Smart Traffic Management System for Effective Handling of Congestion Control, Emergency Service Control and Identify the Stolen Vehicle

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Abstract - *Nowadays most of the cities are facing the problem of Traffic congestion. Due to traffic congestion. People cannot travel and they could not reach the destination in the desired time. In the urban areas the middle class people also provide significant contribution to increase the Traffic congestion. Traffic congestion results in the wastage of time as the work is not completed. This paper represents the ways due to which the traffic congestion can be reduced. In this system the RFID tags are attached to the vehicles for their unique identification. The RFID tags are classified into prioritized, normal and stolen tags. The Sensors will count number of vehicles which are identified by the sensor in the particular area. RFID reader will take the count of the vehicles and the time of the signal will be set accordingly by interacting with Arduino. This system also detects the stolen vehicles when they cross the traffic signal their RFID Tags are scanned and the report is sent to the police station. In order to provide a safe path to the emergency vehicle it uses the dynamic approach for switching the signals. In this system, when a emergency vehicle reaches the traffic signal the traffic signal turns green on detection of emergency vehicle, ensuring that it gets a clear passage.*

Key Words: **Congestion, RFID, Arduino, Sensors, Emergency Vehicle**.

1.INTRODUCTION

Intelligent Traffic Systems (ITS) applications for traffic signals consists of variety of system which includes communications systems, adaptive control systems, traffic responsive, real-time data collection and analysis system, and maintenance management systems that enables the signal control systems to work with a greater rate of efficiency.

Traffic-signal control systems operate to coordinate individual traffic signals to achieve network-wide traffic operations objectives. *These systems mainly focuses on intersection which occurs at the traffic signals, a communications network to bind them together, and the presence of the central computer or network of computers to manage and control the system.

Coordination can be carried out through the use of number of technique which mainly includes time-base and hardwired interconnection methods. To achieve coordination among the traffic signals across agencies requires an enhanced version of data sharing and traffic signal control agreements. The traffic system today is not up to date so to maintain traffic consistency we are performing some ideas which may lead to efficiency up to some extent. As we can see today even the emergency vehicles can-not reach to their intended destination due to inconsistent traffic system. Our suggested traffic system will surely solve such problems leading to efficiency.

1.1. Problem Statement

To implement a system for effective handling of traffic congestion using a dynamic approach to ensure that the emergency services reaches to its intended destination in minimum time. Using RFID tags and Readers for tracking of stolen vehicles and to implement congestion control.

2.LITERATURE SURVEY

Activity blockage is a noteworthy issue in urban communities of developing Nations like India. The sudden rising of population and middle class people are the main reason of traffic congestion [1]. Development in urban populace and the white collar class portion contribute fundamentally to the rising number of vehicles in the urban areas [2]. Blockage on streets in the end brings about moderate moving movement, which expands the time of travel, accordingly emerges as one of the real issues in metropolitan urban areas. In [3], green wave framework was talked about, which was utilized to give freedom to any crisis vehicle by turning all the red lights to green on the way of the crisis vehicle, consequently giving a complete green wave to the craved vehicle. A 'green wave' is the synchronization of the green period of activity signs. With a 'green wave' setup, a vehicle going through a green sign will keep on get green signs as it goes not far

off. Also to the green wave way, the framework will track a stolen vehicle when it goes through an activity light. Preferred standpoint of the framework is that GPS inside the vehicle does not require extra power. The greatest burden of green waves is that, at the point when the wave is irritated, the unsettling influence can bring about movement issues that can be exacerbated by the synchronization.

In such cases, the line of vehicles in a green wave develops in size until it turns out to be too expansive and a portion of the vehicles can't achieve the green lights in time and should stop. This is brought over-immersion [4], [5].

In [6], the utilization of RFID activity control to maintain a strategic distance from issues that for the most part emerge with standard movement control frameworks, particularly those identified with picture preparing and bar interference procedures are talked about. This RFID system manages multivehicle, multilane, multi street intersection regions. It gives a productive time administration plan, in which, an element time timetable is worked out continuously for the section of each activity section. The continuous operation of the framework imitates the judgment of an activity policeman on obligation. The quantity of vehicles in every section and the steering are proprieties, upon which the computations and the judgments are finished. The inconvenience of this work is that it doesn't examine what techniques are utilized for correspondence between the crisis vehicle and the movement signal controller. In [9], it proposed a RFID and GPS based programmed path leeway framework for rescue vehicle. The center of this work is to diminish the postponement in landing of the emergency vehicle to the healing facility via naturally clearing the path, in which, rescue vehicle is going, before it achieves the movement signal. This can be accomplished by turning the activity signal, in the way of the emergency vehicle, to green when the emergency vehicle is at a specific separation from the activity intersection. The utilization of RFID recognizes the crisis and non-crisis cases, along these lines anticipating superfluous activity blockage. The correspondence between the emergency vehicle and movement signal post is done through the handsets and GPS. The framework is completely robotized and requires no human intercession at the movement intersections. The weakness of this framework is it needs all the data about the beginning stage, end point of the travel. It may not work, if the rescue vehicle needs to take another course for a few reasons or if the beginning stage is definitely not known ahead of time.

