



Sri Lanka Institute of Information Technology  
Information Technology Project (IT2080)

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Project Proposal

Boat Safari Management System

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## Problems

The main problems in a manual boat safari management system are as follows:

- Manual systems are hard to handle since there are lot of paperwork and more storage space is required.
- Manual systems are less reliable than a web-based application
- In a manual system, the chance of duplication of data is high and updating data is hectic.
- All calculations (e.g., calculating net salary) are handled by humans and there is high chance of errors.
- Lack of security is a huge concern as information be easily misplaced in a manual system.
- Backups cannot be easily maintained in a manual system.

## Motivations

Here are some benefits of having a web-based system over manual system in a boat safari management system:

- Customers can book and pay for tours directly through the system 24/7 and managing the booking can be done easily.
- Booking slots are determined based on the availability of resources and updated across the system, thus improving the capacity utilization.
- Management can easily offer discounts to incentive bookings for low season or tours with low attendance.
- Customer and booking information can be backed up and secured.
- Management and staff members can easily generate reports and that can be used to make informative business decisions.

## Aim and Objectives

### Aim

As software developers, we want to our client to gain more customers day by day and grow the business and become the most trusted name for boat tours in Sri Lanka and be profitable for customers, management, and the team.

### Objectives

#### *Maintain profitability*

We must make sure that the revenue is higher than the cost every year and use our software tools to achieve that goal.

#### *Certify the safety of the customers and the crew*

Safety is the main target in our boat management system if the vessels aren't repaired and maintained properly it's more likely to expose the crew and the customers to danger.

#### *Ensure customer satisfaction and service*

Since the system is based on a web application, we must draw our full attention to the customer needs and give them a priority every time.

#### *Improve the productivity of resources and the service crew*

To improve productivity, we must have good knowledge about the boat management system and maintain good communication with both customers and the employees. Offer exclusive personalized packages to the customers at the best rates from around the country.

#### *Provide excellent service*

Since we depend on our trusted clients, we must be gentle, trustworthy, responsible, and respectful to all our customers and the crew too. It doesn't matter how small or big the service the client needs we must respond immediately.

## System Overview

In this Boat Management system, we offer boat rides to customers under packages. So that they can choose the best boat package for their budget. Customers can select packages by occasion wise as well. The boats that supply for the packages differ from the number of members participating for the ride. The application server is used by the company to manage all the system's functions and features. The system consisting primary functions are as follows:

- Staff management
- Offers management
- Customer management
- Boat Management
- Payment management
- Driver Management
- Package Details Management
- Booking management

### **Staff management**

This function allows the user to manage staff information and generate reports relevant to the staff members. Adding new staff members, update, and delete staff members and their information, search staff members, allocate shifts to staff members and generate staff attendance reports are the key components of staff management.

### **Offers management**

The customers will be able to have various kind of seasonal offers, discounts or limited items tied to an event during the year. Insert the seasonal offers and discounts at the relevant time, Updating the offers. Selecting the best matching limited items tied to an event during the year, Deleting the offers and the discounts when the offering period is over are the key compo

### **Customer management**

Manage all customer registrations. Create a new record when a new user registered to the system. Get customer feedbacks. Update customer details and feedbacks. Delete an existing customer registration record and customer feedbacks as they wish. Generate a report using customer feedbacks to produce useful information for the system

### **Boat management**

Here are few features of boat management; All the registered boats to the system are managed, assigning boats to rides according to the number of passengers who join for the particular ride, categorizing boats for particular packages and occasions, prices for the boats to be booked are updated

here., creating new boat record when registering a new boat, deleting an existing boat when boat is removed from the system, displaying full details list of the boat when registration number is entered.

### **Payment management**

Key features of payment management are as follows; calculate total payment according to package and booking, include offers in the payment (deduct from total), record payment when made, delete payment if booking is cancelled, keep records of payments to be collect, generate monthly income report.

### **Driver management**

If there are new driver who want to join as a driver with the boat safari system, the manager can add that driver into the system through the driver management. If there are any existing driver who want to resign manager can remove that driver through the driver management. Manager can update driver details. If any user wants to see the full record of drivers, The system retrieves those details by using driver management functionality. Generates a report of drivers for local and foreign customers.

### **Package details management**

The function will be able to manage package types in the boat safari system, such as local, foreign, and seasonal, in this part It contains package rates, customer information as well as timescale. Generate report for most popular package type and engaged participants. Insert latest packages annually, sometimes depends on situations. Updating packages (prices, time). Select / read ongoing packages and registered customers details. Remove or delete relevant details.

### **Booking management**

A registrant will be able to choose the boat package he/she wants. Information about the date, time, number of people and the place of travel should be entered in relation to the selected package. Can see the details of the booked packages under My Bookings page. It is possible to update the selected package i.e., Change the date, time, number of people traveling or book a different package. Booking can be canceled if the selected package is not required.

### **Non - Functional Requirements**

- **Usability** - Customers should be able to view list of packages within 10 seconds after selecting the package section.
- **Reliability** - System must be able to send the successful message within few minutes to the customer after successful booking.
- **Security** - System should not spend more than 5 seconds to verify the user when username and password entered.

## Literature review

This is a company which provides boat ride packages to customers. The company has its own staff, drivers, and boats. Currently, the company follows a manual method to achieve their target, as most of the work is based on paperwork and the calculations are done manually. Then bookings are mostly done over the phone and customer details are also taken by handwritten method. Therefore, there can be duplication and details can be misplaced. The staff managing process is also done mostly by paperwork, so this may lead to more load work. Since a boat safari company each boat ride by the assigned drivers, therefore, assigning the available boat to available drivers is done over the phone, but overall, the company follows a traditional method. Therefore, we can implement some solutions to overcome these issues.

