

# “Design and Development of a Location-Aware, OCR- Integrated Digital Tourism Platform for Discovering Hidden Destinations in India”

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**Abstract-** Tourism in India holds immense cultural and economic significance; however, many rural and lesser-known destinations remain digitally unrepresented. Existing platforms primarily highlight popular locations, limiting the visibility of historically and culturally rich sites. To address this gap, this paper presents TOUR MITRA – a Smart Location-Based Digital Tourism Platform with OCR Integration and Authority Validation Mechanism.

The system utilizes the Google Maps API for real-time location detection and radius-based tourist spot identification, enabling users to explore nearby destinations through interactive map markers and structured information profiles. A key innovation of the platform is the integration of Optical Character Recognition (OCR) technology, which digitizes tourism-related content from printed books and archival sources, converting offline heritage knowledge into searchable digital data.

To ensure authenticity and prevent misinformation, the system incorporates a multi-level validation framework involving District Tourism Officers (DTOs) prior to publication. Built on a scalable three-tier architecture, the platform is technically feasible and suitable for regional and national deployment.

Tour Mitra promotes sustainable tourism, rural economic growth, and digital heritage preservation while supporting India's Digital India vision.

**Keywords:** Location-Based Services (LBS), Smart Tourism, Google Maps API, Optical Character Recognition (OCR), Digital Heritage Preservation, Authority Validation Framework, Geospatial Information System (GIS), Sustainable Tourism Development, Cloud-Based Tourism Platform, Digital India Initiative

## 1. INTRODUCTION

Tourism plays a vital role in driving economic growth, fostering cultural exchange, and generating employment opportunities. India possesses vast diversity in the form of historical monuments, temples, forts, caves, waterfalls, heritage villages, and natural landscapes. While popular destinations receive widespread promotion through digital platforms, thousands of culturally and historically significant yet lesser-known tourist sites remain underrepresented on digital platforms. The lack of structured digital documentation and online visibility restricts tourist exploration and limits economic opportunities for rural and local communities.

In the digital era, travellers increasingly rely on online platforms and mobile applications for trip planning and destination discovery. However, most existing tourism systems focus primarily on commercially established destinations. As a result, **hidden or rural tourist locations documented in books, research papers, or local knowledge remain inaccessible in digital format.** This creates a significant gap in **cultural preservation, tourism expansion, and balanced regional development.**

To address this challenge, this research proposes **TOUR MITRA – a Smart Location-Based Digital Tourism Platform** designed to discover, digitize, and promote hidden tourist destinations. The system integrates **Location-Based Services (LBS) using the Google Maps API for real-time user location detection and radius-based identification of tourist spots.** Each destination is displayed with **structured historical information, multimedia content, and geo-tagged data** to enhance user experience.

A key innovation of the proposed system is the integration of **Optical Character Recognition (OCR) technology to digitize tourism-related information from printed books and archival documents,** transforming offline heritage knowledge into searchable digital content. To ensure authenticity and prevent misinformation, the platform incorporates a **multi-level authority validation mechanism involving District Tourism Officers (DTOs) or authorized officials**

prior to publication.

The system follows a **scalable three-tier architecture (frontend, backend, geospatial API, and cloud database)**, ensuring technical feasibility and long-term sustainability. By combining **commu-**

**nity participation, government validation, and geospatial technologies**, Tour Mitra aims to establish a reliable, inclusive, and sustainable digital tourism ecosystem aligned with **Digital India initiatives**.

## NOVELTY

The novelty of the proposed system lies in the development of a dynamic adaptive radius-based tourism discovery engine that automatically adjusts the search boundary based on user context and environmental conditions. Unlike conventional tourism platforms that rely on static search ranges and popularity-based recommendations, the proposed system integrates hidden-spot prioritization, crowd-density-aware ranking, and real-time micro-itinerary auto-generation within a unified framework.

The main contributions of this work are summarized as follows:

1. A dynamic adaptive radius algorithm that adjusts exploration range based on time availability and travel conditions.
2. A hidden-spot discovery mechanism that prioritizes lesser-known but highly rated tourist locations.
3. A crowd-density-aware ranking model to optimize user comfort and reduce congestion exposure.
4. A real-time micro-itinerary auto-generation engine that creates optimized multi-destination travel plans.

