

LEAF Automation using Near Field Communication

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Abstract—NFC (Near Field Communication) is a wireless communication technology. When a NFC card and NFC reader are brought together, communication will be established. NFC mainly eludes the problems related to time constraints in the society faced by all. Since a student prevails in using this, he/she need not look aback towards the nook and corners of the institution for the purpose of attendance, library record, hall ticket & fee payments (banking). A student may use the NFC enabled devices against the NFC reader for the domain specified above which makes it supple.

Index terms— Attendance, Examination, Fee Payments, Near Field Communication (NFC), RFID, Smart Phone, Tags.

I. INTRODUCTION

College is one such place where we can make the best use of NFC Technology to make the management system hazel free. Successful college begin by engaging students and making sure that they will come to college regularly and carry out few important things smoothly such as Library renewal, getting Examination hall ticket, Attendance, Fee payments etc. It is hard in an institution to carry out these activities for a large number of students & also it is hazel for students to stand in a Queue for long hours just to get book renewal or paying the fee.

Hence there must be a smart system which takes care of these functionalities & helps institution to monitor the entire system and manage the audit. NFC is a simple technology which could be the solution for this problem.

II. RELATED WORK

There have been some researches that developed technology-based attendance system. Technology-based attendance system are divided into two types; i) Biometric-based Attendance Systems and ii) Sensor-based Attendance Systems.

A. Biometric-Based Attendance System

Biometric based attendance system detect the person's identity based on the features such as fingerprint, hand geometry, voice, etc which distinguishes one person from another. The problem in biometric system is it suitable for highly secured system and also the biometric system is expensive [1]. Kadry and Smaili [2], implemented an attendance system based on iris recognition which takes the attendance using, a) a digital image of one person's eyes is verified and captured b) feature extracting algorithm is carried out c) minutiae are extracted and stored as a template for verifying later; d) people to be verified place his eye on the iris recognition sensor and e) matching algorithm is applied to match minutiae. Talaviya et.al [3], implemented a system that takes the attendance of a student using fingerprint sensor. When the student enrolls his finger on the finger print sensor module, his fingerprint will be matched with the database to mark the attendance. Chintalapti and Raghunadh [4], implemented an attendance management system using the face detection and recognition algorithm. When the student enters the class, his images will be captured by the camera placed in the entrance. The images will be able to find the identity of the student and take the attendance for that student. Biometrics systems are more expensive means of setup and operational costs is high.

B. Sensor-Based Attendance System

In this method, Scanners are required to identify the data that given by each barcode by using light beam and scan directly to barcode. During scanning process, a scanner measures intensity of reflected light at black and white region. A black region will absorb the light at the same time white region will reflect it [1]. Smart card is built with a chip and a memory consisting of byte of information which may range from 1K upto 64K. The information in smart card will be read when a physical contact has a reader [1]. Meng and Mahinderjit [1], implemented an attendance system thar takes attendance by using RFID. Figure 1 shows the system architecture of the RFID attendance system[1].

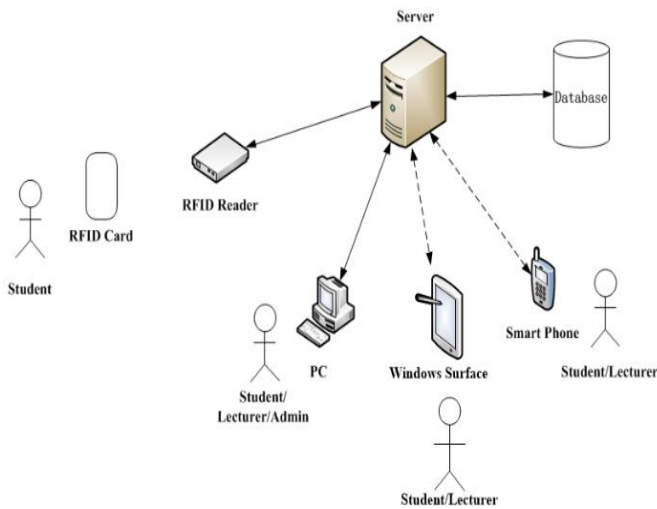


Fig. 1. RFID Attendance System

RFID is an identification method in which identification data will be stored in RFID tags and RFID readers extract these data. As per the figure above, student needs to place his/her RFID tags which contains a unique id number on the reader and their attendance will be taken immediately. Every time the student enters or leaves the class, they need to scan his/her RFID tag with RFID reader. The RFID reader reads the identification code in the RFID tags and transfers the code to the PC, which is connected with USB. A program in PC would retrieve the student's identity from the database using the received identification code. However RFID based attendance systems are expensive and requires additional infrastructure for its operational.

