



Customer Service Information System
for Natural Hills Golf Course

by

Ms. Kanchana Rangsitiyagorn

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

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

December, 2001

**Customer Service Information System
for Natural Hills Golf Course**

by
Ms. Kanchana Rangsitiyagorn

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

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

December 2001

Project Title Customer Service Information System for Natural Hills Golf Course


Name Ms. Kanchana Rangsitiyagorn

Project Advisor Assoc.Prof.Dr. Suphamit Chittayasothorn


Academic Year December 2, 2001

The Graduate School of Assumption University has approved this final report of the three-credit course, CS 6998 System Development Project, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer Information Systems.


Approval Committee:




(Assoc.Prof.Dr. Suphamit Chittayasothorn)
Advisor




(Prof.Dr. Srisakdi Charmonman)
Chairman



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



(Asst.Prof.Dr. Vichit Avatchanakorn)
Member



(Assoc.Prof. Somchai Thayarnyong)
MUA Representative

December 2, 2001

ABSTRACT

Natural Hills Golf Course is located on a magnificent mountainside, about 1 hour to northern Bangkok, in Nakhonnayok province. Natural Hills has been being operated for over 8 years. It is a true Golf Resort and Country Club complete with modern conveniences and recreational facilities. Natural Hills is a semi-private golf course, which welcomes members and walk-in customers. The customers may be classified into several groups; therefore, this project is to develop the effective information system to facilitate the Customer Service Information System.

The current existing Customer Service Information System is manual. Most data are stored on paper, while some parts are kept in the Microsoft Excel, and stored in the file. It requires many administrative staffs to maintain the system, but they have to face the general problems of the manual system, which are error-prone and high maintenance cost.

The new proposed Information System will be developed to replace the manual system with the computerized system. All data are kept in the database server, Microsoft SQL Server 7.0, and are accessed through the Fast Ethernet, Microsoft Access 2000. The user interfaces, moreover, are implemented on Microsoft Access 2000. It will reduce the number of administrative staffs, solve the problem of the manual system and decrease the high maintenance cost.

ACKNOWLEDGEMENTS

The writer would like to take this opportunity to express with high gratitude to the project advisor Assoc.Prof.Dr. Suphamit Chittayasothorn for his value guidance and assistance to the project and acknowledge with a great gratitude for the advices of the project committee. And the writer wishes to acknowledge Mrs. Roongvimol Kerdpanich for providing information of system requirements on Golf Course operations and customer management functions. Thanks also to the staff of the Natural Hills Golf Course who gave good co-operation in the system study.

Also the writer would like to extend her appreciation to the lecturers in Computer Information Systems (CIS) Department of Assumption University for providing knowledge and education throughout her academic years in the University.

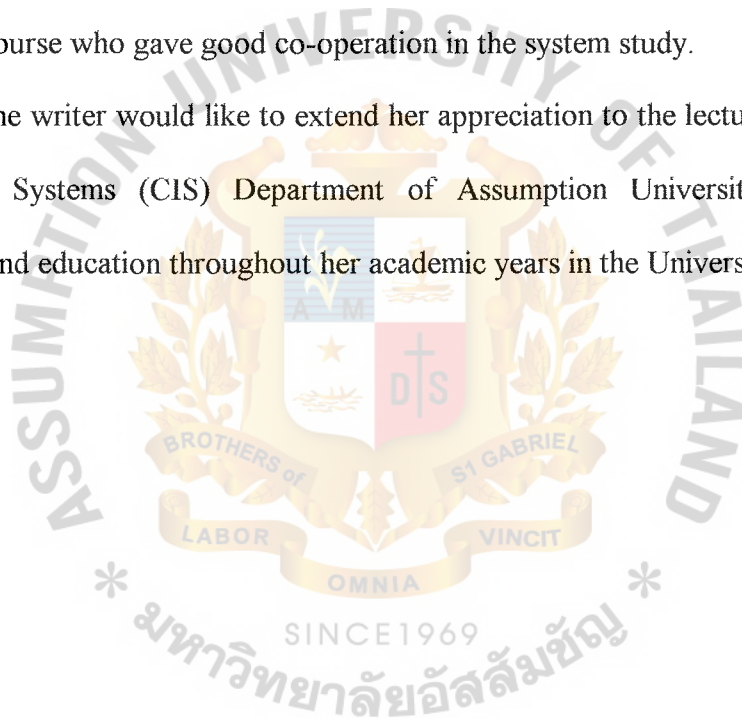


TABLE OF CONTENTS

<u>Chapter</u>	<u>Page</u>
ABSTRACT	i
ACKNOWLEDGEMENTS	ii
LIST OF FIGURES	v
LIST OF TABLES	vii
I. INTRODUCTION	1
1.1 Background of the Project	1
1.2 Objectives of the Project	2
1.3 Scope of the Project	2
1.4 Deliverables	3
1.5 Project Plan	5
II. THE EXISTING SYSTEM	7
2.1 Background of the Organization	7
2.2 Existing Business Functions	10
2.3 Current Problems and Areas for Improvements	11
III. THE PROPOSED SYSTEM	12
3.1 User Requirements	12
3.2 System Design	12
3.3 Graphical User Interface Design	14
3.4 Data Dictionary	14
3.5 Hardware and Software Specification	14
3.6 Cost and Benefits	17
3.7 Time Value of Money	26

<u>Chapter</u>	<u>Page</u>
3.8 Return-on-Investment Analysis	26
3.9 Calculation of Break Even Year	29
3.10 Security and Control	29
IV. PROJECT IMPLEMENTATION	32
4.1 Project Implementation Schedule	32
V. CONCLUSIONS AND RECOMMENDATIONS	36
5.1 Conclusions	36
5.2 Recommendations	37
APPENDIX A CONTEXT DIAGRAM	38
APPENDIX B DATA FLOW DIAGRAM (EXISTING SYSTEM)	39
APPENDIX C DATA FLOW DIAGRAMS (PROPOSED SYSTEM)	40
APPENDIX D DATABASE DESIGN	46
APPENDIX E STRUCTURE CHART	54
APPENDIX F DATA DICTIONARY	55
APPENDIX G GRAPHICAL USER INTERFACE DESIGN	57
APPENDIX H REPORTS AND FORMATS	67
BIBLIOGRAPHY	83

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1.1 Gantt Chart	6
2.1 Organization Chart	10
3.1 Hardware Configuration of the Proposed System	19
3.2 Cost Comparison between the Manual and the Proposed System	25
3.3 Payback Analysis	28
A.1 Context Diagram of the Proposed System	38
B.1 Data Flow Diagram Level 0 of the Existing System	39
C.1 Data Flow Diagram Level 0 of the New System	40
C.2 Data Flow Diagram Level 1 of the Process 1.0	41
C.3 Data Flow Diagram Level 1 of the Process 2.0	42
C.4 Data Flow Diagram Level 1 of the Process 3.0	43
C.5 Data Flow Diagram Level 1 of the Process 4.0	44
C.6 Data Flow Diagram Level 1 of the Process 5.0	45
D.1 Entity Relationship Diagram of the Proposed System	46
E.1 Structure Chart of Inventory Information System	54
G.1 Display Log On Screen	57
G.2 Display Main Menu for Selecting Users' Requirement	58
G.3 A Submenu Use for the Customer File Maintenance Process	59
G.4 A Submenu Use for the Reservation Process	60
G.5 A Submenu Use for the Registration Entry Process	61
G.6 Display the Screen for Update Associaton Record	62

<u>Figure</u>	<u>Page</u>
G.7 Display the Screen for Update Customer Record	63
G.8 Display the Screen for Update Reservation Record	64
G.9 Display the Screen for Create Course on Reservation Record	65
G.10 Display the Screen for Create Green fee on Sale	66
H.1 Report Layout of the Customer: Life Member Report	67
H.2 Report Layout of the Customer: Annual Member Report	68
H.3 Report Layout of the Customer: Land Member Report	69
H.4 Report Layout of the Customer: Natural Hills Golf Club Report	70
H.5 Report Layout of the Customer: V.I.P. Member Report	71
H.6 Report Layout of the Customer: Privilege Member Report	72
H.7 Report Layout of the Group Customer: Government Report	73
H.8 Report Layout of the Group Customer: Travel Agents Report	74
H.9 Report Layout of the Group Customer: Embassies Report	75
H.10 Report Layout of the Group Customer: Associate Club Report	76
H.11 Report Layout of the Daily Reservation Report	77
H.12 Report Layout of the Course Availability Report	78
H.13 Report Layout of the Confirmation Report	79
H.14 Report Layout of the Cancellation Report	80
H.15 Report Layout of the No Show Report	81
H.16 Report Layout of the Total Sales Report	82

LIST OF TABLES

<u>Table</u>	<u>Page</u>
3.1 Hardware Cost	20
3.2 Software Cost	20
3.3 Implementation Cost	21
3.4 Operation Cost	21
3.5 Development Cost	21
3.6 Manual System Cost Analysis	22
3.7 Five Years Accumulated Manual System Cost	22
3.8 Computerized System Cost Analysis	23
3.9 Five Years Accumulated Computerized Cost	24
3.10 The Comparison of the System Costs	24
3.11 Cost Analysis of Proposed System	27
5.1 The Degree of Achievement of the Proposed System	37
D.1 Association	47
D.2 Contract	47
D.3 Customer	47
D.4 Association Membership	48
D.5 Customer Reservation	48
D.6 Course	48
D.7 Course on a Reservation	48
D.8 Green fee on Sales	49
D.9 Association Master File	50
D.10 Contract Master File	50

<u>Table</u>	<u>Page</u>
D.11 Customer Master File	51
D.12 Association Membership File	52
D.13 Customer Reservation File	52
D.14 Course Master File	53
D.15 Course on a Reservation File	53
D.16 Green fee on Sales File	53
F.1 Data Dictionary for the Existing System	55
F.2 Data Dictionary for the Proposed System	56



I. INTRODUCTION

1.1 Background of the Project

Natural Hills is a semi-private golf course which welcomes members and walk-in customers. The customers may be classified into two groups.

(1) Group Customers

The major group is all golf associations which always have a tournament and competition at the golf course. Others are travel agents, embassies, and etc.

(2) Individual Customers

There are annual members, life members, Royal Hills Golf Club members, V.I.P. members, and walk-in persons.

Currently, our existing system is mainly based on manual operation, which is not efficient enough to provide accurate and in time information. These problems can be defined as the delay in finishing customer reservation, data redundancy, incorrect pricing, inefficient reporting system, unupdated customer data, overdue credit, credit over limits, and etc. Because of these problems, the company executive decide to develop the computer system to handle them and to increase the efficiency and support the accurate information for the management.

By making use of a computer-based information system, the difficulty of controlling and operating those tasks can be greatly reduced. Instead of having to handle a massive paperwork, performing repetitive and tedious tasks, and being very fastidious with the task of customer assignment, a well-designed computer information system can handle it all.

The system presented in this project is not designed for a specific organization or golf course business. Rather, it aims to serve the common functions of customer

control and management. The information processed in those activities trends to be almost the same for most golf course business.

1.2 Objectives of the Project

The objective of this project is to convert a purely manual system to the computerized system in order to improve performance of company's activities. I decide to develop the customer management information system as a pioneer project for increasing efficiency of work and customer satisfaction. The clarified objectives are following:

- (1) To study the existing system of Customer Management Information System.
- (2) To determine and analyze business and users' requirements in Customer Management Information System
- (3) To design the proposed system to solve the problems of the existing system.
- (4) To develop and design database of the Customers Data, and test software package.
- (5) To develop the software for handling the proposed system.

1.3 Scope of the Project

The scopes of the project cover these major parts of the procedure in running the system.

- (1) The system must be able to check the history of all customer reservation in a short time.
- (2) The system must be able to store and maintain customer's data and customer's reservation in the database system.
- (3) Updating, inserting and deleting the data must be reached much more easily and in a short time.

- (4) The customer's data will be kept in high-level security.
- (5) The system must generate all reports format to facilitate all user and management.

1.4 Deliverables

The deliverables for the project on Customer Management Information System for Royal Hills Golf Course are as follows:

- (1) A software package supplied in the market can demonstrate user-interface screens and database management.
- (2) Screen Layout and Menu System for user interaction.
- (3) Input screen design:
 - (a) User Logon Screen
 - (b) Main Menu Screen
 - (c) Customer Information Menu Screen
 - (d) Insert Customer Data Screen
 - (e) Update Customer Data Screen
 - (f) Delete Customer Data Screen
 - (g) Reservation Menu Screen
 - (h) New Reservation Screen
 - (i) Update Reservation Screen
 - (j) Manual Tee-Off Time Assignment Screen
 - (k) Daily Reservation List Screen
 - (l) Reservation Confirmation Screen
 - (m) Customer Registration Menu Screen
 - (n) Reservation Customer Screen
 - (o) Walk-in Customer Screen

- (p) Report Screens
- (q) Exit Screen
- (4) Output:
 - (a) Customer: Life Member Report
 - (b) Customer: Annual Member Report
 - (c) Customer: Land Member Report
 - (d) Customer: Royal Hills Golf Club Member Report
 - (e) Customer: V.I.P. Member Report
 - (f) Customer: Privilege Member Report
 - (g) Group Customer: Government Report
 - (h) Group Customer: Travel Agents Report
 - (i) Group Customer: Companies Report
 - (j) Group Customer: Embassies Report
 - (k) Group Customer: Associate Club Report
 - (l) Daily Reservation Report
 - (m) Reservation Forecast Report
 - (n) Confirmation Report
 - (o) Cancellation Report
 - (p) No Show Report
 - (q) Daily Customer Registration Report
 - (r) Monthly Group Customer Report
 - (s) Customer Credit Report
 - (t) Total Sales Report

1.5 Project Plan

The project plan is shown in Figure 1.1.

- (1) Initial studies are on the organizational structure, problems related to each area. Then it defines the area under study and develops the Context Diagrams.
- (2) Interviews and observations are made to provide the understanding of the existing system, problem occurred.
- (3) Conclusions of the existing system are made and development of the new system are settled to solve the problems. This will be included the Data Flow Diagrams, Data Dictionary, Hierarchical Input Process Output (HIPO) for the newly developed system.
- (4) New system requirements are defined including inputs, outputs, and operations.
- (5) Do budget for the analysis and design and implementation, cost/benefit analysis for the proposed system are considered.
- (6) After conclusion, implementation phase is done to develop programs, test, and implement of the new system.

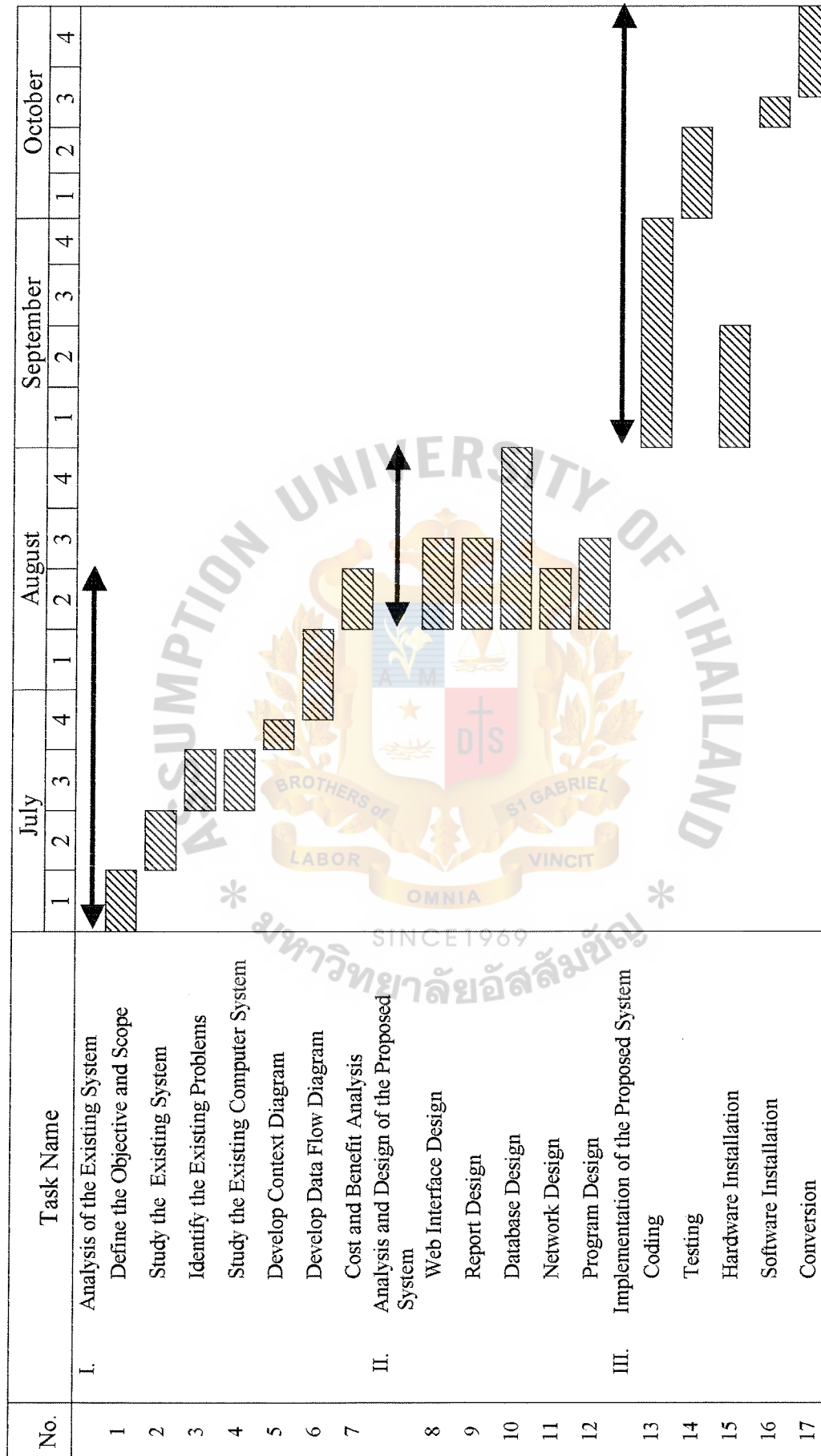


Figure 1.1. Gantt Chart for Customer Management Information System of Natural Hills Golf Course.

