# Tracking Personnel using NFC Devices: A Study on the Feasibility and Benefits

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**Abstract –**

*In today's fast-paced world, tracking personnel has become a necessity for various organizations, especially in industries such as Police Department, and security. The use of Near Field Communication (NFC) devices has emerged as a promising technology for tracking personnel. This paper presents a study on the feasibility and benefits of tracking personnel using NFC devices.*

*Our study is based on NFC (Near Field Communication) which is a wireless communication technology that allows two devices to exchange data when they are brought into close proximity.*

*NFC devices has mainly three main components on which its concept is based reader/writer mode, peer-to-peer mode, and card emulation mode.*

*NFC when used in reader/writer mode NFC device can read from NFC transponders or NFC writer. NFC when used in peer-to-peer mode NFC can be used to exchange information between two NFC enabled devices and in card emulation mode NFC device can be used with Contactless Card for various purposes like paying money or exchanging information*

*Security of NFC device can be ensured by various means of encryption and now we have new web3 technology which can*

## 1. INTRODUCTION

The experiment involves equipping personnel with NFC-enabled ID badges, which were scanned at different checkpoints throughout the Event location. The data collected will be analysed to determine the feasibility of tracking personnel using NFC devices, as well as the benefits that can be achieved.

The results of the study showed that NFC technology is a feasible and effective way of tracking personnel. The use of NFC devices resulted in improved efficiency, reduced errors, and enhanced security. The data collected allowed for a better understanding of personnel movement, which can be used to optimize staffing levels and improve workflow The study also identified some challenges associated with the implementation of NFC technology, such as the need for appropriate training and maintenance of the devices. However, the benefits of using NFC technology far outweighed the challenges, making it a viable option for tracking personnel.

This paper concludes that the use of NFC technology for tracking personnel is a promising approach that can benefit various industries. The study recommends that organizations adopt NFC technology for personnel tracking to achieve improved efficiency, reduced errors, and enhanced security

### 1.1 Objectives of the Project

Tracking personnel has become a crucial aspect of many organizations in various industries. The need for tracking personnel arises from the need to improve efficiency, reduce errors, and enhance security. In industries such as Police Department, security, and manufacturing, tracking personnel is critical to ensure optimal functioning and productivity.

Our project is going to solve these problems by using NFC technology. Near field communication (NFC) is an automatic identification method, relying on storing and remotely retrieving data using devices called NFC tags or transponders. So, the NFC is a wireless identification Normally the NFC system comprises of two main parts are NFC Reader and NFC Tag.

Near Field Communication (NFC) is still an developing technology which can be used to revolutionize tracking of Personnels in Police Department. NFC is still being developed and can be used for various purposes. Data that will be collected from NFC reader through NFC Writer will be used to track the movement of Police Personnels in Events or festivals.

We can provide the officers a NFC enabled device which can track the live positions of the officers. The live feed of current position will be directly sent to higher authority. We will use NFC instead of native GPS system because NFC will be more precise for the small area tracking as well as for identification.

### 1.2 Objectives of the Project

When there is a Festival or event where Police officers are positioned on ground duty. Sometimes it happens that the officers leave their positions and roam around here and there and don't hold their positions.

One of the automatic identification technologies that is more popular right now is near field communication (NFC).

In order to fully utilize this technology, there is extensive research and development being done in this field. In the upcoming years, several new applications and research areas will continue to emerge.

New technologies like NFC, wireless, Bluetooth, Robot are developed and many new technologies are being developed in a developing country like ours. Therefore, these technologies can be to ensure the employee time in/out, to track the location of the staff at specific location at workplace during work hour. In addition to creating an efficient system that automatically records and updates the location of the employee in real-time, this system helps the administration, managers, or boss to monitor and their employees immediately from the record in the database. This will allow its manager, boss, or supervisor to see changes as soon as they occur, rather than waiting for updates to be visible at a later date.

The purpose of this project is to solve the problems that arises when the personnel are not present at their allocated location which leads to unavoidable circumstances which could be avoided. This system implemented because wasting time, energy and fuel of higher authorities is not a good idea.

### 1.3 Scope of the Project

The project's scope is broken down into four primary components: users, system operability, functionality, and system tool. User

a) Personnel

In this system, personnel would be required to register the credentials through the application so that there data can be stored properly into the database, which also allows them to share there live location in the time of need.

b) Higher authority

The Higher authority are allowed to search the data of personnel including their name and designation and the location of personnel.

c) Administrator

For the administrator, they are important user in this system because they allow adding, updating, deleting, viewing, and searching the data of the personnel in the database beside to search the personnel's location.

