ONLINE TICKET MANAGEMENT SYSTEM FOR MONUMENTS

SUBMITTED IN PARTIAL FULFILLMENT FOR THE REQUIREMENT OF THE AWARD OF DEGREE OF

BACHELOR OF TECHNOLOGY IN

COMPUTER SCIENCE

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Session 2024-25

DEPARTMENT OF COMPUTER SCIENCE

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(Affiliated to Dr. A. P. J. Abdul Kalam Technical University, Lucknow, U.P., India) May 2025

DECLARATION

I/We hereby declare that this submission is our own work and that, to the best of our knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

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CERTIFICATE

This is to certify that Project Report entitled "Online Ticket Management System for Monuments" which is submitted by Aditya Pandey, Aryan Srivastava, Sheersh Sharma and Shivansh Singh in partial fulfillment of the requirement for the award of degree B. Tech. in Department of Computer Science of Dr. A.P.J. Abdul Kalam Technical University, Lucknow is a record of the candidates own work carried out by them under my supervision. The matter embodied in this report is original and has not been submitted for the award of any other degree.

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ACKNOWLEDGEMENT

It gives us a great sense of pleasure to present the report of the B. Tech Project undertaken during B. Tech. Final Year. We owe special debt of gratitude to Professor Amit Kumar Singh Sanger, Department of Computer Science, KIET, 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 cognizant efforts that our endeavors have seen light of the day.

We also take the opportunity to acknowledge the contribution of Dr. Ajay Kr. Shrivastava, Dean of the Department of Computer Science, KIET, 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 in the completion of the project.

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ABSTRACT

The conventional way of reserving tickets for monuments and museums involves long queues and the hassle of producing printed tickets. The ticketless booking has increased in use among tourists ever since technology emerged. This paper analyzes the literature on ticketless entry towards monument and museum reservation, elaborating on the various technologies employed and their impact on user experience.

This project “Online Ticket Management System for Monuments” is a web-based application developed to mechanize and modernize the booking, management, and verification process of entry tickets for historical and cultural monuments. Built with React as the frontend framework and Django as the backend framework, the system provides a simple-to-use interface to tourists for viewing monuments, checking availability, and buying tickets online. It also contains admin features for managing ticket stocks and visitor movements for monument authorities to generate reports and track ticket movements. Important functionalities include cross-device compatibility with responsive design, secure user login, real-time visibility of ticket stocks, and QR code validation. The goal is to avoid prolonged queues, prevent manual work efforts, and enable better overall experiences for the visitor through effective contactless entry management.

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LIST OF ABBREVIATIONS

The following abbreviations are used throughout the **Safar-e-tourism** report:

- **API** – Application Programming Interface
- **QR** – Quick Response
- **UI** – User Interface
- **UX** – User Experience
- **DBMS** – Database Management System
- **SQL** – Structured Query Language
- **JWT** – JSON Web Token
- **CI/CD** – Continuous Integration and Continuous Deployment
- **OTP** – One-Time Password
- **HTTP** – HyperText Transfer Protocol
- **HTTPS** – HyperText Transfer Protocol Secure
- **RAM** – Random Access Memory
- **CPU** – Central Processing Unit
- **SSL** – Secure Sockets Layer
- **IDE** – Integrated Development Environment
- **CSS** – Cascading Style Sheets
- **HTML** – HyperText Markup Language

SDG MAPPING WITH JUSTIFICATION

SDG 9: Industry, Innovation, Technology and Infrastructure: This online ticket management system for monuments is a industry innovation, as it provides an online platform by which people can book digital tickets online all over India at any time without standing the long ticket lines outside the monuments. We can further extend this innovation to other countries and there is further a scope to integrate AI and ML in it to provide suggestions to the users.

SDG 10: Reduce Inequality: As we get the news that some people face issues to purchase the ticket maybe due to the clothes they wear, but by this we can promote equality as anyone can purchase the ticket with this platform.

SDG 11: Sustainable cities and communities: Online ticket booking make urban space for modern, safe and improving the accessibility and efficiency of monuments visit.

SDG 12: Responsible Consumption and Production: When anybody purchase tickets offline for visiting monuments then they get the physical paper ticket and as we know that paper is made from trees and lot of industrial processes are also involved in it, but with the help of online ticket booking we can save environment and energy resouces which are used to make paper in industries.

SDG 13: Climate Action: This project indirectly also related to reduce global warming as now we are reducing the use of paper with the use of e-tickets thus saving trees and promoting greenery.

SDG 17: Partnerships for the Goals: The project requires collaboration between governments and tech sectors. Partnerships are critical for deploying the system and sharing data, ensuring inclusive development.

DIAGRAM FLOW TABLE

CHAPTER 1

INTRODUCTION

1.1 Introduction

The monuments and museums are cultural symbols that attract millions of tourists worldwide every year. However, traditional ticketing systems for them are time-consuming, inconvenient, and frustrating for travelers. Travelers are usually required to queue for long periods to buy tickets, and physical tickets have the potential to be stolen or lost, causing inconvenience and delays. We present in this paper a new solution to these issues: ticketless entry via a website.

Our research has the primary goal of investigating electronic solutions that would facilitate ticketless entry to museums and monuments using a website. We will consider how electronic technology like QR codes and other modes of verification could be implemented so that tourists get structured and secure access to such places. Our answer will be to provide an improved and more streamlined experience for visitors, reducing the administrative expense and the effort that comes with traditional ticketing systems.

This report shall give an exhaustive literature review of ticketless computer systems and museum and monument case studies which have implemented ticketless entry through an internet website. We will a lso give a survey of museum visitors to identify their views and choices in respect of digital ticketing options. Finally, we will identify the potential benefits and drawbacks of applying ticketless entry through a museum and monument website, and make recommendations for additional research in this field. Through our research, we will inform creative and sustainable solutions for the management of museums and monuments and enhancing visitor experience. Our mission is to provide insights into digital solution design and deployment for museums and monuments

around the world by considering the possibility of ticketless entry via a website.

1.2 Project Category

The project category for this research falls under "Digital Ticketing Systems" or "Smart Tourism and Electronic Access Management". More specifically, it can be classified as:

- Smart Tourism & Heritage Site Management
- E-Ticketing and Digital Access Systems
- Web-based Ticketing and Verification Solutions
- QR Code-Based Authentication for Monuments & Museums
- Visitor Experience Optimization through Technology

1.3 Objectives

The central idea of this project is to envision, design, and create an extensive and user-friendly online ticket management system in particular for museums and historical monuments. The emphasis is on the digitalization of the conventional ticketing process so that operational effectiveness is increased and the overall visitor experience is bettered. This system will enable users to easily browse through available time slots, confirm ticket availability in real-time, and receive their digital tickets securely as QR codes, which can be quickly scanned on arrival at the monument.

In order to provide a secure and seamless user experience, the application features an optimized user authentication process that triggers only during booking time, thus reducing friction and providing a suitable level of security. A special focus has been laid on the design of a simple and neat user interface with step-by-step instructions to the user for the ticket booking, so even with limited technical know-how, people can use it.

In line with promoting inclusion and accessibility, the website is completely responsive and optimized to all devices including smartphone, tablets, and computers. This ensures consistent and smooth operation across platforms for users regardless of screen or operating system size. Furthermore, extensive security measures are put in place to secure the sensitive data of customers. They include end-to-end encryption, secure handling and storage of finance and personal information, as well as strict observation of pertinent standards of data protection.

CHAPTER 2

LITERATURE REVIEW

2.1 Literature Review

1. Rishabh Patel, Rahul Raghvendra Joshi,

Envision of I-RS (I-Railway System)[1] The article highlights the importance of cloud technology in improving the accessibility, reliability, and performance of conventional railway systems, which tend to be plagued by bottlenecks during peak hours.

This research forms a useful source in the framework of online ticket management systems in the sense that it illustrates the ways in which cloud-based frameworks can transform antiquated public service systems. Using cloud services results in centralized storage of data, enhanced availability, and cost savings on infrastructure, all of which are applicable and scalable for establishing similar systems for other areas of application like the management of entries to museums and monuments. The suggested ideas also facilitate the development of secure, quick, and highly available booking services, which are in good agreement with the goals of the Online Ticket Management System for cultural sites.

2. Smart computing applications in railways systems a case study in Indian railways passenger reservation system

Parag Chatterjee, Ashoke Nath [2] The authors profile the Indian Railways PRS as an actual high-demand system that processes millions of transactions every day. They see some of the main issues with the conventional setup, which include reduced accessibility, delays in response time, and redundancy of data. In order to resolve these problems, the article suggests employing the use of smart computing frameworks capable of automating and optimizing processes like ticket reservation, route management, and tracking seat availability. These improvements not only minimize human intervention but also enhance

the fault tolerance and responsiveness of the system.

This work is very much applicable to the development of online ticketing systems outside the railway sector, such as cultural heritage sites and museums. The system architecture and technologies proposed in the paper form a basis for the development of efficient, user-friendly ticket management systems.

3. Generation E-ticketing system, International Journal of Emerging Research in Management &Technology

Abdul Mateen Ansari, Aftab Alam, Mohammed Mujahid Barga [3] The article focuses on the increasing relevance of e-ticketing systems in various industries like public transportation, events, and tourism, stressing that existing systems are commonly short of real-time integration, multi-platform capability, and effective authentication processes. In response to these shortcomings, the authors present a next-generation e-ticketing model that incorporates mobile app capability with real-time database access and QR code verification to facilitate unproblematic ticket issuance and validation with minimal intervention by humans. One of the standout features of this study is its emphasis on improving user convenience, minimizing the use of printed tickets, and encouraging environmentally friendly practices using paperless transactions. Security is also tackled, using encrypted QR codes and secure login procedures to avert fraud and guarantee authenticity.

4. Android application for Ticket Booking

Subarnarekha Ghosal, Shalini Chaturvedi, Akshay Taywade[4] This article outlines the design and implementation of an Android application that is specifically designed for ticket booking and verification in urban railway systems. The designers wanted to minimize congestion and waiting time at railway stations by allowing booking of tickets by users via a mobile app and enabling railway personnel to check them via mobile phones. The system utilizes mobile computing and QR code scanning to achieve paperless and touchless ticketing, improving user convenience and operational effectiveness. The study points out the main characteristics including retrieval of train schedules in real time,

seat availability inquiry, and electronic ticket generation with a specific QR code. On the administrative front, the system also facilitates ticket checking via QR validation, providing both speed and precision in the checking process. The study focuses on the advantages of implementing such mobile apps in densely populated transport networks, particularly in suburban areas with heavy commuter traffic.

