

Cloud Service Android Model for Safe Trips Using NFC

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Abstract:- In the world of urbanization, safety and security playing a major role in public transport. So, the proposed system aims at improving the safety and security using NFC (near field communication) technology. Usually, passengers had to check the details of the vehicle and owner while travelling. This paper aims to place Public transport vehicles with NFC tags for the driver and vehicle details. Smartphones come with a prebuilt NFC (Near Field Communication) reader mobile application. These passengers can read NFC tags while they are travelling. In this case each public transport vehicle consists of 1NFC tag which contains driver and owner details. Passenger can touch or wave their mobile on NFC tag and add those details to the cloud and they can also check their travel history for future references.

Keywords:- NFC tags, cloud, Public transport, Mobile Application.

I. INTRODUCTION

As of late numerous NFC frameworks have been proposed. Be that as it may, these frameworks have not been applied for Vehicles. Right now, portable NFC system [1] is executed for Android Operating System (OS). Where the administrator composes the tag data on the NFC tag using smart NFC enabled android mobile; the data incorporates the driver subtleties, proprietor subtleties and the plate number. The passenger will read the put away (composed) data inside the NFC tag. All required is moving NFC enabled smart gadget towards the NFC tag and the results are displayed in application interface. The headway of innovation has unquestionably changed the manner in which individuals live their lives. Cell phones, PCs, innovation, and music players have all influenced present day society in unfathomable manners. Present System is utilizing QR(Quick Response) display which depend on fixed data present inside the QR display[2]. Electronic Scanner couldn't interpret the information when the QR display is being harmed. This leads to malfunction of distinguishing identity. Right now, implementing system based on NFC is actualized that can give vehicle data. The administrators compose the vehicle data into NFC tag using smart NFC enabled android mobile. Passenger read the put away (composed) data inside NFC tag. All required is moving smart phone gadget towards NFC tag, then application displays the put away data. By using this implementation it improves the correspondence between various parts in the following framework. Travel

organizations will likewise profit by the proposed framework in trading traveler information at a lot quicker rate for future advertising. Close to Field Communication or NFC is a developing innovation for electronic gadgets which permits them to speak with one another by just tapping or bringing them exceptionally near one another. This demonstration of correspondence is called 'to tap and go' or 'tap-in'. Utilizing NFC, correspondence could occur between two dynamic gadgets, for example, cell phones or even between a NFC gadget and an aloof (or unpowered) 'tag' (Fig 1). Presently, NFC has applications for the most part in the field of contactless electronic installment. NFC is a contactless distinguishing proof advances which requires bringing two NFC good gadgets near one another basically contacting them. Client initially intercommunicate with an passive NFC tag by utilizing smart NFC empowered device. In the wake of contacting happens, NFC shrewd portable can utilize got information, or can utilize offered versatile types of assistance, for example, interfacing with a site page, making a web administration association and so forth. NFC technology is a two way short range, remote correspondence innovation.



Fig 1:- Tap-In Concept

This interaction interlinks two gadgets hardly less than 4cm. The data transmission happened at 13.56 MHz signal at the rate of 424 Kbit/s utilization. This NFC innovation lean on Radio Frequency Identification (RFID) technology[3] and implemented in three phases reader/writer, peer to peer and card emulation, where correspondence occurs by connecting a NFC enabled smart mobile and a NFC peruser, a latent RFID tag (NFC tag), or a mobile on the opposite end individually. Until now, numerous NFC tests conducted all around the world, particularly in installment area. These tests draws an attention towards the NFC innovation, advanced smart

