**MODULES**

**Authentication Module:** The Authentication module is responsible for implementing the QR code scanning mechanism to verify the identity of students and school staff boarding the buses. This module ensures a secure and fool-proof authentication process, reducing the risk of unauthorized access and enhancing overall safety.

**Location Tracking Module:** The Location Tracking module utilizes GPS technology to continuously monitor and track the real-time location of school buses. This information is crucial for parents, school authorities, and the system itself to ensure that buses are on the correct route, provide accurate arrival times, and enhance the overall visibility of the bus fleet.

**Anomaly Detection Module:** The Anomaly Detection module employs advanced techniques to identify unusual activities or emergencies during bus journeys. This module plays a crucial role in raising alerts in real-time, allowing for prompt responses to potential safety concerns. By monitoring deviations from normal patterns, the system enhances overall security measures.

**User Interface Module (Android Application and Website):** The User Interface module provides an intuitive and user-friendly interface for both parents and school authorities. It includes an Android application for parents to track their child's bus and receive notifications, as well as a website for school staff to monitor the overall status of the buses. This module ensures accessibility and ease of use for all stakeholders.

**Optimization and Prediction Module**: The Optimization and Prediction module focuses on enhancing the efficiency of the school bus transportation system. It includes features such as route optimization to minimize travel time and fuel consumption, and traffic-based delay prediction to anticipate and address potential delays. This module contributes to cost savings and ensures a more reliable and punctual transportation service.