II. THE EXISTING SYSTEM

2.1 Background of the Organization

Natural Hills Golf Course is located on a magnificent mountainside, about 1 hour to northern Bangkok, in Nakhonnayok province. Natural Hills has been being operated for over 8 years. It is a true Golf Resort & Country Club complete with modern conveniences and recreational facilities.

Surrounded by mountain, the 1200-rai Natural Hills Golf Course was designed by world-famous architects Nelson & Wright of Belt Collins & Associates (International) Limited. Through a thorough study of the spectacular terrain of the Natural Hills, Nelson & Wright created a golf course that challenges the best abilities of international tournament players. At the same time, the course is designed for rest and relaxation in pristine natural setting. While every hole is a challenge, golfers are surrounded by mountain vistas, virgin forests, wild flower meadows, scenic lakes, babbling brooks and a pair of thundering waterfalls.

Natural Hills is a semi-private golf course, which welcomes members and walk-in customers. The customers may be classified into two groups. The major group is all golf association which always have a tournament and competition at the golf course. Others are annual members, life members, Royal Hills Golf Club members, V.I.P. members, travel agents, companies, embassies, and walk-in persons.

The tariff rate of Natural Hills Golf Course are as follows:

	Weekday	Weekend
(1) Green fee 18 holes	Baht 500.-	Baht 1,000.-
(2) Green fee 9 holes	Baht 300.-	Baht 600.-
(3) Caddy fee 18 holes	Baht 200.-	Baht 200.-

	Weekday	Weekend
(4) Caddy fee 9 holes	Baht 120.-	Baht 120.-
(5) Golf Cart 18 holes	Baht 600.-	Baht 600.-
(6) Golf Cart 9 holes	Baht 300.-	Baht 300.-

2.2 Area under Study

There are 5 departments under the General Manager's control. They are Engineering Department, Sales and Marketing Department, Personnel Department, Financial and Accounting Department, and Service Department.

(1) Engineering Department

This department takes care of all activities about the maintenance of products, which are any part of the club house and the golf course.

(2) Sales and Marketing Department

Sales and Marketing Department takes care of all activities about the sale of product to customer and takes charge in marketing strategy. Its main responsibilities are taking customer order, checking credit and accepting valid reservation from approved customers, assigning the job function to any department.

(3) Personnel Department

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

(4) Financial and Accounting Department

Its major responsibilities of Accounting Department are customer's payment, recording all accounting transactions, generating invoice, and etc. Moreover, it sets the company's budget and creates financial reports.

(5) Service Department

This department is directly responsible for service customers and to make the customers pleased, impressed, and would like to come back to Royal Hills again.



The organization chart will be shown in Figure 2.1.

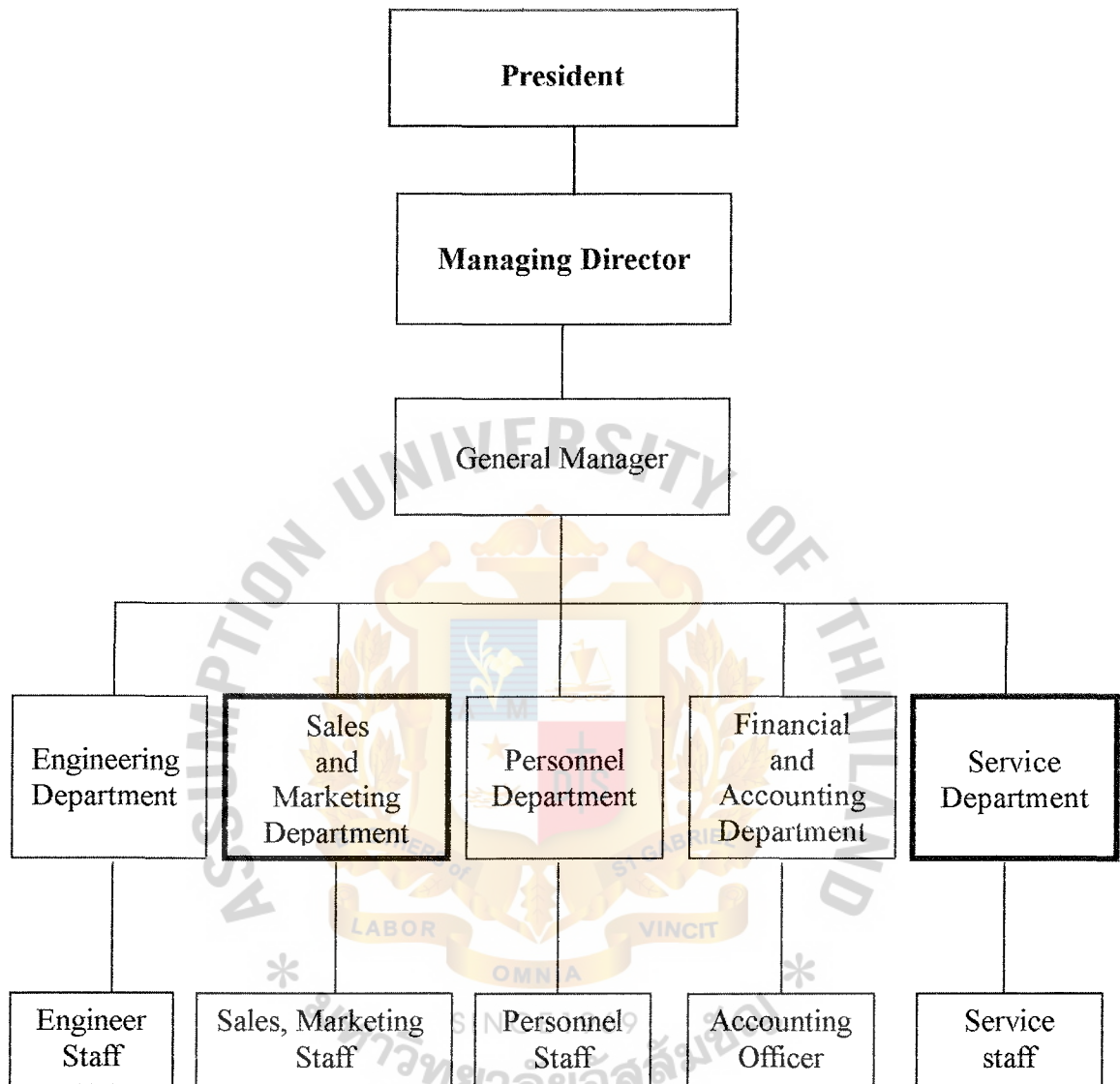


Figure 2.1. Organization Chart.

2.3 Existing System

Since the existing system activities are managed manually, the inputs and outputs, therefore, consist of raw data, paperwork, filing, filled form, etc. The process of the existing system starts when the customers send in their reservations to the Natural Hills Golf Course by telephone, fax, or email. The sales staff receives the

reservation and checks customer requirements and conditions. Then they have to check the customer status such as types of customer, green fee rate, term of payment, and etc. After that they will send confirmation to the customer and submit job function to all concerned departments.

2.4 Current Problems

Although the manual system is very easy to handle by the non computer personnel, it also has many weakness as follows:

- (1) There are duplicated documents.
- (2) There are no systematic standard to support.
- (3) Record of customers and sales processing is slow and inaccurate because of human errors.
- (4) No sufficient information base for management to plan, forecast, and determine in the strategic plan and the marketing plan.
- (5) Report generation is slow and unreliable. When the management needs any information, it takes approximate a week to get the information.
- (6) In case customers want to know about their account, or when the financial officer wants to know customer status, it takes time to find these inquiry information.
- (7) Personnel calculations is not accurate.
- (8) Poor follow up procedure.

III. THE PROPOSED SYSTEM

3.1 User Requirement

The purpose of Natural Hills' Customer Service Information System is to computerize Golf Course's sales and marketing department and service department processes and to maintain information needed for the operation and management. This includes reservation, green fee sale, and customer database management. The user requirements are as follows:

- (1) This system should provide an update and maintain information.
- (2) To have all the processes related to the service department functions automated.
- (3) To reduce paper work and working time.
- (4) The desired reports can be produced and information of the system can be viewed through the enquiry screen.
- (5) There must be a good database designed to ease the job of users.
- (6) Accurate data, to manage database to be accurate and easy to manage.
- (7) The system must be secured enough to protect unauthorized persons.
- (8) To provide the best service for customer.
- (9) To computerize sales and customer information system.
- (10) The system must be able to handle daily reservation, monthly reservation, and yearly reservation in advance.

3.2 System Design

This part shows the analysis and design for the new system. The new system is designed to control major activities on handling reservation and customer service system processes. Some repetitive tasks have been eliminated and there is increasing

clarify of work. The proposed system has more advantages than the existing system in many ways, that can be described as follows:

- (1) It is convenient in maintenance and expansion to meet the future growth of the company since using structured design, the proposed system will have more flexibility than the existing system.
- (2) The proposed system takes less access time than the existing system because it is designed for end-users who may have little or no experience in computerization.
- (3) The information is derived from the proposed system with higher degree of accuracy. This can help the managers perform their tasks effectively.
- (4) The whole proposed system can be divided into 5 processes as mentioned.

Process 1.0 Create New Membership Plan

- (a) To record new membership plan
- (b) To add new association
- (c) To add new contract
- (d) To generate new membership report

Process 2.0 Terminate Membership Plan

- (a) To record membership plan termination notice
- (b) To deactivate the termination contract
- (c) To deactivate the termination association
- (d) To generate termination membership report

Process 3.0 Manage Customer Reservation

- (a) To check old reservations and course availabilities
- (b) To enter new reservation
- (c) To update course on reservation

- (d) To generate reservation report

Process 4.0 Automatically Fill Dated Reservation

- (a) To read the original date from the reservation
- (b) To update the date reservation
- (c) To update the date of course on reservation

Process 5.0 Print Green Fee for Sales

- (a) To read sales information
- (b) To print green fee for sales
- (c) To update sales information
- (d) To generate green fee on sales report

The Context Diagram of the proposed system is shown in Appendix A. The data Flow Diagrams for all processes above are shown in Appendix C.

3.3 Graphic User Interface Design

The graphic user interface designs are the designs of input screens and the outputs for the system. This is shown in Appendix H and Appendix I.

3.4 Data Dictionary

A data dictionary defines the meaning and components of the terminator, data stored and data flow. This is shown in Appendix G.

3.5 Hardware and Software Requirements

The overall system will consist of a server computer which stores the database of the system and client computer in which the staff operates on. All the computers are connected together and form a local area network . The server software selected is Microsoft Windows NT version 2000. The Windows NT is also used as a network operating system. On the client, the software runs on Microsoft Windows 98. The development tool is Microsoft Visual Basic and the database used is Microsoft Access

97. The Microsoft Jet Engine Database is used so that Visual Basic can access Access database.

3.5.1 Hardware Specification

(1) PC Server 1 Unit

- (a) Pentium III 800 MHz
- (b) Memory 128 MB SDRAM
- (c) Hard Disk 20 GB (UDMA) ATA100
- (d) Floppy Disk Drive 1.44 MB
- (e) VGA Card TNT2 16 MB
- (f) Monitor 15"
- (g) 50X CD ROM
- (h) Mouse, Keyboard 108 Keys

(2) PC Clients 5 Units

- (a) Pentium III 600 MHz
- (b) Memory 64 MB SDRAM
- (c) Floppy Disk Drive 1.44 MB
- (d) Hard Disk 20 GB
- (e) VGA Card TNT2 16 MB
- (f) Monitor 15"
- (g) Mouse, Keyboard 108 Keys

(3) Laser Printer 1 Unit

- (a) Hewlett Packard Laser Jet 5P

(4) Dot Matrix Printer 1 Unit

- (a) Epson LQ 1170I

- (5) Network interface card 6 Units
 - (a) Linksys NC100
- (6) Hub 1 Unit
 - (a) Linksys 24 ports
- (7) Unshield Twisted Pair (UTP) Cable
 - (a) Category 5 (supporting 100 Mbps)
- (8) Tape Backup Drive 1 Unit
 - (a) Capacity 2 GB
- (9) UPS
 - (a) Capacity 800 VA

3.5.2 Software Specification

- (1) Operating System
 - (a) Microsoft Windows NT Server version 2000
 - (b) Microsoft Windows 98
- (2) System Development Software
 - (a) Visual Basic for Application in Microsoft Office 97
 - (b) Microsoft Access Version 97
- (3) System Software
 - (a) Microsoft Office Version 97
- (4) Document Preparation Software
 - (a) Visio 5.0 Professional
 - (b) Visible Analysis

3.6 Cost and Benefits

Each department gets new computer hardware with higher specification to use with the new operating system such as Windows 98 and application programs such as Microsoft Office 97.

A LAN system will be used as a system network for this new database system. The computer system is designed as bus topology for the network structure and uses fast Ethernet 100 MB/s as the backbone for connecting the computer to the network system. In case of future upgrading need for the computer system, Ethernet 100 Mbs will be easier to upgrade. The adoption of a LAN will solve the problem of sharing hardware and data between department. By using a LAN and central database server Purchasing and inventory data, duplication will be eliminated. Keeping in our mind that security and reliability are also important concerns, this new system will be using the UPS to protect the data from unexpected accidents. Other security steps are taken by using password system. The Master files and Transaction file can be accessed through the reliable database management system. It has been this project's concern to create database that is easy to maintain and update. Data entry will be standardized so that personnel can easily be trained to perform various data entry tasks.

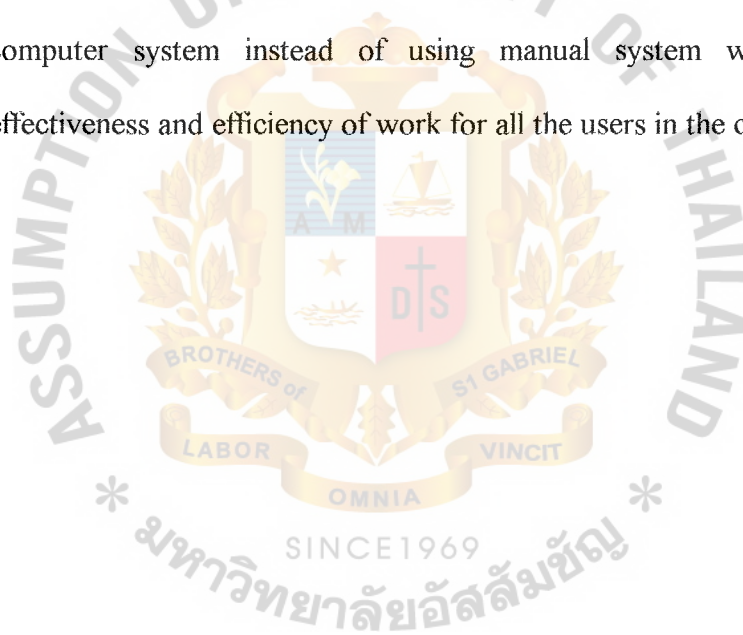
3.6.1 Tangible Benefits

- (1) Reduce human resource used in the system, reduce the salary costs, overtime cost of the workers.
- (2) Save time and cost of implementing data, save cost of stationery and accessories.
- (3) Better database management and better future planning.
- (4) Accurate reports for making decisions and over all planning

- (5) Greater data accuracy, timely and useful reports, faster query access and customizable reporting capability.
- (6) Better security.

3.6.2 Intangible Benefits

- (1) Expanded flexibility and capabilities for workers by allowing authorized employees greater access to critical inventory data and information from and location or department in the company.
- (2) Improve employee's morale.
- (3) Improve effectiveness and efficiency of inventory operation: using computer system instead of using manual system will increase the effectiveness and efficiency of work for all the users in the company.



