Project - I Report

On

Attendance Management System Using QR Code

For the Degree of

Bachelor of Technology

In

Computer Science and Engineering

Submitted by

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AY 2023-24

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Certificate

This is to certify that the Project Report entitled, **"Attendance Management System Using QR Code"** submitted by,

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to **Walchand College of Engineering, Sangli**, India, is a record of bonfire Project work of course **"PROJECT-I (5CS491)"** carried out by him/her under my/our supervision and guidance and is worthy of consideration for the award of the degree of Bachelor of Technology in Computer Science & Engineering during the academic year **2023-24**.

Dr. B. F. Momin
Guide

External Examiner

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Acknowledgement

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At last but not the least, we would like to thank everyone who helped and motivated us to work on this project.

Declaration

I hereby declare that work presented in this project report titled **"Attendance Management System Using QR Code"** submitted by us in the partial fulfilment of the requirement of the award of the degree of Bachelor of Technology (B. Tech) Submitted in the Department of Computer Science & Engineering, Walchand College of Engineering, Sangli, is an authentic record of my project work carried out under the guidance of Dr. B. F. Momin.

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Content

Abbreviations

- **QR-** Quick Response

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Abstract

In the realm of educational innovation and operational efficiency, the "Attendance Management System Using QR Code" emerges as a groundbreaking solution to revolutionize attendance management. Traditional methods of attendance tracking prove unwieldy and susceptible to marking of fake attendance, prompting the need for a dynamic and comprehensive approach. This project introduces an ingenious Attendance Management System leveraging dynamic QR code technology. Departing from conventional, error-prone practices, our system ensures real-time attendance tracking, centralized data storage and customizable reporting. Its user-friendly interface extends its applicability beyond educational institutions to corporate and event sectors. By addressing inefficiencies and other concerns inherent in traditional systems, this project signifies a substantial leap forward in attendance tracking technology, promising heightened efficiency, authenticity, and accuracy.

1 | Introduction

In the age of digital transformation, educational institutions are continually seeking innovative solutions to enhance operational efficiency, improve security, and elevate the overall learning experience. One critical aspect of this pursuit is the modernization of attendance tracking systems. Traditional paper-based methods have proven to be cumbersome, error-prone, and vulnerable to fraudulent practices such as proxy attendance.

To address these challenges, we present the " Attendance Management System Using QR Code " as a dynamic and comprehensive solution designed to revolutionize attendance management in higher education.

This project presents an innovative Attendance Management System built around dynamic QR code technology. Traditional attendance tracking methods suffer from inefficiencies and security concerns. Our system addresses these issues by providing dynamic QR codes to participants, enabling real-time attendance tracking, centralized data storage, customizable reporting, and robust security features. This solution is user-friendly, scalable, and adaptable to various settings, promising to streamline attendance management across education, corporate, and event sectors. This project represents a significant advancement in attendance tracking technology, offering efficiency, accuracy, and security benefits.

2 | Literature Survey

The paper "A Mobile-Based Smart Attendance System Framework for Tracking Field Personals Using a Novel QR Code-Based Technique" addresses the challenge of tracking attendance for field personnel through a novel mobile-based solution employing QR code technology. The literature survey contextualizes this research within the broader landscape of mobile-based attendance systems. It explores existing mobile attendance solutions, emphasizing the role of technologies such as GPS and NFC. [1] Additionally, it investigates the extensive application of QR codes in attendance systems, focusing on their adaptability and advantages. The survey delves into challenges unique to tracking field personnel, examining previous systems' attempts to overcome issues related to remote locations, connectivity, and dynamic schedules. [4]

Furthermore, the literature survey explores the development of mobile applications for attendance tracking, considering both best practices and challenges. Security and privacy concerns related to handling sensitive attendance data for field personnel are discussed, drawing insights from previous studies. The survey also investigates integration challenges with enterprise systems and provides a comparative analysis with alternative tracking technologies such as GPS, RFID, and Bluetooth. [2]

Real-world case studies and implementations of mobile-based attendance systems, particularly those tailored for field personnel, are examined to glean practical insights. The survey concludes by identifying gaps in existing research and proposing potential areas for future innovation, setting the stage for the proposed QR code-based attendance framework. [3]

3 | Problem Statement

Attendance Management System Using QR

4 | Objectives

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1. Develop a system that eliminates the inaccuracies associated with manual attendance tracking methods through automation.
2. Design a touch and feel UI based application for students to mark their attendance.
3. Implement dynamic QR codes that change at regular intervals to prevent proxy attendance.
4. Enable educators and administrators to access attendance data in real time, facilitating timely interventions and informed decision-making.

