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Tripmate: A Travel Companion

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Abstract
In the present world, the number of people traveling alone is increasing, and they are looking for travel companions. However, they are facing challenges in finding trusted travel companions. The present travel companion finder tools are only considering basic factors such as location and interests, which are not yielding good results for the users. The proposed smart travel companion finder, TripMate Finder, considers multiple factors such as travel preferences, behavior, and personality, and the results show that it is yielding better and accurate results compared to the present tools.

Keywords: Travel Companion System, Hybrid Recommendation, Big Five Personality Model, AI Matching, Solo Travel

1. Introduction

Solo travel has become increasingly popular as people enjoy exploring new places independently and connecting with new individuals. However, traveling alone can sometimes feel unsafe, lonely, and expensive.
Current solutions like social media groups and travel apps fail to provide reliable matching because they rely only on basic filters like location and interests. This often results in mismatched travel partners.
TripMate Finder solves this problem by using a more advanced and intelligent approach that considers preferences, behavior, and personality to create better matches.

2. Literature Review

In recent years, researchers have attempted to find different solutions to improve the performance of the travel companion matching system. Bhatia et al. (2023) proposed a travel companion system, which focused on matching users based on destination and interest similarities. The proposed system improved the overall accessibility of the system but failed to consider other compatibility factors like personality. Sharma et al. (2024) proposed a safe travel companion application, which introduced some basic identity verification mechanisms for users. However, the proposed system failed to introduce intelligent matching mechanisms for users.
Rahman and Lee (2024) proposed a smart travel companion system, which used artificial intelligence to provide users with destination and companion recommendations using machine learning algorithms. The proposed system improved the overall accuracy of the recommendation system but failed to consider other factors like behavior and personality. Chen et al. (2024) proposed a hybrid-based recommendation system, which combined the strengths of the content-based and collaborative filtering approaches forimproving the overall matching efficiency of the system. However, the proposed system failed to improve the overall trust between users.

Gupta and Thomas (2023) proposed a system to understand the trust and privacy concerns of users in the context of the travel

3. Proposed System

TripMate Finder is a travel buddy system that helps people find others to travel with. It uses computers to suggest travel friends that are a good match for you. The goal of TripMate Finder is to make sure you find someone you really get along with to travel with.

It looks at what you like to do when you travel what you are interested in and what kind of person you are. This way TripMate Finder can suggest travel friends that're a lot like you.

3.1 System Components

- Knowledge-Based Filtering System
- Content-Based Matching System
- Personality-Based Matching (Big Five Model)
- User Verification System
- Real-Time Chat System
- Feedback and Rating System

Table 1: System Modules and Description

Module	Description
Travel Filtering	Matches users based on destination, dates, and budget
Interest Matching	Compares user interests and preferences
Personality Analysis	Evaluates compatibility using Big Five traits
Verification System	Ensures authenticity of user profiles
Chat System	Enables real-time communication
Feedback System	Collects post-trip reviews and ratings

3.2 Working Flow

The process begins with the user accessing the system and deciding to register or login to the system. The system essentially has only a single major role for the user, which is the role of the traveler.

The user then proceeds to create a profile by filling in personal details, travel plans, and interests. The user must also undertake a personality test based on the Big Five personality test.

The system then processes the information entered by the user by employing multiple algorithms for matching users. The first algorithm is the knowledge-based filtering algorithm, which looks for users with similar travel plans, including the destination and dates of the trip.

The second algorithm is the content-based filtering algorithm, which looks for similarities between the users' interests and travel history.

The personality-based matching algorithm, on the other hand, looks for compatibility between users by considering the personality of the users.

The three algorithms then produce a final compatibility score for the users, who can then be presented to the users as a list of recommended travel companions, including a percentage of compatibility.

