

QR Code Based Smart Attendance System

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Abstract- In today's technological era, smartphones have become an essential part of our daily lives. However, many university lecturers still rely on conventional methods to take attendance, such as calling out student names or passing around an attendance sheet for students to sign. These methods are not only time-consuming, but also pose a higher risk of students cheating about their attendance, especially in large classrooms. To address these issues, a proposed project suggests using an Android application to take attendance. Once installed, the application can download the student list from a designated web server. Using the downloaded list, the device will act as a scanner to scan each student's card to confirm and verify their presence by reading the barcode printed on the card using the device's camera as a sensor. The updated attendance list will then be uploaded to an online database and can also be saved as a file to transfer to a PC later on. This system eliminates current problems and promotes a paperless environment while also being able to be deployed on lecturers' existing Android devices.

Keywords: QR, attendance, system, security in charge, student.

1. INTRODUCTION

We considered using a paper and pen system to take attendance, but knew it was both slow and prone to errors. Additionally, the paper-based method required a time-consuming data entry phase to generate reports, which suffered from the same issues. Instead, we developed an Android application that allows students to use their smartphones to scan a web application-generated QR code. This innovative solution has proven very useful for students, as it makes checking their attendance much more efficient and convenient.

1.1. Main objective

The "QR Code Based Attendance Management System" or "SSA" is a mobile app designed to simplify the attendance recording process using mobile devices. With this app, there is no need for paper to check student attendance, which protects against data loss. The attendance reports provide end-users with the flexibility to manipulate the collected data as needed.

This smart attendance system has several advantages, including better security, easy and cost-effective maintenance, and the ability to generate results quickly and accurately. Additionally, the system is student-friendly, providing a seamless attendance-taking experience. Overall, the QR Code Based Smart Attendance System is a reliable and efficient solution for managing attendance in any educational setting.

1.2. Problem statement

We are developing a SMART QR CODE BASED ATTENDANCE SYSTEM that integrates the SSA mobile app with a QR code and Firebase database to store attendance results. This system will simplify the attendance recording process and eliminate the need for paper-based attendance tracking.

The SSA mobile app will utilize QR codes to scan and record student attendance data, which will be stored securely in a Firebase database. This will provide a reliable and efficient way to track attendance, and the system will be accessible to authorized users from anywhere at any time.

By integrating the SSA mobile app with QR codes and Firebase database, we will create a smart attendance system that provides real-time attendance tracking, generates reports, and allows for easy and convenient management of attendance data. This system will improve the accuracy and efficiency of attendance management, benefiting students, teachers, and institutions alike.

1.3. Features of SSA system

Our SMART QR CODE BASED ATTENDANCE SYSTEM is designed to be student-friendly and easy to use. With this system, students can quickly and easily scan their QR code to register their attendance, eliminating the need for manual paper-based attendance tracking.

The system also generates reports quickly and easily, providing accurate and up-to-date attendance data for teachers and administrators. This data can be used to make informed decisions about course delivery and student progress.

Overall, the SMART QR CODE BASED ATTENDANCE SYSTEM requires very little paperwork and offers a convenient, hassle-free way to manage attendance. By using this system, institutions can streamline their attendance tracking process, freeing up time for more important tasks and providing students with a better overall learning experience.

2.METHODOLOGY

To achieve the objectives of our SMART QR CODE BASED ATTENDANCE SYSTEM, we have followed a step-by-step methodology. This methodology includes the development of a QR code generator android app and an Android app that takes attendance with respect to the specific subject and generates the student attendance sheet as per attendance details.

The first step in our methodology is to develop a QR code generator android app that uses student details such as roll number and student ID to generate a unique QR code for each student. This app will be used to create a QR code for each student, which will be used to record their attendance.

The second step in our methodology is to develop an Android app that takes attendance with respect to the specific subject. This app will use the QR code generated by the first app to record student attendance in real-time. The app will also generate a student attendance sheet as per attendance details, making it easy for teachers and administrators to access and analyze the data.

