Web-based Resorts Reservation System for Travel Agent

by

Ms. Surattanaporn Wiwatsatitwong

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

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
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Project Title	Web-based Resorts Reservation System for Travel Agent
Name	Ms. Surattanaporn Wiwatsatitwong
Project Advisor	Dr. Boonyarit Pokrud
Academic Year	March 2004

The Graduate School of Assumption University has approved this final report of the six-credit course, CS 6999 System Development Project, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer Information Systems.

Approval Committee:

(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)
CHE Representative

March 2004

ABSTRACT

The System development project represents the process of analysis, design and implementation for the Web-based Resorts Reservation System for Travel Agent. The project is developed to solve the problems of resorts reservation of the existing system. The system has been designed to cover the function of Reservation and Guest Registration.

The study of this project begins with the required definition and analysis of the existing system. Information system analysis and design tools are used to analyze both the existing system and the proposed system. Those tools are context diagrams, data flow diagrams, data dictionaries, and structure charts. Then, the candidate systems matrix solution is also used to compare various alternatives to come with most effective solution. Finally, the capital budgeting models are used to evaluate the proposed system. Those models are cost-benefits analysis, break-even analysis, payback period analysis, net present value analysis, and return on investment analysis.

The software tool used is a PC-based software running on Microsoft Window2000. The programming development tool is PHP, which is used to develop the user interface. On the back-end, MySQL is used as a database tool for storing data and its definition.

ACKNOWLEDGEMENTS

The writer would like to acknowledge the contribution of the following organization, without which the completion of this project would not be possible: Smile Travel Resort, for providing information of system requirement on resort operations and management functions. She also would like to forward her sincere Gratitude to Dr.Booyarit Pokrud, a project advisor, who provided advice and comments throughout the development of this project.

Finally, she would like to extend her appreciation to lecturers in Computer Information System (CIS) Department of Assumption University for providing knowledge and education throughout her academic years in the University.

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1.1 Background of the Project

In globalization, every business is highly competitive especially the hospitality industry that is booming worldwide so, is the competition to edge out the rest with better service, greater quality at the most economical cost. Moreover, the trend of the Internet user continues to increase because the Internet users get and send information so quickly via the network. That is one of the advantages of the Internet. With the Internet technology, we provide the web-based resorts reservation system for travel agent to increase efficient performance for the Smile Travel Resorts Co., Ltd. which my company is agency for reservation resorts in Thailand.

Nowadays, the Smile Travel Resorts Co., Ltd., operates the daily routine reservation system by using the manual method. This is inconvenient to the employee and the supervisor who manage the routine booking operation works. Then, the real problem occurs from the lack of good management information system. The management information system (MIS) serves the function of planning controlling, and decision making by providing routine summary and exception reports. So, the management needs a stable information and database management system (DBMS) to provide more accurate information appropriate for the time of need.

However, the proposed system will be based on the existing procedures and we try to introduce a computer-based information system and the Internet reservation service for the Smile Travel Resorts Co., Ltd. The web-enabled reservation system will provide guests with more choices from the traditional styles. Finally, we hope that the manual operation and the current diary book are replaced with a graphical on-line diary and automated report generator.

1.2 Objectives of the Project

The objectives of the Web-based Resorts Reservation System for Travel Agent for the Smile Travel Resorts Co., Ltd. are as follows:

(1) To study the problems of the existing manual system.

(2) To study the problem environment in order to implement corrective solutions taken from computerized system.

(3) To analyze the problems, and propose a new solution as a choice among various ones to solve the existing problems and understand the problem and user's requirement.

(4) To diversify opportunities in to new market sectors by using electronic business to sell supporting services and to develop resorts image.

(5) To add power to gain real-time access directly into resorts reservation systems for selling and viewing accurate up-to-the-minute availability.

(6) To improve rate of technology progress through the exposure to world markets.

(7) To reduce time-consuming to generate, analyze, and disseminate decision information needed to fuel the other system and the overall marketing system.

(8) To develop the reservation page section of the resort's web site.

(9) To add value per booking transaction with the ability of user to interact with the resort's own graphical mapping capabilities and special promotions.

(10) To provide online customer with lower price and privacy guaranteed policy.

(11) To reduce mounds of clerical works, time consuming, double-bookings, lost paper works and manual operation time.

(12) To estimate and compare cost and benefit between and manual and computerized system.

1.3 Scope of the Project

The project will focus on the basic requirements of the Web-based Resorts Reservation System for Travel Agent, which are summarized as follows:

(1) Settle customer booking request in online screen input form.

(2) Generate the interactive customer room-booking transaction.

(3) Ability to check room availability through web interface.

(4) Process room checking, which matches the customer's conditions.

(5) Respond the customer transaction processing in real-time.

(6) Accept the authorized transaction by automated email with confirmation voucher to both resorts and customer.

(7) Ability to create the check-in and checkout list.

(8) Display room status at any time with function key.

(9) Ability to prevent the overbooking.

1.4 Deliverables

The deliverables for the Web-based Resorts Reservation System for Travel Agent, are as follows:

(1) The screen layout for graphical user interface.

(2) The web-site for making Internet reservation service.

(3) Management Information System

(4) The various hard copy layouts containing at least:

(a) Daily Authorization Transaction Statistic Report

(b) Monthly Authorization Transaction Statistic Report

(c) Daily Guest Arrival Report

(d) Daily Guest Departure Report

(e) Daily Room Status Report

(f) No Show Report

(g) Cancellation Report

(h) Guest History Summary Report

1.5 Project Plan

See Figures 1.1 display the project plan of Web-based Resorts Reservation System for Travel Agent.

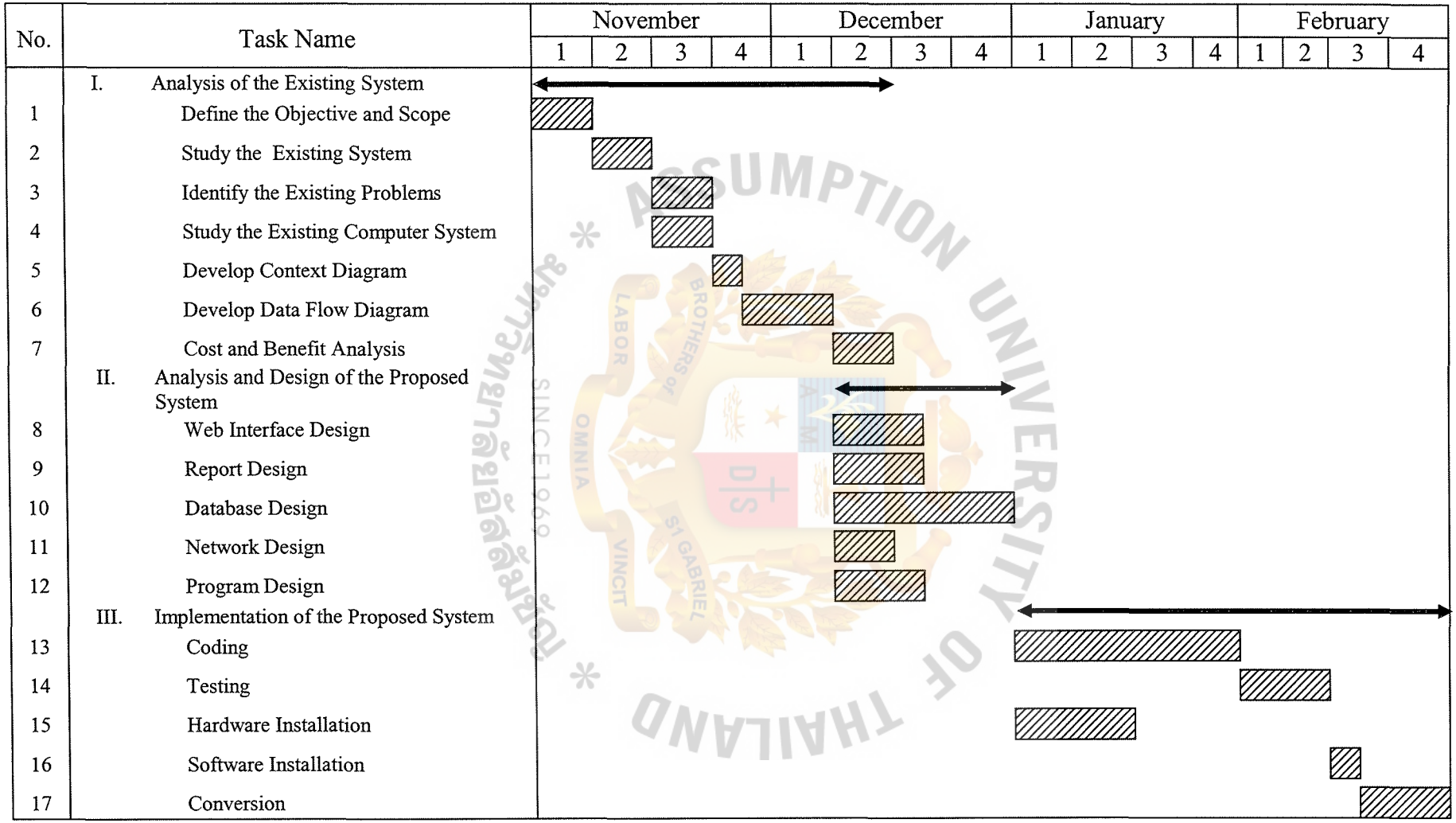

Figure 1.1. Project Plan of Real-time Resorts Reservation System in Thailand.

II. THE EXISTING SYSTEM

2.1 Background of the Organization

Smile Travel Resorts Co., Ltd. is a web-based computer reserve organization. They sell many package tour products, for example, Chiangrai Hill Resort, Phupimarn resort and country club, Amarinlagoon and Rayoug Resort etc. The company has a small storefront located in Pantip Plaza on Petchburi Rd., and has been in the business for only one year. The organization chart is shown in Figure 2.1.

Number of employees that are required to operate the resorts vary with the number of guests. In turn, the numbers of guests are limited by the number of rooms for that resorts. The resorts is divided into eight basic divisions as follows:

(1) Administration

(2) Resorts

(3) Rooms

(4) Guest services

(5) Marketing and sales

(6) Accounting

(7) Security

(8) Engineering

2.2 The Existing System Functions

Reservation in one of the divisions of the front office, the public's main contact with the resorts. The staff members handle reservations, greet guests on arrival, register new guests, dispense keys, handle incoming and outgoing mail, take message for guests, provide information, listen to complaints, and handle checkout procedures when guests depart.

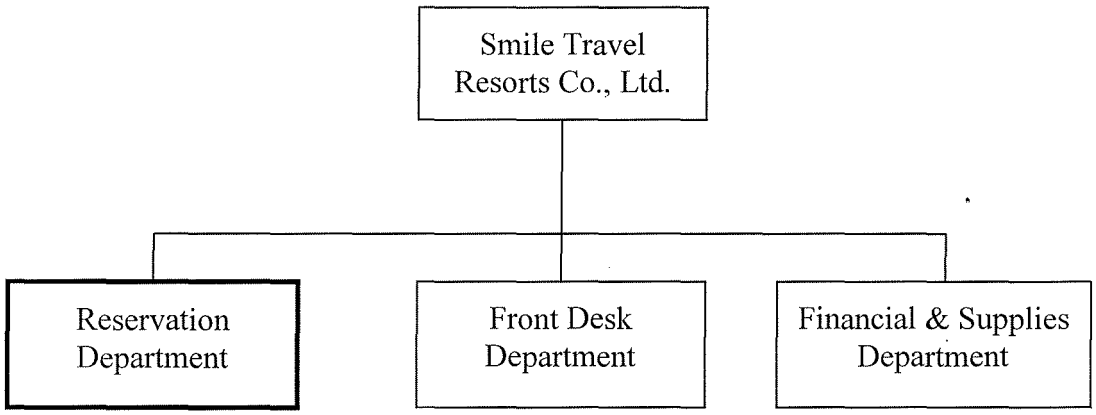

Figure 2.1. The Organization Chart of Web-based Resorts Reservation System for Travel Agent.

In the reservation system, the reservation staff handles guest communication and correspondence regarding reservation at the resorts. Those contacts with potential guests can be through correspondence in the form of email, telephone or fax. On the basis of this information, the staff creates and maintains reservation records for all reservations in the resorts. Once the information has been collected, staff member produces the appropriate confirmation and/or guarantees to the requester. As a part of reservation responsibilities, they track the future room availability and may initiate forecast of room's sales and occupancy. Finally, on the day the guest is expected, the reservation staff will bring forward reservations to the front office. This may be in the form of a physical reservation card or document or simply the release of temporal information in the resorts data processing system. The following are the principle of the system as related to reservations:

(1) Reservation

The reservation staffs handle all types of reservation as following:

(a) Individual reservations

(b) Company reservations

(c) VIP reservation

(d) Travel agency reservations

(e) Group reservations

(f) Source reservations

(g) Reservation by any combination of the above

(h) Waitlist reservations

(2) Rate Availability/Yield Management

Whereas resorts previously sold rooms purely based on availability of room types, many resorts today sell rooms based on rate. A resorts may prefer to reject low price business even if when it is not full when it can predict that the same room can be sold to a higher paying customer. The concept of maximizing revenue with a fixed inventory is known as yield management.

The room rate is varying according to the type of reservation and seasons. For the type of reservation, the examples of room rate are following:

(a) Rack rate

(b) Corporate rate

(c) Government rate

(d) Weekend rate

(e) Honeymoon package

(f) Complimentary

(g) Airline crew rate

The season controls the rates for the specific valid rate code. This should be designed to coincide with the seasonal rate changes given be the marketing department. The resort's property is planning to follow basic yield management practices for example, selling room rate based on demand then the yield management rate codes should leave those dates blank. The objective of season control is to determine optimal procedures for yield management.

2.3 Current Problems and Areas of Improvements

The clerical staff who performs the reservation functions handles a number of tasks that are important to the orderly accumulation and dissemination of reservation information to the appropriate department. In a reservation process, the following difficulties rise:

(1) Difficulty in handing reservation years in advance.

(2) Extreme difficulty in controlling accuracy of reservation records.

(3) A lot of paper work due to various kinds of reservation.

(4) Difficulty in determining room availability during high season.

(5) Making a reservation is time consuming and proning the errors.

(6) Sluggish closure of room sale and reservation done by phone and fax.

The most highly visible duty of the reservation staff is to register guests. Check-in procedures consist of several steps, each of which is important to efficient room management and the maintenance of a pleasure and orderly atmosphere at the front office. The followings are the problems normally found at the front office:

(1) Guests have to wait for registration quite a while when the reservation staff is busy.

(2) Human error can slow down the guest registration procedure.

(3) Repletion task of checking the guest's reservation emails and generating confirmation vouchers are required every day.

(4) Preparing summary of individual arrival list is time consuming.

(5) Extreme difficulty in preparing for statistical and ad-hoc report in timely manner.

III. THE PROPOSED SYSTEM

3.1 System Specification

The purpose of Web-based Resorts Reservation System for Travel Agent is to computerize the resort's reservation process and to maintain information needed for the operation and management. Rationally the customer's reservation comprises of various types, the scope of resorts online system focuses only on the tentative individual customer's reservation. Other types of reservations are generally conducted via fax and phone due to the price negotiation reason.

The main purpose required with the system is to have all the processes related to the automated reservation function, which is self-service. Prospective and guests at the Smile Travel Resorts Co., Ltd. would now check hotel availability, place reservation, and apply charges to credit card. Confirmation number can be automatically assigned and supplied in real time, and customers receive an immediate response from the system as opposed to 3-4 days wait with the traditional phone/fax/mail system. Besides, the necessary report can be produced, and information of the system can be viewed through the inquiry screen.

On the arrival day, the guest does not need to wait for registration for the check in procedure. The confirmation number given to each customer is used as a function key to retrieve the reservation detail and dispensing room key is then made quickly.

The followings are the basic requirements for the reservation staff:

(1) Web-based reservation section for individual reservation.

(2) Make the formalities of reservation request as quickly as possible.

(3) Be able to handle guest without registration at the arrival time.

(4) Can determine room availability in real time with self-service.

(5) Be able to determine room availability based on room type and location.

(6) Can store guest special requirement and other comments.

(7) Generate the confirmation number with the reservation detail automatically.

(8) Automate confirmed email delivered to customer in real time basis.

(9) Intelligence built in to the system helps prevent overbooking.

(10) Credit card details isolated from hotel web hosting via sophisticated transaction mechanisms.

(11) Transaction was authenticated to bank by certificates and vice versa with strong encryption at resorts and bank.

(12) Provision for fraud detection and protection.

(13) Provision of statistic transaction history in web-based and making reconciliation process easier.

3.2 System Design

There are many techniques and models in developing the proposed system such as database modeling, network modeling, process modeling and structure modeling. Each of which is used to accomplish this system design development. Therefore, the design techniques must be designed accordingly to the proposed system description, which is explained as following:

Overview of the Web-based Resorts Reservation System for Travel Agent Processing

(1) The resort decides how many rooms of each room type to make available each day through the web-based interface. This is not allotment and can be altered at any time.

(2) Customers find the details of the resorts web site, by using a search engine or via the hotel guide.

(3) Customers select room type, start and end dates of their visit. They do not need to give any personal information at this stage. If rooms are available, the appropriate room and rate choice are offered with total costs. If there are not rooms available, guests can select alternative date.

(4) If the guests decide to accept one of the room choices offered, they can reserve the rooms by inputting their personal details. They must also confirm it there and then by entering credit card details via the secure server. This acts as a guarantee and triggers the bank authorization to the transaction. Also the generation of "confirmation received" e-mails to the guest and instructs the system to record the permanent decrease of room availability.

(5) The system then sends out the two e-mail message and counts down the number of available rooms. The first e-mail is sent to the person making the reservation. It tells them exactly what has been reserved for how long and at what cost. It also explains the confirmation detail, alter or cancel the reservation. The second e-mail is to the hotel reservation department.

(6) An amendment to the booking is made by the reservation department, in this case, the system keeps both parties informed by e-mail and updates the availability accordingly.

3.2.1 Candidate Solutions

System design deals with the physical or implementation-dependent aspects of a system or the system's technical specifications. After the business requirements having been established in the definition phase of system analysis, the configuration phase will be conducted to identify, analyze candidate solutions and recommend a target system.

So, we should identify alternative candidate solution generated from the ideas and opinions of system owners, system users and other such as system analyst, system designers, technical consultants and other information system professionals.

(1) Candidate Solution 1

The candidate solution uses the HTML (HyperText Markup Language) for application development. With its text style, it makes application development easier.

(2) Candidate Solution 2

The second solution uses the PHP and MySQL for application development for online Internet. The benefit of this solution is : it can easily be implemented and disseminated.

(3) Candidate Solution 3

In the third solution, the program will be written with Visual Studio.NET to support the user requirements. This program can provide high efficiency in customizing the usage of the proposed system.

After alternatives are identified, each candidate solution needs to be analyzed in more details. Candidate system matrix is used to describe the characteristics of each alternative as show in Table 3.1

Table 3.1. Candidate System Matrix

Characteristics	Candidate 1	Candidate 2	Candidate 3
Portion of System Computerized	Software package would be purchased to serve the reservation tracking and purchasing control to satisfy the system	Similar to candidate 1 and reservation control and warehouse operation in relation to reserve package fulfillment	Similar to Candidate 1

Table 3.1. Candidate System Matrix (Continued).

Characteristics	Candidate 1	Candidate 2	Candidate 3
Benefits	Fully supports user required business process for company	Can be implemented quickly and provides more efficiency in accessing and generating report	This solution can support the user requirements but it is a little difficult to use a program in generation a report.
Servers and Workstations	Pentium 4 2.2 GHz. DDR-RAM 256 MB, MS Windows XP	Similar to candidate 1	Pentium 4 2.66 GHz. DDR-RAM 256 MB, MS Window XP
Software Tools Needs	HTML for user interface	PHP Language MySQL Database.	Visual Studio .NET MySQL Database.
Application Software	Customer Solution	Similar to candidate 1	Similar to candidate 1
Method of Data processing	Standalone	Similar to candidate 1	Similar to candidate 1
Output Devices and Implications	(1) HP LaserJet 3300 (2) Epson LQ-570+ dot matrix printer	Similar to candidate 1	Similar to candidate 1
Input Devices and Implications	Keyboard & Mouse	Keyboard & Mouse	Keyboard & Mouse
Storage Devices and Implications	Seagate Hard Disk drive 40 GB	Similar to candidate 1	Similar to candidate 1

3.2.2 Feasibility Analysis Design

Feasibility analysis is the process or the way used to measure the benefit or practical of the information system development in an organization. There are four (4) categories of feasibility analysis.

(1) Operational feasibility (people oriented) : used to measure how well the solution performs in the organization and the feeling or acceptability of the users.

(2) Technical feasibility (computer oriented) : a measure of the practicality of a specific technical solution and also the availability of the technical resources and expertise.

(3) Schedule feasibility : the measure of how long this project should be developed.

(4) Economic feasibility : dealing with the cost and benefits of the information system.

The feasibility analysis matrix is an analysis and ranking of the candidate solutions matrix. However, we cannot know which one is the best. Sometimes, the solution is good for the operational but the cost is very high. Then, the best way to get the final decision is to discuss with the end-users.

In analyzing economic feasibility, we have 2 additional analysis tools. They are payback analysis and net present value analysis of each candidate solution. They will give more information and clear the picture of each solution which will be implemented analysis.

In the first candidate solution, payback period is around

Table 3.2. Feasibility Analysis Matrix.

Feasibility Criteria	Weight	Candidate 1	Candidate 2	Candidate 3
Operational Feasibility	30 %	Fully supports user required functionality Score: 100	Fully supports user required functionality Score : 100	Only supports Reservation system requirements and current business processes would have to be modified to take advantage of computerized system Score: 60

Table 3.2. Feasibility Analysis Matrix (Continued).

Feasibility Criteria	Weight	Candidate 1	Candidate 2	Candidate 3
Technical Feasibility - Technology - Expertise	30%	HTML helps customize the users' requirements and is mush better user interface. It can be revised to be used through the internet for further development plan. Required programmer and training for the end user. Score: 100	Microsoft Windows 2000 with PHP can implement reserve and purchasing control easily and quickly. Required hardware specialist to ser up the application. It requires a training and knowledge of database. Score: 100	For current system, we use manual system that is very slow. So, we change to standalone computerized system. Required hardware specialist to set up the application. It requites a training and knowledge of database. Score: 90
Economic Feasibility -Cost of development: -Payback period (discounted) -Net Present Value: -Detailed calculations:	30%	Approximately 201,800 Baht Approximately 1 year and 6 months. Approximately 542,255 Baht Score: 95	Approximately 181,800 Baht Approximately 1 year and 1 month. Approximately 619,913 Baht Score: 100	Approximately 220,000 Baht Approximately 1 year and 9 months. Approximately 542,055 Baht Score: 90
Schedule Feasibility	10%	5-7 Months Score: 90	3 Months Score: 100	6-8 Months Score: 85
Ranking	100%	97.5	100	80.5

3.2.3 Development the Context Diagram and Data Flow Diagrams

The context diagram of proposed system is used to focus on the data flowing in and out of the system and the processing of the data.