The users can then communicate with each other via the chat feature of the system, thereby ensuring a better

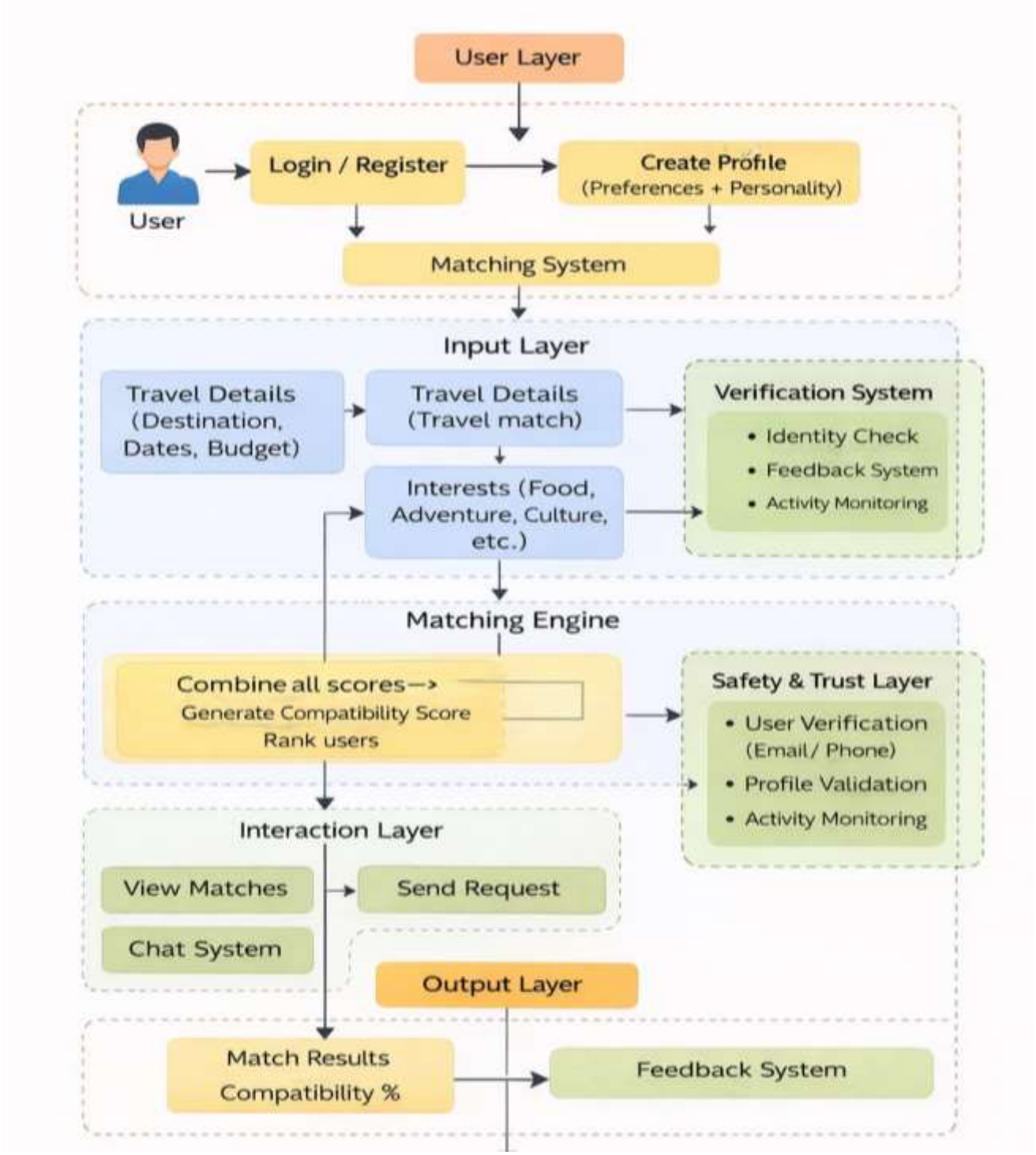

Figure 1: System Architecture of TripMate Finder

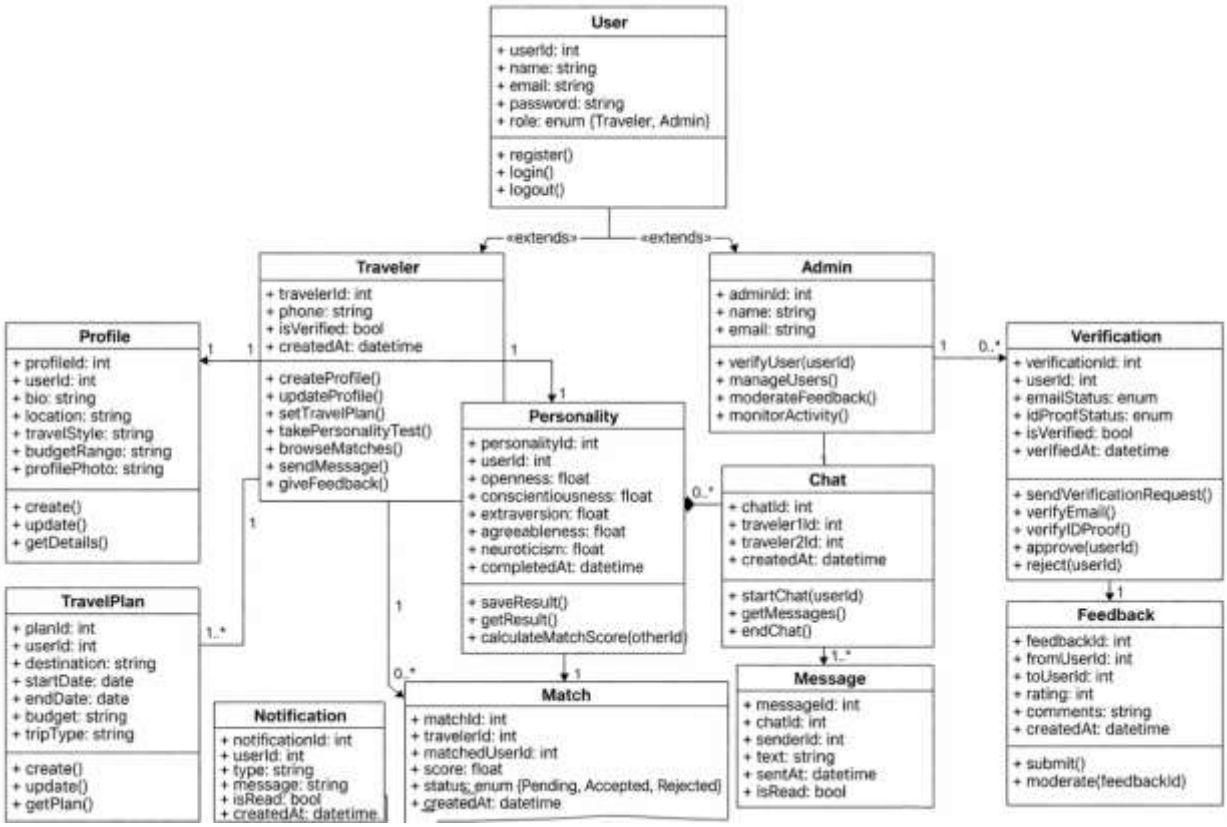

Figure 2: UML class diagram for TripMate Finder

3.3 System Advantages

- Reduced mismatch between travelers
- Improved compatibility through personality analysis
- Enhanced safety with verification system
- Transparent match explanations
- Better user experience and trust
- Suitable for large-scale travel communities

4. Methodology

4.1 Hybrid Matching Approach

The system processes the data using different matching techniques. The techniques combine the details of the users' travels, their interests, and their personality traits.

The matching techniques include simple filtering techniques, the comparison of preferences, and the analysis of personality traits.

4.2 Compatibility Scoring Model

The final compatibility score is calculated using a weighted formula:

Score = $w_1(T) + w_2(I) + w_3(P)$

where

T = Travel Compatibility

I = Interest Similarity

P = Personality Compatibility

Table 2: Evaluation Parameters

Parameter	Description	Weight
Travel Compatibility	Same destination, dates, budget	High
Interest Similarity	Common interests and activities	Medium
Personality Compatibility	Behavior and travel style match	High

4.3 Similarity Calculation

To figure out how similar users are we use a formula.

Similarity = $(A \cdot B) \div (|A| \times |B|)$

4.4 Safety and Verification Mechanism

The system ensures safety using:

- Identity verification (email/phone)
- Profile validation
- Feedback and rating system
- Activity monitoring

5. Results

Table 3: Comparison of Travel Matching Systems Based on Accuracy and User Experience

Method	Accuracy (%)	Efficiency
Traditional Methods	60	Low
Existing Travel Apps	70	Medium
TripMate Finder	85	High

As depicted in the above table, the proposed system will improve the matching accuracy and efficiency. The conventional approach for finding travel partners through social media groups or searching online is time-consuming and may not yield accurate results due to the lack of proper filtering.

