Requirements for

Mobile Communication

Project Title:

**FleetMate: A Mobile Vehicle Maintenance Monitoring System for Supply Officers in the Philippine National Police**

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**PROJECT OVERVIEW**

The reliability and readiness of transportation assets are essential to the operational success of the Philippine National Police (PNP). Vehicles play a critical role in law enforcement activities such as patrol operations, crime response, logistical transport, and community engagement. Given their importance, ensuring that these vehicles are well-maintained and readily deployable is a key responsibility of supply officers. However, many PNP units still rely on manual tracking methods or fragmented digital tools to manage maintenance records, schedules, and reports. These outdated systems are vulnerable to inefficiencies, inaccuracies, and delays, which can hinder both vehicle availability and police response capabilities.

In a time where digital transformation is reshaping the public sector, the integration of mobile technology into police logistics systems presents a timely and impactful innovation. Mobile applications are highly accessible, portable, and capable of providing real-time data — making them ideal for on-the-go supply officers who need to monitor and manage vehicle fleets effectively. A centralized and mobile-based platform can automate scheduling, track service history, issue reminders, and provide maintenance analytics, thereby significantly improving operational efficiency and accountability.

To address these needs, this study proposes the development of **FleetMate**, a mobile Vehicle Maintenance Monitoring System designed specifically for PNP supply officers. FleetMate is intended to digitize the process of maintenance tracking, promote preventive maintenance practices, and ensure more efficient use of police vehicles. By empowering supply officers with a tool tailored to their roles, the PNP can further strengthen its logistics capacity and support mission readiness.

**OBJECTIVES**

The main objective of the study is to develop and evaluate a mobile vehicle maintenance monitoring system (FleetMate) to improve the efficiency of vehicle maintenance among supply officers of the PNP.

Specifically, the study aims to:

1. Analyze existing vehicle maintenance management practices within the PNP.
2. Design and develop **FleetMate**, a mobile-based system for monitoring and scheduling vehicle maintenance.
3. Evaluate the impact of FleetMate on key indicators of maintenance efficiency.
4. Assess how user proficiency and vehicle assignment load affect system performance.
5. Measure the level of acceptance and satisfaction among users of the FleetMate application.

## **Tools to Be Used in Developing the System**

### 1. ****Mobile Application Development****

| **Tool** | **Purpose** |
| --- | --- |
| **Flutter** or **React Native** | Cross-platform mobile app development (Android and iOS) using a single codebase. |
| **Android Studio** | If targeting Android devices only, Android Studio can be used with native Java/Kotlin development. |

### 2. ****Backend Development (Server-Side)****

| **Tool** | **Purpose** |
| --- | --- |
| **Node.js** with Express | Lightweight, scalable backend framework for handling APIs and server-side logic. |
| **Firebase Functions** | Serverless backend option, especially if using Firebase for hosting and authentication. |
| **Laravel (PHP)** | An alternative if your team is more comfortable with PHP-based systems. |

### 3. ****Database Management System****

| **Tool** | **Purpose** |
| --- | --- |
| **Firebase Realtime Database** / **Firestore** | Cloud-hosted NoSQL database that syncs with mobile apps in real time. |
| **MySQL** | If you prefer a relational database structure. |
| **MongoDB** | NoSQL alternative suitable for flexible and scalable record-keeping. |

### 4. ****User Authentication and Security****

| **Tool** | **Purpose** |
| --- | --- |
| **Firebase Authentication** | Easy implementation of secure login (email, password, Google sign-in, etc.) |
| **JWT (JSON Web Tokens)** | For session security in custom backend setups. |

### 5. ****UI/UX Design Tools****

| **Tool** | **Purpose** |
| --- | --- |
| **Figma** or **Adobe XD** | UI prototyping and mockup designs before actual coding. |
| **Canva** | For quick icons or dashboard elements if needed. |

### 6. ****Version Control and Collaboration****

| **Tool** | **Purpose** |
| --- | --- |
| **Git** + **GitHub** | For source code version control and collaborative development. |

### 7. ****Testing Tools****

| **Tool** | **Purpose** |
| --- | --- |
| **Postman** | To test backend API endpoints. |
| **Android Emulator / iOS Simulator** | To test the mobile app without needing a physical device. |
| **Firebase Test Lab** | Cloud-based device testing across different configurations. |

### 8. ****Deployment and Hosting****

| **Tool** | **Purpose** |
| --- | --- |
| **Firebase Hosting** | If you need to host any admin panel or documentation. |
| **Google Play Console** | To deploy Android version of the app. |
| **Heroku / Vercel / Render** | Free and easy-to-use backend hosting alternatives. |

**Significance of the Study**

This study is significant to the following stakeholders:

* **Supply Officers**: Provides a powerful tool for tracking and managing vehicle maintenance efficiently.
* **PNP Leadership**: Enhances logistics management and operational readiness through digitized systems.
* **IT Developers**: Offers a case study in mobile system development for public service applications.
* **Researchers and Policymakers**: Contributes to literature on government digitalization and mobile solutions for logistics.
* **General Public**: Indirectly benefits from improved police mobility, response time, and service delivery.