Faculty of Computer Science and Information Technology

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Event Management System

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Abstract

As we all know, nowadays, people like holding or celebrating events in restaurants, ballrooms, halls and others. Hence, I came out with this system, *Event Management System*, which is suitable for both hotel and restaurant businesses in order to manage events systematically and help to ease tedious tasks for the users. This system will allow people to reserve the place and food to hold events. This is a real-time and online application. People can reserve places through phone, walk-in or Internet.

For the local environment, a booking application will be developed to allow reservation through phone or walk-in. This is to bring conveniences to those customers that are not familiar with the use of Internet. Operators are allowed to send reminders to the customers and view schedule generated by the system to avoid double booking. Besides, this system will help to print out invitation cards to the guests invited and allocate seats for them. Mean while, administrators can add or edit operators' details, company profiles, facilities details, approve events and view reports.

For the online environment, only members can log in to the web site to reserve rooms, meal packages, publish events and send email to their guests. For non-registered member, they can browse through the web site for information about the upcoming events and the facilities provided by the company. They may choose to register as a valid member too.

To ensure the system efficiency and attempt to meet the user needs, existing event management systems have been reviewed to do analysis on user requirements. Synthesis of the proposed system is made based on this analysis.

The methodology, waterfall model with prototyping, has been chosen to develop this system. Functional and non-functional requirements for this system are stated clearly for the purpose of controlling and monitoring in the future.

The basic concept of the system was reviewed to find out the most suitable technologies in order to develop this system. Java, JSP, SQL Server 2000 and other helpful development tools are chosen to develop this system. System architecture design, system functionality design, database design and user interface design were used to develop prototyping for the system before the development of the complete system.

Acknowledgement

Numerous people deserve to be thanked for their assistance during my final year project.

First and foremost, I would like to express my deepest appreciation to my supervisor, Mrs. Norjihan Abdul Ghani, who has given me a great opportunity for the proposal of the project. Without her permission, the beneficial experiences gained through the project would not have been possible for me. Thus, I would like to thank her for her confidence on me.

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Apart from that, I am also grateful to all my friends. They are so friendly and never hesitated to offer guidance whenever I encountered problem. Also, I would like to thank for their supports and cares in the project.

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Chapter 1 Introduction

1.1 Overview of Proposed System

This section aims to describe the proposed Event Management System (EMS). This system is suitable for either hotel ballroom or restaurant business. It will be adopted in two different environments which are online environment and local environment.

For online environment, EMS is a web-based system that provides reservation services such as booking of halls, meal packages and others to all levels of users or customers through Internet. Only registered members can log in to the web site to reserve rooms and meal packages. For non-registered member, they can browse through the web site for information about reservation and they may choose to register as a valid member in order to make any reservations. Besides that, Online EMS also allows users to send invitation card via email to the guests that they wish to invite. They may enter a list of email addresses through this web site and this system will help to send emails to all the entered addresses. Users can only use this service (send e-card to the guests) after they paid deposit for their reservations. Others feature such as checking for rooms availability, booking records overview that allows users to view details of the reservation they made and others may also included in this Online EMS.

For local environment, EMS is an application which will only be accessed by administrator or operator within a local area network. People can walk-in or call to reserve rooms, meal packages or side orders. Total rental amount, total food amount and other relevant charges will be calculated in this system too. The receipt for total amount will only be printed once the event over. Besides that, a list of guests can be entered into this system and this system will print out invitation cards to the guests

listed. Bar code will also be printed on the invitation card for seat allocation purpose. On the other hand, authentication and authorization will provide the level of accessibility to operators and administrators, where operators are only allowed to do daily operations such as booking, viewing schedule and printing of invitation cards while administrators have more powers on editing company profile, report viewing and others.

Besides that, for those users that have booked a ball room, hall or restaurant for public events such as exhibitions, concerts, talks and others, they could publish their events on the web site to attract more visitors or participants.

1.2 Problem Definition

- *Specialization of system.*

  Nowadays, systems are developed for certain users based on their specific requirements. For example, restaurant handling system is only suitable for restaurants while ballroom handling system is only suitable for hotels. This is difficult for those hotels or restaurants that need both of the systems in order to handle their daily businesses. They may have to buy two different softwares and it is a waste of time in order to learn them separately.

- *Printing of invitation cards.*

  Normally, when people book a ballroom or restaurant to hold event, printing of invitation cards is not included. This bring inconveniences to those who need this service, they may have to go for printing company in order to print invitation cards and pay more charges for it.

- *Existing manual system.*

Bulky reservation records may result in time wasting and it may need more processing time to process a requirement from customers. It may also lead to inconsistencies due to the human errors that could not be avoided.

- *Difficult to differentiate between invited and uninvited guests.*

  Guests are allowed to enter the restaurant or ballroom as their wish without concerning whether they are actually invited by the host or not.

- *Seats allocation.*

  Guests always facing a problem when finding their seats or venue in an event they attend.

- *Lack of authentication and authorization*

  Authentication and authorization is needed in order to provide the level of accessibility to different group of users.

1.3 Aim, Objectives, Relevance and Significance

1.3.1 Aim

The aim for this proposed system is to develop an Event Management System for either hotel or restaurant business in order to streamline event planning and handle invitations, registration, bookings and others more effectively.

1.3.2 Objectives

The role as a system analyst is to solve the current problems encountered and provide better solutions or working system to the clients. Based on the specification of the Event Management System, we know that users require a simple yet practical system and we also need to consider that these requirements will change from time to time during the development of the system. In general, the system is expected to achieve the following objectives:

- *Provide a simple yet user-friendly interface to the user*

  The system is easy to operate, as it is menu driven. All it needs is a little general knowledge and some training. The user would be able to operate the system without any problems.

- *Reduce workloads and increase efficiency*

  The system keeps all the necessary records in a database, where all the files are integrated together. By storing the records in the database, files or data retrieval become faster. So, this will help to reduce the operational time, paper work and increase its efficiency.

- *Implement a more convenient and efficient way in handling events*

  Handling events in a systematically way will help to reduce management cost. With an efficient and reliable system, new customers can be attracted and

existing customers will stay retained. Through online EMS, customers are allowed to conduct searches and inquiries 24 hours a day, at their convenience.

- *Provide a secure system*

  Security and confidentiality is one of the most important aspects in any system, no matter it is a manual system or automated system. Thus, one of the objectives for this proposed system is to deter unauthorized access. Only authorized personnel with the correct identification and password would be allowed to access into the system.

1.3.3 Relevance

Events play a key role in marketing, driving demand, reinforcing brand image, and enhancing goodwill with prospects and customers. Yet planning events can be a time consuming and complicated process.

As we all know, nowadays, people like holding or celebrating events in restaurants, ballrooms and others. For example, for popular events such like birthday party, mother's day, father's day, wedding party, talks and others, people like to book a restaurant or even book a ballroom to celebrate these meaningful days or events. In order to hold an event, venue is always the most important feature that will be considerate by customers and these venues may include hotel ballroom, restaurant and others.

Thus, this Event Management System is suitable and needed in the restaurant or hotel industry in order to handle or manage events in a more systematically way and help to ease all the problems faced by the users when holding an event.

1.3.4 Significance

Should this project be successfully implemented, it would provide the hotel or restaurant an added string to its competitive bow. This application is bundled with a user friendly interface for online or real time Event Management System, which allows emphasizes on hassle-free requests. Administrators on the other hand are able to make full use of the administrator module to generate and retrieve useful information. On the whole, this application helps the hotel or restaurant to increase its publicity and business efficiency, thus increase its profit and make it a pleasant experience for its guests.

1.4 System Scope

Basically, this system is to be utilized by the company's staff. It should also provide ease of usage to the indirect users of the system who are in this case the internet users. This proposed system will be divided into three modules, which are administrator module, operator module and user module.

Module	*Targeted Users*
Administrator	Supervisor, manager, senior officer and others.
Operator	Normal staff. Ex: front desk, operator, and others.
Internet User	All level of internet users

Table 1.1 : System Scope

I. Administrator Module

- Allow authorized administrators to access and maintain the database.
- Allow administrators to update, delete, add or view operators' details.
- Allow administrators to view reports.

- Allow administrators to update company profiles, prices of set menus, facilities details such as number of ball rooms.
- Allow administrators to add or delete operators from accessing the system.
- Allow administrators to check and approve those public events (events like exhibition, concert, and others.) details before publish them on to the web site.

II. Operator Module

- Allow operators to do daily operations, such as reserve ballroom or restaurant for customers, print invitation cards and others.
- Allow operators to update, delete, add or view the users' booking details.
- Allow operators to calculate total amount of rental, food and beverage ordered by customers.
- Allow operators to view daily or monthly schedule.
- Allow operators to help guests in searching their seats by host name, date or guest name.
- Allow operators to send reminders to the customers in order to confirm their reservations before cancelling their reservations.

III. Internet User Module (web-based)

- Allow registered users to access the web site to make reservation for an event.
- Allow registered users to send email or e-card to all the guests that will be invited to the event.
- Allow registered users to publish their events online.
- Allow registered users to view records of their reservation(s).

- Allow registered users to view prices of set menus offered, rental and details of ball rooms or restaurant and others.
- Allow non-registered users to sign in as valid users.

1.5 Project Limitation

This system are developed mainly for hotel or restaurant or others businesses that provide room or hall booking for holding events. Thus, this system may not be suitable for others type of businesses. Besides that, this system can either be used by a restaurant or a hotel or others centers that provide hall or room booking for events. It cannot be used simultaneously for those businesses that provide both restaurant and hall booking services in a same time. For example, a hotel that has its own ball rooms and restaurants where both of them also allow booking for events, could not use this system as a single system for both ball rooms and restaurants simultaneously. Others features such like computerized lucky draw, booking for sound equipments and others are not included. Mean while, payment of rental or deposit through the web site is also not included.

1.6 Project Schedule

Project scheduling cursors of the whole development activities are carefully planned out to achieve a systematic progress and ensure on-time delivery of the product. It is important to have a project schedule as it acts as a time management and control to the developer making sure he is in route of the direction of the project.

Figure 1.1 shows the project schedule in Gantt chart. At the project identification and selection stage, the proposed system was accepted by supervisor.

- *Project Initiation and Planning*

Around two weeks are needed to define the objectives, scope, project limitation and project schedule of the proposed Event Management System in chapter Introduction.

- *Literature Review*

  It is estimated that three weeks is needed to do research in order to gather information from various sources from reading materials, Internet or others. This included the time needed to analyze on existing event management system.

- *Methodology*

  About two weeks is needed to determine the proper methodology for this system. Surveys and interviews with targeted users will be conducted. Methodology that will be used for this project will be chosen.

- *System Analysis*

  About three weeks time is needed to complete the analysis of the system requirements. The data collected in the methodology will be analyzed to get the user requirements. Analysis of hardware and software requirements for the system will also be conducted.

- *System Design*

  System design is estimated to take around four weeks time. The design of module for the system is expected to be completed during this period. DFD (Data Flow Diagram) that shows the relationship between entities will be presented. A user-friendly interface will be designed during this period.

- *System Implementation*

  Implementation and coding of the system is expected to take six weeks time as many technical problems will be faced during the process. It is also to ensure the quality of the system.

- *System Testing*

  Testing of the system will take place upon the completion of the coding. It is estimated to take around five weeks time. During the period, unit, module, integration and system testing will take place to make sure that the system is functional according to the requirements.

- *System Evaluation*

  Implementation of the final product will be done in around three week's time. All the modules in the proposed system will be evaluated.

- *Documentation*

  Documentation has been carried out during the whole system development process. Discussion with supervisor is held whenever there are any problems faced.

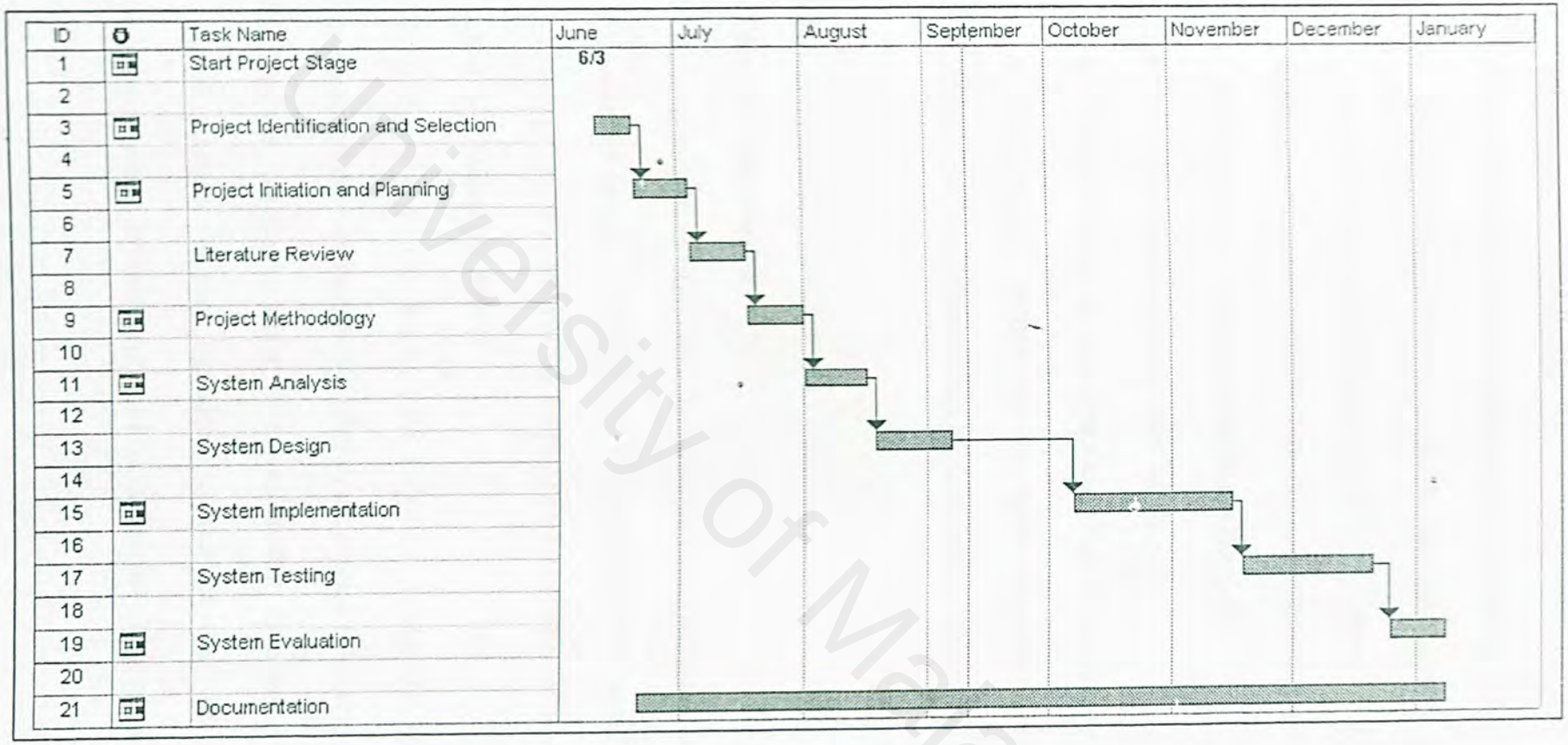


Figure 1.1 : Project schedule in Gantt chart

1.7 Expected Outcome

The expected outcomes of the proposed system are as below:

- The new designed system is simple, user friendly and easy to operate. Once the Event Management System is developed, users are able to book or reserve halls or restaurant to hold events through Internet, phone or walk-in. Hotel or restaurant might handle events more effectively.
- Provide a standard graphic user interface.
- Acceptable response time when users use the proposed system.
- The proposed system can be easily expanded if the capabilities and functionalities of the system are increased in the future.

1.8 Report Overview

Chapter 1 Introduction

This chapter presents the general review and the definition of the proposed Event Management System. The overview, objectives and the limitation of the project are given. A brief explanation of the scope of project is also included.

Chapter 2 Literature Review

This chapter gives the detail of the literature survey that has been conducted by previous scholars. Information related to the system is obtained from various sources such as web, text books, and articles. Besides that, the analysis of the similar existing system available is also included. A brief of each of the system is given. Consideration of technologies used in the proposed system is also included in this chapter.

Chapter 3 Methodology

In this chapter, the methodology used for this project was introduced. Method or approaches used to gather information about system will be identified too.

Chapter 4 System Analysis

In this chapter, the functional and nonfunctional requirement of the system is provided. Besides that, comparison between software and hardware requirements are made to justify which software and hardware is most suitable to develop the system.

Chapter 5 System Design

This chapter presents the design of the Event Management System. The system architecture, database design, data dictionary, interface design, program design and data flow diagram will be included in this chapter. Detail diagram of each module will be described as well.

Chapter 2 Literature Review

This chapter will describe in detail the various studies and researches done on the topic of existing event management systems that are more emphasized on ballroom or restaurant booking and handling in holding events. It is the objective of this chapter to outline systematically all these studies so that it will assist in the proper selection of tools and development methods of the Event Management System. This study will facilitate better understanding of the procedures and functions of an event management system. In the section of existing event management systems, it is evidence that a study needs to be done with regards to Event Management System before the task of developing a system for Event Management System is under taken. Besides that, this chapter will discuss the probable technologies used in the proposed system.

2.1 What is Event Management System?

Literally, Event Management System is a system, software or product that help to handle, manage and plan events in a more systematically way. In this case, events may include conferences, weddings, parties, seminars, concerts, tournaments, meetings and others. Event Management System is suitable for hotels, churches, restaurants, universities or colleges, conference centers, exhibition halls and others.

There are two types of event management system which are online and real-time event management systems. Online Event Management System or Online Event Registration System is a powerful online service that allows us to take registrations and process payments online for our meetings and events. There is nothing to purchase or install and we can access the software over the Internet from any web browser. Further more; the attendees can register 24 hours a day, seven days a week!

This system is perfect for meetings, seminars, conferences, trade shows, classes, sporting events, club functions, and any corporate event. Sophisticated online registration software gives us more than just online registration. We also get a set of event planning and event management tools with functionality like credit card processing, email broadcasting, attendee management, flexible reporting, hotel reservations and room block management, on-site check in, name badges, post-event surveys, reusable event templates, and much more. And best of all, it is the affordable event management service that won't break our budget. On the other hand, a real-time event management system is an application or system that will be used by the company's staffs. The features of this system are rather similar as the Online Event Management System but it is built to help managers and staffs in managing the complete scope of tasks required to stage an event, plan more effective events to drive greater demand, cut costs and leverage buying power, reduce cycle time in planning and executing events and provide improved measurement and reporting.

As we all know, events are playing a growing role in the marketing department, driving demand, reinforcing brand image, and enhancing goodwill with prospects and customers. Users' requirements in handling registrations, managing events and providing financial and management information change frequently. Planning events can be a time consuming and complicated process, made even more difficult when there are dozens of events being planned simultaneously worldwide. Event Management System therefore has to meet new challenges and tasks on a regular basis. The role of Event Management System is to harness technology and to ensure that its customers' needs are met by the introduction of new features and facilities in a timely manner, without the need for constant re-investment. On the other hand, Event Management System helps to streamline event planning, allowing

us to save successful event plans as templates, handle invitations, registration and follow-up automatically, and take advantage of meeting consolidation to achieve economies of scale. It can also improve event measurement and reporting to show which events have the greatest bottom-line impact.

Event Management Systems (EMS) offers a full suite of software solutions that empower any size meeting or event facility to maximize resource utilization, streamline communications and reduce operating costs with customizable workgroup, enterprise-wide and Web-based products. Event Management Software is used to reserve facilities efficiently without double-booking, manage meetings and events, schedule services like catering, manage the inventory of resources like audio visual equipment, handle the billing for every detail, and much more.

EMS software has streamlined room scheduling and event management operations for a wide variety of facilities including conference centers, schools and universities, corporate meeting and hoteling facilities, convention centers, government offices, associations, churches, healthcare facilities, performing arts centers, arenas, parks and recreation departments, and a variety of special event centers.

The following list is just a sampling of the types of industries and facilities that rely on EMS:

- **Academic** including Schools, Colleges and Universities
- **Business** including Corporations, Law Firms, Hospitality, Associations and Non-Profit Organizations

- **Civic & Cultural** including Convention Centers, Community Event Centers, Libraries, Museums and Performing Arts Venues
- **Government** including Federal, State and Local Government Organizations
- **Healthcare** including Hospitals and Healthcare Organizations
- **Religious** including Churches, Synagogues, Schools and Religious Community Centers
- **Sports & Recreation** including Stadiums, Arenas, Sports Facilities and Parks & Recreation

2.1.1 Advantages

One of the advantages of EMS is to eliminate double bookings and subsequently help to increase efficiency in event handling. Besides that, it also helps to improve management by receiving minute by minute event statistic and reporting and reconcile attendee payments instantly. Through its online features, it also benefit from an Internet presence without the trouble and expense of developing and hosting our own web registration system. Furthermore, EMS enhances customer service. Through Internet, customer can access to the system 24 hours a day. EMS also helps to save time and money because it reduces staffing costs for paper works and workers and subsequently reduces error prone.

