Project Synopsis
On
Decentralized AI Trip Generator Using Blockchain

Submitted as a part of course curriculum for

Bachelor of Technology
in
Computer Science

Submitted by
Rohit Halsana (2200290120138)
Sammer Matoria (2200290120146)
Shivam Tyagi (2200290120161)
Rohan Pandey (2200290120137)

Under the Supervision of
Prof. Amit Kr Singh Sanger

KIET Group of Institutions, Ghaziabad
Department of Computer Science
Dr. A.P.J. Abdul Kalam Technical University
2024-2025

ACKNOWLEDGEMENT

It gives us a great sense of pleasure to present the synopsis of the B.Tech Mini Project undertaken during B.Tech. Third Year. We owe a special debt of gratitude to Professor Amit Kr. Singh Sanger, Department of Computer Science, KIET Group of Institutions, Delhi- NCR, Ghaziabad, for his constant support and guidance throughout the course of our work. His sincerity, thoroughness and perseverance have been a constant source of inspiration for us. It is only his/her cognizant efforts that our endeavor have seen the light of the day.

We also take the opportunity to acknowledge the contribution of Dr. Ajay Kumar Shrivastava, Dean of the Department of Computer Science, KIET Group of Institutions, Delhi- NCR, Ghaziabad, for his full support and assistance during the development of the project. We also do not like to miss the opportunity to acknowledge the contribution of all the faculty members of the department for their kind assistance and cooperation during the development of our project.

Last but not the least, we acknowledge our friends for their contribution to the completion of the project.

Signature: Guide Name & Signature
Student's Name: Shivam Tyagi   Dr. Amit Kr. Singh Sanger
Roll No: 2200290120161

Signature: Signature
Student's Name: Rohit Halsana   Project coordinator
Roll No: 2200290120138

Signature:
Student's Name: Sameer Matoria
Roll No: 2200290120146

Signature:
Student's Name: Rohan Pandey
Roll No: 2200290120137

ABSTRACT

A Decentralized AI Trip Generator is an innovative system that combines artificial intelligence (AI), blockchain, and decentralized networks to offer personalized travel planning solutions. Unlike traditional travel platforms that rely on centralized data storage and control, this system leverages multiple distributed AI models and peer-to-peer technologies to create customized travel itineraries based on real-time data inputs.

The system functions through AI-driven models that analyze user preferences such as destination, budget, activities, and time frame. It processes these inputs to recommend trips while dynamically adjusting for factors like weather, transportation availability, and local events. By using blockchain, it ensures transparency, privacy, and security in managing user data, bookings, and transactions. Smart contracts enable decentralized payments and secure travel bookings, while user feedback and reviews are stored in an immutable and decentralized manner.

The MERN stack (MongoDB, Express.js, React, Node.js) plays a crucial role in managing the app's interface, storing user data, and handling API requests. MongoDB stores unstructured travel data, Express.js manages server-side operations, React builds the front-end, and Node.js ensures seamless interaction with decentralized networks.

This approach allows users to maintain control over their data and benefit from a more personalized and secure travel experience, breaking free from the limitations of centralized travel platforms. The Decentralized AI Trip Generator empowers users to plan trips efficiently with real-time, adaptive recommendations.

LISTS OF FIGURES

ABBREVIATIONS

AI – Artificial Intelligence

API – Application Programming Interface

DATG: Decentralized AI Trip Generator

ID: Identification

is_verified: Verification Status Flag

UID: Unique Identifier

Blockchain: Decentralized Ledger System

Smart Contracts: Automated Contract System on Blockchain

UI: User Interface

TABLE OF CONTENTS

Page
No.

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

A Decentralized AI Trip Generator is a cutting-edge approach to travel planning that combines the power of artificial intelligence (AI) and decentralized technologies like blockchain. Unlike traditional travel platforms, which rely on centralized control and data storage, this system leverages multiple distributed AI models and a peer-to-peer network to generate personalized travel itineraries for users.

