



शिक्षा मंत्रालय
MINISTRY OF
EDUCATION



Team Name: *Him-Sarthi*

Domain: Smart Vehicle(Software)

PSID: SIH1382

Problem Statement Title: Real-Time Vehicle Tracking System

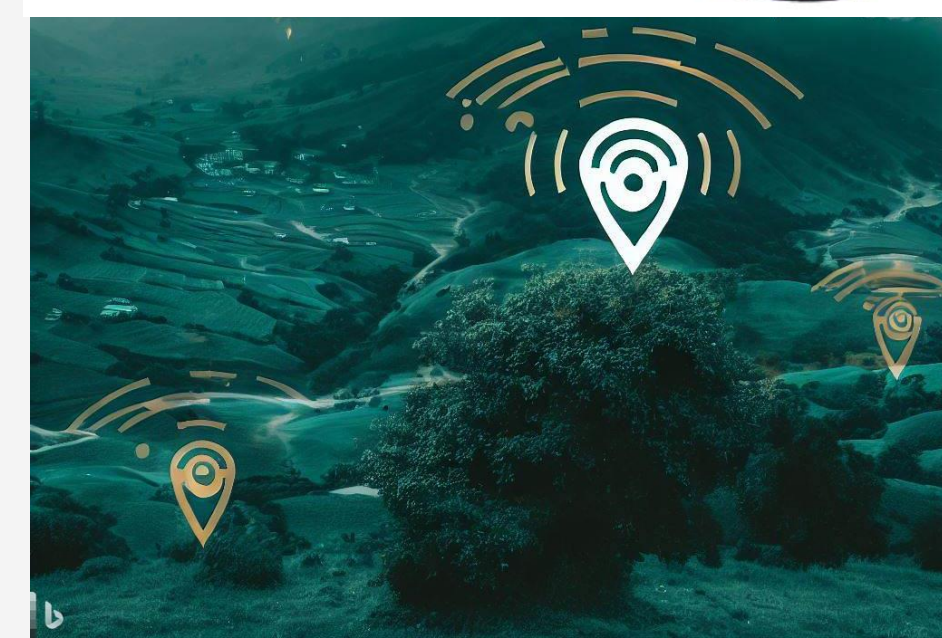
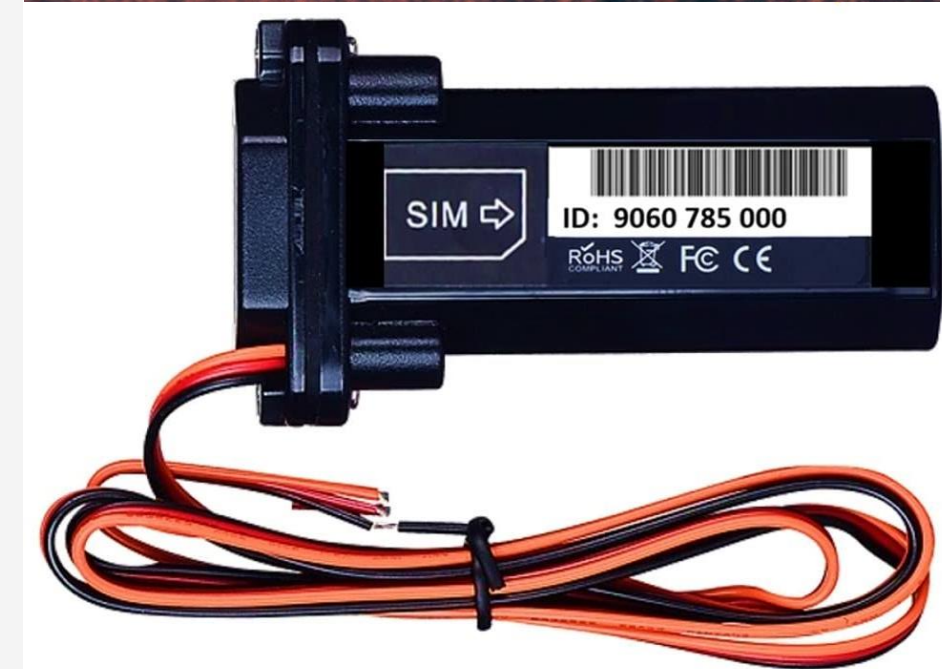
Ministry: Government of Himachal Pradesh

