

Smart License Patrolling by Introducing Enhanced Driving License using Near Field Communication Technology

Nikhil P. Barot¹ Abhijit Bobhate² Pratik Ghogale³ Umesh Rane⁴ Prof. Rashmi Chawla⁵
^{1,2,3,4,5}Department of Information Technology

^{1,2,3,4,5}Rajiv Gandhi Institute of Technology, Mumbai Maharashtra, India

Abstract— The project is about developing an Enhanced Driving License (EDL) which provides a proof of identity and a way to access details about license holders past record. The project consists of three modules NFC tag, handheld mobile device to scan the NFC tag and MVD's database. The first module consists of a NEAR FIELD COMMUNICATION chip that will signal a secure system to pull up your biographic and biometric data for the officer. The second module consists of a handheld device carried by the officer which scans the NFC tag. The third module consists of a MVD database related to licensee's past record which will be accessed by the officer by scanning the NFC tag.

Key words: Enhanced Driving License (EDL), Near Field Communication (NFC), Motor Vehicle department (MVD), RTO (Regional Transport office)

I. INTRODUCTION

The RTO system which is manual in nature is completely removed in this method as we introduce NFC as the underlying technology. A complete NFC system consists of a transponder (tag), reader/writer and computer host. The transponder, better known as the tag is a microchip that has memory to store a unique data and to receive and send data back to the reader. These tags are powered by the electromagnetic signal received from a reader.

Development in technology has made digital world border-less. It's proven that due to developed technology, trade and transaction can be done not only using real money but also virtual one. Shopping process using virtual money has been supported by the existing Near Field Communication (NFC) device. These NFC devices are powered through radio frequency.

In the year of 2011, Google was integrating this device into a Android-based cell phone, that gradually developed transactions using virtual money. The EDL (NFC tag) is used as a unique identity for account of a particular user. When a vehicle driver is caught by a traffic police, its driver is prompted to scan his EDL. If the identity (serial number of the tag) is matched with the one already stored in the system, the associated data of that driver gets fetched on the mobile device. Traffic police can also place a new complaint about that driver. If police placed a new complaint then the fine amount will get deducted from his total balance. After this, the vehicle gets immediate access to drive through. This NFC based RTO system also has some additional features. New user can register themselves with the system and also an old user can recharge his account balance. The amount for recharge can be entered in the system.

II. PROPOSED SYSTEM

Many modern smart phones and tablets have an integrated scanner that can read NFC chips. All one needs to do for

driver's license check is attaching a single low-cost NFC chip to the driver's license.

The NFC chip stores a unique combination of numbers. This ID is read by the smartphone with the underlying NFC technology that uniquely associates with the driver's master data in the web database of MVD. Now the drivers can perform the automated checks with NFC to web application.

They just need to hold their driver's license up to their smartphones. The phone scans the chip and reads the unique id from the chip that fetches driver's data.

The data connection can be either through a mobile data connection or via a local wireless network.

III. MODULES OF THE PROJECT

A. Admin Module:

- 1) Admin can login the application.
- 2) Admin checks the documents and if those documents are legal then he will make a new user account into the application and provide EDL to the user.
- 3) After creating a new user account user will get the username and password by mail.

B. Traffic Police Module:

- 1) Traffic police login to the android application.
- 2) If any user caught by traffic police then police will get the driving license and tap using android phone.
- 3) After tapping, police can view the previous records, can place a new complaint.
- 4) After placing a new complaint the fine amount will get deduct from a total balance of the user.

C. User Module:

- 1) User can login into the system using username and password.
- 2) User can view the complaints which are placed against him.

