

A Major Project Midterm Report on  
**TravelPulse**

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## **ABSTRACT**

This proposal outlines a smart tourism decision-support platform that integrates sentiment analysis with destination exploration to enhance travel planning. By leveraging natural language processing (NLP) techniques, the system classifies sentiments from user reviews and social media posts as positive, negative or neutral. This information is used to provide meaningful insights into traveler satisfaction, safety perception and service quality, thereby supporting better travel decision making.

This project aims to develop an intelligent platform for analyzing and visualizing tourist sentiment. Implemented using Flask for backend sentiment processing, React.js for the frontend interface and Node.js for server-side handling, the platform allows users to explore destinations based on aggregated sentiment data to improve traveler experiences.

Project will consist of two module (admin side and user side) and applies machine learning-based sentiment models to drive dynamic content and decision support.

## **Keywords**

Sentiment analysis, Python, Tourism Intelligence, Natural language Processing, React.js, Machine learning

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# 1. INTRODUCTION

In an era where traveler sentiment shapes tourism trends, understanding the emotional responses of people toward travel destinations is crucial for improving tourism experiences and promoting informed travel. This proposal advocated for a sentiment analysis system focused on tourism-TravelPulse. By harnessing the power of Natural Language Processing (NLP), the system aims to extract valuable insights form user- generated content such as reviews and social media posts, thereby enabling travelers, businesses and tourism boards to make data- driven decisions.

This sentiment analysis project seeks to explore the vast scope of digital feedback from travelers across various platforms. These include travel review sites, blogs, social media, and discussion forums, where tourists openly share their experiences. By systematically collecting and analyzing this feedback, the platform uses advanced sentiment analysis techniques to classify opinions, helping end-users assess real-time perceptions about destinations before planning their journeys.

## 1.1 PROBLEM STATEMENT

Despite the widespread availability of travel reviews and ratings online, there remains a significant gap in interpreting the emotional tone behind those texts. Traditional travel planning systems often rely on star ratings or numerical scores that fail to capture the depth of user sentiment, making it difficult for travelers to assess safety, cultural vibe, or satisfaction effectively. Similarly, local tourism stakeholders struggle to extract meaningful insights from vast, unstructured public feedback.

To address this challenge, there is a pressing need for a robust sentiment analysis system tailored for tourism. By leveraging Natural Language Processing techniques, TravelPulse aims to classify and visualize sentiment trends across multiple digital channels. This enables travelers to make informed choices and allows tourism businesses to detect weaknesses, improve services, and adapt to emerging trends. With this solution, we bridge the gap between raw tourist opinions and actionable insights, enhancing overall travel experience and business decision-making.

## **1.2 OBJECTIVE**

Our primary objectives for this project include:

- a. To simplify and personalize travel planning with real time search, dynamic recommendations and destination information.
- b. To ensure secure booking, account management and user data control.
- c. To provide safe and seamless online payment integration for hassle free transactions.

## **1.3 PROJECT SCOPE AND LIMITATION**

### **1.3.1 PROJECT SCOPE:**

- Provides a platform for users to search, explore and book travel destinations in Nepal.
- Allow user registration, login and account deletion for secure access and control.
- Supports real time booking
- Integrates online payment gateway
- Offers admin control to manage destinations and user data
- Prepares for future integration of a recommended system for personalized travel suggestions.

### **1.3.2 LIMITATIONS:**

- Currently limited to destinations within Nepal.
- Relies on stable internet connection for real time data and payment process.
- No offline access to booking or travel info.
- Limited support for multi language features.
- System may not handle very high user traffic in it's initial version.



## 1.4 SIGNIFICANCE OF STUDY

The TravelPulse project holds significant value for both travelers and the tourism industry:

1. **For Travelers:** It empowers users to make smarter travel decisions by providing insights into how people emotionally react to different destinations, beyond just star ratings or popularity. This helps them choose places that align with their expectations and comfort.
2. **For Tourism Agencies and Businesses:** TravelPulse offers valuable feedback extracted from public sentiment, helping them identify areas for improvement, understand visitor satisfaction, and adapt to changing preferences. This can lead to enhanced services and better customer experiences.
3. **For Researchers and Developers:** The project demonstrates the practical application of sentiment analysis and natural language processing (NLP) in a real-world scenario, serving as a foundation for future innovations in emotion-aware systems.

## **2. LITERATURE REVIEW**

Sentiment analysis has become an essential tool for businesses in the travel and tourism industry to gauge customer satisfaction and improve services. Various sentiment analysis tools are designed to track and evaluate customer feedback, ranging from online reviews to social media mentions. [1]

Himalayan Travel Guide is a travel blog that focuses on adventure tourism in Nepal, including trekking, mountaineering, and cultural tours. It offers detailed itineraries for trekking routes like Everest Base Camp, Annapurna Circuit, and Langtang Valley. The site also provides useful travel tips, gear recommendations, and local insights for tourists looking to explore Nepal's mountains and rich cultural heritage. [2]

Trip Nepal is an online platform offering travel services including tour packages, trekking, and other adventure activities in Nepal. The website provides detailed information about popular destinations like Kathmandu, Pokhara, and Chitwan National Park, as well as the best time to visit and other travel tips. It also features travel blogs and customer reviews, making it a trusted resource for both international and domestic travelers. [3]

MakeMyTrip is one of India's largest online travel agencies, providing a variety of services such as hotel bookings, flight reservations, holiday packages, and car rentals. It features detailed travel guides, destination recommendations, and tips for exploring India's diverse regions. MakeMyTrip also offers insights into local experiences, including cultural festivals and adventure activities like trekking and wildlife safaris. [4]

Goibibo is another popular Indian travel portal that offers booking services for flights, hotels, trains, buses, and holiday packages. It features destination-specific travel content, including city guides, itineraries, and travel tips for exploring various parts of India. Goibibo also provides insights into affordable travel options, making it a great resource for budget-conscious travelers. [5]

In summary, TravelPulse is valuable for understanding user reviews and improving travelling. This project aims to build on these advancements to provide detailed insights for travellers.

