

# Koh Chang Resort Information System

by

Mr. Udomvud Udomkijaree

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

July 2003



**Koh Chang Resort Information System**

by

Mr. Udomvud Udomkijaree

A large, faint watermark of the Assumption University of Thailand logo is centered on the page. The logo is circular with the text 'ASSUMPTION UNIVERSITY OF THAILAND' around the perimeter. Inside the circle is a shield with a blue and white design, flanked by two golden lions. Below the shield is a banner with the text 'BROTHERS OF ST GABRIEL' and another banner below that with 'LABOR OMNIA VINCIT'.

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

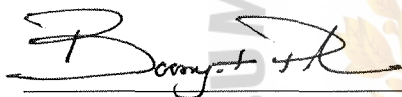
July 2003

Project Title	Koh Chang Resort Information System
Name	Mr. Udomvud Udomkijaree
Project Advisor	Dr. Boonyarit Pokrud
Academic Year	July 20, 2003

---

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.

Approval Committee:



(Dr. Boonyarit Pokrud)  
Advisor



(Prof. Dr. Srisakdi Charmonman)  
Chairman



(Air Marshal Dr. Chulit Meesajjee)  
Dean and Co-advisor



(Asst. Prof. Dr. Vichit Avatchanakorn)  
Member



(Assoc. Prof. Somchai Thayarnyong)  
MUA Representative

July 20, 2003

## ABSTRACT

Koh Chang Resort is one of many resorts in Koh Chang, which provides rooms, services and facilities to both Thais and International tourists. The resort management process includes reservation management, report management, for example, a lot of processes are required to complete the resort management task. Therefore, this project is to develop the effective information system to facilitate the resort management system.

The current existing Koh Chang Resort Information System is based on a manual system. Most of the data are stored on paper while some parts of the data are stored in Microsoft Excel. More space is required to store the pile of papers and too much time is required to process the collected data and information. The system has to face the general problems of a manual system, which are human error, having high maintenance cost, and loss of data.

The new proposed Koh Chang Information System, which is the computerized system, is developed to replace the manual system. The proposed system introduces a new way to handle all resort management tasks, which are reservation data entry, room available searching, reservation making, information inquiry, and generation of any relevant reports and documents. All data and information are kept in file and database server, Microsoft SQL Server 2000, which run on Microsoft Windows NT, and are accessed through the clients, Microsoft Windows 98. The user interfaces, moreover, are implemented using Visual Basic.

The proposed database application system is found to improve the existing operations, and solve all vital problems occurred in the manual system. The proposed database application system is found to reduce the time to operate the resort management and to decrease the high maintenance cost.



## ACKNOWLEDGEMENTS

Several people have made contributions to this project. The writer would like to acknowledge their efforts and thank them for their contributions.

He would like to thank Dr. Boonyarit Pokrud, his project advisor, for his valuable suggestions and advice given throughout the preparation of this project.

He extends his sincere thanks to all lecturers of MS (CIS) program who have imparted of their knowledge to him, resort management system of Koh Chang Resort for their timely assistance and information provided to him while carrying out the data collection required for his project.



## TABLE OF CONTENTS

<u>Chapter</u>	<u>Page</u>
ABSTRACT	i
ACKNOWLEDGEMENTS	ii
LIST OF FIGURES	v
LIST OF TABLES	vii
I. INTRODUCTION	1
1.1 Background of the Project	1
1.2 Objectives of the Project	2
1.3 Scope of the Project	2
1.4 Deliverables	3
1.5 Project Plan	3
II. THE EXISTING SYSTEM	6
2.1 Background of the Organization	6
2.2 Existing Business Function	7
2.3 Current Problems and Areas for Improvement	10
III. THE PROPOSED SYSTEM	12
3.1 System Specification	12
3.2 Requirement Analysis	13
3.3 System Design	22
3.4 Hardware and Software Requirement	30
3.5 Security and Control	33
3.6 Cost and Benefit Analysis	35
IV. PROJECT IMPLEMENTATION	46
4.1 Overview of Project Implementation	46



<u>Chapter</u>	<u>Page</u>
4.2 Stage of Project Implementation	47
4.3 Test Plan	48
4.4 Conversion	49
V. CONCLUSIONS AND RECOMMENDATIONS	51
5.1 Conclusions	51
5.2 Recommendations	54
APPENDIX A DATA FLOW DIAGRAM	55
APPENDIX B PROCESS SPECIFICATION	58
APPENDIX C FEASIBILITY ANALYSIS	63
APPENDIX D DATA DICTIONARY	75
APPENDIX E REPORT DESIGN	76
APPENDIX F INTERFACE DESIGN	80
APPENDIX G DATABASE DESIGN	87
BIBLIOGRAPHY	93

## LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1.1 Project Plan of Resort Information System of Koh Chang Resort	5
2.1 Organization Chart of Koh Chang Resort	7
2.2 Context Data Flow Diagram of Existing System	8
2.3 Level 0 Data Flow Diagram of Existing System	9
3.1 Context Data Model of Proposed System	15
3.2 Context Data Flow Diagram of Proposed System	16
3.3 Functional Decomposition Diagram of Proposed System	18
3.4 Level 0 Data Flow Diagram of Proposed System	21
3.5 The Network Peripherals of New Proposed Database Application System	33
3.6 Cost Comparison between Manual and Computerized System	44
3.7 Payback Period Analysis of the Proposed System	45
A.1 Level 1 Data Flow Diagram of Reservation Process	55
A.2 Level 1 Data Flow Diagram of Payment Process	56
A.3 Level 1 Data Flow Diagram of Registration Process	57
C.1 Payback Period for Candidate 1	69
C.2 Payback Period for Candidate 2	70
C.3 Payback Period for Candidate 3	71
E.1 Report Design: Reservation Summary Report (Monthly Report)	76
E.2 Report Design: Reservation Report (Request by Marketing Department)	77



<u>Figure</u>	<u>Page</u>
E.3 Report Design: Payment Receipt	78
E.4 Report Design: Reservation Summary Report (Annual Report)	79
F.1 Interface Design: Main Menu (Log in is Required to Access the System)	80
F.2 Interface design: Log in Interface	81
F.3 Interface Design: Main Menu (After Log in to the System)	82
F.4 Interface Design: Main Menu (Registration Menu)	83
F.5 Interface Design: Main Menu (Reservation Menu)	84
F.6 Interface Design: Reservation Page (Sample Data Page 1)	85
F.7 Interface Design: Reservation Page (Sample Data Page 2)	86



## LIST OF TABLES

<u>Table</u>	<u>Page</u>
3.1 Candidate System Matrix	24
3.2 Feasibility Analysis Matrix	27
3.3 The Hardware Specification for File and Database Server	30
3.4 The Software Specification for File and Database Server	31
3.5 The Hardware Specification for Each Client Machine	32
3.6 The Software Specification for Each Client Machine	32
3.7 Manual System Cost Analysis, Baht	37
3.8 Five Years Accumulated Manual System Cost, Baht	37
3.9 Computerized System Cost Analysis, Baht	39
3.10 Five Years Accumulated Computerized System Cost, Baht	40
3.11 The Comparison of the System Costs, Baht	40
3.12 Tangible Benefit of Proposed System, Baht	42
5.1 The Degree of Achievement of the Proposed System	52
B.1 Process Specification of Room Management Process	58
B.2 Process Specification of Search Information Process	58
B.3 Process Specification of Information Process	59
B.4 Process Specification of Reservation Process	59
B.5 Process Specification of Prepaid Process	60
B.6 Process Specification of Payment Process	60
B.7 Process Specification of Check In Process	61
B.8 Process Specification of Check Out Process	61
B.9 Process Specification of Report Management Process	62



<u>Table</u>	<u>Page</u>
C.1 Estimated Cost of Candidate 1, Baht	63
C.2 Estimated Cost of Candidate 2, Baht	64
C.3 Estimated Cost of Candidate 3, Baht	65
C.4 Payback Period for Candidate 1, Baht	66
C.5 Payback Period for Candidate 2, Baht	67
C.6 Payback Period for Candidate 3, Baht	68
C.7 Net Present Value for Candidate 1, Baht	72
C.8 Net Present Value for Candidate 2, Baht	73
C.9 Net Present Value for Candidate 3, Baht	74
D.1 Data Dictionary of Resort Management Database	75
G.1 Structure of Guests Table	87
G.2 Structure of Travel Agents Table	88
G.3 Structure of Reservations Table	89
G.4 Structure of Rooms Table	90
G.5 Structure of Receptionists Table	91
G.6 Structure of Vehicles Table	91
G.7 Structure of Expenses Table	92

## I. INTRODUCTION

### 1.1 Background of the Project

Thai Government supports, promotes, and encourages Thais and Internationals tourist to travel in Thailand. Koh Chang, a sub-district of Trat, is a top destination for travel in Thailand. Resorts in Koh Chang are very famous for both Thais and Internationals tourists. There are many resorts were found in Koh Chang to serve many tourists. Koh Chang resort is the one, which is established on 2000 to provide more convenience and more facilities to the tourists. Koh Chang resort is located on White sandy beach, which is the most beautiful beach in Koh Chang.

Koh Chang Resort is done by the manual system or human manner. All data and information are kept in the paper format and some are kept in MS Excel. As a higher competition, the key successes of the resort for compete with the competitors are fast, accurate and reliable system. The manual system cannot accomplish the key success of the resort. Thus, the computerized system has to be developed for this resort in order to accomplish the key success of the resort.

The newly computerized system is introduced to facilitate the users to run the business faster, more accurate and more reliable than the current existing system. The proposed system has to reduce the manual work, paper work and human work, in order to minimize the human-generate mistakes, as well as the cost of running the business. The proposed system has to reduce the time to operate the resort management, to minimize maintenance cost, and to generate the system reports to serve the operation and analytical tasks.



## **1.2 Objectives of the Project**

The main objectives of the project regarding the new proposed Koh Chang Resort Information System are as follows:

- (1) To study the current existing Koh Chang Resort system.
- (2) To identify the current problems and define user requirements of the Koh Chang Resort System.
- (3) To design and develop an effective computerized information system for Koh Chang Resort to replace the current existing system, which is a manual work and cannot handle it efficiently.
- (4) To utilize the use of database approach, network approach, and computer technology together with efficient design and generate reports.
- (5) To provide the on time reliable accurate information and report to resort managers for decision-making.
- (6) To accelerate the period of time and minimize the response time of the system.
- (7) To implement and test the new proposed Koh Chang Resort Information System.

## **1.3 Scope of the Project**

This project is to develop a proposed Koh Chang Resort Information System, which is to be replaced the current existing Koh Chang Resort System. The scopes of the project will cover the major functions of Koh Chang Resort Information system, which are consist of reservation management, check in management, check out management, and report management for concerned users through a graphical user interface (GUI).

#### 1.4 Deliverables

The deliverables of the project on the proposed Koh Chang Resort Information System are as follows:

- (1) Hardware Specification
- (2) Software Specification
- (3) Process Modeling (Context Diagram and Data Flow Diagram)
- (4) Data Modeling (Context Entity-Relation Diagram, Key-Based, and Fully Attributed Diagram)
- (5) Cost and Benefit Analysis
- (6) Test Plan
- (7) Conversion Plan

#### 1.5 Project Plan

The project is divided into seven phases: preliminary investigation phase, problem analysis phase, requirements analysis phase, decision analysis phase, system design phase, system construction phase, and system implementation phase. Each phase serves a role in the problem-solving process. Some phase identify problems, while others evaluate, design, and implement solutions. The project plan included operations and support activities to support the final system. All the activities are completed on September.

The reason that this project has to divide into seven phase and included operations and support is prevent the failures. Many projects have failed to meet expectations, cost more than budgeted, and are delivered much later than promised. As the Gartner Group suggests, "Consistent adherence to moderately rigorous methodology guidelines [a process] can provide 70 percent of [system development] organizations with a productivity improvement of at least 30 percent within two years."

The project plan, which is represented in Gantt Chart Figure 1.1, shows the series of activities as we are mentioned above, time spent for each activity, and project completion date.



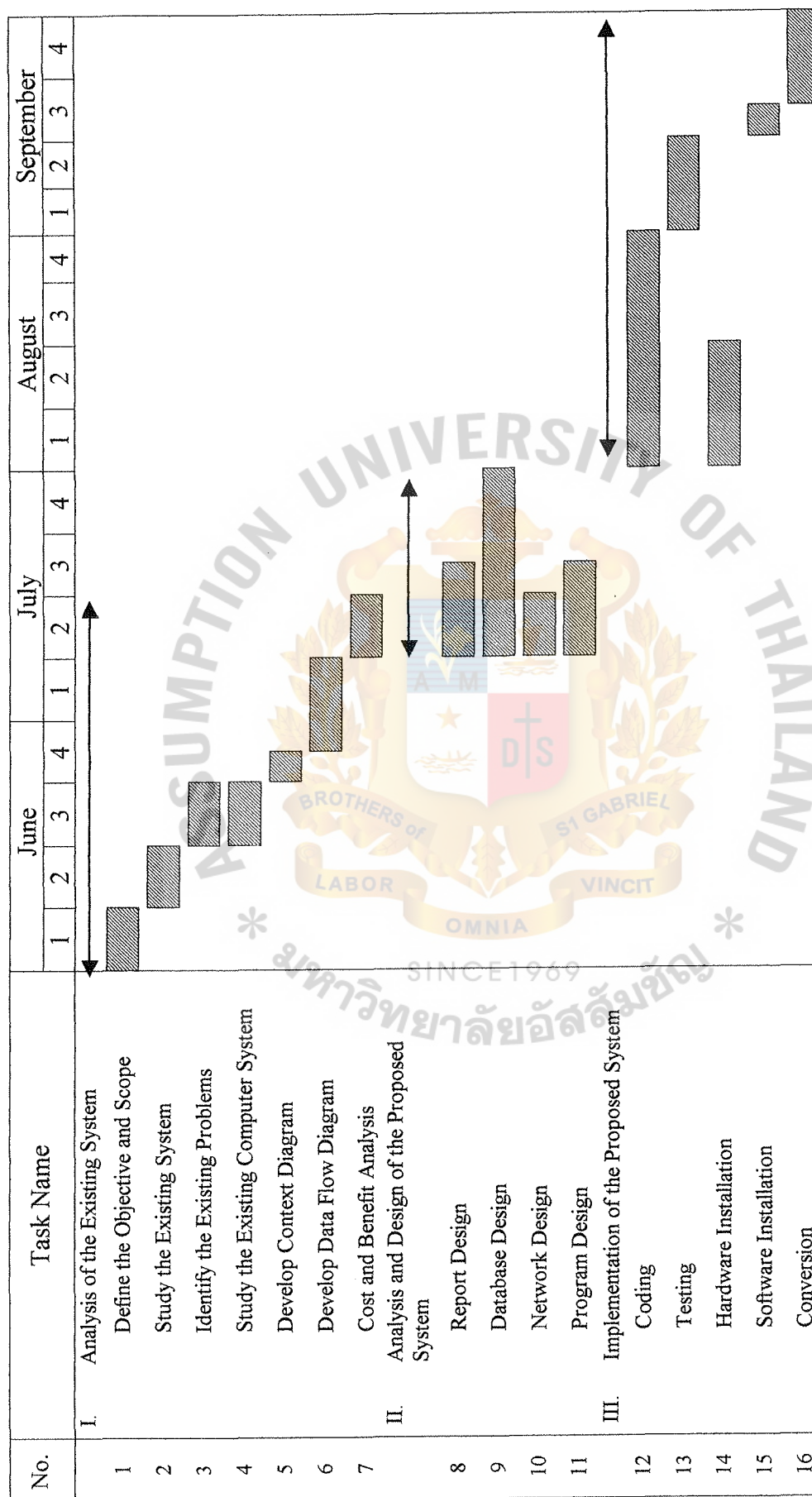


Figure 1.1. Project Plan of Resort Information System of Koh Chang Resort.



## **II. THE EXISTING SYSTEM**

### **2.1 Background of the Organization**

Koh Chang Resort was established since 2000, which is located in White Sandy beach, the most beautiful beach in Koh Chang. Koh Chang Resort has room capacity of 150 rooms. There is restaurant, coffee shop, seminar room, which can serves 150 persons, and swimming pool. The resort provides services for guests as a luxury hotel. These are some of services, which are provided to guests: room service, laundry and ironing service, safe deposit service, and telephone capable of connecting with internal and external telephone through the resort private switch board.

The resort is operated under the seven-departments, which are controlled by a general manager. These are brief details of seven departments:

- (1) Front Office Department: They perform all activities, which are reservation management, information management, check in management, and check out management.
- (2) Marketing Department: They concern in marketing strategy for Koh Chang resort.
- (3) Personnel Department: They perform all activities concern with human resource, which is recruitment, payroll, welfare, etc.
- (4) Accounting Department: The major responsibility of accounting department is controlling, managing, and recording all resort account and resort cash flow.
- (5) Room Service Department: The function of room service department is all services, which are occurred and requested by guest.
- (6) Maintenance Department: This department is responsible for all maintenance activities in the resort.

- (7) Food and Beverage department: All food and beverage services, which provide for guests and tourists, are their major functions.

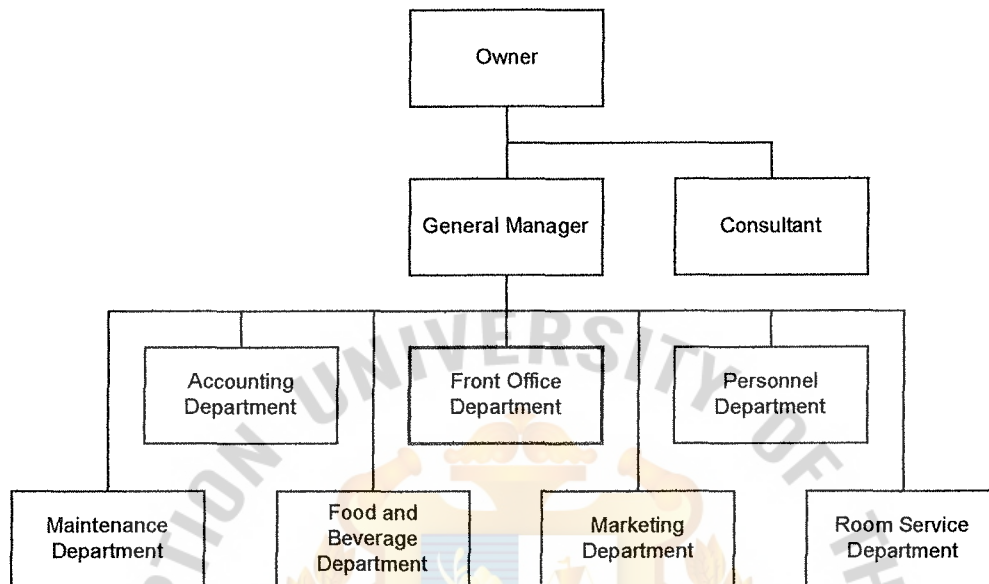


Figure 2.1. Organization Chart of Koh Chang Resort.

