International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 09 Issue: 05 | May - 2025 SJIF Rating: 8.586 ISSN: 2582-3930

Online Chatbot Based Ticketing System

PROF. JACOB AUGUSTINE[1], BODDU KUSHWANTH SAI[2], E RAHUL[3], ABHI C N[4], VADLAMUDI NARENDRA[5]
[1]*Professor in Computer science and Engineering & presidency university, Bengaluru*
[2 3 4 5] *Student in Information Science and Technology & presidency university, Bengaluru*

Abstract - This research introduces a smart Museum Ticket Booking System powered by AI, aimed at simplifying the ticket reservation process and improving public access to cultural spaces. At the heart of the system is an intelligent chatbot that guides users through booking, ensuring a smooth and interactive experience. It also features secure payment handling that supports various payment methods, generates digital tickets with QR codes automatically, and offers a user-friendly, responsive web interface. Built using the Flask framework on the backend and SQLite for managing bookings, the system uses Bootstrap to provide a modern and adaptive frontend design. Its functionality is driven by a state-based chatbot flow, integrated with automated ticketing and secure transactions. Visitors can explore museum options, book tickets with the help of AI, and instantly receive digital passes—all through a clean and accessible platform. This project highlights how AI can be effectively applied to improve the usability and efficiency of traditional ticketing systems in the cultural sector.

Keywords: AI chatbot, Museum ticketing, Flask backend, QR ticketing, Secure payment, Responsive UI, Digital heritage access

1. INTRODUCTION

The Museum Ticket Booking System marks a major step forward in improving access to cultural heritage through digital innovation. By blending artificial intelligence with modern web development tools, this system delivers a smooth and easy-to-use platform for booking museum tickets. At its core is an AI-driven chatbot that offers personalized help during the booking process, making it easier for people from all backgrounds to connect with museums.

Traditional ticketing often involves long waits, manual steps, and limited access for some users. This system overcomes those issues by using a structured conversation flow, secure payment options, and automated ticket creation. With support for multiple

payment methods and the use of QR codes for digital tickets, it not only boosts convenience but also supports eco-friendly practices by cutting down on paper use.

The backend is powered by Flask, with SQLite handling the database operations, ensuring efficient and reliable data processing. The frontend is built using Bootstrap, creating a responsive design that works smoothly on devices of all sizes. Together with the AI chatbot's guidance, these technologies create a modern tool that strengthens the connection between museums and the public. Ultimately, this system supports both the accessibility and long-term preservation of cultural sites.

2. LITERATURE SURVEY

The evolution of online ticket booking systems has accelerated with the rise of artificial intelligence and advanced web technologies. Traditional museum ticketing methods, as highlighted in prior studies, often suffer from inefficiencies such as long wait times, manual operations, and limited accessibility. Researchers have found that adopting digital solutions not only improves operational workflows but also enhances visitor interaction and satisfaction.

Advancements in chatbot technology have brought noticeable changes to customer service models. AI-driven conversational interfaces have been shown to lower service costs while significantly boosting user engagement. Among these, systems that use structured, state-based dialogue flows have proven especially effective in guiding users through complex tasks like ticket booking.

Research on digital payments also supports the integration of secure and flexible payment gateways. Studies show that offering multiple payment options builds user trust and increases the likelihood of successful transactions. Additionally, using QR code-based digital tickets has emerged as a sustainable alternative to paper-

based systems, offering both environmental benefits and greater efficiency during verification processes.

Responsive web design plays a crucial role in ensuring that these systems remain accessible on a wide range of devices. Usability studies consistently underscore the importance of mobile-friendly interfaces in providing a seamless user experience.

Although several museum ticketing platforms have adopted elements of digital transformation, very few have managed to incorporate AI assistance within a fully functional and cohesive booking system. The existing literature points toward a growing need for intelligent, user-centric solutions that combine automation, secure payments, and intuitive design.

The system proposed in this study directly addresses these gaps by integrating AI-powered support, efficient payment processing, and automated ticket generation within a modern, responsive web framework. This approach not only aligns with current technological trends but also sets a benchmark for future developments in the cultural tourism and heritage sectors.