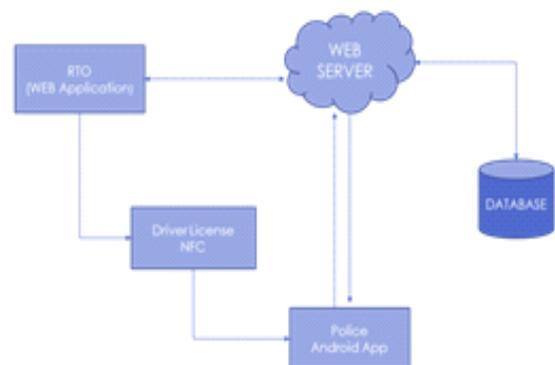


Fig. 1: Working diagram of EDL using NFC technology

D. Near Field Communication:

Near Field Communication is a wireless close-range connectivity technology which allows data trade between two gadgets. NFC commonly integrated within mobile devices. This will allow the device to establish communication with simcard or other reader devices. NFC works using 13,56 MHz radio frequency. This technology is optimum when worked under the space of 20 cm. Transmittable data is only less than 1Mbit. This technology developed in 2004. NFC Concept Nevertheless, the main reason to apply this technology is to be implemented within ticketing application, payment application and public transportation application. When a cell phone equipped with NFC device, that particular cellphone can be used as ticket of conference or theme park and also a “mini wallet” which can be used in certain time. Moreover, the cell phone can also be used as payment tool and an automatic machine, toll payment, and some other transactions. NFC application is also can be used on a public transportation as a substitute of wallet and as a tool to ticket data writing. Basically NFC has 2 different communications which work on different speed, consist of:

- 1) Active NFC Mode, in this mode, initiators and target use self-established radio frequency to communicate.
- 2) Passive NFC Mode, in passive mode, target answer command made by initiator to call modulation scheme. Initiators do the radio frequency creation.

| | NFC | RFID | IrDa | Bluetooth |
|---------------------|--|----------------------|-------------------------------|--|
| Set-up time | <0.1ms | <0.1ms | ~0.5s | ~6 sec |
| Range | Up to 10cm | Up to 3m | Up to 5m | Up to 30m |
| Usability | Human centric Easy, intuitive, fast | Item centric Easy | Data centric Easy | Data centric Medium |
| Selectivity | High, given, security | Partly given | Line of sight | Who are you? |
| Use cases | Pay, get access, share, initiate service, easy set up | Item tracking | Control & exchange data | Network for data exchange, headset |
| Consumer experience | Touch, wave, simply connect | Get information | Easy | Configuration needed |

Fig. 2: Comparison of NFC with other technologies

E. Android Based NFC Reader:

The usage of NFC can be done through 3 major ways: card emulation, reader mode, peer to peer (P2P) mode. The function of NFC introduced by Google into Android 2.3 (API level 9) device. In Android 2.3, the ability of device is limited in only reading the tag. In Android 2.3 data writing and trading ability through mode Peer to Peer (P2P) began to be implemented within android devices. The .nfc android package provides access to NFC function, allows application to read NDEF message (NFC Data Exchange Format) which located at NFC tag. On android.nfc, located several classes which can be used to running NFC function.

F. Android for Mobile Application:

Android is an operating system for mobile devices such as smart phones and tablet computers. It is developed by the Open Handset Alliance led by Google.. Google released most of the Android code under the Apache License, a free

software license. The Android Open Source Project (AOSP) is tasked with the maintenance and further development of Android. Android consists of a kernel based on the Linux kernel, with middleware, libraries and APIs written in C and application software running on an application framework which includes Java-compatible libraries based on Apache Harmony. Android uses the Dalvik virtual machine with just-in-time compilation to run compiled Java code. Android has a large community of developers writing applications ("apps") that extend the functionality of the devices. Developers write primarily in a customized version of Java. Apps can be downloaded from third-party sites or through online stores such as Android Market, the app store run by Google.

IV. ACKNOWLEDGMENT

We wish to express our sincere gratitude to Dr. U. V. Bhosle, Principal and Prof. D. M. Dalgade, H.O.D of Information Technology Department of RGIT for providing us an opportunity to do our project work on “Enhanced Driver’s License using NFC Technology”. This project bears on imprint of many people. We sincerely thank our project guide Ms.Rashmi Chawla for her guidance and encouragement in successful completion of our project synopsis. We would also like to thank our staff members for their help in carrying out this project work. Finally, we would like to thank our colleagues and friends who helped us in completing the project synopsis successfully.

V. CONCLUSION

In this research paper we have put the idea of automating the current scenario in RTO system which will help us in billing and lodging complaints and bring more transparency and make work easier. The technology used in this is android for the mobile application and .NET for the website which will be moderated by the RTO Admin. This is an effort to automate the current system in RTO and hoping for future developments in the RTO system.

VI. FUTURE SCOPE

The technology can be used for the following applications:

- Automated ticketing
- Toll systems
- Mini wallet
- Various licensing system

REFERENCES

- [1] Introduction to Near-Field Communication and the Contactless Communication API - Ortiz, C. Enrique (June 2006).
- [2] An embedded system for practical security analysis of contactless smartcards-Kasper, Timo; Dario Carluccio; Christof Paar (May 2007)