

# **AI Driven Smart Tourism Platform for Personalized, Safe and Sustainable Travel**

R25-006

Project Proposal Report

Srikanthan S – IT21821240

B.Sc. (Hons) Degree in Information Technology Specialized in  
Software Engineering

Department of Computer Science and Software Engineering

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Collaborative travel companion platform

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## DECLARATION

We declare that this is my own work, and this proposal does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other university or Institute of higher learning and to the best of our knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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The above candidate is carrying out research for the undergraduate Dissertation under my supervision.

  
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Signature of the supervisor:

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Date: 27-01-2025

  
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Signature of the Co-supervisor:

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Date: 27-01-2025

# Abstract

This report outlines the development of a Collaborative Travel Companion Platform designed to revolutionize group travel planning through intelligent matching and event-based itinerary creation. The platform uses advanced algorithms to connect users with travel groups based on shared preferences, including travel interests, budgets, and travel styles. By offering personalized trip recommendations, it helps users find compatible travel companions and collaboratively plan their journeys, ensuring a seamless and enjoyable experience. The platform designed to be social and interactive, offering real-time group chats to keep one in touch with their travel group with ease. This feature makes planning easier as members can discuss and fix on the details of a trip. The sharing of experiences within the community adds liveliness to the space, allowing for the exchange of ideas and building connections among travellers. Sentiment analysis is employed to continuously process and refine user feedback, enhancing the accuracy of group matching and trip recommendations. This iterative process ensures that the platform remains responsive to user needs, improving satisfaction and providing a more personalized travel planning experience. By addressing the complexities of group travel, the platform offers a comprehensive solution that simplifies coordination and enhances the entire journey.

**Keywords:** Group Travel Planning, Intelligent Group Matching, Social Travel Experience, Community Travel Sharing, Machine Learning Algorithms, Sentiment Analysis

# TABLE OF CONTENTS

## Contents

Declaration .....	iii
Abstract .....	4
TABLE OF CONTENTS .....	5
List OF Figures .....	6
List OF Tables.....	6
List Of Abbreviations.....	7
1. INTRODUCTION .....	8
1.1 Background & Literature survey.....	8
1.2 Research Gap .....	10
1.3 Research Problem.....	11
2. OBJECTIVES .....	12
2.1 Main Objective.....	12
2.2 Specific Objectives .....	12
3. METHODOLOGY .....	13
3.1 Requirement Gathering .....	13
3.1.1 Past Research Analysis.....	13
3.1.2 Identifying Existing Systems.....	14
3.2 System Diagram .....	14
3.3 Development Methodology.....	15
3.4 Project Management Methodology .....	15
3.5 Feasibility study .....	15
3.5.1 Technical Feasibility .....	15
3.5.2 Schedule Feasibility.....	16
3.5.3 Economic Feasibility .....	16
3.6 System Analysis .....	17
3.6.1 Software Solution Approach .....	17
3.6.2 Tools and Technologies .....	18
3.7 Project Requirements .....	20
3.7.1 Functional Requirements.....	20
3.7.2 Non-functional Requirements .....	20
3.8 Project Scope .....	21
3.8.1 In-Scope.....	21
3.8.2 Out of Scope.....	21

3.9 Testing .....	22
3.10 Timeline .....	23
3.11 Risk management Plan .....	24
3.12 Communication Management Plan.....	25
3.12.1 Communication Objectives .....	25
3.12.2 Communication Media .....	25
4.0 WORK BREAKDOWN.....	26
5.0 COMMERCIALIZATION .....	27
6.0 BUDGET .....	28
7.0 SUMMARY .....	29
REFERENCES .....	30

## List OF Figures

Figure 1 - System Diagram .....	14
Figure 2 - Gantt Chart .....	23
Figure 3 - Work Breakdown Structure .....	26

## List OF Tables

Table 1 : Competitive Analysis .....	10
Table 2 - Risk Management Plan .....	24
Table 3 - Cost Management Plan .....	28

# List Of Abbreviations

Abbreviation	Description
ML	Machine Learning
AI	Artificial Intelligence
NLP	Natural Language Processing
VS CODE	Visual Studio Code
DB	Database
API	Application Framework Interface
VCS	Version Control system
LLM	Large Language Model
UI	User Interface

# 1. INTRODUCTION

## 1.1 Background & Literature survey

In recent years, the tourism industry in Sri Lanka has undergone a significant transformation, largely driven by digital platforms and technological innovations. Group travel, a form of travel that brings together multiple people with shared interests, is one area that has been particularly impacted by these changes. Traditional group travel often presents challenges such as aligning varying preferences, managing budgets, and organizing activities in a way that satisfies everyone. Despite the increasing number of platforms designed for travel coordination, most still fail to address the unique complexities of group travel. Ensuring compatibility between group members is vital for a smooth and enjoyable experience. The Collaborative Travel Companion Platform with Intelligent Group Matching and Event-Based Planning is designed to overcome these challenges by leveraging advanced technologies like Artificial Intelligence (AI), Machine Learning (ML), and real-time communication tools. The platform's goal is to match users with like-minded travellers based on preferences such as travel style, interests, and budget, facilitating the creation of compatible travel groups and enhancing the overall group travel experience.

