



# Online Travel Planning System

**Project Proposal**

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# **Background**

## **Introduction**

The Online Travel Planning System is a web-based application that provides a platform for both tourists and service providers in the tourism industry. The system allows tourists to plan and book their trips online, while service providers can use it to manage their business operations. The client plans to convert their existing manual system to an online system. Due to the economic crisis, countries that depend on tourism, like Sri Lanka, have been greatly affected. The main goal of the client's website is to attract foreign tourists and promote Sri Lanka as an ideal vacation destination. The website integrates various services such as tour guides, hotel reservation, destination management, insurance, advertising, outdoor and adventure activities and vehicle rentals to provide a one-stop-shop for tourists to plan their trip. The website offers a range of hotels and amenities for users to choose from, based on their budget. The website also aims to provide tourists with worry-free vacation options by avoiding overpriced services. The administrator can manage every aspect of the website, including adding or removing hotels, reviewing customer feedback, recruiting new tour guides, monitoring hotel, publishing advertisements, generate reports and vehicle booking status.

## **Client/Company Background**

Southern Lanka is a company that was established in 2018, and it has three partners who are actively involved in the business. The person who is responsible for overseeing the company's administrative activities is Hallaba Gamage Bhanu Bdrawansha, while the other two partners are Warahena Liyanage Prabath Chandima Kumarada De Alwis and Sahitha Weerasinghe. The company currently operates using a manual system, which makes it difficult to maintain a proper system when there is a need to insert data in a large quantity.

It is worth noting that the person who oversees the company's work is also engaged in the field of valuations with another company named Southern Associates Vehicle Valuation Service. This company has 32 branches across Sri Lanka and was established in 2014. In addition to the valuation company, he also owns various other establishments.

Despite the existence of the valuation company and other businesses owned by the person who oversees Southern Lanka's work, the current situation of the company is not practical. Bringing foreigners from abroad using a travel agency is quite difficult to manage manually, especially when dealing with a large quantity of data.

Therefore, Southern Lanka may need to consider adopting a digital system that can streamline its operations and make it easier to manage its business. With the advancement of technology, it is now possible to automate many of the processes that were once done manually. By doing so, Southern Lanka can improve its efficiency and effectiveness, leading to better business outcomes.

## Problem

- Client keeps the records manually

Manual record keeping involves recording data and information on papers or documents which have a greater chance to occur human errors such as misspelling, miscalculations or misplacement. Those errors have serious consequences; for example, errors in financial records result in incorrect billing or payment and financial losses.

- No proper payment system

Due to not having a proper payment system, both the customer and the client have to face many difficulties in processing payments, tracking payments received and accepting payments. And also, without a proper payment system security, risk can be resulted. This can result in financial losses, legal liabilities and damage to the business's reputation.

- Customers can't plan the trip from anywhere

Through an online website, customers can know information about destinations, accommodations, activities, and more from anywhere at any time through the internet. Without this, customers may be limited in terms of where and how they can plan their trip. And also, customers may miss out the opportunity to take advantage of special promotions or deals that are available for a limited time. This can result in higher costs or missed opportunities to experience new destinations or activities. And not having an online website to plan the trip from anywhere may lead to time consuming and inconvenient.

- Client needs to get income in dollars, cashless transactions

Without access to cashless payment methods, client has difficulty receiving payments in dollars. He/She have to rely on physical checks which can be slow. And also, without a website client encounters issues with exchange rates and fees when converting their earnings into his local currency. And also, it can be challenging for client to market his services and find customers who are willing to pay in dollars without an online presence.

- Client don't have any website to promote his business

A website can provide a platform for customers to engage with a business. Without a website, it can be difficult for customers to find information about the business online. Due to this, it is harder to attract new customers and to expand the business's customer base. Therefore, a

business may miss out on customer feedback. And also, not having a website lead to limits their reach and they may struggle to reach potential customers outside their local area.

- Customers facing difficulties when it comes to planning the trip (Determining a total budget around the world)

If customers not have resources that can help them to plan their trip and estimate their total budget, it can make difficult for them to get accurate and up-to-date information. Without an online website, customers don't have access to customer support who can help them to plan their trip and answer their questions. It can make it difficult for customers to get the information they need to determine the total budget according to their needs and preferences. And also, foreign customers need to convert their home currency during their trip and without an online website, it can be difficult for them to get the most up-to-date exchange rates, which can make it difficult to estimate a total budget.

## Motivation

- Improved efficiency

By designing a user-friendly interface that allows users to easily navigate the site and find the information they need; clients can increase their operational efficiency and process samples more rapidly. This translates to faster turnaround times for results, with fewer delays.

- Enhanced productivity

By integrating our travel planning system with other systems such as booking engines and payment gateways can make the process seamless and efficient. Users should be able to quickly find what they are looking for without having to click through too many pages. And provide excellent customer support through various channels such as chat, email, and phone to help users with their travel planning needs.

- Better data management

Better data management is essential for an online travel planning system to operate efficiently and provide a seamless user experience. We can ensure that data is accurate, up-to-date, and easily accessible. Overall, prioritizing data management in our online travel planning system can help client to optimize processes, improve user satisfaction, and stay ahead of the competition in a fast-paced industry.

- Compliance with regulations

By ensuring compliance with regulations, our system can maintain customer trust, avoid legal penalties, and operate in a responsible and ethical manner.

## **Aim**

With the implementation of our system, we aim to address virtually all the issues faced by users when interacting with a travel planning system. With the management of a database by our system the need to keep track of everything and maintain records manually won't be needed. Previously, the process of registering a new user involved manually asking them questions and recording their responses in a book, which was a time-consuming task for both the owner and the user. However, with our system, users can simply fill out a registration form and submit it which in turn saves time and reduces data redundancy and accuracy.

