

### Analysis and Design

#### 4.1 Introduction

In this chapter, the design for the solution of the problem is discussed. The approach which is presented here comprises five modules namely, registration, administration module, check availability, bookings and payments. Next the role of each module is described. Modules were elected by studying the activities involved in the system and the task involved.

#### 4.2 System Requirement specifications (SRS)

##### Functional Requirements

The system shall maintain visitor information.

The system shall maintain site (circuit) information.

The system shall provide available information on tickets and accommodation.

The system shall provide booking details with a booking number and prices.

The system shall facilitate for online payments.

The system shall facilitate for online reservations.

##### Non-Functional Requirements

Update of the database should be done every day.

The system should be programmed using HTML, Java script, PHP, and MySQL

The system should run on Windows 2000 or later operating systems.

The system should provide a web interface.

The system should be able to provide a friendly GUI.

The system should facilitate to access reservations concurrently.

The system should provide security for online transaction.

System in brief was depicted in Figure 4.1

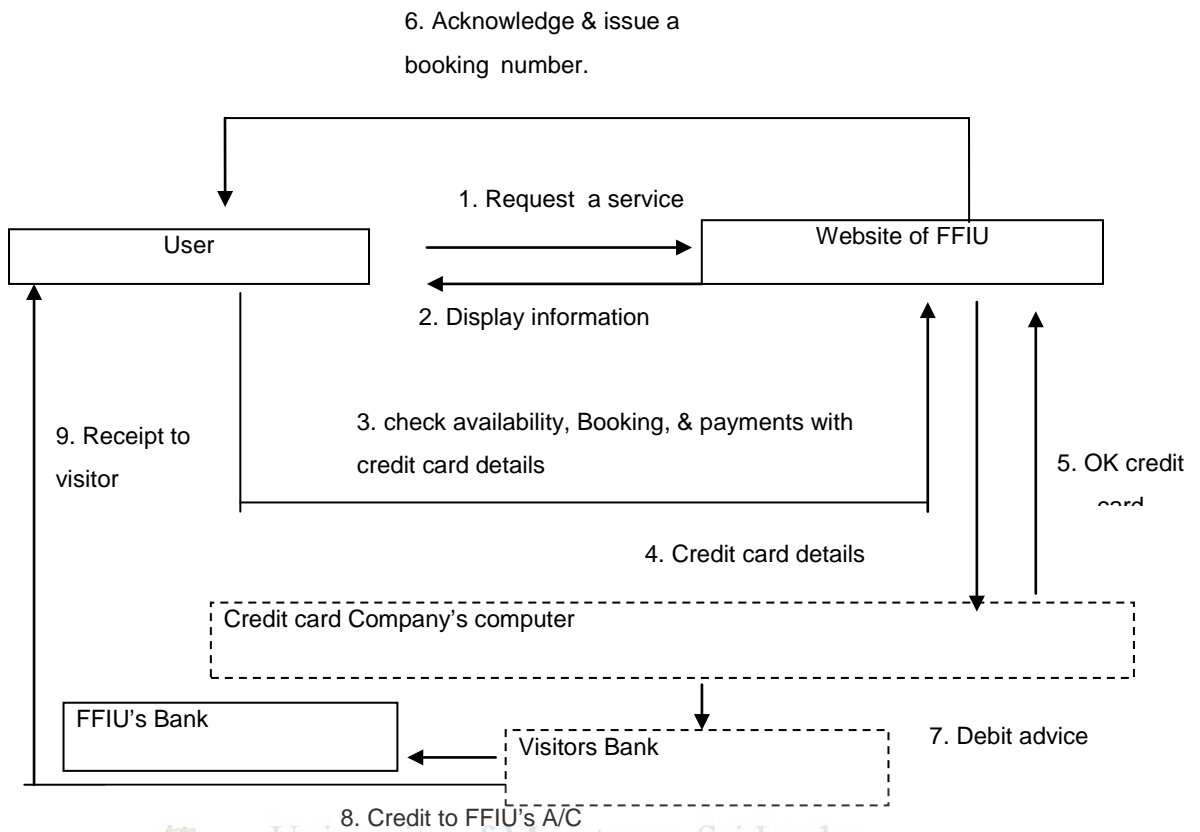


Figure 4.1: System in brief

### 4.3 User requirements

The different user types were identified as follows.

- Visitors (users who are not logged in),
- Users (users who are logged in but don't have admin privileges), and
- Web master, Foresters, FFIU (user who are logged in with administrator's privileges) were considered as different user types. Visitors are considered as guests.

