Virtual Eye - Smart Traffic Navigation System

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Abstract— In recent years usage of private vehicles create urban traffic more and more crowded. As result traffic becomes one of the important problems in big cities in all over the world. Some of the traffic concerns are traffic jam and accidents which have caused a huge waste of time, more fuel consumption and more pollution. Time is very important parameter in routine life. The main problem faced by the people is real time routing. Our solution Virtual Eye will provide the current updates as in the real time scenario of the specific route. This research paper presents smart traffic navigation system, based on Internet of Things, which is featured by low cost, high compatibility, easy to upgrade, to replace traditional traffic management system and the proposed system can improve road traffic tremendously.

Key words: Traffic, Internet-of-Things-IoT, Smart CCTV, GPS, Virtual Eye

I. INTRODUCTION

In recent years private motor vehicles makes urban traffic more and more crowded. As result traffic monitoring is becoming one of important issue all over the world. Some of these concerns are traffic jam and accidents that usually cause a significant waste of time, waste of fuel and increase in environmental pollution. Any type of congestion on roads ultimately leads to financial losses. So, there is an urgent need to improve traffic management. The appearance of the Internet of Things (IoT) provides a new trend for smart traffic management.

This research proposes to implement the IoT, with other technologies to improve traffic conditions and relieve the traffic pressure. Information generated by traffic IoT and collected on all roads can be presented to travelers and other users. Through collected real-time traffic data, the system can recognize current traffic operation, traffic flow conditions and can predict the future traffic flow. The system may issue some latest real-time traffic information that helps drivers choosing optimal routes. Therefore, the system can precisely administrate, monitor and control moving vehicles. Constructing an intelligent traffic system based on IoT has a number of benefits such improvement of traffic conditions, reduction the traffic jam and management costs, high reliability, traffic safety and independence of weather conditions [1,3].

II. PROPOSED SYSTEM

Various technology devices are used in proposed system architecture using Cloud to implement traffic IoT. A GPS navigation device is a device that accurately calculates geographical location by receiving information from GPS satellites.

Fig. 1: GPS + Wi-Fi

When we use the GPS with Wi-Fi, we can get recent updates in GPS about accidents / traffic / natural disasters - heavy rainfall, flood, fire etc. in our route shown in Fig(1)

With the help of Smart CCTVs we can keep eye on the traffic of different areas. We can put smart cameras on street lights, traffic signals, highways etc.So with the help of Wi-Fi we can get recent traffic updates. Thus, we can change our route. Fig (2),(3)

Fig. 2: Smart CCTV watching route (Day)

Fig. 3: Smart CCTV watching route (Night)

If there is no accident in route, it will show CLEAR to Cloud Server. but when accident /anything happens , it will capture in CCTV.

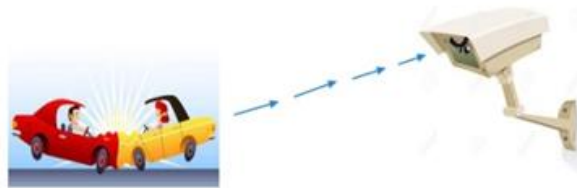It will locate the area and send notification to server via cloud. Fig (4)

Fig. 4: CCTV detects accident

III. PROPOSED SOLUTION- VIRTUAL EYE

The Internet of Things is based on the Internet, network wireless sensing and detection technologies to realize the intelligent recognition on the tagged traffic object, tracking, monitoring, managing and processed automatically. This paper proposes a system architecture that integrates internet of things with agent technology into a single platform where the agent technology handles effective communication and interfaces among a large number of heterogeneous highly distributed, and decentralized devices within the IoT.[4]
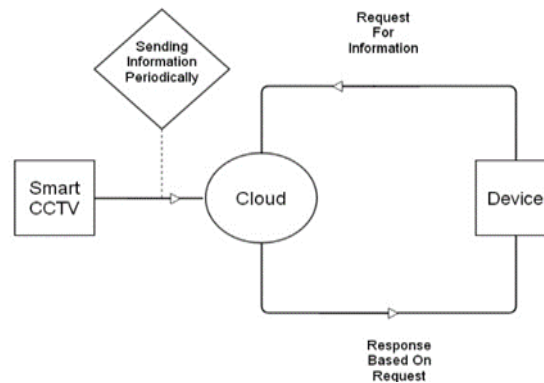
A. System Architecture:

Fig. 5: Proposed System Architecture- Virtual Eye

When a Smart CCTV observe any accident or bad weather condition, it will send message via cloud to main server. Now, if we turn on Wi-Fi in our GPS, we get recent updates about the traffic in our route.