5. Designing an Enhanced Simulation Module for Multimedia Transmission Over Wireless Standards.

Patel, M., Choudhary, N. [5] Although this paper mainly addresses the improvement of simulation modules for wireless multimedia transmission, its results indirectly apply to e-ticketing and digital service platforms. The authors put forward a framework that improves data transmission quality and reliability through intelligent modulation and adaptive encoding methods. This provides a smoother user experience even under fluctuating network conditions, which is essential in real-time applications such as mobile-based ticket reservation.

6. Smart India Hackathon, "SIH 2022 Problem Statements," Available: https://sih.gov.in/sih2022PS

[6] The Smart India Hackathon 2022 Problem Statements are an excellent national-level asset to comprehend real-world issues confronted by government and public service organizations. Amongst the diverse problem statements, there are a number of them addressing digitizing public utilities, modernizing heritage site entry, and enhancing citizen engagement through technology. These statements emphasize the need for smart, scalable, and secure ticketing for museums, monuments, and other public sites.The problem statements give both functional and technical insights that assist in defining the scope of your project.

7. Acme Ticketing, "Why Your Museum Needs Mobile Ticketing Software

[7] This Acme Ticketing article addresses the increasing relevance of mobile ticketing solutions for museums and cultural institutions. It explains how embracing digital ticketing systems can improve the

visitor experience, lower operational overhead, and facilitate contactless entry — which has become ever more critical in the post-pandemic era. The article presents some of the main advantages such as immediate access to tickets, shorter queues, real-time information, and the capacity to monitor visitor behavior and preferences through integrated analytics. The article also highlights the value of flexibility and convenience, citing that mobile ticketing allows users to easily plan visits at their convenience from anywhere and view digital passes directly on their smartphones. Administratively, it simplifies ticket validation via QR codes and lessens the reliance on physical infrastructure and manual efforts.

8. Press Information Bureau, "Government Initiative for Digital India," Nov. 30, 2015.

[8] This official press release by the Press Information Bureau (PIB) gives a comprehensive overview of the Digital India initiative, initiated by the Government of India. It describes the vision of making India a digitally empowered society and knowledge economy through the encouragement of technology-enabled governance and citizen services. Major pillars of the initiative are e-Governance, mobile access to public services, universal digital literacy, and creation of cloud-based platforms for public infrastructure.

2.2 Research Gaps

Upon consideration of prevailing solutions for e-tourism and ticketing, some pivotal shortcomings are that emerge, identifying the necessity of an integrated, accessible, and inclusive system. Below are presented the gaps following in relation to the suggested Online Ticketing System for Museums and Monuments:

(i) No Integrated Digital Tourism Platform

Most contemporary tourism and ticketing solutions operate in silos, each handling a particular function like ticket booking, mapping, or delivering historical information. Yet, consumers tend to have to handle

multiple platforms or applications to meet their requirements—from checking availability and reserving, to reaching a destination and understanding how it's historically significant. Such a fragmented experience leads to inefficiency and user frustration.

The suggested online ticketing system seeks to close this gap by providing a unified platform that not only supports ticket reservation and QR-based entry but also offers features such as monument information, visitor history, and admin insights in an integrated manner. This efficient approach improves both usability and satisfaction, converting the disjointed experience into a cohesive one.

(ii) Lack of Proper Integration of Local Businesses and Experiences

Existing platforms only pay a cursory attention to popular, heavy-traffic attractions, ignoring smaller, culturally important local places. These local points of interest, though providing rich cultural and historical experiences, lack visibility and attention because they have not been properly integrated into the digital space.

(iii) Scalability and Accessibility

Most current digital tourism or ticketing systems are constructed with proprietary tools, heavyweight software, or necessitate strong infrastructure that might be unaffordable in remote or underprivileged places. This constrains the deployability and application of such platforms to urban or high-tech zones, excluding rural or heritage-laden but technology-underdeveloped areas.

In addition, the absence of lightweight, cloud-compatible, or open-source architecture limits the adaptability and value for money aspects of these offerings. This subject matter is notably significant in relation to digital public service systems since inclusivity as well as elasticity are critical areas.

The system proposed is scalable and accessible. It employs open-source technologies, is hosted on scalable platforms such as Firebase, and incorporates mobile-first design to provide accessibility from devices and geographies. Its light weight ensures that it can be deployed even in geographies with less computing capability, enabling museums and

monuments of all sizes to harness digital transformation.

2.3 Problem Formulation

Museums and monuments are important cultural markers, welcoming millions of visitors worldwide annually. The conventional ticketing systems typically employed for access are now more and more found to be ineffective and obsolete, creating many challenges for tourists as well as site managers. Long lines, manual check processes, and the threat of ticket loss or theft typically lead to an exasperating and time-wasting experience for tourists. These are exacerbated for overseas visitors, who are likely to experience language differences or unfamiliar ticketing processes. Physical tickets also have risks such as loss, damage, theft, or fraudulently replicated copying, which not only discommodes guests but also presents administrative headaches and potential loss of income. From a business operational perspective, holding on to manual ticketing requires heavy resources—in terms of people, printing costs, and equipment—making them expensive and non-sustainable in the long run. As a response to these issues, this research suggests the creation of a web-based, digital ticketless entry system for monuments and museums. Through the use of technologies like QR codes, online reservation, and automatic verification, the system aims to simplify entry procedures, reduce waiting times, enhance the overall experience of visitors, and increase operational efficiency. The study will delve into the benefits, drawbacks, and deployment strategies of such an arrangement, finally presenting recommendations for the conceptualization of an innovative, scalable, and sustainable digital ticketing system for cultural heritage sites.

CHAPTER 3

PROPOSED SYSTEM

3.1 Proposed System

In order to overcome the inefficiencies and constraints of conventional paper-based ticketing in the tourism and heritage industry, this project proposes a contemporary, expandable, and user-friendly website-based ticketless entry system. The system will maximize the visitor experience, optimize administrative effectiveness, decrease operational expenses, and facilitate digital tourism. The incorporation of cutting-edge technologies such as QR code verification, automated access control, and centralized management via a dashboard ensures that both administrators and users enjoy a hassle-free and secure system.

- **Online Ticket Booking Platform**

The foundation of the proposed system is an online booking platform that can be accessed through a responsive web interface, with support for both desktop and mobile platforms.

The reservation process is made efficient and backed by a safe payment gateway, enabling users to make payments through various digital modes of payment like credit cards, debit cards, UPI, net banking, and other mobile wallets. Once the payment is successful, an e-ticket is created, which includes necessary visit information and a specific QR code for verification at entry points. This saves manpower, avoids printing expenses, and is in sync with eco-friendly, paperless operations.

- **QR-Based Verification System**

Every digital ticket contains a distinct, tamper-proof QR code that is used as the sole access token of the visitors. Upon arrival of the visitor at the monument or museum, the QR code is read at the entrance through strategically placed QR code readers or scanners. These scanners are linked with the central server, which authenticates the code in real-time against the system's booking database.

The QR-based model offers a safe and convenient substitute for classical

tickets. It allows for rapid entry, eliminates double or counterfeit entries, and enables contactless checks, which is highly significant in today's post-pandemic era. The system records the check-in time and status and updates administrators in real-time regarding the number of active visitors within the building.

- **Automated Entry & Access Control**

In order to completely modernize the process of entering the building, the system provides integration with automated gates or turnstile systems, like those in metro stations or airports. The automated gates feature QR scanners that automatically open following successful authentication, allowing efficient and fast entry for verified ticket holders without any human intervention.

Enhances crowd movement, particularly during peak tourist periods. Keeps precise records of entry times and visitor numbers. Such a system ensures discipline in time slot management and prevents bottlenecks or congestion at the entry points.

- **Admin Dashboard for Museum Management**

Admin dashboard is a robust backend management dashboard designed for museum officials and system administrators. It provides an assortment of tools and features to support daily operations and long-term strategy. The dashboard has the following features:

Real-Time Visitor Monitoring: See the number of people within the buildings at any moment. Booking Analysis: Track ticket sales, peak periods, and most visited monuments or exhibits.

- **Revenue Management:**

Break down earnings from ticket reservations, by date, monument, or mode of payment. Crowd Control Tools: Modify or restrict reservations per time slot according to tourist load. Content Management: Edit monument description, pictures, fare, and vacant slots.

- **Issue Resolution:** View customer grievances, unsuccessful transactions, and QR scan failure for rapid troubleshooting.

This centralized management approach enables museum staff to stay informed, respond quickly to issues, and make data-driven decisions for improving the visitor experience and operational efficiency.

3.2 Unique features of the system

- Secure Online Booking Portal

The portal provides an easy, secure, and fast ticket booking facility through which users can book entry tickets for different museums and monuments on the official website itself. The interface is responsive and web and mobile-friendly, facilitating tourists to book tickets at any time and from anywhere. The use of multiple secure digital payment gateways (such as credit cards, debit cards, UPI, and net banking) provides an added assurance that transactions are convenient yet secure. The application of SSL encryption and transaction validation protocols secures user data and payment details, making the platform reliable and trustworthy for regular users.

- QR-Based Verification System

Each ticket produced by the system upon successful booking contains a distinct QR code. This QR code is used as a digital ticket that negates the need for conventional printed tickets. When arriving at the museum or monument entrance, users merely scan their QR code in special scanners installed there, and these scanners compare the booking details with the system database in real-time. Such contactless confirmation significantly minimizes waiting time at queues and also makes the process of checking the tickets easier. The entire process is based on systems implemented in public transport (such as metro stations), making it familiar and easy to use for the majority of users.

- Contactless and Paperless Entry

Adoption of a QR-based e-ticketing system ensures a totally paperless process, supporting environmental sustainability. Through the removal of physical tickets, the system reduces paper usage to a great extent, enabling institutions to be environment-friendly. Additionally, the contactless nature of the process enhances hygiene and safety, particularly in the post-pandemic world where touchless interaction is a

public expectation. This also reduces administrative efforts required for ticket printing, distribution, and manual checks, making it a cost-effective and modern alternative.

- Automated Entry & Access Control

To further enhance efficiency, the system integrates with automated gate mechanisms, much like those seen in metro or airport terminals. These gates are fitted with QR scanners that permit entry only after successful authentication. After a QR code is scanned and verified, the gate opens by itself, allowing the guest to enter. This automatic access control provides equitable and safe admission along with preventing illegal entries. It also minimizes dependency on human staff for crowd management, increases operational efficiency, and aids in enhancing visitor flow during busy hours or major events.

- Dynamic Ticket Pricing & Discount Management

The system includes a dynamic pricing engine that enables museum administrators to establish flexible ticket price architectures. Depending on time of day, day of the week, volume of visitors, and seasonality, the platform can automatically modify pricing to maximize crowd distribution and revenue. Besides, the system provides support for targeted discount schemes such as student discounts, group bookings or festive-season/off-season offers. This smart pricing policy will enhance reach-ability among various segments of the audience and also increase museum/heritage site footfall as well as revenue generation.

