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Smart Attendance System Using AR Marker

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Abstract: *In the current scenario smartphones play a vital role in our daily life, In fact they are a part of our lives. Smartphones can now handle the majority of problems fast and easily. Every person's life has been made simpler and easier as a result of it. Basically this paper focuses on the problem which is faced by the faculties and students during the process of attendance and there are more chances of proxies in the traditional method (using pen and papers). The paper proposed a system that will use AR Marker technology and handle the problem for recording the attendance of the students in school and colleges. The suggested system consists of two applications: one for creating the AR Marker by entering class information via faculty, and another for scanning the QR code via students. The teacher will generate the QR code and present it to the students using a projector, after which the students will simply open the second app and scan the QR code to get their attendance. The Smart Attendance System is cost effective because it does not rely on biometric devices which are expensive. The paper explains how the system authenticates students' identities in order to prevent fraudulent registrations. By changing the QR code every five to ten seconds and just for five minutes, the system is able to reduce the proxy level. If any student fails to show up for class, the professor may display the QR code again. The system is in charge of managing and evaluating all students' attendance. In addition, the system will save the attendance data in XLS and CSV files for future use.*

Keyword: Smart Attendance System, AR Marker, Attendance System using QR Code, Software as a Service .

I. INTRODUCTION

We used to take attendance manually with paper and pen, despite the fact that we recognised it was a sluggish and inefficient operation. Students act truant and try to cheat on their attendance by having buddies sign the attendance sheet with their initials. As an alternative, we offered a system that is created for a compatible device that can be used to easily take attendance in schools or colleges using QR codes.

According to Go-Gulf statistics and data, 42 percent of smartphone users are 26 years old on average [1].

As a result of the widespread usage of cellphones among university and college students, this research study addresses the issue of lecture time waste and suggests a solution that promises to minimize it by nearly 90% using QR code technology. Students can use their cellphones to mark their attendance in our app by scanning a QR code that will be displayed by the teacher.

II. RELATED WORKS

In the literature and on the market, there are numerous proposals for Advance Attendance Systems. The majority of them concentrate on apps that must be loaded on the faculty device, whether it is a smartphone or a laptop. We will quickly summarize or mention a few of these proposals in this section.

T. Jamil suggests that software be installed on the instructor's cellphone [2]. It allows it to query students' mobile phones via Bluetooth connection and transfer of students' mobile phones' Media Access Control (MAC) addresses to the instructor's phone, confirming the student's presence.

V. Shehu presented another approach that incorporates real-time facial identification techniques into an existing Learning Management System (LMS) [3]. It automatically detects and registers students who attend a lecture, and this information is kept in a database. The system or programme is a complement for educators, combining machine learning algorithms with configurable ways for tracking facial changes over a longer period of time.

The suggestion by Saraswat, Chitresh Kumar, and Amit uses a fingerprint verification approach [4]. They offer a system that leverages fingerprint verification via the extraction of minutiae technology, as well as a system that automates the entire attendance process.

"Smart Attendance System" is a web application and an Android application that was created to track and store students' attendance in institutions on a regular basis. The faculty members in charge of the disciplines will be in charge of creating the QR code and projecting it to the students using a projector. Each student will use the Android app to scan the QR code.

The admin will provide credentials to each faculty member so that they can access the application. A report of the student's attendance will be generated when it is required, as well as on a monthly basis. The automated attendance system's major goal is to computerize the old technique of recording attendance and provide an efficient, authentic, and automated approach for institutions to mark and track attendance.

III. PROBLEM STATEMENT

- 1) The creation of a method for taking attendance that is both efficient and effective.
- 2) The system should minimize the errors and proxies in attendance.



A. QR Code: Quick Response Code

In today's rapidly changing technological environment, the QR (Quick Response) Code offers a wide range of applications. A QR code is made up of black squares organized in a square grid on a white backdrop that may be read by a camera or other image device. QR codes are used to store large amounts of data in a little amount of area. As a result, we decided to incorporate QR codes into our system and presented a clever approach for taking attendance through QR code. With the embedded QR Code, secure authentication is done utilising data-hiding methods.

IV. DESIGN OF FLOW

A. Overview Architecture

In the form of a flow chart, Figure 7 depicts the general architecture of the suggested methodology. Users first open the app and select their college from the drop-down menu.

