Sri Lanka Institute of Information Technology

TOUR MANAGEMENT SYSTEM

PROJECT PROPOSAL

Information Technology Project (IT2080) 2023

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01. Introduction

1.1. Company background

The client brings foreigners to Sri Lanka through foreign agencies that provide grants to the busy tourism industry in Sri Lanka and provide them with the services they need. His main responsibility is to provide an exceptional service and experience to tourists and domestic tourists visiting Sri Lanka. The client's hotel caters to tourists visiting the country for a variety of reasons, including sightseeing, cultural experiences, and business trips. He also owns tourist hotels under which only 30 employees work and has luxury bogie vehicles that transport tourists.

Considering the importance of managing travel activities and accommodation in the tourism industry, the client identified the need for a web application that would help manage these aspects more efficiently. The web application under development is intended to streamline the management of tourism activities including accommodation, transport and tour guides. The app will provide real-time updates on availability and reservations, allowing the hotel manager to make informed decisions and respond quickly to changing conditions.

The client understands that to remain competitive in the travel industry, providing excellent service and experience is critical. The web application will help the client achieve this by ensuring seamless and efficient service to travelers, resulting in a memorable experience that they are likely to share with others.

Overall, the client focuses on an exceptional service and experience for tourists visiting Sri Lanka and Sri Lankan tourists. The web application being developed is an important tool to achieve this goal, enabling the client to manage various aspects of travel activities and accommodation easily and efficiently.

1.2. Problems

The successful day to day operation of a travel agency is dependent on the complex interaction of many parts and efficient handling of multiple records. service System uses a traditional book-based system. That is the main problem of that existing system. It was a tedious task.

- Book-based system

It is very difficult to maintain all the details of system. Customer details, transportation details, financial reports, accommodation details, reservation records are done written manually. So, he needs id-based system to manage those details of the system.

- Difficulty with booking

There is no good booking process. Potential clients may be discouraged from booking tours if the process is challenging or unclear. This could result in missed sales and lower client satisfaction.

- No payment options.

Customers may be unable to complete bookings, if the tour manage does not allow any payment options. It could result in lost revenue.

- Limited availability

The management system does not accurately display tours or activities. Customer may disappoint or frustrated when they are unable to book their preferred tour or time slot.

- Transport issues

Only mobile numbers appear in this existing system. When customer needs to track the driver customer may could not do this. Customer needs to ensure that the vehicle he booked is. That system could not do it. It can lead to decrease customer satisfaction.

The client mention that problems are in his system, and it is difficult to manage them. He needs a suitable system for this.

1.3. Aim & Objectives

1.3.1. Aim

The aim of the TourGenie web application is to provide a comprehensive solution for Private Driver Sri Lanka travel agency to streamline their operations and provide a seamless travel planning experience for their customers. The specific nature of the solution is to provide a user-friendly platform for customers to register, search for and book tours, manage their bookings, and receive notifications about reservation status and payment details. The software also offers a comprehensive tour package and transport management system, as well as a hotel management module, enabling the company to manage reservations, generate invoices, and create reports on reservations. Additionally, the customer support management system provides a platform for customers to seek assistance and clarification, while allowing the company to respond to and manage customer feedback. Overall, the TourGenie application aims to improve the efficiency of operations and provide a better customer experience for Private Driver Sri Lanka travel agency.

1.3.2. Objectives

1. Gather requirements from the Private Driver Sri Lanka travel agency to understand their business needs and goals.
2. Select the Topic.
3. Create the project charter.
4. Collect information to Design the System.
5. Divide Functions.
6. Create Agile Activity.
7. Draw ER Diagram.
8. Create Project Proposal.
9. Presenting the Project Proposal.
10. Design the system architecture, database schema, and user interface based on the requirements gathered.
11. Create a database to store information about customers, hotels, tours, bookings, and employees.
12. Develop frontend.

13. Develop Backend.
14. Implement Search function and Report Generation.
15. Deploy the system to a server for production use.

16. Provide ongoing maintenance and support to ensure the system remains functional and up to date.
17. Final Report Writing.
18. Submission and final VIVA Session.

1.4. Problems & Solutions

- **All-in-one Platform**

When the agency received a reservation, the agency must record all the details manually and contact all the services that are related to the reservation separately. But by using this web application, the travel agency can easily manage the delivery of services to the customers and customers can be given more facilities than before.