5 | Methodology

There have been many approaches for automated attendance system for recording the presence of the working persons. Biometric based attendance systems like face recognition, finger print and even iris-based attendance system. Device based attendance systems like card reader, RFID based are various techniques available in market as products. These various techniques are suitable to different scenarios and are successful in practice deployed in universities, factories, laboratories, offices, institutions etc. But all these techniques can be applicable only within bounded places which has to be owned. For tracking and recording attendance for a field worker the above mentioned automated attendance system techniques will not work out. With smart phones becoming compulsory gadget to be carried by the field workers during their official stay in the field the accountability on them to answer to the observer make them to discharge their duties effectively. But there is no complete solutions for automated attendance system for field personals. But with mobile phone as platform there are quite a few techniques which can achieve the objective to an extent with pre agreed terms and policy. One time password (OTP) mechanism is a common practice for verification through automated process for remotely checking weather authenticated person is present or not in executing a task. It sends a randomly generated number through server to one system and asking the generated code to be replicated in other system for verification. This system is effectively used for verifying banking transactions, but to apply it to the scenario where verification is to be done by remote system on two person interaction happening at field somewhere is not always a fool proof methodology. Impersonation can still happen if verification cannot be done by remote observer all the time. There are proposed work with QR code based automated attendance registration in class room where the QR code is generated in the teaching screen needs to be scanned by students the attendance providers through their mobile. Here the teacher is initiating the attendance and the students are to provide their presence and also the system is applicable in bounded place. If the scenario demands attendance to be taken during lectures by the teacher, it is the students the attendance provider needs to initiate the process of providing attendance by ensuring his interaction with the teacher who invokes the attendance process. The following figure depicts the same process.

Figure 1: Shows the architecture frame work of attendance management system using QR code technique.

Attendance Management System using QR Working Process:

• First the attendance initiator web portal to be used by admin. The registration process in the portal involves setting user details like name, mobile number, and other details. The framework uses firebase real time database for storing data.

• Similar process is done for attendance provider app used by teachers.

• Once this process is done, the students can login into the app with their registered mobile number for marking the attendance.

• An administrator in attendance web portal will do verification on the details submitted through the app to ensure the app is used by the authenticated user and sends approval to the registered user on verification. The attendance portal also generates unique server ID for each registered users through firebase and sends back to the device. This ID will be used while sending scanned code from the generated QR code while proving attendance.

• Now, the approved apps which always checks for approval status from web portal database every time it logs in will be ready to process attendance registration. The recipient's attendance initiator app can initiate QR code from web portal and attendance markers' app is ready to scan and respond back to web portal.

• To initiate attendance process the attendance initiator app used by recipient opens the app, if it holds approved status the app screen asks to view QR code from attendance web portal.

• To register the attendance the attendance provider app used by students will open the app if the app has approved status then it goes to the screen to scan the QR code. The student will hold his device to scan the QR code generated in the teacher.

• The attendance web portal receives the data from attendance provider app which contains authenticating IDs. It authenticates for approved device and compares the code generated for attendance initiator app, if it matches it registers a entry in the database. This process must happen within one minutes since the request generated from attendance initiator app otherwise session would expire and recipient has to again request for another code.

• Provision for monitoring duration of interaction is an optional feature where entry time and exit time could be recorded by scanning two QR codes and calculating the duration between two scan is taken as duration of interaction.

• The administrator has privilege to deactivate the app of registered users any time with disabling approval through web portal.

• Each registered field personals will have a new row field entry in the database table with date wise column entries. Every assignment including the recipient interactions through the smart attendance framework can be appended to the day wise entry. Report can be generated which could bring various statistics information for perusal.

