

Swoosh Rent

Project Overview

Swoosh Rent is a production-oriented electric scooter rental platform designed for real-world usage. The system provides full server-side control over rental logic and real-time interaction with IoT devices. The client application acts as a real-time viewer and control interface, while all critical logic is handled on the backend.

Main Features

- Start, pause, resume, and complete scooter rentals
- Automatic rental termination without client dependency
- Server-side time and cost calculation
- Real-time scooter telemetry (location, speed, status)
- Remote scooter lock and unlock commands
- Event-driven rental architecture for data consistency
- Secure configuration and environment separation

Architecture & Implementation

The platform is built using an event-driven architecture where all rental actions are recorded as events. Firebase Functions (Generation 2) handle rental lifecycle management, billing logic, and system automation. Firestore is used as the primary data store, ensuring consistency and scalability. The Flutter client subscribes to real-time updates and reflects the current rental state without managing critical logic.

Technologies Used

- Flutter (Mobile & Web)
- Firebase Functions (Node.js, Gen 2)
- Cloud Run HTTP APIs
- Firestore & Firebase Auth
- MQTT for real-time data streaming
- Flespi for IoT device management and commands
- REST APIs
- Environment-based configuration (.env)

Development Approach

The project was developed with a backend-first approach. All business logic, security checks, and calculations are isolated on the server. Artificial intelligence tools such as ChatGPT and GitHub Copilot were used to assist with architecture planning, logic validation, and development acceleration, while final decisions and implementation were fully controlled by the developer.

Role

Full responsibility for system architecture, backend development, Flutter client development, and IoT integration.