## 2. LITERATURE SURVEY

### 2.1 Related Work:

The tourism sector in India is growing rapidly; however, many rural, religious, and culturally significant places still lack proper digital representation. Most online platforms provide information only about well-known tourist destinations, while numerous historically and religiously important sites remain undocumented or poorly documented in digital form.

For this research study, an initial field survey was conducted at Bhavani Devi Temple, located at Varanga, District Hingoli. This temple is locally famous and attracts a large number of devotees, especially during the Dussehra festival when a large religious fair (Yatra) is organized. Despite its popularity among local visitors, detailed historical and cultural information about this temple was not available on Google or any major travel information platforms.

To collect authentic information, a direct field visit was conducted. A structured interview was carried out with the temple Maharaj (priest), and the complete historical narration was recorded in audio format. Old printed photographs, physical documents, and mobile-stored information available with the Maharaj were collected for documentation purposes.

According to the information provided, the idol of Goddess Bhavani was initially discovered under a banyan tree. Devotees began worshipping the idol at that location. Gradually, faith in the deity increased, and many devotees started fulfilling vows (Navas). During the Dussehra festival, large gatherings began to take place, and eventually a small temple was constructed. As the number of devotees continued to increase, the temple and the surrounding area underwent gradual development. Today, the site has become an important regional religious center.

A critical observation from this survey was that none of this historical and developmental information was available on Google or other digital tourism platforms. This indicates that many such religious and historical places are still limited to oral history and local knowledge, without proper digital documentation.

A similar survey was conducted at another temple, where again it was found that detailed information was unavailable on Google or travel websites. Some information was shared by Instagram vloggers, but it had not reached a broader audience in a structured or reliable manner.

Furthermore, it was observed that much of the historical information related to such temples exists only in old books, handwritten records, and local documents. These records have not yet been digitized. During the research process, several such documents were collected and converted into PDF format for preservation.

### Identified Problems

Based on the field surveys and observations, the following problems were identified:

1. Many religious and historical places do not have proper digital documentation.
2. Information available on Google and travel platforms is extremely limited.
3. Most historical data exists only in oral form.
4. Important records in old books and documents are not digitalized.
5. Users cannot easily add structured and verified information on existing platforms.
6. Finding nearby tourist places takes significant time, or visitors must manually ask local people for directions and information.
7. There is no unified platform that displays hidden or lesser-known places based on real-time user location.

### Proposed Solution

To address the above problems, a Location-Based Digital Tourism Platform is being developed.

- The proposed system will:
- Automatically detect the user's real-time location.
- Display all tourist places within a 50 km radius (or more) from the user's current location with a single click.
- Show nearby locations sorted by distance (nearest first).
- Provide detailed historical information, images, and relevant documentation for each place.
- Allow users to contribute and add new place information in a structured format.
- Digitally preserve old books, audio histories, and local documentation.

With this solution, users will no longer need to manually search multiple platforms or ask local individuals to discover nearby places.

All nearby tourist destinations will be available instantly based on real-time location detection.

## 2.2 Exploring Tourism Industry Influence: A Transporting Mode-Centric View through Artificial Intelligence [2]

The tourism sector is a vast industry, and transportation is the most essential part of the tourism industry in the 21st century. This research article reveals the role of the transportation system in the tourism industry. Recent tourism transport-related research helps to examine the relationship between transportation and tourism and how the tourism industry influences the transportation system. The data was collected through a recent online research publication and questionnaire related to tourism and transportation. Result revealed that the perceived role of transportation is positively associated with the influence of the tourism industry, and perceived tourism and transportation play a mediating role in this relationship. The findings of this study contribute to the tourism industry with transportation and provide significant implications for tour agencies and transport companies to develop ideas of the role of transportation in promoting the tourism development industry.

## 2.3 Sustainable Digital Transformation of Heritage Tourism [3]

Tourism has always meant big business. With the travel service sector being the economic backbone of several countries, heritage tourism becomes a key fiscal factor for growth. So far, technology in the travel and tourism industry primarily focused on customer engagement and service, aiming at a simplified digital experience from booking a trip and planning the itinerary to organizing payments and post-trip memories. However, with the world coming to terms with the devastation of the COVID-19 pandemic, digital heritage tourism becomes critical to local economies mainly to revive global interest and to keep domestic businesses going. A sustainable transformation to digital heritage tourism can support

nations to vault over physical travel challenges during times such as these, and help governments collaborate with international organizations for positive future change.

