

# Students Attendance Using QR Code

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## ABSTRACT

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Smartphones are becoming a more preferred companions to users than desktops or notebooks. Smartphones are employed to speed up the process of taking attendance by university instructors would save lecturing time. This project proposes a system that is based on a QR code, which is being displayed for students during or at the beginning of each lecture. The students put their attendance with the use of QR code. The attendance output is obtained by excel sheets which can be uploaded for the internals to the university and also sent as mail to the parents. This process reduces the hardware requirement, manual human errors, time consumption and enhances the paperless work and easy information retrieval. AES (ADVANCED ENCRYPTION STANDARD) algorithm is employed for the encryption of student details. The existing systems includes BLUETOOTH, RFID (RADIO FREQUENCY IDENTIFICATION AND DETECTION), FINGERPRINT TECHNOLOGY. The QR CODE processing is much efficient that overcomes many errors of the previous technology that can also be extended to store library dues, internal scores etc and paves way for achieving the "DIGITAL WORLD".

Keywords - QR code, digital attendance, excel sheet, parent's mail

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## I. INTRODUCTION

Students attendance taken by university instructors during every lecture is a time consuming process specifically when the class has greater number in strength. Faculty policies requires attendance to be performed by the instructor in every lecture. Taking into account, out of the total hours which is assigned to a given course, typically forty-five hours is involved per semester, up to eight hours may be lost to take attendance that usually takes around ten minutes per lecture. Statistics shows that 42% of smartphone users are of an average age of 26 years old. Hence, with the widespread usage of smartphones in the university students, this paper resolves the problem of time consuming process waste in the lecture time and also proposes a system that offers to reduce time by almost 90%. The proposed system offers a QR code for the students that has to be scanned via a specific smartphone scanner application. The code with the student identity will confirm the students attendance.

Thus, by the proposed system will not only save time but also efforts which is supposed to be put by instructors for each lecture. This speeds up the process of attendance system and provides much time for the lecture to be delivered properly. The proposed system also takes care of preventing unauthorized attendance by providing head count to every lecture such that we can recognize double count or malpractice. As this follows, we will discuss about some related works in section 2. In section 3, we will give an overview to QR codes. In section 4, we will explain how the system works, and finally in section 5, we will conclude the paper.

## II. RELATED APPROACHES/WORKS

There are many proposed methods for Automatic Attendance Systems in the market. Most of them includes Bluetooth technology, fingerprint sensor, and RFID (RADIO FREQUENCY IDENTIFICATION AND DETECTION). In the section, we will mention briefly few of these proposals. This Reference proposes software which has to be installed in the instructor's mobile telephone that enables to query student's mobile smartphone via Bluetooth connection and transfers the student's mobile smartphone Media Access Control (MAC) addresses to the instructor's mobile telephone to confirm the presence of the student. This Reference is another example on a proposal which employs real time face detection algorithms integrated on an existing Learning Management System (LMS) which automatically detects and registers students presence on a lecture. The system represents a supplemental tool for the instructors, that combines algorithms of machine learning with many adaptive methods that is used to track facial changes during a longer period of time.

This proposal uses a fingerprint verification technique which proposes a system that is based on fingerprint verification which is done by using extraction of minutiae technique and this system automates the whole process of taking attendance. We noticed that many proposals are involved by the instructors during class. Hence, if the attendance system requires some effort from the instructor, then the class lecture will be disturbed every time the instructor allows the late students into the class. On the other hand, our proposal does not require the instructor to do nothing beyond just presenting the slides of the course to students. Hence, students may have to register their presence in the classroom at any time during the class,

mean while having in mind that their registration times are recorded.

### III. QR CODE (QUICK RESPONSE CODE)

QR code (abbreviated from Quick Response Code) is the trademark for the matrix of barcode ( two-dimensional bar code) which is was first designed by the automotive industry in Japan. Bar codes are optical machine-readable labels that are attached to items which records the information related to the items. It was initially patented but however, its patent holder has chosen not to exercise those rights. On recent times ,QR Code system has become popular outside the automotive industry due to its fast readability and greater storage capacity compared to the standard UPC barcodes. This code contains black modules (square dots) arranged in a square grid on a white background. The information encoded is made up of four standardized types ( or "modes") of data (numeric, alphanumeric, byte , Kanji) virtually of any type of data is contained.



