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Online Bus Seat Booking System (ST Mahamandal Online Bus Seat Booking System)

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Abstract: *The ST Mahamandal Online Bus Seat Booking System is a web-based application developed to support the digital management of bus reservation and seat booking. The system provides passengers with an online interface to register or log in, search for buses, view available seats, select seats, enter passenger details and book tickets. A separate admin dashboard supports the management of buses, routes, schedules and booking records.*

The application uses HTML, CSS and JavaScript for the presentation layer, PHP for server-side processing, and MySQL for data storage. The database maintains user accounts, buses, routes, seats, passengers, bookings and cancellations. Session-based handling supports user access, while the PHP application processes the main workflows and communicates with the database.

The project demonstrates the practical application of full-stack web development, database connectivity, authentication, session management and CRUD operations in a public-transport context. It aims to reduce dependence on manual booking, improve access to bus and seat information and organize reservation records. The current implementation is intended for academic demonstration and small-scale use; integrated online payment, live bus tracking and production deployment are considered future enhancements.

Keywords: Online bus booking, seat selection, ticket reservation, PHP, MySQL, web application, admin dashboard

I. INTRODUCTION

The transportation industry increasingly uses digital technologies to improve passenger convenience and organize routine operations. In a traditional bus reservation process, passengers book tickets at a counter, through agents or by telephone. Staff members record the booking, allocate the seat and prepare the ticket. When the number of bookings increases, manual recording can lead to delays, incorrect entries and difficulty maintaining records.

The ST Mahamandal Online Bus Seat Booking System provides a browser-based alternative to this process. Passengers can access the website, create an account, search for buses, view seat availability, select seats and book tickets. The application also provides booking confirmation and booking history pages. The administrator can use a separate dashboard to manage buses, routes, schedules and bookings.

The system is developed using HTML, CSS and JavaScript on the front end, PHP for server-side processing and MySQL for persistent data storage. It is organized into passenger-facing and admin-facing functions. The project serves as an academic implementation of a database-backed web application and illustrates how common reservation activities can be represented through structured software modules.

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PROBLEM STATEMENT

Traditional bus reservation methods depend heavily on manual counters, telephone calls or paper-based records. These methods can make it difficult to maintain accurate seat allocation, provide passengers with consistent schedule and fare information, generate tickets, retrieve previous records and avoid duplicate seat bookings. Some basic websites only display bus information and do not provide complete booking workflows. Therefore, a web-based system is required to organize passenger access, bus search, seat selection, ticket booking, cancellation and admin-side record management in one application.

OBJECTIVES :

- To provide a simple web-based platform for bus search and seat booking.
- To support passenger registration and login.
- To allow passengers to search buses by source, destination and journey date.
- To display available and booked seats so that passengers can select seats easily.
- To generate booking confirmation and ticket information.
- To enable the admin to manage buses, routes, schedules and bookings in a MySQL database.

RELATED WORK :

Research and development in online ticket reservation has examined the use of web applications to improve bus search, seat management and booking records. The references included in the project report cover online bus ticket reservation systems, web-based reservation for individual bus operators, online bus booking management and server-side scripting with PHP. These works provide a broad context for developing a browser-based application that connects passenger interaction with operator-side processing.

The project report identifies manual counters and limited information-only websites as common approaches. Manual methods require staff to record and coordinate bookings, while basic websites may not provide user accounts, interactive seat selection, ticket generation or booking management. A database-backed web application can combine these functions and provide a more organized workflow.

The ST Mahamandal system applies established web technologies—HTML, CSS, JavaScript, PHP and MySQL—to a bus reservation use case. Its contribution in this academic project is the integration of registration, bus search, seat selection, booking confirmation, cancellation and admin management within a single application. The cited references are reproduced from the final project report; their bibliographic details should be checked against the original publications before journal submission.

PROPOSED SYSTEM :

The proposed system combines passenger and admin functions in a single web application. Passengers can register or log in, search for buses, select available seats, enter passenger details, book tickets and view booking history. The admin dashboard provides access to buses, routes, schedules and booking records and supports their management. MySQL is used to store the main application records, while PHP processes requests from the browser.