## 2.2 Existing Business Functions

In the current working environment, receptionists who respond to all of major functions in the resort for example, reservation. All the works are done by manual. The data and information are kept in the paper format, some are store in MS Excel for calculation. All the resort tasks are performed in one computer, which is stand-alone personal computer. Thus, the data and information cannot be shared and be used by the marketing department or any departments. In this section, we will represent the existing system that how the system works under the manual system in the paper format. In the figure 2.2 is the flow of data, which occurs between guest, receptionist, and the existing system. Manager and marketing department is mentioned only report inquiry.

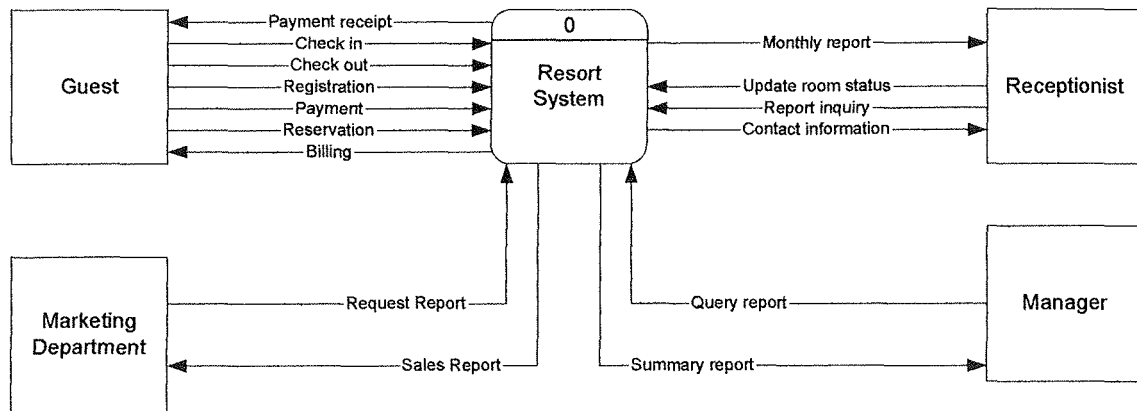


Figure 2.2. Context Data Flow Diagram of Existing System.

As the Figure 2.2 is mentioned, receptionist has to prepare the report for management level for decision-making. In case of the management level or any departments want some information, they have to come to access at the reception, where stored all the resort information or transactions. In the Figure 2.3, we study in the details of the existing system. The data stores in the Figure are the MS Excel files. The documents, which are released in the form of billing or receipt, can be mis-understood because of handwriting.

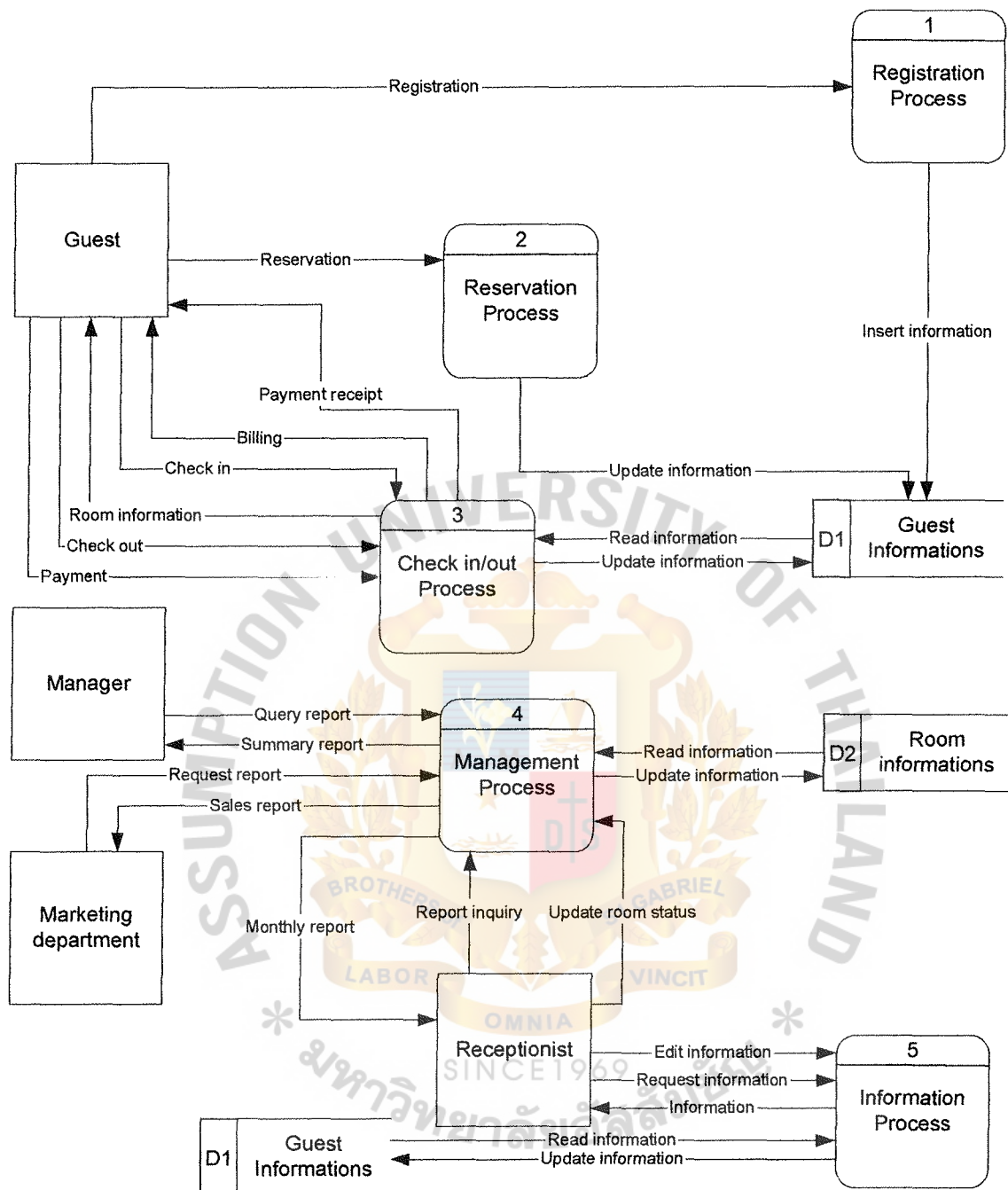


Figure 2.3. Level 0 Data Flow Diagram of Existing System.

As we study the flow of the data in the Figure 2.3, the process in the Figure is represented the receptionist who performed all the tasks that occur day by day.



## 2.3 Current Problems and Areas for Improvement

The manual system that currently applied in the resort causes many potential problems. According to PIECES framework, we can discover problems, opportunities, and directives.

### (1) Performance

The performance of the system can be measured by the throughput and response times. The throughput of the existing system is not good in the peak time because response time is too slow. The existing system consumes much more time to complete guest request or transaction, which has effect with the throughput of the system in the peak period. Thus, the performance of the system is unacceptable.

### (2) Information (and data)

- (a) Outputs: Information, which is produced from the existing system, is not accurate and not timely to its subsequent use. Some of information is not in a useful format. Therefore, the report for management level cannot use to analyze and interpret. Lack of information also is a vital problem.
- (b) Inputs: Data, which the existing system captures, is redundancy (data is captured more than once), and some data is not captured. Handwriting is a cause of errors.
- (c) Stored data: Data, which is stored in the existing system is not secure from accident or vandalism, not accessible, and not well organized.

2487 e.1

(3) Economics

Economic is a major problem for the resort. The resort has to minimize the overall cost and maximize the performance at the same time. Costs in the exiting system are too high, some of costs are untraceable to source, which are not the best way to operate the resort in long run.

(4) Control (and security)

There is too little control and security in the existing system. As we know the existing system is operate in paper format, which can be accessed and altered by authorized persons and unauthorized persons. Data is also lost while the data is processing.

(5) Efficiency

As the manual system, the existing system waste the operation time, materials, and office supplies. Some information is redundantly generated from the existing system.

(6) Service

There is no standard in the existing system. Therefore, the system may produces inaccurate results, unreliable results, and is not easy to learn.

The areas for improvement are emphasized on the existing function of the existing system in order to solve the current problems.

The computerized information system have to be introduced to the resort to facilitate the personnel processes of work, to improve the data security and control, and to generate the accurate information report to management level for decision making.

The personnel have to be well trained for the usage in the proposed system, which is computerized information system. The evaluation is needed for measure the performance of the personnel.

### III. THE PROPOSED SYSTEM

#### 3.1 System Specification

According to the previous chapter, Koh Chang resort now requires an effective Resort Information System, which can facilitate the various processes of Koh Chang Resort, and solve the current problems occurring from the existing manual system as mentioned in previous chapter.

In order to achieve the target, the new proposed Resort Information System should have the components as follows:

- (1) System Database is designed, developed and created in the high performance database server, available for every responsible personnel, staffs, and receptionists, to online manage the data or information and make a query.
- (2) File and Database Server and Client machines perform as the client/server using Local Area Network (LAN) to connect between file and database server and each client machine in order to share data, information, and computer resources among employees and concern users.
- (3) File and database server has to have high specification to run Microsoft Windows NT as operating system and Microsoft SQL Server 2000 as database management system. Each client machine also has high specification to run Microsoft Windows 98 Second Edition as operating system and developed application, which is developed by visual basic, as an application to access and manipulate the data and information in the file and database server. Both file and database server and client machines specification are defined in Hardware and Software Requirement section.

- (4) All resort data and information on the current manual system has to key into the new designed database, which is stored in file and database server to facilitate the resort process such as reservation management and report management, for example. The new designed database in file and database server, which can be accessed through client machines using Local Area Network (LAN), provides online inquiry and generates report on new graphical user interface in the client machines.

### **3.2 Requirement Analysis**

The study of the existing system reveals many problems, such as high maintenance cost and human errors, which cause the users to require the newly computerized system to handle their works more efficiently. After all problems are identified and evaluated, the business requirement for the new system can be summarized as follows:

- (1) The proposed system should facilitate the users in searching reservation information, guest information, and any relevant information. The proposed system should minimize the response time to access the information.
- (2) To calculate the reservation cost and room payment, the proposed system should provide the embedded arithmetic function within the system to generate calculation result automatically.
- (3) The proposed system should enhance the existing data entry process, which produces many human errors. The use of application program, which provides some verification mechanism to verify the input data from the users.



- (4) The proposed system should provide a flexible inquiry for users to inquiry the information to prepare the reports, which are used by many department and management level.
- (5) To encourage the paperless office, the proposed system should provide the request reports or documents to the users by introducing the online inquiry display screen.

To gain a better understanding of the new system requirement, the logical model is drawn to depict the system independent of any technical implementation. In this project, data modelling and process modelling techniques are used to document business requirement, and serve as the logical design of the proposed system. The detail of each technique can be explained as follows:

#### Data Modelling

Data modelling is a technique for organizing and documenting a system's data. Data modelling is sometimes called database modelling because a data model is eventually implemented as a database. Data modelling is depicted in graphical, which is called an entity-relationship diagram, or ERD. There are three levels of entity-relationship diagram: context data model, key-based data model, and fully attributed data model.

The context data model represents only the entity and relationship between each entity. There are five entities, which are discovered in the system: Guest Information, Room Information, Reservation Information, Travel agency Information, and Receptionist Information. Each entity has relationship, when combined with the entity name, in form of simple business sentences or assertions.

In key-based data model, the primary key must be added to each entity to exhibit the unique characteristic of each entity. The foreign key is a primary key of one entity

that is contributed to (duplicated in) another entity to identify instances of a relationship. A foreign key (always in a child entity) always matched the primary key (in a parent entity).

The final data model is fully attributed data model shows all attributes of each entity. To identify all attributes, it requires the understanding of the data attributes for the system. These facts can be discovered through the study the existing reports and documents to be the naming standard for attribution.

The following figure is the context data model of the proposed system.

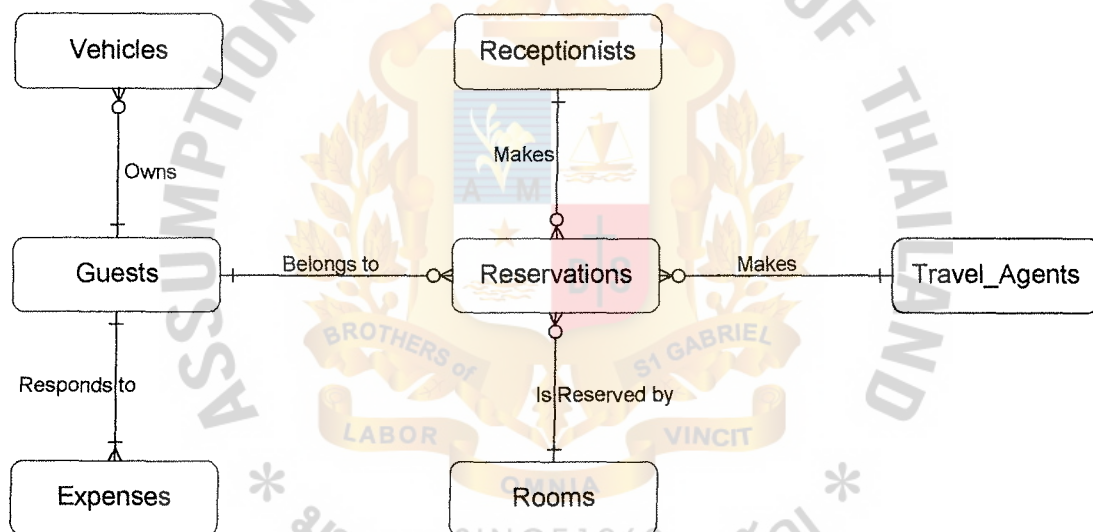


Figure 3.1. Context Data Model of Proposed System.

## Process Modelling

Process modelling is a technique for organizing and documenting the structure and flow of data through a system's process and/or the logic, policies, and procedures to be implemented by a system's processes.

To construct the process model, the context diagram is first drawn to establish the initial project scope, which defines how the developed system interacts with other systems and the business as a whole. Figure 3.2 illustrates the context diagram of proposed system. Four external entities, which are Guest, Receptionist, Marketing Department, and Manager, interact with the system.

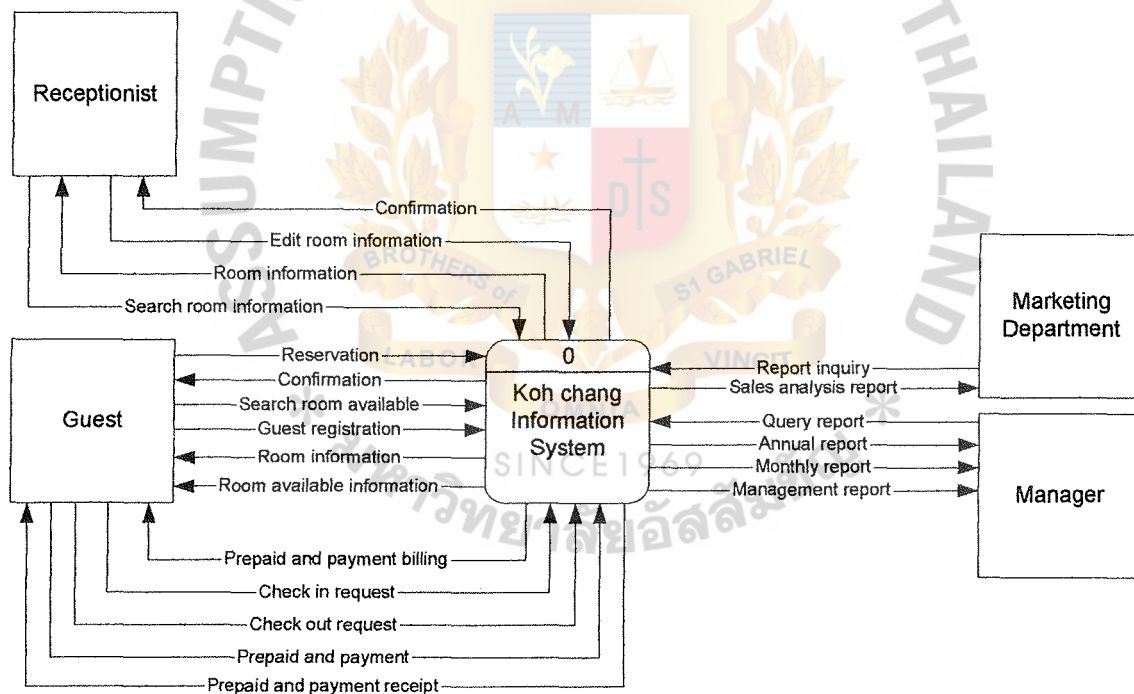


Figure 3.2. Context Data Flow Diagram of Proposed System.

Next, the functional decomposition diagram is created to show the top-down functional decomposition and structure of the system. This diagram also serves as an outline for drawing the data flow diagram. The functional decomposition diagram of proposed system is showed in Figure 3.3.





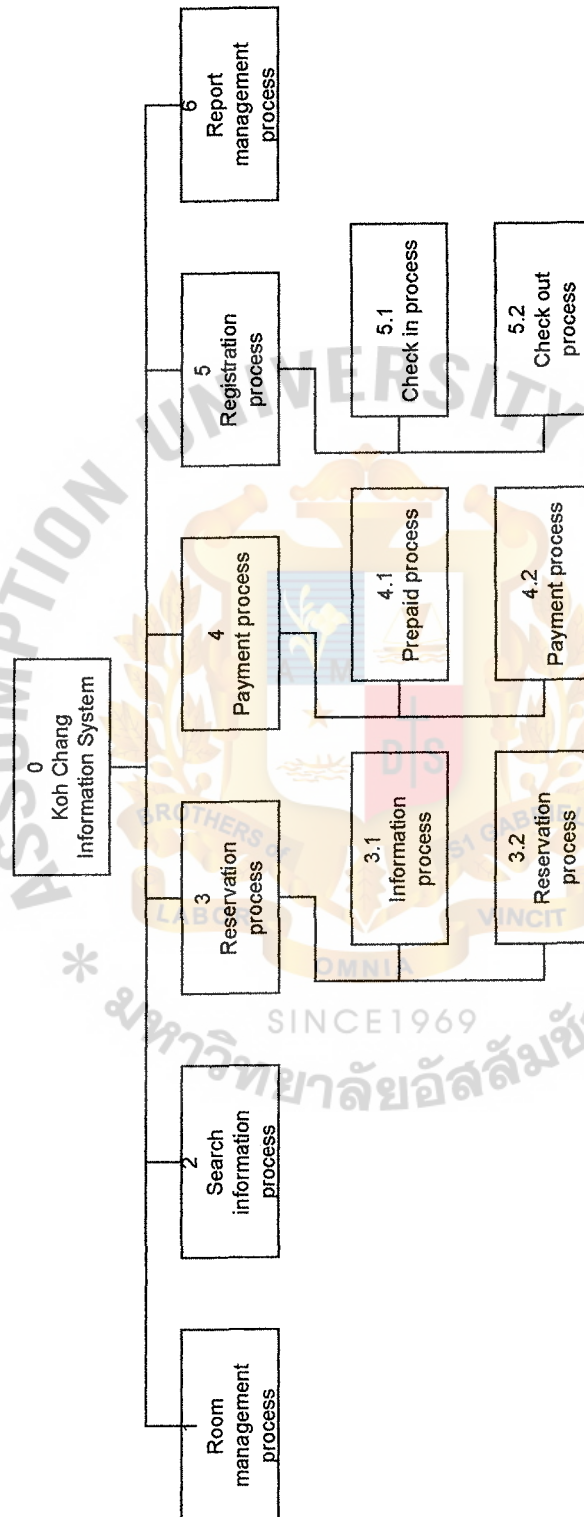


Figure 3.3. Functional Decomposition Diagram of Proposed System.

