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Collaborative Tourism Application

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***Abstract:** Today, thanks to social media, travel is more about engaging, sharing, and connecting with people. Travelers across the globe take the help of social media platforms to discover, suggest, review, and purchase vacation packages. This paper aims at exploring the idea of collaborating tourists with guides where they can book a tour or create one respectively. The features integrated into this social media platform include creating, registering, and reviewing a travel post. Itineraries can be searched and sorted thus offering a good user experience. To deliver a personalized experience, chat interactions are introduced to enhance user engagement. The website uses the MERN stack which is an excellent choice for developing dynamic, high-quality, and robust applications. It comprises ReactJS in the front end, NodeJs in the backend, and MongoDB as NoSQL Database. Further, the paper discusses in detail the methodology and workflow of the application.*
***Keywords:** Social media, Itineraries, MERN Stack, Tourists, Guides, Travel, Tourism, Collaboration.*

I. INTRODUCTION

Technology and social media have been evolving rapidly in recent times. Social media especially is affecting and blooming the travel and tourism industry day by day. Individuals from around the world engage with social networking sites to search, compare and make decisions about their trips as well as share their personal experiences of a particular hotel, restaurant, or mode of transport. Travel and tourism agencies too can now easily reach individuals to make announcements about their offers and upcoming trips and itineraries using these social networking sites. When consumers start planning for a new trip, they usually get recommendations from friends or family, but these social media advertisements play a major role.

With today's technology, there is an application available for almost everything, especially for hotels, restaurants, tourist attractions, etc. A lot of different studies proved that a significant amount of people use these apps for traveling information and to have a better understanding of a certain place. Owing to these different apps and because of social media, more and more people discover and explore different locations. Another thing that is becoming quite popular today is writing reviews. A lot of people share reviews about the place they have visited. Reviews about locations, hotels, activities, restaurants, and many such things are being shared by tourists in big numbers.

Existing travel websites include purchasing a holiday package or booking transportation tickets. These lack customizable user experience where travel freelancers can take people for a trek or tour. This drawback is overcome here by providing a social space to avoid the middleman while planning for trips and directly interacting with tourists and their planners. "Collaborative Tourism Application" is a platform for users to create an account of their own and post about their traveling experiences along with exploring other individuals' accounts for certain information. The term "collaborative" here describes the social integration of different travel users i.e either the guide or tourist and this highlights to be the main objective of this paper. The most popular JavaScript web stack MERN is used here for robust and easier deployment of a full-stack web application. NoSQL database provides easy access, management, and scaling to deal with different types of data.

II. LITERATURE SURVEY

A smart trip planner called Voyageur is developed by Akshen Kadakia, Urvi Mistry, Devanshi Desai [1] to create a space for users to plan trips in minimal time & also make their own personalized itineraries. It has features that include suggestions based on the preference of the user, slot booking, and sharing plans with others. Though this application lacks assistance from guides, no surety of self-designed trips to be successful and secure. Study the successfully established TripAdvisor brands to analyze their business models, gain insights and identify possible areas for open innovation. The authors Kyung-Hyan Yoo, Marianna Sigala, Ulrike Gretzel [2] have studied reviews & ratings, profile management, forums, affordable costing, and showcasing of photos/videos. A case study on MakeMyTrip, a leading online travel portal is done by Lalitha Krishnamurthy [3] to know about its acceptance & impact on the travel business. The most influential factors here are bookings for flights, hotels, holidays, buses, refer and earn program with user feedback options.

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However social interaction with tourists is not possible as it is only booking oriented website. An application called "My Tourist Planner" was built by Ahmad Adnin Abdul Rahman, Zarul Fitri Zaaba and Azham Hussain [4] to focus on managing tour itineraries, budgets & places of interest. It is a personal tour manager app to reduce the burden whilst keeping a checklist. This application lacks security as well as the main focus is on a self-tour tracker rather than bookings of hotels or transport. A smart trip planner is designed by Osmond, Andrew B., Supangkat, Suhono H., Hidayat, Fadhil [5] to support independent travelers to facilitate their itinerary automatically based on users' choices. It has a trip planner engine to generate itineraries based on customer preferences. The results of these itineraries cannot be reliable as it does not consider all the factors of the current environment.

