



## **SMART ATTENDANCE SYSTEM: An Advanced attendance system using QR code**

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### **ABSTRACT**

*A Smart Attendance System is an advanced solution that automates the process of recording and managing attendance using modern technologies such as biometrics, facial recognition, RFID, QR codes, or mobile applications.*

*Traditional attendance systems, such as manual registers or punch cards, are often time-consuming, prone to errors, and susceptible to fraud (proxy attendance). A smart attendance system leverages innovative technologies to enhance accuracy, security, and efficiency. This system can use facial recognition, fingerprint scanning, or RFID-based authentication to automatically log attendance in real-time. Additionally, cloud-based integration allows remote access, data analytics, and instant reporting.*

*By implementing a smart attendance system, organizations can streamline workforce management, reduce administrative burdens, and improve overall productivity. This technology finds applications in educational institutions, corporate offices, and industrial workplaces, ensuring transparency and efficiency in attendance tracking.*

### **I. INTRODUCTION**

The Smart Attendance System using QR Code is an innovative and modern approach to attendance management that leverages technology to simplify and enhance the process of tracking individuals' presence in educational institutions, workplaces, or events. Traditional methods of marking attendance, such as manual registers or biometric systems, can be time-consuming, prone to errors, and often inefficient. In contrast, a smart attendance system using QR codes provides a more streamlined, secure, and real-time solution. In this system, each individual (student, employee, or participant) is assigned a unique QR code, which can be scanned using a smartphone or a QR code scanner. The moment the code is scanned, the system records the individual's attendance automatically. This eliminates the need for paper-based logs or manual data entry, reducing administrative work and the risk of mistakes. The QR-based system offers several advantages, such as \*speed,

*\*\*accuracy, and \*\*convenience, while also enhancing \*\*security\* and enabling \*real-time tracking\* of attendance data. Additionally, it allows for easy integration with other digital platforms like Learning Management Systems (LMS) or Human Resource (HR) systems, making the management of attendance seamless and effective. Overall, the Smart Attendance System using QR codes not only simplifies attendance-taking but also enables organizations to make more data-driven decisions by providing detailed and up-to-date attendance reports.*

The purpose of the internet-grounded attendance system is to computerize the traditional way of registering attendance and to give an easier and smarter way to track institutions attendance currently,



grounded on a unique law for each professor and pupil known as QR law. At the morning of each course, to confirm their attendance, druggies( professors and scholars) are needed to overlook their unique QR law assigned to them during or at the morning of each lecture, using QR reading bias within the classrooms. Grounded on this, the lecture and pupil attendance record and other necessary data will be recorded. The system will help a lot in perfecting pupil attendance in particular courses they need to attend and will save a lot of time.

## **II. LITERATURE SURVEY**

[2.1] Introduction This bankruptcy evaluations on current gadget, attendance monitoring technology, technology and improvement methodologies. [2.2] Review on Existing System According to appendix A, maximum of the colleges and faculties nevertheless report attendance on attendance sheets. Attendance gadget is really lacking out the evolution. According to Hsarena (2017), University Malaysia Sarawak (UNIMAS) turned into the primary in Malaysia to apply QR Code to report attendance in October 2017 accompanied via way of means of University Technology Petronas (UTP) in January 2018. Attendance System at University Technology Petronas (UTP) Similar gadget has applied on University Technology Petronas and Multimedia University as well. Lecturers will every now and then supply a pop quiz to save you dishonest. No similarly prevention is achieved. . [2.2.1] Related Approach Masalha (2014) proposes that the use of QR code to report attendance with extra safety to save you unauthorized attendance registration the use of multi-aspect authentication, which can be username and password with facial identity test. To make certain that the scholars is gift withinside the elegance whilst scanning the QR code, the place can be test as well. Saraswat (2010) proposes that the use of fingerprint scanner to information attendance.