As personalized travel becomes increasingly important, many travellers now seek experiences that align with their individual preferences. At the same time, they continue to enjoy the social and cost-sharing advantages of group travel. Traditional group travel options, however, often lack the flexibility to offer customized itineraries that cater to the diverse interests and needs of travellers. By utilizing AI-driven algorithms, the proposed platform dynamically matches users who share similar travel goals, whether it's a destination, a set of activities, or a specific budget range. Moreover, real-time collaboration features allow group members to effectively coordinate and plan their activities, ensuring that everyone's preferences are considered in the final itinerary [1]. AI has the potential to significantly enhance personalized travel recommendations by tailoring them to users' individual preferences [2]. However, matching users for group travel requires a more complex approach, as it must consider multiple, overlapping factors such as interests, budgets, and travel styles. This gap in current systems is the primary challenge the platform seeks to address.

An essential feature of the Collaborative Travel Companion Platform is its use of sentiment analysis to improve the matching and recommendation process over time. Sentiment analysis plays an important role in the travel industry by providing valuable insights into user satisfaction, which can inform future recommendations and platform improvements. Studies have shown that sentiment analysis, when applied to user feedback and reviews, can help refine recommendation systems, making them more accurate and aligned with user preferences [3], [4]. The platform's approach will combine user preferences with sentiment-driven insights to continuously adapt its group matching and trip recommendation system. This iterative learning process will ensure that the platform becomes increasingly accurate in recommending travel companions and group itineraries, enhancing user satisfaction.

This research contributes significantly to the field of travel technology by addressing a longstanding issue in group travel: the difficulty in coordinating group preferences in a personalized and flexible manner. The integration of AI, real-time communication tools, and sentiment analysis represents a step forward in optimizing group travel experiences. As



emphasized in prior studies, effective real-time communication is crucial for group travel, but it must be paired with intelligent algorithms to offer a truly personalized experience [5], [6]. The proposed platform's integration of these technologies will create a holistic solution that bridges the gap between personalized travel preferences and the complexities of group travel dynamics, ultimately providing users with a smoother and more enjoyable experience.

The significance of this research lies in its potential to revolutionize group travel planning. By enabling intelligent matching and real-time collaboration, the platform can dramatically enhance the group travel experience, ensuring that users are paired with compatible travellers and can easily coordinate trip details. Additionally, the platform's incorporation of sentiment analysis will allow for continuous refinement of its recommendations, making it increasingly responsive to user needs. This capability adds immense value not only to individual travellers but also to the broader tourism industry, where personalized and efficient group travel solutions can increase customer satisfaction and engagement [7], [8]. For tourism providers, offering such a platform could lead to higher customer loyalty, while stakeholders can benefit from the growing demand for more social, personalized travel options. On a societal level, this platform can encourage community interaction, fostering social connections between like-minded travellers. Furthermore, by optimizing the coordination of group activities and transportation, the platform can contribute to sustainable travel practices, helping to reduce both costs and the environmental impact of travel [9].

## 1.2 Research Gap

In the field of collaborative travel planning, existing solutions primarily focus on individual trip planning or group tours that are rigid and predefined. While platforms like Tripadvisor and Visit Sri Lanka offer rich content on destinations and general group tour packages, they fall short in enabling real-time collaboration and personalized group itinerary management. Current systems do not support intelligent group matching based on preferences, such as budget, interests, and travel goals, which is crucial for a cohesive group experience. Additionally, there is a significant gap in integrating AI-driven customization for group travellers, which could enhance the user experience by adapting the itinerary in real-time as per evolving group dynamics.

Another major gap is the lack of real-time collaboration tools in existing platforms. Many group travel solutions still rely on external tools for communication and coordination, which creates a fragmented user experience. There is no platform that allows group members to collaborate in real-time on planning their trip, vote on destinations, or modify itineraries as the trip progresses. Moreover, existing services often do not integrate sentiment analysis to enhance recommendations based on feedback, which means travellers do not have a system that continuously learns and adapts to their changing preferences. Thus, the absence of these features hinders a seamless and enjoyable group travel experience.

Lastly, sustainability remains a largely unexplored area in group travel platforms within Sri Lanka. Despite the growing importance of sustainable travel, platforms currently available do not prioritize eco-friendly travel options or include tools to help groups choose sustainable practices, such as green accommodations or group transportation. This research gap offers an opportunity to integrate sustainability within the collaborative travel planning process. Your proposed platform can fill these gaps by introducing AI-driven group matching, real-time collaboration, personalized itineraries, and sustainability features, providing a much-needed solution for the Sri Lankan travel industry.