- **Proper Management**

All business functions are done through a single system and automate all business-related tasks. Therefore, the company can manage all functions of the business more efficiently than before.

- **Improved Efficiency**

Recording data using different types of spreadsheets or paper is a huge waste of time and these tasks are performed by people, and human errors can also occur. Such conditions reduce the efficiency of a business. But with this web application, all the activities of the business will be done in less time and with greater accuracy. Like generating reports automatically.

- **24/7 Accessibility**

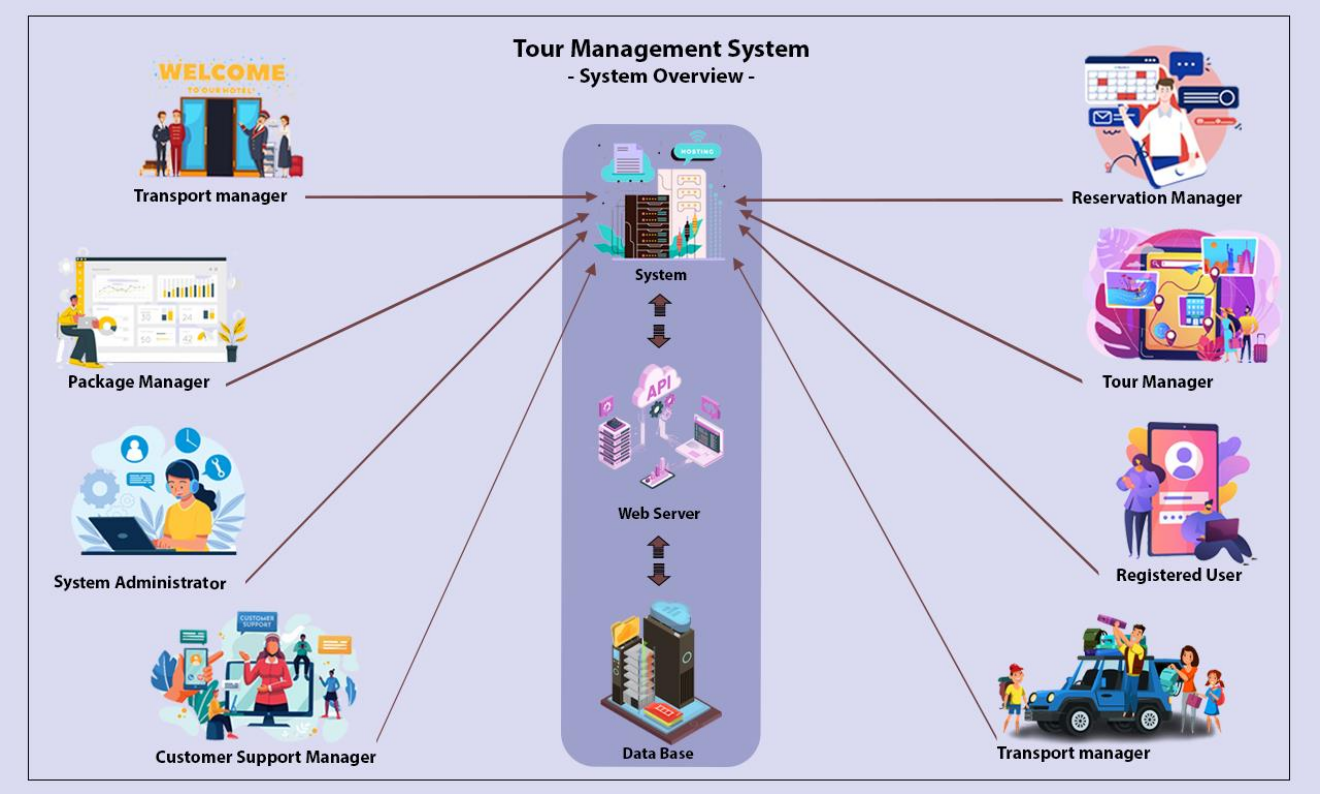
As this is a web-based application, users have 24/7 access. It means if internet facilities are available, this application can be accessed from any location at any time of the day. Higher Levels of Security With a web-based application (with data stored in the cloud), businesses have the peace that should their computer equipment be damaged or stolen, it can very quickly be back to 'business as usual'. In other methods, data does not have this protection. When using a web application, a remote service is available to store the data, so the business can access the database at any time.