User should be able to,

- Log on to the site.
- Check for cabin availability and type.
- View the description of circuits.
- Make comments on the site
- Make ticket bookings.
- Booking accommodation.
- Know the amount paid.
- Paying through a credit card.
- Receive a receipt

Administrators should be able to

- Update the database
- Delete records
- Insert records
- View user bookings.
- View comments made by users and guests.
- Check for cabin availability
- Set cabin types and pricing
- Check previous bookings and credit details.
- Produce monthly reports indicating reservations.

#### **4.4 Views of the system:**

Use case for the overall system (Figure 4.2) and detailed use cases (Appendix D) were drawn for each activity.

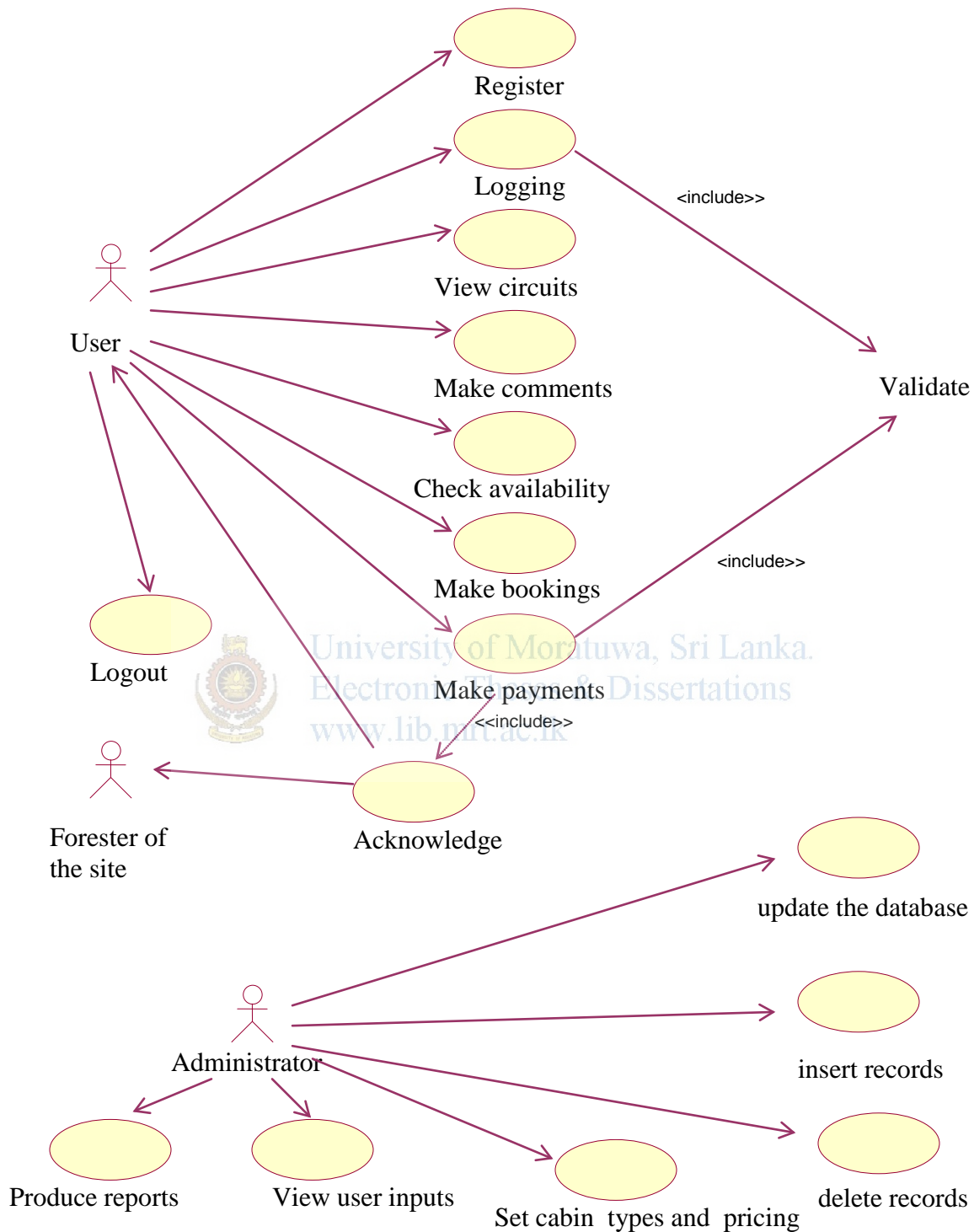


Figure 4.2: Use Case diagram for the system

Sequence diagrams (Figure 4.3, Appendix D) were drawn for visualizing how the object in the system interacts with one another over time. Arrows in the sequence diagram denote messages that go from object to object.