Theme Name: Smart Vehicle

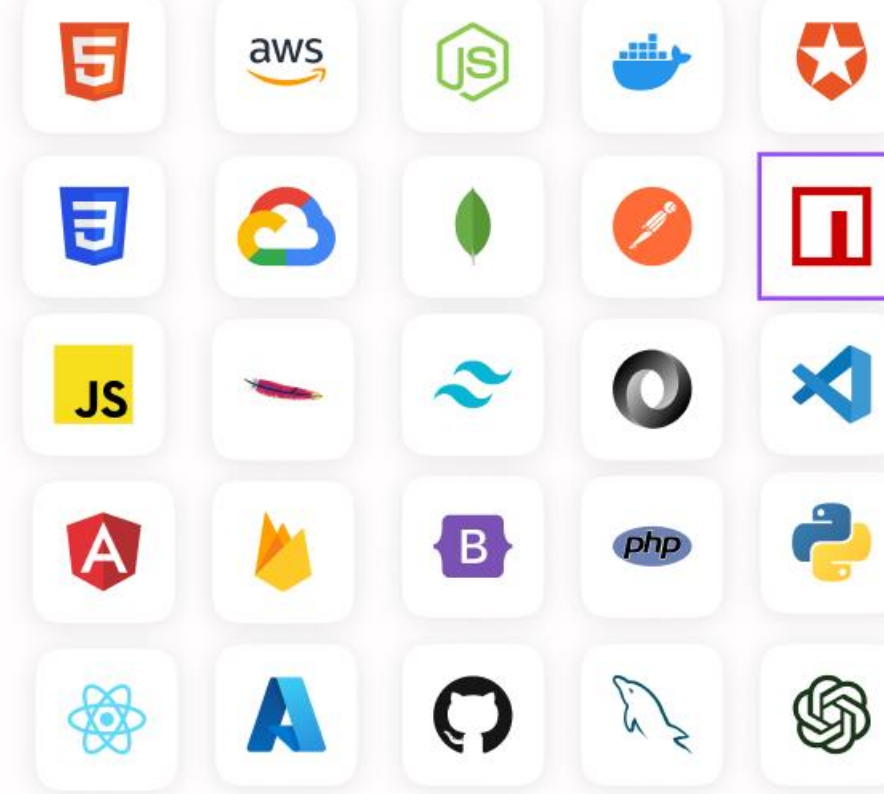