### 2.4 The Research on Construction of College Student Online Tour Guide Platform Based on Wisdom Tourism [4]

In recent years, development and integration of information industry and tourism industry give birth to wisdom tourism. From the perspective of intelligent tourism economy, the college students online tour guide platform has been generated. College students online tour guide platform is an internet platform that is used in the tourism market of college students by intelligent tourism, and is an integrated network that can match the travel demand between university student guides and college guides, and is a communication platform of interconnection between college student tourists and college student guides. Base on the college student online tour guide platform, this paper explores construction and application for this platform. This paper puts forward some constructive suggestions on design, compositions, profit earning and technology of college student online tour guide platform, aiming at becoming the best model for the use of wisdom tourism in college students' tourism market.

### 2.5 Pain Points in Tourism and Its 5G-based Intelligent Solution [5]

Although the construction of smart tourism has aroused a boom, it is still in the early stage of development, and many traditional problems in the tourism industry have not been well solved, as well as some new problems have emerged. The development of 5G provides the basis to realize the ubiquitous high-speed interconnection between people and things as well as between machines and machines, which bring about opportunities to solve these problems. This paper reviews the development of smart tourism, analyses the pain points existing in current systems. From the perspective of cybernetics, a 5G based intelligent tourism system providing intelligent service centered on "tourism experience" under the consideration of sustainable development of tourism industry is put forward.