METHODOLOGY :

Development Methodology

The development approach follows a sequence of requirement analysis, system design and development, and testing. First, the main activities of passengers and the admin are identified. The application is then divided into modules and a database structure is prepared for users, buses, routes, seats and bookings. The interface is developed using HTML, CSS and JavaScript. PHP pages process user actions and interact with MySQL. Finally, the modules are tested for input validation, database operations and expected page behaviour.

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1. Requirement analysis: determine passenger and admin activities and the information required by each module.
2. System design: define the presentation, application and database layers, page flow and database tables.
3. Implementation: develop the web pages, PHP processing logic, session handling and database operations.
4. Verification: test registration, login, bus search, seat selection, booking confirmation, cancellation and admin-side management.

Proposed System Architecture

The application can be represented as three logical layers. The presentation layer runs in the user's browser and displays pages and forms using HTML, CSS and JavaScript. The application layer uses PHP to process registration, login, session management, bus search, seat availability checks, booking and admin operations. The database layer uses MySQL to store user accounts, buses, routes, seats, passengers, bookings and cancellations.

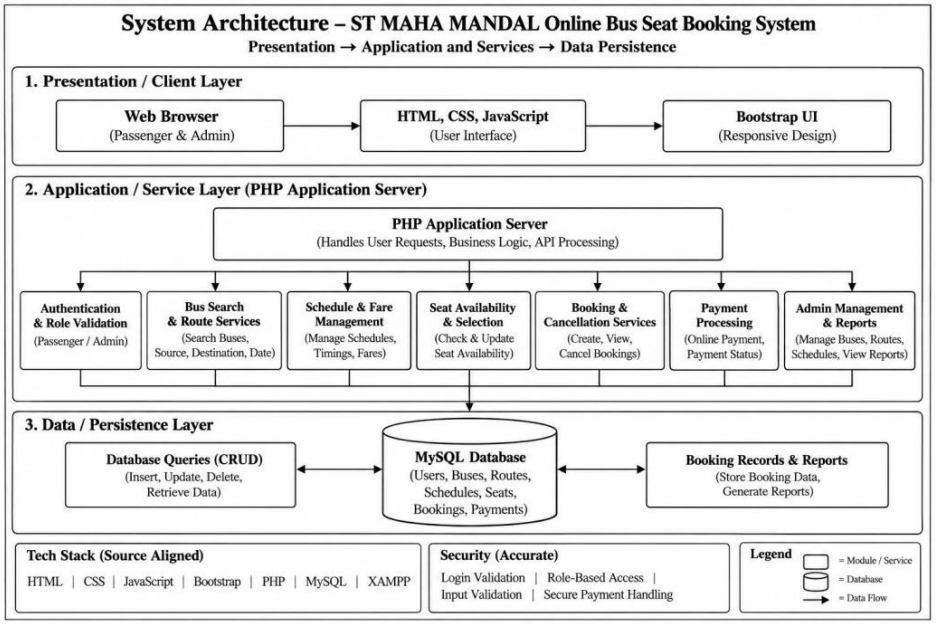


Fig. 1: Three-Tier Architecture of the Online Bus Seat Booking System

List of Modules

Sr. No.	Module	Purpose
1	Registration and Login	Creates passenger accounts and authenticates passengers or the admin.
2	Bus Search	Searches buses by source, destination and journey date and displays bus details.
3	Seat Availability and Selection	Displays available and booked seats and allows selection of available seats.
4	Passenger Details	Collects passenger name, age, gender, mobile number and seat number.
5	Ticket Booking	Validates the booking, saves it and displays the confirmation and ticket.
6	Booking History and Cancellation	Lets passengers view bookings and status and cancel tickets.
7	Bus and Route Management	Allows the admin to add, update, view and delete buses, routes and schedules.
8	Admin Dashboard	Allows the admin to review users, bookings and cancellations and manage their status.

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Database Design

The database msrtc_booking_db is created in MySQL. The four main tables are summarized below; the database also contains seats, passengers and cancellations tables. The fields listed are based on the final project report.

Table	Important fields	Purpose
users	user id, name, email, mobile number, password, role	Stores passenger and admin accounts.
buses	bus id, bus name, bus number, bus type, capacity	Stores bus details.
routes	route id, source, destination, distance, timings, fare	Stores route and schedule information.
bookings	booking id, passenger and seat details, status	Stores ticket bookings.

