Problem Statement

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PS02: Integrated Common Services to Common People

*Aligned with our project, "**Hop On Board**" our goal is to develop a web-based application focusing on addressing common issues in public transportation. Despite the abundance of online information, navigating bus stops, routes, and schedules remains challenging for commuters.*

Deliverables:

1. Data Collection: Gather and integrate real-time bus stop locations, schedules, and routes.

2. Data Preparation: Organize and structure data for accuracy and accessibility.

3. Application Development: Create a user-friendly web interface for users to input their location and access nearby bus stops, available buses, and real-time routes.

4. Tabulate Results: Present findings and user feedback to assess the application's effectiveness in improving public transit navigation.

Our focus on transportation aims to simplify commuter experiences by providing reliable, real-time transit information through a convenient digital platform.

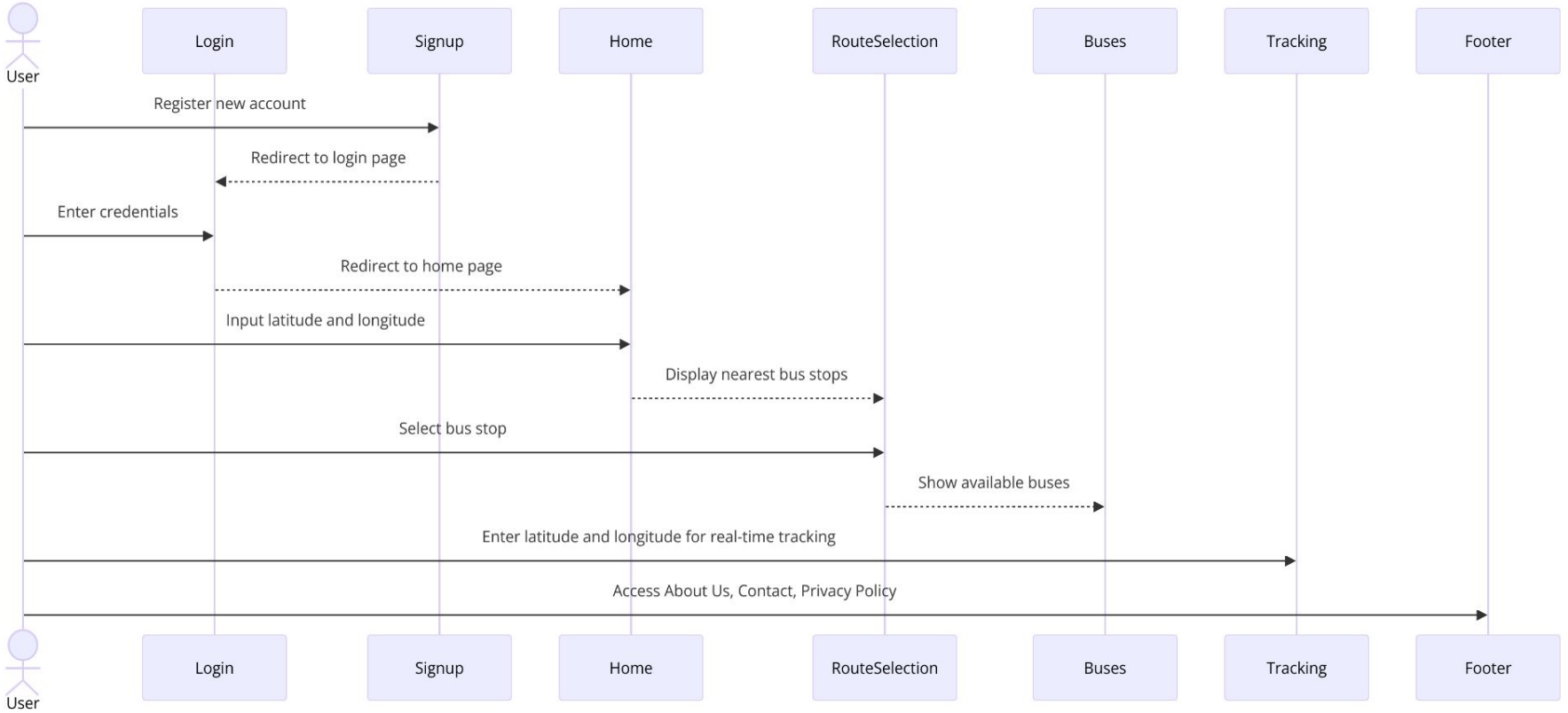
Unique Idea Brief (Solution)