3. PROPOSED METHOD

This research introduces a well-structured, AI-driven Museum Ticket Booking System built on a layered architecture to enhance functionality and user experience. The system integrates intelligent conversational assistance, secure payment options, and automated digital ticketing. Its architecture is organized into four primary layers:

1. **Web Interface Layer** – Developed using the Flask framework, this layer manages user interactions through responsive and interactive web templates.
2. **Core Booking Layer** – This layer facilitates key functions such as museum selection, ticket booking processes, and dynamic QR code ticket creation.
3. **Data Storage Layer** – Utilizes SQLite to store essential data, including booking records, user sessions, and payment history.
4. **External Services Layer** – Connects to third-party services like payment gateways and QR code generators to ensure secure and efficient service integration.

The booking system operates through a streamlined, modular pipeline, guiding users through museum selection (with AI assistance), secure payment steps, and final digital ticket issuance. Its modularity allows easy scalability and maintenance, while also improving the overall booking experience.

3.1 Key Benefits of the System

1. **AI-Driven Booking Support**
   - Employs an intelligent chatbot that intuitively assists users throughout the ticket booking journey
   - Delivers personalized responses and real-time help for queries
   - Enhances user engagement through natural conversational interaction
2. **Robust Payment Processing**
   - Supports a variety of payment options including credit/debit cards, UPI, and digital wallets
   - Ensures secure and validated transactions with clear status feedback
   - Offers real-time payment confirmations to streamline the process
3. **Digital Ticket Delivery**
   - Uses QR code technology to generate scannable digital tickets
   - Reduces dependence on printed tickets, promoting sustainability
   - Speeds up entry at museums through efficient digital verification
4. **Efficient Museum Data Management**
   - Maintains up-to-date information on multiple museums, including timings and pricing
   - Supports different pricing categories tailored to visitor types
   - Displays real-time availability for a transparent booking experience
5. **User Session and History Management**
   - Leverages SQLite for persistent storage of booking histories and user sessions
   - Allows users to track, manage, and revisit previous bookings seamlessly
   - Supports continuity during multi-step booking processes
6. **Mobile-Friendly and Accessible Design**
   - Offers a responsive and user-centric web interface built with Bootstrap

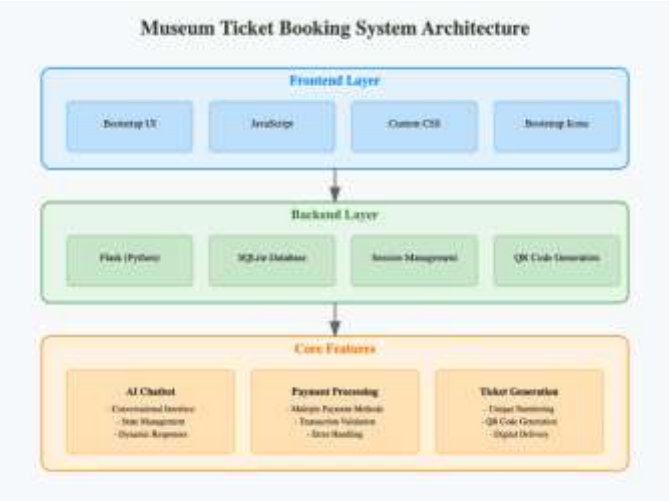
- Ensures accessibility across various screen sizes and devices
- Provides intuitive visual cues throughout the booking workflow

3.2 System Architecture Breakdown

The architecture is composed of three key layers, each designed to handle a specific set of responsibilities to ensure smooth system operation:

1. **Data Layer**
   - Stores comprehensive museum-related information, user sessions, and booking records
   - Logs all payment-related data for transaction transparency
   - Manages QR code ticket storage and past booking details using SQLite
2. **Processing Layer**
   - Integrates an AI chatbot engine that guides users through each step of the booking
   - Handles secure payment transactions with support for multiple gateways
   - Automates QR code creation for ticket generation
   - Validates bookings and confirms user entries in real time
3. **Application Layer**
   - Built on the Flask framework, this layer exposes RESTful APIs to drive functionality
   - Uses Bootstrap for a mobile-friendly, responsive UI
   - Provides real-time status updates, session tracking, and secure user interactions
   - Key features include museum browsing, chatbot-assisted booking, payment handling, and digital ticket delivery

3.3 PROJECT WORKFLOW



4. METHODOLOGIES

4.1 AI Chatbot Layer

The system employs a state-based dialogue management mechanism utilizing natural language processing (NLP) to guide users through the booking workflow. Input validation mechanisms ensure meaningful interactions and preserve conversational context throughout the user session.

