

# Near Field Communication (NFC) Based Employee Tracking System (ETS)

Aliva Sanat Maity<sup>1</sup>, Manasi Anand Patil<sup>1</sup>, Rutuja Suresh Jadhav<sup>1</sup>, Rachana Pratap Shinde<sup>1</sup>,  
<sup>2</sup>Prof. Naina Vaity

<sup>1</sup>Graduate student, Dept. of Computer Engineering, Terna Engineering College, Maharashtra, India.

<sup>2</sup>Professor, Dept. of Computer Engineering, Terna Engineering College, Maharashtra, India.

\*\*\*

**Abstract:** This project is aimed at developing a NFC tracker system to monitor the location of every employee and other staff in a workplace. The system is hoped to help organizations to increase the performance of the working environment among all the employee of the organization. Everyone will be provided with a smart ID with embedded NFC tag. NFC reader will be put on certain location at the workplace to locate the employees. This system can be applicable for tracking the employee in an organization if they are slacking in their work time.

**Keywords:** NFC tag, reader, employee tracking system, mobile phone,

## 1. INTRODUCTION

The two major problems faced by college are time consuming manually location checking and very difficult to get the exact location of the Professor. Our project is going to solve these problems by using NFC technology. Near Field Communication (NFC) is a programmed recognizable proof strategy, depending on putting away and remotely recovering information utilizing gadgets called NFC labels. So, the NFC is a remote recognizable proof Ordinarily the NFC framework comprises of two primary parts are NFC Reader and NFC Tag. The system is hoped to help college to increase the performance of the working environment among all the staff of the college. Every staff will be provided with as mart ID with embedded NFC tag. Certain location at the workplace will be put an NFC reader to locate the staffs. This will ease the teachers, students and even the Principal can monitor the staffs and find the staff if he or she is needed immediately. Arise nowadays is that the teachers go in some class to teach and students go and sit in some other class, to remove the misconception this application will be used for locating the teacher at a particular location. The location of the staff is not detected when teachers go out from college area. This project is implemented to ensure the teachers 'current location effectively and to ensure the location of the staff whether the staff is in or out of work place.

## 2. THEORETICAL CONSIDERATION

### 2.1 Introduction of NFC

Near Field Communication (NFC) innovation makes life simpler and more helpful for shoppers around the world by making it. It is less complex to make exchanges, trade computerized substance, and interface electronic gadgets with a touch. NFC is a radio communication standard that empowers remote information exchange between two gadgets at a exceptionally brief separate that is less than 10 centimeters. We require Android 2.3 for running NFC chip on the phone.

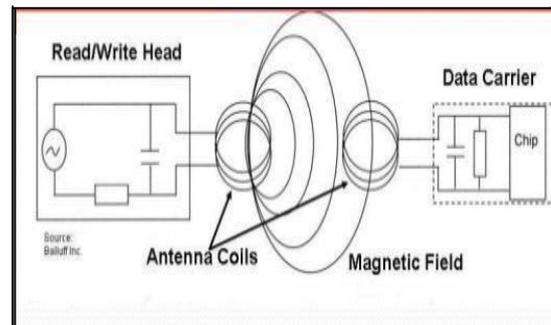


Figure2.1. Block Diagram of Near Field Communication System.

The Near Field Communication basically consists of three components: -

1. Reader
2. Antenna
3. NFC tag

### 2.2 NFC Modes of Communication

Three modes of communication are defined by NFC forum.

1. Read/Write mode
2. Tag emulation mode
3. Peer-to-peer mode

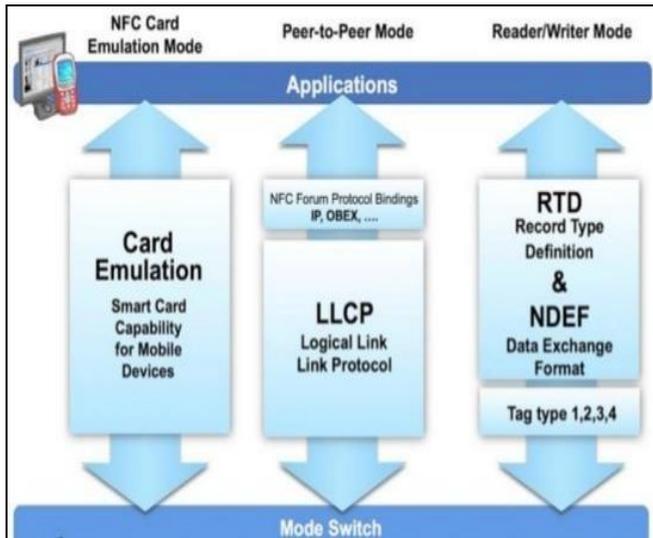


Figure2.2. Modes of Near Field Communication System

### 2.3 NFC Working

There are four ways of how NFC works:

1. Phone to phone
2. Phone to device
3. Phone to tag
4. Phone/Tag to reader

#### 2.3.1 Phone to Phone

In this category two mobile phones equipped with NFC communicate with each other. They can transfer data like music files or pictures by just touching each other.