phones is liable to get more secure, increasingly helpful, speedier and progressively stylish look . The primary favorable position of NFC is that these gadgets were regularly associated with cloud. "Associated" accreditations can be provisioned through the network dissimilar to identification card (Hotel applications). NFC empowered smartphones[4] can be insisted with the devoted applications, which results in any application a huge number of dynamically committed perusers in restriction of the customary devoted framework of ticket, get to control or installment perusers. Each of the NFC companions can associate an outsider NFC gadget with a server for any activity or reconfiguration. NFC innovation covers a huge scope of utilizations and these applications results in genuine executions or models with trial assessments or challenging contemplates. Hence these NFC innovations turned into a appealing examination territory, some of the applications are implemented till now. A few investigations have watched NFC innovations as indicated by their working methodologies . With the fast development of NFC applications, the suggested NFC applications in a single help space may work in one of the working mode or may bolster more than one working mode. In this way, watching NFC applications in administration area give all the more testing bits of knowledge. One of the basic components of NFC, close to handle interchanges innovation is the capacity for NFC empowered gadgets to have the option to be contacted onto uninvolved "NFC labels". This component of NFC innovation is a key facilitator for some applications. The NFC labels are currently manufacturing in exceptionally enormous volumes and then they are delivered across the world. Effectively a huge number have been produced and as this innovation increases more energy, labels will be seen in numerous up to date zones. NFC labels Fig. 2) are detached gadgets enabled to speak with dynamic NFC gadgets (a functioning NFC peruser/essayist). The NFC labels can be utilized inside applications, for example, brilliant banners, and different territories where constrained measures of information can be put away and moved to dynamic NFC gadgets. Inside the banner the live territory can be utilized as a sensing part for the dynamic NFC gadget.



Fig 2:- NFC TAGz

The put away information on the passive tag contain all types of information, for example, charge and Visa data, PINs and contacts, among other data. Be that as it may, some applications are for putting away URLs from where these NFC gadget discovers the additional data. In this perspective on this solitary constrained measures of information might be required. So the correspondence between the dynamic reader and the uninvolved NFC tag was characterized. Similarly as with closeness card innovation, close to handle correspondence utilizes electromagnetic enlistment between two circle radio wires situated inside one another's close to field, successfully framing an air-center transformer. It works inside the all inclusive accessible and unlicensed radio recurrence ISM band of 13.56 MHz on ISO/IEC 18000-3 air interface and at rates extending from 106 kbit/s to 424 kbit/s. NFC includes an initiator and an objective; the initiator effectively creates a RF field that can control a detached objective (an unpowered chip called a tag). This empowers NFC focuses to take exceptionally straightforward structure factors, for example, labels, stickers, key coxcombs, or cards that don't require batteries. NFC labels contain information (as of now somewhere in the range of 96 and 4,096 bytes of memory) and are ordinarily perused just, yet might be rewriteable. NFC labels can possibly supplant more up to data advancements, from bar, QR codes to the Bluetooth technology. NFC labels can be viewed as detached gadgets, which implies that they work without their very own force supply and are dependent on a functioning gadget to come into run before they are initiated. The exchange off here is that these gadgets can't generally do any handling of their own; rather they are just used to move data to a functioning gadget, for example, a cell phone . So as to take control over the NFC labels, electromagnetic enlistment is utilized to make a current in the aloof gadget. The essential guideline is that loops of wire can be utilized to deliver electromagnetic waves, which would then be able to be gotten and turned around into current by another curl of wire. This is fundamentally the same as the procedures utilized for remote charging innovations. The dynamic gadgets, for example, the cell phone, are liable for producing the attractive field. This is finished with a straightforward curl of wire, which produces attractive fields opposite to the progression of the substituting current in the wire. The quality of the attractive field can be balanced by shifting the quantity of turns in the wire curl, or expanding the present coursing through the wire. In any case, increasingly current clearly requires more vitality, and extremely high force necessities would not be alluring for use in battery controlled portable innovations. Consequently why NFC works over only a couple of centimeters, instead of the numerous meters that we're utilized to with different kinds of remote correspondence.