- **Accessibility across devices for users**

Can be used on most browsers and will work uniformly on every operating system, regardless of the update or version being used. This gives the user choice of when and where to use the application, promoting flexible working within businesses to increase overall employee productivity.

02. System Overview

2.1. System Chart



The illustration above depicts the fundamental architecture of our system. It is made up of frontend components, backend components, an API that connects frontend components to the appropriate backend component, and a database that stores all the system's data.

The TourGenie Travel booking, and Management application will be implemented using the MERN stack. The frontend will be built in the Node JS environment using React JS. An API request (rest API) will be sent from the frontend to the backend, which is built with Express JS in the Node JS environment. The API request will be received by the API validators in the backend, and once accepted, it will be routed to the authorization middleware before being routed to the endpoint's service. The function for that endpoint is provided by the service. Finally, to access the DB, a database API request will be sent to the DB (via the node libraries) (MongoDB).

2.2. System Function

2.2.1. User Management

First, as a user/customer must register into the system. Therefore, we should collect personal information (Name, contact Number, Email, etc.) and register them in the tour guide system. Then build a user profile for customers. After that they can login to the system using their credentials. So, when the customers want to login to the system, they must enter their email and password. In that case, system can check whether the email and the password are correct or not. If the email and the password are correct, they can login to the system. Then they can go for a booking. He or She can manage their profiles also. In additionally, they can see their Booking status whether the booking is accepted or not.

Functional Requirements

- Register User

  Customers must first register in the system before they can make any reservations. Then they must enter their information and register. When a customer registers in the system, the system creates a user account for them.

- Login

  After the register into the system they have to login to the system using their own credentials (Email and password).

- Update and delete User account

  If the users want to change their details, they can change them by updating the system and if they don't want their account anymore, they can delete it.

- View booking status

  Customers can check whether or not the hotel they are looking for is already booked when attempting to make a reservation.

- Generate Bill

  After all the bookings have been done, customers can view their Bill amount and also,and they can download it as a pdf

Non-Functional Requirements

I. Security

This helps to prevent from unauthorized access.

II. Scalability

This refers to the ability of a system to handle increasing amount of users.

III. Accessibility

This is the ability of a system to be easily accessible usable by people.

IV. User-Friendly

This refers to the ease of use and simplicity of a system from the perspective of its users.

Technical Requirements

- Frontend – React js
- Backend – Node js, express js
- Database – Mongo DB

2.2.2. Hotel Management

Hotel management is an essential part of a tourist management system. When planning a trip, travelers need to book accommodation at various destinations. Therefore, a tour guide system should have a hotel management model that allows travel operators to manage hotel bookings efficiently.

The hotel management is based on hotel details of the tour guide system such as Location, facilities, ratings, hotel packages, viewers, and online user reviews about the hotel. Hotel manager is capable for adding, updating, and deleting hotel details in the system.

The system will display the availability of hotels. That is system displays available hotel rooms in real time. It avoids double booking. and their ratings with customer reviews. A user can search for hotels and viewing available hotel details in the tour guide system and user can book hotels through our system.

Functional Requirements

I. Manage hotels
   Hotel manager can add hotels to the system. And if there are some changes with main components of hotels, hotel manager can user update option. If any essential Cases hotel manager can use delete option.

II. Update availability
   System can display availability of hotels in real time

III. Search hotels
   Customer can any hotel by searching it name.

IV. View hotels
   Customer can view hotel details by selecting a hotel.

V. Generate reports
   By generating reports hotel manager can know how system improved.

Non-functional Requirements

- Performance
- Reliability
- Usability

2.2.3. Transport management

Importance of transport management

Transport through its role of movement of goods and people, decisively influences the other branches of the world economy, including international tourism. Without transportation there won't be the travel and tourism industry, people won't have means to reach another places that they desire to see.

Features of the Function

- Add Vehicle
- Manage Vehicle
- Search Available Vehicle
- View Available Vehicle
- View Total Booked Vehicle

- **Add Vehicle**

The "Add Vehicle" function is a crucial feature of any transport management system. With this function, Transport managers can easily add new vehicles to their system and keep track of them in real time. Thus, tourists can easily choose the transport modes required to carry out their journeys.