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

3.2.4 Development of Entity Relationship Diagram

An entity-relationship diagram is a data modeling technique that creates a graphical representation of the entities, and the relationships between entities, within an information system.

Data modeling is the analysis of data objects that are used in a business or other context and the identification of the relationships among these data objects. Data modeling is a first step in designing an object-oriented programming. We can then define the class that provides the templates for program object.

A simple approach to creating a data model to visualize the model is to draw a square (or any other symbol) to represent each individual data item and then to express relationships between each of these data items with words such as “is part of” or “is used by” or “uses” and so forth as called entity relationship diagram.

From such a total description, we can create a set of class and subclasses which define all the general relationships. These then become the templates for objects that, when executed as a program, handle the variables of new transactions and other

activities in a way that effectively represents the real world. Entity relationship diagram is shown in Appendix D.

3.2.5 Development of Data Dictionary

Data dictionary is considered as one of the important stages in the structure design. It defines the documentation that supports data flow diagram, containing all terms involved and their definition for data flows. Data store related to the data flow is also defined in data dictionary with the exception of the processes that are defined separately through the use of the process description.

The derivation of data dictionary is to study the existing data elements and to add new required data elements that are essential for the system. Data dictionary is shown in Appendix B.

3.2.6 Design of File Specification

File specification shows that name, attributes name as well as the primary key and foreign key. Elements which fall into each table can be arranged in various file organization structures, which give the number of performances levels. File specification is shown in Appendix G.

3.2.7 Design of User Screen Interface and Output Report

This user screen interface is designed to provide the system user on the input and output interface to make all system users agree upon the same prototype screen control design. The system builder needs to ensure system users of the in-dept understanding and acknowledgement of both input and out interface screen control. User screen interface interacts with the general customers who browse the website and make the online reservation. Real time room availability check enables the customer to check the room availability and then reservation is then made. Likewise, the administrator screen interface is the web-based facility for the system administrator to perform the main task

of reservation such as retrieving the room status and customer details, listing of check in and check out data and room status conversion. Cancellation of reservation is also provided to enable the system administrator to manually unblock the certain room number. The screen interface layout and output report are shown in Appendices F and G.

3.3 Hardware and Software Requirements

The overall system consists of a server computer, which stores the database of the system and three of client computers on which the staff operates.

Table 3.3. The Hardware Specification for the Intranet Server.

Hardware	Specification
CPU	Pentium III 450 MHZ
Cache	256 KB
Memory	64 MB
Hard Disk	10 GB
CD-Rom Drive	50X
Floppy Drive	1.44 MB
Display Adapter	SVGA color
Display	14" SVGA monitor
I/O	2 serial, 1 parallel
UPS	MLP Series UPS 300 VA

The software specifications for each of client computers as shown as follows:

Table 3.4. Software Specification.

Software	Specification
Operating System	Microsoft Window 2000
Database System	MySql version 3.23
Web Server	Apache
Web Page Editor	Internet Explorer 5.0
Protocol	TCP/IP

3.4 Network Configurations

A payment gateway provides a secure interface between a transaction acquirer and a merchant or the resorts web server in this case. The payment gateway has been built by an international team of security experts and software developers, in an international tram of security experts and software developers, in conjunction with the bank in Thailand, to perform this function. It is available as solution to process credit card and other financial transactions originating from the Internet to service providers, acquirers, and banks.

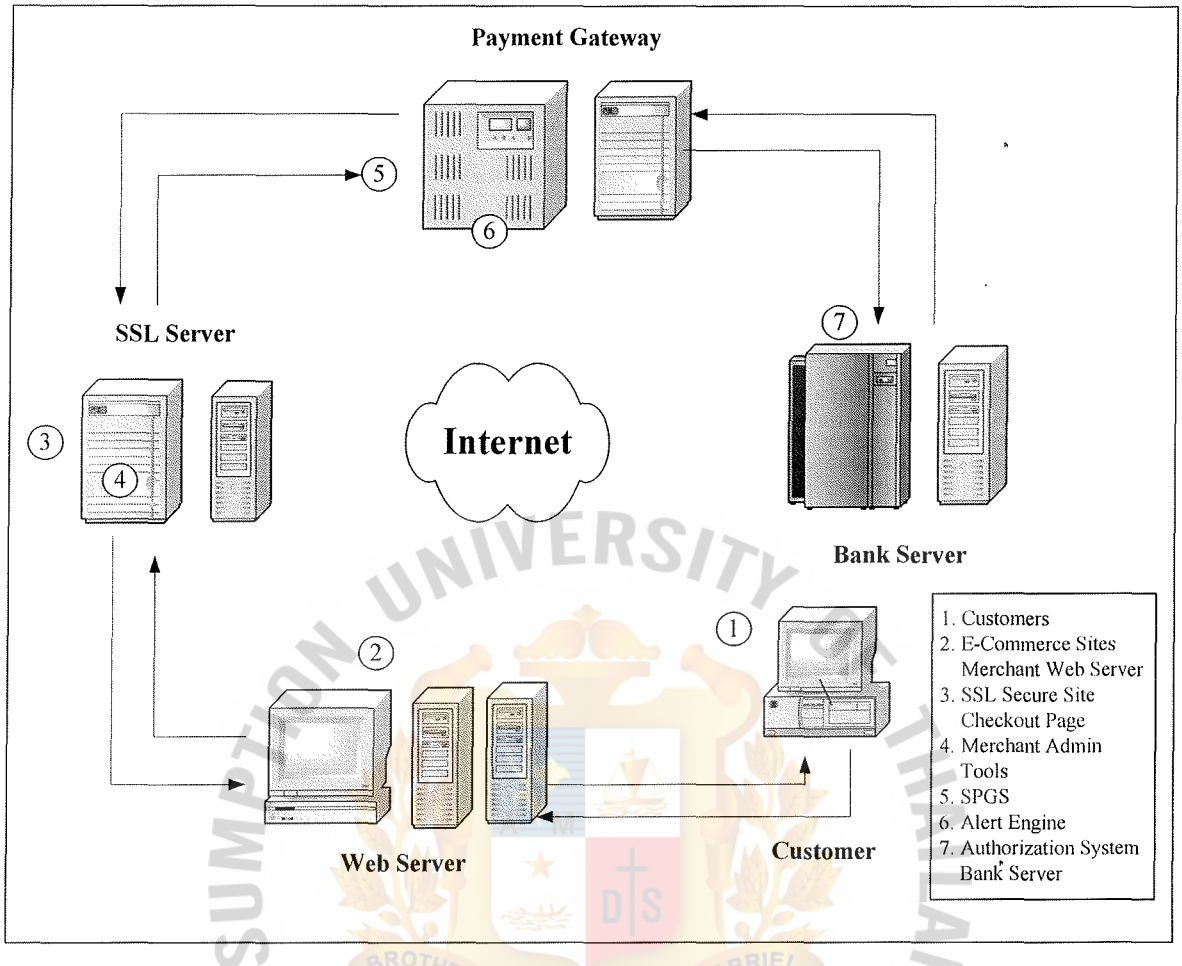

Figure 3.1. Overview of the system diagram.

A transaction occurs as follows:

(1) Consumer browses an e-commerce web site and selects items.

(2) Consumer enters his credit card details on a secure SSL server.

(3) Payment gateway processes and authorizes, within seconds, the transaction with the acquirer.

(4) Consumer and merchant are both informed of the result of the transaction.

3.4.1 System Features

The payment gateway's proprietary alerting engine make sure that all transactions are as safe as possible. The security experts and hand on experience with every facet of conducting e-commerce, have allowed us to develop a sophisticated yet unobtrusive alerting application. This "engine" monitors all activities at the gateways as following:

(1) Communications: Internet, sockets, timeout, ISP failures.

(2) Transactions: Account limit exceeded, possible fraud.

(3) Cryptography: Incorrect signature, invalid key.

(4) System: Host failure, process availability, security compromise.

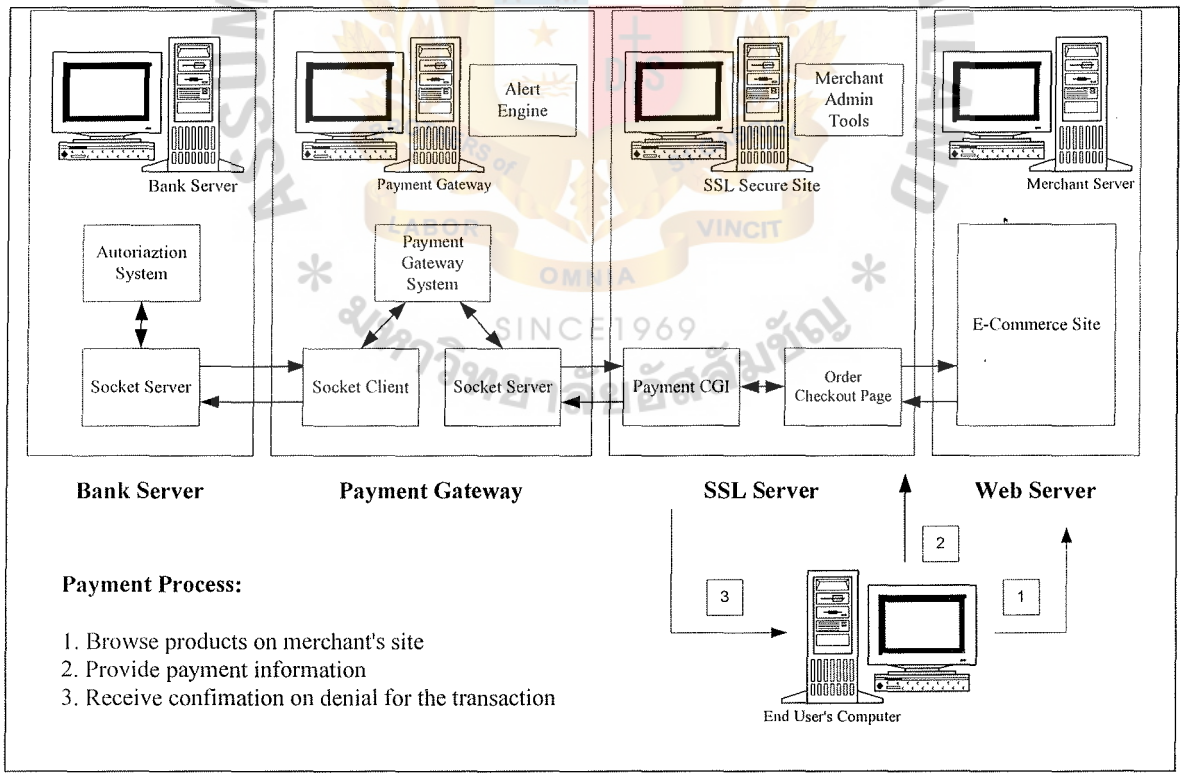

Figure 3.2. Network Configuration of the Proposed system.

The payment gateway system components are as follows:

(1) Real Time Alert Engine

The payment gateway has used its security knowledge and expertise in designing special security enhancement features for the SPGS. One such feature, unique to SPGS payment gateway systems, incorporates additional authentication processes aimed at transaction security.

This security feature has been incorporated to allow both merchants and banks to monitor and track any fraudulent transaction that may be attempted. This security feature is called the payment gateway alert engine.

(2) Queued Transaction Function

Due to occasional problems related to bandwidth availability and lost connections to international sites, Siam Relay have developed a feature that allows transaction queuing at the bank. In the normal e-commerce credit card transaction process, the banking system will acknowledge that the credit card transaction is requested. This is performed through a series of handshaking utilizing a special messaging format. However, due to the nature of the internet, connections are sometimes lost or very slow, thus the on-line shoppers inform them of the progress, however, the transaction is held in queue. The retry period is scaleable according to the requirements of the clients. This also allows transactions that would have been potentially "cancelled", to be processed thus ensuring a higher number of successful transactions and consequently commissions. This security feature is called the payment gateway transaction queuing.

(3) Fraud Management

Fraud is always an issue when processing credit cards in any environment. Payment gateway controls the risks using the following procedures and technology. All are transparent to the customer, but vital to the merchant and bank as follows:

(a) Screening process for consumers (email address, IP range, etc.)

(b) Definition of threshold rules for both merchants and bank.

(c) Archives of all relevant data for further investigation and legal records.

(d) Interface to real-time alerting engine.

3.4.2 Security Architectures

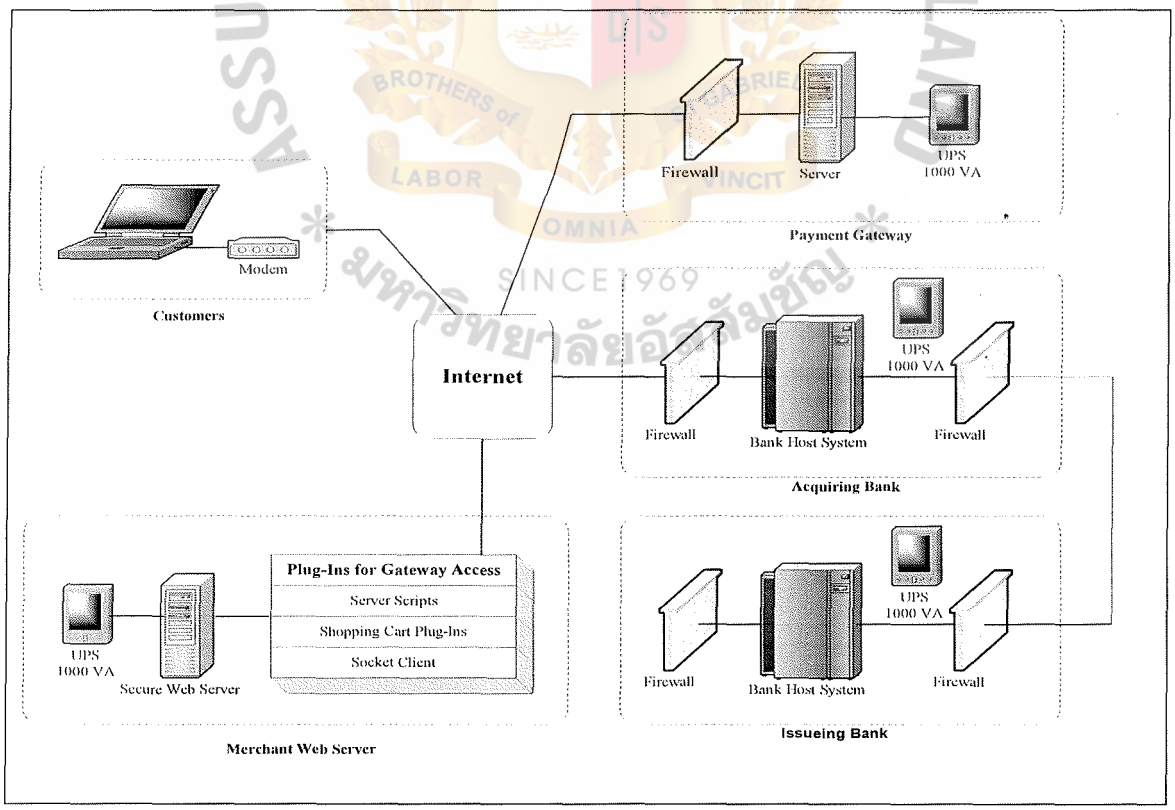

Figure 3.3. Security Configuration of the Proposed system.

The SPGS employs various security mechanisms in order to protect it from abuse. Security issues can be classified in several categories, covering host security, network security, communications security and transaction security.

(1) SPGS Security Perimeter

The SPGS system (initially made of SPGS Engine + Database Engine) is running on Unix platforms and needs to communicate to the merchants as well as with the bank.

The border router used is a CISCO router with the latest IOS. All ports of the router have been closed and ACL have been set very conservatively for efficient packet filtering.

The firewall runs on a specially prepared Unix-based system, stripped of all functions that are not needed for its operations. There are no open ports or running services on the firewall.

An IDS (Intrusion Detection System) is co-located at the perimeter in order to detect hostile actions such as port scanning and probes.

All hosts run a FIC (File Integrity Checker), thus making sure file system integrity is not compromised.

(2) Cryptography

The SPGS system relies on various algorithms for its cryptographic functions. Communication with merchants' SSL server supports SSL2 and SSL3 protocols, with both ITAR-approved 40-bits and 128-bits as well as most popular symmetric algorithms.

(a) Remote Monitoring console supports a variety of cryptographic hashes and protocols, including DES, 3DES, BlowFish, TwoFish, MD5, SHA1, RIPEMD-160, Kerberos IV and V, RSA authentication.

(b) Digital Signatures are created using a combination of DES and MD5. The Digital Signature is part of the ISO-8583 encrypted message.

(c) The ISO-8583 messages exchanged between the SPGS and the bank's host system is encrypted with TripleDES with a 168-bits private key.

The handshake methods and dialogue protocols ensure the authentication, authorization, verification and identification issues as follows:

(a) Any message not coming from an authorized payment processor (IP and port) will be ignored and an alarm will be raised.

(b) Any message that does not match the expected message format (clear text header, encrypted payload, message length) will be ignored and an alarm will be raised.

(c) Any message that is not authenticated by verifying its digital signature will be ignored and an alarm will be raised.

(d) Any authenticated message that cannot be decrypted due to a cryptographic error will be ignored and alarm will be raised.

(e) All messages must be coherent with the ISO-8583 standard, including proper sequencing of terminal sequence numbers.

(3) Transaction Filtering

In order to limit fraud issues and detect deceptive attempts, the SPGS implement the following fraud management mechanisms:

(a) All communications between SPGS and merchants using SSL cryptography, and access control is performed by http_referrer. Merchants that require proprietary shopping carts can use the

cryptographic libraries, as well as our socket client/server mechanisms based on 3DES.

(b) Consumer's email is checked against a list of anonymous e-mail providers and will not allow processing if using a black listed e-mail.

(c) Before the transaction is sent to the bank, the SPGS checks for merchants' thresholds and voids the transaction if exceeded.

(d) The SPGS logs all relevant details about the consumer, including their remote IP address. This can be used for investigation purposes.

3.5 Security and Controls

One of the most important considerations in system development and on-going operation is the system security. The proposed system being the web-based system in which the transactions are conducted over the Internet, we must assure our patrons that they can safety and securely use their credit card to make the room reservation.

Internet payment schemes generally fall into broad range of categories. The secure credit card transactions are what the proposed system is going to be used. Here the focus is on securely interfacing with the existing credit card network. Security is provided by encrypting the credit card number. This type of system raises important issues. An encrypted credit card number is not itself a digitally signed medium of exchange, and hence does not qualify as bona fide digital cash. However, it does highlight a principal concern of all digital cash systems. A customer must be identified or authenticated in some sense before the encryption on the card number becomes a signature. True, the encrypted number cannot be read en route by an eavesdropper. Nevertheless, just as anyone can place a fraudulent order over the telephone, so can anyone who knows a card number send it encrypted over a network.

For the real-time authentication of transaction and validating the credit card number to bank, the system must operate in conjunction with the local bank. Krung Thai Bank Public Company is the party who handles the authenticate processing.

The security and privacy of all card details are maintained by the high levels of encryption, and the transactions authorized within seconds. All transactions are cleared through to the acquiring bank and sent to the issuing bank in real time basis. The credit cards accepted at the present time are Visa, Master Card and KTB.

However, the acquiring bank does not carry out the transaction directly with the merchant web server but there is the third party; Siam Relay Limited Company, a provider of payment gateway of the proposed system which enables the merchant web server to accept credit card orders using real-time verification and handles the transaction for then and transfers the parameter accepted to the bank through SSL session.

The payment gateway system is like an encrypted channel that passes the transaction information securely from the customers' computer to the financial institutions to receive authorization and approval. Once the transaction is complete, the information is sent back through the payment gateway to complete the order and resorts will be provided with the verification.

To the customers this process is very straightforward and to them is seems they are directly ordering from the merchant. In return, the bank and the third party charge 4% of commission fee on their efforts.

Any authorized transactions going through the merchant account while the merchant is in "live" mode will be sent to a real bank for authorization and will be charged appropriately.

The Security Payment Gateway System (SPGS) Processing

SPGS is a real-time transaction processing system that functions as a payment service using a secure transaction server on the Internet.

Merchants with a valid merchant account can use the payment gateway to submit, authorize, capture, and settle credit transactions without the need for a separate transaction terminal or processing software.

The SPGS obtains credits card authorization for merchants directly from the bank's credit card processing system. The SPGS transaction servers use a secure communication link to provide authorizations in less than 5 seconds per transaction. Once a transaction is successfully authorized, the merchant's web site is immediately notified of the successful authorization and can respond accordingly.

Authorization declines cause the system to refuse acceptance of the payment and will prompt the customer for a different payment method in order to proceed.

An Internet merchant account with Krung Thai Bank is required to accept credit cards using the SPGS. An Internet merchant account is a special account with the bank, which is a member of the Visa and MasterCard associations. KTB has been certified by Visa and MasterCard associations and can provide the resorts as the merchant, with all of the services related to the merchant account. Once the resorts merchant account is setup and "live" on the credit card system, the resorts can accept credit card payments from customers over the Internet. An overview of the transactions are as follows:

(1) A customer browses the resorts website and checks the room availability.

(2) The customer makes the reservation and views his/her selections and proceeds to the check-out page on the website.

(3) The checkout page is on a secure server where the customer enters the credit card details for payment.

(4) The SPGS processes the electronic request through the gateway for "authorization to capture funds" from the cardholder's credit card account in the amount of the purchase.

(5) The authorization system immediately receives the request and determines if the cardholder's account is valid and if the funds are available.

(6) The gateway immediately returns the result of the transaction (approved or rejected) to the customer through the resorts web server.

(7) The credit card will be charged to the customer at full amount at this time, unless stated in the cancellation and no show policy, otherwise the refunds will be refunded to the customer on regular or fund transfer.

(8) The funds associated with the transaction are deposited electronically into resorts business bank account within 24 hours. The commission a resorts pays to their merchant account provider is deducted from the deposit it is transferred to resorts bank account, resulting in a "net deposit" of funds.

3.6 Cost and Benefit Analysis

3.6.1 Cost / Benefit Analysis

Cost falls into two categories which are developing costs and operating costs. The cost associated with developing the system are estimated form the outset of a project and should be refined at the end of each phase of the project. Usually one-time costs will not recur after the project has been completed.

The operating costs can only be estimated once specific computer-based solutions have been defined during selection phase or later. They are recur throughout the lifetime of the system.

Benefits normally increase profits or decrease costs, both highly desirable characteristics of a new information system. To as great a degree as possible, benefits should be quantified in currency unit.

Benefits are classified as tangible or intangible. Tangible benefits are those that can be easily quantified and usually are measured in term of monthly or annual saving or of profit to the firm. While intangible benefits are those benefits believed to be difficult or impossible to quantify.

(1) Tangible Benefit

(a) Saving on additional personnel not need.

(b) Saving on paper work documents.

(c) Reducing on human error.

(d) Increasing room sales.

(e) Saving on the local and long distance telephone call.