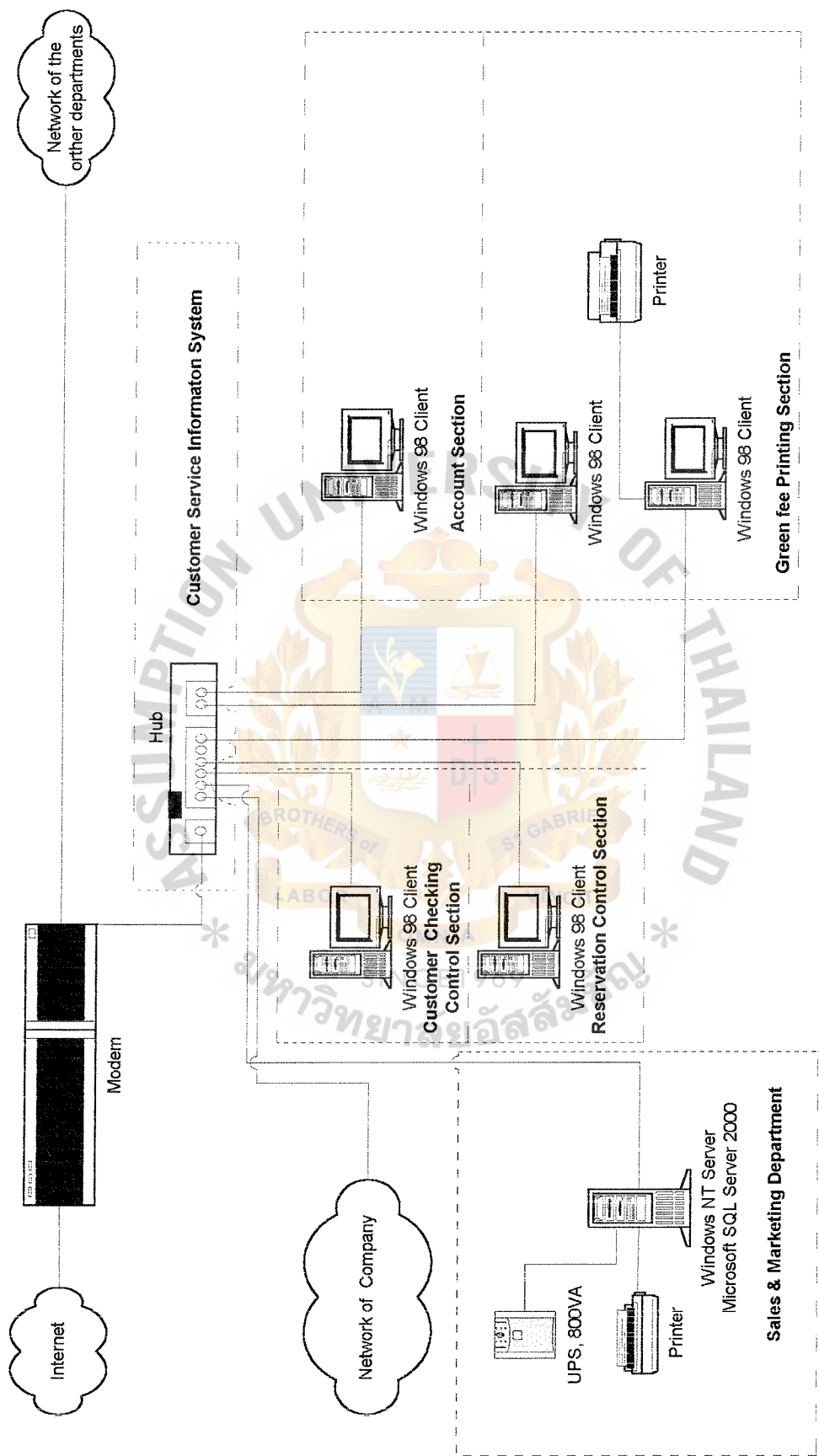


Figure 3.1. Hardware Configuration of the Proposed System.

3.6.3 Cost Analysis of the Proposed System

Table 3.1. Hardware Cost, Baht.

Description	Unit	Price/Unit	Total
File Server	1	50,000	50,000
Workstation	5	40,000	200,000
US Robotic Modem 56K	1	5,000	5,000
Dot Matrix Printer HP LQ 1170	2	30,000	60,000
Accton 10/100 Switching Hub	1	5,100	5,100
Leonic UPS, 800VA	3	3,100	9,400
Terminator connector	5	70	350
Cable UTP/1-5@8 Core Level5	100	10	1,000
Ethernet Card	6	1,500	9,000
Compex 10 Base T Hub	2	4,100	8,200
Total Hardware Cost			345,050

Table 3.2. Software Cost, Baht.

Description	Unit	Price/Unit	Total
Microsoft Windows NT	1	15,000	15,000
Microsoft Window 98 Thai	5	8,770	43,850
Microsoft SQL Server 2000	1	20,000	20,000
Microsoft Office 97	5	21,700	108,500
Total Software Cost			187,350

Table 3.3. Implementation Cost, Baht.

Description	Unit	Price/Unit	Total
Advanced Training Cost	1	105,000	105,000
Basic Training Cost	1	70,000	70,000
Set up Cost	1	200,000	200,000
Total Implementation Cost			375,000

Table 3.4. Operation Cost, Baht.

Description	Unit	Price/Unit	Total
Maintenance Cost	5	10,000	50,000
Operation Cost	1	50,000	50,000
Total Operation Cost			100,000

Table 3.5. Development Cost, Baht.

* Description *	Total
Hardware Cost	345,050
Software Cost	187,350
Implementation Cost	375,000
Total Development Cost	907,400

(1) Costs of the Manual System

Table 3.6. Manual System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
<u>Operating Cost</u>					
<u>Salary Cost:</u>					
Sales & Marketing Manager 1 person @ 25,000	25,000.00	27,500.00	30,250.00	33,275.00	36,602.50
<u>Staff:</u>					
Admin officer 4 persons @ 18,000	72,000.00	79,200.00	87,120.00	95,832.00	105,415.20
Reservation 2 persons @ 9,000	18,000.00	19,800.00	21,780.00	23,958.00	26,353.80
Cashier 2 persons @ 8,000	16,000.00	17,600.00	19,360.00	21,296.00	23,425.60
Reception 6 persons @ 7,000	42,000.00	46,200.00	50,820.00	55,902.00	61,492.20
Total monthly salary Cost	173,000.00	190,300.00	209,330.00	230,263.00	253,289.30
Total Annual Salary Cost	2,076,000.00	2,283,600.00	2,511,960.00	2,763,156.00	3,039,471.60
<u>Office Supplies & Miscellaneous Cost:</u>					
Stationery Per Annual	5,000.00	5,500.00	6,050.00	6,655.00	7,320.50
Paper Per Annual	10,000.00	11,000.00	12,100.00	13,310.00	14,641.00
Utility Per Annual	10,000.00	11,000.00	12,100.00	13,310.00	14,641.00
Miscellaneous Per Annual	5,000.00	5,500.00	6,050.00	6,655.00	7,320.50
Total Annual Office Supplies & Miscellaneous Cost	30,000.00	33,000.00	36,300.00	39,930.00	43,923.00
Total Annual Operating Cost	2,106,000.00	2,316,600.00	2,548,260.00	2,803,086.00	3,083,394.60
Total Manual System Cost	2,106,000.00	2,316,600.00	2,548,260.00	2,803,086.00	3,083,394.60

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

Year	Total Manual Cost	Accumulated Cost
1	2,106,000.00	2,106,000.00
2	2,316,600.00	4,422,600.00
3	2,548,260.00	6,970,860.00
4	2,803,086.00	9,773,946.00
5	3,083,394.60	12,857,340.60
Total	12,857,340.60	—

(2) Costs of the Computerized System

Table 3.8. Computerized System Cost Analysis, Baht.

Cost items	Years				
	1	2	3	4	5
Fixed Cost					
Total Hardware Cost 345,050/5	69,010.00	69,010.00	69,010.00	69,010.00	69,010.00
Computer Server Cost	—	50,000.00	55,000.00	60,500.00	66,550.00
Workstation Cost	—	50,000.00	55,000.00	60,500.00	66,550.00
Total Maintenance Cost	—	100,000.00	110,000.00	121,000.00	133,100.00
Total Software Cost 100,550/5	20,110.00	20,110.00	20,110.00	20,110.00	20,110.00
Implementation Cost:					
Advanced Training Cost	105,000.00	—	—	—	—
Basic Training Cost	70,000.00	—	—	—	—
Setup Cost	200,000.00	—	—	—	—
Total Implementation Cost	375,000.00	—	—	—	—
Total Fixed Cost	839,120.00	189,120.00	199,120.00	210,120.00	222,220.00
Operating Cost					
People-Ware Cost:					
Marketing Manager 1 person @ 25,000	25,000.00	27,500.00	30,250.00	33,275.00	36,602.50
Staff:					
Admin Officer 2 persons @ 10,000	20,000.00	22,000.00	24,200.00	26,620.00	29,282.00
Reservation 1 person @ 10,000	10,000.00	11,000.00	12,100.00	13,310.00	14,641.00
Cashier/Reception 3 persons @ 7,000	21,000.00	23,100.00	25,410.00	27,951.00	30,746.10
Compensation for Retired Worker 6 persons @ 120,000	720,000.00	—	—	—	—
Total Monthly Salary Cost	76,000.00	83,600.00	91,960.00	101,156.00	111,271.60
Total Annual Salary Cost	1,632,000.00	1,003,200.00	1,103,520.00	1,213,872.00	1,335,259.20
Office Supplies & Miscellaneous Cost:					
Stationery 500 per month	6,000.00	6,600.00	7,260.00	7,986.00	8,784.60
Paper 2,500 per month	30,000.00	33,000.00	36,300.00	39,930.40	43,923.00
Utility 1,500 per month	18,000.00	19,800.00	21,780.00	23,958.00	26,353.80
Miscellaneous 3,000 per month	36,000.00	39,600.00	43,560.00	47,916.00	52,707.60
Annual Office Supplies & Miscellaneous Cost	90,000.00	99,000.00	108,900.00	119,790.00	131,769.00
Total Operating Cost	2,542,600.00	1,291,320.00	1,411,540.00	1,543,782.00	1,689,248.20
Total Computerized System Cost	2,542,600.00	1,291,320.00	1,411,540.00	1,543,782.00	1,689,248.20

Table 3.9. Five Years Accumulated Computerized Cost, Baht.

Year	Total Computerized Cost	Accumulated Cost
1	2,561,120.00	2,561,120.00
2	1,291,320.00	3,852,440.00
3	1,411,540.00	5,263,980.00
4	1,543,782.00	6,807,762.00
5	1,689,248.20	8,497,010.20
Total	8,497,010.20	—

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

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

Year	Accumulated Manual Cost	Accumulated Computerized Cost
1	2,106,000.00	2,561,120.00
2	4,422,600.00	3,852,440.00
3	6,970,860.00	5,263,980.00
4	9,773,946.00	6,807,762.00
5	12,857,340.60	8,497,010.20

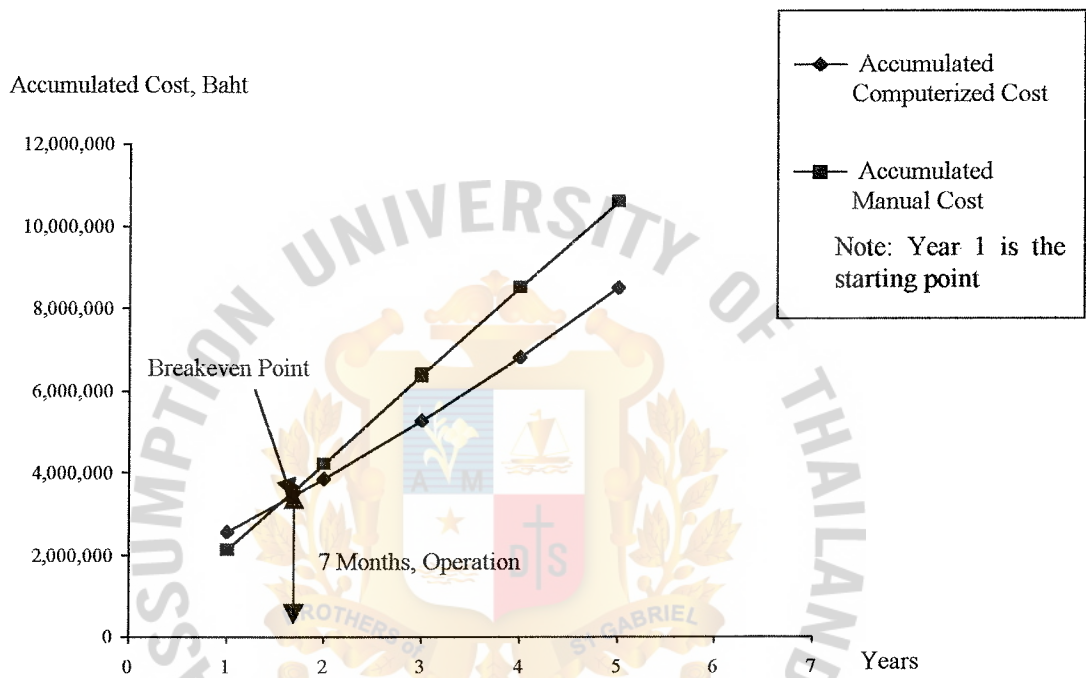


Figure 3.2. Cost Comparison between the Manual and Proposed Systems.

3.7 Time Value of Money

The current value, actually present value, of baht at any time in the future can be calculated by using the following formula:

$$PV_n = 1 (1 + i)^n$$

Where PV_n is the present value of Baht 1.00 n years from now and (i) is the discount rate. Therefore, the present value of a Baht two years from now is:

$$PV_n = 1 (1 + 10)^2 = 0.82$$

3.8 Return-on-Investment Analysis

Technique that compares the lifetime profitability of the new project. The ROI is calculated as follows:

$$ROI \cong \frac{(\text{Estimated lifetime benefits} - \text{Estimated lifetime costs})}{\text{Estimated lifetime costs}}$$

The estimated lifetime benefit minus estimated lifetime costs equal:

$$10,581,466.43 - 7,243,757.68 = 3,337,708.75 \text{ Baht}$$

Therefore, the New project ROI is:

$$ROI = (3,337,708.75 / 10,581,466.43) = 0.3154 \times 100$$

The lifetime ROI is 31.54% and Payback Period 7 months.

Table 3.11. Cost Analysis of Proposed System, Baht.

Cost items	Years				
	0	1	2	3	4
Computerized System Cost	2,561,120.00				
Operation Cost for Proposed System		1,291,320.00	1,411,540.00	1,543,782.00	1,689,248.20
Discount for 10%	1.00	0.90	0.86	0.75	0.68
Time Adjust cost	2,561,120.00	1,162,188.00	1,213,924.40	1,157,836.50	1,148,688.78
Cumulative Time Adjustment Cost	2,561,120.00	3,723,308.00	4,937,232.40	6,095,068.90	7,243,757.68
Operation Cost for Existing System	2,106,000.00	2,316,600.00	2,548,260.00	2,803,086.00	3,083,394.60
Discount Factor for 10%	1.00	0.90	0.86	0.75	0.68
Time Adjust Cost	2,106,000.00	2,084,940.00	2,191,503.60	2,102,314.50	2,096,708.33
Cumulative Time Adjustment Cost	2,106,000.00	4,190,940.00	6,382,443.60	8,484,758.10	10,581,466.43
Cumulative Lifetime Cost and Benefits	-455,120.00	467,632.00	1,445,211.20	2,389,689.20	3,337,708.75

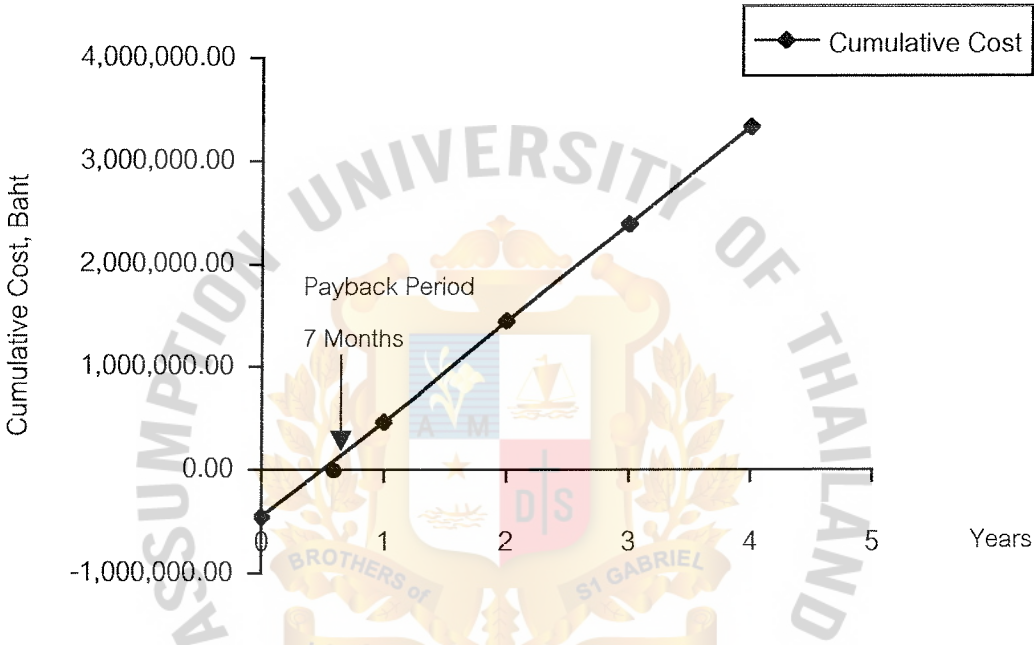


Figure 3.3. Payback Analysis.

