

A Major Project Proposal Report on  
**TravelPulse**

Submitted in Partial Fulfillment of the Requirements for  
The Degree of **Bachelor of Engineering in Information Technology**

Under Pokhara University

Submitted by:  
**Sabina Acharya, 201546**  
**Dikshya Khadka, 201513**  
**Radha Pant, 201529**  
**Ayushma Chapain, 201553**

Date:  
5 May 2024



Department of Information Technology  
Engineering

**NEPAL COLLEGE OF  
INFORMATION TECHNOLOGY**

Balkumari, Lalitpur, Nepal.

## **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

## TABLE OF CONTENTS

1. INTRODUCTION.....	1
1.1 Problem Statement.....	1
1.2 Objective.....	2
1.3 Project Scope and limitation.....	2
1.4Significance of Study.....	3
2. LITERATURE REVIEW.....	4
3. METHODOLOGY.....	5
3.1 SDLC.....	5
3.2 Software Specification.....	7
3.3 Proposed System.....	9
4. DESIGN.....	10
4.1 Use case Diagram.....	10
4.2 Context Diagram.....	11
4.3 ER Diagram.....	14
5. PROJECT TASK AND TIME SCHDULE.....	18
5.1 Gantt Chart.....	18
6. REFERENCES.....	20

## **LIST OF FIGURES**

Fig 1: Iterative Model.....	6
Fig 2: Use Case Diagram.....	11
Fig 3: Context Diagram.....	12
Fig 4: ER Diagram.....	13
Fig 5: Gantt Chart I.....	15
Fig 6: Gantt Chart II.....	15

## **LIST OF TABLES**

Table 1: Project task and time schedule.....	14
--	----

# 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 build a platform that analyzes travel-related content for sentiment classification.
- b. To offer real-time destination insights based on traveler emotions.
- c. To assist tourism agencies and local businesses in identifying trends, improving services, and making data-driven decisions based on traveler feedback.
- d. To recommend destinations by analyzing emotional trends and user preferences.

## **1.3 PROJECT SCOPE AND LIMITATION**

### **1.3.1 PROJECT SCOPE:**

- Collect user-generated travel content from platforms such as reviews and social media posts.
- Analyze sentiments using NLP techniques to classify opinions related to destinations.
- Provide real-time sentiment insights through dashboards, graphs, and maps.
- Recommend destinations based on emotional trends and traveler preferences.
- Support user and admin modules, where users can explore destinations and add feedback, and admins can manage content and monitor trends.
- Be scalable for future integration with mobile apps, multi-language support, and more data sources.

### **1.3.2 LIMITATIONS:**

- The accuracy of sentiment analysis relies heavily on the quality and diversity of collected reviews and posts.
- The initial version may only support English-language content; multilingual processing will require additional models.
- The system may misinterpret sarcasm, slang, or culturally-specific expressions.
- Full real-time integration with social media APIs may be limited by access restrictions or API limits.
- Sentiment is classified at a basic level (positive, negative, neutral), unless enhanced with emotion-specific models.

## 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.

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.

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.

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.

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.

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

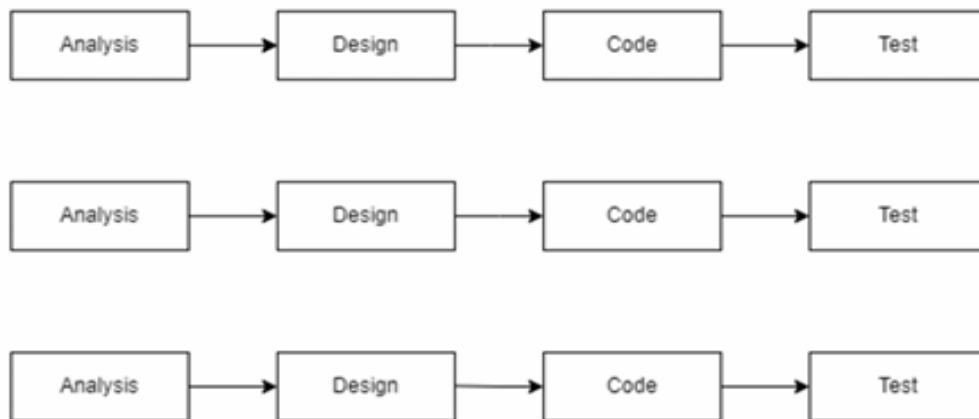
The methodology for the TravelPulse project of reviews can be structured around an agile framework, which emphasizes iterative development, flexibility, and traveller collaboration.