(f) Total cost saving

(2) Intangible Benefit

(a) Improving customer relation and service.

(b) Improving employee moral.

(c) Better planning information.

(d) High level of security of data.

(e) Increasing data accuracy.

(f) Expanding the worker capability.

(g) Eliminating the duplication of works.

(h) Reducing of many manual operations.

(i) Better managerial control of organization.

3.6.2 Payback Period Analysis

The payback analysis technique is a simple and popular method for determining if and when an investment will pay for itself, because systems development costs incurred long before benefits begin to accrue, it will take some time for the benefits to overtake the costs. After implementation, the additional operating expenses should be recovered. Payback analysis determines how much time will lapse before accrued benefits overtake accrued and continuing costs. This period of time is called the "payback period". However, in the actual situation, we use "discounted payback period" to analyze and compare the systems. Discounted payback period is based on the fact that the value of money we earn today is more valuable than the value of money we earn a year from now. Having the money today, we can invest it in a saving account. At the end of a year, the money will have gained interest. This concept is called the present value of money.

We need to adjust the costs and benefits for the time value of money. The present value of a baht in a year depends on something typically called a "discount rate". The discount rate is a percentage similar to interest rates that we earn on our saving account.

Table 3.5. Payback Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
Existing System:					
Labor and operating cost	1,476,000.00	1,623,600.00	1,785,960.00	1,964,556.00	2,161,011.60
Discount factors for 10 %	1.000	0.909	0.826	0.751	0.683
Time-adjusted cost (adjusted to present value)	1,476,000.00	1,475,852.40	1,475,202.96	1,475,381.55	1,475,970.92
Cumulative time-adjusted costs over lifetime of the existing system	1,476,000.00	2,951,852.40	4,427,055.36	5,902,436.91	7,378,407.83
Proposed System:					
Development cost	352,290.00	-	-	-	-
Operation & maintenance cost	1,260,000.00	1,120,900.00	1,220,485.00	1,329,603.25	1,449,186.81
Discount factors for 10 %	1.000	0.909	0.826	0.751	0.683
Time-adjusted cost (adjusted to present value)	1,612,290.00	1,018,898.10	1,008,120.61	998,532.04	989,794.59
Cumulative time-adjusted costs over lifetime of the proposed system	1,612,290.00	2,631,188.10	3,639,308.71	4,631,840.75	5,627,635.34
Cumulative time-adjusted costs over lifetime of the existing system cost – the proposed system	-581,290.00	-358,664.30	-111,746.65	164,596.16	330,772.49

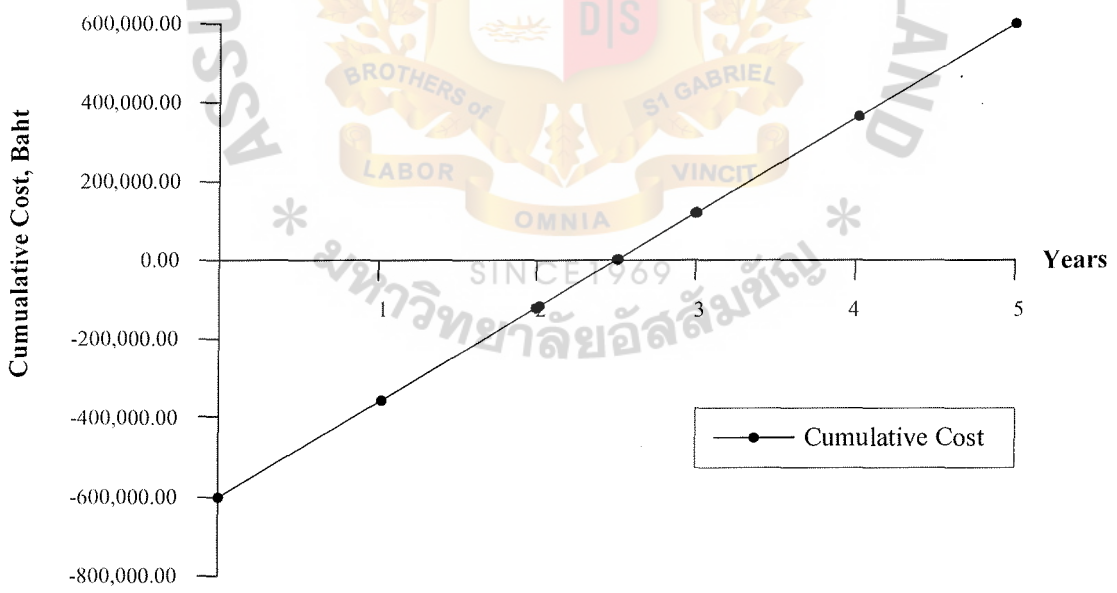

Figure 3.4. Payback Analysis.

3.6.3 Break-even Analysis

Break-even point is the simplest form of cost comparison. We use this method when the costs of the proposed new system intersect the costs of the old system. At this point of intersection, the proposed new system begins to generate a positive monetary return in comparison with the old system. From now on, the amount invested in the new system will be offset by the saving the new system allows.

The first year costs of the proposed system will be considerable because of the hardware and software installation. In the second year and in later years, the cost will decrease slightly and continuously.

The promotion rate for staff rises approximately 10% per year and the inflation rate and annual operation cost of the existing system will increase around 10% per year. The result, as Table 3.4 shows, is that the cost of the proposed system will he higher than the existing system's cost in the first year, the cost of the proposed system will be less and less than the existing system.

Table 3.6. Manual System Cost Analysis, Baht.

Cost items		Years				
		1	2	3	4	5
Fixed Cost						
Workstation PC	1 unit @ 30,000	30,000.00	–	–	–	–
Calculator	7 units @ 2,000	14,000.00	–	–	–	–
Total Fixed Cost (Baht)		44,000.00	–	–	–	–
Operating Cost						
Salary Cost:						
(increase 10% per year)		50,000.00	55,0000.00	60,500.00	66,550.00	73,205.50
Front Desk Manager	1 person @ 50,000					
Staff':						
Reception clerk	2 persons @ 9,000	18,000.00	19,800.00	21,780.00	23,958.00	26, 353.80
Reservation staff	3 persons @ 10,000	30,000.00	33,000.00	36,300.00	39,930.00	43,923.00
Administrator staff	1 person @ 7,000	7,000.00	7,700.00	8,480.00	9,317.00	10,248.70
Total salary Cost (Baht)		105,000.00	115,500.00	127,050.00	139,755.00	153,730.50
Total Annual Salary Cost (Baht)		1,260,000.00	1,386,000.00	1,524,600.00	1,677,060.00	1,844,766.80
Office Supplies & Miscellaneous Cost:						
Stationary	Per Annual	3,000.00	3,300.00	3,630.00	3,993.00	4,392.30
Paper	Per Annual	9,000.00	9,900.00	10,890.00	11,979.00	13,176.90
Utility	Per Annual	8,000.00	8,800.00	9,680.00	10,648.00	11,712.80
Miscellaneous	Per Annual	2,000.00	2,200.00	2,420.00	2,662.00	2,928.20
Total Annual Office Supplies & Miscellaneous Cost		22,000.00	24,200.00	26,620.00	29,282.00	32,210.20
Total Annual Operating Cost (Baht)		264,000.00	290,400.00	319,440.00	351,384.00	386,522.40
Total Manual System Cost (Baht)		1,524,000.00	1,676,400.00	1,844,040.00	2,028,444.00	2,231,288.40

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

Year	Accumulated Manual Cost (Baht)	Accumulated Computerized Cost (Baht)
1	1,524,000.00	1,524,000.00
2	1,676,400.00	3,200,400.00
3	1,844,040.00	5,044,440.00
4	2,028,444.00	7,072,884.00
5	2,231,288.40	9,304,172.40
Total	9,304,172.40	-

Table 3.8. Computerized System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
Fixed Cost					
Hardware Cost:	90,000.00	90,000.00	90,000.00	90,000.00	90,000.00
Client PC Cost	90,000.00	90,000.00	90,000.00	90,000.00	90,000.00
Total Hardware Cost	5,000.00	7,000.00	9,000.00	12,000.00	10,000.00
Maintenance Cost					
Software Cost:					
Total Software Cost	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00
Implementation Cost:					
Payment Gateway Initial Fee	10,000.00	–	–	–	–
Web Hosting Set up Fee	1,000.00	–	–	–	–
Training Cost	40,000.00	–	–	–	–
System Designer 1 person @ 25,000 for 3 months	75,000.00	–	–	–	–
Database Programmer 1 person @ 20,000 for 2 months	20,000.00	–	–	–	–
Graphic Designer 1 person @ 19,000 for 1 month	19,000.00	–	–	–	–
Content Coordinator 1 person @ 20,000 for 3 months	60,000.00	–	–	–	–
Total Implementation Cost	225,000.00	–	–	–	–
Office Equipment Cost:					
Printer 1 Unit @ 9,200	9,200.00	–	–	–	–
Total Office Equipment Cost	9,200.00	–	–	–	–
Total Fixed Cost	336,200.00	102,000.00	102,000.00	114,000.00	112,000.00
Office Equipment Cost:					
Printer 1 Unit @ 9,200	9,200.00	–	–	–	–
Total Office Equipment Cost	9,200.00	–	–	–	–
Total Fixed Cost	336,200.00	102,000.00	102,000.00	114,000.00	112,000.00

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

Cost items		Years				
		1	2	3	4	5
Operating Cost:						
People-Ware Cost:						
Project Manager	1 person @ 50,000	50,000.00	55,000.00	60,500.00	66,550.00	73,205.00
Staff:						
Web Developer	1 person @ 15,000	15,000.00	16,500.00	18,150.00	19,965.00	21,961.50
System Administrator	1 person @ 10,000	10,000.00	11,000.00	12,100.00	13,310.00	14,641.00
Total Monthly Salary Cost		75,000.00	85,500.00	90,750.00	99,825.00	109,807.50
Total Annual Salary Cost		900,000.00	990,000.00	1,089,000.00	1,197,900.00	1,317,690.00
Office Supplies & Miscellaneous Cost:						
Stationary	1,500 per month	1,500.00	1,575.00	1,653.75	1,736.44	1,823.26
Paper	5,700 per month	3,000.00	3,150.00	3,307.50	3,472.88	3,646.52
Utility	5,000 per month	3,000.00	3,150.00	3,465.00	3,811.50	4,192.65
Web hosting	560 per month	560.00	588.00	646.80	711.48	782.63
Miscellaneous	3,000 per month	3,000.00	3,150.00	3,307.50	3,472.88	3,646.52
Annual Office Supplies & Miscellaneous Cost		126,000.00	132,300.00	140,805.00	149,924.25	159,707.36
Total Operating Cost		1,026,000.00	1,122,300.00	1,229,805.00	1,347,824.25	1,477,397.36
Total Computerized System Cost		1,362,200.00	1,224,300.00	1,331,805.00	1,461,824.25	1,589,397.36

Table 3.9. Five Years Accumulated Computerized Cost, Baht.

Year	Total Computerized Cost (Baht)	Accumulated Cost (Baht)
1	1,362,200.00	1,362,200.00
2	1,224,300.00	2,586,500.00
3	1,331,805.00	3,918,305.00
4	1,461,824.25	5,380,129.25
5	1,589,397.39	6,969,526.64
Total	6,969,526.64	-

Table 3.10. Cost Computerized between Manual System and Proposed System, Baht.

Year	Accumulated Manual Cost (Baht)	Accumulated Computerized Cost (Baht)
1	1,224,000.00	1,362,200.00
2	2,900,400.00	2,586,500.00
3	4,744,440.00	3,918,305.00
4	6,772,884.00	5,380,129.25
5	9,004,172.40	6,969,526.64

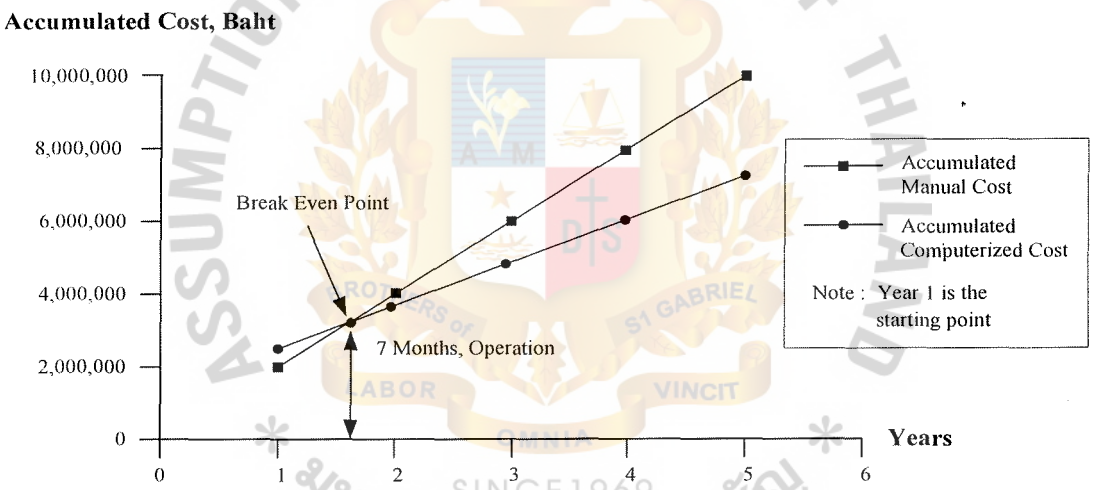

Figure 3.5. Break Even Point Analysis.

The break even point is defines as the point where sales or revenue equal expenses. There is no profit made or loss incurred at the break even point. This figure is important for anyone that manages a business since the break even point is the lower limit of profit when setting prices and determining margins.

In the Figure 3.5 shows that after 1 year and 7 months operation, the proposed system will reach the break even point, where sales or revenue equal to cost of building the system.

IV. PROJECT IMPLEMENTATION

4.1 Databases and Coding

(1) Database

MySQL is a database management system, which is a database, is a structured collection of data. It may be anything from a simple shopping list to a picture gallery or the vast amounts of information in a corporate network.

To add, access, and process data stored in a computer database, we need a database management system such as MySQL. Sine computers are very good at handling large amounts of data, database management plays a central role in computing, as stand-alone utilities, or as parts of other applications.

MySQL is a relational database management system, which stores data, separates tables rather than putting all the data in one big storeroom. This adds speed and flexibility. The tables are linked by defined relations making it possible to combine data from several tables on request. The SQL part of MySQL stands for "Structured Query Language" – the most common standardized language used to access databases.

MySQL is very fast, reliable, and easy to use. MySQL also has a very practical set of features developed in very close cooperation with our users. MySQL was originally developed to handle very large databases much faster than existing solutions and has been successfully used in highly demanding production environments for several years.

(2) Coding

PHP is selected to use in programming tasks. PHP is a server-side, cross-platform; HTML embedded scripting language, which doesn't cost anything. PHP-enabled web pages are treated just like regular HTML pages and can create and edit them the same way as we normally create regular HTML pages.

PHP is a server-side scripting language that can be used on a host of web servers and platforms. We prefer to use it with Apache on either FreeBSD or Linux, but it can even run on Win32 platforms.

What server-side scripting language means is that the script is put into the HTML files that make up a site, but the server processes the script before sending it to the client browser. PHP code is not visible if we view the source of a page because the server processes the code and returns only the output. This is easier to code and debug than writing CGI scripts in Perl or C since the HTML form and related code are all in one page and PHP puts any errors on the browser.

Another advantage that PHP offers is the ability to directly connect to relational databases using full-featured internal functions. It supports a whole fleet of database including Oracle, DB2, and MySQL.

(3) Other

(a) PHP MyAdmin

PHP MyAdmin is intended to handle the administration of MySQL over the web. Currently it can create and drop databases, create, copy, drop and alter tables, delete, edit and add fields, execute any SQL-statement, even batch-queries manage keys on fields, load text files into tables, create and read

dumps of tables, export data to CSV values, and administer multiple servers and single databases.

(b) HTML–KIT

HTML-Kit is a full-featured text editor designed to help HTML, XML and script authors to edit, format, lookup help, validate, preview and publish web pages. New comers to HTML coding can benefit from letting it point out errors and suggest improvements. Experts can save time spent on common tasks using the customizable and extendible editor while maintaining full control over the code.

4.2 Installation and Conversions

After the web interface design of reservation system is completed, the following steps need to be done to process credit card purchase for secure real-time credit card transaction over the Internet.

The resorts will develop their own checkout page (this is where the customer must input details – name, email address, credit card number etc. – as per the information below). The web server must support Secure Socket Layer (SSL) in order to protect the privacy of the customer data

When a customer finishes the input and submits the order, the merchant form will call a script located at the SPGS server. The checkout page of the proposed system is preferably hosted on secure to ensure consumer protection and eliminate possible fraudulent behavior. The sample scripts in Perl. ASP and ColdFusion are in Appendix H. The scripts outline integration of a merchant's shopping cart/check-out page and SPGS. The Perl scripts are fully commented and clearly show what is needed for a successful integration.

4.2.1 Technical Specifications

(1) Fields supplied to SPGS

To invoke a transaction, the merchant must submit necessary customer and transaction information to SPGS. The resorts checkout page must provide the following fields to SPGS via HTTP POST method over a SSL connection:

Table 4.1. Fields Supplied to SPGS.

Field Name	Option	Format	Usage	Example
customerName	Mandatory	Length:64 Allowed: [A-Za-z0-9.,/-‘]+space	Customers full name	John Anderson
customerEmail	Mandatory	Length:80 Allowed: [A-Za-z@.-_.]	Customer Email address	John.andersson@company.com
Customer Address	Mandatory	Length:80 Allowed: [A-Za-z0-9-‘/,()#.]+space	Customer Address line 1	1 Apple Street
CustomerZIP	Mandatory	Length:10 Allowed: [A-Za-z0-9-,]+space	Customer ZIP code	12345
City	Mandatory	Length:64 Allowed: [A-Za-z0-9-,]+space	Customer city	Some city
CcNumber	Mandatory	Length:16 Allowed:[0-9]	Customer Credit Card Number	1234876536546743
CcType	Mandatory	Allowed: [visa, ktbcard]	Credit card type	Visa

Table 4.1. Fields Supplied to SPGS (Continued).

Field Name	Option	Format	Usage	Example
CcExpiry	Mandatory	Length:2 Allowed:[0-9]	Credit card expiry month	01
CcExpiry Year	Mandatory	Length:2 Allowed:[0-9]	Credit card expiry year	01
Amount	Mandatory	Length:16 Allowed:[0-9.]	Amount to be charged	999900 or 9999.00
OrderID	Mandatory	Length: 32	Merchant order ID	AAA111333

Additional Fields Information

(a) ccNumber – Credit Card Number

Credit card numbers must be valid credit card numbers. SPGS uses all known methods for determining if a credit card number is valid.

(b) ccType – Credit Card Type

Credit card type can currently only have one of the following values:

(1) visa – VISA Credit cards.

(2) mastercard – MasterCard Credit cards.

(3) ktbcard – Krung Thai Credit cards.

(c) amount – Amount to be charged

The amount can be submitted in two formats:

(1) "Short" format where the amount is rounded, e.g. '1200', where 1,200 Baht will be charged.

(2) "Long" format where fractions of Baht can be charged, e.g. 9999.00, where 9,999.00 Baht will be charged.

(2) Fields returned from SPGS

When a transaction has been invoked, SPGS will return the result to the merchant and to the customer. The results are presented via a standard web page to the user, the merchant receives the results via four CGI scripts located on the merchants server. The following fields are returned to the merchant:

Table 4.2. Fields Returned from SPGS.

Field Name	Usage	Example
InvoiceID	InvoiceID as issued by bank	314971
AuthNum	Authorization Number as issued by bank	929127
CustomerName	Customers full name	John Andersson
CustomerEmail	Customer Email address	joe@company.com
CustomerAddress	Customer address line 1	1 Apple Street
CustomerZIP	Customer ZIP code	12345
City	Customer city	Somecity
Country	Customer Country	Somecountry
Phone	Customer phone number	001554447778888
CcType	Credit Card type (visa or ktbcard)	Visa
Amount	Amount to be charged	999900 or 9999.00
OrderID	Merchant order ID	AAA111333
Message	Result message	See below
Response	Response given by bank	See below
MerchantID	As issued by bnak	000001805300015

Additional Fields Information

(a) invoiceID – invoice identification number

This number is used to uniquely identify the transaction. This number is issued for all transactions.

(b) authNum – authorization number

This is the authorization code that is issued for all authorized transactions.

(c) orderID – order identification number

If orderID is not submitted, this field will be set to the same as invoiceID.

(d) response and message

The possible responses and messages are as follow:

Table 4.3. Bank Authorization Responses.

Response	Message
00	Transaction authorized.
11	Transaction rejected: Wrong PIN.
12	Transaction rejected: Your card has problem because the maximum number of PIN attempts has been exceeded using another device. Please contact your Bank for mode details. We apologized for any inconvenience. For Krung Thai Bank Card, please contact Customer Service.
20	Transaction rejected: your card has expired. Please contact your Bank for more details. For Krung Thai Bank card, please contact Customer-Service.
21	Transaction rejected: There is a problem with your card, please contact your Bank for more details. For Krung Thai Bank Card, please contact Customer-Service.
31	Transaction rejected: You have exceeded your usage limit for the current day. The limit is usually reset everyday. Please visit us again later. Please contact your Bank for more details. For Krung Thai Bank Card, please contact Customer-Service.

Table 4.3. Bank Authorization Responses(Continued).

Response	Message
41	Transaction rejected: Either your account does not have sufficient funds or there is some other problem with your account. Please contact your Bank for more details. For Krung Thai Bank Card, please contact Customer-Service.
51	Transaction rejected: There is a temporary problem with this shop. Please, try another shop or visit us again later. Please contact mall owner.
91	Transaction rejected: There is a problem with the bank authorization system. Please visit us again later. Contact or E-mail to mall owner.
92	Transaction rejected: Bank system is temporarily unavailable. Please try again later. Contact or E-Mail to mall owner.
93	Transaction rejected: Bank system cannot verify your message. Please visit us again later. Contact or E-Mail to mall owner.
99	Communication error: Transaction canceled.
100	Your order has been queued. Thank you for shopping with us.
200	Your order has been queued. Thank you for shopping with us.

Table 4.4. SPGS Other Responses.

Response	Message
A0	Transaction denied: You have submitted an invalid or incorrect credit card number.
A1	Transaction denied: Invalid characters in the Name field. Valid characters are [A-Z][a-z][0-9][-'.] and spaces.
A2	Transaction denied: Invalid Email address format. Please use [first.last@department.company.suffix] like john.doe@sales.acme.com
A3	Transaction denied: Invalid Address format. Please use only [A-Za-z0-9][-',./()#].
A4	Transaction denied: Invalid Address format. Please use only [A-Za-z0-9][-',./()#].
A5	Transaction denied: Invalid ZIP (Postal code) format. Please use only [A-Za-z0-9][-].

Table 4.4. SPGS Other Responses (Continued).