CHAPTER 4
REQUIREMENT ANALYSIS AND SYSTEM SPECIFICATION

4.1 Feasibility Study

(i) Technical Feasibility:

- Modern Tech Stack: The project uses React.js for the frontend, Django for the backend, and MongoDB for secure data storage in SQL lite. QR codes and JWT-based authentication provide a secure, seamless ticketing experience.
- System Compatibility: The system is technically feasible due to its compatibility with mobile devices, stable internet access, and potential integration with existing ticketing systems, ensuring smooth deployment and user accessibility.

(ii) Economic Feasibility:

- Cost Reduction**:** The system significantly lowers expenses related to ticket printing, staffing, and physical infrastructure maintenance.
- Operational Efficiency: Automation of booking and verification reduces manual workload without affecting user convenience.
- Long-Term Savings: Although there are initial development costs, they are balanced by long-term benefits such as improved visitor experience and increased revenue.

(iii) Operational Feasibility:

- User Friendly Interface: We have provided a user-friendly interface for the seamless and fantastic experience for the users.
- Personalized Experience: We have try to give the personalized experience as the user can login and can have account and have all the previous booking data.

(iv) Market Feasibility:

- Demand: Rising tourism in the country is demanding a better ticket booking system for monuments especially those people who are coming from Europe and America.
- Target Audience: We are targeting the youth and the tourist and as of now we have one of the largest youth populations who demand new technologies to do the task in daily life.

4.2 Software Requirement Specification:

4.2.1 Data Requirements:

Data requirements for the system are very low but crucial to enable essential functionality like ticket reservation, visitor management, and secure user authentication.

User Data:

- The system captures the below user information:
- Name: For ticket customization and user recognition.
- Age: For determining the entitlement to age-related concessions (e.g., children get free entry).
- Gender: Optional; could be employed for demographic reporting.
- Email ID: Serves as a unique identifier and is utilized for communication and verification.
- Citizenship: Necessary to distinguish pricing and access rights for Indian Nationals vs. Foreign Nationals.
- Monument Data:
- The system retains detailed information for every monument or museum such as:
- Name and Location
- Timings and Pricing: For national and international visitors, including free access policies (e.g., for children).

4.2.2 Functional Requirements:

- Functional requirements specify how the system must act and what functionality must be supported for users and admins.
- User Authentication:
- Users should be able to register and securely log in.
- Passwords are encrypted, and user sessions are handled securely using tokens.
- Online Ticket Booking:
- Users can choose a monument, select a date, and book tickets for themselves and friends.
- The system accommodates dynamic form inputs to enter group details such as adults, children, and foreign visitors
- QR-Based Entry:
- Once booked, every ticket is provided with a distinct QR code.
- This QR is read at the entry, akin to public transit ticketing systems (e.g., subway).
- The system cross-checks this QR with the database and permits or prohibits entry accordingly.
- Admin Dashboard:
- Admins (e.g., museum officials) have a designated interface to:

4.2.3 Performance Requirement:

- Performance and Responsiveness:
- The system is required to produce and verify QR codes in real time (within 1–2 seconds).
- Page loading, booking confirmation, and dashboard interaction should be quick and seamless.
- Scalability and Efficiency:
- The architecture is designed to handle growing user traffic,

particularly during peak travel seasons.

- Backend services, deployed through Firebase Cloud Functions, need to be light and optimized to save resources, particularly over mobile networks.
- Cross-Platform Compatibility:
- The frontend, developed using React.js, is completely responsive.
- The application should run on:
- All major web browsers (Chrome, Firefox, Safari, Edge)

4.2.4 Maintainability Requirement:

Maintainability allows the system to be easily updated, debugged, and scaled over time.

- Easy Upgradability
- Developed with a modular design (React components + Firebase backend), allowing easy addition or modification of features without having to refactor the entire codebase.
- Component-based development provides reusability and avoids duplication.
- Minimal Downtime:
- Firebase hosting offers automatic serverless scaling and high availability.
- Any deployment or update results in zero to minimal service disruption, enhancing reliability.

4.2.5 Security Requirements:

- Since Secure Authentication:
- User authentication is achieved through Firebase Authentication that supports:
- Email/password sign in
- Token-based session management
- All these methods guarantee only rightful users access their data and

bookings.

- Data Protection:
- All sensitive user data (e.g., Email, Identity Number) are encrypted with AES encryption prior to being stored in the database.
- Real-time database rules are set to provide role-based access control (User vs. Admin).
- API Security:
- Frontend to backend (APIs) communication is secured using JWT (JSON Web Tokens).
- These tokens authenticate user sessions and block unauthorized access to APIs.

4.3 SDLC Model Used

The Agile methodology was chosen for the development of our project due to its iterative and incremental approach, which is highly suitable for the dynamic nature of our system. This methodology allows us to develop the project in smaller, manageable chunks, making it easier to track progress and make improvements at every stage. Below is a detailed explanation of why Agile is an ideal fit for this project:

- Incremental Development: Our project is planned to have changing features such as user login, ticket reservation, and QR code reader integration. With every release, we can provide working components that are tested and improved based on user reviews. This guarantees that the project matures over time with progressively enhanced functionality, enabling us to fix problems and implement new features more effectively.
- Flexibility: Since the project is integrating with multiple external APIs, like for ticket reservation and generating QR codes, there are chances that the external systems can change or develop further during the development process. The flexibility of the Agile methodology is essential in this context. This flexibility makes it simpler to add new features or accommodate unexpected changes in

external systems.

- Continuous Feedback: Continuous feedback is one of the fundamental principles of Agile. This is very useful for our project since it enables frequent review and feedback loops from users, testers, and stakeholders. Through the gathering and use of feedback throughout development, we can guarantee that the system meets user expectations and requirements. Ongoing feedback ensures that issues are detected earlier on, and it will be easier to fix them when they are still small issues rather than being big problems. It also improves the quality of the end product, as we can polish features based on real usage and user feedback.
- Collaboration: Agile encourages collaboration among all team members, who work together closely. In our project, collaboration is necessary to synchronize the development, testing, and deployment teams so that everyone remains on the same page as far as objectives, timelines, and progress are concerned. Agile's emphasis on teamwork promotes open communication, knowledge sharing, and the consideration of each team member's input.
- In short, Agile methodology is an ideal choice for our project since it supports incremental development, flexibility in accommodating changing requirements, continuous feedback from stakeholders, and strong collaboration between all team members. These advantages guarantee that our project will fulfill the changing needs of the system and produce a high-quality, user-friendly product.
- Incremental Development: The project is likely to be built with evolving features such as user authentication, ticket booking, QR reader integration, the agile model allows for releasing small, working modules incrementally, which we can refine as we go.
- Flexibility: Since this project involves various eternal API’s for code generation, requirements may change as these services evolve. Agile’s adaptability is perfect for handling changes in external systems.

- Continuous feedback: We can continuously improve the system from the feedbacks.
- Collaboration: Agile promotes collaboration among all team members, ensuring that everyone stays aligned on objectives

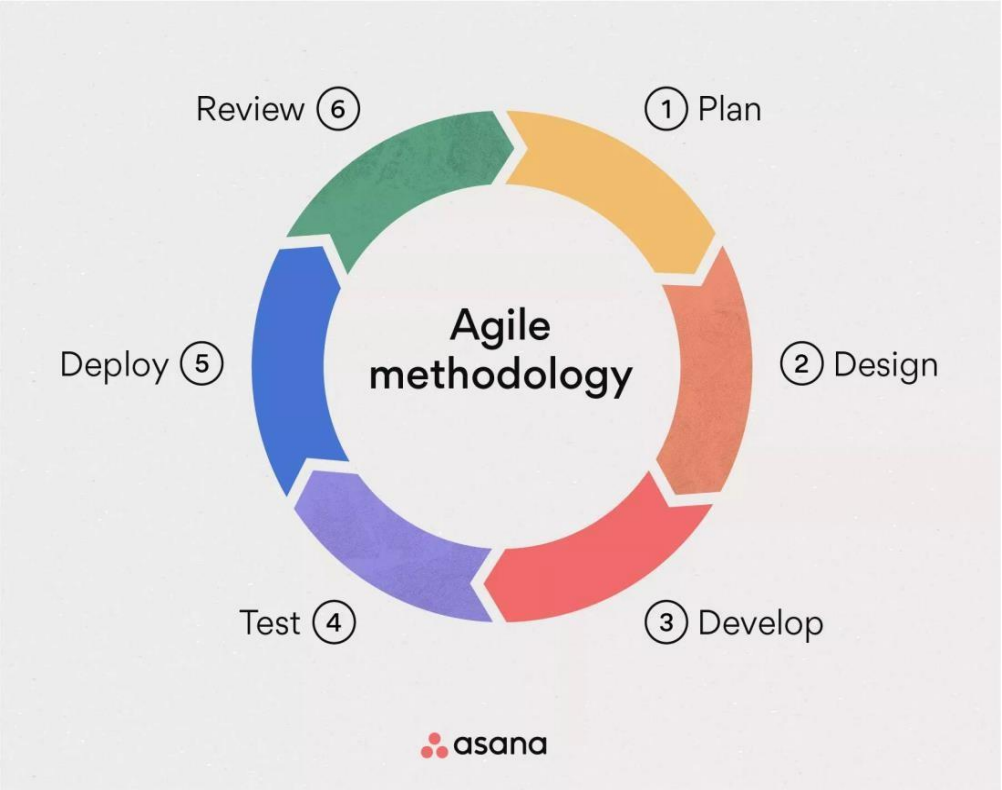

Fig: 4.3 – Agile SDLC

4.4 System Design

- The system structure depicted in the diagram is that of a web-based ticket booking application developed by utilizing a React frontend and Django backend with SQLite database integration. The modular approach of the structure ensures separation of concerns, scalability, and hassle-free user interaction through clear definitions of the responsibilities of the frontend and backend aspects.