First, we can separate the company tasks into subs systems such as staff management, customer management, driver management, boat management, booking management, package details management, offers management, and payment management. Implementing a separate customer management system will be beneficial because it will make it easy to add customer details without any duplications and get a customer information report without any human effort. The customers can be categorized as local and foreign.

To manage the staff from the automated system it will be helpful to autogenerated the staff attendance list and the assign the task according to the shifts and allow to add new staff member and update his or her details. We can prepare a separate report for the drivers as local and foreign and make availability for customers to view their driver information as well.

To manage the boats the system will generate the availability of the boat and categorized the boats for packages and able to admin to view details of boats wen providing a valid number or code. For the booking purpose, it can be an easy method of booking a package without any interruption and should be able to get automated booking details and should have an option to cancel the booking as well. Package details should be categorized as local and foreign, but on some occasions, seasonal can also be added and it may consist of prices and time. Offers are managed by Seasonal Discounts. This will be able to add offers at any time. Payment can be done online to avoid time-consuming paperwork and to record payments after the transaction is confirmed.

## Methodology

### Design methods

As design methods our team has decided to use ER/EER diagrams to design the databases. Using ER or EER diagrams to design the databases the developers can get a clear idea on how the tables in the database interact with each other. Even though we are using MongoDB as our database management software which is a document-based database management tool it is crucial to prepare an ER diagram to get a clear idea about all the information needed to create the MongoDB database.

### Development tools and technologies [1]

For this project our team has decided to use the MERN framework. MERN framework is a full stack development framework for Dynamic web application development. MERN is a variation of the MEAN which replaces the Angular.js JavaScript file with React.js JavaScript file.

#### **What does MERN stand for**

- M - MongoDB
- E – Express.js
- R - React.js
- N – Node.js

#### **Advantages of using the MERN framework**

- MongoDB natively stores JSON making it easier to read and write data into MongoDB using JavaScript files.
- Further the use of Node.js JavaScript file also makes it easier to manipulate data in the MongoDB.

#### **MongoDB [1]**

MongoDB is a document base no-SQL database that stores and manipulates JSON data collected from the front-end (by React.js) and processed by Express.js server.

#### **Express.JS [2]**

Express.js server is a server that runs inside of Node.js server. Express.js server can be defines itself as “fast, unopinionated, minimalist web framework for Node.js”. Express.js server also has URL routing capabilities. URL routing means matching incoming URL with server function.

#### **React.js [3]**

React.js is a JavaScript file used to create Dynamic client-side applications using HTML. React.js lets the user create complex HTML files using simple coding.

#### **Node.js [4]**

Node.js is an asynchronous JavaScript file that can open, close and handle files on the server. Node.js can also collect data from web forms using GET and POST methods.



### Testing methods

Unit testing and integrated testing are the testing methods that are being used to test the developed software for this project.

#### **Unit testing**

Each individual subsystem will be tested individually by the person developing the subsystem. The developer may need to use temporary data to test out the functionality. When data from other subsystem is needed the developer will enter random values for the data needed to test the functionality of the sub system.

#### **Integrated Testing**

The system will be tested by adding all the sub systems together and testing the system integrated together.

Student Number	Student Name	WBS Number	Element name	Functions
IT21059636	Dematagoda H. A	1.0	Staff Management	
		1.1		Update leave request
		1.2		Generate attendance report
		1.3		Add new staff members
		1.4		Update staff members
		1.5		Delete staff members
		1.6		Maintain staff shift records
IT21072260	Dissanayake D.M.S.S	2.0	Offers Management	
		2.1		Update Seasonal offers
		2.2		Remove offers
IT21061448	Seneviratne H.M.T.V	3.0	Customer Management	
		3.1		Get customer feedback
		3.2		Customer registration
		3.3		Update and delete customer details
IT21102196	Sathushka B. A. G	4.0	Boat Management	
		4.1		Add new boats
		4.2		Remove boats from system
		4.3		Update boat details and condition
		4.4		Listing all available boats and their details
IT21080258	Gamage K. M	5.0	Payment Management	
		5.1		Update payment details
		5.2		Confirm payment
		5.3		Show monthly income
		5.4		Cancel and refund payment
IT21086984	Senadheera S.A.T.P	6.0	Driver Management	
		6.1		View drive profiles
		6.2		Manage drivers
IT21042256	Dewma L. D. B. L.B.	7.0	Package Detail Management	
		7.1		Add package details
		7.2		Update package details
		7.3		Delete package details
		7.4		Keep track of ongoing packages
IT21106156	Divyanjana U.D.P.S.	8.0	Booking Management	
		8.1		Book from available packages
		8.2		Show upcoming bookings

Table 1: Work Breakdown Chart

## Gantt Chart

		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
1	Find the client and plan the project												
2	Create and submit the charter document												
3	Agile and scrum												
4	Create the Project proposal and presentation												
5	Develop the functions												
6	Requirement Engineering												
7	System designing												
8	Informal Progress Evaluation												
9	Final report writing												
10	Progress Evaluation												
11	Integrating and testing												
12	Final Presentation												

## References

- [1] "MongoDB," [Online]. Available: <https://www.mongodb.com/mern-stack>.
- [2] "Express," The OpenJS Foundation, [Online]. Available: <https://expressjs.com/>.
- [3] "React," [Online]. Available: <https://reactjs.org/>.
- [4] "Node.js," The OpenJS Foundation, [Online]. Available: <https://nodejs.org/en/docs/>.