Feature	Tripadvisor Sri Lanka	Visit Sri Lanka (Official Tourism Website)	Lanka Traveller	Sri Lanka Group Tours (Tour Operators)	Proposed Collaborative Travel Platform
<b>Group Travel Coordination</b>	Limited; does not offer real-time group planning	Limited; focuses on pre-packaged tours	Limited; group tours available but not customizable	Pre-packaged tours, limited flexibility	Real-time collaboration & customizable itineraries
<b>Intelligent Group Matching</b>	No intelligent matching for travellers based on interests or preferences	No AI-driven group matching	No AI-driven group matching	No intelligent group matching	AI-driven matching based on preferences, budget, and travel goals
<b>Real-time Collaboration</b>	No real-time communication tools	No real-time collaboration features	No real-time collaboration tools	No real-time collaboration tools	Real-time chat, voting on activities, itinerary adjustments
<b>Sentiment Analysis</b>	No sentiment analysis integration	No sentiment-driven recommendation	No sentiment-driven recommendation	No sentiment analysis	Sentiment analysis for personalized recommendations

Table 1 : Competitive Analysis

### 1.3 Research Problem

The Sri Lankan tourism industry has witnessed a surge in digital platforms aimed at enhancing the travel experience. However, there remains a significant gap in addressing the challenges associated with group travel, especially in terms of matching travellers with similar preferences, ensuring budget compatibility, and coordinating activities effectively. Traditional group travel solutions in Sri Lanka fail to offer personalized and flexible itineraries that meet the diverse needs of travellers. Most existing platforms do not consider the complex and dynamic factors such as travel styles, destination preferences, or budget constraints when forming travel groups, leading to dissatisfaction among travellers. Moreover, the limited real-time communication and collaboration tools available in these platforms hinder the smooth organization of group travel, which is critical for ensuring a pleasant and harmonious experience. Therefore, the primary research problem is to design and develop a Collaborative Travel Companion Platform specifically for the Sri Lankan market that leverages AI, Machine Learning, and real-time communication tools to intelligently match travellers and plan group trips based on personalized preferences.

Current systems in the tourism industry, both in Sri Lanka and globally, often focus on one-size-fits-all solutions that lack the flexibility needed to accommodate the diverse interests and preferences of individual travellers within a group. While Artificial Intelligence (AI) has shown promise in personalizing travel recommendations [1], the complexity of group travel requires a more nuanced approach that considers overlapping factors, such as preferences for destinations, activities, and budget. Many platforms focus solely on the destination or the activity, ignoring the holistic nature of group travel. Furthermore, the challenge of incorporating real-time communication and collaboration tools into such platforms has not been adequately addressed in the context of Sri Lankan tourism. Real-time communication between group members is essential for coordination but remains underutilized in current solutions [4]. The research problem, therefore, lies in developing an AI-driven platform that not only matches travellers based on multiple overlapping factors but also fosters real-time collaboration, ensuring a seamless and personalized group travel experience in Sri Lanka.

Additionally, sentiment analysis has emerged as a powerful tool for enhancing personalization in travel recommendations by analysing user feedback [3], [5]. However, its application in group travel coordination is still underexplored, particularly in the context of Sri Lanka. There is a significant gap in platforms that integrate sentiment analysis with AI-driven matching systems to dynamically improve group travel recommendations over time. The lack of personalized group travel experiences that adapt to evolving user preferences and sentiments further compounds the problem. The platform proposed in this research aims to bridge this gap by incorporating sentiment analysis to refine and personalize travel recommendations, improving user satisfaction, and making the travel planning process more adaptive and efficient. The research problem, therefore, is to design a system that combines AI-based group matching, real-time communication tools, and sentiment analysis to provide a comprehensive solution for group travel in Sri Lanka.

## **2. OBJECTIVES**

### **2.1 Main Objective**

The main objective of this research is to develop a Collaborative Travel Companion Platform tailored for the Sri Lankan tourism market, utilizing advanced technologies like Artificial Intelligence (AI), Machine Learning (ML), and real-time communication tools. The platform will address the challenges of group travel by intelligently matching users with compatible travel companions based on preferences such as travel style, interests, and budget. It will also incorporate sentiment analysis to enhance personalized travel recommendations over time. By facilitating seamless communication and collaboration among group members, the platform aims to create personalized, flexible, and cost-effective group travel experiences that cater to the diverse needs of Sri Lankan travellers.

### **2.2 Specific Objectives**

- **AI-Driven Group Matching:** To develop an AI-based algorithm that matches travellers with similar preferences, such as travel destination, activities, and budget, ensuring compatibility for a harmonious group travel experience.
- **Real-Time Collaboration Tools:** To integrate real-time communication and collaboration features into the platform, allowing group members to efficiently coordinate and plan activities together.
- **Sentiment Analysis Integration:** To implement sentiment analysis techniques to gather feedback from users, which will continuously refine and enhance the platform's recommendations and group matching system.
- **Continuous Improvement of Recommendations:** To develop a system that uses data-driven insights and sentiment analysis to adapt and improve the platform's recommendations over time, increasing user satisfaction with each trip.
- **Localization for Sri Lankan Market:** To tailor the platform specifically for Sri Lanka's tourism industry, considering local preferences, travel patterns, and cultural aspects to ensure its relevance and effectiveness.