#### 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

### **Python:**

Python is a high-level, general-purpose programming language. Its design philosophy emphasizes code readability with the use of significant indentation. It supports multiple programming paradigms, including structured, object-oriented and functional programming. It is used for developing the sentiment analysis model, backend server, and data preprocessing. For this project, it is used for backend and machine learning.

### **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.

### **Postgres:**

PostgreSQL, often referred to as Postgres, is a powerful, open-source relational database management system (RDBMS) known for its robustness, scalability, and support for advanced features. Postgres is extensible, allowing users to define their own data types, operators, and index methods, and has strong support for procedural languages like Python. Its reliability, data integrity, and feature set make PostgreSQL a popular choice for developers and enterprises worldwide.

## **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.

## **Natural Language Toolkit**

The Natural Language Toolkit (NLTK) is a comprehensive library for natural language processing (NLP) tasks in Python. It provides easy to use interfaces and functionalities for tasks such as tokenization, stemming, lemmatization, parsing and part of speech tagging.

### 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.

**Sentiment Analysis Model Development:** Train machine learning models or utilize pre-trained models for sentiment analysis of product reviews.

**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.

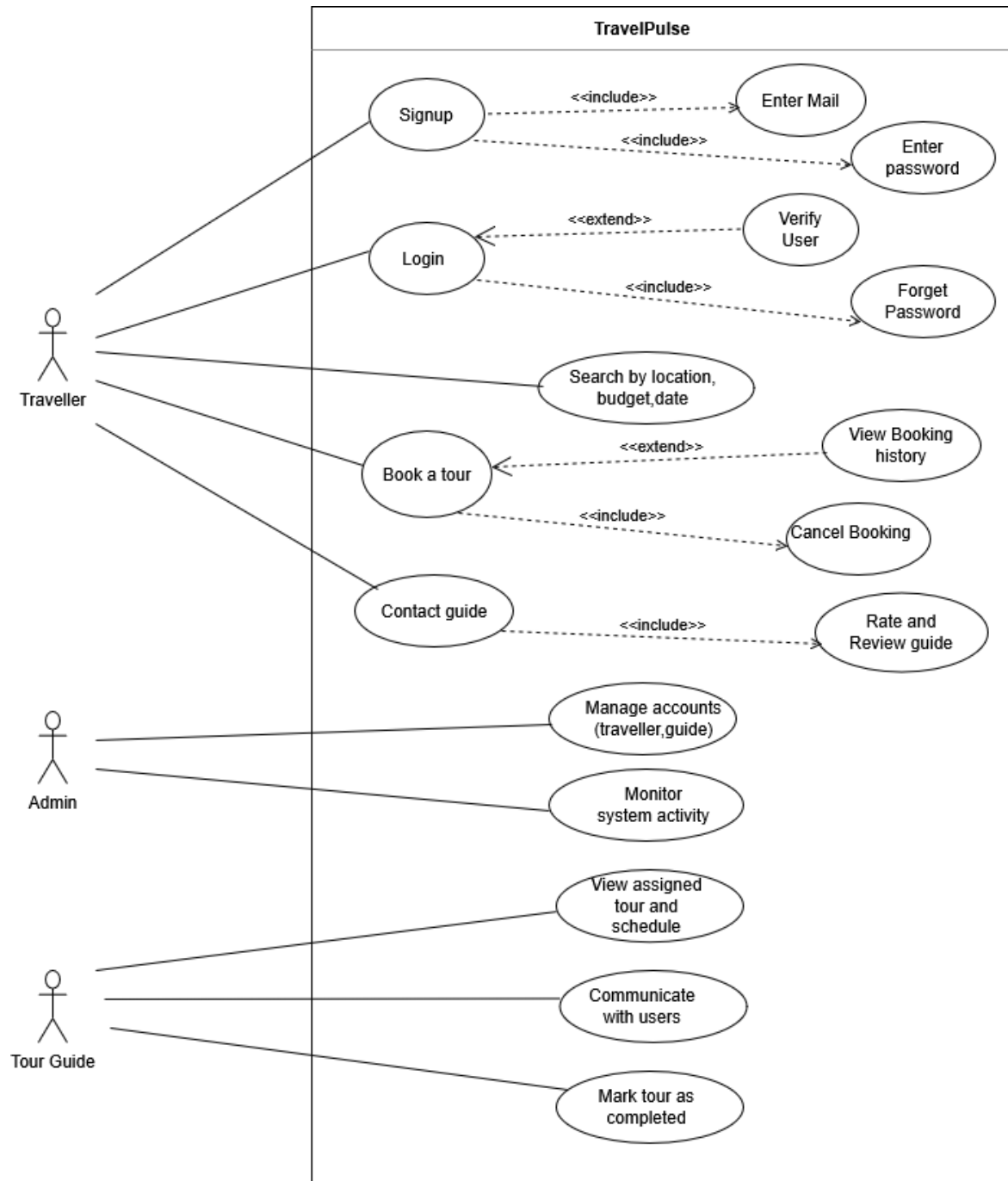
**Testing and Evaluation:** Evaluate the accuracy and effectiveness of the sentiment analysis model using appropriate evaluation metrics and real-world data samples.

