University of Science and Technology of Southern Philippines

Public Transportation System

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An Object Oriented Programming Project

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I. Background of the Study

The Public Transportation System (PTS) was designed to address the common inefficiencies of public transportation services specifically in terminals. Passengers are constantly irritated by availability of the vehicles, which would decrease the satisfaction level with a hesitation to use the public transportation system. Therefore, the goal of this project is to address these issues by the help of a proper software solution that will provide real-time updates and accurate information regarding the public transport.

The ultimate goal is to enhance the overall travel experience, increase passenger satisfaction, and encourage the use of public transportation by making it more reliable and user-friendly. The project is especially important as it has the potential to transform traditional public transport systems into modern, efficient, and technologically integrated services. By offering real-time information, the PTS system will allow passengers to make informed decisions regarding their journeys and optimize the operational efficiency of public transport networks.

II. Objectives

The main focus of this system is to improve the efficiency of the public transport network by providing passengers with real-time updates on transportation. The overall passenger experience will improve by offering user-friendly interface that facilitates easy to navigation.

To encourage greater use of public transport, the system simplifies administrative processes, offering secure tools for administrators to manage system settings and credentials. Additionally, it also supports better decision-making by enabling passengers to evaluate travel options based on estimated arrival times, fares, and route details.

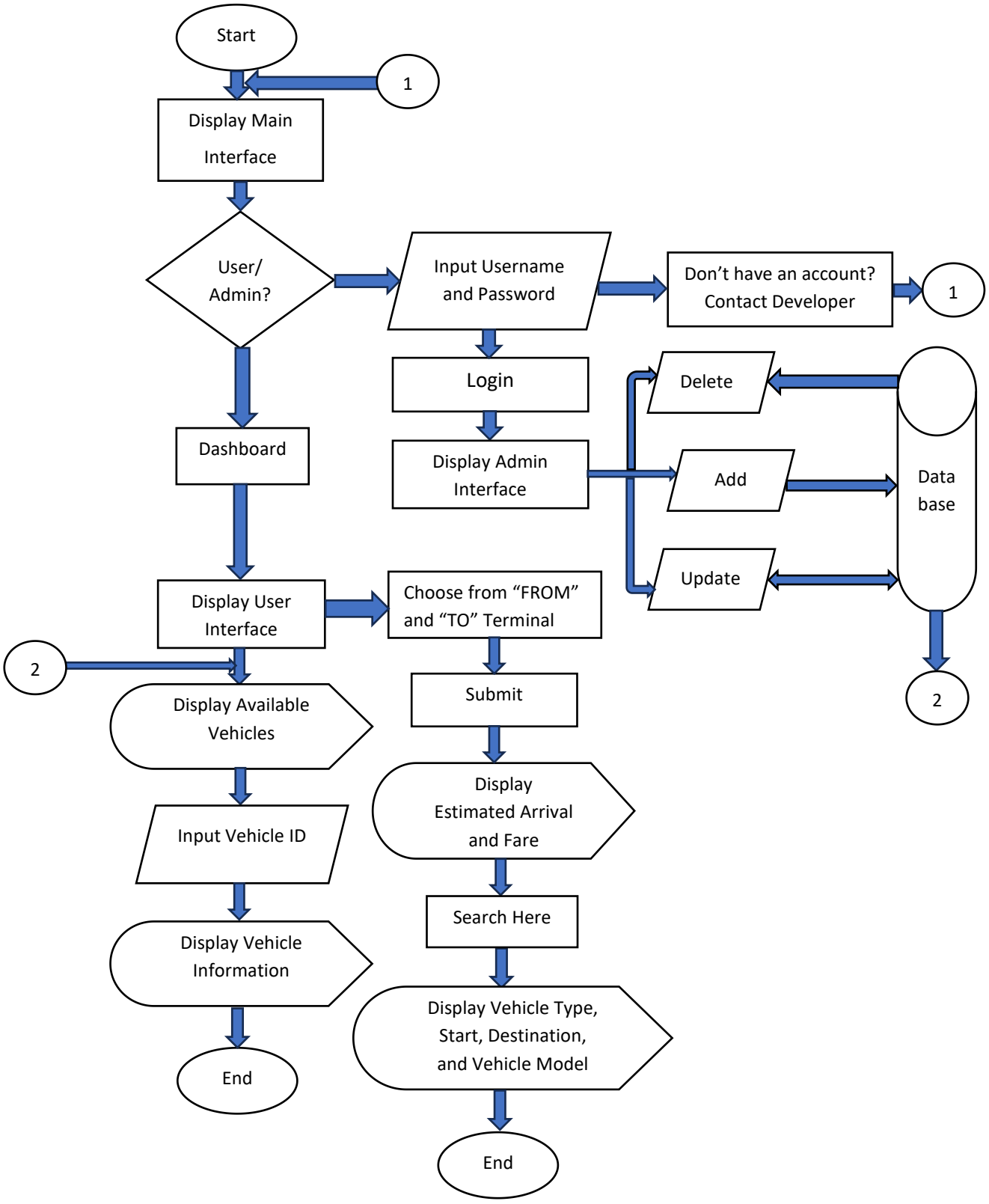
III. Scope and Delimitation of the Study