2.1.2 Disadvantage

The scope of Event Management System is too large to satisfy all users because there are too many types of events need to be handled and there is no single system which can fulfill this demand. The features of a single event management system may not suitable for every business. Sometimes the unexpected down line which happens in the Internet will cause a lot of inconveniences to the users. The security for the online event management system must be strong enough to prevent

unauthorized users to access and modify the database. Sometimes the data shown in the web pages may not be updated, this may lead to an inconvenience situation for the users especially the information or data is not reliable.

2.2 Type of Event Management System

2.2.1 Existing Manual Event Management System

The other name of manual Event Management System is traditional Event Management System. This manual system managed by human, where information is saved in the ledger book or book, the concepts are similar to a calendar or diary book. Customers who request for the reservation for events, their names will be written down on the pages according to the data (Stair, 1996). This type of reservation is seldom used now because it takes time to accomplish the task and the system is also not very reliable. It may cause a lot of delays or crashes during the reservation and subsequently cause the losing of the customers or supporters.

2.2.2 Computerized Event Management System

The computerized Event Management System is the modern type of event management system. It uses computers to manage the flow of reservations and management of events. This system may also provide us with the tools to manage the events as efficiently as possible. It streamlines event planning, allowing us to save successful event plans as templates, handle invitations, registration and others. Therefore, it helps to increase efficiency and profit in many industries, such as hotels, restaurants, convention centers, chambers, civic halls and others.

2.2.2.1 EventPro Event Management System

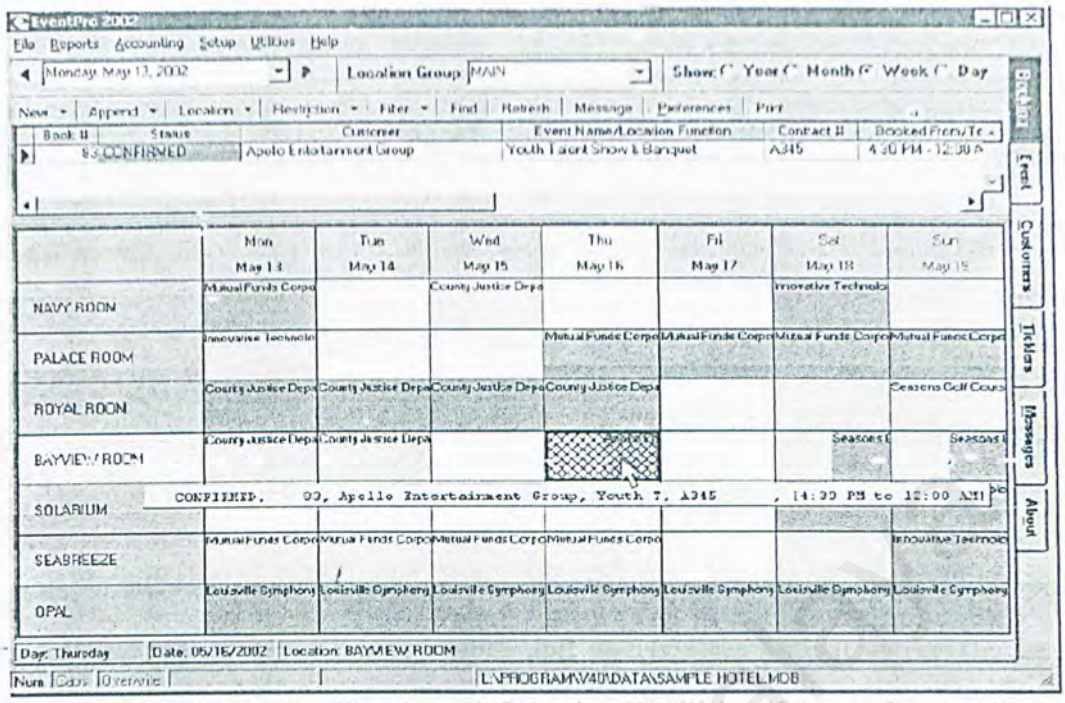


Figure 2.1 : EventPro Hotels and Catering Facilities (System Screenshot)

EventPro Software is a wholely owned subsidiary of Profit Systems Inc. Since 1985 Profit Systems has been providing software solutions to business and wholesale distribution, union management, military mess management, preventative maintenance and event management. EventPro software acts as specialists in event management software; they are committed to one thing - providing us with the tools to manage our events as efficiently as possible.

The website mentioned above will provide information on the software developed for Event Management System. Generally, this software or system is suitable for hotel, church, university or college, conference centre and exhibition centre.

Reference web site: http://www.eventpro.net/

a. System interface.

- EventPro 2003 new layout using the ACCESS 2000 database allows users to navigate the program easier and faster! Quick tabs allow us to quickly jump

from the booking grid, to event management details, to custom contacts and event charges. Before a user can use the system, he/she should register first in order to keep the personal particulars record.

b. System Function

- *Booking calendar*:

  It has a superior graphical booking calendar that offers "Day", "Week", "Month" and "Year" views. Users can select their preference and easily switch views with a simple click. The user-definable color-coded statuses are used to show which rooms are booked and the status of each. A quick reference of event names, times and statuses are shown at the top of the booking grid or in a drop down box when a cell is touched with the mouse.

- *Booking wizard*:

  The software provides a "wizard" to guide the user through the booking process step-by-step. It enables user to move from event information to customer information to room rates and following right on through to event detail information.

- *Contact management*:

  It empowers the salespeople to provide the highest level of service. It keeps complete client information including contact persons. This module has separated file tabs for "Contact Log" (history of contacts), "Notes" and "Ticklers" (reminders). The software also allows staffs to access the built-in Word Processor to create letters for a selected customer or use the "filtering" option to isolate a particular group of customers.

- *Event details*:

  The Event Detail Screen offers individual file tabs for Setup Materials (including A/V), Labor, Catering and Liquor as well as Letters, Images (floor

plans and/or photos), Discounts and Ticklers. The "Copy" function saves endless amounts of data entry time and possible errors. The software has the versatility to handle and add detail items to an event.

- *Catering*:

  This software divides Catering into four levels. These levels being Menu Group (e.g. Breakfast, Lunch, Dinner, and others.), Menu Codes (Specific Menu Names), Menu Categories (Entrees, Potatoes, Salad, Desserts, and others.) and Menu Items (e.g. Roast Beef, Baked Chicken, Scalloped Potatoes, Caesar Salad, and others.). It allows users to choose "Served" or "Buffet" with a simple click of the mouse.

- *Reporting*:

  The software helps in design the report that provides the required information such as Event Reports, Setup Reports, Financial Reports and Accounting Reports. It has a "filtering" feature which allows the user to isolate the exact information to be used for the report. Current, historical and future EventPro's database is offered in Access and Microsoft SQL. The software also includes a built-in report writer

- *Others:*

  Word Processing, Floor Plans, Discounting, Ticklers, Web Integration

c. Software Used

- Interface layout: Microsoft Access 2000
- Supported databases: Access 2000, Microsoft SQL 7 - SP3, SQL 2000, or MSDE 7

d. Advantages

- Eliminate double bookings.
- Internal reminders.

- For web integration features, it allows clients, co-workers, and other EventPro users to view the events taking place in the facility with EventPro's web enabled event screen and publish selected events to the web site. Clients will then be able to see what locations and dates are open and can send in requests to the corresponding staffs.

e. Disadvantages

- This system only suitable for hotel and catering facilities. Others business like convention centre, exhibition hall and others may need to buy different software in order to manage events. It will confuse the buyers on purchasing products.
- The system interface is quite crowded and monotonous.
- Features such like seats allocation, invitation handling and others are not included. These may not satisfy those choosy type customers.

2.2.2.2 FASTBook

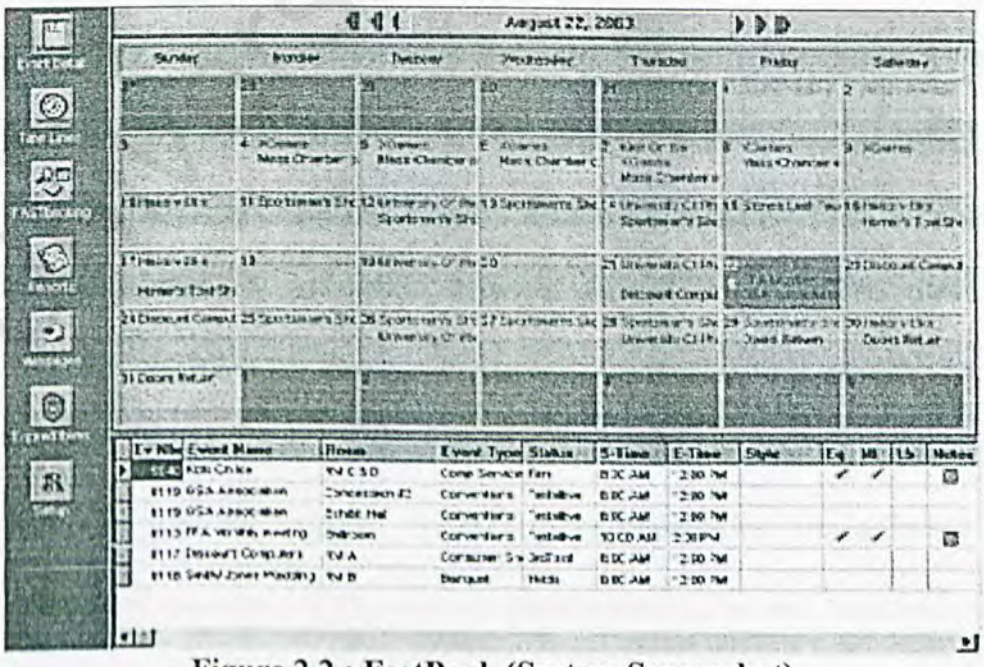


Figure 2.2 : FastBook (System Screenshot)

Reference web site: http://www.eventsoft.com/fastbook1.asp

FASTbook is one of the highest rated facility management programs available. The user-friendly windows environment is simple to use and features extensive context-sensitive on-screen help menus, along with a convenient users guide. FASTbook is a complete, state-of-the-art booking system that is easily customized for your facility and your specific needs. FASTbook performs every function necessary to quickly schedule and track all aspects of an event, from initial inquiry to final invoicing.

a. System interface.

- The user-friendly windows environment is simple to use and features extensive context-sensitive on-screen help menus, along with a convenient users guide.

b. System Function

- *Calendar and Timelines*:

  This software helps to arrange facility's bookings and show us everything that is going on in our facility. The calendar gives us an instant overview of our facility's status in a monthly calendar form. The Daily Timeline is a graphical display of our facility's bookings for one day. It gives us a snapshot of the status of all rooms while he Monthly Timeline displays our facility's bookings for one month.

- *Booking Module*:

  This module helps to manage room availability and booking fast and simple. We can view the calendar to check room availability. This software allows for quick capturing of all essential event information, and then finds the best available room according to customers' specifications. It also allows us to find space, check attributes and book it while the customer is on the phone.

There is an Advanced Booking feature that allows us to schedule repetitive or recurring events. This module allows us to enter all relevant information on one screen while for canceling or changing event statuses, it requires us to change the status of the event on the Event Data screen. The program will take care of the rest.

- *Resource Managers*:

  It helps to coordinate all aspects of facility equipment, meals and labor, including inventory, availability, resource allocation, and invoicing for both in-house and vendor supplied resources. The equipment database manages all aspects of equipments including inventory, availability and cost. We can select meals from a list of meal components for in-house or vendor supplied catering. Besides, we also can select the positions, enter the hours and the software will keep track of labor from scheduling to billing. To obtain a detailed event outline for our event, we can select items from our predefined list and type in the time. Ticklers are available to remind us about the things that we have to do to follow up for an event.

- *FASTmail*:

  Connects to our E-mail, any time we need to correspond with a client to confirm or make a change to their event. This feature can also send the client a reminder.

c. Software Used

- ACT 2000
- Corel Suite 7
- Access, Microsoft word, Excel
- Crystal Report Writer and others

d. Advantages

- The existence of on screen help menus and user guides makes it simple to go through the system.
- This system performs every function necessary to quickly schedule and track all aspects of an event, from initial inquiry to final invoicing.
- This system coordinates all aspects of facility equipment, meals and labor, including inventory, availability, resource allocation, and invoicing for both in-house and vendor supplied resources.

e. Disadvantages

- The system interface is quite dull.
- Features such like invitation handling and others are not included. These may not satisfy those choosy type users.
- The features of this system are too general that sometimes these may not fulfill some users' requirements.

2.2.2.3 EMS from Dean Evans & Associates, Inc

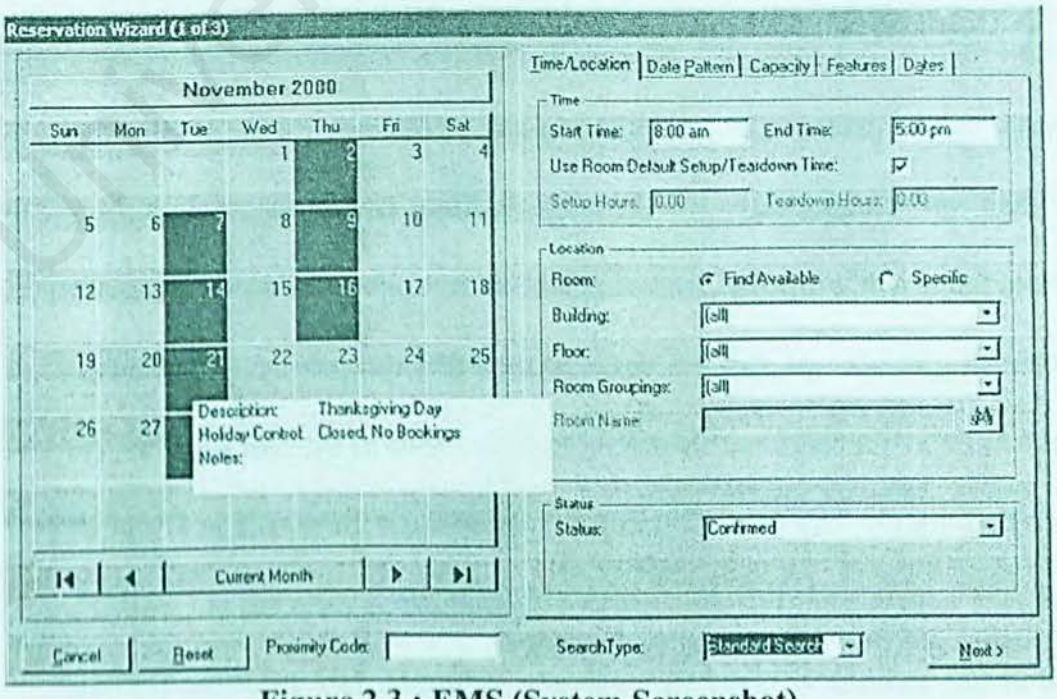


Figure 2.3 : EMS (System Screenshot)

In order to increase flexibility in room scheduling and event management, EMS comes out with several solutions that designed to track the meetings and events that take place in our facility more efficiently. The EMS family products include EMS Enterprise, EMS Professional, EMS Lite, and EMS Hoteling which are ideal for scheduling and managing a wide variety of facility types across various industries.

Reference web site: http://www.dea.com/Default.asp

In general, the features of EMS family products are shown as below:

a. System interface

- ♣ There is a reservation wizard that makes it simple (step by step) to check availability across any conceivable pattern of dates, and include our own search criteria.
- ♣ The user-friendly Reservation Book acts as a powerful tool for visualizing facility use and checking availability in an easier way.

b. System Function

- ♣ *Reservation*:

  This reservation module consists of several sub modules, which are new reservation, open reservation, groups, calendar, reservation books, scrolling book and browse events modules. Each of these sub modules has their own function. When users click on New Reservation, a form with a small monthly calendar will be shown and users can enter the date by selecting the date on the calendar and fill in some relevant details in the fields provided inside the form. Open Reservation module allows users to open and edit all the booking records. On the other hand, Groups module keeps all their regular customers' contact numbers and addresses. Calendar function is another function that

allows users to view the particular booking details by selecting a date on the calendar. Reservation and Scrolling Book are powerful tools for visualizing facility use and checking availability while Browse Events function is a filtered search engine that allows users to search for particular booking details.

- *Reports*:

  The reports shown in the system are Event Schedule report, Event Calendar report, Setup Worksheet report, Reservation Book report and Custom Calendar report.

- *Configuration*:

  Configuration module helps to edit the configuration for the facilities provided such as details on rooms, setup types, event types, holidays and calendar styles.

- *Admin*:

  Administration module allows users to delete old data, registration for group members, change system preference and others.

- *Virtual EMS*:

  The Web-enabling module that provides real-time access to meeting schedules and event calendars online and also provides online room request.

- *Optional modules*: Video display interface, academic import utility and others

c. Software Used

- Microsoft SQL Server and others

d. Advantages

- It optimizes resources utilization.
- It is easy to use because it provides step-by-step wizards simplify the making or changing of data.

- It increases productivity and communication because it reduces the time required to schedule and manage events, so staff can focus more on customer service.
- This system integrates with web modules that can extend the system capability to the web.

e. Disadvantages

- The system does not provide a utilized system that handles every type of events because this system is customized to particular business only.
- There are too many types of Event Management Systems that provided by this company, customers may feel hesitate on choosing the most suitable type of system.
- Features such like invitation handling, seat allocation, printing of invitation cards and others are not included. These may not satisfy those choosy type users.
- This software cannot run on multiplatform, for example, EMS Enterprise can only be supported on Windows NT, 2000 and XP.
- The software does not provide log in module, thus any users of the system can change the preference of the system and do things which are supposed to be done by an administrator.
- The interface is quite messy and the layout of the forms is not organized properly.

2.2.3 Online Event Management System

Nowadays, network connection has played an important role in linking all the networks from different places all over the world. Many companies or industries

have published their business on Internet in order to popularize their businesses or products. It has become a new trend in the business areas.

Since there is a demand in registering events online instead of calling through phone or walk-in registration, here comes the online Event Management System. There is nothing to purchase or install as we can access the online event management system over the Internet from any web browser. Internet users can register 24 hours a day, seven days a week! This system is perfect for meetings, seminars, conferences, trade shows, classes, sporting events, club functions, and any other events. There is also a set of event planning and event management tools with functionality like credit card processing, email broadcasting, hotel reservations and room block management and much more.

2.2.3.1 FASTBook Online

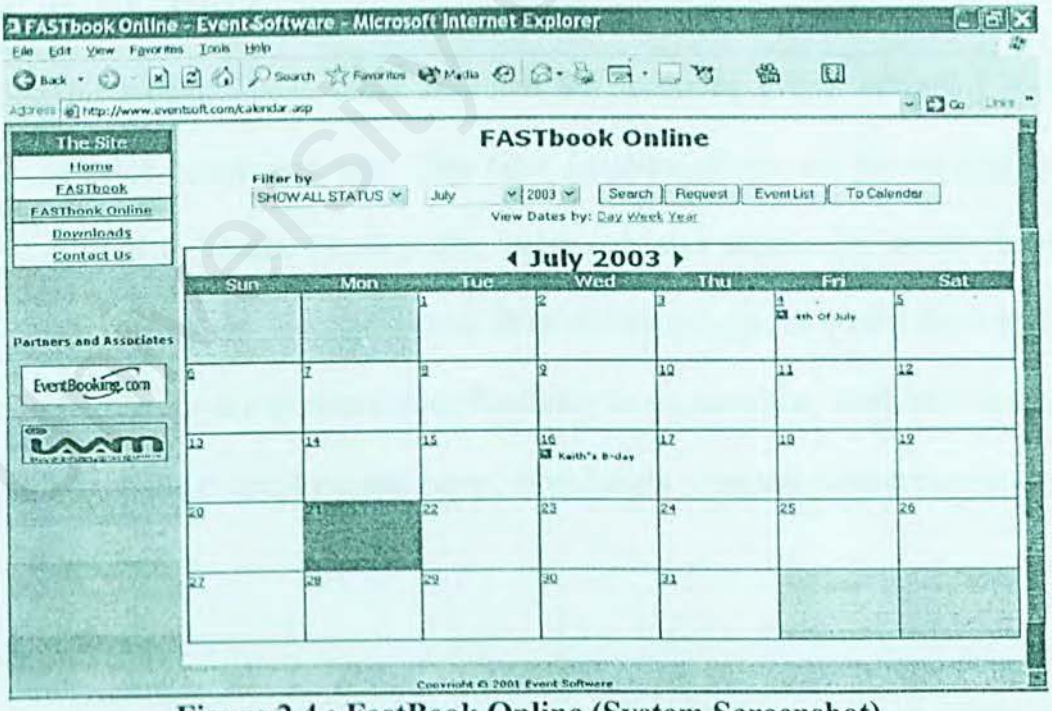


Figure 2.4 : FastBook Online (System Screenshot)

FASTbook Online is a web based software that integrates with FASTbook (a computerized Event Management System that I mentioned above). It enables the world to know what is going on at the company's facility. A calendar of upcoming

events will be displayed on the website for everyone to see. Besides that, this calendar can be put on local intranet and only allows the employees to view. Internet users can click on any of the events in the calendar to find out more information. On the other hand, the calendar is personalized to fit into the website. Company's logo will appear at the top of every page. By using FASTbook as scheduler, the events will be uploaded to FASTbook Online automatically.