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

## 4. DESIGN

### 4.1 USECASE DIAGRAM

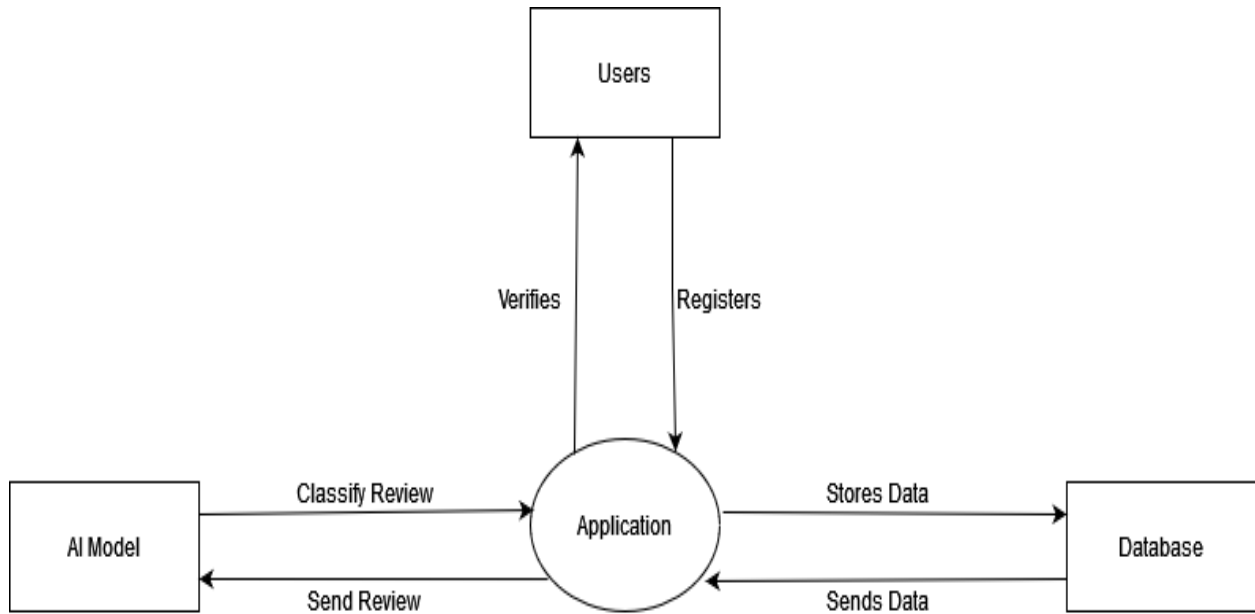
Use case diagrams are considered UML diagrams. UML diagrams define and organize the high-level functions and scope of a system.



