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Design of Automized Inspection Vehicle for RTO

Bhushan R. Vidhale, Ganesh Khekare, Chetan Dhule, Meenal Tayade

Abstract— As we are all aware of current trend of Regional Traffic Office (RTO) system. One has to put a lot of effort in order to get licences from RTO. It is very tedious as well as time consuming process. Otherwise in order to get licences quickly we used to get the help of private agents by paying them much more money which is actually an illegal act according the rules of our government. By which people have to suffer a lot. sSo, with the help of technology we can convert the present tedious and time wasting process of RTO system into simpler and fruitful one. By this way our project also helps us to reduce the corruption which is present in today's RTO system by completely removing the role of private agents and the people also automatically get benefited with this new RTO system". The main aim of designed system in paper is to minimize the corruption by suggesting an ideal module which can be implemented in number of places for number of operation. minimize risk of internal fraud and enhance efficiencies by automating process and minimizing operator intervention, through this we can create an integrated , chain of trust for the identity and issuance process. Creating a secure chain of trust using electronic sensors, microcontroller and embedded programming. This System can be connected to IOT device and we can monitor real time data. Designed system is capable of removing corruption occurring while granting a licence to an applicant, and also capable of avoiding on road accidents caused due to inappropriate driving, because in the system licence will give to the applicant which can drive the vehicle properly.

Index Terms— Regional Traffic Office (RTO) system, AUTOMISED INSPECTION VEHICLE

I. INTRODUCTION

Due to more number of frauds, Authorities in driver's license system are trying to increase security throughout the issuance process & also want to confirm to a number of changing standards that provide security, The title of project implies automized inspection vehicle so in which we can design a system to grant a permanent licence to the person who knows all rules of safely driving. In previous stages of Electronic evolution normal circuits are being created by using logic families and power consuming electronics components like transducers, transistors ,diodes ,traditional antennas are being used. The programming then used to drive a electronic circuit was not so advanced like ALP and Hardware Design Logic due to which the complexity of the system increased to a great extent ,but in our invention we are using advanced techniques like Sensors, Microcontrollers & Embedded Programming and Automation. Automation is the technique of making an apparatus, a process, or a system operate automatically. In our project concept we are using automatic controlling of the process of granting a licence to the person who has completely learnt about the rules and regulations of safely driving a vehicle. The main aim and objective of this project is to provide a technical solution (microcontroller, hardware /software technologies) vehicle licence issuing system. By implementing such concept into reality it will be able to reduce unnecessary consumption time and money .This system will also be beneficial for public and will create a fair atmosphere about licence issuing system and issuing authorities.

Creating a secure chain of trust is using electronic sensors, microcontroller and embedded programming. This invention capable of removing corruption occurring while granting a licence to an applicant, and also capable of avoiding on road accidents caused due to inappropriate driving, because in the system licence will given to the applicant which can drive the vehicle properly.

We are putting our effort in the same direction to solve the difficulties which we usually come across in current RTO system by just modifying it with help of today's Technology. Our HI-TECH system process the data of individual person by reading the barcode present on unique identity card of the person who are applying for getting licences. After completing the formalities automatically by the system the particular person is offered an interested vehicle for which he was applying for getting licences which is fully automated one and then asked to drive vehicle according to instruction displayed on display screen. If a particular person able to drive the vehicle correctly then he will become eligible candidate for getting licences otherwise if he does committee some mistake during test drive then the various sensors which are present on vehicle system will sense accordingly and draws attention of the officer present in monitoring room and a person get failed form test of getting licences.

So, with the help of technology we can convert the present tedious and time wasting process of RTO system into simpler and fruitful one. By this way our project also helps us to reduce the corruption which is present in today's RTO system by completely removing the role of private agents and the people also automatically get benefited with this new RTO system.

The main aim of designed system is to reduce the time requirement for getting licence from the "RTO System". Thus the project aim adds the following objectives.