The major difficulty faced by the users of the previous system was the inability to plan their trips before coming to Sri Lanka which resulted in a significant loss of users. With the implementation of the new system, the users have the ability to plan their whole vacation from anywhere with 24/7 availability of the website with full flexibility when it comes to postponing or cancelling their vacation plans, making their payments from across the world which will give our client the competitive edge when compared with other similar Sri Lankan businesses.

In order to address the issue of not having a proper payment and payment management system of the previous system, we have taken steps in order to integrate the services of a secure payment gateway into our system. This not only ensures that all the financial transactions are conducted in a safe and efficient environment but also provides customer the freedom to choose from a wide range of payment options including traditional cash payments and modern debit and credit cards. While achieving the above we were also able to eliminate unnecessary risks that were associated with the previous system. With the new payment gateway, all the transactions are fully encrypted and secured, making it impossible for any sensitive information to be compromised. This gives our customers the peace of mind they need when making online payments, knowing that their personal and financial information are safe. This solution will not only be beneficial to the customer but also to our client who has the need to get their income in dollars.

By advertising a website, it is possible to create a passive influence on users to at least visit the relevant site. However, when comparing the previous system to the new system, it was evident that the former lacked effectiveness. With the recent implementation of the new system, our client now has the ability to self-promote their own website while simultaneously generating revenue by advertising other businesses. This approach not only provides our client with the opportunity to expand their reach but also allows them to create mutually beneficial partnerships with other businesses.

## Objectives

- Requirement gathering and analysis

Interview and discuss directly with the client to gather information to identify functional and non-functional requirements. This enables us to correctly identify the customer's needs. By analyzing use stories, we were able to gain a deeper understanding of user preferences, and identify the interaction between the user and the system. Used user scenario to understand how the customer interacted with the system to fulfill their needs.

- Design

The database schema provides a structure for storing and retrieving data, ensuring that it is well-organized. Wireframes are visual representations of web pages that focus on their layout and key elements, such as headers, footers, and forms. UI design involves the visual appearance and layout of the website. UX designed is concerned with designing the overall user experience.

- Implementation

The MERN stack which includes Mongo DB, Express.js, React, and Node.js is used to develop the system. Mongo DB is the database program that used to store data, Express is used as the backend web application framework to build web application, react is being used for building user interfaces and Node.js is being used as a cross platform technology and encode the backend. The implementation process includes unit testing to test functions individually, Integration testing to check how functions work together and system testing to check the entire system to ensure that t meets the client's requirements. The final result of all these tests are shown to the client to collect the reviews.

- Testing

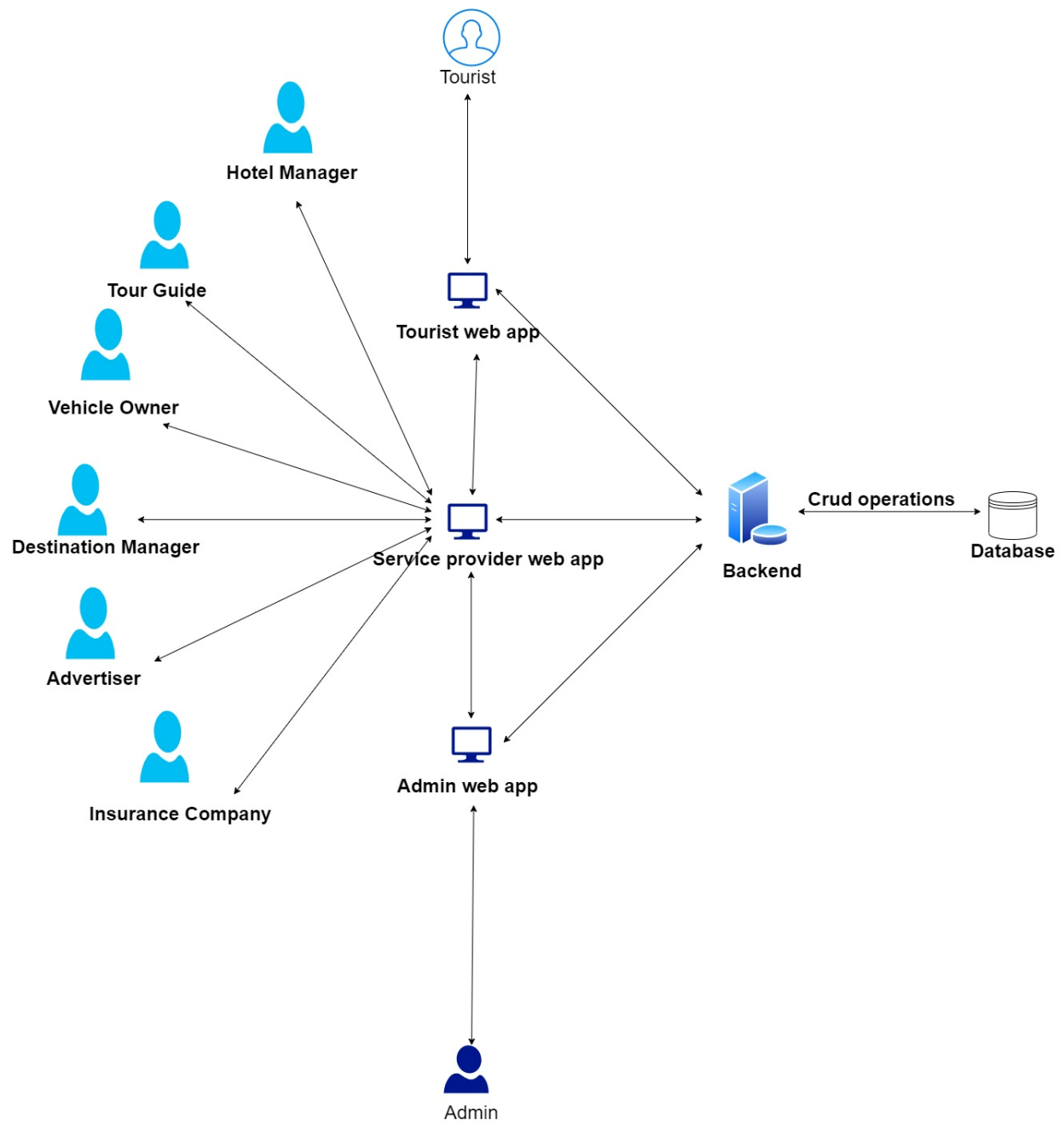
During the implementation process, we used three different types of testing to ensure that the system was functioning properly and meeting the requirements of the client or customers. Unit testing to test functions individually, Integration testing to check how functions work together and system testing to check the entire system to ensure that it meets the client's requirements. The final result of all these tests are shown to the client to collect the reviews.