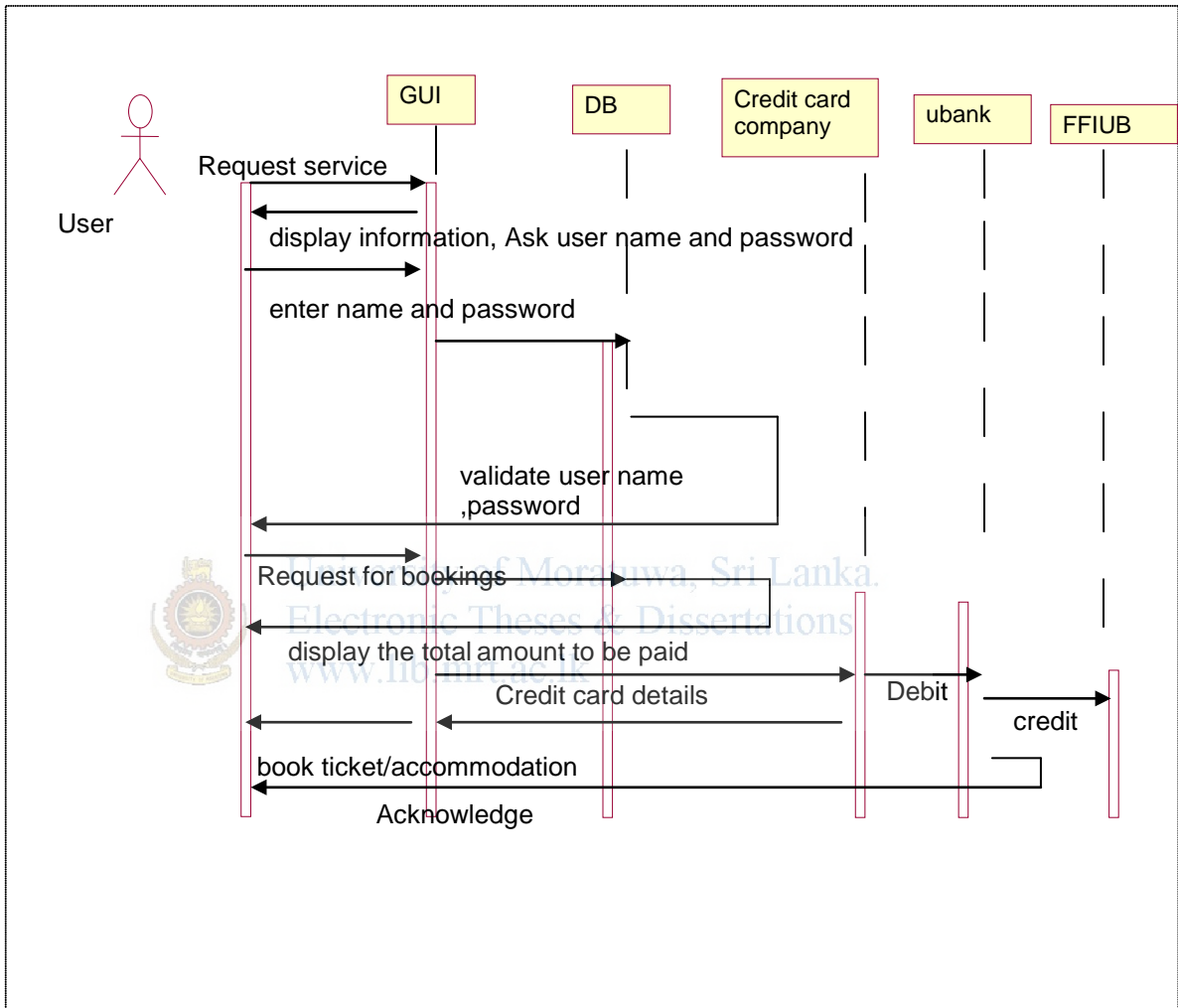


Figure 4.3: Sequence diagram for the system

Class diagrams (Figure. 4.4, Appendix D) show the entities of the system and how those entities relate to one another. Each class is represented as a named rectangle. It is divided into three parts: class name, attributes and operations. There is an association between booking and payments classes and one to one relationship. There can be only one user category (children/school children/adults/foreigner) for each booking. Collaboration diagram was drawn for the system (Appendix D)