1. To reduce time requirement for getting driving licence.
2. To reduce the corruption that is present somewhere in current "RTO System"
3. To reduce manual work by giving complete automation system.

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* Correspondence Author
Dr. Bhushan R. Vidhale*, Department of Electronics and Telecommunication Engineering, G H Raisoni College of Engineering, Nagpur, India
bhushan.vidhale1@gmail.com , bhushan.vidhale@raisoni.net
Prof. Ganesh Khekare, Department of Information and Technology, G H Raisoni College of Engineering, Nagpur, India
Prof.Chetan Dhule, Department of Information and Technology, G H Raisoni College of Engineering, Nagpur, India
Prof.Meenal Tayade, Department of Electronics and Telecommunication Engineering, G H Raisoni College of Engineering, Nagpur, India

II. LITERATURE REVIEW

The article presented in the NEWS paper and news telecasted in local NEWS channel gives us the inspiration to build such an automated RTO system which will give one kind of security to general people in our country from corruption. As we are all aware of current trend of " Regional Traffic Office (RTO)" system. It is very tedious as well as time consuming process. Otherwise in order to get licences quickly we used to get the help of private agents by paying them much more money which is actually an illegal act according the rules of our government. By which people have to suffer a lot.

We are putting our effort in the same direction to solve the difficulties which we usually come across in current RTO system by just modifying it with help of today's Technology. Our project basically makes a use of unique identity card which is allotted to every citizen of our country.

General Survey:

- According to the Motor Vehicle Act 1988, a valid Driving Licence is necessary to drive any motor vehicle on public roads.
- Driving Licence is issued by the Regional Transport Office (RTO) of Motor Vehicles Inspector's Office after the recipient has passed a driving test and has proved the required age.
- The Driving Licence segregated as Motorcycle Licence, Light Motor Vehicle (LMV) licence, and Heavy Motor Vehicle (HMV) Licence.
- Learner's License is issued after passing a theory /Practical test

Types Of Driving Licence:

- Learner Driving License: - This is a temporary licence that is valid up to 6 months from the date of issue. It is basically issued to learn driving of Motor Vehicles.
- Permanent Driving Licence: - Person supposed to get permanent driving licence should be conversant about the vehicle systems, driving, traffic rules & regulations.

International Driving Licence: - The motor licensing authority also issues International Driving Licence. Person visiting the country is required to collect the licence from there within one year period. Apart from address proof and birth certificate, one has to produce a valid passport and valid visa while applying.

III. METHODOLOGY

If a particular person able to drive the vehicle correctly then he will become eligible candidate for getting licences otherwise if he does committee some mistake during test drive then the various sensors which are present on vehicle system will sense accordingly and draws attention of the officer present in monitoring room and a person get failed from test of getting licences.

The applicants first have to swap a card to edge connector. This card is given from RTO office to the applicant. After swapping card applicant have to fallow all the instructions displays on the LCD display. If applicant fallows all instruction properly and correctly then applicant passes the permanent licence examination but suppose applicant fails in any one of the step displays on LCD then applicant is disqualified from the process.

The user needs to follow the following procedure of the system guided on the LCD panel on the vehicle

1.The user have to swap a card in the edge connector ,this card will contain the important information of user like ,His name , age, sex, permanent/correspondence address and phone number .Gathering of all these information eliminates the use of paper and also the hassle of the whole process.

2. The microcontroller then recognizes and stores the data in the memory and ,gives the instruction to fire the ignition of the vehicle ,the LCD will give a 10 second duration to the user to initiate the process if user doesn't executes the firing of the engine ,a signal will be generated back to the microcontroller that this step is failed to be executed.

3. After successfully completion above two process the system will prompt the user via LCD display that to start and drive the vehicle in left direction the LCD will give a 10 second duration to the user to initiate the process if user doesn't executes the signal will be generated back to the microcontroller which will be saved in the memory.

