

QR-BASED DIGITAL PRASADAM BOOKING SYSTEM FOR IMPROVING TEMPLE EXPERIENCE

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Abstract - Religious institutions such as Hindu temples receive millions of devotees annually, yet the operational infrastructure supporting prasadam distribution, darshan scheduling, and visitor management remains largely manual and paper-driven. This results in severe crowd congestion, excessively long queues, lack of real-time information, and significant accessibility challenges for elderly and differently-abled pilgrims. The present paper proposes a QR-Based Digital Prasadam Booking System designed to modernize and streamline the temple visitor experience through the integration of contemporary web technologies. The proposed system leverages React.js for the frontend interface, Firebase Authentication for secure user identity management, Firestore as a scalable NoSQL database for booking and inventory records, and the Razorpay payment gateway for seamless digital transactions. Visitors can initiate the booking process by scanning a QR code placed at the temple premises, select their preferred prasadam type and quantity, complete payment online, and receive a unique digital booking confirmation QR code for staff verification at the counter. The system supports both guest access and Google-authenticated user accounts, ensuring broad accessibility. Empirical evaluation demonstrates significant improvements in operational efficiency, reduction in waiting time, and enhanced usability across diverse visitor demographics.

Key Words: User Experience, QR Code, Temple Management System, Digital Booking, Firebase, Razorpay, Web Application

1. INTRODUCTION

Temples and religious institutions across India and Southeast Asia serve as major pilgrimage destinations, drawing millions of visitors each year. These institutions are deeply embedded in the social and cultural fabric of communities, providing spiritual services, distributing sacred food offerings (prasadam), and facilitating ritual worship. Despite their cultural prominence, the operational mechanisms underlying temple management remain heavily dependent on manual processes, paper-based systems, and in-person queuing. The convergence of increasing visitor numbers and inadequate digital infrastructure has created persistent challenges that undermine the quality of the devotee experience and strain temple administration.

1.1 Problem Statement

Despite the cultural and social significance of temples, the existing prasadam distribution and visitor management systems are predominantly manual and inefficient. Devotees are required to stand in long queues without any prior information regarding waiting times or availability of prasadam. This results in overcrowding, discomfort, and safety concerns, especially during peak seasons and festivals. Additionally, manual record-keeping leads to operational inefficiencies, human errors, and lack of transparency in transactions.

1.2 Objectives of the Proposed System

The primary objective of this work is to design and develop a QR-Based Digital Prasadam Booking System that improves the efficiency and accessibility of temple services. The system aims to eliminate long queues and manual processes by enabling devotees to book prasadam digitally through a simple QR code scan. Another key objective is to provide a seamless and secure payment experience using integrated payment gateways such as Razorpay. The system also focuses on real-time inventory management to prevent

overbooking and ensure accurate availability of prasadam items. Additionally, the proposed system seeks to enhance user accessibility by supporting both guest users and authenticated users, making it inclusive for all types of visitors. It also aims to assist temple staff by reducing manual workload and enabling faster verification through QR-based booking confirmation. Overall, the system is designed to deliver a scalable, efficient, and user-friendly solution that enhances the overall temple experience for devotees.

2. REVIEW OF LITERATURE

Sapna Rangari, Anshul Thakre, Aniket Potbhare, Shreyash Gajbhiye, Prince Wasnik [1] presented an analysis of QR code applications in online reservation systems, highlighting their effectiveness in improving efficiency and user convenience across domains such as ticket booking and event management. Punyaslok Sarkar and Sherly Noel [2] developed an online ticket booking system incorporating user authentication, secure payment processing, and QR-based validation, demonstrating reduced manual workload and improved user satisfaction. Ranjana Singh et al. [3] proposed a cloud-based ticket booking system that enables real-time updates and eliminates the need for physical ticket counters, thereby enhancing accessibility and convenience. P. Suresh and

B. Muni Archana [4] designed an online light booking system that provides centralized access to light information, improving user decision-making and booking efficiency.

Further studies [5]–[12] explore digital ticketing systems, blockchain-based ticket validation, and decentralized booking platforms, emphasizing enhanced security, transparency, and fraud prevention. These works demonstrate how modern technologies can improve trust, scalability, and efficiency in booking systems across various domains.

Recent works [13]–[20] focus on QR code-based ticketing systems and Firebase-based real-time applications, demonstrating improved validation speed, prevention of duplicate usage, and enhanced system scalability. These studies collectively highlight the effectiveness of digital booking systems in reducing manual effort, improving user experience, and ensuring secure and efficient transaction management. However, limited research has been specifically focused on temple management systems, particularly prasadam booking, which motivates the development of the proposed QR-Based Digital Prasadam Booking System.