- **Manage Vehicle**

The "Manage Vehicle" function is an essential component of any transportation management system because it allows transport managers to quickly and easily add, delete, and edit vehicles in their system. Users can use the "Edit Vehicle" feature to change any existing vehicle information, such as the registration number, as needed. By utilizing these functions, users can keep an accurate and up-to-date inventory of their vehicles and efficiently optimize their operations.

- **Search Available Vehicle**

The "Search Available Vehicle" function is a critical feature of any transport management system that enables users to quickly find and book available vehicles. Moreover, it enables the hotel and event management industry to maximize their fleet utilization by ensuring that all available vehicles are booked efficiently.

- **View Available Vehicle**

The "View Available Vehicle" function in a transportation management system is a useful tool for companies operating in the tourism field. This function allows you to easily see all the available vehicles that can be used for a specific trip or route, making it easier to plan and manage transportation logistics

To use this function effectively, follow these simple steps:

I. Log in to your transportation management system and navigate to the "View Available Vehicle" section.

II. Choose the trip or route that you need to plan transportation for.

III. Select the type of vehicle you are looking for, such as a bus, van, or car.

IV. Set any additional criteria, such as the number of seats needed or any specific amenities required.

V. Click "search" to see a list of available vehicles that meet your criteria.

VI. Review the list of available vehicles and select the one that best fits your needs.

VII. Reserve the vehicle by booking it through the transportation management system.

You can quickly and easily find the best transportation option for your specific needs by using the "View Available Vehicle" function. This can help you save time and money while also ensuring that your clients have a pleasant and enjoyable travel experience.

- **View Total Booked Vehicle**

The "View Total Booked Vehicle" function in a transportation management system is a useful tool for companies operating in the tourism field. This function allows you to easily see all the vehicles that have been booked for a specific time period, helping you to manage transportation logistics and ensure that all bookings are properly accounted for.

To use this function effectively, follow these simple steps:

I. Log in to your transportation management system and navigate to the "View Total Booked Vehicle" section.

II. Choose the time period that you need to view, such as the current day, week, or month.

III. Select the type of vehicle you are interested in, such as a bus, van, or car.

IV. Set any additional criteria, such as the pickup or drop-off location, or the number of passengers.

V. Click "search" to see a list of all the vehicles that have been booked during the specified time period.

VI. Review the list of booked vehicles to ensure that all bookings are accounted for and that there are no conflicts or issues.

VII. Make any necessary adjustments or changes to the bookings as needed.

You can easily track all of the vehicles that have been booked by using the "View Total Booked Vehicle" function and ensure that your transportation logistics are properly managed. This can help to reduce confusion and ensure that your clients have a pleasant and stress-free trip.

Functional Requirements

I. Add Vehicle
II. Manage Vehicle
III. Search Available Vehicle
IV. View Available Vehicle
V. View Total Booked Vehicle

Non-Functional Requirements

I. Accuracy
II. Reliability
III. Maintainability
IV. Efficiency
V. Usability

Technical Requirements

- ✓ Front end = react js
- ✓ Back end = node js , express js
- ✓ Database = Mongo DB

2.2.4. Package management

This function is managed by "Package Manager". The package manager creates all kinds of packages offered by the company. Adding a package is done using a forum related to it. Each tour package should have a unique identity, name, description, type of accommodation, type of itinerary, and pricing and include other details, such as the duration of the tour, and the level of activity involved. Each of these packages is added under a category relevant to each package. The package manager can edit and delete existing packages. The package manager can edit an existing package using the edit option. The purpose of providing an edit option is when certain components of a package need to be modified depending on various reasons. Then that facility is very important. Like transportation, accommodation, price, etc. Also, if a package has to be removed from the database at an essential moment, the delete option is provided for that. The package manager has been given the facility to search for packages. By that can search any package-by-package ID.

This web application allows customers to view all of the company's packages. Customers can view all of the packages by using the "Packages" feature on the navigation panel. By clicking on them, he/she can obtain detailed information about the packages available in each category. After selecting a suitable package, the customer will be directed to the booking page if he or she is a registered customer. If an unregistered customer is discovered, he or she will be directed to the registration page. Customers will also have access to a search function. By entering keywords, customers can easily select locations/packages.

The package manager has been given the ability to generate reports in this section. The report displays the package ID, package name, creation date, and the number of times one package has been booked out of the total number of bookings, as well as the total revenue received from each package. The purpose of this function is to assist the package manager in the development of the company's packages.

