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# SOFTWARE REQUIREMENTS SPECIFICATION

for

## Attendance Application

Version 1.0 approved

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March 28, 2023

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# 1 Introduction

## 1.1 Purpose

The purpose of this document is to define the software requirements for the development of an Attendance Application. This software is intended to be used by educational institutions, businesses, and organizations to track the attendance of students, employees, or members. The application will be designed to provide a user-friendly interface, allowing easy and efficient management of attendance records.

The Attendance Application will be developed to provide an automated system that simplifies the attendance-taking process. The software will be designed to reduce the workload of teachers, administrators, and human resource personnel who are responsible for tracking attendance.

This document will outline the functional and non-functional requirements of the software, including the user interface.

## 1.2 Intended Audience and Reading Suggestions

This document is intended for the following audience:

- The development team responsible for implementing the Attendance Application software
- System administrators and users who will be responsible for installing and using the Attendance Application software
- Any other parties involved in the development, testing, and deployment of the Attendance Application software

To fully understand the requirements and constraints outlined in this document, it is recommended that readers have a working knowledge of the following:

- Object-oriented programming concepts and practices
- Android application development technologies and tools such as Android Studio and React Native
- Relational database management systems and SQL

To read the document, readers should start with the Overview sections, including the Introduction and Overall Description, to gain a high-level understanding of the

Attendance Application software and its purpose. From there, readers can move on to the sections that are most pertinent to their specific role or area of responsibility, such as the Other Nonfunctional Requirements section for developers, the External Interface Requirements section for project managers and testers.

## **1.3 Project Scope**

The Attendance Application software is designed to provide an efficient and reliable way for educational institutions to track student attendance. The system is intended to be used by both students and faculty, with different roles and permissions assigned to each user type.

The Attendance Application software will be designed as a smartphone-based application that can be accessed by both students and faculty using their mobile devices. The system will be developed using industry-standard technologies and will be scalable to accommodate additional users and institutions as needed.

## 2 Overall Description

### 2.1 Product Perspective

The Attendance Application software is a new, self-contained product that is being developed to provide an efficient and reliable way for educational institutions to track student attendance. The system will be designed as a smartphone-based application that can be accessed by both students and faculty using their mobile devices.

### 2.2 Product Functions

The Attendance Application software will include the following features and functionality:

- Student attendance tracking
- Attendance reports
- Notification system
- User authentication and security
- Proxy Detection
- Importing and Exporting data

### 2.3 User Classes and Characteristics

1. **administrator** – The administrator is responsible for managing the attendance records of students and faculty. The administrator will be able to view attendance records and manage user accounts.
2. **teacher** – The teacher is responsible for creating courses and editing attendance records for students in their courses. The teacher will be able to view attendance records and generate attendance reports.
3. **student** – The student is responsible for marking their own attendance. The student will be able to view their own attendance records and generate attendance reports.

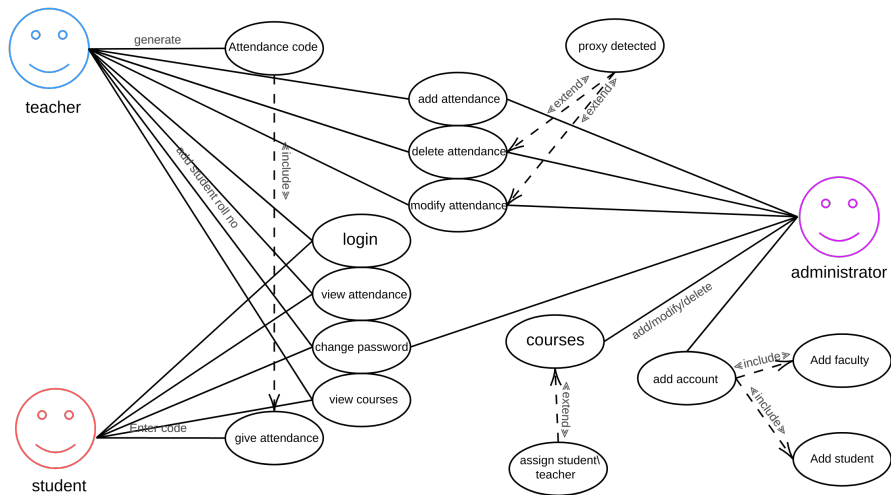
### 2.4 Operating Environment

The Attendance Application software will be designed to operate on mobile devices running Android 7.0 and above, as well as iOS 11 and above.