4.2 Museum Information Pipeline

- **Data Management**: The system maintains structured records of museums, including location details, visiting hours, and ticket pricing.
- **Real-Time Updates**: Dynamic mechanisms are in place to reflect availability and price changes in real-time.
- **User-Friendly Display**: Information is presented through the chatbot interface in a concise and accessible format to facilitate informed decision-making.

4.3 Payment Processing System

Secure integration with trusted payment gateways ensures transaction integrity. The system accommodates multiple payment modes (e.g., UPI, wallets, credit/debit cards) and provides real-time payment status updates for transparency and user assurance.

4.4 Ticket Generation and Management

- **QR Code Generation**: Each ticket is encoded into a unique QR code for easy identification and validation.
- **Digital Ticket Delivery**: Tickets are automatically sent to users upon successful payment.
- **Verification**: A quick-scan verification system enables smooth museum entry.

4.5 Booking History Management

Booking records are stored in a lightweight SQLite database, indexed for performance optimization. CRUD operations and search capabilities are supported to allow users to manage and review their booking history with reliability and speed.

4.6 User Interface Implementation

The application uses Flask for backend logic and Bootstrap for a responsive, device-friendly frontend. Core components include museum browsing interfaces, a chatbot interaction panel, payment forms, and ticket viewing pages — all designed for ease of use.

4.7 Error Handling and Validation

- **Input Validation**: Ensures accurate data entry throughout the booking pipeline.
- **Payment Verification**: Validates transaction success before issuing tickets.
- **Error Recovery**: Implements rollback mechanisms and session continuity in case of failure.
- **Confirmation Feedback**: Users receive immediate feedback regarding the success or failure of each operation.

4.8 Session Management

Secure session handling preserves the user's context throughout the interaction. This ensures seamless transitions between steps while maintaining data integrity and consistent user experience.

5. RESULT

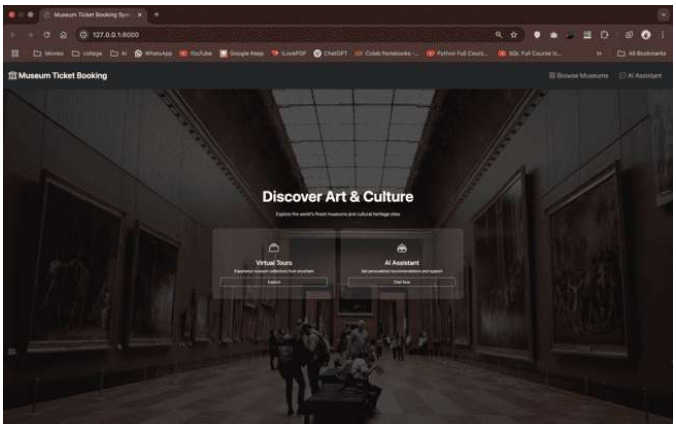
This web application offers an AI-powered platform for booking museum tickets, streamlining the process for users. It features a comprehensive database of Indian museums, including details like location, timings, and pricing. The AI chatbot guides users through the booking process with natural conversation and context-aware assistance.

The system supports multiple payment options, including credit/debit cards, UPI, and wallets, ensuring secure transactions with real-time validation and automated payment confirmations. After booking, users receive digital tickets with QR codes for easy verification at museums.

User management features include session-based interactions, nationality-based pricing, and access to booking history. This platform enhances convenience and accessibility, providing a seamless ticket booking experience with AI assistance and secure payment processing.

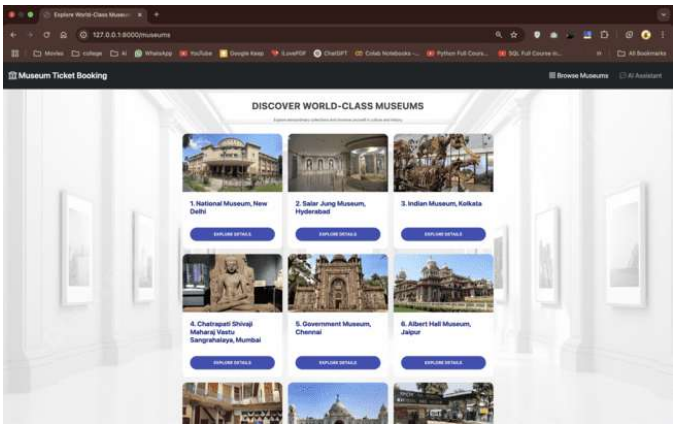
5.1 Landing Page

This website invites you to explore art and culture in a visually captivating way. You can take immersive Virtual Tours from anywhere, while an AI Assistant is there to guide you with personalized help. The museum-themed design adds charm and makes the experience feel both inspiring and easy to enjoy.