### 3. METHODOLOGY

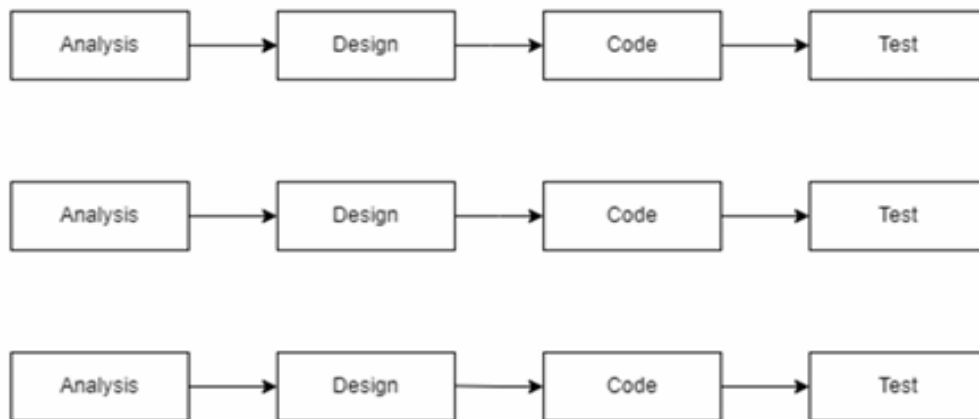
The methodology for the TravelPulse project of reviews can be structured around an agile framework, which emphasizes iterative development, flexibility, and traveller collaboration.

#### 3.1 SOFTWARE DEVELOPMENT LIFECYCLE

For our project's software development, we have chosen to use the Incremental Model. This approach involves gradually constructing the system through multiple iterations, with each iteration covering the phases of Analysis, Design, Coding, and Testing.

During initial iteration, we will be focusing on implementing the fundamental features such as user authorization and authentication, frontend and backend part. These essential elements form the core functionality of our platform.

In subsequent iteration, we will introduce our Machine Learning and Modeling part that analyze the review and classify it accordingly. The following subsection provides a concise overview of the different phases of the incremental SDLC model that we will utilize in the system's development.



**Fig 1: Incremental model**

### **3.1.1 REQUIREMENT ANALYSIS**

In this phase, analysis will be performed in order to find out the requirement of the system. The necessary requirement for further analysis of the project is gathered from the end-user, the internet and customers. As a result, final specification of the project is established.

### **3.1.2 DESIGN PHASE**

In this phase, the specifications gathered are designed as per the requirement. Further the database models, machine learning model and the logic are implemented in the project.

### **3.1.3 CODING PHASE**

After the analysis and design, coding is done according to the specifications. Coding in progress, leads to a working system in this phase.

### **3.1.4 TESTING PHASE**

In this phase, the system will be tested with each testing list of changes to the system developed, and the change will be applied to the software and the software would be delivered as a successive increment until a satisfying system is achieved.

## 3.2 SOFTWARE SPECIFICATION

### **JS:**

JavaScript is a popular programming language used to make websites interactive and dynamic. It works alongside HTML and CSS and allows features like animations, form validation, and real-time updates. JavaScript can run in the browser as well as on the server using Node.js. It is widely used in web development, and frameworks like React and Angular make it easier to build modern web apps.

### **React JS:**

React.js is a widely-used open-source JavaScript library developed by Facebook for building user interfaces, particularly single-page applications. It utilizes a component-based architecture, allowing developers to create reusable UI components, and employs JSX, a syntax extension that facilitates embedding HTML within JavaScript.

### **Node JS:**

Node.js is an open-source, cross-platform runtime environment that allows developers to execute JavaScript code outside a web browser, primarily on the server side. It supports the development of a wide range of applications, from web servers and real-time chat applications to APIs and micro services. Node.js uses a single-threaded event loop to handle multiple connections concurrently, which significantly enhances performance for I/O-heavy tasks.

### **MongoDB:**

MongoDB is a popular NoSQL database that stores data in a flexible, JSON-like format called documents. Unlike traditional relational databases, MongoDB doesn't use tables and rows—instead, it uses collections and documents, which makes it easier to store complex data structures. It is highly scalable, fast, and good for handling large amounts of unstructured or semi-structured data.

**Stripe:**

Stripe is a popular online payment platform that allows websites and apps to accept payments securely. It supports various payment methods like credit/debit cards, digital wallets, and bank transfers. Stripe is easy to integrate with APIs and is often used in e-commerce sites and mobile apps for one-time payments, subscriptions, and refunds. It's known for being developer-friendly and secure.

**Cloudinary:**

Cloudinary is a cloud-based service used for uploading, storing, and managing images and videos. It allows developers to easily upload files from websites or apps, automatically optimize them, and deliver them quickly using a content delivery network (CDN). Cloudinary also provides tools to resize, crop, and transform media files on the fly, making it ideal for modern web and mobile applications.

**SendGrid:**

SendGrid is a cloud-based email service used to send transactional and marketing emails from web and mobile applications. It helps developers manage email delivery, track email performance (like opens and clicks), and ensure reliable delivery to users' inboxes. SendGrid is commonly used for sending password resets, sign-up confirmations, newsletters, and other automated emails through easy-to-use APIs and SMTP integration.