Figure2.3.1: Phone to Phone NFC Transaction.

#### 2.3.2 Phone to Device

Here NFC equipped mobile phone can communicate with any device. For example, by touching payment device can perform payment transaction.



Figure2.3.2: Phone to Device Transaction

#### 2.3.3 Phone to Tag

The tag contains the data. Normally NFC tags are integrated on posters for marketing purposes. The mobile phone is touched with the NFC tag and the data from the tag is transferred to the mobile phone. This is what we are using in our project.



Figure2.3.3: Phone to Tag Transaction.

#### 2.3.4 Phone to Reader

We can store data using our mobile phones or the tags. The mobile phone can communicate with the external reader by just touching it with the reader.



Figure2.3.4: Phone to Reader NFC Transaction.

### 2.4 Key Benefits of NFC

NFC provides a range of benefits to consumers and businesses such as:

1. Intuitive: NFC interactions require no more than a simple touch Healthcare.
2. Information collection and exchange.
3. Loyalty and coupons
4. Payments
5. Transport

Administrators or developers can know more about NFC through the following factors: -

1. Versatility: NFC is ideally suited to the largest number of industries, environments, and uses.
2. Open and standards-based: The basic layers of NFC innovation take after all around executed ISO, ECMA, and ETSI standards.
3. Technology-enabling: NFC encourages quick and basic setup.
4. inheritant Security: NFC communication is exceptionally brief extend around a few centimeters.
5. Interoperability: NFC works with existing contactless card technologies
6. Security-ready: NFC has built-in capabilities to support secure applications

### 3. SYSTEM ARCHITECTURE

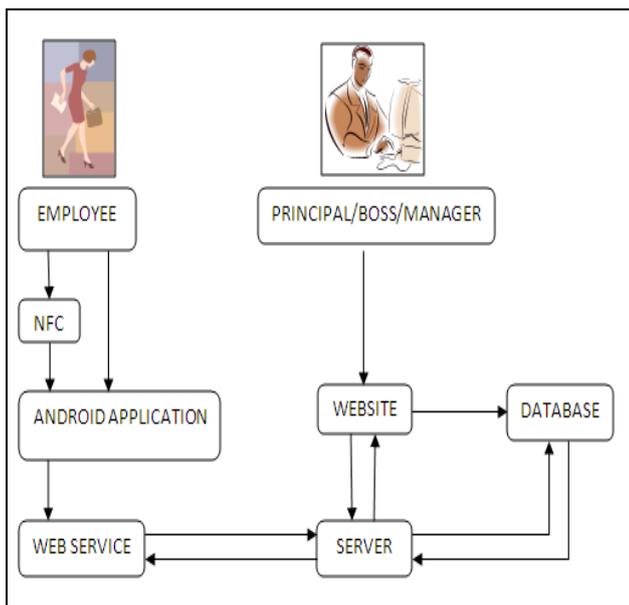


Fig 3. System Architecture

### 4. IMPLIMENTATION

HARDWARE SPECIFICATION:

- NFC tag
- NFC based Android Mobile
- Intel processor IV and above
- 1 GBRAM
- 160 GB hard disk

SOFTWARE REQUIREMENTS:

- Visual Studio 2010
- MS SQL Server 2008
- SDK for Android 4.2
- Windows Operating System
- Android Studio

The aim of project is to develop a system that can partially computerize the work performed by the Employee. Android phone is required with greater version 7.0. This project is developed by using ASP.NET and MySQL.ASP.NET is used as a front end which is use for database access from centralized server. Java programming language and Android SDK, JDK is use for developing the application. MySQL Server 2008 is a back-end database used to access data from server.

### 5. WORK FLOW

The system software is mainly consisting of following two modules.

- ❖ Recorder
- ❖ Administrator

Recorder module is responsible for controlling NFC readers, getting detected tags from readers, authorizing and storing them into database. The recorder application is mainly responsible for controlling NFC Readers, taking the raw data from the authorized tags through NFC readers, filtering data & storing the data into the database. This data would be used to generate attendance report of employees. This also continuously monitors the presence of employees and displays the time and name of the tag holder.

