SMART-DRIVING LICENSE
(An IOT-Based System for secure vehicle system)

MOHD DAUD, NIPUN JAIN, NIKITA BHADULA

ABSTRACT:- This paper represent the development of idea of making the proposed mechanism for a SMART Driving License using the concept of IoT(Internet of Things). The concept of SMART DL came into existence to provide a secure vehicle-system by providing the prototype of upgraded authorised version of simple driving license by holding all the necessary information about the DL-holder, car owner, & the vehicle with all their required documents into a single physical authorized device, using IoT so that the problems of several frauds, thefts, heavy challans, terrorism could be stopped at maximum extent. The system must be containing a RFID reader and a GPS to tracking purpose. The proposed mechanism for SMART DL when inserted into the vehicle, all the necessary information like unique ID no., U.ID, vehicle no., Location, all goes to server (cloud), and that information could be restored and viewed through a web-portal/application maintained, which could also be handled by the owner of vehicle as per his/her requirement.

KEYWORDS

IoT, Cloud-Computing, Arduino, RFID, SMART-DL, GSM module, GPS.

1. INTRODUCTION

The SMART DL is an IOT based project, which is basically a proposed mechanism for a upgraded version of a simple Driving License, holding all the necessary information about DL-holder vehicle owner and the vehicle, location and all other required data in a single card. The main objective of proposing this SMART-DL is to provide a secure-vehicle system.

The concept of proposing a SMART DL came into existence to enable the licensing authority and to ensure secured storage of data, authentication of delinquent drivers, thefts, frauds, terrorism, etc. & resulting into a quite secured vehicle-system. Both DL holder & the vehicle owner would get benefits of using a SMART DL as until & unless the DL holder, will not insert his/her SMART DL into the vehicle it won't get start, so a person couldn't forget his/her DL at home. Secondly, information about vehicle like current location could be known.

The SMART DL is far more superior than simple driving license as it contains all the required information about DL holder, vehicle owner, vehicle itself, location. Moreover, it has secured storage of data, which helps in authentification. Activities like, terrorism, fraud, theft, etc. could also be reduced at a great extent as all the information & tracking of vehicle could be done when required. The another advantage of SMART DL is that one no longer has to worry about forgetting DLs at home, tearing of DL, getting wet, etc. making it easy to installed in vehicle itself, hence heavy challans could get stopped.

2. PROJECT DESIGN & IMPLEMENTATION

The proposed mechanism for SMART DL system can be divided into hardware and software modules. The methodology is discussed as follows:-

2.1 HARDWARE CONFIGURATION OF PROPOSED SYSTEM

The system consists of a RFID reader which operates on radio waves for analyzing items people, along with a ARDUINO, which is a processer to the system. The system also contains a GPS for tracking purposes and GSM for transmitting messages/signals. An android application is also used for tracing & tracking the vehicle and the driver through mobile phones from respective places.