**Mongoose**

Mongoose is an Object Data Modeling (ODM) library for MongoDB and Node.js. It provides a straightforward way to define schemas for your MongoDB collections, enforce data validation, and interact with the database using easy-to-use JavaScript methods. Mongoose is widely used for development because it simplifies database operations and offers an easy workflow, helping developers organize and manage data efficiently in Node.js applications.

**Visual Studio Code:**

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

**Github:**

GitHub is a web-based platform used for version control and collaboration. It allows developers to store, manage, and track changes to their code using Git, a powerful version control system. GitHub makes it easy for teams to work together on projects by enabling code sharing, issue tracking, and project management. It's widely used in software development to keep code organized, review changes, and collaborate efficiently.

### 3.3 PROPOSED SYSTEM

The proposed system for the sentiment analysis project of product reviews aims to develop a robust and user-friendly application that effectively analyzes and interprets customer sentiments towards products

**Data Collection and Preprocessing:** Gather product reviews from various sources, such as travel websites, social media platforms, and forums.

**Backend Development:** Develop a backend server using a framework like Flask to handle HTTP requests and responses.

**Frontend Development:** Design a user-friendly frontend interface using HTML, CSS, and JavaScript frameworks like ReactJS.

**Integration and Deployment:** Integrate the backend server with the frontend interface to enable seamless interaction and data visualization.

**Testing and Evaluation:** Evaluate the accuracy and effectiveness of the sentiment analysis model using appropriate evaluation metrics and real-world data samples.

**Documentation and Maintenance:** Provide comprehensive documentation for developers, including API documentation, code comments, and technical guides.



## 4. DESIGN

### 4.1 USECASE DIAGRAM

Use case diagrams are considered UML diagrams. UML diagrams define and organize the high-level functions and scope of a system.

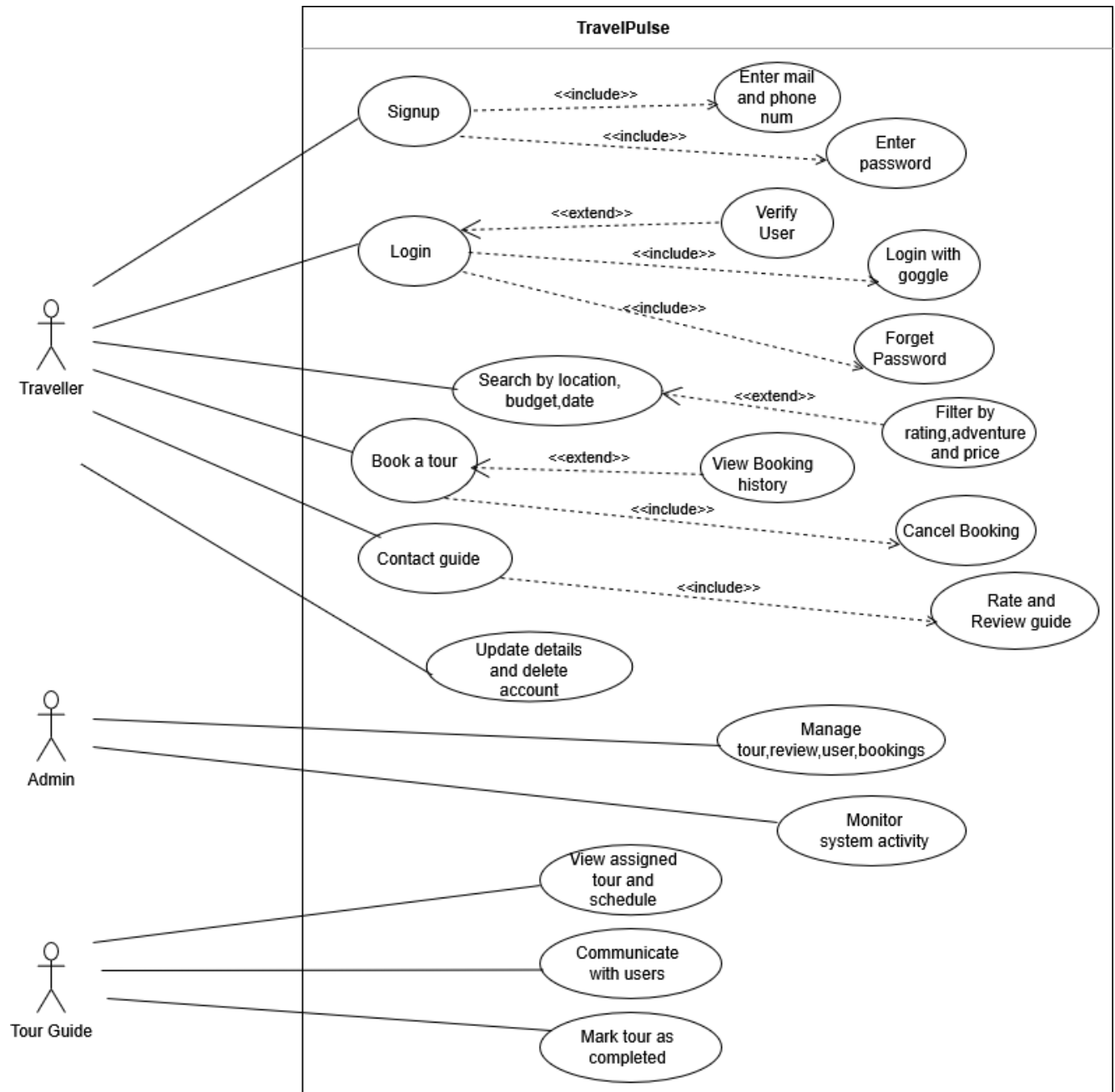
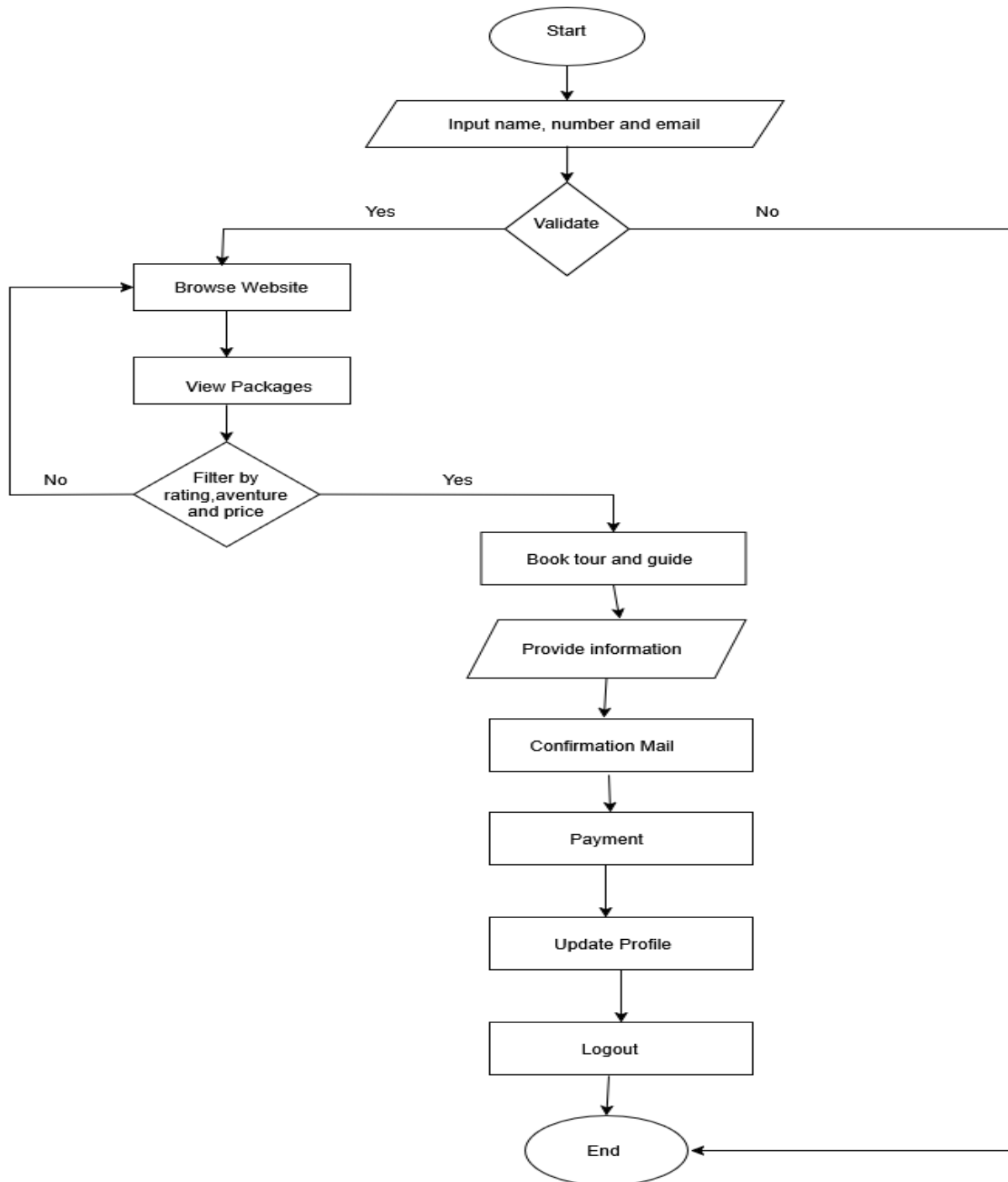


