____            │
│  9.  Security plan              _____          _____            │
│  10. Error message actions      _____          _____            │
└─────────────────────────────────────────────────────────────────────────┘
```

Figure 4.1.   System Checklist Form.

Training Plan

For making a training plan, an appropriate training program is set for the end users. The objective of the training program is to make the users readily familiar with the new system before taking the real action in order to prevent some mistakes that might occur at that time. The training course will finish within one week.

Installing Database

For installing database, due to the fact that the old system is a manual system, there are no data to be converted from the existing system. We need people to key in the data. The details of this activity are as follows:

(a)   Two personnel staffs work entering data

(b)   10 days spent on keying all data

(c)   Printing reports for checking errors

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After installing the new system, we have to test the whole system to ensure having a complete system. The new system is tested by users using simulated data over some period of time in a simulated environment and after that the real data are used In live environment testing. They are used in live environment testing. There are two levels of testing as follows:

(1) Verification testing:

(2) Validation testing:

Verification testing:

After personnel staff key in the data, the real data will be backed up at one place and another copy is in the new system. The system will run in a simulated environment using simulated data. The test will look for errors and omission regarding user requirements. This test is done in one week.

Validation testing:

At this time, the new system runs in a live environment using real data. The test takes one week. During this test, a number of items are tested which are:

(1) System performance: Throughput and response time is tested.

(2) Peak workload processing performance: Workload at peak time is tested. Hardware and software functions are tested.

(3) Methods and procedure test: Users check their understanding.

(4) Backup and recovery testing: A data loss disaster is simulated and we test the time required in recovering from that disaster.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The existing Hotel Reservation Information System is studied by analyzing the current problems and user requirements, interviewing staffs in Hotel Reservation Department and reviewing the existing form and documents.

In order to meet the users' requirement which usually emphasize on reducing processing time and needing accurate information, it is difficult to get all work done with the existing system. The study of the existing system has portrayed the weakness and areas for improvement.

The new system is designed and implemented to replace the manual operations in the area of the Hotel Reservation Department. The manual operations take a high cost and yield unsatisfactory productivity. The computerized system is expected to improve the efficiency while reducing operation costs. We can make a conclusion concerning the development of the system as follows:

(1) Cost-benefits analysis

It is expected to take about 1.5 years for the benefit to overtake the costs. After that, all benefits gained from the system will totally be the surplus for the company. The lifetime of the system is estimated to be longer than 5 years.

(2) Cost reduction

Computerization will help reduce work force normally required by the manual operation. The company will need fewer people to do the jobs because of the use of computer. We can expect a 20% deduction in work

(3)   Employees satisfaction

There are other benefits derived from the system other than the

benefits that can be measured in terms of money. The employees are

satisfied with the new system and this increases the productivity of

employees.

(4)   Better decision making and planning

With computer technology involved, the mistake from human errors

and inaccurate information are decreasing. The top management can use the

accurate and timely information in decision making and planning.

Degree of Achievement of the Proposed System

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

Process	Existing System	Propsoed System
Process Room Available	10 mins.	1 min.
Process Update Reservation Information	25 mins	10 mins.
Process Update Guest Information	25 mins	10 mins.
Check In Process	10 mins.	1 min.
Check Out Process	1 hr.	30 mins.
Total	2 hrs. 10 mins	52 mins

(1)   Process Room Available

In the existing system, to check room for available, front office officer

had to find out by manual looking at the book which kept the room available

information in order to know which rooms were available when guest was

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going to make the reservation. But In the proposed system, front office officer just looks at the monitor, which require less time.

(2)   Process Update Reservation Information

In the existing system, to check for reservation information, front office officer had to find out by manual looking at the book which kept the reservation information in order to edit or delete the reservation plan of guests. But In the proposed system, front office officer just looks at the monitor and edit or delete the reservation plan, which require less time.

(3)   Process Update Guest Information

In the existing system, to check for Guest information, front office officer had to find out by manual looking at the book which kept the guest information in order to edit the information of guests. But In the proposed system, front office officer just looks at the monitor and edits the information of guests, which require less time.

(4)   Check In Process

In the existing system, to check for reservation information for check in process, front office officer had to find out by manual looking at the book which kept the reservation information in order to know which rooms guests had reserved. But In the proposed system front office officer just looks at the monitor, which require less time.

(5)   Check Out Process

In the existing system, to check for how much the expense that guest had to pay to the hotel, front office cashier had to find out by manual looking at each bill for room, foods, telephone, etc. But In the proposed system front office officer just looks at the monitor, which require less time.

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

5.2 Recommendations

The Hotel Reservation Information System is developed under Microsoft Visual Basic for Application in Microsoft Access. Even though this new system has been designed and developed for handling current business user requirements in the Front Office Department, we expect that the new computerized system can satisfy the business requirements at least for the next 5 years (estimated from expected business growth).

Some information cannot be automated and shared. When other departments want to know some information, the reports must be printed out from the Front Office Department. Then, further development should take place and become on-line and link to other departments as well.

Presently, the proposed system has been developed and can serve the workload of the company. In the future, if the users need a fully computerized system in every department, this system cannot serve the workload. Then, it is recommended to upgrade the system or buy another CPU for faster processing.

The company should have a plan for future system upgrade or even developing the new system. During the period that the current system is workable, the company should train its employees to become analysts or at least computer-educated. These people will become the persons who know both business requirements and technical solutions.

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The application architecture of this system is not suitable for a big system. Such a system that covers large geographical areas or the system that handles high transaction rates. In order to cover more large geographical area, the system should be redesigned.

The company should employ a full-time staff who takes care of the system and holds the responsibility of help-desk. The system will become a core of the business. It requires considerable attention.

The company should train the user to know some basic knowledge about computer and software development. In the future, if there are any small problems with the system, the users can solve them themselves in order to save time and cost.
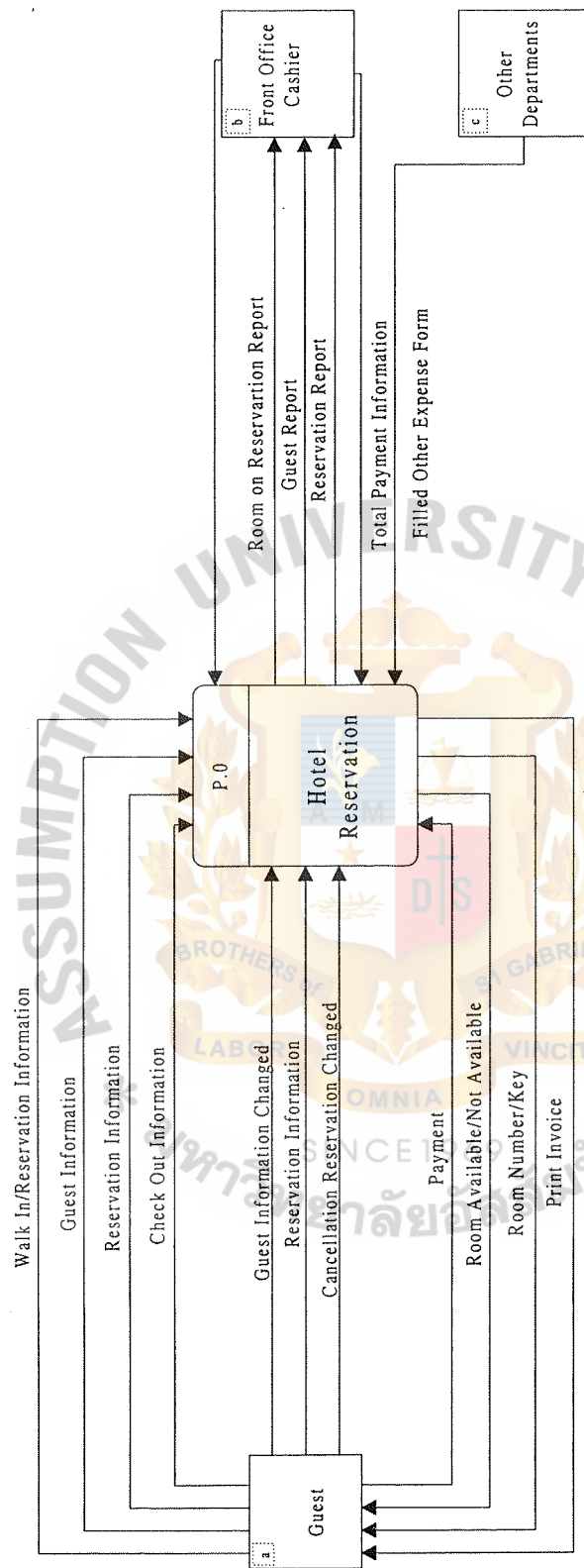
APPENDIX A

CONTEXT DIAGRAM

Figure A.1. Context Diagram of Hotel Front Office information System.

APPENDIX B

DATA FLOW DIAGRAM

Figure B.1.   Data Flow Diagram Level 0 of the Proposed System.

Figure B.2.   Data Flow Diagram Level 1 of the Proposed System.