Figure 2: Generating QR Code (by Teacher)

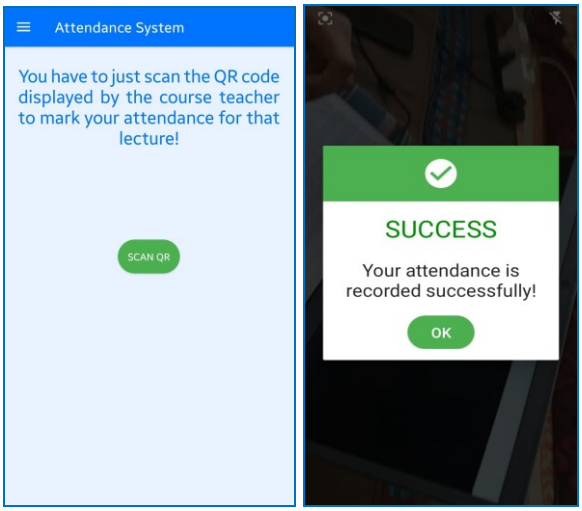


Figure 3: Scanning QR Code (by Student)

Flow Chard representing the above mention process of attendance QR generation and marking attendance:

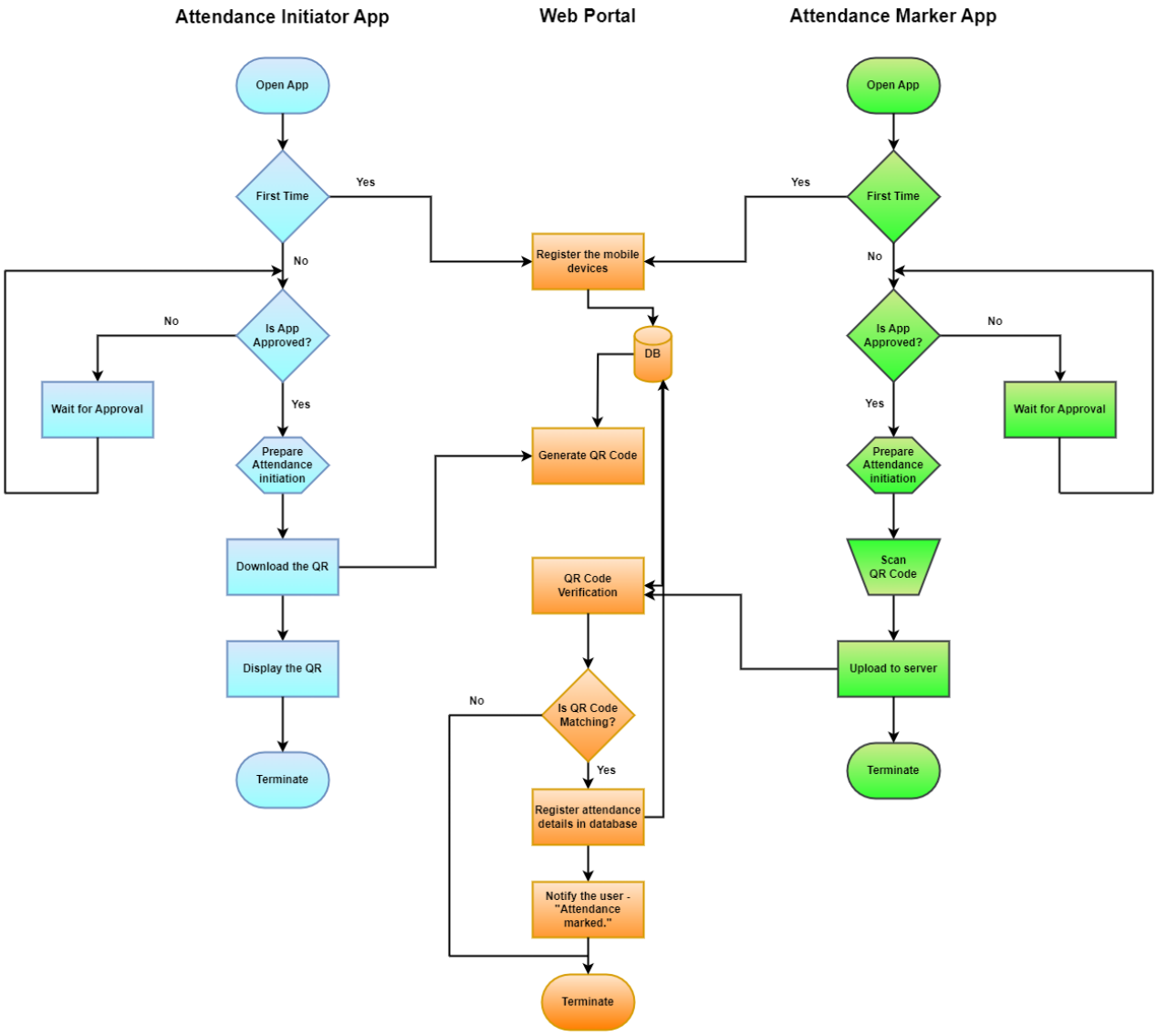


Figure 4: Flowchart

6 | Result and Discussion

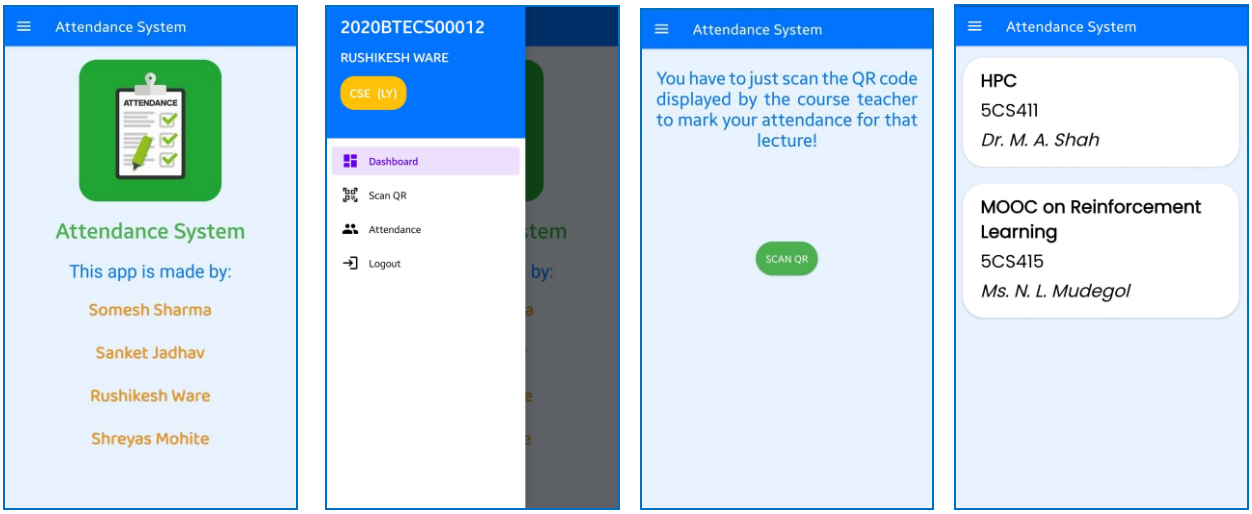
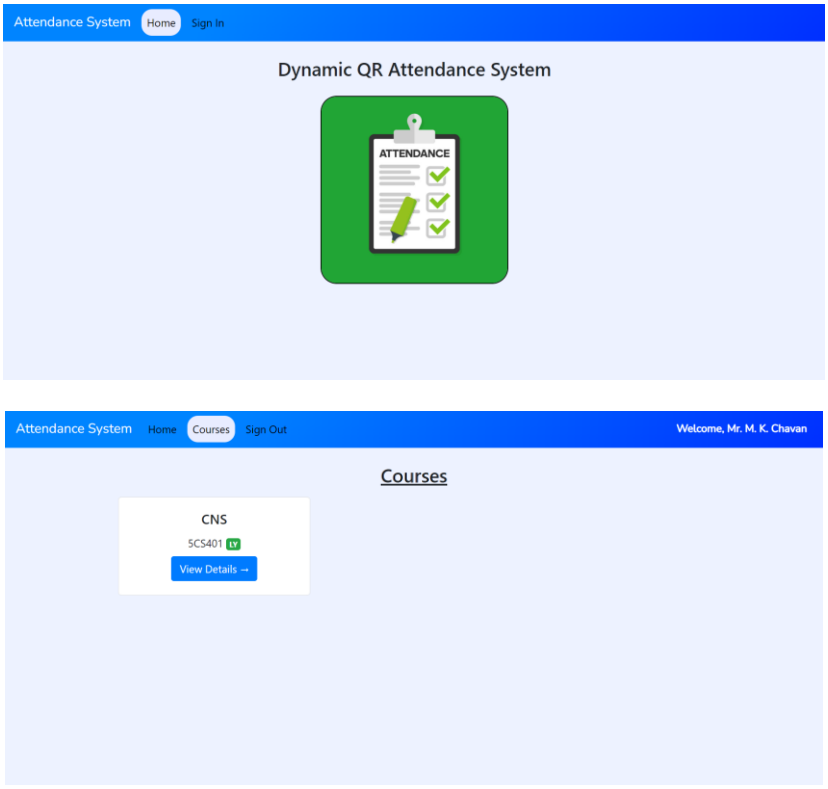


