Infallible and FastQR Code Based Attendance Plus Feedback System

Ramgude.Akshay.Dilip

Department of Computer Engineering, Sanjivani College of Engineering,Kopargaon
Email: akshayramgude007@gmail.com

Abstract
We all know that keeping track of students' attendance is a crucial part of their education. Marking attendance, particularly in higher educational institutions, is a time-consuming and inefficient operation due to the large number of students. Taking feedback from students during seminars or guest lectures is also a time-consuming and demanding endeavor. It has a significant impact on an educational organization's overall productivity. We also understand that smartphones have become common, as well as a need in this rapidly changing digital world. Various smartphone applications have been developed, allowing us to boost our productivity while saving a significant amount of time. Many digital technologies, such as fingerprint scanning, RFID, facial recognition, QR codes, and barcode-based systems, have been presented in recent years. However, they were unable to adopt these ideas on a broad scale due to factors such as sophisticated functionality, easy to cheat, time demanding, and poor user experience. Furthermore, there are no effective or time-saving methods in place for collecting student feedback during seminars or guest lectures. To address all of these concerns, we devised and suggested a quick, scalable, and error-proof QR code-based system capable of accurately recording attendance and collecting feedback at seminars or guest lectures.

Keywords: QRcode; Feedback; Attendance

1. Introduction

The majority of the time, students cheat when taking attendance, and some students fail to note their attendance in a traditional/manual manner. Face identification, fingerprint identification, RFID, log books, barcode based, QR code based, punch cards, and other types of attendance systems are also available. However, these systems are time-consuming, complicated, and easy to cheat. The 'Infallible and Fast QR Code Based Attendance plus Feedback System' is primarily intended to digitalize traditional methods of taking attendance and providing feedback. The proposed system is separated into two parts: a QR code generator for professors, guests, and lecturers, and a QR code scanner for students. In the proposed system, third party tools/methods like google forms, google sheets, user login/sign up, etc. are not required which makes the system user friendly and effective.

1.1 Main objective

The 'Infallible and Fast QR Code Based Attendance plus Feedback System' is a combined system which includes a web application for teachers/professor and android application for students. In this system, the professor, who is conducting the lecture will have the responsibility to record the attendance of students. Each student has to install the android application in order to scan the given QR code. The attendance/feedback report in pdf format will be

generated at the professor's side within the limited time.The major objective of this system is to record the attendance of students at lecture and feedbacks of students during seminars or guest lecture.

Following are the advantages of 'Infallible And Fast QR Code Based Attendance Plus Feedback System':
- Simple and easy to use
- No need of tools like Google sheets, Google forms,Wi-Fi, Bluetooth, GPS, etc.
- Time-saving and effective
- No registration required
- Difficult to cheat and almost foolproof
- Single-click operations
- Can be also used to take feedback
- Almost zero maintenance and cost effective

1.2. Problem statement

- Development of a 'Infallible And Fast QR Code Based Attendance Plus Feedback System'
- Generating accurate and fast attendance report.
- Collecting feedback during guest lectures or seminars in effective manner.
- Designing trustworthy and time saving attendance system by integrating smartphones with QR code.

1.3. Feasibility

- Economic feasibility: Because both the web application and the smartphone application include single-click procedures and time limits, the designed solution is time efficient. It's also cost-effective because there's no paperwork involved.
- Technical feasibility: The system is relatively low-cost as it does not require any additional hardware or software.
- Behavioral feasibility: The system is straightforward and easy to use. All of the operations are usually done with a single click.

1.4. Characteristic of proposed system

- User Friendly
- Time saving
- Reports are generated with ease
- Almost no paperwork required
- Records feedback
- Cost effective
- Almost fool proof

2. Related Approaches/Work

In the beginning, a punch card system, also known as Hollerith cards, was utilized for data storage, with companies being able to save and access data by inserting the card into the computer system [1]. It is currently widely utilized in educational institutions as an attendance system. Employees punch in and out by waving their individual cards near a reader, validating their presence [2]. Several prior studies in the field of computer science produced student attendance monitoring systems to improve record keeping in class utilizing various technologies. RFID [3] or near-field communication (NFC) technologies [4] are two examples of it.