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

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D3 | Guest

Insert New Guest Information

Guest Information

Guest Information Changed

Guest Information

P3.1 Create Guest Information

P3.2 Edit Guest Information

P3.3 Generate Guest Report

Guest Information

Guest Information Changed

Guest Report

Guest
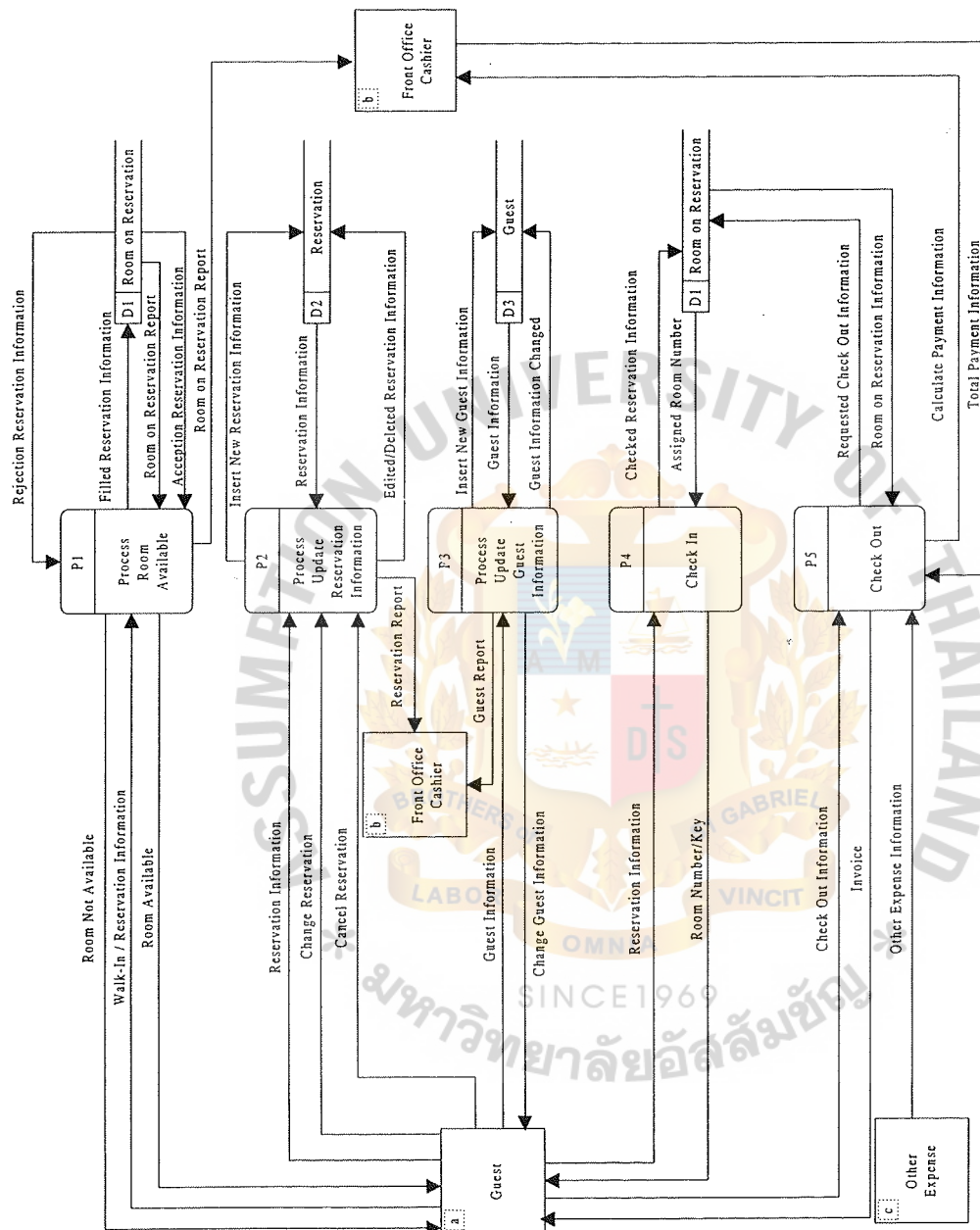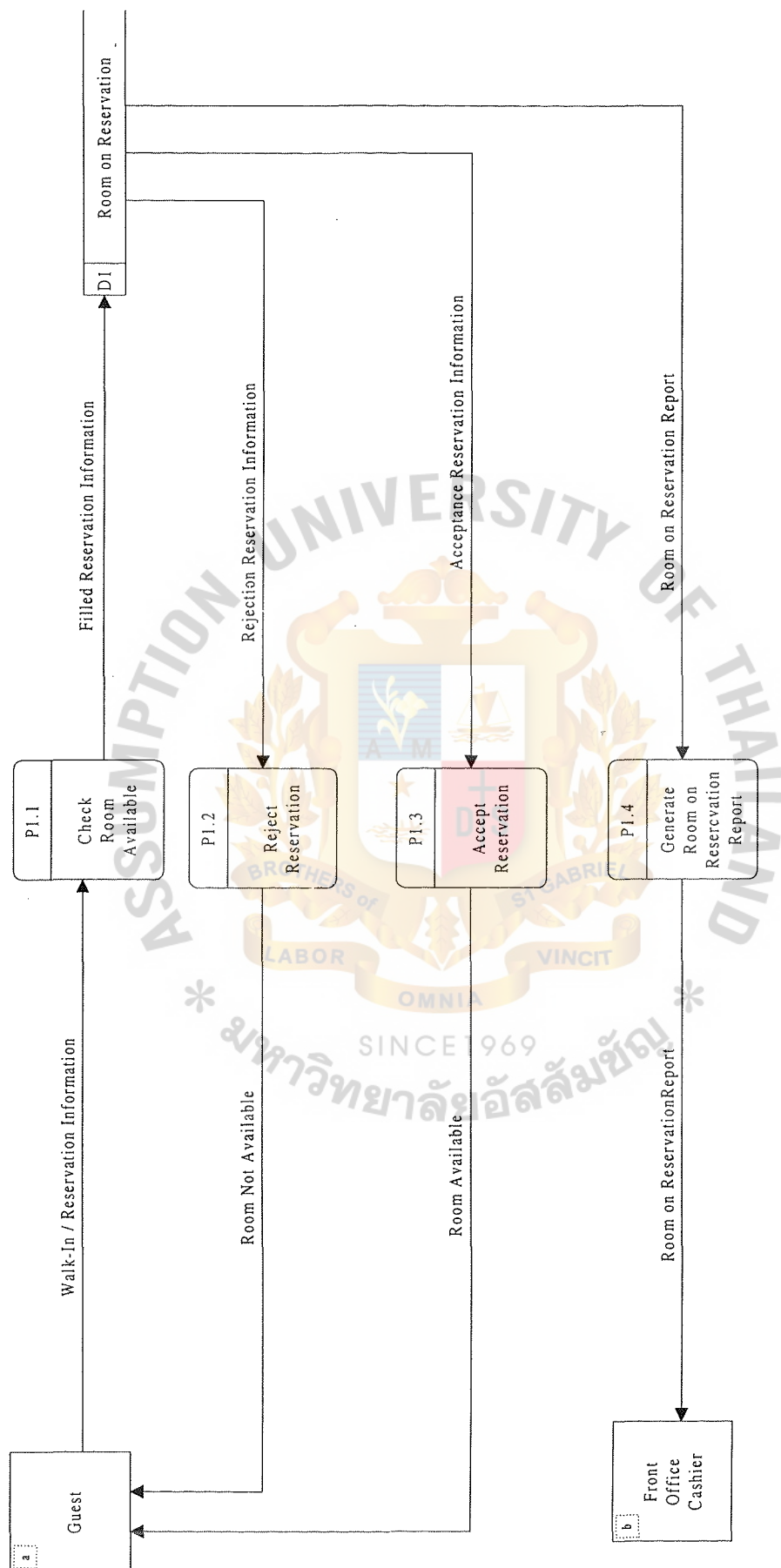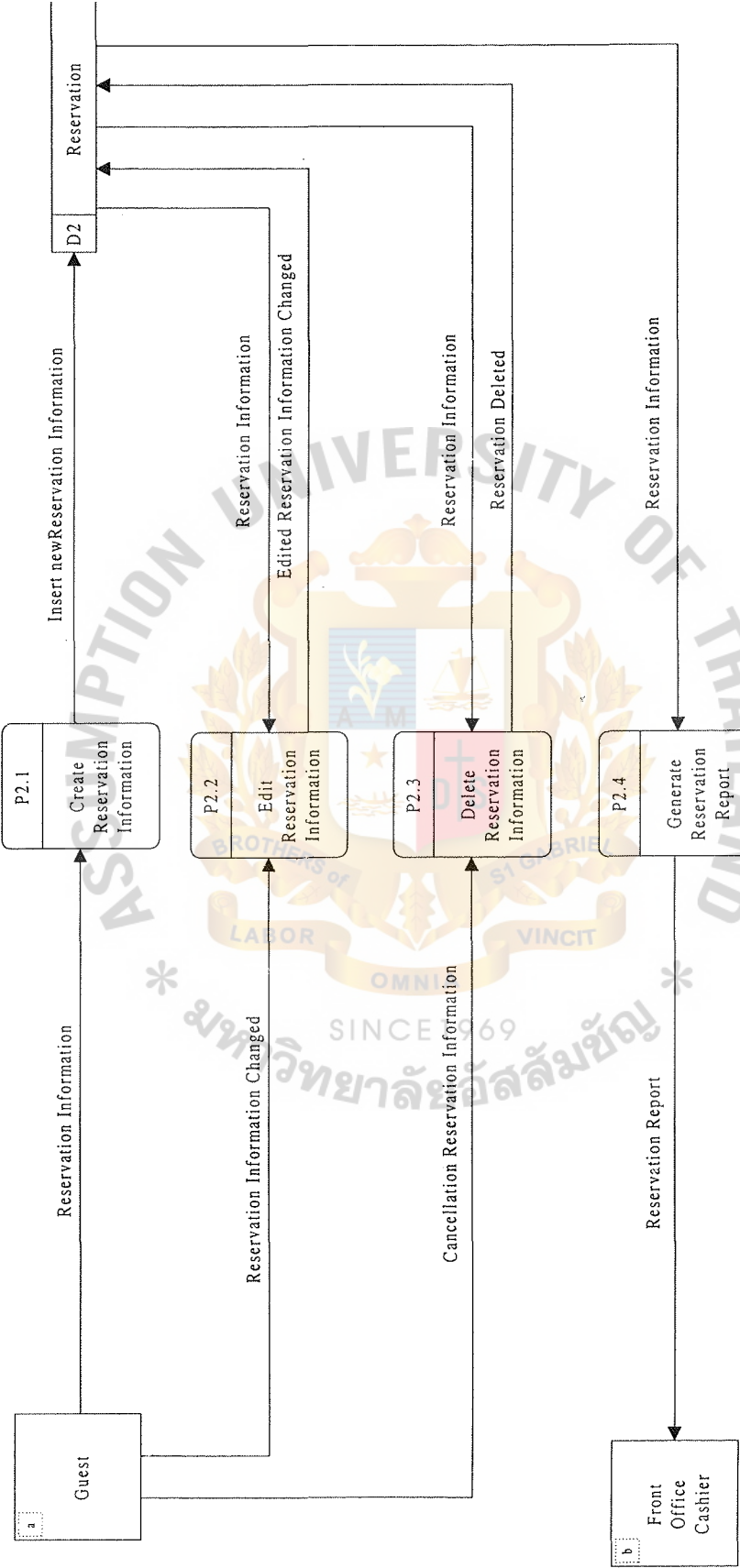
a

Front Office Cashier

b
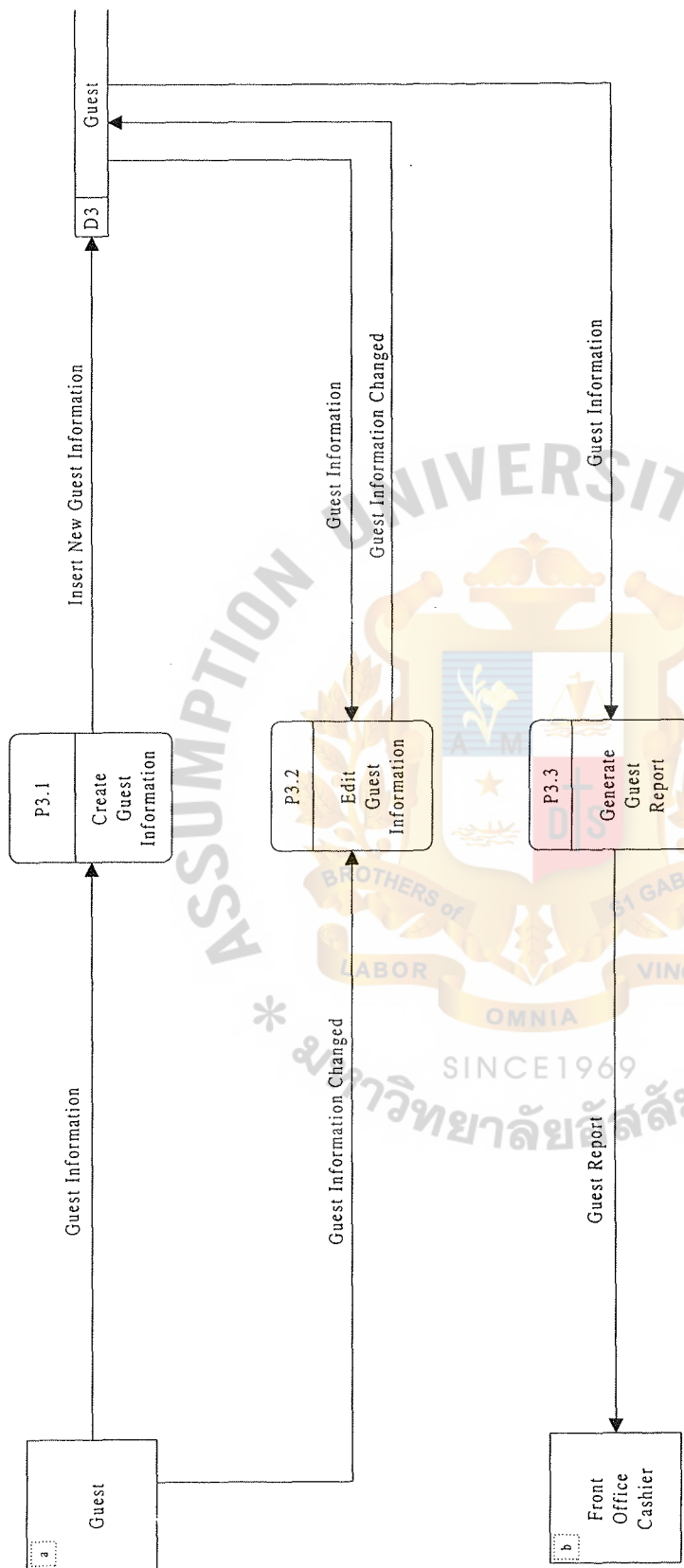
Figure B.4.   Data Flow Diagram Level 1 of the Proposed System.
