

SCS 3214 / IS 3113: Group Project II - 2025 Interim Report

Proposed Project Title:

LankaTrails – A Smart Trip Planning & Booking Platform for Customizable Travel and Local Tourism Empowerment

Project Group Details

Group number: 50

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Details of Project Supervisor, Co-supervisor, Advisors and Clients

Proposed Project Supervisor (Academic Staff of UCSC):

Name of the supervisor: Dr. K.D. Sandaruwan

Signature of the supervisor:

Date: 30/05/2025

Proposed Project Co-Supervisor (Assigned by Course Coordinator):

Name of the co-supervisor: Ms. W.D.I.U. Welikanna

Signature of the co-supervisor:

Date: 30/05/2025

Table of Contents

Project Title:	5
The Goal and Objectives:	
Goal	5
Objectives	5
Problem Definition:	
Research Background	6
A brief introduction to the project:	
The scope of the project:	
Users of the system	
In Scope	
Out Scope	
Main Functionalities	
Tourists	
Service providers	8
Admin	9
Feasibility Study:	
Operational Feasibility	9
Economic Feasibility	10
Legal Feasibility	10
Schedule Feasibility	11
System Architecture	12
High-Level System Architecture	12
Requirement Specification:	
Use Case Diagram	
ER Diagram	
Component Diagram	15
User Interfaces:	
Colour Theme	
UI Screenshots	16
Mobile Application	16
Web Application	21
Main deliverables of the system:	
The Project Plan:	
Time frame Analysis	
The Gantt Chart	
References:	
Problem Definition & Research Background:	
Technology Stack:	
Declaration:	31

Project Title:

LankaTrails – A Smart Trip Planning & Booking Platform for Travel and Local Tourism Empowerment

The Goal and Objectives:

Goal

To develop an intuitive mobile-first platform that simplifies trip planning and management for tourists in Sri Lanka, while enhancing visibility and accessibility for local service providers.

Objectives

- To enable tourists to create, customize, and manage entire travel itineraries.
- To integrate services which include accommodations, transport, attractions, tour guides and activities.
- To include cost tracking and budget allocated throughout the itinerary planning.
- Include group chat for collaborative trip planning.
- To allow for the inclusion of additional trip expenses
- Dashboards with a calendar to service providers to include the bookings they received

Problem Definition:

Sri Lanka is a popular travel destination but tourists (both foreigners and locals) struggle to plan their trips efficiently managing cost and time. Currently, travel planning requires navigating multiple apps, websites, or relying on word-of-mouth to find accommodation, transport, food and activities. Many small and medium tourism businesses still lack online visibility, and there's no centralized platform offering all these services through multiple service providers for tourists to select according to their preference. This results in inefficient planning, overspending, and missed opportunities for immersive travel experiences.

"In 2018, tourist arrivals peaked at 2.5 million, who spent a total of US\$5.6 billion in the country. However, the COVID-19 pandemic caused tourist numbers to decrease by 92% in 2020. As of 2022, tourist numbers have not rebounded from the pre-crisis high."

Post-pandemic recovery demands smarter digital infrastructure to rebuild and grow

Research Background

Research by UNWTO and Sri Lanka Tourism Alliance highlights a need for digital transformation in the tourism sector. A McKinsey study (2022) showed that tourists globally now expect "seamless, mobile first" travel experiences. A survey by Booking.com found that 73% of travelers prefer apps that help plan their entire trip in one place. Furthermore, 60% of small travel-related businesses in Sri Lanka lack digital booking or marketing channels (SLDTA 2021). These insights confirm the market demand for a unified, localized travel planning and service-booking platform.

A brief introduction to the project:

"LankaTrails" is a mobile-first application that empowers travelers to plan, manage, and execute their trips in Sri Lanka efficiently. It allows tourists to create complete itineraries, book services, and explore culturally significant places. Inspired by the gaps in existing tools such as Google Travel or Trip Advisor, "LankaTrails" goes further with the integrated booking, group trip coordination, smart feasibility analysis, and a Sri Lanka - specific focus. This project is motivated by a passion to modernize Sri Lanka's tourism landscape while enabling a user-centric experience for both solo travelers and groups.

Existing applications for travel planning don't include this level of integration and localization. While TripAdvisor offers reviews and maps, and Google provides basic itineraries, "LankaTrails" brings the entire trip lifecycle into one app, with special attention to local businesses and public heritage.