Functional Requirements

i. Create a package
   The system allows the package manager to create a new package by adding the package name, accommodation, transportation, description, etc.

ii. Update a package
   If a change has to be made in an existing package, it should be possible to do it through the edit option.

iii. Delete a package
   The system should allow a package to be removed from the database when needed.

iv. Read a package
   When the customer clicks on the package which wants to view, the database retrieves the information and displays it on the customer user interface.

v. Search a package
   By providing the package ID, the package manager can find the related package.

vi. Generate a report

The system can generate a package report related to a specified period.

Non-Functional Requirements

I. Accuracy
II. Reliability
III. Maintainability
IV. Efficiency
V. Usability

2.2.5. Reservation management

The Reservation manager is responsible for managing all the reservations made by customers. Once a reservation is created, it contains all the details of the user, including their name, contact information, and the dates and times of the reservation. The reservation also includes information about the places that the user has reserved, such as the hotel or restaurant name.

The reservation manager has access to all the reservations made by customers and can view them at any time. When the manager views a reservation, they can see all the details of the reservation, including the user's information and the places they have reserved.

Once the manager has reviewed a reservation, they have 15 days to confirm it. During this time, the user has the option to cancel their reservation. If the manager confirms the reservation, the user is notified via a notification. When the driver arrives to pick up the customer, the booking manager can generate a reservation statement for that specific reservation. This statement contains all of the reservation details and serves as proof of the reservation for the customer. The booking manager can also look up any reservations made by a customer using their NIC (National Identity Card) or passport ID number. In addition, the manager can create customer notices that are displayed in the user interface. The reservation manager is also in charge of financial matters. It is possible to accomplish this by integrating a payment gateway.

Functional Requirements

I. The system must allow the booking manager to view all reservations made by customers and review them before confirming them.

II. The system must provide a notification to the user when their reservation is confirmed by the booking manager.

III. The system must allow the booking manager to issue a reservation statement for each reservation, which contains all the necessary details.

IV. The system must allow the booking manager to search for any reservation made by a customer using their NIC / passport ID number.

V. The booking manager must be able to create notices for customers that are displayed in the user interface.

VI. The reservation manager should be able to process financial transactions seamlessly through the integrated payment gateway.

Nonfunctional Requirements

i. Usability

The user should have a user interface which can be used easily for reservation manager.

ii. Reliability

The system should be able to handle many reservations without downtime.

iii. Performance

The system should be able to handle multiple reservation requests simultaneously.

2.2.6. System administration

The administrator of a travel agency is in charge of all employees and customers. They employ a system that necessitates login credentials in order to access various features. The system administrator creates employee profiles, and each employee is assigned a unique login credential to access the system. The system generates identity cards, making it easy to identify employees. If an employee leaves the company, the administrator can have them removed from the system. The admin is also in charge of the system's customer profiles. They can view customer information and, if necessary, remove customers. When a customer books a travel package, the admin can view the booking details, including customer information, and search for bookings by day. They can also view available transport, hotel, and tour details, along with associated costs. If necessary, the admin can create profiles for managers and add their details to the system. They can also update login credentials or manager details if needed. Overall, the travel agency admin has complete control over the system, allowing them to manage employees and customers efficiently. The use of identity cards makes it easy to identify employees, and the ability to view booking details helps the admin stay on top of customer bookings.

Functional Requirements

- Employee profile creation and management
- Search and view booking details by day
- View available transport, hotel, and tour details with associated costs
- Update login credentials or manager details if needed

Non-Functional Requirements

- Accuracy
- Reliability
- Maintainability
- Efficiency
- Usability

03. Literature review

3.1. Using of Excel Spreadsheets

Excel spreadsheets can be used effectively in a tour guide management system in a variety of ways. Such as scheduling their availability for tours, to maintain budgets for each tour, to track expenses, monitor revenue, calculate profits for each tour, to store client information, to plan and organize tours, and to track important metrics such as customer feedback, tour ratings, and revenue generated by each guide.

3.1.1. Pros and cons of Using Excel Spreadsheets

Pros	Cons
• Data can be stored well organized	• Highly subjected to human error and mistakes
• Not necessary to obtain technical support	• Not a suitable method in doing collaborative work
• Easily available at anytime	• No proper security
	• Slow and less reliability
	• Manual entering can consume a lot of time.

