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Quick Response Code Based Smart Attendance System

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ABSTRACT:

Nowadays, smart phones have made everyone's life simpler and easier. This article proposes the use of smart phone-based QR codes to track the attendance of students or employees. Colleges employ mobile attendance systems to reduce the amount of time it takes in recording and maintaining the attendance. Our project combines Google Apps Script and MIT App Inventor to create a mobile attendance system that reduces a lot of paperwork and prevents data loss. On each Student's ID card, a unique QR code will be printed. The QR code mobile app scanner interface is created using MIT App Inventor software. The created Mobile app scanners can now scan and connect with Google Sheets with the help of Google Apps Script platform integrated with Android Barcode Scanner. If the entered data is matched with the data in the database, the system will immediately record the "In time" or "Outtime" of students /employees and display it on the scanner screen. Since the created QR Code Attendance System's portable scanners and database systems are also accessible online by the management, it is extremely practical. Using Google Sheets, one can rapidly generate an accurate attendance report. As a result, the system for tracking student/employee attendance will be more effective and easier to manage. The advantage of using QR Code Attendance System is that it provides an efficient and automated method to track attendance for students using QR Code.

KEYWORDS: QR code, MIT App Inventor, Google Apps Script, Attendance system, QR code based smart attendance system, Database, Google sheets, Java Script, App.

1. INTRODUCTION

There are many methods to register a presence in the market, such as punch cards, fingerprint systems, barcodes and also RFID. Each method has its advantages and the reasons why it is chosen by the management. The traditional attendance management technique requires more effort and time. The shortcomings of the existing system can be remedied with a QR code-based attendance system. Google Apps Script is a fantastic framework for creating applications, with numerous advantages over alternative options. Google Apps Script is similar to Android Studio, but easier to use, which makes it a viable option.

Tracking student attendance is an important aspect of assessing student performance in the classroom (Billah, M. et al. (2017)). The typical method of documenting attendance with pencil and paper in manual registration and subsequent conversion to a desktop application (Mukesh Krishnan, M.B. et al. (2017)). The desktop application is a standalone program that runs on a computer's desktop or laptop. The disadvantage of this approach is that computer systems are not portable and therefore cannot be used anywhere for care tasks (Ibrahim, F. et al. (2018)). As a result, the traditional way of verifying presence is a time-consuming process (Hamzah, N. et al. (2018)). The approach of (Amit. Et al. (2010)) uses a fingerprint verification mechanism. They offer a system that uses minutiae extraction to verify fingerprints and a system that automates the entire presence detection process. Technology has been used to authenticate user identification, as biometrics measuring unique behavioral or physiological characteristics.

The ability to track the existence of an authenticated user during a session is increasingly important. However, this system has several disadvantages such as: B. Cost: a significant investment in biometrics is required for security; Data Breaches - Biometric databases can still be hacked; Tracking and data: Biometric devices such as facial recognition systems can limit user privacy. (Qinghan Xiao. (2019)) Describes a prototype system that uses facial recognition technology to monitor authenticated users or students. Facial recognition was carried out using a technique based on neural networks, while facial recognition was carried out using the method of one's own face. But in this there is also the risk of errors due to errors in technology.

The QR code presence system is easy to use and does not require additional devices such as biometric scanners and can be done using our smartphones. The use of QR codes for assistance systems is the subject of some studies. Students must scan the QR code with their smartphone to demonstrate their presence in class during or at the beginning of each lesson (Hirzallah, N. et al. (2014)). Each course or subject that students must take during the semester has a unique QR code. Students are given a QR code with which they can scan a voucher from each faculty member for each course unit. This is an efficient solution for the attendance system, but it also has some drawbacks as it cannot control the presence of the deputy. Students can share the unique QR code with their friends who are not on campus. You can still log in and mark your participation.

Therefore, the main reason for our proposed solution is to avoid paperwork and the presence of substitutes and to provide a very efficient and inexpensive support system because no additional module other than the smartphone is required. This attendance tracking method can also be used by schools and universities in rural areas as the app is designed to be user friendly and easy to use for anyone (with a smartphone). This method can also be integrated into teaching classes to maintain the attendance list.