- Deployment and maintenance

By making the system available for the client, the client can use the system to achieve their goals productively. It is important to ensure that the system is secure, reliable, and easy to use in order to ensure the client's satisfaction and success with the system.



## System overview



Our system has 8 main components. And 8 types of users that use it.

We have identified two types of users who primarily use the website as expert and amateur travelers. New users can't plan a trip properly. They usually miss important locations or book hotels in an area not near to the locations that they are planned to visit. We have identified that new travelers are often scammed when they using three wheelers in Sri Lanka.

On the other hand expert travelers knows how to find hidden, important locations and knows how to deal with the issues a traveler would experience.

When we are developing the system we consider both of the users. Amateur users can book a whole holiday plan according to budget they can customize some of the recommended hotels, vehicles, event and outdoor activities. While expert travelers can fully customize the holiday with the website.

## **Outdoor & Adventure Experience**

Imbued with the essence of natural beauty, Sri Lanka offers a plethora of exhilarating outdoor activities that are sure to satiate your thirst for adventure, and we have meticulously handpicked our favorite tours, trips, and events to make your holiday a truly unforgettable experience.

In the admin side we are getting outdoor and adventure activity details and images or videos on web page.

At our website, we provide a wide range of options for outdoor activities and events that customers can choose from and book according to their preferences. With our user-friendly platform, customers can easily plan and schedule suitable locations to carry out their desired activities within their tour itinerary. Additionally, our team is dedicated to providing personalized recommendations and suggestions to tourists that align with their primary tour plans, ensuring that they have a fulfilling and enjoyable travel experience. For example, Assume that someone wants to participate in adventure activities during their trip to Galle. Considering that on the outdoor and adventure web page, we will push activities near to the destination such as Hikkaduwa for coral watching, surfing, and outdoor events.

Travelers can book one or more activities on suggested list buy searching for them. After getting the service, customers can give feedback through the system as well and then the admin can manage the booking as well. If a traveler needs to cancel or update their booking, it can also be done by themselves.

Aside from that, we are also suggesting some exciting food options, such as street foods and food zones.

Event planners can add or delete events in the system. When payments and all are clear we will send confirmation email to the service provider and post the relevant event details on our web

page. Visitors can search for island-wide events, purchase tickets and ask event organizers questions. If visitors need to cancel or update their tickets, it can also be done by themselves.

## Functional requirements

- Event planner registration and login to the System.
- Add Outdoor and adventure Activities.
- Add Events.
- Event tickets and outdoor activity payment.
- Email generation
- Customer feedback

## Non-Functional requirements

- **Performance:** The system should be able to handle a large number of users without slowing down. Response times for user requests should be quick and reliable.
- **Scalability:** The system should be able to scale without significant changes to the underlying architecture.
- **Security:** The system should be designed with security in mind in order to protect user data and prevent unauthorized access.
- **Availability:** The system should be available 24/7, with minimal downtime for maintenance or upgrades.
- **Usability:** The system should be easy to use and navigate, with user-friendly interfaces.
- **Reliability:** The system should be reliable, with a low error rate and a mechanism for recovering from failures.
- **Maintainability:** The system should be easy to maintain, with clear documentation and a modular design that allows for easy updates and bug fixes.
- **Integration:** The system should be able to integrate with other systems or services, such as payment gateways or social media platforms.

## Technical requirements

- Web hosting
- Database management
- User management
- Content management

## **Hotel Reservation System**

With the development of technology people tend to use online hotel reservations. There are many reasons to why online reservation is more favorable. Main reasons are convenience and easily modifiable. Also, the current economic crisis in Sri Lanka, made foreigners to hesitate bring cash with them. That brings a need of an online hotel reservation system in Sri Lanka a must need. Our hotel reservation system will be a good solution for these problems.

We have Identified two types of users as new users and expert users. New users can select a room from a pre build package while expert users can reserve hotel with full customization. Admin can add packages that suits travers. The user must login to the system first then user can view a list of hotels when he enters the location and days that there are staying in. A list hotel will load up and customer can choose a hotel room based on his budget. The user can get a transparent prospective about the hotels by looking at other user's reviews. Then the user can choose a room based on the facilities and the availability. Once the user selects a room, system will display a page containing a description about the room and images. For example, size of the bed, the room view of the room and etc. When a user selects a room, the user must fill the form about the information of the person/s staying in the room. System will calculate the bill and display it to the customer. Then the customer has to pay for the hotel in order to continue. The system will display a confirm message if the payment was a success. Otherwise, the booking will be cancelled. Once the user stayed in that room the, can give a review about the experience.

Once the payment is done user can see the details of the booking in their profile. If they need to update the room or cancel the room user can change it from the profile. Once the user edits the changes system will again redirect the user to the payment page to display the updated bill. If the user chooses to cancel he could be given a refund.

Hotel owners must register to the web site and register their hotel to the system. Owner has to fill a form to show the hotel room in the hotel list when the customer search for a hotel. Admin must to approve the hotel room to register in to the web site. Once it's done a notification will send to the owner. The owner can see the customers who booked the rooms of their hotels. Hotel owners can generate a profit report. Also, hotel owners can edit their information about the rooms.

