RTO Automation Using NFC/QR Code

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ABSTRACT: French drivers are now being issued with new multi-application driving licenses based on contactless smart cards that contain both a public and a private data area. The private area can only be accessed and verified by police and other authorities while the public area can be read by an NFC phone and used by third parties to, for instance.

The new licenses are being introduced by Imprimerie Nationale, the French national printing works, and use Gemalto's Sealysmulti-application electronic driving license technology.

The polycarbonate driving licenses house an ISO 14443 compliant microprocessor that includes two storage areas, one for public and one for private data. The private space will be used to store driving license data so that it can be verified by police officers in cases involving suspected fraud or other criminality. The space provisioned for public usage will be offered to a variety of service providers and will be able to be read by an NFC phone.

Keywords: NFC, License, Android, RTO, QR code, Corruption, Violation.

I.   INTRODUCTION

The need for manual RTO based systems is completely reduced in this method and the RTO system works through NFC.A complete NFC system consists of a transponder (tag), reader/writer and computer host. The transponder, better known as the tag. The microchip contains 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 bring digital world to be border-less. It's proven through a developed technology, when trade and transaction can be done not only using real money but also virtual one. Shopping process using virtual money has even more supported by existed Near Field Communication (NFC) device. This particular device works using radio frequency. In the year of 2011, Google was integrating this device into a Android-based cell phone, which made transactions using virtual money gradually developed.

The NFC tag is used as a unique identity for account of a particular user. When a vehicle driver caught bay a traffic police, its driver is prompted to scan his NFC tag. If the identity (serial number of the tag) is matched with the one already stored in the system, the historical records of that driver get fetch on a mobile phone. Traffic police can also placed 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. A new user can register him with the system. Also an old user can recharge his account balance. The amount for recharge can be entered in the system. In beginning, the user is prompted to scan his tag or ID. The serial code of the tags identified by the reader module and is sent for comparison with stored data. If the ID is matched by the microcontroller, the fine amount is deducted from user's balance and user gets to drive through the area.

II.   PROBLEM STATEMENT

"Most police departments have members who commit corrupt acts from time to time. Only some police departments, however, become corrupt policedepartments." [1]

As was suggested at the outset, there are many competing definitions of corruption. There are broad, inclusive definitions which suggest that police corruption is 'loosely' identified as 'deviant, dishonest, improper, unethical or criminal behaviour by a police officer.' [2] There are also significantly narrower definitions. James Q Wilson. [3] for example, distinguishes between activities such as   accepting bribes (which he along with everyone else considers to

be the prototypical form of corrupt behaviour) and 'criminal' activities such as burglary on duty (which he considers to be qualitatively different – criminal but not corrupt). Although both acts are criminal, the point of Wilson's distinction is that bribery in a way that burglary by police officers need not. There is a parallel here with work on so-called 'white collar crime.' [4]

III. 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 licence checks is attach a single low-cost NFC chip to the driver's licence.

The NFC chip stores a unique combination of numbers. This ID will be read by the smartphone and the NFC to web app with the underlying NFC technology and uniquely associated with the driver's master data in the web application.

Now the drivers can perform the automated checks with NFC to web application. They just need to hold their driver's licences up to their smartphones. The phone scans the chip and fetch the unique id from the chip. The data connection can be either through a mobile data connection or via a local wireless network.

IV. IMPLEMENTATION

The proposed system consist of three modules which work simultaneously which are as follows:

A. Admin Module:-
- admin can login into the application.
- admin check the documents and if those documents are legal then he will make a new user account into the application and provide a new licence to the user.
- after creating a new user account user will get the username and password by mail.

B. Traffic Police Module:-
- Traffic police login to the androidapplication.
- if any user caught by traffic police then police will get the driving licence and tap using android phone.
- after tapping, police can view the previous records,can placed a new complaint.
- after placing a new complaint the fine amount willget deduct from a total balance of the user.

C. User Module:-
- User can login into the system using username andpassword.
- User can view the complaints which are placedagainst him.

Fig 1. ArchitectureNear 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 optimizely works 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 deviced, 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:

- Active NFC Mode, in this mode, inisiator and target use self-establised radio frequency to communicate.
- Passive NFC Mode, in passive mode, target answer command made by inisiator to call modulation scheme. Inisiator do the radio frequency creation.

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.

V. REQUIRREMENT ANALYSIS
Hardware Requirements:
- NFC tags
- NFC based Android Mobile

- Intel processor IV and above
- 1 GB RAM
- 160 GB hard disk

Software Requirements:
- Visual Studio 2010
- MS SQL Server 2005
- SDK for Android 4.2
- Windows Operating System
- Eclipse

VI. FEASIBILITY
Operational Feasibility:
The site will reduce the time consumed to maintain manual records and is not tiresome and cumbersome to maintain the records. Hence operational feasibility is assured.

Technical Feasibility :
- At least 166 MHz Pentium Processor or Intel compatible processor.
- At least 16 MB RAM.
- 14.4 kbps or higher modem.
- A video graphics card.
- A mouse or other pointing device.
- At least 3 MB free hard disk space.
- Microsoft Internet Explorer 4.0 or higher.

Economical Feasibilty:
Once the hardware and software requirements get fulfilled, there is no need for the user of our system to spend for any additional overhead. For the user, the web site will be economically feasible in the following aspects:
- The web site will reduce a lot of paper work. Hencethe cost will be reduced.
- Our web site will reduce the time that is wasted inmanual processes.
- The storage and handling problems of the registerswill be solved.