Fig 1. Traffic in urban cities [1]

3.RELATED WORK

From the present issue area, it can be seen that, existing advancements are lacking to handle the issues of blockage control, crisis vehicle freedom, stolen vehicle location, and so on. To take care of these issues, we propose to execute our Wise Activity Control Framework. It principally comprises of three sections. Initial segment contains programmed signal control framework. Here, every vehicle is outfitted with a RFID tag. When it comes in the scope of RFID reader, it will send the sign to the RFID reader. The RFID reader will track what number of vehicles have gone through for a particular period what's more, decides the clog volume. As needs be, it sets the green light span for that way. Second part is for the crisis vehicle freedom. The third part is in charge of stolen vehicle location. Here, when the RFID reader peruses the RFID label, it thinks about it to the rundown of stolen RFIDs. In the event that a match is discovered, it sends SMS to the police control room and changes the activity light to red, so that the vehicle is made to stop in the movement intersection and neighborhood police can make suitable move. List of technologies to used in the experiment are Arduino, PCB Circuit, IR Sensors, RFID, Switches, JDK 7, Netbeans, Apache tomcat 7, Android SDK

To develop this system desktop application for controlling the traffic signal. Intelligent traffic control system to pass emergency vehicles smoothly. Each individual vehicle is equipped with special radio frequency identification (RFID) tag (placed at a strategic location), which makes it impossible to remove or destroy. Also the Priority vehicle detection and rule break detection is using by RFID.

I. Desktop Application Modules

- Desktop application for controlling the traffic signal.
- Acknowledgment sent to the hardware device and according to the signal received, switching is perform.
- Algorithms: k-means clustering for handling the time based on the vehicle count.
- Find out the rules broken if count greater than 5; send sms to vehicle owner's number that 'your driving license is canceled temporary'.
- If count between 3 and 4 send the sms to deduct the fine from owner's account.
- If less than 3 send the normal sms notification alerting the status. PCB hardware to glow the lights using Arduino and PCB circuits; this is for simulation purpose.

II. Android Application

- Login and registration
- Displaying signal data be selecting the date

III. Hardware

- The LEDs (on the board) must be rotated clockwise and the traffic timing must be manipulated according to the car count.
- RFID is used to detect registered vehicles, detect priority vehicles (ambulance, VIP, stolen, Normal vehicles which has broken the rule)
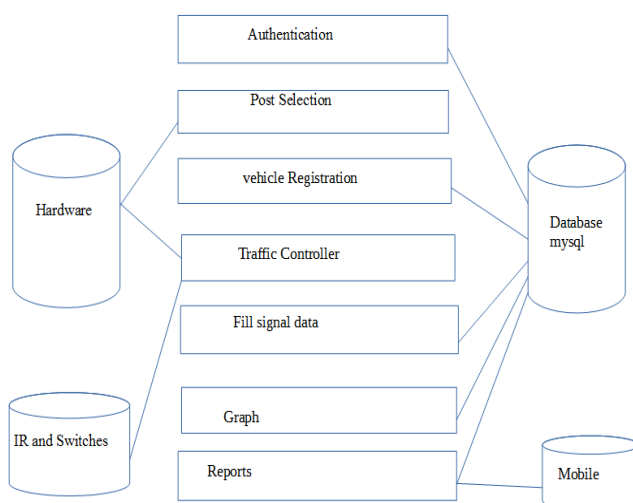

Fig 2. Architecture Design [5], [6]

4. CONCLUSION AND FUTURE SCOPE

Project has hardware part which is tested and runs properly according to the code. The code is tested. It contains no errors as so far. A very important module dynamic traffic lights is successfully implemented and tested accordingly.

Also some other features to view the traffic conditions an android application is provided also the fine system is provided but at basic level. In short, not fully but up to some extent we have provided efficiency to the traffic system.

5.REFERENCES

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