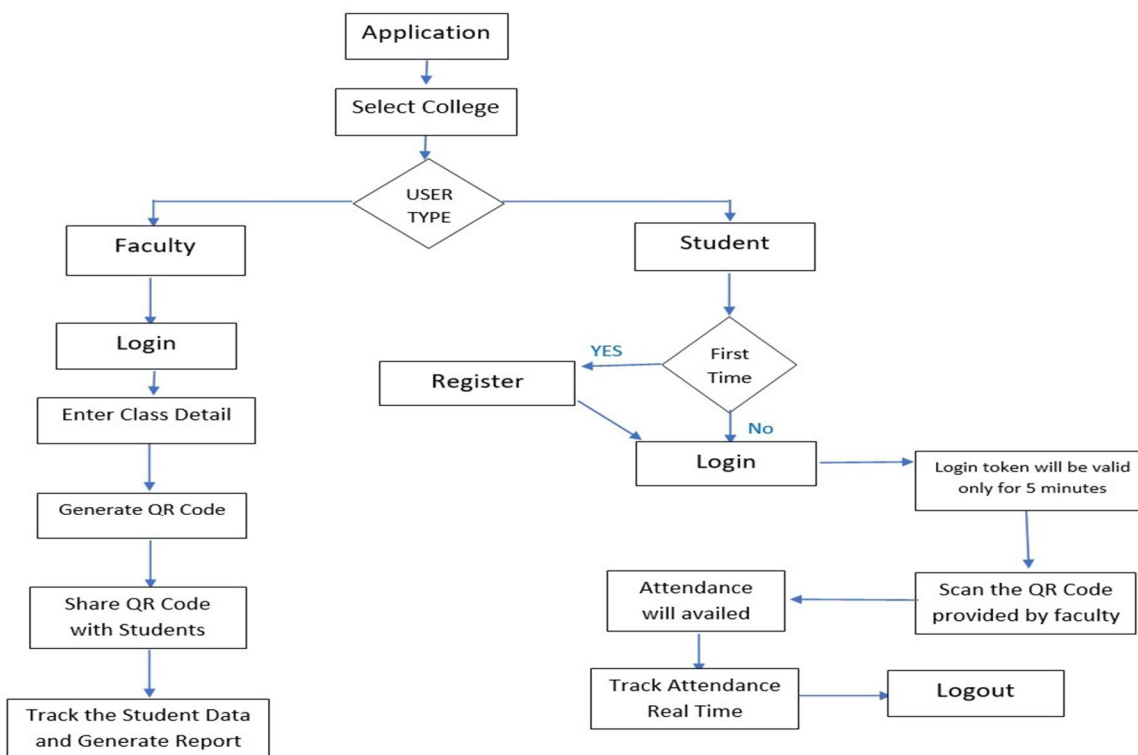
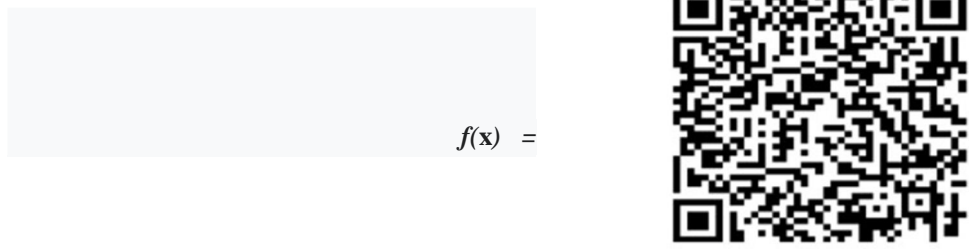


Fig.1 Flow Chart of Proposed Methodology

B. Dynamic Content QrCode Algorithm

The QR code algorithm for dynamic content is based on a number of characteristics that make each QR code unique. The faculty will benefit from this method because it will reduce the likelihood of the same QR code appearing. We use the pass-lecture - name +current date +system-current-millisecond +UII method, which has 15 random and unique variables as well as a unique time function, to make the QR code unique.

1) Functional Representation of Dynamic content QrCode



Here , x is the combination of 15 variables which are random and unique along with a unique time function , which triggers after every 2 seconds and update the QR content