While Excel spreadsheets can be useful in a tour guide management system, they do have some disadvantages that should be considered:

1. Limited scalability: Excel spreadsheets are not designed to handle large amounts of data or complex calculations. As the tour guide management system grows, the spreadsheets may become slow and prone to errors.
2. Limited collaboration: Excel spreadsheets are often used by one person at a time, and multiple people cannot easily work on the same document simultaneously. This can cause delays and errors in data entry and analysis.
3. Limited security: Excel spreadsheets are stored on a local computer or network, which makes them vulnerable to security breaches, such as viruses or hackers. Additionally, if the spreadsheet is not password-protected or shared securely, sensitive information may be at risk.

So that's why we emphasize the cruciality in having more successful and a more technological based solution (which is the system that the client has requested for us to design) to completely handle all the tasks efficiently.

3.2. Booking through Phone Calls

Booking through phone calls in a tour guide management system involves accepting bookings from clients over the phone, entering the details into a centralized system, and assigning a tour guide to the booking. After
receiving a call from a customer, they must get their details over the phone and enter those details into their system.

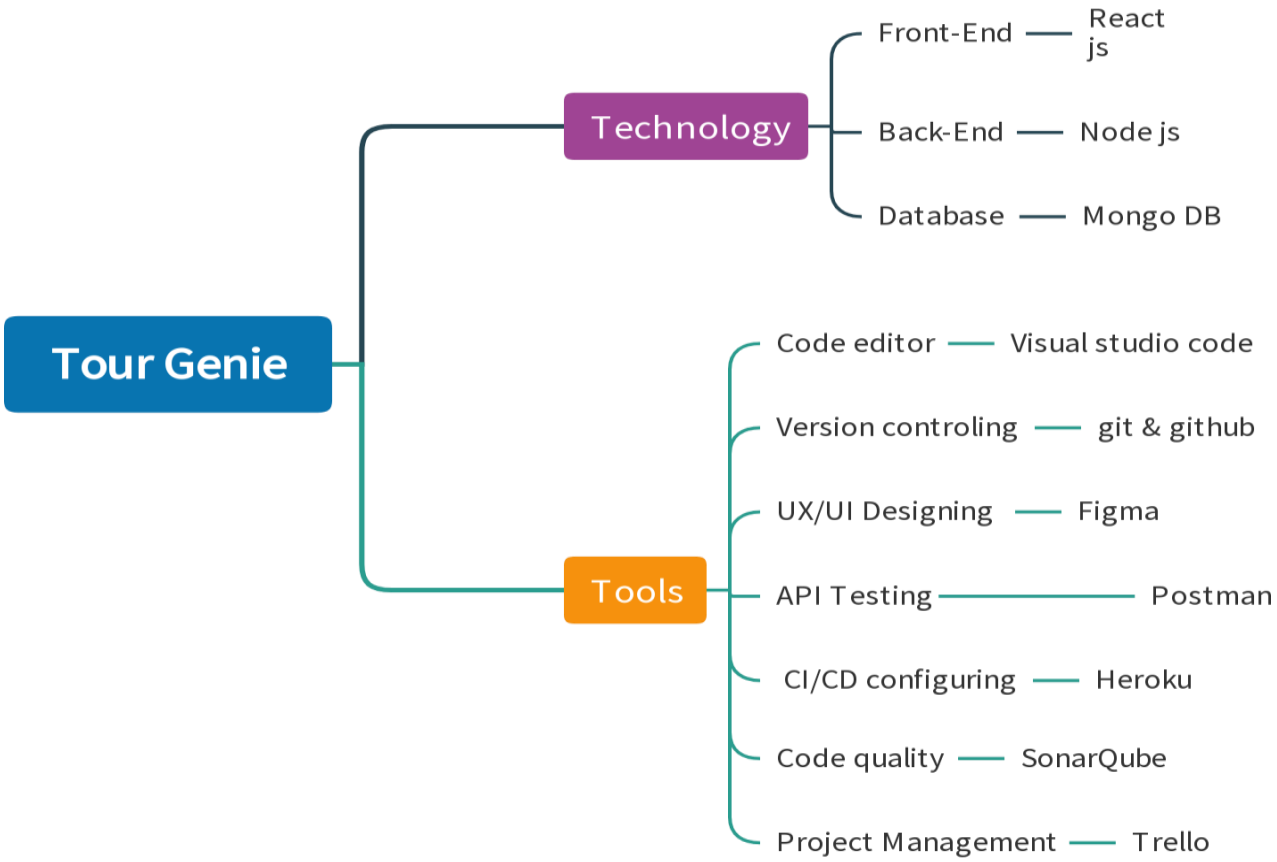
3.2.1. Pros and Cons of Booking through phone calls

