ATTENDANCE MANAGEMENT SYSTEM USING BLUETOOTH LOW ENERGY

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***Abstract*— The attendance system plays a huge role in every universities, schools and colleges etc. (i.e) Older way of using attendance book based system consumes time and can't be managed for so long. Most educational institutions administrators are concerned about student irregular attendance. Malingering can affect student overall academic performance. The conventional method of taking attendance by calling names or signing on paper is very time consuming and insecure, hence inefficient. Thus our system is to developed and deployed an intelligent system based on mobile phones inbuilt BLE / ULTRASONICS to replace the traditional attendance system which can acquire, store and check information of students and export the data in the form of their attendance record to a centralized database. The new way of digital attendance making both reducing the cost and time and also reduce the time and energy for teachers. This Android Application is developed which helps the administration and the students to view their attendance in real time and the entire system is cheap and reliable. This paper present a fully automated attendance system which can be used to keep attendance log of students in educational institutes. This module is useful to take attendance of students for individual lectures and to produce an attendance report as per the need. This is one of the best way of making attendance system when compared to others.**

I. INTRODUCTION

Nowadays mobile phone users are increased day by day. The attendance system is used to monitor the attendance of students within their class hours and to prepare materials for processing wages. Attendance System is developed for daily student attendance in schools, colleges and institutes. It facilitates to access the attendance information of a particular student in a particular class. The information is stored in the database, which will be provided by the teacher for a particular class. This system will also help in evaluating attendance eligibility criteria of a student. The purpose of developing attendance system is to computerized the tradition way of taking attendance.

Human authentication is the security task whose job is to limit access to physical locations or computer network only to those with authorization. This is done by equipped authorized users with passwords, tokens or using their biometrics. The biometrics also suffers from some inherent limitation and specific security threats. A more practical approach is to combine two or more factor authenticator to reap benefits in security or convenient or both.

One of the critical steps in designing a secure system is protecting the templates of the users that are stored either in a central database or on smart cards. If the template is compromised, it leads to serious security and privacy

threats because unlike passwords, it is not possible for a legitimate user to revoke his /her identifiers and switch to another set of uncompromised identifiers.

This paper gives full of security for user details. The lack of published attacks, combined with various "proven" security properties has been taken by some as a sign that these technologies are ready for deployment**.** Reliable information security mechanisms are required to combat the rising magnitude of identity theft in our society.

While cryptography is a powerful tool to achieve information security, one of the main challenges in cryptosystems is to maintain the secrecy of the cryptographic keys. So we have to proposed an attendance system with BLE / ULTRASONICS to mark their attendance.

Bluetooth Low Energy (**Bluetooth LE**, **BLE**, formerly marketed as **Bluetooth Smart**) is a wireless personal area network technology. Bluetooth Low Energy is intended to provide considerably reduced power consumption and cost while maintaining a similar communication range**.**

Mobile operating systems including IOS, Android, Windows Phone and BlackBerry, as well as MACOS, Linux, Windows 8 and Windows 10, natively support Bluetooth Low Energy.

Ultrasonic is sound waves with frequencies higher than the upper audible limit of human hearing. Ultrasound is no different from 'normal' (audible) sound in its physical properties, except in that humans cannot hear it. This limit varies from person to person and is approximately 20 kilohertz (20,000 hertz) in healthy, young adults. Ultrasound devices operate with frequencies from 20 kHz up to several gigahertz.

Ultrasonic is used in many different fields. Ultrasonic waves are used to detect objects and measure distances. This attendance system is one of the best system to reduce the time and energy for teachers.

II. Related Work

Students monitoring is focused as a major issue. There are several systems existing to update and monitor the attendance. Radio Frequency Identification (RFID) is an existence for attendance update. The motivation of our paper is to make attendance marking and capturing misbehavior students efficiently by giving accurate details on attendance and misbehavior issue's. The paper is developed mainly for institution's that has high population where it's difficult to maintain up to date record on students. By using ultrasonic sensor, student tracking is easier. Android application helps to transform messages from server to officials. Mock-up attendance is gradually decreased.

This paper is presented about a system of recording student attendance using fingerprint identification that allows students to monitor student attendance to class is a true electronically. It can reduce the presence of fraudulent students who are now mostly done by the students and the system can also reduce problems such as the presence of the missing paper and easily damaged. With this system can replace the existing manual system to a more systematic and electronics. This attendance system will be displayed on a computer lecturer with more attractive and graphics and have students complete detail using Microsoft Visual Basic Studio and integrated using the Fingerprint Reader.

In recent trends industries, organizations and many companies are using personal identification strategies like finger print identification, RFID for tracking attendance and etc. Among of all these personal identification strategies face recognition is most natural, less time taken and high efficient one. It's has several applications in attendance management systems and security systems. The main strategy involve in this paper is taking attendance in organizations, industries and etc. using face detection and recognition technology. A time period is settled for taking

the attendance and after completion of time period attendance will directly stores into storage device mechanically without any human intervention. A message will send to absent student parent mobile using GSM technology.

In this paper, we propose a system that takes the attendance of students in the lecture. This system takes the attendance automatically using face recognition. However, it is difficult to estimate the attendance exactly using each result of face recognition independently because the face detection rate is not sufficiently high. In Our paper, we propose a method for estimating the attendance exactly using all the results of face recognition obtained by continuous observation. Continuous observation improves the performance for the estimation of the attendance. We constructed the attendance system based on face recognition, and applied the system to classroom lecture. In our system, we are using raspberry pi. we use Open cv library which is installed in pi for face detection and recognition.