3.9 Calculation of Break Even Year

It is reasonable to apply the concept of break-even analysis to compare between the current system and the proposed system. In this case the cost of the new system is compared to the cost of the current system to determine the point at which the new system costs the same as the old one.

Figure 3.2 Cost of Computerized system and Benefit Derived from New System diagram, shows that the cost of the new system initially would be higher than the current system. In three years and a month, the new system would have reached the break-even point and thereafter becomes more economical to operate than that of the current system.

3.10 Security and Control

One of the most important considerations in system development and on-going operation is the system security. Security of the system is concerning security of hardware and security of data.

Hardware security

Hardware security refers to all the equipment's related to the computer system such as the computer itself, hard disk, LAN card, network equipment, and other things that could be illegally accessed, stolen, or destroyed. The following control should be in place so that the risk or damage to the computer system is minimized:

- (1) Server computer should be in a place where only authorized person can have access.
- (2) A closed-circuit TV monitor should be installed to monitor the system.
- (3) An on-line uninterruptible power supply (UPS) should be used to protect the sags and surges in power output or brownouts (low power) or power down which might cause a hard disk damage.

- (4) Hard disk with raid 5 system will be used to store database on the server so that if one hard disk fails, other can continue in operation.
- (5) Network wiring should be done properly to prevent the damage to the cable.
- (6) Spare of the equipment's should also be prepared to replace the damaged equipment.

Data security

Data security refers to protection of data in the system. This includes preventing unauthorized access to the data, control of access to the sensitive data, minimize loss or damage of data, and data integrity. The following control is implemented to ensure the security of data:

- (1) A password control for user logging into the system.
- (2) Restriction is applied to the accessing of specific module which contains sensitive data such as customer information.
- (3) A user is allowed to use only the module which he/she is responsible for.
- (4) Different user is restricted to different modes of access to the data i.e., read only or achieved
- (5) Data in the system has to be backed up daily.
- (6) Data integrity is enforced in the database designed.
- (7) Audibility is implemented to track time and user who accessed the data.

IV. PROJECT IMPLEMENTATION

4.1 Implementation Procedures

Implementation includes all the activities related to preparing the system for end users. The following activities are carried out in implementation phase:

- (1) Site preparation
- (2) Hardware installation
- (3) Software installation
- (4) User training
- (5) Data conversion (Input initial data into system)
- (6) Parallel run
- (7) System review
- (8) Live run
- (9) Post implementation review

Site Preparation

Site preparation involves installation of electrical and network equipment. Electrical installation includes the electrical wiring and placement of outlets, if they are not already in place. Then the UPS is installed and tested. Network installation includes the network wiring and placement of outlets. These activities takes 3 days to complete.

Hardware Installation

After the site preparation is completed, all the hardware will be put in place and tested. This can be done in a few hours.

Software Installation

The installation of the software includes installing operating system, Windows NT for server and Windows 98 for clients, Microsoft Access database, Visual Basic, and Golf Course's customer service information system on the server. The network system is tested to ensure that the client workstations can access programs and database on the server. Then users and security scheme are created and set up in the system. This takes 3-4 days.

User Training

User training can be done prior to or in parallel with the three activities above. The personnel who will be associated with or affected by the system, must know in detail what their role will be, how they can use the system, and what the system will or will not do. Both systems operators and users need training.

- (1) System operators are persons who are responsible for keeping the equipment's running as well as for providing the necessary support service. Their training must ensure that they are able to handle all possible operations. Those people are such as EDP manager or computer operator. The training needed for system operators are Windows NT, Windows 98, Microsoft Access, and etc.
- (2) Users are people who will be using the system in assistance to their work. User training involves equipment usage and the how to operate the system implemented. The operation of system training emphasizes on the data handling activities and procedures. This includes adding data or new transaction, editing data, formulating enquiries, deleting data and producing report in all the modules in the system.

Data Conversion or Input Initial Data into the System

If there is an existing system in operation, all the data fields in files or tables must be identified. Then they must be completed with the data structure of the new system so that the correct data are transferred into the new system. For the data fields that do not exist in the existing system and are required by the new system, it is the responsible of users to define the values of those data and input them into the system. If the amount of data in the existing system is not a lot, the data can be manually input to the new system. This method is highly recommended as to get users familiar with the system and validation of data is properly done through the entry procedure of the new system. But in case where there are too much of data to handle, a conversion program will be developed to get data from the existing system and transfer to the new system.

Test Run (parallel run)

When all the data are entered into the system and everything is in place, the system is ready to run. At the beginning, the system should be operated in parallel with the existing system. Since users are not yet familiar with the new system and unexpected problem could occur. This step should go on for around 2 weeks or until users are confident with the new system.

System Review

System review is carried out throughout the test run of the new system. The system review is the process conducted by user and system analysis to determine how well the system is working, how it has been accepted and whether the adjustments are needed. If any unexpected error occurs, they can be corrected before the system goes live.

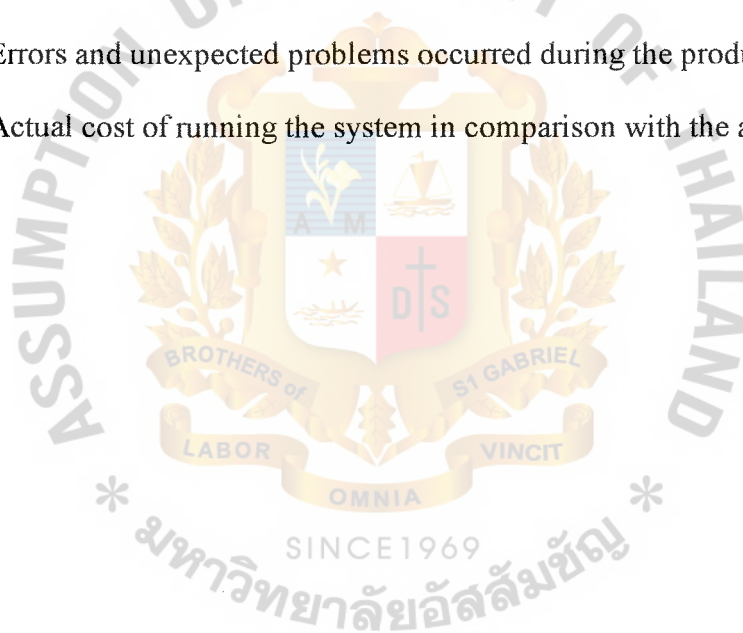
Live Run

Finally, after the revision of the system and all the errors have been corrected, the system is now ready to turn over to the users and go on live.

Post Implementation Review

Post implementation review is a critical examination of the system after it has been put into production. The evaluation is conducted in three months of the live run of the system. The post implementation reviews focus on the following:

- (1) A comparison of the system's actual performance and the anticipated performance objectives.
- (2) Errors and unexpected problems occurred during the production.
- (3) Actual cost of running the system in comparison with the anticipated cost.



V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The study of system development project of the Natural Hills' Customer Service Information System reveals a need for a golf course organization to utilize a computer system. A system which automates the customer database management and reservation processes offers users a great deal of benefit, compared to the manual system. A clear tangible benefit that a golf course organization receives from using this computer system is reducing the cost of man power. 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.

The system presented in this project was designed for a golf course organization in general. Some modifications may be required in order for the system to fit user requirements of a specific organization. Well known and popular tools are used to develop the system. This ensures that the system tools won't be obsolete in near future, and can be upgraded to newer version. The operating system and network operation system are also easy to use and maintain. The hardware suggested, computers and network equipments, are high-end of its range. This is because the hardware technology changes very fast and the system will be able to cope with future expansion.

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

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

Process	Existing System	Proposed System
Create New Membership Plan	1 hr.	10 mins
Terminate Membership Plan	1 hr.	10 mins
Manage Customer Reservation	4 hrs.	5 mins
Automatically Fill Dated Reservation	2 hrs.	3 mins
Print Green Fee for Sale	12 hrs.	5 mins
Total	20 hrs.	33 mins

To create New Membership Plan and terminate Old Membership Plan, the user must sort the membership information on the file and also write the membership plan detail. After that the user must add, delete, compare the information on the manual existing system. Computerized system can sort and display all the detail of the customer, automatic corrected, and clarify.

To manage Customer Reservation, this process the user must add, delete, edit, compare the reservation on the manual existing system. It takes time to adjust and rewrite reservation. Computerized system can be easily automatic corrected and adjusted by the computer.

Print Green Fee for Sale, computerized system can be input out immediately.

5.2 Recommendations

After all consideration of all concerns with the existing manual system and the computerized system, the author believes that the proposed computerized system is more attractive than the existing system. The proposed system has shown, from the analysis, that it provides effectiveness and efficiency of works, also tendency of higher revenue and cost saving which means higher profit margin that the firm can

earn. Also the expansion of the system to serve the expansion of business in the future has to be mentioned.

After the proposed system is applied, the firm would have to study for further information about computerization and some adjustments might have to be done to fit the firm, perfectly. We can add more optional into the system which are not a big influence to the system but to be a better way of using this system as follows:

- (1) To use a Touch Screen System instead of human input.
- (2) To set security policy for the computer system.
- (3) To integrate an accounting process into the computerized system.
- (4) To link the headquarter and the golf course via a WAN link.

For the future, the firm can decide which section should be developed into the computerized system. The study must concern the costs and benefits that the firm will be able to realize.



APPENDIX A

CONTEXT DIAGRAM

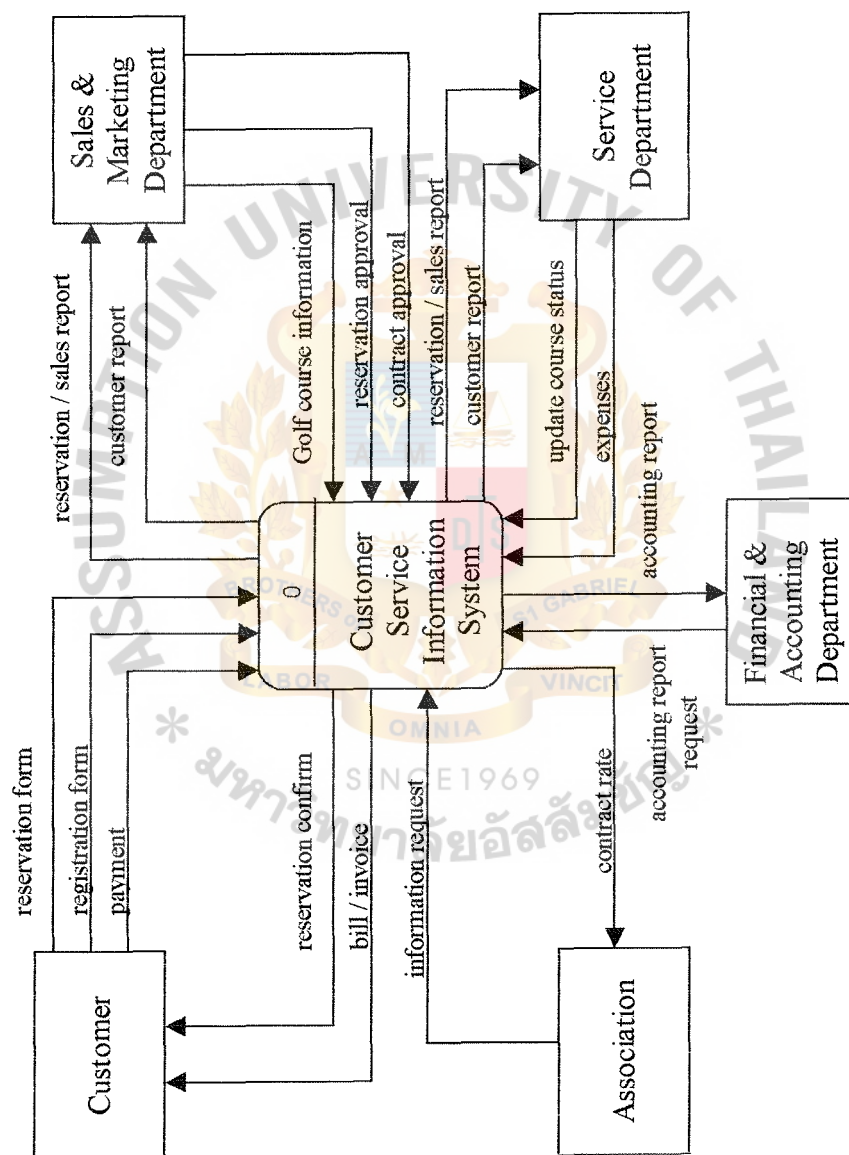


Figure A.1. Context Diagram of the Proposed System.



APPENDIX B

DATA FLOW DIAGRAM (EXISTING SYSTEM)

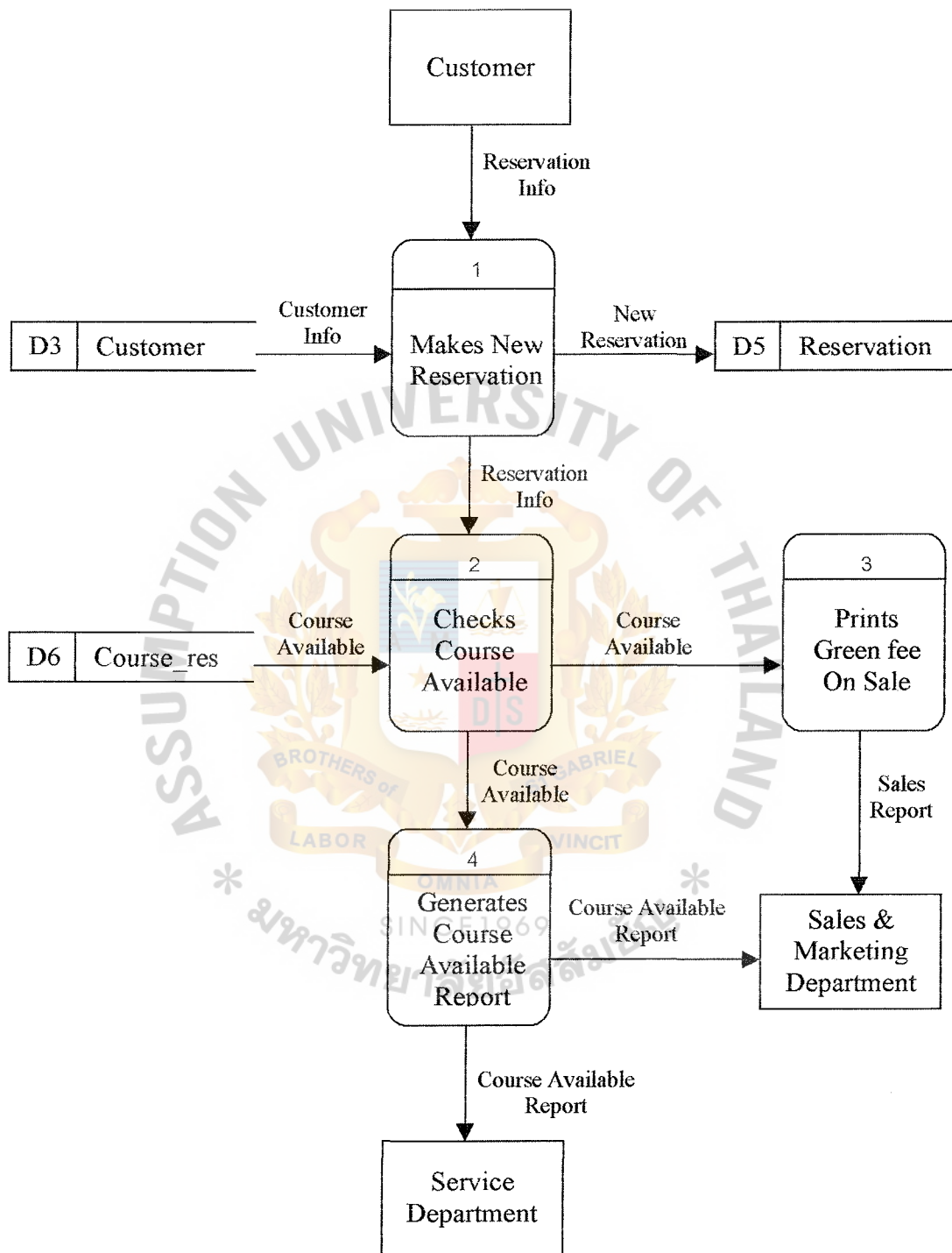


Figure B.1. Data Flow Diagram Level 0 (Existing System).