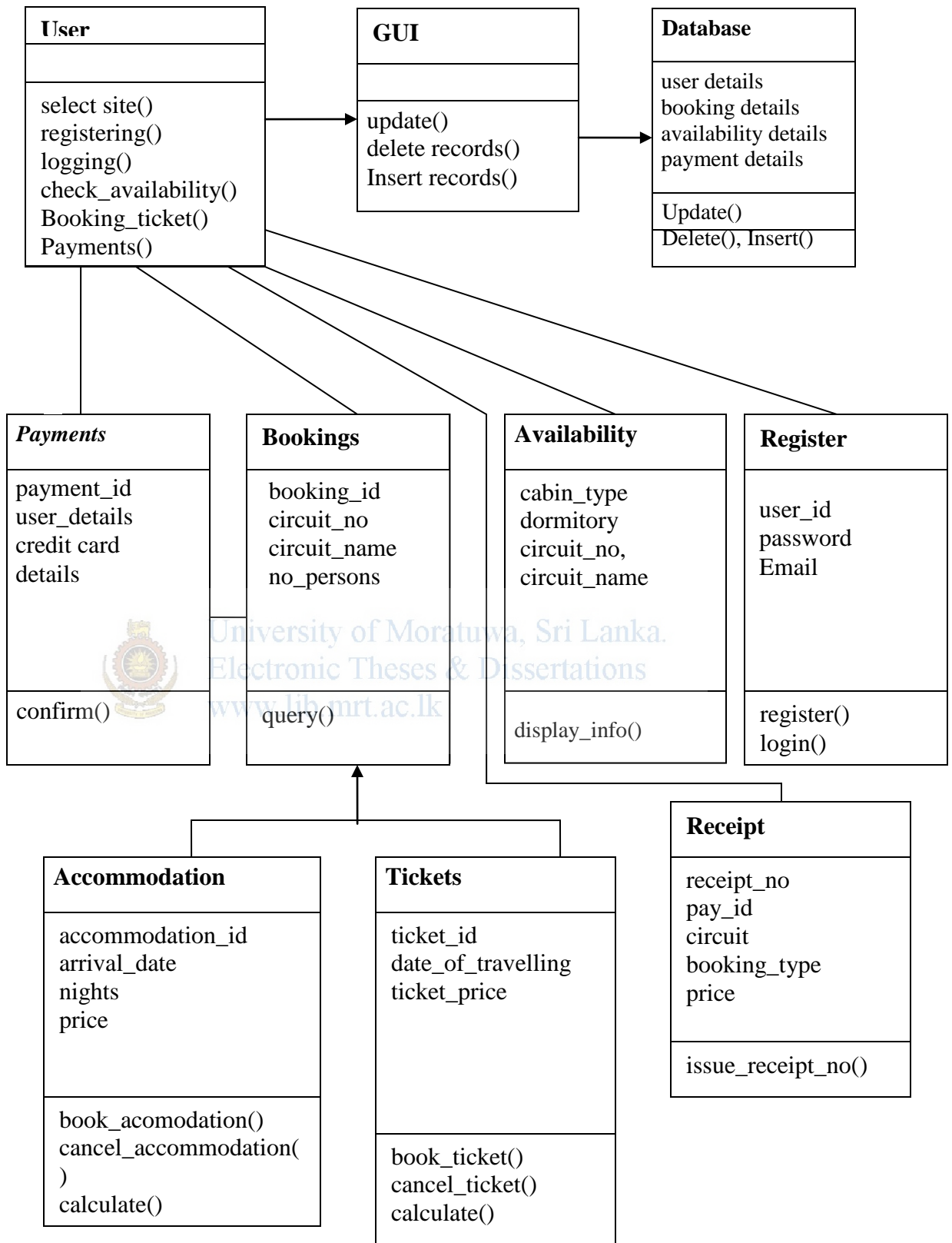


Figure 4.4: Class diagram for the system

#### **4.5 Interaction Modules:**

As Online booking system is an application driven site, pages are functional.

The web site 'On line booking system for visiting Sinharaja and Kanneliya forests in Sri Lanka' consists of number of modules such as registration, check availability, bookings, payments, and administration. The administrator of the web site is Flora and Fauna Information Unit.