### **Functional requirements**

- Hotel owner registrations and logins
- Buy pre build packages
- Room availability and booking
- User Reviews
- Room descriptions and types
- Online payment

- Room cancelation and editing
- Report and analytics

## Non-Functional requirements

- The system should be perform **responsively**, fast and handle high traffic volumes.
- The interfaces should be **user-friendly**, easy to navigate and simply designed.
- The system should be highly **reliable** with less down times and quickly recover from errors.
- This system should be **scalable** to add more features
- This web site will be access many users from different ,it **compatible** for everyone
- The system should **available** 24/7 for the users to reserve rooms

## Technical requirements

- Web hosting
- Database management
- Payment Processing
- User management
- Content management

## Vehicle Renting System.

Sri Lanka, with its stunning landscape, rich cultural heritage, and warm hospitality is a popular destination for tourists from all over the world. However, for those looking to explore the country on their own terms, renting a vehicle can be a daunting task. From hidden fees, security risks, availability of vehicles during peak travel seasons to maintenance and breakdowns could make a peaceful vacation into a nightmare. In order to make renting a vehicle simple, the vehicle renting system has been introduced. The system has been portioned into two significant components which includes vehicle renting and vehicle registering. In addition, the system will be comprised of two supplementary components namely maintenance, driver registration and customer feedback.

The vehicle renting component will be mainly divided into two major components which separates tourists with an international driving license and those who do not have international driving license. The tourists that do not have an international driving license will be given the option to choose a vehicle that accompanies a local driver. User are provided with a variety of vehicles varying from five-seater sedans to seven-seater SUVs and price varying from economical to deluxe packages. The customer has the ability to update or cancel any bookings. With the inclusion of vehicle service maintenance component, the customer and the vehicle owner have no cause for concern. The vehicle service maintenance will automatically remove vehicles that are nearing their service date and add those vehicles to separate web page and inform the admin along with the

details of the vehicle owner and a SMS will be sent to the vehicle owner mentioning about the upcoming vehicle service date.

Vehicle owners who are interested in using their vehicles for renting purposes has the ability to register their vehicle in the system. After registering the vehicle, a full inspection would be carried out and all the details including milage, damages and etc. would be saved. The milage of a particular vehicle will be saved before and after tour in order to maintain full transparency between the vehicle owner and company. The system is designed in such a way that both the administrator and the vehicle owner are given the capability to generate comprehensive reports, thereby enabling them to extract crucial information critical to their decision making. The owners of their respective vehicles also have the ability to assign a driver while the system will assign drivers for driverless vehicles.

The driver registration component represents the conclusive component of the system which allows individuals with a valid driving license to register to the system and become a verified driver of the company. Only after a thorough inspection process, the drivers will be eligible to be added to driverless vehicles according to the ascending order of their registration.

The customer feedback component will enable users to submit a rating of the service provided by the driver and submit a rating of the vehicle's overall quality which will be stored and displayed on the website to improve customer experience.

## Functional requirements

- Vehicle registration
- Driver and vehicle owner registration and login
- Report generation
- SMS generation
- Vehicle maintenance management
- Online payment
- Customer feedback

## Non-functional requirements

- The system should be **user-friendly** by having an attractive and simple design to provide the client with a competitive edge.
- The system should be **secure** in order to protect the privacy and sensitive details of the customers, drivers and vehicle owners who has registered with the system.
- The system should have a good **responsive** time to load the webpages without any delays.
- The system should be **reliable** with minimum down times and zero data loss.

- The system should be **compatible** with any device which includes but not limited to PC to ensure proper functionality.

## Technical requirements

- Web hosting.
- User management.
- Content management
- Database management.
- SMS Api.

## **Insurance Management System**

Due to Sri Lanka's critical crisis, customers cannot find a reliable insurance but by using our system this problem can be solved. Insurances are varied from customers satisfaction. Customers can book their vacation and make them more comfortable by providing an efficient insurance policy. Our system will provide users with a wide range of insurance packages selected from several insurance companies. The main functions of an insurance company are to provide information about the insurance policies and the service they offer to the worldwide users. To get an insurance policy, the unregistered user must register to the system and login to the website. Then after registered customers can view the details and sections of the insurance page. A list of insurances is listed on the website.

The website displays the detailed information about the types of insurance available, coverage plans and their prices. Insurances are divided into different categories such as health insurance, life insurance and property insurance. Customer can choose any insurance plan for their requirement and later if they don't want any service from insurance company, they can remove the insurance company from their user profile. As the insurance admin, he/she can accept or decline the customer's request. And admin can manage every customer and their details from the system. If the customers are no longer available, system admin can remove or send warning messages to the customers.

Insurance company website has a policy administration feature that allows the customer to manage their policies online and customers can update their profile, making coverages and filling claims and allows the customers to file a claim online. This can help the efficiency of the claims process and make it more convenient for the customers.

This website allows the users to purchase any insurance policies online and they can proceed with a secured payment portal that allows the customers to pay their insurances safely. As a system admin he/she can generate the reports of the customers and update the customer's list daily.

The website offers a service feature that allows the customers to contact the customer representative with questions or concerns and request any help for the customers. This will include

an email support or phone support. Customers can rate and give feedback about their user experience in this website.

### Functional requirement

- Insurance company registration and logins
- Policy management
- Claim management.
- Customer management.
- Reporting

### Non-Functional requirements

- Security - The system must protect the customer's important data and prevent unauthorized access.
- Reliability - The system is available in 24/7 and minimal of system maintenance.
- Performance – The system is designed to provide fast response to the customers.
- Maintainability – Ease of modifying and updating software without introducing new errors or unexpected behavior over time.
- Availability - Accessible and ready for use or implementation, typically characterized by the absence of obstacles or constraints.
- Availability – The system must be accessible for the registered or authorized user in any location.

### Technical requirements

- Database management
- Security
- User interface
- Maintenance and support
- Insurance management

### **Payment management system**

The travel industry has undergone a massive transformation over the years, thanks to technological advancements. One such transformation is the introduction of an all-in-one travel management system that manages travelers' travel planning, booking, payments, service provider's charges, and advertising charges. The system's primary function is to provide travelers with an easy and convenient way to plan and book their travel needs. The process starts with the traveler visiting the site and searching for what they want. They can



add or remove their needs from the cart, and a quotation with service charges is generated on the cart page.