The scope of the project:

Users of the system

- Tourists (Both local and foreign)
- Service Providers
 - o Accommodation Providers (Hotels, Hostels, Villas, Homestays)
 - o Food & Beverage Services (Restaurants, Cafes, Street Food Vendors)
 - Transportation Services (Taxi, Rentals, Tuks, Tour Buses)
 - Tour Guides
 - o Activity Providers (Safari, Scuba Diving, Hiking, Surfing, etc.)
- Admin

In Scope

- Login and registration for tourists, service providers and admins to "LankaTrails".
- Providing a list of tourist attractions that the tourists can visit when there is a time gap in between two planned items in the trip
- Plan a trip with accommodation, food, transport, tour guides, activities along with itinerary creation and management of the itinerary.
- Tourists can have a group chat per trip to collaboratively plan their trip.
- Tourists have the ability of creating and managing multi-stop trips.
- Listing all the available services with the pricings, which makes it easier for the tourists to decide the most appropriate service that they are searching for.
- Tourists can communicate with the service providers via the chat room when acquiring their service.
- Booking accommodations, transportation services, tour guides, activities etc.,
 with or without making an advance payment.
- Separate profiles for each service provider to manage reservations (by checking the calendar) made by the tourists and to manage their services.
- Separate profiles for each tourist who are registered in "LankaTrails" to manage their details and retrieve details and summaries about their previous trips.
- Tourists can make reviews and ratings for the services they acquire, and the service providers can view the reviews and ratings for their services.
- Tourists can create their budget and track the cost, whether it will be passing the budget or not.
- A separate panel for Admin to perform service provider onboarding and to handle complaints made by the tourists.

Out Scope

- International flight booking
- Visa applications and immigration services
- Entire room management, hotel management, inventory management etc...
- Government approval or licensing processes for service providers
- Offline booking or agent-based services
- AR/VR-based location exploration

Main Functionalities

Tourists

- Plan Trip: Smart trip planner with multi-stop itinerary creation and viewing the destinations in the map.
- Discover Services: Search places, activities, and services (categorized and filterable)
- Cost Management: Include additional expenses and the target budget. Also get notified when the target budget is being crossed.
- Group trip chat room: Plan the entire trip while discussing as a group, sharing details
- Itinerary Management: Real-time updates, Trip summary, Gap & Auto Suggestions
- Book the Service: Advance payments or full payments for services
- Notification System: Booking Confirmations, Trip Reminders
- User Profile Management: View of past trips, Profile updating
- Ratings & Reviews: Leave reviews and ratings for the services used

Service providers

Common Features

- Dashboard with a calendar indicating the bookings, earnings, and analytics
- Service Management (add/edit/delete services)
- Direct Messaging between service providers and the tourists
- Notifications for bookings, Booking cancellations, and customer messages.
- View Reviews & Ratings
- Bookings and availability calendar indicating the booked dates as occupied.
- Selection of the categories the provider offers
- Include policies (mainly for cancellation of a booking)

Accommodation Providers

- Room Availability: Include different types of rooms available with images
- Set Pricing: Seasonal rates, weekend pricing, and regular prices
- Guest Profile History

Food & Beverage Services

- Menu Creation: Food items with photos, descriptions, pricing and other related information
- Signature Experiences: Highlight special dining experiences (beachside dinner, cultural performances)

 Daily Specials: Include time-sensitive offers (happy hour, lunch combos, seasonal dishes)

Transportation Services

- Vehicle Availability: Detailed vehicle listings with capacity, amenities (A/C, Wi-Fi), and photos
- Pricing Models: Per km, hourly, and daily rates with distance-based calculations
- Driver Profiles: Driver information and language capabilities inclusion when they are provided for tourists.

Tour Guides

- Language & Specialization: Include multi-language capabilities and expertise areas (history, nature, culture)
- Digital Portfolio: Professional profile with certifications, experience, and photo galleries
- Cost and the Locations based: Pricing, Group sizes and the areas the guide will be available

Activity Providers

- Experience Catalog: Detailed activity descriptions with difficulty levels, durations, safety concerns and requirements
- Define Requirements: Age restrictions, Safety Concerns, Activity Description, Safety Instructions

Admin

- Service Provider Onboarding: Review the registration application and approval or rejection of the request to onboard for the application.
- Dashboard: Service provider performances and analytics
- Complaint Handling: Detailed view of the complaint, Resolve/Reject options, and notifications to complainants

Feasibility Study:

Operational Feasibility

The app is designed for both the tourists and the service providers to have a good usability experience that consists of,

- Intuitive UI (React, ReactNative)
- Clear navigation (Trips, Explore, Profile etc.)
- · Admin dashboard for easy management
- Plan the trip using the web as well

Maintenance involves the continuous activities required to keep the application running smoothly. It ensures the system remains reliable, bug-free, and performs optimally over time.

Updates refer to introducing new features, improvements, or integrations to enhance the app's functionality and user experience over time.

- Modular architecture using Spring Boot + PostgreSQL allows:
 - Easy bug fixing
 - Scalable API versioning
 - o ReactNative supports OTA (Over-The-Air) updates using Expo
- A small development team can maintain:
 - APIs
 - o UI updates
 - o Moderation Tasks

Economic Feasibility

Economic feasibility determines whether the **expected benefits** of the LankaTrails project outweigh the **costs** involved in developing, deploying, and maintaining the application. Here's a breakdown of categories for economic criteria based on a 22-weeks plan.