Pros	Cons
• Personalized service	• Limited availability
• Real-time assistance	• Risk of miscommunication
• Flexibility	• Time consuming
• No technological constraints	• Lack of transparency

Overall, booking through phone calls is a traditional way. It can be time consuming and prone to errors. Instead of that using online booking platforms or specialized software can help this process. This is the main purpose of the client. Therefore, through our system customers can make their bookings very easily and client can follow up them very quickly and easily without wasting time.

04. Methodology

4.1. Tools and Technologies



React

React is a very powerful JavaScript library used for creating fast and attractive user interfaces for web development. This JavaScript library is maintained by Facebook and a community of individual developers and companies. [1] The frontend of our web application will be developed using React. These are the benefits of using react for front end development,

- It is an open-source library
- It has reusable components
- It is SEO friendly

Node.js

Node.js Node.js is an open-source, cross-platform, back-end JavaScript runtime environment that runs on the V8 engine and executes JavaScript code outside a web browser. Node.js lets developers use JavaScript to write command-line tools and for server-side scripting-running scripts server-side to produce dynamic web page content before the page is sent to the user's web browser. [1]

Express.js

Express.js, or simply Express, is a backend web application framework for Node.js, released as free and open-source software under the MIT License. It is designed for building web applications and APIs. It has been called the de facto standard server framework for Node.js.

MongoDB

MongoDB is an open-source document database that provides high performance and scalability. Collections and Documents are the main structures of MongoDB. Most importantly MongoDB is one of the leading NoSQL databases. In this project, we are using MongoDB Atlas which is a full-range cloud database.

Reasons for using MongoDB Atlas are mentioned below.

- Simple and easy to integrate.
- Built-in data browser
- Provides multiple levels of security. [2]

Visual Studio Code

Visual Studio Code, also commonly referred to as VS Code, is a source-code editor made by Microsoft with the Electron Framework, for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.

Benefits for us,

- Cross-platform support
- Intuitive user interface
- Large extension marketplace
- Integrated terminal
- Debugging capabilities
- Git integration

Git

Git is a distributed version control system that tracks changes in any set of computer files, usually used for coordinating work among programmers.

Benefits for us,

- Version controlling
- Collaboration
- Branching and merging
- Speed
- Backup

Git Hub

It is a provider of Internet hosting for software development and version control using Git. It offers the distributed version control and source code management functionality of Git, plus its features.

Figma

Figma is a web-based collaborative design tool used by designers, developers, and product teams to create and share user interfaces, visual designs, and prototypes. It allows for real-time collaboration between team members, making it easy to work together on a project from anywhere.

Postman

Postman supports a wide range of request methods, including GET, POST, PUT, DELETE, and many others, and allows us to customize headers, parameters, and other request options. We can also use Postman to set up tests for your APIs, including assertions to check that the responses we receive are correct.

Heroku

Heroku is a cloud platform as a service (PaaS) supporting several programming languages. [3]It allows developers to deploy, manage, and scale their applications without having to worry about infrastructure or server management. With Heroku, we can quickly deploy our applications written in a JS.

SonarQube

SonarQube solution is a self-managed, automatic code review tool that systematically helps you deliver *clean code*. As a core element of our SonarQube integrates into your existing workflow and detects issues in your code to help you perform continuous code inspections of your projects .

Trello

Trello is a web-based project management tool. It is designed to be highly customizable and provides a wide range of features to help us manage our project more effectively. We can create checklists, attachments, and custom fields for each card, and use integrations with other tools such as Google Drive to streamline project workflow. 2) Requirements Engineering Methods

- Questionnaires or Surveys
- User Observation
- Document Analysis

1. Design Methods

- UML diagrams are used to design use case diagram.
- ER Diagram are used to design the database.

