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CITY BASED TRAFFIC PATH PROBLEM IDENTIFYING AND SOLVING USING IOT

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Abstract: *This is a kind of technology which is used to monitor city trafiic using the concept of IOT. There are many sensors existing in traffic which sense all objects exist on road. In this technology, there are three technologies is combined with one another. These are IOT, Cloud Computing and Big data analytics and wireless network. There are different types of sensors fixed all over the roads. These sensors sense the all type of objects and then it will be communicated through the cloud computing. So, the persons those who are travelling on this road know city all road status. If the person knows the traffic details, he or she will change his are travelling path. It gives all details about the traffic in any cities. This system sends messages in the form of video, audio and text message. There is central control room availble in this network. This will control all the details about the city road traffic.*

Key Words: *IOT, Sensor, Cloud Computing.*

Introduction:

Now days IOT (Internet of Things) is a emerging technology which can be applied to all field. This technology connects objects which are different in nature. IOT connects different kinds of objects which may be mechanical, electrical, chemical or any kind of object. The sensors sense the environment and pass the information through the internet. Here we can access this communication from any where in the world. So, in this technology we can operate and control objects from remote places. So, the objects get the command from remote place and act according to command passed from user. For Example, in Home Management System full house is fixed by sensors. Suppose, the refrigerator is not working, then the sesnsor detects refrigritator and pass the signal to the remote place through the Cloud computing technology. So, we can give the command from anywhere else and clear the refrigerator problem. In a Home Based IOT contain TV in the Room. Suppose if the TV is not switch off after closing the door. Then the sensor immediately gives the signal to the user. This signal is passed through the cloud computing. Then the user give the command through the Cloud computing and Switch Off the TV. This is the General oprating in IOT.

Urban Population is continuosly increasing every year. According to a United Nations report, the percentage of urban population in the whole world constitutes about 56% in 2015, with a steep increase of 1.84% every year. According to the predictions, by 2050, about 64% of the developing world and 86% of the developed world will be urbanized [1]. Due to Increase in the urban population transportation is the biggest problem. In transporation in the third world nation there is huge traffic occur. If any accident along the road it will detected in this system and started the immediate action.Indian Government annouced nearly 100 cities will be converted into smart cities. So, this idea there will be build smart city concept using the IOT. The full city will be fitted different kind of sensor in the Road. This sensors are detected various kind of information. For Example pollution sensor which detect air pollution of the vechile. The Full city will be Monitor and identify the Illegal activity of that person.

(i) Sensors:

In this System various kind of Sensors are used in the Road. Following are the Sensor used for this System. These are:

1. Inductive Loop Detectors: This Sensor is used for Vehicle detection. It is used for Accident detection, Traffic monitoring and traffic control. It is attached with platform of the Road through the insulated wire. It identifies different types of vehicles and its speed. This detector is fitted along Roads of city.

2. Microwave Detector: Unlike ILD, it is not installed on the platform of the Road. The main advantage of the microwave detector si that it works all type of Environment such as Snow, Rainy, windy and sunny.

3. Infrared Sensors: There are two types of Sensors used in the IR sensors. There are:

a) Active Sensor b) Passive sensor.

a) Active Sensor: The active infrared sensor emit infrared energy to the road, then reflected rays will be received by infrared receiver. It is used to identify speed of the vehicle, vehicle classification and vehicle identification.

b) Passive Sensors: This is opposite of active sensor. It does not emit any energy, but it observe energy which come from vehicle. It detects vehicle length, number of vehicle, speed and its occupancy. But this type of sensor does not work under the severe weather condition.

4. Acoustic Detectors: This kind of sensor works in all lighting environment and adverse wheather condition. It detects carrage occupancy, speed and volume of the vehicle.

5. Weigh in Motion (WIM) Sensors: This type of sensor is used to detect the weight of the vehicle. Suppose if the vehicle weight is move then it will intimate us in the form of signal. The weight depends on the vehicle axle. If the axle is high, then the weight is high. If the axle is low the weight is compatively low.

6. Roadside Weather Information System: This type of sensor is used to detect Road weather condition such as Smoky, Sunny and Cloud Situation.

(ii) Other Equipment:

1. LCD Television: The LCD TV is fixed on every 200 meter on the Road side. This Equipment will Broadcast all details of various parts of the city road current traffic status. It also gives alternative path if any road is blocking or huge traffic occurred. So, the person those who travel on the road, he know the traffic status of the city. So, based on this status, he will travel on alternative path if any traffic jam is occurred. The information comes from this device to the central control room. The central control room gives the details of the current status of the all road in the city. Moreover, the the person those who travel on the city road he knows the environment factors such as rainy, smoky, etc.

2. CCTV Camera: The CCTV camera fixed on every 200 meter on the road, will give the details of the current traffic level status of the city. This camera will send the information in the form of videos. This will be received by the cenral control room. If the video is essential, it will be sent to all roadside LCD TV and it will be broadcasted. So, all the details are centralized.

3. GPS Sensor: This device is used for location on the earth. This sensor is attached with other sensor. Because we want to know the current location of the earth. Suppose if rainy situation occurs at one place, it will be intimated with the location of the road.

