DR.DRIVE

SMART ROAD SAFETY MOBILE APPLICATION

Project Progress Report

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1. Introduction and Background

Sri Lanka continues to record a high rate of road accidents every year, primarily caused by speeding, reckless driving, and poor road awareness.
Although authorities have implemented stricter laws, accident prevention remains a challenge due to the lack of real-time monitoring and alerts.
This project introduces a Smart Road Safety Mobile Application that uses smartphone sensors (GPS, accelerometer, gyroscope) and cloud-based analytics
to detect unsafe driving patterns, deliver instant hazard alerts, and send SOS notifications during emergencies. It also ensures compliance by reminding
users about license, insurance, and emission test renewals. The application aligns with the National Road Safety Policy and contributes to a safer
transportation ecosystem in Sri Lanka.

2. Problem Statement and Project Objectives

The increasing number of vehicles in Sri Lanka has resulted in frequent road congestion and accidents. Despite having smartphones with advanced sensors, drivers lack an integrated system that provides real-time hazard warnings, behavior analysis, and compliance reminders. Existing systems either focus on navigation or emergency alerts, but none provide an end-to-end safety solution.

Drivers face difficulties when responding to unexpected events like roadblocks or bad weather, leading to delayed responses and increased accident risks.
Moreover, delays in renewing critical driving documents such as licenses and insurance often result in fines and legal complications. Therefore, an intelligent mobile solution is essential to bridge this gap by combining behavior monitoring, hazard alerting, and compliance tracking.

Project Objectives:

1. To develop a mobile-based system that monitors driving behavior, detects hazardous conditions, and provides real-time alerts for accident-prone areas.
2. To integrate an SOS feature for emergency notifications and provide automated reminders for document renewals.
3. To promote safe driving habits and contribute to the reduction of road accidents in Sri Lanka.

3. Introduction to Similar Systems

Several international applications attempt to address road safety, yet none offer complete solutions for developing regions.
Google Maps provides route guidance and traffic updates but lacks behavioral monitoring.

Waze allows users to report roadblocks
and hazards but does not offer compliance reminders or driver analytics.

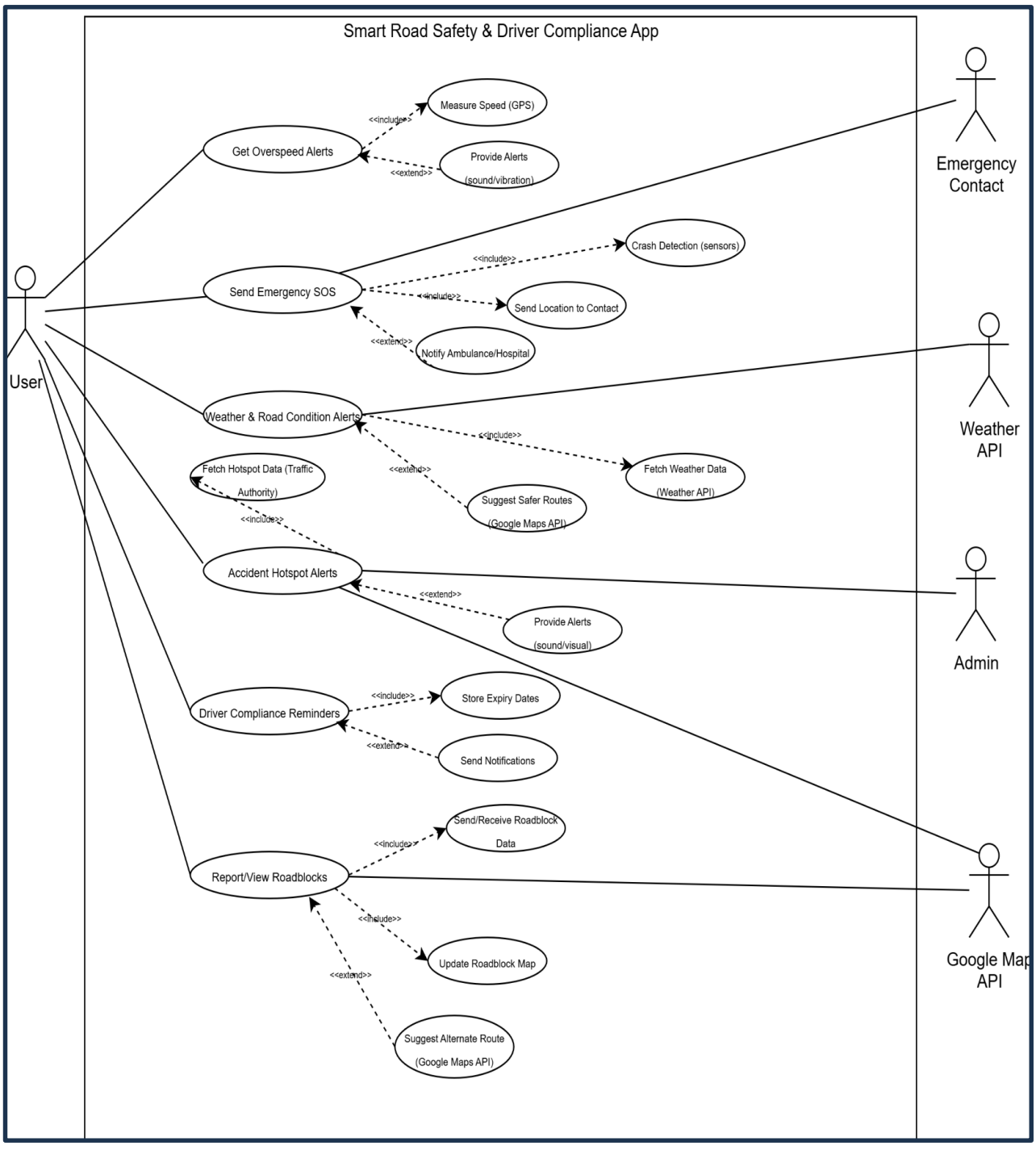
Life360 focuses on family tracking and crash detection,
while its data privacy standards and localization options remain limited.

