SMART CITY

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Abstract— Smart city is an improved and efficient way of living in all possible ways. They bring innovation and a sustainable place for our future generations to live in. It provides smart environment, smart standard of living, smart technological advancements for the welfare of the citizens, cost effective services and it helps in dealing with the ever increasing population. Smart city makes advancements in incompetent existing technologies hence making it fruitful for the purpose of living. The concept has been implemented in many parts of the world already and in India as well the work is under construction in Dholera (Gujrat). In this paper, few such technologies are added to the Smart City which includes smart vehicle detection based street light system, smart car parking system, smart irrigation system and smart alert system.

Keywords— smart city, smart street light system, smart irrigation system, smart car parking system, smart alert system

INTRODUCTION

Making a city "smart" is emerging as a strategy to mitigate the problems generated by the urban population growth and rapid urbanization. Smart city is not a very old concept, it is originated back in 1998 but the funds came later. All around the world the meaning of smart city varies and differentiate from each other. Different countries have different ideas and technologies for their cities to be smart but the parameters remains somehow same.

Smart city is an innovative city which has different axes to keep in mind for urban and rural areas. Smart city can be classified as Smart economy, smart mobility, smart environment, smart people, smart living and smart governance. Any city with any one of these feature or classification can lead to a smart city or a dream city. The new emerging technologies and ideas being implied to a city can definitely increase the value of that city.

With increasing population and demand of a better way of living, the need for advanced technologies is increased but the advanced technologies should also be a cost effective method otherwise sooner or later there will be a problematic situation.
 The inefficient consumption of natural resources like water , electricity etc leads to immense wastage and this paper give few ideas which may help in preserving the natural resources and development of urban and rural areas.

There are four ideas which are being discussed in this paper are as follows:

1 Alert System.

2 Car Parking System.

3 Automatic Street Light System.

4 Automatic Irrigation System.

The idea of automatic irrigation system is basically for the rural areas where the farmers faces problem for always checking on to the moisture content in crops and then to irrigate them. The car parking System can be a very effective method for maintain the discipline among the vehicles as the vehicles are given with the proper slots and are also informed if the slots are empty or occupied.

SMART STREET LIGHT SYSTEM

Street lights are basically used for the safety on roads. They provide the vehicles and on footers with light during the night time on roads. A smart vehicle detection based street light system is included in the smart city which helps in reducing the cost and saves a lot of electricity for the betterment of the society. The basic idea of this concept emerged from the fact that roads at night are not much used and even if they are used that is not always and not anywhere and thus when there are no vehicles or no one on the roads for even some time, then street lights still remain on which is a complete waste of electricity. So, this electricity can be saved by turning the street lights off when there are no vehicles on the roads or when there is no one on the roads. This is basically the smart vehicle detection based street light system.

In this IR sensors are placed at some distance from the other and having a bunch of street lights in between. When a vehicle is detected by a sensor, then a bunch of street lights after that sensor are turned on and remains on until the vehicle is detected on the next sensor and when it is detected on the next sensor, the next bunch of street lights is turned on and so on.

The main advantage of this vehicle detection based street light system is that electricity is saved which is a very crucial part in today's scenario.
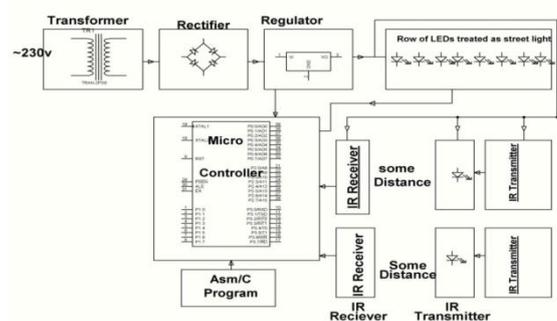

Figure1: Block Diagram

ALERT SYSTEM

The conflict of security in banks and shops have always been a keen point to focus on and smart alert system helps to solve this problem. The system consist of a motion sensor or PIR(Passive Infrared) sensor which detects the movement of humans or living beings on the basis of their body temperature. PIR sensor is basically divided into two parts, which works simultaneously by sending and receiving the

infrared rays continuously altogether. In case of stable objects both the sides of the sensor will detect together and have high pulses which implies that the object is stable. In case when someone is moving, one part of the sensor receives a high pulse and other part receives low pulse and just on the next instant when object has moved, the other part receives high pulse while first part receives low thus this show a movement in the body which the sensor detects. When such a movement is encountered at night when the banks or shops are closed then an alarm turns on which indicates the presence of threat.

CAR PARKING SYSTEM

To ensure whether the parking is full or not and to gain the knowledge of how many slots in a parking area are empty this smart car parking system is designed. In this smart car parking system, the person can have the knowledge of the parking slots prior to entering the car parking. Let there be n number of slots in the parking area, then there will be n number of IR(Infra Red) Sensors implemented across each slot. At a particular slot, if the car is parked, that is if the slot is occupied, then the sensor will detect the car and hence the output from that sensor can be taken as high or occupied, and if the slot is empty that is no car is parked in that slot, then the output is low. If all the sensors show high, then Parking Full can be displayed. Two more sensors are connected at the input and output gates, so that whenever a car is sensed by the sensor at the input gate, then the details about the parking can be displayed to the visitor and the visitor can also be greeted. Whenever the car is sensed by the sensor at the output gate, then another message like Thank you for visiting can be displayed.
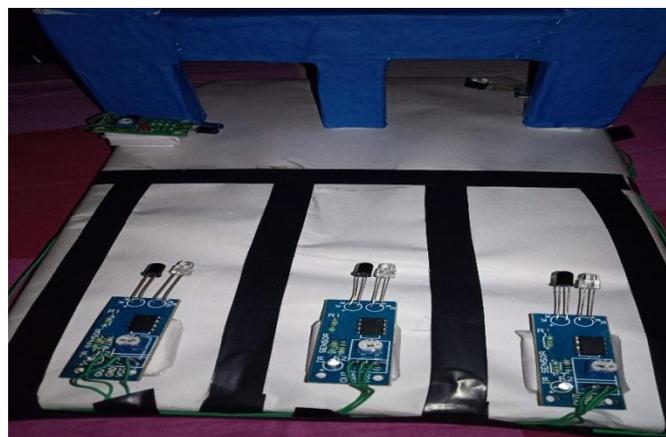

Figure2: Car Parking

AUTOMATIC IRRIGATION SYSTEM

Among the agricultural inputs which include seeds, fertiliser, plant protection, machinery and credit, irrigation assumes an importance place. Irrigation means watering the fields by any means other than rain, but in this process there is huge amount of wastage of water. The difference between water supplies and water demand is increasing in many areas of the world.

Some areas already suffering water lacking, increasing drought will be the major constraint to agricultural growth and development. Climatic changes will cause a decrease in annual water availability in many areas of the world. To avoid this situation automatic irrigation system is designed. This system provide water to the agriculture field only when it is required. The system consist of soil moisture sensor which sense moisture content in soil and accordingly provide signal to water pump which control the flow of water. By this system we can manage to reduce wastage to water in irrigation process.

Figure3: Automatic Irrigation System

CONCLUSION

Smart city is a generous step not only towards the growth of the society but also towards the country. It can be a great challenge for the government and the citizens of the country. As the people are migrating from rural to urban areas, the cities have to deal with the upcoming issues related to large scale urbanization. India is one among the most populated countries in the world and the smart elucidation can deal with the ever increasing population which could be a major step towards the betterment of the country and its growth.

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