By following this step-by-step methodology, we will create a reliable and efficient SMART QR CODE BASED ATTENDANCE SYSTEM that streamlines the attendance tracking process and provides accurate attendance data. This system will benefit both students and institutions, providing a better overall learning experience and enabling institutions to make data-driven decisions about course delivery and student progress.

2.1. Software requirement

- Application Based On QR attendance System

2.2 Hardware requirement

Hardware : intel core
 Speed : 2.80 GHz
 RAM : 8GB
 HardDisk : 40 GB

2.3 Input/output

- **Input:** QR code

Database used

- Firebase Database

2.4. System Architecture

The various actors of the system along with their functionality are described in the

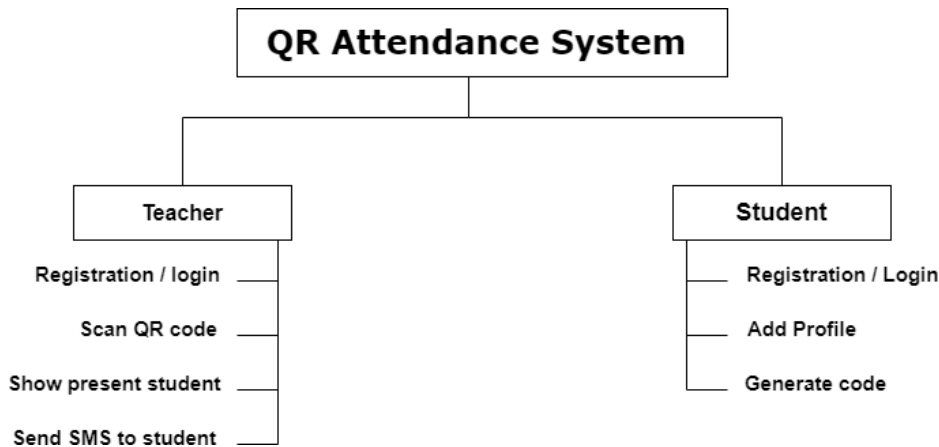


Figure 1. System Architecture

2.5. Data flow diagram

The data flow diagram of the system is given in the diagram:

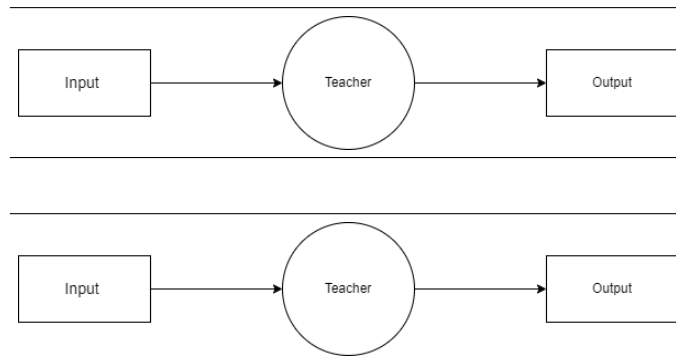


Figure 2. Data flow diagram

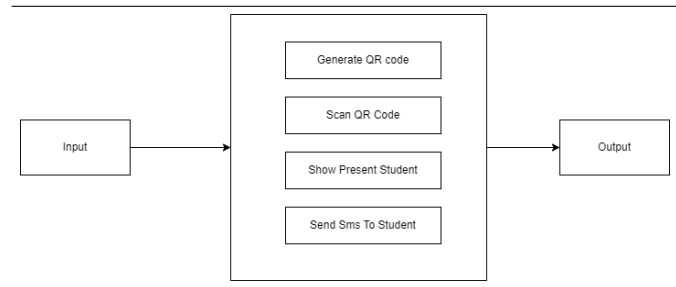
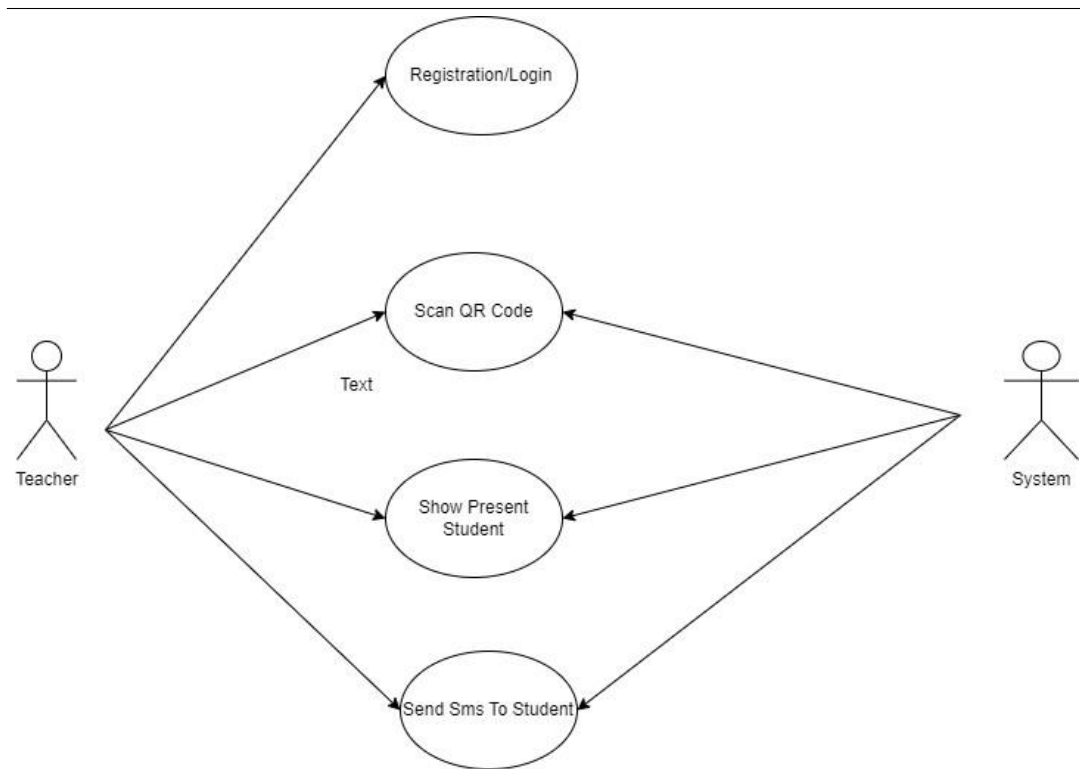


Figure 3. Dataflow diagram

2.6.UML Diagram



3. Mobile applications opening page

The GUI of our project is shown in below, we have given name as SSA we need to select the user in the app.



Figure 4. GUI of developed project

3.1. Student Section

For students section GUI ;

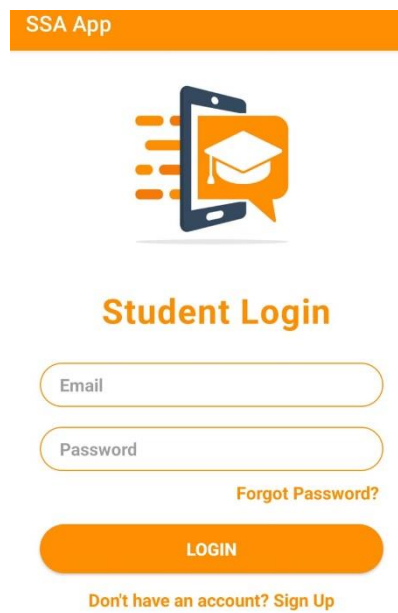
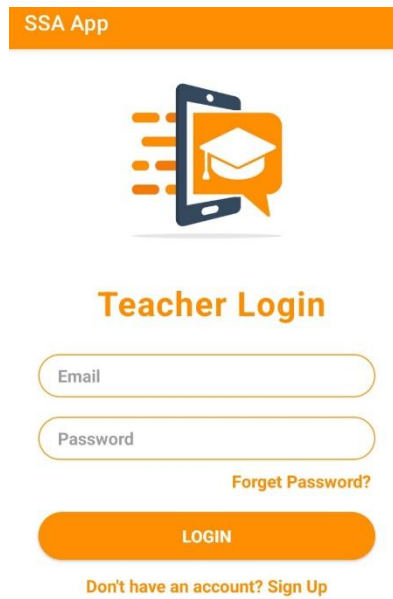