##### **4.5.1 Registration module:**

Registration module is used to verify and authenticate the user. This module can be accessed by any of the authorized users of the system.

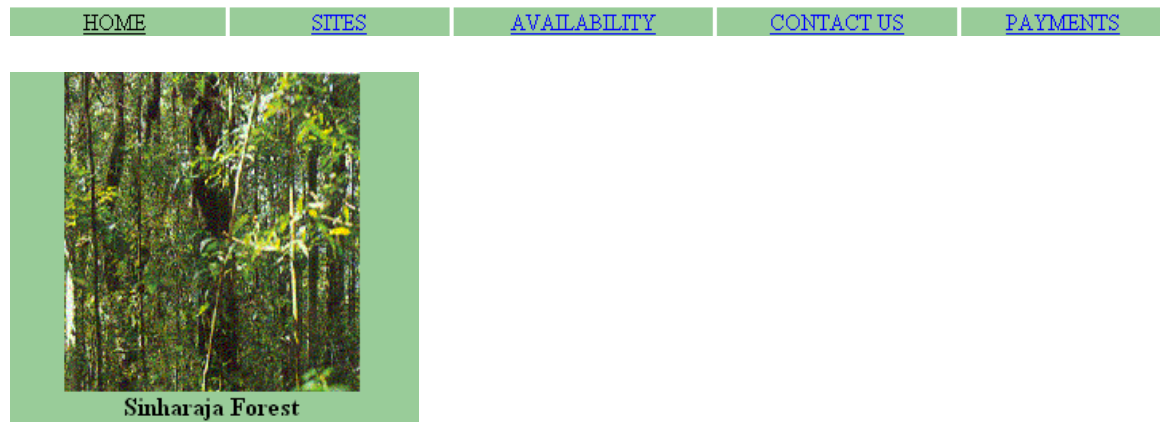
##### **The User Interface**

Familiarity (the terms and objects which are familiar and related to the user environment), consistency, user guidance (meaningful feedback when errors occur), recoverability (recover from errors), and minimal surprise were considered in the user interface design. The same format was used for every web page to reduce user learning time. Facilities were provided to the user to recover from their errors such as typing mistakes. The number of colours used in interface design was limited. The user interface is divided into header, navigation area and main content, and footer. Header consists of a banner (Figure 4.5).



Figure 4.5: Header of the user interface (Banner)

The user can go to different areas by clicking on the links in the navigation area (Figure 4.6).



[Sinharaja](#)

Figure 4.6: Navigation area of the user interface

**Welcome to Sinharaja and Kanneliya Online Reservations**

**If you are a registered user with your own user id and password, you can login here. If you are a new user you can [register](#) first.**

**userid:**

**password:**

Figure 4.7: Login for the registered users

New user can enter desired name for username and password. Email is asked to notify a password for login to the user (Figure 4.8). User can log into the site using that password sent through email (Figure 4.7). It is only accessible by users who have been given administration privileges. When the user clicks on the register button, the information is stored and login information is mailed to the email address.

## New User Registration

To register for access, please enter your desired username, password and your email address below.

You will be informed login information by an Email.

**Username:**

**Password:**

**Email Address:**

Figure 4.8: Registration for the new users

### 4.5.2 Check availability module:



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To check availability select the circuit and click Display

**circuit**

SINHARAJA

KANNELIYA

Figure 4.9: Design for the availability check

The check availability module is used to search the user whether the accommodation is available (Figure 4.9). The availability of cabins and/or dormitory in each site (circuit) is displayed in the webpage. If the accommodation is available, the user can enter his/her request.

### 4.5.3 Booking module

It is used for the bookings of ticket and accommodation. The user has to select the request for accommodation and tickets as depicted in Figure 4.10 and Figure 4.11.

#### select your preference for accomodation

##### circuit

SINHARAJA

KANNELIYA

Category   Number of persons

select the cabins you want.

Note:S(Sinharaja), K(Kanneliya), 1(single cabin), 2(double cabin)

You can't select dormitory for Kanneliya.

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Cabin name    
Nights

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Type the arrival date in the cage below (yy-.mm-dd e.g. 2007-07-21)

Arrival date

Figure 4.10: Design for booking accommodation

# Welcome to Sinharaja and Kanneliya Online Reservations

## select your preference for tickets

### Circuit

- SINHARAJA  
 KANNELIYA

### Category

Adults

**Number of persons** (type the number in the cage)

Date (travelling) - Month:   Date:   Year:   Sri Lanka.  
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Figure 4.11: Design for booking tickets

#### 4.5.4 Payments Module

Payments module is used to connect with the payment gateway. The user has to fill the form and submit to connect with the payment gateway. After filling the form, user will be sent a receipt by email. Form for payments is shown in Figure 4.12.