A mobile dynamic trip planner for E-Tourism is built by Hamzah Alghamdi, Shiai Zhu and Abdulmotaleb El Saddik [6] for a balanced orienteering problem to solve the planning aspect of tour planning. The application recommends trips and also its additions if more time persists to complete the trip. The disadvantage of this mobile planner is that it is only a suggestion-based app and no real-time bookings or tour registrations are considered. CRM System is being used in the travel industry its implementation is identified by Pan Lei [7] proposing the basic principles of CRM system & provides a travel plan for various agencies. The model types are introduced as customer-oriented, establish-scheme, and business cooperation. But these designs are quite traditional and can be made more customized according to our needs. An overview of how technology is supporting tourism for the collaboration of companies for the travel business is analyzed by Sulistyo Heripracoyo, Suroto Adi, Bachtiar H Simamora [8]. It focuses on integrating of hotels, transport, and tourist attractions with various business partners. This is a tedious and difficult process to include already-established brands to come together collectively for an effortlessly good user experience. The impact of social media on tourism destination marketing is analyzed by Shengnan, Jinxing, Xiang, Hongqin [9]. The paper describes the footprints and features that social media websites can create for tourism. However qualitative research is needed for further understanding. The travel intentions of Gen Z travelers and how social media plays a vital role is described by Bui Tanh Khoa, Bhui Tanh Long [10]. Hence it makes us aware of the impact social media is creating on recent generations though it does not solve the problem at a larger scale. A comparison of Gen X, Y, and Z travelers needs to be analyzed to fully understand the impact social media is creating on the tourism industry as a whole.

III. PROPOSED SYSYTEM

Everyday emerging technology has enabled individuals to choose their travel destinations from a wide range of options. Traveling is something that is now viewed as an escape from reality, which this generation tends to find very stressful. Especially considering the pandemic situation for a couple of years in the past, people now want to travel and explore various destinations in order to reduce stress. Our application is liable for providing a variety of best, trusted, and cost-efficient itineraries to users who wish to explore the country. The proposed system is a work on "Collaborative Tourism Application", which system ensures that customers find it easy to navigate through the whole app. We have designed this considering the factors which help customers easily share their experiences and travel. The main objective of the application is to provide a platform to the users for interacting with other customers as well as the tour guide to get detailed knowledge about the trips. The Frontend of the application is implemented using technologies like HTML, CSS, and ReactJS. These technologies ensure an easy-to-use structure, efficient working, and an attractive look for a web application. The Backend is developed with technologies like NodeJS and MongoDB which make sure the user data is stored and managed safely and efficiently. A user can simply register to the application by providing the necessary credentials like name, role (Tourist/Guide), email id, username, and password. This will create their account which can be used whenever the user chooses to use the application. Once the user has successfully registered by providing the required details, they can log in to the application by entering the username and password provided earlier. After successful login, the user is landed on the Explore page of the application. If the user is a Tour Guide, he/she can post itineraries including title, source, destination, dates, cost, group size, descriptions, and images. If the user, on the other hand, is a Tourist who is looking for itineraries, they can explore accounts of the Tourists Guides to view the posts and get information about upcoming trips and journeys. They can interact with the guides and can register for the trip then and there or save the trip for future reference. Thus, the "Explore" Page of the application will display all the posts uploaded by the guides' account. Users are also able to like, write and read comments on each post and save a post for future reference. These comments can be quite helpful as people can better understand a particular trip or an itinerary and also for those who face a difficult time coming to a decision. They can read the user experiences and make a decision easily. Each post has the option to Register for the trip, by which a user finalizes the trip and enters the additional credentials, and thus makes the payment for the same. The "Profile" Page will display the details entered by the user at the time of registration. These details can be edited or updated as and when required. It also displays the list of accounts a user has followed and the saved trips which the user wishes to register for. About the Backend of the web application, the data is stored in a MongoDB Cloud Database. This database further consists of two collections for Users and Posts respectively.

