# Automated Attendance System with QR Verification

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**Abstract:** *Institutions of higher learning have found a strong correlation between student engagement in class and their overall academic success. Despite this, the prevalent method for tracking student presence remains outdated and inefficient, posing a significant challenge in courses with a high number of enrollees. Traditionally, universities have relied on manual methods for managing attendance. Addressing the inefficiencies of such systems, our initiative introduces a sophisticated attendance mechanism designed to streamline the process. This system utilizes Quick Response (QR) codes as a modern solution for monitoring and documenting the presence of students in academic sessions and practical workshops across various disciplines, as discussed in this document.*

**Keywords:** QR Code, attendance, teacher, student, principle, smart

## I. INTRODUCTION

In the current fast-paced environment, efficiency and rapid learning are key to achieving superior outcomes. This is particularly true in the realms of education and business, where management systems play a pivotal role in fostering effective oversight and progress in learning or professional activities. Recognizing these benefits, we believe that an automated system is essential for monitoring student attendance at universities. Regular attendance is a fundamental requirement across educational systems, and failure to comply can result in students being barred from examinations. Moreover, exceeding the permissible number of absences could lead to disqualification from final assessments. The existing manual systems are prone to errors, prompting us to devise and implement an enhanced web-based solution. This new system is adaptable to various devices, including smartphones, tablets, and computers, ensuring secure access to comprehensive attendance data for both individual students and entire classes, with automated report generation by educators.

The objective of this web-based attendance system is to modernize the conventional attendance recording process, offering a more streamlined and intelligent approach to monitoring attendance within institutions. Utilizing a distinctive QR code assigned to each educator and student, the system requires users to scan their codes at the start of each session. This method ensures accurate recording of attendance details and other vital information. The implementation of this system promises significant improvements in student attendance for required courses and a substantial reduction in time spent on administrative tasks.

## II. LITERATURE REVIEW

### A. Problem Statement

Documenting student presence in tertiary education is a laborious and inefficient task, becoming increasingly cumbersome with larger class sizes. Ensuring the integrity of attendance records is a further challenge. Post-lecture, educators are tasked with transferring attendance data from physical sheets to a digital system, a process that detracts from their valuable instructional time. Despite these issues, there is a reluctance within the academic community to alter traditional attendance methods. As per appendix A, a staggering 85% of institutions continue to rely on paper-based sign-in methods for attendance tracking.

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In Malaysia, mobile phone usage has soared to 131.8%, with smartphone ownership reaching 70% among the population as of the last year's third quarter, according to The Star. Given the ubiquity of smartphones among university students and the inefficiencies plaguing the current attendance process, a streamlined solution is proposed. This solution advocates the use of QR codes, enabling students to register their attendance via their smartphones. This method not only expedites the attendance recording process but also contributes to environmental sustainability by reducing paper consumption.

The suggested system enhances security against fraudulent attendance through the implementation of multi-factor authentication. The intricacies of these authentication measures will be detailed in subsequent chapters.

### B. Proposed Solution

The envisioned approach involves utilizing QR Codes for attendance registration. A survey indicates that 37.5% of participants view the QR Code method as the most economical option. The appeal of QR Codes lies in their minimal setup costs. Leveraging a device ubiquitous among students—the smartphone—facilitates a seamless attendance process.

A web interface presents a dynamically generated QR Code, courtesy of a backend service. This code refreshes every quarter-minute to deter fraudulent scans by non-present students. Students use their mobile devices to scan the displayed QR Code, which sends a verification request to the backend. Upon confirmation, the system updates the attendance database. This streamlined procedure is designed to conclude within a five-minute window, significantly more efficient than traditional methods.

Additionally, educators have the capability to oversee student attendance via the web interface. They can amend attendance records for students with justified absences and manage class schedules, including the creation of new sessions for make-up classes or alterations to existing ones. Administrators are empowered to handle user profiles through the same web interface, enabling them to onboard new educators or students, modify user details, or remove profiles as needed.

### C. Review on Attendance Tracking Technologies

In-class polling often involves students responding to questions posed by instructors or inputting a distinct code. However, this system is susceptible to dishonesty, as students can easily share the code or answers with peers outside the classroom. Similarly, attendance tracking via geolocation is problematic due to GPS's limited indoor accuracy, leading to unreliable attendance data. The use of QR Codes for attendance verification is another common method, but it too can be compromised if the code is shared with non-attendees. To fortify the integrity of this system, several enhancements are proposed. Firstly, the QR Code should regenerate at rapid intervals, such as every 15 seconds, rendering any shared codes obsolete almost immediately. Additionally, the system should enforce a single-device login policy per student account, further deterring deceptive attendance practices.