If the traveler wants to book any service, they can do so by adding valid payment and booking details. The system then passes the booking and payment details to the relevant service provider and the traveler via notifications. Once the payment process is completed, the tourist can view their payment reports.

As the payment admin their can search, update, or delete all payment and booking details. The admin can also view the monthly payment report. The system charges a service charge for the advertisements published by hotels, vehicle renting, guest booking, outdoor and adventure activities. When the customer books through the site, the relevant payment is transferred to the service providers. The full payment collected from the advertising function is charged as the service charge.

The system's benefits are numerous, from streamlining the travel booking process, ensuring secure payment transactions, to providing travelers with an all-in-one platform to plan and book their travel needs. With this all-in-one travel management system, the travel industry is set to experience a new level of convenience and efficiency.

## Functional requirements

- User registration and login
- Add payment details and update payment
- Users can update, create, delete, and print invoices.
- View transaction history and bills.
- Email generation.
- Generate payment report.
- Admin can manage all the payments.

## Non-Functional requirements

- **Security:** The payment system must have strong security measures to protect customer information, prevent unauthorized access, fraud, and cyberattacks.
- **Scalability:** The payment system must be able to handle a large volume of transactions and support growth in the number of users and customers.
- **Availability:** The payment system must be available at all times with minimal downtime or disruption to service.
- **Performance:** The payment system must process transactions quickly and efficiently with low latency and high throughput.

- **Reliability:** The payment system must be reliable, with minimal errors or failures in processing payments.
- **Usability:** The payment system must be user-friendly and easy to navigate for both customers and administrators.

## Technical requirements

- Database Management
- Security
- Hosting
- Version Control

## Destination Management System

This is the management function for destinations. This function is responsible for all clients, travelers, destination managers and the system administrator. This will provide all the accurate details about the locations. This can unlock many benefits, such as delighting tourists, providing tourists with a good understanding of the relevant locations, planning the trip effectively which will ultimately increase the revenue etc. At a time when the whole world is facing a big economic crisis, we have had to attract a large number of locals and foreign tourists to develop the tourism industry in our country. The main purpose of this function is to draw the attention of local and foreign travelers to the beautiful and historically valuable locations in our country. It is possible to link the destinations with outdoor and adventure activities.

Before choosing a destination, the user must first log in to the system. The customer has the ability to search destinations according to his/her choice by looking at the reviews and ratings beforehand. When a tourist wishes to get to his destination, he uses our system to choose a package that suits his/her needs. This allows a tourist to reserve one or more places to visit as they wish. The tourist can select places that are connected to the location-filtered category. The customer can use the package or reserve a place under the appropriate locations. Then the map provides the direction and position data from the customer's location to selected destinations. For example, if the desired location is filtered without the outdoor and adventure activities event category, all of the locations are presented, and the traveler may choose the one they want. The map depicts the selected sites' information and directions. Once the customer has selected a relevant destination, the customer must fill out the form with the necessary information.

Then the customer needs to submit the form and the system will calculate and display the relevant bill. After making the relevant payment, the system displays a message to let the customer know that the payment has been successful. Otherwise, the booking will be canceled. Then all details about the selected and booked destinations will be displayed on the customer's profile. If the customer wants, they can update or delete the selected destination details from their profile. After doing that, the customer will be redirected to make the payment again.

To add new destinations and destination packages to the system, the destination manager must first register and log in to the system. The destination manager has the ability to view, update and delete details of destinations as well as customer details and generate reports. When a customer wishes to add a location, the transaction is handled by the administrator. The administrator oversees inserted, updated, and deleted categories, locations, and data from the system. For example, if a customer wants to add a venue and information to an outdoor event category, they should contact the administrator.

## Functional Requirements

- Destination manager registration and login
- Registered customer chooses a destination
- Registered customer update and delete the selected destinations
- Destination manager adds new destination packages
- Destinations updating and deleting
- Online payments
- Generate destination reports

## Nonfunctional Requirements

- Availability – The system should be available 24/7 and the maintenance or upgrades should be kept to a minimal time.
- Performance – System should have quick response time so user can login to the system without any delay.
- User-friendly - The system should be user-friendly by having simple designs and an interactive interface.
- Reliability - This ensures that the system and its data are always available when needed without any data loss.
- Efficiently – The system should have the ability to complete tasks quickly and effectively to fulfill customers' needs.
- Security – The system should be secure since it contains sensitive data, personal information and transaction details
- Maintainability – The system should be easy to maintain and comes with clear documentation and reports

## Technical Requirements

- Payment Processing
- User management
- Database management
- Content management

## **Tour Guide Management**

This is a management function for the guides. A guide is a person who leads tourists through unknown or unfamiliar locations. Here, a guide can register as a tour guide through the system. In that case, the guide must provide their personal information and other relevant details. Once registered and verified, the system admin will provide the guide with access to the system where they can create their profile, upload their tour schedules, and manage their bookings.

In our system, tourists can search for a tour guide based on their interests and needs. Once a tourist has selected a guide, they can send a booking reservation, specifying the number of days they would like to book. To ensure that the guide is available for the requested dates, each guide has an availability calendar that shows which days they are available for bookings. When the tourist sends a booking request, the guide receives a notification and can either confirm or deny the reservation. If the guide approves the request, their availability calendar is updated to show that they are no longer available for the booked period.

Once a booking is confirmed, tourists should be able to pay securely through the system. This will help prevent fraud and ensure that the guides are paid promptly for their services. And once the payment is made, the system notifies the tour guide about the booking details. The notification should include the tour date, time, location, and any special requests or requirements from the customer.

Further, tourists should be able to leave ratings and reviews for tour guides they have booked in the past. This will help future tourists choose the best guide for their needs and will also incentivize guides to provide an excellent service.