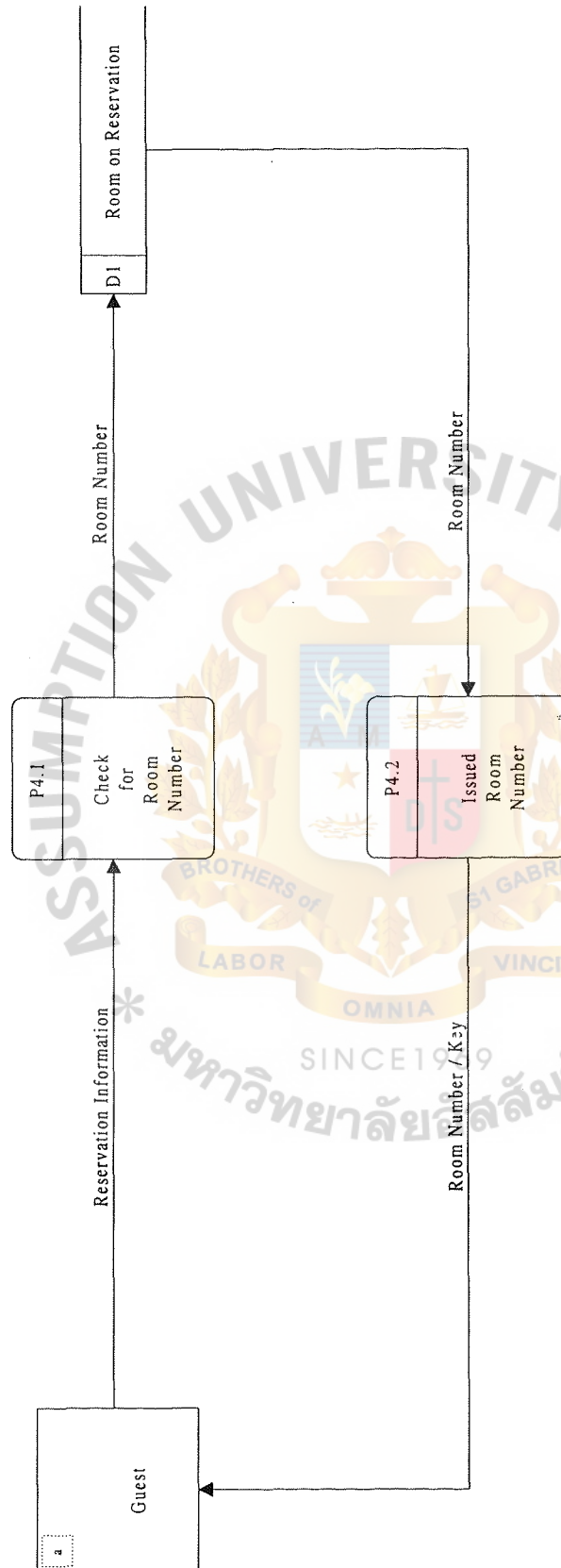
Figure B.5. Data Flow Diagram Level 1 of the Proposed System.

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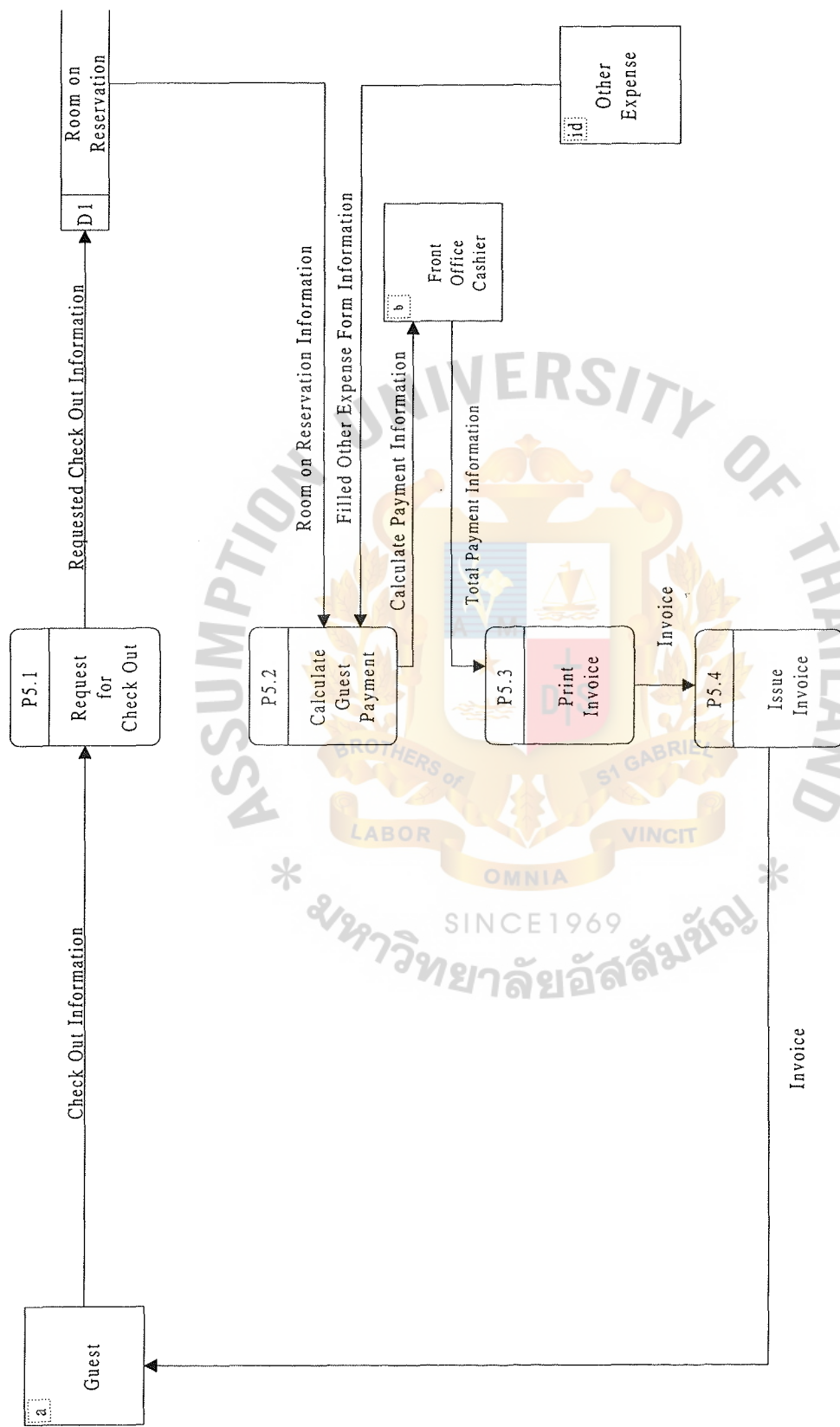
Figure B.6. Data Flow Diagram Level 1 of the Proposed System.

APPENDIX C

OUTPUT DESIGN & INPUT DESIGN
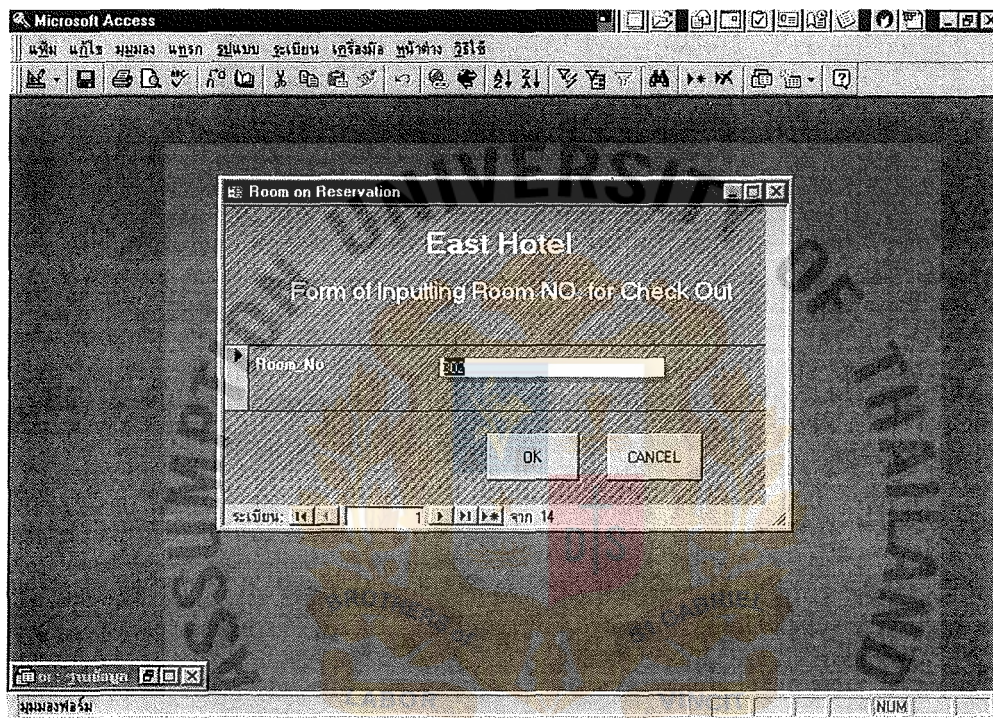
Figure C.1.   Form of Inputting Room No. for Check Out.

