ELECTRONIC ATTENDANCE SYSTEM USING NFC

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Abstract- In today's world, efficiency and transparency is what needed to increase the performance and liminate thepresence of fraudulent in a system. Recording and monitoring students' attendance become very important part for any institutions. This paper is presented about an Electronic Attendance System (EAS) using Near Field Communication (NFC). System allows teachers and parents to monitor student attendance electronically. With this system teachers can replace the existing time consuming and inefficient system and eliminate any illegal attendance.

Keywords- Electronic attendance system, Near Field Communication (NFC), and Radio Frequency Identification (RFID).

I. INTRODUCTION

Mostly, in universities and colleges attendance are taken by calling students names, while, in others, passing attendance sheet, where student are asked to sign just next to their names. Both methods have disadvantages. In the first case, for instance, lecturers with large class may find hassle to check all of these students by names and it might take precious time of each lesson; in second case, some students may unintentionally or deliberately sign another student's name or manual signing of attendance by students are troublesome and may distract teacher from teaching [1]. This paper based student attendance registration cause loss of time for students and the teachers and lack student attendance authentication. Therefore, it is essential for educational institutions to have solutions that simplify and increase the speed of data collection and boost the lectures efficiency. Technological enhancements can be useful tools to help in the development of new attendance systems to eliminate the disadvantages of the manual methods while improving its advantages. Bluetooth, Radio Frequency Identification (RFID) and NFC (Near Field Communication) are few of the examples of such tools [4]. In this paper we presentourweb based attendancesystem using Near Field Communication (NFC) technology. The presentation in this paper is organized as follows: Section II presents a review on works done by some researches related to electronic attendance system, which include some latest technology like biometric, RFID and NFC. Section IIIdiscussed about the methodology. The working of the system is explained in Section IV. Results are presented in section V. Finally the last part presents the conclusion.

II. RELATED WORK

Due to the increased number of students in the higher education institutions there is a high demand for the automation of student attendance system. In effort to this, number of reasonable solutions are available that helped in accomplishing this task. For instance, record all the students'attendance via fingerprints[2]. A fingerprint device is used in fingerprint attendance system. The students mark their attendance by inserting their finger on the device's sensor (Figure 1). There are multiple benefits such as ease of access and not requiring any means of entry such as a card. Other than its data recording, this system can also be used as a door lock that can lock and unlock the door upon the user's entry.



Figure1: This device registers the attendance by reading the users fingerprints.

In Radio Frequency Identification (RAFID) based, the method of attendance and entry is the same as the fingerprint reader, the only difference is the tools used, which is the RFID card [3]. The idea of the RFID card is to store data on the card that consists of the user's information. All that data is encrypted into the card which is used as a key to access and record when the user arrived [5]. A NFC is a method to give students and faculty members a key to access to labs, classroom, gym, library, and parking[6]. The NFC is accessible by the user's phone, as shown below in Figure2. Apart for its access capability, it can also be used as a way to pay. This is handy when purchasing a book from the bookstore and getting lunch from the central restaurant. But the reason we are interested in this idea is its ability to register the student's attendance upon entry. It is fast and easy[7].



Figure2: The user can unlock doors, purchase items, and register forattendance by using NFC

III. METHODOLOGY

To clarify the components within our artifact, we drew a sketch to demonstrate how our design works and the processes needed to generate the outputs for our Electronic Attendance System (EAS). As shown in Figure 3, our design uses a number of processes in able to generate the desired data. In our drawing, we clarified what each component's main function is in this design and how each step reflects on the outcome of our design.