Response	Message
A6	Transaction denied: Invalid City format. Please use only [A-Za-z0-9][-,].
A7	Transaction denied: Invalid Country format. Please use only [A-Za-z0-9][-,/'].
A8	Transaction denied: Invalid Phone number format. Please use only [0-9][+-].
A9	Transaction denied: Invalid Amount format. Use only formats 1000 or 1000.00
AA	Transaction denied: Invalid Expiry date.
B5	Transaction denied: The merchant does not allow free Email addresses: Please provide an address with an ISP or registered organization.
B6	Transaction denied: You have recently submitted an almost identical order. If this is a new order please wait one minute and resend the order.
B8	Transaction denied: We can not verify that payment is submitted from an authorized merchant. [Hint: Merchant error or your browser is hiding-your identity]
B9	Transaction denied: For your protection a secure SSL connection is required. Please contact merchant.

There are four possible groups of responses, which will be returned to the merchant via HTTP POST method over a SSL connection as indicated below. Merchant needs to provide Siam Relay with URL to the pages that will be called for each of these responses.

(1) Transaction Authorized

(2) Transaction Rejected

(3) Transaction Queued

(4) Error

The four groups can be defined as:

(1) Transaction Authorized – The transaction has been authorized, and customer has been charged.

(2) Transaction Rejected – The transaction has been rejected, and no charges have been made.

(3) Transaction Queued – The transaction could not be performed, and has been queued. The transaction will be repeatedly retried, until is expires. Both merchant and customer will be notified via email when the transaction is completed.

(4) Error – An unspecified error has occurred, and Siam Relay was not able to provide more information. Customer should come back later and try to submit the order again.

Other Requirements

Before processing with the payment gateway can begin, a merchant needs to provide the payment gateway acquirer with the following details:

(1) Merchant ID

(2) Terminal ID

(3) Merchant name

(4) Merchant URL

(5) Merchant email address

(6) Queuing timeout

4.3 Test Plan

The module testing method is adopted for the system software development. This testing allows the system developers to test the system module be module to ensure the system performs properly and meets its requirements; special cases of testing are validation, verification, and certification. Besides, the programming and testing can be carried out in parallel and thus, reduce time consuming.

The purpose of testing is to find error, not to prove correctness. Test in this case, is to find the broken link and bug.

The two levels of testing are uniting and system testing. At first, the analyst tests the programs, making up the system. In contrast, system testing is aimed at finding any discrepancies between the system and its original objectives so failures in testing show up quickly when the system is implemented.

Testing of specific program, subsystems and total systems essential to quality assurance. Testing is done to turn up any existing problems and interface before the system is actually used. The essential activity in the system development project is conversion before the program testing.

Conversion is the task of the user's current files, forms, and database to the format required by the system. The major issues, which should be considered are:

(1) A conversion of software used to translate the current files into the format required for the new system. It sometimes turns out to be difficult to convert the data in an automated form because of different formats.

(2) A large volume of existing data will be impractical to consider converting it all at once. It needs coordination and planning to convert the data in an automated form because of different formats.

Due to the nature of the system, which is conducted online through the payment gateway, it is very important for the resorts to test the procedure for making and Internet merchant's web site live, and accept real transactions for payment processing. To test the payment page with the payment gateway, the following steps need to be taken.

When the integration and testing phase for a merchant's web site are completed, their configuration must be made "live" by Siam Relay to accept and process real transactions.

Test mode is for the merchant to test and debug their web site, credit card payment page and response pages. Any transactions made while the merchant is in test Mode will not be charged for, as the acquiring bank credit card network does not authorize the transactions.

When operating in live mode, all transactions will be processed with the acquiring bank and credit card network. All authorized transactions will be charged appropriately and will be settled unless otherwise instructed. There are no test credit card facilities available during live mode.

(1) Merchant Integration Testing

A sample payment page, authorization and response system have been set up for testing purposes and also to give merchants additional examples of a payment page and response pages. Merchants are encouraged to use these pages to test their integration with SPGS at any time. All current merchants, merchants wishing to see what is would be like to process credit cards, merchants wishing to test a new configuration before roll-out, etc. should test their changes with this system.

(a) Payment Page

The payment page is a basic HTML form which makes a HTTP POST over a SSL connection to the authorization script. The fields "amount" and "orderID" have been hidden, but can be seen in the source code. Credit card numbers are fixed for testing purposes and are the only ones that should be used for testing with SPGS.

A merchant who wisher to integrate with SPGS must have a payment page. This page must be protected be SSL and must post the required fields to SPGS authorization scripts.

(b) Authorization Script

This is the script that receives the required fields when the payment page is submitted. A merchant who wishes to test his own response script(s) can, with additional parameters posted to the authorization script, control where the responses are sent. Simply include any of the following parameters to the script, URLAUTHORIZED, URLREJECTED, URLERROR, URLQUEUED with the value of a fully qualified URL. For example, https://www.siamrelay.com/../testauth.cgi?customerName=testuser&.. &URLAUHORIZED=http://www.mysite.com/mypage/authorized.cgi

(c) Response scripts

SPGS standard sample response scripts are used by default. However, the resorts can create their own to add functionality such as database updates on web site, customized messages, etc.

(2) Completion of Testing

The website owner or the resorts should test their completed web site on the merchant web server or SPGS Secure Server, to ensure that no last-minute change need to be made. This must include full testing of the credit card payment page, and any response pages.

4.4 Implementation

To implement the new system, the related software has been designed an developed.

(1) Software development fundamentals

The designed software should have good quality such as being user friendly. The followings are the guidelines for the software development that this project follows:

(a) The software should exhibit a hierarchical organization that makes intelligent use of control among the elements of software.

(b) The software should be modular and should be logically partitioned into elements that perform specific function and sub functions.

(c) The software should contain a distinctive and separable representation of data and procedure.

(d) The software should lead to modules that exhibit independent function characteristics.

(e) The software should be modified using a repeatable method that is derived from information obtained during software requirement's analysis.

(2) Program Implementation

The implementation of program application can be divided into three phases: program coding, program testing and program maintenance.

(a) Program coding

Coding is the process of writing a set of instruction in which computer system can execute directly.

(b) Program testing

Testing is the process of executing a program with the intent of finding an error. This involves the testing of the program, a system test, and the documentation of the program.

(c) Program maintenance

Maintenance of installed program application consists of many procedures. In this project, it includes training, backup and recovery, hardware maintenance and software maintenance.

Implementing a system consists of the three primary activities of training conversion, and post implementation review.

Training the system operators includes not only instruction of how to use equipment, but also of how to diagnose malfunctions and what steps to take when they occur. Training also involves instruction is system run procedures and normal operating activities such a loading files, changing printer forms, and initiating data communication.

The conversion plan describes all the activities that must occur to implement the new system and put it into operation. It identifies the tasks and assigns the responsibilities for carrying them out. The conversion plan should also anticipate the most common problems such as missing document, incorrect data formats, lost data, and unanticipated system requirements, and provide ways for dealing with them when they occur.

After the system is implemented and the conversion is completed, a review should be conducted to determine whether the system is meets the expectations and where improvements are needed. The review not only assesses how well the current system is designed and implemented, but also a valuable source of information that can be applied to the next system project.

In fact the implementation is the final phase in which a good deal of effort is still required, including the following activities:

(1) Training

(2) Equipment conversion

(3) File conversion

(4) System conversion

(5) Auditing

(6) Evaluation

(7) Maintenance

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The study of system development project of Web-based Resorts Reservation System for Travel Agent reveals a need for a agent resorts organization to utilize a computer system. A system, which automates the reservation process, offers users a great deal of benefit, comparing to the manual system. A clear tangible benefit that a agent resorts organization will receive from using a computer system is reducing the cost of manpower. The computerized system also provides a lot of intangible benefits, in term of data accuracy, data security, efficiency and control, to the organization. Moreover, tasks, which are tedious, complex and repetitive, can be eliminated.

After the proposed system has been converted to the existing system, and place into the operation, the degree of achievements has arisen from gaining the benefit derived from the new system in comparison to the existing system as the following:

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

Process	Existing system (time spent)	Proposed system (time spent)
Room sales process	20 mins	2 mins
Customer registration process	20 mins	2 mins
Customer report process	50 mins	5 mins
Room status information process	35 mins	10 mins
Room report process	45 mins	5 mins
Reservation operation process	40 mins	5 mins
Reservation report process	45 mins	10 mins
Room cancellation process	30 mins	15 mins
Check in process	15 mins	2 mins
Total	5 hours	53 mins

With resorts reservation online and is available to the public, it quickly becomes apparent that some of the base services come from self-service. Prospective and current customers guests at the all resorts in my project may now check resorts room availability, place reservations, and apply charges to credit card. This service is available only to the online tentative individual reservation. The confirmation numbers can be automatically assigned and supplied in real-time, and customer receive an immediate response from the system as opposed to 3-4 days wait with the traditional phone/fax/mail system.

All the resorts in my project, keeping up with the tide of competition are only the beginning. The resort's energetic acceptance of e-business bring addition awards. By providing exposure to new customers, the resorts expects the web site to generate sale leads the contribute toward the 40% of all room sales to be conducted online. Room sales close 80% faster with the online system than via phone or fax. The reservation department runs 20% more efficiently with the online system. Intelligence built in to system helps prevent overbooking. And overall business has simply increased. The all resorts believes it is a perfect match for an industry that demands twenty-four hours service.

Besides, with the web-based interface, the resort has a potential exposure choice to offer a periodically special price package. The resort internet marketing strategy would apply to electronic media as the cutting edge solution for a virtual level of the resorts organization.

5.2 Recommendations

The system presented in this project has been designed for a resort organization in general. Some modifications maybe required in order for the system to fit user requirement of a specific organization. Well-known and popular tools are used to

develop the system. This ensures that the system tool will not be obsolescing in the near future, and can be upgraded to a newer version. The hardware suggested computer and network equipments are high-end of its range. This is because the hardware technology changes very fast the system will be able to cope with future expansion.

The reservation system here is designated to the individual online customer. Other type of guests such as group or corporate guest still needs to contact the resorts through phone or fax, the traditional communication. The recommendation to the system is to expand the reservation system to handle most types of guests.

Reservation, cancellation or amendment to the reservation detail can now be carried thought their web-based profile. Histories of transaction and payment detail are then generated and allow agency to examine by themselves.

Connecting to the real resorts database is also on important issue to be considered. The proposed reservation system does not connect to the real resorts database directly. In turn, the resorts needs to decide how many rooms to make allotment on each day. Once the authorized transaction is accepted and logged onto the resort's web database, the resorts administrator has to import these reservation transactions to the local database server, which handles all types of reservation.

Finally, the system has not been designed to assist users in almost all functions and process, still, enhancement can be added to the system to provide even greater benefits to users. The following features are the recommendation of enhancement that should be added to the systems.

(1) Interface and link to the telephone system for automatic calculation of expenses.

(2) Graphical layout of rooms in hotel for convenience in room assignment task.

(3) A customer's history module for future room sales and analysis purposes.

(4) Analysis report for canteen department.

(5) A module that fully handles organization of seminar or conference rooms.

APPENDIX A

DATA FLOW DIAGRAMS

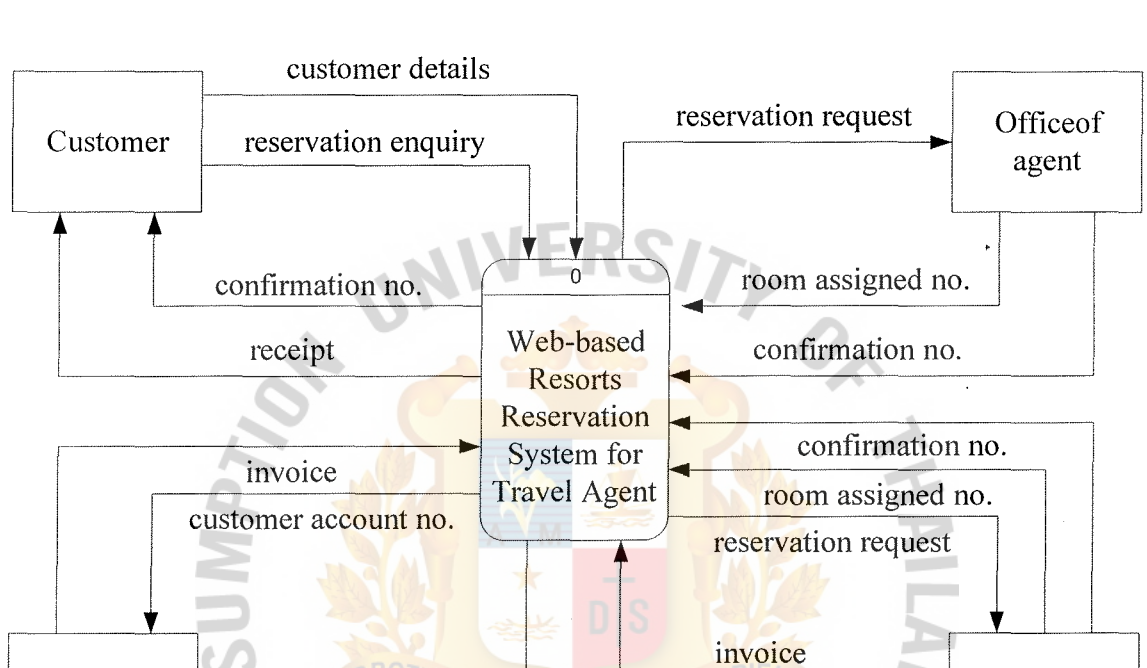

Figure A.1. Context Diagram Data Flow of Web-based Resort Reservation System for Travel Agent.

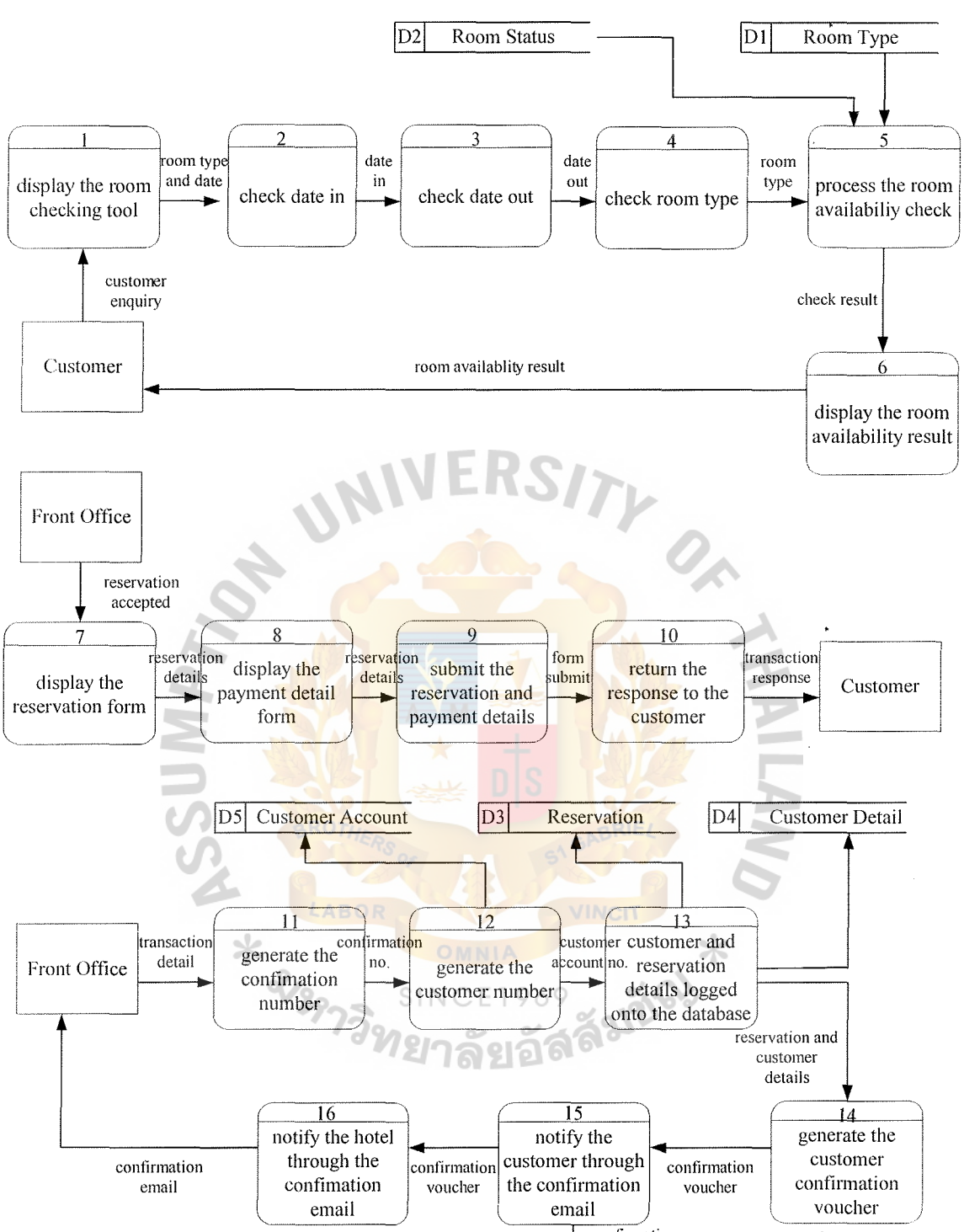

Figure A.2. Level 0 Data Flow Diagram of Web-based Resort Reservation System for Travel Agent.

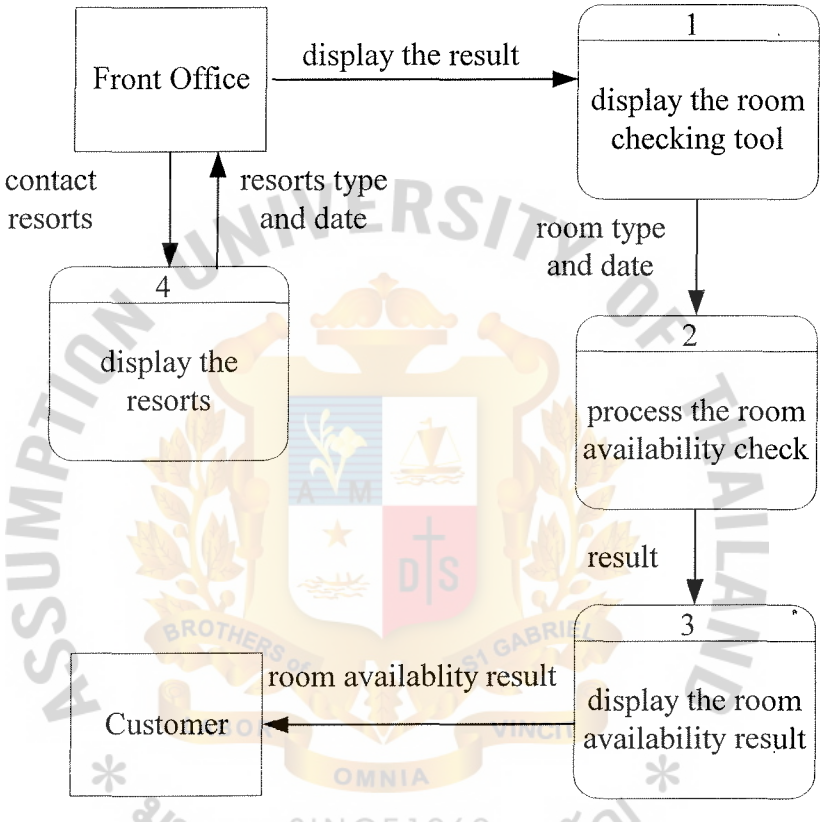

Figure A.3. Level 1 Data Flow Diagram of Web-based Resort Reservation System for Travel Agent.

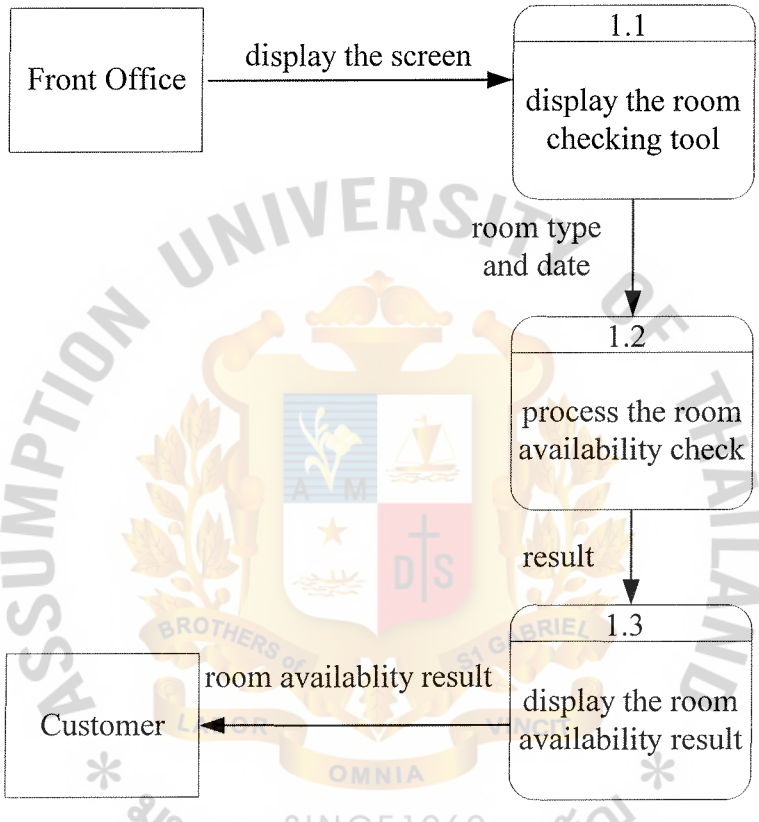

Figure A.4. Level 1.1 Data Flow Diagram of Room Availability Check Subsystem of Web-based Resort Reservation System for Travel Agent.