Based on [5], the authors tried an approach to develop a student attendance tracking system using QR codes, as well as Google Forms and Google Sheets, which are easier for lecturers to use and require no technical or computer programming knowledge. The author in [6] also proposed a comparatively time saving approach using QR codes.

One tool that Jainetal has created is a desktop program that displays a list of all enrolled students in a certain course when the class begins. Attendance is recorded by checking a box next to each student's name who is there, and then pressing the register button to mark their presence [7].

The authors' proposed approach [8] intends to track all student participation using a unique QR code created for each course for each class day. This QR code is then copied by the instructors and pasted on the opening slide of the lecture. If the instructor's policy is to accept late students and designate them as present or late, the QR code should be copied on one of the four corners of as many slides as the instructor desires. When the students arrive in class, they should first take out their cellphones, open the Mobile Module, and scan the QR code, after which the Server Module will do an identity check on the registered students. This is accomplished by comparing the face image transmitted per transaction with the image saved on file for the student in question, after which the system controls the student's location.After that, a location check will be carried out.

Biometric recognition technologies such as the iris, voice, fingerprint, and face were considered by Hoo and Ibrahim [9] as a way to validate user information utilizing systems that do not have the same limitations as previous techniques. However, their solution necessitates the integration of potentially costly and complicated technology into a learning environment. Furthermore, the collection of biometric data from consumers raises serious security and privacy problems. Another experiment [10] suggests combining location and voiceprint. However, their approach needs users to talk to authenticate their identification, which could lead to classroom interruptions. These systems, on the other hand, necessitate a lot of student involvement.

By focusing on creating a simple student attendance tracking system that can be used to take attendance that is both fast and affordable in comparison to other methods, our proposed model differs in a way that should be fool proof, easy to apply, and quick in recording attendance during a class session. It is also highly cost effective when compared to other ways because it does not employ tools like Wi-Fi, Bluetooth, GPS, fingerprint scan, facial identification, RFID, google forms, google sheets, iris, voice, and so on. During seminars or guest lectures, our proposed method can also collect feedback from students.

3. Proposed System

This section covers the tools and techniques required to create an efficient attendance and feedback system with QR codes, as well as the system's overall functionality.