## 3. METHODOLOGY

### 3.1 Requirement Gathering

The requirement gathering for the Collaborative Travel Companion Platform will involve extensive consultations with key stakeholders, including travellers, tour operators, and local tourism experts. User surveys will be conducted to collect data on the most common challenges faced by group travellers in Sri Lanka, as well as their preferences regarding travel styles, destinations, budgets, and activities. Additionally, data will be gathered on real-time communication needs, such as the most effective ways for group members to coordinate and share plans. The platform's data set will also be enriched by collecting user feedback on past travel experiences, particularly focusing on sentiment analysis to understand satisfaction levels and preferences. This will be done by integrating sentiment analysis tools that gather insights from existing public data set. By combining these sources, a comprehensive dataset will be built, which will then inform the AI algorithms for group matching and itinerary planning.

#### 3.1.1 Past Research Analysis

Group travel has historically played a significant role in tourism, delivering social and economic benefits. However, the coordination of group preferences, budgets, and itineraries remains challenging. Traditional travel platforms are inadequate for group travel needs, as they largely cater to individual planning. The emergence of Artificial Intelligence (AI) and Machine Learning (ML) offers opportunities for personalization, but their application to group travel is still underdeveloped, particularly in addressing group dynamics such as member compatibility and diverse preferences [1].

AI-driven personalization enhances user experiences by aligning travel recommendations with individual preferences. Research demonstrates that AI effectively generates itineraries by analysing user behaviours, preferences, and historical data. However, applying this to group travel introduces challenges like overlapping travel styles, interests, and budgets. Advanced algorithms are required to dynamically evaluate group compatibility and ensure collective satisfaction [2].

Sentiment analysis has been explored to refine travel recommendation systems by analysing user reviews and feedback. This approach improves user satisfaction by offering insights into traveller expectations. However, existing platforms focus on post-trip feedback and lack real-time adjustment capabilities for group dynamics, leaving a critical gap in collaborative travel planning [3].

Real-time communication tools are crucial for group travel coordination, as they significantly reduce planning conflicts and enhance travel experiences. Integrating these tools with intelligent algorithms could create seamless group planning environments. Despite this potential, current platforms often fail to combine these features, limiting their applicability for group travel [4].

Studies on AI and ML in travel matching reveal their potential in aligning travellers based on shared interests and goals, improving compatibility among group members. However, their

application in large-scale group travel remains limited. Integrating ML algorithms with real-time collaboration features can provide comprehensive group travel solutions [2].

Sustainability is another critical area for group travel. Intelligent travel platforms can optimize group activities by reducing redundant transportation and promoting shared resources, aligning with sustainable tourism practices, particularly in environmentally sensitive regions [8].

While research highlights the potential of AI, ML, and sentiment analysis, the unique challenges of group travel remain largely unexplored. Most platforms lack a holistic approach that integrates intelligent matching, real-time communication, and sentiment-based insights. The proposed Collaborative Travel Companion Platform aims to bridge this gap by addressing group dynamics, enhancing real-time collaboration, and delivering personalized, sustainable itineraries.

### 3.1.2 Identifying Existing Systems

In Sri Lanka, platforms like Travel Lanka and TripAdvisor Sri Lanka aim to connect travellers and offer insights about destinations, accommodations, and activities. Travel Lanka primarily serves as a space for users to share travel plans, join group tours, and explore local destinations. While users can interact and share their itineraries, the platform does not offer detailed group matching or real-time communication tools for seamless planning. Similarly, TripAdvisor Sri Lanka provides a wealth of user-generated content, such as reviews and activity recommendations, but lacks the ability for travellers to collaborate or match with like-minded individuals based on shared preferences, budgets, or travel styles. Users typically plan trips individually or through local agencies, and the platforms offer little to no integration for group event planning.