Figure C.2.   Form of Checking Room for Available.

Figure C.3. Form of Inputting Guest Information.
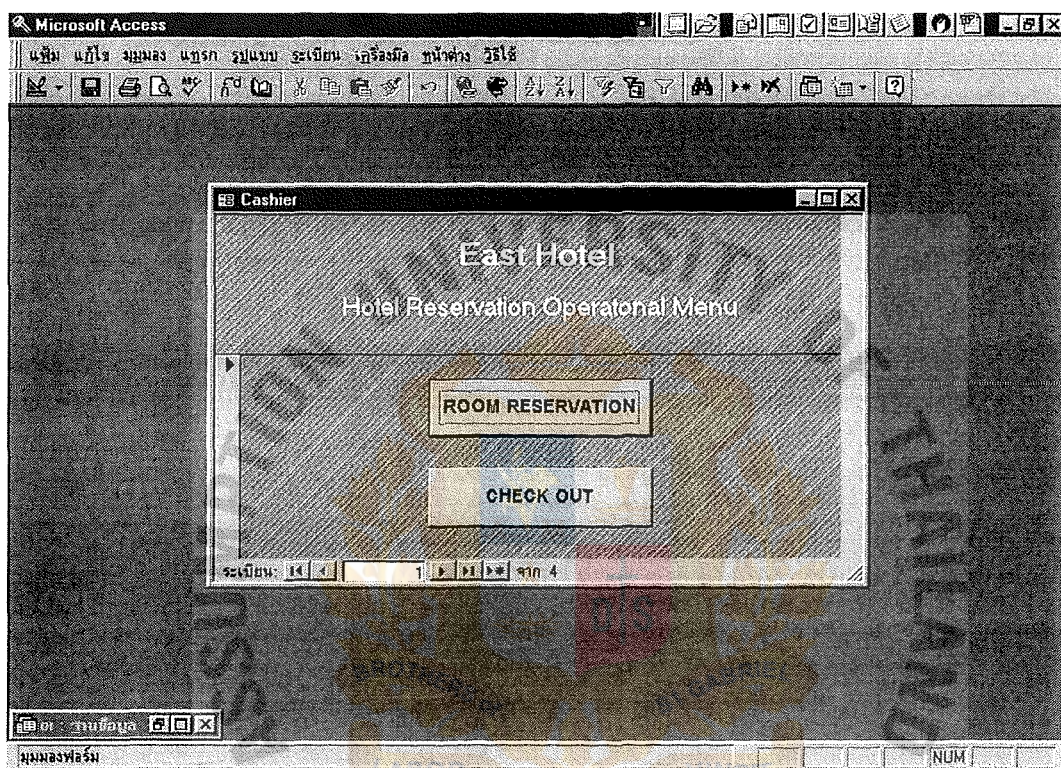
Figure C.4.   Hotel Reservation Operational Menu.
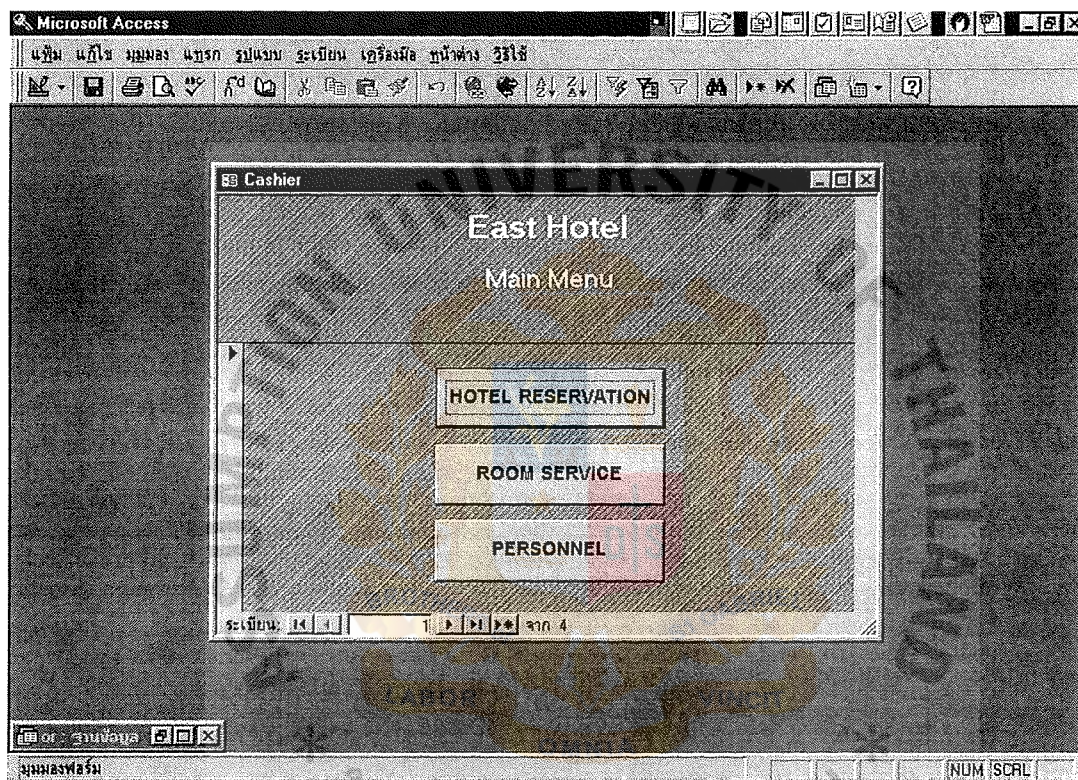
Figure C.5.   East Hotel Main Menu.

Figure C.6.   Form on Inputting Reservation Information.
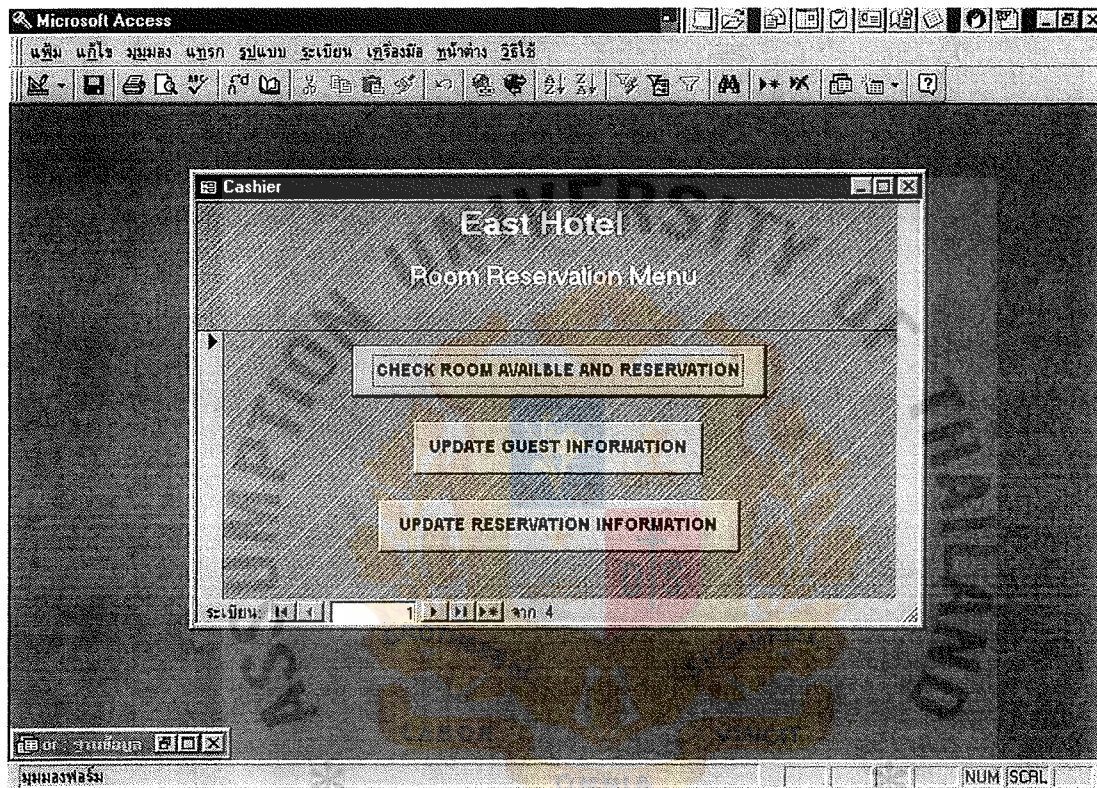
Figure C.7.   Room Reservation Menu.

East Hotel Guest Arrival List

Guest_Name	Start Date	Room_No	Type	Price
Chanchai Jairakdee	01-Mar-44	310	VIP	1300
Nakit Toudpitak	01-Mar-44	324	twin room	550
Parapol Thondee	01-Mar-44	326	twin room	550
Sasithorn Limsrimanee	01-Mar-44	320	Suit	825
Sompop kunaprakarn	01-Mar-44	322	twin room	550

Figure C.8.   Guest Arrival List Report.

East Hotel Cashier Report

Cashier_ID	Cashier_Name	Cashier_Tel	Cashier_Address
1	Kamolwan Panthpa	960009	Amphur Thamai
2	Kamolthip Chinpraditsuk	493426	Amphur Thamai
3	Somsri Sukjai	335544	Amphur Muang
4	Somjai Suksom	442544	Amphur Muang

Figure C.9.   Cashier Report.

```
+--------------------------------------------------------------+
|                                                              |
|           East Hotel Guest Departure List                    |
|                                                              |
+--------------------------------------------------------------+
|                                                              |
|   Guest_Name               EndDate          Room_No          |
|                                                              |
|   Kongkorn Leelapatree     28-Feb-44         306             |
|                                                              |
|   Sombat Meatanee          28-Feb-44         318             |
|                                                              |
|   Somchai Thamdee          28-Feb-44         316             |
|                                                              |
|   Thanai Thamasuree        28-Feb-44         308             |
|                                                              |
+--------------------------------------------------------------+
```

Figure C.10.   Guest Departure List Report.