The scope of this study involves the development of a Public Transport System (PTS) with key features focused on the improvement of user experience and improving administrative processes. The system provides a user interface where passengers are to select their current terminal and destination. It offers a list of available vehicles, such as buses and vans.

Moreover, the system will show details including vehicle types, vehicle id, vehicle destination, departure time, vehicle model and information of drivers, such as name, contact number, and the plate number of their vehicle. The system also includes a route planning feature where the users pick the departure terminal and the destination terminal as well, while displaying estimated arrival times and travel fares. In addition an administrator interface is integrated into the system, providing secure log-in functionality with role-based access control to manage system settings and informations.

The delimitations of the study focus on the user interface and administrative functionalities, excluding broader aspects like vehicle maintenance or real-time vehicle tracking and also it can be only used in selected terminals, such as Gingoog terminal, Claveria terminal, Agora terminal, Balingasag terminal, Balingoan terminal, and Salay terminal. Furthermore, the system does not address traffic management or the optimization of the overall transport network infrastructure.

IV. Flowchart



This flowchart illustrates the functional processes of a system designed to manage and display vehicle-related information for both users and administrators.

1. Start

The process begins when the user opens the system's main interface.

2. User or Admin Selection

The user is prompted to identify their role—either as a “User” or an “Admin”.

- User Process:
  - Dashboard Button: Once click, the system directs the user to the user interface.
  - Choose the FROM and To: The user selects terminals for their journey by choosing the "FROM" and "TO" destinations.
  - Submit: Once submit, the system displays the estimated arrival and fare.
  - Search Bar: The user can search in the search bar, then the system displays in table the vehicle type, starting point, destination, and model.
  - View Available Vehicles: Based on what terminal that the user choosed, the system displays a list of available vehicles.
  - Input Vehicle ID: The user inputs the ID of a specific vehicle to get more details.
  - View Vehicle Information: The system provides comprehensive information about the selected vehicle, including the driver, driver contact, and plate number.

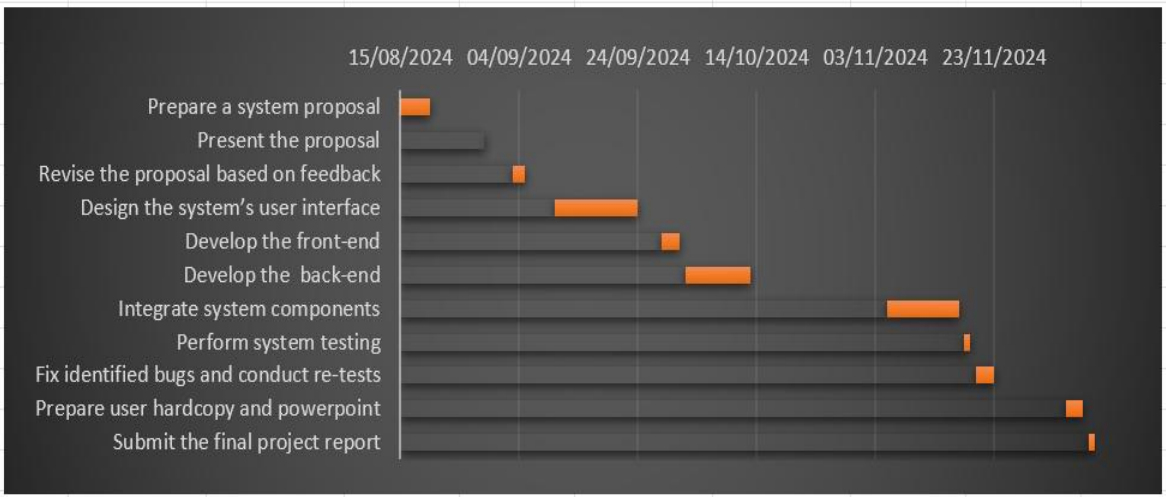
- Admin Process:
  - User Login: The user enters their username and password to log in. If they do not have an account, they are instructed to contact the system developer.