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IV. METHODOLOGY

A. Technology

The "Collaborative Tourism Application" developed here uses the full stack web technology called "**MERN**". MERN stack consists of MongoDB, ExpressJS, ReactJS, and NodeJS. It is an open-source platform used to develop dynamic websites. The MERN stack enables modern enterprises to build and deploy applications. Faster and more efficient than traditional servers and it is more sensitive to user input which results in a better user experience. The MVC architecture separates presentation details from business logic. Full-stack web development supports both front-end and back-end development. A fast, fault-tolerant web server saves you time troubleshooting I/O and CPU issues.

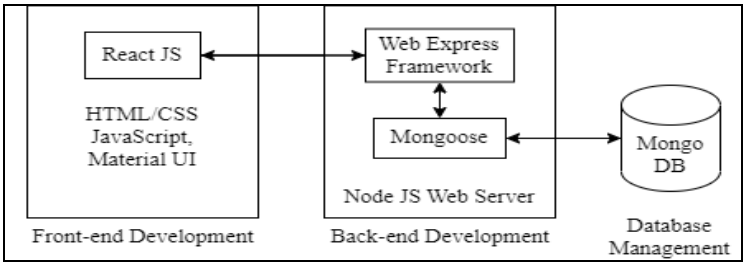


Fig.1 MERN Stack Development

The basic components are explained as:

1) *MongoDB:* It is the most popular document-oriented unstructured query language (NoSQL) database. It uses a binary version of JSON to store dynamic data. MongoDB allows you to run multiple databases concurrently. Features of MongoDB are flexible schema-less, self-managed, highly scalable, and multi-cloud data platform.
2) *Express.js:* It is a flexible and lightweight version of the Node.js framework. Express.js is powerful, asynchronous, and fast. Some features of Express.js include Single-page and multi-page web applications, Content negotiation, and Pluggable and highly flexible, HTTP utility methods (Put, Get, Delete, or Post).
3) *ReactJS:* It is a frontend JavaScript library developed by Meta and popularly known as React, which is used to develop dynamic single-page web applications. Its main goal is to improve the speed and performance of your application. Some characteristics of React are nested components, unidirectional reactive data flow, and Virtual Document Object Model (DOM).
4) *Node.js:* It is a native web server, or you can think of it as JavaScript outside the browser. Developers primarily use it to develop internal API services, traditional web applications, and mobile applications. Some Node.js Features: Dynamic Web Content, Free ASCII Text File Templates, NPM (Node Package Manager), Event-Based Asynchronous Model.

B. Design And Implementation

The application is designed in a way to integrate different types of users i.e. tour guides and tourists. Hence possess two login options and a different functional experience. MERN Stack being used for full stack development proves to be the best choice for this website. The robustness and dynamic nature help to separate the presentation details from the business logic. It creates a space where guides can post an itinerary and tourists can register for it. The guide can create a post by including title, source, destination, dates, cost of trip, group size, image and a detailed description. Each post can be viewed, liked, or reviewed to enhance user engagement just like any other social media website. Chat interactions are possible to connect with people and know more about a trip or suggest one. The "Explore" section consists of all the travel itineraries posted by different users. These can be sorted in any desired order. The most recent itineraries can be viewed in the "Top" posts section. Destinations can be searched using the "Search" bar. Other users can be found either by “Find others” section or with the help of “Search” bar. Registration for a particular trip is possible and multiple user bookings can be done. Payment can be done for the same with the total amount that will be provided in the bill. Current availing options of UPI prove to be a good choice for confirming trips. The trips can also be saved for future reference. The guide can view the list of registered people for a particular trip. The database is of NoSQL type that uses MongoDB to provide a flexible data storage instead of traditional rows and columns in a SQL database. Personal details like password are encrypted while storing to ensure privacy and protection of the user account.