Fig 2: Use case Diagram

## 4.2 FLOWCHART

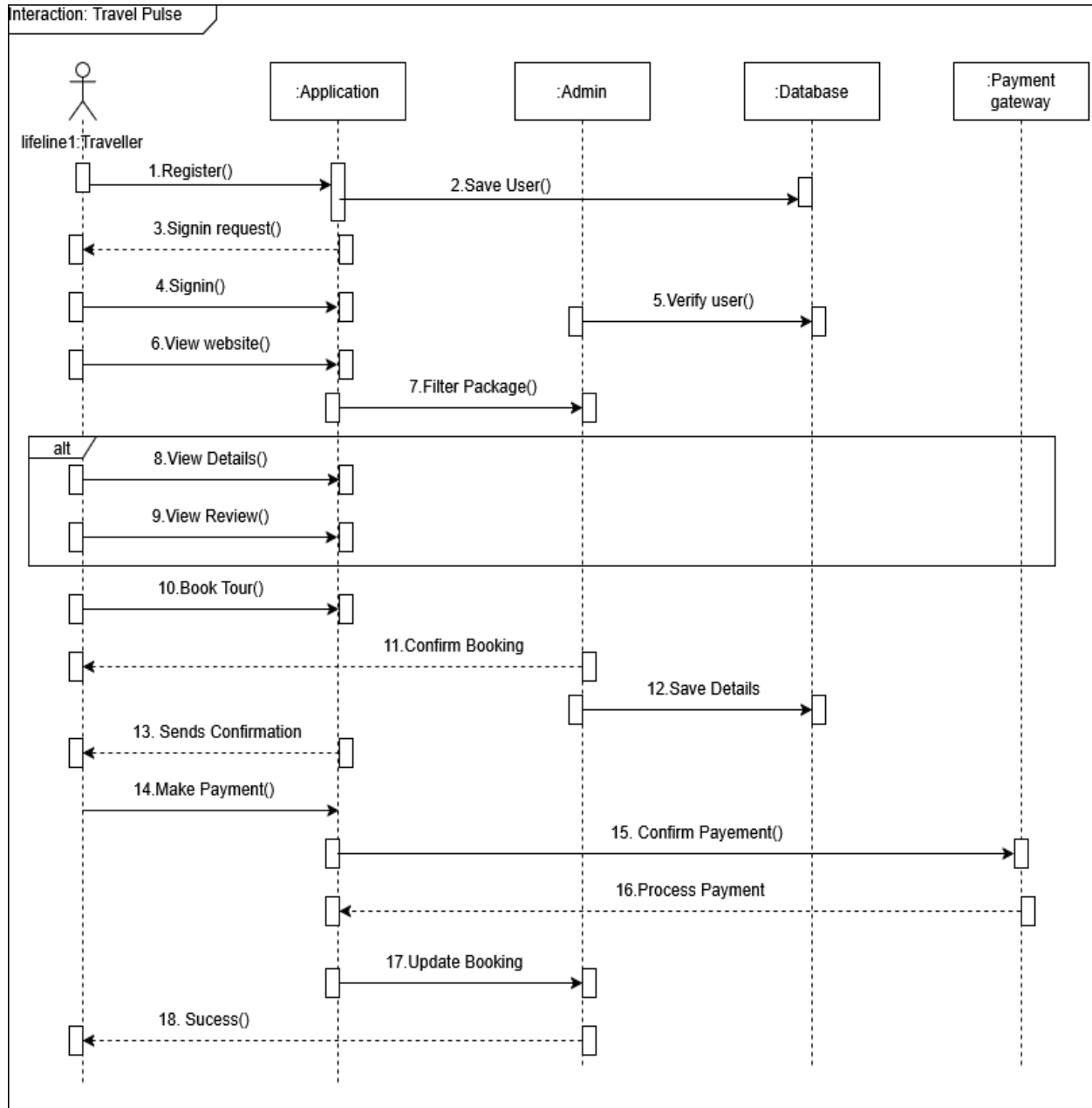
A flowchart is a visual diagram that shows the steps of a process in a clear and logical order.



**Fig 3: Flowchart**

### 4.3 SEQUENCE DIAGRAM

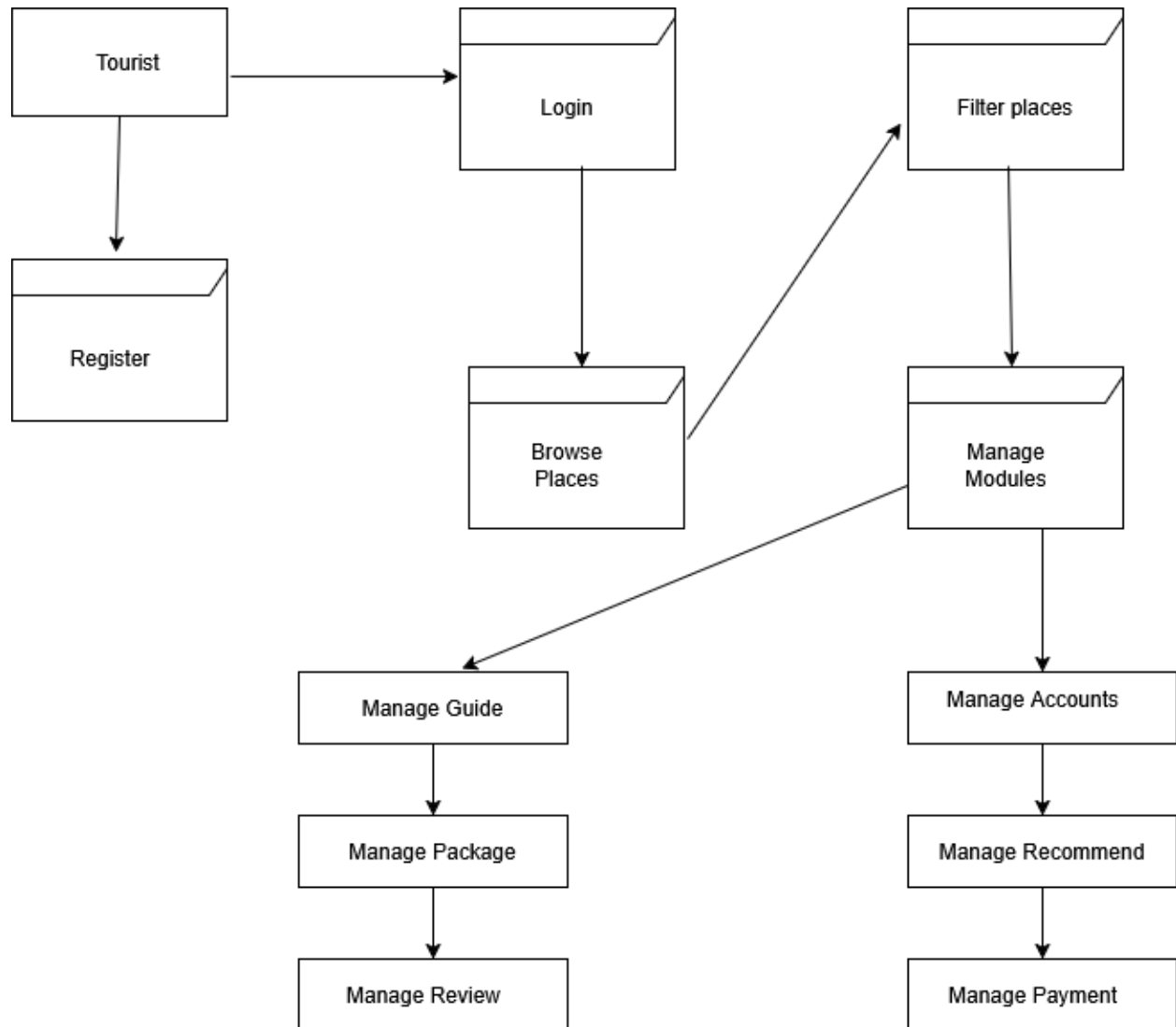
A sequence diagram is a UML diagram that shows how objects interact with each other in a specific order over time using messages.