- Display Admin Interface: Upon successful login, the admin is presented with the admin interface.
- Database Operations: The admin can manage the system's database by performing the following actions:
  - Add: Insert new vehicle details into the database.
  - Update: Modify existing entries in the database.
  - Delete: Remove records from the database.

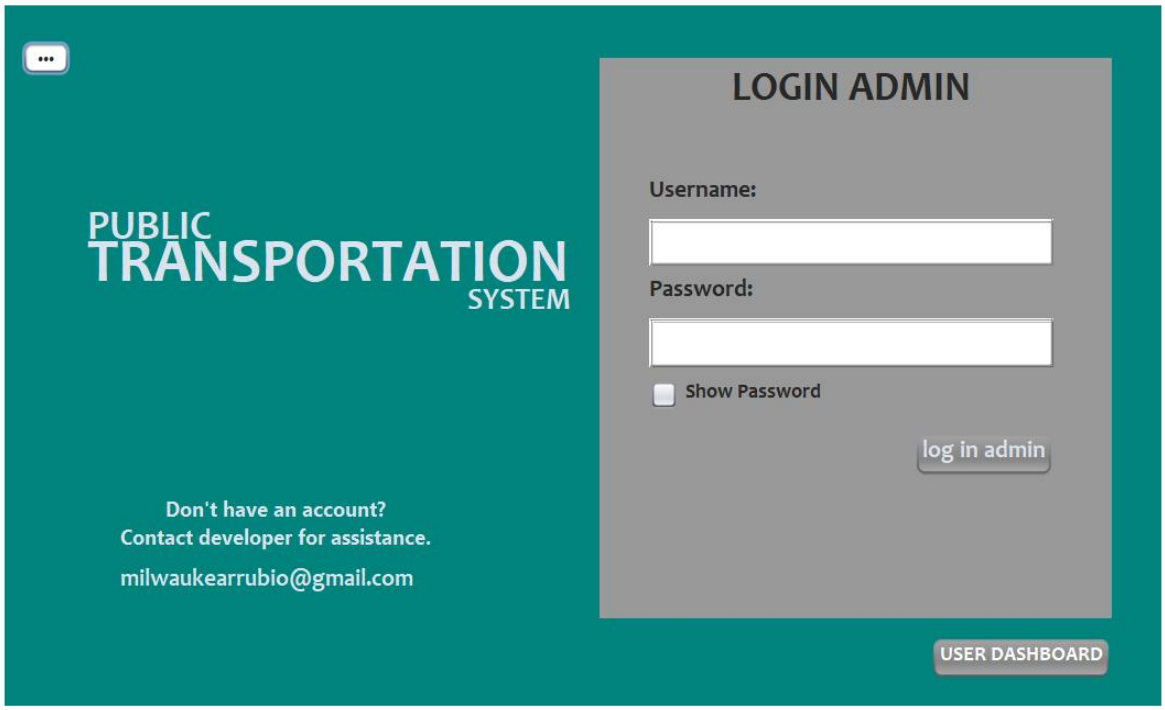
3. End:

Both processes (User and Admin) conclude at the respective endpoints once the desired tasks are completed.

V. Gantt Chart



VI. System Design



Main Title and Branding:

- The title "**Public Transportation System**" is prominently displayed in the center of the interface, giving the application its identity.

Dashboard Button:

- A large button labeled "**DASHBOARD**" is placed below the login admin.
- Clicking this button is likely intended to lead to a user interface.
- Leads directly to a user interface or guest dashboard, skipping the login requirement for general information or non-restricted functionalities.

Admin Login Panel:

- Contains fields for:

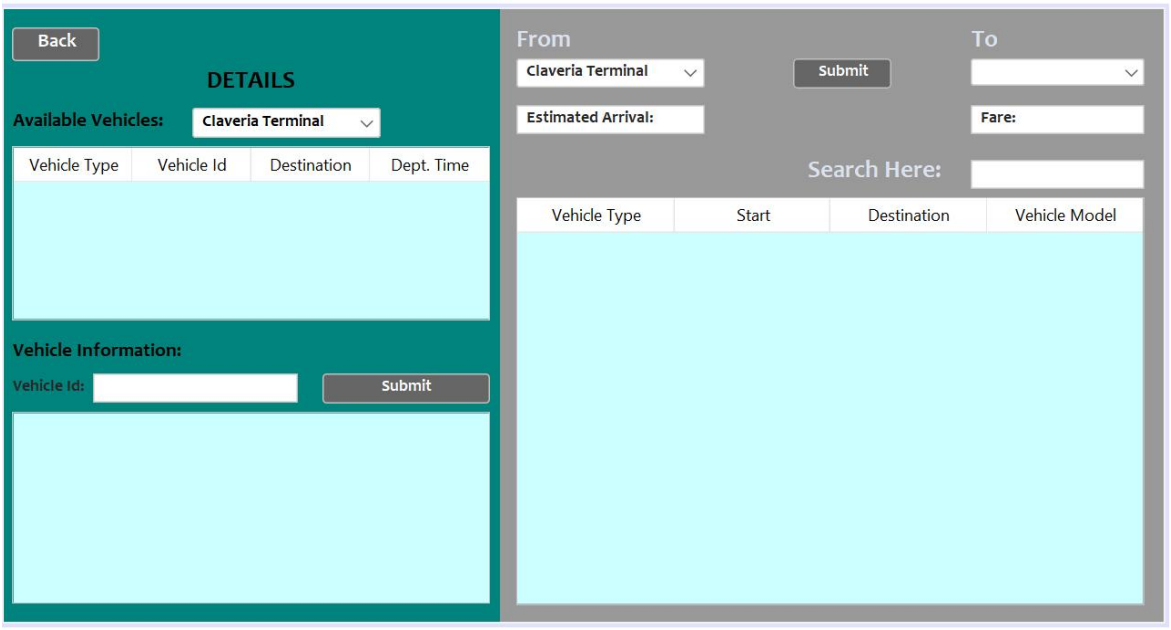
  Username: To input the admin's username.

  Password: To input the admin's password.
- A **"Show Password" checkbox**, which allows the user to toggle the visibility of the password.

- A **"Login" button** for submitting credentials to authenticate the admin.

Assistance Section:

- A message provides guidance for users who do not have an account or need assistance, with a placeholder email for contacting the developer (milwaukeearrubio@gmail.com).



Back Button:

- This button allows users to return to the main interface from any sub-page or detailed view within the application.

Choosing a Terminal:

- The user selects a terminal from a combo box. This selection determines which set of available vehicles will be displayed.
- Upon selecting a terminal, a table is populated with information about the available vehicles. This includes details such as vehicle type, vehicle ID, destination, and departure time.

Vehicle Information Section:

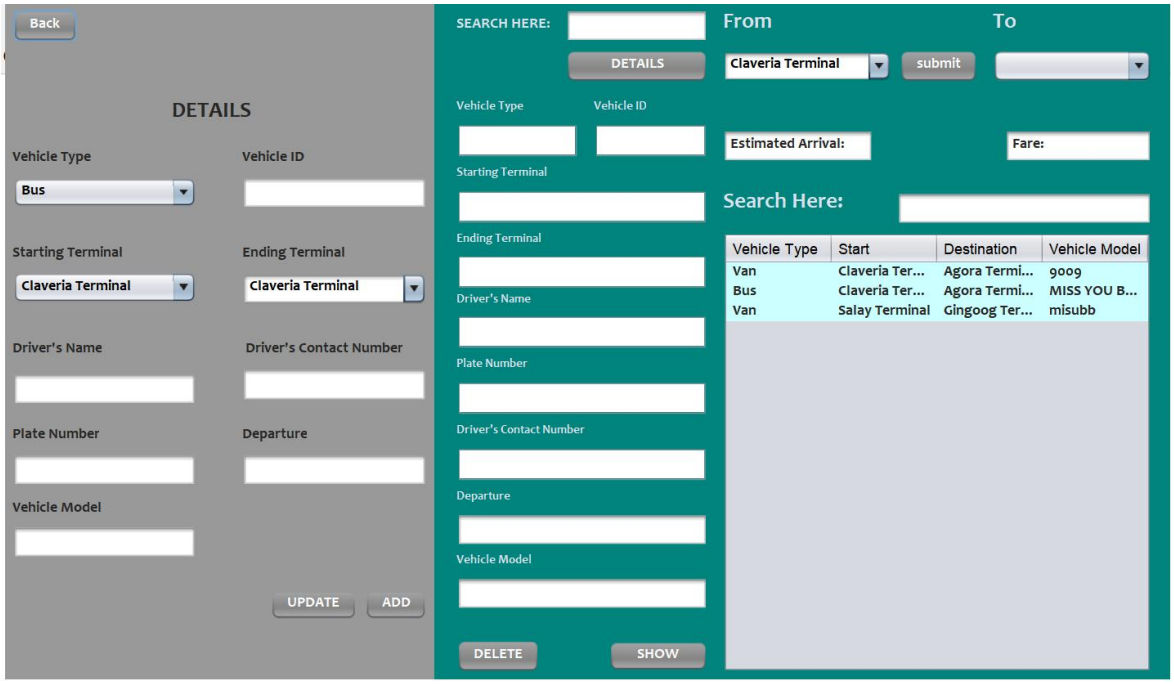
- Here, the user can input a specific vehicle ID into a form. After submitting this ID, the system retrieves and displays detailed information about the vehicle, including the driver's name, contact details, and vehicle plate number.