- Human Resources
- APIs and Licenses
 - Google Maps API
 - Stripe
- Miscellaneous Costs
 - Testing Devices
 - o Documentation & Design Tools

Legal Feasibility

Sri Lanka does not yet have a fully enacted Data Protection Act, but one is proposed. It's best to adhere to global standards like GDPR principles.

- o Collect only necessary user data
- Ask for explicit consent (especially location, trip data, payment)
- Provide clear Privacy Policy and Terms of Service
- Allow users to delete or request their data

When considering payment processing compliance, we will be using Stripe as the payment gateway, Stripe is globally compliant with **PCI DSS** standards. The backend will never store **card details** and always use secure HTTPS endpoints.

Respect usage terms of external APIs:

- o Google Maps (requires attribution and has usage limits)
- o Weather APIs or tourism data sources

Schedule Feasibility

The scope of the project can be covered within the schedule because the group consists of 6 members with different capabilities. The below mentioned is the work hours schedule assigned for the group members.

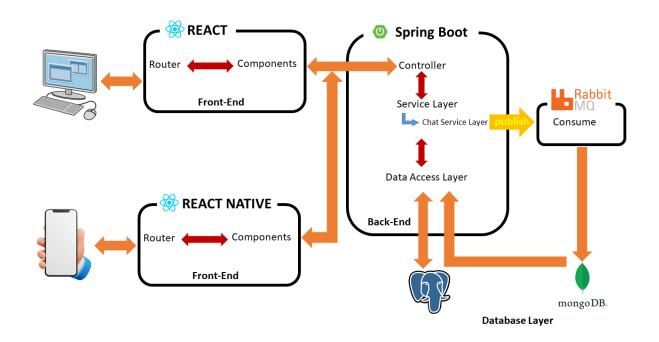
Project start date	19/05/2025						
Project end date	20/10/2025						
Estimated number of weeks	22						
Weekdays working hours	3						
Weekend working hours	3						
Number of members	6						
Man-hours per week	(3 + 3) * 5 = 30						
Estimated total of man-hours	30 * 22 = 660						

For testing purposes, we can choose either manual testing or automated testing and we can do testing in two approaches. They are functionality testing and implementation testing.

While considering the project domain, scope and time plan the proposed system "LankaTrails" is feasible under the criteria scheduling.

System Architecture

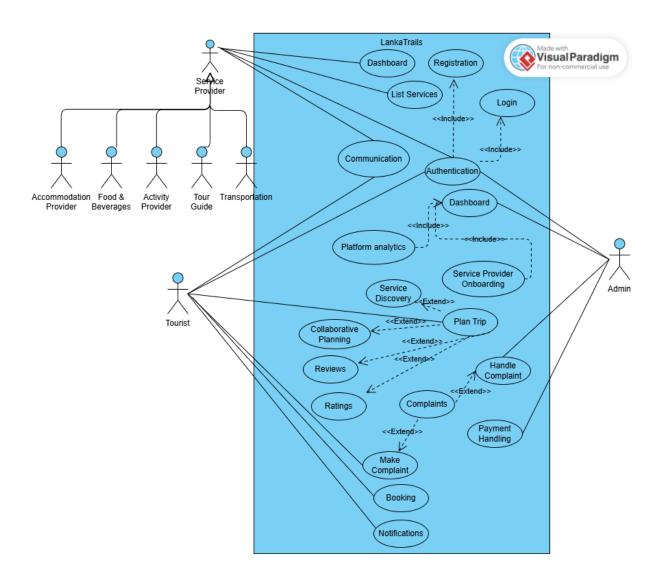
High-Level System Architecture



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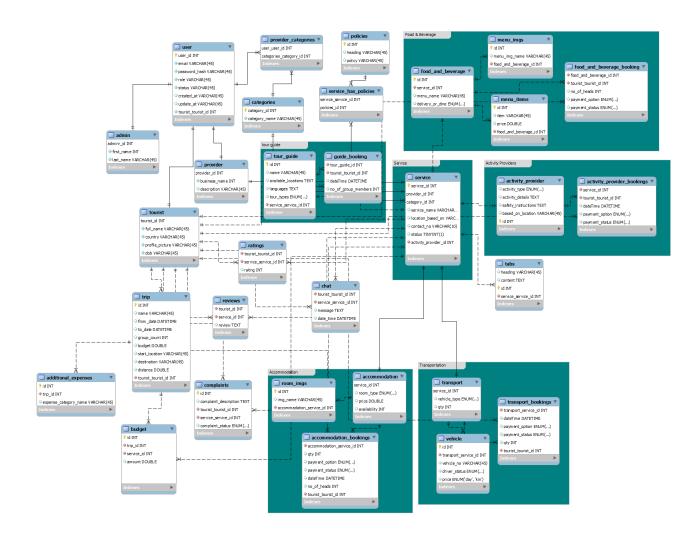
Requirement Specification:

Use Case Diagram



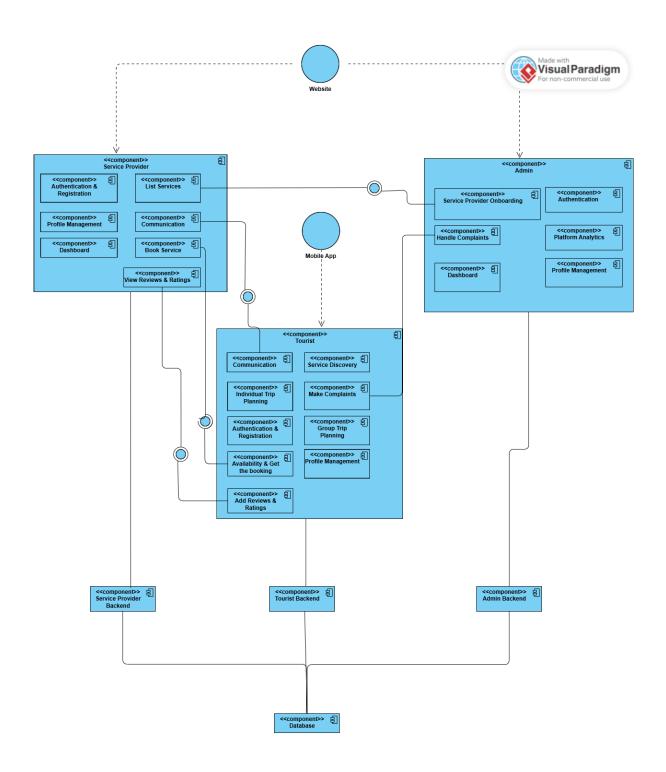
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ER Diagram



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Component Diagram



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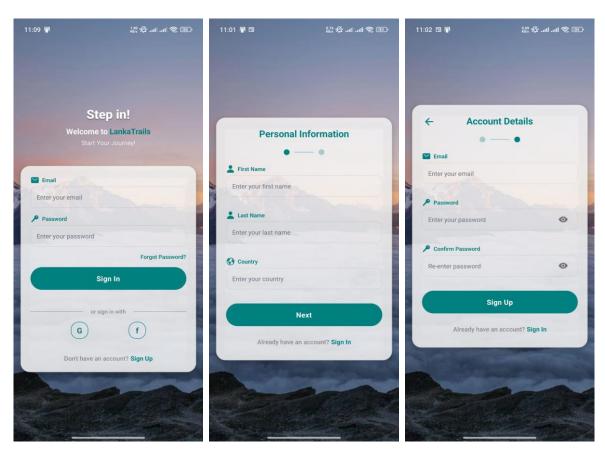
User Interfaces:

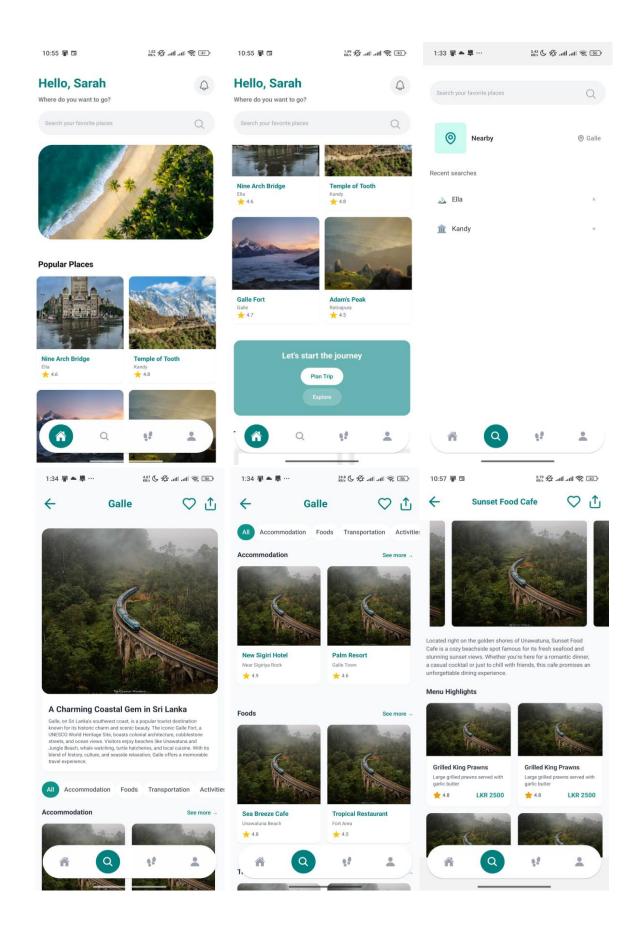
Color Theme

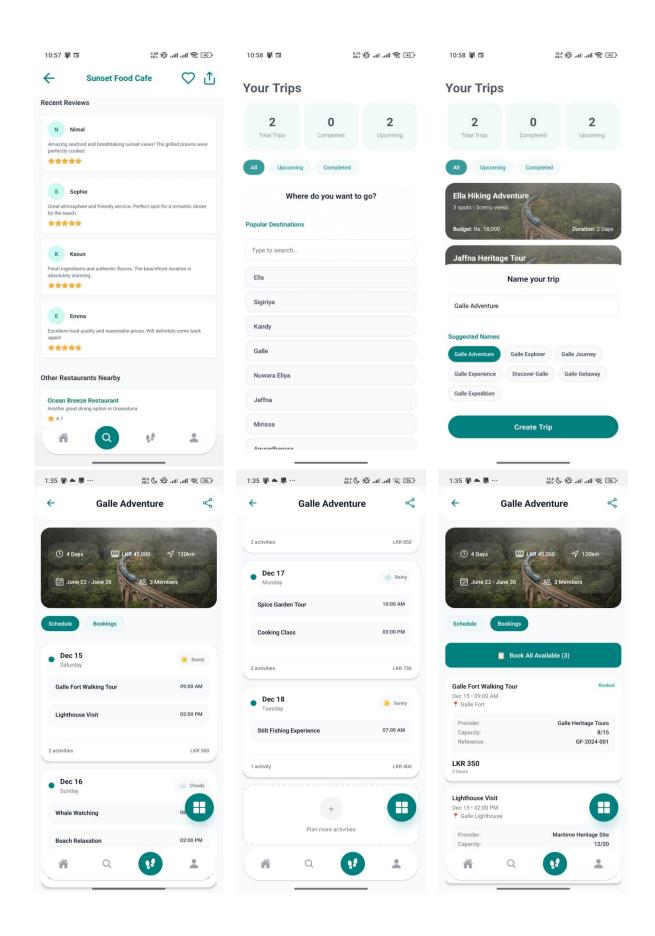


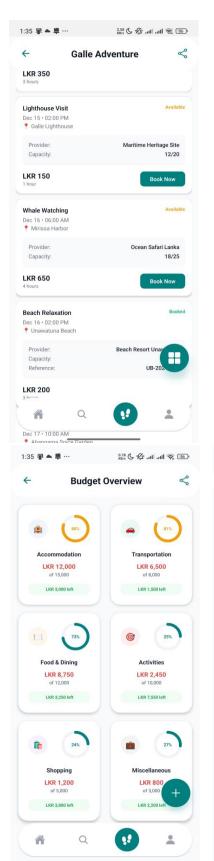
UI Screenshots

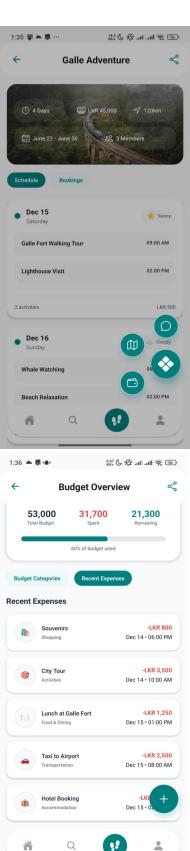
Mobile Application



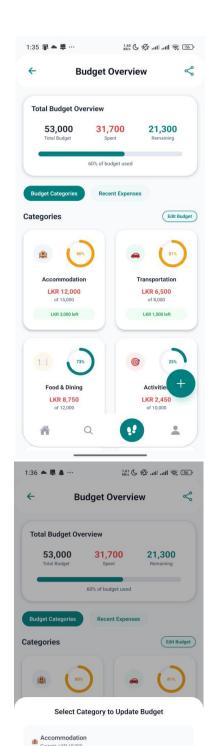








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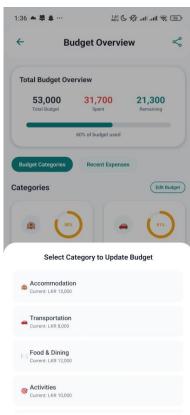