2. PROPOSED METHODOLOGY

A structured methodology is used to achieve the project's objectives. This methodology includes

developing an android app for generating QR code using student/employee details; developing a mobile scanner module for scanning the generated QR code; creating a database using Google Sheets for recording and storing attendance with in time and out time. A QR code is a two-dimensional code that can hold hundreds of characters and numbers in a small image and will be printed on the student credential. Attendance is recorded by scanning the QR code using a mobile module scanner operating on Android OS. We've used MIT Inventor and the Android Barcode Scanner integration to create the scanner interface for the mobile application. MIT App Inventor is a user-friendly visual programming environment that allows anyone to design fully functional Android and iOS apps. Its blocks-based tool enables developers to create complex, high-impact programs in a fraction of the time, making it more efficient. sing Google Apps Script, mobile scanning apps are scripted into the database. By scanning the QR code on each student ID card, the system will be able to quickly confirm students' identities. Creating and publishing add-ons for Google Docs, Sheets, Slides, and Forms is straightforward with Google Apps Script. Apps Script lets you to do more with Google, all on a modern JavaScript platform in the cloud, and create solutions to help you collaborate and be more productive.

Google Sheet stores information on students and employees such as their ID/enrolment number, name, in-time, out-of-time, working hours, overtimes (for employees), and less time. All of the information concerning the attendance on a daily basis has been entered into the database that has been built. Google Sheets are collaborative, intelligent, and secure spreadsheets that are ideal for fast-paced businesses. It was designed with the needs of dynamic enterprises in mind. One can utilize AI to gain access to the correct data and make informed business decisions. One can easily collaborate with anybody, anywhere, at any time, this is possible because of its cloud-based design.

The proposed system, MarkIT App has the Google Apps Script code (web application code) running in the background which is linked to the database, Google Sheets. The web application's deployment link (which is generated by deploying the code from Google Apps Script) is then linked to the code of the android application. The person using the android application has the option to click on the Time In and Time Out buttons. These buttons open the QR scanner which scans the QR code (unique for each student) and verifies if it is present in the database, the attendance is marked for the ID (QR code is generated from this ID) of the student/employee. The attendance is marked as the time stamp in the Time In or Time Out section of the database depending on the button clicked. The application is designed in a way that it automatically opens a new sheet in the beginning of every month. The application and data are automated thus making the App dynamic.

The User Interface of the application is mentioned below:

Some of the sample screenshots of the developed Quick Response Code based Attendance application are depicted below inFigures1 to5:

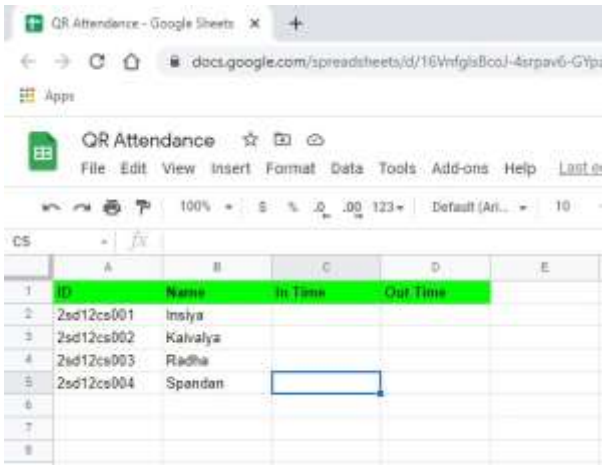

Figure1:"Before in Time"for ID-1

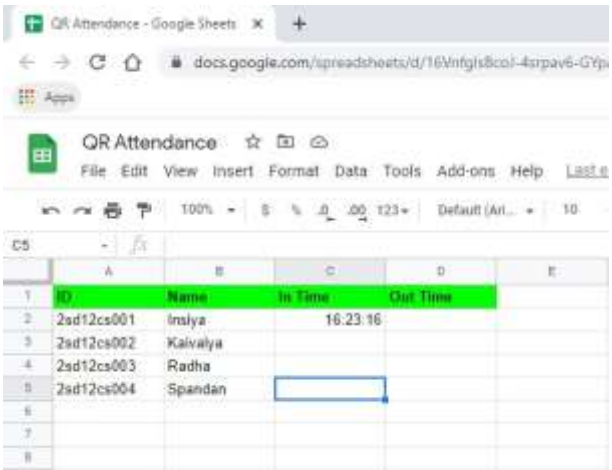

Figure2:The Database View with updated" In Time" for ID-1

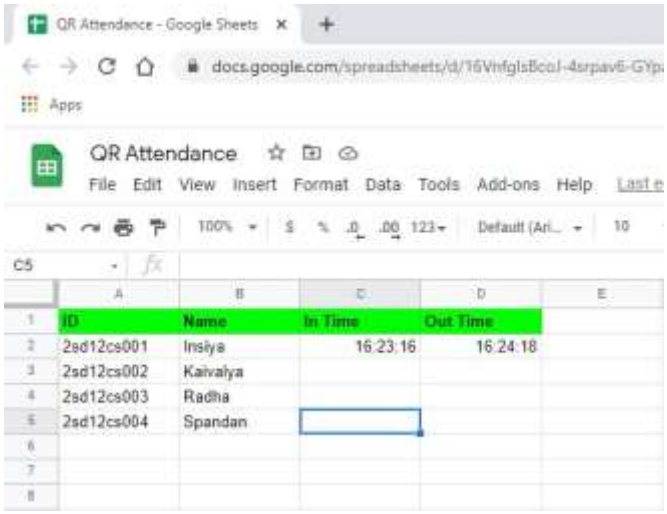

Figure3: The Database View with updated "In Time" and "Out Time"

But if a wrong QR code is scanned ,i.e., the one which is not registered in the database, the result is shown below:

Figure 4: Scanningofunauthorized QR Code ID

3. FLOWCHART

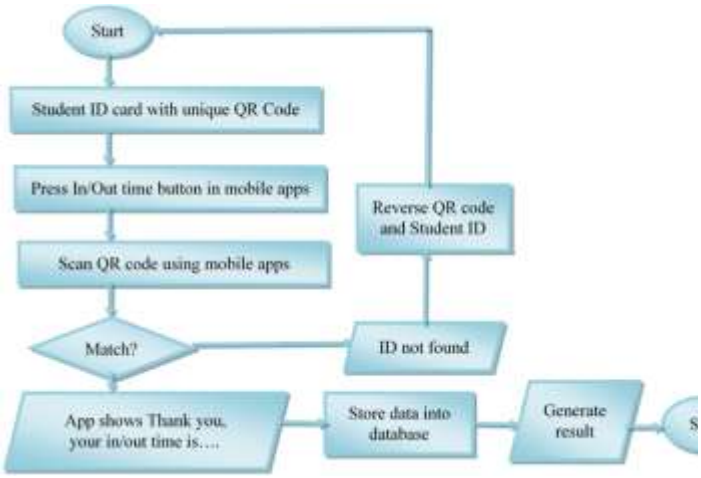

Figure 5: Flowchart: Process Flow of the Proposed Method

Application Demonstration:

Figure 5: Application Interface

Figure6: When the user clicks on the In Time Tab

Figure7: When the user clicks on Out Time Tab.

4. RESULT

The developed system presented in this paper has successfully been tested. The attendance status of each student will be

analyzed and exported in the form of "in time" and "outtime" when the QR code is scanned. In our daily lives, an attendance monitoring system is critical. QR Code Based Smart Attendance System has a significant advantage; among all types of code scanning technology, it is the most accurate. We have discussed the benefits of using a smart attendance monitoring system. It is a more efficient technique of storing attendance on a smart phone rather than was ting paper.

5. CONCLUSION AND FUTURE SCOPE

In conclusion, the developed system has created a more user-friendly method of taking attendance. Attendance can be taken in a variety of situations, including tuition sessions, sports classes, worker check-ins, and so on. As a result, this system offers a wonderful customization feature.

Future Scope: In the future, as part of our effort, students will have access to missed class topics and notes. With more secure and enlarged options, the professor will have complete control. Finally, we came to the conclusion that if our attendance monitoring system is integrated with a face recognition tool, the system will be able to manage real-world attendance problems, implying that Artificial Intelligence and Machine Learning principles will be useful in the future.

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