Card holders name as written on the card :

Company :

Card statement address :

City :

If you are a Foreigner Select Your Country

Country :

State or Province :

Postal or Zip code :

Credit card no:

Card verification number:

Credit card expiration date: Month  Day

Credit Card Type:

Figure 4.12: Form for payments

To process the credit card, the administrator needs a bank account (merchant account) and payment gateway. Merchant account allows accepting credit cards as payment for tickets and accommodations. Payment gateway allows accepting credit card payments in real time over the internet. It provides User id and password to the administrator.

#### 4.5.5 Administration module

Users who have been given administrative privileges can access to the admin center by typing the password provided by the administrator. These persons can view accommodation and booking details, update, delete or add records in the database directly from the web site. Administration module also facilitates to send monthly reports to the conservator of forest. Reports include total number of persons accommodated at Sinharaja and Kanneliya forest reserves, total number of tickets booked at these sites and ticket numbers issued in each site.

User can logout (Figure 4.13) at any time after logging.



Figure 4.13: Logout facility

Details for the Flora and Fauna Information Unit is included in the 'Contact us' page (Figure 4.14).



Figure 4.14: Design for FFIU details

Main Html files (Table 4.1), other html files (Table 4.2) and php files used to design the system are depicted as follows.

Table 4.1: Project screens- main HTML files

No.	File name	Description
1	Index.html	Home page of the on line booking system
2	Sites.html	Short descriptions about circuits with photographs
3	availability.html	Availability of circuits and tickets can be searched. Bookings can be done through this file.
4	payment.html	Form to fill for payments
5	contactus.html	Receipt and for further details

Table 4.2: Project screens- other HTML files

No.	File name	Description
1	register.html	Register page for new users
2	Guestbook.html	Page For users (guests)who do not like to login, and for users who want to keep their comments on the site.
3	accommodation.html	Bookings accommodation can be done through this file.
4	tickets.html	Bookings tickets can be done through this file.
5	FAQ.html	Frequently asked questions
6	Deleterecords.html,addrrecords.html, updatebookings.html	Administrator's files

Table 4.3: Project screens- phpfiles

File name	Description
Register.php,ccc.php,	Files used to connect the database for new users
logi.php, logout.php	validate logging details and logout
guestbook.php, ccc1.php, form.php, read.php	Files used to connect the database, for guests, insert and, retrieve details from the database.
display.php	To display available details for Sinharaja and Kanneliya
ticketprice.php, tickets.php, ticket1.php, ticket2.php	Calculate ticket price according to the user request, store user request in the database.
bookingprice.php, accommodation.php, accommodation1.php,accommodation2.php	Calculate price for accommodation according to the user request
Receipt1.php, Receipt2.php	To issue booking number and ticket number
Reporttocf.php, Reporttocf2.php, Reporttocf3.php	Reports

#### 4.6 Designing the Data Layer:

The data layer mainly consists of five relational tables. Register table, availability tables, Reservation tables, guest table, credit details table, payment table. Register table is used for both registering and to logon to the website. Reservation tables were divided into accommodation, and tickets tables. Availability tables were divided into availability at Sinharaja and Kanneliya circuits (Availabilitya table). Normalization was done to reduce data redundancy (ER diagram in Figure 4.15 and EER diagram in Figure 4.16).