Transportation

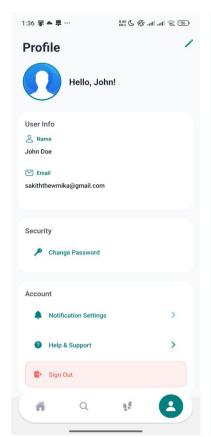
Food & Dining

Activities
 Current: LKR 10,000

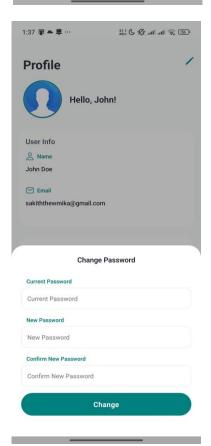






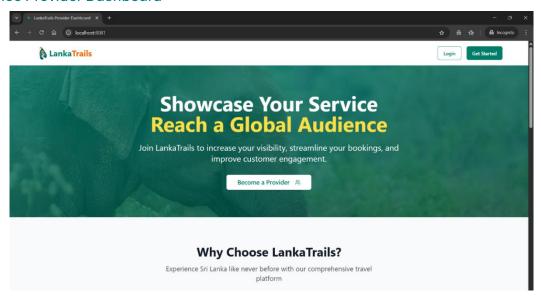


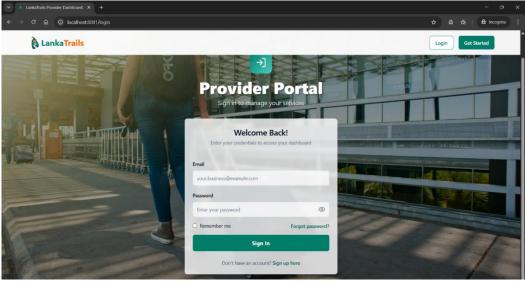


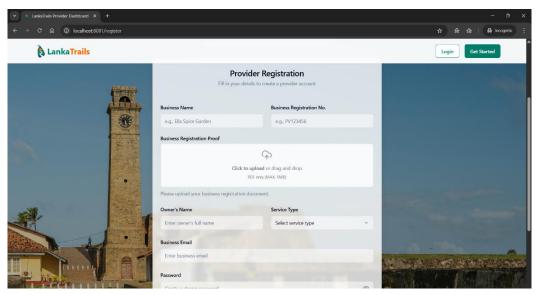


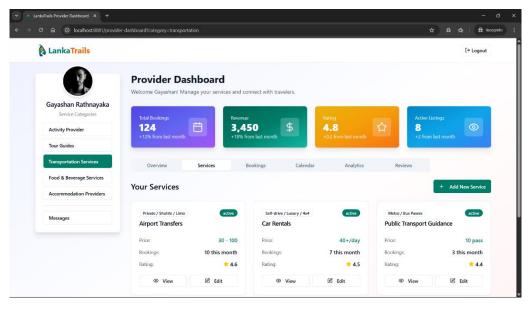
Web Application

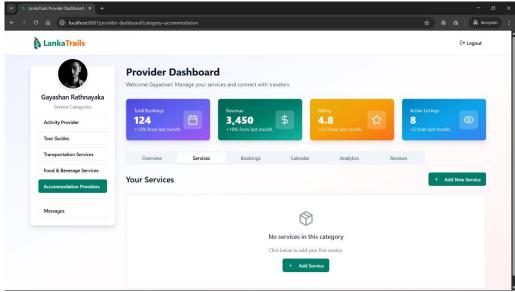
Service Provider Dashboard

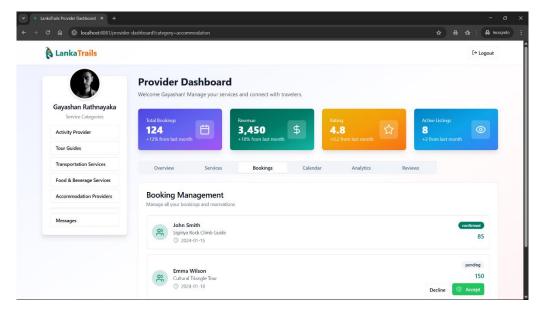


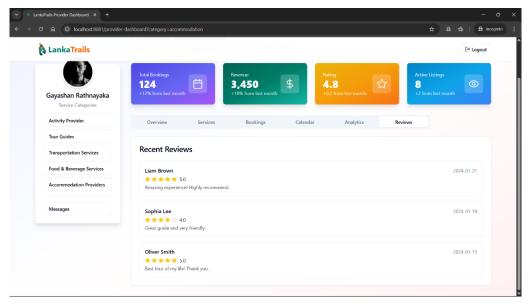


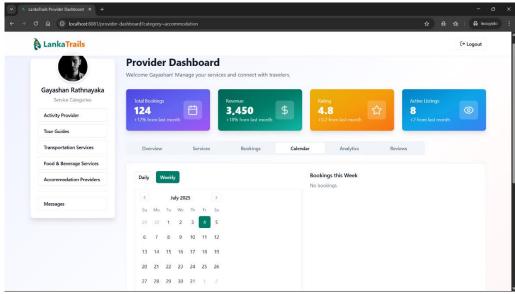


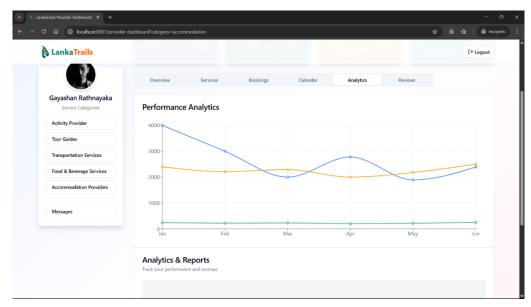


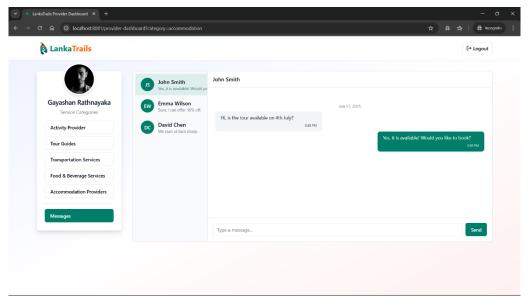


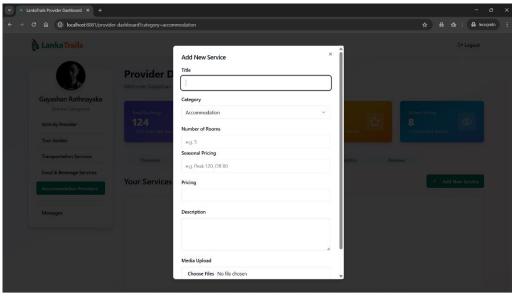


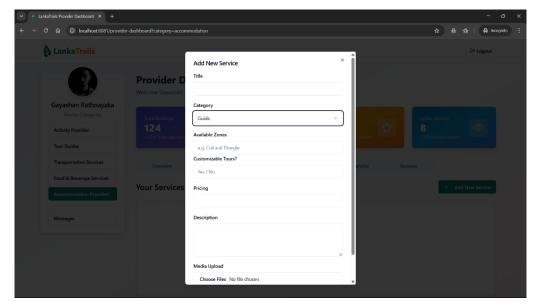


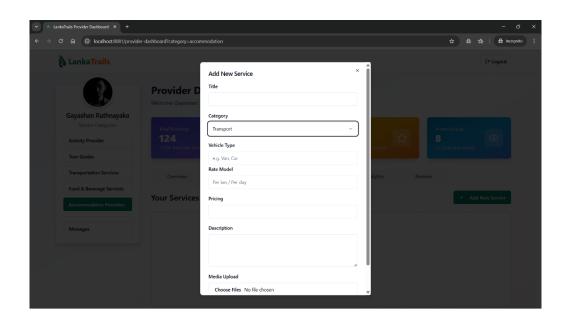


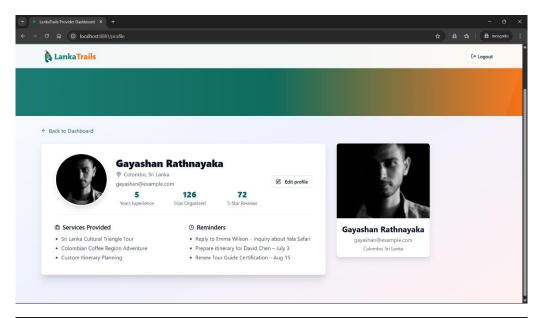


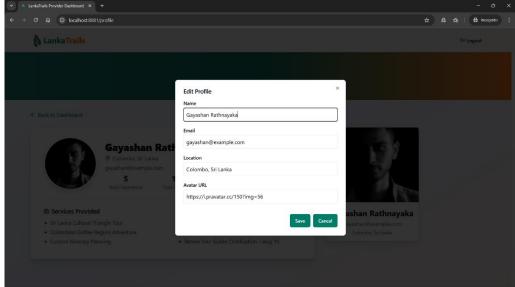




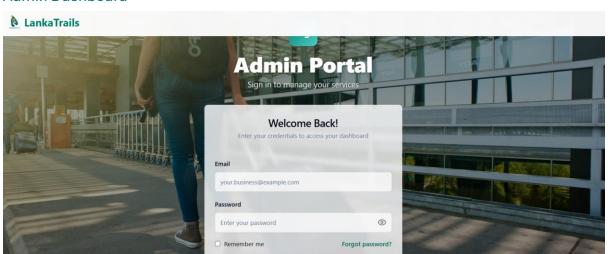




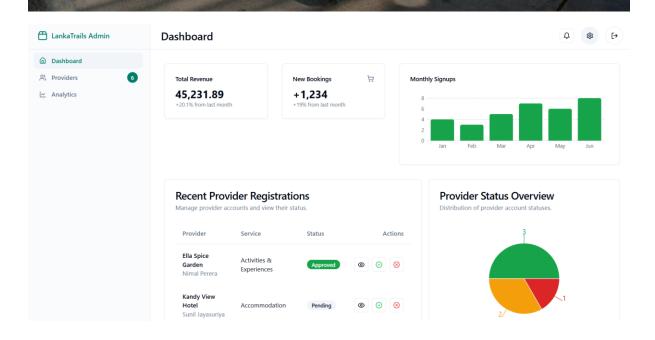


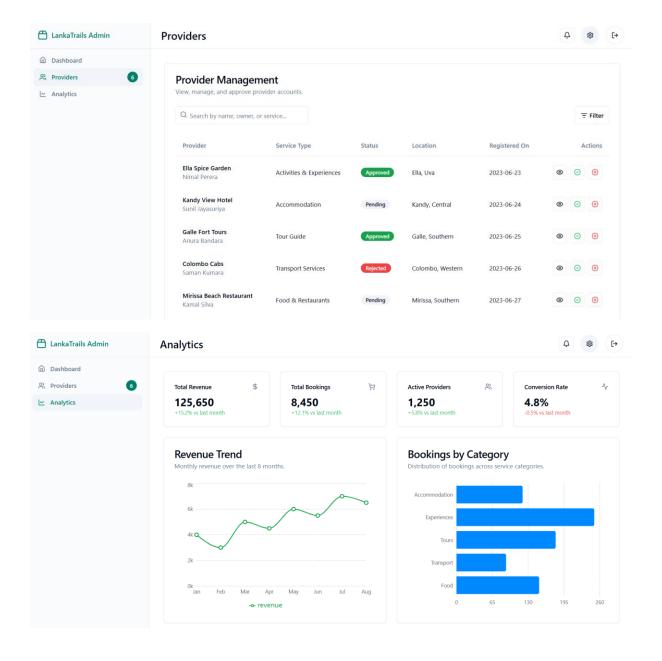


Admin Dashboard



Sign In





Main deliverables of the system:

- Complete working app for planning trips along with a website for more convenient planning and adding services.
- Website based dashboard for admin for managing activities, handling complaints, viewing and getting reports etc.
- Complete Software Requirement Specification
- User manual
- Administrators manual together with deployment instructions

The Project Plan:

Methodology to be followed: Rapid Application Development (RAD)

- Can obtain an idea of the product since a working demonstration is available after each iteration.
- Ability to reiterate and fix if there are issues.
- Due to time constraints and Agile methodologies being used in the industry.

The panel mentioned that our scope is too huge and considered reducing it to a reasonable workload.

Therefore, we reduced some functionalities. They are,

