Information Security Through QR Authentication

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ABSTRACT: The QR code has gained a lot of popularity these days. With the rapid growth in information technology, the QR code has made their way in to the world. This facilitates the QR code in the educational system. In this paper, we are implementing a way of managing of student by creating a Student profile using his basic registration information. This profile can be simultaneously updated and once the registration has been done the student will be provided with a QR code in their mobile and they can use it for the Entry at the gate in their College, Mess, Hostel, library and Attendance. This system also check the regularity of the student in the college if the QR code is not scanned regularly then it will send notification to parent regarding irregularity in the college. Because of this system is to eliminate the gap between the student and the institutional management. Due to this reduces the problem of queue, wastage of time and reduction in paper consumption. This way there is a smoother and systematic management at the student's side as well as the administration side.

KEYWORDS: QR Codes, Quick Response Code, Academic Libraries.

I.INTRODUCTION

The QR code is the quick Response code which was developed by Masahiro Hara from Denso Wave a subsidiary of the Toyota car company in 1994. In 2000, the QR code was established as an international standard by the International Organization for Standardization (ISO). The 2D code was first used in automotive industry to track the inventory (parts of vehicles) throughout its delivery process. From then, it was slowly getting recognized in the industries. The QR code was mainly created to overcome the limitation of a traditional barcode. The 2 dimensional barcodes are much faster as compared to the barcode. The smart phones are used by every member in a family regardless of his/her age. Also in the places like India, from a rich business tycoon to a poor man living in a cottage every person has a mobile phone. Not only the working men and women but also the students studying in schools and colleges make use of an android phone. The purpose can be anything. It can be used for entertainment of communication or any other purpose. In consideration of that, the QR code started making its way in the field of education. The QR codes are very easy to scan as they can be captured from any angle. For scanning a QR code, a QR code scanner is required or they can be easily scanned by any mobile device containing a QR code scanning application. Nowadays, inbuilt QR code scanning applications are by various mobile companies. SO it is not always necessary to go to the play store and download the QR code scanner.

QR codes, the most popular 2D barcodes are widely used for the purposes other than product identifications. The higher data capacity provided by the QR codes can still be enhanced by the use of colors. Even then insecure QR codes make its applications narrow. QR codes made available in public Wi-Fi and LAN networks can be an issue in user privacy.

Taking students attendance by university instructors during each class is a time consuming process especially when classes are big. Some faculty policies require this task to be performed by the instructor in each lecture. In other words, out of the total hours that is assigned to a given course, which is typically forty-five hours per semester, up to eight hours may be lost to perform this process that usually takes around ten minutes per lecture. Statistics shows that 42% of smartphone users have an average age of 26 years old. Thus, with the widespread of smartphone among university students, this paper addresses the problem of such a waste in the lecture time and

proposes a system that offers to reduce it by almost 90%. The proposed solution offers a QR code for the students to scan it via a specific application. The code along with the student identity taken by the application will confirm the students' attendance. This way, the system will save not only time but also efforts that were supposed to be put by instructors during each lecture. It will speed up the process of taking attendance and leave much time for the lecture to be given properly.

The proposed system also takes care of preventing unauthorized attendance registration using multi-factor authentication. That is, it considers "Something you know", "Something you have", and "Something you are" to confirm the student identity. In this project, we are implementing a way of managing of student by creating a Student profile using his basic registration information. This profile can be simultaneously updated and once the registration has been done the student will be provided with a QR code in their mobile and they can use it for the Entry at the gate in their College, Mess, Hostel, library and Attendance purpose. This system also check the regularity of the student in the college if the QR code is not scanned regularly then it will send notification to parent regarding irregularity in the college. Because of this system is to eliminate the gap between the student and the institutional management. This is not only an efficient system but also reduces the problem of queue, wastage of time and reduction in paper consumption. This way, there is a smoother and systematic management at the student's side as well as the administration side.

Therefore, the rest of the paper is organized as follows, such as: in Section II give the literature survey, Section III provides proposed system and explain the actual system. Finally, Section IV, V gives the result and conclusion.