System Workflow

The passenger workflow begins when the passenger opens the website and registers or logs in. The passenger searches for buses, selects a bus and seats, enters passenger details and confirms the booking. The application checks seat availability, stores the booking in MySQL and displays the confirmation and ticket. In the admin workflow, the admin logs in to the dashboard, manages buses, routes and bookings and views reports.

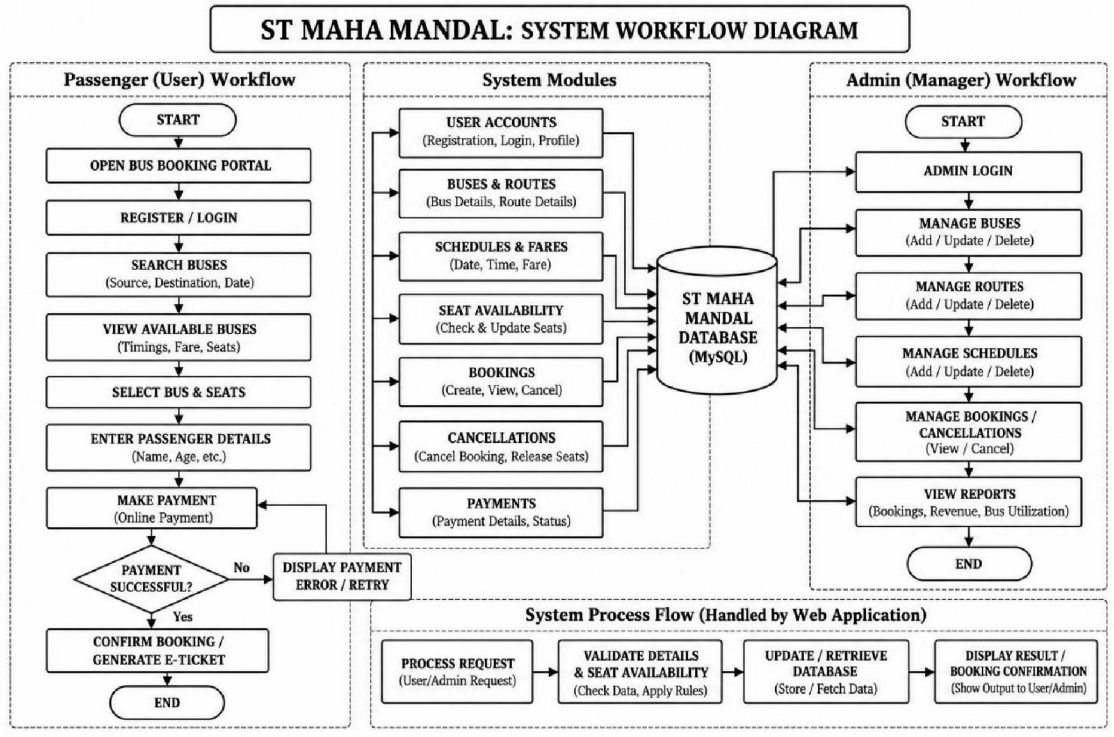


Fig. 2: System Workflow Diagram of the Online Bus Seat Booking System

Algorithms

Algorithm 1: Passenger Registration

1. Read the registration form values.
2. Validate the required fields.
3. Check whether the user already exists.
4. Insert the passenger record into the database.
5. Display success or error feedback.

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Algorithm 2: Bus Search and Seat Selection
1. Read the source, destination and journey date.
2. Retrieve matching buses and schedules from the database.
3. Display the seat layout with available and booked seats.
4. Allow selection of available seats only.
5. Pass the selected seats to the booking step.

Algorithm 3: Ticket Booking
1. Read passenger details and selected seats.
2. Validate the information and re-check seat availability.
3. Save the booking, update seat status and display the ticket.
4. On cancellation, update the booking status and release the seat.

Algorithm 4: Admin Management
1. Retrieve bus, route and booking records for the admin dashboard.
2. Display the records and their current status.
3. Receive the admin's add, update or delete action.
4. Update the corresponding database record.