The proposed solution is by taking attendance using QR Code. 37.5% of respondents think that QR Code solution is the most cost effective. The reason of using QR Code is that it provides low initial cost for implementing the system. By using the tools that everyone student has, smartphone to take attendance. As previously mentioned, the QR code can be employed in almost all fields [14], and thus we find it present in the automotive industry, commercial tracking of goods, transportation tickets, and product price definition, and it is also used extensively by companies as a practical and fast way to access their websites, Through the mobile tag feature, it suffices to indicate that the month of June 2011 witnessed the use of 14 million rapid response codes in the United States of America alone [15], so that we realize the importance of this new technology and the extent of its penetration in our daily life There are many creative ideas in which QR Code can be employed as in 2017: A group of students using QR Code technology improves office services (field study at the Faculty of Science and Technology Library at Mohammed Khudair. Biskra) was aimed at facilitating access to the content of the sources with the possibility of loading the summary or bibliographic data for each container at the Faculty of Science and Technology Library [15].

If we shed light on the economic, social, or educational (academic) field in general, we will realize the extent of its need to introduce modern technology in the conduct of services [21-22]. And we will find that in light of the conditions that the world suffers from due to Covid-19, we urgently need to apply this technology in companies and educational institutions to achieve divergence. Social and privacy of working people and preventing contact between students, so we worked to design a system that deals with the problem of attendance registration and departure for

## **III. OBJECTIVE**

The objective of a \*Smart Attendance System using QR codes\* is to streamline and automate the process of tracking attendance in various environments such as schools, universities, or workplaces. This system aims to:



1. **\*Increase Efficiency\***: Automate the attendance recording process to reduce the time and manual effort involved in taking attendance.
2. **\*Accuracy\***: Minimize human error by using a digital system that automatically records attendance based on scanned QR codes.
3. **\*Real-time Data\***: Provide real-time attendance data, allowing immediate access to attendance records without delays.
4. **\*Enhanced Security\***: Ensure that attendance is taken only by the person physically present, reducing the likelihood of proxy attendance.
5. **\*Easy Integration\***: Allow easy integration with existing digital systems such as learning management systems (LMS) or HR software.
6. **\*Convenience\***: Simplify the attendance process for both students or employees and administrators by utilizing smartphones or other devices to scan QR codes.
7. **\*Track Trends\***: Help monitor attendance patterns over time, aiding in identifying potential issues like chronic absenteeism.

In short, the system makes attendance management more efficient, secure, and data-driven, using QR codes as a quick and convenient way for individuals to mark their presence. The QR code-based attendance system aims to address these challenges by providing a fast, secure, and efficient solution. The system works by generating a unique QR code for each individual or session, which can be scanned using a smartphone or other scanning devices. When the QR code is scanned, the system automatically records the attendance data in real-time and updates it in a centralized database. This reduces the chances of proxy attendance and human error while ensuring quick and accurate data processing. The system can also integrate with other platforms to generate reports, monitor attendance trends, and send notifications to stakeholders. Furthermore, it enhances security by encrypting the QR code data and implementing verification mechanisms to prevent unauthorized access. The smart attendance system not only saves time and effort for both students and faculty but also provides valuable insights into attendance patterns, helping institutions to improve overall management and decision-making processes.

#### **IV. METHODOLOGY USED IN OUR SYSTEM**

To achieve the above discussed objectives, a step-by-step methodology has been followed. The details of methodology are given below: Develop a QR code generator android app using the details of student such as roll number, student ID. Develop an Android app that take the attendance with respect to the specific subject and generate the student attendance sheet as per attendance details.