**Fig 4: Sequence diagram**

## 4.4 Process Flow Diagram

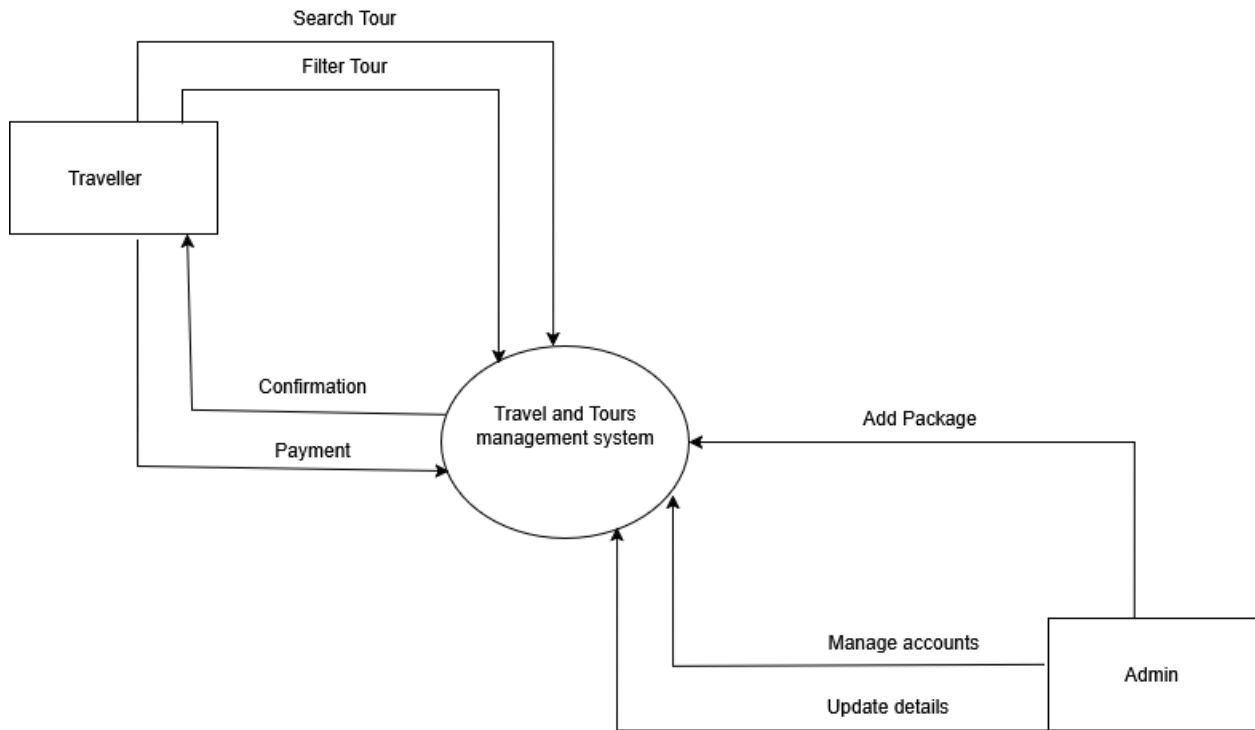
A process flow diagram is a visual representation that shows the sequence of steps in a process using symbols like arrows, rectangles, and circles to illustrate how inputs are transformed into outputs.



**Fig 5: Process Flow diagram**

## 4.5 LEVEL 0 DFD

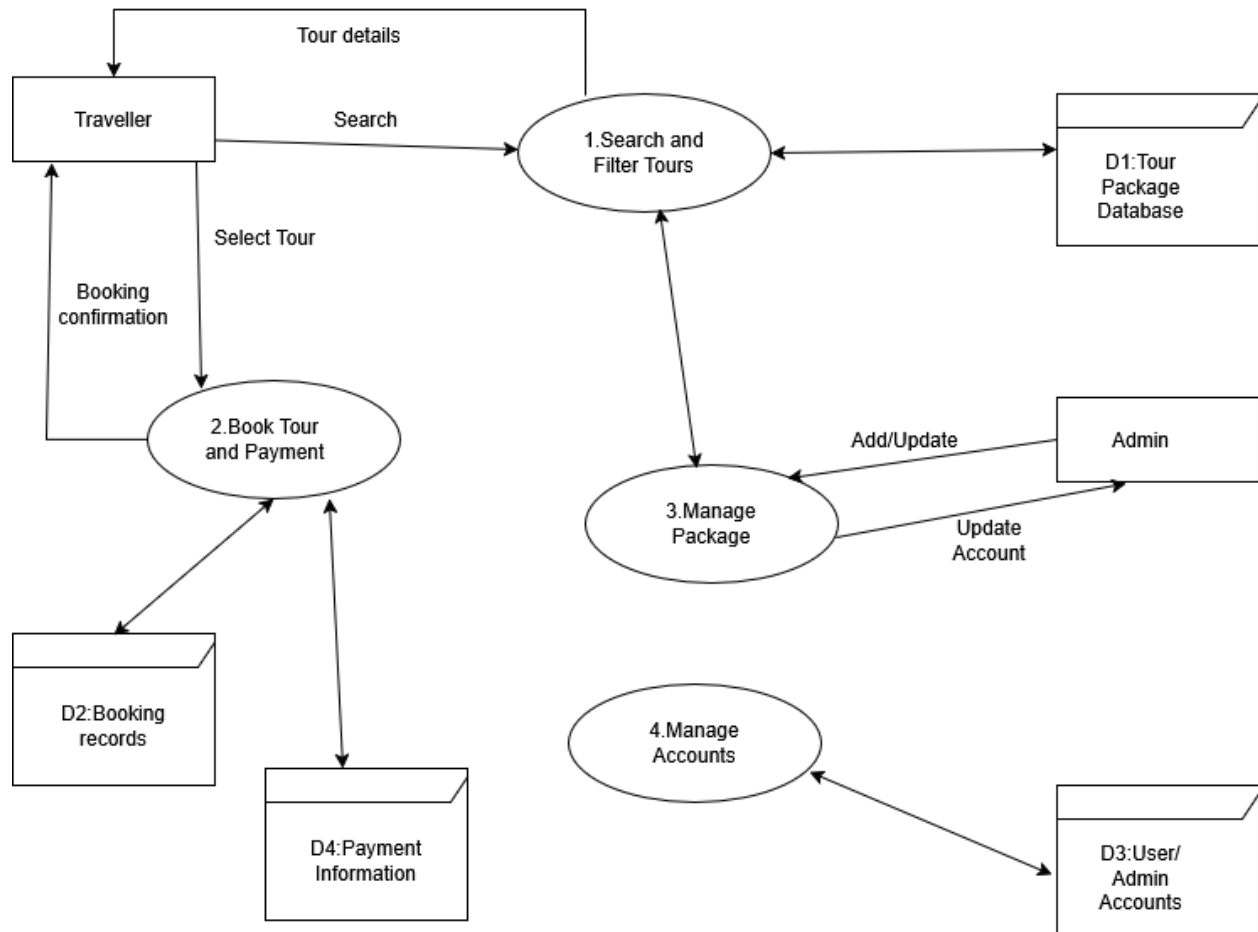
A context diagram is a high-level diagram that shows a system as a single process and gives an overview of the system's boundaries and data flow.