- The frontend React is at the top of the diagram, which provides the User Interface (UI) necessary to allow end-users to interact with the system. Users can carry out numerous actions including registration or log in, ticket booking, QR code scanning and displaying, and administrative operations. These operations are carried out via API calls to the Django backend, providing the user with a responsive and dynamic interface without full page reloads.
- The backend, built with Django, consists of four critical modules that manage respective responsibilities: the Auth API, Booking API, QR Code Generator, and Admin APIs/Views. Upon every attempt by a user to login or register, the frontend sends API requests to the Auth API, which manages authentication and saves user credentials securely in the SQLite database. For ticket reservation, the Booking API handles the request from the frontend, book the ticket, and store the necessary information in the database.
- One of the unique aspects of this application is the QR Code Generator, which is invoked on successful ticket booking. It creates a special QR code for the ticket, saves required data to the database, and returns the QR code to the frontend for display or scanning. This provides a paperless and efficient method of ticket verification.
- The Admin APIs and Views module is intended for administrative users who require performing backend operations like viewing booking information, managing users, and creating reports. These admin operations are also passed through the frontend interface but are supported by particular Django views and APIs that directly interact with the SQLite database to retrieve or update data as appropriate.
- At the heart of this design is the SQLite database, acting as the focal point for the data store. It stores user data, booking details, QR code data, and admin logs. All of the backend modules talk to this database to allow for data persistence and consistency.
- Overall, this architecture provides a stable, interactive, and scalable

ticketing system where the frontend and backend interact smoothly through RESTful APIs, and each module has a clearly defined role in the achievement of the objectives of the system.

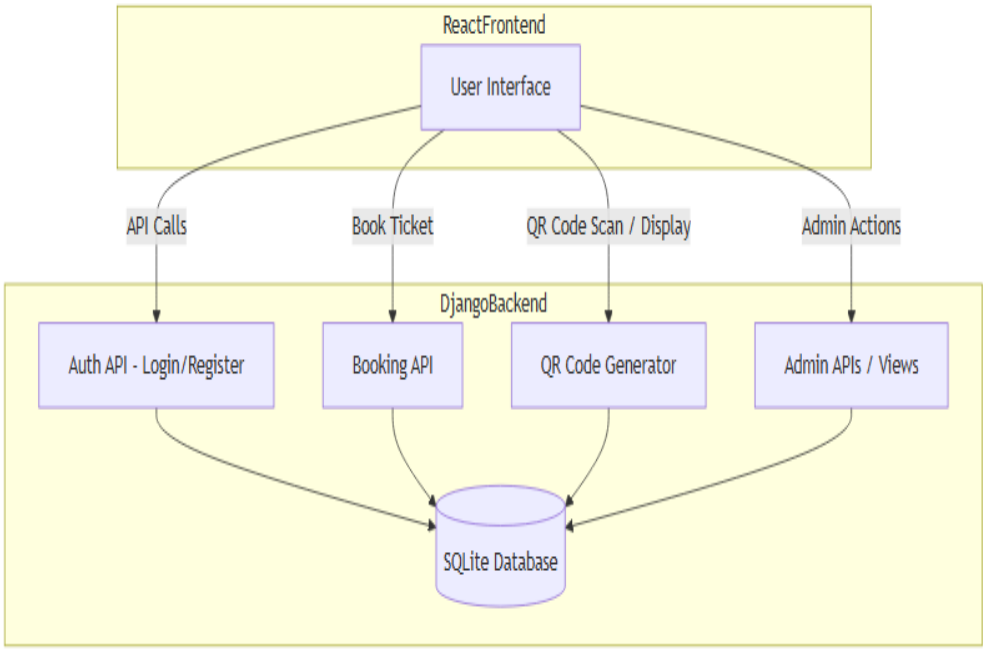

Fig: 4.4 - System Design

4.4.1 Data Flow Diagram

The data flow diagram of the project are divided into levels, level-0, level-1 and level-2. The diagrams are given in figures fig-4.4.1(a), fig-4.4.1(b),fig- 4.4.1(c) respectively.

LEVEL - 0 DFD

In this DFD Level 0 diagram we have shown mainly two users –

User – This represent all the users who access the website to book the tickets. It means all the people who are the customer would come under this category.

Admin – This is the block that represent the admin control, means a dedicated person who have the access to manage all the tickets and of the monuments.

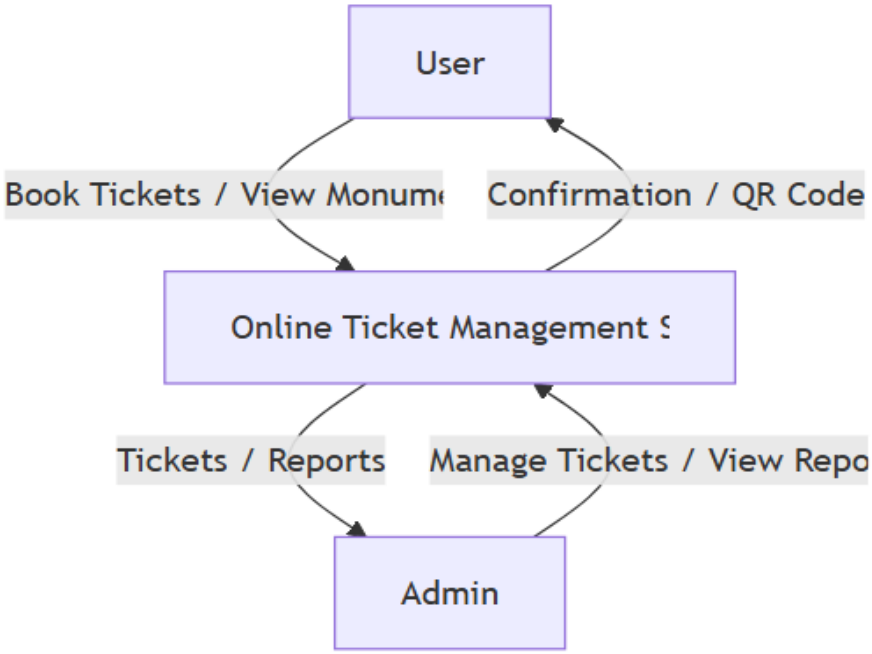

Fig-4.4.1(a) Level-0 DFD

LEVEL - 1 DFD

- User Interaction and Authentication: Users first register or log-in through User Authentication module (1.0), and access other things when logged in. They can view any present monuments (2.0) having retrieved descriptor data from the database.
- Ticket Booking and generation of QR Code: Once a monument has been chosen, users go on to book tickets using the Ticket Booking module (3.0), which in turn updates the stock of tickets in the database, and initiates generation of a QR code using the QR Code Generator (4.0) for verification purposes.

- Admin Management and Reporting: Admins will access the Admin Management module (5.0) to manage tickets, monitor visits and report. They use the access to retrieve ticket and visitor data in the database to work on administrative functions.

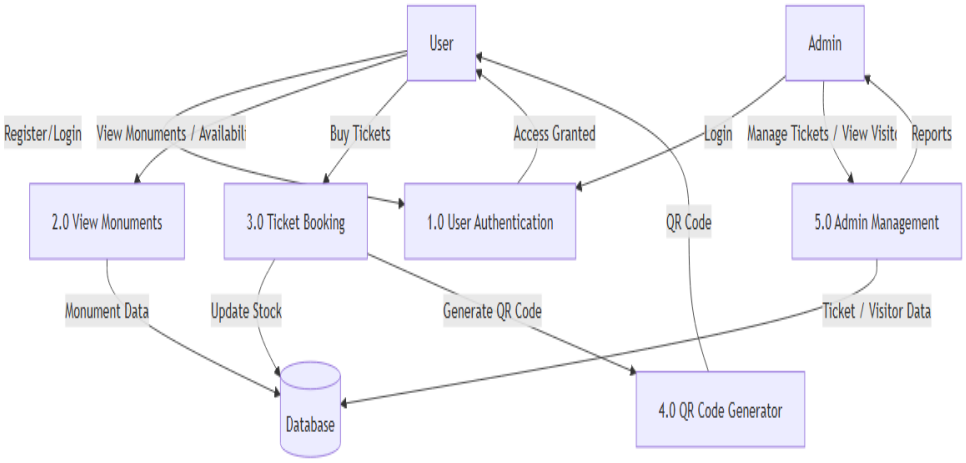

Fig-4.4.1(b) Level-1 DFD

LEVEL – 2 DFD

- User Processes: After authentication steps (1.1–1.3), Users log into or register (1.A–1.B) to access monunents and tickets availability (2.1–2.2) with reference to Users and Tickets tables respectively. Users continue by making payment (2.3) in which they receive a ticket and QR code (2.4) which is saved in the Bookings table after choosing a monument.
- QR Code Handling: Once a ticket is created its information is encoded to a QR code (3.1) and it gets saved to QR Code Data repository. Later on, this QR code is scanned and verified upon entrance to the monument (3.2) to confirm its legitimacy and accessability.
- Admin Functions: Admins oversee monument data (4.1), see visitor records (4.2) and produce system usage reports (4.3). Their actions maintain system control and analytics and update the Tickets tables and

the Bookings tables and the Admin logs.

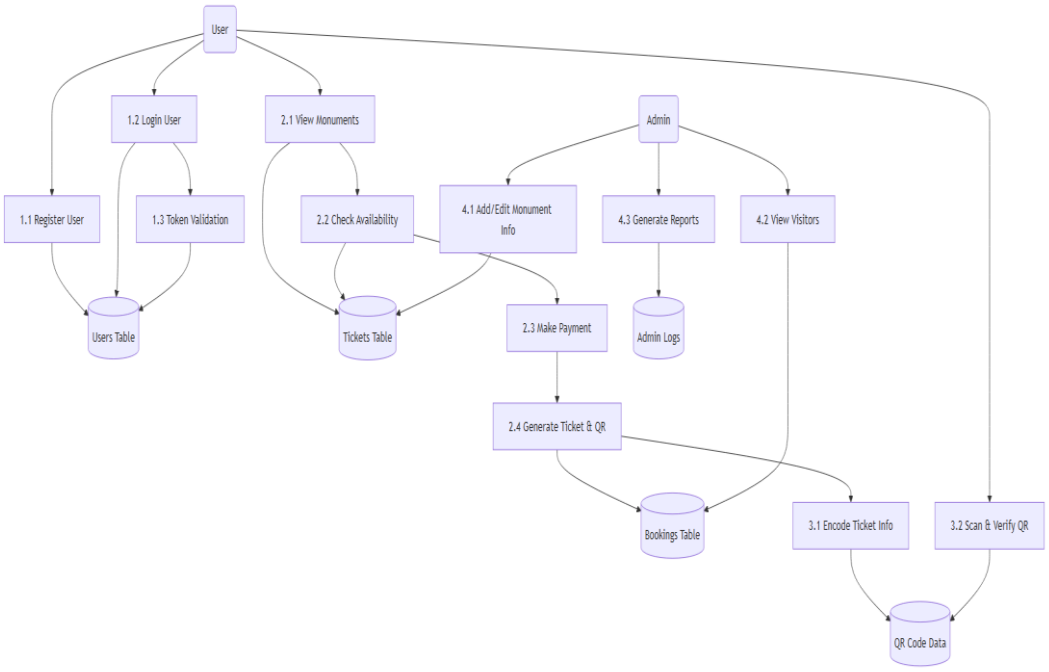

Fig-4.4.1(c)- Level-2 DFD

4.4.2 Use Case Diagram

- The use case diagram of the project is given below:
- The use case diagram of the Online Ticketing System shows the interaction between the user and the main functionalities provided by the system. It depicts the main use cases categorized under two main categories: User Authentication and Data Fetching. The actor in this diagram is the end-user accessing the application through a web interface built using React and backend activities managed by Django.
- Actor: User
- The central actor in the system is the User. This user can access various features of the ticketing system such as registration, login, searching monuments, and booking tickets.