The proposed model (Figure 1) is separated into two modules: the first is for professors and guests, and it includes a QR code generator as well as an attendance/feedback report generator. This module's basic function is to collect student roll numbers and feedback, store it in a database, and transform it into a PDF or CSV report. This is the primary module, which is a web application. When the lecture begins, the professor will instruct the students to turn on the internet, open the smartphone application (secondary module), enter the relevant roll number in the input area, and be prepared to scan the QR code that will be presented on the projection screen for 10 seconds.
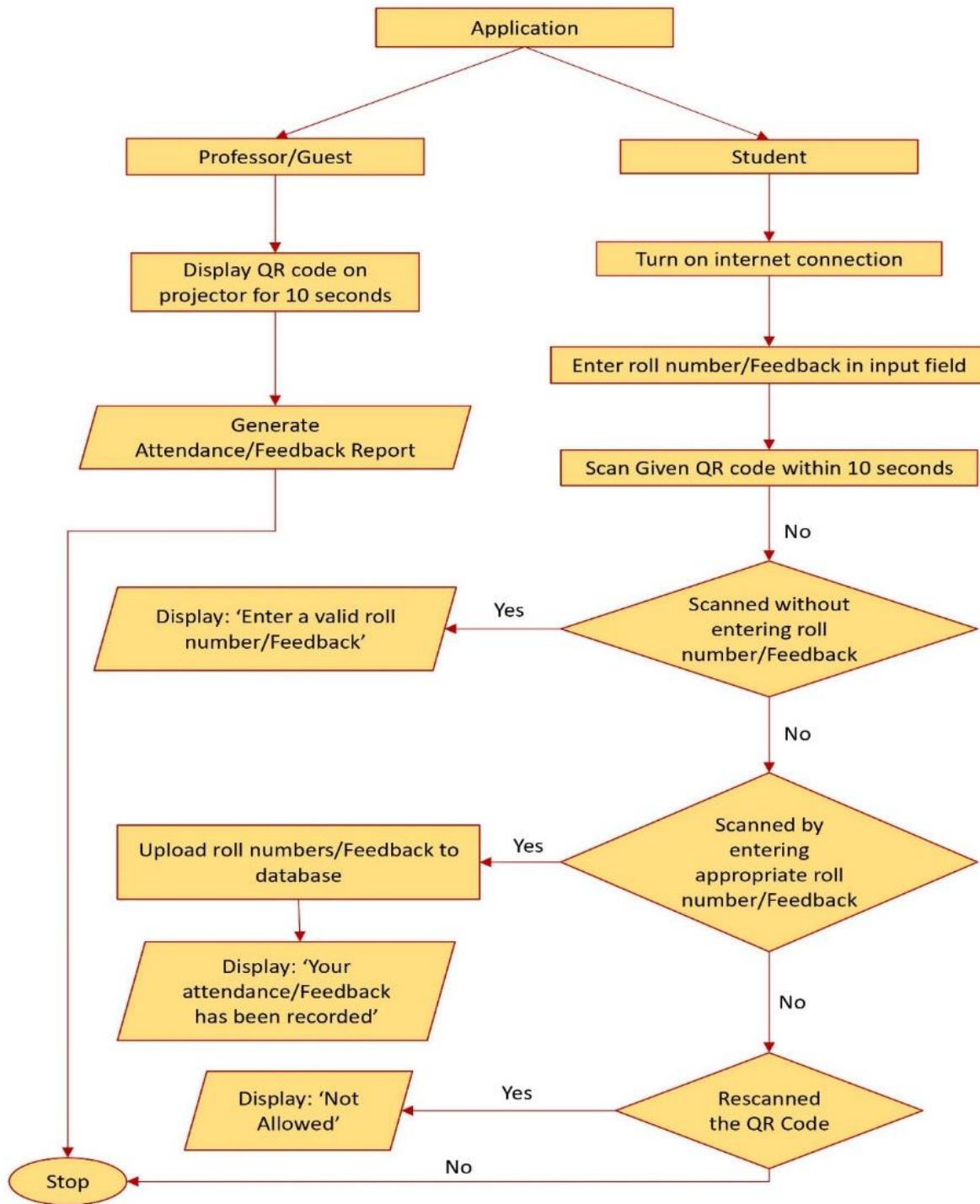
Figure 1: Proposed System Architecture

Figure2: Web Application module

The professor/lecturer then clicks the 'Generate QR code' button and the unique QR code gets displayed on the projector screen for very limited time (10 seconds). After the given time is over, the attendance/feedback report gets downloaded automatically in PDF and CSV format. For taking feedback from the students during seminars and guest lectures, all steps are same as specified previously just the input roll number gets replaced by student ID in combination with the feedback.

Figure3: Attendance Report

Figure 4: Feedback Report

The second module is a smartphone application that students must download and install on their smartphones. This module has a QR code scanner as well as an input field. Students must scan the displayed QR code in a short amount of time using this application.