After finishing the previous two diagrams, a data flow diagram (DFD) can be drawn to depict the flow of data to, from, and within the system. A data flow diagram has many levels of details. The lower the level of data flow diagram, the more details of processes within the system has. The details of each process can be explained briefly as follows:

(1) Room Management Process:

This process is created for receptionist or authorized person. The process performs updating or editing room information. This process will generate the log file to show who alters the information, when the authorized person alters the information, and which room or record is altered.

(2) Search Information Process:

This process is created for searching the room information, reservation information, and room available information. This process is useful for reception to search all information in the system.

(3) Reservation Process:

This process is created for gathering guest and travel agency information, and making a room reservation. All reservation tasks are done by this process.

(4) Payment Process:

This process is created for calculating both prepaid payment or booking fee or reserve fee, and payment that occurs after the guest check out the room. This process also calculates the service charge, expense charge, and any charge that occurs while the guest is using the room. Nevertheless,

the calculating charge is in the future plan of this project thus, this project is excluded the calculating any charges.

(5) Registration Process:

This processes is created for recording the check in and check out the room by guest request. This process will check guest check in/check out by retrieving the guest information, travel information, and reservation information to verify the check in/check out task.

(6) Report Management Process:

This Process is created for generating the reports, which are provided for Marketing Department, Management level, and any relevant department.

Figure 3.4 is illustrated level 0 data flow diagram of proposed system. The lower levels of data flow diagram are shown in the Appendix A.

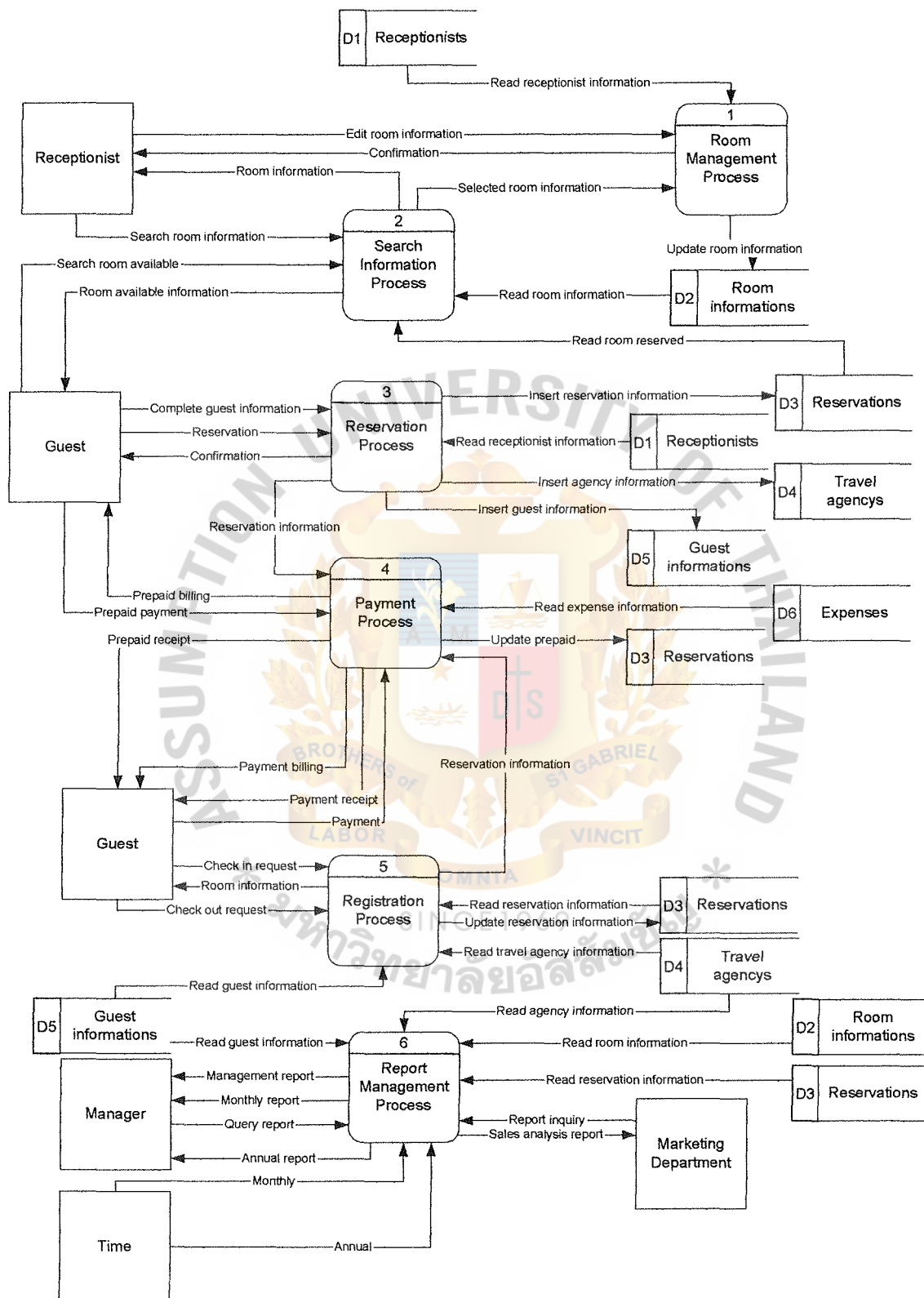


Figure 3.4. Level 0 Data Flow Diagram of Proposed System.



### 3.3 System Design

The previous requirement analysis section primarily focuses on the logical aspects of the system, whereas system design deals with the physical implementation aspects of a system. Various design techniques are applied to construct the system to accomplish the objectives of the project. The details of each design technique can be explained as follows:

#### Candidate Solutions

Given the business requirement established in the previous section, the alternative candidate solutions can be identified from the idea and opinion of the development team and user. Along with reviewing the system specification, the three candidate solutions can be defined for the proposed system.

(1) Candidate 1: Resources Sharing with Local Area Network – File Server

Microsoft Visual Basic is a very popular development tool. The existing programmer can use it without any technical assistance. As a visual style of Microsoft product, it facilitates the programmer to develop the new application quickly. For network architecture, the file server is used in this candidate to store database, and the client machines execute all database instructions. This means that the entire database and tables may have to be transported to and from the client machines across the network. The database software, MS Access 97, is used to manage data in the system.

This candidate is easy to implement because our development team has an experience in visual basic. Thus, this candidate takes less time to implement and design the proposed system.

(2) Candidate 2: Two Tiers Client/Server Computing – Database server

As we mention in the candidate 1, visual basic is also used in this candidate as the development tool. The database software is Microsoft SQL Server 2000, relational database management system as database server. This solution supports the multi-user environment and relational database technology. Database server is used to follow the concept of two-tier client/server computing

Our development team has an experience in visual basic and SQL server 2000. This solution provides the best way of developing and managing the system by introducing the effective development tool and database software.

(3) Candidate 3: Two Tiers Client/Server Computing – Web Database

Active server Page (ASP) and Microsoft SQL Server 2000 are used in this solution to develop the web-based application as intranet. The network for this solution as we mention in the previous solution, which is two-tier client/server computing. The database server serves not only as the system database but as it also serves as the web server for developed program. This kind of architecture is called corporate intranet.

This candidate can be implemented quickly because it requires only a web browser to run the developed application. No additional software is installed in the client machines. However, our development team does not have an experience in the web base development. Training course is required for our development team.

The candidate systems matrix of proposed system is illustrated in Table 3.1, which explores the characteristics of each candidate in more details.

Table 3.1. Candidate Systems Matrix.

Characteristics	Candidate 1	Candidate 2	Candidate 3
<p>Portion of system computerized:</p> <p>Brief description of the portions of the system that would be computerized in the candidate.</p>	Fully supported all relevant departments involved in resort management process.	Same as candidate 1.	Same as candidate 1.
<p>Benefits:</p> <p>Brief description of the business benefits that would be realized in the candidate.</p>	Easy to develop the application.	Powerful RDBMS and application enable user perform their tasks more efficiently and effectively.	Quickly implemented and easy to run with client machines.
<p>Servers and Workstations:</p> <p>A description of the server and the workstations needed to support this candidate.</p>	Microsoft Visual Basic and Microsoft Access 97.	Microsoft Visual Basic and Microsoft SQL Server 2000.	Internet Information System (IIS) 5.0, Internet Explorer, and MS SQL Server 2000.
<p>Application software:</p> <p>Description of the software to be purchased, built, accessed, or some combination of these techniques.</p>	Custom Solution.	Same as candidate 1.	Same as candidate 1.
<p>Method of data processing:</p> <p>Generally some combination of online. Batch, deferred batch, remote batch, and real time.</p>	Client/Server, File Server.	Client/Server, Database Server.	Client/Server, Web Database.
<p>Output devices and implications:</p> <p>A description of output devices that would be used, special output requirements (e.g. Network, preprinted form, etc.) and output considerations (timing constraints).</p>	Display monitor, Dot matrix printer, and Laser printer.	Same as candidate 1.	Same as candidate 1.

Table 3.1. Candidate Systems Matrix (Continued).

Characteristics	Candidate 1	Candidate 2	Candidate 3
<p>Input devices and implications:</p> <p>A description of input methods to be used input devices (e.g. Keyboard, mouse, etc.), special input requirements (e.g. new or revised forms from which data would be input), and input considerations (e.g. timing of actual inputs).</p>	Keyboard and mouse.	Same as candidate 1.	Same as candidate 1.
<p>Storage devices and implications:</p> <p>Brief description of what data would be stored, what data would be accessed from existing stores, what storage media would be used, how much storage capacity would be needed, and how data would be organized.</p>	File server with 20 GB storage capacities.	Microsoft SQL Server 2000 with 20 GB Storage capacities.	Same as candidate 2.

### Feasibility Analysis

After the candidate solutions are identified, the feasibility analysis can be done for each candidate. The following feasibility criteria should take into consideration when development team wants to select the best solution to implement in the production environment.

#### (1) Operational feasibility:

It is a measure of how well the solution of problems or a specific solution will work in the organization. It is also a measure how people feel about the system. All candidates are fully supporting the current business process but the candidate 2 is the most feasible because it can be implemented easily and managed tasks more efficiently and effectively.



(2) Technical feasibility:

It is measure of the practicality of a specific technical solution and the availability of technical resources and expertise. Our development team has not experience in web programming thus, candidate 3 is not suitable for this project. Both candidate 1 and 2 are the most suitable because our development team has experience in visual basic, MS Access 97, and MS SQL Server 2000.

(3) Economic feasibility:

It is measure of the cost-effectiveness of a project or solution. All the candidates require hardware and system analyst to implement and operate the developed system as equilibrium.

(4) Schedule feasibility:

It is measure how reasonable the project timetable is. Both candidate 1 and candidate 2 take less time to implement the developed system because of experience that our development team has. Candidate 3 consumes the most time in interface design and implement because our development team has to train to design web interface and implement web application.

Up to this point, all four feasibility criteria assessments are provided for each candidate solution. The score is then assigned to each feasibility criteria for each candidate, and multiplied by the weight, which is expressed in percentage, distributed from the total 100% to all four-feasibility criteria according to their degree of importance. The weight scores of each feasibility criteria are summed up for each candidate to rank the candidate solution of the proposed system.

The feasibility analysis result reveals that candidate 2 has the highest scores in operational, technical, economic, and schedule feasibility. Thus, candidate 2 has the highest total score, and ranks the best solution for the proposed system.

The completed feasibility analysis matrix for each candidate is illustrated in Table 3.2. In addition, the full details of cost-benefit calculations (Economic feasibility) are showed in Appendix C, which are all candidate cost tables, payback tables and graphs, and net present value (NPV) tables.

Table 3.2. Feasibility Analysis Matrix.

Feasibility Criteria	Wt.	Candidate 1	Candidate 2	Candidate 3
Operational feasibility:  Functionality. A description of to what degree the candidate would benefit the organization and how well the system would work.  Political. A description of how well received this solution would be by user management, user, and organization perspective.	30%	Fully supports the requirements in terms of functionality and business process.  Score: 85	Fully supports the requirements in terms of functionality and business process. This candidate performs task more efficiently and effectively.  Score: 90	Same as candidate 1  Score: 85

Table 3.2. Feasibility Analysis Matrix (Continued).

Feasibility Criteria	Wt.	Candidate 1	Candidate 2	Candidate 3
<p>Technical feasibility:</p> <p>Technology. An assessment of the maturity, availability (or ability to acquire), and desirability of the computer technology needed to support this candidate.</p> <p>Expertise. An assessment of the technical expertise needed to develop, operate, and maintain the candidate system.</p>	30%	<p>Current technical staff has full experience in Microsoft product, therefore the development process can be done easily.</p> <p>Microsoft Visual Basic is a mature technology based on version number.</p> <p>Score: 85</p>	<p>Current technical staff has full experience in Microsoft visual basic and MS SQL server.</p> <p>Microsoft Visual Basic is a mature technology based on version number.</p> <p>Score: 90</p>	<p>Current technical staff has only MS SQL server experience.</p> <p>Required to hire or train ASP expertise and web designer to perform this project.</p> <p>Score: 80</p>
<p>Economic feasibility:</p> <p>Cost to develop:</p> <p>Payback period:</p> <p>Net present value:</p> <p>Detailed calculations:</p>	30%	<p>Approximately 582,500 Baht</p> <p>Approximately 2.6 years</p> <p>Approximately 1,190,246 Baht</p> <p>See Appendix C:</p> <p>Score: 85</p>	<p>Approximately 528,500 Baht</p> <p>Approximately 2.5 years</p> <p>Approximately 1,244,246 Baht</p> <p>See Appendix C:</p> <p>Score: 90</p>	<p>Approximately 897,500 Baht</p> <p>Approximately 3.3 years</p> <p>Approximately 875,246 Baht</p> <p>See Appendix C:</p> <p>Score: 80</p>
<p>Schedule feasibility:</p> <p>An assessment of how long the solution will take to design and implement.</p>	10%	<p>Approximately 5 months</p> <p>Score: 90</p>	<p>Approximately 5 months</p> <p>Score: 90</p>	<p>Approximately 7 months</p> <p>Score: 85</p>
Ranking	100%	85.5	90	82

### Process Specification

The purpose of process specification is to define what the system does to transform inputs into outputs. It provides the details of system processes in table format, which is easier to look at all related input, output, and relevant process than in a diagram. All specified tables, which are process from the logical DFD. Process Specification is illustrated in Appendix B.

### Data Dictionary

To support system design, data dictionary provides a list of terms and definition for all data items and data stores within the developed system. The data dictionary for entity-relationship diagram is shown in Appendix D.

### Database Design

Referring to the data modelling (ERD) in the previous section, it requires some additional process called data analysis to convert the design logical data model into implemented database. In data analysis, a normalization technique is used to transform all data in ERD into applicable database. The result of database design is database structure in table format. The database design is shown in Appendix G.

### Output Design

Output requirements also come from the data flow diagram. These system outputs are easily identified and examined through the data flows that are connected to external entity. More details of output design can be gathered from interviewing the system users about their output requirements.



### 3.4 Hardware and Software Requirement

The proposed system needs two types of computer: file and database server and client machines. We have decided to use the Microsoft software, which is widely known in the market and is compatible with the other software.

The server must have the hardware specification, which can run Microsoft Windows NT as operating system and SQL server 2000 as database management system.

The hardware and software specifications of file and database server for the proposed System are shown in the Table 3.3 and Table 3.4 respectively.

Table 3.3. The Hardware Specification for File and Database Server.

Hardware	Specification
CPU	Pentium IV 1.4 GB or higher
Cache	256 KB or higher
Memory	512 MB or higher
Hard Disk	20 GB or higher
CD-ROM Drive	32x or higher
Floppy Drive	1.44 MB
Network Adapter	Ethernet 10-Base T
Display Adapter	SVGA Card
Display Monitor	17" Monitor
Printer	Dot Matrix, Ink Jet
UPS	500 VA

Table 3.4. The Software Specification for File and Database Server.

Software	Specification
Operating System	Microsoft Windows NT Server 4.0 (Service pack 4)
Database Management System	Microsoft SQL Server 2000
Application Software	Microsoft Office 97 Professional Edition

In the Koh Chang Resort Information System, the client machines will have capacity only high enough to run a Visual Basic Database Application, which we develop to operate the information system. It however should have specification higher than that, because it is sometimes used to run any other office automation software, for example, word processing. Therefore, in general standard, it should have hardware specification high enough to run Microsoft Windows 98 Second Edition and Microsoft Office 97 Professional Edition. The hardware and software specifications for each client machine are shown in the Table 3.5 and Table 3.6 respectively.

Table 3.5. The Hardware Specification for Each Client Machine.

Hardware	Specification
CPU	Pentium IV 1.0 GB or higher
Cache	256 KB or higher
Memory	128 MB or higher
Hard Disk	20 GB or higher
CD-ROM Drive	32x or higher
Floppy Drive	1.44 MB
Network Adapter	Ethernet 10-Base T
Display Adapter	SVGA Card
Display	17" Monitor

Table 3.6. The Software Specification for Each Client Machine.

Software	Specification
Operating System	Microsoft Windows 98 Second Edition
Application Software	Microsoft Office 97 Professional Edition
Application Development Software	Visual Basic (Database Application Software)

Other than file and database server and client machines, the connection cannot be established if we do not have any network peripherals. The database application system, however, does not use any network peripherals different than any other general Local Area Network (LAN). The network peripherals of the new proposed database application system are shown in the Figure 3.5.