APPENDIX C

DATA FLOW DIAGRAM (PROPOSED SYSTEM)

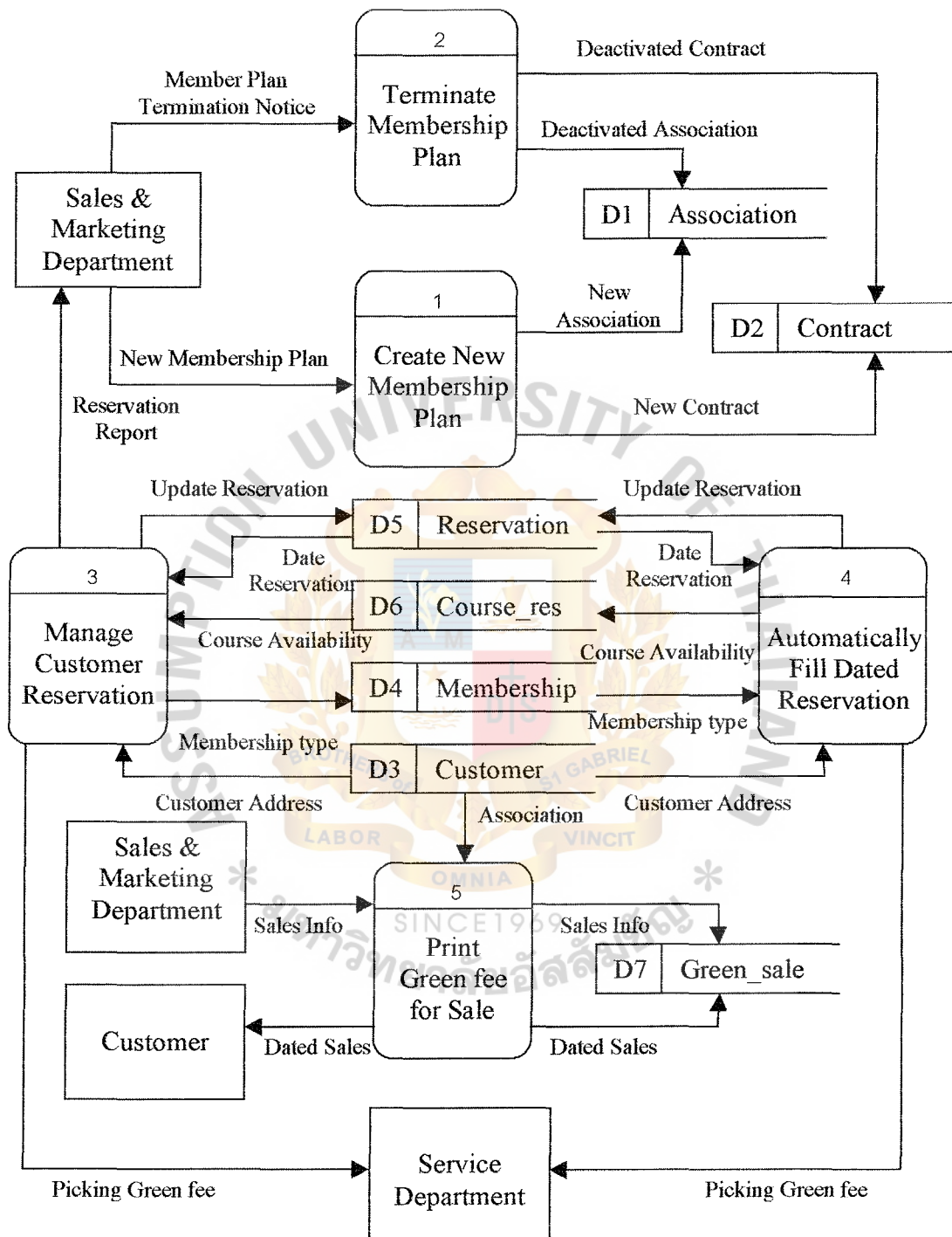


Figure C.1. Data Flow Diagram Level 0 (New System).

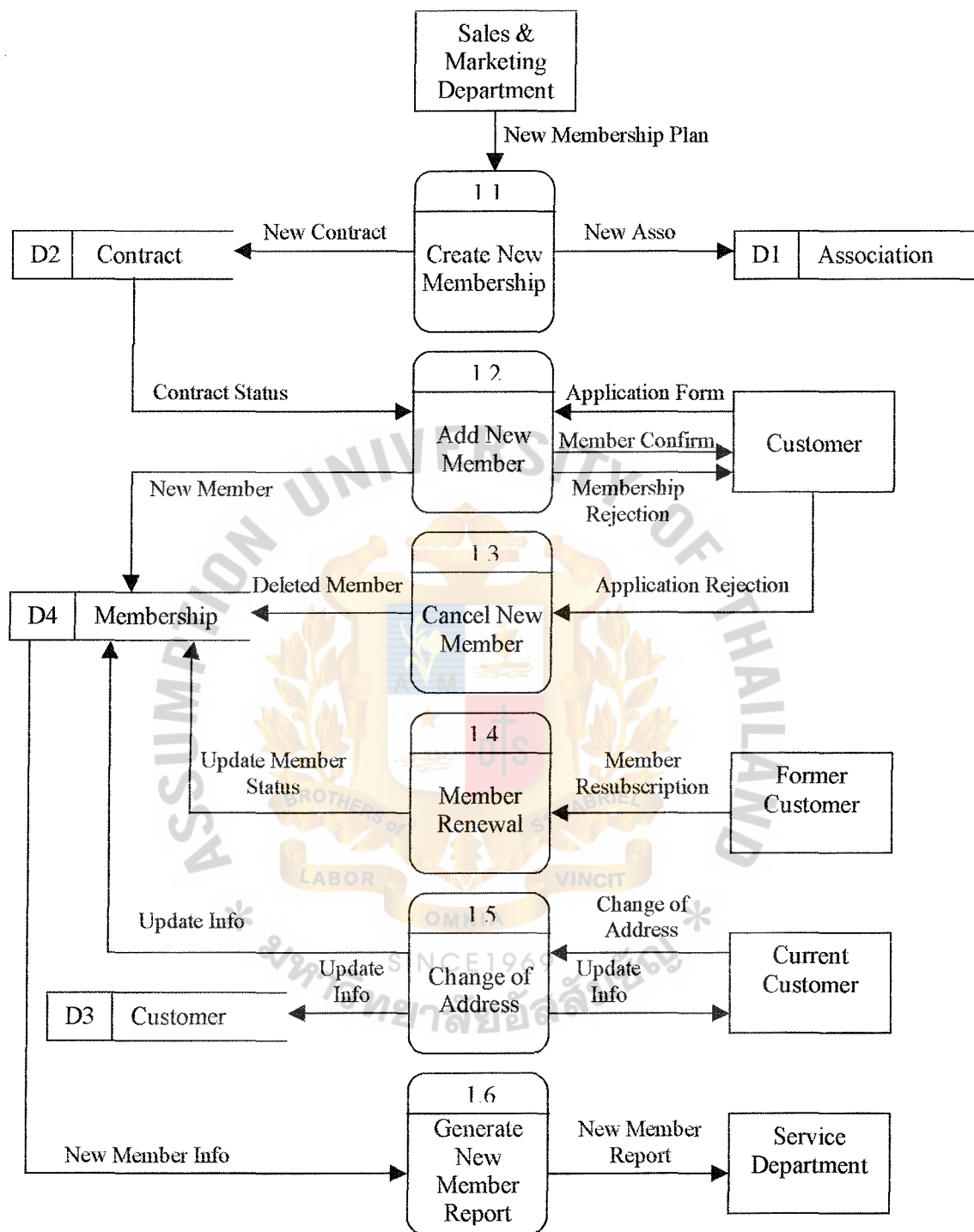


Figure C.2. Data Flow Diagram Level 1 for Process 1 of the Proposed System.

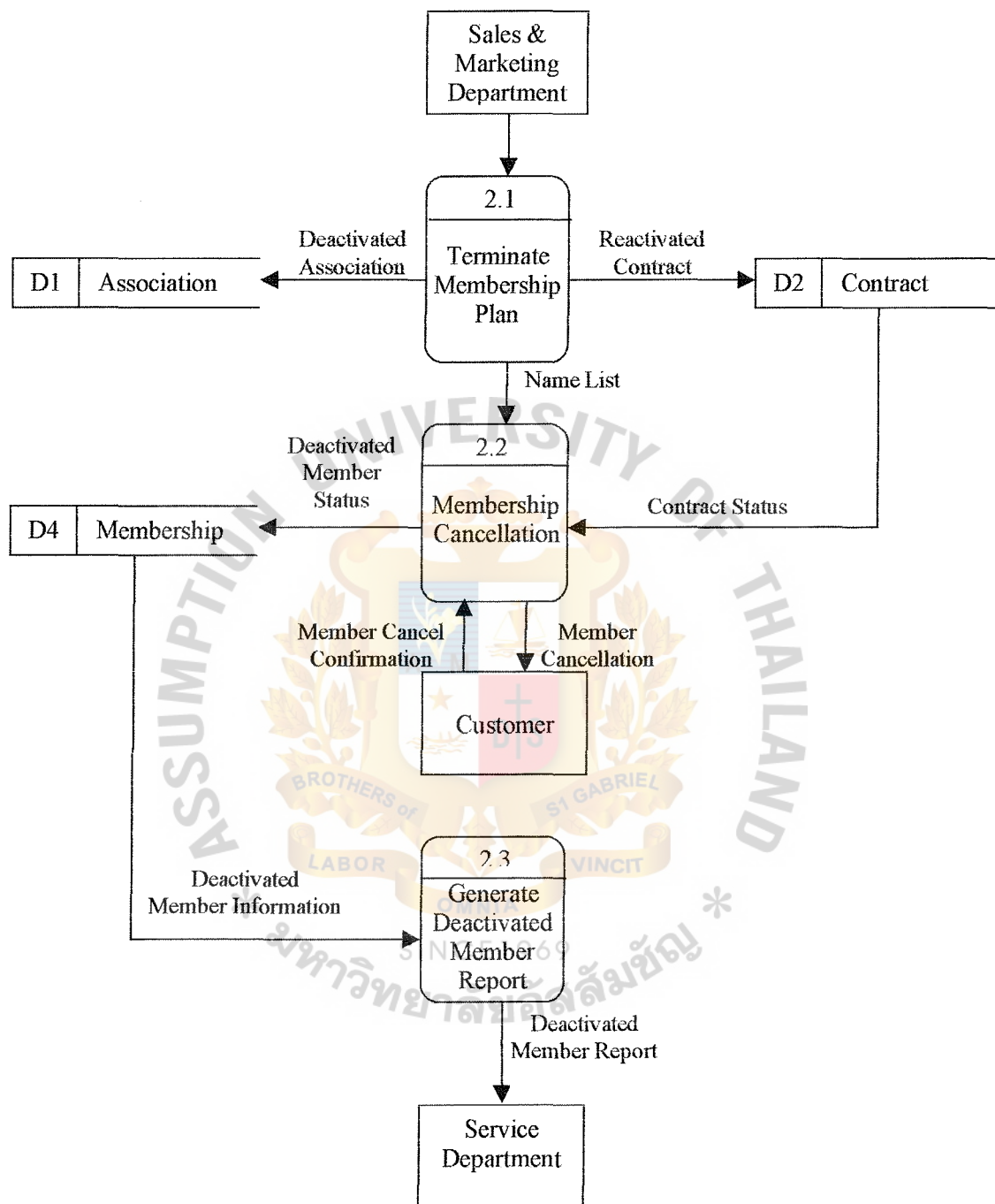


Figure C.3. Data Flow Diagram Level 1 for Process 2 of The Proposed System.

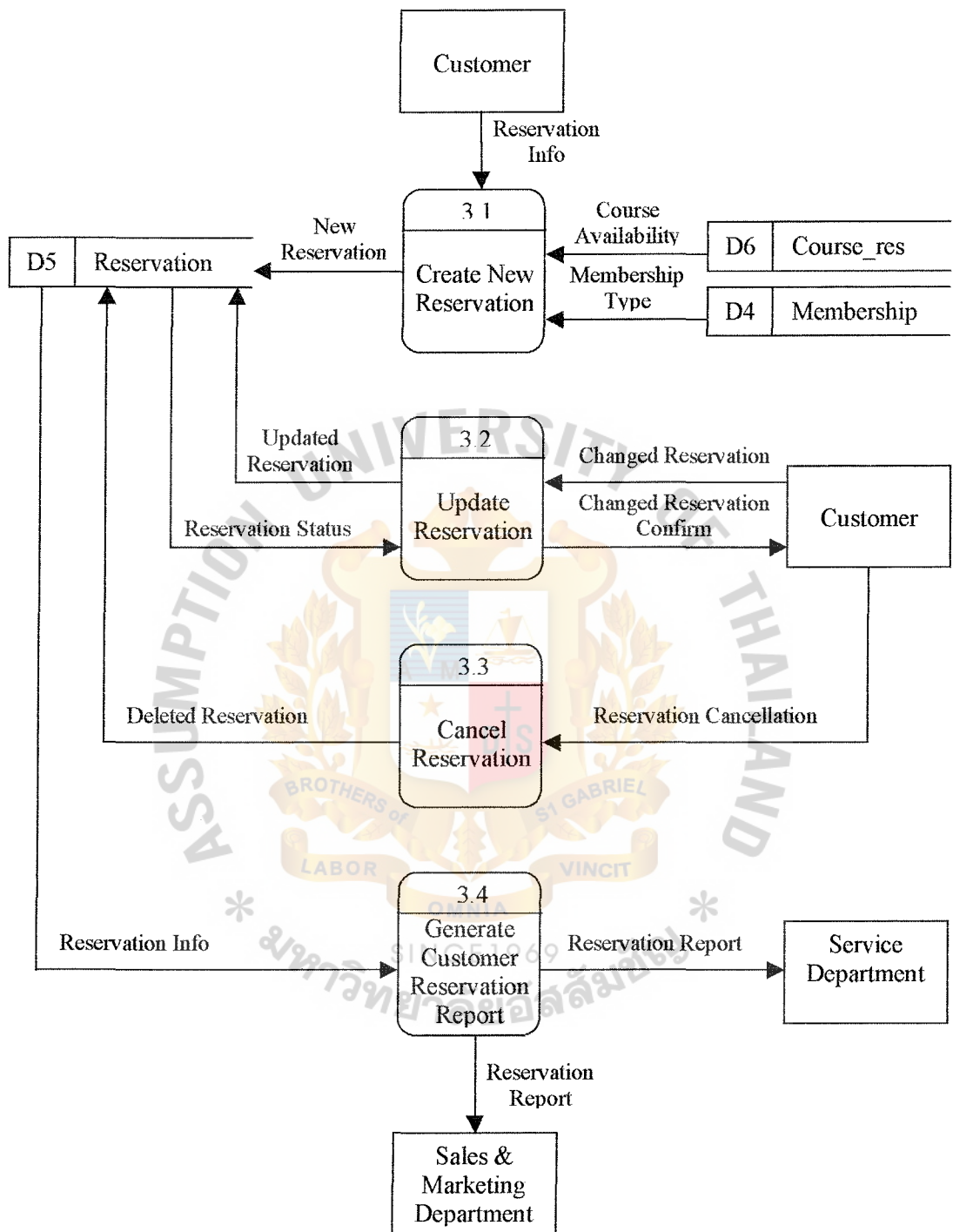


Figure C.4. Data Flow Diagram Level 1 for Process 3 of the Proposed System.

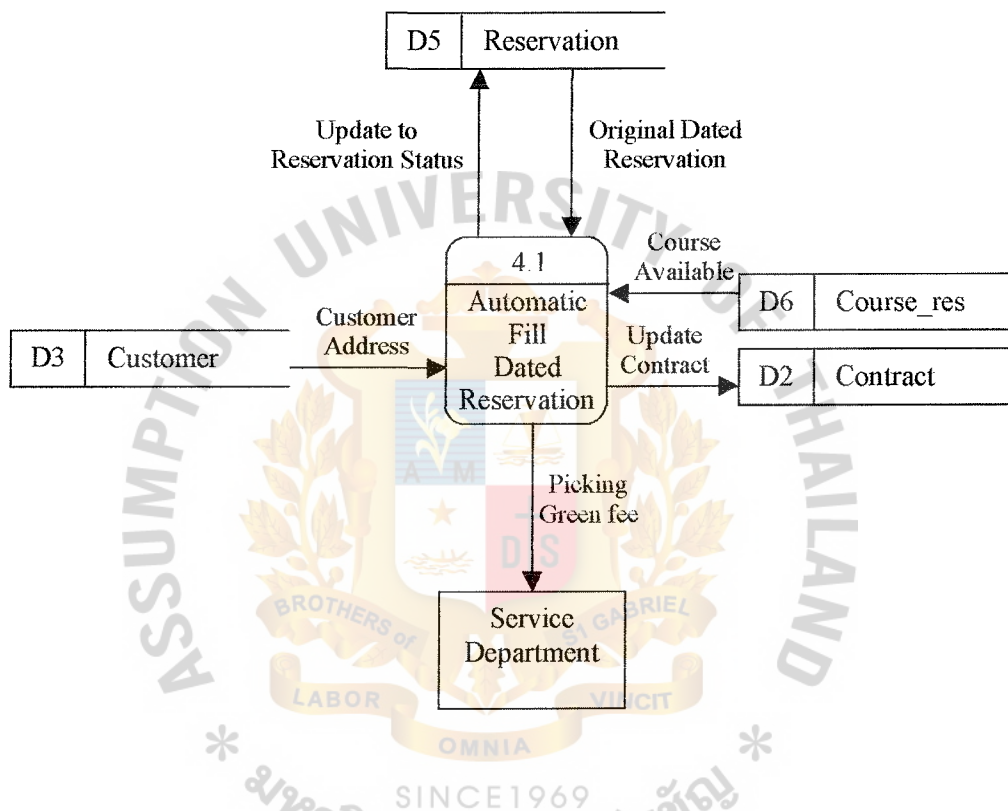


Figure C.5. Data Flow Diagram Level 1 for Process 4 of the Proposed System.