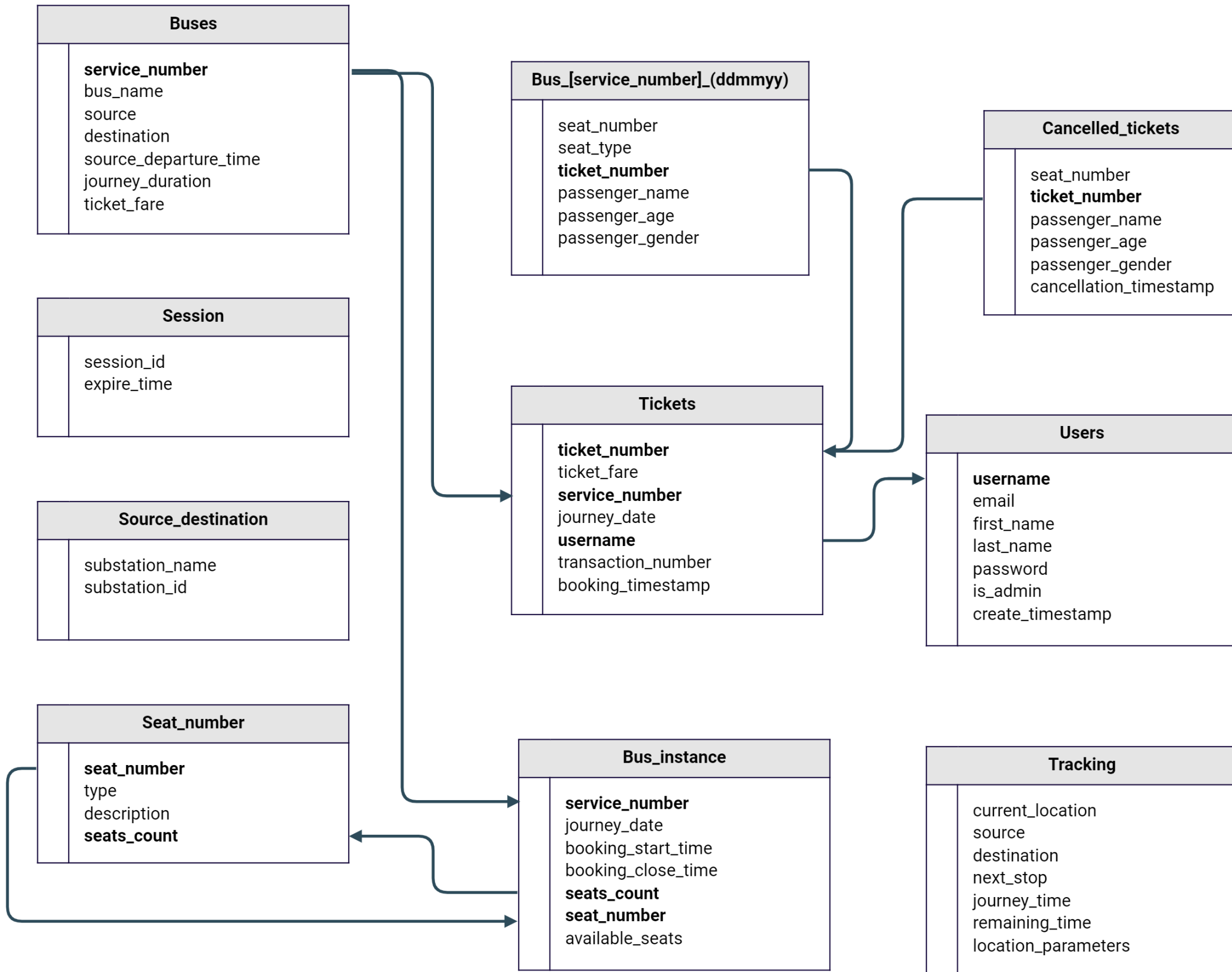