- When managing bookings, the service providers will only be able to update the availability of their service in the service provider dashboard by updating the calendar.
- Removed allowing service providers to make advertisements and advertise their services.

Also, the panel guided us to come up with different approaches to achieve recommendations/personalization/optimization functionalities

- Recommendations On behalf of the recommendations, we will be loading
 the popular tourist attractions, making it easier for them to discover
 services. Also we will be providing a list of tourist attractions that the tourists
 can visit when there is a time gap in between two planned items in the trip.
 Also we will be validating when a new activity is planned, whether it can be
 done by the time after completing the previous activity
- Personalization -On behalf of personalization, we will be allowing the tourists to contact the service providers through the chat room and customize the service according to their needs

• Optimization - Google maps API provides a Route Optimization API as well

We also can conclude that we are aligning with the progress timeline that we demonstrated during the proposal presentation.

Time frame Analysis

- Start Date 19/05/2025
- End Date 20/10/2025

Task	Duration (Weeks)	Milestones
 Planning & Requirement Analysis 	02	Project Proposal Submission
Proposal DefenseSystem Design & Architecture	02	Proposal PresentationFinalized design & architecture
 Authentication Module Tourist Core Features Service Provider Module Interim Report Interim Presentation 	06	 Developed the front-end and the back-end of the listed tasks. Interim report submission. Interim presentation
Bookings & PaymentChat SystemAdmin & Reporting	06	Developed the tasks defined
Testing & Bug FixesFinalizationDeployment	04	 Prepared test cases and fixed the issues that had arisen. Finalizing the system