The Smart Road Safety App combines these ideas and extends them for the Sri Lankan context.

It integrates local APIs, supports
Sinhala and Tamil, and provides compliance management alongside behavior monitoring and emergency response. This combination makes
it a comprehensive tool for improving driver awareness and road safety across the island.

4. Proposed Solution

The Smart Road Safety Mobile Application functions as a unified platform for road hazard detection, driving analytics,
and emergency support. By analyzing sensor data from smartphones, the system identifies overspeeding, sharp turns,
and sudden braking. The app sends instant notifications through visual, vibration, or voice alerts.



5. Technology Planning

The system's architecture uses modern, scalable, and secure technologies suitable for real-time mobile applications.
The frontend is developed using Flutter, ensuring compatibility across Android and iOS platforms. UI design is created in Figma
for a clean and intuitive layout. The backend is powered by Firebase Firestore and AWS DynamoDB, supporting real-time synchronization,
scalability, and offline data storage.

Authentication and encryption mechanisms use Firebase Authentication and JWT tokens for secure communication. Serverless architecture
is implemented via AWS Lambda to reduce maintenance overhead. Testing tools include Appium for automation, Selenium for UI testing,
and JMeter for load testing. Continuous integration and deployment are managed through GitHub CI/CD, ensuring smooth and iterative
development cycles.

6. Project Progress

Task	Progress	Remarks
Requirement Gathering	Completed	Finalized with supervisor approval.
UI/UX Wireframes	Completed	Reviewed by stakeholders.
Database Design	Pending	Cloud schema finalized on Firebase.
API Integration	In Progress	Testing weather and maps integration.
Backend Development	In Progress	AWS functions under implementation.
Frontend Development	50% Done	User dashboard and Basic UI built.
Testing & Debugging	Pending	To start after backend integration.
Documentation	Ongoing	Retrospectives and reports updated weekly.

Since initiation, the project has achieved steady progress across key milestones. Requirements gathering and SRS documentation are complete,
while user interface and database design have reached their final stages. The team employs an Agile approach, conducting weekly sprints
and using Trello for task management and GitHub for code versioning.

The next phase involves integrating the backend APIs with the mobile interface, followed by rigorous testing.
The team plans to begin user testing by early November 2025. Overall, the project remains on track with 75% completion of total planned deliverables.

7. Project Timeline and Conclusion

The development timeline ensures a balanced workflow, focusing on requirement analysis, design, implementation, and evaluation.
Milestones are monitored using CMMI-based progress reviews and sprint retrospectives.