❖ Idea and Solution

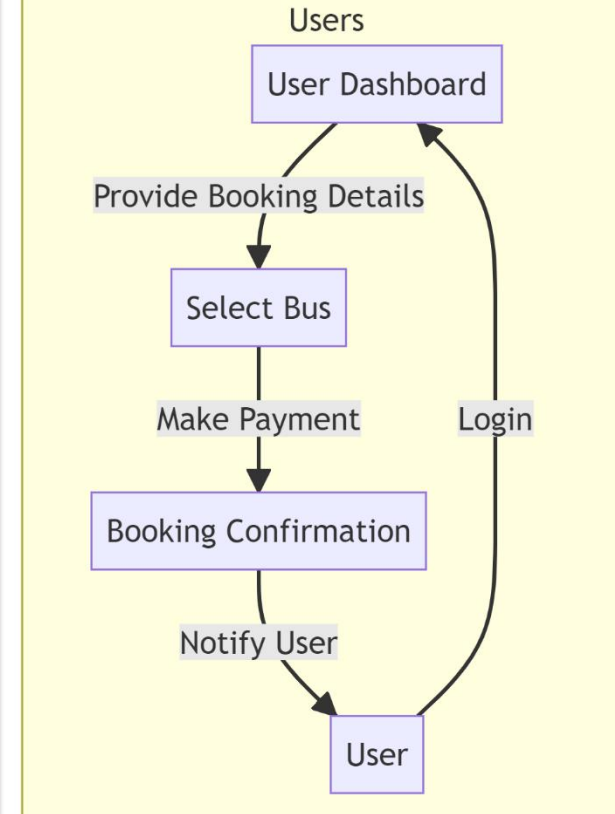
- The absence of **live bus tracking system** for **people** and **bus management system** for **Himachal government (HRTC)**. Currently, there is no **reliable** means to **locate** *buses* of various types at any station, **live track** their positions, or **reserve** and **confirm** seats in advance. Furthermore, there is a **lack of a unified system** to **monitor** and **manage** the entire *fleet of buses* operating within the state.
- ✓ A **web application**(App + Website) that integrates all the **User needs** to *track & search*, **live bus location**, bus **routes**, book and *reserve* seats with **simple UI experience**. A **bus management system** for the **government** to *track* all the buses, drivers, passenger, routes and other **analytics** with **elevated visualization**. Some over the top **brief details of the solution** includes:
 1. **Real-Time Bus Tracking** : **Accurate** bus tracking using **Drivool 890-IN GPS Tracking Device** and **Geofencing** integrated with **10+ Google API's** providing users and *admin* to track live **bus locations**, **Speed** , **traffic** , **time** , **sub-stations** etc. for *every route buses* of all type for **better scheduling**.
 2. **Reliable Bus Management System** : *Developed New Route Algorithm* to **crack** the **unsolved** problem of **substation inconsistency** in the current applications *streamlined* with **ACID** compliance of *optimized* **Heroku MySQL Database**.
 3. **Clean and Minimalist UI-Experience**: Quick & responsive **React JS Front-end** and *robust* **Back-end** using **Angular** with **Flask** , **Google Firebase** , **Bootstrap** , **Node JS** , **Express JS** and **Typescript**.