"Hop On Board" is a pioneering web platform created to simplify and enhance public transportation navigation. Our website allows users to effortlessly find the nearest bus stops by inputting their latitude and longitude. Once the bus stops are identified, users can select their preferred stop from multiple options and view available buses. Additionally, the platform offers a tracking feature that provides real-time bus route information based on the user's location. Beyond these core functionalities, "Hop On Board" includes essential resources like About Us, Contact, and Privacy Policy in the footer. Designed with a user-friendly interface, our platform aims to revolutionize the public transit experience, making it more efficient, accessible, and convenient for all users.

Features Offered

1. **Nearest Bus Stop Finder**: Enter your latitude and longitude to instantly locate the nearest bus stops.
2. **Route Selection**: Choose from multiple nearby bus stops to find the most convenient option for your journey.
3. **Available Buses Display**: View detailed information on the buses available at your selected stop.
4. **Real-Time Tracking**: Access live updates and real-time routes by simply entering your current location.
5. **User-Friendly Interface**: Navigate our platform with ease, thanks to its intuitive design and seamless functionality.
6. **Comprehensive Footer Links**: Access essential information through our About Us, Contact, and Privacy Policy pages.
7. **Efficient Navigation**: Enjoy a streamlined public transportation experience tailored to your specific needs.
8. **Enhanced Accessibility**: Our platform is designed to be accessible and convenient, ensuring a smooth transit experience for all users.

Process flow



The diagram best illustrates how our web-application is designs to work, you can also refer to our demo video.

Architecture Diagram

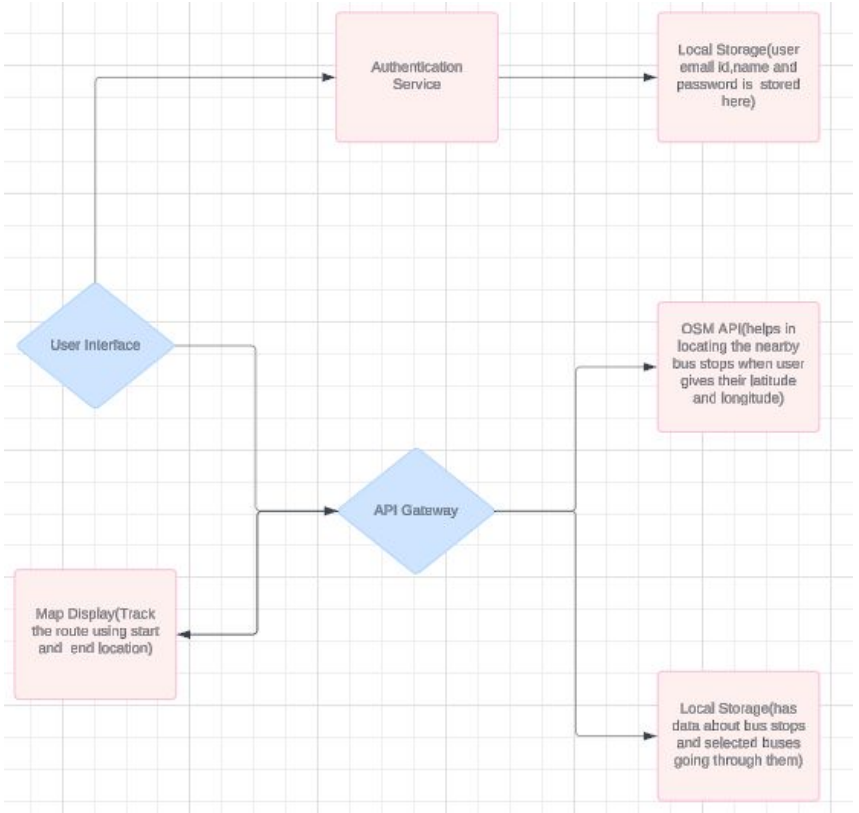
This system integrates several key components, each playing a crucial role in delivering the required functionalities:

1. **User Interface**:Serves as the entry point for users to interact with the system. Users can log in, provide their location, and view bus routes and stops.
2. **Authentication Service:**Validates user credentials (email ID, name, and password) stored in local storage to ensure secure access to the system.
3. **API Gateway**:Acts as a mediator between the User Interface and various backend services, managing the communication flow and routing user requests to the appropriate service
4. **OSM API:**Utilizes the OpenStreetMap API to locate nearby bus stops based on the user's latitude and longitude. It sends this information to the API Gateway, which then forwards it to the User Interface for display.
5. **Local Storage:**
6. There are two instances:

- One stores user credentials for authentication.
- The other contains data about bus stops and the buses passing through them, which is accessed via the API Gateway to provide route information.

7. **MAP DISPLAY**:Tracks and displays the bus route based on the user's start and end locations, providing a visual representation of the route on the User Interface.

This system ensures that users can easily find bus stops nearby their location and track their desired bus routes efficiently.



Technologies used

Our bus travel service provider project aims to enhance commuter experience by providing real-time information on bus stops and routes. The application allows users to log in, input geographical coordinates, and discover nearby bus stops. Key functionalities include retrieving bus schedules and displaying routes on a map interface.

The project leverages fundamental web technologies and APIs to achieve its goals:

- **Frontend Development**: Implemented using HTML/CSS for structure and styling, along with JavaScript (ES6+) for dynamic frontend interactions.
- **APIs and External Services**: Integrates the OpenStreetMap (OSM) API for geographical data retrieval and utilizes local storage for offline access to bus stop information.
- **Authentication and Security**: Secures user interactions with JSON Web Tokens (JWT), ensuring authenticated access to features.
- **Tools and Libraries**: Utilizes Axios for managing HTTP requests and Webpack for bundling JavaScript modules, optimizing performance.
- **Deployment and Version Control**: Hosted and managed on GitHub, employing Git for version control to facilitate collaborative development and code management.
- **Development Environment**: Developed and tested in Visual Studio Code, ensuring compatibility across major web browsers for a seamless user experience.

This technology stack enables robust functionality and user-friendly features, enhancing the usability and reliability of our bus travel service provider application.

Team members and contribution:

TEAM NAME: CYBER SISTERS

Saakshi Dewangan: As a dedicated and skilled developer, Saakshi played a crucial role in both the front-end and back-end development of "Hop On Board." Her expertise in web development ensured the platform's user-friendly interface and seamless functionality. Saakshi's commitment to the project was instrumental in bringing our vision to life.

Samiksha Samal: Equally talented and committed, Samiksha was a vital contributor to the project's success. She worked alongside Saakshi, handling both the front-end and back-end aspects of the application. Samiksha's proficiency in development and her dedication to the project were key factors in creating an efficient and accessible platform for users.

Together, Saakshi Dewangan and Samiksha Samal collaborated closely, sharing responsibilities and leveraging their skills to develop a comprehensive and innovative solution for public transportation navigation. Their joint efforts and unwavering commitment were essential to the success of "Hop On Board."

Conclusion

"Hop On Board" represents a significant step forward in simplifying public transportation navigation. By offering a user-friendly interface and real-time route information, our platform addresses the common challenges faced by commuters. The collaborative efforts of Saakshi Dewangan and Samiksha Samal, who equally contributed to both front-end and back-end development, were crucial in bringing this project to fruition.

Our innovative solution not only enhances the ease of locating bus stops and tracking routes but also aims to improve the overall public transit experience. With features like the nearest bus stop finder, route selection, and real-time tracking, "Hop On Board" is set to revolutionize how users interact with public transportation systems.

As we move forward, we are excited to see the positive impact "Hop On Board" will have on the daily lives of commuters, making public transit more accessible, efficient, and convenient.