### D. Summary of Survey

It's evident that a vast majority of universities, 90%, continue to rely on traditional sign-in sheets for attendance, with only 10% adopting more modern methods like QR codes and barcode scanning. This indicates a general lack of progression towards updating attendance systems.

From the student viewpoint, three-quarters of those surveyed are content with the status quo and equally many acknowledge the ease of manipulating attendance records. Yet, there is a consensus that an automated system would enhance efficiency for faculty and minimize errors in logging attendance data. Seventy-five percent support this upgrade, and 60% advocate for full automation to alleviate faculty from monotonous tasks.

When it comes to securing attendance against fraud, biometric scanners are favored by 40% of respondents as the most effective measure. However, concerns over cost and practicality lead 35% to prefer QR codes for their affordability. Meanwhile, 25% lean towards interactive polling, and 20% back the use of student ID readers, with a minority of 10% considering geolocation and biometric scanners equally viable.

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## III. PROPOSED WORK

### A. Proposed Model Architecture

This segment outlines the methodologies and apparatuses utilized in the development of a digital attendance system leveraging QR code technology, along with its operational aspects. QR Codes are two-dimensional barcodes decipherable by smartphones, capable of encoding in excess of 4000 characters within a compact two-dimensional space.

These codes can serve multiple functions, such as presenting information to users, directing them to websites, storing contacts, or facilitating text message composition. "QR Code" is a trademarked term owned by Denso Wave Incorporated. The versatility of QR codes allows them to be scanned by a wide array of mobile devices and webcams through internet browsers.

Regarding system modules, the administrative segment is tripartite, encompassing roles for the main admin, the head of the academic program, and the program's administrative manager. The primary admin's duties include system and database backups, modifications, and the management of user profiles for professors, students, and academic departments. They are also tasked with appointing heads and managers for various academic programs. Conversely, the academic program head is charged with scheduling faculty sessions and assigning departments within their program, while the program manager selects the requisite courses for students each semester.

