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Development of Digital Traffic Anti-Violation System

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ABSTRACT

For any traffic violation act the fine is acknowledged only through manual receipts which might be fake in most of the cases. The complete information about the vehicle is checked just manually. Nowadays the charged fine are paid in the court. As there are many pending cases in the court, the fine may not be received in proper time. Corruption may occur by receiving the fine without charging the crime. Using android application, the fine can be charged digitally as per the government tariff and the database is linked with government website. Using Radio Frequency Identification (RFID), the vehicles can be automatically identified using electromagnetic fields. The information about the vehicle and the owner can be viewed through RFID reader. RFID uses an attached antenna to capture data from tags. In this work, RFID reader reads the data from the RFID tag fixed in the vehicle. Then those data are transferred to the PIC microcontroller which is processed in the android application.

Keywords: RFID readers, PIC microcontroller, buzzer, CCS compiler, proteus, USB2 serial controller, ANDROID studio.

1. INTRODUCTION

The main objective is to design a digital machine for avoiding traffic violation, monitoring and managing the databases of crimes related to traffic rules and obtaining the original details about the vehicle digitally using android application and RFID . RFID readers contain all the information about the vehicle and the owner. RFID readers are devices that power & communicate wirelessly with tags. RFID deliver tag data to the operating system software. RFID is an acronym for "radio-frequency identification" and refers to a technology whereby digital data encoded in RFID tags or smart labels (defined below) are captured by a reader via radio waves. RFID is similar to bar coding in that data from a tag or label are captured by a device that stores the data in a database. RFID, however, has several advantages over systems that use barcode asset tracking software.

The most notable is that RFID tag data can be read outside the line-of-sight, whereas barcodes must be aligned with an optical scanner .Advantages of this system is Traffic monitoring can be controlled, Corruption can be avoided, Crime records will be maintained properly, Public receive the acknowledgement message immediately. It is used for digital transaction of fine amount using android application and to control traffic violation act by avoiding corruption. It is used to identify vehicle and owner information and to monitor the duty time of traffic police through the time of login and logout.

2. EXISTING SYSTEM

In our state, for any traffic violation act the fine is acknowledged only through manual receipts which might be fake in most of the cases. In Some other states, the billing is done with the electronic machine as shown in fig.1, which has no any storage facility, so that the database cannot be maintained .The complete information about the vehicle is checked just manually. Nowadays the charged fine are paid in the court. As there are many pending cases in the court, the fine may not be received in proper time.

Fig.1.Fine collection machine

3. PROPOSED SYSTEM

Using android application, the fine can be charged digitally as per the government tariff and the database is maintained and linked with government website. Using Radio Frequency Identification (RFID), the vehicles can be automatically identified using electromagnetic fields. RFID readers contain all the information about the vehicles and the owner. The block of proposed system is shown in fig.2

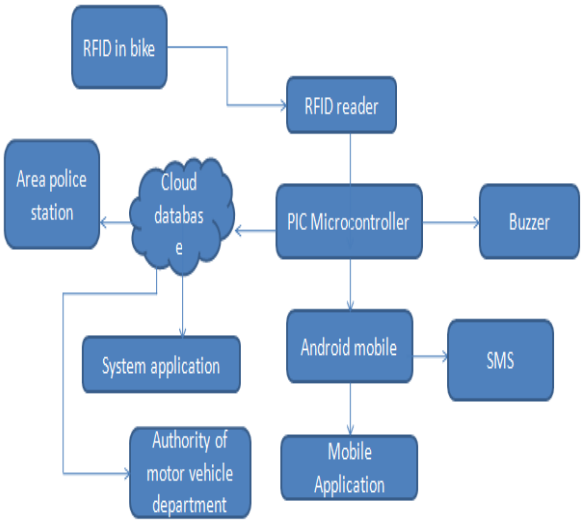

Fig .2. Proposed System Block Diagram

3.1. RFID READER

Radio Frequency Identification (RFID) uses radio frequency signals to automatically identify objects. RFID readers which are shown in fig .3, are devices that power and communicate wirelessly with tags. It delivers tag data to the operating system software. The digital data encoded in the RFID tags or smart labels are captured by a reader via radio waves as shown in fig.4. RFID is similar to bar coding in that data from a tag or label are captured by a device that stores the data in a database. RFID, however, has several advantages over systems that use barcode asset

tracking software. The most notable is that RFID tag data can be read outside the line- of -sight whereas barcodes must be aligned with an optical scanner.