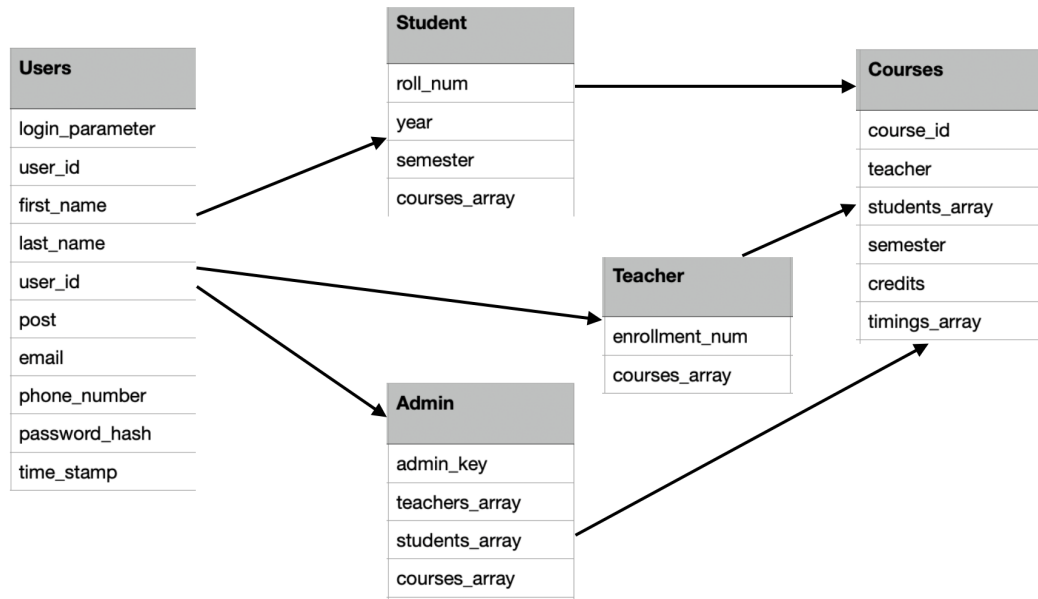
The software components and applications that need to peacefully coexist with the Attendance Application software are: Web server, Database system, and Network infrastructure Overall, the Attendance Application software will operate in a networked environment that requires the peaceful coexistence of multiple software components and applications.

## 2.5 Design and Implementation Constraints

### 2.5.1 Use-Case Diagram



## 2.5.2 Class Diagram



## 2.5.3 Constraints

The development of the Attendance Application software is subject to the following constraints:

- Limited time: The development team has a fixed short timeline for completing the project.
- Learning new frameworks: The development team will need to learn and use new frameworks to develop the app. This requires additional time and resources to ensure the team has the necessary skills.
- Security considerations: The Attendance Application software will handle sensitive data, including student and course information. Security considerations will need to be considered during the design and development phases.

## 2.6 User Documentation

The Attendance Application software will be accompanied by a user documentation package that will include the following materials:

- User manual: User manual including step-by-step instructions will be provided to guide users through installing and using the software.



- Quick reference guide: A quick reference guide will be provided to help users perform common tasks, such as taking attendance or generating and exporting reports.
- Relevant technology documentation: The user documentation package will also include links to relevant technical documentation, such as React Native documentation.

## **3 External Interface Requirements**

### **3.1 User Interfaces**

#### **3.1.1 Home Page**

It gives 3 options for login - for student, teacher or design It also gives an additional option for new users to register

#### **3.1.2 Login/Register Page**

In this page, Login/Registration is done by taking relevant input from user (E-mail ID, Password, and some additional information in case of Registration). Moreover, it will show an option of "Forgot Password" in Login

#### **3.1.3 Student Home Page**

This will show an option at the top to give attendance, if a course is going on currently and attendance period is active. Below that, a list of the student's currently enrolled course would be visible. On clicking on a certain course, it gives them a record of their attendance in that course.

#### **3.1.4 Teacher Home Page**

This will show an option to take attendance, if a class is going on, and an option to close attendance period if it is currently open. Below it is a list of the Teacher's current courses. On clicking on any of them, it gives the Teacher a student-wise record of attendance along with overall statistics.