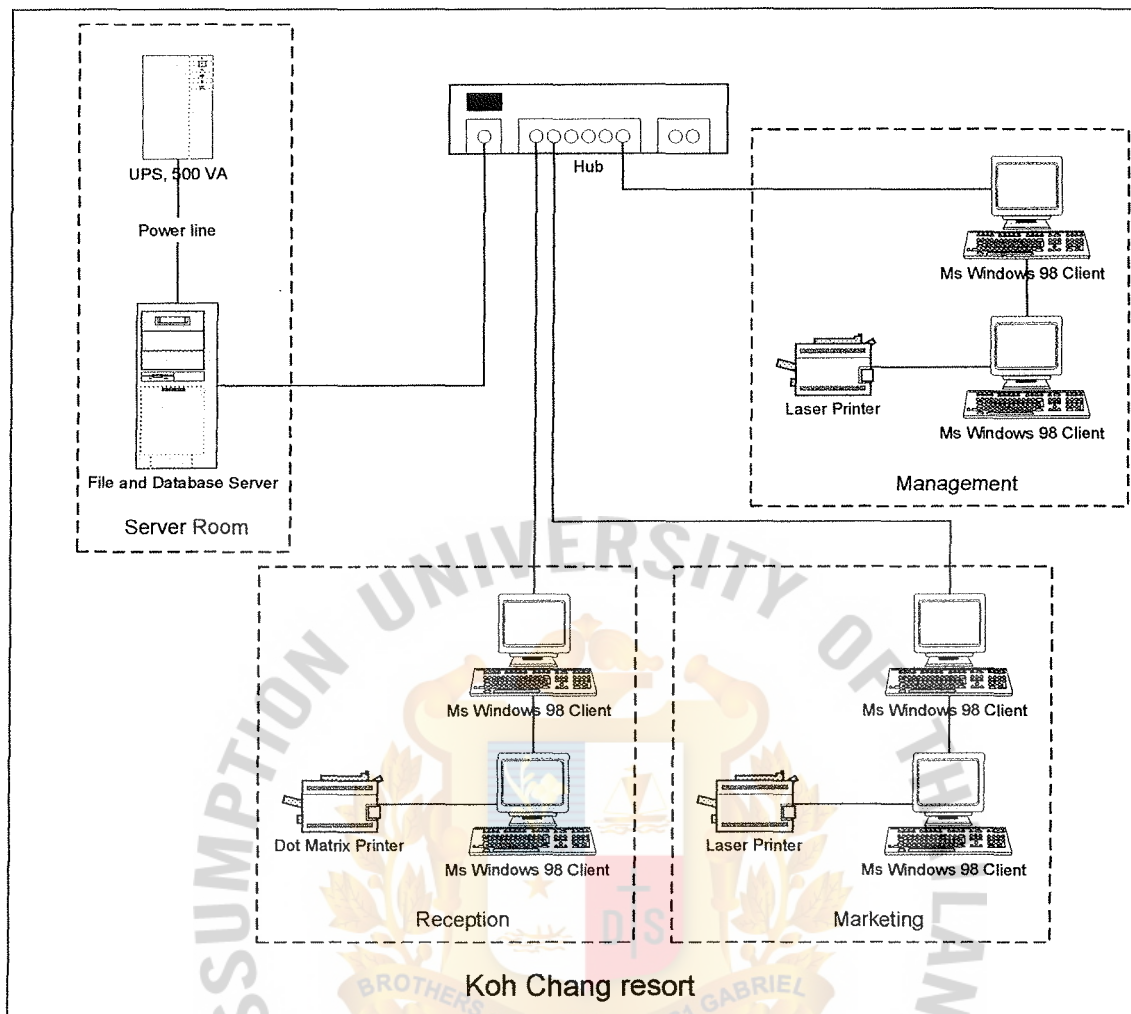


Figure 3.5. The Network Peripherals of New Proposed Database Application System.

### 3.5 Security and Control

The following minimum requirement of security standard must be applied to computerized system to prevent unauthorized access and alteration to the system. Security and control for the proposed system can be listed as follows:

(1) Identification:

The system must have the unique User ID and Administrative System ID. The procedure to control the creating of User ID must be set up to ensure the proper verification over the system users. The user responsibility



to the system must be specified in advance before granting authorized level to each user. Every User ID must have an owner (holder), and can prove their existence. In each department, User ID must not be shared among staffs or users. Administrative System ID must be carefully assigned to the responsible person for managing all User ID of the system and the system. System log is required to keep track of all changes made to the system.

(2) Authentication:

The password system is required to authenticate the assigned user. The system/security parameter of password feature must be carefully configured to ensure the password is properly defined and monitored. The characteristics of good password feature are the specification of minimum range of password (normally 6 to 8 lengths), non-displaying password on system screen, forces user to change the password automatically when the password is expired in specified duration, and locks User ID when entering incorrect password more than specified times (normally 3 times). The users must keep their password secretly to prevent unauthorized person to use their password to enter the system and cause the unauthorized alteration to the system.

(3) Authorization:

The authorized level of each user must be carefully assigned to limit the area of accessing to the system information because of the sensitivity of data and information. The user authorization should be updated when the users resign. These user authorizations have to be reviewed every 6 months to ensure the users have the appropriate authorization in the system.

(4) Auditing:

The system must have audit trail to investigate the system in case of unauthorized access and alteration the system. The audit trail may be in form of system log to monitor the changes to the system and the access violation. This log has to be reviewed by the assigned person on a consistence basis.

(5) Production Environment:

The system must separate the development area and the production area when developing the new application form or extend the new application form. This practice ensures the proper control over the unauthorized modification of the developed program in the production area because any new or modified programs must be tested in the development area before migrating into the production area.

(6) Backup and Recovery:

The backup and recovery procedures are required to ensure the availability of the system information. The backup may be done on a daily, weekly, or monthly basis according to backup schedule. The recovery process must be cleared to ensure that all relevant persons know how to restore information from backup media into production.

### **3.6 Cost and Benefit Analysis**

When the proposed system is developed to replace the existing system, the detail of both cost and benefit of the proposed system compare with the existing system must be illustrated. Therefore, the tables and figures of cost information are constructed to provide clear picture of the comparison of both system costs. Furthermore, the benefits of the proposed system are presented in both tangible and intangible terms. Finally, the

analysis techniques, which are breakeven analysis and payback period, are applied to show the benefits over the cost after the implementation of the proposed system.

(1) The cost of Manual System:

The existing system is operated manually, and incurs both fixed cost and annual operating cost. For fixed cost, there is only office equipment cost, and, for operating cost, it includes salary cost and office supplies and miscellaneous cost. The office equipment that our team uses in their operation is calculators for calculating all cost that occur in the process and typewriters for doing the report. To operate the existing system, our team requires one manager to manage and control all the operation, two receptionist to prepare and make the reservation process and the another processes, one general officer to prepare the information for all positions. The details of the existing system cost are summarized on Table 3.7.

Table 3.7. Manual System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
<b>Fixed Cost</b>					
Typewriter 2 units @ 10,000	20,000.00	0.00	0.00	0.00	0.00
Calculator 5 units @ 2,500	12,500.00	0.00	0.00	0.00	0.00
<b>Total Fixed Cost</b>	<b>32,500.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Operating Cost</b>					
<b>Salary Cost: 8% increase</b>					
Manager 1 person @23,000	23,000.00	24,840.00	26,827.20	28,973.38	31,291.25
Receptionist 2 persons @11,000	22,000.00	23,760.00	25,660.80	27,713.66	29,930.76
<b>Staff: 3% increase</b>					
General officer 1 persons @10,000	10,000.00	10,300.00	10,609.00	10,927.27	11,255.09
Staff 3 persons @ 8,000	24,000.00	24,720.00	25,461.60	26,225.45	27,012.21
<b>Total Monthly Salary Cost</b>	<b>79,000.00</b>	<b>83,620.00</b>	<b>88,558.60</b>	<b>93,839.76</b>	<b>99,489.30</b>
<b>Total Annual Salary Cost</b>	<b>948,000.00</b>	<b>1,003,440.00</b>	<b>1,062,703.20</b>	<b>1,126,077.10</b>	<b>1,193,871.63</b>
<b>Office Supplies and Miscellaneous Cost: Per Annual</b>					
Stationary 10% increase	5,600.00	6,160.00	6,776.00	7,453.60	8,198.96
Paper 5% increase	9,500.00	9,975.00	10,473.75	10,997.44	11,547.31
Utility 10% increase	6,500.00	7,150.00	7,865.00	8,651.50	9,516.65
Miscellaneous 5% increase	5,000.00	5,250.00	5,512.50	5,788.13	6,077.53
<b>Total Annual Office Supplies and Miscellaneous Cost</b>	<b>26,600.00</b>	<b>28,535.00</b>	<b>30,627.25</b>	<b>32,890.66</b>	<b>35,340.45</b>
<b>Total Annual Operating Cost</b>	<b>974,600.00</b>	<b>1,031,975.00</b>	<b>1,093,330.45</b>	<b>1,158,967.76</b>	<b>1,229,212.08</b>
<b>Total Manual System Cost</b>	<b>1,007,100.00</b>	<b>1,031,975.00</b>	<b>1,093,330.45</b>	<b>1,158,967.76</b>	<b>1,229,212.08</b>

Table 3.8. Five Years Accumulated Manual System Cost, Baht.

Year	Total Manual Cost	Accumulated Cost
1	1,007,100.00	1,007,100.00
2	1,031,975.00	2,039,075.00
3	1,093,330.45	3,132,405.45
4	1,158,967.76	4,291,373.21
5	1,229,212.08	5,520,585.29
<b>Total</b>	<b>5,520,585.29</b>	<b>-</b>



(2) The cost of Computerized System:

The proposed system cost is classified into fixed cost and annual operating cost. Fixed cost includes hardware and software cost, people-ware cost (only the salary cost of specialized persons who are involved in developing the new system), maintenance cost (both hardware and software), and implementation cost, whereas annual operating cost has the same cost category as incurred in the existing system. With the newly computerized system, there is no office equipment cost but it requires some investment in computer hardware and software. The maintenance cost for new hardware and software is also paid to the vendor with the proposed option to have the free of maintenance charge in the first year of system implementation. The additional salary cost is paid to the people who are involved in the system development process. Before implementing the proposed system, the training and implementation costs are spent according to the project budget. The details of the proposed system cost are summarized on the Table 3.9.

Table 3.9. Computerized System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
<b>Fixed Cost</b>					
Hardware Cost:					
Computer server Cost 1 units	45,000.00	0.00	0.00	0.00	0.00
Workstation Cost 8 units	200,000.00	0.00	0.00	0.00	0.00
Total Hardware Cost	<u>245,000.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
Maintenance Cost:					
Hardware Maintenance Cost (10% increase)	0.00	10,000.00	11,000.00	12,100.00	13,310.00
Software Maintenance Cost (10% increase)	0.00	11,000.00	12,100.00	13,310.00	14,641.00
Total Maintenance Cost	<u>0.00</u>	<u>21,000.00</u>	<u>23,100.00</u>	<u>25,410.00</u>	<u>27,951.00</u>
Software Cost:					
System Software Cost	22,500.00	22,500.00	22,500.00	22,500.00	22,500.00
Application Software Cost	12,500.00	12,500.00	12,500.00	12,500.00	12,500.00
Development Application Software cost	35,000.00	0.00	0.00	0.00	0.00
Total Software Cost	<u>70,000.00</u>	<u>35,000.00</u>	<u>35,000.00</u>	<u>35,000.00</u>	<u>35,000.00</u>
Implementation Cost:					
Training Cost	20,000.00	0.00	0.00	0.00	0.00
Set up Cost	15,000.00	0.00	0.00	0.00	0.00
Total Implementation Cost	<u>35,000.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>
Total Fixed Cost	350,000.00	56,000.00	58,100.00	60,410.00	62,951.00
<b>Operating Cost</b>					
People-Ware Cost: (8% increase)					
Manager 1 person @ 25,000	25,000.00	27,000.00	29,160.00	31,492.80	34,012.22
Receptionist 2 persons@ 12,000	24,000.00	25,920.00	27,993.60	30,233.09	32,651.74
Staff: (3% increase)					
Staff 1 person @ 9,000	9,000.00	9,270.00	9,548.10	9,834.54	10,129.58
Total Monthly Salary Cost	58,000.00	62,190.00	66,701.70	71,560.43	76,793.54
Total Annual Salary Cost	<u>696,000.00</u>	<u>746,280.00</u>	<u>800,420.40</u>	<u>858,725.17</u>	<u>921,522.46</u>
Office Supplies and Miscellaneous Cost:					
Stationary 1,500 per month	18,000.00	19,800.00	21,780.00	23,958.00	26,353.80
Paper 2000 per month	24,000.00	25,200.00	26,460.00	27,783.00	29,172.15
Utility 1000 per month	12,000.00	13,200.00	14,520.00	15,972.00	17,569.20
Miscellaneous 1200 per month	14,400.00	15,120.00	15,876.00	16,669.80	17,503.29
Annual Offices and Miscellaneous Cost	<u>68,400.00</u>	<u>73,320.00</u>	<u>78,636.00</u>	<u>84,382.80</u>	<u>90,598.44</u>
Total Operating Cost	764,400.00	819,600.00	879,056.40	943,107.97	1,012,120.90
Total Computerized System Cost	1,114,400.00	875,600.00	937,156.40	1,003,517.97	1,075,071.90

Table 3.10. Five Years Accumulated Computerized System Cost, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	1,114,400.00	1,114,400.00
2	875,600.00	1,990,000.00
3	937,156.40	2,927,156.40
4	1,003,517.97	3,930,674.37
5	1,075,071.90	5,005,746.27
Total	5,005,746.27	-

- (3) The Comparison of the System Costs between Computerized System and Manual System:

After both the existing system cost and the proposed system cost are identified, the comparison table is constructed to reveal the cost saving after the implementing the new proposed system. The figures of the comparison of the system cost are summarized on Table 3.11.

Table 3.11. The Comparison of the System Costs, Baht.

Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	1,007,100.00	1,114,400.00
2	2,039,075.00	1,990,000.00
3	3,132,405.45	2,927,156.40
4	4,291,373.21	3,930,674.37
5	5,520,585.29	5,005,746.27

(4) Benefit Analysis:

The benefit of the proposed system can be classified into tangible and intangible benefits. The tangible benefit can be expressed in monetary value, whereas the intangible benefit is qualitative, and difficult to measure. The details of these benefits can be summarized as follows:

Tangible benefits:

The tangible benefit of the proposed system is shown on the Table 3.12, and grouped into three main categories as follows:

(a) Cost Saving:

The proposed system introduces the new way to handle resort management task. Fewer staffs and officers are required to operate the system. The demand of paper and stationery are reduced because the resort information is stored in file and database server. Thus, the proposed system saves the operating cost, which are salary cost, office supplies, and miscellaneous cost.

(b) Operation Time Improvement:

From the comparison of the total operation time between the existing system and the proposed system, it can be concluded that the proposed system can improve the operation time from 3 hours and 35 minutes to 50 minutes. This operation time improvement relieves the staffs and officers to perform other tasks. The full details of the operation time comparison are presented in Chapter 5.



(c) Elimination of the possible long run cost:

The proposed system provides a better reservation service for guests, therefore it can be applied to other resort services. Thus, it can eliminate the possible recruitment cost of the future staffs and officers to operate them.

Table 3.12. Tangible Benefit of Proposed System, Baht.

Benefit Item	Price
Cost Saving:	
Salary Cost:	
1 General Officer (10000 Baht per month)	120,000.00
2 Staffs (16000 Baht per month)	192,000.00
Total Salary Cost	<u>312,000.00</u>
Operation Time Improvement:	
1 General Officer (7000 Baht per month)	84,000.00
2 Staffs (8000 Baht per month)	96,000.00
Total Operation Time Improvement	<u>180,000.00</u>
Eliminate of the Possible Long Run Cost:	
1 General Officer (10000 Baht per month)	120,000.00
2 Staffs (16000 Baht per month)	192,000.00
5 Temporary staffs (25000 Baht per month)	300,000.00
Total Long Run Cost Eliminate	<u>612,000.00</u>
Total Tangible Benefit	1,104,000.00

Intangible Benefit:

The intangible benefit of the proposed system is guest satisfaction, better decision-making, and better productivity.

(5) Breakeven Analysis:

Breakeven analysis shows the point where the accumulated cost of the existing system is equal to the accumulated cost of the proposed system. At the beginning, the cost of the proposed system is higher than the cost of existing system. The difference comes from the implement and development cost incurred at the first year of the proposed system. However, for the long term, the proposed system can reduce the annual operating cost, especially salary cost and office supplies cost.

The breakeven point of the proposed system is depicted in Figure 3.6. As the figure represented, This result is satisfactory for investing and implementing the proposed system because it will incur less operating cost than the existing system in the long run operation.

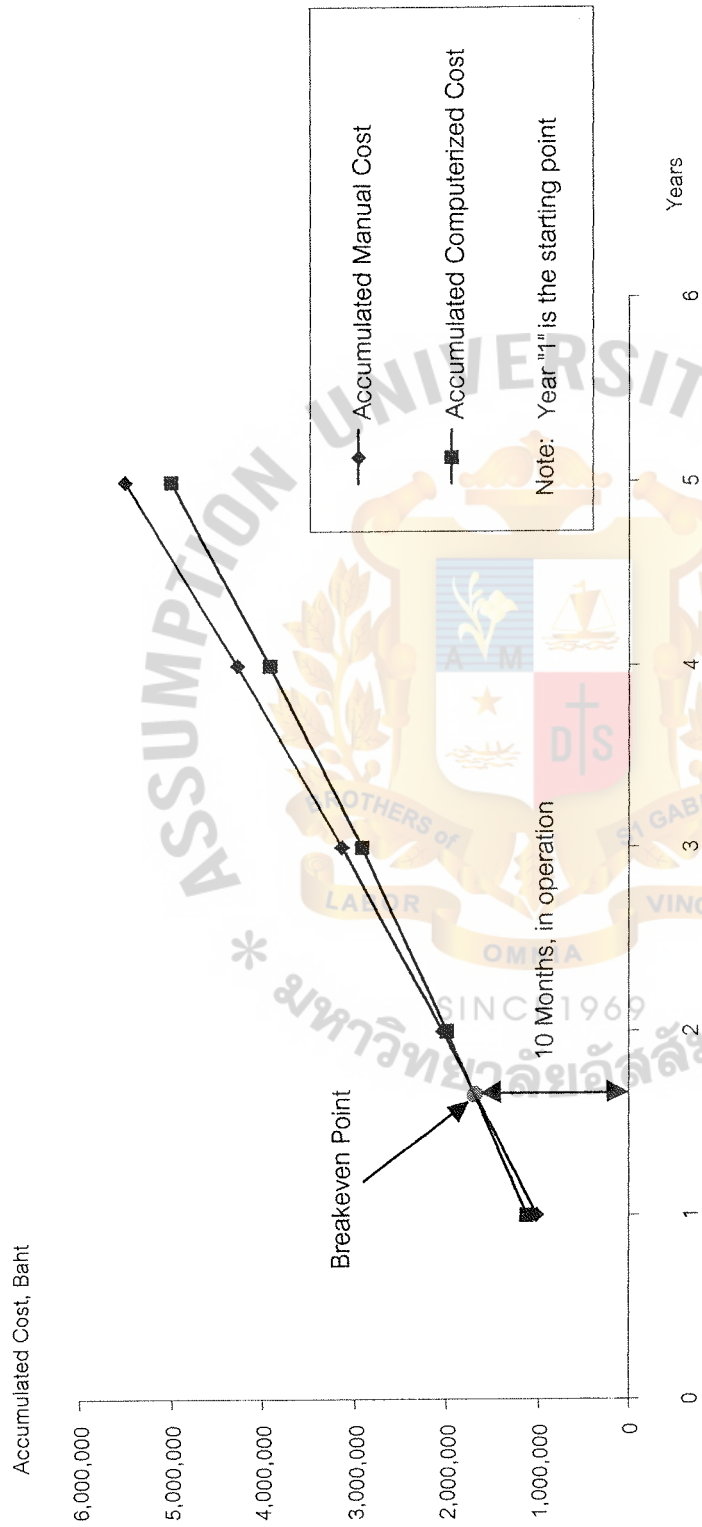


Figure 3.6. Cost Comparisons between Manual and Computerized System.

(6) Payback Analysis:

The Payback analysis technique is a simple and popular method for determining if and when an investment will pay for itself. Because system development costs are incurred long before, benefits begin to accrue. It will take some time for the benefits to overtake the costs.

