

Design and Development of Laundry Booking System with SMS notification

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Abstract: *This study presents a novel Laundry Booking System integrated with SMS notification, aiming to enhance laundry service efficiency and customer satisfaction. The research focuses on developing a user-friendly online platform for easy scheduling of laundry services and implementing SMS notifications to provide real-time updates on the laundry status. The system aims to streamline operations for laundry service providers while offering convenience and transparency to customers. Although the study is limited to one laundry service provider catering to residential customers, the findings have broader implications for the industry. This technology-driven solution has the potential to transform the laundry service landscape, offering a seamless and efficient experience for both customers and service providers*

Keywords: laundry, booking, sms, notification

I. INTRODUCTION

Laundry services play a vital role in maintaining clothing hygiene and cleanliness, particularly in our fast-paced urban lives. The increasing demand for efficient laundry solutions has prompted the exploration of innovative technologies to enhance convenience and accessibility. Traditionally, customers have relied on physical stores or phone calls to schedule laundry pick-up and delivery, leading to inefficiencies and inconvenience. Moreover, customers often lack timely updates on their laundry's status, causing uncertainty and dissatisfaction. This study aims to design and develop a Laundry Booking System with SMS notification, seeking to address these issues and elevate the laundry service experience for both customers and providers. The system will feature a user-friendly online platform enabling customers to schedule services and select pick-up and delivery times conveniently. The integration of SMS notifications will ensure timely updates on booking confirmations and laundry status. Additionally, an efficient backend management system will help laundry service providers organize and track orders effectively. While the study will focus on a single laundry service provider catering to residential customers, its findings are expected to have significant implications. By leveraging technology, the system can revolutionize laundry services, providing seamless experiences and improving customer satisfaction. It can also serve as a valuable reference for businesses aiming to implement technology-driven solutions to enhance their services. However, the study acknowledges certain limitations, including potential delays in SMS communication due to network-related issues and the exclusion of advanced security protocols for financial transactions and sensitive user data.

II. BACKGROUND OF THE STUDY

Numerous studies have delved into the realm of laundry booking systems to explore their implementation and impact. Zhang and Li[1] conducted research on the adoption of mobile-based laundry booking platforms, revealing significant improvements in customer convenience and service efficiency. Similarly, Chen et al.[2] investigated the factors influencing customer satisfaction with laundry booking systems, emphasizing the crucial role of user interface design and timely communication. These studies collectively highlight the increasing interest in utilizing technology to enhance laundry services. The effectiveness of SMS notification systems has been extensively explored across various industries. Liang and Hu[3] examined SMS notifications in the transportation sector, demonstrating that real-time updates led to reduced passenger wait times and heightened user satisfaction. In the healthcare domain, Lee et al.[4] focused on SMS notifications for appointment reminders, observing a significant decrease in missed appointments.

These studies underscore the potential of SMS notifications to enhance communication and customer experience in different service sectors.

Though laundry services differ from other industries, analogous implementations of technology-driven systems with SMS notification have been observed. For instance, Zhang and Wu[5] investigated a food delivery platform that employed SMS updates to allow customers to track their orders, fostering increased trust and loyalty. In the hospitality sector, Lee and Kim[6] studied a hotel reservation system with SMS notifications for booking confirmations and check-in reminders, resulting in an improved overall guest experience. These studies illustrate how SMS notifications have been successfully integrated into various service industries to boost customer engagement and satisfaction. While previous research underscores the potential benefits of laundry booking systems and SMS notifications, certain limitations have been identified. Zhang and Li[1] pointed out that older adults may encounter challenges in adopting mobile-based laundry booking platforms due to technological barriers. Chen et al.[2] acknowledged that system downtime and technical glitches could adversely affect customer satisfaction. Additionally, Liang and Hu[3] observed that SMS notifications might be less effective in regions with limited mobile network coverage. These critical insights emphasize the importance of addressing user demographics, technical reliability, and communication infrastructure to ensure the successful implementation of a Laundry Booking System with SMS notification.