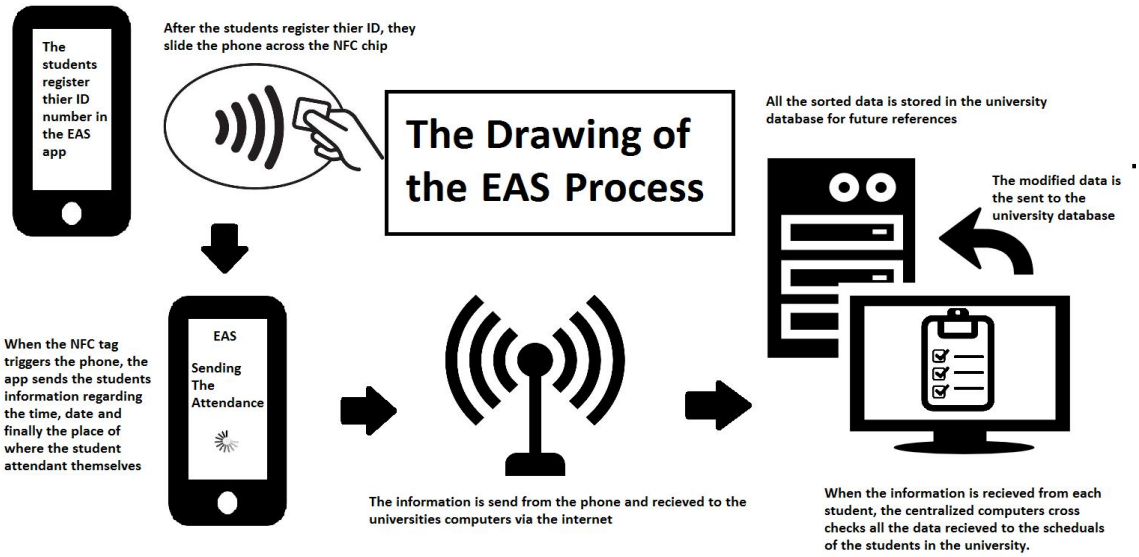


Figure 3: displays the processes that our design undergoes to guarantee an efficient and accurate outcome that is both less time consuming and easy to use

IV. WORKING

To use the EAS, the steps required are both straight forward and simple. All the student needs is the mobile app installed in his or her phone, shown in Figure 4. In able for the students to successfully register themselves using this app, it only takes four easy steps.



Figure 4: shows the icon for the EAS. The app is on the right with the checkmark

1. When opening the app, a pop up window appears. In this pop up window, students are asked to enter their ID number and then press ok.
2. Next screen shows student information such as his or her university ID number.
3. The student slides or brings their mobile phone next to the NFC tag. After the mobile phone is connects to the NFC patch, a sound and another pop up window displays. A message is shown stating that the command for the students' registration is being sent.
4. Finally when the mobile app displays the information regarding the location of where the student is, the app also displays a message, that the attendance was successful or not.

V. RESULTS

We tested our application efficiency to reassure of the outcomes. The benefits we get from testing our artifact is to modify or change certain aspects of the specification until the desired outputs are met. Three team members were given an android based smart phone with the NFC feature.
The devices that were used, in our experiment are:
1. Samsung SII
2. Samsung Note II
3. Sony Xperia

After asking each team member to give his schedule containing the time and what day of the week the students attend the class. We conducted this experiment three times to reassure that our results are realistically accurate.
The results are identical. The devices are all similar in its process time and from the results of the experiment, shown in the Figure 5, the yellow bar which symbolizes the average time of the three results are extremely similar to all the team members. This demonstrates that the device works fast. Even in

the worst case scenario, which is 15 sec., it is still considered fast compared to the traditional method.

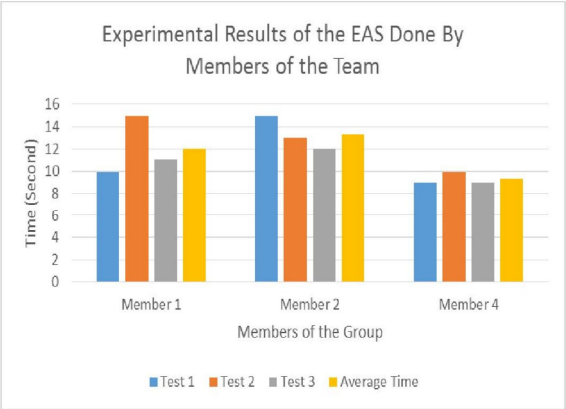


Figure 5: Three of our team members tested the EAS using different phones.

CONCLUSION

Our idea was to take real time students attendance using personal mobile phone without any wastage to time. Using NFC chips on each seat, the app on the mobile phone is used to read the NFC chip. NFC chip has encrypted data that contains information such as the building number, the classroom number, and even the seat number in the case of a student using this attendance system during an exam. Providing teachers a new technology to attains overall attendance of a student directly without any manipulations from attendance sheet. No students can mark attendance for other unintentionally or deliberately. With this idea in mind, we have worked together to make this design idea come to life.

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