**Fig 5: Level 0 diagram**

## 4.6 LEVEL 1 DFD

A level 1 DFD (Data Flow Diagram) breaks down the main process from the context diagram into sub-process showing more detailed data flow between processes, data stores, and external entities. It helps to understand how the system functions internally.



**Fig 6: Level 1 DFD diagram**

## 5. TASK DONE

<b>Login Credentials</b>	<ul style="list-style-type: none"><li>-Name, Phone, Email, Password (Authentication and Authorization)</li><li>-Forget Password</li><li>- Successful mail receive</li><li>- Password Reset</li><li>-Hi User message</li><li>-Login with Goggle</li><li>- Add Photo</li><li>- Edit credentials, Update details</li><li>- Logout</li></ul>
<b>Frontend Development</b>	<ul style="list-style-type: none"><li>-Home page</li><li>- Tour packages</li><li>-Filter by adventure, price and rating</li><li>-Embedded map</li><li>- Booking</li><li>-Reviewing</li><li>-Search Tours</li><li>- Traveller account</li></ul>
<b>Backend Development</b>	<ul style="list-style-type: none"><li>-Login details</li><li>-Mailing Credentials</li><li>- Booking history</li><li>- Managing accounts(edit, Update and delete)</li><li>-Database maintain</li><li>-Managing accounts, bookings and reviews</li></ul>

**Table 1: Task done**

## **6. RESULTS AND DISCUSSION**

### **6.1 RESULTS**

1. Successfully developed a user-friendly interface for planning and booking travel within Nepal.
2. Enabled safe and secure booking through verified travel agencies.
3. Added personalized travel recommendations based on user preferences.
4. Responsive Webpages

### **6.2 DISCUSSION**

1. The system enhances digital travel experiences by simplifying booking and planning.
2. Real-time features improve user satisfaction but depend on stable internet connectivity.
3. Secure payment integration builds trust among users.
4. Recommendation logic is effective but can be improved using machine learning in the future.

Overall, TravelPulse meets the major goals of improving safe, smart, and localized travel planning in Nepal.



## **7. PERFORMANCE ANALYSIS AND VALIDATION SCHEME**

### **7.1 Performance Analysis**

#### **1. Define Performance Metrics**

Accuracy, Processing time and error rates are performance metrics.

#### **2. Conduct Load Testing**

Simulate different volumes of user feedback to evaluate the system's ability to handle varying data loads.

#### **3. Collect Feedback**

Use feedback to identify areas for improvement and to enhance user satisfaction.

### **7.2 Validation Scheme:**

#### **1. Validation Objectives**

Ensure the system accurately classifies sentiments and provides data security.

#### **2. Create Test Cases**

Develop comprehensive test cases covering various sentiment scenarios, including positive, negative, neutral and mixed sentiments.

#### **3. User Acceptance Testing (UAT)**

Collect feedback from users to ensure the system meets their needs and expectations.

#### **4. Documentation**

Provide clear documentation on system performance, validation results and any actions taken to address identified issues.

## **8.TASKS REMAINING**

### **a. Payment Integration**

Users will be able to do the secure payment.

### **b. Recommendation System**

Users will be recommended the places as they have already explored.

