Android Based Advanced Attendance Vigilance System Using Wireless Network with Fusion of Bio-metric Fingerprint Authentication

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Abstract— In this digital era, different organizations have started taking attendance using biometric fingerprint authentication. This will keep the track of employee's attendance but the question arises if the employee is fully present at his/her workplace after giving attendance. In this modern era of digitalization, it is seen that after giving attendance a huge number of employees escape away from their workplace and do their personal job in the office time. This paper focuses on a smart attendance system where an android device will be used as a smart ID card. A mobile application is developed in Java to ensure the attendance of an individual employee using bio-metric fingerprint authentication. In addition, the entire working place will be a Wi-Fi zone. So, the connection or disconnection of the android device (Smart ID card) to the router will determine whether an employee is present in the working place or not. A counter will be there into the system to count the total amount of time an employee spends in the working place.

Keywords—Wireless Network, Router, MAC address, Attendance System, Android Based Mobile Application, Fingerprint

I. Introduction

In the recent years, biometric fingerprint authentication has become very popular to identify an individual. Due to its uniqueness and consistency [1], it is widely used in the world. This technology can't be forged easily. It is highly secured.Different organizations use it to identify their employees. It diminishes the proxy giving the attitude of the employees.To identify the employee, the fingerprint sensors are generally set up in front of the entrance or exit door.Sometimes, some employee misuses the advantage of this fingerprint sensor. An employee uses his own fingerprint to open the door for someone else to leave.So, the fingerprint sensor can't ensure the presence of an employee in the workplace.

To reduce the misuse of the hardware, an android application can play a powerful role. As the android application system has made our life smooth and comfortable. In recent years, mobile phones have become one of the popular gadgets and people can't think of their lives without mobile phones for a minute. So, we have developed a fusion of wireless network and fingerprint authentication system as a mobile application.

A mobile application can't ensure the physical presence of an employee inside his workplace. To ensure the physical presence, we need the workplace to be connected to a router. An employee can be able to give his attendance only if he is connected to that specific router. This ensures the physical presence of an employee. A counter will be there in the system which will calculate the time of being present in the workplace as long as someone is connected to the router. When an employee leaves, the device will get disconnected and as soon as it comes into the range of the router (Working place) it will be reconnected again and resume the counting process where it left. The whole system is a fusion of fingerprint authentication system and wireless router where the attendance will be started counting only after an employee is in the router range and gets logged in through fingerprint authentication at the same time. This is a session based log-in system which will randomly get signed out at any time of the working hour and needs the employee to get logged in again through fingerprint authentication within a given time to resume the attendance process. The log in process is session based so that an employee cannot leave the place without the device (Smart ID) as he does not know when the device gets signed out and needs a quick log in to resume the process. Our proposed system can supersede the traditional attendance system through fingerprint technology as it has many advantages such as high accuracy, optimize time complexity and router system [2]. Our proposed advanced attendance system would be ideal for implementation in different organizations for identification and authentication.

The rest of the paper is organized as follows. The literature work of our work is presented in Section II. In Section III, we discuss the need findings, the conceptual architecture of the proposed system. The development of the system is given in Section IV. The result of evaluation of our system is demonstrated in Section V. The discussion, implications, and idea for future work are presented in Section VI. Finally the conclude the paper in Section VII.

II. Literature Review

The manual attendance tracking system for any system is a very tedious and cumbersome process. It consumes a lot of time. Our advanced attendance system will help to get rid of this problem. In this section we have briefly discussed those works which are related to automatize the attendance system.