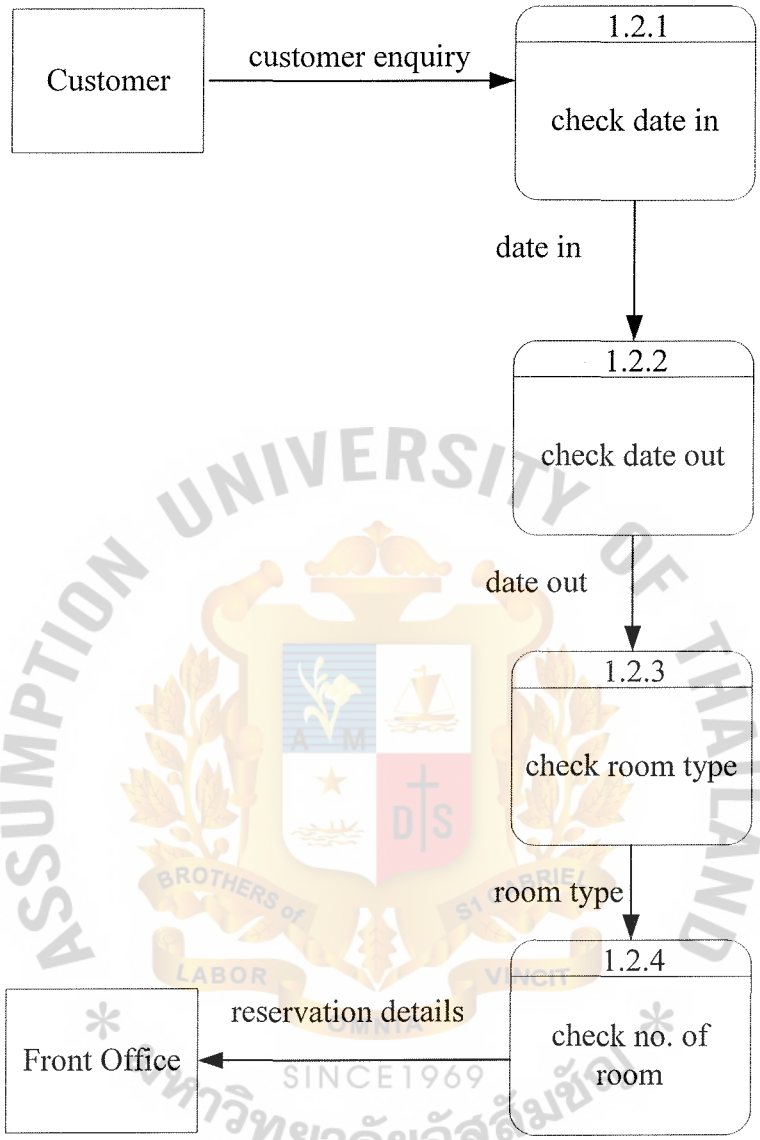

Figure A.5. Level 1.2 Data Flow Diagram of Room Availability Check Subsystem of Web-based Resort Reservation System for Travel Agent.

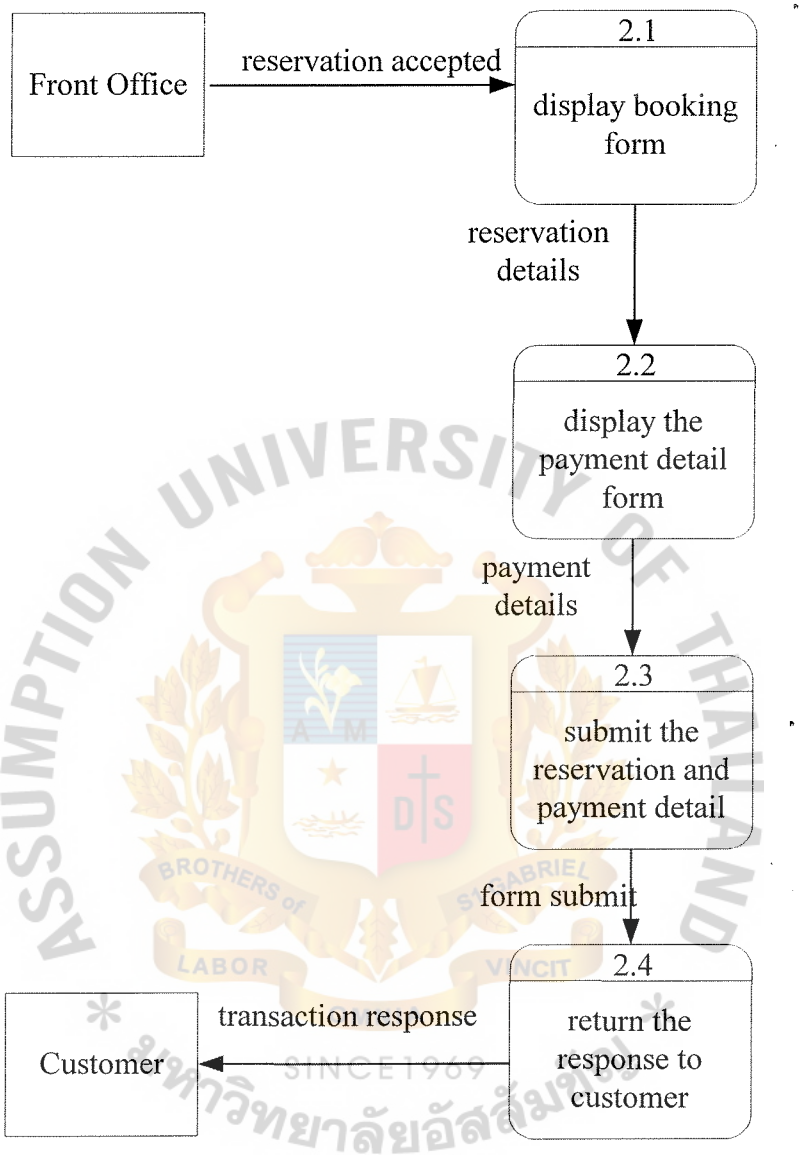

Figure A.6. Level 2 Data Flow Diagram of Web-based Resort Reservation System for Travel Agent.

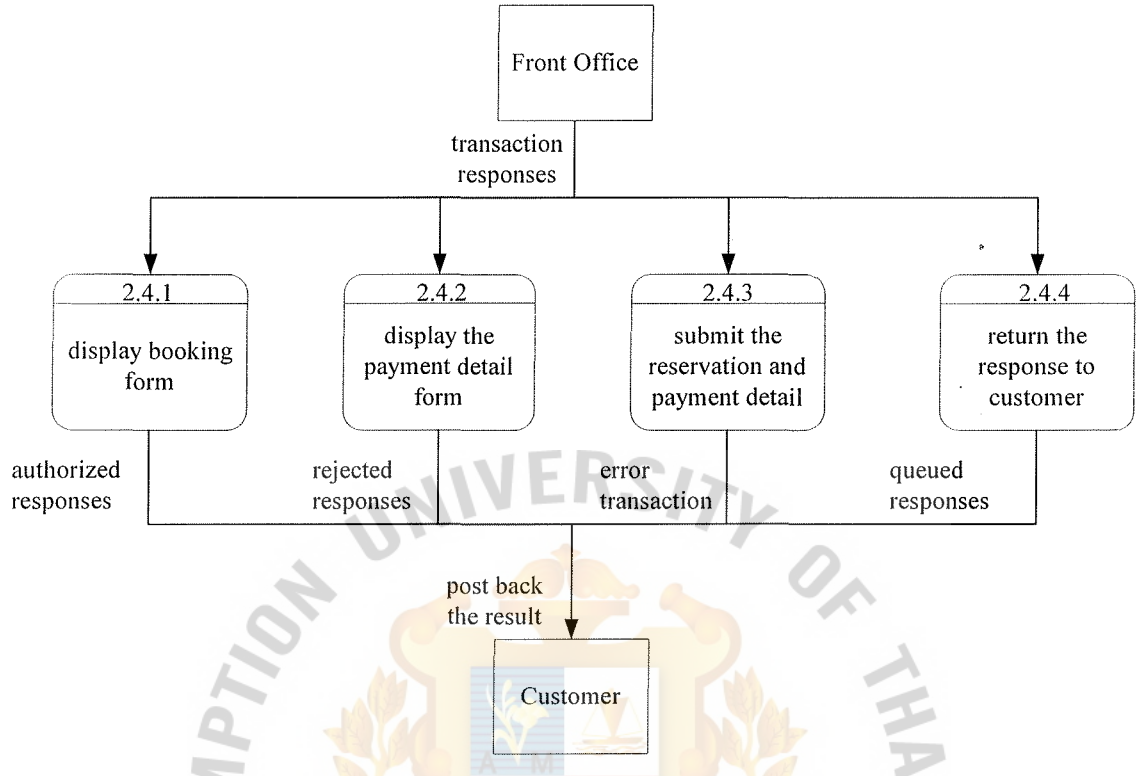

Figure A.7. Level 2.1 Data Flow Diagram of Return the Response to the Customer of Web-based Resort Reservation System for Travel Agent.

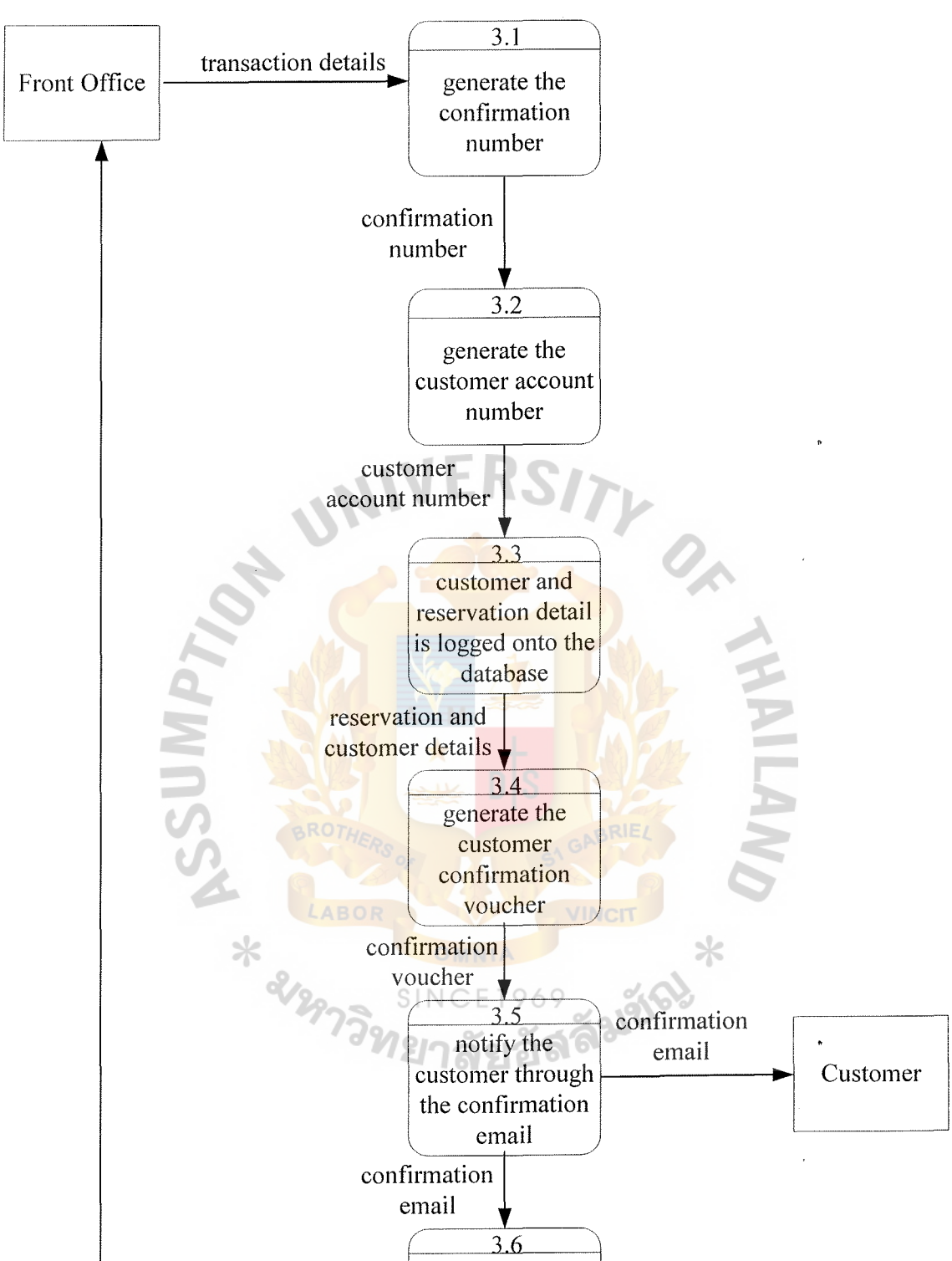

Figure A.8. Level 3 Data Flow Diagram of Authorization Transaction Subsystem of Web-based Resort Reservation System for Travel Agent.

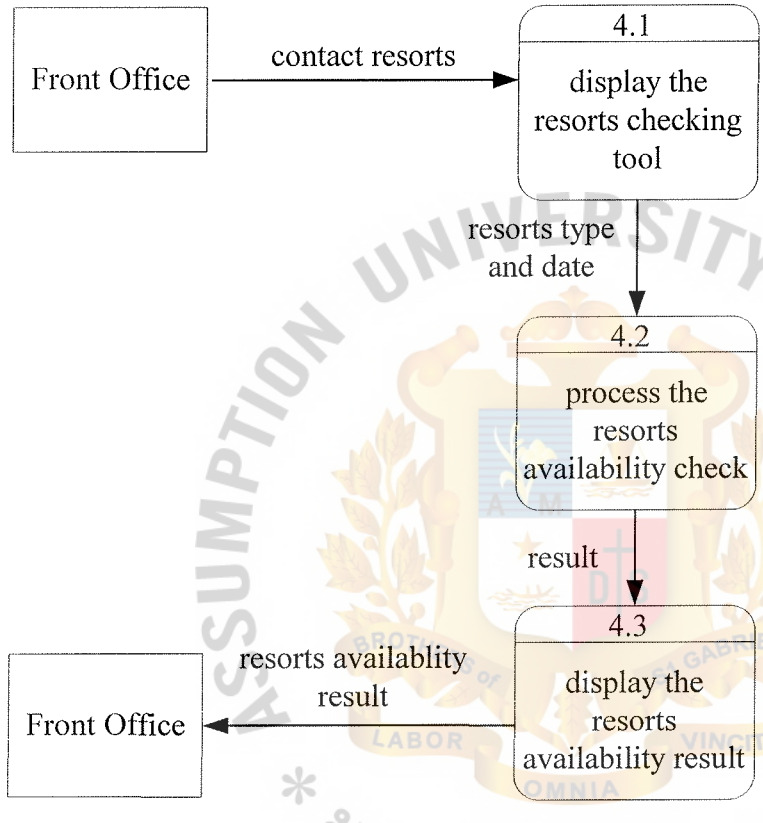

Figure A.9. Level 4 Data Flow Diagram of Authorization Transaction Subsystem of Web-based Resort Reservation System for Travel Agent.

APPENDIX B

DATA DICTIONARY

DATA DICTIONARY

Table B.1. Data Dictionary of Smile Travel Resorts Database.

Field Name	Meaning
authnum	The authorization number generated by the payment gateway
cancel_due_date	The cancellation due date with on charge
conf_no	The confirmation number
cus_acc_no	The account of customer
cus_address	The address of customer
cus_amount	The amount of reservation costs
cus_card_name	The credit card holder name of customer
cus_card_type	The credit card type of customer, such as Visa, Amex, etc
cus_city	The city name of the customer
cus_company	The company name of the customer
cus_country	The country name of the customer
cus_email	The email address of customer
cus_fax	The fax number of customer
cus_fname	The first name of customer
cus_gender	The gender of customer
cus_home_tel	The home telephone number of customer
cus_id	The identification number of customer
cus_lname	The last name of customer
cus_nation	The nationality of customer
cus_no_visit	The number of visit resorts of customer
cus_office_tel	The office telephone number of customer
cus_region	The region of customer
cus_special_req	The special request of customer, such as room location
cus_site_source	The web site at which the customer finds the resorts web site such as smail_travle_resort.com
cus_zip	The post code of the customer's address
data_check_in	The date in which customer checks in
data_check_out	The date in which customer checks out
end_date	The end date of certain season period
no_of_resv_room	The number of reserved room
resort_id	The identification number of resorts
resort_name	The name of resorts
resort_detail	The detail of resorts
resort_phone	The telephone of resorts
resort_fax	The fax of resorts
rb_date	The room block date
resv_date	The data at with the certain reservation transaction takes place
room_building	The building at which the certain room is located
room_floor	The floor at which the certain is located
room_loction	The location of the certain room, such as pool view, balcony view, etc
room_no	The unique identification of room

Table B.1. Data Dictionary of Smile Travel Resorts Database (Continued).

Field Name	Meaning
room_rate	The room rate which vary according to the type of room and season code
resv_comment	The reservation comment of particular transaction
rb_comment	The comment of particular room block event
status_start	The data at with the status of particular room has started
status_end	The data at with the status of particular room has ended
status_comment	The remark or comment of status application
season_code	The code of season
season_desc	The description of season
start_date	The start date of certain season period
status_code	The status code of certain room, such as VR, VO, etc
status_name	The status name of certain room, such as Vacent&Ready
type_code	The type code of room, such as SSS, SST, RY1, DD, etc
type_desc	The type description of room ,such as living room
type_name	The type name of room, such as Super Special Single, Royal Suit, President Suit, Double Deluxe, etc

APPENDIX C

PROCESS SPECIFICATION

PROCESS SPECIFICATION

Table C.1. Process Specification of Process 1.1.

Items	Descriptions
Process Name:	Display Room Availability Check Engine
Data In:	Room Type & Date Request
Data Out:	Room Type & Date
Process:	(1) Display the room availability check form with the date of check in, date of check out, type of room and number of reserve room
Attachment:	(1) Customer

Table C.2. Process Specification of Process 1.2.

Items	Descriptions
Process Name:	Display Room Availability Check Request
Data In:	Reservation Inquiry
Data Out:	Room Availability Check Result
Process:	(1) Receive the reservation request from the customer (2) Check the reservation request onto the resorts database
Attachment:	(1) Customer (2) Data Store D1 (3) Data Store D2

Table C.3. Process Specification of Process 1.2.1.

Items	Descriptions
Process Name:	Check Date of Check In
Data In:	Check In Date Request
Data Out:	Availability Check In Date
Process:	(1) Receive the request date of check in form customer
Attachment:	(1) Customer

Table C.4. Process Specification of Process 1.2.2.

Items	Descriptions
Process Name:	Check Date of Check Out
Data In:	Check Out Date Request
Data Out:	Availability Check Out Date
Process:	(1) Receive the request date of check out form customer
Attachment:	(1) Customer

Table C.5. Process Specification of Process 1.2.3.

Items	Descriptions
Process Name:	Check Type of Room
Data In:	Type of Room Request
Data Out:	Availability Room Type
Process:	(1) Receive the request room type
Attachment:	(1) Customer

Table C.6. Process Specification of Process 1.2.4.

Items	Descriptions
Process Name:	Check Number of Room
Data In:	Number of Room Request
Data Out:	Number of Room Available
Process:	(1) Receive the request number of room
Attachment:	(1) Customer

Table C.7. Process Specification of Process 1.3.

Items	Descriptions
Process Name:	Display Room Availability Result
Data In:	Room Availability Check Result
Data Out:	Room Status Result
Process:	(1) Receive the room availability result from the system (2) Return the result to the customer
Attachment:	(1) Customer

Table C.8. Process Specification of Process 2.1

Items	Descriptions
Process Name:	Display Reservation Form
Data In:	Reservation Accepted
Data Out:	Customer Details
Process:	(1) Accept mandatory information such as customer data, customer name, address, and generated reservation number
Attachment:	(1) Customer

Table C.9. Process Specification of Process 2.2.

Items	Descriptions
Process Name:	Display Payment Detail Form
Data In:	Customer Details
Data Out:	Payment Details
Process:	(1) Accept the mandatory credit card detail such as credit card number, CVV, card type name, and expiry date
Attachment:	(1) Customer

Table C.10. Process Specification of Process 2.3.

Items	Descriptions
Process Name:	Submit Reservation and Payment Details
Data In:	Credit Card Details
Data Out:	Authorization Number, Invoice ID
Process:	(1) Send the HTTPS post action to the payment gateway with mandatory parameters to the payment gateway script such as customer name, customer email address, etc
Attachment:	(1) Customer

Table C.11. Process Specification of Process 2.4.

Items	Descriptions
Process Name:	Return Response to Customer
Data In:	Payment Transaction Form Details
Data Out:	Response Number
Process:	(1) Field checking form to verify the data type and free email address (2) Transfer the credit card number and amount to the acquiring bank (3) Acquiring Bank transfer credit card number (4) Verification to the credit card number (5) Return the response to Acquiring Bank (6) Acquiring Bank transfer the response to the payment gateway (7) Payment gateway return the response to the customer through the merchant web server
Attachment:	(1) Customer (2) Data Store D3

Table C.12. Process Specification of Process 2.4.1.

Items	Descriptions
Process Name:	Authorization Transaction
Data In:	Payment Transaction Submission
Data Out:	Authorization Number
Process:	(1) Response number is generated from the issuing bank and transferred to the payment gateway (2) Payment gateway post back the response to the customer through the web server
Attachment:	(1) Customer

Table C.13. Process Specification of Process 2.4.2.

Items	Descriptions
Process Name:	Rejected Transaction
Data In:	Payment Transaction Submission
Data Out:	Response Number
Process:	(1) Payment Transaction Submission (2) Payment Gateway post back the response to the customer through the web server
Attachment:	(1) Customer

Table C.14. Process Specification of Process 2.4.3.

Items	Descriptions
Process Name:	Error Transaction
Data In:	Payment Transaction Submission
Data Out:	Response Number
Process:	(1) Payment Transaction Submission (2) Payment Gateway post back the response to the customer through the web server
Attachment:	(1) Customer

Table C.16. Process Specification of Process 3.1.

Items	Descriptions
Process Name:	Generate Confirmation Number
Data In:	Customer Detail Record
Data Out:	Customer Detail
Process:	(1) Get necessary customer data, customer name, address, phone number and assign new customer ID (2) Record the customer data into corporate customer database
Attachment:	(1) Customer (2) Data Store D2

Table C.17. Process Specification of Process 3.2.

Items	Descriptions
Process Name:	Generate Customer Accounts Number
Data In:	Customer Details
Data Out:	Customer Account Number
Process:	(1) Receive the requirement from the customer (2) Record the contact status into Customer database (3) Send the introduction and make the data presentation to a customer (4) Repeat step 1 unit the actual requirement has already been established
Attachment:	(1) Customer (2) Data Store D3

Table C.18. Process Specification of Process 3.3.

Items	Descriptions
Process Name:	Logged Customer and Reservation Details onto the Database
Data In:	Authorization Number with customer details
Data Out:	Customer Account Details
Process:	(1) Update the database with the transaction detail such as customer name, customer address, reservation details
Attachment:	(1) Customer (2) Data Store D3 (3) Data Store D5

Table C.19. Process Specification of Process 3.4.

Items	Descriptions
Process Name:	Generate Customer Confirmation Number
Data In:	Transaction Details
Data Out:	Confirmation Numbers
Process:	(1) Generate the confirmation number to the customer
Attachment:	(1) Customer (2) Data Store D3 (3) Data Store D5

Table C.20. Process Specification of Process 3.5.

Items	Descriptions
Process Name:	Notify Customer through Confirmation Email
Data In:	Reservation Details
Data Out:	Confirmation Details
Process:	(1) Retrieve the customer and reservation details (2) Generate the email with the confirmation vouchers
Attachment:	(1) Customer (2) Data Store D2

Table C.21. Process Specification of Process 3.6.