Reference Web Site: http://www.eventsoft.com/fbonline1.asp

a. System interface

- The background is plain in order to avoid transmission delay when accessing the system. The icons and wordings are clear and concise. Overall, the interface is simple and easy to use.

b. System Function

- *Search Module*:

  This module allows users to search for upcoming events according to the selected month and year. The filter function allows the events displayed filtered by status. Besides that, users can also search for events through clicking on the "Search" button from the main page. A search form will be displayed and it provides more flexibility to the searching methods. Users can search the events by event name, room location, status, customer, event type and date.

- *Calendar*:

  The calendar gives us an instant overview of the upcoming events in a monthly calendar form. By simply clicking on the event date from the calendar, details of the particular event will be displayed.

- *Request An Event*:

Another function of this system is request for event. By clicking the "Request" button from the main page, the system will direct the users to the Request form. Users may have to fill in their personal details and the event information in order to make a request for event.

c. Technology Used

- The system is developed using ASP with the extension files ended with asp.

d. Advantages

- The interface, words and icons displayed are plain and understandable. It is user friendly and easy to use.
- The respond time is fast and there isn't any lag when loading from page to page.
- The search module is quite complete and easy to use. Users may feel convenience when searching events information from the search engine provided by the web site.

e. Disadvantages

- This system does not provide the company information, details on room rental, meal packages that offered by the company and others on the web site.
- Features such like invitation handling through e-mail and others are not included. These may not satisfy those choosy type users.
- The request for event form does not allow users to select their desired venue to hold an event.
- Meal reservation is not allowed on this web site. This may not satisfy those users that need catering service online.

2.2.3.2 Trowbridge Civic Hall

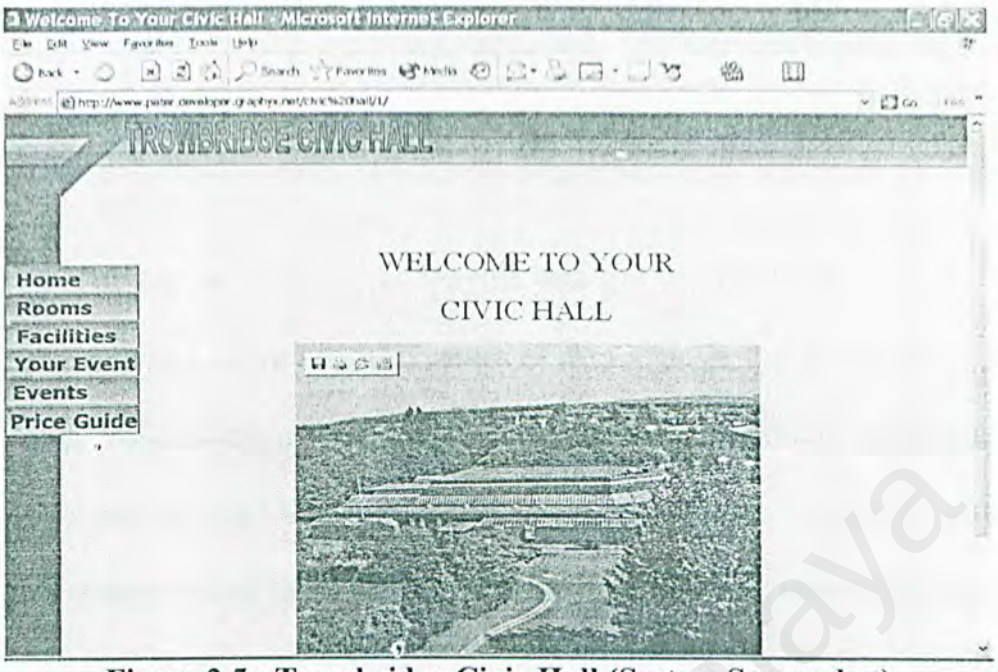


Figure 2.5 : Townbridge Civic Hall (System Screenshot)

Trowbridge, the county town of Wiltshire, is a vibrant industrial, commercial and administrative centre, situated close to the western boundary of Wiltshire. It has a civic hall which equipped with complete facilities that are always available for Trowbridge residents. This web site provides services such as reservation, information provider and others. People can go through this web site and make reservation for their events easily.

Reference Web Site: http://www.peter.developer.graphyx.net/civic%20hall/1/

a. System interface

- The background is plain in order to avoid transmission delay when accessing the system. The icons and wordings are clear and concise but the layout of the web site is not attractive enough. Overall, the interface is simple and easy to use.

b. System Function

- *Reservation::*

  From the main page, we can click on the link below which will direct the users to a reservation form in order to make a reservation. This reservation

form allows users to key in their desired event details, such as event name, time, choose a required room, additional requirement (piano, audio and others), wine, drinks, food, music band, term and condition and others.

- *Information Provider:*

  By clicking the "Rooms" button, the web site will direct the users to a page that provides rooms pictures, names of the rooms, rooms size and equipment that provided by each room. We can view for facilities information by clicking on the "Facilities" button where facilities include equipment, refreshments and food. Trowbridge Civic Hall's floor plan is also provided in a page named "Your Event". Besides that, by clicking "Events" button, we can view for the details of the upcoming events that will be held in Civic Hall. Through the "Price Guide" page, we can know more about the price of the food packages, rental of each room and equipments.

c. Technology Used

- The system is developed using ASP and HTML with the extension files ended with asp and htm. The reservation form is designed using HTML but the action posted by the form is using ASP for privacy purpose while other pages are mainly developed using HTML only.

d. Advantages

- The booking or reservation form provides flexibility for the users in order to make reservation for their events. They can select their venue, food, refreshments, equipment, music band and other facilities they need through this form.
- Information provided by this web site is satisfied and enough. People can go through this web site searching for the information of their facilities and compare the rooms' rental or price of each food before making a request.

- It provides better links. All the needed links are designed in button form which can be found at the left hand side of each page. Thus, users can access to their desired links by simply clicking on the buttons fast and easy.

e. Disadvantages

- Features such like invitation handling through e-mail and others are not included. These may not satisfy those choosy type users.
- Upcoming events should be displayed in calendar form instead of displaying them in a list form in order to make it easier to use and attractive.
- The web site does not provide any company profile. This may not satisfy those users who need extra information.
- The layout of the interface is not attractive enough.
- The web site does not support payment online; this may bring dissatisfaction and inconvenience to the users.

2.2.3.3 Ez-Event

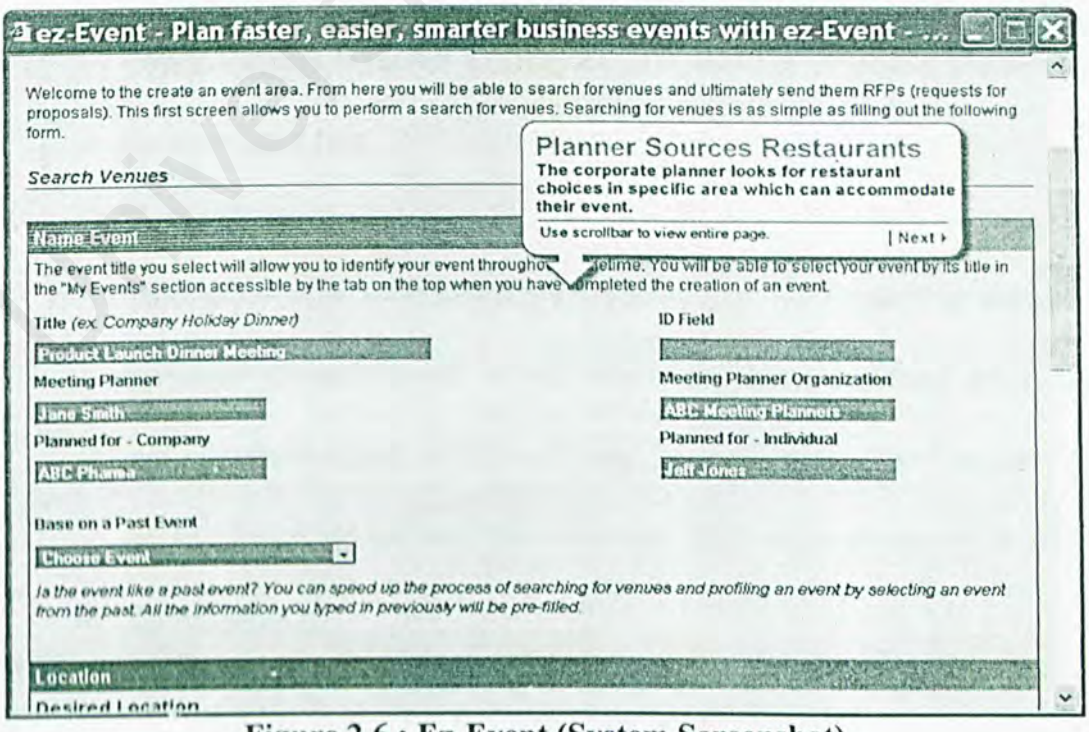


Figure 2.6 : Ez-Event (System Screenshot)

EZ-Event is one of the online booking systems that bring full service restaurants ongoing group dinner meeting business from corporate America. EZ-Event facilitates a private exchange between corporate meeting planners (customers) and the sales/banquet staff resulting in repeat dinner meeting bookings and quantifiable results. It pays to be an EZ-Event member.

Reference Web Site: http://www.ez-event.com/restaurants.asp

a. System Interface:

- The background is plain in order to avoid transmission delay when accessing the system. The layout of the web site is simple and organized. Step by step reservation may bring convenience to users while making a request for event.

b. System Description:

- *How does it look like:*

i) Listing page:

This page consists of two listings which are Basic Listing and Premier Listing. This is a powerful presentation of our restaurant's unique qualities. Top placement (Premier Listing) ensures that the corporate planner sees our restaurant first.

ii) Venue Home page:

This page helps to make our restaurant best impression. It draws the corporate planner in with a high resolution photo, enrolling description, and important details which will help the corporate planner to agree that our restaurant are the best choice for their next corporate dinner meeting.

iii) Photo Gallery:

This is the page which will provide the corporate planner with up to 20 photos depicting our restaurant atmosphere, private rooms and menu items.

iv) Photo Gallery Enlarged:

All photos can be enlarged by the corporate planner for a close look. Photos are formatted into a scrolling photo gallery.

v) Menus:

This page gives the corporate planner our restaurant's cuisine and preset menus.

vi) Maps:

It is easy to find the location of the restaurant through the two customized maps that had been pre-created for the restaurant.

♣ *How it works:*

i) Search Venue:

The corporate planner looks for restaurant choices in specific area which can accommodate their events. There is a form which the corporate planner has to fill in the details.

ii) Restaurant Choices:

The system displays the restaurants that are in the selected area. Premier restaurants are displayed first and follow by basic restaurants.

iii) Selected restaurants:

The corporate planner reviews restaurant information and selects suitable choices.

iv) Event Request:

The corporate planner defines event criteria (numbers of guests, date, and others) and submits the event request to the selected restaurants. Selected restaurants receive an email alert informing them they have a new event request. The restaurant reviews the event request.

v) Proposal:

Using the cost worksheet, a proposal is created which includes a preset menu. The proposal is submitted back to the corporate planner.

vi) Proposal Accepted:

Restaurant then will receive the credit card and contact information.

vii) Receipt:

Restaurant sends a receipt confirming deposit amount, and event is confirmed.

c. Technology Used:

- The system is developed using ASP with the extension files ended with asp.

d. Advantages:

- This system gathers all the restaurants according to specific area and this will bring conveniences to the corporate planners in order to choose their desired area and restaurant to hold their events. It establishes the restaurant as a preferred venue in the particular area.
- Photos depicting the restaurant atmosphere, private rooms and menu items are shown in this system and this gives an opportunity to the corporate planners to view the restaurant environment before making a reservation.
- Step by step reservation processes has made it simple to the corporate planners while making a request for event.

- Corporate planners will not find it difficult to pay deposit for the reservation because this system allows online payment through credit card.

e. Disadvantages:

- The system does not allow meal or refreshment reservation. This may not satisfy those corporate planners that need catering services.
- This system is mainly developed for restaurants, therefore, it does not support any others businesses which are also provide event handling services.
- This system is not suitable for those regular customers who desire to hold their events such as party, wedding and others in the restaurants because this system is mainly developed for corporate planners regarding their dinner meeting bookings.

2.2.3.4 Restaurant 101 Cape Cuisine

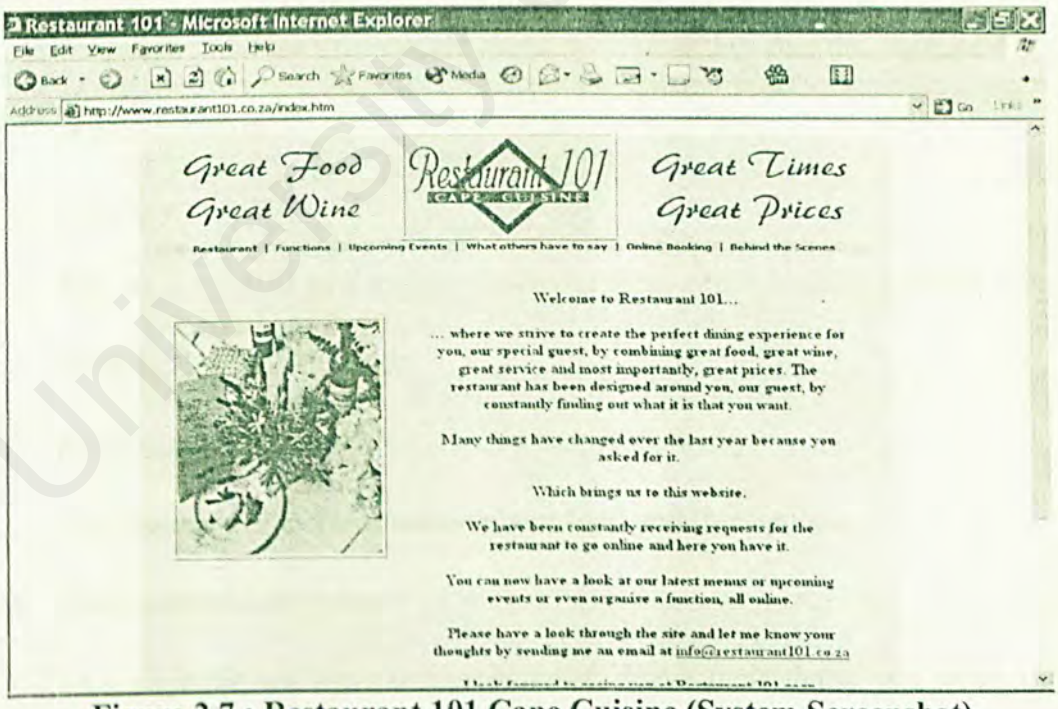


Figure 2.7 : Restaurant 101 Cape Cuisine (System Screenshot)

Restaurant 101 is a restaurant where they strive to create the perfect dining experience for customers, their special guest, by combining great food, great wine, great service and most importantly, great prices. The restaurant has been designed

around their guest, by constantly finding out what it is that customers want. Though this web site, users can now have a look at their latest menus or upcoming events or even organize a function in their restaurant all online.

Reference Web Site: http://www.restaurant101.co.za/

a. System Interface:

- The background is plain and simple in order to avoid transmission delay when accessing the system. The layout of the web site is simple and organized.

b. System Description:

- *Home*:

  This page briefly describes about Restaurant 101.

- *Functions*:

  This page provides information about meal packages that the restaurant offers to hold function.

- *Upcoming Events*:

  This page consists of a monthly calendar form which enables Internet users to view the upcoming events.

- *Restaurant*:

  This page provides information about food and their prices.

- *What others have to say*:

  This page allows users or customers to leave their thank you notes to the restaurant.

- *Online booking* :

A booking form will be displayed. Users can fill in their details such as personal details, event date and time, approximate guests and additional information. This page also provides Restaurant 101 telephone number and address.

c. Technology Used:

- The system is developed HTML with the extension files ended with html. The reservation form is designed using HTML and the details filled will be converted to a text file which will be kept in Restaurant 101 records.

d. Advantages:

- The design of the interface is attractive and soothing.
- Information provided by this web site is satisfied. People can go through this web site searching for the information of their facilities and meal packages before making a request.

e. Disadvantages:

- Some of the web sites are not accessible. This will annoy some of the Internet users.
- The booking for event form is too simple, that users cannot select their desired venue, book for meal packages and others.
- Features such like invitation handling through e-mail and others are not included. These may not satisfy those choosy type users.
- Customers will only know whether their reservation successful or not through email or phone because the web site does not provide any checking for availability function.

2.3 Consideration of Technologies

2.3.1 Consideration of Operating System

2.3.1.1 Windows XP Professional

With improved reliability, security, mobility, and ease of use features, Microsoft Windows XP offers both business users and consumers increased productivity and value. Windows XP is the convergence of business and consumer operating systems and combines the dependability of Microsoft Windows 2000 with the ease of use of Windows Millennium. Windows XP was launched by Microsoft and available to the public on October 25 2001.

There are four editions of Windows XP which are Windows XP Professional, Windows XP Home Edition, Windows XP Tablet PC Edition and Windows XP Media Center Edition. Among these four editions, Windows XP Professional and Windows XP Home Edition are the most popular editions if compared with others.

For individual consumers or those with small home networks, Windows XP Home Edition is generally the right choice. On the other hand, Windows XP Professional contains all the features in Windows XP Home Edition plus additional features for business and power users.

Some of the features available only in Windows XP Professional:

- Peer to peer networking for up to 10 simultaneous users (Windows XP Home only supports five simultaneous users)
- Server-based networking using domain authentication and support for Active Directory
- Remote Desktop allows you to work from virtually anywhere and access files, applications and network services from almost any computer

- Encrypted File System (EFS) helps protect sensitive data, even if your computer is stolen
- Support for dual processors
- Access Control restricts access to files and folders
- Enhanced software restriction policy allows administrators to identify software and control its ability to execute
- Group Policies allow administrators to organize users into logical groups and assign settings (security, appearance, management options)

2.3.1.2 Windows 2000

Windows 2000 (Professional, Server, and Advanced Server) is a server and workstation operating system made by Microsoft that runs on Intel/Cyrix/AMD Pentium.

Windows 2000 is Microsoft's third attempt to provide a reliable desktop operating system. The first attempts were Windows 98 and Windows NT. Windows 2000 was originally planned to combine the ease of use of Windows 98 with the supposed "reliability" of Windows NT, but Microsoft still was unable to accomplish that modest goal and announced plans for a continued two track system (Windows 2000 for "professional" use and Windows Millennium Edition (ME) for desktop use).

Microsoft has been running a series of television commercials claiming that Windows 2000 is reliable and that it can be left unattended for days at a time without human intervention. It is secure and immune from hacker and virus attacks. Microsoft also claiming that Windows 2000 can easily connect to other systems and that it is easy to merge operations on separate Windows 2000 systems. The Windows family of operating systems (including Windows 2000) is subject to the greatest

number of viruses of any operating system family (more than 10,000 as many viruses as the UNIX family of operating systems).

2.3.2 Consideration of Server Side Scripting

2.3.2.1 JSP

JavaServer Pages (JSP) technology provides an easy way to create dynamic web pages and simplify the task of building web applications that work with a wide variety of web servers, application servers, browsers and development tools.

JavaServer Pages technology allows web developers and designers to easily develop and maintain dynamic web pages that leverage existing business systems. As part of the Java technology family, JSP enables rapid development of web-based applications that are platform-independent. JSP separates user interfaces from content generation, enabling designers to change the overall page layout without altering the underlying dynamic content.

In basic form, a JSP page is simply an HTML web page that contains additional bits of code that execute application logic to generate dynamic content. This application logic may involve JavaBeans, JDBC objects, Enterprise Java Beans (EJB), and Remote Method Invocation (RMI) objects, all of which can be easily accessed from a JSP page. For example, a JSP page may contain HTML code that displays static text and graphics, as well as a method call to a JDBC object that accesses a database; when the page is displayed in a user's browser, it will contain both the static HTML content and dynamic information retrieved from the database.

