

Theoretical Foundation of the Booking System

3.1 Introduction

In this chapter, web technology and the use of web technology to solve the real problem in the Forest Department of Sri Lanka, are reported and an approach to solve the problem is proposed. It elaborates the inputs, outputs, processes, users and the features of the proposed system.

3.2 Web Technology

Many web applications use an architecture called the three-tier architecture for database which adds an intermediate layer between the client and the database server [2]. The user interface, application rules and data access are three tiers here.

An internet banking systems can be implemented using the three-tier architecture. The bank's customer database provides data management services, a web server provides the application services such as facilities to transfer cash, generate statements, pay bills, etc. and the user's own computer with an internet browser is the client [5]. Sommerville [5] has pointed out that the use of three-tier architecture in the banking system allows information transfer between the web server and the database server.

According to Sommerville [5], this architecture can be used for large scale applications, with hundreds of clients. As it is centrally located it can be easily updated. SQL (Structured Query Language) can be used to handle information retrieved from the database. In three-tier architecture, a single server computer can run both the application processing and the application data management separately.

In the two-tier architecture which is the simplest client sever architecture, the three logical layers; presentation, application processing and data management must be mapped on to two computer systems. If one of the two forms of two-tier architecture (thin-client model or fat-client model) is chosen, a problem would arise with scalability or performance. To avoid these problems, an alternative approach is three-tier client server architecture [5]. As described at the beginning of this chapter, presentation, application processing and data management of three-tier architecture are logically separate processes.

Web contents can be categorized as static or dynamic. Dynamic content requires computation, reduces effectiveness of caching, and is slower than static content. When considering the taxonomy of the existing web Technology, Dynamic content is further divided into two classes as client side and server side. Client-side is handled (processed) by a web browser or software on a local machine. Java, JavaScript, ActiveX (browser handled), Shockwave, and RealAudio (separate downloaded software), are some examples of Client-side.

The Server-side is handled by a web server and CGI, SSI, PHP, ASP, Cold Fusion, Domino are some examples. SSI, PHP, and ASP, are server modules and are included in Apache and/or IIS.

Java script improves usability of web pages. Advanced functions like database connections or file access cannot be done using Java script. Java is a powerful, flexible, extensible programming language with robust security but not necessarily is web related. Both Java and Java script can't be used for search, index, translate or print.

ActiveX is also easy to develop but can work with only the Windows Operating System.

Active Server Pages (ASP) is used only for Windows IE Operating System. ASP can be used for connecting databases. It is easy to develop.

Any language can be used with CGI (Common Gateway Interface). It is maximally flexible but debugging is hard. CGI is not platform-specific and source code is also protected in CGI. PHP (personal home page) is a powerful scripting language and easy to incorporate into HTML. Source codes are hidden in PHP. Two disadvantages of PHP are poor documentation and the absence of a development environment [6]. Session is a series of related interactions between a single client and the web server, which take place over an extended period of time. To keep the data on the server only is more practical than storing the data on the client machine. PHP has its own session management system built in. When a PHP session starts, the server assigns it a session identifier (SID). Variables are stored on the server, when it is registered as a session variable [1].

The Client side is handled by web browser or software on local Machine whereas the Server side is handled by web server.

3.3 Approach to the use of web technology for the booking system

Using the technology mentioned in the above section, an approach to solve the real problem in the Forest Department is as follows.

The top level architecture of the proposed system comprises of the data layer (MYSQL database), the application layer, and the user interface was built as a solution for the current problem identified in the Forest Department. Figure 3.1 shows the interaction among these modules.

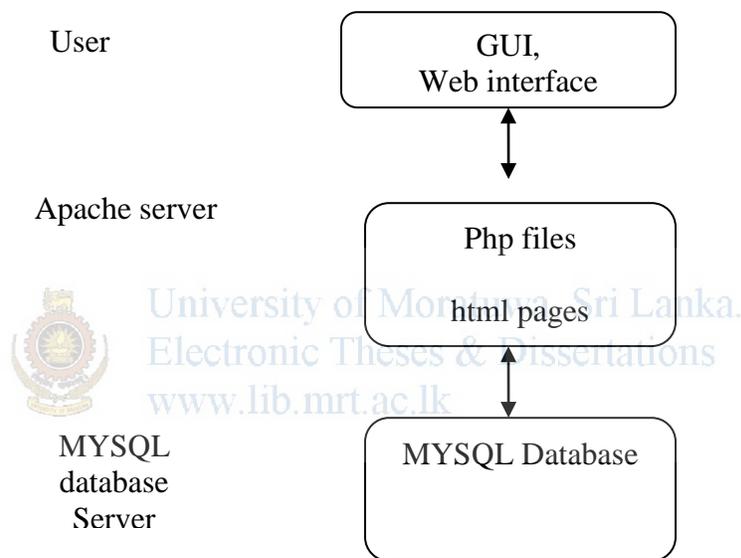


Figure 3.1: The architecture of the proposed system

The user interface was designed using, HTML, Java script, server side scripting language PHP, and Apache web server as front end and MySQL Database server running as back end. The standard socket level security mechanism, SSL, is available as an Apache module. Cascading Style sheet technology was used to helps to maintain the 'look and feel' for the site. Sessions were used to keep data on the server.

3.3.1 Inputs

User information

A new user has been given permission to logon to the web site of the “Flora and Fauna Information Unit” by entering a desired user name, a password and an email address. After entering above data the new user is registered. A regular visitor has the opportunity to use his user id, and password to enter the site directly. The user gets the status of the availability of accommodation and tickets. If accommodation is available he can make a reservation to visit by selecting options provided by the system. The user can view his booking details with the price which he has to pay. To make payments he has to fill in a form. After filling in the form, an email notification is sent to the user by the system. The users who do not like to log on to the system are considered as guests. Guests, new users or regular users can forward their comments on the site through the Guest book.

3.3.2 Processes

This prototype allows user to search for availability of accommodation and tickets of each circuit, choose a circuit and book a circuit, make comments and payments. It also facilitates to authorized users to view bookings and accommodation details, add, update and delete records and to set cabin types and prices.

3.3.3 Outputs

Receipts, reports (monthly report to the Forest Department)

The prototype is developed to be used for booking tickets and accommodation online, by users who need to visit MAB reserves in Sri Lanka, effectively and efficiently.

3.3.4 Users

- Researchers
- Students/regular visitors
- Forest Department officers
- Foresters
- Foreigners

3.3.5 Features

Authentication & Validation – log on procedure. User ID is used for authenticating users. System can reject or approve user authentication.

Security-encrypted user password using MD5 (Message Digest) algorithm

Credit card number is not stored in the FFIU database as security is considered. .

The facility to update database day-by-day basis is the main advantage of FFIU. Each Forester can view or the progress of the projects at different stages. Flora and Fauna Information Unit of the Forest Department, maintains a Centralized database which can be accessed by all site offices. This eliminates inconsistencies in customer information and project details between the Department and site office.

Usability-This system provides user friendly sites and general information (flexibility).

Error handling-Error messages are displayed when something goes wrong.

3.4 Summary

This chapter discusses the web technology as a new approach to the solution of this problem. The next chapter will discuss the analysis and design of the proposed system. It elaborates the inputs, outputs, processes, users and some of the features of the proposed system.