By analyzing user preferences—such as destination, budget, travel dates, and interests—the AI system offers dynamic trip recommendations that adapt to real-time data, like weather updates, transportation options, and local events. The use of blockchain ensures transparency, privacy, and security, allowing users to interact with the system without fear of data misuse. Additionally, smart contracts on the blockchain enable secure and decentralized transactions, from booking hotels to paying for services, without the need for intermediaries.

The MERN stack (MongoDB, Express.js, React, Node.js) forms the backbone of this platform. MongoDB stores user data and travel information, Express.js manages API requests, React provides a seamless user interface, and Node.js ensures efficient communication with decentralized networks and AI models.

In essence, a Decentralized AI Trip Generator not only provides personalized travel experiences but also offers greater privacy, control, and transparency, making travel planning more secure and efficient for users.

1.2 PROBLEM STATEMENT

Current travel planning platforms are heavily centralized, leading to issues such as data privacy concerns, biased recommendations, limited personalization, and lack of transparency. Users often face challenges in getting real-time, adaptive travel suggestions tailored to their specific preferences, with centralized platforms holding control over their data and decision-making processes. Additionally, the reliance on a single point of failure makes these systems vulnerable to outages, data breaches, and monopolistic practices.

To solve these challenges, there is a need for a **Decentralized AI-Trip Generator** that leverages distributed AI models and blockchain technology to provide highly personalized, secure, and transparent travel itineraries. This system must empower users to control their data, receive unbiased recommendations based on real-time conditions, and ensure safe, decentralized transactions without intermediaries.

1.3 OBJECTIVES

1. Provide Personalized Travel Itineraries: Use AI models to generate customized trip recommendations based on user preferences like destination, budget, activities, and travel dates.

2. Ensure Data Privacy and User Control: Implement decentralized technologies to give users control over their personal data, ensuring privacy and minimizing risks of data misuse or breaches.

3. Enable Real-time, Dynamic Recommendations: Continuously update trip plans based on real-time factors like weather changes, transportation availability, and local events for a more responsive travel experience.

4. Promote Transparency and Security: Utilize blockchain for secure, transparent transactions and bookings, ensuring trust between users and service providers without the need for intermediaries.

5. Decentralize Travel Planning Infrastructure: Shift away from centralized systems to a distributed, peer-to-peer network that eliminates single points of failure and monopolistic control, ensuring a more resilient platform.

6. Foster Community-driven Contributions: Encourage users to contribute reviews, feedback, and travel data, rewarding them via decentralized mechanisms, such as tokens or reputation systems.

7. Enable Secure and Decentralized Payments: Integrate cryptocurrency or blockchain-based payments for hassle-free, secure transactions during bookings or service payments.

1.4 SCOPE

- Personalized Travel Itineraries
- Blockchain-based Secure Transactions
- Data Privacy and User Control
- Decentralized User Reviews
- Reward Systems for Contributions
- Global Accessibility and Scalability
- Cross-industry Integration

CHAPTER 2

LITERATURE REVIEW

The following studies provide insights that can directly contribute to enhancing the functionality and user experience of our **AI Trip Generator** app, with a focus on **personalization**, **security**, and **trust**.

1. **"Do you trust ChatGPTs? Effects of the ethical and quality issues of generative AI on travel decisions"** (2024) by **Jeong Hyun Kim et al.**
   This study demonstrates how the **ethical concerns** and **quality of AI-generated recommendations** significantly influence user **trust** and **satisfaction**. It shows that when AI recommendations are perceived as unreliable or ethically questionable, users are less likely to trust the system. For our app, ensuring **accuracy** in AI recommendations and providing clear disclaimers about the AI's capabilities will be key in establishing user **confidence** and **acceptance**.

2. **"TravelAgent: An AI Assistant for Personalized Travel Planning"** (2021) by **Aili Chen et al.**
   This research illustrates how the use of **large language models (LLMs)** can generate **dynamic, personalized travel itineraries** based on real-time data. It emphasizes the importance of incorporating factors like **budget**, **preferences**, and **availability** to tailor travel plans. For our app, leveraging **LLMs** to provide customized recommendations based on individual user profiles will improve **personalization** and **user engagement**, making the travel planning process more intuitive and enjoyable.