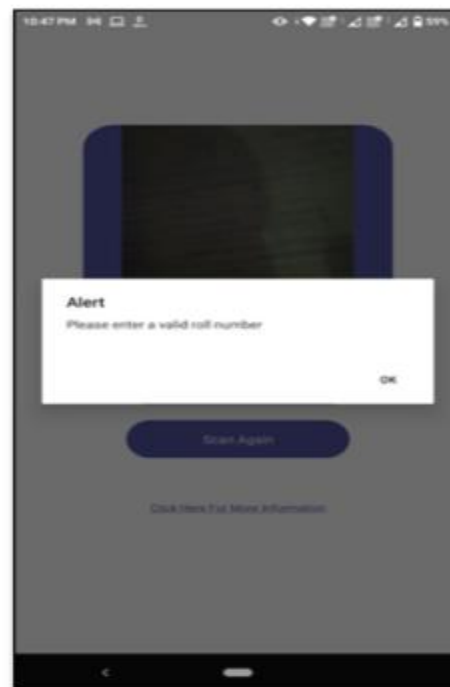Figure 5: Mobile application GUI

Figure 6: Output after scanning without entering roll number or feedback

If a student scans the QR code without providing a valid roll number, a warning message will appear that says "Please enter a valid roll number." If a student scans the QR code and enters the appropriate roll number, an alert message such as "Your attendance for this session has been recorded" appears, and his or her roll number is logged into the database. If the students rescan the QR code by entering other roll numbers and tries to cheat the system, alert message as "Not allowed" will be displayed. For taking feedback from the students during seminars and guest lectures, all steps are same as specified previously just the input roll number gets replaced by student ID in combination with the feedback.
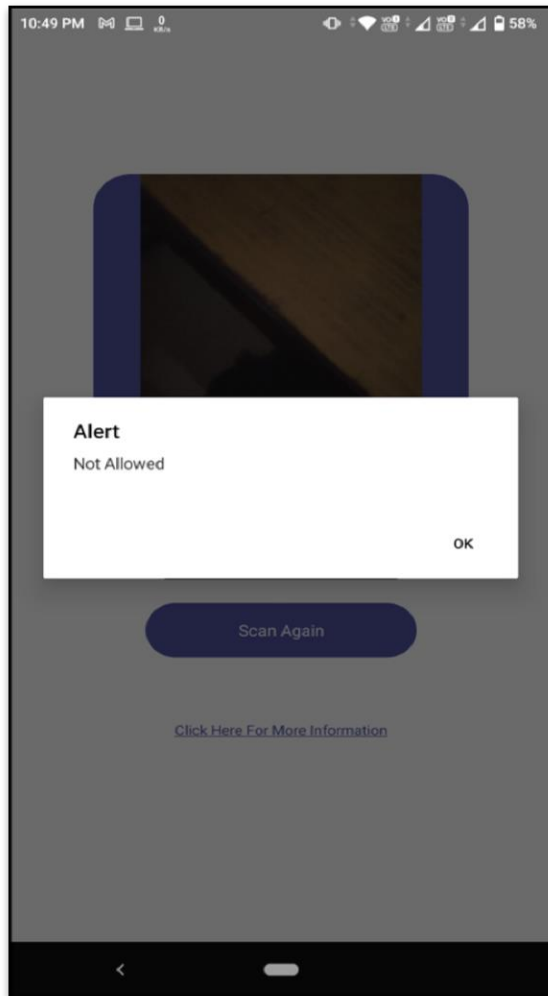

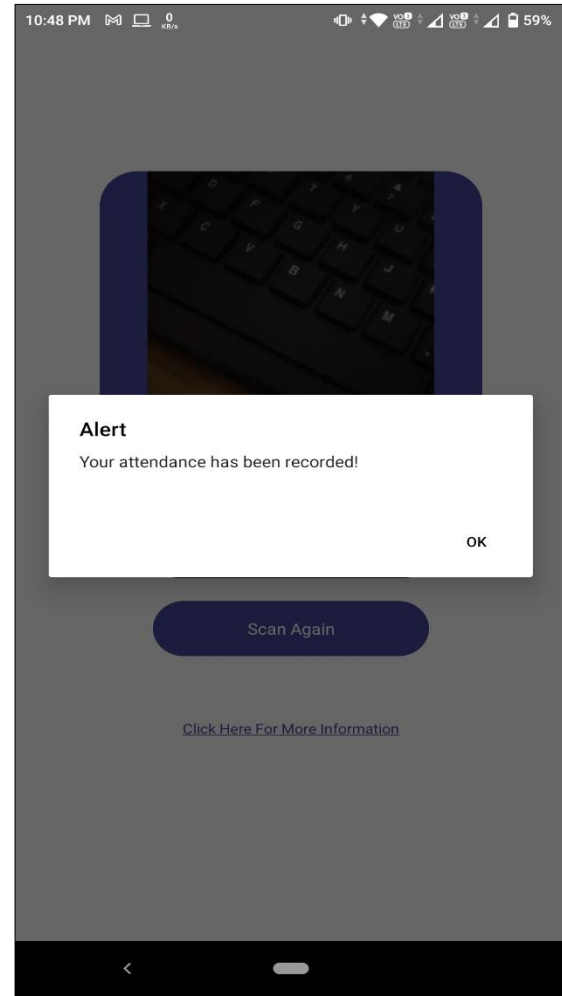Figure7: Output after rescanning the QR code with other roll number.