The separation of user interface and program logic in a JSP page allows for a very convenient delegation of tasks between web content authors and developers. It also allows developers to create flexible code that can easily be updated and reused. Because JSP pages are automatically compiled as needed, web authors can make

changes to presentation code without recompiling application logic. This makes JSP a more flexible method of generating dynamic web content than Java servlets, whose functionality JavaServer Pages extend. There are plenty advantages in using JSP, such as:

- JSP pages easily combine static templates, including HTML or XML fragments, with code that generates dynamic content.
- JSP pages are compiled dynamically into servlets when requested, so page authors can easily make updates to presentation code. JSP pages can also be precompiled if desired.
- JSP tags for invoking JavaBeans components manage these components completely, shielding the page author from the complexity of application logic.
- Developers can offer customized JSP tag libraries that page authors accessed using an XML-like syntax.
- Web authors can change and edit the fixed template portions of pages without affecting the application logic. Similarly, developers can make logic changes at the component level without editing the individual pages that use the logic.

In general, JSP allows developers to easily distribute application functionality to a wide range of page authors. These authors do not have to know the Java programming language or know anything about writing servlet code, so they can concentrate on writing their HTML code while concentrating on creating the objects and application logic.

2.3.2.2 ASP.NET

ASP.NET is Microsoft's next-generation framework for developing Web server applications. Because ASP.NET is a layer on top of the .NET Common

Language Runtime, it has access to the full range of .NET programming languages; the distinction between scripting languages and "real" languages is a thing of the past. ASP.NET is the next "version" of ASP. The word version placed around with quotes because ASP.NET is not really a natural evolution from ASP 3.0; rather, ASP.NET offers an entirely new paradigm for creating server-side Web scripts.

ASP.NET is different from ASP in two major ways: first, ASP.NET offers several programmatic enhancements over ASP. Microsoft really did a great job of listening to ASP developers' comments and ideas for improvements and incorporated those improvements in ASP.NET; second, ASP.NET offers a change in programming fundamentals, in the way we write the code for creating these pages. Chances are we are very comfortable writing ASP pages. Writing ASP.NET pages is an entirely different experience.

ASP.NET offers several important advantages over previous Web development models:

- Enhanced Performance
- World-Class Tool Support
- Power and Flexibility
- Simplicity
- Manageability
- Scalability and Availability
- Customizability and Extensibility
- Security

2.3.3 Consideration of Browser Side Scripting

2.3.3.1 VBScript

Microsoft Visual Basic Scripting Edition brings active scripting to a wide variety of environments, including Web client scripting in Microsoft Internet Explorer and Web server scripting in Microsoft Internet Information Service.

If we already know Visual Basic or Visual Basic for Applications (VBA), VBScript will be very familiar. Even if we do not know Visual Basic, once we learn VBScript, we are on our way to programming with the whole family of Visual Basic languages.

VBScript talks to host applications using Windows Script. With Windows Script, browsers and other host applications do not require special integration code for each scripting component. Windows Script enables a host to compile scripts, obtain and call entry points, and manage the namespace available to the developer. With Windows Script, language vendors can create standard language run times for scripting. Microsoft will provide run-time support for VBScript. Microsoft is working with various Internet groups to define the Windows Script standard so that scripting engines can be interchangeable. Windows Script is used in Microsoft Internet Explorer and in Microsoft Internet Information Service.

2.3.3.2 JavaScript

JavaScript is a new scripting language for Web- pages. Scripts written with JavaScript can be embedded into your HTML- pages. With JavaScript we have very many possibilities for enhancing your HTML- page with interesting elements. For example we are able to respond to user- initiated events quite easily. Some effects that are now possible with JavaScript were some time ago only possible with CGI. So we can create really sophisticated pages with the help of JavaScript. We do not

need any special tools, programs, or compilers to write JavaScript; whatever we are currently using to write HTML should work just fine.

JavaScript can be used to make your Web pages interactive and dynamic. A static HTML page without any JavaScript just sits there -- if a visitor returns to our site next week, it will look exactly the same as it did today. With JavaScript, we can display different images, give feedback on forms, control the user's browser (for instance, displaying different pages based on the user's plug-ins), and manage framed sites. Overall, we use JavaScript to give the user feedback: the feeling that our site is responsive to their actions.

The most common use of JavaScript is the ubiquitous image rollover. It is gotten to the point on the Web where if we do not use JavaScript to change our clickable buttons, some users will not click on them, as they will not realize that they have that option. Image rollovers have become a de facto Web user interface standard, so we should use them if we want to give our visitors the experience they expect.

JavaScript is sometimes referred to as JScript or ECMAScript. These are not exactly the same languages as JavaScript, but the name JavaScript is often used to include them, too.

2.3.4 Consideration of Web Server

2.3.4.1 Apache Tomcat Version 4

Tomcat is the servlet container that is used in the official Reference Implementation for the Java Servlet and JavaServer Pages technologies. The Java Servlet and JavaServer Pages specifications are developed by Sun under the Java Community Process.

Tomcat is developed in an open and participatory environment and released under the Apache Software License. Tomcat is intended to be a collaboration of the best-of-breed developers from around the world. We invite you to participate in this open development project.

Tomcat 4.x implements a new servlet container (called Catalina) that is based on completely new architecture. The 4.x releases implement the Servlet 2.3 and JSP 1.2 specifications.

Tomcat 4.1.27 Stable is the latest release of Tomcat 4.1.x. Tomcat 4.1 is a refactoring of Tomcat 4.0.x, and contains significant enhancements, including:

- JMX based administration features
- JSP and Struts based administration web application
- New Coyote connector (HTTP/1.1, AJP 1.3 and JNI support)
- Rewritten Jasper JSP page compiler
- Performance and memory efficiency improvements
- Enhanced manager application support for integration with development tools.
- Custom Ant tasks to interact with the manager application directly from build.xml scripts

For Tomcat 4.0.x, Tomcat 4.0.6 is the old production quality release. Tomcat 4.0 is the next generation of Tomcat. The 4.0 servlet container (Catalina) has been developed from the ground up for flexibility and performance. Version 4.0 implements the final released versions of the Servlet 2.3 and JSP 1.2 specifications. As required by the specifications, Tomcat 4.0 also supports web applications built for the Servlet 2.2 and JSP 1.1 specifications with no changes.

2.3.4.2 Internet Information Server 5.0

Microsoft's IIS is the default Web server for Windows systems; it runs 29 percent of all public Web sites, according to Netcraft's survey, and comes free with Windows 2000. Its tight integration with the OS makes installing and administering easy, which also helped place it among the top performers on our benchmark tests. If you want an inexpensive and easy-to-use Web server and are comfortable with hewing to a Microsoft-centric strategy that includes Active Server Pages (ASP), COM+, and Visual Studio, then IIS holds a lot of appeal.

IIS supports all the basic features we would expect of a Web server: setting up virtual servers, throttling (based on bandwidth per computer or virtual server and on CPU time per virtual server), rotating logs automatically by date or size, and enforcing access restrictions by IP address, domain, and user log-on name.

In addition to the basics, IIS offers some advanced abilities. WebDAV support simplifies Web publishing by making WebDAV-compliant clients, including Internet Explorer, treat directories on the Web server just like local directories, so we can drag and drop files into them. Reliable Restart will automatically restart the server should it go down.

On the security-standards front, IIS supports not just the usual SSL and TLS (Transaction Layer Security) but also SGC (Server-Gated Cryptography, an SSL extension for financial transactions), the Fortezza security standard used by government agencies, Kerberos authentication, and more. The IIS interface also makes mundane tasks like setting up MIME types, custom HTTP error pages, or even RSAC (Recreational Software Advisory Council) content ratings easy.

IIS's programming interfaces are extensive but (not surprisingly) strongly favor Microsoft's own technologies. There's direct support for FrontPage Server

Extensions and ASP but not for JSP or other popular third-party scripting languages such as Perl and PHP, except via CGI.

IIS supports clustering and fail-over for higher-volume Web sites. In addition to the Web server, IIS components include an FTP server, a newsgroup (NNTP) server, and an SMTP mail server.

2.3.5 Consideration of Database Server

2.3.5.1 SQL Server 2000

Microsoft SQL Server 2000 is a full-featured relational database management system (RDBMS) that offers a variety of administrative tools to ease the burdens of database development, maintenance and administration. Six of the more frequently used tools: Enterprise Manager, Query Analyzer, SQL Profiler, Service Manager, Data Transformation Services and Books Online.

- ✓ **Enterprise Manager** is the main administrative console for SQL Server installations. It provides us with a graphical "birds-eye" view of all of the SQL Server installations on our network. We can perform high-level administrative functions that affect one or more servers, schedule common maintenance tasks or create and modify the structure of individual databases.
- ✓ **Query Analyzer** offers a quick and dirty method for performing queries against any SQL Server databases.
- ✓ **SQL Profiler** provides a window into the inner workings of our database. It can monitor many different event types and observe database performance in real time. SQL Profiler allows us to capture and replay system "traces" that log various activities.

- ✓ **Service Manager** is used to control the MSSQLServer (the main SQL Server process), MSDTC (Microsoft Distributed Transaction Coordinator) and SQLServerAgent processes.
- ✓ **Data Transformation Services (DTS)** provide an extremely flexible method for importing and exporting data between a Microsoft SQL Server installation and a large variety of other formats. The most commonly used DTS application is the "Import and Export Data" wizard found in the SQL Server program group.
- ✓ **Books Online** is an often overlooked resource provided with SQL Server that contains answers to a variety of administrative, development and installation issues. It is a great resource to consult before turning to the Internet or technical support.

2.3.5.2 Microsoft Access

Microsoft Access is relational database management system (RDBMS). Whether users are creating a stand-alone desktop database for personal use, departmental use or for an entire organization, Access offers an easy-to-use database for managing and sharing data. Access 2000 brings not only the traditional broad range of easy data management tools but also adds increased integration with the Web for easier sharing of data across a variety of platforms and user levels and additional ease-of-use enhancements to assist with personal productivity.

Access 2000 allows easily sharing information via the corporate intranet and the ability to easily host a database within the browser. This combines the power of a desktop database with the power of the web.

2.3.6 Consideration of Software Development Tool

2.3.6.1 Java - J2EE Technology

The Java 2 Platform, Enterprise Edition (J2EE) defines the standard for developing multi-tier enterprise applications. J2EE simplifies enterprise applications by basing them on standardized, modular components, by providing a complete set of services to those components, and by handling many details of application behavior automatically, without complex programming.

The Java 2 Platform, Enterprise Edition, takes advantage of many features of the Java 2 Platform, Standard Edition, such as "Write Once, Run Anywhere" portability, JDBC API for database access, CORBA technology for interaction with existing enterprise resources, and a security model that protects data even in internet applications. Building on this base, Java 2 Enterprise Edition adds full support for Enterprise JavaBeans components, Java Servlets API, JavaServer Pages™ and XML technology. The J2EE standard includes complete specifications and compliance tests to ensure portability of applications across the wide range of existing enterprise systems capable of supporting J2EE.

Portability and scalability are also important for long term viability. Enterprise applications must scale from small working prototypes and test cases to complete 24 x 7, enterprise-wide services, accessible by tens, hundreds, or even thousands of clients simultaneously.

As a single standard that can sit on top of a wide range of existing enterprise systems, database management systems, transaction monitors, naming and directory services, and more, J2EE breaks the barriers inherent between current enterprise systems. The unified J2EE standard wraps and embraces existing resources required by multi-tier applications with a unified, component-based application model. This

enables the next generation of components, tools, systems, and applications for solving the strategic requirements of the enterprise.

With simplicity, portability, scalability and legacy integration, J2EE is the platform for enterprise solutions.

2.3.6.2 VB.NET

Microsoft Visual Basic.NET is the next version of Microsoft Visual Basic, built on the .NET Framework to enable you to easily create next-generation applications for the Microsoft Windows operating system and the Web. With Visual Basic.NET, it is a snap to visually develop Web applications, XML Web services, Windows-based applications, and server-side components. In addition, Visual Basic .NET delivers XCOPY deployment of Windows applications, so there is no longer need to worry about DLL versioning issues. With Visual Basic .NET, DLL conflict is a thing of the past.

When designing Visual Basic .NET, we looked at the top requests of Visual Basic developers worldwide. The Visual Basic language is now truly object-oriented and supports implementation inheritance. The form designer supports visual inheritance and contains new features such as automatic form resizing, resource localization, and accessibility support. The data tools now inherently support XML data, and the design-time data binding works with disconnected data. In addition, Visual Basic .NET is built directly on the .NET Framework, so can full access to all of the platform features, as well as interoperability with other .NET languages.

Chapter 3 Methodology

3.1 Introduction

Methodology is one of the early phases in system development. This chapter summarized the fact finding techniques used to collect relevant information for the proposed system. Methodology is included into this chapter to see how the project will be developed.

3.2 Fact Finding

Fact finding techniques are the formal process of using clear reasoning and researching methodologies to collect information about systems, requirements and preference for a system development project. This is also known as information gathering or data collection. There are various fact finding techniques such as sampling existing documents and hard data, site visits, interviewing, observing, questionnaires, prototyping, Rapid Application Development and Joint Application Development. Overall, fact finding is most crucial to two development phases, which are the systems planning and the systems analysis phases.

It is important for me to examine and analyze raw data and proposed information in order to develop a system that fulfils the requisite requirements. Implementing different types of fact finding technique will offer different types of information. In most cases, a combination of these techniques is implemented to increase both effectiveness and efficiency in gathering factual information to leverage the project development. Together, these provide a comprehensive factual and analytical approach that is widely used for the development of any large and complex system. One of the key steps for successful project development is eliciting requirements from the existing and potential users and systems. Therefore, I have

examined both quantitative and qualitative information from the fact finding techniques in order to piece together an accurate picture of the proposed project.

3.2.1 Utilizing Printed Materials

There are a wide variety of printed materials available to obtain information. This ranges from books, encyclopedias, almanacs, yearbooks, periodicals, magazines, handbooks, manuals, directories, dictionaries, government document and policies, statistics and others. Intrinsically, all these documents have a specific purpose and are published for a group of targeted audience. One can rely on the contents of printed materials, as it still remains as the most authoritative resources in information gathering.

Printed resources especially journal articles were used to obtain information about definition of terms, concepts and research activity in the area of Event Management System, reservation System, existing manual system and others. This knowledge helps to understand the basic features required for the proposed system.

3.2.2 Utilizing Internet and Electronic Materials

Although the Internet was developed since the last three decades, its current potential as new information-focused technological advancement is just a scratch of its surface. There is still a long way to go to achieve an organized Internet with accurate search retrieval of electronic materials. At present, although the Internet is chaotic and unorganized, it still provides an immeasurable amount of data, including substantial academic information. In the past, it has provided a useful means for researchers to communicate with each other, mostly through electronic mail and discussion groups. Some of the useful things that can be found on the Internet are huge number of information topics ranging from company financial reports to

conference proceedings and academic researches, as well as other useful services such as forums, emails, discussion lists, search engines, databases and subject gateways. In this project, the Internet has enabled me to gather Event Management System related information by visiting available web sites regarding this topic. Internet provides invaluable information and supports through a faster and easier way. Information such as definition of Event Management System, features of different software provided by different companies, Event Management System current trend, types and variation of Event Management System and others invaluable information has been extracted from Internet to make comparison and summaries. Besides, Internet enables any internet users from any place in the world to access and experience the serviceable online Event Management System. Thus, I can take a tour going through the web site and gather information needed. Some web sites even allow users to download the trial real time Event Management Software before purchasing the software. Forums, discussion groups and others that available on Internet have also help me a lot in gathering relevant information.

3.2.3 Discussion

I have also discussed about the proposed system with my friends, colleagues from the company that I underwent my industrial training and family to gather ideas on the existing reservation system that they had experienced before, what they know about Event Management System, how I should improve and design the system in order to make it as user friendly as possible, what are the additional requirements after experiencing the current restaurant or hotel ballroom booking system and others relevant information.

3.3 Methodology

A methodology is a systematic way of accomplishes certain tasks and may be defined as a collection of procedures, techniques; tools and documentation which may help the software developers in speeding up and simplifying the software development processes.

There is no single precise approach to develop a system. Every development method has its strengths and drawbacks. It depends on the circumstances of the system and the people who involved in the development activities.

3.3.1 What is software process model?

In contrast to software life cycle models, software process models often represent a networked sequence of activities, objects, transformations, and events that embody strategies for accomplishing software evolution. Such models can be used to develop more precise and formalized descriptions of the software life cycle activities. Their power emerges from their utilization of a sufficiently rich notation, syntax, or semantics, often suitable for computational processing. There are various types of software process models, which are following different types of strategies. Among all the available models, Waterfall Model, Waterfall Model with Prototyping, Prototyping Model, V Model, Incremental Model, Spiral Model and Unified Software Development Process had been chosen for discussion.

3.3.2 Waterfall Model

Waterfall Model is well-defined development process in which one phase has to be finished before the next phase. The model is very simple to use. The model can be used if the requirement is well understood and defined. Waterfall model is used if the problem is very well understood.

Usually, designers use the waterfall model to develop a simple system because it is hard to change if the model is used. If customers come by and ask for

changing requirements, designers will have to start from the scratch because there is no fast way to design the system with the new requirement. Also there is a big problem for testing later if there is a change in requirement. The testers do not have well-define set of test cases, so the test is easy to fail. In brief, waterfall model is used if designers have a well-defined list of user requirements.

3.3.3 Waterfall Model with Prototyping

Waterfall Model with Prototyping is the technique which helps to control the trashing by including prototyping that enhance understanding. A prototype is a partially developed product that enables customer and developers to examine some aspect of the proposed system and decide if it is suitable or appropriate for the finished product.

Often, the user interface is built and tested as a prototype, so the users understand what the new system will be like and the designers get a better sense of how the users like to interact with the system.

3.3.4 Prototyping Model

Prototyping Model is the technique which helps designers and users to clarify the requirement of the system. A throw-away prototype is developed by designers and is evaluated by users. From feedback of users, designers will understand the system better and improve the prototype.

The prototype model is a good model for the project which has unambiguous user requirement. The model will helps users to understand what they actually want. A throw-away prototype is developed so that users can realize what the system like. Human computer interface (HCI) is a big problem in requirement engineering because HCI depends on different user groups. Different user groups have different need or desire for the interface; therefore, designers have to build the prototype so that users can see and feel it. The prototype model is also good for deploying the new

technology. Before the technology is used, users are interested in know whether the technology works or not. Therefore, the prototype is a neat way to demonstrate the idea to users or customers.

3.3.5 V Model

V Model is similar to waterfall model. The difference is that each test phase matches each development phase: requirements with system testing, high-level design with integration testing, and detailed design with unit testing.

V model is an improved version of waterfall model. V model does not run into the problem that the software is impossible to be tested because system test, integration test, and unit test are planed ahead. For example, when we plan the requirement, we also plan for system testing. Therefore, when the system is built, we have a whole set of test cases for system testing. By that way, the system does not meet user requirements.

3.3.6 Incremental Model

The designers develop the software in a number of stages and are able to deliver the product early. At each phase the designers have a goal to deliver certain features to customers. Incremental model is good for fast delivering product to the marker place.

Incremental model has many advantages over the other techniques. One of advantages is that the system can be developed at several stages. Each stage has its own requirement; usually it has certain features or core of the system. Each stage can use V-shaped, prototype or waterfall model to develop the requirement for this stage. Regardless what kind of model is used in each stage, the product with certain features must be done at the end of the stage. Incremental model satisfies the requirement of fast delivery to the market place, so business people are interested in this model.

3.3.7 Spiral Model

Spiral Model is an iterative approach. The model carefully takes risks into account. The designers develop a small part of the project and evaluate the risks. If the risk is low, designers keep developing more features. There are six steps in each iteration process:

- Determine objectives, alternatives, and constraints.
- Identify and resolve risks.
- Evaluate alternatives.
- Develop deliverables and verify that they are correct.
- Plan the next iteration.
- Commit to an approach for the next iteration.

Spiral model is heavily involved in risks management. If we have a project with a very high risk, we should implement spiral model. We would have a chance to evaluate the risks and to forecast whether the project keeps going or stops in every iteration process. Similar to incremental model stage, designer can use V-shape, prototype, or waterfall in each iteration process. Spiral model is usually used in large projects such as financial system, wireless cellular communication management system, network management system and others.

3.3.8 Unified Software Development Process

Unified Software Development Process (USDP) represents the object oriented methodology. USDP adopts an iteration approach within four main phases: inception, elaboration, construction and transition. The number of iterations in each phase is determined on a project by project basis. At the end of each iteration, an increment is delivered. In USDP, an increment is not necessarily additive; it may be a reworked version of a previous increment. A phase may involve a series of different activities. In USDP, the activities are independent of the phases, and it is the

mix of the activities that changes as the project proceeds. Various UML techniques and notations are used, as well as other techniques.