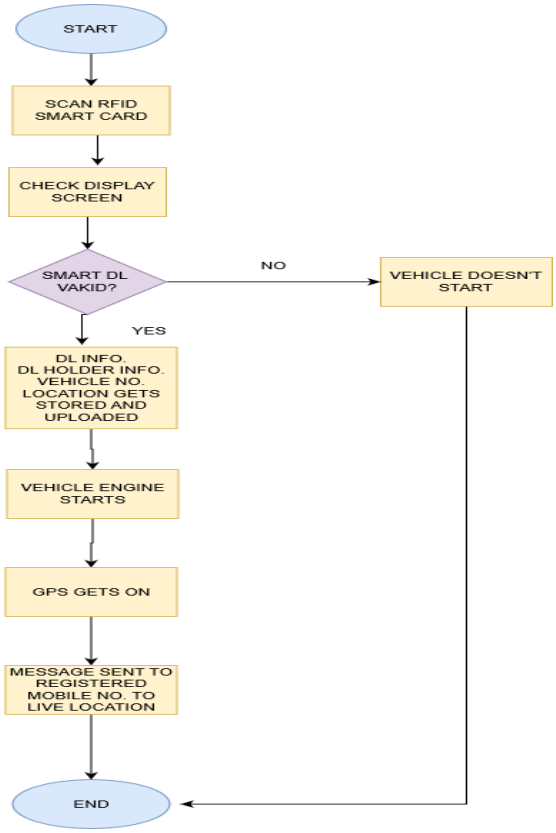


Fig 2.1 (a) Flow chart for smart dl designing and implementation

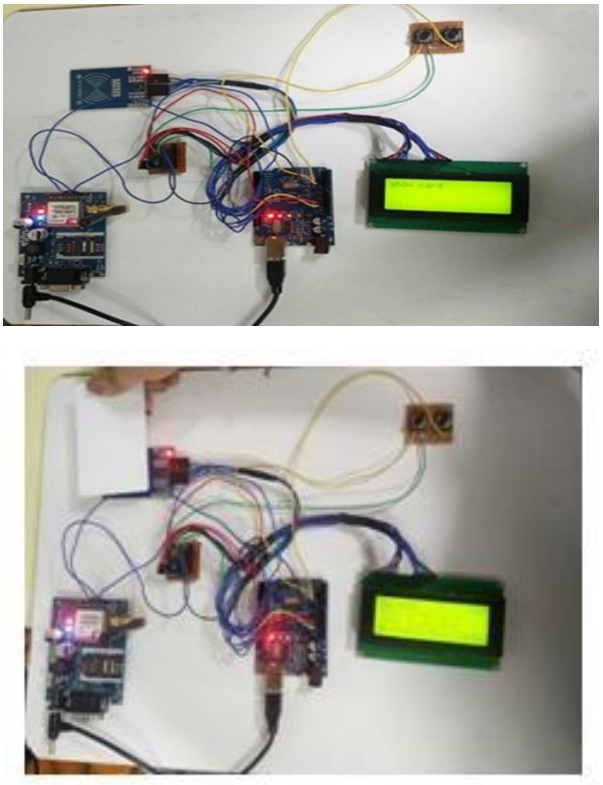


Fig 2.1 (b) Connections amongHardware Components of the Proposed System

The system containing RFID reader as a SMART DL, inserted into the holder of the vehicle, contains all the necessary information like unique id number (U.ID) vehicle number, location, and all get stored in the cloud (acting as a server), and that information could be viewed/checked through the web portal/mobile application, which could be handled by the owner of the vehicle as per his/her need. The point which needs attention is that designing the mechanism for SMART DL is the vehicle starts only when the SMART DL is the vehicle starts only when the SMART DL is the vehicle starts only when the SMART DL as a card is inserted into the holder, so that no one driving the vehicle could leave their respective DL at home & hence could be easily tracked, no heavy challans, no frauds, no thefts and no terrorism and every information could be retained if needed.