- Use Case 1: User Authentication
- This part guarantees safe access to the platform via the following use cases:
- Signup:
- Permits new users to sign up by filling in necessary information like name, email, and password. This information is safely stored in the backend, and can also initiate a verification process.
- Login:
- Verifies registered users based on their credentials. After successful verification, the user is provided with access to protected routes and system functionalities.
- Logout:
- Allows the user to safely terminate their session, keeping their data secure after usage.
- Use Case 2: Data Fetching
- This part includes the main functionalities pertaining to monument browsing and ticket reservation.
- Search Monument.
- Users can look up or search monuments on the basis of name, location, or other filters. The system retrieves monument information from the database and displays it dynamically. Select Monument:
- Once a suitable monument is found, users can see more information such as ticket types, opening times, and availability.

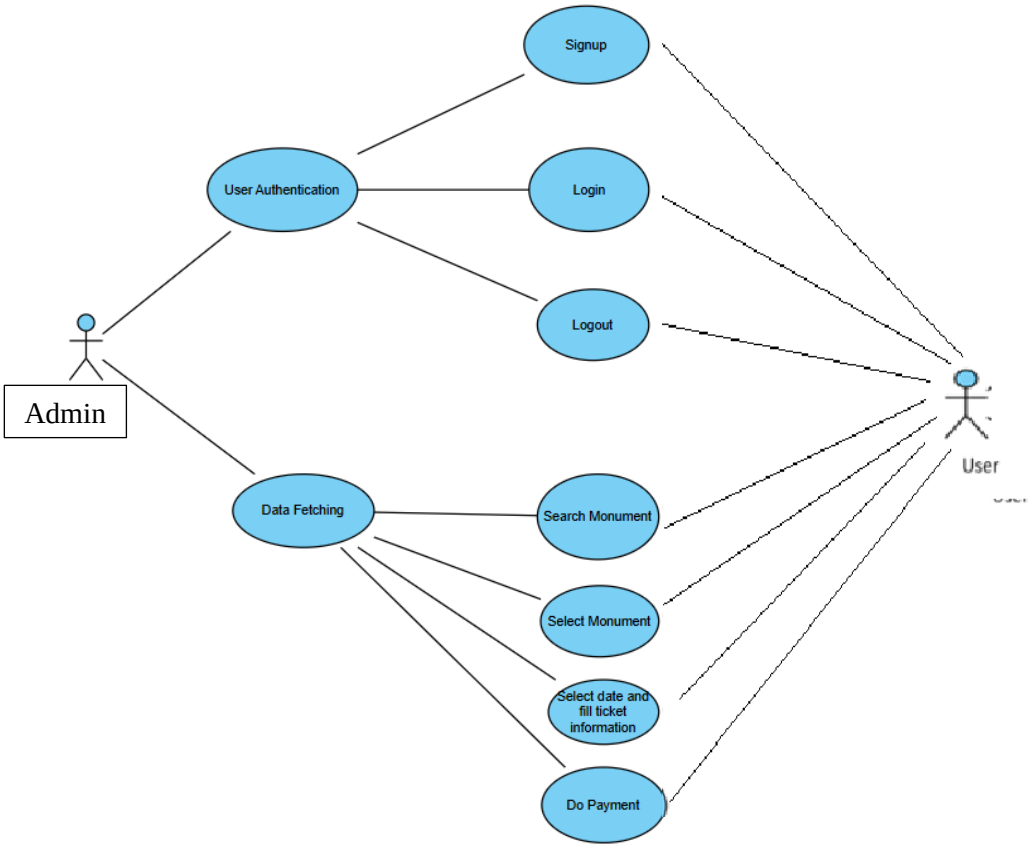

Fig: 4.4.2- use case diagram

4.5 Database Design

- At this point, that is currently the project utilises only one database to maintain the user authentication. That is there is single database name “user database”, which have user information i.e Email and password for registered users.
- The database structure of the Online Monument Ticket Booking System is such that it facilitates the effortless interaction between the users, the bookings of tickets, payment gateways, and administrative verifications. It relies on a relational schema of three primary tables—auth_user, qrscan_monumenttickets, and qrscan_tickett—that each plays distinct but related functions in the system. At the heart of the database is the auth_user table, which is based on Django's default authentication model. This table safely holds user

credentials such as the username, email, and hashed password, as well as account status flags such as is_active, is_staff, and is_superuser. The date_joined field assists with auditing and tracking user registration patterns. This table is the basis upon which authentication, authorization, and session management throughout the platform are built, protecting against unregistered and unverified access to ticket booking facilities.

- qrscan_monumenttickets table is designed to handle extensive ticket reservations with categorized tickets and personal authentication. It stores in-depth user-submitted details, including the visitor's name, email, phone number, and city. The monument and date columns monitor the location and time of visit. One major advantage of this table is that it offers support for various visitor types—count_adult, count_children, and count_abroad—so that the system can calculate individual prices via price_adult, price_children, and price_abroad columns. These are summed up to calculate the total_cost, which, in combination with order_id and razorpay_payment_id, facilitates tracking of online payments.
- Both qrscan_monumenttickets and qrscan_tickett tables are associated with the auth_user table through foreign key relationships, allowing one-to-many associations where a single user may have multiple bookings across various monuments and time. Such relational integrity guarantees that all records of bookings can be traced back to their corresponding users, which is important for administrative control, analytics, and debugging.
- Overall, the database design of this project is modular, extensible, and includes strong data validation. It manages user authentication, complex and simple ticketing situations, and integrates well with Razorpay payment gateway for secure online payments. The design is not only scalable to support increasing user bases but also ensures data consistency and supports a real-time operational environment, making it suitable for a national-level or state-level monument

ticket booking system.

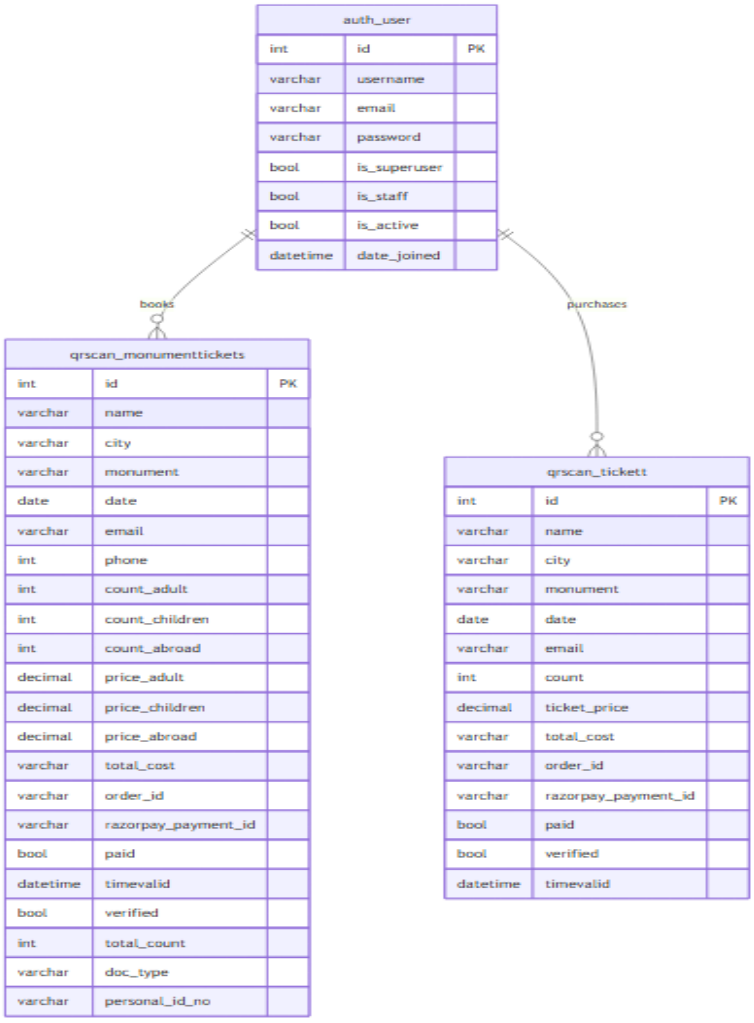

Table- 4.5 – database design – (user database)

CHAPTER 5
IMPLEMENTATION

5.1 INTRODUCTION & TECHNOLOGIES USED

- In this the designing and deployment of the Online Ticket Booking System involved a plethora of programming languages, development tools, frameworks and libraries to present a robust, scalable and easy-to-use platform. Django, a high-level Python web framework, formed the backbone of the backend; it was employed because of its ease of use, as well as the in-build authentication, admin interface and ability to scale high-speed development with clean and pragmatic design. Django was chosen primarily for the logical business and database models, as well as the user authentication and server-based processes. For the frontend JavaScript was very important and React.js was used as a main framework to create a responsive and interactive user interface. React JS's component-based architecture enabled the creation of modular UI components which enhanced the user experience with enhanced rendering times.
- In order to handle source code and development, Visual Studio Code (VS Code) was used as the primary integrated development environment (IDE) due to strong support for JavaScript and Django, as well as live linting, debugging, and version control extensions. GitHub was used as the version control and collaborative development tool where code repositories were maintained.
- The system default was the light weight database management system SQLite, specifically suitable as a development and testing and tool due to its simplicity and usability of linking with Django's ORM. In addition, certain packages

- specific to Django and React (for example, axios for frontend-backend HTTP communication, react-router for routing, and integration of Razorpay API for accepting online (secure) payments) were added to ease functionality. Inners combined, the two technologies facilitated the development of a full-stack web application dynamic as well as secure which could easily handle real time ticket booking, user authentication, and data management.

Fig: 5.1 Overview of tech uses

CHAPTER 6

TESTING & MAINTENANCE

6.1 Testing Techniques and Test Cases Used

- **Unit Testing**

Objective: The main objective of unit testing was to check the correctness of separate pieces and functions independently, like user authentication, booking logic, and generating a QR code.