II.LITERATURE SURVEY

There are many proposals for Automatic Monitoring Systems in the literature and in the market. Most of them do focus on applications to be installed on the lecturer device, whether a Smartphone or a laptop. In the section, we will mention briefly few of these proposals Fadi et.al [2] propose software to be installed in the instructor's mobile telephone. It enables it to query student's mobile telephone via Bluetooth connection and, through transfer of students' mobile telephones' Media Access Control (MAC) addresses to the instructor's mobile telephone; presence of the student can be confirmed. Amar et.al [3] is another example on a proposal using real time face detection algorithms integrated on an existing Learning Management System (LMS). We noticed that most proposals do involve applications being used by the instructor during class. Hence, if the Monitoring system requires some action from the instructor, then the class time will be disturbed each time the instructor allows some late students into the class. On the other hand, our proposal does require the instructor to do nothing extra beyond presenting the slides of the course to the students. Hence, students may register their presence at any time they wish during the class, while having in mind that registration times are recorded. Biometric authentication is a "what you are" factor and is based on unique individual characteristics. Two types of biometric properties are useful for authentication. Physical biometrics includes DNA, fingerprints, facial recognition, and eye scans (iris, retina). Behavioral biometrics includes voice recognition and handwritten signatures. The biometric authentication process consists of several stages: measurement, signal processing, pattern matching, and decision making. Environment and usage can affect measurements, Systems are not 100% accurate require integration and/or additional hardware, Cannot be reset once compromised. RFID based student attendance system for a school is no exception to this. To begin with, lets start with pros of RFID attendance system. Each technological development or new innovation or technical advancement has its own particular upsides and downsides. At the point when RFID attendance system came, individuals were pondering about its proficiency, effectiveness and usefulness. But very soon, registers were replaced by rfid attendance systems for students. Just a I-Card embedded with embedded RFID chip became the new norm for student attendance in schools. In the short run, costs of diffusion and implementation for an RFID smart card-based fare collection system can be rather high, An RFID-based fare collection system has the potential of seriously invading people's privacy. Check out the Potential Misuses section of the site to obtain specific examples of this threat, RFID technology ultimately involves software that allows each user to be identified by a central database. This infrastructure will certainly be under attack by hackers.

QR Codes QR-Quick Response codes are one among the most powerful 2D barcodes. The features of QR code like readable from 3600, linking functionality, masking, data restoration functionality, small size, high speed reading etc. The code could handle Japanese and Chinese characters as well. Going to the structure of QR codes the standard QR

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code consists of a Function region, Data Region and a Quiet Zone that separates QR code from other regions. QR codes adopt an arrangement of black and white squares for all the required functions. In particular, each module represents a single bit following a simple rule: black squares store 0 and white squares store 1. The finder patterns, alignment patterns and the timing patterns make QR codes easily detectable as well as decodable. Once the special patterns are set the information to be encoded is then included in the other parts. The encoding type is first identified for the given data and then encoding is done based on that. Due to great features of QR code it is to be implemented for college application.

III.PROPOSED METHODOLOGY

The main objective is to implement a way of managing of student by creating a Student profile using his basic registration information. This profile can be simultaneously updated and once the registration has been done the student will be provided with a QR code and they can use it for the Entry at the gate in their College, Mess, Hostel, and library. Because of this system is to eliminate the gap between the student and the institutional management. This is not only an efficient system but also reduces the problem of queue, wastage of time and reduction in paper consumption. This way, there is a smoother and systematic management at the student's side as well as the administration side.