## 3.2 System Diagram

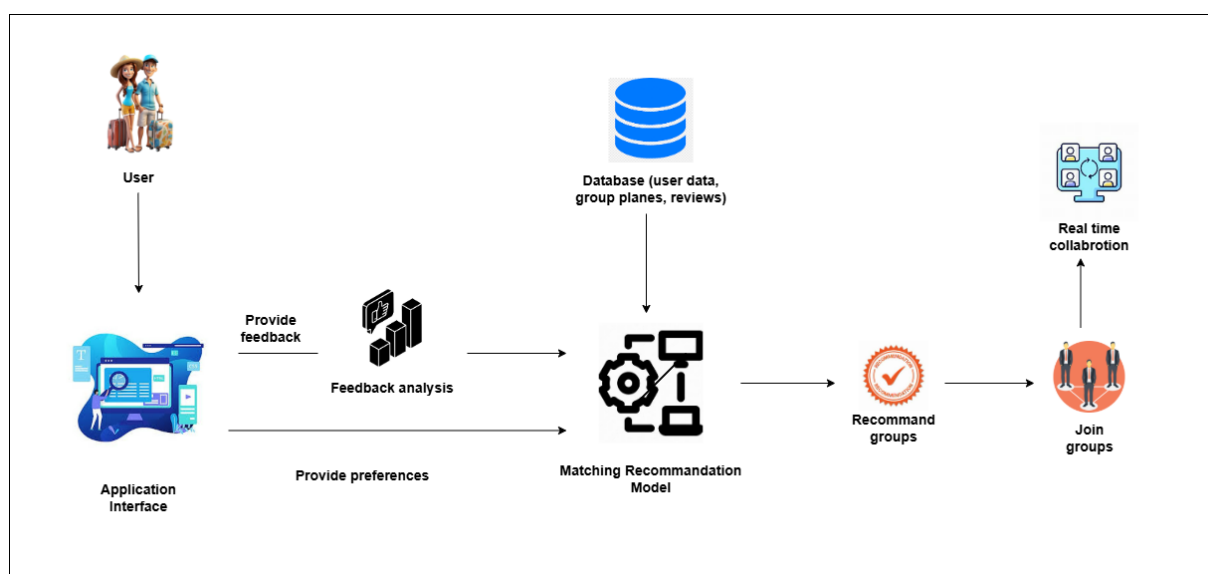


Figure 1 - System Diagram

### **3.3 Development Methodology**

To effectively manage the development of the Collaborative Travel Companion Platform, time, scope, and cost must be carefully considered. The project should accommodate changes in requirements while also allowing for adjustments throughout its lifecycle. After thorough evaluation of these factors, the Agile methodology was chosen to guide the development process. This approach allows for the creation of a functional prototype that can be iteratively refined based on regular feedback from the mentor. By incorporating feedback in brief sprints, there will be sufficient time to make necessary improvements, ultimately resulting in a product that meets the highest satisfaction of both the author and the mentor. Presenting a functional prototype facilitates easier and more precise mentor feedback.

### **3.4 Project Management Methodology**

Research requires effective project management, where scope, time, and cost must be carefully aligned through a structured system or procedure. For the Collaborative Travel Companion Platform project, a process-oriented methodology will be employed, dividing the project into distinct stages with meticulously planned inputs and outputs. This approach is designed to accommodate changes, identify risks, and manage the project effectively. JIRA will be used to support this methodology, providing a robust platform for tracking progress, managing tasks, and ensuring that project requirements and timelines are met efficiently.

### **3.5 Feasibility study**

#### **3.5.1 Technical Feasibility**

##### **3.5.1.1 Knowledge on Technologies**

To develop the proposed solution, the knowledge in below mentioned technologies should be wanted.

- **Data Preprocessing:** Ability to clean and prepare user data (preferences, budget, interests) for accurate travel group matching. Extracting relevant features to improve the accuracy of recommendations (e.g., location, travel style).
- **Large Language Models (LLMs):** Experience in using language models to generate personalized travel plans and real-time chat responses. Analysing user reviews and feedback to improve recommendations and content.
- **Machine Learning Frameworks:** Familiar with machine learning frameworks like TensorFlow and Scikit-learn to build models for group matching and recommendation systems. Using recommendation algorithms to match users to groups based on shared preferences and behaviours.
- **Adaptive Algorithms:** Familiarity with algorithms like Item Response Theory (IRT) to adjust trip recommendations based on user experience. Adapting recommendations and group suggestions based on individual user engagement and past behaviour.
- **Performance Analysis Tools:** Experience with analysis tools to improve recommendations and overall user satisfaction.

### **3.5.1.2 Knowledge on Tools**

To develop the proposed optimization model, all members should have quite an in-depth understanding of the development tools and project management, as well as other supportive tools. We will be using Jira to facilitate project tracking and management throughout the development process.

### **3.5.1.3 Data Collection Knowledge**

- **Data Collection:** For this project, data will be collected from user surveys, user profiles, travel preferences, feedback from past trips, reviews and publicly available travel datasets. This approach ensures comprehensive and relevant data for matching users to travel groups and enhancing trip recommendations.
- **Data Preprocessing:** The collected data will be meticulously cleaned and formatted to ensure consistency and relevance, including steps such as removing any irrelevant or redundant information, standardizing formats, and addressing any missing values to prepare the data for effective analysis and modelling.

### **3.5.2 Schedule Feasibility**

Another important consideration during this investigation was the feasibility of the project schedule. To ensure that the timeline is realistic and manageable, tasks are created and tracked using Jira. This approach allows for detailed planning and scheduling, with a major emphasis placed on setting up the necessary tools and resources for effective project management and assessment. By utilizing Jira, we can closely monitor progress, address potential delays, and adjust as needed to maintain a feasible and resilient project timeline

### **3.5.3 Economic Feasibility**

Economic feasibility involves assessing the potential costs of development and the use of tools and technologies. This includes estimating expenses for software licenses, development tools, infrastructure, and ongoing operational costs. By carefully evaluating these factors, we aim to ensure the project remains within budget and delivers a cost-effective solution.