3.3.9 Methodology of the Project

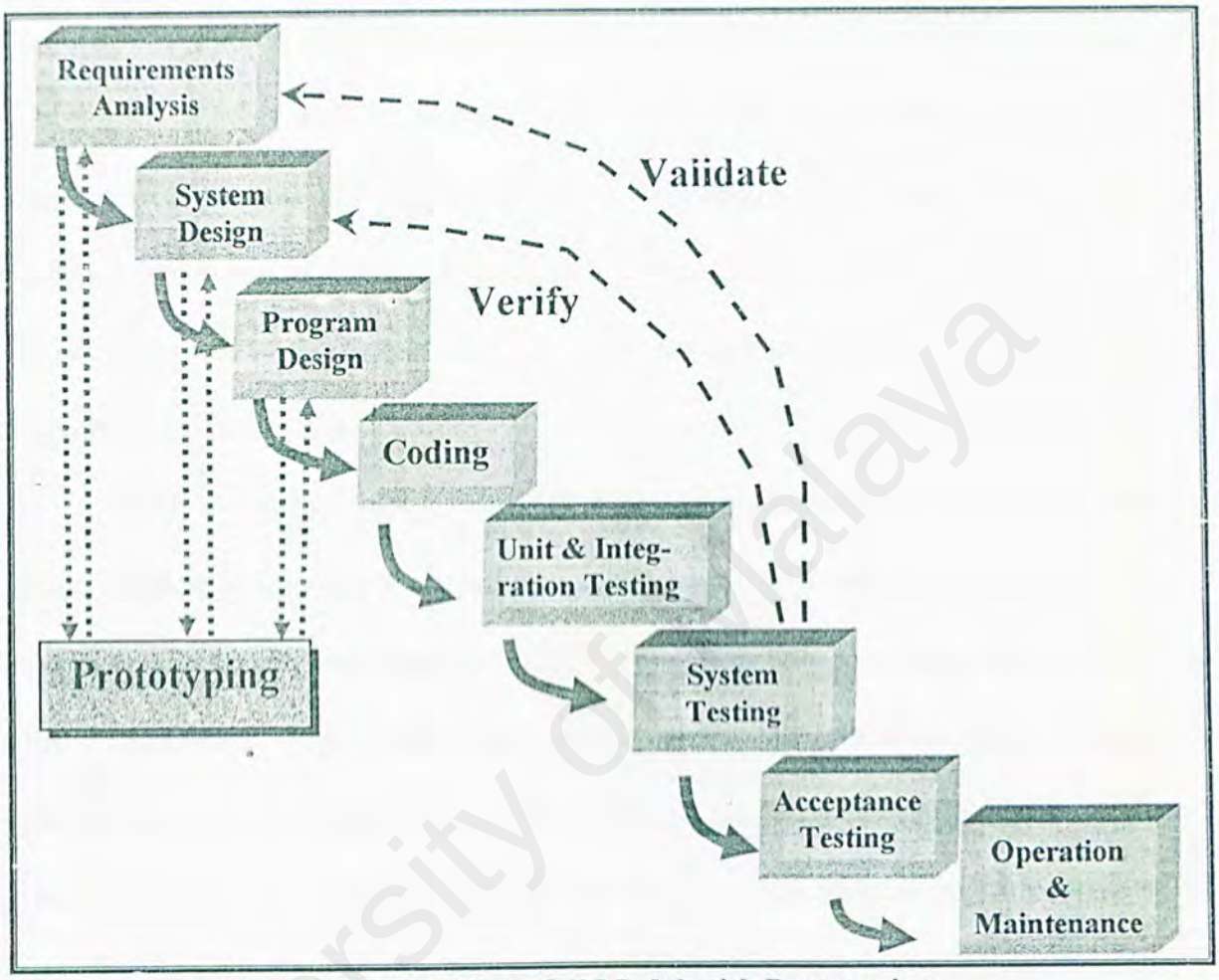


Figure 3.1 : The Waterfall Model with Prototyping

Waterfall model, V model, and prototyping model are the three basic models which are suitable for small project while Incremental model and Spiral model are more suitable for large project. A large project is usually divided into well-defined small project (or phase or stage or iteration). Therefore, this kind of small projects can adopt waterfall, V-shape, or prototyping model for their developments. The models chosen for the developments are always depending on the organization (Trung Ma, 1999).

Due mainly to the time constraints and the nature of this system, the waterfall model with prototyping is being used for this project. This is the model which

includes prototyping method in the traditional waterfall model in order to enhance the understanding of the development process. In another words, this model is one of the variations of waterfall model. This method is chosen because it solves the biggest problem in waterfall model which it does not reflect the way the code been developed. Further more, project rarely flows in a sequential way and the requirements are always difficult to be stated especially at the beginning stage of the project. Since waterfall approach needs well-understood requirements before starting the development of the project, so, it is not wise to adopt the waterfall model if the requirements are not clear enough.

With this methodology, waterfall model with prototyping, developers may build a system to implement a small portion of some key requirements to ensure that the requirements are consistent, feasible and practical; if not, revisions are made at the requirements stage, rather than at the more costly testing stage. Design prototyping helps developers assess alternative design strategies and decides which one is the best for a particular project. The designer may address the requirements with several radically different designs to see which have the best properties.

Major problems in the requirements are addressed and fixed before the requirements are officially validated during the system testing. Validation ensures that the system has implemented all of the requirements, so that each function can be traced back to a particular requirement in the specification. System testing also verifies the requirements. Verification ensures that each function works correctly. In another words, validation makes sure that the developer is building the right product (according to the specification), while verification checks the quality of the implementation. Prototyping is useful for verification and validation.

Chapter 4: System Analysis

- ✓ Introduction
- ✓ System Requirements
- ✓ Proposed Tools
- ✓ Hardware and Software Requirements

Chapter 4 System Analysis

4.1 Introduction

System analysis is one of the early phases in system development. It involves identification of functional and non-functional requirements. This chapter focuses on the aspects of analyzing the information obtained from fact finding so that it can be incorporated into the system. Synthesis is done from existing system and some features will be adopted into the proposed system. System analysis is the process of understanding broader aspects of the system that would be required to solve problems. The overall emphasis is to gather information obtained and use this information to consider other alternatives possibilities before choosing the best solutions for the proposed system. The system analysis is done first to obtain requirements for the system. Tools and language for the development will be discussed and determined for the development of the project.

4.2 System Requirements

4.2.1 Functional Requirements

Functional requirements are statements of services the system should provide, how the system should react to particular inputs and how the system should behave in particular situations (Sommerwille, I, 2000). All identified functional requirements have been grouped into several modules.

Module	Sub Module
Administrator	*Login, Admin, Report Generation*
Operator	*Login, Reservation, Schedule, Invitation Handling*
Internet User	*Login, Reservation, View, Invitation Handling*

Table 4.1 : Functional Requirements

The next section introduces the functionality of each module.

For Administrator Module:

Login Module

- Administrators have to enter their user names and passwords before logging in to the system. Only authorized users are allowed to enter the system. Users are not allowed to enter the system anymore after entering the wrong passwords or usernames for three times.
- Administrators have more controls or rights if compared with operators, such as report viewing, edit company profile, and others.
- Administrators are allowed to change their passwords after entering the system.

Admin Module

- This module shall be designed only for administrators.
- Administrators shall fill in the company profile, rooms' information, meal packages provided, meal types and card types information through the admin module.
- Administrators shall be able to add, update and delete the company profile and facilities information.
- Administrators shall be able to view reports.
- Administrators shall validate the events details that users wish to publish such as seminar, exhibition, concerts and others before publish it on to the web site.
- Administrators shall be able to add new operators into the system or remove existing operators from the system.

Report Generation Module

- This module shall be designed only for administrators.
- Administrators shall have full rights on viewing all the reports for management purpose.

- This module shall associate with search techniques, such as allow administrators to key in host name, date or event name, which the search engine will search the data from database according to the data entered by administrators, and from this, a report will be generated.

For Operator Module:

Login Module

- Operators have to enter their user names and passwords before logging in to the system. Only authorized users are allowed to enter the system. Users are not allowed to enter the system anymore after entering the wrong passwords or usernames for three times.
- Operators are allowed to change their passwords after entering the system.

Reservation Module

- Customer may reserve their venues or meal packages to hold events through phone booking or walk-in.
- Operators are allowed to use this module in order to make reservations for customers.
- This module shall provide services to allow new reservations where operators can fill in the details of the customers in order to book a room or meal package. The details filled in may include customer's personal data, event start time and end time, desired room, types of meal, side orders and others.
- This module shall allow operators to edit or cancel the booking details according to the customers.
- This module shall help to check the rooms' availability before confirming the reservation.

- This module shall calculate the total amount of room rental, food, side orders and others necessarily charges. Receipts shall be printed which will be kept by the customers.
- This module shall be able to send reminders to the customers in order to confirm their reservations before canceling their reservations

Schedule

- This module shall display all the event names in a monthly calendar form.
- This module shall display a time line which will show a daily schedule for every room within a time period (business hour). This time line shall clearly show which room is occupied for a particular time to avoid double booking.

Invitation Handling Module

- This module shall allow operators to enter a list of guests, which the customers wish to invite to attend their events, into the system.
- This module shall be able to allocate each guest (seat allocation).
- This module shall help the guests in searching their seats. Operator shall be able to search by host name, guest name or date.
- This module shall print out invitation cards that will include all the necessarily details, such as guest name, event name, host name, event time, seat number and others.
- These invitation cards will then be collected by the hosts themselves.

For Internet Users Module:

Login Module

- Internet users shall login before entering the system online.
- Only registered members are allowed to enter this online system. Those who are not registered can sign up to be a member through this web site.

- Users are allowed to modify their details online include changing their passwords.
- Users have to login to make reservations except for viewing what is the latest or upcoming events that publish on the web site, such as concerts, seminars, exhibitions and others.

Reservation Module

- This module shall provide the same services as the reservation module which designed for operators, except for total amount calculation function. The calculation will be done by the operators on the finishing of the event.
- Customers or valid members can book their desired venue and meal packages by themselves without the assistant from any operators.

View Module

- Internet users shall be able to view their booking details whenever they wish.
- This module shall display the company profiles, catering, facilities information and upcoming events which had been approved by administrators.
- This module shall help customers to publish their events details such as concerts, seminars and others on to the web site. This will help increase the publicity.

Invitation Handling Module

- This module is slightly different from the invitation handling module that designed for operators.
- This module shall allow the internet users to send invitation cards to their guests through email after paying their deposit.
- This module is similar to a simple email function.

4.2.2 Non-Functional Requirements

Non-functional requirement are defined as constraint under which the system must operate and the standards, which must be met by the delivered system. Event management system includes the following non-functional requirements:

- ***Reliability***
  - A system is said to have reliability if it runs undisrupted for a very long period of time without failure or crashing. A system does not produce dangerous or costly failures when it is used in a reasonable manner, that is in a manner that a typical user expects is normal, the system have to be reliable to make sure the reservation is made in safely.
- ***Robustness***
  - Robustness refers to the quality that causes a system to be able to handle or at least avoid disaster in the face of unexpected data. The system supports robustness by developing a processing logic to process anticipated errors in the input such as testing for presence of alphabetic data that was accidentally keyed into a numeric field. When such an error is detected, an error message is prompted.
- ***User Friendly***
  - This system can be considered as an attractive and easy application because the users will only have to click on the hypertext or image by using the mouse. The grouping of the information provided by sections will make it easier for the visitor or customer to browse. The use of suitable frames and navigation applet will guide the user in using the system. The system should display an error message if an error occurs, such as invalid data input, invalid password and unsuccessful reservation process.

- *Modularity*
  - Modularity is one of the key factors in a good program design. The way a system works is that it is decomposed into modules so that distinct functions of the modules would be isolated from each other. Modularity has the advantage in making testing and maintenance much easier. In the system, modularity of program will be applied from the beginning, as this will lead to easier modification in future. The modules with its design approved will easily combine or join the other small modules at a later stage.
- *Accuracy*
  - Accuracy refers to the precision of computations and control. This system provides various accuracy measures. For instance, the booking of room is able to eliminate duplicate records such as times and days for the same person, therefore it always maintains an accurate database.
- *Efficiency*
  - Efficiency in computer technology means a process or procedure that can be called or accessed in an unlimited number of times to produce similar outcomes as output at creditable pace or speed.
- ***Maintainability and Expandability***
  - Maintainability may be defined qualitatively as the case with which software can be understood, corrected, adapted or enhanced. Expandability is the degree to which architectures, data or procedural design can be extended. This system is designed to be expanded in the future.
- *Security*
  - The security features prevent unauthorized access into the system. Administrator or operator must log in with a correct user name and password

in order to access the administrator or operator section. In the other words, only authorized access is allowed to the administrator and operator modules.

- *Flexibility*
  - The system is flexible and able to fulfill all user requirements. The system hardware and software have the capability to take advantages of the new technology and resources and can be implemented in the changing environment.
- *Availability*
  - The system is highly available. The users are allowed to retrieve or update the information needed at any time and place.

4.3 Proposed Tools

After studying on the strengths, constraints and limitations of various technologies, I decide to use JSP technology in Internet User module. JSP technology is chosen because it is simple to implement and no extra additional software is required besides Apache Tomcat server. On the other hand, Java Script will be used as my scripting language because it is more widely supported. It is normally used to generate HTML dynamically on the client, building parts of the web page as the browser loads the document. Java script can also be used on the server besides client. The reason I choose Java Script as my scripting language is the similarity between Java and Java Script since Java Script is completely distinct from Java programming language. Due to the time constraints, this similarity is desired for it to lighten the burden of learning a whole new language like VB script.

For administrator and operator module, Java programming language will be used to build a management application in a local environment. This approach is chosen because it provides more security than in an online environment. In the local

environment, the system is not exposing to any unauthorized users and intruders to hack into the system because this application does not connect to the Internet. Java is used because it is more powerful and Java is free for download at the Sun Web site. This is convenience for those developers who are facing tight budgets and lengthy budget planning cycles. Besides that, an application which developed with Java is lighter in weight.

Microsoft FrontPage and Macromedia Dreamweaver MX will be used occasionally to create interesting layouts for the web page.

As for the database repository, Microsoft SQL Server 2000 is chosen. The database will be connected in Java through JDBC (sub protocol of ODBC) connection.

4.3.1 JavaServer Pages (JSP)

JavaServer Pages (JSP) technology enables us to mix regular, static HTML with dynamically generated content from servlets. Many web pages that are built by CGI programs are primarily static, with the parts that change limited to a few small locations. In JSP, parts that are generated dynamically are marked with special HTML-like tags and mixed right into the page.

JSP is being considered for the web-based event management system because it allows class import, where the classes can be developed by using Java when developing the administrator and operator module. It also allows using of JavaBeans with JSP. However, if compared with other technologies, JSP is chosen due to some reasons which shown below:

- The dynamic part is written in Java, not VBScript or another specific scripting language, so it is more powerful and better suited to complex applications that require reusable components. Besides that, JSP already has

an extensive API for networking, database access, distributed objects and the like.

- JSP is portable to other operating systems and web servers; we are not locked into Windows NT/2000 and IIS, such as ASP or ASP.Net. We could make the same argument when comparing JSP to Cold Fusion; with JSP we can use Java and are not tied to a particular server product.
- JSP documents are automatically translated into servlets behind the scenes. But it is more convenient to write regular HTML than to have a zillion *println* statements that generate the HTML. Plus, by separating the presentation from the content, we can put different people on different tasks; our web page design experts can build the HTML using familiar tools and leave places to the servlet programmers to insert the dynamic content.
- JSP has a richer set of tools for building or inserting the external defined pieces into a static web page and has more options regarding the stage of the HTTP response at which the piece actually gets inserted.
- Regular HTML cannot contain dynamic information, so static HTML pages cannot be based upon user input or server-side data sources. JSP is easy and convenient that it is quite reasonable to augment HTML pages that only benefit slightly by insertion of dynamic data.

4.3.2 Java

Java is being considered for the application of event management system because of some of its main features. The reasons are as follows:

- **Java is simple**

  No language is simple, but Java considered a much simpler and easy to use object-oriented programming language. Java uses automatic memory

allocation and garbage collection. The number of language constructs in Java is small for such a powerful language. The clean syntax makes Java programs easy to write and read.

- **Java is distributed**

  Distributed computing involves several computers on a network working together. Java is designed to make distributed computing easy with the networking capability that is inherently integrated into it.

- **Portability: Program once, Run anywhere (Platform Independence)**

  One of the most compelling reasons to move to Java is its platform independence. Java runs on most major hardware and software platforms, including Windows 95 and NT, the Macintosh, and several varieties of UNIX. Thus, JAVA programs become more portable.

- **Security**

  Java is one of the first programming languages to consider security as part of its design. The compiler, interpreter, and Java-compatible browsers all contain several levels of security measures that are designed to reduce the risk of security compromise, loss of data and program integrity, and damage to system users.

- **Reliability**

  Security and reliability go hand in hand. Java compiler provides several levels of additional checks to identify type mismatches and other inconsistencies while Java runtime system duplicates many of the checks performed by the compiler and perform additional checks to verify that the executable byte codes form a valid Java program.

- **Multimedia: Images, Sounds and Animation**

  The sizzle of Java is Multimedia - Sounds, Images, Graphics and Video. Java, through the packages of classes that are an integral part of the Java programming world, provides extensive multimedia facilities that will enable a programmer to start developing powerful multimedia applications immediately.

- **JavaBeans**

  JavaBeans make it easy to write reusable components that can be strung together with a minimum of additional coding. Although Microsoft's ActiveX offers similar advantages, Beans are less focused on a Windows-centric world and are somewhat more portable. JavaBeans offer a promising mechanism for building general-purpose business components that you can reuse with minimal modifications.

- **Java is Robust**

  Java puts a lot of emphasis on early checking for possible errors, as Java compilers are able to detect many problems that would first show up during execution time in other languages. Java eliminates certain types of programming constructs in other languages that are prone to errors. For instance, Java does not support pointers, which eliminates the possibility of overwriting memory and corrupting data. Java has a runtime exception-handling feature to provide programming support for robustness, and can catch and respond to an exceptional situation so that the program can continue its normal execution and terminate gracefully when a runtime error occurs.

- **Java is Multithreaded**

In Java, multithreaded programming has been smoothly integrated into it, while in other languages, operating system-specific procedures have to be called in order to enable multithreading. Multithreading is especially useful in graphical user interface (GUI) and network programming.

- **Java is Dynamic**

  The Java programming language was designed to adapt to an evolving environment. New methods and properties can be added freely in a class without affecting their clients. Besides, Java is able to load classes as needed at runtime.

4.3.3 SQL Server 2000

Microsoft SQL Server 2000 is being considered for the database repository in event management system instead of Microsoft Access.

A fileserver database, such as Microsoft Access, handles requests for data by directly accessing the database file located somewhere on the network or on the server itself. The actual requests are made from the database engine on the client computer, which is responsible for locating the necessary database file(s) and determining what data should be read. This is extremely inefficient, as large amounts of data need to be transferred to the client for processing. A single request may actually require several accesses to the database, for example when updating a record, and accordingly a large amount of communication between the client's database engine and the fileserver database is necessary. A fileserver-based database is therefore best suited in a single-user desktop application, or systems with a small number of users with simple requests. Event Management System handles a big number of customers from any place and any time in making reservation. Microsoft Access can only support 255 concurrent users in a time but Event Management

System needs more than that because it has to support many simultaneous transactions between database and client from Internet, administrators and operators.

On the other hand, SQL Server is a client/server database which has more scalable and robust database architecture. In a client/server system, the server itself handles all requests for data. Applications on the client side send high-level requests, usually Structured Query Language (SQL) queries, which the server processes and returns only the result for. The clients do not directly read from or write to the database file and there is a much lower communication overhead as only queries and their results are sent over the wire. This approach proves to be very efficient for handling a large number of requests and is employed in most industry strength databases. Therefore, if compared to Microsoft Access, SQL Server 2000 is more suitable for Event Management.

In addition to the significant performance and scalability advantages SQL Server has over Microsoft Access, there are a number of other key considerations to be taken into account. SQL Server is a transactional database system, providing integrated fault tolerance to ensure the data is always left in a consistent state, even in the event of the server crashing. Microsoft Access does not offer such robustness and often fails under a heavy workload, such as in a hosting company's shared Web Server environment. Although Microsoft Access databases are much easier to develop and administer than SQL Server databases, the technology's limited scalability and robustness does not make it a viable option for serious development projects.