Hence this creates a holistic social space for travel enthusiasts to provide a good user experience. A new edge website for posting, connecting, engaging, sharing, and reviewing is established to promote the tourism industry. It proves to be a great example in collaboration of travel bookings with social media experience.

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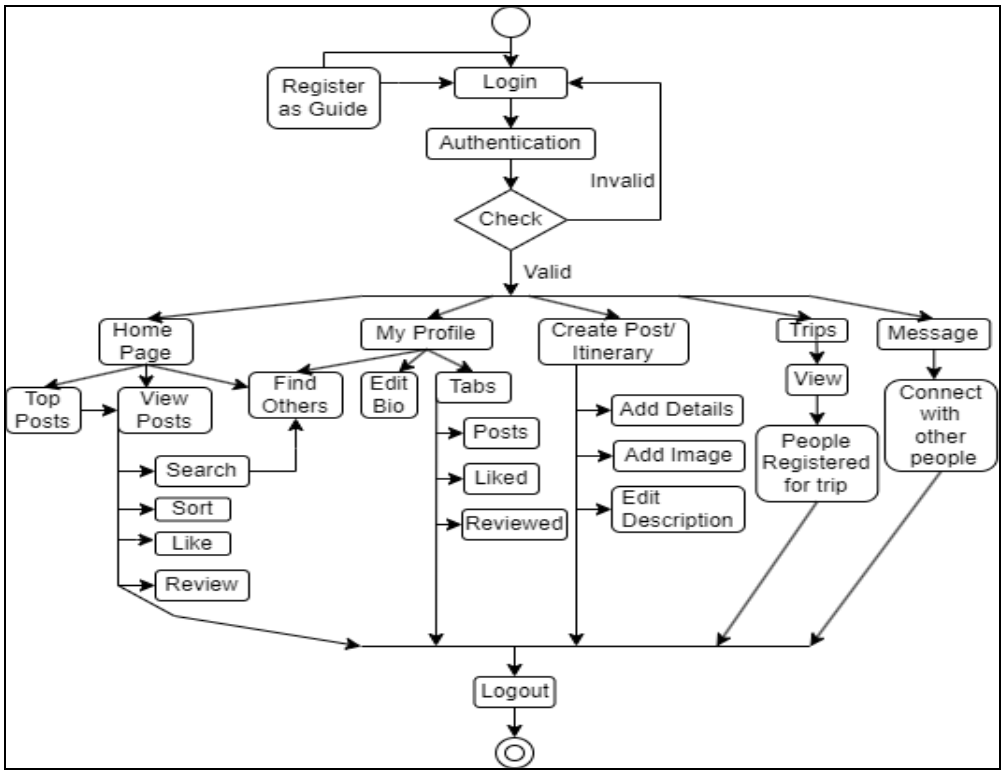


Fig.2 Activity Diagram for User as a 'Guide'