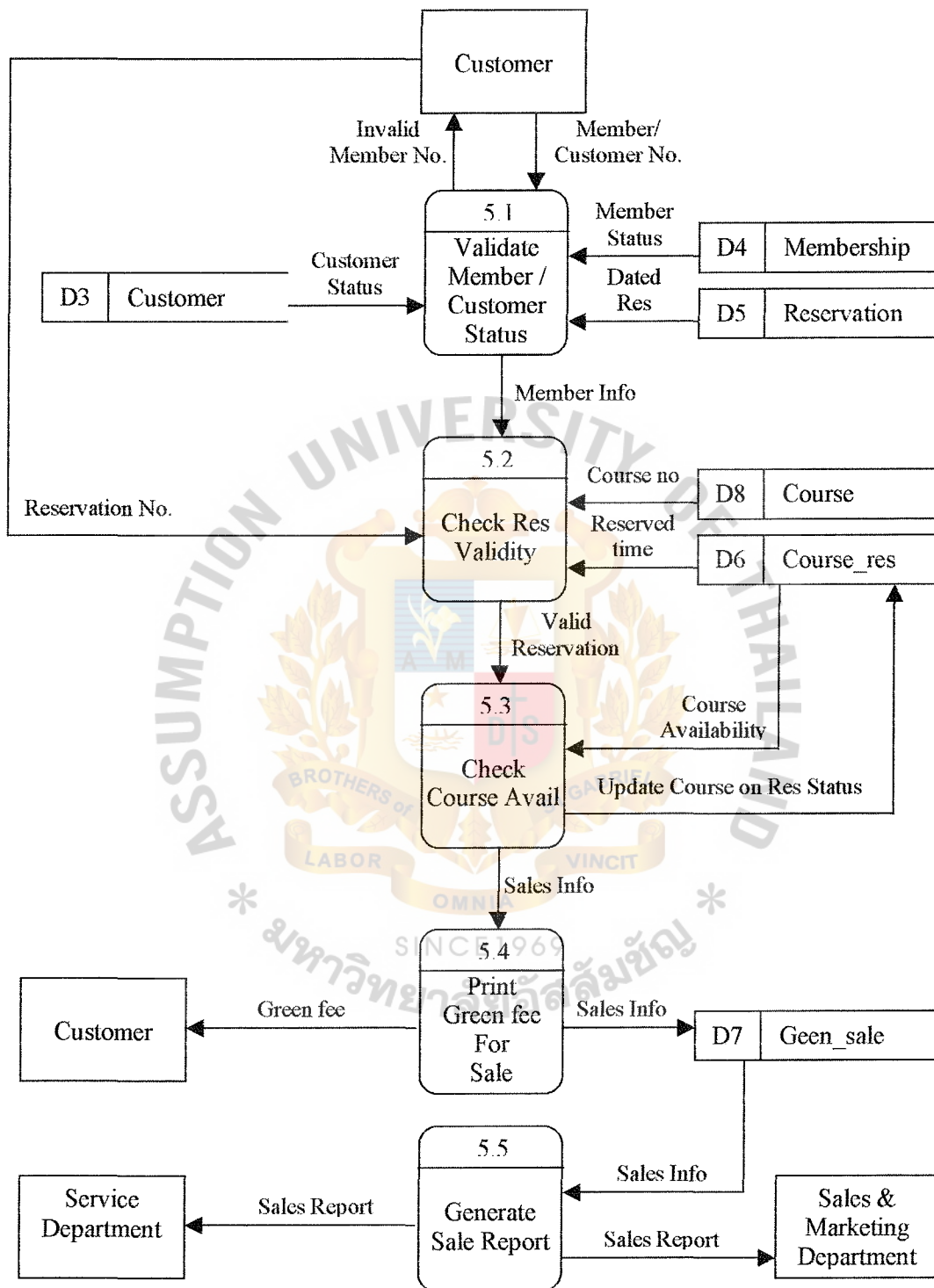


Figure C.6. Data Flow Diagram Level 1 for Process 5 of the Proposed System.



APPENDIX D
DATABASE DESIGN

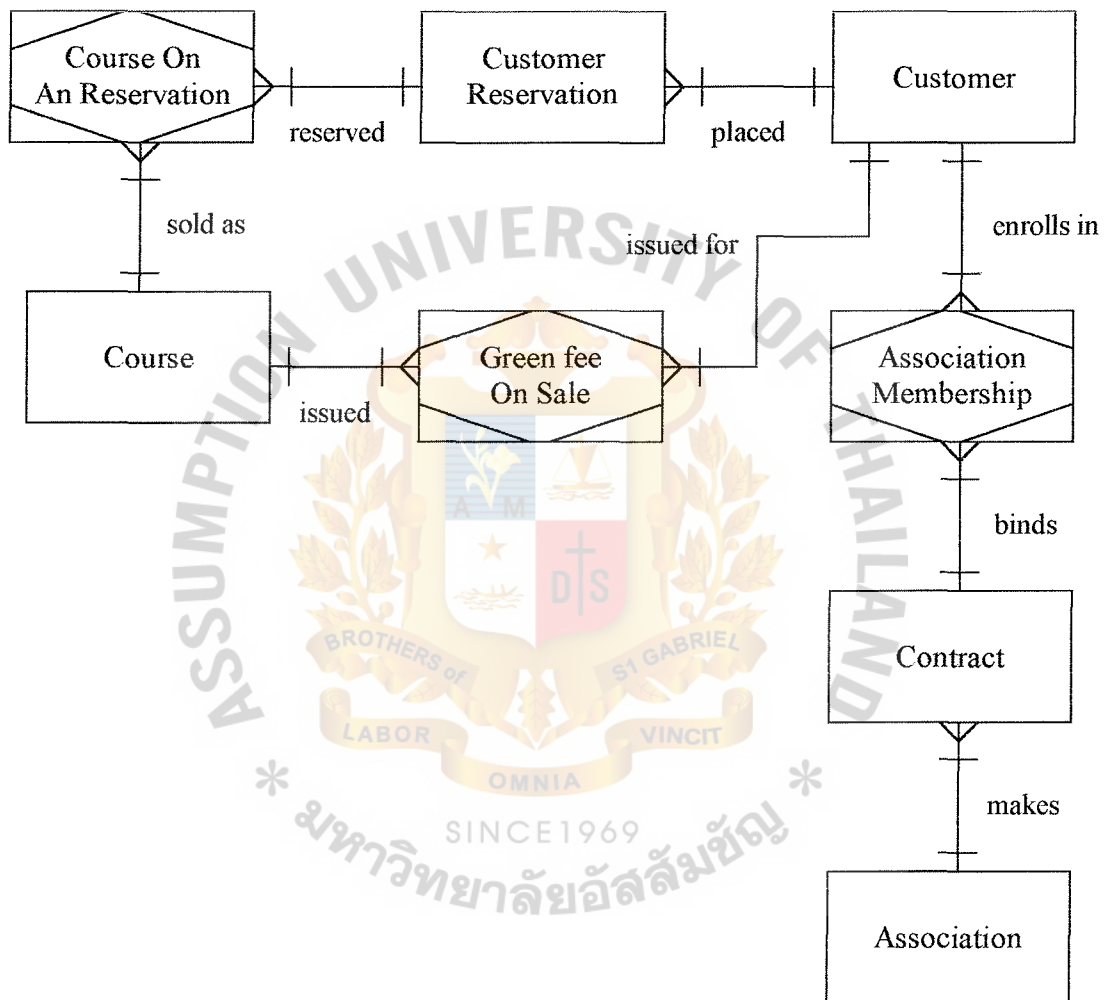


Figure D.1. Entity Relationship Diagram of the Proposed System.

Table D.1. Association.

Asso_no	Asso_name	Asso_type	Asso_address	Asso_phone1	Asso_phone2	Asso_fax	Contact person
---------	-----------	-----------	--------------	-------------	-------------	----------	----------------

No. of member	A_Remark
---------------	----------

Table D.2. Contract.

Contract_no	Asso_no	C_active_date	C_valid_date	WD_green_rate	WE_green_rate	Obligation_period	Condition
-------------	---------	---------------	--------------	---------------	---------------	-------------------	-----------

Table D.3. Customer.

Cust_no	Cust_name	Cust_surname	Gender	Nationality	Birth_date	Age	Home_address1	Home_address2
---------	-----------	--------------	--------	-------------	------------	-----	---------------	---------------

Country	Post Code	Home_Tel	Home_Fax	Id_no	Id_active_date	Id_valid_date	Occupation	Position
---------	-----------	----------	----------	-------	----------------	---------------	------------	----------

Cust_company	Work_address1	Work_Tel	Work_Fax	Contact_address	Status	Spouse	No_Children
--------------	---------------	----------	----------	-----------------	--------	--------	-------------

Cust_handicap	Cust_remark
---------------	-------------

Table D.4. Association Membership.

Member_no	Cust_no	Contract_no	Member_type	No_Share	M_active_date	M_valid_date	M_Remark
-----------	---------	-------------	-------------	----------	---------------	--------------	----------

Table D.5. Customer Reservation.

Res_no	Cust_no	Member_no	Asso_name	Res_date	Res_time	Qty_group	Qty_person	Res_creation_date
Reserved_by	Res_Phone	Res_status	Res_remark					

Table D.6. Course.

Course_no	Course_name	Distance	Qty_hole	Qty_par	Open_time	Close_time	Close_date
-----------	-------------	----------	----------	---------	-----------	------------	------------

Table D.7. Course on an reservation.

Sale_no	Course_no	Res_no	Qty_round	Teeoff_date	Teeoff_time1	Teeoff_time2	Teeoff_hole	Qty_player
---------	-----------	--------	-----------	-------------	--------------	--------------	-------------	------------

Table D.8. Green fee on sale.

Green_no	Course_no	Cust_no	Date	Green_type	Green_price	Payment
----------	-----------	---------	------	------------	-------------	---------



Table D.9. Association Master File.

Field Name	Field Description	Type	Width	Decimal
Asso_no	Code number of association.	C	8	-
Asso_name	The name of the association.	C	50	-
Asso_type	Type of association.	C	2	-
Asso_address	The address of the association.	C	200	-
Asso_phone 1	Telephone no. 1 of the association.	C	15	-
Asso_phone 2	Telephone no. 2 of the association.	C	15	-
Asso_fax	Facsimile number of the association.	C	15	-
Contact_person	Contact person of the association.	C	20	-
No. of member	The quacity of member of the asso.	C	5	-
A_Remark	Association remark.	C	200	-

Table D.10. Contract Master File.

Field Name	Field Description	Type	Width	Decimal
Contact_no	Code number of contract.	C	8	-
Asso_no	Code number of association.	C	8	-
C_active_date	The day that contract is activated.	D	8	-
C_valid_date	The day that contract is valid.	D	8	-
WD_green_rate	The rate of the green fee on Weekday.	N	6	2
WE_green_rate	The rate of the green fee on Weekend.	N	6	2
Obligation_period	The period between C active_date and C valid_date.	C	15	-
Condition	The Condition of the contract.	C	200	-

Table D.11. Customer Master File.

Field Name	Field Description	Type	Width	Decimal
Cust_no	Code number of customer.	C	8	-
Cust_name	The name of the customer.	C	50	-
Cust_surname	The surname of the customer.	C	50	-
Gender	The gender of the customer.	C	1	-
Nationality	Nationality of customer.	C	10	-
Birth_date	Customer's birthday.	D	8	-
Age	The age of the customer.	C	10	-
Home_address 1	The address of the customer's home.	C	60	-
Home_address 2	The address of the customer's home.	C	60	-
Country	The country where the customer stays.	C	15	-
Post code	The post code of the customer's address.	C	8	-
Home_Tel	The telephone number of the customer's home.	C	15	-
Home_Fax	The facsimile number of the customer's home.	C	25	-
Id_no	The identity card number of the customer.	C	15	-
Id_active_date	The day that the identity card are activated.	D	8	-
Id_valid_date	The day that the identity card is valid.	D	8	-
Occupation	The occupation of the customer.	C	30	-
Position	The job position of the customer.	C	30	-
Cust_company	The company's name which the customer works for.	C	50	-
Work_address	The company's address which the customer works for.	C	200	-
Work_Tel	The telephone number of the customer's company.	C	15	-
Work_Fax	The facsimile number of the customer's company.	C	15	-
Contact_address	The place which we can contact the customer.	C	15	-
Status	Customer's status.	C	15	-
No_children	The number of the customer's children.	N	2	-
Cust_handicap	The handicap of the customer.	C	2	-
Cust_remark	The more info. of the customer.	C	200	-

Table D.12. Association Membership File.

Field Name	Field Description	Type	Width	Decimal
Member_no	Code number of member.	C	8	-
Cust_no	Code number of customer.	C	8	-
Contract_no	Code number of contract.	C	8	-
Member_type	Type of member.	C	15	-
No_Share	The amount of share which the customer has for the golf course.	N	10	2
M_active_date	The day that the membership is activated.	D	8	-
M_valid_date	The day that the membership is valid.	D	8	-
M_Remark	The more information of the member.	C	200	-

Table D.13. Customer Reservation File.

Field Name	Field Description	Type	Width	Decimal
Res_no	Code number of Reservation.	C	8	-
Cust_no	Code number of customer.	C	8	-
Member_no	Code number of member.	C	8	-
Asso_name	The name of the association.	C	50	-
Res_date	The day which the customer reserves course.	D	8	-
Res_time	The time which the customer reserves course.	C	5	-
Qty_group	The quantity of the customer's group.	N	2	-
Qty_person	The quantity of the player in group.	N	2	-
Res_create_date	The day when the customer makes the reservation.	D	8	-
Reserved_by	The name of the person who makes the reservation.	C	15	-
Res_phone	Telephone number.	C	15	-
Res_status	Status of the reservation.	C	10	-
Res_remark	The more info of the reservation.	C	200	-

Table D.14. Course Master File

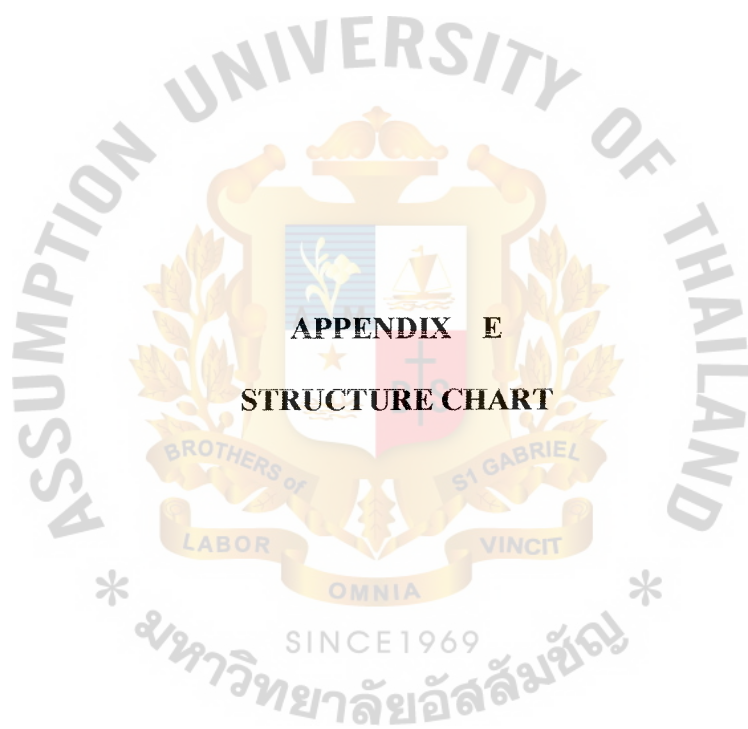
Field Name	Field Description	Type	Width	Decimal
Course_no	Code number of the golf course.	C	8	-
Course_name	The name of the golf course.	C	30	-
Distance	The long distance of the golf course.	C	15	-
Qty_hole	The quantity of the holes in the golf course.	C	10	-
Qty_par	The quantity of pars in the golf course	C	10	-
Open_time	The opened time of the golf course.	C	5	-
Close_time	The closed time of the golf course.	C	5	-
Close_date	The closed date of the golf course	D	8	-

Table D.15. Course on a reservation file.