The passive gadget works similarly, just in invert. When the inactive gadget is in scope of the active gadget's attractive field, the electrons in the getting curl of wire ask into produce a present that coordinates that in the transmitting cell phone. There is in every case some force lost during transmission through the air, yet over short separations the current produced is sufficient to control the

hardware in the NFC tag. These circuits are tweaked to a specific recurrence, which builds the gadget's affectability to signals at a particular recurrence. This takes into account a most extreme exchange of vitality over the air. NFC Forum characterizes four sorts of tags[5] that give diverse correspondence velocities and capacities regarding configurability, memory, security, information maintenance and compose continuance. The Forum additionally advances NFC and affirms gadget consistence and on the off chance that it fits the criteria for being viewed as an individual zone arrange. NFC labels convey utilizing the ISO 14443 sort A and B remote measures, which are the universal standard for contactless smartcards, utilized on numerous open transportation frameworks. This is the reason NFC gadgets can be utilized with existing contactless innovations, for example, card installment focuses. There are a scope of various label types accessible, each offering diverse capacity levels and move speeds. Label types 1 and 2 accompany limits between only a small 48 bytes and 2 kilobytes of information, and can transmit that data at only 106 kbit/s. In spite of the fact that that may sound very little, particularly contrasted with your regular SD card, that is sufficient information for some basic snippets of data, for example, a site URL, and is all you requirement for most fundamental NFC labels. These labels are intended to be profoundly financially savvy, and can likewise be re-utilized on the off chance that you need to change the information put away on them. Type 3 uses an alternate Sony FeliCa standard, and can move information at a marginally quicker 212 kbit/s. These will in general be utilized for progressively confused applications, yet tragically can't be modified. So also, type 4 is again perused just, however has a bigger memory limit of up to 32 Kbytes and correspondence velocities of between 106 kbit/s and the most extreme NFC 424 kbit/s. Label type 4 works with combination of both sort A and sort B of the ISO14443 standard.

II. SOFTWARE DEVELOPMENT

This Project is created in Java Programming Language by utilizing the Android Studio Integrated Development Environment (IDE)[7]. Android Software Development Kit (SDK) is utilized which incorporates an assortment of custom devices that assist us with creating versatile applications on the Android stage. It consists of Android Emulator and the Android Development Tools (ADT) modules. Android runs a huge number of cell phones in excess of 200 nations around the world. It's the biggest introduced base of any portable stage and developing quick consistently another million clients power up their Android gadgets just because and begin searching for applications, games, and other advanced substance. Android gives you a world-class stage for making applications and games for Android clients all over the place, just as an open commercial center for circulating to them in a split second. Android is fundamentally a working framework for cell phones. Be that as it may, it's discovered presently incorporated into touch pads or TVs, even vehicles (trip PC) or internet books. Developers make applications using Java Android application parts are the

essential structure squares required to build up an Android application. By using these parts a framework can have an incorporated association with an application. The application goes through many segments such as Activities, Services, Content Provider and Broadcast Receiver. Each and every segment has its own job and is utilized to begin an application or interlink one with the other .

- The first segment is Activities. It is the beginning stage of the android application. A single movement can be an application or a solitary application containing numerous activities. Every action speaks to a solitary screen and has a (UI). This segment collaborates with a client reacting to the occasions. For instance contacts application in a mobile contains single activity for displaying individuals subtleties, second action for refreshing individuals subtleties and third action for video calling.
- The second part is Services: which speaks to the foundation procedure without a UI. It additionally has its own life cycle. For the most part activities taking quite a while, for example, getting information from Internet should be possible utilizing the Services. This part empowers one to perform various tasks in any event, when few different applications are dynamic.
- The third segment of an android application is Content Provider. It shares the information among the Activities and the Services that are put away in gadgets using any and all means. In addition utilizing this segment a client can inquiry and even change the information. For instance phone directory are accessible to each application.
- The final part is the Broadcast Receiver: which goes about as a framework's occasion listener. The present segment makes alarms or communicates at whatever point it identifies an adjustment in the framework, for example, any hardware fails or network issues. The Android application system gives all things required to actualize the normal application. The Android application lifecycle moves around the corresponding parts:

- The applications are performed using activities.
- views characterize the application's framework.
- Intents provide details to system about the latest application's advancements.
- Services take into consideration foundation handling without client association.
- Notifications sends the alerts to the user.