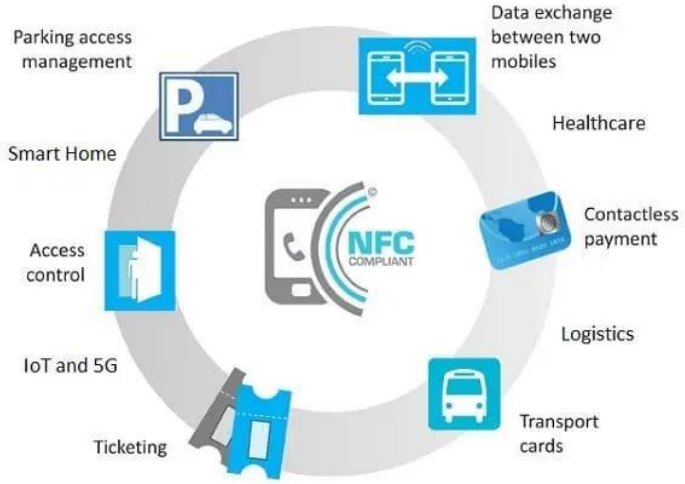
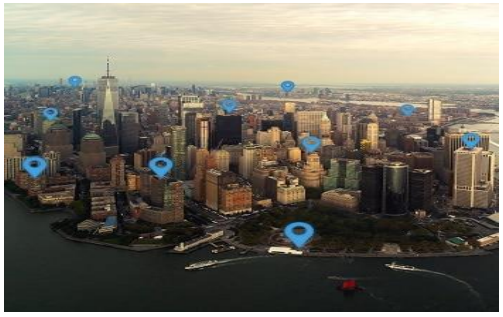



**Diagram 1- NFC Usage.**

### 3. System functionality

For the functionality of this system, the main function of the system is searching location of the personnel during the time of ground posting and the higher authority receives the live location of the personnel who leaves the place of ground posting with there name and designation. Higher authority can also check the data of each personnel in the database according to there need of date and time.

The Administrator will be able to add, update, delete, view, and search the data of the personnel but they are not allowed to check the location of the personnel.



### 4. System operability

The personnel tag will be detected by NFC reader only when it is in the range of NFC reader and it will start reading information from personnel's NFC card. NFC reader will read the information through the NFC tag and store it inside the database accordingly. The database of the system will automatically update the personnel location and the higher authority can view the location of personnel.

Data and information from the NFC system will be stored in proper hardware and software. For this data collection google cloud server will be used.

When the personnel will go out of range of NFC reader the data of personnel's location and other information will be directly stored in google cloud server from which higher authority can fetch information regarding the personnel location.

## 5. Design

As for design there will be NFC writers which personnels will carry and there will be NFC readers placed at various geo Location at which the event or festival where Police Personnels will be stationed according to their provided information and Software will have easy to use UI because of which it will be easy for anyone using the Software

The design section will involve the software part which important to display the personnel credentials besides to take their location. Software is also plays an significant role to display the location of the personnel to the higher authority.

Additionally, there will be integration between the user's interface and the interface of higher authority by which the authority can continuously keep an eye upon the location of the personnel during their working hours.

## 6. Testing

The software and NFC system have been carefully linked so that they can operate without error and satisfy the demands of higher authorities. A numeral experiment will be conducted on both small-scale and large-scale bases and under every terrain, temperature to perform under various conditions so that the performance of the system can be checked. Testing of this will provide better result in close environment as NFC works very well in close proximity. With hardware Software application will be tested to see if there are any error because Software application is the crucial part which will link all the hardware together and retrieve information from hardware.

## 7. Deployment

Deployment of the system is to prepare for the installation. Once the system is tested efficiently in all the extreme conditions and tested without error, the software and the system will then be deployed at the purposed position if there exist any complaints about the product from the user, the product will be rechecked and then the feedback of the user will be taken care of which will help to efficiently enhance the system.

## 8. CONCLUSION

Our study concludes that the NFC based Personnel tracking system can instantly track the location of Personnel within the range of NFC system. The system will directly store the credentials and location-based data into the Google cloud server with precise date and time-stamps, which will then be used by higher authority. The vital achievements of this project include proper management of events and festivals due to which there can be less chances of any illegal or criminal activity been committed, higher authority can also monitor the performance of the Personnel and take proper actions accordingly, this can also save time of higher authorities as they do not need to go to the ground-posting to check if every Personnel is present at their location and working properly. Overall, this system will be beneficial to citizens as well as government.

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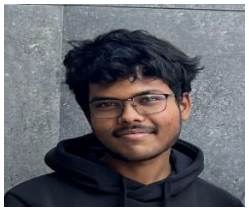


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