III. NEAR FIELD COMMUNICATION ATTENDANCE SYSTEM OVERVIEW

NFC is a set of protocols which governs communication when an NFC card and reader are brought together communication is established. There is a unique ID for each NFC card corresponding to which the details of each student regarding his Library records, Examination, Attendance and Fee payments details (LEAF) is fetched from the database with the help of a Server scripting and Query languages.

Presently NFC cards are used for the attendance purpose. Here we are trying to implement it for using it for other purposes such as, carrying NFC card which serves the purpose of both ID card and hall ticket during examination, also for the fee payments and library details.

NFC is novel because

1. It is easily implementable
2. Fuss free
3. Cost effective
4. Time saving
5. Tension free

A. Block Diagram

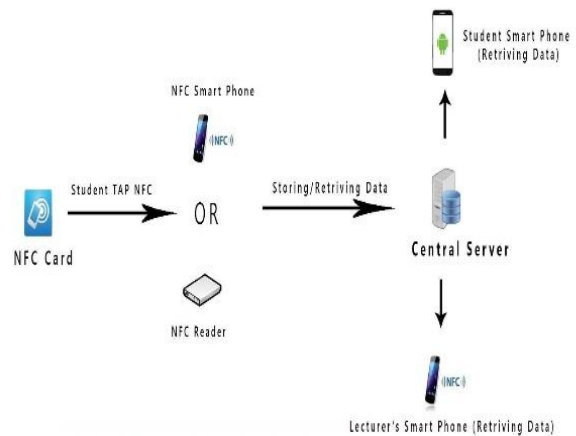
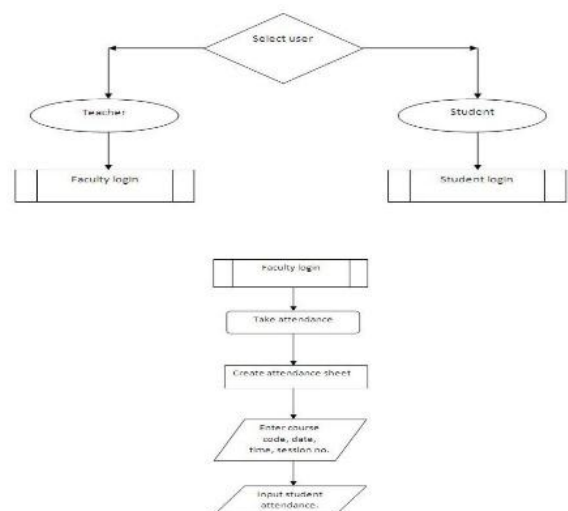


Fig 2. Model Diagram of NFC Smart Attendance/ Banking/ Library

The NFC card can be tapped against an NFC card reader, this triggers the card reader to access data from the card, using this data, the reader contacts the server and attains the relevant data. This is implemented using a query language such as MySQL. For example, when a student uses it in library, the reader retrieves data such as borrowed books, due dates and any fees due for that particular student. Another instance is for fee payment, data such as payment method, bank account details, amount to be paid, any previous dues, etc. the payment process is taken care of by the payment gateway.

The NFC card gives real time updates on student's status on attendance, then status regarding library, examination, fee payment details can be obtained. Not necessary to carry a huge amount to pay the fee or carry the books for the purpose of renewal, & also carry separate ID card & hall ticket for the purpose of examination, as NFC card fulfills all this purpose.

B. Basic Logic Of The System



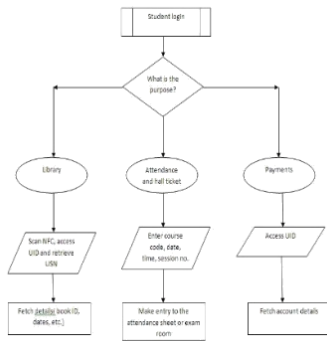


Fig 3. Basic Logic of the System

IV. CONCLUSION

A smart web/android application along with NFC technology could perform library renewal, exam hall ticket collecting process, attendance, fee payment in single tap of NFC tag. NFC has various uses and can be used in campus for efficient and fast transactions of following: Library, Accounts / Banking, Examination section, Canteen and Attendance.

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