Figure 3.7 is illustrated the payback period of the proposed system that has already been calculated to evaluate the candidate solution (see the full details of payback calculation in Table C.6 on Appendix C.). The lifetime costs are gradually increasing over the five-year period because operating costs are being incurred. Nevertheless, it also can be noticed that the lifetime benefits are occurring at a much faster pace. The result of payback period is 2.5 year, which is less than the predefined maximum desired payback period (4 years). Thus, this project is acceptable to implement with the return on investment to recover the initial investment within three years.

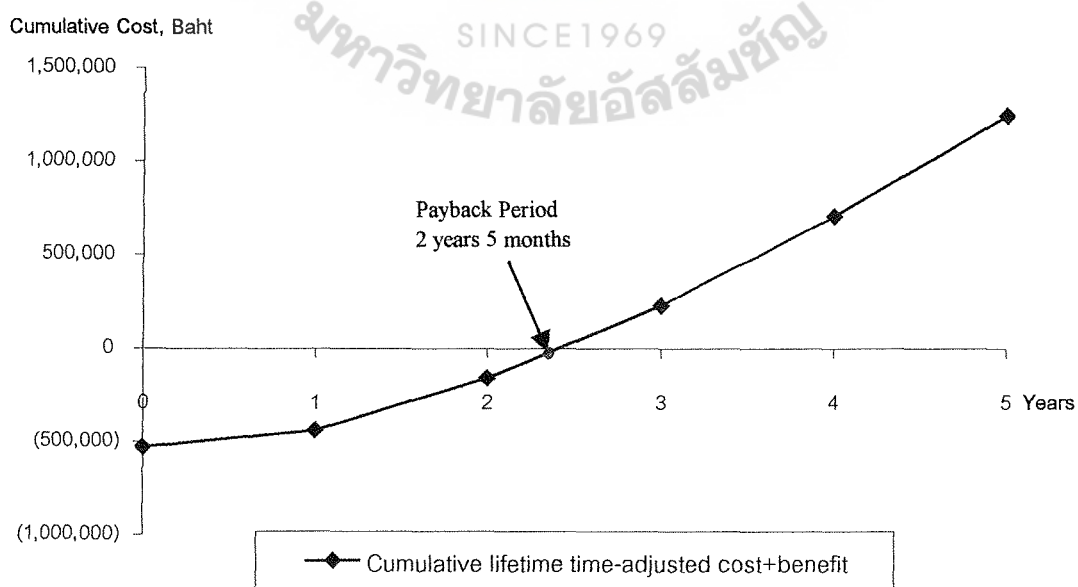


Figure 3.7. Payback Period Analysis of the Proposed System.



## IV. PROJECT IMPLEMENTATION

### 4.1 Overview of Project Implementation

System implementation is the planned and orderly conversion from an existing system to the proposed system. The final design should be evaluated first to make sure that the proposed system can meet the desired goals and objectives, and then the other remaining processes will be performed. The typical processes of the System Implementation are:

- (1) Hardware and Software acquisition, development and installation:

The proposed system must be newly purchased and installed both file and database server and client machines. The database must also be newly designed for the proposed system.

- (2) Personnel training:

Training is provided to both end-user and system administrator. The benefits of training are to give more understanding of the proposed system to all relevant users, and the system administrator is able to configure the system and to control adding, updating, and deleting User ID and password of all system users.

- (3) Site and data preparation:

The IT specialists are responsible for preparing the site to implement the proposed system. LAN connection and other facilities should be ready before the developed system is implemented. The system user will prepare data to input into the proposed system.

(4) Testing:

Testing is conducted to ensure that the proposed system is working properly. Unit testing, system testing, and integration testing are done to fulfill this objective.

(5) Conversion:

Before converting the existing system to the proposed system, the conversion plan must be prepared to serve as a guideline for the entire conversion process.

Moreover, it also involves fine-tuning system elements, in order to maximize the system efficiency and productivity.

#### **4.2 Stage of Project Implementation**

To simplify the implementation process, the overall processes can be categorized into two main stages, which have the details as follows:

(1) Construction Stage:

The purpose of the construction stage is to build and test a functional system to ensure that the proposed system meets the business and design requirements. It also constructs the application program of the proposed system. In summary, this stage includes the process of installation and acquisition of the new hardware and software, preparation of data and site for the proposed system, and conducts the various types of testing to ensure there are no errors or no problems in the proposed system.

(2) Delivery stage:

In the delivery stage, the conversion plan is prepared to provide a smooth transition to the proposed system. Database is installed, and network is configured for the proposed system. The training and documentation is provided to individuals who use the proposed system. Finally, the existing system is converted to the proposed system with a predefined procedure to ensure the transition is smooth. After the proposed system is operated, the system evaluation is conducted to measure the proposed system performance, and to discover any troubles that may occur in the developed system.

#### 4.3 Test Plan

The database testing must immediately precede other programming activity because the databases are the resources shared by the computer programs to be written. The database testing is performed with simulated data. Sample data may be keyed into tables for testing the database.

Testing should not be deferred until after the entire program has been written. There are three levels of testing to be performed: Stub testing, unit or program testing, and systems testing.

Stub testing is the test performed on individual events or modules of a program. A single program works properly does not mean that it works properly with other modules. Unit or program testing is needed to test all the events and modules as an integrated unit. It is the testing of an entire program. Systems testing is performed to test the integrates set of programs, which should be run through the systems test to make sure one program properly accepts, as input, the output of other programs.

#### 4.4 Conversion

Once a successful system test has been completed, we can begin preparations to place the proposed system into operation. The parallel conversion is selected to place the proposed system into the operation. Under this approach, both the existing system and the proposed system are operated for some period. This ensures that all major problems in the proposed system have been solved before the existing system is discarded. The final cutover may be either abrupt or gradual, as portions of the proposed system are deemed adequate. This strategy minimizes the risk of major flaws in the proposed system causing irreparable harm to the resort.

Due to the fact, the existing system is a manual system, which all data are kept in the paper format. There is no need to convert or populate the existing data from the existing system to the proposed system database. We need the staffs to key in all existing data to the proposed system database.

The systems acceptance test is the final opportunity for staffs (end-users), management, and information systems operations management to accept or reject the system. Validation testing is selected to run the system in a live environment using real data because we need to test the peak workload processing performance. There are many items are tested in validation testing as follows: system performance, human engineering test, methods and procedures test, and the vital item is backup and recovery testing.

Converting to a proposed system necessitates that staffs (users) be trained and provided with documentation (user manuals) that guides them through using the proposed system. Group training is preferred. It is a better use of our time, and it encourages group-learning possibilities.



The staffs and the concerned users have to provide the valuable feedback pertaining to the actual use of the proposed system. They will be the source of the majority of the feedback used to measure the system's acceptance.



## V. CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Conclusions

The project study indicates that the proposed system introduces the new way to handle and manage the resort management process. In the existing system, most of resort management processes are done manually. The result is human-error, slow response time to user, and high operating cost, especially salary cost. To improve the current operation, this project is proposed to solve the mentioned problems, and improve its normal operation. For the proposed system, the information technology is utilized to simplify the resort management process, and increase its efficiency.

The proposed system improves the current operation in terms of both cost and time. It saves cost for the management who requires reducing department operating cost, and time for user in making the resort transactions. The benefit of saving cost and time can be proved by the work performed in previous section: Cost and Benefit Analysis.

Referring to cost and benefit analysis section, the table and figure reveal the fact that the proposed system incurs less operating cost than the existing system. Some cost items that are incurred in the existing system can be eliminated and reduced, such as salary cost, and office supplies and miscellaneous cost, for example. In the cost comparison table, the cost of existing system is less than the cost of the proposed system, during the first year of operation (approximately 10 months) because the proposed system incurs some development cost in the first year of its implementation. Nevertheless, the benefit will be explored and become clear after breakeven point in the last quarter of the first year.

The proposed system also spends less time to operate than the existing system. This fact is illustrated in the following additional Table 5.1.

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

Process	Existing System	Proposed System
Room available searching	20 Minutes	5 Minutes
Reservation making	40 Minutes	15 Minutes
Reservation data entry	20 Minutes	15 Minutes
Report generation	1 Hour 30 Minutes	10 Minutes
Reservation inquiry	45 Minutes	5 Minutes

The details of this operation time improvement can be summarized as follows:

(1) Room available Searching:

The existing system spends 20 minutes to search the room available to make the reservation in the paper. In the contrast, 5 minutes to search the room available in the proposed system, which provides the graphical user interface to ease the search information.

(2) Reservation making:

The existing system consumes 40 minutes to make the reservation. This process is waste the time. With the proposed system, the reservation process is introduced to do the reserve the rooms through the client/server and store all information in the database server.

(3) Reservation data entry:

The existing system consumes 20 minutes to complete the information into paper form or Microsoft Excel. In contrast, the proposed system provides the graphical user interface to ease the input process of reservation data. The application provides the process verification to check input data before store in the database.

(4) Report Generation:

The existing system uses Microsoft word, Microsoft Excel, and typewriter to prepare the report and distribute to the relevant departments. It consumes too much time to finish the report because some information must be rearranged into predefined format, and the result must be checked with the raw data before printing the report. This process can be improved through the report generation feature embedded in the proposed system. The report can be selected and generated automatically according to time and user requirement.

(5) Reservation inquiry:

In the existing system, our staffs spend too much time in searching the reservation information in hard copy document and Microsoft word to respond to the staffs' inquiry. The proposed system introduces the online inquiry screen to search the reservation transaction according to the user inquiry.



## 5.2 Recommendations

At present, information technology plays an important role in operating a business. Some people may gain the competitive advantage if they apply the information system in their business properly. This project is an example of applying information system in some business processes. The management should monitor and study it carefully because it provides valuable information that can be taken into the consideration before applying its concept throughout the resort.

In addition, the developed system may be expanded some feature to support the related process such as Service recording, Service calculating, etc. The staffs can record all expenses or services occur in each room through client machines in each zone or section, which connect through the main server at lobby in order to calculate the service charge or expense charge while making customer payment. This practice must consider the cost of investment in client machines, area to locate the client machines, etc. The information technology specialist may implement new feature to complete the resort information system.



## APPENDIX A

### DATA FLOW DIAGRAM

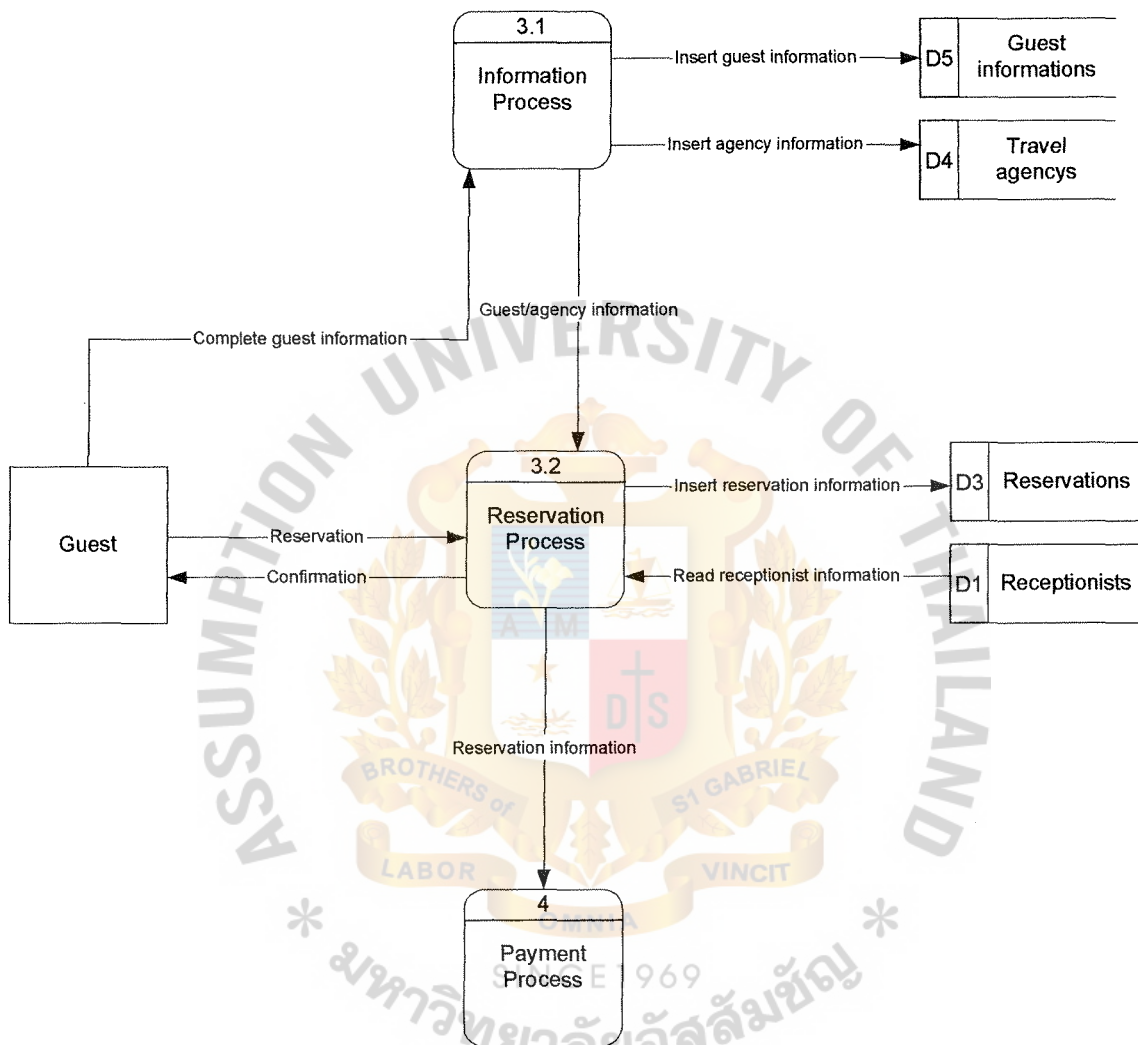


Figure A.1. Level 1 Data Flow Diagram of Reservation Process.

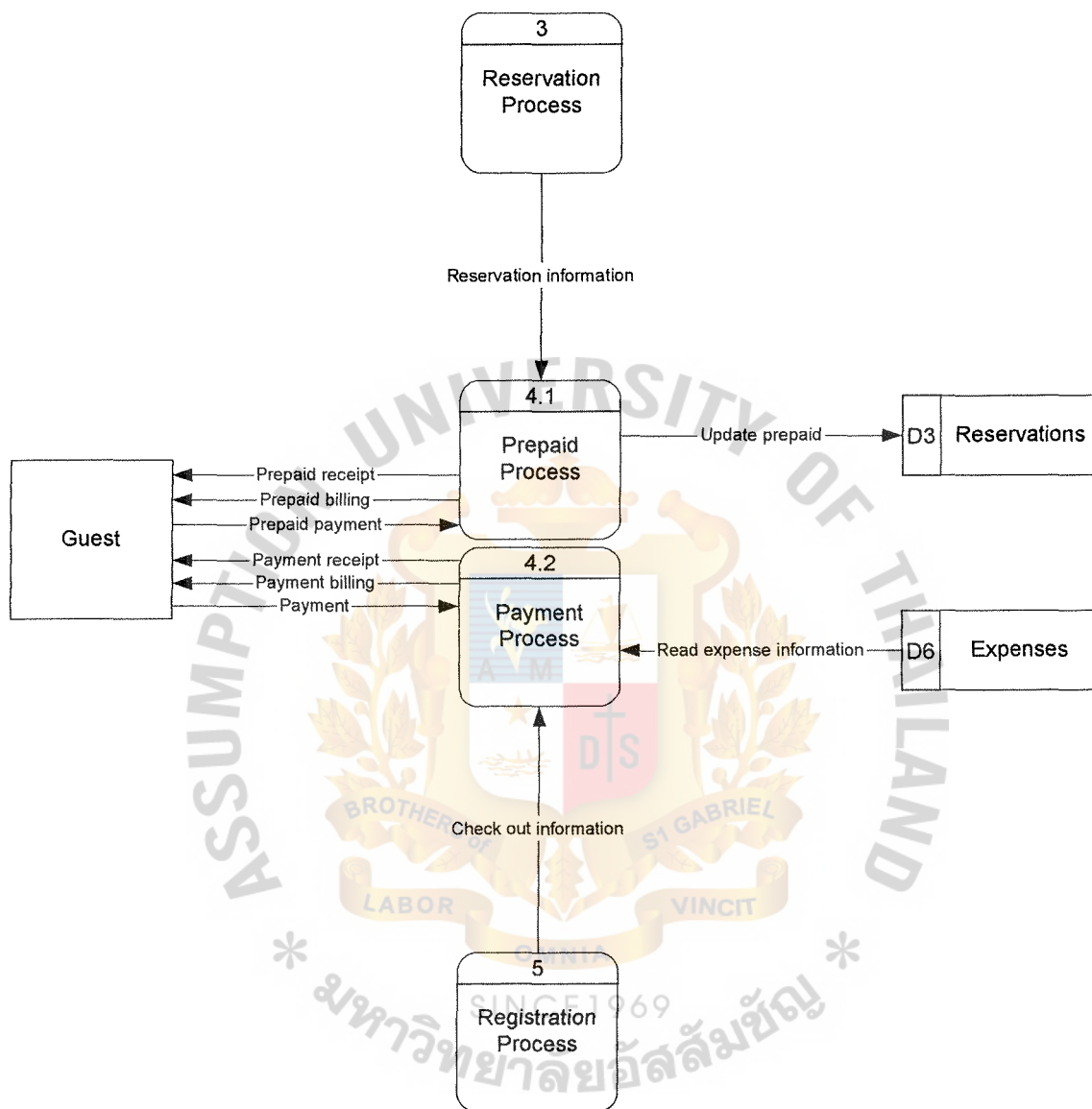


Figure A.2. Level 1 Data Flow Diagram of Payment Process.



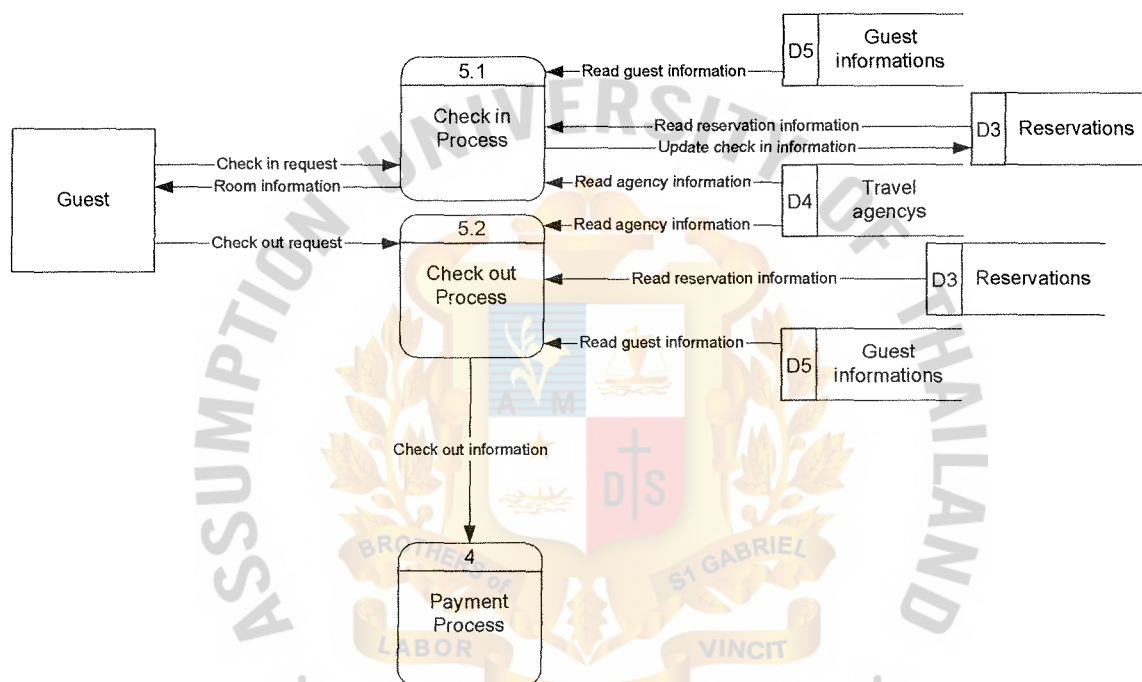


Figure A.3. Level 1 Data Flow Diagram of Registration Process.