Field Name	Field Description	Type	Width	Decimal
Sale_no	Code number of sale.	C	8	-
Course_no	Code number of course.	C	8	-
Res_no	Code number of course.	C	8	-
Qty_round	The quantity of round which the player plays golf.	C	8	-
Teeoff_date	The day that the player tees off.	D	8	-
Teeoff_time 1	The first time that the player tees off.	C	5	-
Teeoff_time 2	The second time that player tees off.	C	5	-
Teeoff_hole	The hole that the player tees off.	C	8	-
Qty_player	The quantity of player in group.	N	2	-

Table D.16. Green fee on sale file.

Field Name	Field Description	Type	Width	Decimal
Green_no	Code number of green fee.	C	10	-
Course_no	Code number of golf course.	C	8	-
Cust_no	Code number of customer.	C	8	-
Date	The day that computer prints green fee.	D	8	-
Green_type	Type of green fee.	C	15	-
Green_price	Price of green fee.	N	10	2
Payment	The way that player pays money for green fee.	C	200	-



APPENDIX E
STRUCTURE CHART

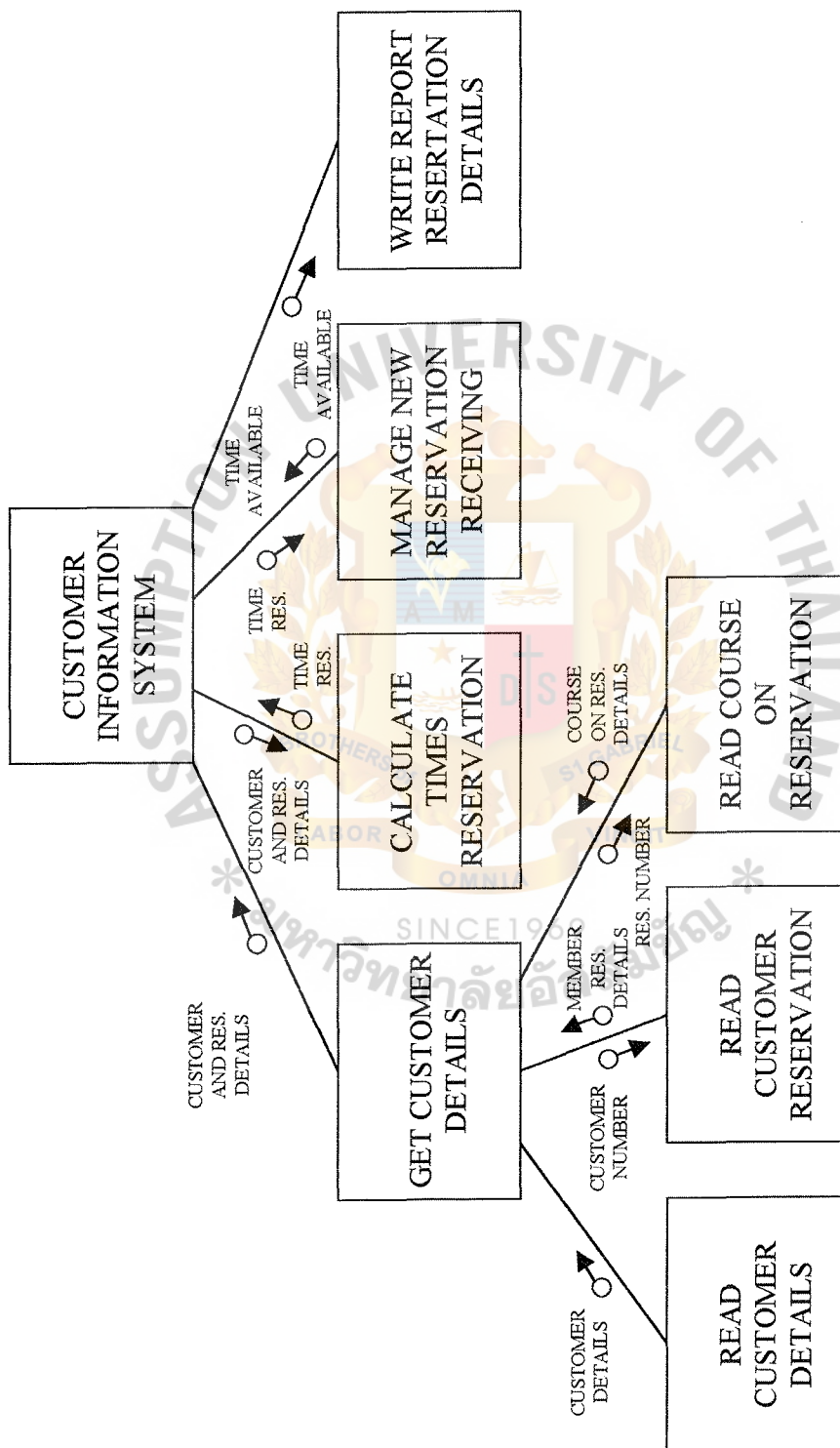


Figure E.1. Structure Chart of Customer Service Information System.



APPENDIX F
DATA DICTIONARY

Table F.1. Data Dictionary for the Existing System.

Field Name	Meaning
Reservation Info	The information of golf course reservation which customers reserve them with the company's staff.
Customer Master	Data Store: D3
Customer Info	The information of customers.
Reservation Master	Data Store: D5
New Reservation	New golf course reservation from customers.
Course res	Data Store: D6
Course Available	The available time of golf course which golfers can tee-off.
Sales Report	Report from sales & marketing department including product, sales status, type of sales, and prices.
Course Available Report	Report from sales & marketing including golf course status and available tee-off time.



Table F.2. Data Dictionary for the Proposed System.

Field Name	Meaning
Member Plan Termination Notice	The causes and the notices that make us terminate an old member plan.
Deactivated Contract	The contract that is deactivated by the sales & marketing department.
Deactivated Association	The association that is deactivated by the sales & marketing department.
Association Master	Data Store: D1
Contract Master	Data Store: D2
New Membership Plan	New membership plan.
New Association	The association which the golf course makes with new contract.
New Contract	The contract which the golf course makes with new association.
Update Reservation	The reservation which is updated from the staff.
Date Reservation	The day which the staff makes the reservation.
Course Availability	The available time of golf course which golfers can tee-off.
Membership Type	Type of membership.
Customer Address	The address of the customer.
Reservation Master	Data Store: D5
Course res	Data Sotre: D6
Membership	Data Store: D4
Customer Master	Data Store: D3
Association	The name of the association.
Sales Info	Information from sales & marketing department including product, sales status, type of sales, and prices.
Dated Sales	The day that we sale green fee.
Green sale	Data Store: D7
Picking Green fee	Picking green fee.
Reservation Report	Report from sales & marketing department including reservation information.



APPENDIX G

GRAPHICAL USER INTERFACE DESIGN

File Edit View Insert Format Records Tools Window Help

NATURAL HILLS GOLF COURSE

User Name:

Password:

Record: 1 of 1

Form View

* Figure G.1. Display Log On Screen *



Figure G.2* Display Main Menu for Selecting Users' Requirements.

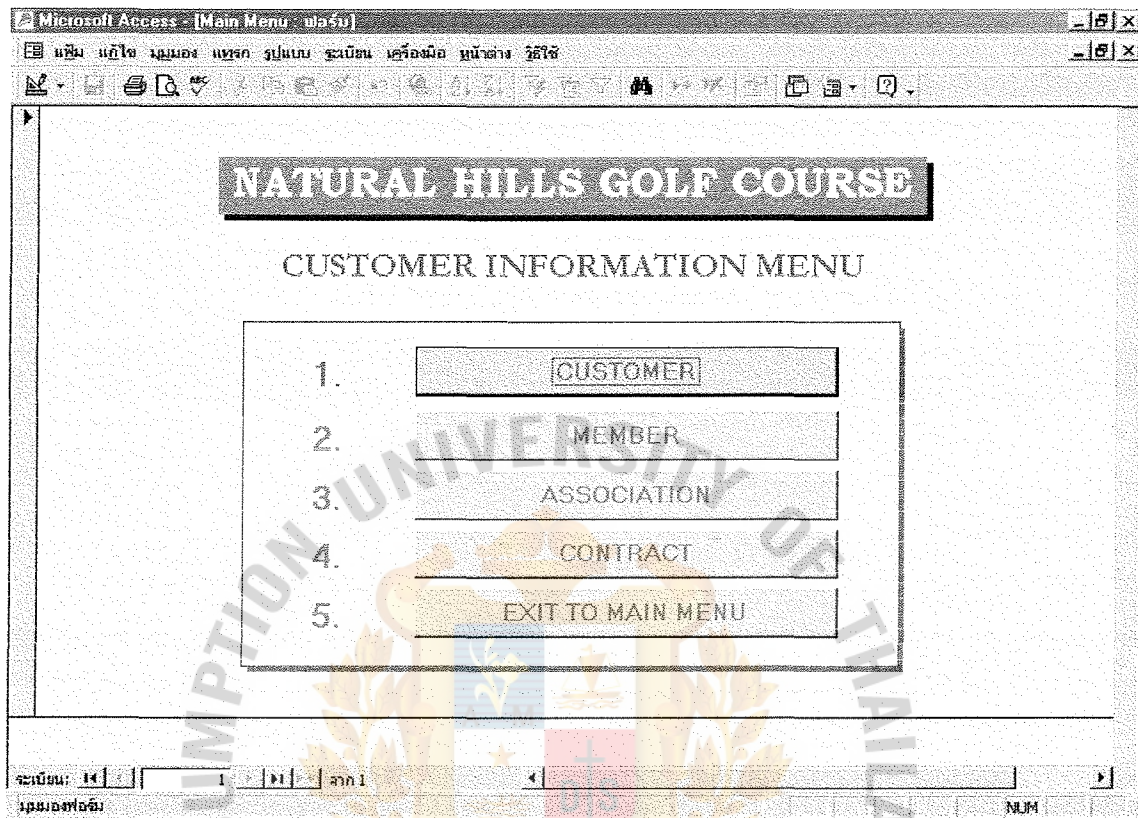


Figure G.3. A Submenu Use for the Customer File Maintenance Process.



Figure G.4. A Submenu Use for the Reservation Process.



Figure G.5. A Submenu Use for the Registration Entry Process.

Microsoft Access - [Association]

เมนู แก้ไข มุมมอง แพรด รูปแบบ ควบคุม เครื่องมือ หน้าต่าง ฐานข้อมูล

NATURAL HILLS GOLF COURSE

ASSOCIATION

Asso_no	MGAAAAU1	Asso_name	Thai Fly Travel Co., Ltd.
Asso_type	AG	Asso_addr	188 Moo4 Soi Sukhumvit 101
Asso_phon		Asso_tax	
Asso_phon		A_remark	
Contact_ps			
No_of_me			

ADD NEW SEARCH UPDATE DELETE SAVE

EXIT TO MENU

จำนวน: 14 1 11 11 จาก 1

มุมมองฟอร์ม

NUM

Figure G.6. Display the Screen for Update Association Record.

The screenshot shows a Microsoft Access database form titled "NATURAL HILLS GOLF COURSE". The form is for "CUSTOMER INFORMATION". It contains the following fields and data:

Field Name	Value
Cust_no	NW00000
Cust_nm	Kazaredeen Ahmad
Gender	M
Nationality	T-AI
Birth_dt	
Age	
Home_ad	
Home_t	
Home_f	
Id_no	
Id_addr	
Id_vald	
Occupat	
Position	
Work_Td	
Work_f	
Contact	
State	
Signature	
Idb_chi	L
Guest No	

Figure G.7. Display the Screen for Update Customer Record.

Microsoft Access - [Reservation]

แฟ้ม แก้ไข มุมมอง แทรก รูปแบบ ควบคุม เครื่องมือ หน้าต่าง 363%

Arial 9 B I U

NATURAL HILLS GOLF COURSE

RESERVATION

Res_no	00000001	Qty_group	1
Lust_no	00000001	Qty_person	5
Member_no	MW000001	Res_creation	03-พ.ย.-01
Asso_name	WALK IN	Reserved_by	Kanchana
Res_date	10-พ.ย.-01	Res_Phone	
Res_time	8:00 AM	Res_status	
Res_remark			

ADD NEW SEARCH UPDATE DELETE SAVE

EXIT TO MENU

จำนวน: 1 จาก 1

มุมมองฟอร์ม

NUM

Figure G.8. Display the Screen for Update Reservation Record.

Microsoft Access - [Course on reservation]

เมนู แก้ไข เปรียบเทียบ แยกออก รูปแบบ กรอบข้อมูล เครื่องมือ หน้าต่าง ฐานข้อมูล

Arial 9 B I U

NATURAL HILLS GOLF COURSE

COURSE ON RESERVATION

Sale_no	SL0000001	Course_no	A
Res_no	000000001	Qty_round	1
Teeoff_date	10-พ.ย.-01	Teeoff_hole	A/1
Teeoff_time1	8:00 AM	Qty_player	5
Teeoff_time2			

สถานะ: 1 จาก 1

NUM

Figure G.9. Display the Screen for Create Course on Reservation Record .

Microsoft Access

เพิ่ม แก้ไข มุมมอง แทรก รูปแบบ ฐานข้อมูล เครื่องมือ หน้าต่าง 261%

Arial 9

Green fee

NATURAL HILLS GOLF COURSE

GREEN FEE ON SALE

Green_no	0000000001	Date	10/11/01
Course_no	A		
Cust_no	C0000001		
Green_type	WD/W		
Green_price	500		
Payment	CASH		

ADD NEW SEARCH UPDATE DELETE SAVE

EXIT TO MENU

มุมมองฟอร์ม NUM

Figure G.10. Display the Screen for Create Green Fee on Sale.



APPENDIX H

REPORTS AND FORMATS

NATURAL HILLS GOLF COURSE

CUSTOMER: LIFE MEMBER REPORT

DATE: 25/10/01, TIME: 13.15

Member No.	Name	Surname	No. Share	Active Date	Valid Date	Telephone	Remark
MM000001	Akkradech	Niyompanich	100	01-Aug-93	NONE	02-2331279	
MM000002	Anusorn	Umpolpan	100	01-Aug-93	NONE	01-4457841	
MM000003	Bancha	Patchana	100	01-Aug-93	NONE	02-7013600	*Land
MM000004	Boonchai	Aranyik	100	01-Aug-93	NONE	02-2223999	
MM000005	Adulsiri	Suwantra	100	01-Aug-93	NONE	02-2997000	
MM000006	Bamroong	Laocharoenwattanachai	100	01-Aug-93	NONE	01-3417951	
MM000007	Phasit	Sevikul	100	01-Aug-93	NONE	02-3872767	*Land
MM000008	Apichart	Kuptasatien	100	01-Aug-93	NONE	02-5309871	
MM000009	Chamnan	Youthanasombat	100	01-Aug-93	NONE	02-4456782	
MM000010	Densak	Tanpaibool	100	01-Aug-93	NONE	02-2589073	
MM000011	Kamol	Asawasatitporn	100	01-Aug-93	NONE	02-7227219	
MM000012	Keree	Chaichanawongs	100	01-Aug-93	NONE	01-8116778	

Figure H.1. Report Layout of the Customer: Life Member Report.

NATURAL HILLS GOLF COURSE

CUSTOMER: ANNUAL MEMBER REPORT

DATE: 24/10/01, TIME: 14.45

Member No.	Name	Surname	Year	Active Date	Valid Date	Telephone	Remark
MY000001	Akkradech	Niyompanich	3	01-Aug-01	01-Aug-02	02-2331279	
MY000002	Anusorn	Umpolpan	3	01-Aug-01	01-Aug-02	01-4457841	
MY000003	Bancha	Patchana	3	01-Aug-01	01-Aug-02	02-7013600	
MY000004	Boonchai	Aranyik	3	01-Aug-01	01-Aug-02	02-2223999	
MY000005	Adulsiri	Suwantra	3	01-Aug-01	01-Aug-02	02-2997000	
MY000006	Bamroong	Laocharoenwattanachai	1	01-Aug-00	01-Aug-01	01-3417951	*Deactivated
MY000007	Phasit	Sevikul	2	01-Aug-01	01-Aug-02	02-3872767	
MY000008	Apichart	Kuptasatien	3	01-Aug-01	01-Aug-02	02-5309871	
MY000009	Chamnan	Youthanasombat	3	01-Aug-01	01-Aug-02	02-4456782	
MY000010	Densak	Tanpaibool	2	01-Aug-01	01-Aug-02	02-2589073	
MY000011	Kamol	Asawasatitporn	1	01-Aug-01	01-Aug-02	02-7227219	
MY000012	Keree	Chaichanawongs	1	01-Aug-01	01-Aug-02	01-8116778	

Figure H.2. Report Layout of the Customer: Annual Member Report.