## 3. DESIGN AND IMPLEMENTATION

### 3.1 Block Diagram

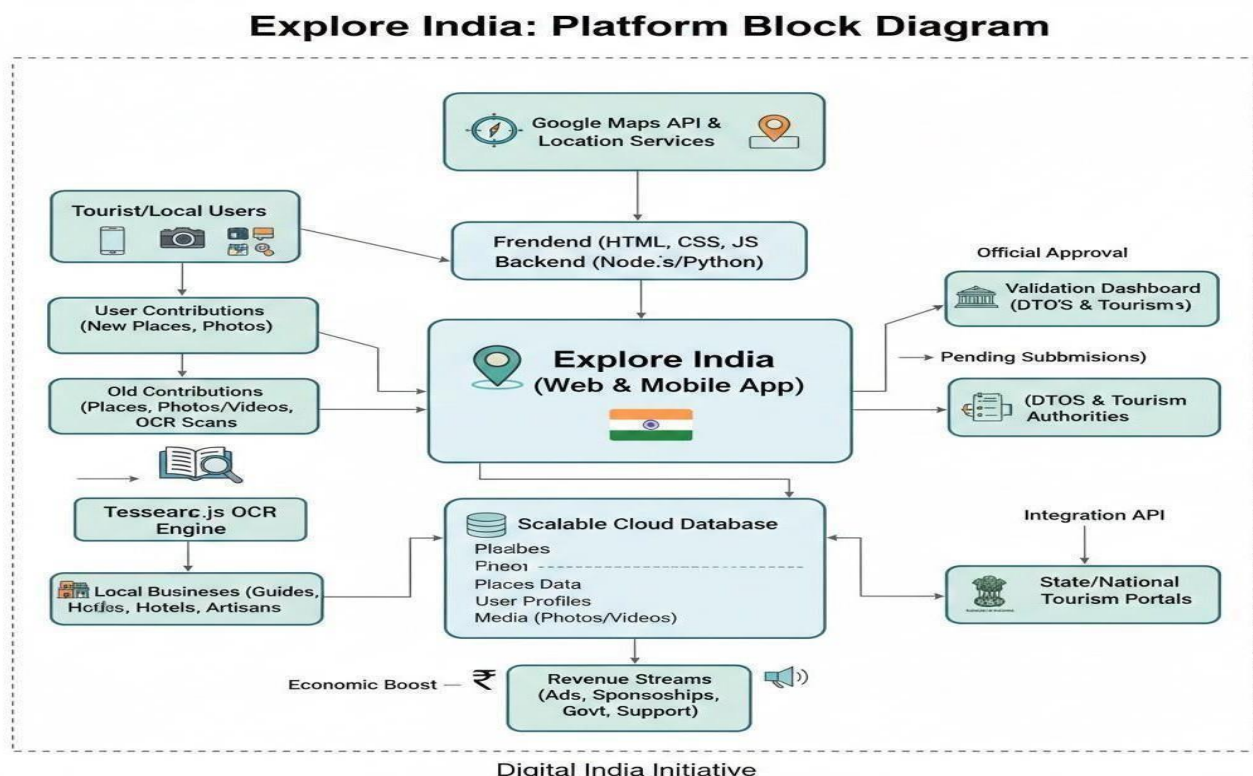


Figure 3.1 Block diagram of the system

### 3.2 Level Data Flow Diagram (DFD)

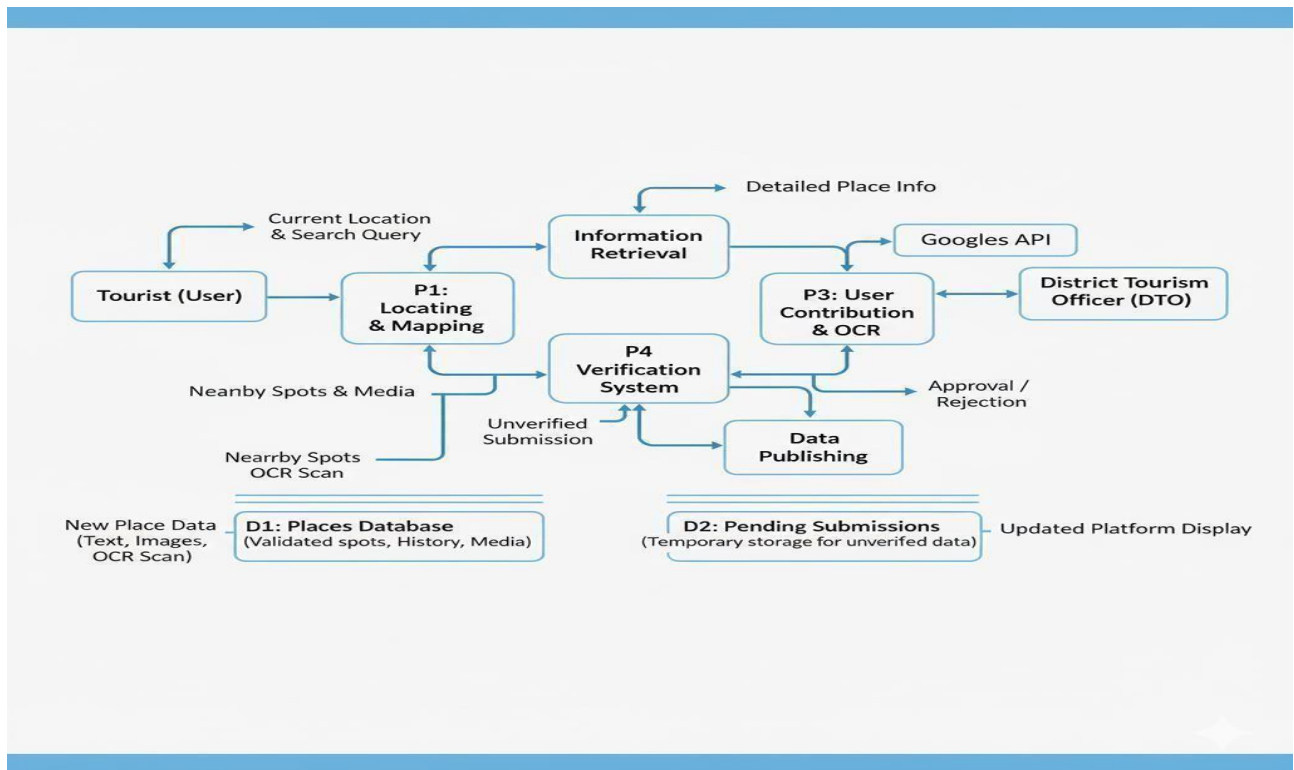


Figure 3.2 Level Data Flow Diagram (DFD)

#### 1) Home Page Design

The landing page contains navigation links (Home, Features, Pricing, and Contact), Login, and Admin Login options. It includes a hero banner and call-to-action buttons.