## APPENDIX B

### PROCESS SPECIFICATION

Table B.1. Process Specification of Room Management Process.

Items	Description
Process Name:	Room Management
Data In:	Receptionist Information Room Information Edit Room Information
Data Out:	Update Room Information Confirmation
Process:	(1) Query receptionist information for Receptionists Data store (2) Get room information from Search Information Process (3) Edit room information (4) Confirmation (5) Update room information into Room Informations Table
Attachment:	(1) Receptionists Data Store (2) Room Informations Data Store (3) Receptionist (4) Search Information Process

Table B.2. Process Specification of Search Information Process.

Items	Description
Process Name:	Search Information Process
Data In:	Search Room Information Search Room Available Read Room Information (Room Informations Database) Read Room Information (Reservations Database)
Data Out:	Room Information Room Available Information
Process:	(1) Complete search form (2) Query room information from Room Informations Database and Reservations Database
Attachment:	(1) Room Informations Database (2) Reservations Database (3) Guest (4) Receptionist (5) Room Management Process

Table B.3. Process Specification of Information Process.

Items	Description
Process Name:	Information Process
Data In:	Guest/Travel Agency Information
Data Out:	Insert Guest Information Insert Travel Agency Information Guest/Travel Agency Information
Process:	(1) Complete guest/travel agency information form (2) Insert new information into Guest Informations Database and Travel Agencies Database
Attachment:	(1) Guest Informations Database (2) Travel Agencies Database (3) Guest (4) Reservation Process

Table B.4. Process Specification of Reservation Process.

Items	Description
Process Name:	Reservation Process
Data In:	Guest/Travel Agency Information Reservation Form Read Receptionist Information
Data Out:	Insert Reservation Information Confirmation Reservation Information
Process:	(1) Get guest/travel agency information from Information Process (2) Query receptionist information from Receptionists database (3) Complete guest/travel agency reservation form (4) Insert guest/travel agency reservation information into Reservations Database (5) Submit reservation information to Payment Process
Attachment:	(1) Reservations Database (2) Receptionists Database (3) Information Process (4) Guest (5) Payment Process



Table B.5. Process Specification of Prepaid Process.

Items	Description
Process Name:	Prepaid Process
Data In:	Reservation Information Prepaid Payment
Data Out:	Prepaid Billing Prepaid Reciept Update Prepaid Information
Process:	(1) Get reservation information from Reservation Process (2) Generate prepaid billing to guest/travel agency (3) Update prepaid information into Reservations Database (4) Generate prepaid reciept to guest/travel agency
Attachment:	(1) Reservations Database (2) Guest (3) Reservation Process

Table B.6. Process Specification of Payment Process.

Items	Description
Process Name:	Payment Process
Data In:	Reservation Information Payment
Data Out:	Payment Billing Payment Reciept
Process:	(1) Get reservation information from Check Out Process (2) Generate payment billing to guest/travel agency (3) Generate Payment reciept to guest/travel agency
Attachment:	(1) Check Out Process (2) Guest

Table B.7. Process Specification of Check In Process.

Items	Description
Process Name:	Check In Process
Data In:	Check In Request Read Reservation Information Read Guest Information Read Travel agency Information
Data Out:	Room Information Update check In Information
Process:	(1) Guest requests for check in room (2) Query reservation information from Reservations Database (3) Query guest and travel agency information from Guest Informations and Travel Agencys Database (4) Verify information (5) Provide room information to guest and travel agency (6) Update check in information into Reservations Database
Attachment:	(1) Reservations Database (2) Guest (3) Guest Informations Database (4) Travel Agency Database

Table B.8. Process Specification of Check Out Process.

Items	Description
Process Name:	Check Out Process
Data In:	Check Out Request Read Travel agency Information Read Guest Information Read Reservation Information
Data Out:	Reservation Information
Process:	(1) Guest request for check out the room (2) Query reservation information from Reservations Database (3) Query guest and travel agency information from Guest Informations and Travel Agencys Database (4) Verify information (5) Submit reservation information to Payment Process
Attachment:	(1) Reservations Database (2) Guest Informations Database (3) Travel Agencys Database (4) Guest/Travel agency (5) Payment Process

Table B.9. Process Specification of Report Management Process.

Items	Description
Process Name:	Report Management Process
Data In:	Read Guest Information Read Travel Agency Information Read Reservation Information Read Room Information Report Inquiry
Data Out:	Monthly Report Annual Report Sales Analysis Report Management Report
Process:	(1) At the end of the month, generate report to management (2) At the end of the year, generate report to management (3) Report inquiry from management level and marketing department (4) Generate sales analysis report to marketing department and management report to management level
Attachment:	(1) Reservations Database (2) Guest Informations Database (3) Travel Agencys Database (4) Room Informations Database (5) Marketing Department (6) Manager



## APPENDIX C

### FEASIBILITY ANALYSIS



Table C.1. Estimated Cost of Candidate 1, Baht.

Cost Items	Price
Development Cost:	
Hardware:	
1 File and Database Server	45,000.00
8 Client machines	200,000.00
1 UPS	6,500.00
Total Hardware Cost:	<u>251,500.00</u>
Software:	
1 Server Software	22,500.00
8 Client Softwares	12,500.00
Total Software Cost:	<u>35,000.00</u>
Personnel:	
1 System Analyst (3 months @ 18,000 Baht/month)	54,000.00
2 Programmer (3 months @ 12,000 Baht/month)	72,000.00
1 Database Specialist (3 months @ 25,000/month)	75,000.00
1 Network Specialist (3 months @ 20,000/month)	60,000.00
Total Personnel Cost:	<u>261,000.00</u>
Implementation Cost:	
Training cost	20,000.00
Installation cost	15,000.00
Total Implementation Cost:	<u>35,000.00</u>
Total development Cost:	582,500.00
Project Annual Operating Cost:	
User:	
1 Manager (25,000 Baht per month)	300,000.00
2 Receptionist (24,000 Baht per month)	288,000.00
1 Staff (9,000 Baht per month)	108,000.00
System Support:	
1 System Analyst (18,000 Baht per month)	216,000.00
Database Specialist (25,000 per month)	0.00
Network Specialist (20,000 Per month)	0.00
Office Supplies and Miscellaneous Cost:	
Stationery (1,500 Baht per month)	18,000.00
Paper (2,000 Baht per month)	24,000.00
Utility (1,000 Baht per month)	12,000.00
Miscellaneous (1,200 Baht per month)	14,400.00
Maintenance Cost:	
Hardware Maintenance cost (10,000 Baht per year)	10,000.00
Software Maintenance Cost (11,000 Baht per year)	11,000.00
Total Project Annual Operating Cost:	1,001,400.00
Total Project Annual Cost:	1,583,900.00

Table C.2. Estimated Cost of Candidate 2, Baht.

Cost Items	Price
Development Cost:	
Hardware:	
1 File and Database Server	45,000.00
8 Client machines	200,000.00
1 UPS	6,500.00
Total Hardware Cost:	<u>251,500.00</u>
Software:	
1 Server Software	22,500.00
8 Client Softwares	12,500.00
Total Software Cost:	<u>35,000.00</u>
Personnel:	
System Analyst (12 months @ 18,000 Baht/month)	0.00
2 Programmer (3 months @ 12,000 Baht/month)	72,000.00
1 Database Specialist (3 months @ 25,000/month)	75,000.00
1 Network Specialist (3 months @ 20,000/month)	60,000.00
Total Personnel Cost:	<u>207,000.00</u>
Implementation Cost:	
Training cost	20,000.00
Installation cost	15,000.00
Total Implementation Cost:	<u>35,000.00</u>
Total development Cost:	528,500.00
Project Annual Operating Cost:	
User:	
1 Manager (25,000 Baht per month)	300,000.00
2 Receptionist (24,000 Baht per month)	288,000.00
1 Staff (9,000 Baht per month)	108,000.00
System Support:	
1 System Analyst (18,000 Baht per month)	216,000.00
Database Specialist (25,000 Baht per month)	0.00
Network Specialist (20,000 Baht Per month)	0.00
Office Supplies and Miscellaneous Cost:	
Stationery (1,500 Baht per month)	18,000.00
Paper (2,000 Baht per month)	24,000.00
Utility (1,000 Baht per month)	12,000.00
Miscellaneous (1,200 Baht per month)	14,400.00
Maintenance Cost:	
Hardware Maintenance cost (10,000 Baht per year)	10,000.00
Software Maintenance Cost (11,000 Baht per year)	11,000.00
Total Project Annual Operating Cost:	1,001,400.00
Total Project Annual Cost:	1,529,900.00

Table C.3. Estimated Cost of Candidate 3, Baht.

Cost Items	Price
Development Cost:	
Hardware:	
1 File and Database Server	45,000.00
8 Client machines	200,000.00
1 UPS	6,500.00
Total Hardware Cost:	<u>251,500.00</u>
Software:	
1 Server Software	22,500.00
8 Client Softwares	12,500.00
Total Software Cost:	<u>35,000.00</u>
Personnel:	
System Analyst (6 months @ 18,000 Baht/month)	0.00
1 Programmer (3 months @ 12,000 Baht/month)	36,000.00
1 Database Specialist (12 months @ 25,000/month)	300,000.00
1 Network Specialist (12 months @ 20,000/month)	240,000.00
Total Personnel Cost:	<u>576,000.00</u>
Implementation Cost:	
Training cost	20,000.00
Installation cost	15,000.00
Total Implementation Cost:	<u>35,000.00</u>
Total development Cost:	897,500.00
Project Annual Operating Cost:	
User:	
1 Manager (25,000 Baht per month)	300,000.00
2 Receptionist (24,000 Baht per month)	288,000.00
1 Staff (9,000 Baht per month)	108,000.00
System Support:	
1 System Analyst (18,000 Baht per month)	216,000.00
Database Specialist (25,000 per month)	0.00
Network Specialist (20,000 Per month)	0.00
Office Supplies and Miscellaneous Cost:	
Stationery (1,500 Baht per month)	18,000.00
Paper (2,000 Baht per month)	24,000.00
Utility (1,000 Baht per month)	12,000.00
Miscellaneous (1,200 Baht per month)	14,400.00
Maintenance Cost:	
Hardware Maintenance cost (10,000 Baht per year)	10,000.00
Software Maintenance Cost (11,000 Baht per year)	11,000.00
Total Project Annual Operating Cost:	1,001,400.00
Total Project Annual Cost:	1,898,900.00

Table C.4. Payback Period for Candidate 1, Baht.

Cost Items	Years				
	0	1	2	3	4
Development cost:	-582500	-1001400	-1001600	-1001800	-1002000
Annual Operating cost:					
Discount Factors for 12%	1	0.893	0.797	0.712	0.636
Time Adjusted Costs (adjusted to present value)	-582500	-894250.2	-798275.2	-713281.6	-637272
Cumulative time-adjusted cost over life time:	-582500	-1476750	-2275025	-2988307	-3625579
Benefit derived from operation of the new system:					
Discount Factors for 12%	1	0.893	0.797	0.712	0.636
Time Adjusted Benefits (adjusted to present value)		985872	1075950	1103600	1113000
Cumulative time-adjusted benefits over life time:		985872	2061822	3165422	4278422
Cumulative lifetime time-adjusted cost+benefit	-582500	-490878.2	-213203.4	177115	652843
					1190245.6



Table C.5. Payback Period for Candidate 2, Baht.

Cost Items	Years				
	0	1	2	3	4
Development cost:	-528500				
Annual Operating cost:		-1001400	-1001600	-1001800	-1002000
Discount Factors for 12%	1	0.893	0.797	0.712	0.636
Time Adjusted Costs (adjusted to present value)	-528500	-894250.2	-798275.2	-713281.6	-637272
Cumulative time-adjusted cost over life time:	-528500	-1422750	-2221025	-2934307	-3571579
Benefit derived from operation of the new system:		1104000	1350000	1550000	1750000
Discount Factors for 12%	1	0.893	0.797	0.712	0.636
Time Adjusted Benefits (adjusted to present value)		985872	1075950	1103600	1113000
Cumulative time-adjusted benefits over life time:		985872	2061822	3165422	4278422
Cumulative lifetime time-adjusted cost+benefit	-528500	-436878.2	-159203.4	231115	706843
					1244245.6

Table C.6. Payback Period for Candidate 3, Baht.

Cost Items	Years				
	0	1	2	3	4
Development cost:	-897500				
Annual Operating cost:		-1001400	-1001600	-1001800	-1002000
Discount Factors for 12%	1	0.893	0.797	0.712	0.636
Time Adjusted Costs (adjusted to present value)	-897500	-894250.2	-798275.2	-713281.6	-637272
Cumulative time-adjusted cost over life time:	-897500	-1791750	-2590025	-3303307	-3940579
Benefit derived from operation of the new system:		1104000	1350000	1550000	1750000
Discount Factors for 12%	1	0.893	0.797	0.712	0.636
Time Adjusted Benefits (adjusted to present value)		985872	1075950	1103600	1113000
Cumulative time-adjusted benefits over life time:		985872	2061822	3165422	4278422
Cumulative lifetime time-adjusted cost+benefit	-897500	-805878.2	-528203.4	-137885	337843
					875245.6

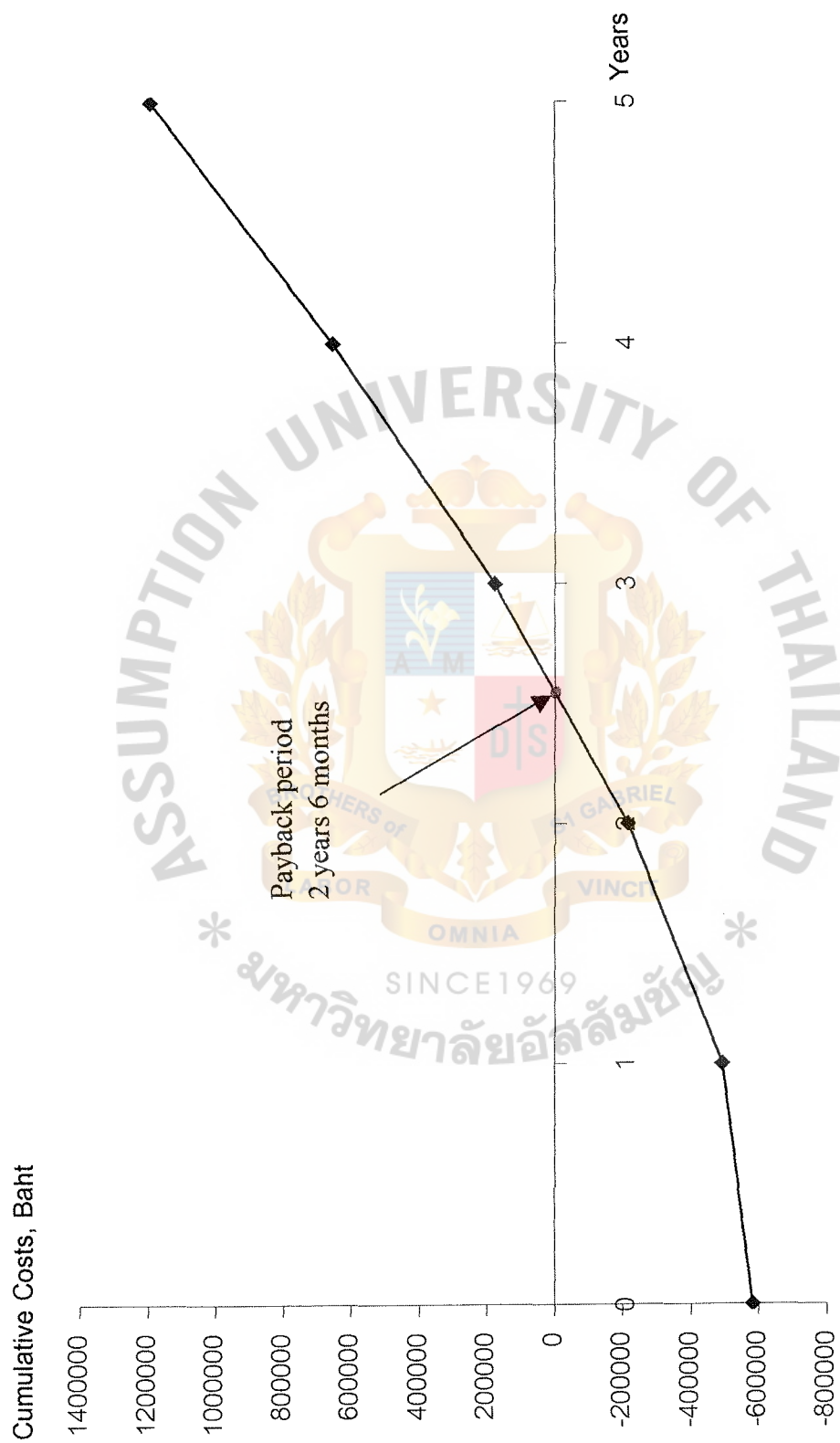


Figure C.1. Payback Period for Candidate 1.