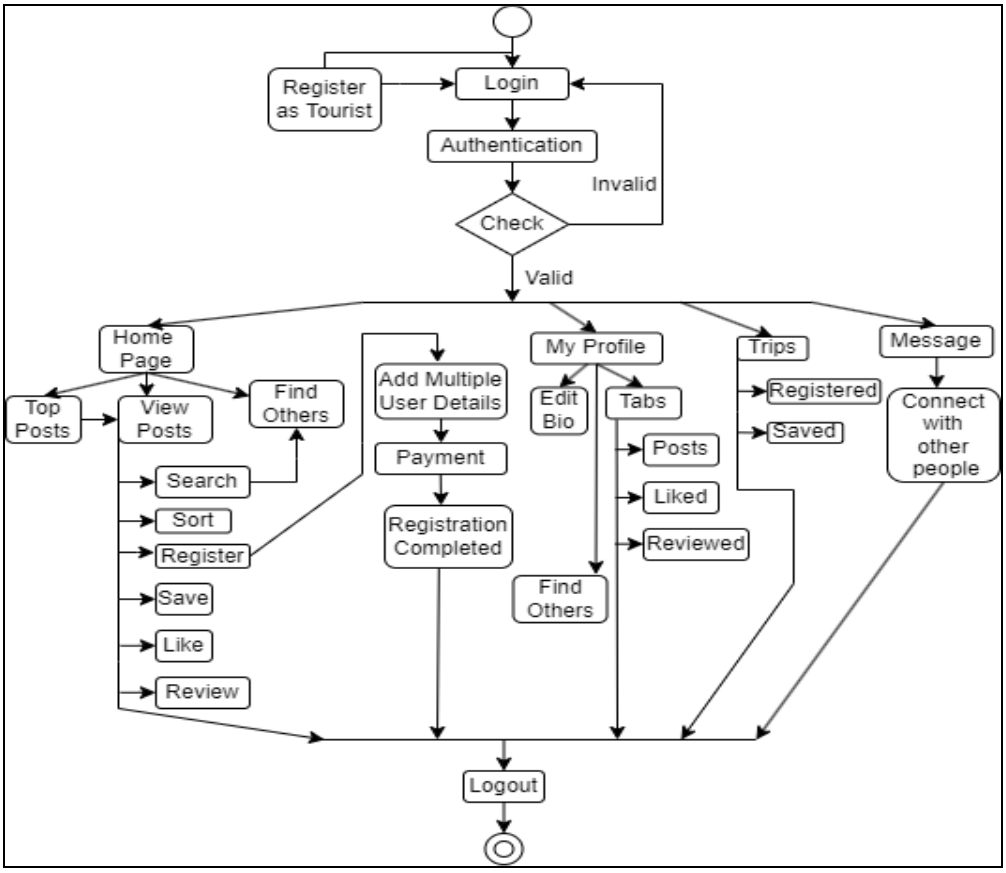


Fig.2 Activity Diagram for User as a 'Tourist'

V. FUTURE SCOPE

The research paper clearly explains the development of a website that promotes the collaboration of guides and tourists via social media. Though it is fully functional with the system proposed, it can be further improved and enhanced for growth by considering the following points:

A. Integration Of AI and ML

AI and ML are emerging to become a daily routine of today's world. Hence the website can be improved and made smarter by including a recommendation system for itineraries based on user preferences. Suggestions on local experiences and climate updates can be helpful for choosing a destination.

B. Gamification

Guides can be provided with virtual badges as verified guides on reaching certain milestones. This will help tourists choose a better tour guide for their trip. This increases user engagement.

C. Mobile Optimization

To optimize the website for mobile phones and make it easy to access and use. Hence be able to do bookings and modifications in a user-friendly manner.

D. Expand The Geographical Area

Currently, the website is built to cover a shorter geographical area. This can be expanded by adding google maps for exact location sharing and making it more diversified.

