Innovation in E-Attendance System using Biometrics

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Abstract-In this paper we propose a system that works on an attendance system using biometrics that authenticates the user and marks his/her attendance in the easiest way possible. The current system involves lots of paper work due to manual attendance by the faculty and even the RFID card based attendance system provides scope for proxy attendance. The proposed system is user friendly and complete wireless system that is accessible to students, admin, faculties and parents using a web portal which includes features like timetable generation, daily attendance report, weekly feedback mechanism, notifications to parents, pending approvals for admin and many more.

Keywords-Attendance system, Biometrics, PHP, SQL Server, JSON, Android, Wireless Communication, Push data technology
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I. INTRODUCTION

Fingerprint identification is considered to be the best authentication mechanism for marking an attendance as each of our ten fingerprints is different from one another. Even the identical twins have different fingerprints that make it highly secure medium of authentication. [1]
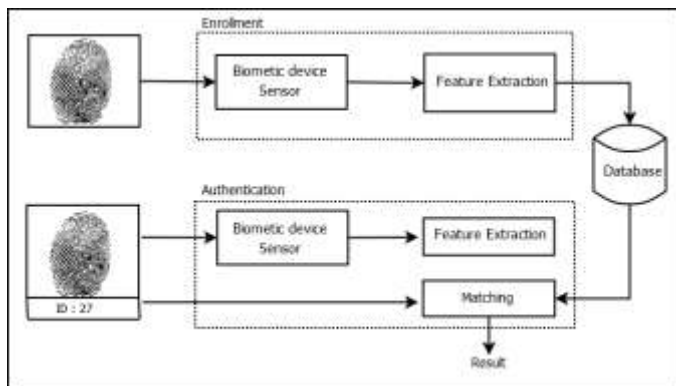

Fig.1. Architecture of Biometric system [1] .

For attendance, the student has to place his finger on the biometric device and if the device prompts out to be verified then the student is marked as present otherwise invalid entry is prompted. Later, the students can view their attendance in the web portal for the day, month and complete semester as well. Anyone having attendance less than 75% is marked as red and needs to improve his attendance for the subject.

II. EXISTING SYSTEM

We have seen over the years that the process of manual attendance is carried out in educational institutions. It promotes proxy attendance and plenty of paperwork to be maintained. Then, the RFID card based system reduced the paper work but couldn't avoid the proxy attendance. These systems were time consuming and insecure. So, the new innovated system is introduced.

III. PROPOSED SYSTEM

Our system focuses on building a flexible user interface that reduce the administrative workload by increasing security and also provide easy communication with students and parents. An android app is installed on the faculty's phone which fetches the timetable for the day. When the faculty selects a lecture, start button is to be pressed which activates the wireless biometric device that is to be circulated among the students during the lecture. Then at the end of the lecture the faculty needs to press the end class button to end the lecture. After that none of the student is able to mark his attendance. A manual attendance mechanism is kept for at the faculty login in case of any problems during class as a backup. This punch data is directly pushed to the SQL Server database using a wireless network and updates the database to calculate the attendance at the backend of the system. Once the admin updates by clicking the calculate attendance button, the attendance is uploaded for every student and he/she can now see their analyzed attendance report of their login. They are now able to view attendance in the form of calendars and

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graphs. Some subjects are being marked as red as the attendance is less than 75%.