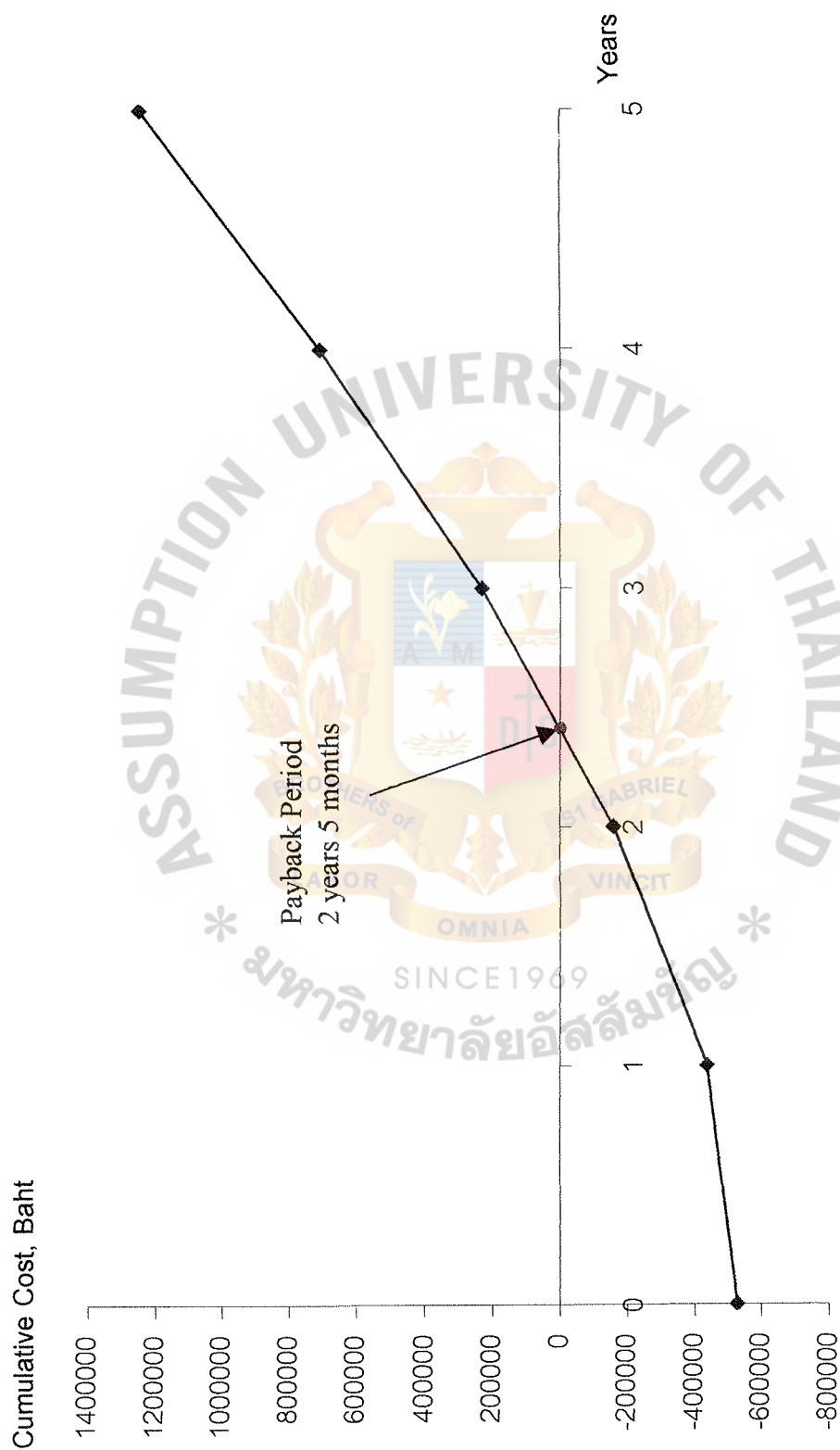


Figure C.2. Payback Period for Candidate 2.



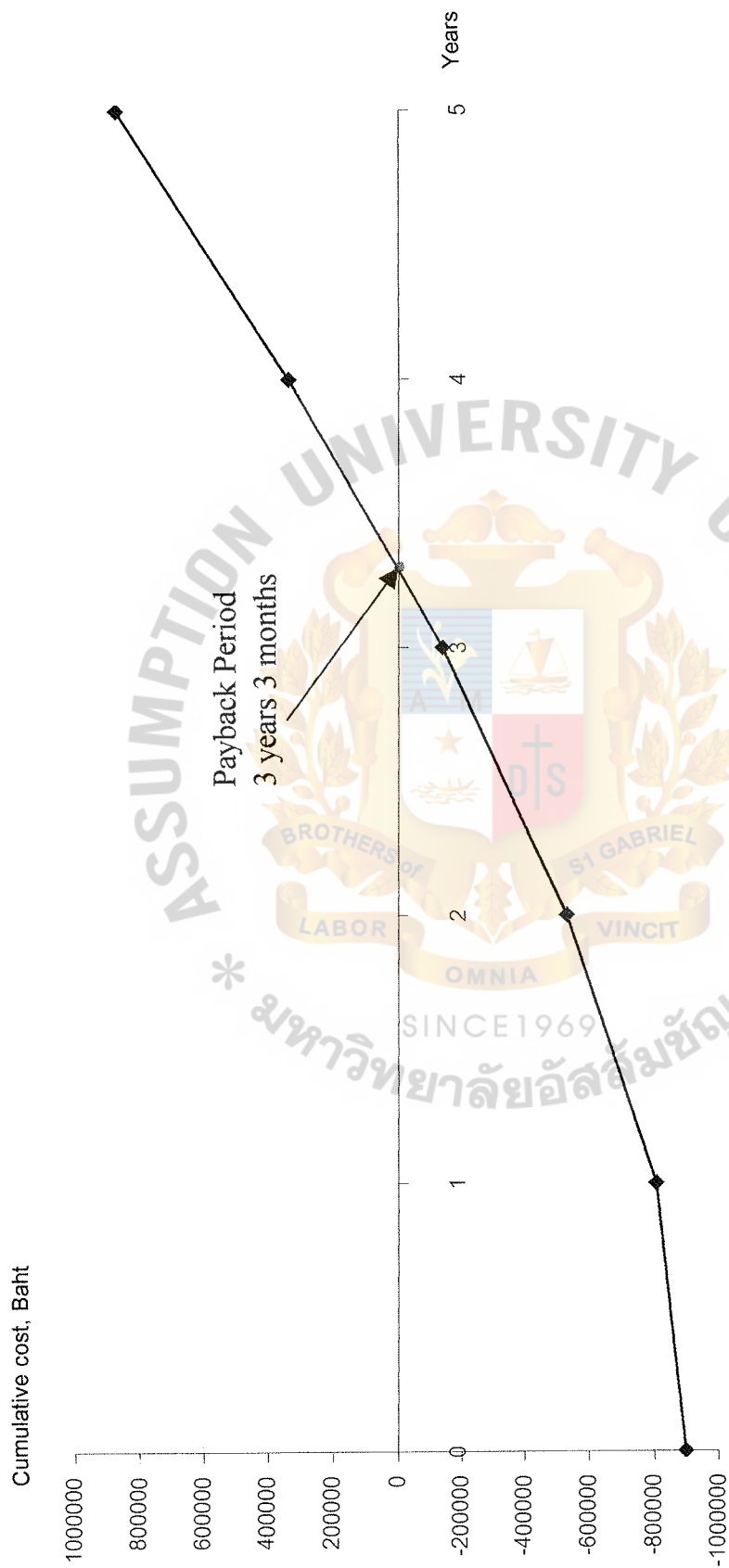


Figure C.3. Payback Period for Candidate 3.

Table C.7. Net Present Value for Candidate 1, Baht.

Cost Items	Years				
	0	1	2	3	4
Development cost:	-582500				
Annual Operating cost:		-1001400	-1001600	-1001800	-1002000
Discount Factors for 12%	1	0.893	0.797	0.712	0.636
Time Adjusted Costs (adjusted to present value)	-582500	-894250.2	-798275.2	-713281.6	-637272
Cumulative time-adjusted cost over life time:					-4193826
Benefit derived from operation of the new system:		1104000	1350000	1550000	1750000
Discount Factors for 12%	1	0.893	0.797	0.712	0.636
Time Adjusted Benefits (adjusted to present value)		985872	1075950	1103600	1113000
Cumulative time-adjusted benefits over life time:		985872	2061822	3165422	4278422
Cumulative lifetime time-adjusted cost+benefit					1190245.6

Table C.8. Net Present Value for Candidate 2, Baht.

Cost Items	Years					
	0	1	2	3	4	5
Development cost:	-528500					
Annual Operating cost:		-1001400	-1001600	-1001800	-1002000	-1002200
Discount Factors for 12%	1	0.893	0.797	0.712	0.636	0.567
Time Adjusted Costs (adjusted to present value)	-528500	-894250.2	-798275.2	-713281.6	-637272	-568247.4
Cumulative time-adjusted cost over life time:						-4139826
Benefit derived from operation of the new system:		1104000	1350000	1550000	1750000	1950000
Discount Factors for 12%	1	0.893	0.797	0.712	0.636	0.567
Time Adjusted Benefits (adjusted to present value)		985872	1075950	1103600	1113000	1105650
Cumulative time-adjusted benefits over life time:		985872	2061822	3165422	4278422	5384072
Cumulative lifetime time-adjusted cost+benefit						1244245.6

Table C.9. Net Present Value for Candidate 3, Baht.

Cost Items	Years				
	0	1	2	3	4
Development cost:	-897500				
Annual Operating cost:		-1001400	-1001600	-1001800	-1002000
Discount Factors for 12%	1	0.893	0.797	0.712	0.636
Time Adjusted Costs (adjusted to present value)	-897500	-894250.2	-798275.2	-713281.6	-637272
Cumulative time-adjusted cost over life time:					-4508826
Benefit derived from operation of the new system:		1104000	1350000	1550000	1750000
Discount Factors for 12%	1	0.893	0.797	0.712	0.636
Time Adjusted Benefits (adjusted to present value)		985872	1075950	1103600	1113000
Cumulative time-adjusted benefits over life time:		985872	2061822	3165422	4278422
Cumulative lifetime time-adjusted cost+benefit					875245.6





## APPENDIX D

### DATA DICTIONARY

Table D.1. Data Dictionary of Resort Management Database.

Name	Description
Address	Guest's address
Agency_Id	Identification number of travel agency
Agency_Name	Name or company name of travel agency
Agent_Name	Agent name who contacts with the resort
Brand	Brand name of vehicle
City	City where the guest lives
Color	Color of vehicle
Commission	Commission of agent
Company	Company name of guest
Date_In	Date that guest expects to check in resort
Description	Description of each room
Duration	Period of time since guest check in til check out
Employee_Id	Identification number of employee
Employee_Lastname	Surname of employee
Employee_Name	First name of employee
Expense_Detail	Description of expense
Expense_Id	Identification number of expense
Expense_Price	Price or cost of expense
Guest_Number	Identification number of guest
Last_Stay	Date that guest stayed in the past
Lastname	Surname of guest
Model	Model or series of vehicle
Name	First name of guest
Nationality	Nationality of guest
Number_of_Night	Number of nights that guest reserves
Number_of_Stay	Number of stay that guest had stayed in the past
Passport_Number	Identification number of overseas guest
Phone	Telephone of travel agency
Position	Position of employee
Post_Code	Zip code or postal of local guest
Prepaid_Amount	Amount of money that guest has to pay, as booking fee
Prepaid_Type	Type of prepaid payment (cash, credit card)
Price	Price of each room
Rate	Rate of payment
Reservation_Code	Identification number of reservation
Reservation_Date	Date of reservation
Room_Number	Identification number of room
Room_Status	Status of each room (ready, maintenance)
Room_Type	Class of each room (regular, deluxe, luxury)
Street	Street where guest lives
Telephone	Telephone number of guest
Title	Title of guest (Mr., Ms., Mrs.)
Zone	Zone of room (beach, house)





*Koh Chang Resort*

**Koh Chang Resort**

Reservation Summary Report

On April, 2003

---

Summary of Reservation on April 30, 2003

Total Room Reservation:	150
Total Guest Check in:	197
Total Guest Check out:	152
Net Receive Amount:	410100

---

Printed on April 30, 2003

Approved by

Figure E.1. Report Design: Reservation Summary Report (Monthly Report).





*Koh Chang Resort*

**Koh Chang Resort**

**Reservation Report**

**On April 30, 2003**

Report classify by class Deluxe:

Total Deluxe class reservation

Between March 1, 2003 – March 31, 2003:

<b>Guest</b>	<b>Reserve Date</b>	<b>Check In Date</b>	<b>Duration</b>	<b>Room Number</b>
G100000250	March 2, 2003	April 4, 2003	3	A5
G100001001	March 2, 2003	April 4, 2003	3	A25
G110000012	March 2, 2003	April 4, 2003	3	A14
G110000110	March 3, 2003	April 4, 2003	3	B3
G110000122	March 4, 2003	April 11, 2003	3	C6
G110000201	March 4, 2003	April 11, 2003	3	B17
G110000221	March 4, 2003	April 11, 2003	4	A22
G110000259	March 5, 2003	April 11, 2003	4	C13
G110000290	March 5, 2003	April 11, 2003	3	B25
G110000331	March 5, 2003	April 11, 2003	3	B27
G110000345	March 5, 2003	April 11, 2003	3	B29
G110000459	March 10, 2003	April 11, 2003	3	B45
G110001359	March 15, 2003	April 11, 2003	4	A25
G110001932	March 15, 2003	April 11, 2003	3	A36
G110001979	March 24, 2003	April 11, 2003	3	C25
G110002301	March 24, 2003	April 11, 2003	3	C19
G110002451	March 24, 2003	April 11, 2003	4	C23
G110003147	March 28, 2003	April 19, 2003	3	A10

Prepared by

( )

Figure E.2. Report Design: Reservation Report (Request by Marketing Department).



*Koh Chang Resort*

**Koh Chang Resort**

23 Moo 3 White Sandy Beach, Koh Chang

Tel. 66(0)-3955-1290-6 Fax. 66(0)-3955-1283

---

**Payment**

**Items**

Prepaid payment 2,160.-

Payment:

- Regular class @1,800

- 2 rooms: 2 nights 7,200.-

Net Payment: 5,040.-

Received:

on April 14, 2003

---

**Koh Chang Resort** (Bangkok branch) 45/2 Vipavadi Rd. Donmeaung BKK. 10210

Tel. 66(0)-1442-6579. fax. 66(0)-2982-7526.

Figure E.3. Report Design: Payment Receipt.



*Koh Chang Resort*

**Koh Chang Resort**

Reservation Summary Report

On Year, 2002

---

Summary of Reservation on Year, 2002

Total Room Reservation:	150
Total Guest Check in:	1654
Total Guest Check out:	1646
Net Receive Amount:	4,684,900

---

Printed on December 31, 2002

Approved by

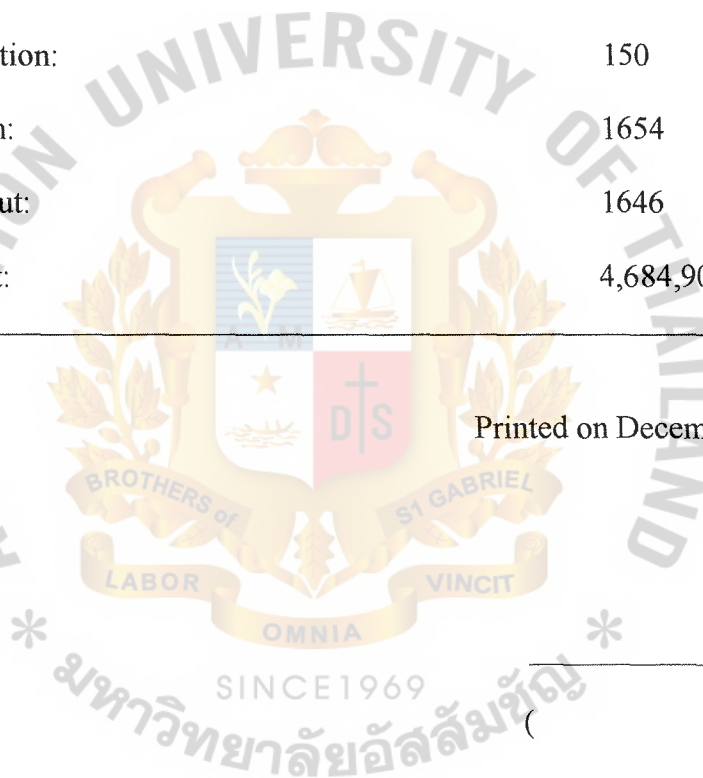


Figure E.4. Report Design: Reservation Summary Report (Annual Report).



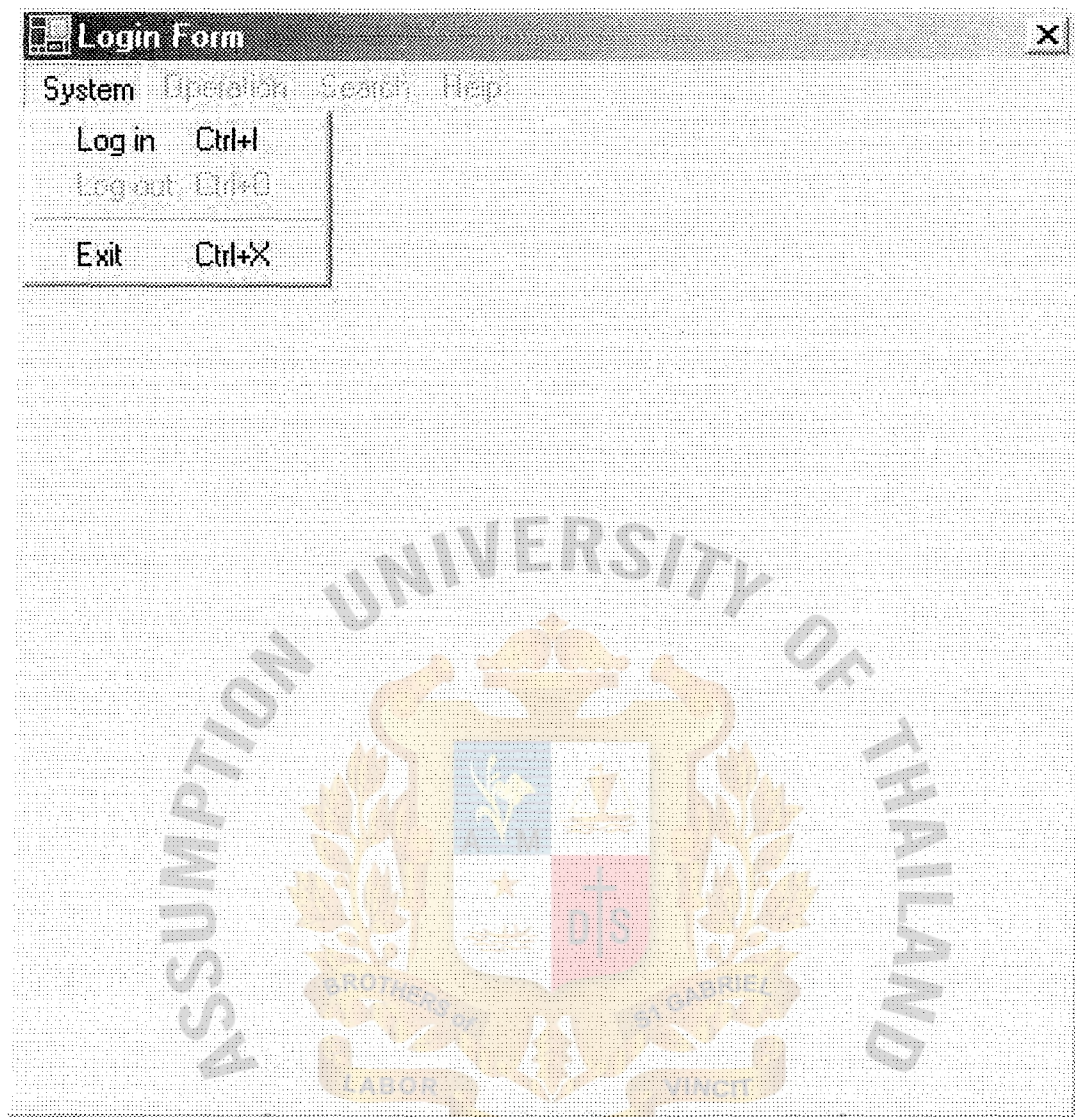


Figure F.1. Interface Design: Main Menu (Log in is Required to Access the System).