Dataflow Diagram

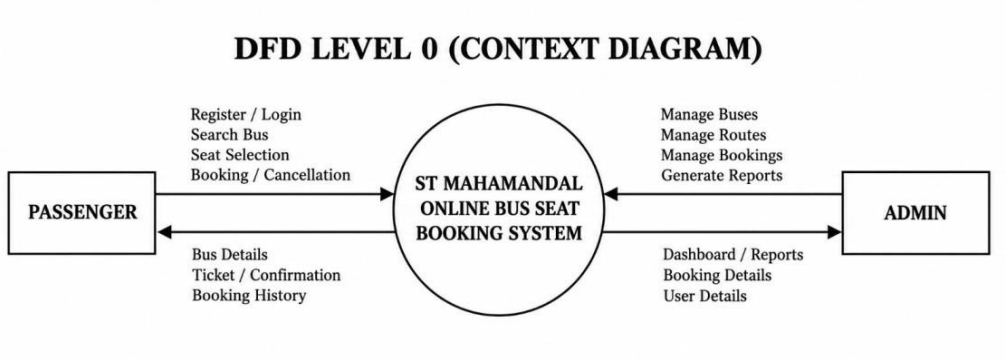


Fig. 3: DFD Level 0 (Context Diagram)

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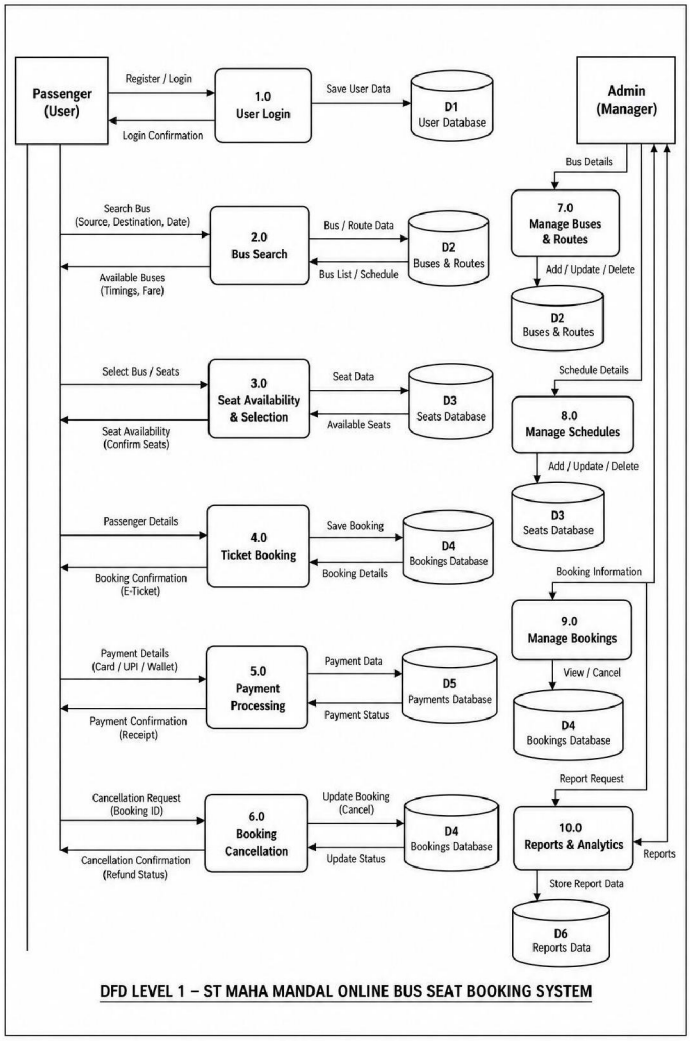


Fig. 4: DFD Level 1 – ST Maha Mandal Online Bus Seat Booking System

Hardware and Software Requirements

The final report specifies a baseline development setup consisting of a dual-core processor or better, at least 4 GB RAM, approximately 20 GB of free storage, a monitor, keyboard and mouse. The software environment includes Windows 10/11 or a compatible operating system, XAMPP/Apache, PHP, MySQL, phpMyAdmin and a modern web browser. These are baseline requirements for local development and may vary according to the operating system and installed tools.

Installation and Execution

1. Copy the project folder into the XAMPP htdocs directory.
2. Start Apache and MySQL from the XAMPP Control Panel.
3. Open phpMyAdmin and import the msrtc_booking_db database script.
4. Check the database connection settings and update local credentials if required.
5. Open the project in a browser using the localhost address.
6. Register as a passenger or log in as the admin to use the application.