3. **"Automation and artificial intelligence in hospitality and tourism"** (2021) by **Fauzia Jabeen et al.**
   The study outlines critical factors for the successful implementation of **AI technologies** in the hospitality and tourism industries, including **technology readiness** and **user acceptance**. It also discusses how automation can enhance operational efficiency. In the context of our app, focusing on **user-friendly interfaces** and ensuring the system's **reliability** and **adaptability** will be crucial for its adoption and success. Understanding the barriers to **AI acceptance** will guide the development of an app that is both **innovative** and **accessible**.

4. **"BloHosT: Blockchain Enabled Smart Tourism and Hospitality Management"** (2020) by **Unnamed authors**
   The paper advocates the use of **blockchain technology** to address **security** issues in tourism, such as fraud in payments and personal data breaches. By offering **secure transactions** and establishing a **reputation management system** for various stakeholders in tourism, blockchain can eliminate middlemen and enhance trust. Integrating **blockchain** in our app will ensure **secure payments**, **data integrity**, and a **transparent ledger**, which will increase user **confidence** in the app's reliability and privacy.

Summarizing the key studies and their actionable insights:

Study	Year	Key Focus	Detailed Actionable Insights for AI Trip Generator App
"BloHosT: Blockchain Enabled Smart Tourism and Hospitality Management"	2020	Blockchain, Security, Data Integrity	- Secure Payments: Use blockchain to facilitate secure transactions and reduce fraud. - Data Integrity: Blockchain guarantees data security and immutability, preventing tampering. - Transparent Reputation Systems: Blockchain enables transparent reputation systems for service providers, building trust. - Smart Contracts: Implement blockchain for automatic confirmations, payments, and refunds, streamlining processes.
"Automation and artificial intelligence in hospitality and tourism"	2021	AI Adoption, User Acceptance, Operational Efficiency	- User-Friendly Interface: Ensure the app has an intuitive design, easy to navigate without overwhelming the user. - Overcoming AI Skepticism: Educate users about AI's benefits to improve adoption. - System Reliability: Ensure smooth app performance, providing consistent, error-free recommendations. - Cross-Platform Accessibility: Make the app accessible across various devices and platforms. - Continuous Learning: Ensure the app learns from user interactions to optimize future recommendations.
"TravelAgent: An AI Assistant for Personalized Travel Planning"	2021	Personalization, LLMs, Dynamic Itineraries	- Personalized Recommendations: Use LLMs to create travel plans based on real-time data, budget, and user preferences. - Real-Time Data Integration: Integrate live data (flights, weather, hotel availability) to make recommendations more adaptable. - Dynamic User Profiles: Build profiles that store user preferences and past trips to refine future suggestions. - Customizable Features: Allow users to adjust parameters like trip duration and type of trip for a more personalized experience.
"The Role of Blockchain in Travel Security and Fraud Prevention"	2021	Blockchain, Security, Fraud Prevention	- Blockchain for Travel Security: Implement blockchain to ensure secure, traceable transactions, preventing fraud in booking and payments. - Decentralized Data Management: Store sensitive data on a decentralized network for better protection and transparency. - Verifiable Credentials: Use blockchain to verify user credentials, enhancing security in bookings and transactions.
"Artificial Intelligence in Tourism and Hospitality: Insights and Future Directions"	2022	AI in Tourism, Service Automation, Chatbots	- AI Chatbots for Customer Support: Use AI-powered chatbots to assist users in real-time with travel queries, bookings, and recommendations. - Service Automation: Automate routine tasks like booking confirmations, trip adjustments, and cancellations to streamline the user experience. - AI-Driven Marketing: Utilize AI to identify and target potential customers through personalized offers and content.
"AI-Driven Travel Personalization: A Case Study of Enhancing Customer Experience in the Travel Industry"	2023	AI, Personalization, Customer Experience	- Hyper-Personalization: Use AI to deeply analyze user behavior and preferences for targeted travel suggestions. - Predictive Recommendations: AI should forecast user preferences based on historical data, offering suggestions proactively. - Context-Aware Suggestions: AI should consider factors like time of year and social media activity to refine recommendations. - Seamless Integration: Integrate personalized suggestions with booking, itineraries, and alerts for a seamless experience.
"Do you trust ChatGPTs? Effects of the ethical and quality issues of generative AI on travel decisions"	2024	Trust, Ethics, AI Recommendations	- Trust Building: Users are more likely to trust the app if AI recommendations are presented with clear disclaimers about capabilities and limitations, setting accurate expectations. - Ethical Transparency: Emphasizing ethical standards (data privacy, AI fairness) will improve user confidence. - Quality Assurance: Focus on providing accurate, reliable AI-generated recommendations to maintain trust. - Feedback Loops: Incorporating a feedback system where users can rate AI suggestions will help maintain and improve recommendation quality.