DocumentationFinal Presentation	02	 Finishing all the documentation including the manuals as well Pre-Final Presentation & System Demonstration Final Report Submission Final Presentation

The Gantt Chart

		May Ju			une		July			August			September				October				
Project Tasks	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3
Planning & Requirement Analysis																					
Proposal Defence																					
System Design & Architecture																					
Authentication Module																					
Tourist Core Features																					
Service Provider Module																					
Interim Presentation																					
Bookings & Payment																					
Chat System																					
Admin & Reporting																					
Testing & Bug Fixes																					
Finalization																					
Deployment																					
Documentation																					
Final Presentation																					

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Problem Definition & Research Background:

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Technology Stack:

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Declaration:

We as members of the project titled "LankaTrails", certify that we will carry out this project according to guidelines provided by the coordinators and supervisors of the course as well as we will not incorporate, without acknowledgement, any material previously submitted for a degree or diploma in any university. To the best of our knowledge and belief, the project work will not contain any material previously published or written by another person or ourselves except where due reference is made in the text of appropriate places

Name	Signature
(i) P.K.M.S. Thewmika	Soul
(ii) H.K. Nonis	Hindle
(iii) E.S. Wijesekara	E
(iv) W.P.D. Weerasinghe	** <u>*</u>
(v) A.J.R.G. Pamudu	Carped.
(vi) P.D.R.O. Samaranayaka	Ruveen.