- **Gui for Student profile**:- Matlab based gui will be developed for student profile
- **Student Profile**:-After registration, the student is enrolled. And the Student Profile is created. This Profile can also work like ID-card.
- **Assigning the code**:- After student enrolment, automatically, a QR code is assigned to the candidate(this QR code is unique for every individual).
- **Registration Complete**: - After the code is assigned, the registration phase gets completed. And the Data is stored in the database
- **Authentication**:-This module provides security to user and only authorized user is able to call the module and access the information.
- **Verification**:-This module is used to verify student information from database.
- **Updating**:-This module cannot be accessed by any student. Only the administrator has the authorization to update the database.
- **Decoding the QR**:-The QR code assigned to the student is to be used at college gate and different places camera is used to scan the QR code and decode the information using matlab.
- **Regular Scanning**:- The QR code given should the scan at college gate regularly otherwise it send the message to the parents that student is not regular in college.
- **Message Sending**:-If student is not regular then the message will be not to parent with the help of Arduino and Gsm module.
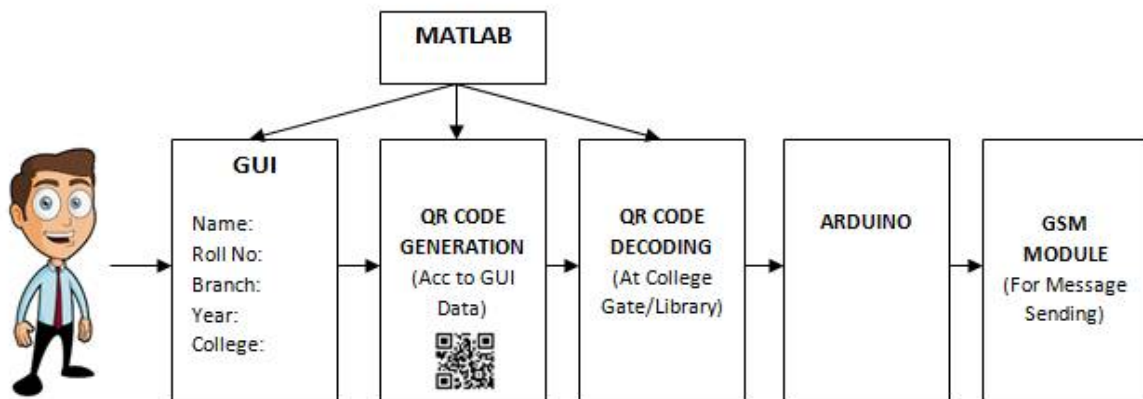
3.1 Block Diagram:

Fig 3.1.1 Block Diagram of Proposed System

3.2 Elements of Block Diagram:

1. Matlab:-

MATLAB (matrix laboratory) is a multi-paradigm numerical computing environment. A proprietary programming language developed by MathWorks, MATLAB allows matrix manipulations, plotting of functions and data, implementation of algorithms, creation of user interfaces, and interfacing with programs written in other languages, including C, C++, C#, Java, Fortran and Python

- Its basic data element is the matrix. A simple integer is considered a matrix of one row and one column. Several mathematical operations that work on arrays or matrices are built-in to the Matlab environment. For example, cross-products, dot-products, determinants, inverse matrices.
- Vectorized operations. Adding two arrays together needs only one command, instead of a for or while loop.

Matlab is been used for gui development, QR code generation, QR code decoding and also been interfaced with arduino.

2. Gui:

Gui for Student profile, Matlab based gui will be developed for student profile containing the Name, Roll no, Branch, Year, College
.

3. QR Code Generation:

QR Code is generated according to the information provided by the student in the gui, the QR Code is generated with the help of matlab and is unique for every student.

4. QR Code Decoding:

The QR code assigned to the student is to be used at college gate and different places, camera is used to scan the QR code and decode the information using matlab. The QR code given should the scan at college gate regularly otherwise it send the message to the parents that student is not regular in college.

5. Arduino:

Arduino is an open source computer hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive

objects that can sense and control objects in the physical and digital world. Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards or Breadboards (*shields*) and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs from personal computers. The microcontrollers are typically programmed using a dialect of features from the programming languages C and C++. In addition to using traditional compiler tool chains, the Arduino project provides an integrated development environment (IDE) based on the Processing language project. Arduino is interfaced with the matlab and then to the gsm module. As the arduino receive the command that the student has not scanned regularly it will send command to gsm module to send message.

6. GSM Module:

GSM Module is interfaced with the arduino as soon as the matlab send the command to the arduino that the student is not scanning regularly then arduino will send command to gsm module to send message.

IV. RESULT

The QR codes for college applications was developed using the above algorithm and was successfully decoded with 95% results. The coding was done in matlab environment and with the help of matlab only the QR code encoding and decoding operations was done. This helps in easy implementation of encoding and decoding Black and White QR codes. The QR codes was generated successfully as per the information field in Gui and decoded too. If the scanning is not done regularly to insure that student is regular in college then the message is sent to parent that she/he is not attending college this is done with the help of arduino and gsm module successfully

V.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. Looking at the existing situation, we have thought of using the technology to efficiently benefit of the system which will beneficial for the student to use QR code for their entry in college, mess, library and for the attendance system too Time taken by instructors to take attendance may be viewed sometimes as a waste of the lecture time, especially when classes are big. For that, we have proposed a way to automate this process using the student's profile.

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