## **Functional requirements**

- Tour Guide Registration and login
- Tour Booking
- Tour Management
- Tour Guide Assignment
- Tour Guide Availability Management
- Tour Guide Communication
- Reporting
- Feedback and Review Management

## Non-functional requirements

- Performance
- Scalability
- Security
- Reliability
- Maintainability

## Technical Requirements

- Platform
- Database
- Security
- Integration
- Maintenance and Support

## **Advertising management system**

Advertising management function is a complex process which mainly manages all the advertising services. This is an important tool of promotion to all the companies or individuals who are engaging in selling goods and services. To promote the client's business, admin can publish advertisements related to his business. Not only the ads related to online travel planning services but also the ads related to other businesses, including those that are not directly related to client's own services can be published in the system. From that, the system can generate revenue through advertising fees and provide additional value to the users by presenting them with a wider range of products and services.

To publish an advertisement, firstly the person or the company must register on the system. After registering, the advertiser would be able to log into the system. There are five packages categorized based on the place where the ad has to be posted and their prices differ from each other. Then they can choose a package which suits their needs and preferences from the set of advertising packages we have provided. According to the package they have selected, they have to fill a form to publish the advertisement and then, they can upload their advertisement in the space provided. If the advertiser wants to extend the time duration of the advertisement than the default time period we have provided, or to add another additional service, they have to make a payment in addition to the price of the package they have selected. Then the advertiser should make the relevant total payment by using the payment management procedure. After that, the system administrator will check the details and the payment and let the advertiser know whether their advertisement is confirmed or rejected in their user profile. If the ad is accepted, the administrator will publish the advertisement. If it is rejected, the administrator will return the payment to the advertiser.

If the advertiser wants to make any changes to their advertisement or to extend the time it should be posted, they can request the admin through a form to update the advertisement. According to

the advertiser's needs the admin will update and add the required additional services to the advertisement.

The advertisers can inform admin to delete their advertisement or else they have the access to delete their advertisement by themselves if they want to.

The system administrator controls all the information about the advertisers. The administrator has the ability to update, edit or delete advertiser profile as needed. And the admin can generate the profit reports to ensure its continued profitability.

## Functional Requirements

- Advertiser registration and login
- Choose an advertising package (Ad placement)
- Add advertisement and ad details
- Online payment
- Advertisements removing and updating
- Advertiser management
- Generate profit reports

## Non-functional Requirements

- Performance – The system should be able to deliver ads in real-time to ensure maximum visibility. Response times for advertiser requests should be quick and reliable.
- Security – The system should have strong security measures in place to protect advertiser data and prevent unauthorized access.
- Usability – The system should be user-friendly and easy to use and navigate.
- Scalability – The system should be able to scale up or down depending on the needs of the business or advertisers.
- Reliability - The system should be reliable, with a low error rate and a mechanism for recovering from failures.
- Compatibility – The system should be compatible with various web browsers and support any device.
- Availability – The system should be available 24/7 for both advertisers and users.

## Technical Requirements

- Web hosting
- Payment processing
- Database management
- Security
- Reports and analytics

## Literature review

There are many online travel planning web sites are in the internet. Any of them full fill our vision and the client requirements.

Web site name	Advantages	Disadvantages
Expedia [1]	<ul style="list-style-type: none"><li>• Have many filters to choose hotels and vehicles</li><li>• Have a virtual agent which powered by AI</li><li>• A good amount of reviews given to the places and vehicles</li></ul>	<ul style="list-style-type: none"><li>• The web site is not optimized for Sri Lanka.</li><li>• User may choose random hotels without a plan.</li><li>• Prices are higher than other web sites</li></ul>
Klarna. Trip [2]	<ul style="list-style-type: none"><li>• User friendly interface</li><li>• User can get a proper travel plan the web site</li><li>• Web site is optimized for Sri Lanka</li></ul>	<ul style="list-style-type: none"><li>• No options to book hotels from the web site it will redirect to another web site</li><li>• No other options like rent a vehicle or find a tour guide</li></ul>
SriLanka.Travel [3]	<ul style="list-style-type: none"><li>• The hotels are validated by Sri Lankan tourism</li></ul>	<ul style="list-style-type: none"><li>• Limited rooms are available in the website</li><li>• Only the home page is user-friendly</li><li>• No user reviews to places and rooms</li><li>• There no wide range of events</li></ul>
wander log [4]	<ul style="list-style-type: none"><li>• Calculate the budget for the trip</li><li>• Web site recommend places to visit</li><li>• Recommend hotels to stay in the area which the user add the places to the timeline</li></ul>	<ul style="list-style-type: none"><li>• All the good options unlock when the user upgrade his package to pro</li><li>• Some functions unlock after write an email to the web site</li></ul>
Trip Adviser [5]	<ul style="list-style-type: none"><li>• Have a huge user base so the reviews are better</li><li>• User-Friendly interface</li><li>• Competitive pricing</li><li>• Many options to choose from</li></ul>	<ul style="list-style-type: none"><li>• Tour guides cannot be book from the web</li><li>• Some features for Sri Lanka appear to be available but not when selecting the requirements</li></ul>

Above mention web site are provide many useful functionalities but our aim is not full filled by those.

1. The client requested to make a web site under his business name so putting his properties to those web sites are not an option
2. Our group have a suggestion to add insurance for user's safety based on the current situation in country. There are no any web site capable of doing that.
3. These web sites have loyalty programs but according to the owners it just adding a complexity to the user. Most of the people will not use loyalty programs it just waste of resources. [6], the president of Expedia Brands
4. Expedia - This web site does not have any option to add tour guides to the system. Also, there are no options to add vehicles to rent in Sri Lanka
5. Klarna. Trip – The client requested to book hotel from the web site, but this web site can't full fill the client requirement.
6. SriLanka.Travel – The client has some hotels owned. The Sri Lankan tourism has to validate the clients' properties in order to post the hotels in the web site. The client requests a user-friendly interface to the web site.
7. Wander log – This web site is not free for all users, so the limited amount users can access the full futures. Now the client is facing a problem with low guests in hotels so this is not a great way to gather many of the uses as possible.

