

NFC- Based Attendance System

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Abstract: The number of students enrolling in educational institutions is always increasing every year. As the attendance records of a student indicate the punctuality and discipline of a student, teachers use attendance in giving out final grades and so it has become necessary to devise newer and better technologies for recording student attendance and maintaining records. Usually attendance is taken using paper sheets and then the record is manually updated into a register or a system. This method is however time consuming and flawed in many ways. This paper focuses on harnessing the potential of the ever increasing technology of NFC into building a portable attendance system which tries to erase many of the flaws in the conventional method of taking attendance and makes the procedure more concrete and automatic. Portable devices like an NFC enabled smart phone can be used to implement this project.

Keywords: NFC, NFC Card, NFC Card Number, Attendance.

I. INTRODUCTION

For the conventional day to day attendance practise a professor enters the classroom usually and verbally calls out student names in order to mark the student's attendance or pass a sheet of paper where students have to mark their name or sign on it. Both practices have their own disadvantages. In the first case, if the entire strength of the students attend the lesson then verifying individual students by their name and last name might reduce the intended lecture time; also friends of absent students may try to mark their attendance. These practices place lecturers or professors and their colleges at considerable disadvantages when it comes to taking attendance. To correct these flaws, we decided to put the NFC tag into use here[1]. Each NFC tag has a unique ID which cannot be duplicated. These NFC tags are then given to students of every faculty and department in college. While students who enter classrooms touch these tag on lecturer's NFC enabled mobile phone[2], NFC readers program on the lecturer's mobile phone will read individual tags, identify and verify the students from their respective NFC tag[3] and send the attendance data to the lecturer's smart phone[4]. Smart phone, in turn, sends all the attendance data it has collected to the main server[5] by the end of the lecture, or by day end according to the preference of professor. This results into saving of precious lecture time of the professor.

II. PROPOSED SYSTEM

In the proposed system we will try to minimize most of the flaws of the existing system. In the proposed system we use a NFC card as an Identity-Card for students. By using this NFC card we will mark attendance of students. Attendance record of each student with the lecture is stored on main server side. The steps in the proposed system are as follows:-

- NFC card of every individual student will be registered with an Admin. A unique Identity-Card will be assigned to individual student. Chances of duplication will be overcome primarily itself.

- Then lecturer will go for lecture with an NFC enabled phone and the proposed attendance android application preinstalled in it.
- Lecturer will login in the application using his/her username and password. After successful login lecturer will set class time and duration for the attendance record.
- Lecturer passes the smart phone to every individual student. Student has to scan their NFC card on the lecturer's smart phone. When a student scans card on mobile then the application reads card number from NFC card. Android application will send the NFC card number to main server. At main server side student's attendance is recorded for that respective lecture.
- As lecture ends the lecturer will close the application.

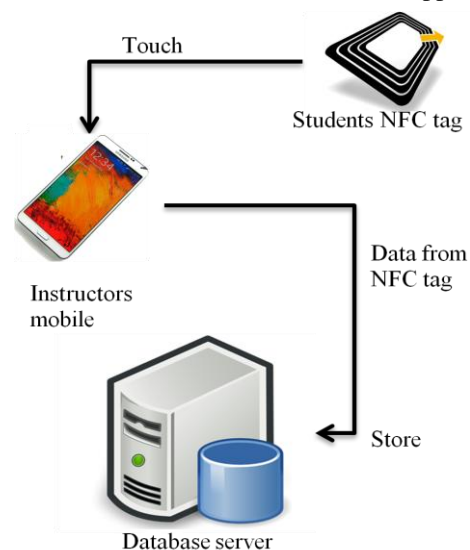


Fig. 1 Architecture Diagram

III. DESIGN AND IMPLEMENTATION

This paper proposes to create a system with one server into which all mobile phones are connected, so that all

data will be saved into one database on mobile phone and sent to the database server on application.



Fig. 1 Login page that appears at start of application

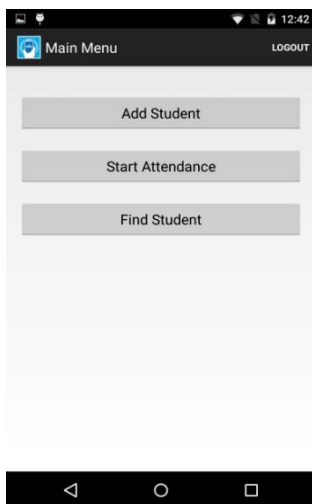


Fig. 2 Main menu page that appears after login

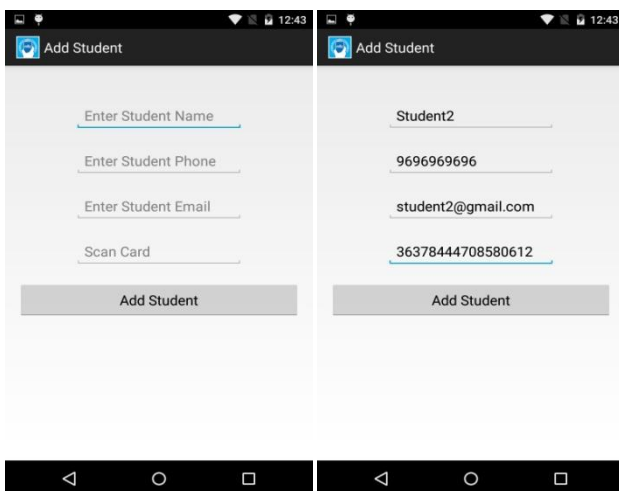


Fig. 3 (a)

Fig. 3 (b)