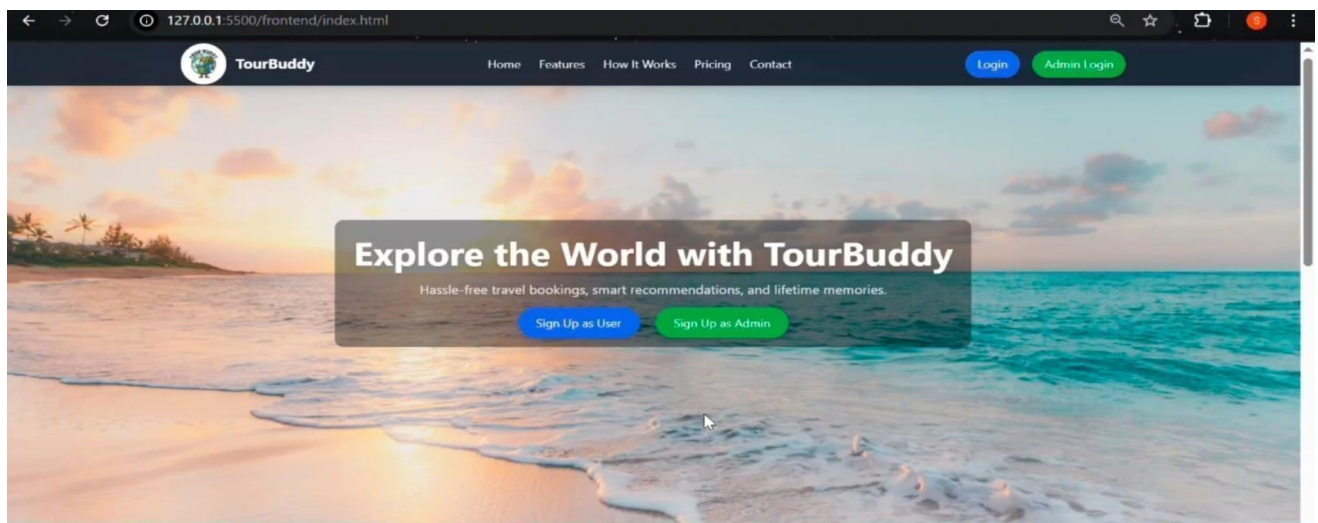


Figure 3.3 Home Page Design

## 2) User Dashboard Design

After login, users are redirected to the dashboard where real-time Google Map integration is enabled. The dashboard includes:

- Location search bar
- Dynamic map rendering
- Marker placement
- Pop-up information windows

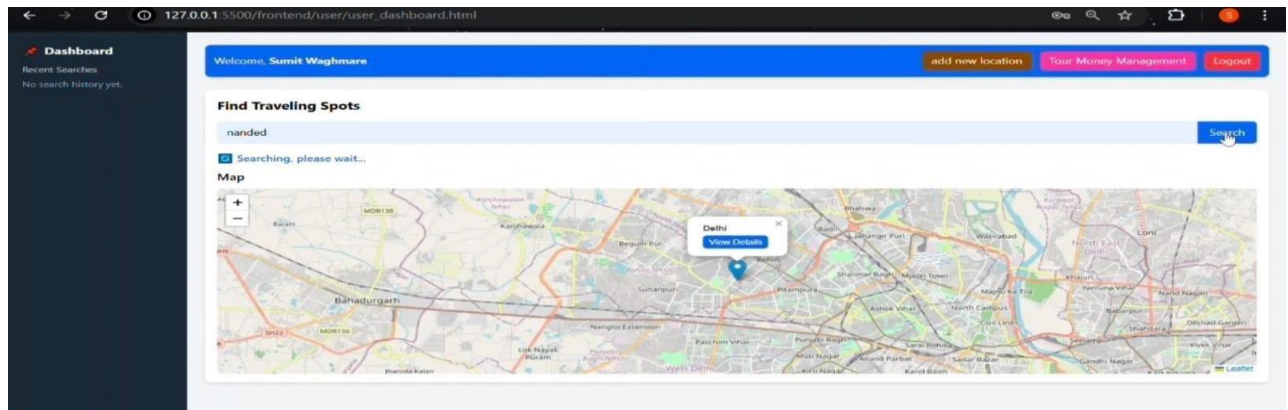


Figure 3.4 User Dashboard Design

## 3) Tourist Place Contribution Module

Users can add new tourist places by providing:

- Place Name
- Description
- Latitude & Longitude
- Media Upload
- Status Indicator (Pending/Verified)

