Software Requirements Specification

for

Mahindra University Mobile Application

Version 1.0

Prepared by Group 38

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# Introduction

## Document Purpose

This document outlines the Software Requirements Specification (SRS) for the Mahindra University Mobile Application (MU App). The application is intended to facilitate university operations for students, faculty, and parents by offering key functionalities such as attendance tracking, fee management, location tracking, announcements, project submissions, and scheduling.

## Product Scope

The **MU App** is a cross-platform mobile application aimed at providing real-time access to university-related information. The application is categorized into three user roles:

* **Student Version:** Includes profile management, attendance tracking, announcements, project submissions, scheduler, and tasks.
* **Faculty Version:** Includes announcements, timetable, task assigning, and evaluation.
* **Parent Version:** Includes location tracking, attendance reports, fee details, and notifications.

## Intended Audience and Document Overview

This document is intended for:

* **Developers** - For implementation reference.
* **Project Managers** - For scope and timeline tracking.
* **University Administration** - To ensure alignment with institutional requirements.
* **Users (Students, Faculty, Parents)** - To understand application functionality.

## Definitions, Acronyms and Abbreviations

|  |  |
| --- | --- |
| Acronym | Definition |
| MU | Mahindra University |
| SRS | Software Requirements Specification |
| API | Application Programming Interface |
| UI | User Interface |

## Document Conventions

* **Spacing:** Single spaced
* **Font:** Arial 12pt
* **Section Titles:** Bold

## References and Acknowledgments

* Mahindra University Documentation
* IEEE SRS Standard

# Overall Description

## Product Overview

The **MU App** will integrate with Mahindra University's existing database and authentication system to provide secure access to students, faculty, and parents. The app will be developed using **React Native** and **Firebase Authentication** for secure login and data management.

## Product Functionality

* **Student Portal:** Attendance tracking, announcements, project submissions, scheduler.
* **Faculty Portal:** Task assignments, timetable management, announcements.
* **Parent Dashboard:** Location tracking, fee payment status, student attendance reports.

## Design and Implementation Constraints

* **Platform:** Android & iOS
* **Technology Stack:** React Native, Firebase Authentication
* **Hardware Requirements:** Smartphones with iOS 13+ or Android 8+
* **Compliance:** GDPR, University Data Policies

## Assumptions and Dependencies

* Users must have a stable internet connection.
* The university database should be regularly updated.

# Specific Requirements

## External Interface Requirements

### User Interfaces

The mobile application will feature an intuitive and user-friendly interface, tailored for three types of users:

1. **Parents** - Dashboard with attendance tracking, fee details, and notifications.
2. **Students** - Access to profile, timetable, announcements, and submission features.
3. **Faculty** - Task management, announcements, and scheduling tools.

**Interface Features:**

* **Navigation Bar**: Bottom navigation bar for seamless transitions.
* **Login Screen**: Email/Password authentication with Firebase.
* **Dashboard**: Displays key metrics for users.
* **Push Notifications**: Real-time updates and alerts.

### Hardware Interfaces

* **Mobile Devices**: Android and iOS smartphones.
* **GPS Tracking**: Integrated with Parent module.
* **Biometric Authentication**: Future implementation for secure login.

### Software Interfaces

* **Firebase Authentication**: Handles user login and security.
* **Google Maps API**: Location tracking for parents.
* **Cloud Firestore**: Real-time data synchronization.
* **Node.js Backend**: Handles request processing and data management.

## Functional Requirements>

**3.2.1 Authentication & Authorization**

* **F1**: The system shall allow users to log in using Firebase Authentication.
* **F2**: The system shall support role-based access for Students, Faculty, and Parents.

**3.2.2 Student Module**

* **F3**: Students shall view attendance, assignments, and announcements.
* **F4**: Students shall submit assignments through the app.

**3.2.3 Faculty Module**

* **F5**: Faculty shall post announcements and assign tasks.
* **F6**: Faculty shall view student submissions and update progress.

**3.2.4 Parent Module**

* **F7**: Parents shall track student attendance.
* **F8**: Parents shall receive notifications on fees and academic updates.

## Use Case Model

**Use Case Diagram**

A use case diagram representing the actors (Student, Faculty, Parent) and their interactions with the system is provided below.

**Use Case: Student Assignment Submission**

* **Author**: Group 38
* **Purpose**: To allow students to submit assignments.
* **Priority**: High
* **Preconditions**: The student must be logged in.
* **Postconditions**: The assignment is uploaded successfully.
* **Actors**: Student, Faculty
* **Basic Flow**:
  1. Student logs in.
  2. Navigates to the submission page.
  3. Uploads the assignment.
  4. Receives confirmation.
* **Exceptions**:
  1. File format not supported.
  2. No internet connection.

# Other Non-functional Requirements

## Performance Requirements

* **P1**: The app shall load within **2 seconds** on standard devices.
* **P2**: Authentication requests shall process within **1 second**.
* **P3**: Push notifications shall be delivered in **real-time** (<1 second delay).

## Safety and Security Requirements

* **S1**: All user data shall be stored in encrypted format.
* **S2**: Firebase Authentication shall enforce **multi-factor authentication**.
* **S3**: Parent tracking data shall only be accessible via secure authentication.
* **S4**: The system shall log all failed login attempts and notify administrators of potential threats.

## Software Quality Attributes

**4.3.1 Reliability**

* The system shall maintain **99.9% uptime** to ensure accessibility.
* Automated backups shall run daily to prevent data loss.

**4.3.2 Maintainability**

* Code shall follow **modular architecture** to allow easy updates.
* API documentation shall be maintained for future development.

**4.3.3 Usability**

* The app shall follow **Material Design Guidelines** for intuitive user experience.
* A **help section** shall be included to guide users.

**4.3.4 Portability**

* The app shall support **Android (API 24+)** and **iOS (14+).**
* The system shall be adaptable for **web version in future updates**.

# Other Requirements

* The app shall be **compliant with GDPR & FERPA regulations**.
* The app shall support **multi-language functionality** for wider accessibility.

Appendix A – Data Dictionary

| Variable | Description | Type |
| --- | --- | --- |
| user\_id | Unique identifier for each user | String |
| Role | Defines whether user is Student, Parent, or Faculty | Enum |
| Attendance | Attendance record for a student | JSON Object |
| task\_submission | File uploaded by student | File |
| gps\_location | Real-time location of parent-tracked student | GPS  Coordinates |

Appendix B - Group Log

| **Date** | Meeting Agenda | Members Present | Notes |
| --- | --- | --- | --- |
| 10-Mar-2025 | Initial Planning | All Members | Defined core modules |
| 15-Mar-2025 | UI/UX Finalization | UI Team | Completed wireframes |
| 20-Mar-2025 | Backend API Integration | Dev Team | Integrated Firebase APIs |