Tools Used: Backend testing was done with Django's in-built unittest framework and React Testing Library for testing frontend components and form validations.

Results: All key modules successfully passed their corresponding unit tests. Backend operations like user login, registration, and ticket generation produced the desired outcomes. On the frontend, component rendering and input validations worked as expected under different test inputs, ensuring the stability of individual modules.

- **Integration Testing**

Objective: Integration testing aimed at verifying the smooth interaction among various modules, e.g., communication between APIs, database updates, and QR code generation.

Tools Utilized: Postman was utilized to test REST API endpoints manually, while Django REST Framework's test client facilitated automatic testing of integrated processes.

Findings: Minor flaws in data serialization and response formatting were revealed by the tests and, as such, were fixed. Following the enhancements, all modules integrated seamlessly. The booking process interacted smoothly with the QR generator and updated the SQLite database accordingly.

- **System Testing**

Objective: At this phase, the goal was to confirm the functionality of the well together.

Tools Used: Manual testing on different browsers (e.g., Chrome, Firefox) was done to check compatibility, and the SQLite Browser was utilized to observe data changes in the database.

Results: Testing was comprehensively done from user registration to booking of tickets and generation of QR codes. There were no show-stopping problems during testing. Minor UI irregularities were picked up and addressed, resulting in a consistent and seamless user experience across platforms.

- **Performance Testing**

Objective: Performance testing was conducted to examine the system's responsiveness, scalability, and behavior under load.

Tools Utilized: Apache JMeter was used to test concurrent requests by users and response times and throughput.

Outcome: The program could manage up to 50 simultaneous API calls with a mean response time of around 300 milliseconds. Though the system performed well with reasonable loads, it degraded marginally with heavy loads, citing the need for more scalable database management such as PostgreSQL in future implementations.

- **User Acceptance Testing (UAT)**

Purpose: The purpose of UAT was to decide if the application fulfilled end-user needs and was ready for deployment in real environments.

Tools Used: Structured feedback forms were used to gather feedback, and observational sessions were carried out as users used the system.

Results: Users appreciated the system for being easy to use. Most important features such as booking tickets and generating QR codes were commended for their speed and ease of use. Minor UI changes such as button naming and introducing a view for ticket history based on feedback were made, which improved the overall user satisfaction.

Test Case ID	Test Scenario	Expected Output	Actual Output	Status
TC-001	Check for invalid login details	Invalid login data	Invalid login	Passed
TC-002	Doing user registration	Successfully registered	Registered successfully	passed
TC-003	Loggin in	Successfully login	Logged in	passed
TC-004	Ticket booking with incomplete data	Do not proceed to next step	Didn't proceed	passed
TC-005	Search on searchbar	Search data found	Search monument appeared	Passed
TC-006	Ticket booking	Ticket should be received on mail	Ticket received in mail	passed
TC-007	QR code scanning	Scan completed	Scan successful for valid QR	passed

Table-8.1(a): Test cases performed

CHAPTER 7
RESULT AND DISCUSSION

7.1 Description of Modules with Snapshots

1. Admin Login using react

- Developed with React and styled with React-Bootstrap to guarantee a responsive and user-friendly interface, the AdminLogin module is a crucial part of the monument ticket booking system. This module offers a safe login form designed exclusively for administrators, giving them access to backend features like visitor tracking, monument information management, and report generation. It efficiently manages form state by utilizing React's useReducer hook, which dynamically captures and updates inputs for the password and username fields.
- The login form is positioned neatly in the middle of the page thanks to the interface's straightforward and user-friendly layout, which makes use of Bootstrap's Container, Row, and Col components. The admin's username and password are entered in the form's input fields, which are both linked to the state via onChange handlers. In order to safely pass a CSRF token and guard against cross-site request forgery during the login process, a hidden input field is also included.

```
<Container className="Shift">
<Row>

  <Col ><Form action="/login/" method="post">
<Form.Group className="mb-3">
  <Form.Label >Enter Username</Form.Label>
<Form.Control name="username" onChange={handleInput}  />

</Form.Group>
<Form.Group className="mb-3" >
  <Form.Label >Enter Password</Form.Label>
  <Form.Control type="Password" name="password" onChange={handleInput}  />
</Form.Group>
<br></br>
<br></br>
<input type="hidden" name="csrfToken" value="1234567890abcdef"/>

<Button type="submit">Sign In</Button>
<br>
</br>
<br></br>
```

```
export function AdminLogin(props) {

 const handleInput = evt => {
    const name = evt.target.name;
    const newValue = evt.target.value;
    setFormInput({ [name]: newValue });
  };
const [formInput, setFormInput] = useReducer(
    (state, newState) => ({ ...state, ...newState }),
    {

      "username": "string",
      "password":"string"
      }

  );


    return (
      <div>
       <h1>.....</h1>
       <h1>Admin Login</h1>
      <div>
```

Fig – 7(a): snapshot for admin login

2. Booking Confirmation Module

- The Booking module in the monument tourism web application is a React-based component that facilitates the viewing and deletion of hotel bookings by users or administrators. This module employs key React hooks such as useState to manage the local state and useEffect to perform data fetching operations upon the component's initial render.The API returns a list of hotel bookings, which is then stored in the users state variable and dynamically rendered in the UI using JavaScript's .map() function.
- Bootstrap classes are used to display each booking record in a card format for consistent and responsive styling. The details that are displayed include the city name, hotel name, number of people, length of stay, and unique booking ID; these fields are arranged in a table for readability and clarity. Additionally, each booking card has a "DELETE BOOKING" button that enables the user to remove a booking, which, when clicked, sends a DELETE request to the server with the relevant booking ID. The list is then updated by calling the getUsers function again to reflect the updated state.

```
export default function Booking(props) {

  const [users,setUser]=useState([])
  useEffect(()=>{
    getUsers();

  },[])
  function getUsers()
  {
    fetch("http://localhost:3000/hotel1s").then((result)=>{
      result.json().then((resp)=>{
        // console.warn(resp)
        setUser(resp)
      })
    })
  }
  console.warn(users)
  function deleteUser(id)
  {
    fetch(`http://localhost:3000/hotel1s/${id}`,{method:'DELETE'}).then((result)=>{result.json()
      console.warn(resp)
      getUsers()
    })
  })
  }



  console.log(props);
```

```
    <h2>HOTELS</h2>

      {
        users.map((item,i)=>
        <div key={i}>

        <div class="col d-flex justify-content-center">

<div class="card w-75" >
<div class="card-body">
<h5 class="card-title">
  <table cellpadding="75" >
<tr>
  <td><span>{item.city_agra}</span><br/><pre>CITY</pre></td>
  <td><span>{item.hotel_agra}</span><br/><pre>HOTEL</pre></td>
  <td><span>{item.ppl_agra}</span><pre>NUMBER OF PEOPLE</pre></td>
  <td><span>{item.days_agra}</span><pre>NUMBER OF Days</pre></td>

  </tr>
  </table>
  <p><small>BOOKING NUMBER-{'    '}{item.id}</small></p>
  </h5>
<button type="button" onClick={()=>deleteUser(item.id)} class="btn btn-outline-danger">DELETE BOOKING</button>
</div>
</div>
</div>
<br/>
        </div>

        )
      }
```

Fig- 7(b): code for ticket confirmation

3. Database: The database is made in SQL lite 3.

- The database module for the online ticketing system is constructed from SQLite, which is a compact and swift relational database engine. This module is very important for performing all the data operations such as user authentication, session tracking and ticket management. The database schema consists of default tables created by the Django framework and of custom tables created specifically for the ticketing functions.
- Django automatically creates a number of tables to allow for managing user accounts and permissions, for instance auth_user which contains credentials and information for users; auth_group that describes user groups and auth_permission with access permissions, and mapping tables auth_user_user_groups and auth_user_user_permissions for matching users with groups and permissions, respectively.
- There are also two custom tables designed for ticket operations in the system apart from these built-in tables. The qrscan_ticket table is the master table storing tickets information; each entry has unique

ticket ID and name field which is probably the name of the ticket holder or type. From the qrscan_monumenttickets table it seems to store data related to tickets for monument visits such as a session data field and name field, possibly for visitor or monument. These are custom tables that support the most basic function of issuing tickets and validating them, perhaps in combination with reading QR codes which contains enough information for the user to experience an efficient digital ticketing system. Combined, this well-organized database module is responsible for secure, scalable and maintainable data management of the online ticketing system.