Fig. 3 Add student pages with and without details

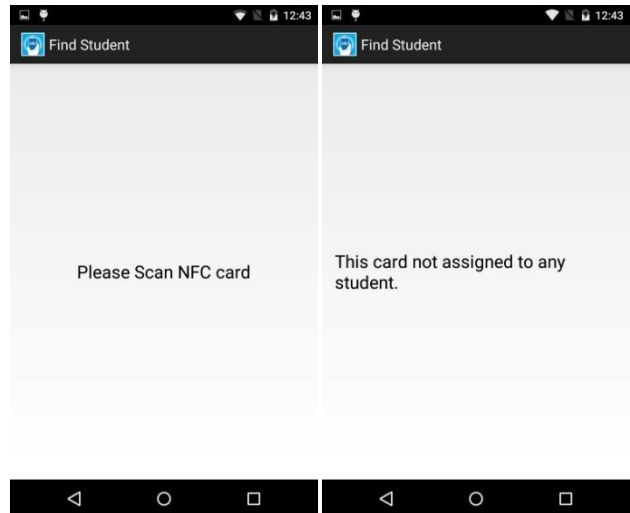


Fig. 4 (a) Prompt for card scan Fig. 4 (b) Invalid card



Fig. 4 (c) Valid card scanned

Fig. 4 Finding a student detail by scanning a NFC card

When students enter the classroom and touch their NFC tag near instructor's mobile phone which is waiting for an NFC scan, the NFC reader on mobile phone automatically reads their NFC tag.

These ID's are sent to the database, SQLite on instructor's mobile phone[7], where system will compare their information with information stored on the SQLite database according to their ID's that have been assigned to them. Eventually, the instructor will submit all the information collected, and the SQLite will have a record of who came and who failed to come to class on any given day and instructor can send the backup data to store in database server.

IV. ADVANTAGE

- This application will be helpful in marking attendance of all students.
- Faculties need not bring attendance sheet as everything is automated[8].

- Attendance will be recorded from the proposed application.
- Attendance will be stored at server side, so it can be accessed from any remote location.
- All colleges can benefit from this[9].
- All records are digital in nature.
- Chances of error are fewer as the system has less manual functions. All calculations are performed automatically.

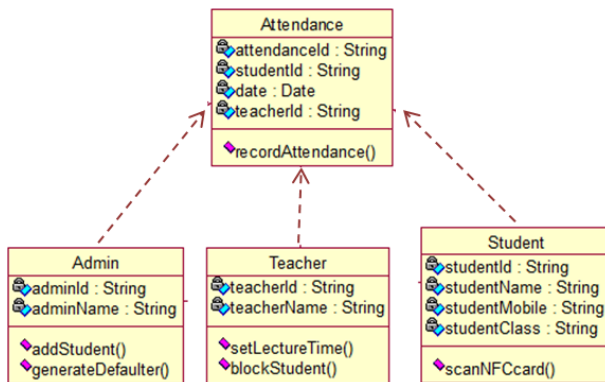


Fig .5 ER Diagram

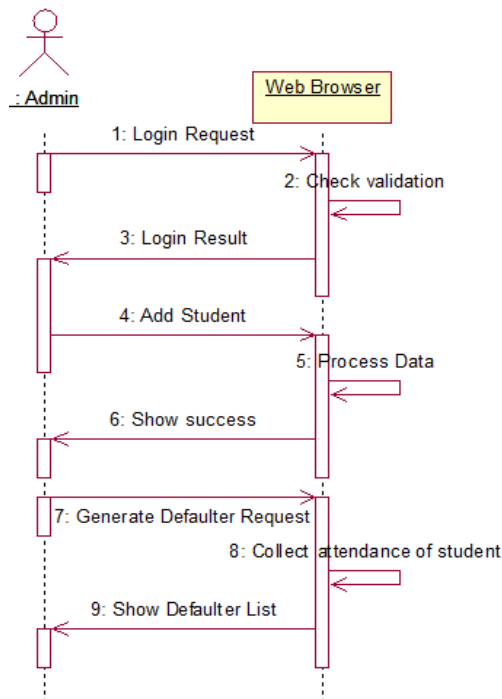


Fig. 6 Admin Sequence Diagram

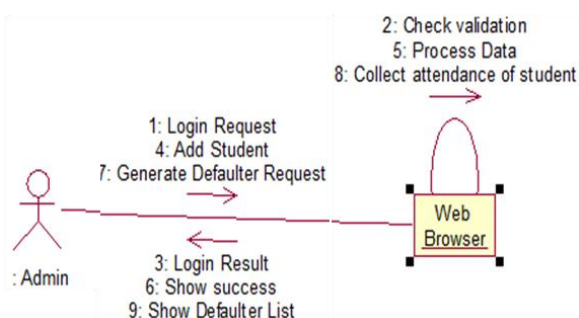


Fig. 7 Admin Collaboration Diagram

V. APPLICATION

- It may be used as attendance system for any educational institution.
- It can be used as payroll system for the corporate industry.
- In future it can be also used for GO card ticketing system.
- Also using NFC we can also utilize money transfer functions as Google provided this new feature support in API 23.
- It can also be used in shopping mall to scan product and add it into a cart.

VI. CONCLUSION

This research has shown that a system relying on NFC technology may be developed. The NFC system is flexible, that is by adding more modules it can also be extended. The tags employed for the proposed system are NFC tags, and the coding has shown reliable and stable outcomes. also, this application has secured important data that we have stored in these tags. These can be put to use at university level and it can replace student Identity cards. As demonstrated, personnel and students, alike can use these tags for multiple purposes. Additional functions can always be added into the proposed system and greater security can be provided to the tags. NFC technology is ever growing, and the time has come for us to harness for ourselves, its potential and abilities. The main aim of this project has been to harness and demonstrate potential usage of NFC technology and build a simple system based on it.

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