CHAPTER 3

PROPOSED METHODOLOGY

3.1 ALGORITHM PROPOSED

1. **Input Collection:**

   ❖ **Step 1**: Start.
   ❖ **Step 2**: Collect user preferences (destination, travel dates, budget, interests).
   ❖ **Step 3**: Store the user input securely in decentralized storage (IPFS).

2. **AI Recommendation Generation:**

   ❖ **Step 4**: Retrieve user input.
   ❖ **Step 5**: Fetch real-time data (weather, events, transportation options).
   ❖ **Step 6**: Analyze user preferences and real-time data using AI model
   ❖ **Step 7**: Generate personalized itinerary based on input.

3. **Blockchain Integration:**

   ❖ **Step 8**: Present the generated itinerary to the user.
   ❖ **Step 9**: Use blockchain smart contracts to handle payments securely.
   ❖ **Step 10**: Store transaction details on the blockchain.

4. **Review and Feedback Mechanism:**

   ❖ **Step 11**: After the trip, prompt the user to submit reviews and feedback.
   ❖ **Step 12**: Store user reviews in a decentralized review system using blockchain for transparency and security.

5. **Incentive Mechanism:**

   ❖ **Step 13**: Reward users with tokens for contributions (reviews, feedback).
   ❖ **Step 14**: Update the user's token balance in the decentralized ledger.

6. **End:**

   ❖ **Step 15**: Loop back to the user dashboard for further interactions or new trip planning

CHAPTER 4

TECHNOLOGIES USED

1. Blockchain:

- **Smart Contracts:** Self-executing contracts with predefined rules, allowing for automatic transactions and data exchanges between nodes in the network without intermediaries.

- **Distributed Ledger:** Ensures transparency and data integrity by maintaining a shared, immutable record of transactions and contributions across all nodes.

- **Tokenization:** To incentivize users or AI nodes to contribute travel data, reviews, or other valuable inputs. Token rewards can be given for participation.

2. React and Node.js Integration with Firebase

React.js:

- Build an intuitive UI where users input preferences (budget, destination, travel days) and receive real-time AI-generated trip plans.

Node.js:

- Serve as the backend for real-time communication between Firebase, AI models, and blockchain networks.

  In short, MERN helps manage the app's interface, user data, and API interactions in a Decentralized travel app.

3. Firebase

Firestore (Database):

- Store user profiles, trip history, geospatial data, and dynamic recommendations in a real-time, scalable database.

Authentication:

- Manage secure user logins and access control for personalized trip experiences.