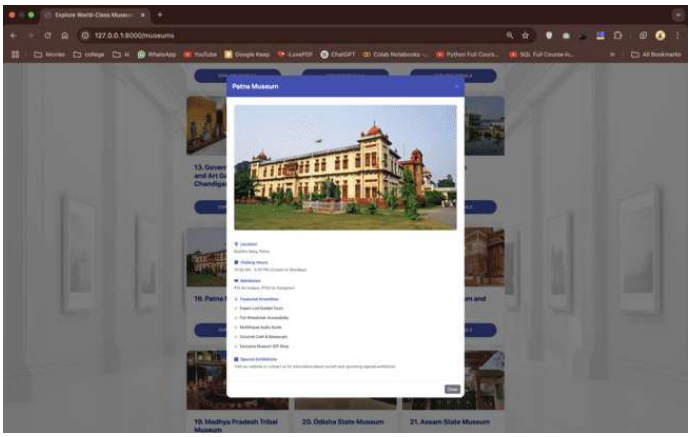
5.2 Explore Museums

The "Museum Ticket Booking" page showcases six well-known museums from cities like Delhi, Hyderabad, and Kolkata. Each museum appears to represent a different theme or type, based on the images shown. Every listing includes an "Explore Details" button, inviting users to dive deeper. With a clean, user-friendly layout and options like "Browse Museums" and "All Assistants," the site feels like it's built for easy discovery—and possibly booking—of cultural experiences across India.



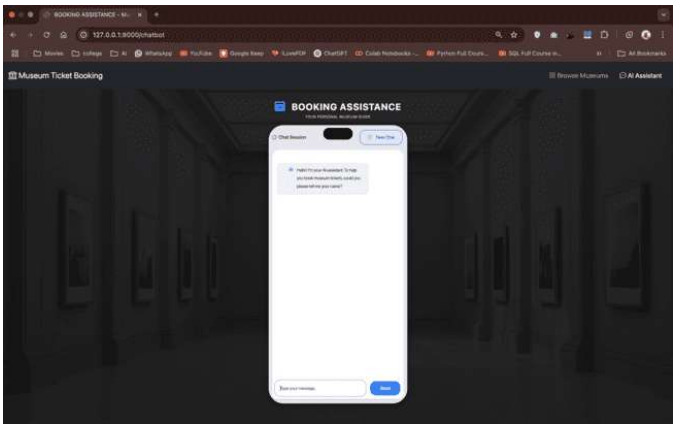
5.2.1 Explore Details

The "Explore Details" feature gives users a closer look at each museum. It usually covers everything visitors might want to know—like available facilities (parking, restrooms, cafes, souvenir shops), and accessibility features such as wheelchair access. You'll also find helpful info like opening hours, location, contact details, ticket options, and visitor guidelines—all designed to make planning your visit simple and stress-free.



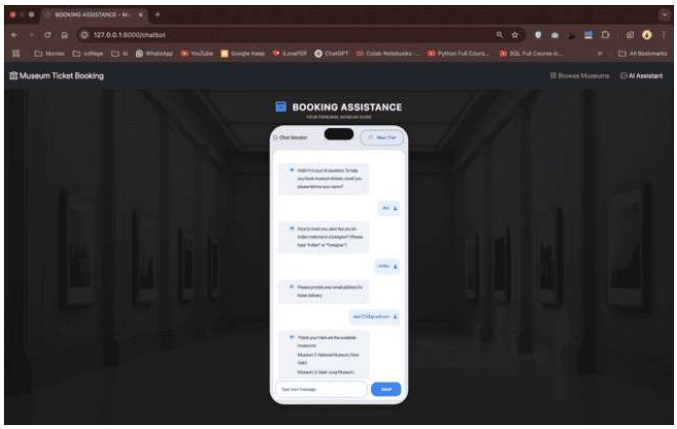
5.3 Chatbot Interface

The chatbot interface has a clean, minimalist design with a clear chat window and input area. Blue highlights key elements like the header and "Send" button, while rounded corners create a user-friendly, efficient experience for booking assistance.