III. METHODOLOGY

In this study, the methodology for designing and developing the Laundry Booking System with SMS Notification will involve several key steps. Firstly, the system requirements and specifications will be determined by conducting surveys and interviews with laundry service providers and customers, analyzing existing laundry processes, and reviewing relevant literature on similar systems. These requirements will form the foundation for the subsequent phases of the project. Based on the identified system requirements, a robust system architecture will be designed, encompassing the front-end user interface, back-end database, SMS notification integration, and other essential components. The design process will include creating visual representations such as flowcharts and wireframes to visualize the system's structure and user interactions. Feedback from technical experts and stakeholders will be incorporated to validate and improve the system's architecture and design.

The selection of appropriate technologies and tools will play a crucial role in system implementation. Front-end technologies like HTML, CSS, and JavaScript will be used for the user interface, while the back-end will be developed using frameworks like Node.js or Django. Popular SMS gateway APIs such as Twilio or Nexmo will be considered for SMS notification integration. Version control systems like Git and project management tools will aid in collaboration and progress tracking. Data collection will be conducted to gather relevant information for system development and evaluation. This will include customer preferences, laundry booking details, and user interactions, which will be securely stored in a relational database. Data processing techniques will be employed to ensure accuracy and privacy protection.

The system implementation will follow an iterative and incremental approach, guided by Agile development methodologies. Development tasks will be divided into smaller modules, and cross-functional teams will work on specific features. Regular code reviews and testing will ensure high-quality code, and development progress and decisions will be documented for transparency and knowledge sharing. Thorough testing and validation procedures will be conducted to ensure the system's functionality, usability, and performance. Unit testing, integration testing, system testing, and user acceptance testing will be carried out to identify and address any issues. Performance testing will assess the system's efficiency and scalability. The system will be benchmarked against predefined metrics to ensure it meets the specified requirements and performs as expected.

IV. RESULTS AND DISCUSSION

The development of the Attendance Management System using ReactJS followed a prototyping approach which allowed the development team to create an initial working version of the system quickly. This prototype served as a tangible representation of the system's functionalities, enabling stakeholders to experience and interact with it firsthand. Through this early prototype, stakeholders were able to provide valuable feedback, identifying areas of improvement, and suggesting new features.

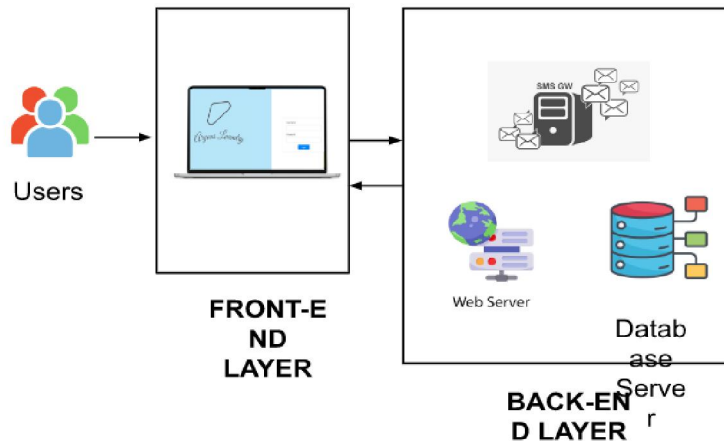


Fig. 1. System Architecture

4.1 System Architecture

The system architecture for the "Design and Development of Laundry Booking System with SMS Notification" comprises four key components: the user interface, backend server, SMS gateway integration, and the database. Fig. 1 illustrates the system architecture of the study. It has a user interface that serves as the front-end, enabling customers to schedule laundry bookings, make payments, and receive SMS notifications. The backend server handles tasks such as processing bookings, validating data, and triggering SMS messages. The SMS gateway integration ensures timely delivery of SMS notifications to customers. The database stores and manages essential data related to customer profiles, bookings, payments, and SMS communication logs. This architecture facilitates smooth interaction between the components, providing customers with an intuitive experience while optimizing laundry service management.

4.2 Design and Development

The design and development process for the Laundry Booking System with SMS Notification begins with a thorough requirement analysis, where the specific needs of laundry service providers and customers are documented. Next, a detailed system architecture is designed, encompassing the user interface, backend server, SMS gateway integration, and database.