Items	Descriptions
Process Name:	Notify Resorts through Confirmation Email
Data In:	Reservation Details
Data Out:	Confirmation Details
Process:	(1) Retrieve the customer and reservation details (2) Generate the email with the confirmation vouchers
Attachment:	(1) Customer (2) Data Store D3

APPENDIX D

ENTITY RELATIONSHIP DIAGRAM

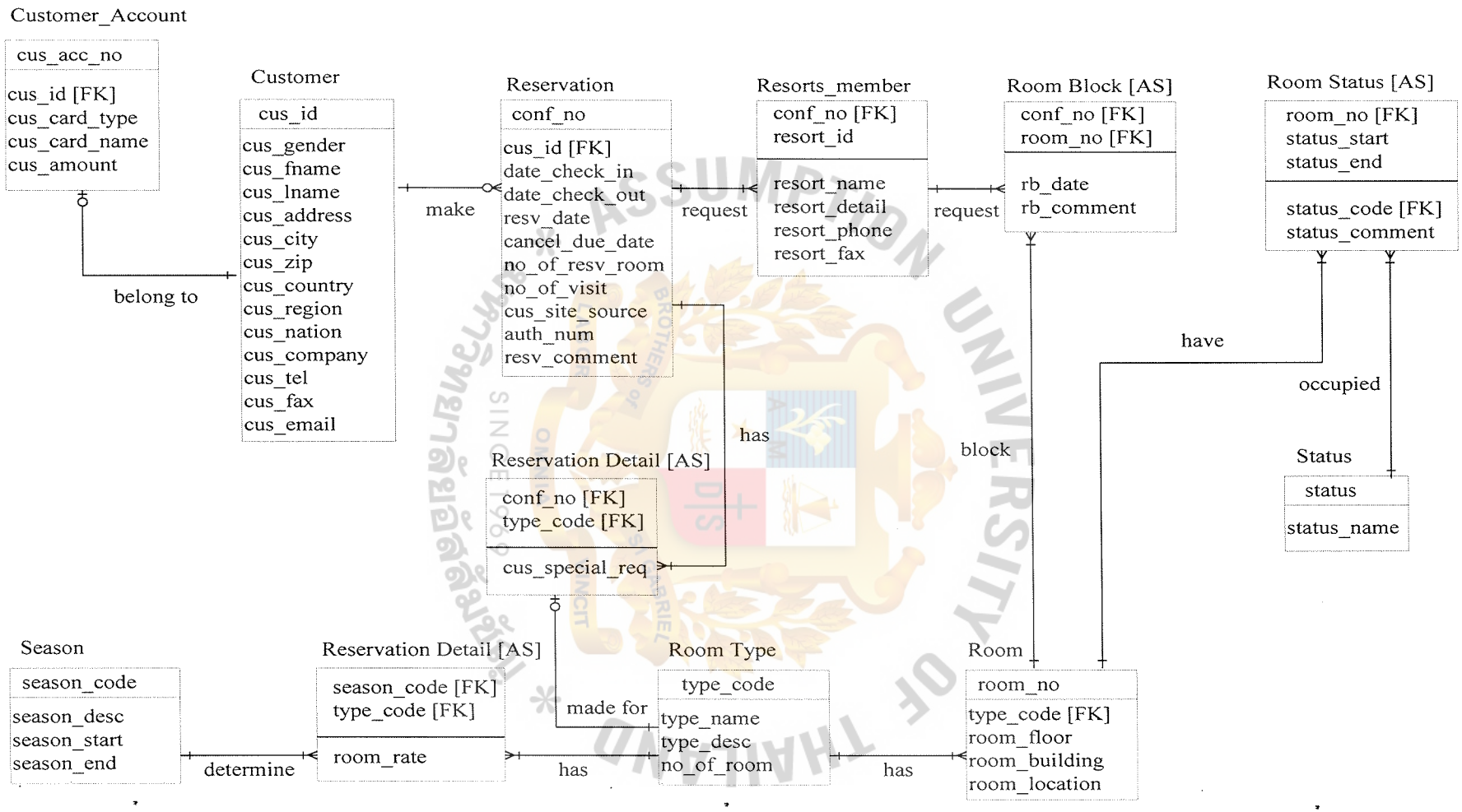

Figure D.1. Entity Relationship Diagram of Web-based Resorts Reservation System for Travel Agent.

APPENDIX E

STRUCTURE CHARTS

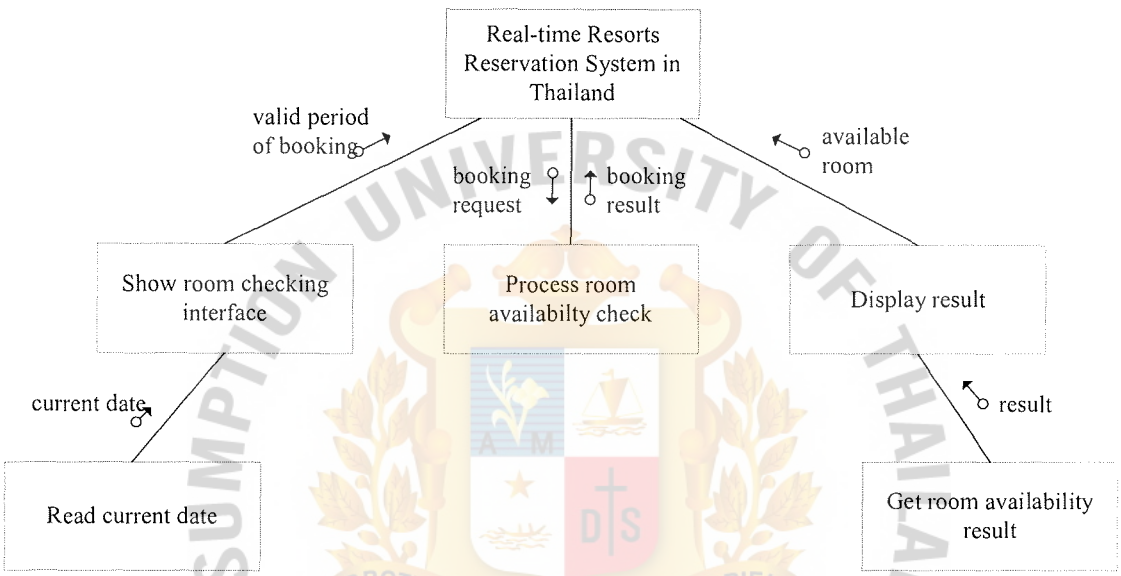

Figure E.1. Structure Chart of Web-based Resort Reservation System for Travel Agent.

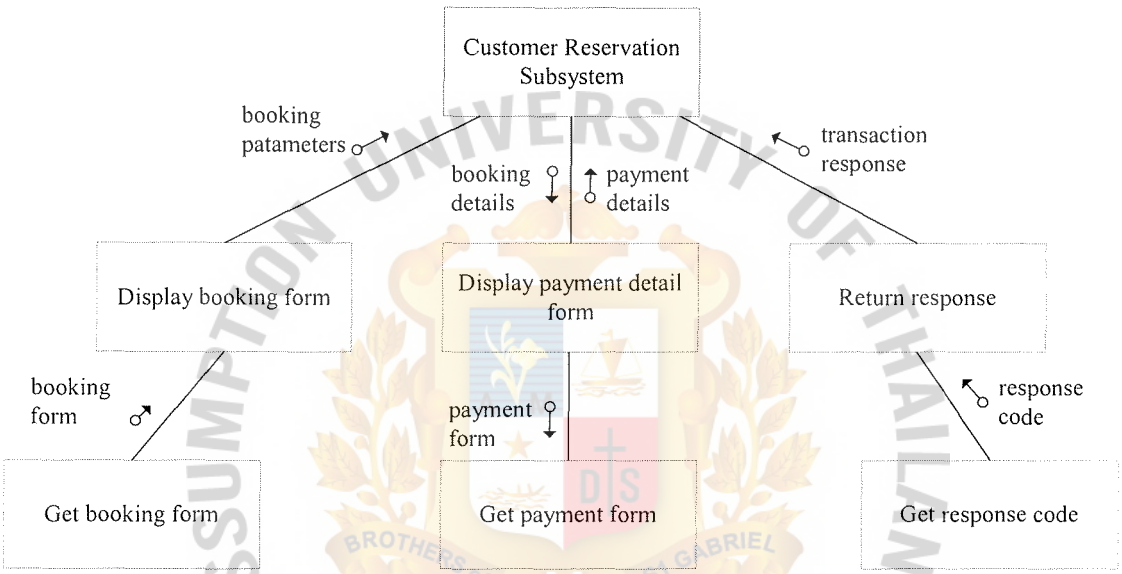

Figure E.2. Structure Chart of Customer Reservation Subsystem.

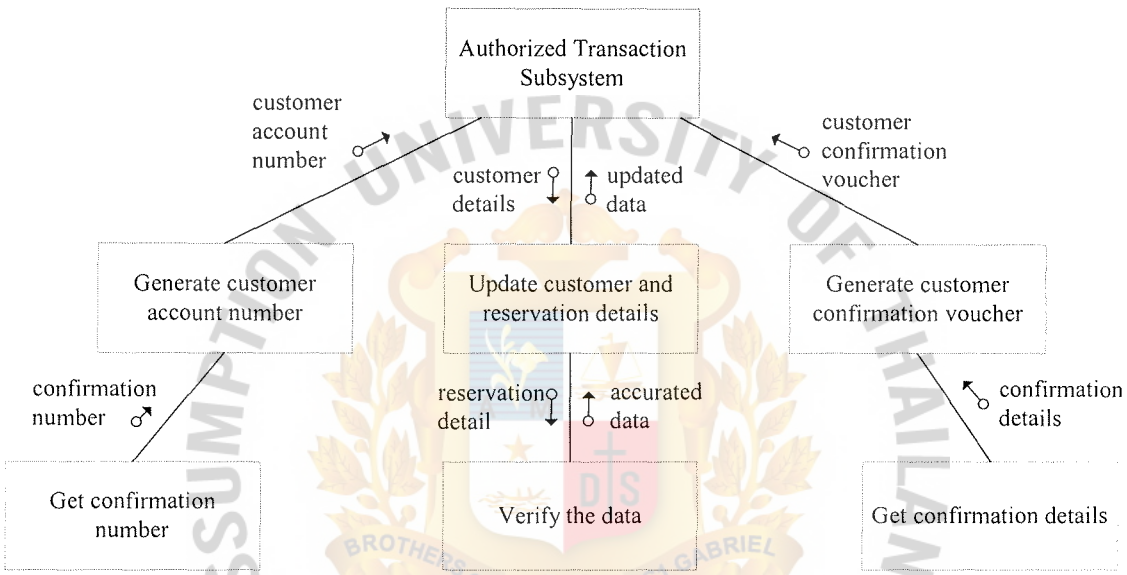

Figure E.3. Structure Chart of Authorized Transaction Subsystem.

APPENDIX F

WEB INTERFACE DESIGN

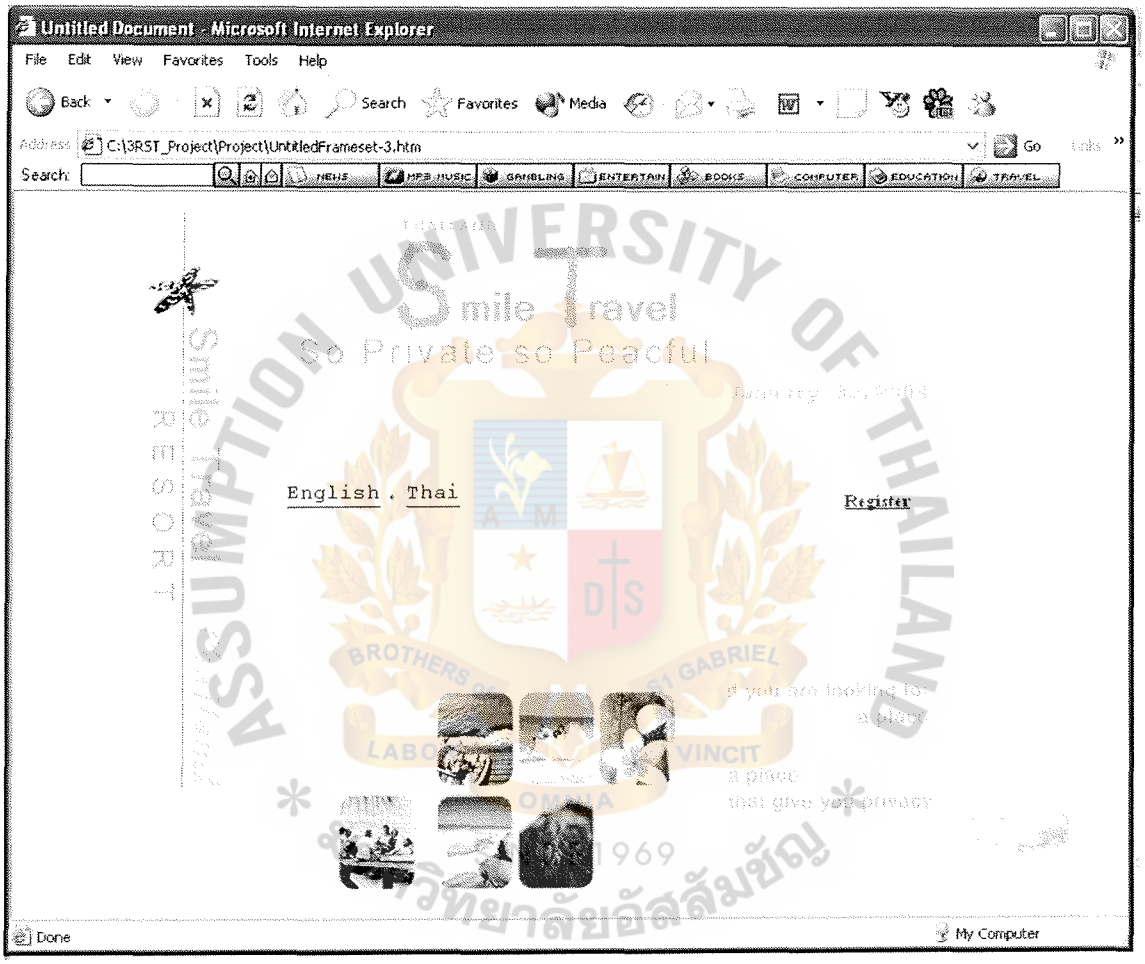

Figure F.1. Resort Availability User Screen Interface of Web-based Resort Reservation System for Travel Agent.

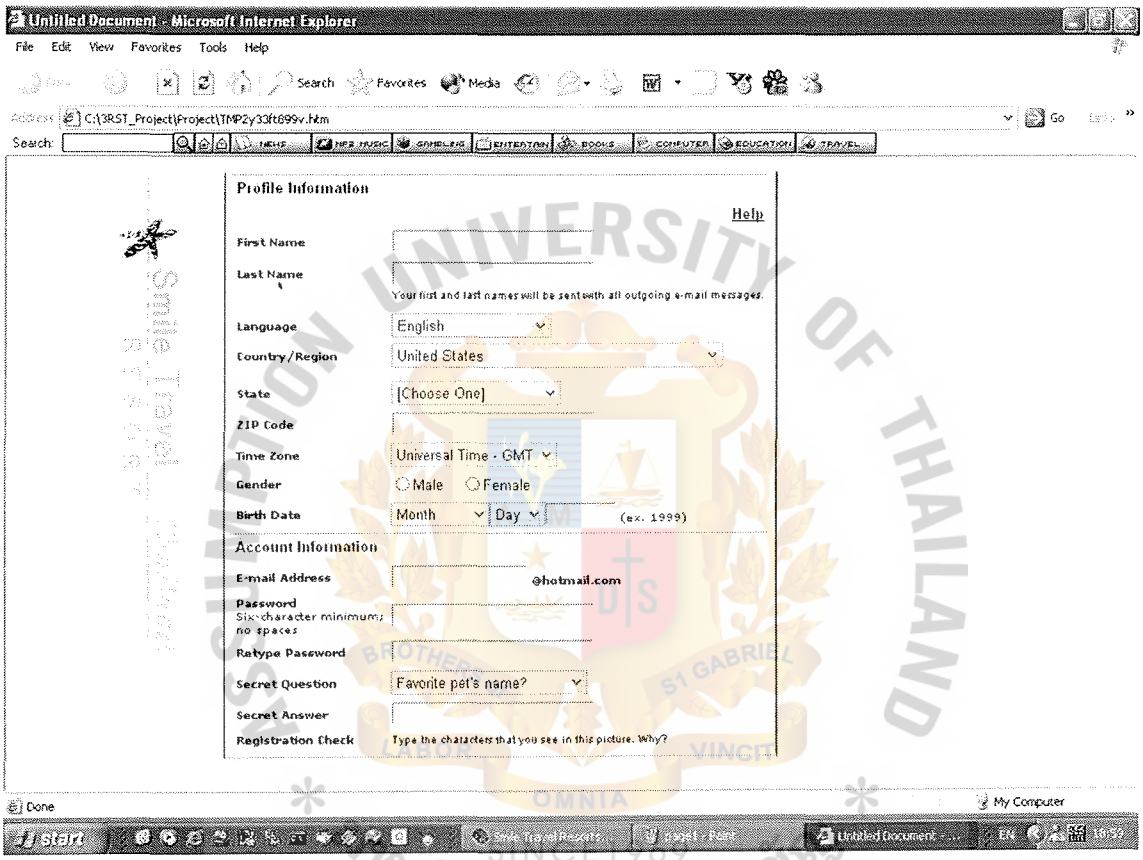

Figure F.2. Register Form User Screen Interface of Web-based Resort Reservation System for Travel Agent.

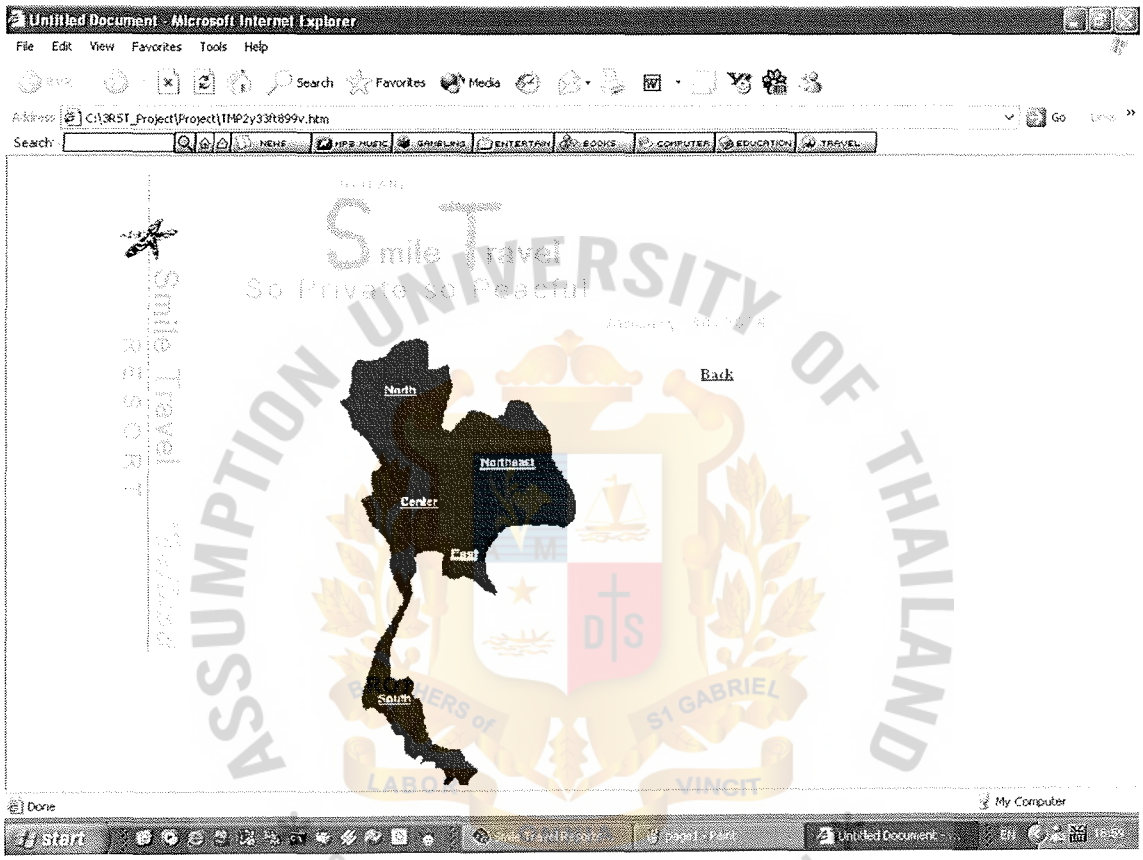

Figure F.3. Thailand Resorts Map User Screen Interface of Web-based Resort Reservation System for Travel Agent.

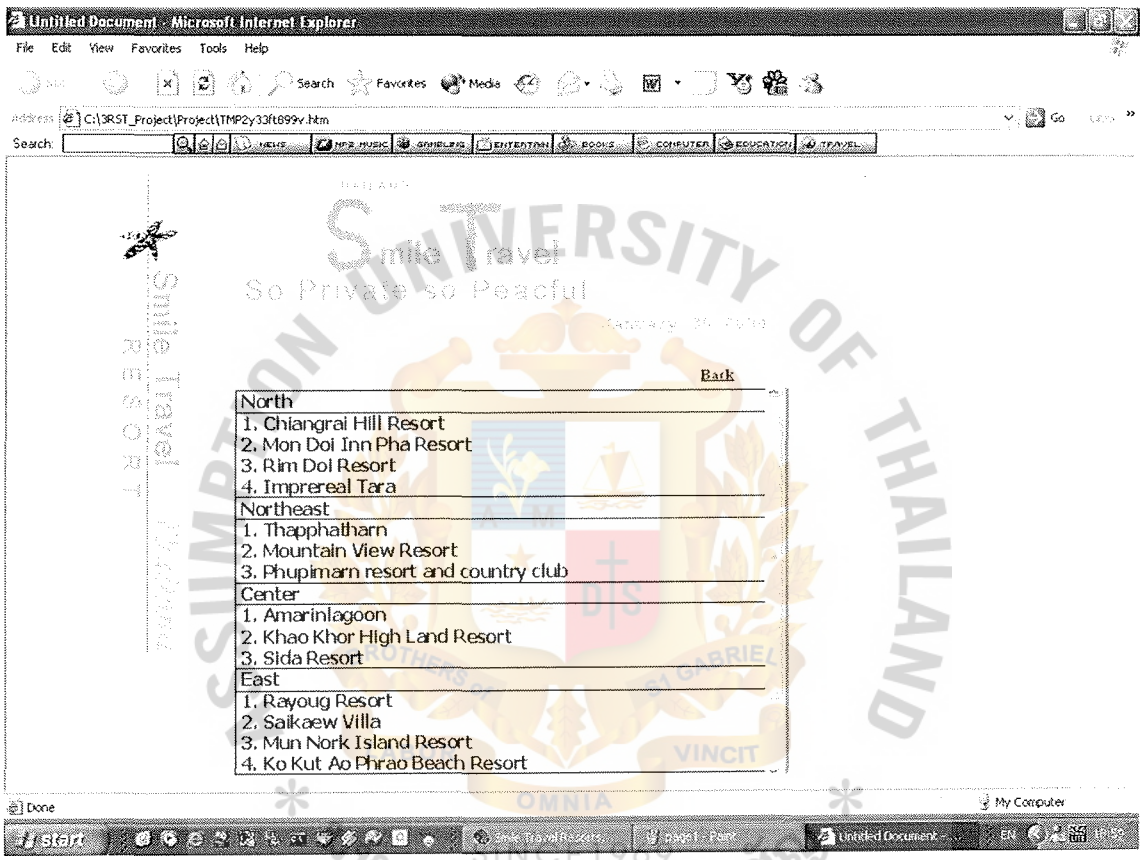

Figure F.4. Thailand Resorts User Screen Interface of Web-based Resort Reservation System for Travel Agent.

