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**Project Title**

**VIA Rail Ticket booking Management System**

**Project Scope:**

The VIA Rail Ticket Booking Management System seeks to address the evolving needs of modern passengers in their pursuit of an efficient and comprehensive travel booking experience. With the digital era reshaping consumer expectations, traditional booking methods need rejuvenation.

The VIA Rail Ticket booking Management System aims to modernize how passengers reserve and handle their train tickets. In today's digital world, it's essential to offer an easy-to-use online platform. This tool won't just handle regular bookings but will also have added features to enhance the overall travel booking experience. The app is designed to cover many aspects of online ticket reservations.

On the technical front, the system will allow users to buy, store and check mobile tickets comfortably, with one-click. Forget about paper/physical tickets, you have everything that you on the screen of your app/

With the wallet feature, users can store many tickets as they want, for different routes and dates. And plus, store all your family tickets together and keep control of your trips.

In essence, the VIA Rail Ticket Booking Management System aspires to be a holistic solution, bridging the gap between passengers' expectations and the offerings of contemporary digital booking platforms.

1. Features of the Selected Project:

• User Registration & Authentication: A secure system where users create their unique profiles, allowing them to manage bookings, view history, and save personal preferences.

• Ticket Booking Form: An intuitive form facilitating seat selection, date of journey, source, destination, and timings. It would also provide real-time seat availability checks.

• Online Receipt Generation: Upon successful booking, users would receive digital receipts which can be saved as PDFs or printed. QR code integration might be considered for easier verification during travel.

• Admin Dashboard: A comprehensive platform for administrators to view all bookings, generate reports, see user activity, and manage any flagged or suspicious activities.

1. End Users:

The project will have 2 types of users, which are the following:

* Travelers: Individuals looking to book train tickets.
* Admin: System overseers responsible for day-to-day management.

These types of users are going to have a user role to define the level of access to each part of the system.

1. Integration of the End Users with the project:

This essentially means how our system interacts with its users. The application will feature intuitive UI/UX designs ensuring easy navigation. Our application's approach to integration focuses on meeting users at their point of need and ensuring their engagement is fluid and productive.

For travelers:

* They will encounter streamlined UI/UX designs, promoting effortless navigation and providing them with the most relevant information upfront.

User Stories for Travelers:

* + As a traveler, I want to be able to save my frequent routes so that I can book tickets without entering them repeatedly.
  + As a traveler, I want to view my booking history, so I can keep track of my past travels.
  + As a traveler, I wish to modify or cancel my bookings through the application itself.

For administrators:

* The admin interface isn't just about oversight; it's about proactive management. Therefore, alongside basic tools, predictive analytics to gauge demand, user behavior patterns, and tools for direct communication with travelers (like sending out bulk notifications or alerts) would be integrated.

User Stories for Admins:

* + As an admin, I want to view peak booking times to manage resources better.
  + As an admin, I want to analyze feedback from travelers to improve system functionalities.
  + As an admin, I want to send out advisories or notifications to all users in case of large-scale changes or disruptions.

1. Areas Covered by This Project:

* Ticket Booking Form: This module is central to the application. Users can enter details such as travel date, starting point, destination, and desired time. The system then shows available trains and allows users to proceed with the booking.
* User Registration & Authentication: Before making a booking, users will need to register with the platform. This module ensures secure sign-ups and logins, thereby safeguarding personal information.
* Admin Module: The administrators have a comprehensive dashboard that allows them to manage the overall system. They can:
  + View all bookings made by users.
  + Generate detailed reports.
  + Track and manage ticket availability.
  + Monitor user activity for any anomalies.
  + Update train schedules, timings, and any offers or promotions.
* Online Receipt Generation: Once a ticket is booked, users receive an electronic receipt that can be saved as a PDF or printed out. These receipts will contain details of the booking and may have a QR code for easy verification during travel.
* Feedback and Queries Module: Users, especially travelers, can provide feedback about their experience. They can also raise queries or issues, which the admin can address. Certain queries can also be made available for viewing to other users, depending on their access levels.

Project Users, Actors, Vendors, Actuators:

* Users:
  + Travelers: Regular passengers and occasional travelers.
  + Admin: Backend system managers.
* Actors:
  + Database Managers: Oversee data integrity and efficiency.
  + Backend Developers: Create and maintain the system logic.
  + Frontend Developers: Design the user interface and experience.
* Vendors:
  + Microsoft: Providing the .NET Framework and SQL Server.
  + GitHub: Offering source control and versioning.
* Actuators:
  + Ticket Booking Engine: Central component handling all reservations.
  + User Authentication Mechanism: Secures user data and ensures only authenticated access.

Project Properties

The project is going to be developed by using C# and Microsoft SQL Server 16.x for the programming language and database, respectively, and the .Net Framework: 4.8 provides a robust and secure platform for development. The use of GitHub for source control will allow for easy collaboration and version control.

* Programming Language: C#
* Database: Microsoft SQL Server 16.x
* Front-end Technologies: WPF (Windows Presentation Form)
* Framework: .Net Framework: 4.8
* Web Framework: ASP.NET
* Unit testing: NUnit
* Deployment Environment: Microsoft Azure Once the application is developed and tested.
* Source Control: GitHub is going to manage the source code.

Plan of Work

* Week 1 (Sep 11 – Sep 17):
  + Develop project proposal.
  + Define project scope and requirements.
  + Identify project users, actors, vendors, and actuators.
  + Select programming language, database, framework, and source control.
* Week 2 (Sep 18 - Sep 24):
  + Design the database schema and create the required tables and relationships.
  + Establish initial structure for the user profiles, accommodating preferences and booking histories.
* Week 3 (Sep 25 - Oct 1):
  + Develop the user registration and login module.
  + Initiate the ticket booking form, focusing on seat selection and real-time availability checks.
* Week 4 (Oct 2 - Oct 8):
  + Complete the ticket booking form, integrating journey date, source, and destination.
  + Start the development of the online receipt generation, emphasizing PDF saving and printing options.
* Week 5 (Oct 9 - Oct 15):
  + Develop the admin dashboard, beginning with functionalities to view all bookings and user activity.
  + Incorporate Bootstrap for frontend beautification, emphasizing user registration and booking form UI.
* Week 6 (Oct 16 - Oct 22):
  + Fine-tune and finalize the frontend using Bootstrap, ensuring a responsive and interactive user dashboard.
  + Integrate QR code functionality in the online receipt for easier verification during travel.
* Week 7 (Oct 23 - Oct 29):
  + Unit testing using NUnit for both user and admin modules.
  + Begin implementing user feedback systems and integrate early user reviews and suggestions for system improvements.
* Week 8 (Oct 30 - Nov 5):
  + Address bug fixes, focus on performance optimizations, especially in the user dashboard and ticket booking form.
  + Refine the admin module, integrating advanced reporting capabilities.
  + Start documentation of user manuals with guidelines for profile management, booking processes, and receipt retrieval.
* Week 9 (Nov 6 - Nov 12):
  + Final testing and debugging.
  + Prepare for final presentation and submission.

In conclusion the VIA Rail Ticket booking Management System is an effort to simplify and enhance the train ticket booking process. Over the span of 9 weeks, we aim to bring this vision to life, creating a platform that is user-friendly, secure, and efficient. With meticulous planning and execution, we are poised to deliver a product that stands out, offering convenience and functionality to its users.