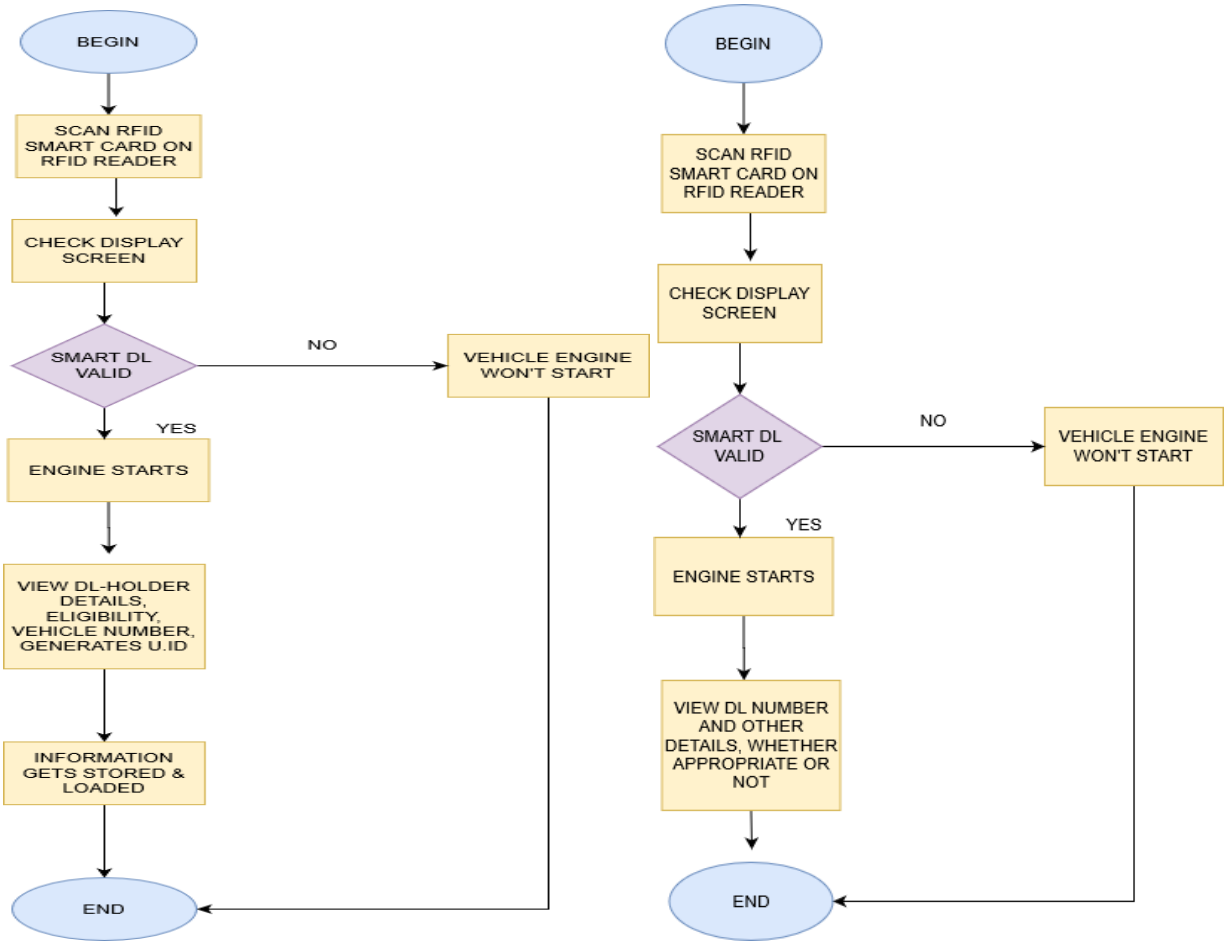
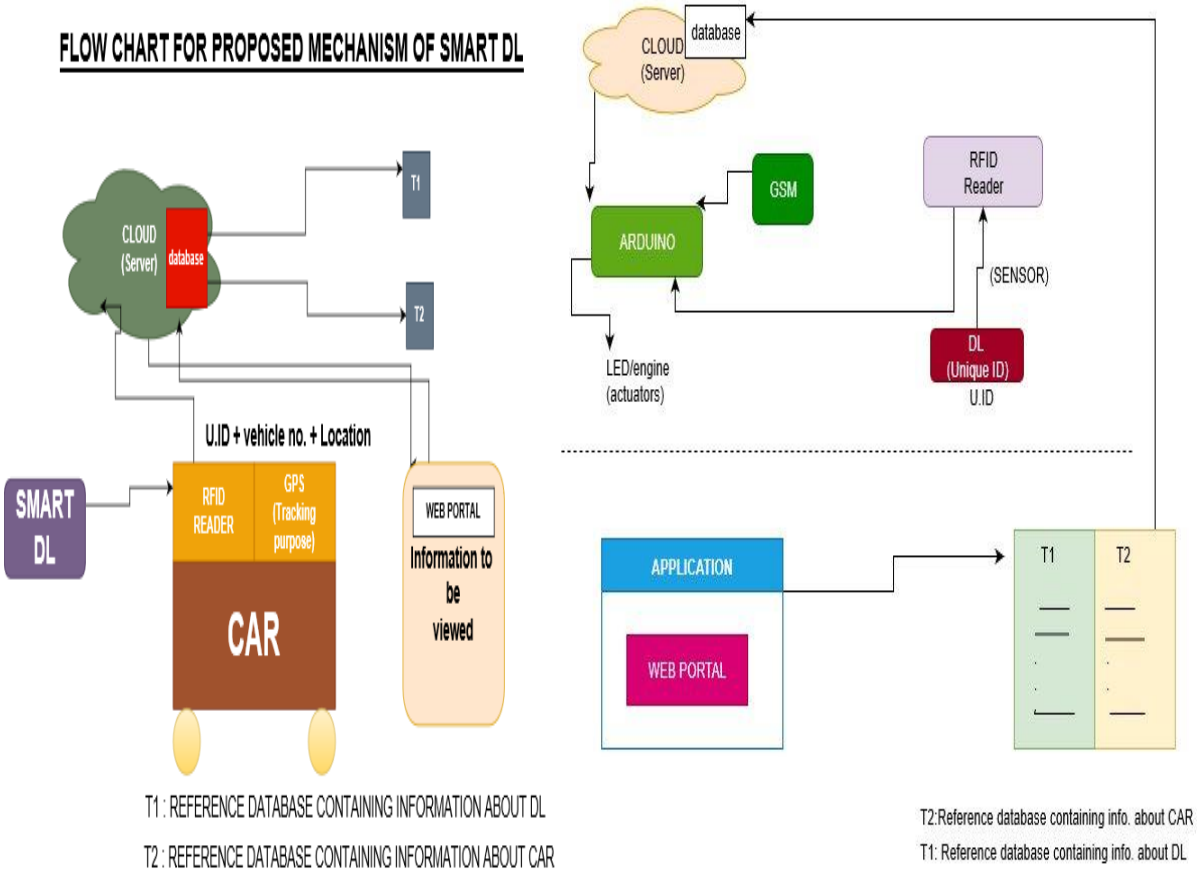


