Project Report on

DIU Transport Service Mobile Application

Course Code: CSE316

Course Title: Software Project III

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Project Title: DIU Transport Service Mobile Application.

Project Principle: This report presents the development plan for a mobile application, "DIU Transport Service," designed to address transportation challenges faced by students at Daffodil International University (DIU). The app offers on-demand ride booking, real-time tracking, and a variety of transportation options, catering specifically to the needs of the DIU students. Ensuring transport services are easily accessible to all members of the university community.

Project Description:

The Daffodil International University (DIU) Transport Service project aims to provide suitable transportation for students, faculty, and staff.

- New Buses: Introducing new, comfortable, and eco-friendly buses for a better travel experience.
- Fixed Routes: Establishing fixed routes and schedules to cover major residential areas and key city points.
- Real-Time Tracking: Using GPS tracking so users can see bus locations and arrival times through a mobile app.
- Easy Payment: Offering smart ticketing with options for digital payments and monthly passes.
- Safety First: Ensuring all buses have safety features like seat belts and first aid kits, and conducting regular maintenance checks.
- Eco-Friendly: Promoting sustainable practices by using energy-efficient buses and considering electric or hybrid buses for the future.
- User Feedback: Providing a platform for users to give feedback and suggestions to continually improve the service.

Overall, this project aims to make commuting to and from the university safe, easy, and environmentally friendly.

Target Audience:

The primary target audience for DIU Transport Service is the student population of Daffodil International University. The app caters to students seeking a convenient, reliable, and efficient on-campus and surrounding area transportation solution.

Project Architecture :

The Daffodil International University (DIU) Transport Service project can be designed using two popular architectural patterns: MVC (Model-View-Controller) and MVP (Model-View-Presenter).

MVC Pattern:

Here's a simple explanation of how MVC pattern can be applied:

Model: Represents the data layer of transport service. This includes details about bus routes, schedules, and real-time tracking information. Example: A Bus-Route class that handles information about different bus routes and schedules.

View: The presentation layer that handles the display of information to the user. It's the interface of the application, such as the mobile app screens. Example: A Route-View that shows the list of available bus routes and their schedules.

Controller: Acts as an intermediary between the Model and the View. It listens to user input from the View, processes it (possibly updating the Model), and updates the View. Example: A Route-Controller that handles user input to search for bus routes and updates the Route-View with the search results.
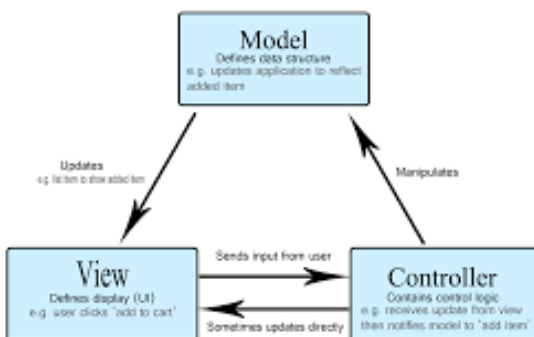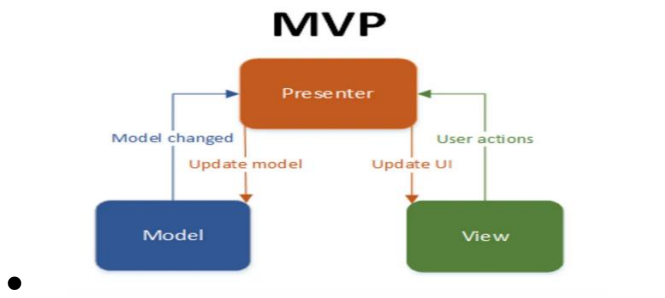

MVP Pattern:

Model: Similar to MVC, the Model in MVP represents the data and business logic. Example: A Bus-Schedule class that manages the data for bus schedules and real-time tracking.

View: The View in MVP is more passive and only knows how to display information. Example: A Schedule-View that shows bus schedules and tracking information.

Presenter: Acts as the middleman between the Model and the View. The It also handles user interactions, making it more active than the Controller in MVC. Example: A Schedule-Presenter that fetches bus schedules from the Bus-Schedule model and updates the Schedule-View.

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In choosing the architecture of transport service,I carefully considered the benefits of both the Model-View-Controller (MVC) and Model-View-Presenter (MVP) patterns. MVP is preferred because it makes the View more passive and the Presenter handles more logic, leading to better separation of concerns and easier testing.

DIU Transport Planning and requirments:

I'm going to continue with the project based on the MVP architecture because all that is required of us in this one is UI design. Here, I will design my user interface's presentation layer and assign responsibilities to each UI component. Additionally, the user interface will be demonstrated, and its responsibilities and logic will be developed by the software's activity.

Requirments:

- User Registration and Authentication: Allow students, staff, and drivers to register and log in.
- Bus Scheduling: Manage and view bus schedules.
- Booking and Reservations: Enable users to book seats on buses.
- Notifications: Send alerts and notifications for bus schedules and updates.

- Route Management**:** Manage bus routes.
- Admin Panel**:** Admin functionalities for managing users, schedules, and routes.
- GPS Tracking: Basic GPS tracking of buses.

Technology Stack:

The development process will average strong technology stack to ensure optimal performance, scalability, and user experience.

Development Tools, Method & Environment Explanation:

Mobile App Development:

Framework: React Native, Flutter

The user interface students interact mobile App (Flutter/React Native)

- Schedule Screen
- Booking Screen
- Login/Register Screen
- Notifications Screen
- Profile Screen

Design & Development Tools: Industry-standard UI/UX design tools (e.g., Figma, Adobe XD) combined with framework-specific development tools (e.g., React Native CLI, Flutter DevTools).

Database: Flexible NoSQL database (e.g., MongoDB) for efficient user data, location information, and ride detail management.

- Users Table,Buses Table
- Schedules Table
- Bookings Table
- Routes Table

Mapping Service: Integration with a leading mapping service (e.g., Google Maps API) for real-time location tracking and optimized route planning.

- The development environment included tools like Visual Studio Code, along with various dependency packages and plugins to streamline the process and enhance functionality.

Also, I will use Figma software to design the app's UI and for development will use JavaScript programming language with React as a framework. Moreover, the code of the website will be uploaded to GitHub.

Project justification:

The DIU Transport Service aims to transform student commutes with features like secure authentication, real-time tracking, transparent fare estimation, secure payment integration, and a feedback system. By offering convenience, reliability, and efficiency, it has the potential to significantly enhance student life at Daffodil International University. Leveraging a strong technology stack and user-centered design, the app empowers students with control over their commutes, enriching the overall university experience.

Future Features and Development of the Project: I have big plans for this project in the future and after launching this project I will slowly move forward with its new features and development. Future upgrades for DIU Transport may involve smarter routes, more payment options, and predictive maintenance for better management. These advances aim to make student commutes smoother, enhance service efficiency, and maintain a seamless transportation experience at Daffodil International University.

Overview of Full Developed Project and Conclusion:

The DIU Transport Service project includes new eco-friendly buses, fixed routes, real-time tracking, smart ticketing, and safety measures, all managed via a user-friendly mobile app. This project ensures safe, timely, and efficient transportation for the DIU community, enhancing convenience and sustainability.