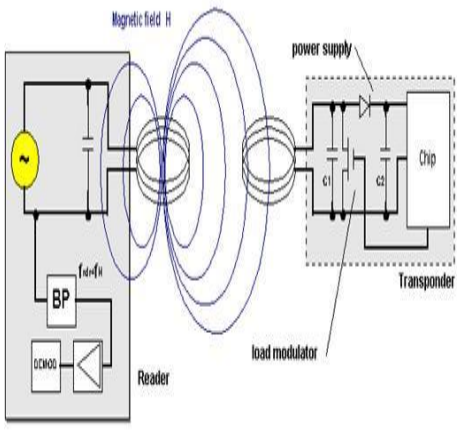

Fig.3.RFID card reader

Fig .4.How does RFID works

3.2. PIC MICROCONTROLLER

The PIC16F8X family of devices are CMOS microcontrollers consisting of the PIC16F83, PIC16C83, PIC16F84, PIC16C84 and PIC16LF8X types(fig.5). CMOS technology offers a number of advantages over other technologies. For example, CMOS circuits consume very little power, operate over quiet wide voltage range are quiet forgiving of bad layout and electrical noise. The PIC16X8X is available in an 18 pin IC package. The IC consists of two pins for the power supply, two pins for the oscillator, OSC1 and OSC2, a pin for the master reset clear line MCLR and 13 pins for input/output ports, RA0 to RA4 and RB0 to RB7. The pin diagram of PIC microcontroller is shown in fig.6.

Fig .5.PIC Microcontroller

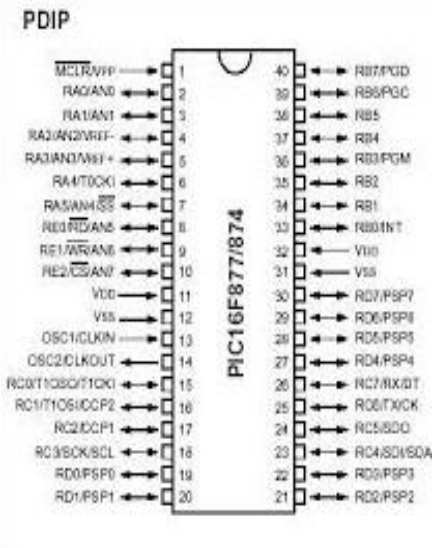

Fig.6.Pin diagram of PIC16F8XX

3.3. USB2 SERIAL CONTROLLER

In telecommunications, RS-232(Recommended standard 232)is the traditional name for a series of standards for serial binary single-ended data and control signals between DTE(Data terminal Equipment) and a DCE (Data Circuit-terminating Equipment). It is commonly used in computer serial ports. An RS-232 port was once a standard feature of a personal computer for connections to modems, printers, mice, data storage, un-interruptible power supplies and other peripheral devices. RS-232 has mostly been replaced in personal computers by USB for local communications. Compared with RS-232, USB is faster, uses lower voltages, and has connectors that are simpler to connect and use. Serial ports with RS-232 are commonly used to communicate to headless systems such as servers, where no monitors or keyboard is installed, during boot when operating system is not working yet and therefore no network connection is possible. An RS-232 serial port can communicate to some embedded systems such as routers as an alternative to network mode of monitoring.

3.4. BUZZER

A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke. Buzzer is an integrated structure of electronic transducers, DC power supply, widely used in computers, printers, copiers, alarms, electronics, automotive electronic equipment, telephones, timers and other electronic products for sound devices. Active buzzer 5V Rated power can be directly connected to a continuous sound, this section dedicated sensor expansion module and the board in combination, can complete a simple circuit design, to "plug and play".

Specifications:

1. On-board passive buzzer
2. On-board 8550 triode drive

3. Can control with single-chip microcontroller IO directly
4. Working voltage: 5V
5. Board size:22(mm)x12(mm)

3.5. CCS COMPILER

Intelligent and highly optimized CCS C compilers contain standard C operators and Built-in function libraries that are specific to PIC registers, providing developers with a powerful tool for accessing device hardware features from C language level. Standard C pre processors, operators and statements can be combined with hardware specific directive and CCS provides built-in functions and example libraries to quickly develop applications incorporating leading edge technologies such as capacitive touch, wireless and wired communication, motion and motor control and energy management.

3.6. PROTEUS

The Proteus design suite is wholly unique in offering the ability to co-simulate both high and low-level micro-controller code in the context of a mixed mode SPICE circuit modulation. Proteus Virtual System Modelling (VSM) improves efficiency, quality and flexibility throughout the design process. Proteus VSM is possible to develop and test designs before a physical prototype is constructed. The simulation takes place in real time. Proteus VSM also provides extensive debugging facilities including breakpoints, single stepping and variable display for both assembly code and high level language source.