## 3.6 System Analysis

### 3.6.1 Software Solution Approach

1. Project Planning
  - Define Objectives: Establish clear goals for the Collaborative Travel Companion Platform, focusing on real-time adaptability, group matching, and effective trip planning.
  - Gather Requirements: Collect requirements from stakeholders
  - Create a Project Timeline: Develop a timeline with milestones for each phase of development.
2. Data Collection

Gather data from user surveys, profiles, travel preferences, past trip feedback, reviews, and public travel datasets.
3. Pre-Processing
  - Data Cleaning: Remove irrelevant or erroneous data to ensure accurate analysis.
  - Data Structuring: Organize data into a structured formats for model training
4. Model Selection
  - Use collaborative filtering or content-based filtering for recommending groups and trip plans.
  - Sentiment analysis on trip reviews using natural language processing (NLP).
5. Algorithm Implementation

Develop and fine-tune algorithms for intelligent group matching.
6. Performance Analysis
  - Performance Metrics: Evaluate algorithms using metrics such as precision, recall, and sentiment polarity scores.
  - Report Generation: Provide insights into user engagement, satisfaction rates, and system performance.
7. User Interface (UI) Design
  - Design: Develop a user-friendly interface for users to interact with the platform, ensuring ease of navigation and accessibility.
  - Prototyping: Create mockups and prototypes for the interface and review them with stakeholders for feedback.
8. System Integration
  - Integrate Components: Combine the front-end, back-end, and ML components seamlessly.
  - API Development: Develop APIs for interaction between the frontend and backend components.
  - Use cloud platforms (e.g., AWS or Google Cloud) for scalability and performance.

## 9. Testing and Quality Assurance

- Unit Testing: Test individual components for functionality and accuracy.
- Integration Testing: Verify that integrated components work together correctly.
- User Testing: Conduct usability testing with actual users to gather feedback and identify areas for improvement.
- Performance Testing: Assess system performance under various loads to ensure reliability and responsiveness.

### 3.6.2 Tools and Technologies

- Programming Languages
  - Python - For implementing machine learning models and NLP tasks
- Frameworks and Libraries
  - Scikit-learn - For implementing recommendation algorithms like collaborative or content-based filtering.
  - TensorFlow - For building custom ML models for advanced matching algorithms.
  - NLTK - For feedback analysis and sentiment scoring using NLP.
- Recommendation engines
  - Surprise - A lightweight library for building and analysing recommendation systems.
  - LightFM - A hybrid recommendation framework that combines collaborative and content-based filtering.
- Data Storage and Management
  - MongoDB - NoSQL database for storing user profiles, preferences, and trip data
  - PostgreSQL - Relational database for handling structured data and advanced queries.
- Development and Project Management Tools
  - Google Colab or VS Code: For development and testing of models and code. Google Colab is suitable for collaborative work and leveraging cloud resources.
  - Jira: For project management, tracking progress, and managing tasks.
- UI Design and Development
  - Figma: For designing user interfaces and user experience elements.
  - React JS: For front-end development, creating dynamic and responsive user interfaces. Tailwind CSS: For designing and developing UI components with a utility-first approach.
  - Node.js with Express.js - For building scalable RESTful APIs and handling business logic.

- Diagramming and Design Tools
  - Draw.io: For creating system diagrams and visualizing architectural designs.
- Version Control System
  - Git: For version control
  - GitHub - For collaborative repository management.
- Collaboration Tools
  - Microsoft Teams or WhatsApp: For team communication and collaboration.
- Testing Tools
  - Pytest - For writing and running test cases in Python, ensuring code quality and reliability.
  - Jest - For unit and integration tests.
  - Postman - For testing and debugging APIs.
- Deployment Tools
  - Docker - For creating consistent development and production environments
  - Kubernetes - For orchestrating containerized applications.

## **3.7 Project Requirements**

### **3.7.1 Functional Requirements**

- **Gather and Manage Dataset:** Collect and maintain a comprehensive dataset, including user preferences, travel interests, trip reviews, and public travel information, to enhance group matching and trip recommendations.
- **User Matching and Recommendations:** Match users with travel groups based on shared preferences (e.g., budget, interests, travel style) and provide personalized group recommendations.
- **Trip Planning and Collaboration:** Allow users to join travel groups, create new trip plans, and collaborate with other group members to organize trips.
- **Real-Time Communication:** Enable real-time group chats for participants to coordinate activities, share transportation plans, and manage cost-sharing.
- **Feedback Collection and Analysis:** Collect ratings and reviews on group trips, analyse feedback to measure satisfaction, and use insights to improve group recommendations.
- **Platform Implementation:** Develop and integrate algorithms, implement user-friendly interfaces, and track user performance and engagement in real time.

### **3.7.2 Non-functional Requirements**

- **Performance** - Real-time communication must have a latency
- **Scalability** - The system must handle an increasing number of users and groups without significant performance degradation.
- **Reliability** - Implement regular data backups to prevent data loss
- **Usability** - The platform must have an intuitive UI and be accessible to users with varying technical skills.
- **Security** - Secure user data with encryption, implement role-based access control (RBAC) for managing sensitive operations.
- **Maintainability** - The codebase must follow clean coding standards and include proper documentation.

## **3.8 Project Scope**

### **3.8.1 In-Scope**

- User Registration and Profiles - Creation and management of user profiles, including preferences and travel styles.
- Intelligent Group Matching - Matching users with travel groups based on preferences like budget, travel interests, and destinations. Personalized recommendations for travel groups and trip plans.
- Real-Time Communication - Real-time group chats for coordination of travel plans and activities.
- User Interface - Development of a user-friendly web interface. With mobile and web compatibility.
- Feedback and Analytics - Gathering and analysing user feedback to improve group matching and trip recommendations.