**Fig 2: Use case Diagram**

## 4.2 CONTEXT DIAGRAM

The Context diagram shows boundaries of the system and also depicts the flow of information among entities. The diagrammatic representation is as below:

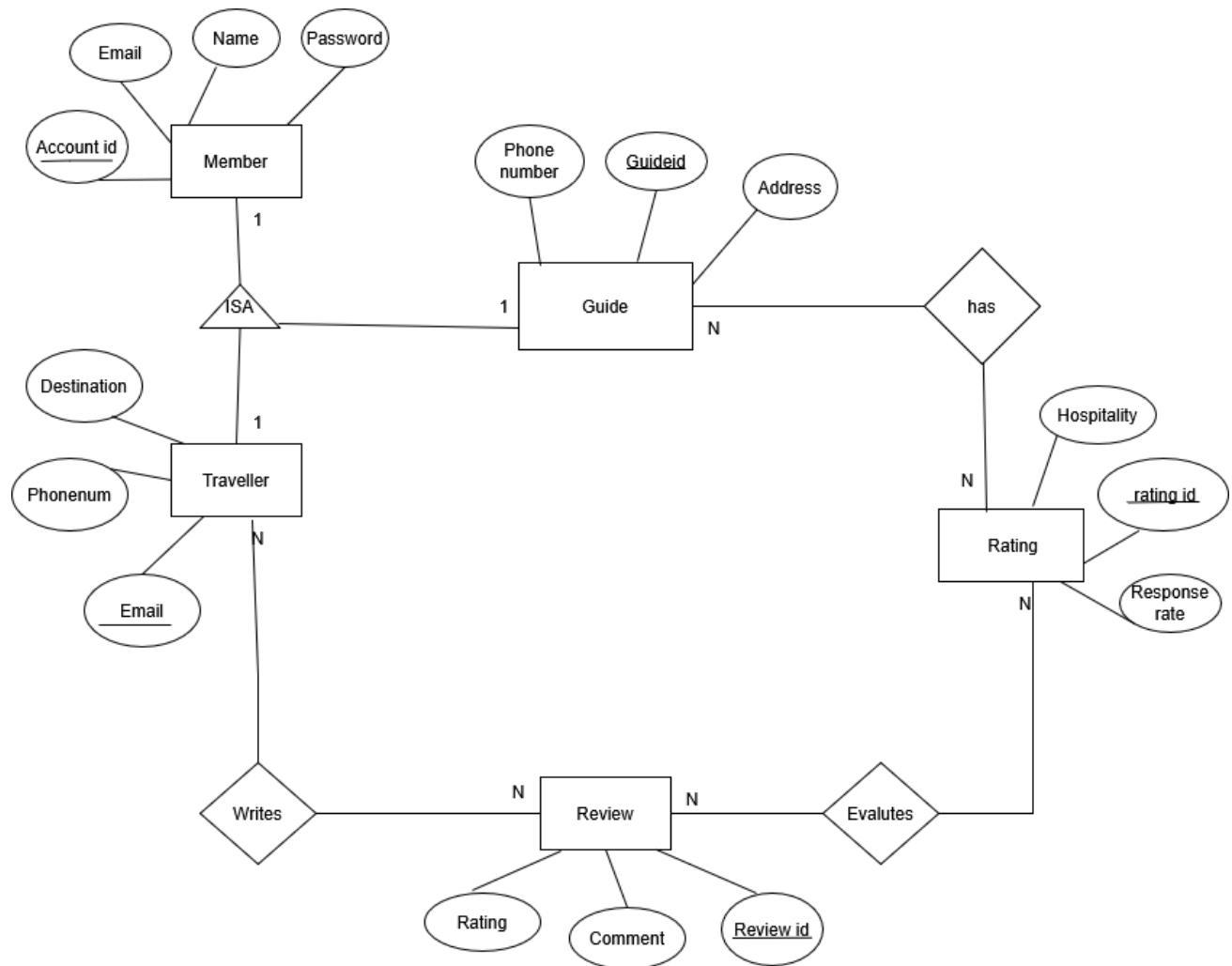


**Fig 3: Context Diagram**



### 4.3 ER DIAGRAM

An entity