East Hotel Guest information Report

Guest_Name	Guest_Tel	Guest_Address
Chalermpol Wongmek	01-3355441	395 BKK
Yongyuth Nitadnopakul	01-3358510	123 BKK
Kongkorn Leelapatree	01-6256677	452 BKK
Thanai Thamasuree	01-4933349	557 BKK
Somchai Thamdee	01-4554455	4441/44 BKK
Sombat Meatanee	02-2890572	678 BKK
Chanchai Jairakdee	02-3911250	4877 BKK
Napapilai Chaipradit	02-2890429	415/25 Samuthprakarn

Figure C.11.   Guest Information Report.

East Hotel Reservation Information of Room Type (twin room)

Res_ID	Guest_Name	StartDate	EndDate	Room_No	Type
3	Chalermpol Wongmek	03-Feb-44	06-Feb-44	302	twin room
4	Yongyuth Nitadnopakul	05-Feb-44	08-Feb-44	304	twin room
5	Kongkorn Leelapatree	14-Feb-44	28-Feb-44	306	twin room
12	Saithong saisamur	15-Mar-44	18-Mar-44	423	twin room
14	Sompop kunaprakarn	01-Mar-44	04-Mar-44	322	twin room
15	Nakit Toudpitak	01-Mar-44	03-Mar-44	324	twin room
16	Parapol Thondee	01-Mar-44	04-Mar-44	326	twin room

Figure C.12. Reservation Information of Room Type (Twin Room) Report.

East Hotel Reservation Information of Room Type (VIP)

Res_ID	Guest_Name	StartDate	EndDate	Room_No	Type
9	Chanchai Jairakdee	01-Mar-44	04-Mar-44	310	VIP
10	Napapilai Chaipradit	04-Mar-44	09-Mar-44	312	VIP
11	Ladda Dasakul	08-Mar-44	12-Mar-44	314	VIP

Figure C.13.   Reservation Information of Room Type (VIP) Report.

East Hotel Reservation Information of Room Type (suit)					
Res_ID	Guest_Name	StartDate	EndDate	Room_No	Type
6	Thanai Thamasuree	18-Feb-44	28-Feb-44	308	Suit
7	Somchai Thamdee	21-Feb-44	28-Feb-44	316	Suit
8	Sombat Meatanee	25-Feb-44	28-Feb-44	318	Suit
13	Sasithorn Limsrimanee	01-Mar-44	05-Mar-44	320	Suit

Figure C.14.   Reservation Information of Room Type (Suit) Report.

East Hotel Room Report (Grand VIP)

Room_No	Floor	Price	Type
328	3	1700	Grand VIP

Figure C.15.   Room Report (Grand VIP).

East Hotel Room Report (VIP Room)

Room_No	Floor	Price	Type
310	3	1300	VIP
312	3	1300	VIP
314	3	1300	VIP
332	3	1300	VIP
334	3	1300	VIP
336	3	1300	VIP
338	3	1300	VIP

Figure C.16.   Room Report (VIP Room).

East Hotel Room Report (Suit)

Room_No	Floor	Price	Type
910	9	825	Suit
912	9	825	Suit
914	9	825	Suit
916	9	825	Suit
930	9	825	Suit
932	9	825	Suit
934	9	825	Suit
308	3	825	Suit
316	3	825	Suit
318	3	825	Suit
320	3	825	Suit
330	3	825	Suit
340	3	825	Suit

Figure C.17.   Room Report (Suit).

East Hotel Room Report (twin room)

Room_No	Floor	Price	Type
837	8	550	twin room
839	8	550	twin room
841	8	550	twin room
902	9	550	twin room
904	9	550	twin room
906	9	550	twin room
908	9	550	twin room
918	9	550	twin room
920	9	550	twin room
922	9	550	twin room
924	9	550	twin room
926	9	550	twin room
928	9	550	twin room

Figure C.18.   Room Report (Twin Room).

APPENDIX D

DATABASE DESIGN

DATABASE DESIGN

1. Guest(<u>Guest ID</u><PK>,GuestName,GuestTel,GuestAddress,GuestDiscount)

Table D.1.   Guest Table.

Field Name	Type	Size
Guest_ID	Character	5
Guest_Name	Character	30
Guest_Tel	Character	15
Guest_Address	Character	256
Guest_Discount	Character	4

2. Reservation(<u>Res ID</u><PK>,Guest_ID<FK>,Cashier_ID<FK>,StartDate,EndDate)

Table D.2.   Reservation Table.

Field Name	Type	Size
Res_ID	Character	5
Guest_ID	Character	5
Cashier_ID	Character	5
StartDate	Date	10
EndDate	Date	10

3. RoomOnReser.(Res ID<PK>,Room_No<PK>)

Table D.3.   RoonOnReser Table.

Field Name	Type	Size
Res_ID	Character	5
Room_ID	Character	3

4. Cashier(Cashier ID<PK>,CashierName,CashierTel,CashierAddress)

Table D.4.   Cashier Table.

Field Name	Type	Size
Cashier_ID	Character	3
Cashier_Name	Character	30
Cashier_Tel	Character	9
Cashier_Address	Character	256

5. Room(Room No<PK>,RoomType_No<FK>,Floor)

Table D.5.   Room Table.

Field Name	Type	Size
Room_No	Character	3
RoomType_No	Character	3
Floor	Character	2

6. RoomType(<u>RoomType_No</u><PK>,Type,Price)

Table D.6.   RoomType Table.

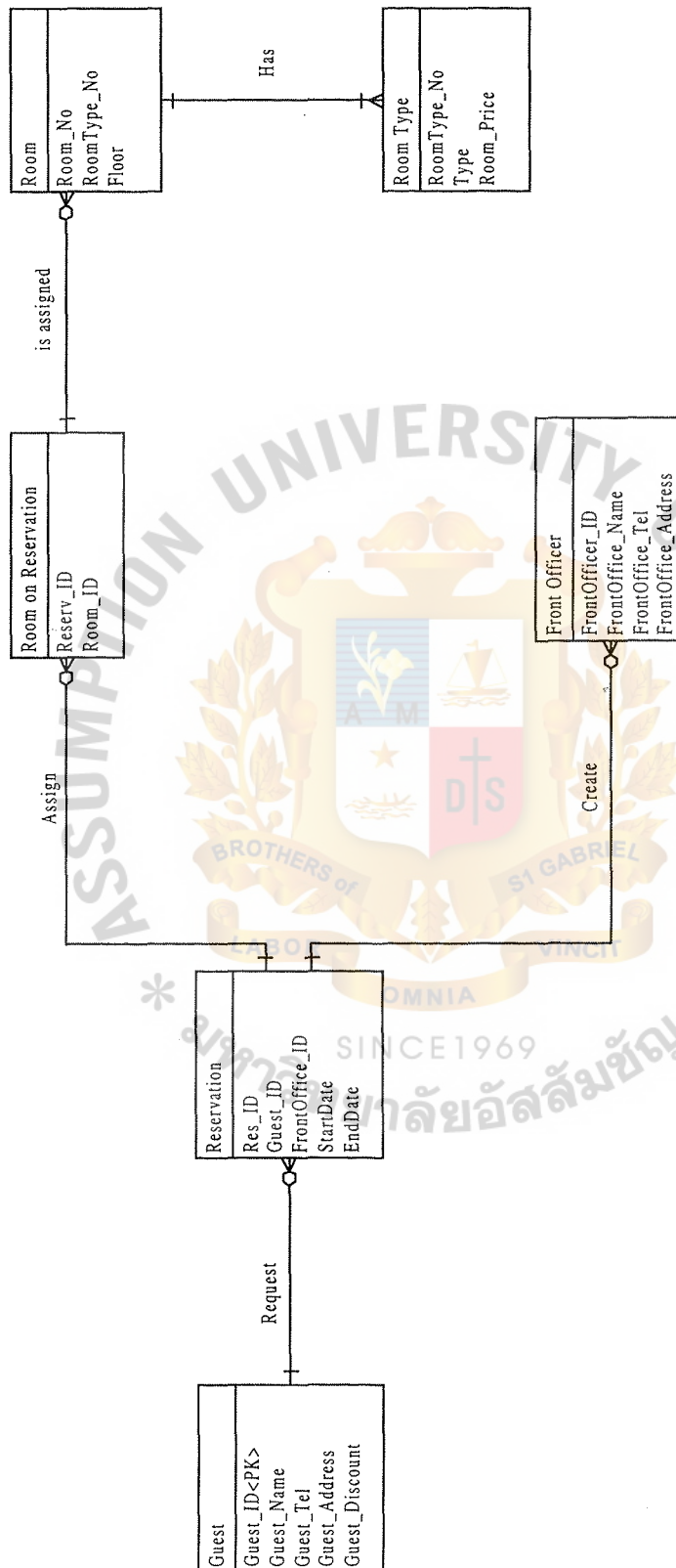| Field Name	Type	Size
RoomType_No	Character	3
Type	Character	3
Price	Number	5

Figure D.1. Entity Relationship Diagram of Hotel Reservation System.