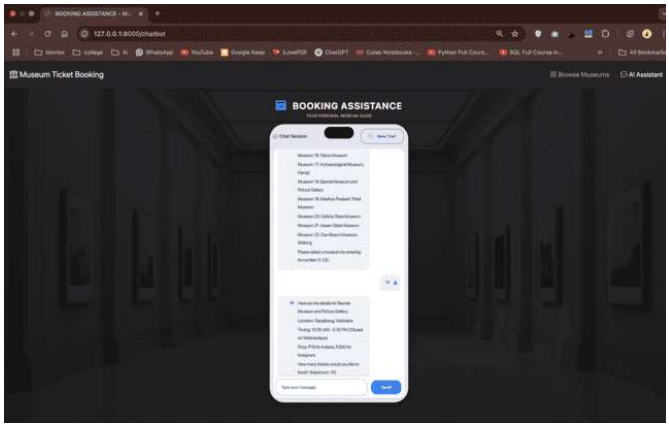
5.3.1 Chatbot Conversation

The chatbot starts with a friendly greeting and asks for your name, then collects booking details like nationality and email. It follows up with a numbered list of museums, guiding you step-by-step. This organized flow makes booking your museum tickets quick and easy.



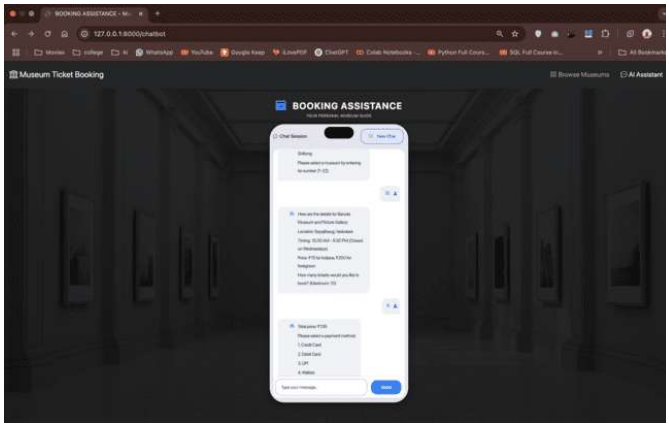
5.3.2 Booking Process

The chatbot provides a numbered list of museums (1-22) for selection. After you choose a museum (e.g., '3'), it shows details like location, timings, and ticket price, then asks for the number of visitors to continue the booking process.



5.3.3 Payment Process

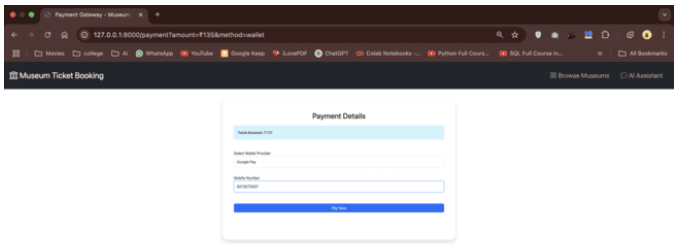
Once the total ticket cost is calculated, the chatbot presents a range of payment options to complete the booking. You can choose from credit/debit cards, UPI, or popular mobile wallets. Simply select your preferred payment method to finalize your booking.



5.4 Payment Process

The "Payment Details" page offers a smooth way to complete your transaction. You'll need to select your wallet service and enter your mobile number. Once the details are provided, a clear button lets you easily proceed with the payment.

Wallet payment:



6. CONCLUSION

The Museum Ticket Booking System highlights how thoughtful use of technology can truly enhance everyday experiences. What was once a time-consuming task—booking museum tickets—has been transformed into a quick, seamless process thanks to the integration of an AI-powered chatbot. This intelligent assistant not only guides users step by step but also makes the interaction feel natural and stress-free. By simplifying everything from selecting a museum to completing payment, the system ensures that users of all backgrounds can easily access and enjoy cultural spaces. It's a great example of how user-friendly tech can bridge gaps, save time, and improve how we connect with public services.

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