NATURAL HILLS GOLF COURSE

CUSTOMER: LAND MEMBER REPORT

DATE: 25/10/01, TIME: 13.15

Member No.	Name	Surname	No. Share	Active Date	Valid Date	Telephone	Remark
ML000001	Akkaradech	Niyompanich	100	01-Aug-93	NONE	02-2331279	
ML000002	Anusorn	Umpolpan	100	01-Aug-93	NONE	01-4457841	
ML000003	Bancha	Patchana	100	01-Aug-93	NONE	02-7013600	
ML000004	Boonchai	Aranyik	100	01-Aug-93	NONE	02-2223999	
ML000005	Adulsiri	Suwantra	100	01-Aug-93	NONE	02-2997000	
ML000006	Bamroong	Laocharoenwattanachai	100	01-Aug-93	NONE	01-3417951	
ML000007	Phasit	Sevikul	100	01-Aug-93	NONE	02-3872767	*Transfer
ML000008	Apichart	Kuptasatien	100	01-Aug-93	NONE	02-5309871	
ML000009	Chamnan	Youthanasombat	100	01-Aug-93	NONE	02-4456782	
ML000010	Densak	Tanpaibool	100	01-Aug-93	NONE	02-2589073	
ML000011	Kamol	Asawasatitporn	100	01-Aug-93	NONE	02-7227219	
ML000012	Keree	Chaichanawongs	100	01-Aug-93	NONE	01-8116778	

Figure H.3. Report Layout of the Customer: Land Member Report.

NATURAL HILLS GOLF COURSE

CUSTOMER: NATURAL HILLS GOLF CLUB MEMBER REPORT

DATE: 25/10/01, TIME: 13.15

Member No.	Name	Surname	Handicap	Active Date	Valid Date	Telephone	Remark
MN000001	Akkaradech	Niyompanich	24	01-Aug-93	CLOSE	02-2331279	
MN000002	Anusorn	Umpolpan	24	01-Aug-93	CLOSE	01-4457841	
MN000003	Bancha	Patchana	24	01-Aug-93	CLOSE	02-7013600	
MN000004	Boonchai	Aranyik	18	01-Aug-93	CLOSE	02-2223999	
MN000005	Adulsiri	Suwantra	19	01-Aug-93	CLOSE	02-2997000	*VIP Member
MN000006	Bamroong	Laocharoenwattanaichai	24	01-Aug-93	CLOSE	01-3417951	
MN000007	Phasit	Sevikul	21	01-Aug-93	CLOSE	02-3872767	*Land Member
MN000008	Apichart	Kuptasatien	20	01-Aug-93	CLOSE	02-5309871	
MN000009	Chamnan	Youthanasombat	24	01-Aug-93	CLOSE	02-4456782	
MN000010	Densak	Tanpaibool	24	01-Aug-93	CLOSE	02-2589073	
MN000011	Kamol	Asawasatitporn	24	01-Aug-93	CLOSE	02-7227219	
MN000012	Keree	Chaichanawongs	24	01-Aug-93	CLOSE	01-8116778	

Figure H.4. Report Layout of the Customer: Natural Hills Golf Club Member Report.

NATURAL HILLS GOLF COURSE
CUSTOMER: V.I.P. MEMBER REPORT

DATE: 25/10/01, TIME: 13.15

Member No.	Name	Surname	Year	Active Date	Valid Date	Telephone	Remark
MV000001	Akkaradech	Niyompanich	1	01-Aug-01	01-Aug-02	02-2331279	
MV000002	Anusorn	Umpolpan	1	01-Aug-01	01-Aug-02	01-4457841	
MV000003	Bancha	Patchana	1	01-Aug-01	01-Aug-02	02-7013600	
MV000004	Boonchai	Aranyik	1	01-Aug-01	01-Aug-02	02-2223999	
MV000005	Adulsiri	Suwantra	1	01-Aug-01	01-Aug-02	02-2997000	
MV000006	Bamroong	Laocharoenwattanachai	1	01-Aug-01	01-Aug-02	01-3417951	
MV000007	Phasit	Sevikul	1	01-Aug-01	01-Aug-02	02-3872767	
MV000008	Apichart	Kuptasatien	1	01-Aug-01	01-Aug-02	02-5309871	
MV000009	Chamnan	Youthanasombat	1	01-Aug-01	01-Aug-02	02-4456782	
MV000010	Densak	Tanpaibool	1	01-Aug-01	01-Aug-02	02-2589073	
MV000011	Kamol	Asawasatitporn	1	01-Aug-01	01-Aug-02	02-7227219	
MV000012	Keree	Chaichanawongs	1	01-Aug-01	01-Aug-02	01-8116778	

Figure H.5. Report Layout of the Customer: V.I.P. Member Report.

NATURAL HILLS GOLF COURSE

CUSTOMER: PRIVILEGE MEMBER REPORT

DATE: 25/10/01, TIME: 13.15

Member No.	Name	Surname	Year	Active Date	Valid Date	Telephone	Remark
MP000001	Akkaradech	Niyompanich	1	01-Jan-01	31-Dec-01	02-2331279	
MP000002	Anusorn	Umpolpan	1	01-Jan-01	31-Dec-01	01-4457841	
MP000003	Bancha	Patchana	1	01-Jan-01	31-Dec-01	02-7013600	
MP000004	Boonchai	Aranyik	1	01-Jan-01	31-Dec-01	02-2223999	
MP000005	Adulsiri	Suwantra	1	01-Jan-01	31-Dec-01	02-2997000	
MP000006	Bamroong	Laocharoenwattanachai	1	01-Jan-01	31-Dec-01	01-3417951	
MP000007	Phasit	Sevikul	1	01-Jan-01	31-Dec-01	02-3872767	*Apply from P.M.Y.
MP000008	Apichart	Kuptasatien	1	01-Jan-01	31-Dec-01	02-5309871	
MP000009	Chamnan	Youthanasombat	1	01-Jan-01	31-Dec-01	02-4456782	
MP000010	Densak	Tanpaibool	1	01-Jan-01	31-Dec-01	02-2589073	
MP000011	Kamol	Asawasatitporn	1	01-Jan-01	31-Dec-01	02-7227219	
MP000012	Keree	Chaichanawongs	1	01-Jan-01	31-Dec-01	01-8116778	

Figure H.6. Report Layout of the Customer: Privilege Member Report.

NATURAL HILLS GOLF COURSE

GROUP CUSTOMER: GOVERNMENT REPORT

DATE: 25/10/01, TIME: 13.15

Member No.	Association Name	Contact Person	No. Member	Address	Telephone	Facsimile
MGG00001	Asia Organization	Ms. Suchada R.	200	294/8 Payathai Rd., Huaykwang, BKK.	022150155	022150156
MGG00002	Export Promotion Dept.	Mr. Arun Boonnag	150	198 Moo 2, Rachadapisek Rd., BKK.	025301986	025873545
MGG00003						
MGG00004						
MGG00005						

Figure H.7. Report Layout of the Group Customer: Government Report.

NATURAL HILLS GOLF COURSE

GROUP CUSTOMER: TRAVEL AGENTS REPORT

DATE: 25/10/01, TIME: 13.15

Member No.	Association Name	Contact Person	No. Guest	Address	Telephone	Facsimile
MGT00001	Benasia Travel	Ms. Suwanha S.	90	51/954 Ladprao 103, Ladprao Rd., BKK.	029506741	029506742
MGT00002	Blue Sky Travel	Mr. Somboon R.	50	87/3 Jatuchak Rd., Ladyao Rd., Bkk.	025748632	025748631
MGT00003	Oscar Nova Tour	Mr. Dumrong P.	200	154 Sukhumvit 53, Sukhumvit Rd., BKK.	022501341	022501345
MGT00004						
MGT00005						
MGT00006						

Figure H.8. Report Layout of the Group Customer: Travel Agents Report.

NATURAL HILLS GOLF COURSE

GROUP CUSTOMER: CORPORATES REPORT

DATE: 25/10/01,TIME: 13.15

Member No.	Association Name	Contact Person	No. Member	Address	Telephone	Facsimile
MGC00001	Berry Yuker Co., Ltd.	Ms. Suwana S.	90	51/954 Ladprao 103, Ladprao Rd., BKK.	029506741	029506742
MGC00002	Osotsapa Co., Ltd.	Mr. Lertlak M.	50	326 Lamkamhaeng 36, Bangkokpi, BKK.	025748632	025748631
MGC00003						
MGC00004						
MGC00005						

Figure H.9. Report Layout of the Group Customer: Corporate Report.

NATURAL HILLS GOLF COURSE

GROUP CUSTOMER: ASSOCIATE CLUB REPORT

DATE: 25/10/01, TIME: 13.15

Member No.	Association Name	Contact Person	No. Member	Address	Telephone	Facsimile
MGA00001	Old Navy Golf Club	Ms. Suchada R.	200	294/8 Payathai Rd., Huaykwang, BKK.	022150155	022150156
MGA00002	Green Singh Golf Club	Mr. Arun Boonnag	150	198 Moo 2, Rachadapisek Rd., BKK.	025301986	025873545
MGA00003						
MGA00004						
MGA00005						

Figure H.10. Report Layout of the Group Customer: Associate Club Report.

NATURAL HILLS GOLF COURSE

DAILY RESERVATION REPORT

DATE: 23/10/01, TIME: 10:30

Date	Res No.	Member No.	Name	Course	Res Date	Time	Qty	G	Qty	P	Status	Remark
22/10/01	10000101	MW0000001	Ronnachai Jamnong	A/1	28/10/01	8:00	1	5			W/C	
22/10/01	10000101	MW0000297	Phasit Sevikul	A/2	28/10/01	8:05	1	5			W/C	
22/10/01	10000201	MW0000565	Yen-Chung Chang	A/3	26/10/01	10:30	1	5			W/C	
23/10/01	10000101	MW0000045	Esther Chang	A/1	29/10/01	9:00	1	5			W/C	
23/10/01	10000201	MW0002890	Paul Bunnag	A/2	28/10/01	11:45	1	5			W/C	
24/10/01	10000201	MW0000980	Michael Eliot Butler	A/1	28/10/01	8:30	1	5			W/C	
25/10/01	10000201	MW0000970	Olivier Bonard	A/2	27/10/01	9:00	1	5			W/C	
25/10/01	10000201	MW0000047	Sean Biedrager	A/3	26/10/01	1:00	1	5			W/C	
25/10/01	10000101	MW0000089	Emi Asanuma	A/5	26/10/01	2:00	1	5			W/C	
25/10/01	10000101	MW0000065	Kayomi Aoki	A/1	28/10/01	2:30	1	5			W/C	
25/10/01	10000101	MW0000089	Anuchi Anuchithathai	A/2	31/10/01	4:00	1	5			W/C	

Figure H.11. Report Layout of the Daily Reservation Report.

NATURAL HILLS GOLF COURSE

COURSE AVAILABILITY REPORT

DATE: 23/10/01, TIME: 10.30

Course And Time	Course A				Course B		Customer	Remark
	Hole 1		Hole 10		Hole 19			
	Gr.	Py.	Gr.	Py.	Gr.	Py.		
6:00								
6:08								
6:16								
6:24								
6:32	1	4					Mr, Surachai C.	* 1 Round
6:40								
6:48								
6:56								
7:04			2	10			Mr. Boonma A.	* 2 Round
7:12								
7:20								
7:28								
7:36								
7:44								
7:52								
8:00								
8:08								
8:16								
8:24								
8:32								
8:40								
8:48								
8:56								
9:04								

Figure H.12. Report Layout of the Course Availability Report.

NATURAL HILLS GOLF COURSE

CONFIRMATION REPORT

DATE: 23/10/01, TIME: 10.30

Date	Res No.	Member No.	Name	Course	Res	Date	Time	Qty	G	Qty	P	Status	Remark
22/10/01	10000101	MW0000001	Ronnachai Jamnong	A/1		22/10/01	8:00	1	5			C/F	
22/10/01	10000101	MW0000297	Phasit Sevikul	A/2		22/10/01	8:05	1	5			C/F	
22/10/01	10000201	MW0000565	Yen-Chung Chang	A/3		22/10/01	10:30	1	5			C/F	
23/10/01	10000101	MW0000045	Esther Chang	A/1		23/10/01	9:00	1	5			C/F	
23/10/01	10000201	MW0002890	Paul Bunnag	A/2		23/10/01	11:45	1	5			C/F	
24/10/01	10000201	MW0000980	Michael Eliot Butler	A/1		24/10/01	8:30	1	5			C/F	
25/10/01	10000201	MW0000970	Olivier Bonard	A/2		25/10/01	9:00	1	5			C/F	
25/10/01	10000201	MW0000047	Sean Biedrager	A/3		25/10/01	1:00	1	5			C/F	
25/10/01	10000101	MW0000089	Emi Asanuma	A/5		25/10/01	2:00	1	5			C/F	
25/10/01	10000101	MW0000065	Kayomi Aoki	A/1		25/10/01	2:30	1	5			C/F	
25/10/01	10000101	MW0000089	Anuchi Anuchithathai	A/2		25/10/01	4:00	1	5			C/F	

Figure H.13. Report Layout of the Confirmation Report.

NATURAL HILLS GOLF COURSE

CANCELLATION REPORT

DATE: 23/10/01, TIME: 10.30

Date	Res No.	Member No.	Name	Course	Res Date	Time	Qty	G	Qty	P	Status	Remark
22/10/01	10000101	MW0000001	Ronnachai Jamnong	A/1	28/10/01	8:00	1	5			C/L	
24/10/01	10000201	MW0000980	Michael Eliot Butler	A/1	24/10/01	8:30	1	5			C/L	
25/10/01	10000201	MW0000970	Olivier Bonard	A/2	25/10/01	9:00	1	5			C/L	
26/10/01	10000101	MW0000008	Kazuyoshi Kihara	A/2	26/10/01	9:15	1	5			C/L	
26/10/01	10000101	MW0000090	Eugene Kim	A/1	26/10/01	11:35	1	5			C/L	
26/10/01	10000101	MW0000100	Sun Ahe Kim	A/4	26/10/01	12:45	1	5			C/L	
26/10/01	10000101	MW0000087	Jacqueline Klinski	A/2	26/10/01	3:15	1	5			C/L	

Figure H.14. Report Layout of the Cancellation Report.

NATURAL HILLS GOLF COURSE

NO SHOW REPORT

DATE: 23/10/01, TIME: 10.30

Date	Res No.	Member No.	Name	Course	Res Date	Time	Qty	G	Qty	P	Status	Remark
22/10/01	10000101	MW0000001	Ronnachai Jamnong	A/1	28/10/01	8:00	1	5			N/S	
25/10/01	10000101	MW0000065	Kayomi Aoki	A/1	25/10/01	2:30	1	5			C/F	
25/10/01	10000101	MW0000089	Anuchi Anuchithathai	A/2	25/10/01	4:00	1	5			C/F	
26/10/01	10000101	MW0000008	Kazuyoshi Kihara	A/2	26/10/01	9:15	1	5			N/S	
26/10/01	10000101	MW0000090	Eugene Kim	A/1	26/10/01	11:35	1	5			N/S	
26/10/01	10000101	MW0000100	Sun Ahe Kim	A/4	26/10/01	12:45	1	5			N/S	
26/10/01	10000101	MW0000087	Jacqueline Klinski	A/2	26/10/01	3:15	1	5			N/S	

Figure H.15. Report Layout of the No Show Report.

NATURAL HILLS GOLF COURSE

TOTAL SALES REPORT

DATE: 23/10/01, TIME: 10.30

Month	Life Member			Land Member			Annual Member			Club Member			V.I.P. Member			Privilege Member			Walk-in Member			Group Member			Total	
	Qty.	Revenue	Qty.	Revenue	Qty.	Revenue	Qty.	Revenue	Qty.	Revenue	Qty.	Revenue	Qty.	Revenue	Qty.	Revenue	Qty.	Revenue	Qty.	Revenue	Qty.	Revenue	Qty.	Revenue		
1																										
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										
Total																										

Figure H. 16. Report Layout of the Total Sales Report.

BIBLIOGRAPHY

1. Burch, John G. System Analysis, Design, and Implementation. Columbia: Boyd & Fraser Publishing Company, 1992.
2. Date, C. J. An Introduction to Database Systems, Sixth Edition. California: Addison Wesley Publishing Company, Inc., 1995.
3. FitzGerald, J. and Ardre F. FitzGerald. Fundamentals of System Analysis. NY: John Wiley & Sons, 1987.
4. Greer, Tyson. Understanding Intranets. Redmond, WA: Microsoft Press, 1998.
5. Kosiur, David. Understanding Electronic Commerce. WA: Microsoft Press, 1997.
6. Laudon, Kenneth C. and Jane P. Laudon. Management Information Systems, Fifth Edition. USA: Prentice-Hall International, Inc., 1989.
7. Senn, James A. Analysis and Design of Information Systems. Baltimore: McGraw Hill Inc., 1985.
8. Stallings, William. Operating Systems Internals and Design Principles, Third Edition. USA: Prentice-Hall International, Inc., 1998.
9. Trepper, Charles. E-Commerce Strategies. USA: Microsoft Press, 2000.
10. Whitten, Jeffrey L. and Lonnie D. Bentley. Systems Analysis and Design Methods, Fourth Edition. Taipei: McGraw-Hill, 1998.