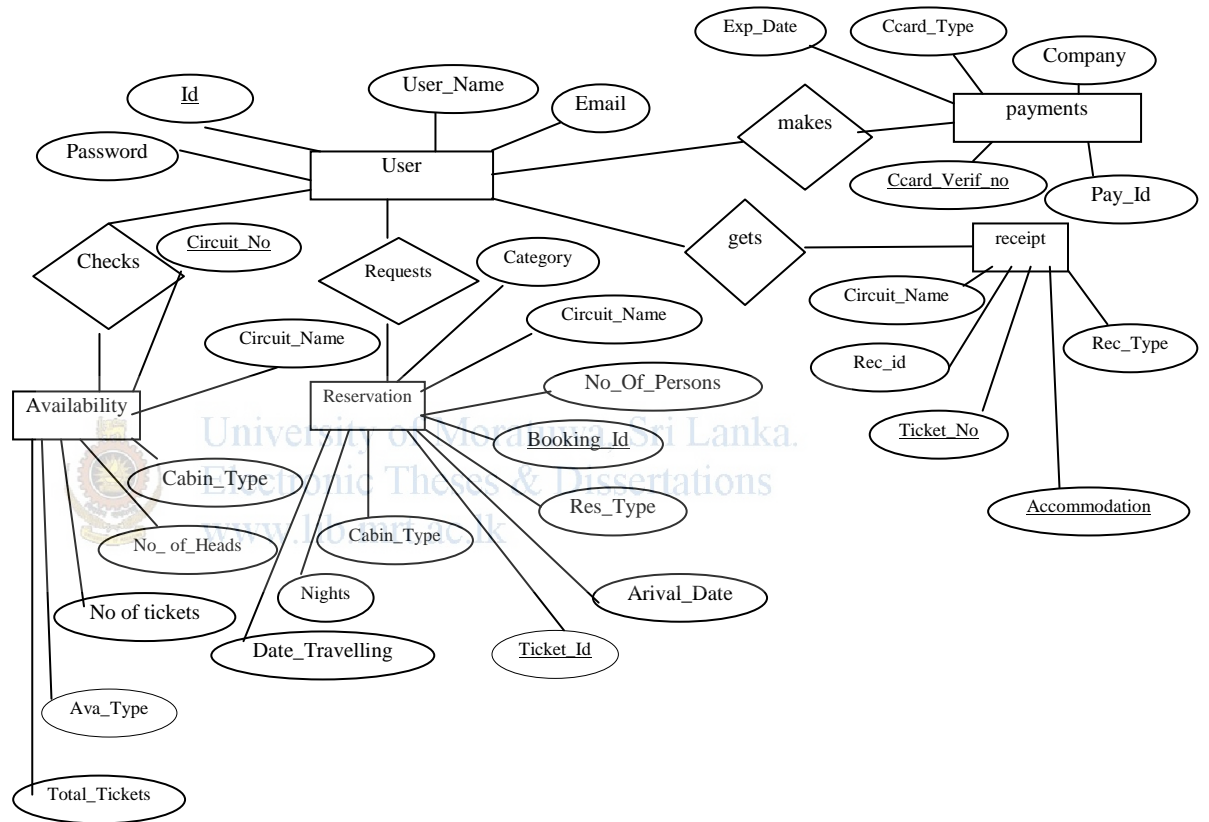


Figure 4.15: Online booking system Entity Relationship diagram

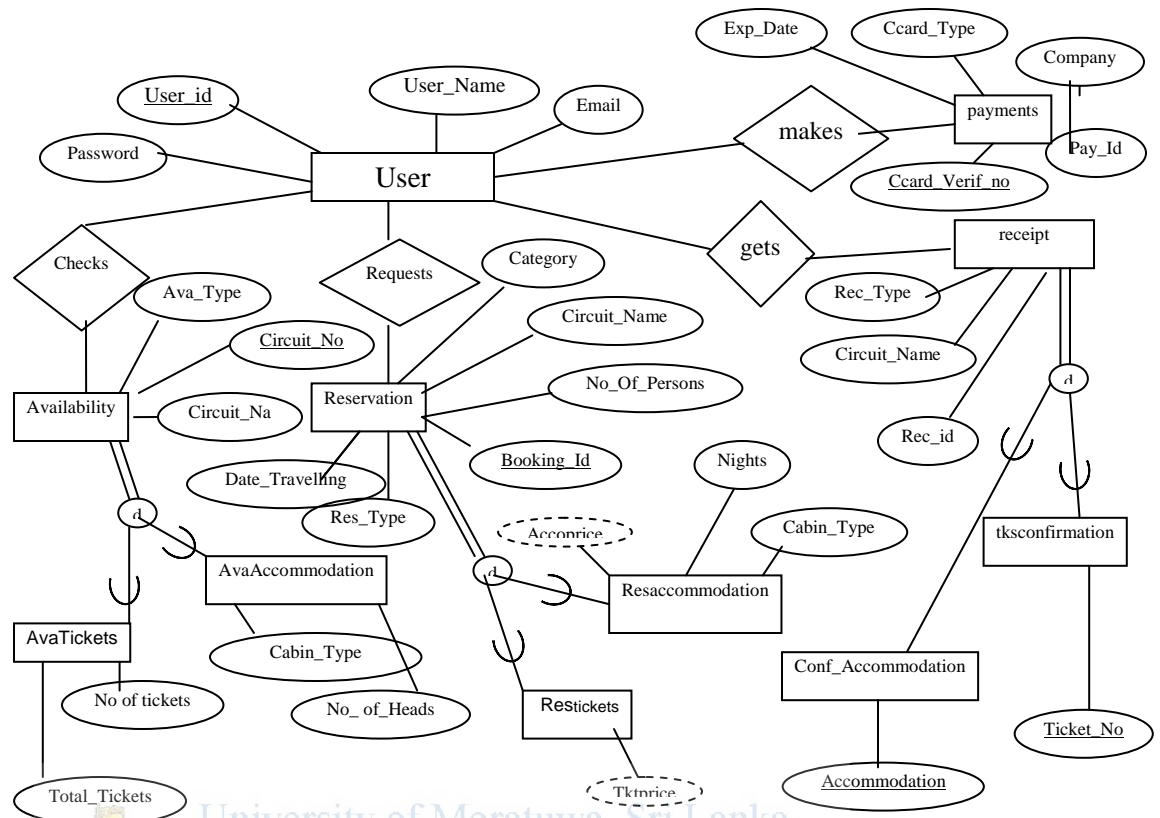


Figure 4.16: Online booking system Extended Entity Relationship diagram

Main tables are structured as follows.

Table 4.4: Register

Field	Type	Null	Attributes
id	mediumint(5)	No	Auto_increment
username	varchar(30)	No	none
password	varchar(30)	No	binary
email	varchar(50)	No	none

In the table 4.4, id field is automatically incremented and username is declared unique to ensure that no two rows can have the same value. When a new user registers, the id is set to one greater than its current value. The id field is defined as a primary key and is used to establish a relationship with other tables. Password is declared as binary and therefore it is case sensitive.

Table 4.5.1: Availability of accommodation at Sinharaja circuit (availabilitya table)

Field	Type	Null	Attributes
circuit_id	int(8)	no	Auto_Increment
circuit_no	varchar(10)	no	none
circuit_name	varchar(10)	no	none
Cabin_type	varchar(10)	no	none
Number	varchar(10)	no	none

Circuit\_id fields is defined as primary key for the availabilitya table.

Table 4.5.2: Availability of tickets at Kanneliya and Sinharaja circuits (availabilityt table)

Field	Type	Null	Attributes
circuit_id	int (8)	no	Auto Increment
circuit_no	varchar(10)	no	none
circuit_name	varchar(10)	no	none
Total_tickets	varchar(10)	no	none
Tickets_available	varchar(10)		

Circuit\_id field is defined as the primary keys for the availabilityt table



Table 4.6: Booking

Field	Type	Null	Attributes
booking_id	int(10)	no	Auto increment