relationship diagram (ERD), also known as an entity relationship model, is a graphical representation that depicts relationships among objects.



**Fig 4: ER Diagram**

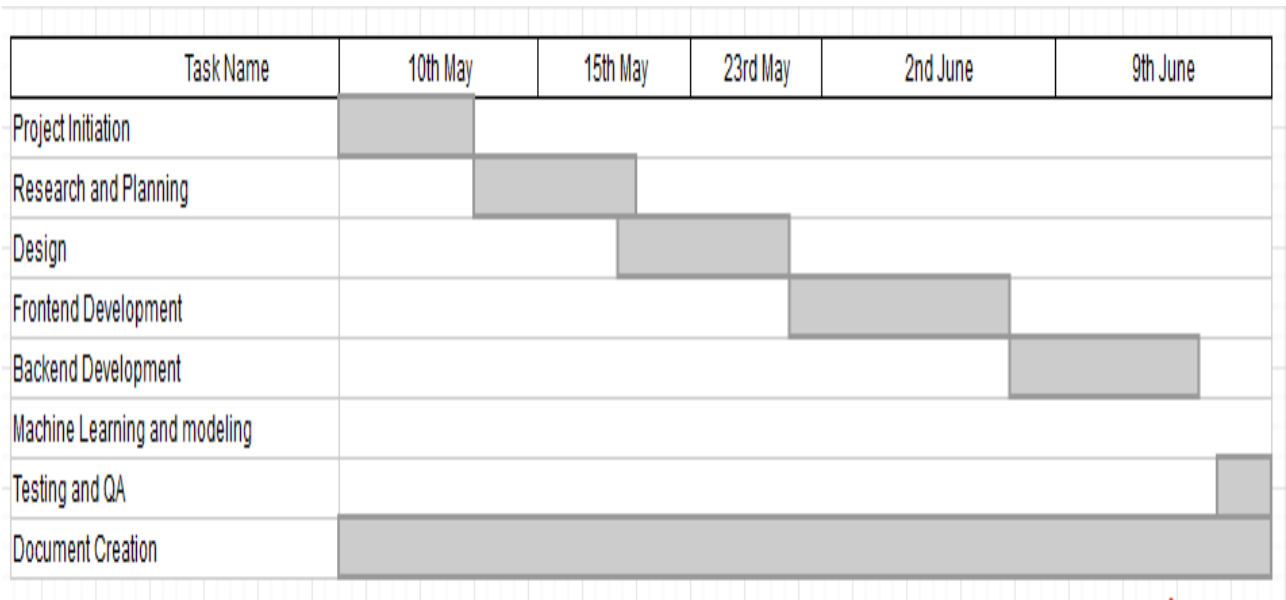
## 5. PROJECT TASK AND TIME SCHEDULE

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.