## **9. DELIVARABLES**

1. User- Friendly web application
2. Real-time application
3. Explore different pages
4. Safe Payment
5. Recommendation

## 10.TASK DIVISION

Member	Role
Radha Pant	Frontend Development plus Slide Presentation
Ayushma Chapain	Login Credentials plus Mailing Credentials
Dikshya Khadka	Backened plus Payment Integration
Sabina Acharya	Backend, Recommendation system and Documentation

**Table 2: Task Division**

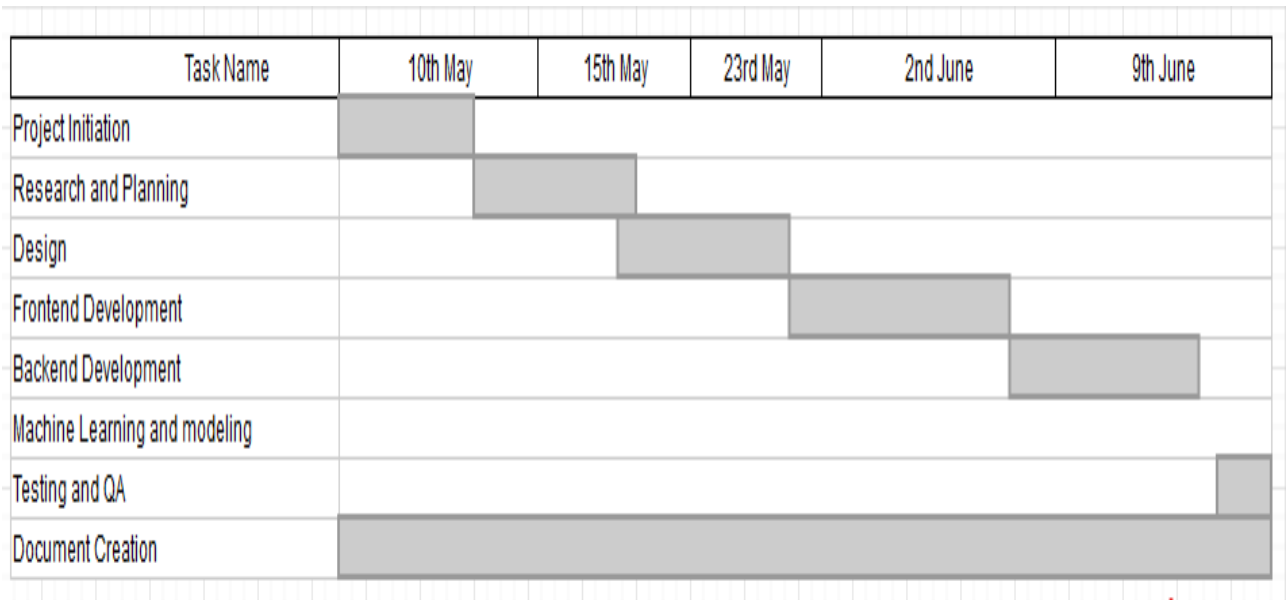
## 11. PROJECT TASK AND TIME SCHEDULE

The project schedule has been designed for duration of two months. The main preference is given to Research and Planning followed by Documentation. The next preference is given to actual core system development process.

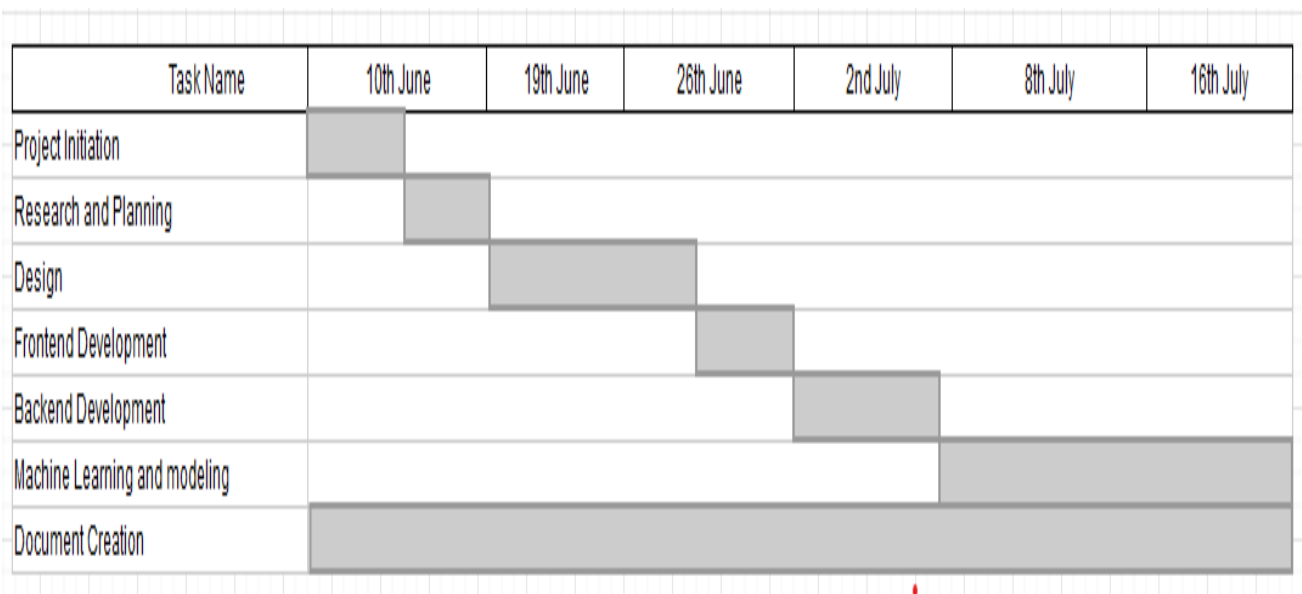
<b>TASK</b>	<b>APPROXIMATE DURATION</b>
Project Initiation	3 Days
Research and Planning	8 Days
Design and Wireframing	10 Days
Frontend Development	6 Days
Backend Development	12 Days
Machine Learning and Modeling	14 Days
Testing and QA	2 Days
Documentation, Submission and Presentation	Throughout

**Table 3: Project Task and time schedule**

## 11.1 GANTT CHART



**Fig 8: Iteration I**



**Fig 9: Iteration II**

## 12. REFERENCES

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