

IOT BASED SMART CITY

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ABSTRACT

The Massive implementation of internet of things (IoT) is allowing smart City projects and initiatives all over world. Approach of Internet things is to merge the various sensors with ICT solutions. In last few years more than 50 billions objects has been connected for the implementation of smart cities. Internet of things (IoT) communications is the hub of smart City operations. The reason behind the designed of internet of things (IoT) is to support the smart city concepts, which aims to use advanced communication technologies for city administration and to promote various services for the citizens. Advanced technologies has made smart cities a versatile parameters for controlling, monitoring and operating in various fields, like(Traffic management, overflowed of garbage's, waste of electricity etc.). The cities are become smarter than ever before in efficient manners without spending much time and manpower. This project is a sincere effort's to list the essentials of 'smart city' and to overcome the problems that face by ordinary tasks. Also, the main purpose of this system is to make daily tasks easy and more efficient and it help's to reduce manpower.

Keyword: Sensor, IoT, Network, Cloud, ESP32, Online platform.

1. INTRODUCTION

The population density is increasing day by day in cities. Due to this infrastructure and necessary services are essential to provide the people. Because of this, there is outstanding growth for devices like as sensors, handsets which provides huge potential for IoT and all electronic devices are connected and communicate with each other with on internet. IoT is the heart of smart city projects. IoT supports smart city operations which helps to used most advance communication network with sensor's, software's and other technologies that communicate with other devices. Smart cities are rapidly developed with IoT model.

1.1 Problem statement

As we have seen in many cities people problems like garbage overflow, car parking issue, wastage of electricity this is because of negligence of citizens. Which affects on safety, security and health of citizens.

1.3 Aim of our project

The aim of our project is to design a city with smart car parking system, Automated Street light, home automation system, Smart garbage level monitoring system. Which will helps to reduce human efforts and which is energy efficient. By using ESP32 controller, sensors, fire-based cloud and android app. So that user can monitor the data all time.

2. METHODOLOGY

Our proposed system is consist of ESP32 controller, IR sensors, Ultrasonic sensor, LDR, LEDs. ESP32 has inbuilt WIFI module and Bluetooth. The output of sensors are given to the ESP32 controller as a input. As Controller get sensors data it process on it and send the data to the cloud. The output of system is display on Android app. For monitoring purpose.

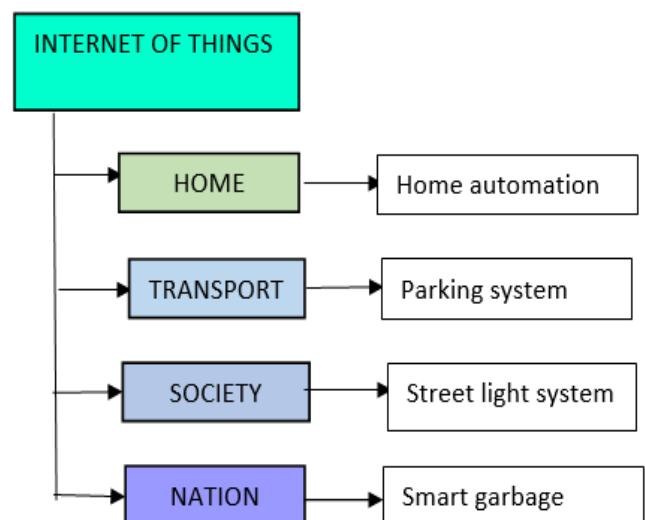


Fig no:1

2.1 Project model

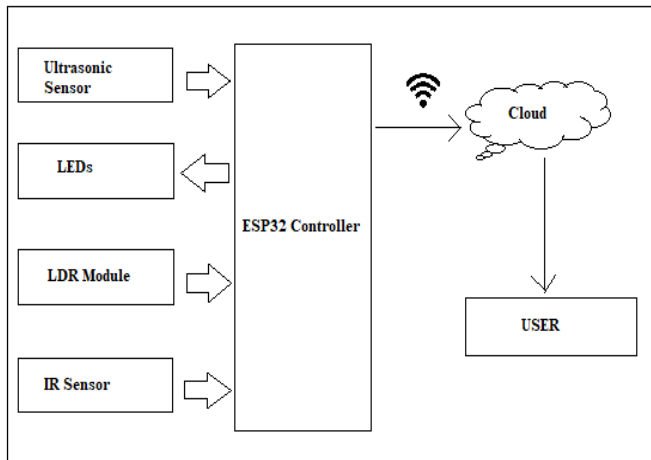


Fig no:2

3 .MODELING AND ANALYSIS

For the implementation of this project required hardware and software are shown below

3.1 Hardware components

- ESP32 controller
- LED'S
- IR Sensors
- Ultrasonic sensor
- LDR

3.2 Software required

- ARDUINO IDE (For programming)
- PROTEUS ISIS8 (For simulator or power supply)
- ANDROID APP (To monitor the data)