E. Analytics And Reporting

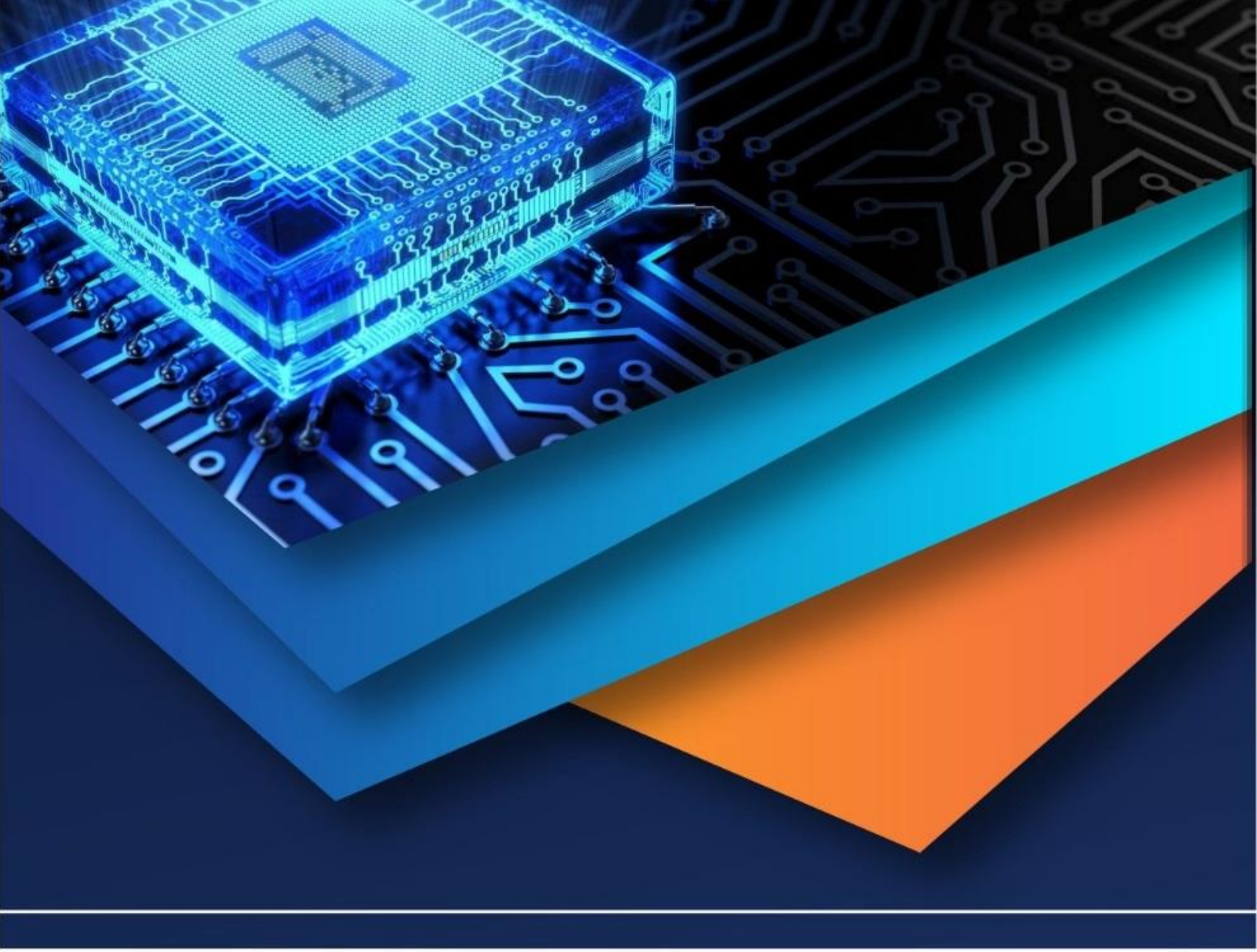
User behavior, interests, preferences, and activities of clickstream can be used as valuable insights for improving the quality of the website.

VI. CONCLUSION

A fully functional web application named "Collaborative Tourism Application" has been developed. The impact of social media on the tourism industry has been tremendous in recent years. Keeping that in mind, it has become a priority to develop a model which makes it efficient for its users to get an idea about tourist destinations. The topic "Travel and Tourism" focuses on the objective of making traveling and making decisions for the trip easy for its users. The advantage of such a model is to discard the process of looking for itineraries of tourist destinations in various places and inquiring about the same with various people. All of this can be done on this very platform quickly, with ease and comfort. The application design is kept simple with the flexibility of sharing and searching individuals' travel experiences. The Explore page consists of posts shared by the users which contain titles, sources, destinations, dates, images, and descriptions. Users will have multiple options of itineraries to choose from. The Account page will maintain the credentials entered by the user during the registration to the "Collaborative Tourism Application". The major highlight of the project is the technologies used for it. Recent and most secure web development technologies have made the website more fascinating. Front End technologies like ReactJS, HTML and CSS have proved to be more responsive and easy event-handling mechanisms. The data storage part has been backed with MongoDB and NodeJS. This has made the user details stay more secure and flexible.

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