4. Wireless Remote Control Speakers: There is wireless speaker which is fixed at every 200 meter on road. If any problem occurs on the road, then it will be regulated through the voice which comes from central control room. So, the road traffic will be easily regulated through this speaker. The central control room will pass the command through the speakers.

5. Smoke Detectors: The sensor detects the fire and smoke. If any kind of smoke or fire ocurrs at the time of accident or emergency condition, it will be intimated to the central control room. Moreover, the proposed system is attached with firstation. So, the fire can be immediately responded.

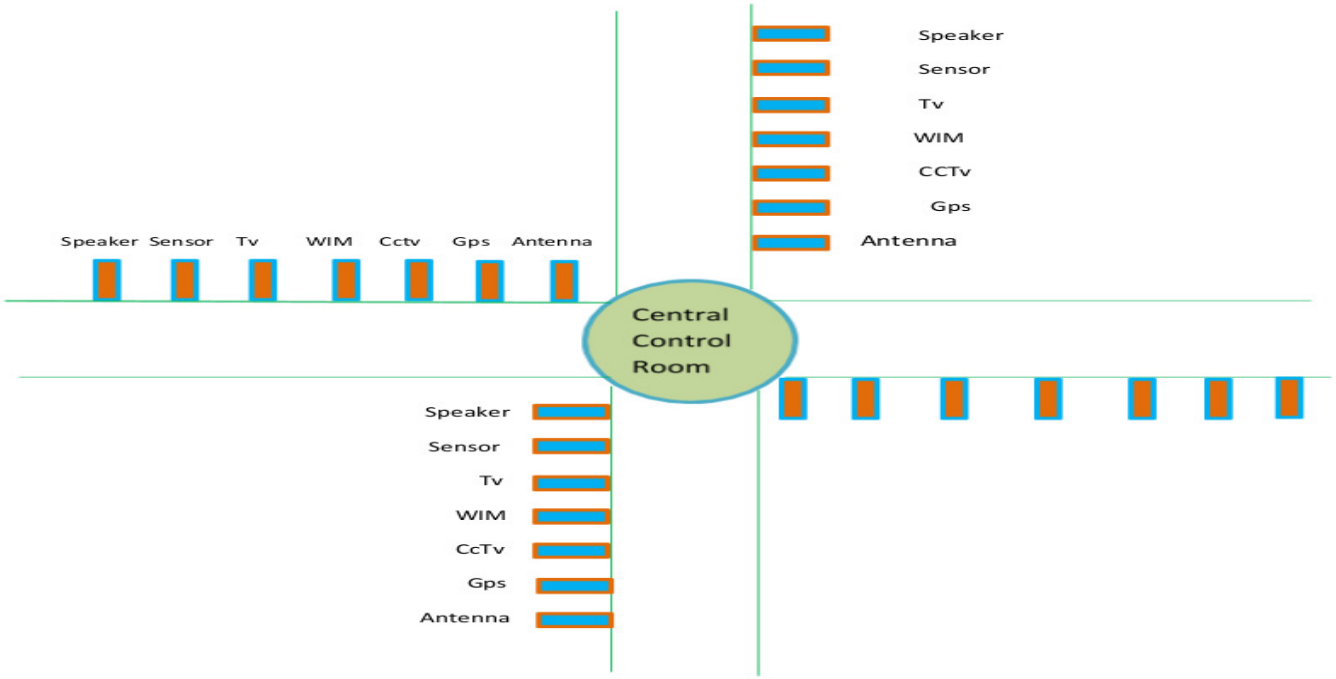
6. No_2 Sensor and CO Sensor: Thes two sensors are used to detect the nitrous oxide and corbon monoxide in the air. Thes two gases are poisonous for air. Thes sensors will detect air pollution and intimate to the Cenral conrol Room.

Advantage of the Proposed System:

The present system of the traffic management is not centralized. Only the person those who is administor can access the status of the traffic in the city. But the proposed system is centralized. That means it will be accessed by the administrator as well as user. Here user represents the person those who travel on any road of the city. But the user cannot control the system. So, the proposed system will reduce the traffic along with any kind of environment factors such as smoky, rainy in any part of the city it will be detected by the sensor. If any accident thappens in any part of the city it will be intimated to the hospital through this system. So, in this technology is the combination of IOT and Cloud Computing. In this proposed system, this will be connected into multiple areas. For example, traffic details are connected to control room, hospital, weather, report centre, etc. So, we can access the status of the road from any where in the world.

Moreover, this proposed System not only deals with the traffic but also it deals with climate condition, theft, accident, etc. The Road total status will be stored into the database. Mostly, this technology belongs to Big Data Analytics. The Road side videos all are stored into the bigdata tools like hadoop, Rtools, etc. Moreover we are storing the climate condition in the city road everyday in all part of the city. Then we store the accident, people activity in the roadside.