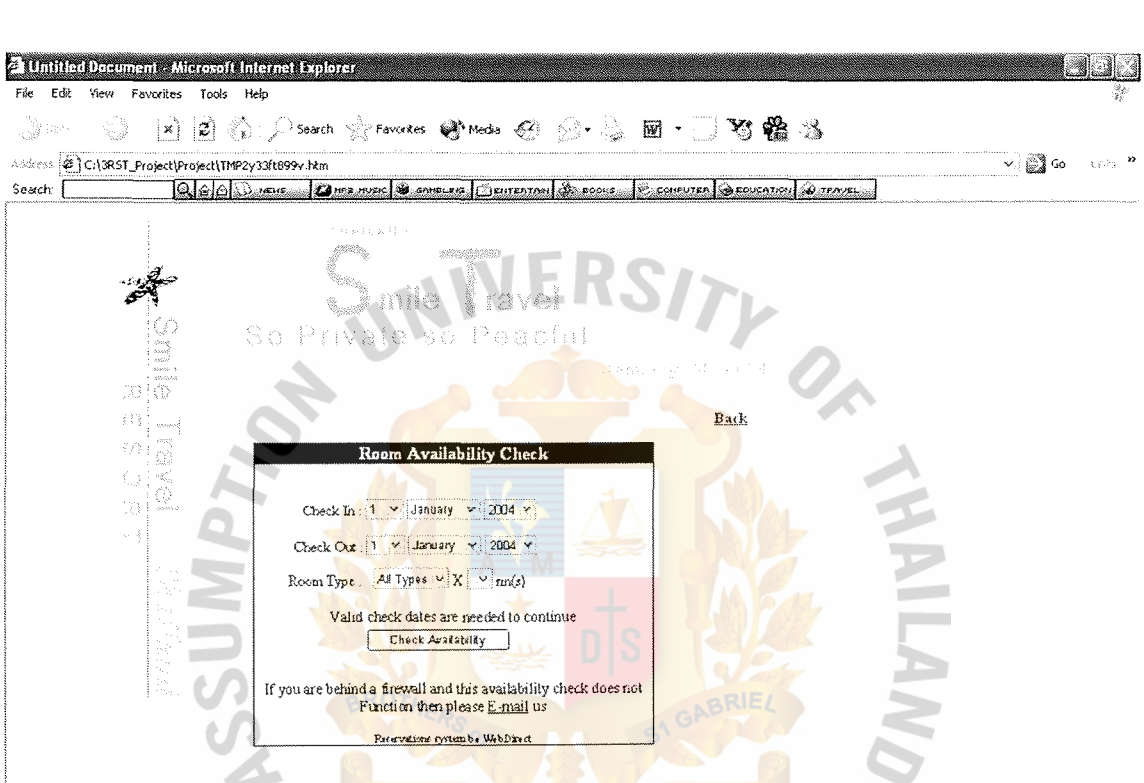

Figure F.5. Room Availability Check User Screen Interface of Web-based Resort Reservation System for Travel Agent.

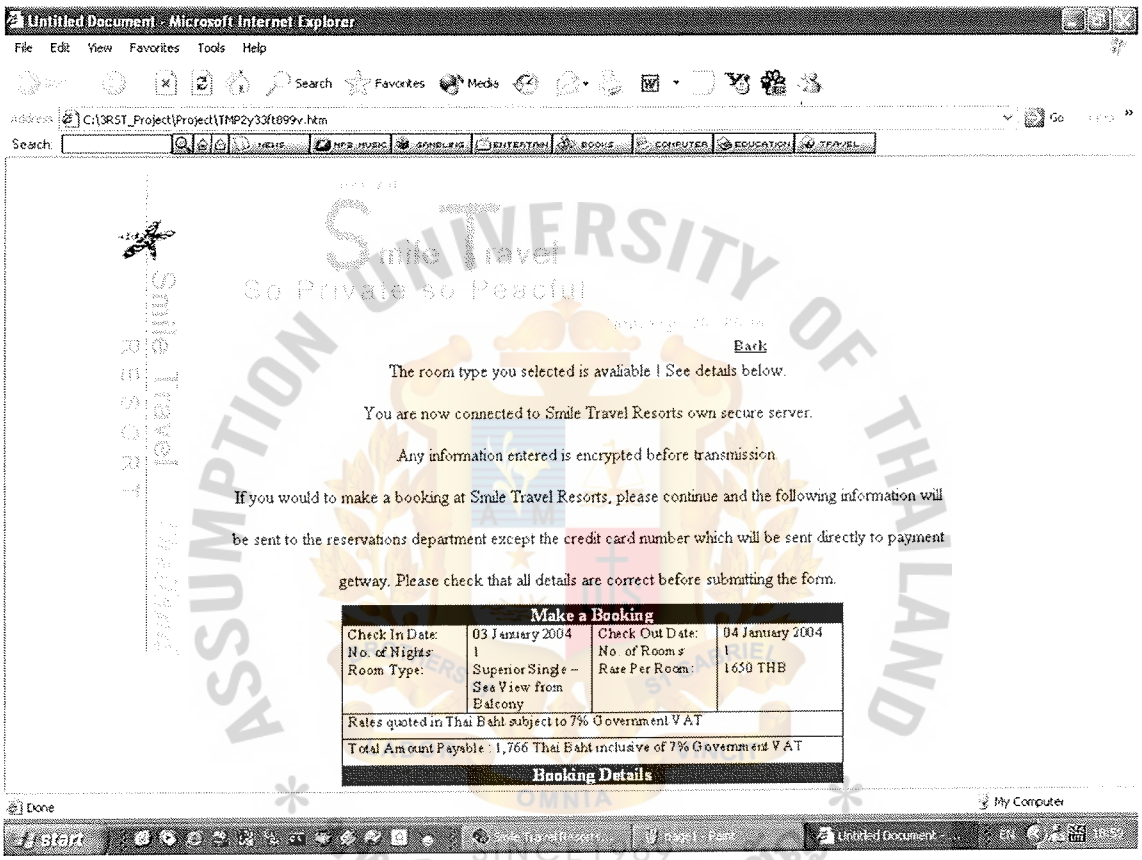

Figure F.6. Reservation Form User Screen Interface of Web-based Resort Reservation System for Travel Agent.

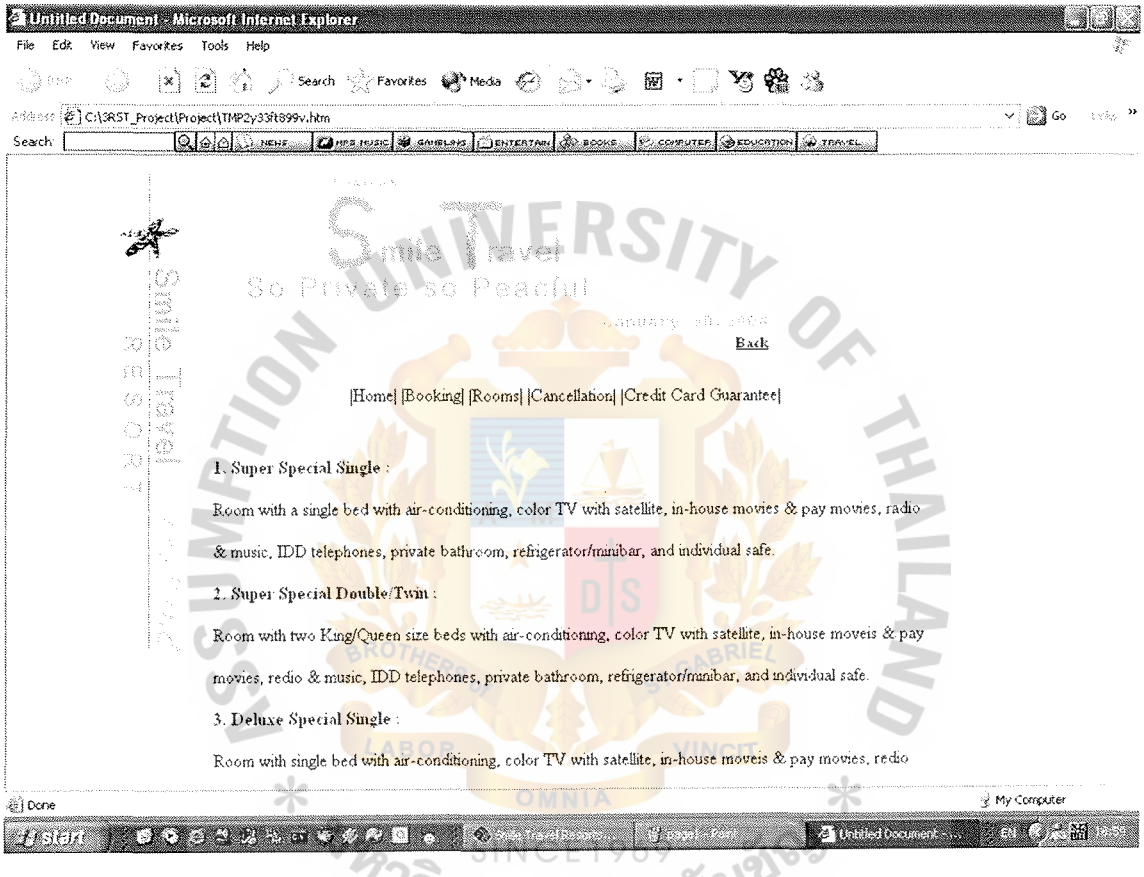

Figure F.7. Room Detail User Screen Interface of Web-based Resort Reservation System for Travel Agent.

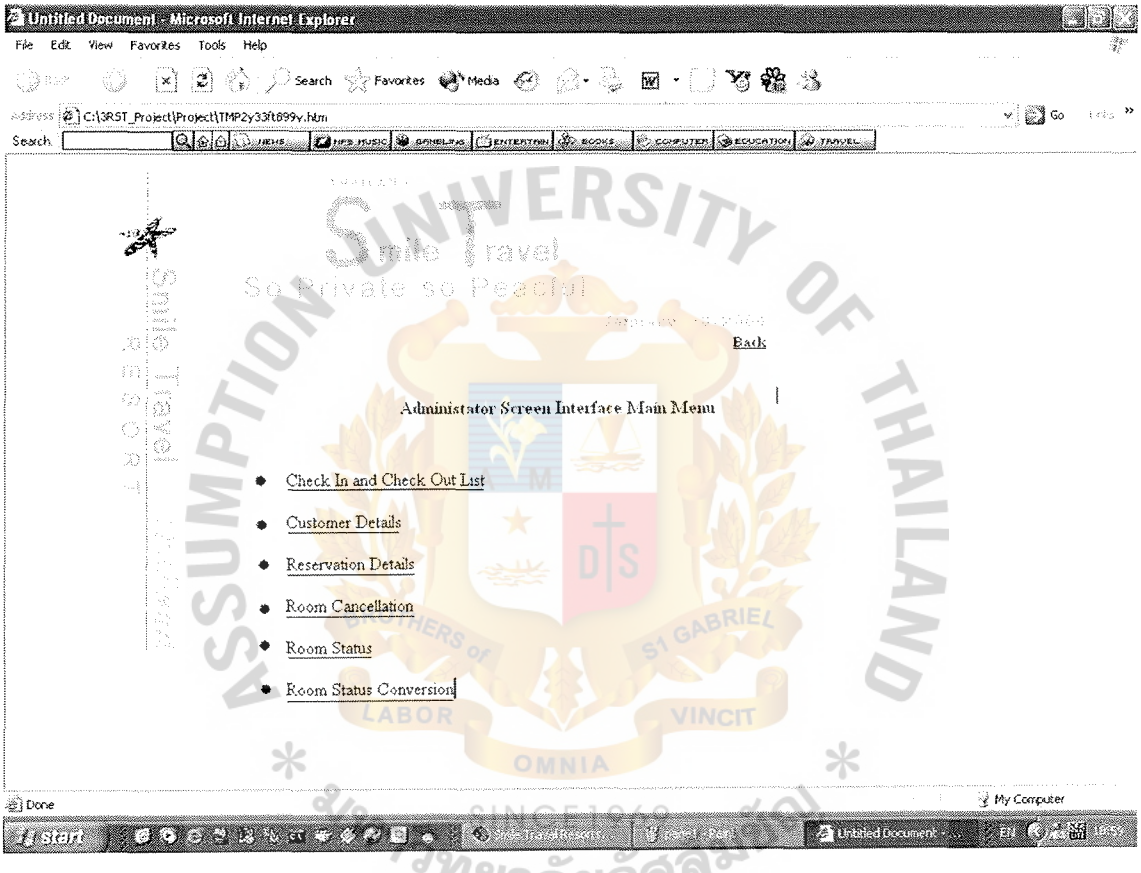

Figure F.8. Main Menu Administrator Screen Interface of Web-based Resort Reservation System for Travel Agent.

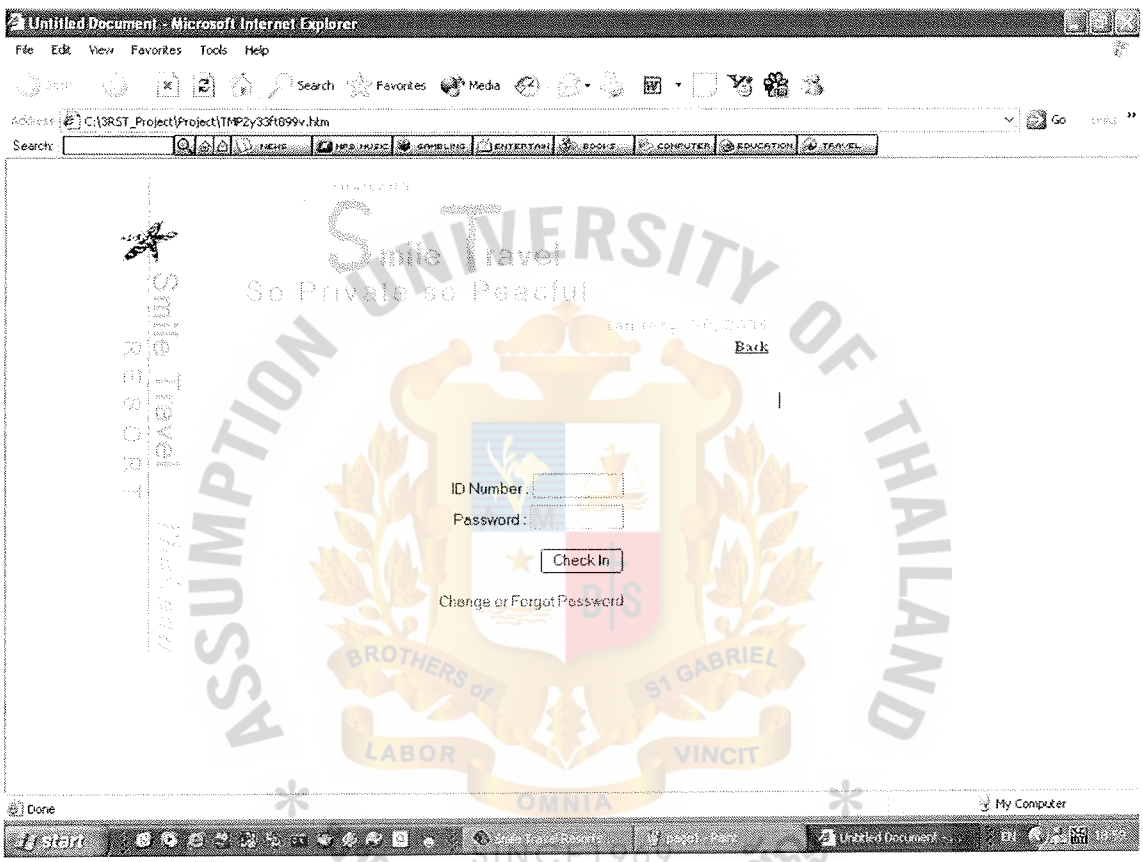

Figure F.9. Log on Administrator Screen Interface of Web-based Resort Reservation System for Travel Agent.

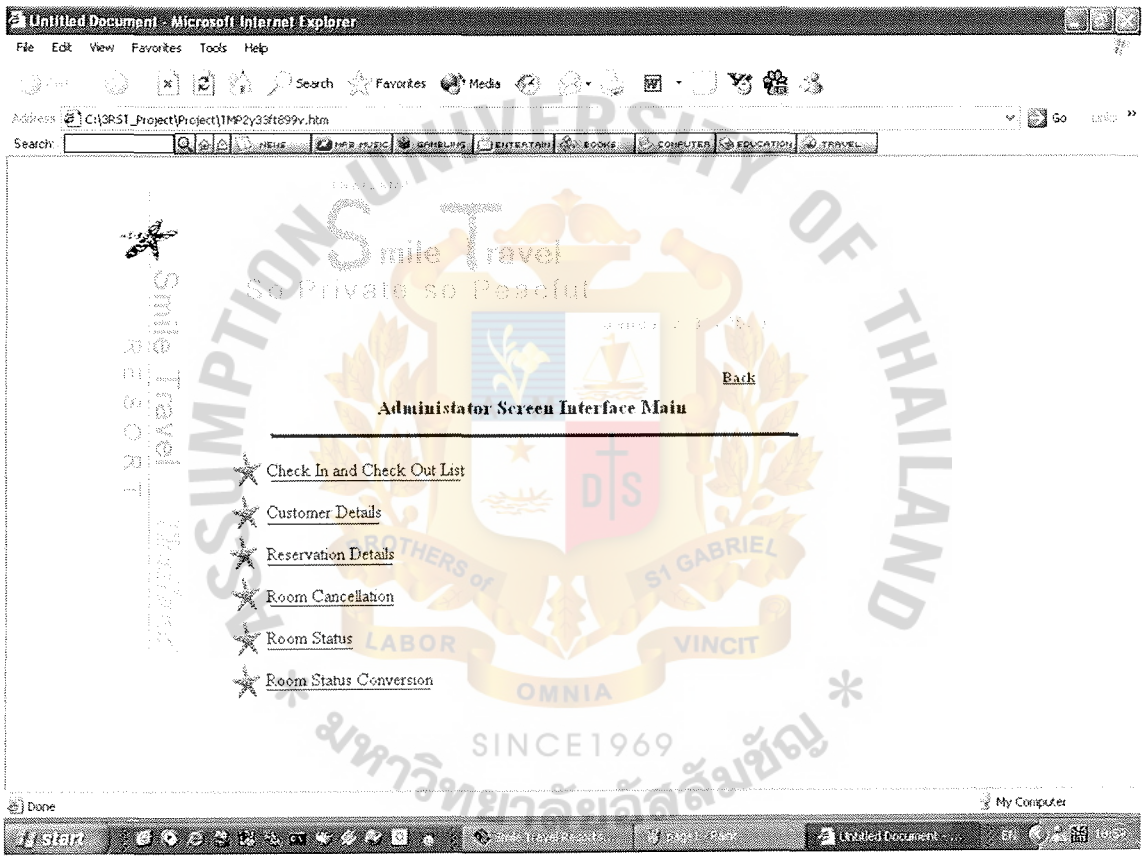

Figure F.10. Main Menu Administration Screen Interface of Web-based Resort Reservation System for Travel Agent.

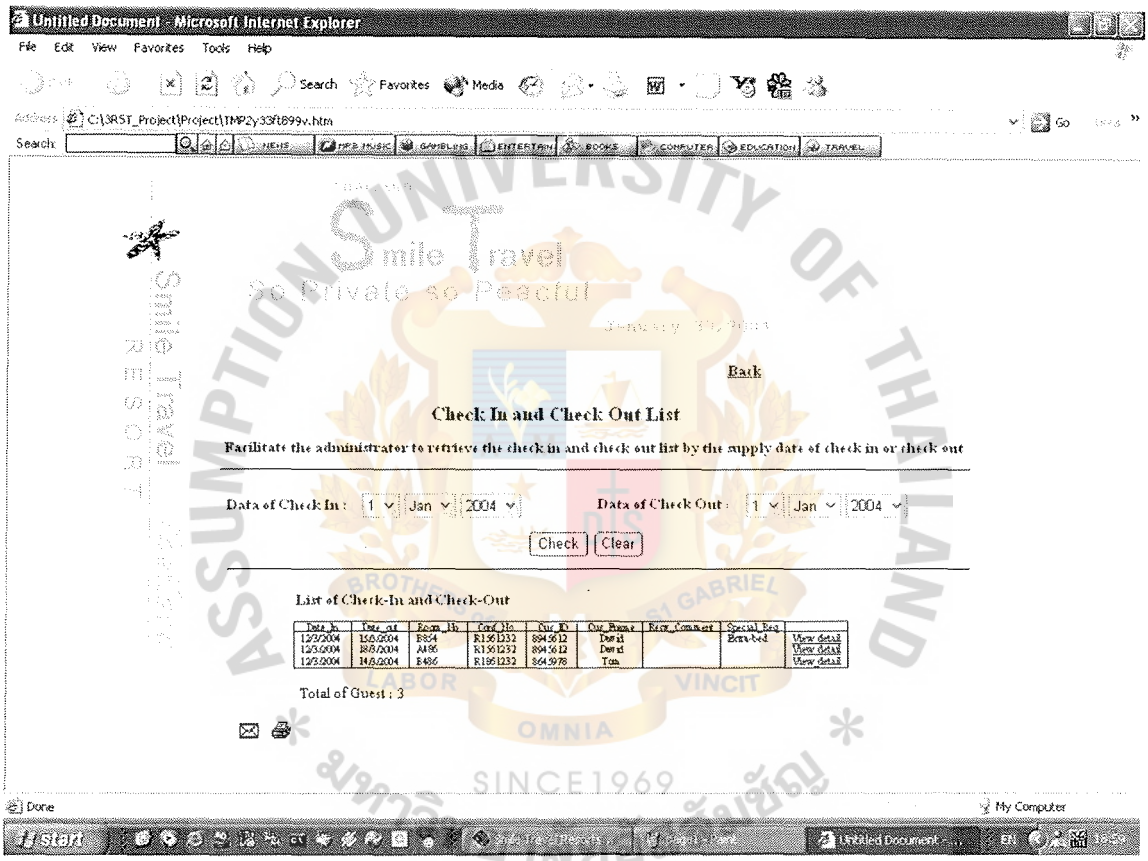

Figure F.11. Check In and Check Out Administration Screen Interface of Web-based Resort Reservation System for Travel Agent.