Administrator module i.e. the website and the android application is responsible for employee registration. The administrator has the access to update, add and delete the records and the boss or principal can view the daily report.

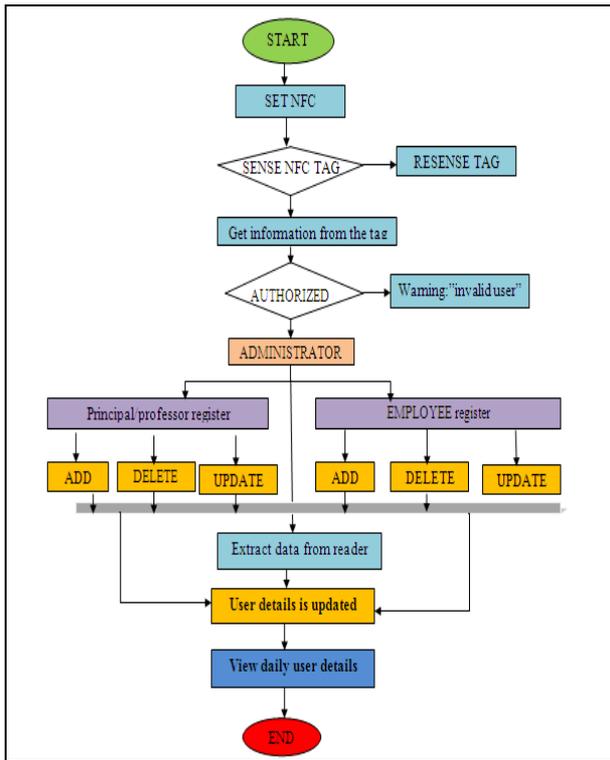


Fig: Flow chart of the proposed NFC tracing system

## 6. APPLICATIONS

This application can be used in many organizations like IT industry, hospitals and etc. for monitoring the employee performance.

Field service management is possible. Manager can access real-time locations of employee. It can be used in colleges for students to track their attendance to minimize the bunking of lectures.

## 7. RESULT

The client should be able to connect to the server properly without any problems. The connection establishment between the mobile device and the server should take minimal time. The mobile device should be able receive data from the server uninterruptedly. Information provided by the application should be correct and as per the user's need. Thus, NFC Tracker System is to ensure the professors' time in/out, to track the location of the staff at specific location at the workplace during work hours.

This system also is to ease the administration or college to monitor their employee immediately from the record in database besides building an effective system that automatically record and update location of the employee in real-time that will allow its supervisor like the coordinators or even the principal to see changes as soon as they occur, rather than waiting for updates to be visible at some later.

## 8. CONCLUSION

The NFC Based Employee Tracking System could automatically detect the identities of the employees and will perform the Location Tracking. The system could automatically make a log of all the timings and as well as details of the employee. These will be the major achievements met in the project, among other objectives also achieved which include report generation patron daily and monthly basis and establish remote database connection. Reading items and object sin motion can be done accurately using NFC.A system developed with a login windows enables security and the overall cost of implementing the system may seem high but after year of running the system, very high benefits will be realized. The whole system is very convenient and saves much on time.

This system is made to track an individual in a certain area that is to track professors in a college. So, for the future this system can be used in any organization that is a company, school, university or even the hospital.

## REFERENCES

- [1] Beginning NFC: Near Field Communication with Arduino, Android, and Phone Gap by Tom Igor, Don Coleman, and Brian Jepson.
- [2] Field Communication (NFC) by Hussein Ahmad Al-Of eishat Mohammad A.A.A L Raba bah, Al Balga APPLIED University Department of Computer Engineering, Northern Border University Faculty of Computing and Information Technology.
- [3] RFID by Contributors: Bichlien Hoang, Ashley Caudill, initially distributed on the IEEE Emerging Technology portal, 2006-2012. Visit: <http://www.ieee.org/go/emergingtech>.
- [4] Radio Frequency Identification (RFID) Based Employee Monitoring System (EMS) Saumya Sharma\*, Shimi S.L.A and S.Chatterji. Saumya Sharma, Dept. of Electrical Engg Nitttr, Chandigarh India Accepted 10 Sept 2014, Available online 01 Oct 2014, Vol.4, No.5 (Oct 2014)
- [5] Employee Monitoring System Using Android Smartphone Prof. Rachana Sabale, Pranjal Pawar, Sana Sayyed, Aishwarya Kadadekar, Pavan Kawade Department of Computer Engineering, SavitribaiPhule Pune University G.H.R.I.E.T., Wagholi, Pune, India