The complete system is wirelessly connected using an access point centrally located to gain the information and pass on to the database. The backend involves the PHP and the connection of the android device to the database is done using JSON. [3] The SQL Server is used as it works efficiently in large number of logs data produced every day and gets easily connected to android and PHP. This could be backed up in case of any network failures or the system failures.
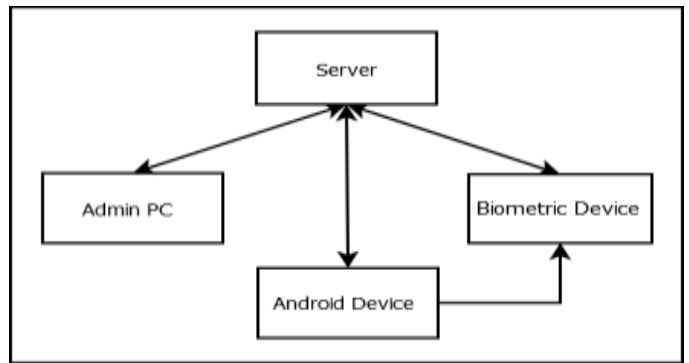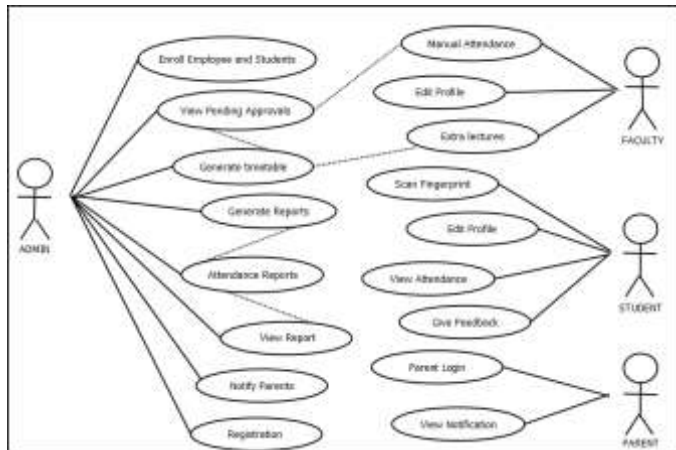

Fig.2. Use Case Diagram of Attendance System

IV. MODULAR DESIGN

The systems of four primary modules named admin, student, faculty and parent. Each of them is having a separate login panel which take them to a specified pages stuffed with featured of attendance records.[2] The admin has the authority to create a timetable by registering the required details. Admin can view complete attendance report of students according to the class and even the attendance report of faculties whether they started lecture on time or not. Moreover, Admin can check the feedback of students and even approve the pending approvals for extra lectures and manual attendance in case of any medical or sports issues. Students can view their attendance report in the tabular format and when clicked on particular subject, he/she can view attendance record for complete month or semester in the form of calendar. This calendar specifies the conducted lectures, attended lectured and absent lectures in a very efficient user-friendly way. Students can also give weekly feedback to the faculty and the overall grade is visible only to the admin. Faculty can ask for extra lectures to admin and mark manual attendance only after the approval of admin. Lastly, Parents are notified to look for the student's attendance report using a randomly generated user id and password.

Fig.3. Hardware connections in System

V. HARDWARE

A biometric device is used for taking input from the students which authenticates with the previously saved fingerprint in the device and prompts out correctly verified otherwise prompts as an invalid entry. This device is connected wirelessly to the SQL Server which gets updated as soon as the fingerprint is authorized using a push data technology. An access point is also used to connect an android device [4], biometric device and admin pc wirelessly. Finally, the analyzed attendance records of the students are visible on the web portal in no time.

VI. RESULT

The proposed system is tested in our university in two classes each of 80 students. It works very well with accurate results. The biometric device does not accept any entry after an end class is triggered from android device. It also updates the data and displays analyzed attendance in best way. [2] The report of each student is obtained in their respective logins and the overall result can be viewed on the admin panel.

VII. CONCLUSION

In this paper, a web portal is presented for monitoring attendance. It offers portability, time-consumption, accuracy and user-friendly approach. It can be implemented in all classrooms connected to a wireless network. Moreover, parents are notified for their wards progress via SMS or e-Mail. [3] Even Admin can approve the pending approvals of students in case of manual attendance by faculty and even for arranging extra lectures at runtime.

VIII. FUTURE SCOPE

In future our system needs to follow all steps in SDLC and produce accurate results. Admin could take some decisions based on the weekly feedback provided by the students like automatically arranging for extra lecture in case of off lecture and both faculties are notified for the same. This system could be developed to get runtime ward present status to parents.

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