Trip Planning Section:

- On the right side of the interface, the user is presented with options labeled "From" and "To." These likely represent the origin and destination of a journey. After selecting both options and submitting the information, the system displays the estimated arrival time and date for the chosen trip.

Search Functionality:

- There is also a "Search Here where users can input search queries related to buses or other aspects of the service. The results of this search are then displayed in a table below, providing additional filtering or detailed information.



Details Section:

- This is where the admin can add, update, or delete vehicle information.

Add Vehicle:

- The admin selects "Add" and then chooses the vehicle type (bus or van).
- The admin inputs the vehicle ID, starting terminal, ending terminal, driver's name, driver's contact number, and plate number.
- After entering all necessary details, the user presses the "Add" button to save the new vehicle information.

Update Vehicle:

- The admin can modify any of the existing vehicle details.
- After making the necessary changes, the admin clicks the "Update" button to save the updated information.

Delete Vehicle:

- The admin can delete any of the existing vehicle details.

Search Functionality:

- On the right side of the interface, the admin can input search criteria in the "Search Here" field.
- After entering the search criteria, the admin clicks the "Details" button.
- The system retrieves and displays the relevant vehicle information in the text fields on the left side of the interface.
- The "Show" button is automatically displayed in the details part on the left side if the user does not wish to input any more information.

Automatic Display:

- When the admin searches for a vehicle, the corresponding details are automatically populated in the without requiring the user to input each detail manually.
- This feature simplifies the process of viewing and managing vehicle information, making it efficient for admins to update and retrieve data as needed.

VII Conclusion

The development of the Public Transportation System (PTS) aims to address critical inefficiencies in public transportation, particularly in terminal operations. By introducing real-time updates and accurate information, this system enhances passenger satisfaction, increases operational efficiency, and fosters a user-friendly environment. The combination of features such as vehicle information display, trip planning tools, and the administrative interface allows passengers and administrators alike to navigate the public transportation landscape more effectively.

Key components like the user interface (UI) ensure that passengers can easily select terminals, check available vehicles, and view detailed trip information, including estimated arrival times and fares. These features aim to minimize the hesitation that passengers often experience when deciding whether to use public transportation. For administrators, the ability to manage vehicle details, monitor system performance, and make real-time adjustments ensures that the system remains efficient, transparent, and responsive to users' needs.

Overall, the system's focus on usability, real-time information, and effective administrative controls offers a holistic approach to modernizing public transportation services. It not only helps passengers make informed travel decisions but also streamlines the management process for administrators, ultimately contributing to the more widespread use and greater satisfaction with public transportation networks.

VIII. Recommendations

To further enhance the functionality of the Public Transportation System (PTS) and expand its capabilities, the following recommendations are made:

1. **Integration of Real-Time Vehicle Tracking:**
    - To further improve passenger satisfaction, integrating GPS-based tracking could allow passengers to see the real-time location of buses and vans. This would help them better plan their travel by providing more precise arrival

times, reducing wait times, and enhancing the overall reliability of the system.

2. **Expansion to More Terminals:**
    - The current scope of the system is limited to selected terminals. Expanding the system to include more terminals would improve accessibility for a broader user base and help standardize the service across various locations.
3. **Traffic Management Integration:**
    - While the system focuses on providing real-time updates for passengers, incorporating traffic data and optimization tools could further enhance the operational efficiency of the public transport network. Such an integration would allow the system to adjust vehicle schedules dynamically in response to traffic conditions.

4. **User Feedback Mechanism:**
    - Introducing a feedback section where passengers can report issues, rate services, or make suggestions could help improve the system continuously. This would allow administrators to make adjustments based on user input and enhance the system's responsiveness to passenger needs.
5. **Extended Administrative Functions:**
    - The admin interface could be further developed to include more sophisticated data analytics tools. For example, analyzing trip patterns, vehicle usage, and other metrics could help improve decision-making for future improvements to the system.

In conclusion, the Public Transportation System (PTS) lays a solid foundation for improving passenger experience and administrative efficiency. By adopting these recommendations, the system could evolve into a more comprehensive and adaptable tool that addresses the growing demands of modern public transportation networks.