APPENDIX E

DATA DICTIONARY

DATA DICTIONARY OF ER DIAGRAM

Cashier_Address = *Address or where cashiers live.*

Cashier_ID = *Number used to represent cashier.*

Cashier_Name = *Name of cashier.*

Cashier_Tel = *Telephone of cashier.*

EndDate = *The last date that guests are going to stay in the hotel.*

Floor = *The floor of the room in the hotel.*

Guest_Address = *Address of guests to be printed in the invoice.*

Guest_Discount = Discount in percentage for some special guests.*

Guest_ID = *Number used to represent guests.*

Guest_Name = *Name of guests.*

Guest_Tel = *Telephone of guests.*

Res_ID = *Number used to represent reservation information made by guests.*

Room Price = *Price of the room.*

Room_No = *Number of the room.*

RoomType_Name = *Name of room type.*

RoomType_No = Number used to represent how many type of the room there are.*

StartDate = *The first date that guests are going to stay in the hotel.*

Guest = @Guest_ID + Guest_Name + Guest_Tel + Guest_Address + Guest_Discount

Reservation = @Res_ID + Guest_ID + Cashier_ID + StartDate + EndDate

Room on Reservation = @Res_ID + @Room_No

Room = @Room_No + RoomType_No + Floor

Room Type   = @RoomType_No + Type + Price

Cashier   = @Cashier_ID + Cashier_Name + Cashier_Tel +

                       Cashier_Address

DATA DICTIONARY OF PROCESS MODEL

Check Out Information   Data Flow   = * Information needed for checking out or it is a room number of guest that have to tell to the front office for request for checking out.*

Guest Information   Data Flow   = * Personal information of guest for keeping in the database of the hotel.*

Guest Information Changed   Data Flow   = * Guests may change their personal information such as their address or telephone number.*

Guest Report   Data Flow   = * Report that can show information of guests such as adress when hotel want to send information to.*

Invoice   Data Flow   = * A report showing the expense of guests.*

Other Expense Information   Data Flow   = * Other expense of guests in other department such as extra bed,F&B.*

Payment Information Calculated   Data Flow   = * Payment information of guests that have been calculated.*

Reservation Information   Data Flow   = * Information needed for reserve the room such as

			start date and end date.*
Reservation Information Changed	Data Flow	=	* Reservation plan may be changed according to the need of guests.*
Reservation Information Deleted	Data Flow	=	* Reservation plan may be deleted according to the need of guests.*
Reservation Report	Data Flow	=	* A report showing the reservation information upon the request of executive.*
Room Available	Data Flow	=	* A acceptation message from the database to guest that room areavailable.*
Room NO.	Data Flow	=	* Room number to tell guest their room number when check in.*
Room Not Available	Data Flow	=	* A rejection message from the database to guest that room are not available.*
Room on Reservation Information	Data Flow	=	* Information of both room table and reservation table for query.*
Room on Reservation Report	Data Flow	=	* Report of information in both room and reservation table after query.*
Accept Reservation	Data Process	=	* Process of accepting reservation when guests make a reservation.*

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Calculate Guest Payment	Data Process =	* Process of calculating expense of guests.*
Check In	Data Process =	* Process of checking in for the guests.*
Check Out	Data Process =	* Process of checking out for the guests.*
Check Room Available	Data Process =	* Process of checking room for available.*
Create Guest Information	Data Process =	* Process of inputting guest information.*
Create Reservation Information	Data Process =	* Process of inputting reservation information.*
Delete Guest Information	Data Process =	* Process of deleting guest information.*
Delete Reservation Information	Data Process =	* Process of deleting reservation information.*
Edit Guest Information	Data Process =	* Process of editing guest information.*
Edit Reservation Information	Data Process =	* Process of editing reservation information.*
Issue Guest Report	Data Process =	* A process of issueing guest report.*
Issue Invoice	Data Process =	* A process of issueing invoice for guest.*
Issue Reservation Report	Data Process =	* Process of issueing reservation report.*
Issue Room NO.	Data Process =	* Process of issueing room number for guest.*

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Issue Room on Reservation Report	Data Process	=	* Process of issueing room on reservation report.*
Print Invoice	Data Process	=	* Process of printing invoice for guests.*
Process Room Available	Data Process	=	* Process of checking room for available for reservation.*
Process Update Guest Information	Data Process	=	* Process of updating guest information including create, edit,delete.*
Process Update Reservation Information	Data Process	=	* Process of updating reservation information including create, edit,delete.*
Reject Reservation	Data Process	=	* Process of rejecting reservation when room are not available.*
Request for Check In	Data Process	=	* Process of requesting from guests to check in.*
Request for Check Out	Data Process	=	* Process of requesting from guests to check out.*
Request for Guest Report	Data Process	=	* Process of requesting from executive a guest report.*
Request for Reservation Report	Data Process	=	* Process of requesting from executive a reservation report.*
Request of Room on Reservation Report	Data Process	=	* Process of requesting from executive a room on reservation report.*

Room on Reservation	Storage	= * A associated table of room and reservation table.*
Reservation	Storage	= * A table that show the reservation information.*
Guest	Storage	= * A table that show the guest information.*
Guest	External Agent	= * There are the customers that request to stay in the hotel for a period of time.*
Front Office Cashier	External Agent	= *A person who is responsible for collect money from guest.*
Other Department	External Agent	= * Other department that contact with hotel reservation department.*
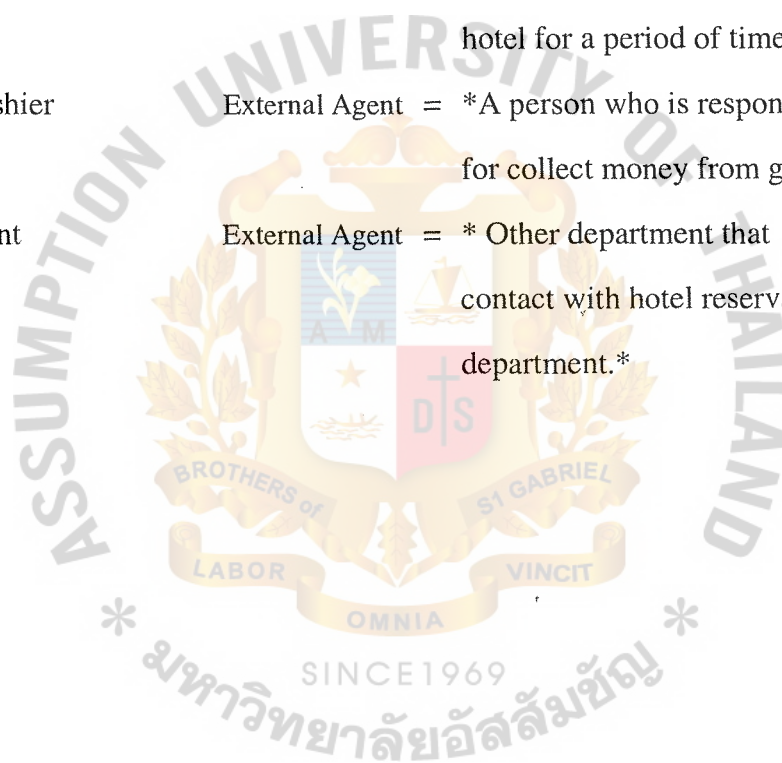
APPENDIX F

PROCESS SPECIFICATION

PROCESS SPECIFICATION

Process 1.0   Room Available

Process no.   : 1.1

Process name : Check Room Available

Description   : Check room available for our guests

Input   : Walk-in / reservation information

Output   : Filled reservation information

Process   : 1.   Guests ask for the room available

          2.   Reservation information is sent to room on reservation database for query that rooms are available or not

          3.   Return to hotel reservation menu

Process no.   : 1.2

Process name : Reject Reservation

Description   : Reject the reservation after check from room on reservation database

Input   : Rejection reservation information

Output   : Room not available

Process   : 1.   Receive the rejection message from room on reservation database

          2.   The front office officer tells guest that rooms are not available

          3.   Return to hotel reservation menu

Process no.   : 1.3

Process name   : Accept Reservation