III. PROPOSED METHOD

- In our proposed system we developed mobile phones inbuilt BLE / ULTRASOINC to mark their attendance.
- This system is designed to store user's information like, user id and their attendance data during student enrolment to the institution.
- If any educational institute use this application means that management register the organization details like institution name, admin name, e-mail, password, mobile no and address etc.
- The next process is to sign in our application then specify the role, group and user information. That all information are stored in the database. The student can only view the attendance record on day, weekly, monthly, and whole semester basis. The authorized staff can view as well as modify the attendance record.
- The next stage is the users must login the application by our android phones .Our app follows master / slaves concept. Masters are the faculties, slaves are students.
- If the faculty entering our class means he/she just open the application at the time slaves also open it and click the make attendance button then the BLE / ultrasonic sounds are used from each & every smart phones that waves will transmit the data / unique Id to nearby object.
- The master device will emit the unique id that every slave devices will be listening for it if the unique id matches with the groups authority ID the student is marked present otherwise not.

Software is divided into separately named and addressable components called modules that are integrated to satisfy problem requirements. Modularity is the single attribute of software that allows a program to be intellectually manageable.

The key components of our frameworks are,

1. ADMINISTRATOR
2. USER AUTHENTICATION
3. USER MANAGEMENT
4. USER PASSWORD ENCRYPTION

5. ATTENDANCE TRACKING

1. ADMINISTRATOR:

A system administrator or system admin, is a person who is responsible for the upkeep, configuration, and reliable operation of systems. Here system admin is to sign up our application and give every details of organization.

2. USER AUTHENTICATION:

The user authentication module integrates with our environment to authenticate users by verifying that person is authenticated or not. An authentication module is a plug-in process that collects user information such as user ID and password ,and compares the information against entries in a database .The user information are validated they have granted access to the requested resource. If the user information are not validated and denied access to the requested resource.

3. USER MANAGEMENT:

User management module controls and manages users and administrators. In this module we can create users who have access to extensions and the settings associated with those devices. Users are entities that can be authenticated, each user is assigned with unique identity. In our system we can create and manage multiple users (students/faculties) that is specified as users name, e-mail, password, address, and mobile number for sign up our application.

4. USER PASSWORD ENCRYPTION:

This password encryption is a simple module to encrypt the hashes of user passwords. It provides an extra level of security beyond using a multiple iterations of the algorithm. In our system gives full security to users if encryption is enabled , any existing passwords for users with the chosen roles will be encrypted.

5. ATTENDANCE TRACKING:

This attendance tracking is the main module to place the attendance of the student. So the students gives an attendance to their android phones to click make attendance button the BLE / ULTRASONICS are used from each and every smart phones then that waves will transmit the data to nearby object and check the unique id from the database if it's matches with group authority id the attendance will be marked in the database.

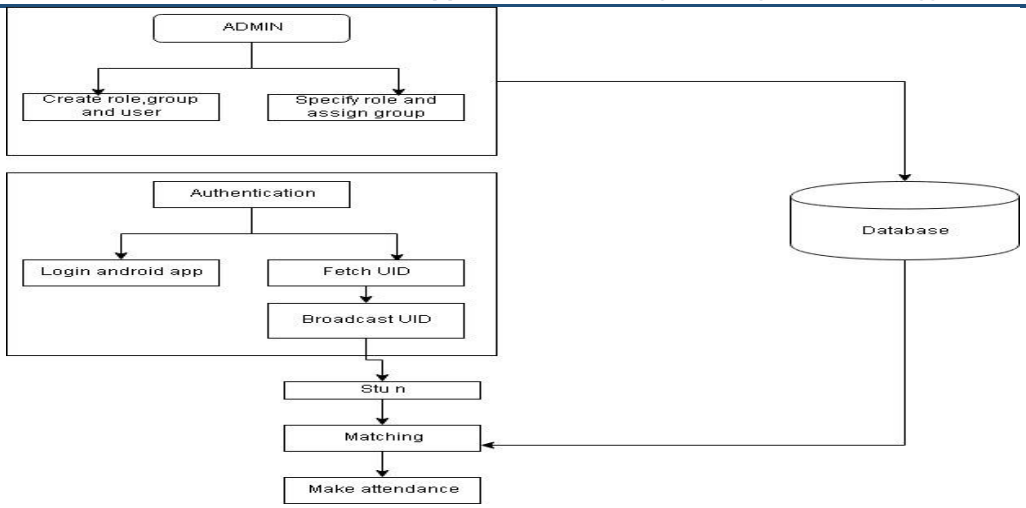

Fig 1. Architecture Diagram

IV. CONCLUSION

[1]. In this paper, we proposed a system of android phone for checking the attendance of students in an automatic fashion.

[2]. Experimental results show that our method can give much better attendance system than traditional methods.

[3]. We seek to design a BLE / ULTRASONIC based system that figures out whether a student with her smartphone is inside of a classroom.

[4]. The key idea of this paper is to make the attendance of students by using BLE / ULTRASONIC sound will listen the data transmitted from nearby object then it check that data in the database.

[5]. If the unique id matches with the groups authority ID the student is marked present otherwise not.

[6]. In the future, we add the extra quality as the parents get attendance alerts, mark of their child through SMS/EMAIL.

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