##### **1. Software requirement**

- Android Studio
- Android OS 4.2+ (Mobile)
- MS Excel

##### **2. Hardware requirement**

- Android Smartphone running Android OS version 4.0.3(API level 15)+

##### **3. Input/output**

- Input: QR code, Bar code
- Output: XLS and CSV sheet

##### **4. Database used**

- Firebase

##### **5. Use case**

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

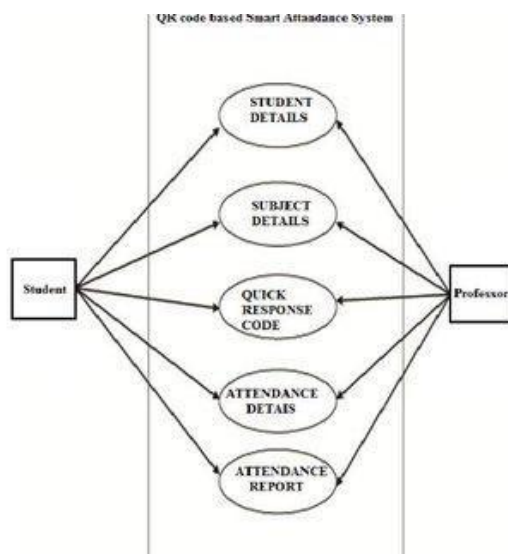


Figure 3.1. USE CASE DIAGRAM

## V. REPORT GENERATION AND INSIGHT

- Start – The process begins.
- Generate QR Code – A unique QR code is created for each user.
- Scan QR Code – The QR code is scanned using a device.
- Valid QR Code?
  - YES – Proceed to the next step.
  - NO – Show an error message and stop the process.
- Record Attendance – If valid, attendance is marked.
- Update Database – The attendance record is updated in the system database.
- End – The process ends.

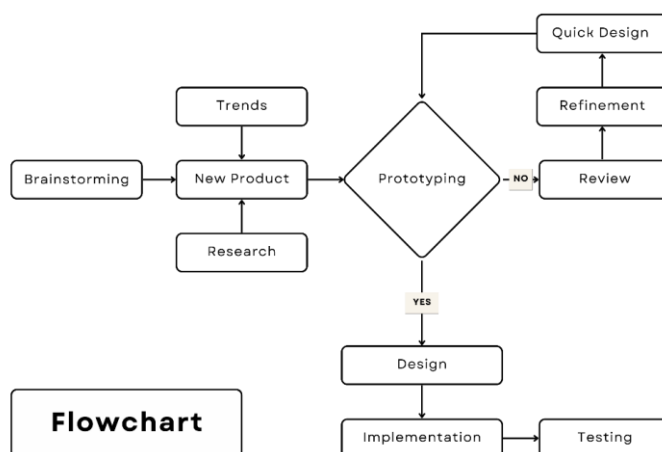


Figure 4.1. Flowchart



## 1. XML (User Interface)

### VI. Purpose:

### VII. TECHNOLOGY USED

- XML (Extensible Markup Language) is used to design the user interface (UI) of the application.
- It defines the layout, buttons, input fields, and other UI elements.

## 2. Java (Backend Logic)

### • Purpose:

- Java handles the core functionality of the app, including:
  - QR code generation
  - QR code scanning and decoding
  - Data processing and validation.

## 3. Firebase (Database & Authentication)

### • Purpose:

- Firebase acts as the backend for:
  - Storing user data (student records, attendance logs)
  - Real-time data syncing
  - User authentication

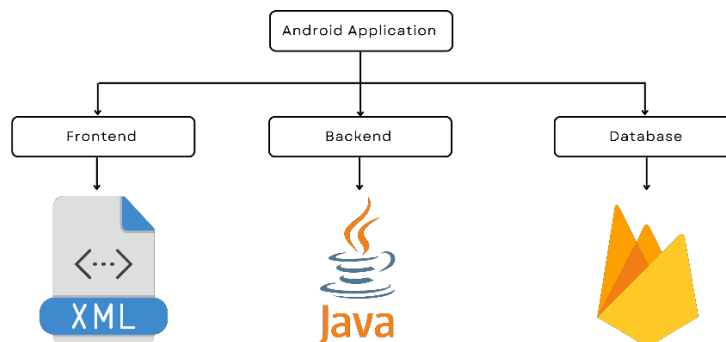


Figure 6.1. Technology used

## VIII. CONCLUSION

These days it is required to keep up with the latest technologies, especially in the field of education. Educational institutions have been looking for ways to enhance the educational process using the latest technologies. Seeing as everything moves towards digitalization, we think that this system is pretty much necessary for the University. The acceptance of QR code by students and educators is critical to the successful implementation of this technology. Therefore, it is important to understand the factors that affect student and lecturer intentions to use the QR code for this purpose.