FIG.1

A QR code, as shown in Fig.1 is read by an imaging device, such as a camera, scanner application and formatted by algorithms by the underlying software Reed-Solomon error correction such that the image can be appropriately interpreted. Data is then extracted from the patterns present both in horizontal and vertical components of the image. The QR features are listed in table 1. Figure shows a sample of an unencrypted QR code that will be needed by the proposed system.

### IV. THE PROPOSED SYSTEM

This system lies between online e-learning and traditional learning as a facilitation for the attendance management process, in a way by which it enriches the instructor time by which it can better be utilized in providing useful materials to students rather than wasting the time by taking attendance.

The system provides a simple login process by which the class instructor through its Server Module has to generate an encrypted QR code using the LAN connection provided by the university. This can be done at any time before the class start. During the class, or at the beginning,

the instructor displays an encrypted QR code to the students. The students scans the displayed QR code using the system Mobile Module, provided to them through their smartphone . The Mobile Module communicates the information collected to the Staff Module to confirm the students attendance. The whole process would take less than a minute for any student as well as for the whole class in order to complete their attendance confirmation. Smartphones communicates with the server via either the local Wi-Fi coverage offered by the institution or by the internet. As mentioned earlier, the system is composed of staff module by which after the students process of scanning is performed it gets updated in the staff module database which contains the student details along with their specific IP addresses of students smartphones. At the beginning of fresh batch the registration of all the students along with the specific IP address of their smartphones .The students can also view their details in their module also the mobile address. In certain issues where the smartphones are replaced by students or if there is a new admission in class it has to be updates to their instructors in order to make registration. To identify the malpractice or forgery in attendance head count is sent to staffs by which two entries can be identified and necessary actions are involved.

The highlights of proposed system are as follows:-

- This proposed system also highlights by sending the academic year attendance of students to their parents mail which clears all issues or queries from the parents side.
- The instructors are much benefited by reducing the manual errors and also efforts by extracting the attendance by excel sheets at the end of session which can also be uploaded to university for internal phase calculations. That reduces the burden of staffs into half.
- This system is proposed to reduce the hardware requirements which is present in the existing systems.
- The checkbox is present in the student module which confirms the attendance. The system also offers by P for Present, L for Late, and A for Absent in staff module based on their attendance timings provided by the university rules.

This system can also be extended for storing internal marks ,library dues,students activities etc.,in diary format and also be implemented along with e-learning platform that leads to “digital world”

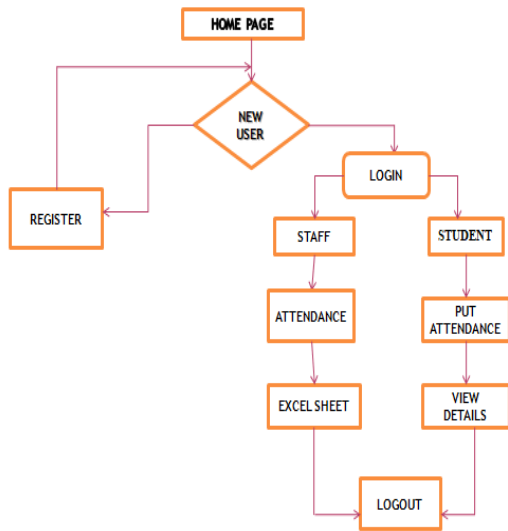


Fig.2 Architecture Diagram



Fig.3 IP Address Of Student

The instructor may recheck any of the student’s presence during the lecture by manually checking the updated attendance list that shows the matching weights during or after class.