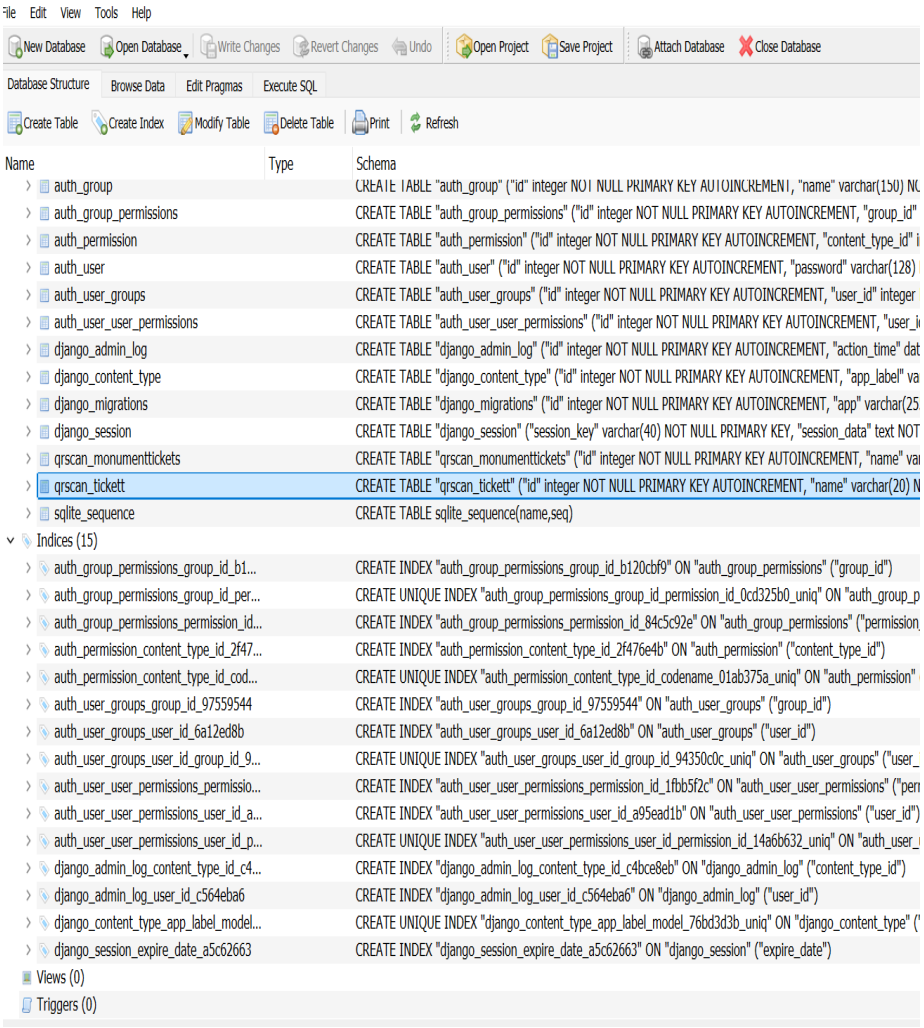

Fig – 7(c): Database Table List

```python
class Tickett(models.Model):
    name=models.CharField(max_length=20)
    city=models.CharField(max_length=20)
    monument=models.CharField(max_length=20)
    date=models.DateField()
    email=models.EmailField()
    count=models.IntegerField()
    ticket_price=models.DecimalField(decimal_places=1,max_digits=7)
    total_cost=models.CharField(max_length=20)
    order_id = models.CharField(max_length=100, blank=True)
    razorpay_payment_id = models.CharField(max_length=100, blank=True)
    paid = models.BooleanField(default=False)
    timevalid=models.DateTimeField(blank=True, null=True)
    verified=models.BooleanField(default=False)
    def __str__(self):
        if self.paid:
            a="paid"
        else:
            a="unpaid"
        if self.verified:
            b="verified"
        else:
            b="unverified"
        return f"{self.name}-{a}-{b}"

class MonumentTickets(models.Model):
    name=models.CharField(max_length=20)
    city=models.CharField(max_length=20)
    monument=models.CharField(max_length=20) #change max_length = 50
    date=models.DateField()
    email=models.EmailField()
    phone=models.IntegerField(max_length=10) #change max_length
```

Fig – 7(c): Database Module

4. User Authentication Module

- In the web ticketing system, the auth module is an important module for securely handling user credentials and access to multiple services. The following code snippet depicts a portion of a client init class that embeds an optional auth handler used to handle authenticated API calls to secure backend services. This Python class, perhaps a part of a bespoke service layer or API wrapper, accepts an optional session and an auth parameter, which may contain credentials or an auth object.
- The auth parameter is bound to self.auth so that it can be used throughout the class for sending authorized requests. The session is passed in externally or created using Python's requests.Session(), which provides persistent HTTP connections with shared headers and cookies. This comes in handy when dealing with login sessions across requests in a stateless context like RESTful APIs.
- Within the context of the Django-driven ticketing system, this auth object could encapsulate Django session tokens, JWT tokens, or any other credentials that need to be used to authenticate requests when dealing with secure endpoints—like creating or validating tickets, retrieving user-specific information, or handling bookings. The class also establishes the base URL to use for requests and securely loads SSL certificates from the local directory, further protecting data in transit.
- The last section of the snippet illustrates dynamic initialization of resources. It traverses a dictionary of RESOURCE_CLASSES, binding each class (most likely representing different API endpoints such as Tickets, Users, Events) to the client instance dynamically with setattr(). This approach exposes the authentication context to all resources that are initialized under this client so that every API interaction will be properly authenticated.

```python
def __init__(self, session=None, auth=None, **options):
    """
    Initialize a Client object with session,
    optional auth handler, and options
    """
    self.session = session or requests.Session()
    self.auth = auth
    file_dir = os.path.dirname(__file__)
    self.cert_path = file_dir + '/ca-bundle.crt'

    self.base_url = self._set_base_url(**options)

    self.app_details = []

    # intializes each resource
    # injecting this client object into the constructor
    for name, Klass in RESOURCE_CLASSES.items():
        setattr(self, name, Klass(self))
```

Fig – 7(d): User Authentication

5. Front-end

- The frontend of the web-based ticketing system, named "Safar", is developed on React.js, a contemporary JavaScript library that supports the creation of quick, responsive, and component-based user interfaces. The fundamental goal of the frontend module is to deliver an intuitive and aesthetically rich experience to customers who want to browse tourist sites and purchase tickets online. The UI has been developed with a focus on accessibility, responsiveness, and simplicity in order to appeal to both local and global users.
- Landing Page and Location Overview
- The homepage comprises an engaging and vibrant layout that

highlights Indian cultural symbols and iconic landmarks in a way that attracts the users' attention straight away. In the middle of the screen, the title "SAFAR" is highlighted, representing the journey concept of the platform. Underneath the banner, cards of various tourist destinations like New Delhi, Jaipur, and Pune are arranged in grid view. The card contains a good-quality picture of the monument, its title, and an "Explore" button. Tapping on the button takes the user to a separate page for booking tickets of that particular location.

- Monument-Specific Booking Page
- There is a specific booking page for each monument that has:
- Image Display: A high-resolution image of the monument to enable users to visually verify the location.
- Ticket Pricing: A well-segmented price panel that separates Indian Nationals and Foreign Nationals. The price also incorporates special exceptions, including free admission for children under 15 years, to build user trust and transparency.
- Below the static details, an interactive ticket booking form is presented that encompasses fields like:
- User's Name, Phone Number, and Email Address
- Date Selection with a date picker
- Drop-downs to select the number of Children, Adults, and Foreign Nationals
- A "Book Now" button which initiates the ticket reservation process
- Admin Dashboard
- An admin dashboard is created specifically for authorized staff to monitor and administer ticket verifications and visitor statistics. Included are:
- A drop-down menu for choosing the monument.
- A live ticket scanner module that applies QR code technology.
- A visitor counter module to assist in keeping track of the number of people visiting daily

- The QR code system demonstrated on the admin panel enables the scanning and validation of tickets at the entry point with ease via mobile devices. When a ticket is scanned, the system cross-matches the information stored against the booking database and shows the validity of the ticket.
- Design and Usability

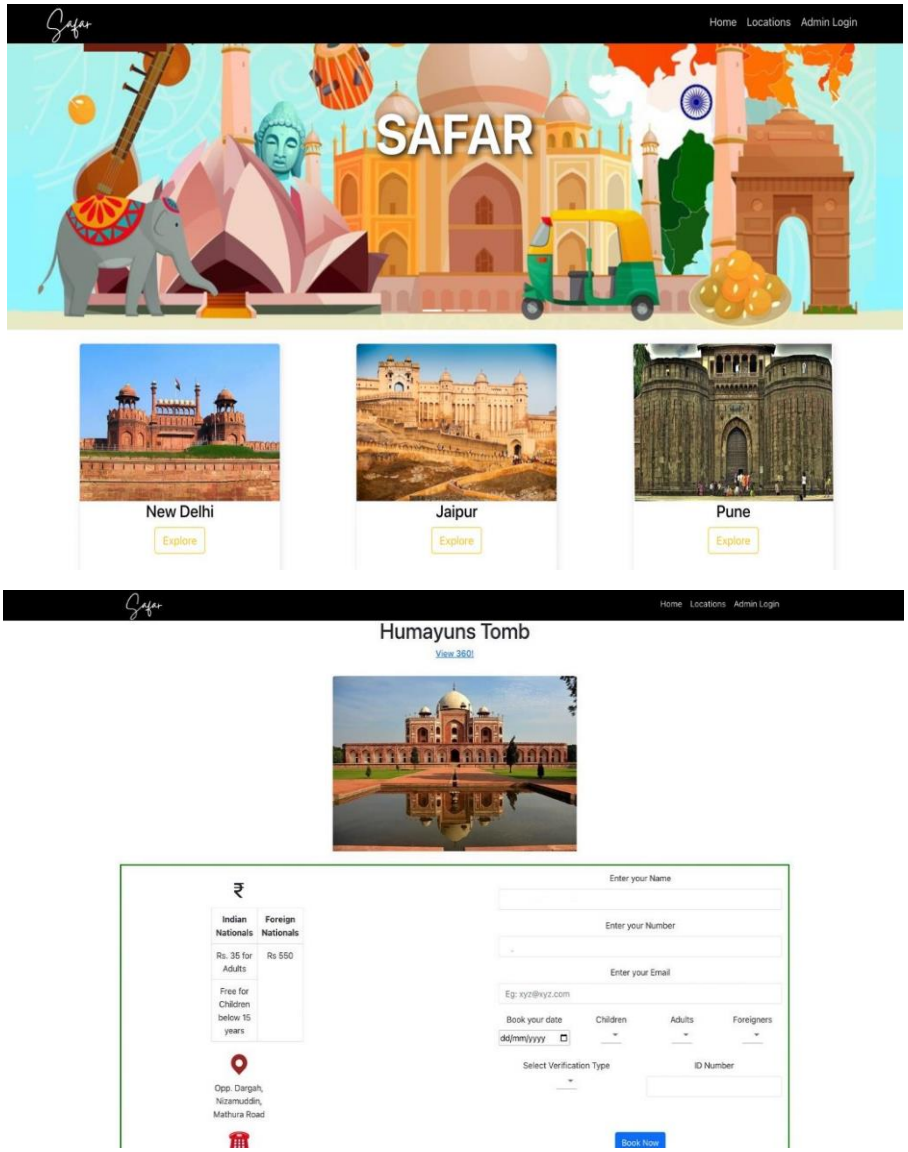

Fig-7(e)- frontend of website

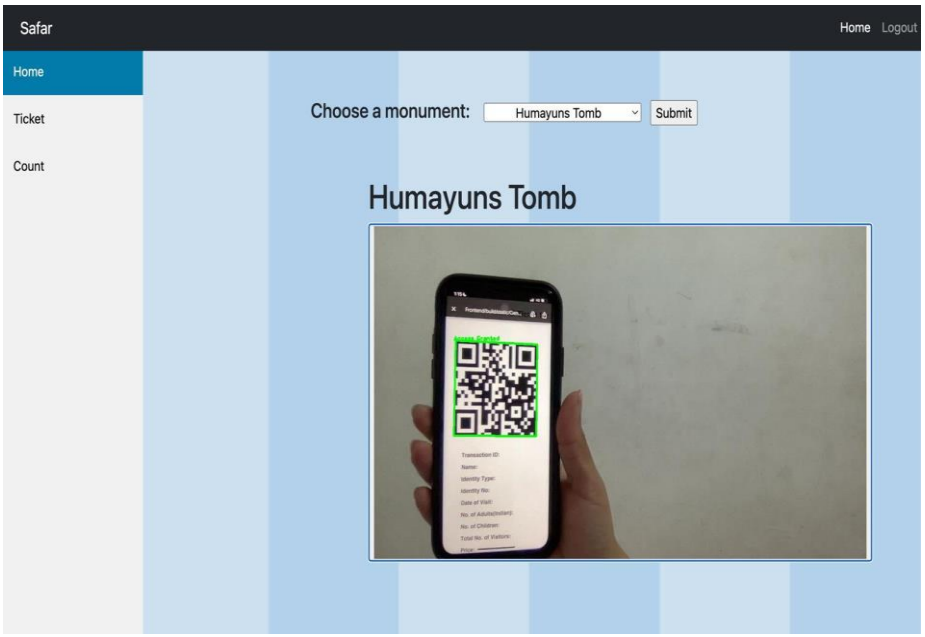

Fig-7(e)- System front-end

7.2 Key Findings

- The application and assessment of the digital ticketing system provided numerous significant findings that demonstrate its innovation, ease of use, and applicability to real-world scenarios. All these major findings contribute to a paradigm shift in how cultural or public site admission and ticket control can be administered effectively and securely in the digital era.
- The most notable impact of the project is the total conversion from conventional paper-based ticketing to a new, digital, and online booking platform. The system simplifies the whole process of ticketing so that customers can book tickets from any device connected to the internet, eliminating the need to go to counters or stand in queues. This digital revolution not only improves the user experience but also reduces the reliance on human labor, making the system efficient and cost-effective. The outcome is a smooth, accessible, and highly responsive ticketing service.

