IOT BASED SMART TRAFFIC CONTROL

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Abstract - **Traffic management system is one of the major proportions of a smart city. With the rapid growth of population and rapid increase of vehicles across the whole country which further leads to the traffic Congestion which is usually seen on roads. Nowadays traffic congestion is a difficult issue to deal with as number of vehicles is increasing day by day. To tackle various issues of traffic on roads and to help authorities in proper planning, a smart traffic management system using the Internet of Things (IoT) is proposed in this paper. A simple, effective and less costly method is used to optimize traffic flow on roads and an algorithm is devised to manage various traffic situations efficiently and automatically. For this purpose, the system takes traffic density as input from 8 different sensors which are there in 4 lanes which manages traffic signals. Besides this manual control of this system using Wi-Fi is also used to prioritize the emergency vehicles such as ambulances and fire brigade vehicles during a traffic jam, so that we can open the specific lane with the remote using Wi-Fi. To show the effectiveness of this proposed traffic management system, a prototype is developed which optimizes the traffic having lesser cost and is very effective. And the real time data will also be visible in the mobile phone through application**

*Key Words***: IOT, Traffic, Notification, Alerts.**

INTRODUCTION

Traffic congestion on road networks creates many problems such as increased fuel consumption, increase air pollution, increased queuing of the vehicles and many more. When the number of vehicles exceeds on the road and the traffic controller is not very effective then the traffic congestion occurs. In every cities of India traffic congestion is a major problem which we are facing nowadays. Traffic congestion is caused when the number of vehicle exceeds the available road capacity and second if the proper management is not available. This is known as saturation [1]. Individual incidents such as accidents or sudden braking of a car in a smooth flow of heavy traffic have the highest effects of the slowing speed and cause traffic jams [2]. There are also even a severe many security problems in traffic system in our country due to many elements which also leads to the congestion of traffic at one place. In India, there is an annual loss of Rs 65,000 cores due to traffic congestion which also includes fuel wastage. Congestion in India has also led to slow speeds of freight vehicles, increases fuel consumption, increase air pollution and increased waiting time at checkpoints and toll plazas [3].As per data the average speed of vehicles on key corridors like Mumbai-Chennai, Delhi-Chennai is less than 30kmph, while there is 22 kmph on Delhi-Mumbai stretch. As per the road corporation of India , India's freight volume is increasing annually at a rate of 9.08 percentage and that of vehicles at 10.76, but that of road is only by 4.01. These all things combined resulted in reduced road space in comparing to the number of total vehicles in the country[3].The average fuel mileage in India is only about 4 km per litre. The major reason for this is traffic congestion[3].India is the 2nd most populated country after China in the world, thus with increase in population, the number of vehicles also increasing day by day[4].The economic growth has certainly had an impact on country traffic. As technology is improving or we can say its advancing day by day, more and more people starting to buy cars rather than two wheelers [5]. Thus which will directly lead to traffic conjuctions.Hence there is a need to manage traffic in a smart way as the management of traffic with the conventional way such as the smart automatic signalling system to reduce the congestion.

PROBLEM DEFINITION

A smart traffic management system utilizing sensor data, communication and automated algorithms is to be developed to keep traffic flowing more smoothly. The aim is to optimally control the duration of green or red light for a specific traffic light at an intersection. The traffic signals should not flash the same stretch of green or red all the time, but should depend on the number of cars present. When traffic is heavy in one direction, the green lights should stay on longer; less traffic should mean the red lights should be on for longer time interval. This solution is expected to eliminate inefficiencies at intersections and minimize the cost of commuting and pollution.

MOTIVATION

The challenges imposed on local public servicing outsourcing in saving human lives resulting from vehicle accidents have become a critical concern. An automated and intelligent mobile solution is required for a zero-mortality rate since there is a lack of automated on-site medical assistance, late accident reporting, inaccurate geographic location, and lack of injured medical information. The current existing solutions that assist passengers in case of a vehicle accident are concerned with user interaction after the incident.

OBJECTIVE
- To calculate traffic density.
- To detection of ambulance in traffic.

- To detection of accident

PROJECT SCOPE
In 2014, 54 of the total global population was urban residents. The prediction was a growth of nearly 2 each year until 2020 leading to more pressure on the transportation system of cities. Additionally, the high cost of accommodation in business districts lead to urban employees living far away from their place of work/education and therefore having to commute back and forth between their place of residence and their place of work.