3.7. ANDROID

Android is Linux-based operating system designed primarily for touch screen mobile devices such as smart phones and tablet computers. Initially developed by Android, Inc., which Google backed financially and later brought in 2005, Android was unveiled in 2007 along with founding of Open Handset Alliance: a consortium of hardware, software, and telecommunication companies devoted to advancing open standards for mobile devices.

Android is open source and Google releases the code under the Apache License. The Open-source code and permissive licensing allows the software to be freely modified and distributed by device manufacturers, wireless carriers and enthusiast developers. Additionally, Android has a large community of developers writing applications ("apps") that extend the functionality of devices, written primarily in a customized version of the Java programming language.

Applications are developed in the Java programming language using the Android software development kit (SDK). The SDK includes a comprehensive set of development tool, including a debugger, software libraries, a handset emulator based on QEMU, documentation, sample code and tutorials. The officially supported integrated development environment (IDE) is eclipse using the Android Development Tools(ADT) plug in. Other development tools are available, including a Native Development Kit for applications or extensions in C or C++,

Google App Inventor, a visual environment for novice programmers, and various cross platform mobile web applications frameworks.

4. RESULTS AND DISCUSSION

Thus the computerized view of digital fine collection using RFID and android application is shown in below figures. The traffic police can login this application by entering the username and password as shown in fig.6(a)

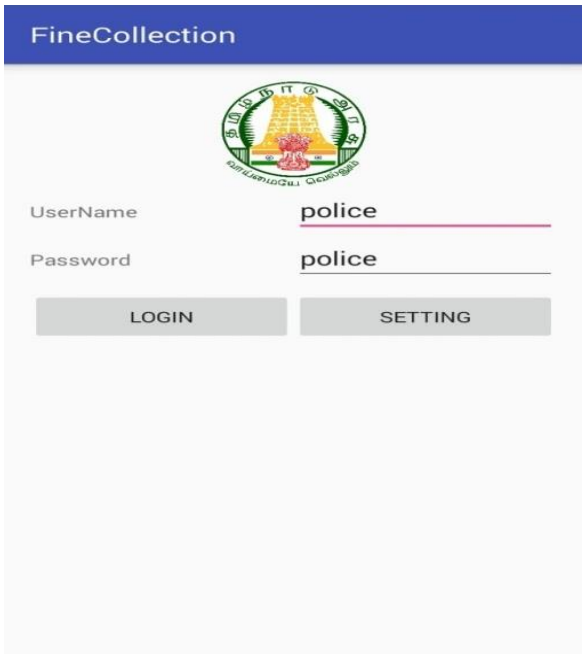

Fig .6(a)

The required details about the fine collection, vehicle detail, payment backlogs, complain backlogs can be viewed is shown in fig.6(b).

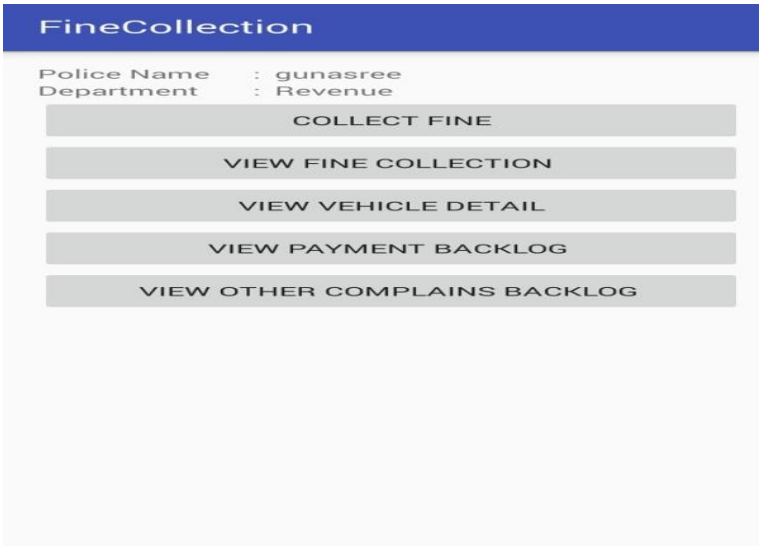

Fig.6(b)

Thus the information about the vehicle, license period, and registration certificate has displayed as shown in fig.6(c).

Fig.6(c)

The overall collection of a day by the particular traffic police can be consolidated and viewed as shown in fig.6(d).

Fig.6(d)

The backlog of any vehicle can be checked by clicking view other complaints backlog as shown in fig.6(e)

Fig.6(e)

Fig 6: Computerized view of digital fine collection

5. CONCLUSION

The proposal of this paper is to control the traffic violation and to maintain the records in a database thereby avoiding corruption. In future, the backlogs in any cases can be verified.

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