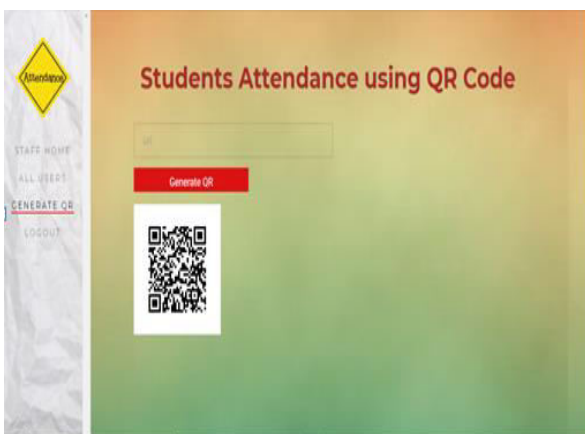


Fig.4 Generation Of QR Code

## V. ANALYSIS

Security measures are involved by AES Algorithm (ADVANCED ENCRYPTION STANDARD). Thus, it is not easy for unauthorized access for the user’s private data such as personal and other financial details and then use that information to perform fraudulent acts. Using a username and password together along with hardware device that only the user makes it harder for any intruders to gain access and steal the users personal data or identity. The proposed system will need three steps from each student. These steps are opening the application, scanning the QR code and confirming the attendance which gets updated in the staff module. Thus, unauthorized users are not possible to get access to changing the presence status of one student. Since it involves specific mobile IP address of the respective students.

However, for taking attendance, the challenge is in the fact that the student can give his/ her smartphone the other one which allows double scanning process of single student. But this can also be resolved by providing head count number to instructors in which double scans is identified, and necessary actions is implemented. The other major advantage is same LAN connection is required to confirm the attendance. Hence by which the student who is at home just by scanning the QR code cannot confirm the attendance, the process requires the same LAN connection that is provided by the university. [6].

S_No	Reg	Name	IP	Time	Date	Status
1	dinesh	2	192.168.1.	7:47 PM	01-04-18	present
2	Bhuvana	3	192.168.1.	7:52 PM	11-04-18	present
3	Bhuvana	3	192.168.1.	7:52 PM	12-04-18	present
4	dinesh	2	192.168.1.	1:04 PM	13-04-18	present
5	sadhan	5	10.143.228	1:19 PM	14-04-18	present
6	DAVID	3	192.168.1.	9:25 AM	15-04-18	present
7	david	1	192.168.1.	1:33 AM	16-04-18	present
8	david	1	192.168.1.	1:36 AM	17-04-18	present
9	david	1	192.168.1.	1:38 AM	18-04-18	present
10	david	1	192.168.1.	11:26 PM	19-02-19	present
11	david	1	192.168.1.	11:28 PM	17-02-19	present

Fig.5 Excel Sheet Attendance View

This system is proposed reduces the hardware requirements that is present in the previous existing systems. The checkbox is also present in the student module that confirms their attendance. The system also provides P for Present, L for Late, and A for Absent for the staff module which is purely based on their attendance timings provided by the university rules. This system can also be extended for storing internal marks, library dues, students activities etc., in diary format and also be implemented along with e-learning platform that leads to “digital world”

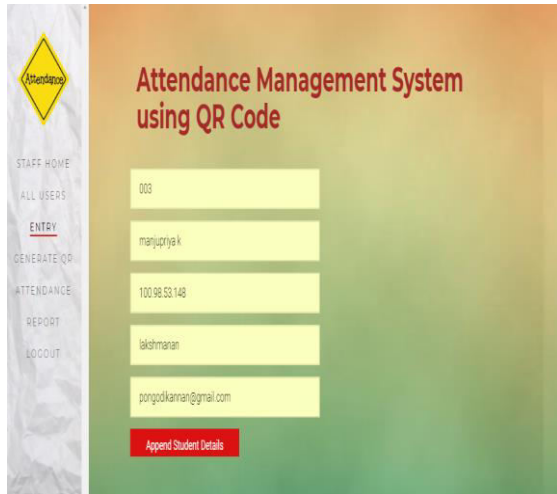


Fig.6 Registration Of Student

Furthermore, as smart phones embrace always-on, ubiquitous in usage. The instructors are much benefited by which the manual errors and also their efforts are reduced. This system also extracts the attendance by excel sheets format at the end of every session that can also be uploaded to university for internal phase or scores calculations for their academic performance. This proposed system reduces the burden of staffs into half. Following the earlier, the system consists of staff module in which after the scanning process of students is performed it gets updated in the staff database which contains the student details along with their specific IP addresses of the respective students smartphones. At the beginning of fresh academic year batch the registration process is performed for all the students along with the specific IP address of their respective smartphones. The students can also view their details in their module along with their mobile address.