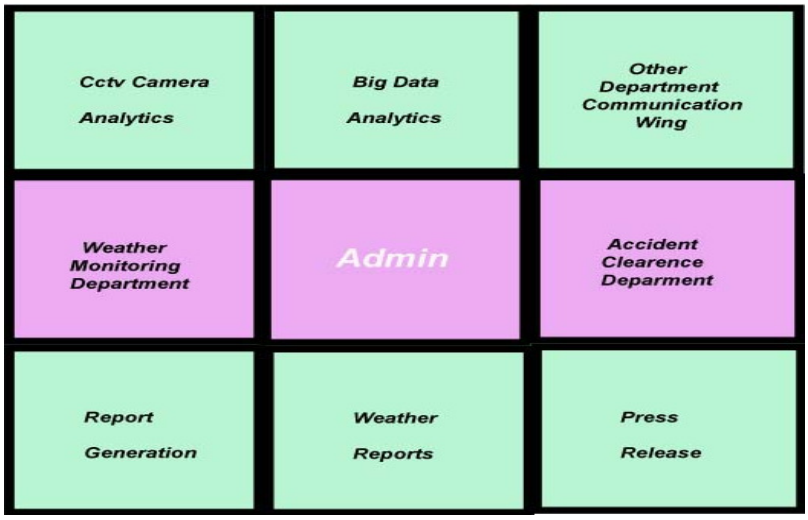
Structure of the Proposed System

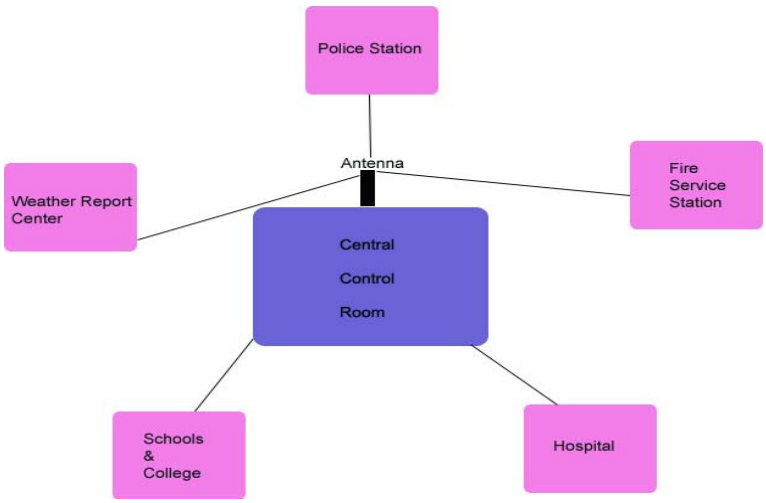


The Following are the components of the smart road management concept in city. These are :

1. Central Control Room 2. Various Sensors 3. LCD TV 4. CCTV Camera

1. Central Control Room:





The Central Control Room Receives different data which come from the various roads in the city. Then, it will be broadcasted to traveller in the city. Moreover, it will be accessed through the website. The person those who travel in any road of the city can know the status of the any road in the city. If any accident occured in the city, it will be intimated through the sensor or CCTV camera to nearest hospital. The hospital ambulance will attend within 10 to 15 minutes. times. If the vehicle speed is above normal speed that will be intimate to the control room. So, they watch vehicle number and they will give the message to nearset police station.

The Central Control Room consists of the various components in itself. One side it will montor overall city traffic through the CCTV camera and GPS. The second component will monitor the accident on the road. If any accident occurs it will be intimated to the hospital and police station. The third component will watch the Vechile details. That means total number of vehicles existing on the road, speed of the vehicle, volume, pollution and other things in the road. The fourth Component watches the criminal activity along the road. This component dirctly communicates to the police station. The fifth component the weather report and other activity. So the Central Control Room is the biggest one. So, it will be operated by many persons. This room data will be attached with police station, fire station, RTO office, Weather Report center, etc. So the Centrol

Control Room is the cenralized one. It will give services to the user through the website. This website give the main details of the user which are useful for the user who is travelling the city. Moreover, the CCR gives the some useful information to the person those who travel along the road.

2. Sensors Action:

If any road has huge traffic problem occur, then it will be immediately intimated to the central control room through the Inductive Loop Detectors (ILD). Then the immediate actions will be taken that means the vehicle path will be diverted in that particular Road. It will be broadcasted to other roads in the city. So, the person those who want to travel can change his path into another direction. After the Traffic clears it will immediately intimated to other roads travellers. So the traveller can easily know the details of the Road.

If the vehicle is very high weight then it will be intimate to the central control room through the WIM sensors. So, the vehicle will be stopped. The WIM sensor is fixed along the road. So, if any vehicle is overloaded, it will be identied and intimated to the central control room. WIM sensor which is used for heavy vehicle like Bus, truck, lorry etc.

Moreover the vehicle sound will be detected by the acoustuc sensor. If the sound is above normal, warning will be issued come from the central control room to vehicle driver. The Pollution Sensor is used for detecting the pollution in the city.

Big Data Analytics for Road Transport

All details are stored into the bigdata database like hadoop, Dbmango, R tool etc. These tools are stored with all type of information. This information may be in the form of text, image, video, audio etc.

Difference and Advantage of the Proposed System

The proposed centralized system coordinates all the system automatically and reduces human error provided that it introduces true smart city concepts to bring in to reality.

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