4.4 Hardware and Software Requirements

The proposed system developed, would necessitate the use of the hardware and software equipment as specified below:

➢ *Hardware*

The hardware requirements include:

- Pentium IV MHz (Recommended for faster performance)
- 256MB DDR RAM
- 40 GB Hard Disk Drive
- 1.44MB Floppy Disk Drive
- CD-RW Drive
- Display Monitor
- Keyboard & Mouse
- PCI 10/100base T Network Adapter Card

➢ *Software*

The software packages requirements:

- Microsoft Windows XP Professional
- Microsoft Office XP
- Microsoft Project 2000
- Microsoft SQL Server 2000
- Java ™ 2 SDK, Standard Edition, version 1.4.0 or above
- Macromedia Dreamweaver MX
- Microsoft Internet Explorer 4 or above
- Apache Tomcat 4.1
- IntelliJ IDEA (Java compiler)

Table 5.8 : Total Amount table definition

File Specification			
File ID	**Amount**		
File Name	Total Amount File		
File Description	This file stores the total amount that will be paid by the customers.		
File Organization	Indexed File		
Record key	Nil		
Field Name	**Types**	**Length**	**Description**
Res_ID	Char	10	Reservation ID
Rental	Char	10	Rental of Room
Meal_Total	Char	10	Total amount of meal ordered.
SideOrder	Char	10	Total amount of side order.
Card_Charge	Char	10	Total amount of invitation card charges.
Discount	Char	10	Discount given
Deposit	Char	10	Deposit given
Total	Char	10	Total amount that a customer should pay.

Table 5.9 : Guests table definition

File Specification			
File ID	**Guests**		
File Name	Customer Guests File		
File Description	This file stores the guests' lists provided by the customer.		
File Organization	Indexed File		
Record key	Nil		
Field Name	**Types**	**Length**	**Description**
Res_ID	Char	10	Reservation ID
Guest_Name	Char	50	Guest Name
Seat_Allocation	Char	10	Seat Number
Pax	Char	10	Pax

Table 5.10 : Company Staff table definition

File Specification	
File ID	**Staff**
File Name	Company Staff File

File Description	This file stores the company staffs' profile.		
File Organization	Indexed File		
Record key	Staff_ID		
Field Name	**Types**	**Length**	**Description**
Staff_ID	Char	10	Company Staff ID
Staff_Type	Char	20	Staff Type 1. Operator 2. Administrator
Name	Char	50	Staff Name
Contact_No	Char	12	Staff Contact Number
Login_ID	Char	8	Staff Login ID
Login_pw	Char	8	Staff Login Password

Table 5.11 : Internet User table definition

File Specification			
File ID	**InternetUser**		
File Name	Internet User File		
File Description	This file stores registered internet users' profile.		
File Organization	Indexed File		
Record key	Cus_ID		
Field Name	**Types**	**Length**	**Description**
Cus_ID	Char	10	Customer ID
Login_ID	Char	8	Registered Users' Login ID
Login_pw	Char	8	Registered Users' Login Password

Table 5.12 : Invitation Card table definition

File Specification			
File ID	**Card**		
File Name	Invitation Card File		
File Description	This file stores the invitation card amount ordered by customers.		
File Organization	Indexed File		
Record key	Nil		
Field Name	**Types**	**Length**	**Description**
Res_ID	Char	10	Reservation ID
Card_ID	Char	10	Invitation Card Type ID

Total_of_Card	Char	10	Total of Cards Ordered by Customer

Table 5.13 : Events table definition

File Specification			
File ID	**Events**		
File Name	Events File		
File Description	This file stores the details of the events that will be published on to the web site.		
File Organization	Indexed File		
Record key	Event_ID		
Field Name	**Types**	**Length**	**Description**
Event_ID	Char	10	Event ID
Event_Name	Char	100	Event Name
Host	Char	50	Host Name
Description	Char	500	Event Description
Date	Datetime	8	Event Date
Time	Char	20	Event Time
Link	Char	50	Relevant Link
Status	Char	20	Event *Approve* or *Not Approve*
Reason	Char	500	Reason of disapproving an event

5.5 Draft - User Interface Design

The Human Computer Interface (HCI), commonly called the user interface is a doorway into an interactive software application. The interface is the system for most users. However poorly designed, is stands as the representation of the system. The interface must help users and business get the information they need in and out of the system by addressing the following objectives:

- *Effectiveness as achieved through the data of interface that allow users to access the system in a way that is congruent with their individual needs*

- *Efficiency as demonstrated through interface that both increase the speed of data entry and reduce errors*
- *User consideration as demonstrated in the description of suitable interfaces and by providing appropriate feedback to users from the system*
- *Productivity as measured by ergonomically sound of design for user interfaces and workspaces.*

As information of EMS displayed in web pages form, it is also important to consider the web page design. Below are some consideration taken when designing the user interface for the web site:

- *Form layout presentation*
- *Form appears as it is suppose to when rendered by different browser*
- *Resolution of the page elements (Graphic & Animation)*
- *The speed of modem used to download pages*

5.5.1 Event Management System Screen Design

Screen design in Event Management System is presented in a web document form on the browser and in a real time form. The web document will contain components like text, graphic, input fields, buttons and others, which normally can be found in the web document. Since EMS is developed using JSP, thus this web based application is supported by Java. On the other hand, Java will be used to develop an interface for administrators and operators in a local environment.

5.5.2 General Consideration When Designing User Interface

a) Be consistent, which means use a consistent format for menu selection and data display. Use of consistent label, standard abbreviation is also necessary

b) Offer meaningful feedback such as display appropriate error message when the user has done or key in wrongly

c) Reduce the command that must be memorized in order to carry out any operations

d) Combo boxes will be used instead of text boxes to memorize any complex logic operations

e) The system should be able to forgive mistakes so that it could protect itself from failure due to user mistakes

The design of the graphical user interface for EMS is divided into the admin and operators screens and the internet user screen. To use the function of the system, the users just need one click on the selected task to do their jobs. The following screens are some of the graphical interface design for the EMS.

For Online Environment:

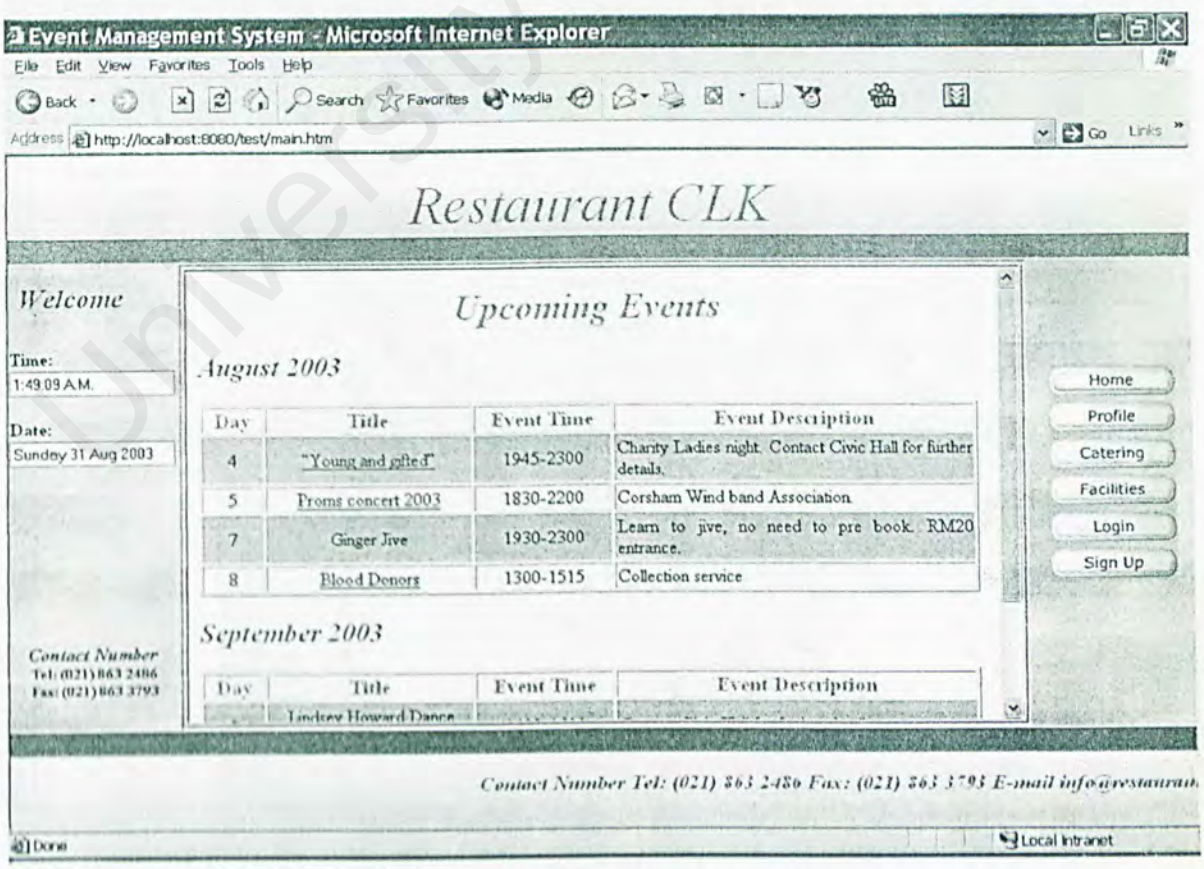


Figure 5.19 : Internet User Main Page

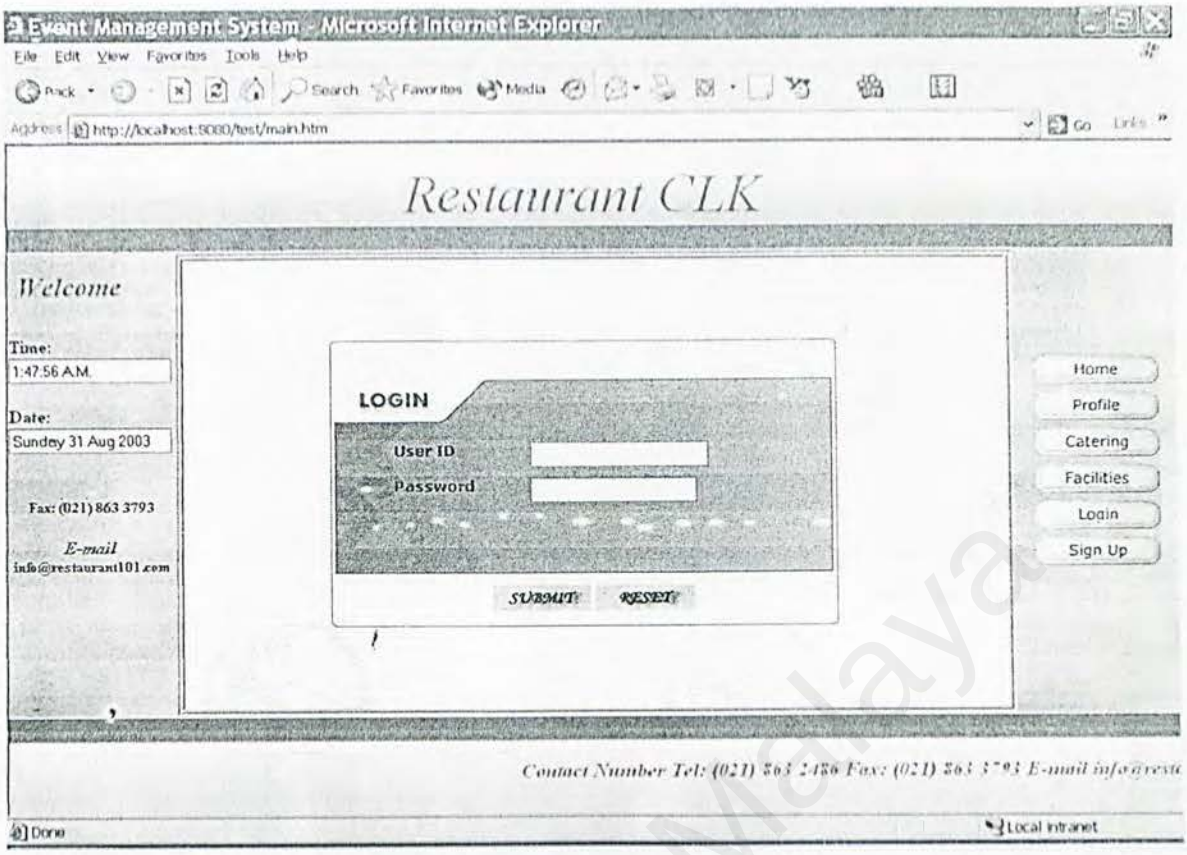


Figure 5.20 : Internet User Login Page

For Local Environment:

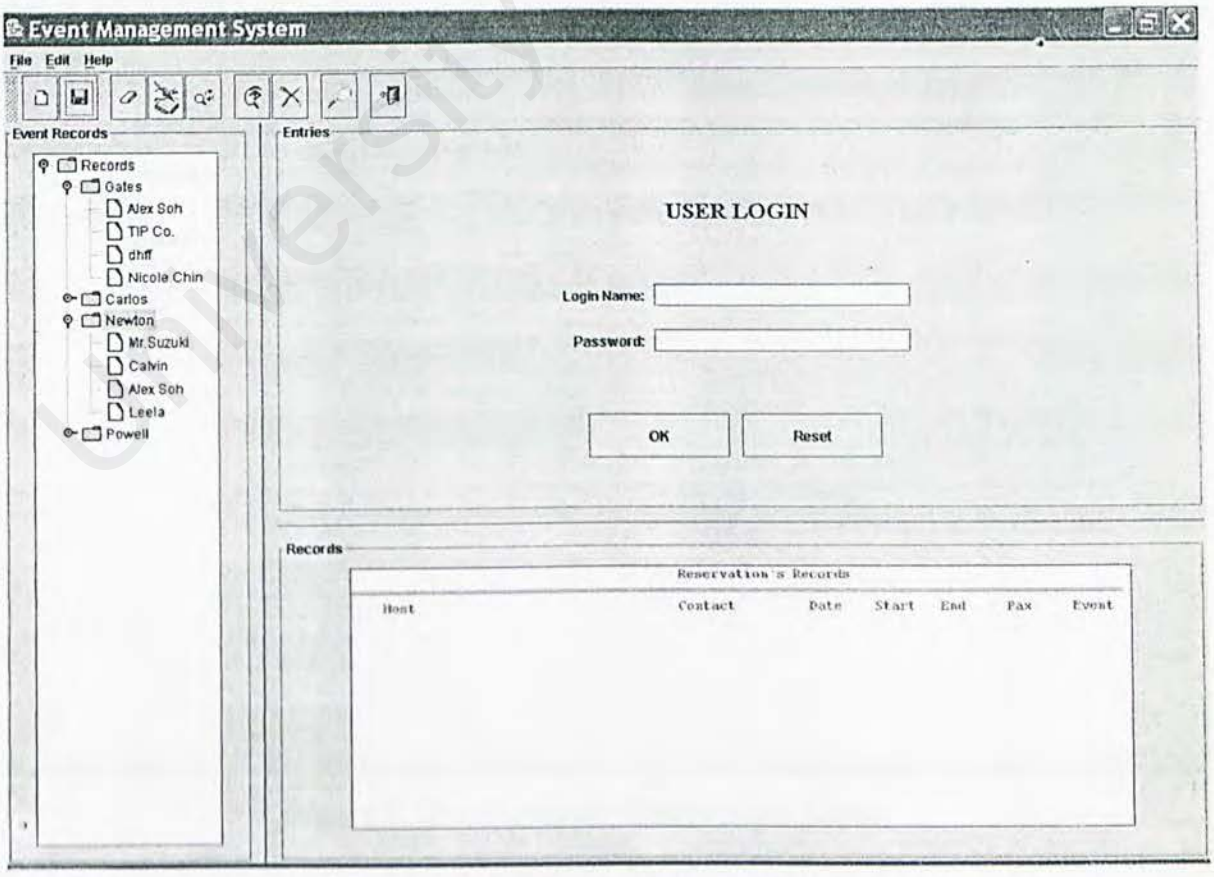


Figure 5.21 : Administrator and Operator Login Page

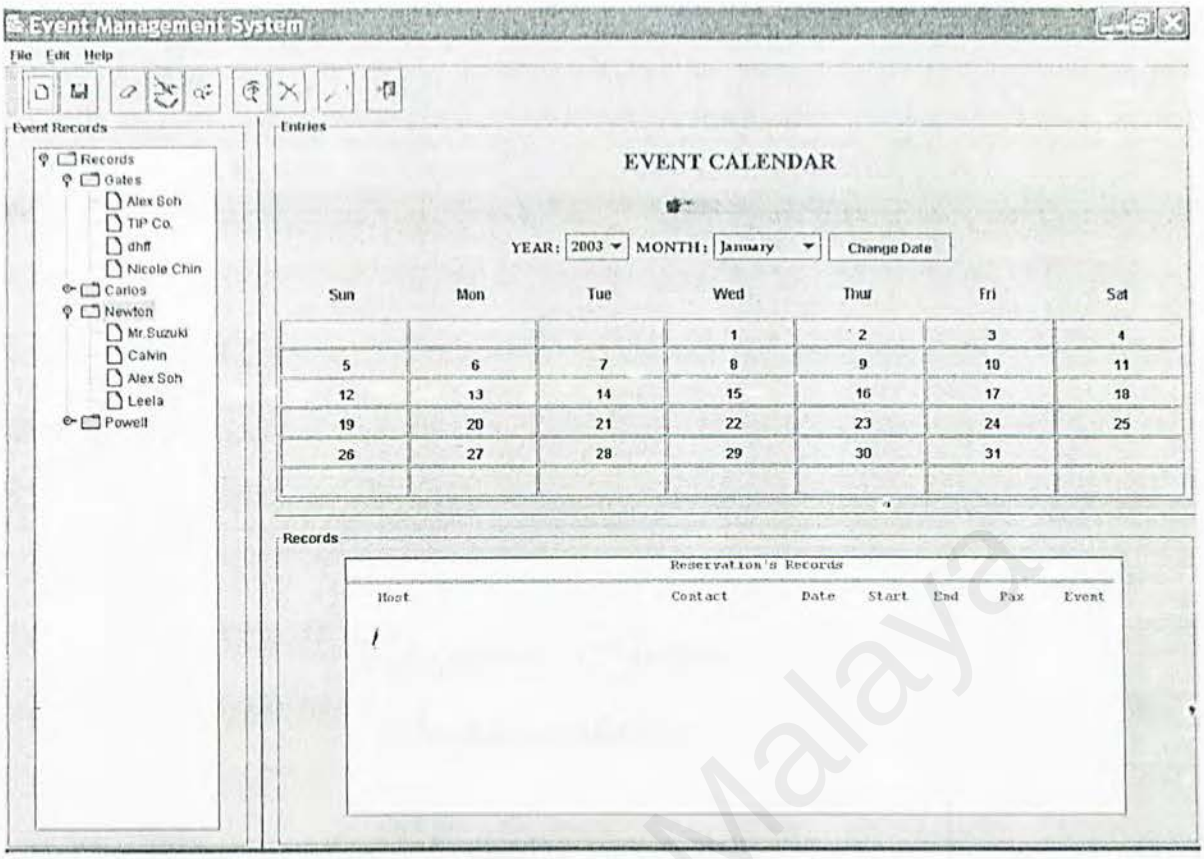


Figure 5.22 : Operator Event Calendar Viewer

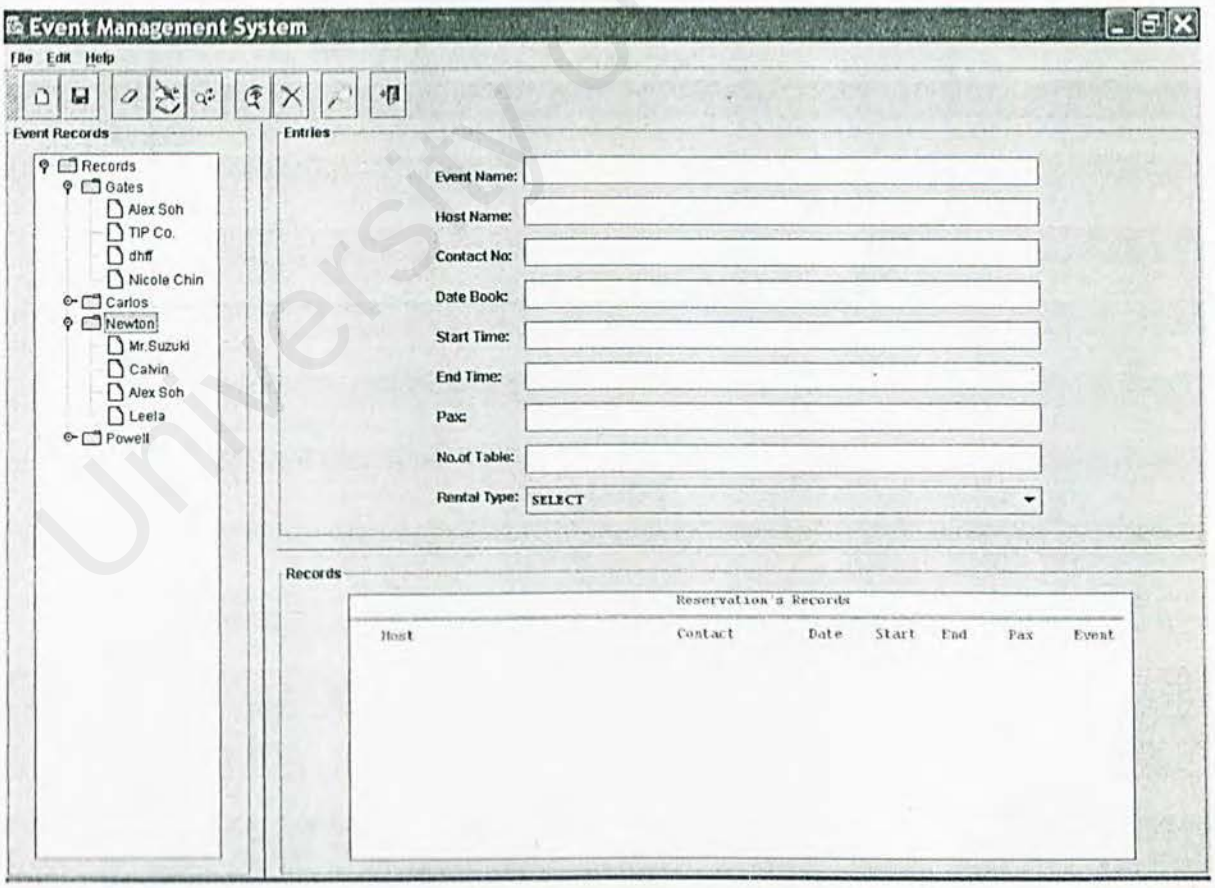


Figure 5 .23 : Operator Reservation Form

Chapter 6 System Implementation

6.1 Introduction

System implementation is a process that converts the system requirements and system designs into workable program codes. The initial stage of system implementation involves setting up the development environment which involved installing proposed development tools to facilitate the system implementation.