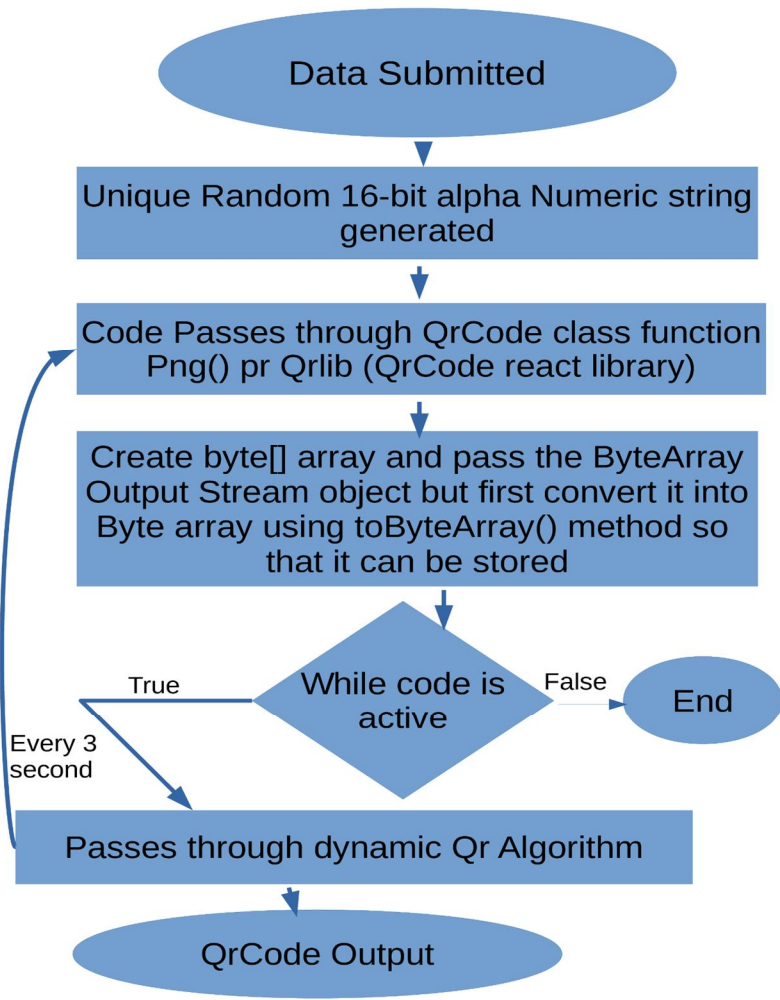


Fig. 2 Block Diagram of QrCode Algorithm

V. METHODOLOGY

A step-by-step process was used to attain the aforementioned objectives.

- 1) Develop a QR code progressive web app for the faculties and students
- 2) Both students and faculties will be registered within our app and get verified.
- 3) Student's mobile identity will also be captured which ensures that students can login to their account only with their own mobile.
- 4) Faculty generate QR code which will use the details like subject, subject code and other necessary details.
- 5) Students scan the QR code and mark their attendance.

VI. RESULT OF PROGRESSIVE WEB APPLICATION

Beta Progressive WebApp Link : <https://smartattendance.netlify.app>

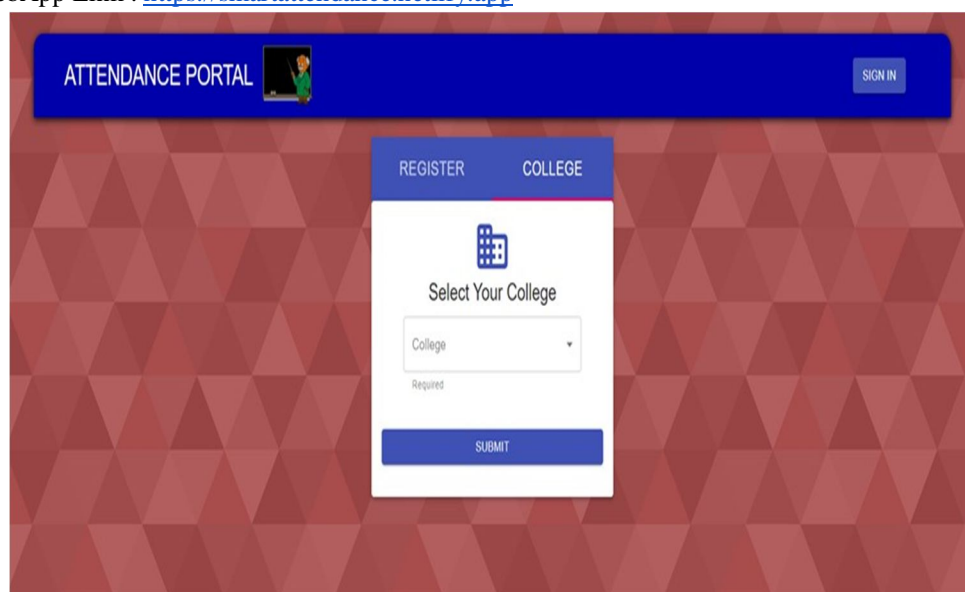


Fig 10. IndexPage of Application

VII. RESULTS

- 1) Both Student and Faculty are authenticated within our application
- 2) Faculties are able to Generate Qr Code of their Subjects
- 3) Dynamic content QrCode is working as expected i.e. it keeps changing every time which implies that students cannot capture active encrypted code.
- 4) Student can mark attendance only in their own classrooms

VIII. CONCLUSION

Attendance recording is a tedious and time-consuming chore that necessitates a lot of paperwork and is frequently inconvenient. It is necessary for educational institutions to adapt to new technology in this digital era. In light of the existing scenario, the paper proposes a cost-effective and efficient method for recording student attendance that reduces human labor. This system is intended for usage in colleges and schools, but it can also be utilized in other workplaces with simple modifications. The method aids productivity, and because it is online, students can track their attendance and teachers can keep track of student attendance with only a few clicks.

IX. FUTURE SCOPES

- 1) We can add multibiometric functionalities to increase the efficiency of the system.
- 2) We can add a location aspect to the system so that only students in the class can get their attendance. We can utilise GPS (Global Positioning System) or WPS (World Positioning System) (Wi-Fi Positioning System).



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