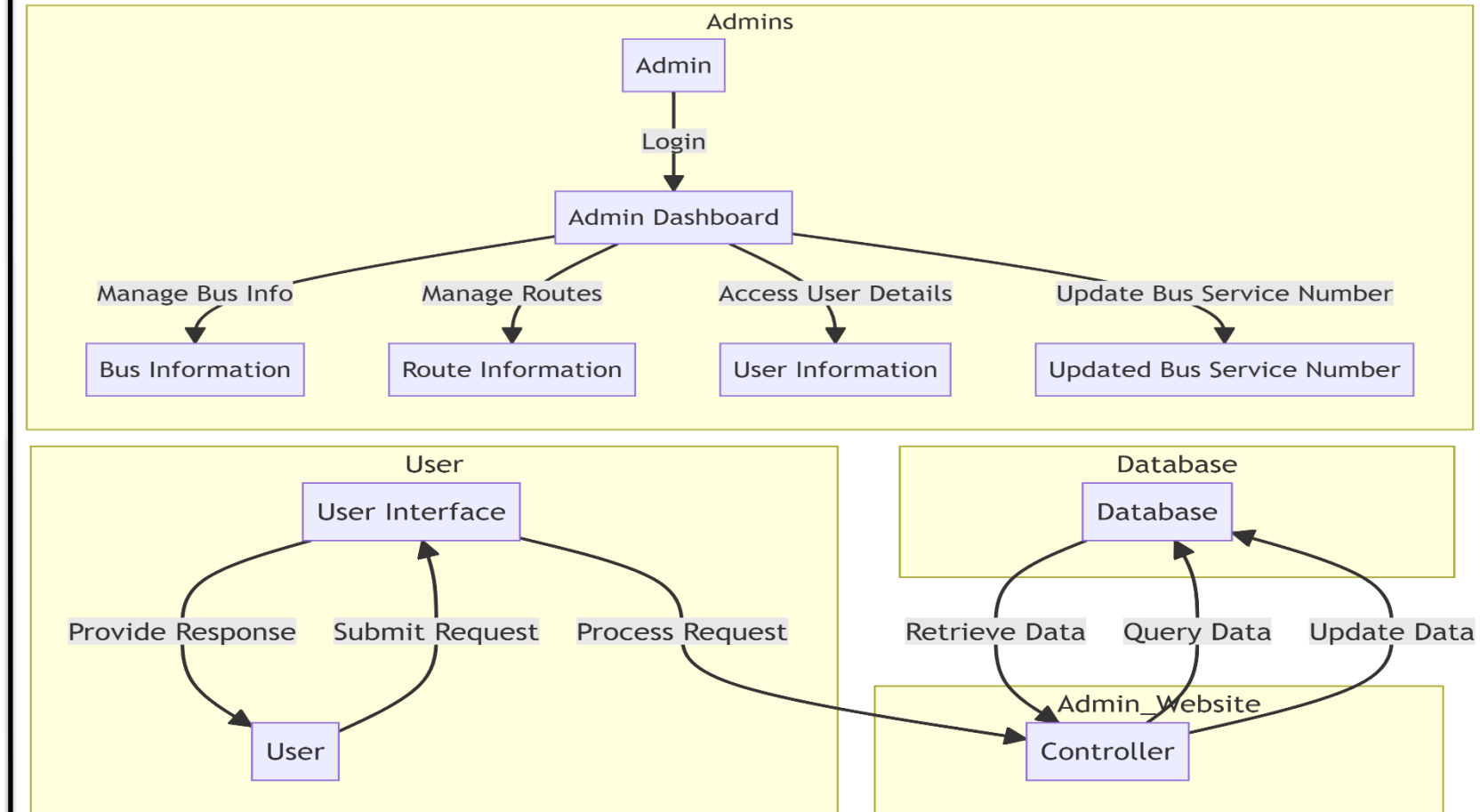
• Flowchart of Database



• Tech-Stack used



• User portal flow



• Frameworks Integration flow & Admin Portal access

❖ Differentiating Factor, Dependencies and Use Case

1. **Drivool 890-IN GPS** : The tracking device offers **affordable, optimized tracking**, designed for **reliability** in **low-network zones**, including *hilly terrain*. Its standout feature is its **precision** in **challenging weather conditions**. Our GPS device *dependency* ensures **accurate live tracking** data with **minimum ping**, supporting *efficient route direction matrix* and **monitoring** within the application.
2. **Substation Inconsistency Problem** : Existing applications **lack inter-substation** result for the **user services**, but *our New Database Algorithm* bridges this gap by offering **seamless transportation user convenience** between *any substation*. The *algorithm* **not only amplifies** the **application queries response** and **structures** the **database management for engineers** *but* also **establishes & maintains** the **data security**.
3. **Data Management and visualization** : The **project forks** into **2 section** ; **user** and **admin**. The user level **incorporates errorless booking , real time schedules , trip planning , cost estimation , e-ticketing and flexible payment** whereas the **admin level** has **added features** to **observe the live tracking , fuel consumption , emergency support , passengers and driver information , inferenced 3D Analytics and optimizing algorithms** for all.
4. **Visual Design and Layouts** : Our **project prioritize** the **user satisfaction** by providing a **top notch interaction** platform using **responsive frameworks** like **Material UI , Adobe XD ,Hotjar** etc. It completely **optimizes** the **performance, responsiveness, gestures, personalization** in the **navigation, accessibility, typography** and **buttons**. The **impression** of our **application** leaves with **positive emotion** *resulting* in the **increased engagement and high usability**.