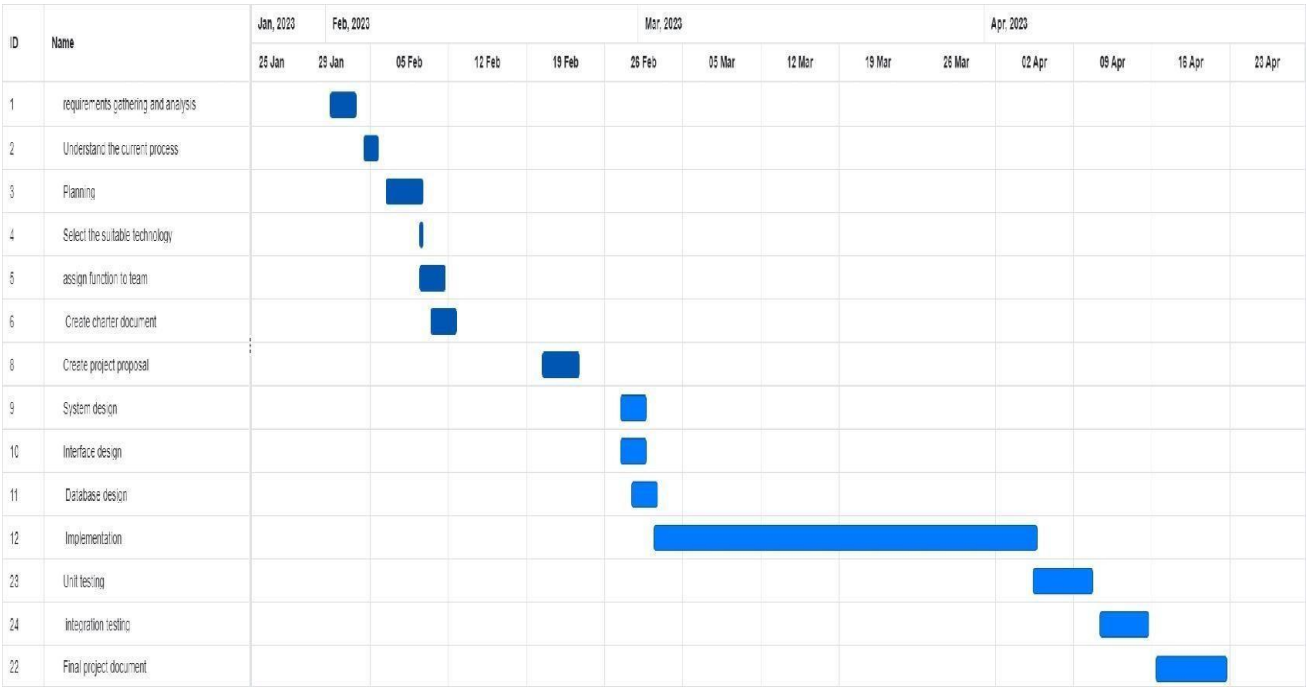
2. Testing Methods

- Functionality Testing
- Usability Testing
- Web UI Testing
- Compatibility Testing
- Performances Testing
- Security Testing

3. Integration Methods

- Presentation-Level Integration
- Business Process Integration
- Data Integration
- Communications-Level Integration

4.2. Gantt chart



4.3. Work breakdown structure

No.	Student ID & Name with initials	Tasks
1	Sandeepani A.W.S IT21173004	• Register user. • Login • Update and delete user account. • Generate bill. • View Booking status
2	Dhanawardhana H.M.I.K IT21183690	• Manage hotels. • Search hotels. • Update availability. • Generate report.
3	Dissanayake D.M.W.B.T IT21164194	• Manage vehicles. • Generate a report. • Search Available Vehicle • View Available Vehicle • View Total Booked Vehicle
4	Chathuranga K.H.D IT21168772	• Manage tour Details. • View tour details • Search for available tours • Generate a report.
5	Wijayasooriya W.A.K.A IT21164026	• Add a package & view package. • Update a package. • Delete a package. • Generate a report. • Search a package.
6	Tharaka P.D.G. IT21181092	• Manage customer reservation. • Notification (SMS alert) • Generate reservation statement. • Search user reservation • Notices Management • Payment method
7	Karunarathne D.G.V.S IT21785610	• Add a review & View review. • Edit and Update review. • Delete review. • Search review • Generate report.
8	Herath H.M.M.D IT21173240	• Manage employees. • Manage Customer • Search booking details • Generate ID card. • View hotels, tour, transport, package details

05. References

[1] [Online]. Available: https://nodejs.org/en/docs/.
[2] [Online]. Available: https://www.mongodb.com/docs/.
[3] [Online]. Available: https://en.wikipedia.org/wiki/Heroku.