Username and Password are case sensitive

Username:

Password:

OK Cancel

Figure F.2. Interface Design: Login Interface.

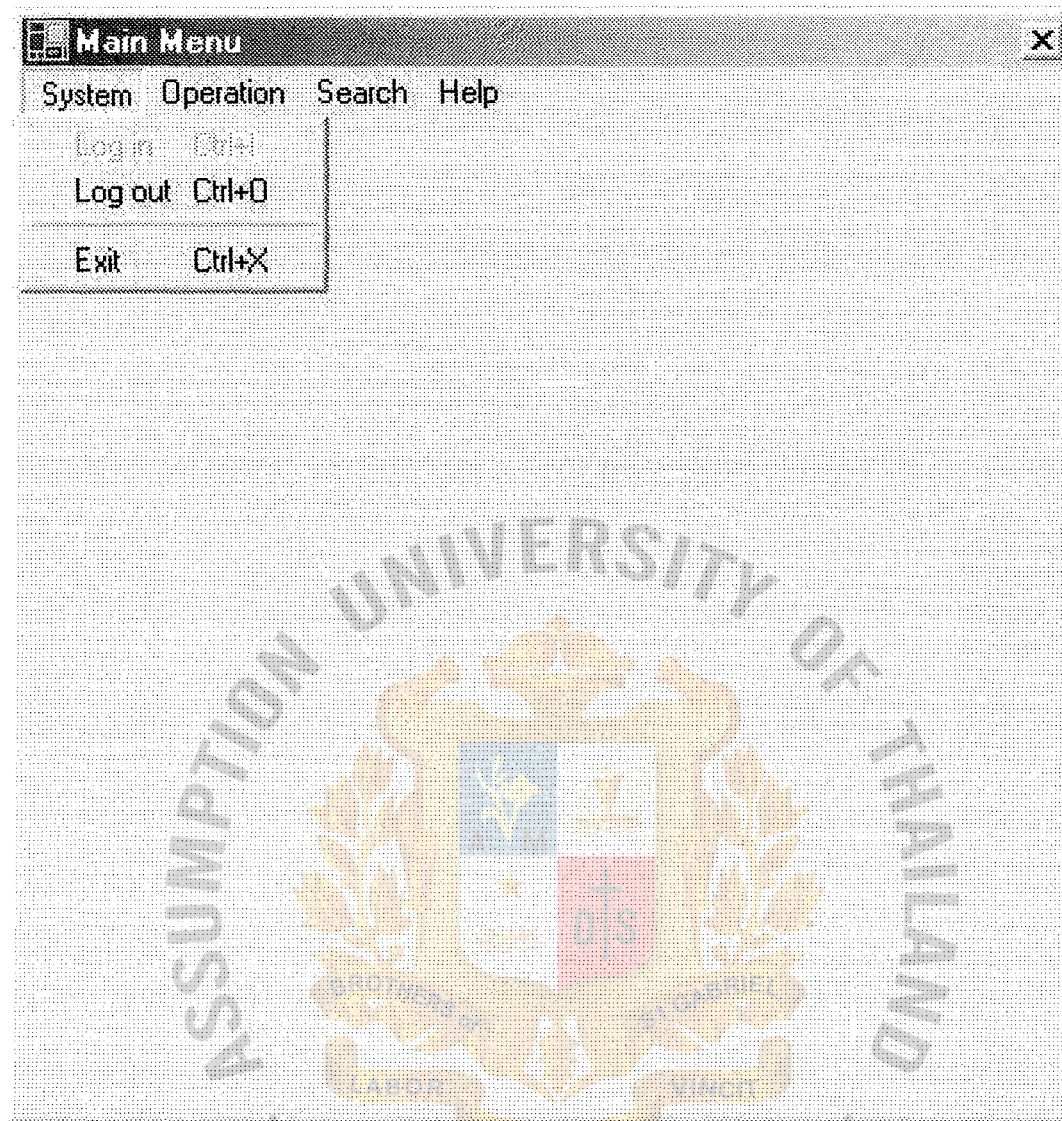


Figure F.3. Interface Design: Main Menu (After Log in to the System).

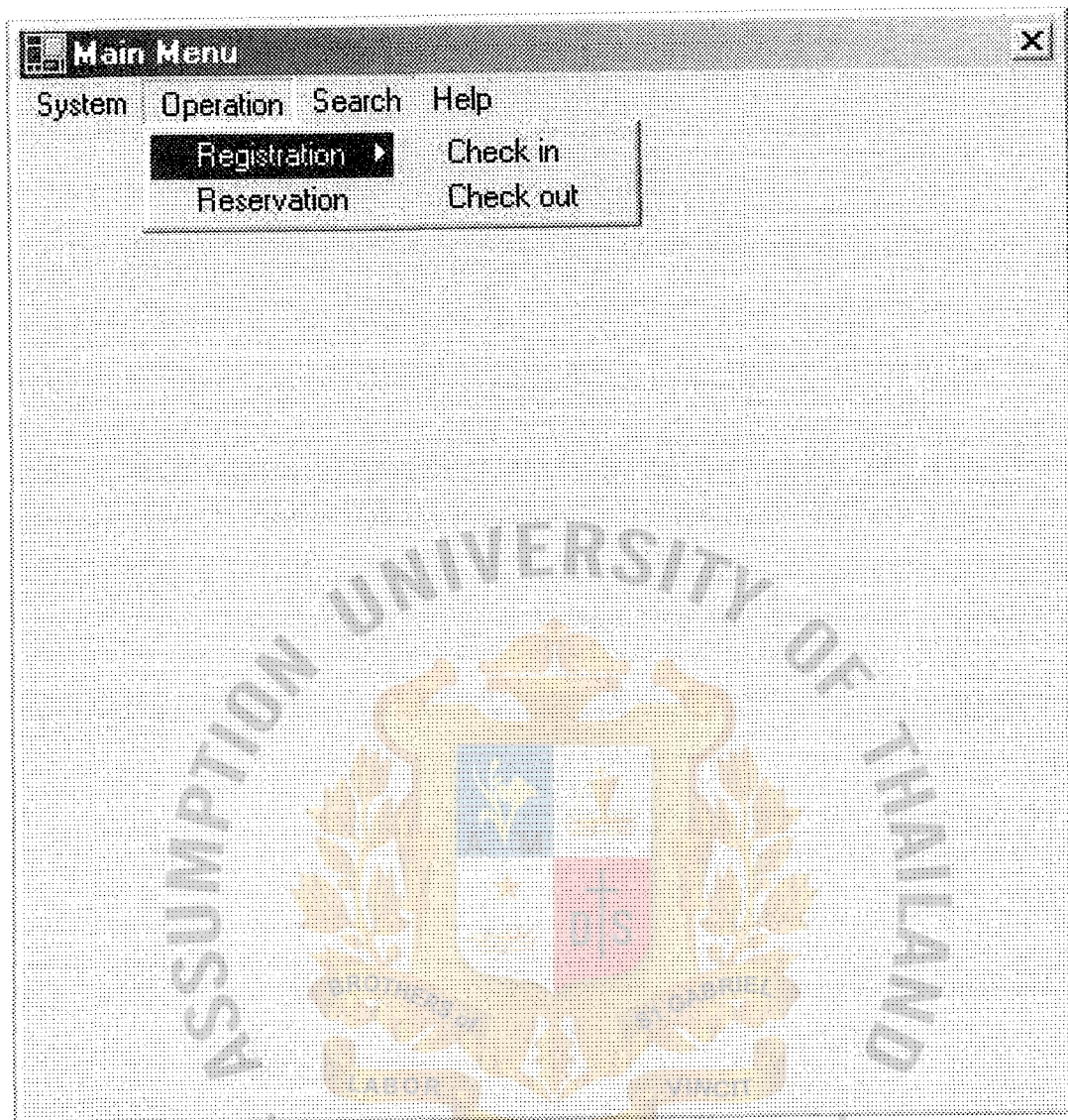


Figure F.4. Interface Design: Main Menu (Registration Menu).



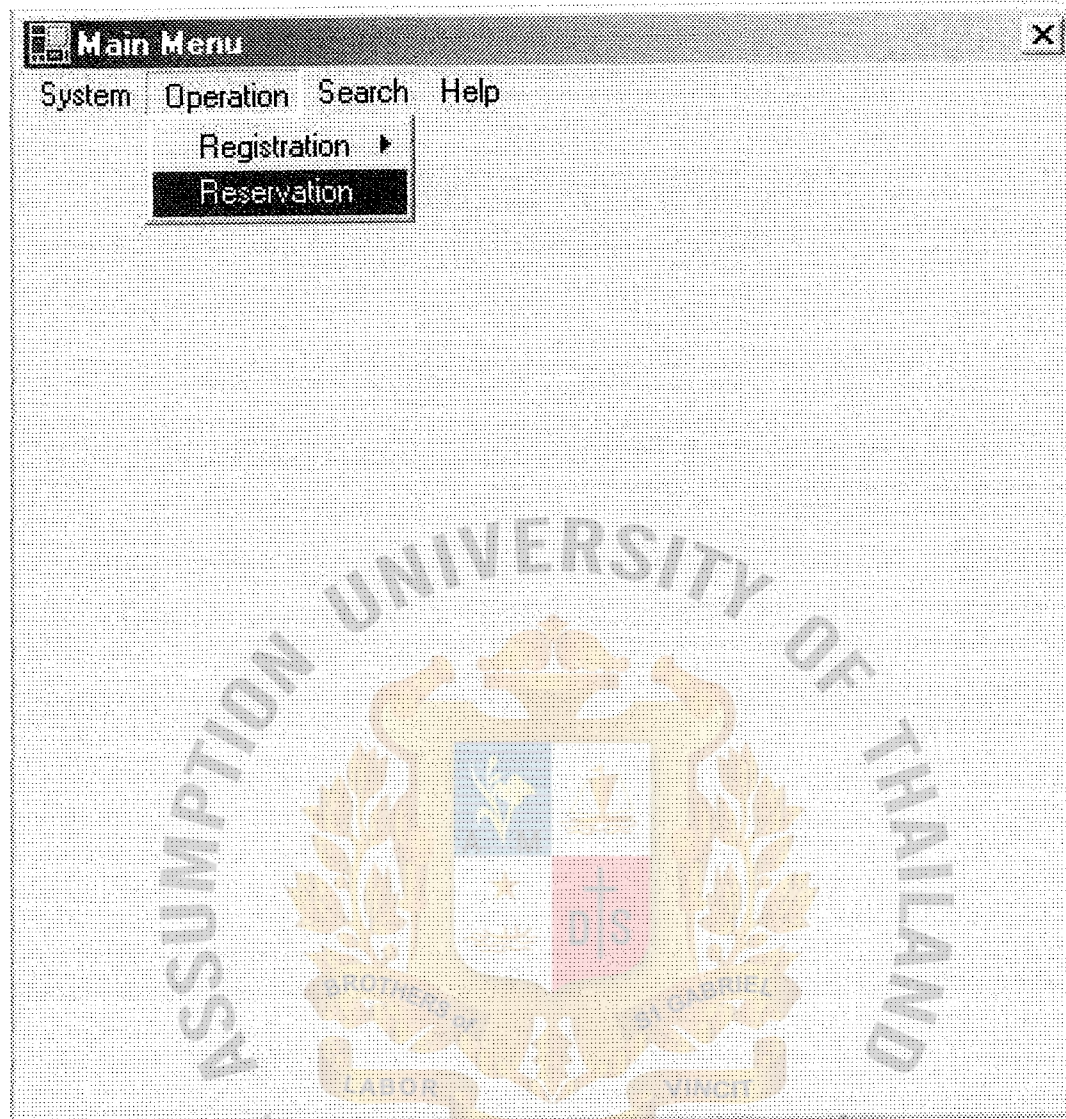


Figure F.5. Interface Design: Main Menu (Reservation Menu).

**Reservation**
✕

System    Operation    Search    Help

Employee ID: e103-01
Date: 25/06/03

Guest ID: g10000124
Rate: Regular

**Guest Information:**

Title: 
Name: 
Lastname:

Company Name: 
Optional

Address:

Street: 
City:

Telephone:

**Agency Information**

Agency Id:

Agency Name:

Agent Name:

Telephone: 
Commission:

**Vehicle Information**

Registration Number: 
Model:

Brand: 
Color:

Next

Figure F.6. Interface Design: Reservation Page (Sample Data Page 1).



**Reservation**
✕

System   Operation   Search   Help

Date: 25/06/03

Employee ID: e103-01

Guest ID: g10000124

Reservation Code: r20001354

Room Information

Room Number: b26

Zone: Beach

Room Status: Ready

Room Type: Twin

Description: Regular room with twin bed

Price: 2,000 Baht / Night

Reservation Information

Reservation Date: Friday, July 11, 2003

Duration: 2 Night

Date Check in: Friday, July 11, 2003

Payment Information

Prepaid Type: Credit Card

Card Number:

Prepaid Amount: Baht

OK

Cancel

Figure F.7. Interface Design: Reservation Page (Sample Data Page 2).



Table G.1. Structure of Guests Table.

Name	Type	Null	Foreign Key to Table	Check	Key Type
Guest_Number	Character (10)	Not Null	Reservations Table Vehicles table	-	Primary Key
Title	Character (3)	Not Null	-	-	Attribute
Name	Character (50)	Not Null	-	-	Attribute
Lastname	Character (50)	Not Null	-	-	Attribute
Company	Character (100)	Null	-	-	Attribute
Address	Character (150)	Not Null	-	-	Attribute
Street	Character (100)	Not Null	-	-	Attribute
City	Character (100)	Not Null	-	-	Attribute
Telephone	Number (10)	Not Null	-	-	Attribute
Last_Stay	Number (7)	Not Null	-	-	Attribute
Rate	Character (100)	Not Null	-	-	Attribute
Number_of_Night	Number (7)	Not Null	-	-	Attribute
Number_of_Stay	Character (7)	Not Null	-	-	Attribute

Table G.2. Structure of Travel Agents Table.

Name	Type	Null	Foreign Key to Table	Check	Key Type
Agency_Id	Character (10)	Not Null	Reservations Table	-	Primary Key
Agency_Name	Character (100)	Not Null	-	-	Attribute
Agent_Name	Character (50)	Not Null	-	-	Attribute
Phone	Number (10)	Not Null	-	-	Attribute
Commission	Character (10)	Not Null	-	-	Attribute



Table G.3. Structure of Reservations Table.

Name	Type	Null	Foreign Key to Table	Check	Key Type
Reservation_Code	Character (10)	Not Null	-	-	Primary Key
Room_Number	Character (10)	Not Null	-	-	Primary Key
Zone	Character (10)	Not Null	-	-	Primary Key
Reservation_Date	Date/time	Not Null	-	-	Attribute
Duration	Number (5)	Not Null	-	-	Attribute
Date_In	Date	Not Null	-	-	Attribute
Prepaid_Amount	Number (10)	Not Null	-	-	Attribute
Prepaid_Type	Character (50)	Not Null	-	-	Attribute
Agency_Id	Character (10)	Null	-	-	Foreign Key
Guest_Number	Character (10)	Null	-	-	Foreign Key
Employee_Id	Character (10)	Null	-	-	Foreign Key

Table G.4. Structure of Rooms Table.

Name	Type	Null	Foreign Key to Table	Check	Key Type
Room_Number	Character (10)	Not Null	Reservations Table Expenses Table	-	Primary Key
Zone	Character (10)	Not Null	Reservations Table	-	Primary Key
Room_Status	Character (100)	Not Null	-	-	Attribute
Room_Type	Character (100)	Not Null	-	-	Attribute
Description	Character (200)	Null	-	-	Attribute
Price	Number (7)	Not Null	-	-	Attribute

Table G.5. Structure of Receptionists Table.

Name	Type	Null	Foreign Key to Table	Check	Key Type
Employee_Id	Character (10)	Not Null	Reservations Table	-	Primary Key
Employee_Name	Character (50)	Not Null	-	-	Attribute
Employee_Lastname	Character (50)	Not Null	-	-	Attribute
Position	Character (50)	Not Null	-	-	Attribute

Table G.6. Structure of Vehicles Table.

Name	Type	Null	Foreign Key to Table	Check	Key Type
Guest_Number	Character (10)	Not Null	-	-	Primary Key
Brand	Character (50)	Not Null	-	-	Attribute
Model	Character (50)	Not Null	-	-	Attribute
Color	Character (50)	Not Null	-	-	Attribute

Table G.7. Structure of Expenses Table.

Name	Type	Null	Foreign Key to Table	Check	Key Type
Expense_Id	Character (10)	Not Null	-	-	Primary Key
Expense_Detail	Character (50)	Not Null	-	-	Attribute
Expense_Price	Number (7)	Not Null	-	-	Attribute
Room_Number	Character (10)	Not Null	-	-	Foreign Key



## BIBLIOGRAPHY

1. Date, C. J. An Introduction to Database Systems. MA: Addison-Wesley, 1995.
2. Date, C. J. An Introduction to Database Systems Volume I, Sixth Edition. Reading, MA: Addison Wesley, 1996.
3. Forouzan, B. A. Introduction to Data Communication and Networking. MA: McGraw-Hill International, 1998.
4. Goldman, J. E. Client/Server Information System: A Business Oriented Approach. NY: John Wiley & Sons, Inc., 1999.
5. Greer, Tyson. Understanding Intranets. Redmond, WA: Microsoft Press, 1998.
6. Kosiur, David. Understanding Electronic Commerce. WA: Microsoft Press, 1997.
7. Laudon, Kenneth and Jane P. Laudon. Management Information System. NJ: Prentice Hall International Company, 2000.
8. Loomis, Mary E. S. Data Management and File Structures, Second Edition. London: Prentice-Hall International, 1989.
9. Meesajjee, Chulit. The Guidelines for MS (CIS) CS 6998 Project and CS 7000 Thesis, Fourth Edition. Bangkok: Assumption University, 2000.
10. Microsoft Corporation. The Windows Interface Guidelines for Software Design. USA: Microsoft Press, 1996.
11. Pratt, J. Philip and Joseph J. Adamski. Database Systems Management and Design, Third Edition. Cambridge: Course Technology, 1994.
12. Schewalbe, Kathy. Information Technology Project Management. MA: Course Technology, 1999.
13. Trepper, Charles. E-Commerce Strategies. USA: Microsoft Press, 2000.
14. Whitten, L. Jeffrey and Lonnie D. Bentley. System Analysis and Design Methods, Fourth Edition. Boston: Irwin McGraw-Hill International, 1998.
15. Whitten, L. Jeffrey, Kevin C. Dittman, and Lonnie D. Bentley. System Analysis and Design Methods, Fifth Edition. Boston: Irwin McGraw-Hill International, 2002.
16. Wheelen, L. Thompson and David J. Hunger. Strategic Management & Business Policy. NJ: Prentice-Hall, 2000.