Fig 2.1 (c) Flow for viewing driving license (DL) and DL-holder details

2.2 SOFTWARE CONFIGURATION OF PROPOSED SYSTEM

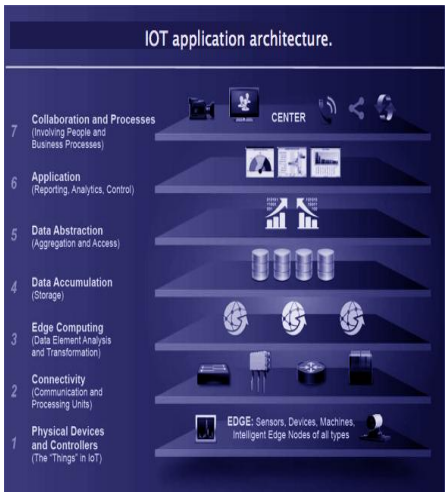
The SMART DL system is an IoT-based system using it as a technology for its implementation and also using cloud computing as another necessary implementational technological model for the proposed mechanism of SMART DL.

In the proposed mechanism model for SMART DL, RFID reader as a SMART DL, when inserted into a vehicle-holder, containing all the information of the DL holder, vehicle, vehicle owner, location gets transmitted to the processor (ARDUINO) and the cloud (server) as well. The android application/web portal is also containing data, linked to the server (cloud) about DL holder, vehicle, location, owner. When the database stored in CLOUD, matches appropriately to the information from the RFID reader, the engine of the vehicle starts & if not, it doesn't start. Hence, a valid DL-holder, and the valid details of vehicle should get matched for starting a vehicle. For tracking purposes, GPS sends the live location for security purposes.