## Methodology

- **Requirements engineering methods:** In order to obtain and comprehensively document the requirements of the stakeholders, we had to use requirement gathering techniques such as conducting interviews, conducting questionnaires with the pertinent stakeholders. In order to make the new system function like the previous system while being more accurate and efficient, we had to get a proper idea of how the previous manual system of our client worked. This was achieved by using techniques such as document analysis and observation which played a significant role in gathering the requirements. To document the identified requirements, use-case diagrams and use-case scenarios were made using draw.io and MS word respectively. The reason for selecting draw.io out of alternatives such as lucidchart was the limitation of 60 shapes per lucidchart document and MS word was selected due to all the members of the group being familiar with the software. The



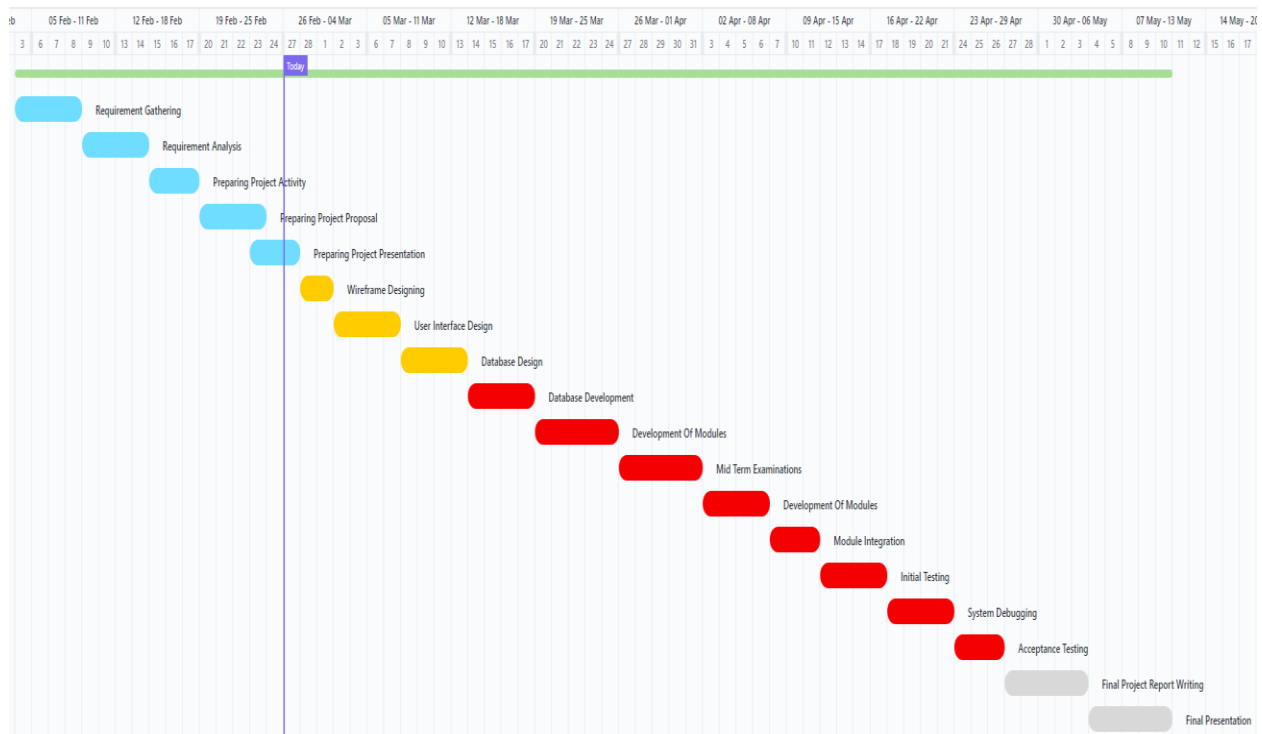
above-mentioned use-case diagram and use-case scenarios will be updated accordingly depending on the requirements of the stakeholders.

- **Design methods:** To design the system to include interactive interfaces we have decided to use figma as the collaborative interface design tool. When considering which design tool was to be used for our project, we examined and evaluated a range of options out of which figma, adobe XD and sketch were selected. While adobe XD is a popular and widely used design tool, we ultimately decided not to consider it due to a lack of a specific limitation which was the unavailability of importing images in .SVG format. Lastly, we decided to omit the usage of sketch due to its availability only on apple devices.
- **Development tools and technologies:** When it comes to the development of the system, we decided to use MERN as the technology to be used. MERN is a software stack composed of Mongo DB, Express.js, React.js, Node.js. Out of which Mongo DB will be used for all the database management purposes while react.js will be used for development of the frontend of the website and the backend will be developed using express and node.js. Alternative options for MERN consisted of MEAN and MEVN. Out of which MEAN was suitable for enterprise projects while MERN was suitable for small projects. Due to MEVN being considerably new when compared to MERN, our team decided not to use it. When considering the version control aspect of our project, GitHub was selected due to its familiarity by our group members when compared to other version control systems such as AWS CodeCommit and plastic SCM.
- **Testing methods:** In order to test the final product, we have decided to use both automated and manual testing methods where the automated testing will be carried out by using postman. The types of tests that are going to be carried out include unit testing, integration testing, system testing and acceptance testing.
- **Integration methods:** In order to seamlessly integrate the different components of the system, we will be using the incremental integration method which will allow the members to detect errors early and reduce the risk when compared with the other integration methods.