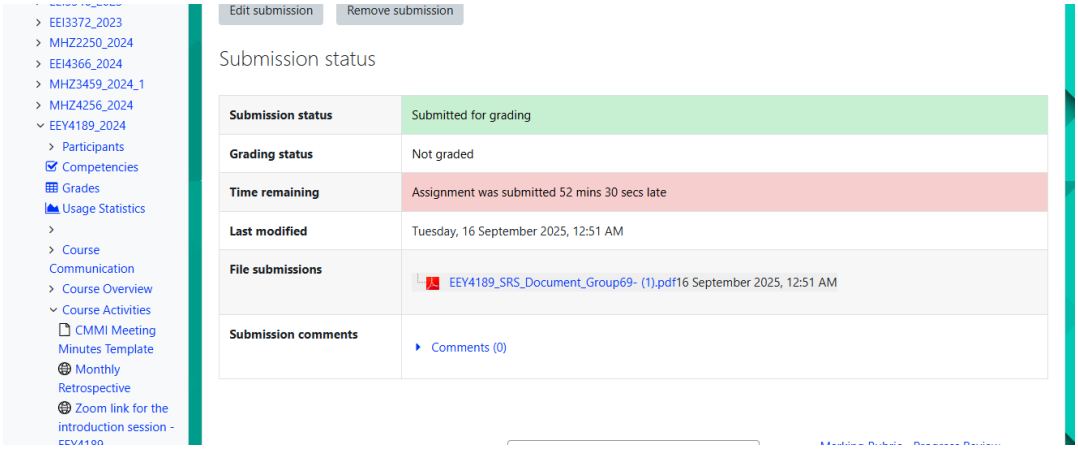
Month	Task
June 2025	Project Proposal Start
July 2025	Requirements Gathering & SRS Development
August 2025	UI/UX Design
September 2025	Build UI Front end
October 2025	Frontend Development Testing
November 2025	Backend Development & API Connection
December 2025	Final Submission & Presentation

In conclusion, the Smart Road Safety Mobile Application demonstrates a transformative approach to improving road safety.
By combining advanced mobile technologies with real-time analytics, the app empowers drivers to make informed decisions,
respond to emergencies promptly, and maintain compliance with traffic regulations.
Upon completion,
the system will serve as a reliable tool for reducing road accidents and promoting safe driving habits across Sri Lanka.

8. Appendix

I. Software Requirement Specification (SRS) Document.

We submitted SRS Document in the SRS Submission Portal.



II. Monthly Retrospective Reports

What Went Well:

- Completed the system architecture and UI wireframes.
- Successfully set up Flutter workspace and built basic UI.

What Didn't Go Well:

- Not familiar with Flutter/Dart; development took longer.
- Experienced delays due to scheduling conflicts among team members.

Lessons Learned:

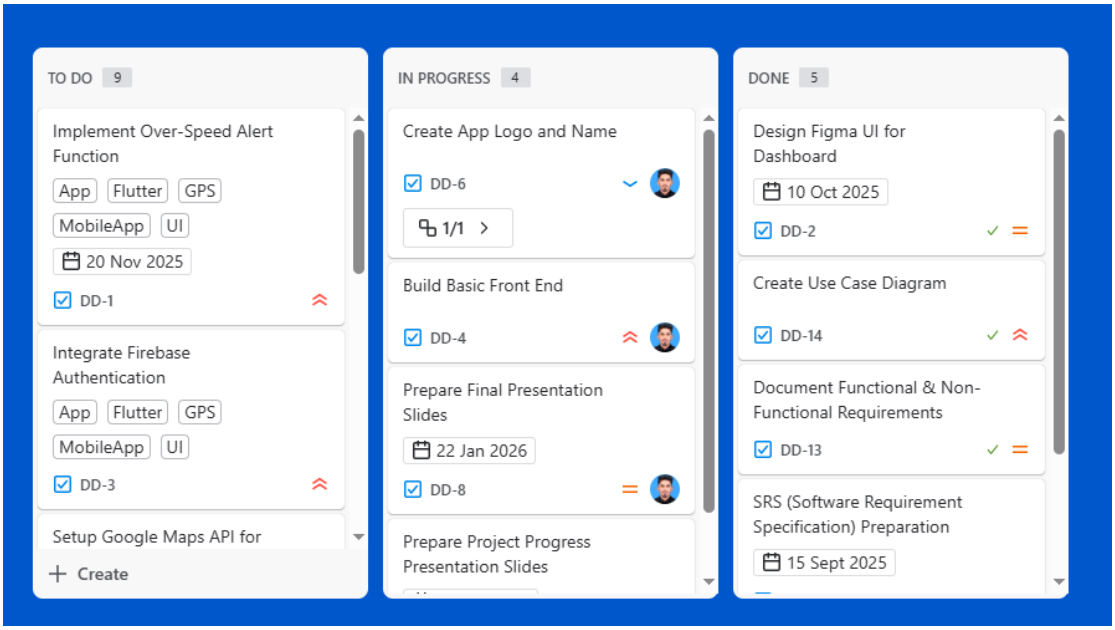
- Allocate time to learn new technologies.
- Improve team coordination and scheduling.