The developed system presented in this paper has been successfully designed and tested. The student's attendance status will be analysed and exported. Attendance monitoring system is very important in our daily life. It possesses a really great advantage, among the whole types of code scanning technology, QR Code Based Smart Attendance System is the most accurate. In this project report, we have given an introduction of Attendance monitoring system and its advantage. It is an efficient method to store the attendance in the smart phone rather than wasting the paper.

## IX. REFERENCES

- [1] Huang, M. C., Chen, I. P., Huang, H. L., Sung, S. F., & Wang, A. G. (2021). Project Design and Implementation of Face Recognition, Fever Detection, and Attendance Record Based on Sensing Technology. *Sensors and Materials*, 33(6), 1787-1797.
- [2] Reddy, K. P., Latha, R. C., Lohitha, M., Sonia, R., & Usha, A. B. (2021). Smart Attendance Management System Using Face Recognition.
- [3] Shirley, D. R. A., Amruthavarshni, R. B., Durainathan, A., & Karthika, M. P. (2021, May). QR-BASED INVENTORY MANAGEMENT SYSTEM (QR-IMS) OF PASSENGER LUGGAGE USING WEBSITE. In 2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS) (pp. 1180-1185). IEEE
- [4] Yan, L. Y., Tan, G. W. H., Loh, X. M., Hew, J. J., & Ooi, K. B. (2021). QR code and mobile payment: The disruptive forces in retail. *Journal of Retailing and Consumer Services*, 58, 102300.
- [5] Ross, A., Jain, A., & Reisman, J. (2003). A hybrid fingerprint matcher. *Pattern Recognition*, 36(7), 1661-1673.
- [6] Din, Marina Md, and Ahmad Fazal Fazla. "Integration of Web-Based and Mobile Application with QR Code implementation for the library management system." *Journal of Physics: Conference Series*. Vol. 1860. No. 1. IOP Publishing, 2021.
- [7] Ozkaya, E., Ozkaya, H. E., Roxas, J., Bryant, F., & Whitson, D. (2015). Factors affecting consumer usage of QR codes. *Journal of Direct, Data and Digital Marketing Practice*, 16(3), 209-224.
- [8] Pise, S., Moundekar, R., Meshram, R., Mohadikar, S., Durugwar, R., & Banabakode, D. (2019). Implementation of Handling Android Application using SMS (Short Message Service).
- [9] Bagaitkar, K., Lande, K., Welekar, A., Yadav, A., Tambe, A., & Chopade, A. (2019). Tractor Hiring application for Farmers. *International Research Journal of Engineering and Technology*, 6(3), 2401-2409.
- [10] Wong, J. W. (2020). Ecommerce shipping solution for mobile platform (Doctoral dissertation, UTAR).
- [11] Fourment, M., & Gillings, M. R. (2008). A comparison of common programming languages used in bioinformatics. *BMC bioinformatics*, 9(1), 1-9.
- [12]. [http://eprints.utar.edu.my/3386/1/FYP\\_report\\_corrected.pdf](http://eprints.utar.edu.my/3386/1/FYP_report_corrected.pdf)
- [13]. [https://www.researchgate.net/publication/275605455\\_A\\_Students\\_Attendance\\_System\\_Using\\_QR\\_Code](https://www.researchgate.net/publication/275605455_A_Students_Attendance_System_Using_QR_Code)
- [14]. <https://ieeexplore.ieee.org/document/9134225>
- [15]. <https://docs.python.org/3/library/tkinter.html>
- [16]. What is a QR Code?, available at: <https://www.the-qrcode-generator.com/whats-a-qr-code>, last accessed: 07 Jan 2020