Design Details:
A. DFD diagram:

Fig 4. Admin DFD diagram
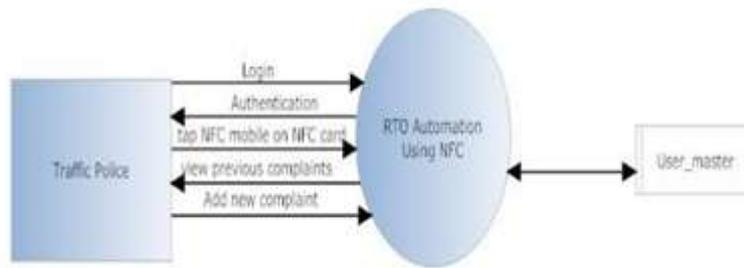
Fig 3. Traffic Police DFD diagram

B.   Use case diagram:
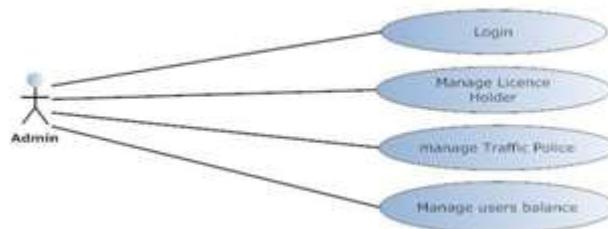
Fig 4. Admin Use Case diagram
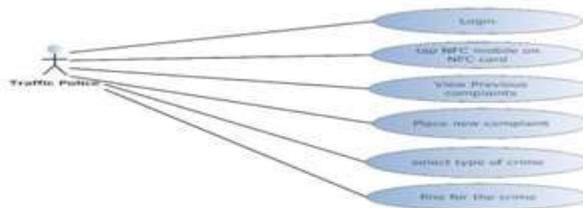
Fig 5. Traffic Police Use Case Diagram

C.   Activity diagram:
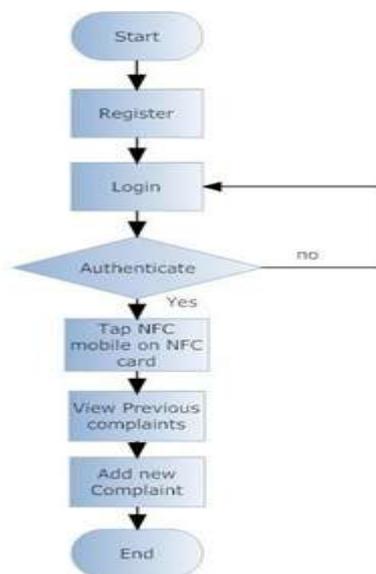
Fig 6. Activity diagram

D. State level diagram
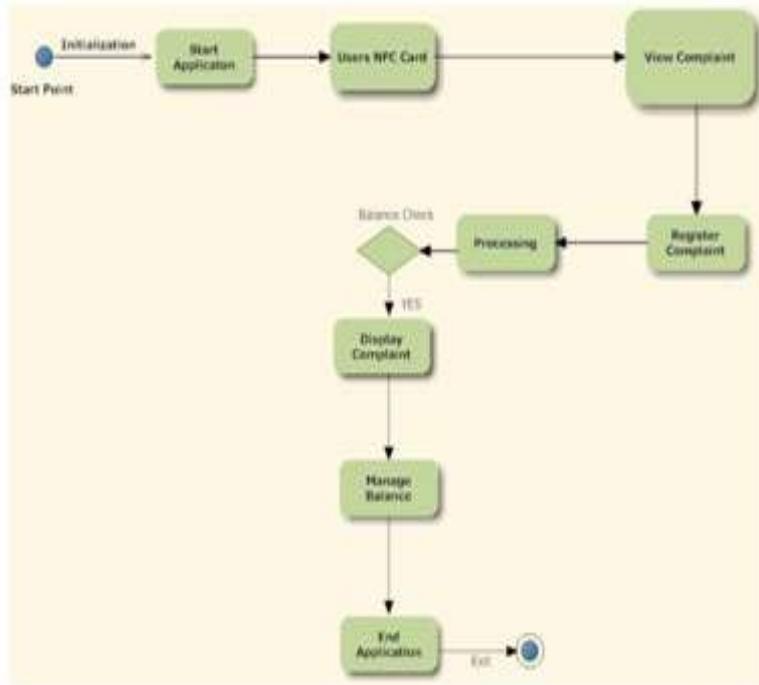
Fig 7. State level Diagram

VII. CONCLUSION

When a vehicle driver caught bay a traffic police, its driver is prompted to scan his NFC tag. If the identity (serial number of the tag) is matched with the one already stored in the system, the historical records of that driver get fetch on a mobile phone. Traffic police can also placed 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. A new user can register him with the system. Also an old user can recharge his account balance.

VIII. FUTURE SCOPE

NFC could be used for so much more than just data transfer and payments. We can purchase our tickets, reserve hotel, unlock and lock rooms and cars etc. The truth is that all of this and more is possible with NFC.As long as vendors get a reader that supports NFC, capable phones can quickly and easily send information to those devices. With Android, Nokia and Blackberry all in various stages of supporting NFC, the pressure to offer support as well to avoid falling behind in a technologically advanced world. Some current as well as developing applications of NFC include:

Google Wallet: Google's smartphone program that allows users to load credit card information and payment. Visa and Samsung have partnered to create a NFC compatible smartphone geared at fans of the Olympics. This smartphone will carry special content and aims to make purchases and other interactions at the Olympic Games faster and easier. As other cell phone manufacturers race to keep up, NFC could grow substantially and being offered on more and more devices. All in all, the future of NFC looks bright.

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