Description   : Accept the reservation after check from room on reservation

Input   : Acceptance reservation information

Output   : Room available

Process   : 1.   Receive the acceptation message from room on reservation database

                          2.   The front office officer tells guest that rooms are available

                          3.   Return to hotel reservation menu

Process no.   : 1.4

Process name   : Request for Room on Reservation Report

Description   : Request for room on reservation report from room on reservation database

Input   : Report request information

Output   : Requested reports Information

Process   : 1.   Receive the request for report from front office cashier

                          2.   Send the requested report information to room on reservation database

Process no.   : 1.5

Process name   : Issue Report

Description   : Issue report for needed information from room on reservation database

Input   : Room on reservation report Information

Output   : Printed room on reservation report

Process   : 1.   Receive room on reservation report information from the database

                   2.   Send printed room on reservation report to front office cashier

                   3.   Return to hotel reservation menu

Process 2.0   Update Reservation Information

Process no.   : 2.1

Process name   : Create Reservation Information

Description   : Filled the new reservation information

Input   : Reservation information

Output   : Insert new reservation information

Process   : 1.   Input reservation information to the database

                   2.   Go to input screen of guest information database

Process no.   : 2.2

Process name   : Edit Reservation Information

Description   : Edit the reservation information when guest may do

Input   : 1.   Reservation information

                 : 2.   Reservation information changed

Output   : Edited reservation information

Process   : 1.   Request needed reservation information record from the database

                   2.   Edit reservation information to the database

                   3.   Return to hotel reservation menu

Process no.   : 2.3

Process name   : Delete Reservation Information

Description   : Delete the cancellation reservation information

Input   : Reservation information

                   Cancellation reservation information

Output   : Reservation deleted

Process   : 1.   Request needed reservation information record from the database

                   2.   Delete reservation information to the database

                   3.   Return to hotel reservation menu

Process no.   : 2.4

Process name   : Request for Reservation Report

Description   : Request for reservation report from reservation database

Input   : Report request information

Output   : Requested reports information

Process   : 1.   Receive the request for report from front office cashier

                   2.   Send the requested report information to reservation database

Process no.   : 2.5

Process name   : Issue Report

Description   : Issue report for needed information from reservation database

Input   : Reservation report

Output   : Printed reservation report

Process   : 1. Receive reservation report information from the database

                 2. Send printed reservation report to front office cashier

                 3. Return to hotel reservation menu

Process 3.0   Update Guest Information

Process no.   : 3.1

Process name : Create Guest Information

Description   : Filled the new guest information

Input   : Guest information

Output   : Insert new guest information

Process   : 1. Input guest information to the database

                 2. Return to hotel reservation menu

Process no.   : 3.2

Process name : Edit Guest Information

Description   : Edit the incorrect guest information

Input   : 1. Guest information

                 2. Guest Information changed

Output   : Edited guest information

Process   : 1. Request needed guest information record from the database

                 2. Edit guest information to the database

                 3. Return to hotel reservation menu

Process no.   : 3.3

Process name : Request for Guest Report

Description   : Request for report from guest database

Input   : Report request information

Output   : Requested reports information

Process   : 1.   Receive the request for report from front office cashier

                2.   Send the requested report information to guest database

Process no.   : 3.4

Process name : Issue Guest Report

Description   : Issue report for needed information from guest database

Input   : Guest report information

Output   : Printed guest report

Process   : 1.   Receive guest report information from the database

                2.   Send printed guest report to front office cashier

                3.   Return to hotel reservation menu

Process 4.0   Check In

Process no.   : 4.1

Process name : Request for Check In

Description   : Request for check in for reservation guest

Input   : Assigned reservation information

Output   : Checked reservation information

Process   : 1.   Receive assigned reservation information from guest

2. Send those information to check for room no. at room on reservation database

Process no.   : 4.2

Process name : Issued Room Number

Description   : Issued room number with key for guest

Input   : Assigned room number

Output   : Room number / key

Process   : 1. Receive room no. that has been assigned from the database

                   2. Send room no. along with key to guest

Process 5.0   Check Out

Process no.   : 5.1

Process name : Request for Check Out

Description   : Request for check out from guest

Input   : Check out information

Output   : Requested check out information

Process   : 1. Receive check out information or room no. from guest

                   2. Send Requested check out message along with check out information or room no. to room on reservation database

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Process no.   : 5.2

Process name : Calculate Guest Payment

Description   : Calculate all in house payment for guest

Input   : Room on reservation information

                    Filled other expense form information

Output   : Calculate payment information

Process   : 1.   Receive room on reservation information from the database

                    2.   Receive filled other expense form from other department

                    3.   Calculate total expenses of the guest

Process no.   : 5.3

Process name : Print Invoice

Description   : Print invoice from calculate payment information

Input   : Calculated payment information

Output   : Payment Information

Process   : 1.   Receive the calculated payment information from process

                    calculate guest payment

                    2.   Send printed invoice to guest
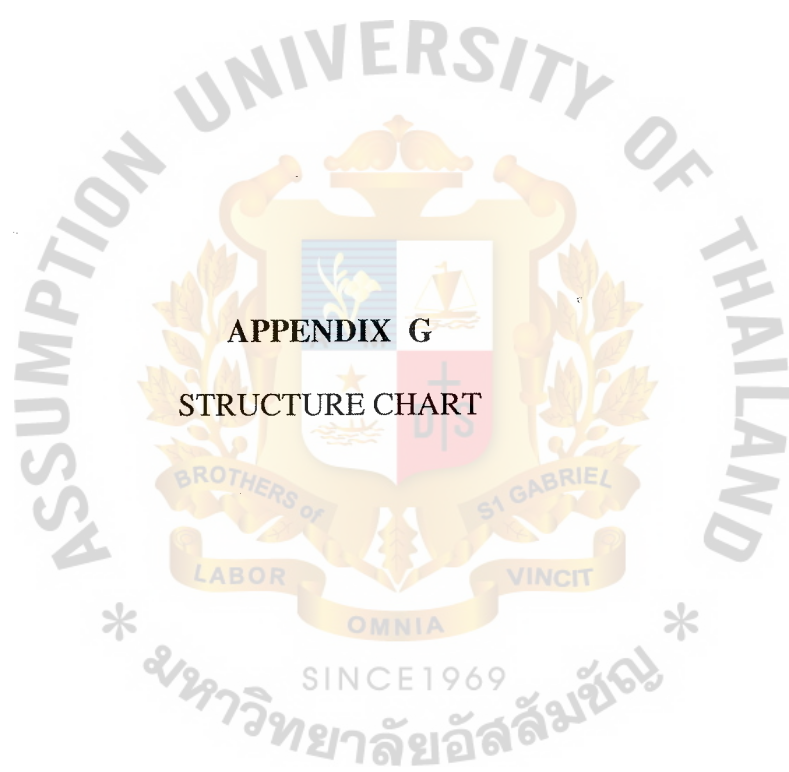
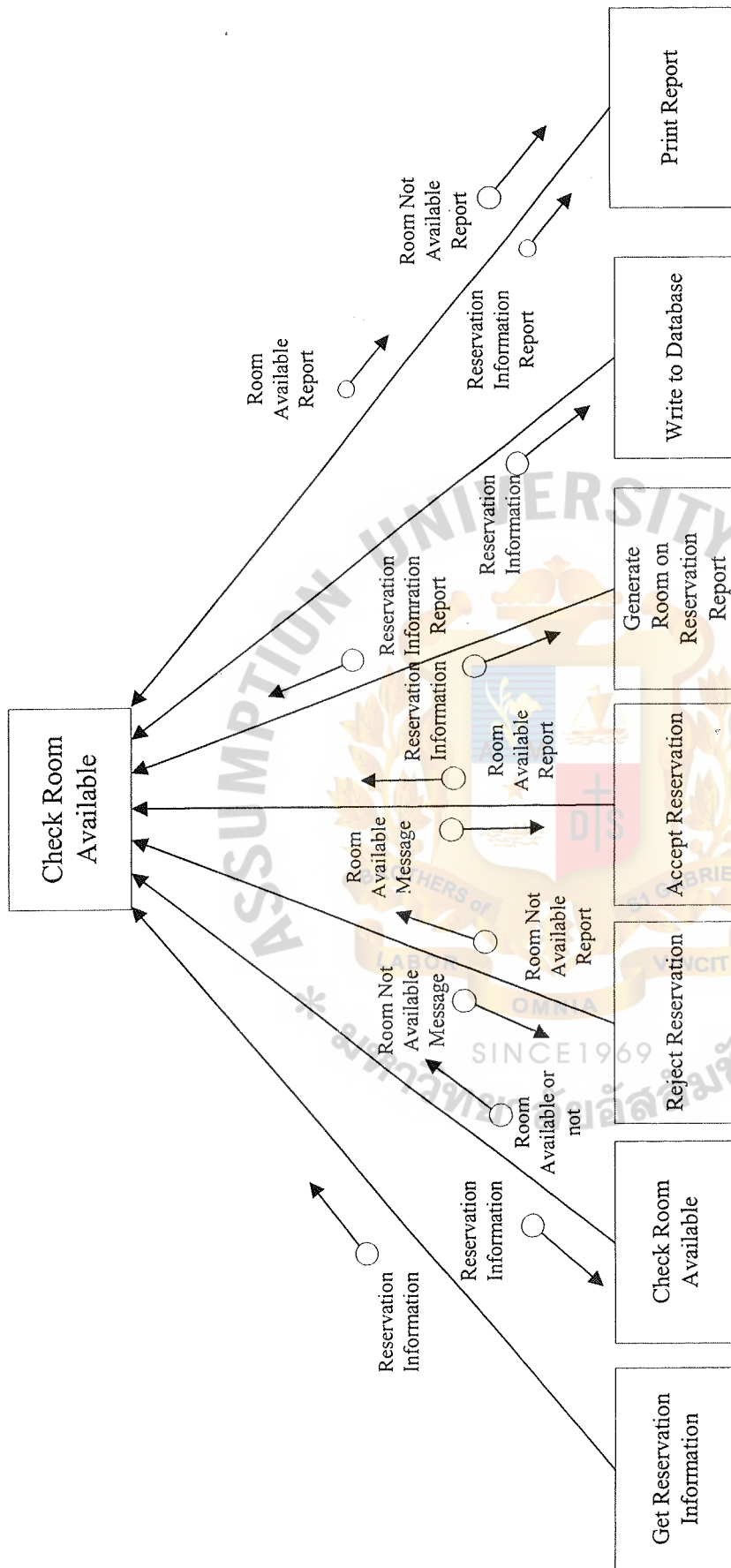**APPENDIX G**

STRUCTURE CHART

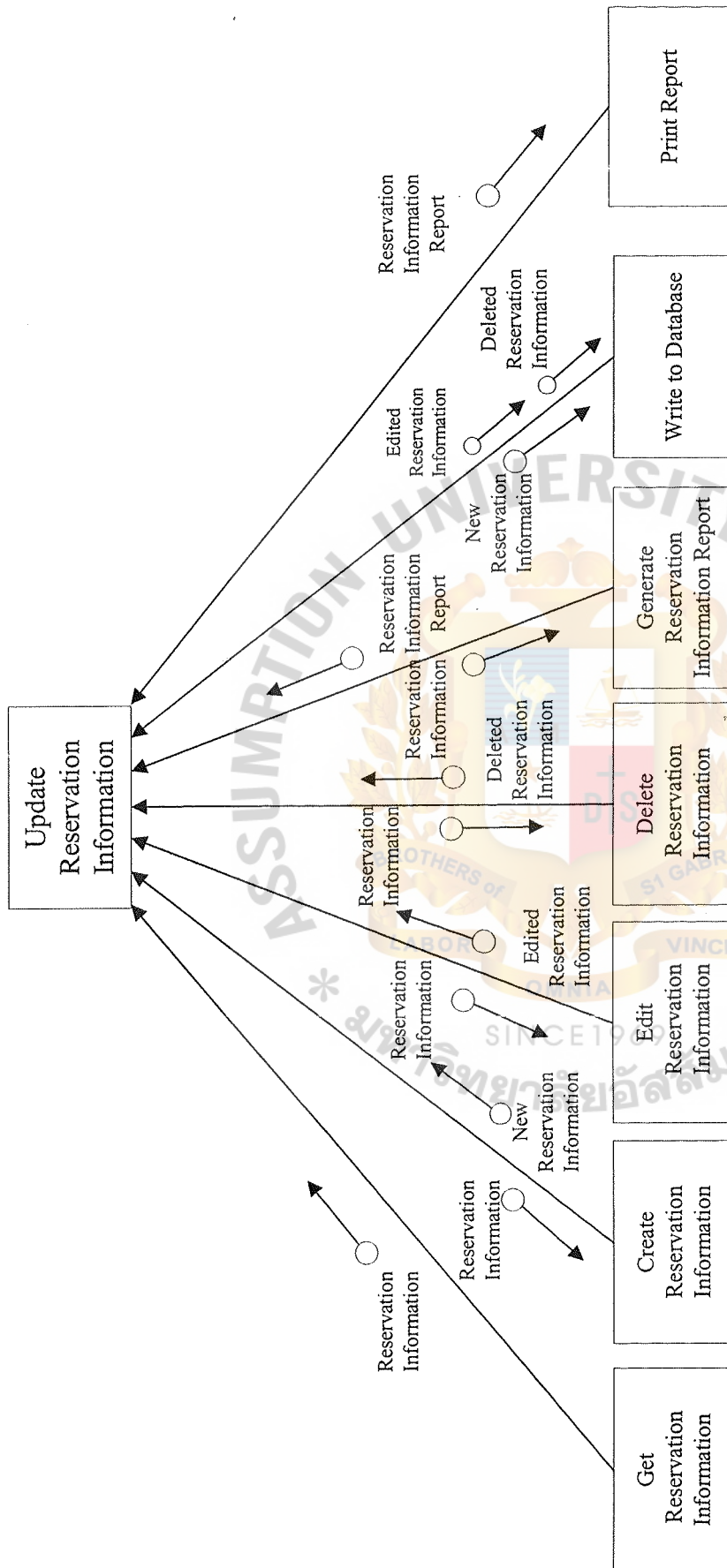Figure G.1. Structure Chart of Process Check Room Available.