- Efficient Ticket Classification and Pricing Management.
- The backend of the system is designed to accommodate various ticket types like adult, child, and foreign visitor types, each with configurable price and quantity settings. This degree of detail enables the system to calculate total costs dynamically based on user input and chosen ticket types. The structured classification not only facilitates precise billing but also detailed analytics for administrative purposes. Authorities can analyze visitor demographics, forecast ticket demand, and adjust pricing strategies based on past data, leading to more intelligent management and planning.
- Secure and Traceable Payment Integration
- The use of Razorpay as the payment gateway provides secure, encrypted online payments. The system retains both the order_id and payment_id during every transaction, which are unique identifiers that establish an open audit trail. This association between ticket reservations and payment transactions increases accountability, simplifies the resolution of disputes, and greatly minimizes the possibility of fraudulent transactions. The integration offers a seamless payment experience for users while providing financial transparency to administrators.
- QR Code-Based Contactless Access and Authentication
- The key innovation of the system is its use of QR code-based verification to facilitate contactless access to locations like monuments or heritage sites. Every ticket is provided with a specific QR code, and validation is managed through backend fields such as verified and timevalid to guarantee authenticity and time-based access control. This functionality is especially important in the post-COVID period, as it facilitates hygienic, fast, and safe entry without physical touchpoints. It improves both visitor convenience and on-ground safety.
- Admin Dashboard for Real-Time Monitoring and Reporting

- The system backend is created with robust administrative features, where privileged staff can see real-time information on bookings, ticket availability, and visitor numbers. These features include an administrative module for report generation, management of bookings, and ticket tracking. These functionalities aid in operational decisions with the provision of insights into peak times, high-demand tickets, and revenue streams, enabling more effective and responsive management of site operations.
- User Management and Role-Based Access Control
- Based on Django's own authentication mechanism, the application features strong user authentication and role-based permission control. This enables separate levels of access for ordinary users, staff, and admins. Sensitive functionality such as reporting, modification of bookings, and analytics are available only to designated roles, both improving data security and system integrity. The modular access approach ensures users only interact with the pieces that apply to their role.
- Scalable and Extensible Backend Design
- The database schema adheres to normalization rules, with neatly designed tables like qrscan_monumenttickets, auth_user, and auth_group. Not only does this structure accommodate existing functionality, but it also renders the system scalable and simple to extend in subsequent versions. New functionality—like more monuments, more ticket types, more user roles, or even integration with third-party data analytics tools—can be added with little disruption to current workflows. This renders the platform sustainable and flexible for future expansion and changing needs.

7.3 Brief Description of database

The database is designed in SQL Lite 3 database as it is easy to use and work faster due to less load on the system.

We have developed different tables for different database characters

like for admin control, user, monument ticket data and so on.

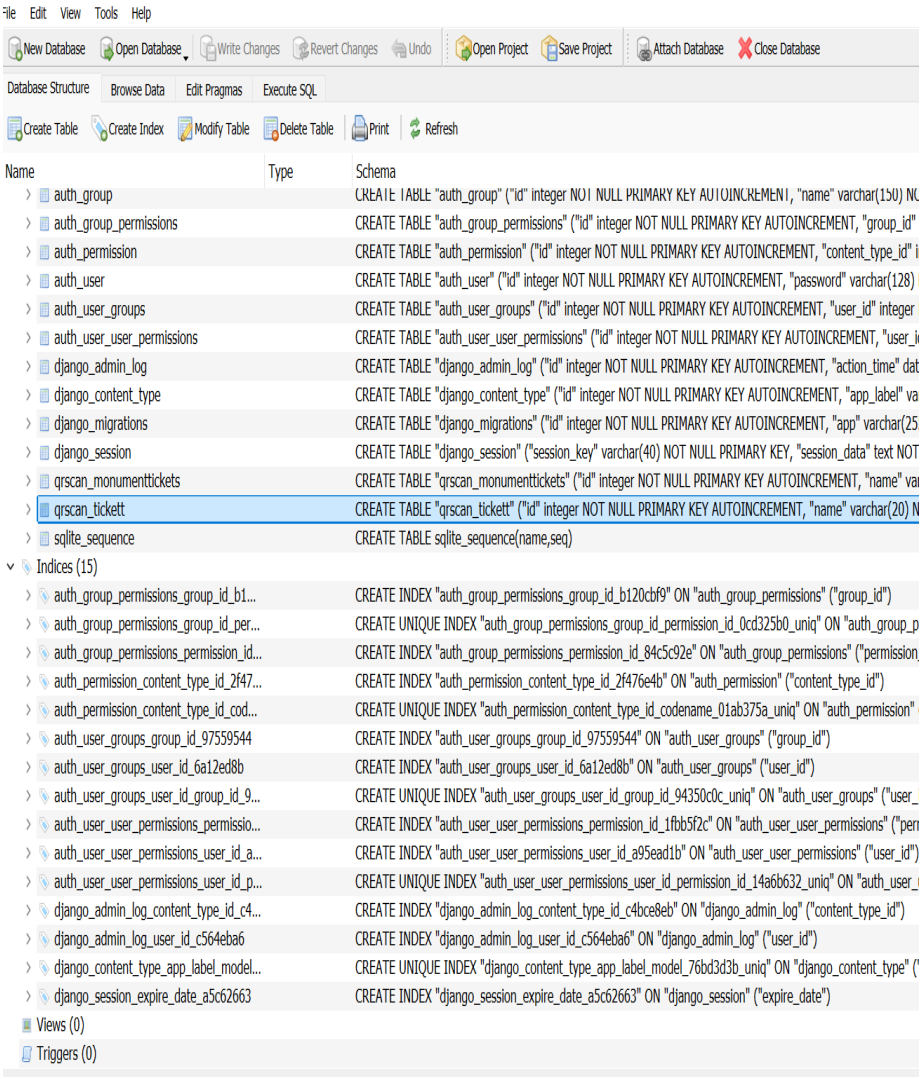

Fig – 7(f): Database Table List

CHAPTER 8
CONCLUSION AND FUTURE SCOPE

8.1 Conclusion

The museum and monument ticketless entry system offers a hassle-free and effective solution to visitors by doing away with the requirement of tickets. With the inclusion of web-based authentication processes like QR codes and electronic verification, the system improves accessibility, security, and user experience. The project effectively overcomes issues that are typically associated with conventional ticketing systems, including lengthy queues, lost tickets, and significant administration expenses. The use of secure authentication processes provides effective access control, while automation reduces human interaction. Not only does this solution enhance visitor experience, but it also optimizes operations for museum and monument officials.

8.2 Future Scope

To take the online ticket booking system for monuments to a higher level of functionality and user interaction, some future enhancements and features are suggested. The system may be expanded with a wider database of historical sites and cultural locations throughout India, with regional sights such as museums, temples, and heritage monuments, and also with a monument-suggested user feature to enhance engagement. The incorporation of AI-driven personalized suggestions will enable the platform to recommend monuments and travel plans on an individual user's choice, visit history, and best time to visit. Immersive technologies like Augmented Reality (AR) and Virtual Reality (VR) can be utilized to offer historical reconstructions, 360-degree virtual tours, and interactive audio

guides. Voice-enabled multilingual assistance can provide services to domestic and foreign tourists alike, increasing accessibility. Smart ticketing technologies, such as QR code e-tickets, NFC-enabled entry, and biometric check-ins, will offer contactless and frictionless access. Real-time visitor analysis based on AI can assist with crowd forecasting, live density notification, and safety warnings due to weather or high-traffic times. Travel and hospitality services will be integrated into the platform to allow users to book accommodations, transportation, and guided tours under one umbrella, along with recommending nearby food and shopping options. To facilitate participation by the community, social features like reviews, sharing photos, and interactive contests can be implemented. A chatbot and virtual guide powered by AI can also be used to aid users in asking questions and give historical information during a visit. Lastly, gamification by implementing a loyalty program that rewards points, discounts, and travel benefits will motivate prolonged use and interaction with the site.

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DPR (Dense passage retrieval) is one of
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The de facto method for answering open
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vector space models, such as BM25 or TF
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research demonstrates that retrieval may
be achieved effectively using dense representations, where embeddings are
picked up from a small amount of passages
and questions utilising a simple dual
encoder framework. Test results on
multiple open-domain QA datasets, with
numerous open-domain QA benchmarks
are obtained are studied in this research.
Multiple state of art techniques and their
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DPR(Dense
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Created on: Sun, 25 May 2025 09:41:54 GMT

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PATENT STATUS

Status: published

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :25/03/2025

(21) Application No.202511027465 A

(43) Publication Date : 11/04/2025

(54) Title of the invention : ONLINE TICKET MANAGEMENT SYSTEM

(51) International classification	:G06Q0010020000, G06Q0050140000, E01F0013020000, G06Q0030060100, G06Q0020340000
(86) International Application No Filing Date	:NA :NA
(87) International Publication No	: NA
(61) Patent of Addition to Application Number Filing Date	:NA :NA
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(57) Abstract :
The present invention provides a web-based Online Ticket Management System for Monuments, built using the MERN stack, to modernize ticket booking, enhance security, and optimize visitor management. It features QR-based digital tickets for contactless entry, block chain security to prevent fraud, and real-time analytics for efficient crowd control. By replacing paper-based tickets, the system promotes sustainable tourism while offering a seamless and scalable solution for cultural and historical site management.

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