### **3.8.2 Out of Scope**

- Offline Access - The platform does not support full offline functionality, as it requires real-time synchronization and internet connectivity for core features like group chats.
- AR/VR Features - Augmented Reality (AR) or Virtual Reality (VR) experiences for trip previews are not included in the scope.
- Complex Travel Logistics - Advanced logistics like visa processing, insurance handling, or detailed legal travel documentation are out of scope.
- Gamification - Advanced gamification elements such as leaderboards or achievements are not part of the initial scope.

### 3.9 Testing

Testing is a crucial stage in validating the Collaborative Travel Companion Platform. The process will begin with unit and system testing conducted by the development team to ensure all functionalities operate correctly and to identify any potential issues. This initial phase will focus on verifying key features such as group recommendations, user profile creation, trip plan suggestions, real-time group chats, and feedback analysis.

Following this, the platform will be tested with a select group of users in both controlled and live environments. This phase will include acceptance testing, with alpha and beta testing to evaluate how the platform performs in real-world scenarios and to collect user feedback.

The testing process will primarily be manual, but it will be supported by internal checks and assertions to validate specific functionalities of the platform. This strategy will ensure that the platform not only meets the intended functional requirements but also consistently delivers a reliable and personalized learning experience for the users.

### 3.10 Timeline

For the timeline, the project will follow a structured development process. Initially, the team will focus on finalizing the platform's design, including the detailed system diagram and selection of key technologies. This will be followed by the implementation phase, where the core functionalities will be developed. Concurrently, the integration of performance analysis tools and other components will take place. The final stages will involve rigorous testing, performance evaluation, and the development of commercialization strategies. The project is expected to progress through these phases, ensuring thorough development and testing before the platform is launched.

Tasks	2024		2025									
	November	December	January	February	March	April	May	June	July	August	September	October
Research topic selection												
Feasibility Study												
Evaluate feasibility and backgroud study												
Topic evaluation												
Requirement gathering												
Background survey												
Literature reviw												
Requirement analysis												
Software requirement specification												
Functional and non functional requirements												
Project charter												
Proposal presentation												
Project proposal report												
Software design												
Designing wireframes												
ML component development												
Front end development												
Progress presentation 1												
Research paper												
Unit Testing												
Progress presentation 2												
Software integration												
Integration Testing												
Deployment and maintenance												
Final presentation and Viva												

Figure 2 - Gantt Chart

### 3.11 Risk management Plan

Identified Risk	Risk level	Probability for occurrence of risk	Mitigation plan
Technical Failures or Bugs	High	High	Seek expert advice or consult with the supervisor and co-supervisor to address and resolve technical issues quickly.
Limited Knowledge in the field	High	Medium	Close knowledge gaps by participating in relevant online courses, workshops, and expert consultations.
Insufficient Technical Skills	High	Medium	Explore existing technologies and projects to build the necessary skills, especially in implementing algorithms and adaptive systems.
Changes in Project Scope	High	Medium	Examine the scope thoroughly and make feasible modifications with input from the supervisor and co-supervisor to ensure alignment with objectives.
Difficulty in Defining Requirements	High	Low	Employ effective requirement gathering techniques and consult with experts to ensure clear and accurate project specifications.
Data Loss from System Failures	High	Medium	Implement regular data backups, utilize cloud storage solutions, and adopt strong cybersecurity practices to prevent data loss.
Modifications Requested by Review Panel	High	Medium	Evaluate requested changes promptly and adjust the project timeline as needed, with guidance from the supervisor and co-supervisor.
Risk of Data Breaches or Security Vulnerabilities	High	Low	Apply stringent security measures, perform regular security audits, and use encryption to safeguard user data and maintain confidentiality.

Table 2 - Risk Management Plan



### **3.12 Communication Management Plan**

The Communications Management Plan is designed to ensure that all team members, as well as the supervisor and co-supervisor, receive the necessary information to effectively perform their roles throughout the project. Effective communication is crucial for successful project execution. This plan outlines how communication will occur with various stakeholders, specifying the audience, content, format, frequency, and expected outcomes. It also details each stakeholder's role, task assignments, and communication strategy based on their influence, interests, and expectations.

#### **3.12.1 Communication Objectives**

Proactive communication is essential for project success. Communication should be:

- Adequate: Providing information in the right format and content.
- Specific: Tailored to the targeted audience.
- Sufficient: Including all necessary details.
- Concise: Clear and to the point, avoiding unnecessary repetition.
- Timely: Addressing relevant points at appropriate times.

#### **3.12.2 Communication Media**

The following media will be utilized for communication throughout the project:

1. Email: For formal updates, documentation, and detailed communications.
2. Documents (MS Word and PowerPoint): For reports, presentations, and detailed project documentation.
3. Phone Calls: For quick discussions and urgent matters.
4. Meetings: Conducted via meeting rooms, conference phones, or Microsoft Teams for in-depth discussions, planning, and progress reviews.
5. Chats (WhatsApp): For informal, quick exchanges and real-time updates.