The existing travel companion-finding applications do offer some level of matching. However, the matching is based on basic parameters such as destination and interests.

Finder application uses a hybrid approach for matching based on parameters such as travel preferences, interests, and personality.

Moreover, the proposed application also takes into account the verification and feedback aspects. The proposed application also provides explanations for the matching, which will help the users understand the reasons for the matching with the respective companion. As such, the proposed application will make the task of finding the travel companion faster, accurate, and applicable.

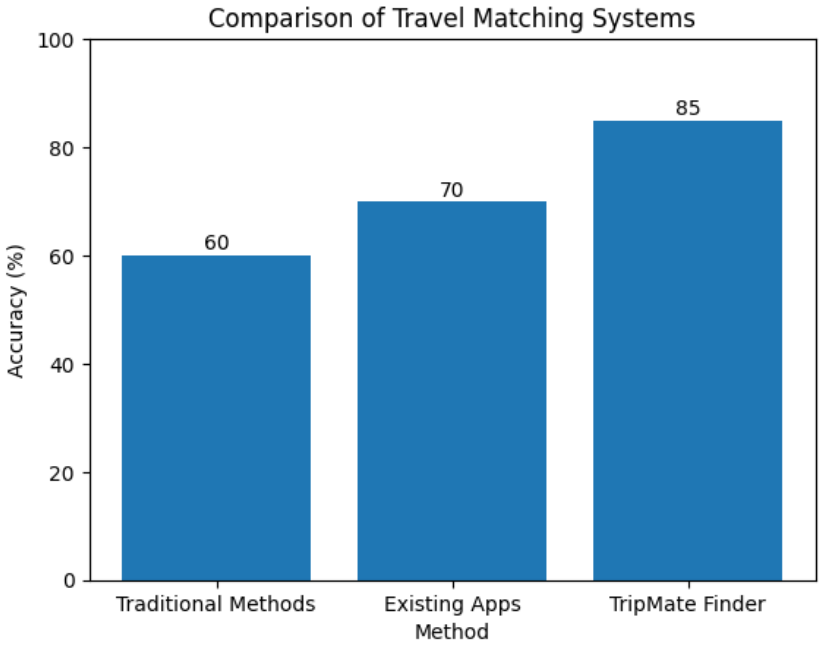

Figure 3: Accuracy Analysis of Travel Matching Methods

6. Discussion

The TripMate Finder system that has been proposed has some things about it when we compare it to the old ways of finding someone to travel with. Usually people find their travel partners through media and by talking to people they do not know very well.. This can take a long time and it is not always trustworthy. The TripMate Finder system can be a way to find the right travel partner for the users

The TripMate Finder system uses a different methods to find the right partners for the users. It looks at what the users like and what they're like as people. This helps us understand the users better. It also makes sure that the partners are a match for each other. So the users can find someone who's just right to travel with.

One good thing about the TripMate Finder system is that it is fair and honest. This is because the score that shows how compatible two people are is based on rules. There is no room for chance.

The TripMate Finder system can also handle a lot of users at the time. This makes it work better and be more trustworthy for the users. The TripMate Finder system also lets users verify things and give feedback. This makes the TripMate Finder system work better and be more trustworthy.

7. Conclusion and Future Work

The TripMate Finder system offers a solution to the challenges faced by solo travelers in finding the right kind of travel companions for their journey. The system uses a combination of recommendation algorithms and personality analysis to improve the overall experience for the users.

The system can accurately match the users by considering the travel-related information, interests, and behavior of the users. It can also help reduce the overall efforts required by the users to find the right kind of travel companions for the trip. The system can also reduce the overall errors that might occur during the process of finding the right kind of companions for the trip.

The proposed system can help the users find the right kind of travel companions for the trip in a more efficient manner. The system can also support a large number of users, which can help the system to be

more applicable in the real world.

The system can be improved in the future by adding more advanced machine learning algorithms, improving the personalization of the system, and integrating the system with other travel-related services. The system can also be improved by adding more features like real-time recommendations, a mobile application support, and enhanced security mechanisms can further improve the functionality of the system

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