circuit_name	varchar(10)	no	none
category	varchar(10)	no	none
no_persons	int(10)	no	none

Booking\_id, is the primary key in the booking table.

Table 4.6.1: Accommodation

Field	Type	Null	Attributes
accommodation_id	int(10)	no	Auto increment
cabin_type	varchar(10)	no	none
nights	int(3)	no	none
arrival_date	date	null	none

accommodation \_id, is the primary key in accommodation table.

Table 4.6.2: Tickets

Field	Type	Null	Attributes
ticket_id	int (10)	no	Auto increment
date_travelling	date	no	none

ticket\_id is the primary key in tickets table

Table 4.7: Receipt

Field	Type	Null	Attributes
receipt_id	int (10)	no	Auto increment
circuit_name	varchar(10)	no	none

Table 4.7.1: Receipt for tickets

Field	Type	Null	Attributes
tpid	int (10)	no	Auto increment
ticket_no	varchar(10)	no	none

Table 4.7.2: Receipt for accommodation

Field	Type	Null	Attributes
apid	int (10)	no	Auto increment
accommodation_no	varchar(10)	no	none

Table 4.8: Payments

Field	Type	Null	Attributes
pay_id	Int(10)	no	Auto increment
card_holder	varchar(10)	no	none
company	varchar(10)	no	none
country	varchar(10)	no	none
province	varchar(10)	no	none
postal_code	varchar(10)	no	none
card_veri_no	int(10)	no	none
Exp_date	Date	null	none
card_type	varchar(10)	no	none

Pay\_id is a primary key and card\_veri\_no (card verification number) is unique in the payments table.

#### **4.7 Summary**

This chapter discussed the approach to web technology with reference to the solution of the problem and the design of the proposed system. Next chapter will discuss the implementation for solving the problem.



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