Next Month's Plan:

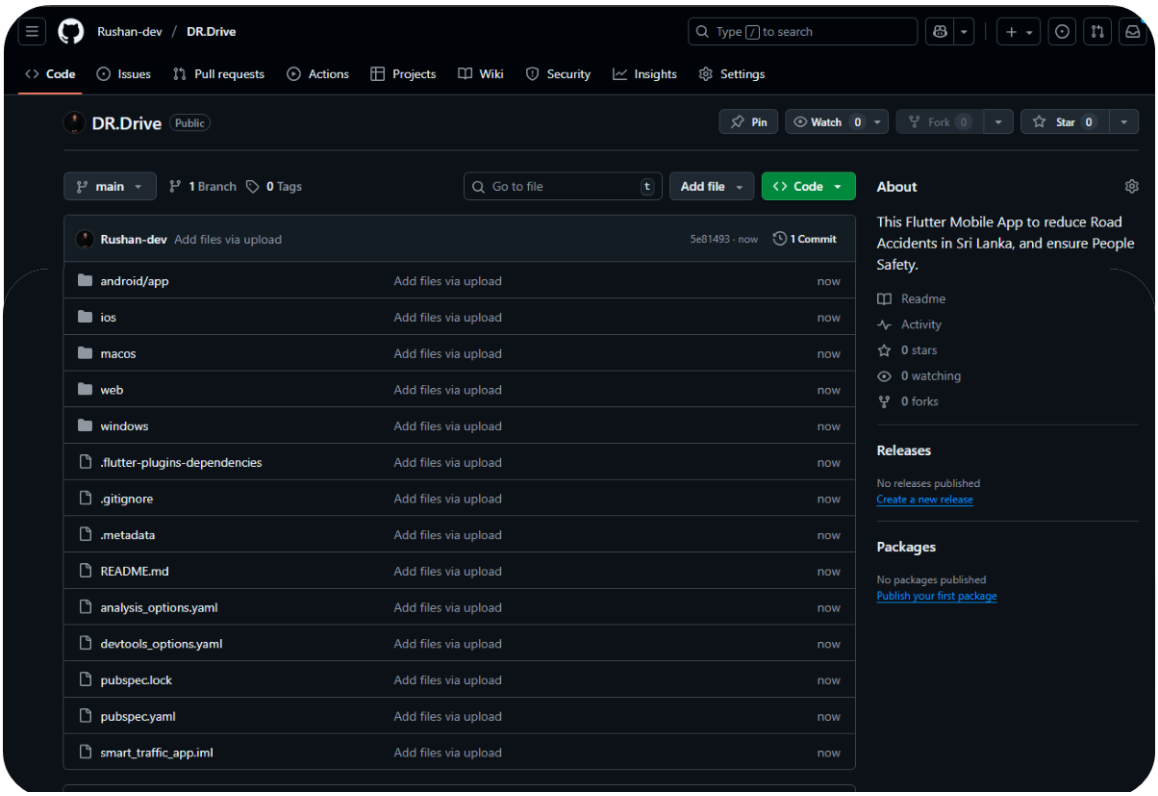
- Complete core UI components.
- Begin backend integration with Firebase.
- Test and optimize development workflow.

III. Evidence of Project Governance Tools (Trello, Jira)

Jira



GitHub



IV. GitHub Repository Link and Commit History

You can view the full project source code and track all development changes in the GitHub repository:
https://github.com/Rushan-dev/DR.Drive

The commit history captures every update made—new features, bug fixes, and refactoring—providing a transparent timeline of the project's evolution and each team member's contributions.

V. CMMI Meeting Minutes

Meeting Title: CMMI Review Meeting – Dr.Drive Project

Date: 24th September 2025

Time: 7:00 PM – 8:00 PM

Venue: WhatsApp Group Call

Attendees:

- Mrs.M.H.Rinosha
- Mr.T.Aravinth
- Mr.P.Rushanth
- Supervisor: Unassigned

Agenda:

- Review current project progress and milestones.
- Assess development process based on CMMI standards.
- Identify issues, risks, and improvement opportunities.
- Plan next steps for upcoming development phase.

Discussion Points:

- System architecture and UI wireframes have been completed.
- Flutter workspace setup and basic UI successfully built.
- Encountered issues with API integration and unfamiliarity with Flutter/Dart language.
- Identified delays due to scheduling conflicts among members.
- Discussed importance of early testing and clear task distribution.

Decisions Made:

- Allocate additional time for learning and experimenting with Flutter/Dart.
- Begin backend integration with Firebase in the next sprint.
- Conduct API testing earlier in the development cycle.
- Continue progress tracking through Trello and GitHub commits.

Action Items:

Task	Responsible Member	Deadline
Design UI Wireframes	Mr.P.Rushanth	25th September 2025
Report and Presentation Preparation	Mrs.M.H.Rinosha	13th October 2025
Built Basic UI Complete	Mr.T.Aravinth	30th October 2025
Connect Firebase and Google API	Mr.T.Aravinth	15th November 2025

Next Meeting:

Date: 19th October 2025
Purpose: Review Frontend UI build progress and system testing results.

-Thank You-