Android Applications can collaborate with the working framework and hidden equipment utilizing an assortment of managers. Every manager is liable for keeping the condition of some fundamental framework administration. For instance, there is an "location Manager" that encourages association with the location based services accessible with respect to the handset. The "View Manager" and "Window Manager" oversee UI essentials.

III. EXISTING SYSTEM

There are so many existing systems which leads to inconvenience for users. There are so many drawbacks with each system respectively. One of the existing systems is barcodes scanning. When the user scans the barcode there may be false redirection to the user and it usually damaged when projected to sunlight and unexpected weather conditions. Other implementation of existing systems is QR codes. When user scans the QR code, it may respond quickly but there are so many chances to give proxy respond.

These QR codes can be easily vulnerable. This leads to inconvenience for the user. So, the proposed system is based on NFC technology. There are so many advantages when compared to existing system.

IV. PROPOSED ARCHITECTURE

Monitoring travelling data of passengers will be most complex problem. The proposed architecture will be solving one of the complex problems of safety and security. The given data flow diagram (Fig 3) divided into simpler tasks. The architecture diagram consists predefined NFC Tag, NFC enabled smart phone, authentication and cloud database. The system follows step by step procedure. The first step is provisioning every passenger vehicle with NFC technology. This technology places the NFC tag in the vehicle. This NFC tag was written by the administrator. Each vehicle will be given a unique identification number. The data which was present inside the NFC tag was the vehicle details and owner details. These details was read by the passenger for safety and security. These details are stored in the cloud database which retrieves again for future purposes. The second step is to verify the user identities. In this process the user has to sign up for the application. The user has to provide the basic details like email address and phone number and first name and last name. These details are used for future emergency purposes. After signing up for the application it redirects to the login page which contain basic authentication template. These authentication provide the predefined dashboard for the each user. This provide the privacy for the user. The third step will be the user tapping the NFC device which is inserted in the vehicle. After tapping the NFC tag it goes to the fourth step which is fetching the vehicle details to the smart phone through cloud database. These details are visible to the user once he done with the authentication process for the application.

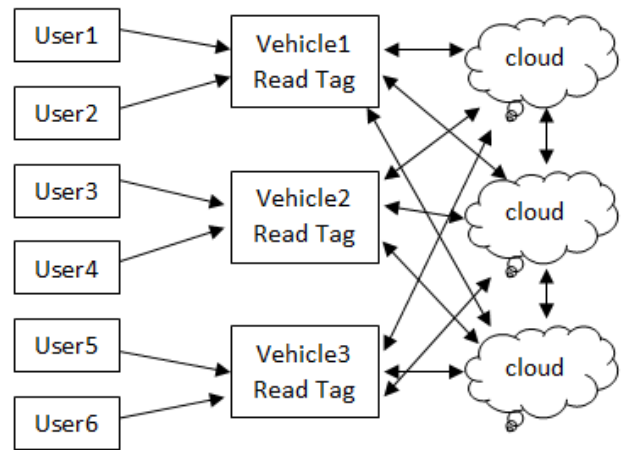


Fig 3:- Data Flow Diagram

This stores the details like which user travelled in which vehicle at which time. This provides the clear travelling record of the each and every passenger who travelled in smart vehicles at any time.

The process of fetching the vehicle details from cloud database contains systematic procedure. The data which was present in the NFC tag was an identification number. This identification number will also be stored in the cloud database. Which was stored by the Administrators. Once the user tapped the NFC tag with smart phone. This smart phone identifies the unique identification number which was present in the NFC tag. This identification number will be given to cloud database to fetch the details of the vehicle. The android application graphical user interfaces (GUI's) will display the fetched information from the cloud database. Each and every passenger, vehicle follows the same mechanism.