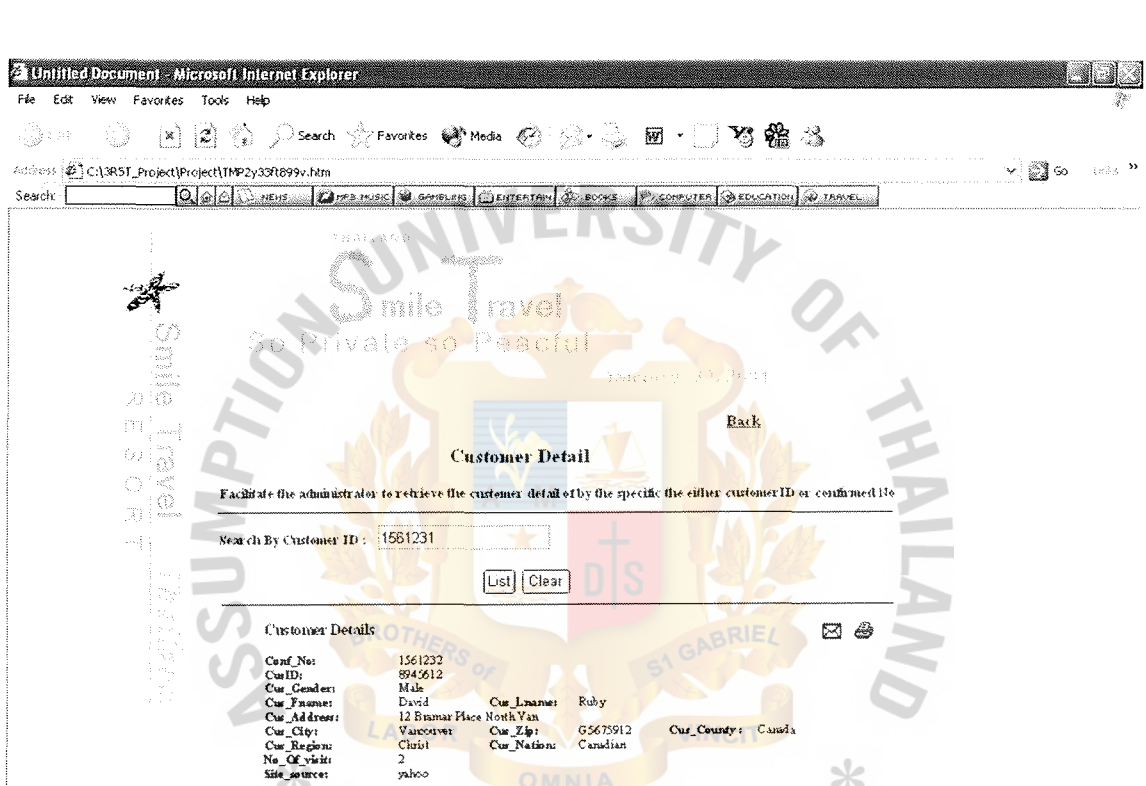

Figure F.12. Customer Details Administrator Screen Interface of Web-based Resort Reservation System for Travel Agent.

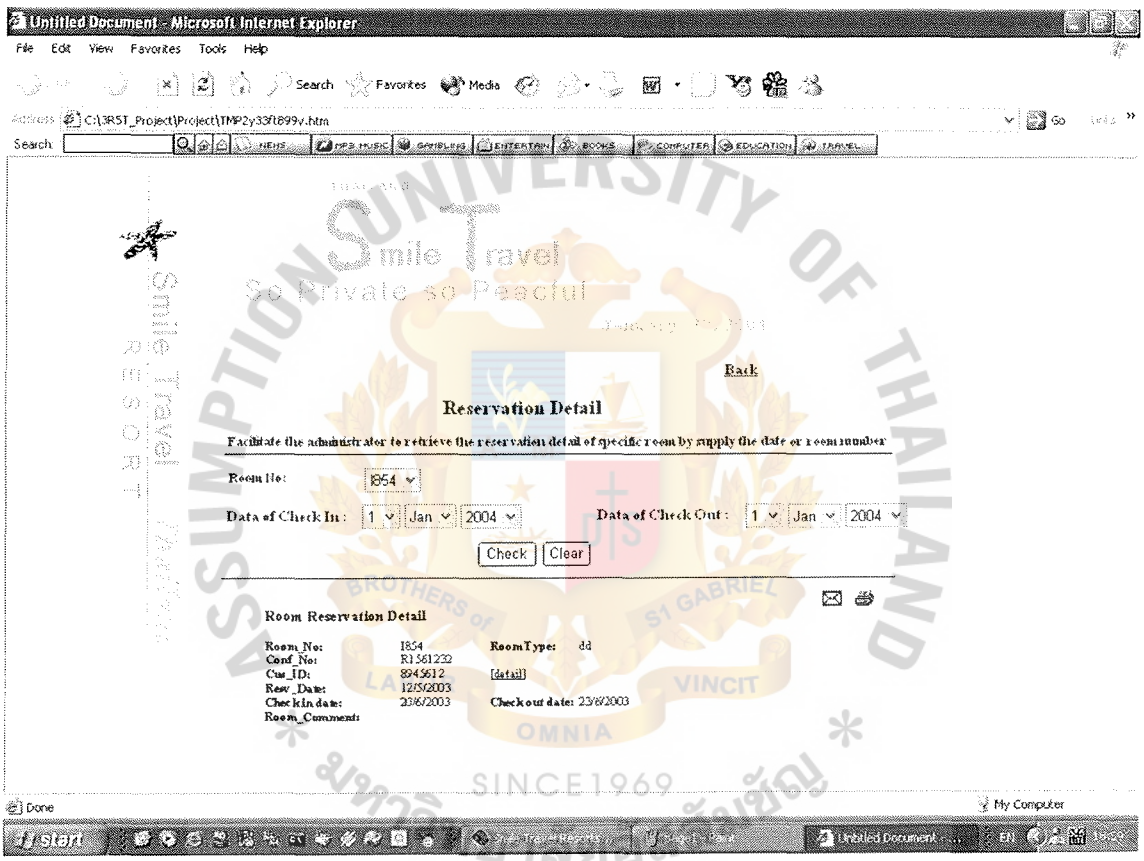

Figure F.13. Reservation Details Administration Screen Interface of Web-based Resort Reservation System for Travel Agent.

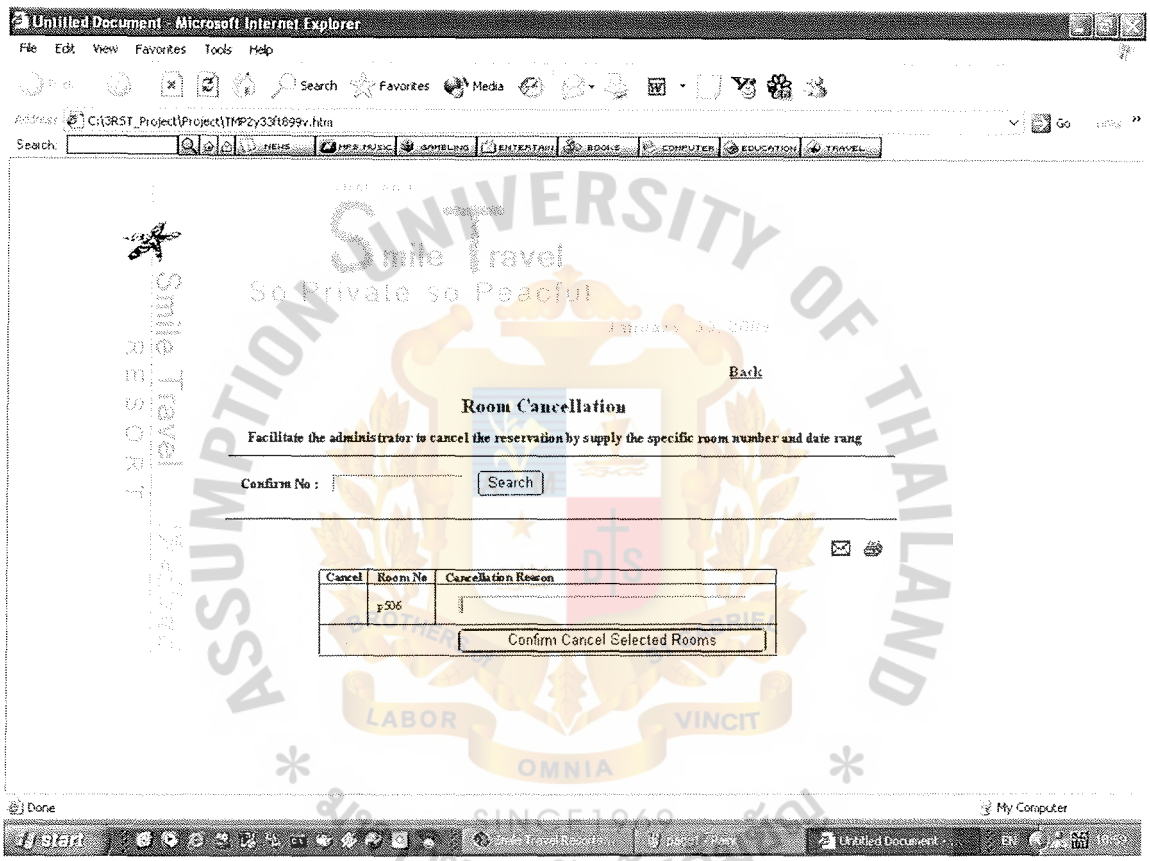

Figure F.14. Room Cancellation Administration Screen Interface of Web-based Resort Reservation System for Travel Agent.

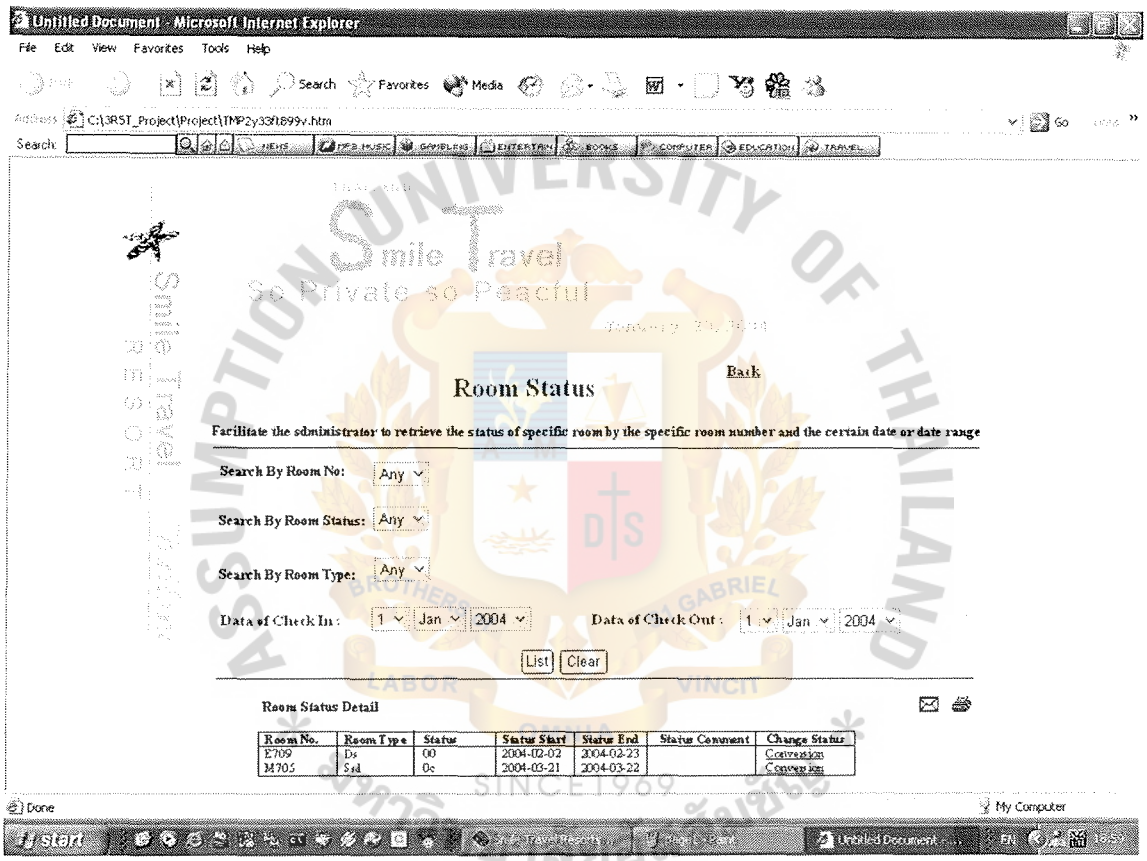

Figure F.15. Room Status Administration Screen Interface of Web-based Resort Reservation System for Travel Agent.

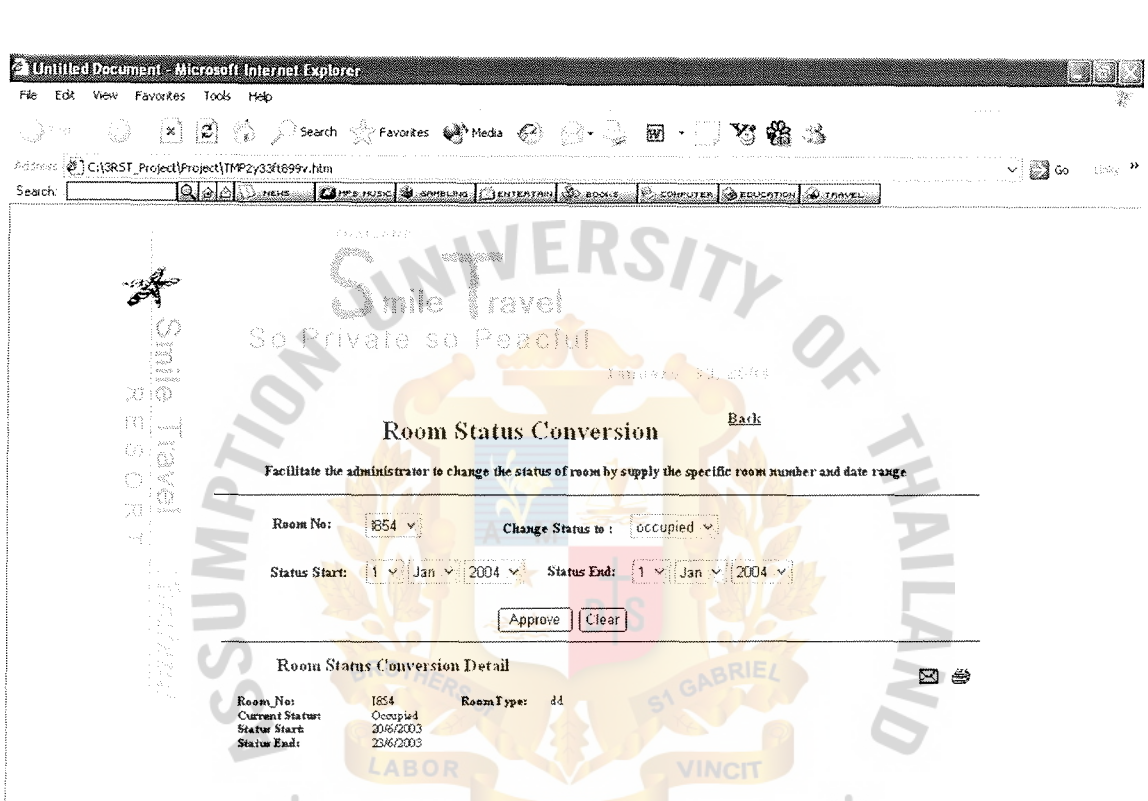

Figure F.16. Room Status Conversion Administration Screen Interface of Web-based Resort Reservation System for Travel Agent.

APPENDIX G

OUTPUT REPORTS

Merchant Transaction Statistics

Merchant ID: 000001805300015

Data: 25/12/03 to 30/12/03

Data	Order ID	Sequence ID	Invoice ID	CC Type	Amount	AuthNum
25/12/2003	4838	314971	314971	MasterCard	5,900.00	929127
26/12/2003	4830	315013	315013	MasterCard	58,520,00	358686
27/12/2003	2423	315153	315153	VISA Card	1,700.00	341154
28/12/2003	4848	315313	315313	MasterCard	7,470.00	400227
29/12/2003	4846	315466	315466	MasterCard	10,680.00	545932
30/12/2003	4818	315523	315523	VISA Card	12,580.00	680859
Total					96,850.00	

Figure G.1. Daily Authorization Transaction Statistic Report of Web-based Resort Reservation System for Travel Agent.

Merchant Transaction Statistics

Mode: Transaction Month to date

Merchant ID: 000001805300015
Data: 01/12/03 to 09/12/03
By Credit Card Type

Data	Credit Card	Amount
01/12/03	MasterCard	24,110.98
01/12/03	VISACard	45,382.48
02/12/03	MasterCard	24,937.61
02/12/03	VISACard	47,212.50
03/12/03	VISACard	38,464.34
03/12/03	MasterCard	31,849.51
04/12/03	VISACard	24,345.91
04/12/03	MasterCard	300.00
05/12/03	VISACard	45,181.45
05/12/03	MasterCard	43,181.45
06/12/03	MasterCard	38,417.54
06/12/03	VISACard	58,030.10
07/12/03	VISACard	43,653.46
07/12/03	MasterCard	23,953.20
07/12/03	KTBCard	527.51
08/12/03	VISACard	21,749.62
08/12/03	MasterCard	15,275.27
09/12/03	VISACard	4,658.78
09/12/03	MasterCard	2,359.61
Total VISA		328,678.64
Total MC		204,259.90
Total KTB		527.51
Total other		0.00
Total all		533,466.05

Figure G.2. Monthly Authorization Transaction Statistic Report of Web-based Resort Reservation System for Travel Agent.

Arrival Report

Date: 25/12/03

Conf#	Fname	Lname	Company	Arr.Fgt	Time	Source	LEN	#RMS	C/F	Note
C1642456	Angles	Willy	CRS	TG332	7.30	1	5	1	Y	
C1456142	Paul	Hains	Australian Embassy	CX207	15.30	1	1	1	Y	
C1671512	Chen	Linlee	Intel	EF224	14.00	1	2	2	N	
C1491261	Sandy	Tompson	Northern Real Estate	-	17.00	1	3	1	N	
C1416425	Somboon	Sukherviriya	Fidelio Software	-	14.00	1	3	1	Y	
Total		5								

Figure G.3. Daily Guest Arrival Report of Web-based Resorts Reservation System for Travel Agent.

Departure Report

Date: 25/12/03

Conf#	Fname	Lname	Company	Aep.Fgt	Time	#RMS	Note
C2642456	Tample	Cheery	World Travel Service	TG327	7.30	1	Room only bill to co.,
C5456142	Thakorn	Pick	Diethelm Travel	CX201	15.30	1	Own A/C
C2671512	Dutch	Faldo	Intel	-	14.00	2	
C7491261	Sam	Tompson	Westin Banyan Tree	-	17.00	1	
C6416425	Suksai	Photong	Acer	TG208	14.00	1	
Total		5					

Figure G.4. Daily Guest Departure Report of Web-based Resorts Reservation System for Travel Agent.

Room Status Report

Date: 25/12/03 Floor 4

Room No	Room Type	Building	Status	Notes
e401	sss	Emerald	oc	
e402	sss	Emerald	vc	
e403	ds	Emerald	oc	
e404	dd	Emerald	oc	
M405	rs1	Monarch	oc	
M406	rs2	Monarch	vc	
M407	sss	Monarch	vc	
M408	sss	Monarch	vc	
a409	ds	Andaman	vc	
a410	dd	Andaman	oo	Water leaking in the bathroom
a411	ps1	Andaman	vc	
a412	sss	Andaman	vc	

vc: vacant oc: occupied oo: out of order v/o: status unchear

Figure G.5. Daily Guest Room Status Report of Web-based Resorts Reservation System for Travel Agent.

No Show Report

Date: 25/12/03

Conf#	Cus#	Fname	Lname	ArrDate	DeptDate	Type	PAX	ResType	Made on
C469426	1162	Aggassi	Harald	25/12/03	9/12/03	CI	1	1	5/12/03
C681531	1654	Edberg	Francis	25/12/03	12/12/03	TF	1	1	5/12/03
C803456	2492	Stich	Edberg	25/12/03	14/12/03	TF	1	1	5/12/03
C174256	1635	Castillo	Mcrow	25/12/03	9/12/03	TW	1	1	5/12/03
Total							4		

Figure G.6. No Show Report of Web-based Resorts Reservation System for Travel Agent.

Cancellation Report

Date: 25/12/03

Room	Conf#	Fname	Lname	RmTy	#Rm	ArrDate	DeptDate	Company	Cancellation Reason
M705	C46926	Jame	Colautti	DDD	1	25/12/03	28/12/03	East VL	Cancelled 21/12/03 15:59 Tipsuda Businesstrip postponded
E206	C68131	Shin	Cheol	SSS	1	25/12/03	29/12/03	One Travel	CVL. By K.Vilaiwan Cancelled on 09/12/03 15:04
A785	C80356	Daniel	Beudin	SSD	1	25/12/03	26/12/03	TRG Group	Flight not confirmed/cancelled Cancelled on 14/12/03 11:39
E652	C14256	Greg	Bofield	SSD	1	25/12/03	29/12/03		Warut No reason given Cancelled on 14/12/03 10:25 Flight not confirmed/cancelled

Figure G.7. Cancellation Report of Web-based Resorts Reservation System for Travel Agent.

Guest History Summary

Date: 25/12/03

Lname	Fname	Created	City	Country	Last Stay	Next Resv
Abbot	Scott	13/12/2003	Sydney	AUS	21/12/2003	11/01/2004
Anthony	Abrahams	17/12/2003	Columbo	SRI	23/12/2003	17/01/2004
Ahmad	Abdulsalam	23/12/2003	Saudi Arabia	SAU	24/12/2003	23/01/2004
Kazaki	Syuichi	19/12/2003	Chiba	JAP	20/12/2003	19/01/2004
Kimtsen	Sladimiz	24/12/2003	Moscow	RUP	29/12/2003	14/01/2004

Figure G.8. Guest History Summary Report of Web-based Resorts Reservation System for Travel Agent.

APPENDIX H

FILE LAYOUT

Table H.1. Customer.

cus_id	cus_gender	cus_fname	cus_lname	cus_address	cus_city
cus_zip	cus_country	cus_region	cus_nation	cus_company	cus_tel
cus_fax	cus_email				

Table H.2. Customer Accounts.

cus_acc_no	cus_id	cus_card_name	cus_amount

Table H.3. Reservation.

conf_no	cus_id	date_check_in	date_check_out	resv_date	Cancel_due_date
no_of_resv_room	cus_no_of_visit	cus_site_source			

Table H.4. Reservation Detail.

conf_no	type_code	cus_spec_req	resv_comment

Table H.5. Room.

room_no	type_code	room_floor	room_buliding	room_location

Table H.6. Room Type.

type_code	type_name	type_desc	no_of_room

Table H.7. Room Rate.

season_code	type_code	room_rate

Table H.8. Season.

season_code	season_desc	season_start	season_start	season_end

Table H.9. Room Block.

conf_no	room_no	rb_date	rb_comment

Table H.10. Room Status.

room_no	status_start	status_end	status_code	status_comment

Table H.11. Status.

status_code	status_name

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