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DESIGN AND DEVELOP AN INSTITUTIONAL SMART ATTENDANCE SYSTEM BASED ON HEART BIT AND FINGERPRINT BIOMETRIC

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Abstract : Time and Attendance System provides many benefits to organizations, Offices, Colleges. It enables an employer to have full control of all employees working hours. It helps control labour costs by reducing over-payments, which are often caused by transcription error, interpretation error and intentional error. Manual processes are also eliminated as well as the staff needed to maintain them. It is often difficult to comply with labour regulation, but a time and attendance system is invaluable for ensuring compliance with labour regulations regarding proof of attendance. We implement Institutional Smart Attendance System Based On Heart Bit And Fingerprint Biometric. In our system every college has a specific location, which is determine by the Wi-Fi. The location of an staff can be determined by Wi-Fi technology using smart device(Mobile Phone). If the location of staff and the location of college is same (Approx.), then it should be said that, the staff is in the college, then system take input as a fingerprint for performing biometric authentication based on fingerprint and heart bit. When staff goes outside after marking attendance then the notification is send to server by using indoor mapping technique. This system use location as a proof of attendance and proposed a new time and attendance system based on location.

Keywords : authentication, biometric, Fingerprint, confidentiality, integrity, securiyt etc.

I. INTRODUCTION

Today, several institutions of higher learning are using access cards as access control measure to gain access to their institutions and facilities. Security in general term can be considered as the provision of information integrity, confidentiality and available [1]. Security has become a great concern to individual, organizations and the government as they knowledge about the textual description of target images he/she searching for. tend to find a better way to protect their information and valuable assets.

Though, these cards are simple and convenient in terms of usage, they offer the lowest security strength as they are often prone to lost, theft, forget and clone. If compromised, valuable information and asset can be stolen or destroyed. However, every institutional security goal is to protect the students, staff, information and assets. Thus, to strengthen the security level, institutions should provide security measure that is difficult if not impossible to compromise.

This system presents an attendance system which is easier to use and less prone to error and makes use of technologies already existing in institutes. An attendance system should be easy to use by the teachers and students alike [1]. It should not require additional hardware or be incur additional costs.

The attendance system must be less prone to errors or technological failures and should be robust. Digitizing the attendance system allows us to not only calculate the attendance faster but also helps us to track the staff who goes outside of college area after marking attendance. It will also help the teacher to generate salary record as per present days.

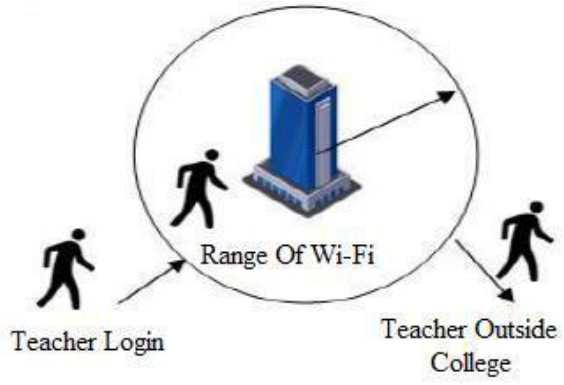

Figure 1. Basic Idea

This paper therefore, proposes an approach to reinforce the security in universities using biometric authentication. Biometric system is an automated method of recognizing a person based on his physiological and behavioral characteristic. It is a system that verifies human identities through characteristics such as fingerprints, faces, retinal pattern, palm, etc. This technology is being used in several

applications such as access control for high security, credit card usage verification, and employee identification.

We designed and implemented a system prototype called Institutional Biometric Authentication System (IBAS) to provide security to students, staff and assets. Additionally, IBAS is generic and can be used to manage attendance, prevent impersonation and other valuable benefits. Biometric security is advantageous as every individual has unique traits that cannot be forged, stolen or lost [2]. That is, it is directly connected to a person because they make use of an individual's unique feature for identification and authentication.

I.1 Goals and Objectives:

i. To make cheats impossible.
ii. To designed and implemented a system prototype called Institutional Biometric Authentication System (IBAS) to provide security to students, staff and assets.
iii. To provide biometric security is advantageous as every individual has unique traits that cannot be forged, stolen or lost
iv. To proposed a staff attendance system based on location criteria and biometric schema for authentication.
v. To get the record of salary of staff as per attendance.
vi. The main objective of our project is to automate the manual attendance system to save the time and eliminate redundant work of entering and calculating attendance on daily basis.
vii. To trace the location of staff if they goes outside of college area after marking attendance.

II. RELETED WORK

A literature review can be refers to as a review of current system that the researcher had done previously and the review of the system that will be developed. Literature review also focuses on the knowledge and ideas established on a topic as well as their strengths and weaknesses. Nowadays, technology is getting better and better to replacing the traditional system to speed up the process by introducing the computerized system. There are few types of attendance system that had been introduced nowadays in school, college, and university.

Traditional staff's attendance is taken manually, done by using attendance sheets given to an officer, in charge of monitoring the staffs' work place attendance and the time they spent on their particular assignments[3]. Unfortunately this practice is revealed to be ineffective as personnel often find their way around it. Resulting in an inaccurately and efficient attendance record keeping from the administration, lectures and other staffs are often paid for time they did not spend on duty. Resulting in bad professional behavior and financial lost.

Over the years the process of manual attendance has been carried out which is not only time consuming but also provides erroneous result. Automated time and attendance monitoring system provides many benefits to organizations. This reduces the need of pen and paper based manual attendance tracking system [6]. Following this thought, we have proposed a smart location based time and attendance tracking system which is implemented on android mobile application on smartphone reducing the need of additional biometric scanner device [7]. The location of an organization has a specific location, which can be determine by the GPS. Each employee's location can be determined by the GPS using smartphone. This location is defined as a key of time and attendance tracking in our system.

