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**FACULTY OF ENGINEERING AND TECHNOLOGY**

**SOFTWARE REQUIREMENT SPECIFICATION DOCUMENT**

**PRESENTED BY GROUP 25**

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# 

# 1. Introduction

## 1.1 Purpose

The purpose of this document is to define the functional and non-functional requirements for the development of a mobile application that diagnoses car faults...

## 1.2 Definitions, Acronyms, and Abbreviations

AI – Artificial Intelligence  
UI – User Interface  
UX – User Experience  
OBD – On-Board Diagnostics  
App – Mobile Application

## 1.3 Overview

The rest of this document outlines the system’s general description, functional and non-functional requirements, external interfaces, and additional supporting information.

# 2. Overall Description

## 2.1 Product Perspective

The system is a standalone mobile application developed for Android and iOS platforms

## 2.2 Product Functions

• Dashboard light recognition via camera  
• Engine sound analysis via microphone  
• Issue severity classification  
• Suggestive repair tips

## 2.3 User Classes and Characteristics

• General car owners  
• DIY mechanics  
• Professionals

## 2.4 Operating Environment

• Platforms: Android 9.0+, iOS 13+  
• Minimum RAM: 2 GB  
• Requires access to microphone, camera, GPS

## 2.5 Design and Implementation Constraints

• Must comply with mobile OS security/privacy policies  
• AI models must be optimized for mobile inference

## 2.6 User Documentation

• In-app tutorials  
• FAQ and troubleshooting section  
• User manual (downloadable PDF)

## 2.7 Assumptions and Dependencies

• Users will grant microphone and camera permissions  
• AI models trained with diverse engine sounds and dashboard icons

# 3. System Features and Requirements

## 3.1 Functional Requirements

* FR1: The app shall allow users to scan dashboard warning lights using the camera.
* FR2: The app shall analyze engine sounds recorded via microphone and identify faults.
* FR3: The app shall classify fault severity and urgency.
* FR4: The app shall provide repair suggestions and preventive maintenance tips.
* FR5: The app shall store and display a history of past diagnostics.
* FR6: The app shall notify users in real-time when a serious issue is detected.
* FR7: The app shall work offline for dashboard recognition and sound diagnosis using local AI models.
* FR8: The app shall display video tutorials based on diagnosed problems.
* FR9: The app shall show nearby mechanics and towing services if location services are enabled.
* FR10: The app shall allow users to submit anonymous data (photos, sounds) to improve AI accuracy.

## 3.2 Non-Functional Requirements

* Performance: App should respond to sound analysis within 5 seconds.
* Reliability: AI model accuracy ≥ 80% for common issues.
* Availability: 90% uptime for online services.
* Security: All user data must be encrypted in transit and at rest.
* Maintainability: Modular architecture for easy updates.
* Usability: Intuitive UI with accessibility support.
* Portability: Compatible with both Android and iOS.

## 3.3 External Interface Requirements

### 3.3.1 User Interfaces

Simple onboarding with permissions, Home screen with options: Diagnose, History, Help, etc.

### 3.3.2 Hardware Interfaces

Access to smartphone microphone, camera, GPS

### 3.3.3 Software Interfaces

Cloud AI inference service, Map API, Secure data sync with cloud database