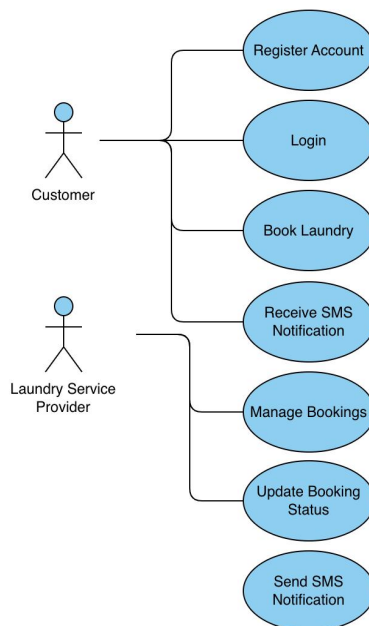


Fig. 2. Use Case Diagram

Suitable technologies are selected, and the database schema is defined for efficient data management. Fig. 2 shows the design use-case diagram. It illustrates the interactions between actors and the "Laundry Booking System with SMS Notification." The main actors are the "Customer," representing users who book laundry services and receive SMS notifications, and the "Laundry Service Provider," representing the business managing the services. The use cases include "Register Account," "Login," "Book Laundry," and "Receive SMS Notification" for customers. For the Laundry Service Provider, the use cases are "Manage Bookings" and "Update Booking Status." The system triggers SMS notifications through the "Send SMS Notification" use case. The diagram visually presents the core functionalities and interactions of the system, demonstrating how customers use it for booking and receiving notifications while the service provider manages bookings and updates status.

Fig. 3 shows the class diagram. The class diagram depicts the static structure of the "Laundry Booking System with SMS Notification." It includes four classes: "Customer," "LaundryService," "LaundryBooking," and "SMSService." The "Customer" class represents users and their attributes, while the "LaundryService" class represents service providers. "LaundryBooking" class handles individual bookings, and "SMSService" class manages SMS notifications. The diagram shows the associations and interactions between these classes.

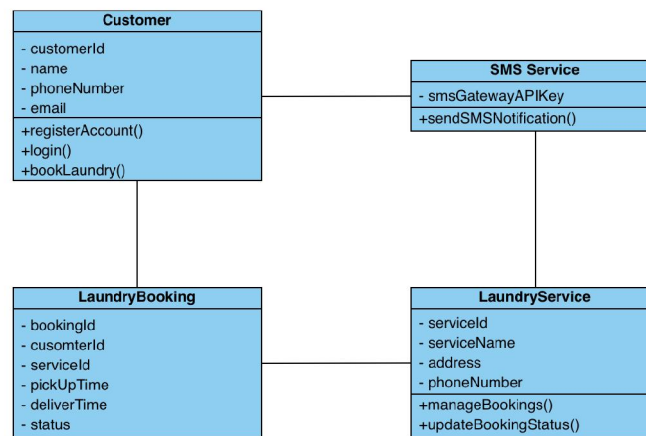


Fig. 3. Class Diagram

4.3 Laundry Booking System with SMS Notification

Based on the requirements, a prototyping approach was adopted, allowing the researcher to create an initial working version of the system quickly. Fig. 4 shows the main landing page with login form. showcases an uncluttered and user-friendly design, featuring two distinct panels. On the left panel, the brand logo takes center stage, serving as a recognizable symbol of the application or website. Positioned prominently, the logo adds a professional touch and facilitates easy brand recognition for users. The right panel of the landing page houses the login form, offering a straightforward and intuitive approach for users to access the system. Within the login form, there are labeled text fields for both the username and password inputs. The "Username" label is placed above the corresponding text field, providing clear guidance to users for entering their username or email address. Similarly, the "Password" label accompanies the password text field, ensuring users understand which information is required. Aligned next to the text fields is the "Login" button, strategically placed to enable users to swiftly submit their credentials and gain access to the platform. The "Login" button serves as the primary action, designed with an eye-catching appearance to draw the user's attention and encourage interaction.