Generally, the development environment is suited according to different development phases, which can be categorized into system design, system development and report writing process. Each module in Event Management System is developed separately and later integrated into a fully functional system once every module has been tested successfully.

6.1.1 System Design

Microsoft Visio 2000 and Microsoft Word XP are used in preparing data flow diagram (DFD), and flow charts for developed system. Although system design is being stated clearly in Chapter 5, nevertheless, during the initial stage of system development, a number of considerations and adjustments were done to the initial system design when the earlier proposed techniques are found not suitable and also in order to match the actual needs and requirements.

6.1.2 System Development

The basic tools used for the system development are:

1. Microsoft Windows XP Professional (Operating System)
2. Apache Tomcat 4.1 (Web Server)
3. Microsoft SQL Server 2000 (Database Management System)
4. TextPad and IntelliJ IDEA (Web Technology and Development Platform)
5. Macromedia Dreamweaver MX (Web Authoring Tools)
6. Microsoft Front Page XP (Web Authoring Tools)

7. Internet Explorer 6.0 (Web Browser)
8. Notepad (Editor for HTML coding)
9. Adobe Photoshop 7.0 (Image Creation Tool)
10. Greeting Card Factory Deluxe (Greeting Card Creation Tool)

6.1.3 Report Writing

All the problems encountered, together with solutions found throughout the processes (from system implementation until system evaluation) were recorded, as well as the result from system testing and system integration.

6.2 System Coding - Coding Approach, Style and Scripting Language

6.2.1 Database Implementation

For Event Management System, the database is stored in a PC in which Microsoft SQL Server 2000 is installed. Any data creation, updates or data retrieval will be connected directly to the database server through JDBC-ODBC.

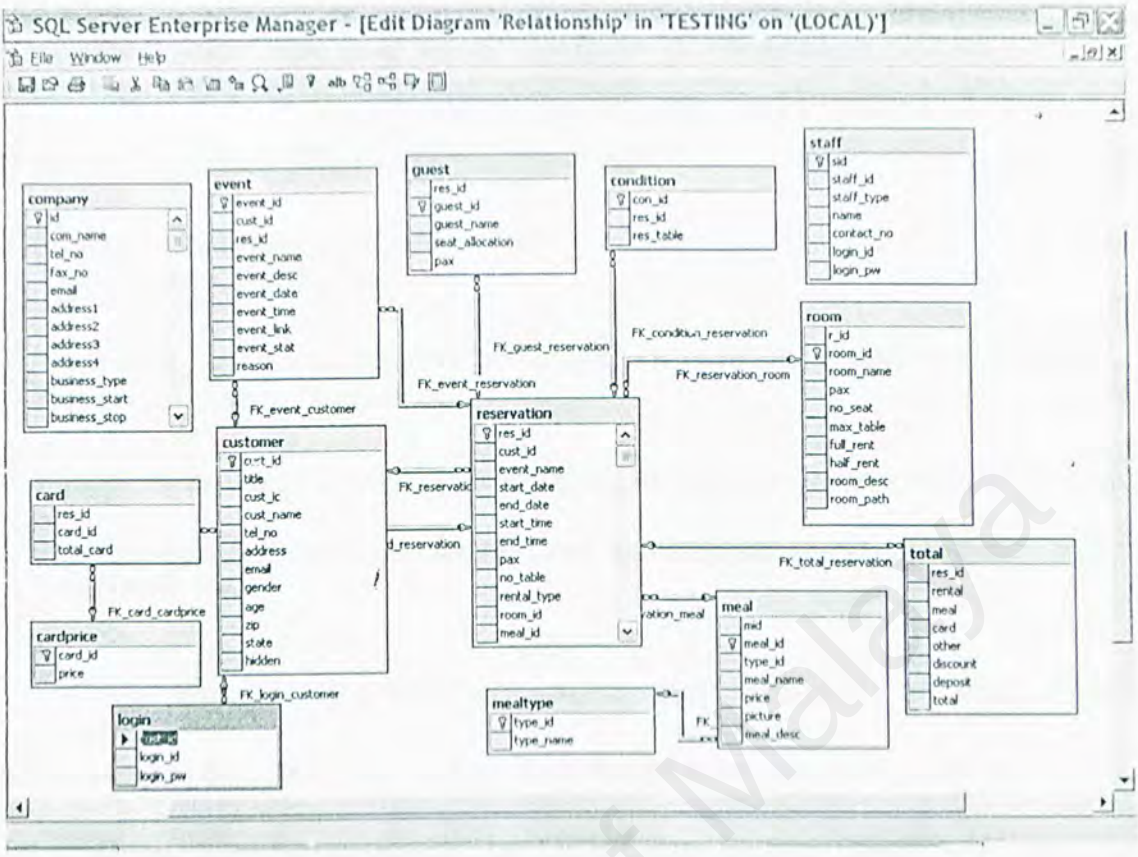
In general, the database includes tables to keep users' details including users' authentications information. Event Management System is a real time or window-based application in which the administrators can create, edit and delete administrative records directly from or into Event Management System database while the operators will help the customers on reserving rooms and handling invitation. Operators are also allowed to add, edit or delete any reservation records from or into the database. On the other hand, customers can only view their reservation records and modify them through the function from the web-based application. Customers are allowed to publish their events onto the web where these records will be recorded into the database and only administrators are granted the right to validate those information posted from the customers through the web site.

In order to fulfill the system's requirements, a database named "EMS" is built using Microsoft SQL Server 2000 Enterprise Edition. This database includes 14 tables as shown below:

Table 6.1 : Database Description

Table Name	Description
Card	This table is used to store data about the amount of cards printed by customers and the cost involved.
Cardprice	This table is used to store data about the card types and their prices provided by the company.
Company	This table is used to store data about company profile, including the business hour, email, address and other relevant data.
Condition	This table is used to store data about the condition of the tables booked by customers. If the table is fully filled with their guests, the condition of this table will be changed to "FULL". This is to increase the efficiency and effectiveness of the operation of guests allocation.
Customer	This table is used to store personal data about customers, including their contact number, IC number and others.
Event	This table is used to store data about the events published on the company's web site.
Guest	This table is used to store the guest names invited by the host and their seat numbers.
Login	This table is used to store the customers' login names and passwords for validation purpose.
Meal	This table is used to store data about the meal packages provided by the company, including their prices per table.
Mealtype	This table is used to store data about the meal categories provided by the company, such as breakfast, lunch and others.
Reservation	This table is used to store customers' reservation details.
Room	This table is used to store data about the rooms provided by the company, including their rental.
Staff	This table is used to store data about the staffs using this system, either operators or administrators. The data stored including their login IDs and passwords.
Total	This table is used to store data about the total amount charged for an event.

Figure 6.2 : Database Relationship



After the Event Management System is completed and tested successfully, all the raw data were flushed from the database. All the unnecessary tables were eliminated from Event Management System database to avoid data overlapping and to reduce workload of the entire system during the deployment.

6.2.2 Web Server Configuration

By using the JSP platform, not much configurations or settings needed to be done on the server side. In JSP, all developments should be treated as a single application. Web-based EMS is created by configuring Apache Tomcat as following:

Table 6.2 : Web Server Configuration

	Configure Apache Tomcat 4.1
1	**After finishing the installation of Apache Tomcat 4.1, you may have to copy an xml file which named "admin.xml" from the *webapps* folder, subdirectory of Tomcat 4.1, which will normally located in C:\Program Files\Apache Group\Tomcat 4.1, and save the file as a new file in the same directory as "ems.xml".**
2	**Open the "ems.xml" file in Notepad and change the line shown below:**

<Context path="/admin" docBase="../server/webapps/admin"
To
<Context path="/ems (*any name*)" docBase="C:/Documents and Settings/MSUSER/Desktop/OnEMS (*Directory of where the JSP files located)* "
AND
prefix="localhost_admin_log." suffix=".txt"
To
prefix="clk (*any name*)." suffix=".txt"
AND finally, save the file.

3 **Next, start your Tomcat server by clicking on *start->All Programs->Apache Tomcat 4.1->Start Tomcat.***

4 **Finally, to access your page, type the URL in any browser which has the format below:**
http://computer_name:port_number/ems (*or any name you state in the Context path*)/main.jsp

To make sure the EMS application, either web-based or window-based, connecting to Microsoft SQL Server 2000 database, we have to register the database as an ODBC Data Source through the ODBC Data Sources option in the Windows Control Panel. After that, a few lines of codes need to be inserted into each JAVA files which are:

```
try
{
        Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");

        connection = DriverManager.getConnection(co.getUrl(),co.getUser(), co.getPass());
}
catch(ClassNotFoundException cnfe)
{
        System.out.println("Fail To Open DataBase");
}
catch(SQLException sqle)
{
        System.out.println("Unable To Connect JDBC");
}
```

By having these codes, the files will be automatically connected to EMS database.

6.2.3 Program Implementation

6.2.3.1 Coding Approach

Top-down coding method is selected to code the EMS. Top-down coding method is based on the principle of coding the higher-level modules first and leaving the lower level; modules called in skeleton form, to be filled in later. The lower modules are only a shell, with an entry and an exit. In other words, as the higher module is being coded, references are made to the lower modules as if their coding is available. But in fact, a call to that still-incomplete module will result in an empty action. This approach is used to allow testing to begin on some of the modules while others are still being coded. By using this approach, the most serious types of errors are identified early.

6.2.3.2 Coding Style

Several programming principles are being applied in the coding of the system to ensure the system consistency, maintainability and readability. The principles are:

i. Indenting, formatting and commenting the code to help to increase the system code's readability.

ii. Using a variable naming convention consistently to increase the program's consistency and maintainability.

6.2.3.3 Scripting Language

In EMS, there are two scripting languages on the client side which are the JavaScript and JSP.

JavaScript

In EMS, JavaScript is used to validate data from the forms before it is submitted to the server.

```
function Submit()
{
        logx = document.frmbook
        logx1 = logx.event.value;
        logx2 = logx.hall.value;
        logx3 = logx.sdate.value;
        logx4 = logx.edate.value;
        logx5 = logx.sTime.value;
        logx6 = logx.eTime.value;
        logx7 = logx.pax.value;
        logx8 = logx.rental.value;
        logx9 = logx.table.value;
        logx10 = logx.MName.value;

        if((logx9.length!=0 && logx10==0) || (logx9.length==0 && logx10!=0))
        {
                alert("Please make sure you reserve TABLES if you want to reserve MEAL
PACKAGES!")
                return false
        }

        if(logx1.length <=0 || logx2==0 || logx3.length <=0 ||  logx4.length <=0|| logx5 ==0 ||
logx6==0|| logx7.length <=0|| logx8==0)
        {
                alert("Please fill in the mandatory fields!")
                return false
        }
        else
        {
           if(parseInt(logx5)>=parseInt(logx6))
           {
                alert("Invalid Time!")
                return false
           }
           else if(isNaN(logx9)||isNaN(logx7))
           {
                        alert("Invalid Number Format!")
                        return false
           }
           else
           {
                document.frmbook1.event1.value = document.frmbook.event.value;
                document.frmbook1.hall1.value = document.frmbook.hall.value;
                document.frmbook1.rental1.value = document.frmbook.rental.value;
                document.frmbook1.sdate1.value = document.frmbook.sdate.value;
                document.frmbook1.edate1.value = document.frmbook.edate.value;
                document.frmbook1.stime1.value = document.frmbook.sTime.value;
                document.frmbook1.etime1.value = document.frmbook.eTime.value;
                document.frmbook1.pax1.value = document.frmbook.pax.value;
                document.frmbook1.table1.value = document.frmbook.table.value;
                document.frmbook1.meal1.value = document.frmbook.MName.value;
                document.frmbook1.other1.value = document.frmbook.other.value;
                document.frmbook1.submit();
           }
        }
}
```

Figure 6.2 : Java Script in EMS to validate the fields before submitting them

Besides that, the Java Script can also be used together with DHTML events to control HTML elements. When an event occurs, the Java Script functions will be called to do something.

```
<script language="JavaScript" type="text/JavaScript">
        var i = 0;
        var speed = 5;
        var count=10;
        var direction=1;
        var firstLine=["  Welcome "," To Event"," Management"," System ..."];

        function start()
        {
                window.setInterval("run()",50);
                showtime();

        }

        function showtime()
        {

                var now = new Date();
                var hours = now.getHours();
                var minutes = now.getMinutes();
                var seconds = now.getSeconds();
                var timeValue = "" + ((hours > 12) ? hours - 12 : hours);
                timeValue += ((minutes < 10) ? ":0" : ":") + minutes;
                timeValue += ((seconds < 10) ? ":0" : ":") + seconds;
                timeValue += (hours >= 12) ? " P.M." : " A.M.";
                document.TimeDate.time.value = timeValue ;
                TimerID = setTimeout("showtime()",1000);
                timerRunning = true;


                // Array of day names
                var dayNames = new Array("Sun", "Mon", "Tue", "Wed","Thur", "Fri",
"Sat");
                var monthNames = new Array("Jan", "Feb","March","April",
"May","June","July", "Aug","Sept","Oct", "Nov","Dec");
                var y  = now.getYear();

                // Y2K compliant
                if (y < 1000)
                y += 1900;
                var d=(dayNames[now.getDay()] + " " + now.getDate() + "
"+monthNames[now.getMonth()]+" "+y);
                document.TimeDate.date.value = d;
        }

        function run()
        {
                count+=speed;
                if((count%200)==0)
                {
                        speed*=-1;
                        direction=!direction;
                        pText.innerHTML="<font size=4><b><i>"+firstLine[i++ %
```

```
4]+"</i></b></font><br><br><br><br>";
                }
        }
</script>
```

Figure 6.3 : Java Script in EMS during body 'onload'

6.2.3.4 Development of EMS

Most of the codes in web-based EMS are using HTML tags, JSP Scripts and Java Script. For EMS windows-based application, Java 1.4.0 had been used. Below are some examples of JSP script and Java coding.

```
<jsp:useBean
 id="myJoinBean"
 scope="session"
 class="bookingbeans.JoinBean"
/>
<jsp:setProperty
 name="myJoinBean"
 property="bnLogin"
 param="login"
/>
<% if(myJoinBean.check()=="")
  {
   response.sendRedirect("join1.jsp");
  }
  else if(myJoinBean.check2()=="")
  {
   response.sendRedirect("join1.jsp");
  }%>
```

Figure 6.4 : A sample of JSP script

```
public void dateCompare2()
{
        try {
                Date theDateObject = getDateForString(getResDate(), "ddMMyyyy");
                Date theDateObject1 = getDateForString(getResDay(), "ddMMyyyy");
                String nowDate = getSystemDate();
                Date theDateObject2 = getDateForString(nowDate, "ddMMyyyy");

                if(theDateObject1.before(theDateObject) ||
theDateObject1.before(theDateObject2) || theDateObject.before(theDateObject2))
                {
                    JOptionPane.showMessageDialog(reservation.this,"Invalid
Date","Alert",JOptionPane.WARNING_MESSAGE);
                    date_field.setText("");
                    day_field.setText("");
                    date_field.grabFocus();
                }

        }
        catch(Exception src){
                    JOptionPane.showMessageDialog(reservation.this,"Invalid
Date","Alert",JOptionPane.WARNING_MESSAGE);
                    day_field.setText("");
                    //day_field.grabFocus();
                    date_field.setText("");
```

```
            date_field.grabFocus();
        }
    }
```

Figure 6.5 : A sample of Java Coding.

6.3 Chapter Summary

Chapter 6 presented the System Implementation in terms of the coding approach, coding principle, developing coding for EMS and the development tools used. During the development of web-based EMS, HTML is basically used to show the interfaces. Forms created using HTML is processed using JSP scripting. In order to have a more dynamic and interesting interfaces, client-scripting language like JavaScript with DHTML events is used. While for EMS windows-based application, which is used by administrators and operators, was developed by using Java 1.4.0. Next, Chapter 7 will further discuss the system-testing phase in EMS System.

Chapter 7 System Testing

7.1 Introduction

Testing is an important process in developing a system. All of the system's newly written or modified application programs-as well as new procedural manuals, new hardware, and all system interfaces must be tested thoroughly. Testing of a system does not actually come at the end of the system development, but should be carried out during the development phase.

The purpose of testing is to ensure that the resulting component of program as well as the program as a whole fulfills the requirement specification and to eliminate faults in the program. Due to the errors that have been done during the system development or system design, faults and failures may happen even when the entire system has been developed. Therefore, the main idea of testing is to demonstrate correctness of the program, identify the errors in the system coding or the system design. The errors that are discovered during the testing procedures will be corrected.

7.2 Types of Testing

Although the testing process involved a lot of methods and testing levels, but basically there are 4 major stages of testing involved in the EMS system.

1) Unit Testing
2) Module Testing
3) Integration Testing
4) System Testing

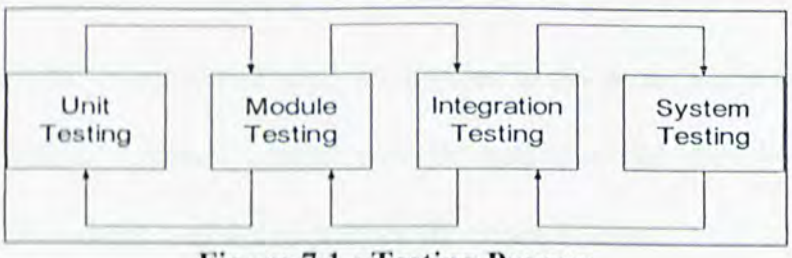


Figure 7.1 : Testing Process

7.2.1 Unit Testing

Unit testing is the process to test the individual component to ensure that they function properly. Each component is tested independently without the interference from other system components. Unit test is performed concurrently with the development process.

The unit testing involves:

- Testing the interfaces to ensure that the information flows properly into and out of the program unit.
- Testing the boundary condition to ensure that the component is operating correctly at boundary values.
- Make sure that all independent paths in a control structure are tested at least once.
- Testing all error handling paths.

Table 7.1 : Unit Test Case in windows-based EMS

No	*Test Procedure*	*Output/Error*	*Analysis of Test Result*
1	Key in correct data into User ID and Password.	Main page (either Operator or Admin Menu) displayed.	User ID and Password was proceed successfully in Login coding.
2	Click OK button without key in any data.	A warning message was pop out.	Java function is working.
3	Click Calculation button from the Main Menu	Calculation screen was displayed.	The link is working.

7.2.2 Module Testing

Module testing is performed without other system modules. A module consists of a collection of dependent components to perform a particular task or function. Different possible test cases are applied to the module and the test results would be verified. Unusual results will be analyzed and they would help in debugging sub-modules in order to produce the desired output.