#### **3.1.5 Admin Home Page**

This will show the admin a list of courses, and an option to edit or add courses at the top. On clicking of any of the courses, they get an option to modify teacher, add/remove student and modify student attendance.

### **3.2 Software Interfaces**

The system will be made to function on both Android and iOS. Both the student and the teacher are supposed to use smartphones with location-sharing capabilities via GPRS. This will aid in the proxy detection during attendance.

## 4 System Features

### 4.1 Student Attendance Tracking

#### 4.1.1 Description and Priority

Priority: **High**

This feature allows teachers and instructors to keep track of student attendance in real-time. The feature enables teachers to create and manage courses, and edit attendance for each student. Students can also view their attendance record, including their current attendance percentage, the number of days present, absent, and late.

#### 4.1.2 Functional Requirements

- REQ-1: The system shall allow teachers to create and manage courses.
- REQ-2: The system shall allow teachers to edit attendance for each student.
- REQ-3: The system shall allow students to enroll in courses set up by teachers.
- REQ-4: The system shall allow students to mark their attendance within a specified time frame for each course.
- REQ-5: The system shall allow students to view their attendance records.

### 4.2 User Authentication

#### 4.2.1 Description and Priority

Priority: **High**

This feature allows users to create an account and log in to the app. The allowed user types are students, teachers, and administrators. Only administrators can accept new user account creation requests.

#### 4.2.2 Functional Requirements

- REQ-1: The system shall allow users to create an account in categories of student, teacher, or administrator.
- REQ-2: The system shall allow users to log in to the app using correct credentials.
- REQ-3: The system shall allow only administrators to accept new user account creation requests.

## **4.3 Attendance Reports**

### **4.3.1 Description and Priority**

Priority: **Medium**

This feature allows teachers and students to view attendance reports for each course. Teachers can view attendance reports for all students in a course, while students can view their own attendance reports.

### **4.3.2 Functional Requirements**

- REQ-1: The system shall create attendance reports for each student in each course.
- REQ-2: The system shall allow teachers to view attendance reports for all students in a course.
- REQ-3: The system shall allow students to view their own attendance reports.

## **4.4 Proxy Detection**

### **4.4.1 Description and Priority**

Priority: **Medium**

This feature allows teachers to detect students who are using a proxy to mark their attendance.

### **4.4.2 Functional Requirements**

- REQ-1: The system should detect students who are using a proxy to mark their attendance.

## **4.5 Notification System**

### **4.5.1 Description and Priority**

Priority: **Low**

This feature allows teachers to send notifications to students regarding low or irregular attendance to any student in a course.

### **4.5.2 Functional Requirements**

- REQ-1: System should be able to notify students.
- REQ-2: System should allow teachers to modify and send notifications to students.

## **4.6 Importing and Exporting Data**

### **4.6.1 Description and Priority**

Priority: **Low**

This feature should allow teachers and administrators to import and export data from the system. This will allow already existing data to be imported into the system, and data from the system to be exported to other systems.

### **4.6.2 Functional Requirements**

- REQ-1: System should work with CSV files to store data.
- REQ-2: System should allow teachers and administrators to import and export data from the system.

## 5 Other Nonfunctional Requirements

### 5.1 Safety Requirements

- The system will store sensitive information essential to the functioning of Institutions which will be using it. It is therefore essential to keep backups of everything and to ensure that the data is not lost.
- The system will be used by students and teachers who are not necessarily tech-savvy. It is therefore essential to ensure that the system is easy to use and does not require any special training.
- The system should also be able to handle any errors that may occur.
- The system should expect the proxy detection to not be perfect and should be able to handle false positives.

### 5.2 Security Requirements

- The system will handle sensitive information such as student and teacher details. It is therefore essential to ensure that the system is secure and that the data is not leaked.
- The login feature should not be vulnerable to brute force attacks.
- The import and export feature should not be vulnerable to SQL injection attacks.

### 5.3 Software Quality Attributes

The following are the quality attributes that the system should have from highest to lowest priority:

- The application should not be platform dependent and should be able to run on both Android and IOS devices.
- The system should be easy to use as it will be used by students and teachers who are not necessarily tech-savvy.
- The codebase should be well documented and easy to understand. This will allow for easier maintenance and addition of new features.

- The application should be able to handle any errors that may occur.
- The application should be lightweight and fast to use.