Fig. 6: Person uses Virtual Eye in his GPS

Time is very important parameter in routine life. The main problem faced by the people is real time routing. Current system provides route status and it does not determine in case any problem occurs on the route . There are many problems that occur while traveling such as an accident, some bad whether condition, heavy traffic etc. If there is a system which provides the current status of route based on user request then it would be better for the people to choose the route. Using concept of IOT, we propose a system so people can easily get real time route updates and suggestion based on current situations. Our system will provide real time route updates using surveillance system and Geo tracking system. The system will notify user about the current status of specific route based on request. We will use smart cctv cameras and server to store the information. As of now we are going to use existing cameras and external device to store the information. With   the help of this system users can get the route update easily and it shall be helpful for the people to save the time. Our system will provide the current updates as in the real time scenario of the specific route. Fig(7), (8).

IV. RESULT SCREEN SHOT

By Implementing traffic IoT as Virtual Eye, following searching route and route updates are given to user periodically or when the request is placed. Fig(7),Fig)(8)
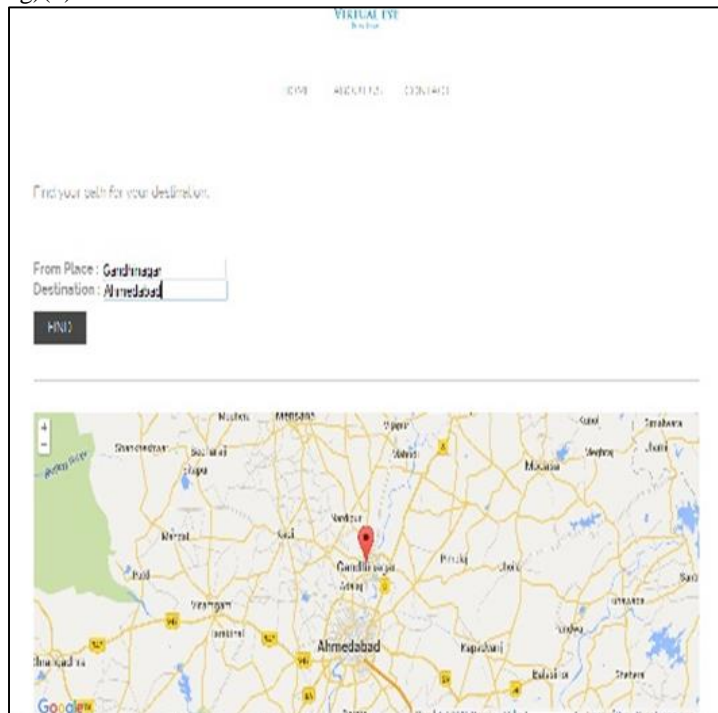

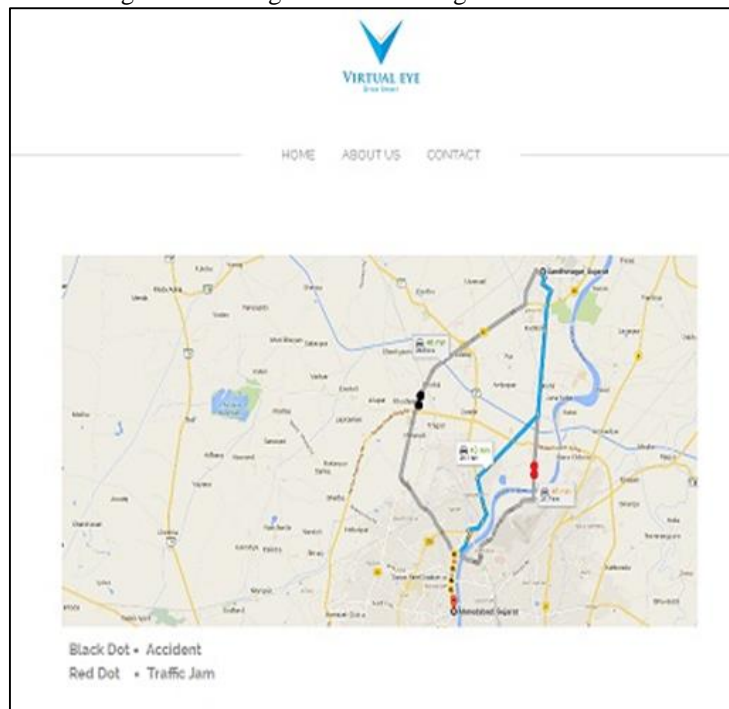Fig. 7: Searching route Gandhinagar to Ahmedabad

Fig. 8: Resulting route with Real time updates

Black dots = Accident

Red dots = Traffic Jam

V. CONCLUSION

This paper presents a real-time traffic information collection and monitoring system architecture to solve the problem of real-time monitoring and controlling road vehicles. Our Virtual Eye system can provide a new way of monitoring traffic flow that helps to improve traffic conditions and resource utilization. In addition, transport administration department, using real-time traffic monitoring information, can in time detect potentially dangerous situations and take necessary actions to prevent traffic congestion and minimize number of accidents thus ensuring safety of road traffic. In general, the IoT will play an important role in the traffic management enhancing the efficiency of information transmission, improving traffic conditions and management efficiency, traffic safety, and reducing management costs. Advantages of our system We can get recent updates about our route in our personal GPS

It will save our time. It will also helpful to Government and public for stopping robbery and crimes.

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