4. After execution of above process the system will prompt the user via LCD display that to start and drive the vehicle in left direction the LCD will give a 10 second duration to the user to initiate the process if user doesn't executes the signal will be generated back to the microcontroller which will also be saved in the memory.

5. Then user will be asked to increase the speed of vehicle slowly within 10 seconds and if the user is not able to perform the given instruction then signal will be generated back to the microcontroller which will also be saved in the memory.

6. Then user will be asked to decrease the speed of vehicle slowly within 10 seconds and if the user is not able to perform the given instruction then signal will be generated back to the microcontroller which will also be saved in the memory.

7. The next step will be the testing of upper indication and lower indication head lights of vehicle. Then LCD will give a 10 second duration to the user to initiate the process if user doesn't executes the signal will be generated back to the microcontroller which will also be saved in the memory.

8. In the last step the user will be asked to stop the vehicle. Then LCD will give a 10 second duration to the user to initiate the process if user doesn't executes the signal will be generated back to the microcontroller which will also be saved in the memory.

9. After completion of whole testing process a signal will be generated in microcontroller that the user has performed the entire process of granting a licence and knows all norms of safe driving. A SMS of completion of this process with a unique number generated by microcontroller by the help of GSM module is send to the users registered mobile number.

If applicant fallows all instruction properly and correctly then applicant passes the permanent licence examination but suppose applicant fails in any one of the step displays on LCD then applicant is disqualified from the process.

If applicant passes all instruction then applicant is granted a licence otherwise applicant have to give retest of granting licence in specific duration of time.

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Merits of System:

1. Avoids bribing in RTO's and accidents because licence is given to perfect drivers only.
2. The project is simple in construction and can be installed in any vehicles.
3. Reduces the Time & Money of peoples as well as Government.
4. Fully atomized system no human interference.

IV. DESIGN AND IMPLEMENTATION

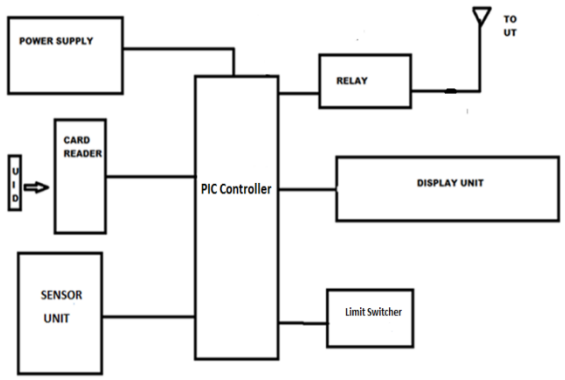

Fig 1. Functional Block Diagram

Above Diagram shows operation of system. When the applicant comes near the vehicle for giving a trial test he will be asked to insert his identity proof card into the Edge connector, after insertion the card reader scans and stores the information in the microcontroller unit. The power supply hears provides the energy for the whole system to be operational. The system then will give instructions to the applicant to follow, for eg. The system will give the instruction to the applicant to fire the ignition of the vehicle etc .The Sensor unit mainly consist of important parameter sensing mechanisms like Intensity of Light ,Rotational movement of Handle in clockwise or counter clockwise so as to determine whether the applicant has taken left or right turn. The LCD display here shows the instruction on its display panel which then an applicant follows step by step hierarchically.

Relay is a type of switch which energizes on very low voltages and trips the circuit to form a complete connection link .Relay is attached at every stage in every sensor level so as to generate a proper signal which can be sensed/detected by the microcontroller. A USART is communication peripheral used to transfer the result of the applicants trial test to the RTO end terminal.

Method of Implementation:

The applicants first have to swap a card to edge connector. This card is given from RTO office to the applicant. After swapping card applicant have to fallow all the instructions displays on the LCD display. If applicant fallows all instruction properly and correctly then applicant passes the permanent licence examination but suppose applicant fails in any one of the step displays on LCD then applicant is disqualified from the process.