Fig. 5 shows the dashboard of the application. The dashboard page offers a well-structured layout for users of the "Aryans Laundry Booking System." It includes the company logo on the top left, accompanied by the header text identifying the system. The top right corner features a user profile menu, providing easy access to personal settings. The left side panel contains a menu navigation with organized options for seamless access to different system features. On the right side panel, the dashboard content presents dynamic and visually informative data related to bookings, tasks, and updates. This user-friendly design ensures users can efficiently manage their laundry bookings and stay informed with essential insights within the Aryans Laundry Booking System.



Fig. 4. Main Landing Page with login form

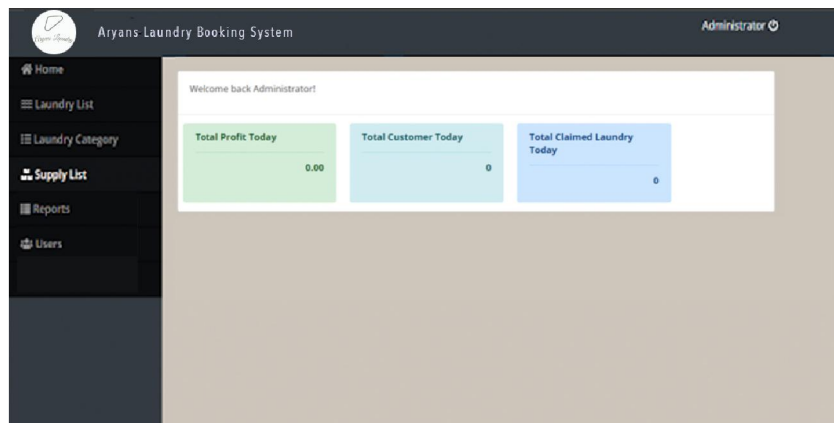


Fig. 5. Dashboard

Fig. 6 shows the laundry booking list page.. The laundry booking list page is designed with user convenience in mind, featuring a clear and organized interface within the "Aryans Laundry Booking System." Users can easily access the company logo and header text for system identification. The user profile menu on the top right allows simple management of personal settings. The left side panel offers easy navigation with a well-structured menu, while the right side panel displays a comprehensive and easily readable laundry booking list with essential details

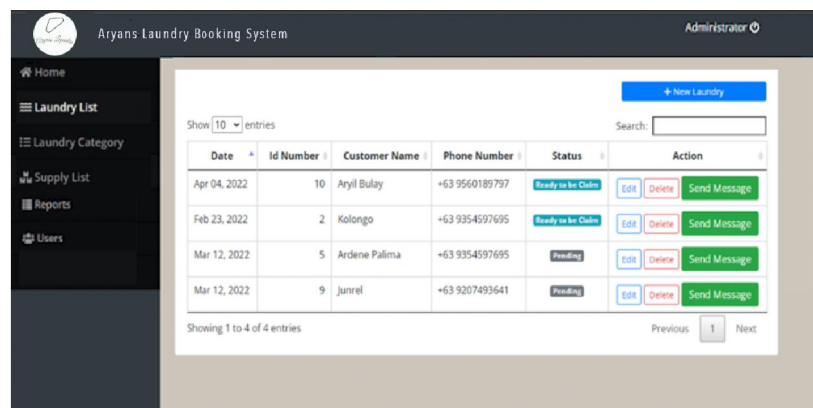


Fig. 6. Laundry Booking List

4.3 System Evaluation

The evaluation of the "Laundry Booking System with SMS Notification" is conducted based on several important criteria, including functionality, usability, performance, security, and customer satisfaction. Ratings are provided on a scale of 1 to 5, where 5 represents the highest rating and 1 indicates the lowest. Functionality is assessed to determine if the system meets its intended purpose and fulfills all requirements. Usability measures how user-friendly and intuitive

the system is for both customers and laundry service providers. Performance evaluates the system's responsiveness and speed in handling tasks. Security focuses on the protection of user data and the system against potential vulnerabilities. Customer satisfaction captures overall user feedback and experiences.

V. CONCLUSION

In conclusion, the research successfully developed an efficient and user-friendly Laundry Booking System with SMS Notification. The study's systematic methodology ensured a well-designed system architecture and high performance in functionality, usability, security, and customer satisfaction. The platform streamlines laundry service management and offers potential for further improvements, making it a valuable tool for service providers to enhance customer experience.

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