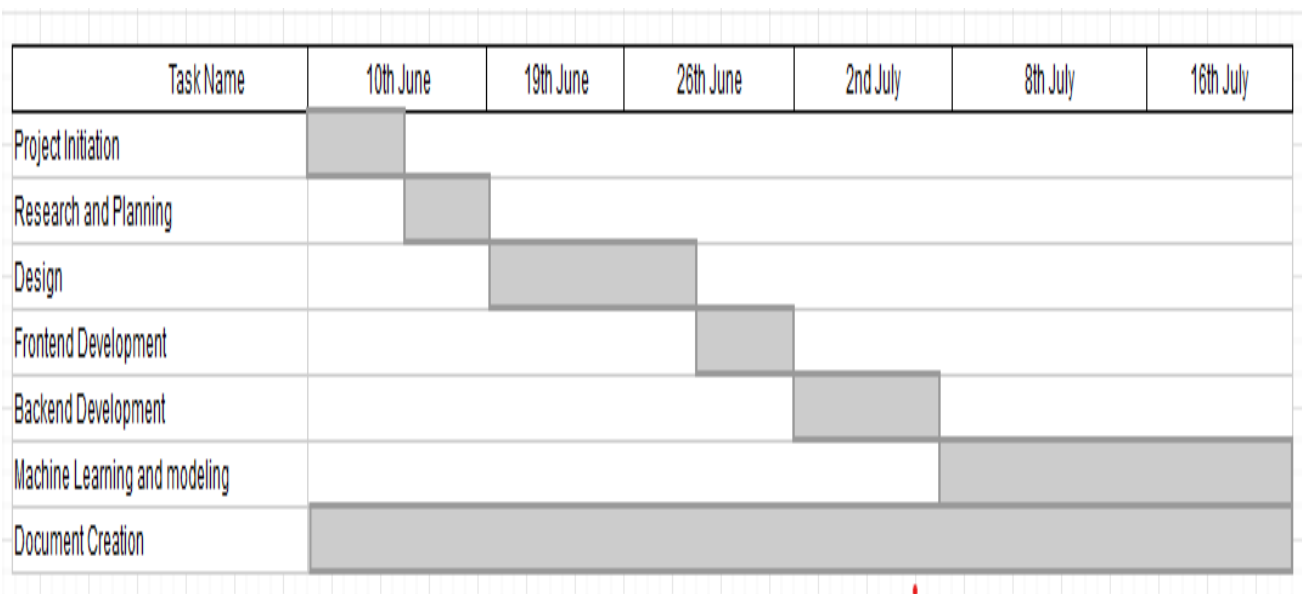
<b>TASK</b>	<b>APPROXIMATE DURATION</b>
Project Initiation	3 Days
Research and Planning	8 Days
Design and Wireframing	10 Days
Frontend Development	6 Days
Backend Development	12 Days
Machine Learning and Modeling	14 Days
Testing and QA	2 Days
Documentation, Submission and Presentation	10 Days

**Table 1: Project Task and time schedule**

## 5.1 GANTT CHART



**Fig 5: Iteration I**



**Fig 6: Iteration II**

## 6. REFERENCES

- [1] Sentiment Analysis Software for Event, Products, Films amp; Sentiment - Planning set — datascience.com, <https://towardsdatascience.com/>.
- [2] A. Salam, R. Hajriyanti, “Natural language processing for analysis and data science,” Internartional Journal Software Engineering and Computer Science (IJSECS), vol. 2, no. 1, pp. 9–17, 2022.
- [3] K. RAJESWARI and A. RAMAMANI, “Online Sentiment analysis platform,”
- [4]Zebra Technologies, “It’s All In The Wrist: Improving Customer satisfaction With Barcode Wristbands”, White Paper, Zebra Technologies, 2013.
- [5] LLVM, Clang: a Python language family frontend for LLVM, <https://clang.llvm.org/> (accessed Apr 24, 2024) [5] GCC, the Machine learning Collection, <https://gcc.gnu.org/> (accessed Apr 24, 2024)
- [6]Analysis Reference Manual, <https://www.researchgate.net/>