## IV. RESULTS
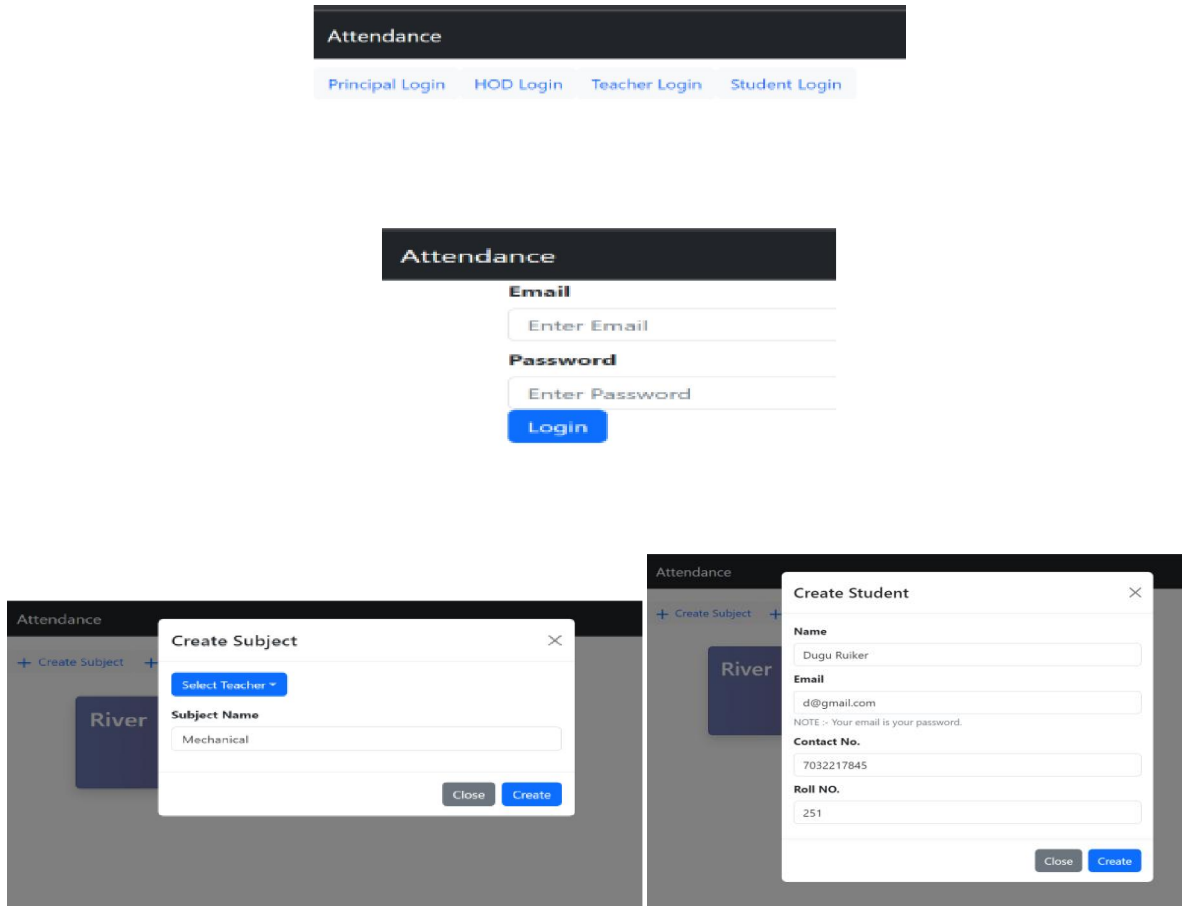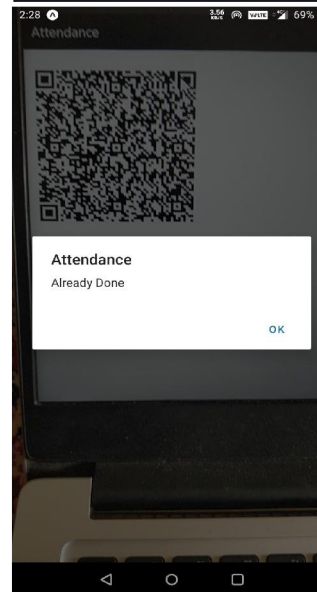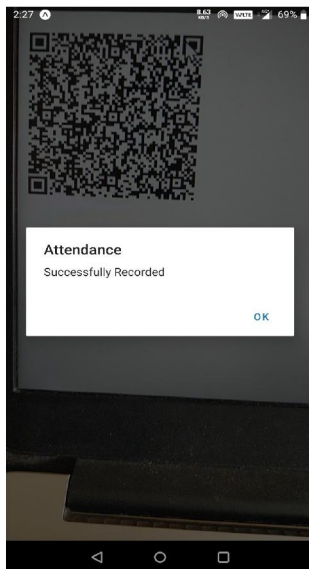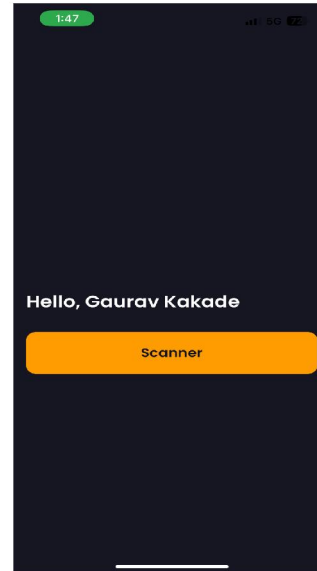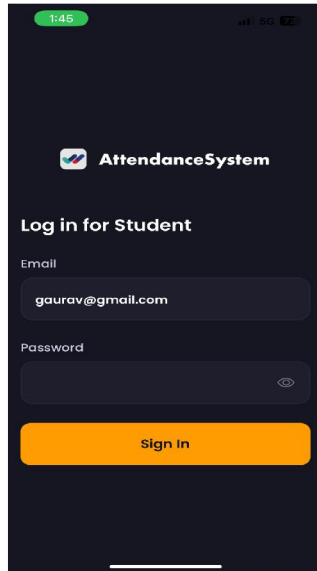
## V. CONCLUSION

In the contemporary educational landscape, staying abreast of technological advancements is essential. Institutions are increasingly seeking to enrich the learning experience through digital innovation. With the trend towards digitalization, the necessity for such a system within universities is becoming apparent. The system outlined in this document

integrates QR codes and internet-enabled devices to streamline student attendance tracking. Our research indicates that QR codes, a versatile component of modern smart devices, offer an effective alternative to the conventional roll-call method. This system was conceived following a comprehensive evaluation of existing manual practices and a comparison with systems employed by other academic institutions. The cost-effective nature of this QR code system facilitates a more rapid attendance recording process, particularly beneficial in larger classes, thereby conserving precious instructional time.

The system in question enhances security measures beyond those of traditional attendance methods, notably by reducing the likelihood of proxy attendance. Despite the existence of comparable solutions, our proposed model stands out for several reasons. Chief among them is its precision and efficiency in database attendance management, accessible via any smart device, thus eliminating paper waste. The adoption of QR codes by both students and faculty is vital to the success of this initiative. Understanding the motivational factors that influence their willingness to utilize QR codes is crucial for effective implementation.

## REFERENCES

[1]. 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. 35–40J.

[2]. 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.

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

[4]. 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

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