## 4.0 WORK BREAKDOWN

The Work Breakdown Structure (WBS) for the Collaborative Travel Companion Platform is a critical element of the project management process. It involves dividing the overall project into smaller, manageable tasks or work packages. This structured approach ensures that every aspect of the platform, from data collection to final validation, is carefully planned and executed. The WBS supports clear task delegation, progress monitoring, and effective control over the project, helping the team manage resources, timelines, and deliverables efficiently. Additionally, it helps identify dependencies and critical paths, ensuring that all project goals are achieved within the defined constraints.

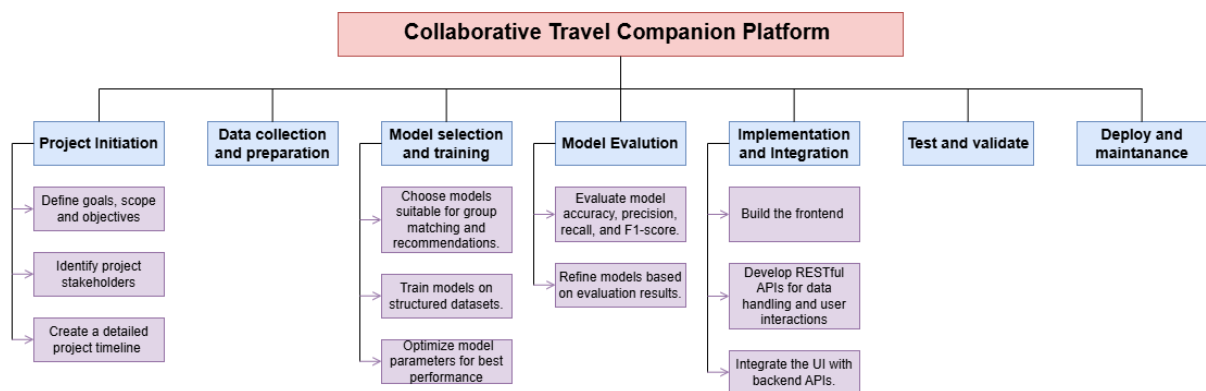


Figure 3 - Work Breakdown Structure

## 5.0 COMMERCIALIZATION

**Subscription Model:** The web application, designed specifically for user for users who love to travel within Sri Lanka, will offer both free and premium subscription plans tailored to users in Sri Lanka. The free version will provide limited access to key features such as basic group recommendations and trip planning tools. Premium subscribers will enjoy full access to all platform functionalities, including advanced group matching, personalized travel suggestions, real-time group communication, and exclusive travel resources. Subscription plans will be flexible, allowing users to choose options that best suit their travel needs, with additional perks like priority customer support and early access to new features.

**Advertising Strategy:** To increase the visibility and adoption of our web application, a targeted advertising campaign will be launched. This campaign will focus on reaching travellers, travel enthusiasts, and industry professionals through various digital channels, including social media, travel forums, and online communities. Advertisements will highlight the unique benefits of our application, such as the Collaborative Travel Companion Platform and its integration with other tools, aiming to establish it as a go-to resource for tourists.

## 6.0 BUDGET

To ensure the successful development and deployment of the Collaborative Travel Companion Platform, a comprehensive budget has been outlined to cover essential expenses. This budget includes costs associated with internet use and web hosting, which are crucial for maintaining the platform's online presence and functionality. Training costs are allocated to equip team members and users with the necessary skills and knowledge. Publication costs cover the expenses for disseminating information and promoting the platform. Additionally, a small amount is set aside for stationery needs. The total budget required for these components is outlined below.

Type	Cost
Internet use and web hosting	LKR.10,000.00
Training Cost	LKR.30,000.00
Publication Cost	LKR.30,000.00
Stationery	LKR.5,000.00
Total	LKR.75,000.00

*Table 3 - Cost Management Plan*

## 7.0 SUMMARY

The research for the Collaborative Travel Companion Platform focuses on creating an innovative solution for travellers in Sri Lanka. The platform is designed to match users with travel groups based on shared preferences, such as budget, travel style, and interests. By offering dynamic group recommendations, the platform aims to enhance the travel experience by helping users find like-minded companions for their trips. The platform will include real-time communication features to facilitate coordination of activities, transportation, and cost-sharing, with personalized travel suggestions based on user preferences. Detailed performance analysis will be integrated to evaluate user engagement, satisfaction, and effectiveness of recommendations, supporting a customized and collaborative travel experience.

The platform is part of a larger web application that includes various components developed by the project team, such as trip planning tools, budget allocation system and real time safety assistant. The commercialization strategy includes a flexible subscription model with free and premium plans, providing users with access to essential features and advanced functionalities. The development will use a combination of modern web technologies such as Python, TensorFlow, and MongoDB, along with tools like Jira, Figma, and Docker for project management and development. Communication will be managed via Microsoft Teams and WhatsApp to ensure seamless coordination within the team.

The proposal also outlines strategies for reaching the target audience, particularly Sri Lankan travellers, through targeted advertising campaigns across digital platforms like social media, travel blogs, and online communities. These strategies aim to drive platform adoption and engagement while ensuring the platform's scalability and long-term sustainability in the travel tech market. The focus on intelligent group matching, personalized travel experiences, and community interaction is intended to establish the platform as a go-to resource for Sri Lankans looking to plan and enjoy collaborative travel experiences.

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