3. METHODOLOGY

The QR-Based Digital Prasadam Booking System is designed as a full-stack web application consisting of a frontend interface, backend services, and a database layer. The workflow begins when a devotee scans a QR code placed at the temple premises, which opens the web application in a mobile browser without requiring installation.

Upon accessing the system, users can either continue as a guest or sign in using Google Authentication through Firebase. This ensures accessibility for all users while also providing additional features such as booking history for authenticated users. After entering the system, users can view the available prasadam items along with their respective quantities and pricing details.

Users select the desired prasadam and proceed to payment through the integrated Razorpay payment gateway, which supports multiple payment options such as UPI, debit cards, credit cards, and net banking. Once the payment is successfully completed, the system generates a unique booking identifier, which is converted into a QR code. This QR code acts as a digital receipt and is presented by the user at the prasadam distribution counter.

Temple staff scan the QR code using a verification interface to retrieve booking details from the database and confirm the transaction. Once verified, the booking status is updated to prevent duplicate usage. The backend system uses Firebase Firestore for real-time data storage and synchronization. Booking records and inventory details are maintained efficiently to prevent overbooking and ensure accurate availability of prasadam items. This architecture ensures scalability, reliability, and improved operational efficiency.

4. DESIGN DETAILS

The overall system architecture is illustrated in Fig. 1.

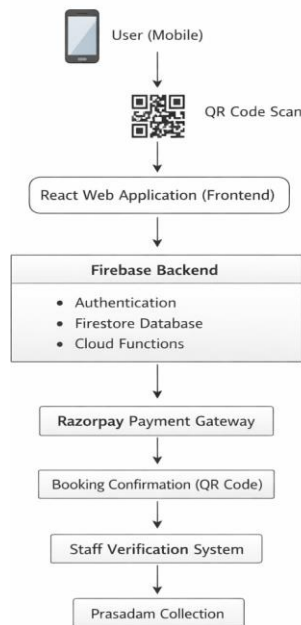


Fig. 1: System Architecture Diagram

The design of the QR-Based Digital Prasadam Booking System follows a layered architecture consisting of a presentation layer, service layer, and data layer. The user interaction process is illustrated in Fig. 2.

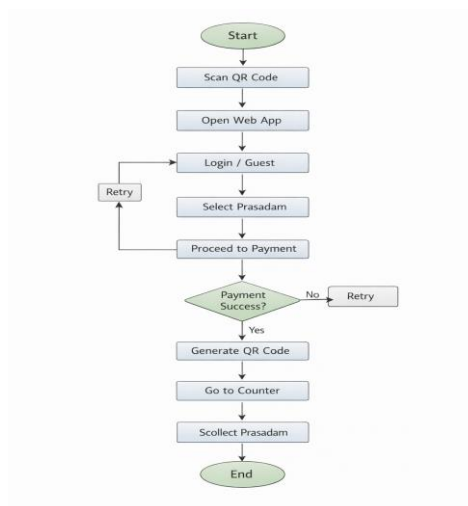


Fig. 2: User Flow Diagram

5. IMPLEMENTATION RESULTS

The proposed QR-Based Digital Prasadam Booking System was implemented using React.js for the frontend, Firebase for backend services, and Razorpay for payment processing. The system was tested across multiple devices, including smartphones and desktops, ensuring compatibility and consistent performance. The application successfully enabled users to book prasadam through QR code scanning, reducing the need for physical queues. The integration of real-time database management ensured accurate inventory tracking and prevented overbooking. The payment process was secure and efficient, supporting multiple payment methods. The QR code-based verification system allowed temple staff to quickly validate bookings, reducing manual workload and improving service speed. The overall implementation demonstrated improved user experience, reduced waiting time, and increased operational efficiency compared to traditional manual systems.

6. CONCLUSIONS

This paper presented a QR-Based Digital Prasadam Booking System aimed at improving the efficiency and accessibility of temple services. By replacing manual booking and queue-based systems with a digital solution, the proposed system effectively reduces crowd congestion and waiting time. The integration of modern technologies such as React.js, Firebase, and Razorpay enables secure, scalable, and user-friendly operations. The use of QR codes for booking and verification ensures a seamless and efficient process for both devotees and temple staff. The system demonstrates significant improvements in user experience, operational efficiency, and service transparency. It can be extended further by incorporating features such as multilingual support, analytics dashboards for temple management, and deployment across multiple temples. Overall, the proposed system provides a practical and scalable solution for modernizing temple management systems.

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BIOGRAPHIES



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