Fig.7 Attendance Process

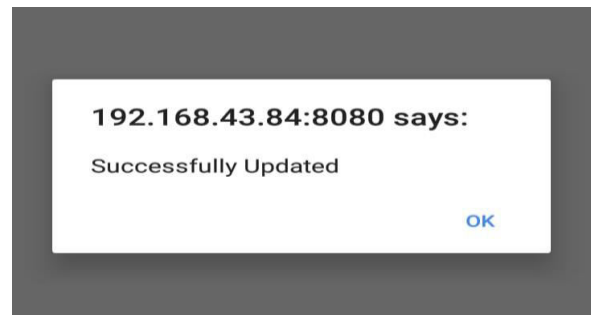


Fig.8 Attendance Confirmation

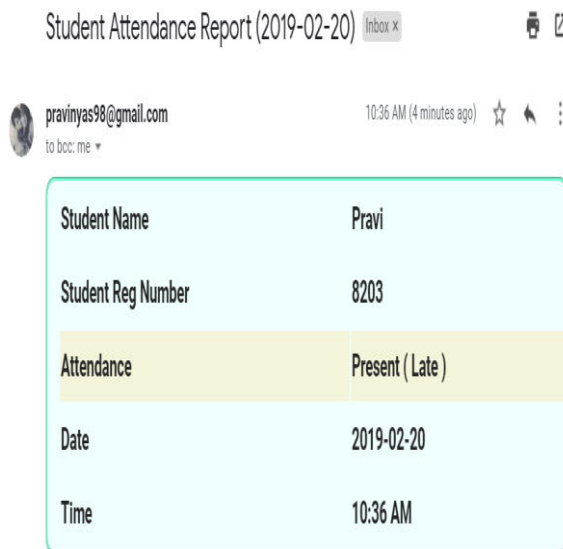


Fig.6 Parent's Mail View

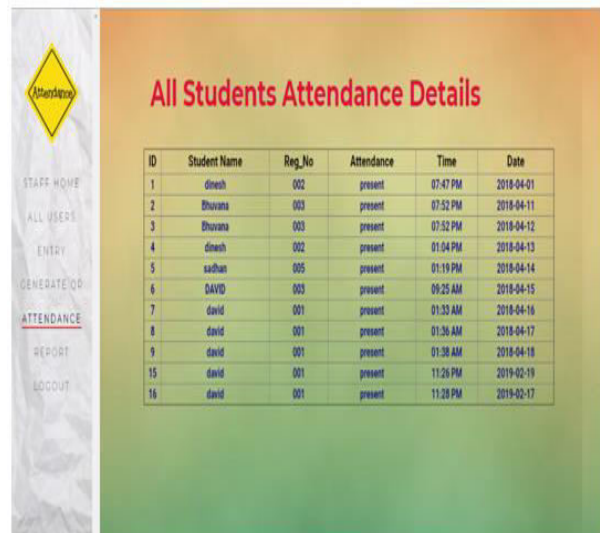


Fig.9 Staff Attendance Database

## VI. CONCLUSION

On recent days it is required in order to keep up with the latest technologies and trends, especially in the field of computer science. Educational institutions are looking



forward to enhance the educational process using the latest technologies by software in reducing manual work. Taking on note at the existing situation, we have thought of using the mobile technology to efficiently benefit from the complete assigned lecture time. Time consumption by instructors to take attendance is viewed sometimes as a waste of the lecture time, especially when classes are of greater in strength. For that, we have proposed a way to automate this attendance management system process using the students smartphone devices rather than implementing the hardware requirements as in existing systems. In other way, the instructor need not do perform extra during the class beyond presenting the slides of the subject that has to be taught to the students. This system provides the entire session for lecture rather than wasting in attendance. This paves way for “DIGITAL WORLD”

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