4. Gemini API

- Integrates and processes travel data for generating personalized trip plans.
- Interacts with AI models to optimize trips based on user preferences, budget, and travel duration.
- Ensures scalability for handling large-scale travel data efficiently.
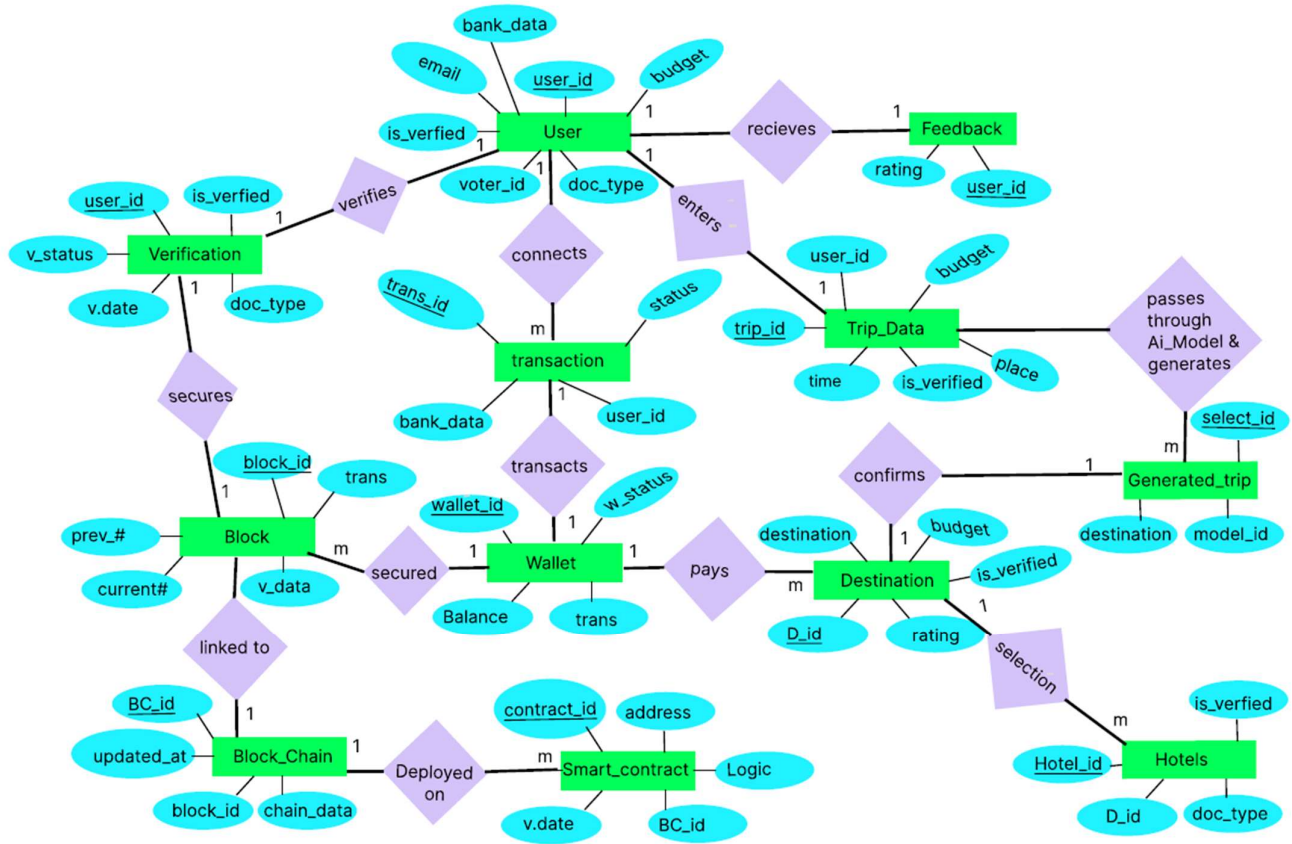
CHAPTER 5