## Project Plan

We have decided to finish the development of the system by the end of the march and afterwards the remaining time will be used to implement the system and to do the necessary the testing and debugging in order to make the client satisfied with the provided system. The group members will implement their corresponding component and general components such as the navigation panel, footer of the website, logo, the homepage and etc will be divided among the members equally. To make it better to understand we have decided to have a weekly meeting with the necessary stakeholders and inform them about the current progress of the website to maintain a totally transparent relationship which would make it easier to get their feedback and do the necessary changes to the website without waiting till the whole system is completed and then changing the necessary components. To meet the set goals and requirements, Trello, which is a project management system, will be used to ensure that the members continue their respective work seamlessly. Trello was chosen out of other alternatives such as Hive, ClickUp, Airtable and ect. Was the presence of a user-friendly interface along with the availability of a mobile version which makes it possible for every member to track their work from anywhere.

## Gantt chart



## Work breakdown structure

Name	Function	Description
Heras U.A.A.S	Outdoor and Adventure Experiences Management	<ul style="list-style-type: none"> <li>• UI designing</li> <li>• Create profile/Register Event planner</li> <li>• Add Events</li> <li>• Edit Events</li> <li>• Delete Events</li> <li>• Add Event tickets</li> <li>• Delete Event tickets</li> <li>• Event planner and Customer Q&amp;A</li> <li>• Buy tickets</li> <li>• Send Email</li> <li>• Add Outdoor Activities</li> <li>• Edit Outdoor Activities</li> <li>• Delete Outdoor Activities</li> <li>• Admin Manage all Outdoor and Adventure activities</li> <li>• Calculate bill</li> <li>• Customer Feedback and Rating</li> <li>• Generate Report</li> </ul>
Sapukotana K.R	Hotel Reservation System	<ul style="list-style-type: none"> <li>• UI designing</li> <li>• Create profile/Register Hotel owner</li> <li>• Add Hotel</li> <li>• Edit Hotel</li> <li>• Delete Hotel</li> <li>• Search Hotel</li> <li>• Reserve Room</li> <li>• Update reservation</li> <li>• Cancel reservation</li> <li>• Generate Report</li> <li>• Insert Details</li> <li>• Admin Manage all Hotel details</li> <li>• Calculate bill</li> <li>• Customer Feedback and Rating</li> </ul>
S.A.P. Kumarasiri	Vehicle Renting Management	<ul style="list-style-type: none"> <li>• UI designing</li> </ul>

		<ul style="list-style-type: none"> <li>• Create profile/Register Vehicle owner and Driver</li> <li>• Send SMS</li> <li>• Generate the reports</li> <li>• Add Vehicle</li> <li>• Update Vehicle</li> <li>• Remove vehicle</li> <li>• Customer Feedback and Rating about driver and vehicle</li> <li>• Calculate bill</li> <li>• Update Driver</li> <li>• Remove Driver</li> <li>• Vehicle Maintenance</li> </ul>
Silva W.I.S	Insurance Management System	<ul style="list-style-type: none"> <li>• UI designing</li> <li>• Admin remove or send warning messages</li> <li>• Generate the reports</li> <li>• Customer Feedback and Rating</li> <li>• Policy management</li> <li>• Claim management.</li> <li>• Online payments</li> </ul>
Perera L.S	Payment Management System	<ul style="list-style-type: none"> <li>• UI designing</li> <li>• Create profile/Register Customer</li> <li>• Add payment Details</li> <li>• Edit bills</li> <li>• Create bills</li> <li>• Delete bills</li> <li>• Search bills</li> <li>• Print bills</li> <li>• Send Email</li> <li>• Generate the reports</li> <li>• View transaction history and bills</li> <li>• Add requested services to relevant queues</li> <li>• Admin Manage all Payment Details</li> </ul>
Hewage H.N	Destination Management System	<ul style="list-style-type: none"> <li>• UI designing</li> <li>• Create profile/Register Destination Manager</li> <li>• Search Destination</li> <li>• Add Destination</li> <li>• Update selected Destination</li> </ul>

		<ul style="list-style-type: none"> <li>• Delete selected Destination</li> <li>• Add new Destination package</li> <li>• Update and remove destination packages</li> <li>• Calculate bill</li> <li>• Generate Destination Report</li> <li>• Admin Manage all Destination details</li> <li>• Create profile/Register Advertiser</li> </ul>
Madarasinghe S. U	Tour guide management system	<ul style="list-style-type: none"> <li>• UI designing</li> <li>• Create profile/Register Tour guide</li> <li>• Tour guide Availability</li> <li>• Add packages</li> <li>• Update packages</li> <li>• Delete packages</li> <li>• Search Tour guide</li> <li>• Update Tour guide</li> <li>• Delete Tour guide</li> <li>• Admin Manage all Tour guide details</li> <li>• Customer Feedback and Rating</li> <li>• Generate Report</li> <li>• Chat service</li> <li>• Calculate bill</li> </ul>
Jayaweera J.A S.M	Advertising Management	<ul style="list-style-type: none"> <li>• UI designing</li> <li>• Create profile/Register Advertiser</li> <li>• Add Advertisement</li> <li>• Add Advertisement packages</li> <li>• Update Advertisement</li> <li>• Delete Advertisement</li> <li>• Admin Manage all Advertisement details</li> <li>• Admin Manage all Advertisers details</li> <li>• Generate profit reports</li> <li>• Calculate bill</li> <li>• Check Status</li> </ul>

## Evaluation Method

1. **User testing:** This technique involves observing users as they interact with the system and identifying any usability issues they find. This can be done through user testing sessions in which users are assigned tasks to perform on the system and their actions and comments.
2. **A/B testing:** A/B testing involves presenting different versions of a system to users and determining which version performs best in terms of user engagement or conversion rates.
3. **Surveys:** Surveys can be used to collect user feedback on their overall satisfaction with the system, as well as specific aspects such as ease of use, usefulness, and reliability.
4. **Analytics:** Analytics can be used to track users' behavior on the system, such as the pages they visit, the time they spend on each page, and the actions they take. This data can be used to identify areas of the system that are working well and areas that need improvement.
5. **Expert Evaluation:** This method involves using usability or travel experts to evaluate the system and provide feedback on its performance.

## References

- [1] Expedia. [Online]. Available: <https://www.expedia.com/>.
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