LITERATURE SURVEY:
AN IOT-BASED SMART EXAM APPLICATION
This paper The exam statistics are crucial for instructors to better assess the exam metrics, e.g., exam duration. However, one statistic, time spent on each question by each student, is not available or difficult to obtain by human observation. In this work, we propose a smart exam system that obtains such statistics and sends data to a web application for further processing by using an internet-of-things based technology. The information obtained by the proposed system can even be used to diagnose students with learning difficulties or disabilities, e.g., dyslexia. We provided an experimental setup and conducted experiments with volunteers. The experiments conducted during the study show that the proposed system effectively collect information and process data for the use of instructor.[1]

Iot security (iotsec) mechanisms for e-health and ambient assisted living applications
The Internet Of Things (IoT) is poised to make substantial inroads in all aspects of modern life before the end of this decade, including applications in smart grids, smart cities, transportation, crowdsensing, e-health, ambient assisted living, and home automation, to list just a few. Although it is recognized that IoTSec mechanisms and principles are needed across the entire IoT ecosystem, many of the intrinsic features of IoT systems make the IoT vulnerable to cybersecurity breaches. Firms wonder if the mechanisms required to protect the users and the data are ready for "prime time", especially in the e-health arena. The field of big data as related to security event processing, is relatively new, especially in the context of IoT, challenges include but are not limited to capture, transmission, analysis and curation of the data. This article provides a novel IoT protocol architecture and examines security tools and techniques that can be leveraged as part of the deployment of IoT, these mechanisms are particularly important in e-health and assisted living applications.

A novel IoT access architecture for vehicle monitoring system. In paper The Internet of Things (IoT) is becoming increasingly important for traffic monitoring, medical treatment and other industrial applications. With the continuous development of the IoT, more and more "things" will be able to access to the IoT. Considering a large number of heterogeneous "things", how to provide a unified access mechanism to the IoT is a fundamental and key issue. In this paper, we propose a novel IoT access architecture based on field programmable gate array (FPGA) and system on chip (SoC), which can provide a unified access to the IoT for a wide variety of low-speed and high-speed devices with associated extendibility and configurability. We have adopted IEEE1451.2 standard for this design and applied the proposed design to vehicle monitoring system. The results indicate that the system can provide good performance in practical application [3]

PROBLEM DEFINITION
Road traffic and traffic congestion are major problems worldwide. To avoid such problems surveillance is the most economical technique for monitoring road traffic. Traffic monitoring has become vital to make sure quick detection of an incident's location, to avoid traffic and obstacles due to traffic. With the increasing number of vehicles on the road, heavy traffic congestion has substantially increased in major cities. This happened usually at the main junctions commonly in the morning, before office hours and in the evening, after office hours. The main effect of this matter is the increased time-wasting of the people on the road. At certain junctions, sometimes even if there is no traffic, people have to wait. Because the traffic light remains red for the preset time period, the road users should wait until the light turn to green. This happens because the timer values are already set on the basis of average traffic on that lane

SYSTEM ARCHITECTURE
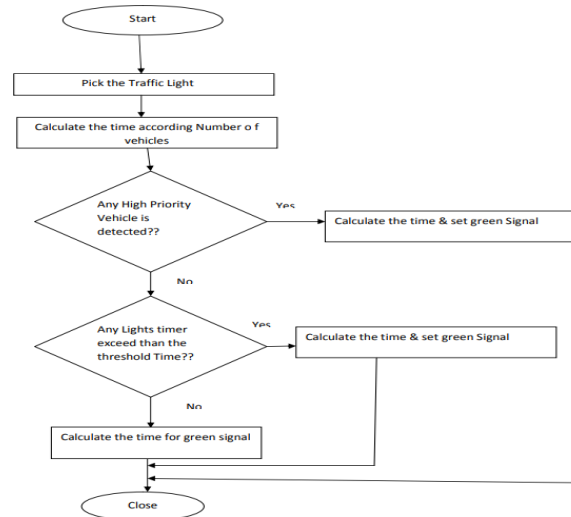
Fig -1: System Architecture Diagram

The Internet of Things (IoT), also sometimes referred to as the Internet of Everything (IoE), consists of all the web-enabled devices that collect, send and act on data they acquire from their surrounding environments using embedded sensors,processors and communication hardware. These devices, often called "connected" or "smart" devices, can sometimes talk to other related devices, a process called machine-tomachine(M2M) communication, and act on the information they get from one another. Humans can interact with the gadgets to set them up, give them instructions or access the data, but the devices do most of the work on their own without human intervention.

APPLICATION
- Traffic management system.
- Accident prediction system.
- Accident control.

ADVANTAGES
- Helps to the prevent traffic jams
- System will keep sensor record and utilized it for emergency vehicles.
- System is user friendly Saves time
- Low cost

CONCLUSION

we have described about a traffic management system which is working on the basis of Iot and its embedded network and it is taking real time data as the input to track the traffic management system and giving output in terms of time assigned to traffic lights on the basis of density.The existing traffic system has not much option so in future this system can be used to control traffic in smart way by saving time, decreasing the accidents and also it can give real time traffic notification to people so they can choose the right lane or road to pass through. This system is also cost effective than the existing system.

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