Figure 5. GUI of Students section

3.2. Teacher Section

Teacher section GUI to generate id and do login:



The screenshot shows the 'SSA App' logo at the top. Below it is an icon of a smartphone with a graduation cap and a speech bubble. The main heading is 'Teacher Login'. There are two input fields: 'Email' and 'Password'. A link 'Forgot Password?' is located below the password field. A large orange 'LOGIN' button is centered below the fields. At the bottom, there is a link 'Don't have an account? Sign Up'.

Figure 6. GUI of student section

3.3. QR code of added student in the list

QR code for the students who has added successfully in the data base is generated which contains all the details of the student.



Figure 7. Added students QR code

3.4. Teacher profile

Teacher have option to select which action he want to perform.

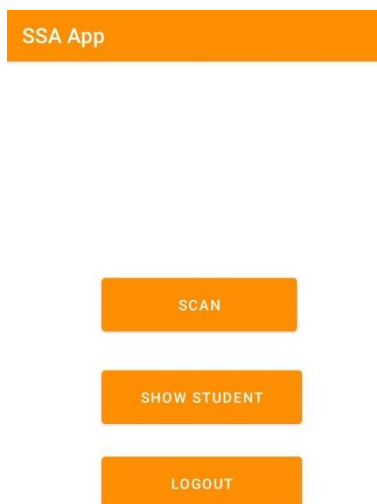


Figure 8. Teacher profile

3.5. Result of Marked Attendance

Result of students who is present is marked

SSA App
Name - Harshraj Mobile No. -9764979785 Department -ENTC Acadmic Year -2023 Address - Pune
Name - Sneha Lagaskar Mobile No. -9307941177 Department -ENTC Acadmic Year -2019 Address - JSPM ICOER
Name - Mobile No. - Department - Acadmic Year - Address -
Name - omii Mobile No. -7888102699 Department -ENTC Acadmic Year -2023 Address - Pune

Figure 9. Result page

4. CONCLUSION: The SMART QR CODE BASED ATTENDANCE SYSTEM presented in this paper has been designed and tested successfully. The system enables the analysis and export of student attendance data, providing an efficient and reliable attendance monitoring solution.

Attendance monitoring is an essential aspect of daily life, and the benefits of a QR Code Based Smart Attendance System are numerous. Among all types of code scanning technology, QR codes are particularly accurate and reliable.

In this project report, we have provided an introduction to attendance monitoring systems and their advantages. By using the QR Code Based Smart Attendance System, we are able to store attendance data efficiently on smartphones, reducing paper waste and streamlining the attendance tracking process.

5. FUTURE SCOPE

Our future work will focus on enhancing the SMART QR CODE BASED ATTENDANCE SYSTEM by providing missed class topics and notes to students and giving professors full control over the system with more secure options.

Furthermore, integrating the attendance monitoring system with a face identification tool can provide a more comprehensive solution to real-world attendance problems, further increasing the accuracy and reliability of the system.

In conclusion, the SMART QR CODE BASED ATTENDANCE SYSTEM provides an efficient and reliable method for tracking student attendance, reducing paper waste, and streamlining attendance monitoring processes. With the potential for further enhancements, the system can become even more valuable for educational institutions in the future.

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