Figure8: Output after scanning QR code with appropriate roll number

4. Conclusion

It is necessary to stay up with the latest technologies these days, particularly in the realm of education. Educational institutions have been exploring for methods to use cutting-edge technology to improve the educational process. We believe that, as the world evolves toward digitization, this technology is a must-have for the University. In this study, we discuss a proposed system for taking student attendance that uses QR codes and internet-connectivity. This study demonstrates how the QR code, widely utilized feature of smart devices, may be used to efficiently record attendance and also the feedback, replacing the old, inefficient approach of calling students roll numbers in

the class and collecting roll numbers using google forms and google sheets. This system was created after evaluating and assessing the previous manual system as well as other universities' systems.

This low-cost and scalable QR code-based attendance and feedback system allows lecturers to save critical teaching time by speeding up the process of marking attendance, especially in big classrooms. The proposed solution is more secure than existing ways, as it eliminates the possibility of students enrolling roll numbers for those who aren't there. Despite the fact that similar platforms have already been there in a market, we believe the proposed system will be more efficient for a number of reasons as follows: The QR Code attendance plus feedback system is the most accurate, failsafe, scalable, and efficient means of recording attendance and generating instant reports, rather than wasting both paper and time.

As future work, we will try to explore the various methods like generating daily, weekly and monthly attendance reports as well as generate statistical information which will help the educational institute to track the performance of students in effective manner.

References

[1] Punch Card, available at: https://www.computerhope.com/jargon/p/punccard.htm

[2] Punch card attendance system, available at: http://www.bioenabletech.com/punch-card attendance-system.html

[3] M. A. Abas, T. B. Tuck, and M. Dahlui, "Attendance Management System (AMS) with fast track analysis," in 2014, International Conference on Computer, Control, Informatics and Its Applications (IC3INA), 2014, pp. 35–40.

[4] T. J. Zhi, Z. Ibrahim, and H. Aris, "Effective and efficient attendance tracking system using secret code," in Proceedings of the 6th International Conference on Information Technology and Multimedia, 2014, pp. 108–112.

[5] A. Manori, N. Devnath, N. Pasi, and V. Kumar, "QR Code Based Smart Attendance System", Int. J. Smart Bus. Technol., vol. 5, no. 1, pp. 1–10,Jul. 2017.

[6] AsriNuhi, AgonMemeti, FlorindaImeri, and BetimCico, "Smart attendance system using qr code," in Mediterranean Conference on Embedded Computing. IEEE, 2020, pp. 1–4.

[7] S. K. Jain, U. Joshi, and B. K. Sharma, "Attendance Management System," Masters Project Report, Rajasthan Technical University, Kota.

[8] FadiMasalha and NaelHirzallah, "A Students Attendance System Using QR Code", International Journal of Advanced Computer Science and Applications vol. 5, no.3, pp. 75-79, Jan. 2014.

[9] Hoo, Seng Chun, and Haidi Ibrahim. "Biometric-Based AttendanceTracking System for Education Sectors: A Literature Survey on Hardware Requirements." Journal of Sensors, 15 Sept. 2019, pp. 1–25.,doi:10.1155/2019/7410478.

[10] S. Yang, Y. Song, H. Ren and X. Huang, "An automated studentattendance tracking system based on voiceprint and location," 2016 11thInternational Conference on Computer Science & Education (ICCSE),Nagoya, Japan, 2016, pp. 214-219, doi: 10.1109/ICCSE.2016.7581583.

[11] P. Kavitha , R. SubhaShini , R. Priya, "An Implementation Of Statistical Feature Algorithms For The Detection Of Brain Tumor", Journal of Cognitive Human-Computer Interaction, 2021, DOI: https://doi.org/10.54216/JCHCI.010202.

[12] Sonia Jenifer Rayen, "Survey On Smart Cane For Visually Impaired Using IOT", Journal of Cognitive Human-Computer Interaction, 2021, DOI: https://doi.org/10.54216/JCHCI.010205.

[13] Ajith Krishna R , Ankit Kumar , Vijay K, " An Automated Optimize Utilization of Water and Crop Monitoring in Agriculture Using IoT", Journal of Cognitive Human-Computer Interaction, 2021, https://doi.org/10.54216/JCHCI.010105.