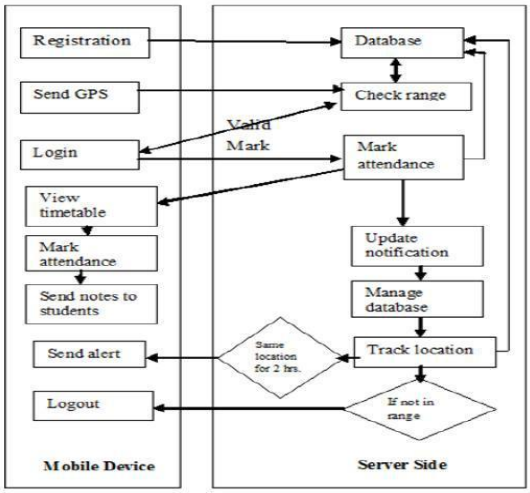

Figure 2. System Flow

III.PROPOSED ALGORITHEM

A. Fingerprint-Matching Algorithm

We propose a fingerprint-matching approach based on genetic algorithms (GA), which tries to find the optimal transformation between two different fingerprints. In order to deal with low-quality fingerprint images, which introduce significant occlusion and clutter of minutiae features, we design a fitness function based on the local properties of each triplet of minutiae.

Algorithm details:

Fingerprint Matching Genetic Algorithms(GA):
Input: Fingerprint image
Output: Authentication

Method:

Step 1: Deal with low-quality fingerprint images.
Step 2: Introduce significant occlusion and clutter of minutiae features.
Step 3: Design a fitness function based on the local properties of each triplet of minutiae. Step 4: Get an image of your finger.

Step 5: Determine whether the pattern of ridges and valleys in this image matches the pattern of ridges and valleys in pre-scanned images.
Step 6: Filtered specific characteristics, which are unique to every fingerprint.
Step 7: Saved as an encrypted biometric key or mathematical representation.
Step 8: Detect image and generate result.
Step 9: Authentication Result.
Step 10: Display Result.

B. Indoor Positioning System Using Wi-Fi

Inside buildings Wi-Fi is a good alternative to GPS, which is not available indoors. In most cases it is easy to install a Wi-Fi positioning system (WPS), since Wi-Fi access points already exist in many buildings. The advantage is that for example existing cash register systems, public hotspots and access points of shops or exhibitors can be used. The user doesn't necessarily have to connect with the Wi-Fi, it is sufficient to have Wi-Fi enabled. The strength of the Wi-Fi signals (received signal strength indication, RSSI) and the MAC address (media access control) are significant. There must be an appropriate app installed on the smartphone which calculates the current position based on these data.

IV. SYSTEM ARCHITECTURE

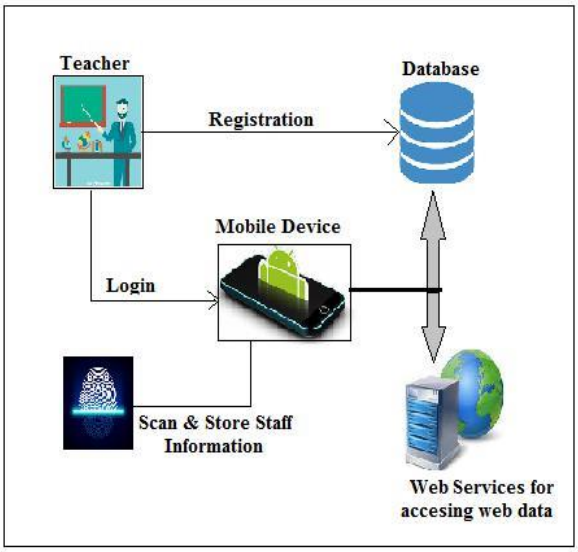

Figure.3 System Architecture

IV 1. Proposed System work:

The proposed system provides a solution to manual attendance taking problem. This system is a location based smart time and attendance tracking system based on the concept of web services which is implemented as an android mobile application. A unique user ID and location (WiFi coordinate) was associated with the application. A time and attendance software was installed on workstation for process the data receive from user mobile and store the information (time, entry and leaving) to the Database.

The user has to install the respective APK files developed for them on their android devices. At first it is important to save the college coordinates by entering the latitude, longitude and radius of area. User has to save the IP (internet protocol) address of the office internet. At the same time one user can save their information through the info menus of the App.

This location based time and attendance tracking system locates your position and logs your login and logout time. As the staff enters his workplace area, the system connects to the office internet and sends the staff id and local time to the server. Then the server gets the local time and stores the information in a database. Again when staff leaves the office area, the system notifies the office server that the staff is leaving.

This system employs four hardware and software components, described as follows. The smart phone is built-in with a WiFi receiver, which can receive radio signals from satellites, respectively. Google maps API (Application Programming Interface) is used here for finding personal meaningful location; based on the GPS readings, the application can perform geo-locationing to estimate the current location of the user [9]. Then the application sends the location and user Id to Time and Attendance Management Software for further process. After processing the data the management software store the information to database.

V. CONCLUSION

In conclusion, fingerprint recognition attendance system will be developed to replace the traditional attendance system that are currently widely using by many colleges and universities. This project will be considered succeed once hybrid staff attendance is developed. This system is designed to make the whole attendance taking and salary generation process to become more reliable, convenient, efficient, and accurate. Besides that, with the implementation of biometric technology will help in reduce errors and attendance data will be able to compile in easier way.

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