Figure 5: Android Application



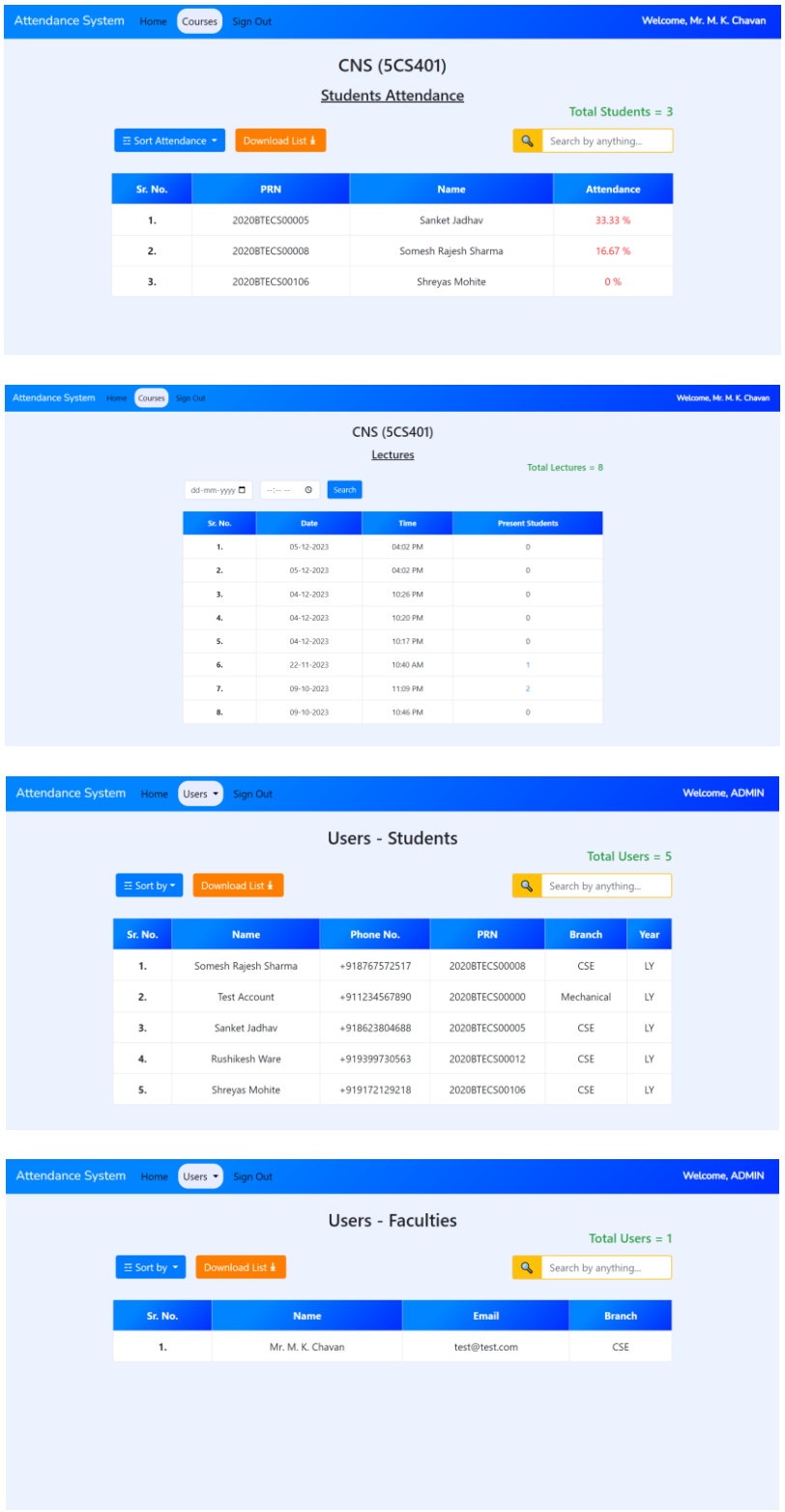


Figure 6: Web Portal and Administrators' Window

7 | Conclusion

The project Attendance Monitoring System using QR Code is successfully able to generate QR code using the teacher's portal and students are able to scan QR and mark their attendance. Hence, making an entry in the database about the present students.

Teachers or attendance initiator can also generate reports and download them to monitor attendance at ease.

8 | References

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9 | Annexure