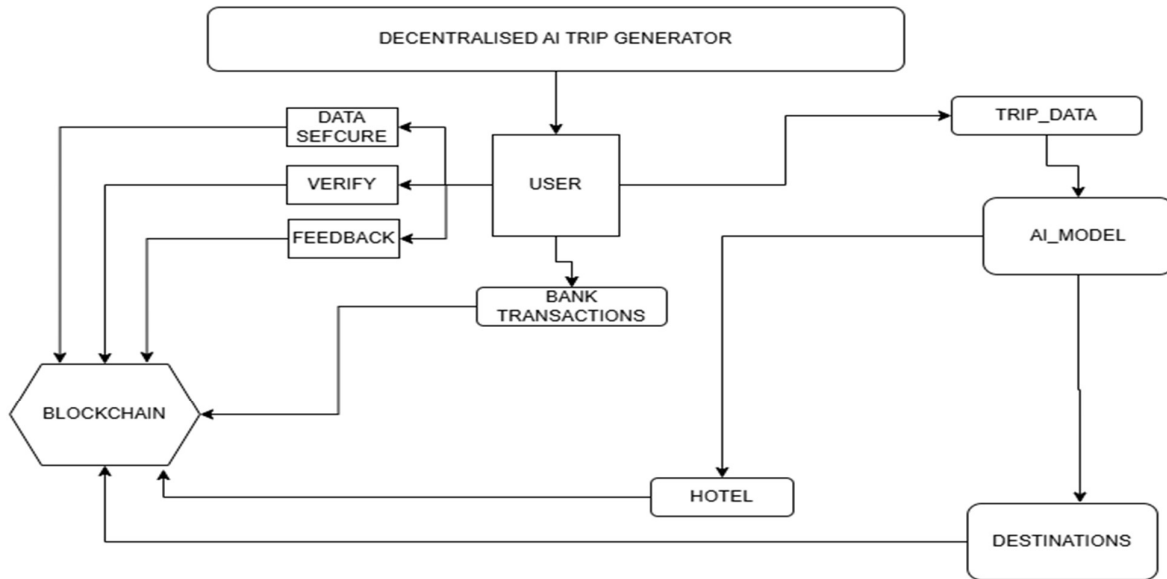# ER DIAGRAM

FIG-1

Flow Chart Diagram

Fig 2

CHAPTER 6

CONCLUSION

The Decentralized AI Trip Generator is a revolutionary approach to travel planning that leverages artificial intelligence and decentralized storage to deliver highly personalized and secure user experiences. By analyzing user preferences, behaviors, and real-time data, the system creates customized travel itineraries tailored to individual needs. Decentralized storage ensures user data remains private and secure, providing a robust foundation for trustworthy travel planning.

Although the platform currently focuses on AI-driven personalization and secure data handling, the integration of blockchain technology is a key milestone we plan to achieve soon. Blockchain will enable transparent and tamper-proof transactions, fostering trust and reliability in the platform. Additionally, features like decentralized review systems and token-based rewards are part of our roadmap to create a more engaging and community-driven experience.

As the travel industry continues to evolve, the Decentralized AI Trip Generator aims to set a new standard by combining advanced technology with user-centric design. We are committed to expanding the platform's capabilities through the implementation of blockchain and other decentralized features, shaping the future of travel planning to be more secure, transparent, and tailored to each user's unique preferences.

REFERENCES

1. W. Liu, Y. Zhang, and H. Gao, "Personalized Travel Recommendation Using Deep Learning," *IEEE Access*, 2018.

2. S. Xie, C. Li, and J. Li, "Blockchain-Based Secure Travel Booking System," *IEEE Trans. Ind. Inform.*, 2020.

3. H. Zhang, L. Wang, and T. Li, "Decentralized Data Storage Using IPFS," *IEEE Trans. Cloud Comput.*, 2019.

4. Y. Wu, F. Zheng, and S. Deng, "Real-time Data Processing for AI Travel Recommendations," *IEEE IoT J.*, 2021.

5. Q. Yang, Y. Liu, T. Chen, and Y. Tong, "Federated Machine Learning," *IEEE Trans. Big Data*, 2019.

6. J. Zhao, W. Chen, and H. Zhao, "Collaborative Filtering in Decentralized Systems," *IEEE Access*, 2020.

7. V. Nguyen, H. Yeo, and K. Lee, "Blockchain-Based Reputation System," *IEEE Access*, 2020.

8. S. Kumar, A. Agrawal, and P. Rao, "Token-Based Reward Mechanisms," *IEEE Blockchain Trans.*, 2021.

9. T. Lin, Y. Huang, and B. Guo, "Edge Computing for AI Recommendations," *IEEE Network*, 2021.

10. Y. Chen, Z. Liu, and M. Sun, "Scalability of Decentralized Networks," *IEEE Trans. Netw. Serv. Manag.*, 2022.