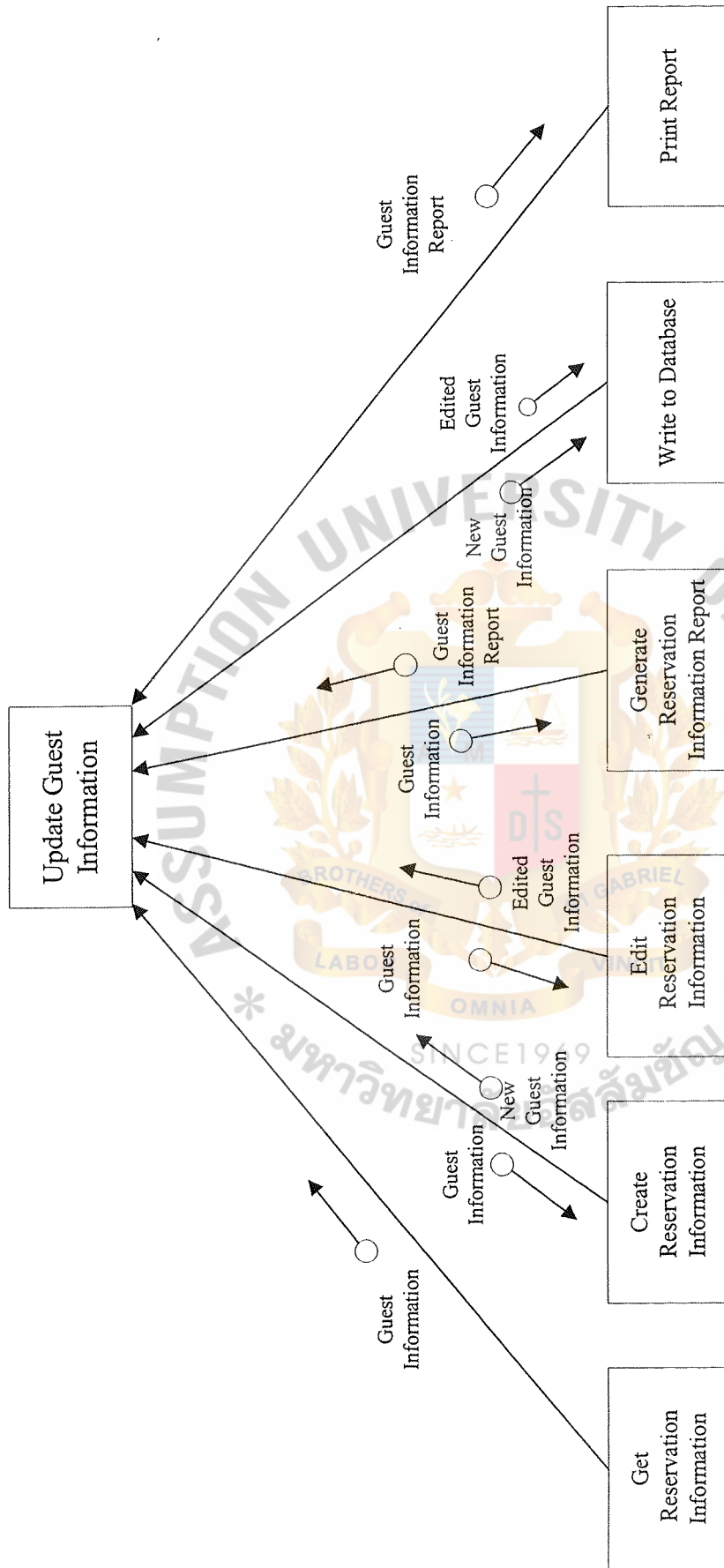Figure G.2.   Structure Chart of Process Update Reservation Information.

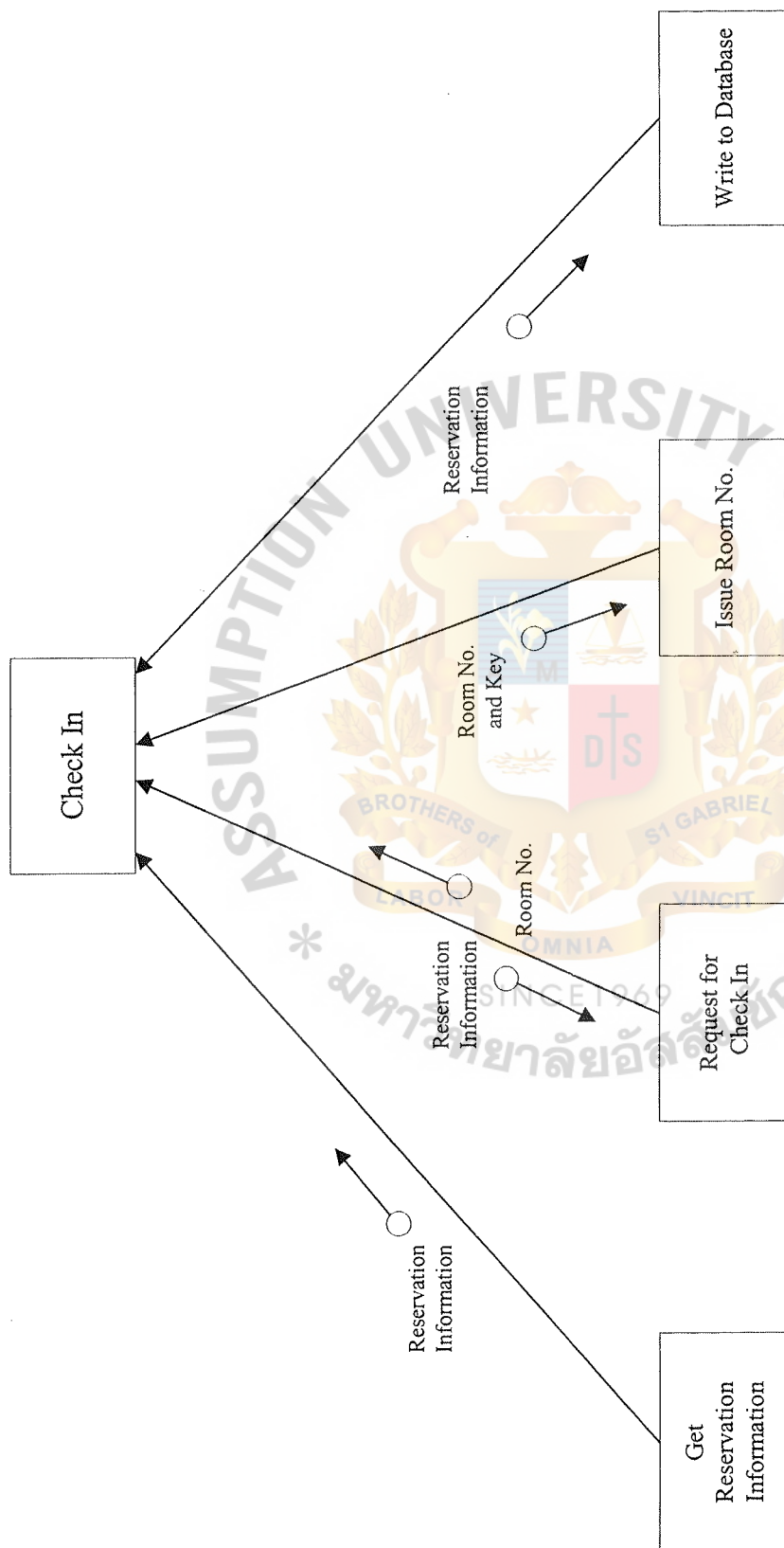Figure G.3. Structure Chart of Process Update Guest Information.

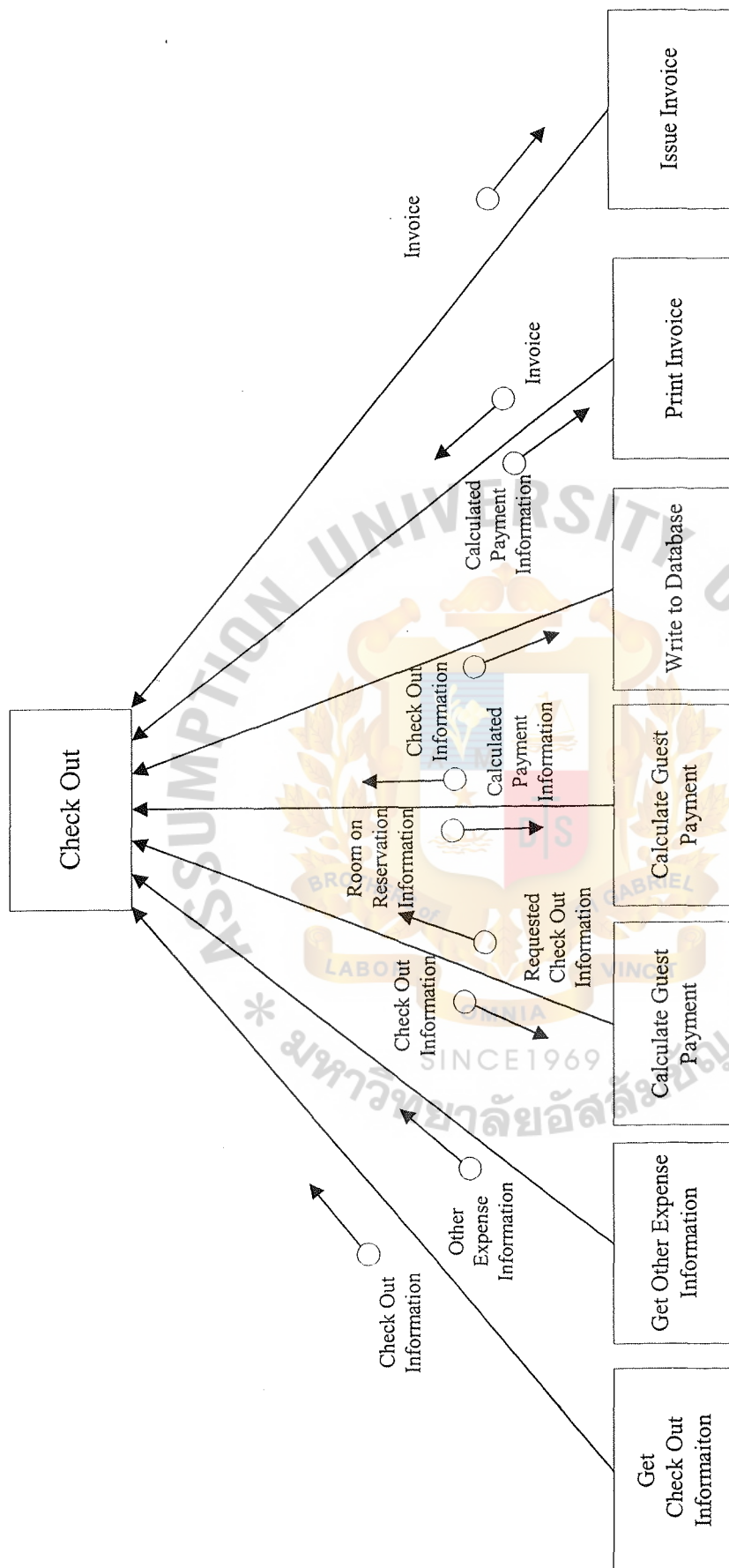Figure G.4. Structure Chart of Process Check In.

Figure G.5. Structure Chart of Process Check Out.

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