Firstly applicant have to swap a card through which applicant can be identified then applicant have to turning on the vehicle instructed by LCD display then applicant have to fallow all the instructions such as turn left/right, increase/decrease speed, apply break to which the system gives 10 sec time to the applicant to follow instructions. If applicant passes all instruction then applicant is granted a licence otherwise applicant have to give retest of granting licence in specific duration of time.

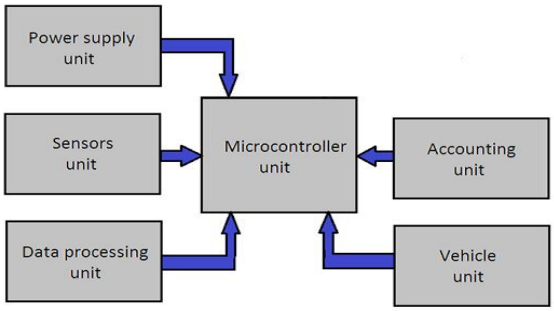

Fig 2: Sensor Interfacing to Controller

- Proximity sensor: A proximity sensor is a sensor able to detect the presence of nearby objects without any physical contact.
- Magnetic Sensor: Magnetic field sensing depending on the magnitude of the measured field.
- LDR Sensor: Diodes, like all semiconductor devices, are governed by the principles described in quantum physics

Above sensors which are being mentioned are the vital parts of conversion of a physical phenomenon to respective electrical signal in the project.

Design Tool used in project is Kiel IDE. The µVision development platform is easy-to-use and helping quickly create embedded programs that work.

V. CONCLUSION

After testing and confirming the output of the individual circuit we connect all this circuit on vehicle. When we make the circuit carefully connect all the connecting wire and to avoid loose connection soldered and check the continuity of the wires and tracks by the millimeter. And then give the supply to the input side of the circuit and checks all modes on output side of the circuit. After completing all modes and operation are works as per our assumption. Hence it is said that proper assembling and testing plays an important role for success of the project. This System can be connected to IOT device and we can monitor real time data. Thus, in this project I have implemented system to reducing the manual work in order reduces the time requirement for issuing the licence from the RTO office and to reduce the human effort. Use of automation also leads to get rid of corruption which is present in present RTO system by removing the role of private agents. Also by making use of modified well developed vehicle for test drive it's become very useful for driver for giving test drive and it is also remove human errors as system itself will analyse the situation and gives out the decision correspondingly.

In this way this project provides full automation to the RTO system thereby remove the corruption.

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AUTHOR PROFILE

Dr. Bhushan Vidhale , is working as an Assistant Professor in the G. H. Raisoni College of Engineering,Nagpur. He received her B. Tech in Electronics & Telecommunication Engineering from MIT,Pune and M.Tech in Electronics Engineering from the Nagpur University with honors during 2008 and 2011, respectively. He completed his PhD at Nagpur University with good number of publications indexed by Scopus. He has also more than 14 international and national conference publications. He has around 11 years of teaching experience. His areas of interests include RF VLSI, Wireless Networks, Vehicular Adhoc Network and Mobile communication

Mr. Ganesh S. Khekare is pursuing a Ph.D. in Computer Science & Engineering from Bhagwant University, India. He pursued Master of Engineering from G H Raisoni College of Engineering, Nagpur in the year 2013, and Bachelor of Engineering from Priyadarshini College of Engineering, Nagpur in 2010. Currently working as an Assistant Professor at G. H. Raisoni College of Engineering, Nagpur since 2012. He is a member of ACM since 2014, a life member of the ISTE and IEEE, IAENG, IFERP, IERD member since 2018. He has published more than 10 research articles in reputed international journals including Thomson Reuters (Scopus & Web of Science) and conferences including IEEE. He has filled one patent. His main research work focuses on the Internet of Things, Machine Learning, VANET, Image Processing, Smart Cities, Data Analytics, etc. He has more than 9 years of teaching experience and 3 years of research experience.