3.3 Flow chart

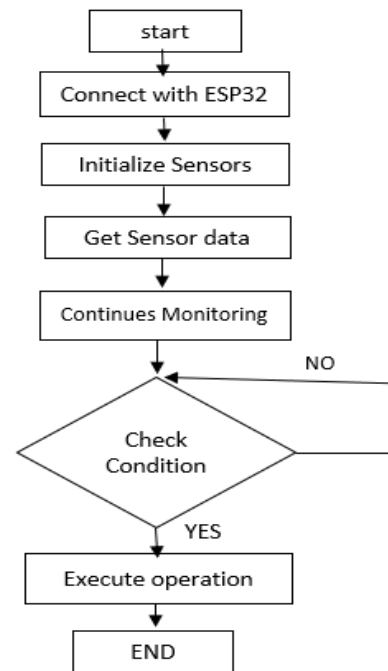


Fig no:3

4. WORKING

The system architecture consist four model like Home Automation, Smart parking, Street Light, & Garbage System.

1) Home Automation

For Home Automation Control home appliances using user Application. The module of home automation is totally based on software. This module uses mobile app to connect to the cloud and control home light.

2) Smart Car Parking

This system consists of a microcontroller as well as an IR sensor. Smart Parking is continually monitoring whether it is book or empty by using IR Sensor, Controller gets sensor data and sends it to the cloud. Then the user can monitor all time. IR sensor used as an obstacle detector. An IR sensor emits the infrared radiation which is bounces from the surface of car then the signal is detects at infrared receiver .Here we use three IR sensors for three parking slots. When the car is available at the first slot then the first slot is "book" shown on the user's mobile screen. It uses same concept for remaining slots. Smart Parking is continually monitoring whether it is book or empty by using IR Sensor, Controller gets sensor data and sends it to the cloud. Then the user can monitor all time.

3) Smart Street Light System

The intelligent street light system consists of IR sensors, LDR. The vehicle which passes by the street light is detected by IR sensor. LEDs are on/off the street. We are using here three IR sensors and three LEDs. Here we use LEDs as a street lights. When the car is passing through first street light then controller get sense data of sensor and controller. Controller turn ON the first street light based on sensor data. When car is passing through the second street light it will automatically turn ON second street.

Light and turn OFF the first street light after some delay. At last it car passing in front of last street light then it will turn ON and turn OFF the second lamp.

4) Smart Garbage monitoring system

Smart Garbage System is continually monitor the dustbin full or empty. By using Ultrasonic sensor. It has 4 pins, VCC, trigger, echo, ground. Echo pin act as a output pin for controller and trigger act as a input pin for ultrasonic. Both pins are connected to the ESP32 controller. The garbage level is shown on the mobile app in percentage. When there no garbage present in Dustbin then "0%" Show on mobile screen and when garbage bin is full then the "100%" result display on mobile app.

5. RESULT

All the overview of the project is the collected information about garbage level, availability of parking. LED is ON or OFF is send to the online platform i.e. Android App. It will look like below fig. which contains the three parking slots, garbage level in percentage and a switch to turn ON or OFF the LED of home automation system. So that user can monitor or control home appliances anywhere or anytime at everywhere we want.

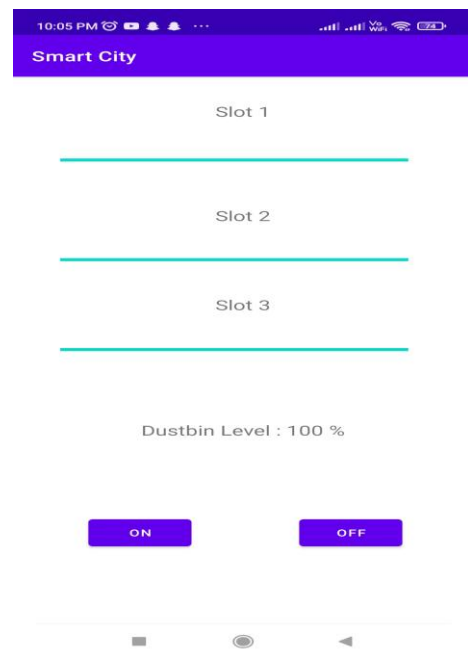


Fig no. 4

4. PROTOTYPE MODEL



Fig no. 5

6. CONCLUSION

We have successfully implement the smart city model using IoT. A smart city as any IoT system uses smart equipment. The system modules are working efficiency and is able to send sensor data to remote user and user can control and monitor the data in order to keep city clean and rebuts. This system provides economic development opportunities with low power consumption and real-database monitoring system based on IoT technology.

The smart city systems uplift the human living standard and also given pleasurable environment.

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