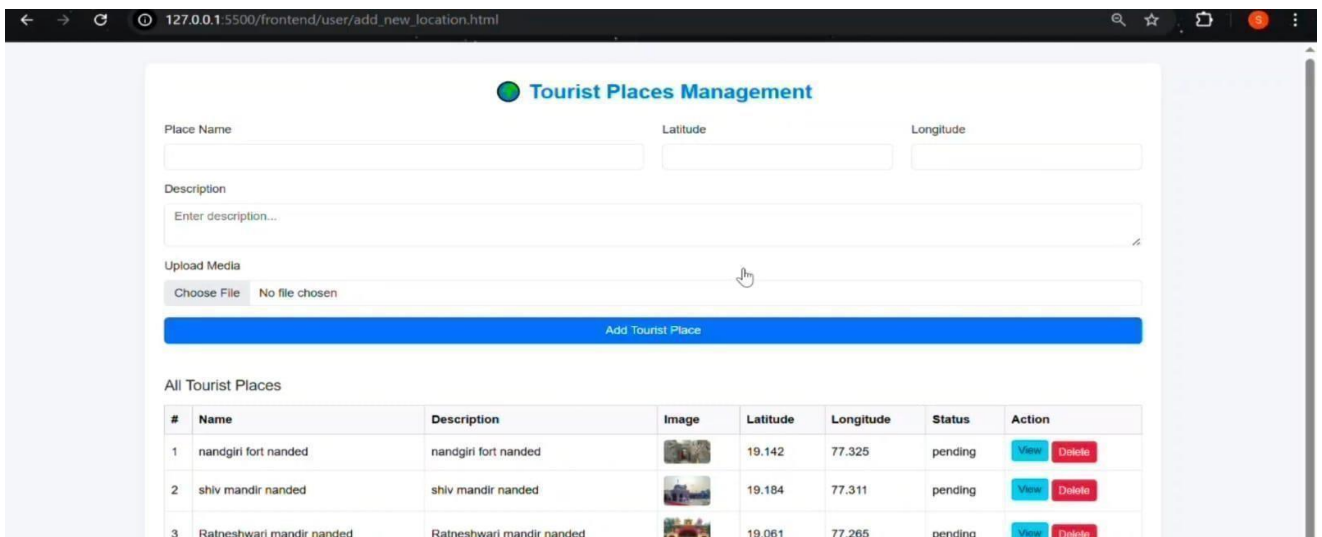


Figure 3.5 Tourist Place Contribution Module

#### 4) Nearby Tourist Places Display

Tourist places within a 50+ km radius are displayed in card format with images and short descriptions

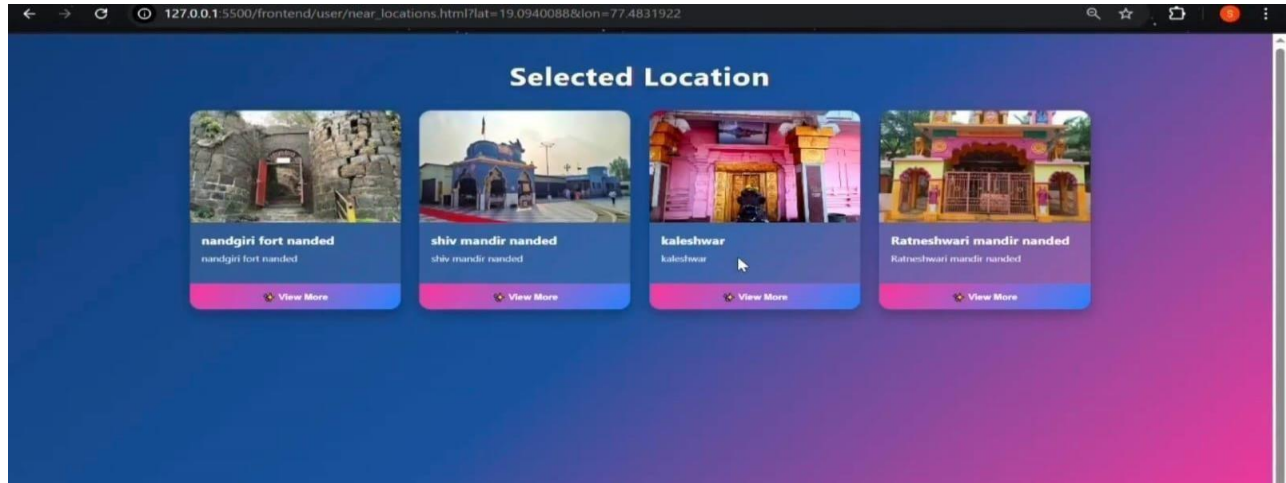


Figure 3.6 nearby Tourist Places Display

#### 5) Detailed Information Page

Each tourist location includes historical description, media content, reference links, and verification status



Figure 3.6 Detailed Information Page

#### 6) Admin Panel Implementation

The Admin Dashboard enables:

- Approval or rejection of submissions
- Monitoring pending records
- User management
- Data integrity maintenance

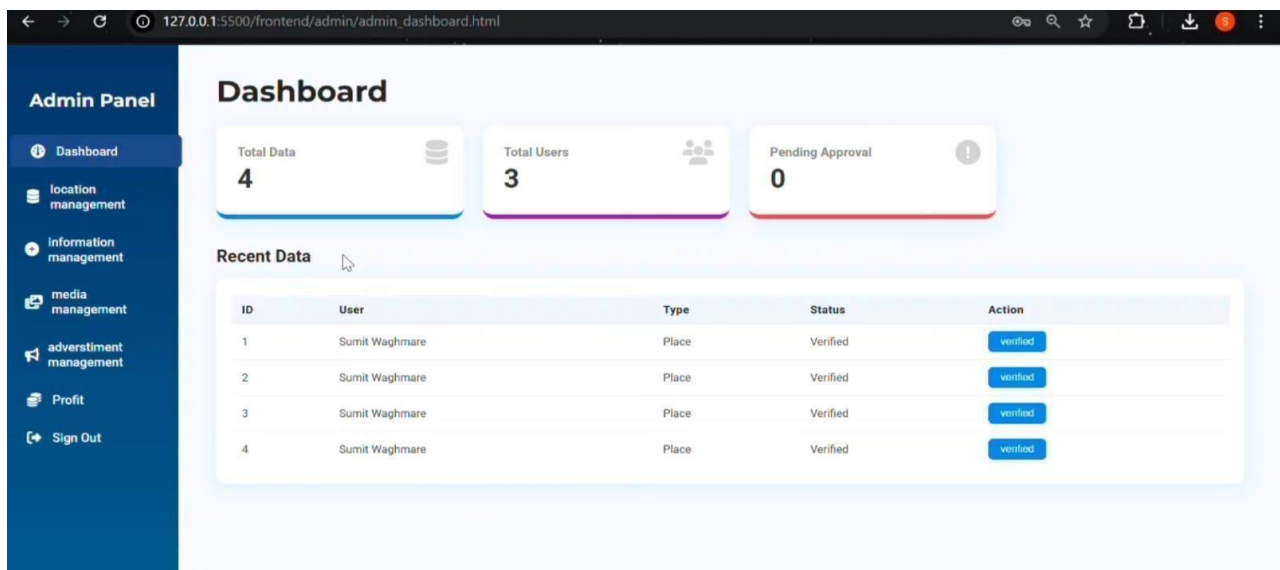


Figure 3.7 Admin Panel Implementation

#### 4. INTEGRATION & TESTING

The “Explore India With Tour Mitra” platform integrates frontend, backend, Google Maps API, OCR module, and a validation system into a unified architecture. The frontend communicates with the backend through REST APIs using JSON-based data exchange. Real-time geolocation and a dynamic 50 km radius are implemented using the Google Maps API to display nearby tourist spots. The OCR module (Tesseract.js) extracts text from uploaded images for the digitization of book-based tourism information. A role-based validation mechanism ensures that DTOs approve user submissions before publishing. Unit and integration testing verified the proper functioning of geolocation, radius filtering, OCR extraction, and approval workflow. The results confirm reliable system performance, accuracy, and secure data handling under moderate operational conditions.

#### 5. SAFETY & LEGAL COMPLIANCE

The “Explore India With Tour Mitra” platform ensures that all published tourist information is verified by authorized District Tourism Officers (DTOs) before public visibility to prevent misinformation and false listings. User-generated content remains in a pending state until officially approved. The platform follows Indian IT regulations and applicable data protection guidelines to ensure secure handling of user data and digital content. OCR-based digitized information from books is published only after validation and proper acknowledgment to respect copyright norms. These measures ensure safe operation, legal compliance, and trustworthy tourism information dissemination.

#### 6. CONCLUSION

The “Explore India With Tour Mitra” platform is designed to make hidden and lesser-known tourist places digitally accessible to everyone. By integrating real-time location services, Google Maps API, OCR-based digitization, and an official validation mechanism, the system ensures accurate, reliable, and user-driven tourism information. It supports local economies by increasing visibility of small destinations and promoting community participation. The platform is scalable, technically feasible, and aligned with Digital India initiatives. In the future, the system can be enhanced with AI-based recommendations, mobile application support, and integration with national tourism portals for large-scale implementation.

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