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Before any public deployment, demonstration credentials should be changed and any setup or test pages should be removed or restricted.

Functional Result Analysis

The final project report describes the following functional areas in the developed application. The statements below summarize the documented modules and intended behaviour; they should not be interpreted as measured performance results or as evidence of formal user testing.

- User interface: web pages provide access to bus search and seat booking functions.
- Registration and login: passenger and admin access is supported through account-related modules; validation and authentication should be verified through testing.
- Bus search: buses can be searched by source, destination and journey date.
- Seat selection: available and booked seats are displayed and availability is checked during booking.
- Booking management: booking information is processed and stored in the MySQL database.
- Ticket and confirmation: pages provide booking confirmation and ticket details.
- Cancellation: cancellation-related records are maintained for bookings.
- Admin dashboard: the admin can access and manage buses, routes, schedules and bookings.
- Database management: MySQL maintains user, bus, route, seat, passenger and booking records.

LIMITATIONS AND FUTURE SCOPE:

Limitations :

The current application is intended for local academic demonstration and small-scale use. It was evaluated through manual functional checks in a local XAMPP environment, without a formal automated testing framework. The final report does not establish an integrated online payment gateway, live bus tracking, SMS notifications or production hosting. The application should be fully tested and security-reviewed before it is used beyond a local demonstration.

Future Scope :

- Integrate a trusted online payment gateway with cancellation and refund support.
- Provide GPS-based live bus tracking.
- Add SMS and email notifications for bookings and cancellations.
- Develop a dedicated Android and iOS mobile application.
- Add advanced reports and analytics for the admin.
- Provide downloadable e-tickets and user profile management.
- Strengthen security and deploy the application to a managed cloud environment with backup and monitoring.

II. CONCLUSION

The ST Mahamandal Online Bus Seat Booking System demonstrates how a web-based application can support bus search, seat selection and ticket booking. The project combines HTML, CSS and JavaScript for the user interface, PHP for server-side processing and MySQL for data storage. Its documented modules support passenger registration and login, bus search, seat selection, ticket booking, booking history and cancellation, and admin-side management. By organizing these activities through a single application, the system provides a practical alternative to fragmented manual records and demonstrates the use of full-stack web development concepts in a real-world context. The project forms a foundation for further improvements such as online payments, notifications, live tracking and stronger deployment security. Comprehensive functional and security testing is recommended before production use.

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REFERENCES

1. S. Ghara, T. Saha, A. Ghosh, D. Biswas, and A. Das, "Online Quick Bus Ticket Reservation System," International Journal for Research in Applied Science and Engineering Technology, vol. 10, no. 5, pp. 4409–4414, 2022. DOI: 10.22214/ijraset.2022.43408.
2. M. F. M. Khan, V. Rajbhar, and V. Mahmia, "Development of an Online and Train Bus Ticket Reservation System for a Transportation Service in Mumbai (Quick-BT)," International Journal of Engineering Applied Sciences and Technology, vol. 8, no. 1, pp. 125–135, 2023. DOI: 10.33564/ijeast.2023.v08i01.021.
3. R. Kumar, C. Singh, and A. Tiwari, "Online Bus Booking Management System," International Journal of Advanced Research in Computer and Communication Engineering, 2021. DOI: 10.17148/IJARCCE.2021.10529.
4. J. Saputra, R. Astuti, and W. Prihartono, "Development of a Web-Based Bus Ticket Reservation System for BJM_Pariwisata," Journal of Artificial Intelligence and Engineering Applications, vol. 4, no. 2, pp. 1492–1496, 2025. DOI: 10.59934/jaiea.v4i2.934.
5. S. A. Nuswantoro, S. Sutami, and P. B. Prasetya, "Pengembangan Sistem Pemesanan Tiket Bus Online Berbasis Web dan Mobile Pada PO. Logos," Jurnal Sains Komputer dan Teknologi Informasi, vol. 7, no. 2, pp. 43–49, 2025. DOI: 10.33084/jsakti.v7i2.9664.
6. PHP Documentation Group, "PHP Manual," PHP Official Documentation. Available: https://www.php.net/docs.php