The following section discusses some of the modules testing in detail:

1. *Login Module*

- Login as a valid user with correct User ID and Password. Validated users are allowed to access the website.
- Login as user with either incorrect login ID or password. The program will alert the users that either the login ID or password is incorrect.
- Login as administrators or operators for EMS application. The administrators or operators are then allowed to access the administrative services such as add, edit and delete functions.

2. *Reservation Module*

- Test to reserve ball room by filling in all values in all fields from the booking screen.
- Test with entering correct data and incorrect data.

3. *Delete Module*

- Test to cancel an existing record.

4. *Update Module*

- Test to update or change a reservation record.
- Try to select or key in any values to proceed.
- Test on Reservation History to view existing reservation records.

7.2.3 Integration Testing

The integration testing is carried out after the module testing process has been done. When the individual components or modules are working in satisfactory and meeting the system objectives during the module testing, those modules are then being combined into a whole working system. Several independent modules combined into a single system may cause some unpredicted and unexpected errors that relates to the integration of these modules. Therefore, integration testing is a systematic approach for constructing the application while conducting tests to

discover errors associated with interfacing of different components or modules. Several important aspects are checked to ensure that the flow of the data in EMS is well organized and are user friendly to all the system users.

Table 7.2 : Integration Testing for web-based EMS

Step	*Test Procedure*	*Output/Error*	*Analysis of Test Result*
1	Login as a user	User login into Reservation Main Menu.	User ID and Password is proceed successfully in Login script.
2	In Reservation Screen, book a room after key in values in all fields. Then click Submit.	Confirmation of booking shown. Status for a new reservation is "RESERVED".	Booking script is running correctly without any errors. Booking details will be updated in database.
3	In Reservation Screen again, leave all the fields blank and click Submit.	Error occurred. An error message "Please in the mandatory fields" was shown.	Error handling is working in script.
4	Go to Records menu, click on any of the existing booking records.	The booking details will be shown and allow for updating and deletion.	Viewing script is working. All data is retrieved successfully from database.
5	Modify the details by selecting a date that has been booked by another customer and click on "Update Details" button.	Error occurred. An error message "Sorry, Fully Booked! Please try a new date or time!" was shown.	Error handling is working in script.
6	Go to Events menu to publish an event by choosing a ref# number and key in all values in all fields. Then, click on Publish Details.	Confirmation of publishing shown. Status is changed to "PENDING"	Event Publishing script is working. All data is stored successfully into the database.
7	From Events menu again, if your reservation status is still remain on "RESERVED" (combo box does not show any ref# numbers) or do not select any ref# number. Publish Details button is clicked.	Error occurred. An error message "Sorry, please pay your deposit before publishing any events!" was shown.	Error handling is working in script.

8	From Events Menu, do not select any ref# number or leave all the fields blank. Click on Delete Details button.	Error occurred.	Error handling is working in script.
9	Click on Invitation button, select ref# number (if exist) and enter email addresses. Then click on Send Email button.	Confirmation of sending shown.	Email function is working properly.
10	From Invitation menu again, key in invalid email addresses.	Error occurred. An error message "Invalid address" was shown.	Error handling is working in script.
11	Click on User button, modify the details and click on Update Details button.	Confirmation of updating shown.	User Details updating is working properly.
12	From User Menu again, modify details with special characters password or password exceeding 12 characters, invalid email, invalid IC and invalid contact number.	Error occurred.	Error handling is working in script.
13	Click Logout button to log out.	Web page will be directed to the main page.	All session is closed successfully. Redirect function is working in script.

7.2.4 System Testing

After all the modules are completed, the entire system must then be validated. Carrying out the system testing process does the validation of the system. Testing the whole system is very different from module and integration testing. When the system testing process is being carried out, the major difference compared to module and integration testing is that one needs to work with the entire environment of the system such as the hardware, software, databases and the computer systems.

The objective of system testing is to verify and validate the functional and non-functional requirements of the system. The functional and non-functional requirements of EMS system are as defined in Chapter 4 System Analysis.

There are several types of system testing that can be used to test a software system. But only 3 types of system testing are applied on the EMS system.

- *Function Testing*

  Function testing focuses on the functionality of the system. It is based on the system functional requirement. The process is to check whether the system provides the function to do the task for example like generating report for management purpose in EMS.

- *Security Testing*

  The main objective of security testing is to verify that protection mechanism built into the system will protect it from improper penetration. Although not much of security is applied in the EMS system except the validations of password to enter the system, it is part of the testing which has been carried out too by testing the login module aggressively for any possible penetration.

- *Performance Testing*

  This part of testing is carried out after the function testing. When the system performs the function required by the requirements, the testing process then turns to test the way in which those functions are performed. Thus, the performance testing addresses the non-functional requirements. The purpose of this testing is to test the run time performances of the software within the context of an integrated system. It involves both hardware and software instruments.

7.3 Chapter Summary

Chapter 7 presents the System Testing in terms of the types of testing conducted for the system. Unit testing is conducted in the first stage, followed by module testing. After that, integration testing is carried out so that to discover errors associated with interfacing of different components or modules. System testing is carried out after integration testing to make sure that the whole system is working properly together with the environment of the system.

Chapter 8: System Evaluation

- ✓ Introduction
- ✓ Problems Encountered and Its Solutions
- ✓ Future Enhancements
- ✓ Knowledge and Experience Gained
- ✓ Chapter Summary
- ✓ Conclusion

Chapter 8 System Evaluation

8.1 Introduction

This chapter is the final phase in the life cycle of the project, during the periods of coding and implementation, various problems were encountered especially this system was built from scratch. So this chapter will highlight some of the problems faced throughout the project duration and also with the solutions that have been taken to solve those problems. Besides that, this chapter will also include the evaluation of the system to identify its strengths and limitations. Possible ways to enhance the system are also being explored as suggestions to further improve the system.

8.2 Problems Encountered and its Solutions

1) Unknown SMTP host at port 25

After installing this system into a LAN environment, the SMTP host, which named "smtp.hotpop.com", I used previously when using dial up connection become invalid. The error message shown on the screen indicated that the system unable to connect to the SMTP host and it unable to detect the SMTP host: smtp.hotpop.com at port 25.

Solution

This problem occurred because our faculty Internet Service Provider (ISP) had blocked the default SMTP port which is port 25 for outgoing mail to avoid spamming. The only solution for this is by using our ISP's SMTP server instead of ours (smtp.hotpop.com). Therefore, I decided to use "smtp1.um.edu.my" as my SMTP host instead of "smtp.hotpop.com" when running my system in our faculty's LAN environment.

2) Unable to use Crystal Report as my reporting tool

Although Microsoft Visual Basic or .Net can easily connect to crystal report, JAVA needs some classes and tedious codes to fulfill this task. After searching and copying all the classes needed for integration between JAVA and crystal report, problems still occurred such as "No response from server", "Cannot connect to server" and others problems related to the RAS (Report Application Server).

Solution

I searched for alternate reporting tools instead of Crystal Report, such as IntelliVIEW, RReport, JFreeReport, JasperReport and other reporting tools that can easily integrate with JAVA from the Internet. Finally, I chose JasperReport as my reporting tools because it provides many features such as reports zooming, printing function, exporting reports to PDF, HTML, Excel format and many other features. By using the classes provided and going through the examples given, I successfully created a report by using JAVA and JasperReport.

3) Barcode printing on invitation cards

It is not an easy task to search for free or sample source code to create a barcode from Internet. However, I found a sample source code for barcode 3 of 9 from the Internet but this source code is mainly on showing the barcode on a label from the system, which is for viewing purpose. I needed to modify it in order to print this barcode out to an invitation card. The problem is I cannot print out the full barcode onto an invitation card.

Solution

The solution for this is by modifying the coordinates of the barcode used in this source code to fit the paper size and the desired location when printing invitation cards. By modifying some calculations, the height and the length of the barcode, I managed to get the desired barcode size.

8.3 Evaluation by End User

8.3.1 System Strengths

Simple and User Friendly Interface

For web-based EMS, customers know how to reserve a ball room without any help. They can simply click on the button provided to view their booking records and modify it easily. The function of invitation is created simple enough to allow the customers on inviting their guests through email. Invitation message has been created for them and they only need to key in the email addresses in order to invite their guests. For EMS application, it is only used by administrators and operators in a local environment. Administrators and operators will be able to operate the application in a short time. They just need to move around their mouse to select the operations needed from the application window. Messages prompt out to indicate the status once an operation done. By viewing or clicking through the "tree" provided, the operators and administrators will be attached to the latest reservation details. The web-based EMS is simple and easy to use with bright links and buttons to indicate the availability of the links. While for EMS window-based application, the links are designed with image button and drop down menu to facilitate administrators and operators while going through the system.

Security Features

This system includes the security control that only allows authorized customers to access the web-based booking system. Each login done by the customers will have to go through a login checking control to make sure that the customers are using the correct and unique user ID and password in order to access the system. Hence, unauthorized users are prohibited from accessing the records in the database. Furthermore, EMS window-based application which used by the

administrators and operators is a local environment application where it can not be accessed through online. Besides that, only authorized users who provide the correct user ID and password are allowed to enter this system.

Processing Speed

Compared to web-based application, server side EMS application is performing faster than the web-based EMS because the EMS windows-based application is only installed in a local workstation to perform its task on maintaining or operating the system.

Validation of Input Data

The system will prompt the users if there are any invalid data input or if the mandatory fields are not filled. The system will prompt error messages to the users when the users attempt to perform illegal actions, typos, or null value insertions. The error messages are efficient enough to detect the format of the data to be inputted. These messages are helpful and important to the users because it allows the users to be kept updated regarding each process.

8.3.2 System Constraints

No Multi Level Security for Administrators' and Operators' Accesses and Encryption of Password in the Database

Due to the reason that the only administrators or operators that are going to maintain the users' records are the company staffs themselves, multi level database security are eliminated from the project so that the staffs are able to view all the records and perform any actions to the records such as editing and correcting the data. However, there will be a need for multi level database security where each level may only view certain allowed data from the database. This feature has also been suggested in the future enhancement recommendation.

Version Dependent

The EMS system is version dependent. As it is built with JAVA and JSP, it can only be run in any platform with the same JAVA version used when developing the system.

8.4 Future Enhancements/ Suggestions

After evaluating the system, there are some further improvements or enhancements can be done in order to upgrade the system, which stated as follow:

a) The system could scan the barcode printed on the invitation cards which will be bring along by the guests when attending events and take attendance in order to make sure how many guests have been arrived based on the barcode scanning.

b) Due to the time constraints, the system can only generate two reports whereby there could be more reports generated for management purposes.

c) In order to manage events in a more efficient way, the system could provide a lucky draw function, so that the system can pick up a number according to the number printed on the invitation cards randomly and determine who the lucky draw winner is.

d) The system could provide help function to assist the administrators or operators during their operations.

e) The web-based EMS could provide FAQ and help function to assist the customers during their reservation.

f) The web-based EMS could provide electronic payment function for faster transaction. This could eliminate the burdens laid on the server side, and subsequently reduce the operators' workloads.

8.5 Knowledge and Experience Gained

With basic HTML and programming knowledge that learn in FCSIT, I am still a newcomer in JSP and JAVA. With the additional hard work of learning from scratch and self-learning JSP and JAVA syntaxes and semantics where both the technologies have the similar syntaxes, the knowledge gained were precious and valuable. A handful of new experiences and knowledge were gained and they are:

1. Querying for information from the databases, and web resources were made easier and more confident, especially the project's contents itself are all about getting the right and precise information one needs. The loads of information found are intelligently digested and has helped a lot in both the academically part and technical parts of the EMS system.
2. Knowledge about web-based application such as the roles played by web servers, application servers, and how web pages are transmitted from one destination to another destination was obtained.
3. Knowledge of JAVA was obtained during system development like several methods to connect to the database.
4. New knowledge gained of Microsoft SQL Server 2000.
5. Improved knowledge about JavaScript, JSP, HTML (especially the usage of tables for aligning) and Dynamic HTML (DHTML).
6. Improved knowledge of using graphical tools like Macromedia Dreamweaver MX, Adobe Photoshop 7.0 and others. All these graphical tools are used in images editing, images creation, text manipulation as well as design of the page layout.
7. Acknowledgement of the useful notepad, which is found to be helping a lot in most of the programming side.

8. Understand the use of functions calling, variables naming as they ease the codes presentations and readings.
9. Lastly the most valuable experience gained was how to solve problems when sometimes certain modules do not work.

8.6 Chapter Summary

System evaluation in terms of the problems encountered and its solutions, certain situation faced in the system and its considerations, evaluation by end users, system strengths, and system constraints are evaluated in this chapter. Future enhancement is also included in this chapter so that the system can be further enhanced to a better system that matches all its requirements to become an impressive system that cater users' needs in all dimensions. This chapter concludes with the knowledge and experience gained during the software development.

8.7 Conclusion

Event Management System is a pretty simple system. Basically, this system is to be utilized by administrators and operators. Besides, it also provides ease of usage to the indirect users of this system who are in this case the customers. Several studies have been done in order to find out the best solutions during the development of the system.

Now, I have a better and clearer understanding on how to design a system. It is because through out this project I have studied many of the related materials and have obtained some knowledge which we cannot learn from books. The problems and needs of EMS system had been gone through to determine how computer hardware and software can improve the system.

There are many skills needed through out the whole project, which are planning, directing and controlling the development of the system within a specified

time frame, scheduling to make sure that the system can submit to the lecturer on time.

Lastly, it is believed that event management system will bring convenient in managing the events systematically and helping to ease tedious tasks for the users.

Reference

3- and n-Tier Architectures. (1998). Available at http://www.corba.ch/e/3tier.html (Data accessed 16/8/2003)

Advantages of Java. (2000). Available at http://arizonacommunity.com/articles/java_32001.shtml (Data accessed 17/7/2003)

Amital Data Ltd. – The Event Management System. (2000). Available at http://www.amital.co.il/products/item2.htm (Data accessed 15/7/2003)

An Introduction to ASP.NET. (2002). Available at http://www.devguru.com/Features/tutorials/aspnet_intro/aspnet_intro.html (Data accessed 17/7/2003)

Apache Jakarta Project (1999). Available at http://jakarta.apache.org/tomcat/ (Data accessed 15/7/2003)

Aprimo Marketing Event Manager. (2003). Available at http://www.aprimo.com/products_services/demand_creation/event_manager.asp (Data accessed 14/7/2003)

ASP.NET: An Introduction and My Views on the Matter. (2002). Available at http://www.4guysfromrolla.com/webtech/071500-1.shtml (Data accessed 17/7/2003)

Birmingham Jefferson Convention Complex. (2001). Available at http://www.bjcc.org/booking/index.html (Data accessed 8/7/2003)

Connolly, T., Begg, C. & Strachan, A. (1996). *Database Systems A Practical Approach to Design, Implementation and Management.* 1st ed. Addison-Wesley.

Consensus Event Management System (2003). Available at http://www.consensus.co.uk/ems.asp (Data accessed 15/7/2003)

Dell – Microsoft Windows XP. (2003). Available at http://www.dell.com/us/en/hea/topics/winxp_000_index.htm (Data accessed 21/7/2003)

Easy Booking System (1999). Available at http://www.sid.com.au/Easy%20Booking%20System.htm (Data accessed 20/7/2003)

EMS Event Management Systems (1995). Available at http://www.dea.com/Default.asp (Data accessed 17/7/2003)

Event Management Systems. (2000). Available at http://www.eventmanagementsystems.co.uk/company.htm (Data accessed 15/7/2003)

EventPro Software (1997). Available at http://www.eventpro.net/ (Data accessed 17/7/2003)

Ez-Event (2002). Available at http://www.ez-event.com/restaurants.asp (Data accessed 9/7/2003)

FastBook (2001). Available at http://www.eventsoft.com/index.asp (Data accessed 18/7/2003)

H.M. Deitel and P.J. Deitel (1999). *Java How to Program.* 3rd ed. Deitel & Deitel Prentice Hall.

INNfinity Hospitality System (1997). Available at http://www.innfinity.com/ (Data accessed 18/7/2003)

Internet Information Server Overview and Architecture. (1998). Available at http://www.windowsitlibrary.com/Content/141/01/1.html (Data accessed 15/7/2003)

Introduction to JavaScript - Part1. (1996). Available at http://www.ville-ge.ch/musinfo/techref/javasc~1/javascr.htm (Data accessed 17/7/2003)

James A. Senn. (1998). Analysis & Design of Information System. 2nd ed. McGraw-Hill.

Jasper Report. (2001). Available at http://jasperreports.sourceforge.net/ (Data accessed 25/01/2003)

Java 2 Platform, Enterprise Edition. (2003). Available at http://java.sun.com/j2ee/overview2.html (Data accessed 22/7/2003)

Java Barcode Packages. (1999). Available at http://www.idautomation.com/java/#source_code (Data accessed 10/01/2003)

Java Server Pages. (2002). Available at http://java.sun.com/products/jsp/index.html (Data accessed 16/7/2003)

Java Skyline – Learn EJB. (2000). Available at http://www.javaskyline.com/learnrmi.html (Data accessed 20/01/2003)

Jeffrey, L. W., Lonnie, D.B. and Kevin, C. D. (2000). *System Analysis & Design Methods*, McGraw-Hill.

JSP Insider. (2002). Available at http://www.jspinsider.com/showsource.jsp (Data accessed 20/12/2003)

JSP Resource Index (1999). Available at http://www.jspin.com/home/tutorials/email (Data accessed 15/12/2003)

Kendall, K.E., Kendall, J.E. (1996). *System Analysis and Design.* 4th ed. Prentice Hall Inc.

LA Center: Conference and Banquet Facilities (2003). Available at http://www.lacentre.com/ (Data accessed 12/7/2003)

MacMillan. (2002). *MacMillan English Dictionary For Advanced Learners.* 1st ed. Macmillan Publishers Limited.

Marty Hall. (2000). *Core Servlets and JavaServer Pages.* 1st ed. Prentice Hall PTR.

Microsoft® Visual Studio® .NET Professional - The Product and Technology Catalog. (2002). Available at http://www.microsoft.com/catalog/display.asp?subid=22&site=11128 (Data accessed 15/7/2003)

MS Access vs SQL Server. (1999). Available at http://www.lupo.net.nz/resources/articles/accessVsql.asp (Data accessed 19/7/2003)

NextBrick-Content Infrastructure Solutions (2002). Available at http://www.nextbrick.com/ems.htm (Data accessed 19/7/2003)

Online Registration. (2003). Available at https://www.regonline.com/default.asp?sc=3005 (Data accessed 14/7/2003)

Operating System Technical Comparison. (2002). Available at http://www.osdata.com/ (Data accessed 16/7/2003)

OracleJSP Support for JavaServer Pages Developer's Guide and Reference. (2000). Available at http://download-west.oracle.com/otndoc/oracle9i/901_doc/ja va.901/a90208 /genlovw.htm (Data accessed 16/7/2003)

Parker, A, and Teare, R. (1992) *"A Brand Extension Strategy for Holiday Ian Worldwide Development." International Hospitality Management: Corporate Strategy in Practice.* John Wiley & Sons, Inc..

PC Magazine reviews Microsoft Internet Information Services 5.0. (2002). Available at http://www.pcmag.com/article2/0,4149,11533,00.asp (Data accessed 16/7/2003)

Prague, C.N., Irwin, M.R. (2001). *Access 2002 Bible*. 1st ed. Hungry Minds Inc.

Restaurant 101 Cape Cuisine (2001). Available at http://www.restaurant101.co.za/jul.htm (Data accessed 12/7/2003)

Shari L. P. (2001). *Software Engineering, Theory and Practice*. 2nd ed. Prentice Hall Inc.

SMTP Host. (1997). Available at http://www.buzzsoft.com/engsupport/SMTP%20Host.html (Data accessed 23/12/2003)

Sommerwille, I. (2000). *Software Engineering*. 6th Edition. Addison Wesley Ltd.

Stair, R. (1996). *Principles of Information System: A Managerial Approach*, International Thomson publishing, Inc..

The Comparison of Access 97/2000 with SQL Server 7.0/2000. (2000). Available at http://www.mssqlcity.com/Articles/Compare/SQLvsAccess.htm (Data accessed 19/7/2003)

Townbridge web site (2001). Available at http://www.trowbridge.gov.uk/index.html (Data accessed 8/7/2003)

Valacich, Joseph S., George, Joey F., & Hoffer, Jeffrey A. (2001). *Essentials of System Analysis & Design*. Prentice Hall Inc.

Weston Data Software (2002). Available at http://www.westondata.co.uk/productinfo.htm (Data accessed 20/7/2003)

Windows XP Product Information. (2003). Available at http://www.microsoft.com/windowsxp/evaluation/default.asp (Data accessed 22/7/2003)