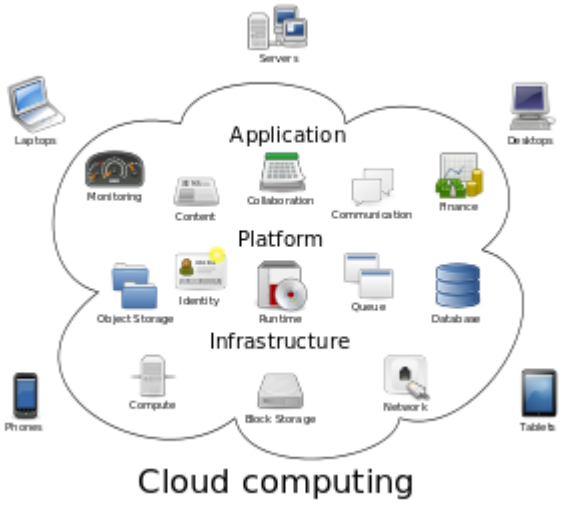
2.2.1 IoT

IoT abbreviated as ‘Internet of Things’ also referred to ‘indutrial internet’ has occupied a distinctive position as current technology paradigm, visualized as a network existing globally for several devices & machinery, capable of associating with each other through various inter-connection. The IoT is acknowledged as one of the influential technology in future aspects and attaining huge attention from a wide variety of industries, with various business application, logistics, analytics, information sharing & collaboration and enterprise-applications. All this has resulted in internet for communication and attaining different services over devices, and all such technological developments have made it truely possible for all of us today.



2.2.2 CLOUD COMPUTING

Cloud-computing is a shared-pool model of various configurable resources for implementing on-demand access and a convenient network that can be managed on a rapid rate. Cloud computing indulges with an ideal back-end result for handling large data streams and process them for various unique number of IoT devices in real-time. This technology has been increasingly incorporated via different companies as cost effective way for making resources and services available continuously when required. Through, as a consequence of service & halts at cloud provides, attaining operational reliability for resources is a major breakthrough of cloud computing.



2.2.3 RADIO FREQUENCY IDENTIFICATION (RFID)

RFID technology is one of the major step-forward discovery in the ingrained communication prototype, that enables designs of several microchips for wireless communication of the data.

The term RFID, observated as Ratio frequency Identification, is a technology that operates on radio waves for analyzing item or people. Majorly, this technology involves the need of RFID tag and a reader. The reader realeases a field of electromagnetic waves, that are consumed by the tag. The absorbed

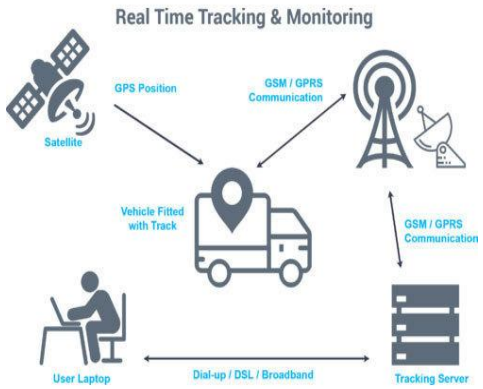
energy is then used to power up the tag identification number sent block to reader.

2.2.4 GSM module

The term GSM refers to ‘Global system for mobile communication’ which is generally used mobile correspondence framework available to produce an advanced configuration utilizing narrowband TDMA method (Time division multiple access) for various content-based administration. It is an indusive recognized standard for mobile communications. It uses TDMA technique for transmitting signals. GSM is an advanced and open cell-innovation for transmitting voice and services regarding information transmission tasks at 850 MHz, 1800 MHz and 1900 MHz frequency bands.

2.2.5 GPS

The GPS stands for Global Positioning System, which is a satellite-based navigation system, used for providing accurate location, time and velocity information to many suitably equipped users. The main objective is GPS is for tracking vehicles for security-purposes. It functions by transmitting signals and uses a network of settelites which allow people with GPS receivers to track their location anywhere in the earth. It has many applications in several areas like mapping, weather forecasts, vehicle-location, equipment, military, and many other.



3. CONCLUSION

This paper proposes the mechanism for SMART DL for secure vehicular system, intended to store all crucial information related to the vehicle and the DL holdeR. This RFID based SMART DL developed in this project will remove the need to carry other documents and provide security at a great extent by easily detecting frauds, delinquent drivers, duplication of DLs, thefts, heavy challans, and easy to carry. The GPS will send the live location of the vehicle when needed & GSM module for transmitting message signals to the vehicles owner. This project is developed keeping in mind the security and safety of people, their vehicles and Indian government’s smart & secure mission. Such smart card will also promote the concept of smart living and security amongst the public of the country.

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