V. ANDROID APPLICATION GUI'S

NFC based Identification system has been created using Android platform. Vehicles are provisioned using NFC tag and Passengers will be having smart NFC enabled smart phone



Fig 4:- Admin User Page

The Admin is the one who administrates the vehicle data and controls the policies in the application. Once when admin done with authentication, manually enters the vehicle data into the cloud database. This application uses the firebase cloud storage. Once the administrator done with data entry part into the storage. When the user login into the application, he is able to see the menu page. Menu page contains read_nfc button and history button. When user entered into the vehicle, he able scan the nfc tag which was present inside the vehicle.



Fig 5:- Menu Page

Once the user tapped the nfc tag, the mobile application throughs the view record page, where he is able to see the complete details about the vehicle.

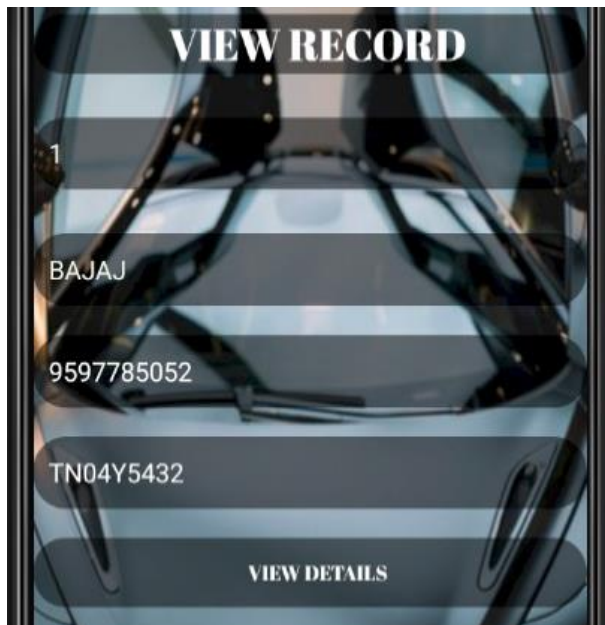


Fig 6:- View Record Page

Once the user completed the fetching part from cloud storage. User is able to see the travel history from history button. When user clicks the history button, he is through with records history page.

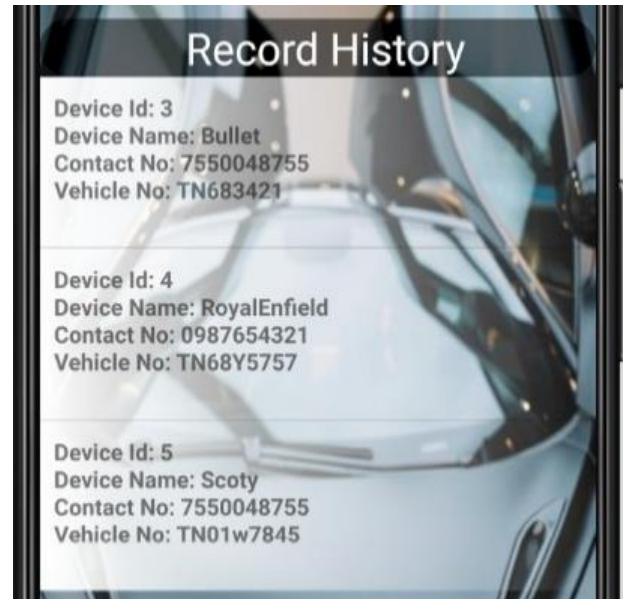


Fig 7:- Record History Page

NFC innovation will be used for identification when a vehicle is identified, the ID will directed towards the cloud database to fetch all the information about the vehicle. When Smartphone are placed near the NFC tag data will be read by mobile and this unique ID will be sent to cloud database to select the appropriate record. When the passenger is authenticated through gadget, he can get additional features such as storing the travelled trips and SOS (save our souls) button in case of emergency and can view travel history. The NFC enabled smart phone will consists of predefined hardware. This hardware helps the smart mobiles with NFC technology.

VI. CONCLUSION

The android application could be improved by including more highlights, for example traffic updates, artificial intelligence system which makes passenger friendly application.

- The NFC innovation has changed the present generation.
- NFC technology has shown smart communication between people and the powerful machines.
- This NFC tag system work effectively in all weather conditions.

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