

## IOT BASED SMART CITY USING RASPBERRY PI

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### **ABSTRACT**

*This paper focuses on design and implementation of an IOT based smart city using raspberry pi .Aim of project is to create an urbon IOT system that helps to achieve the smart city and also solving the domestic problem using cloud-computing. Now a daysautomation plays important role in implemented system three parameters are automizedwhich are car parking system,garden automation and water management .such type of automized system can work more efficiently as compare to manually operated system which saves human efforts and increases accuracy of system.*

**Keyword:Cloud-Computing, IOT,Raspberry Pi, WiFi.**

### **I.INRODUCTION**

A smart city is an urban area there are different types of electronic data collection sensors to supply information.. smart cities use information and communication technologies(ICT) to be more intelligent and efficient in the use of resources, resulting in cost and energy savings, improved service delivery and quality of life, and reduced environmental footprint, all supporting innovation and the low carbon economy.

This is the concept of basically connecting any device with an ON and OFF switch through the internet. This includes everything from cell phones, washing machines, lamps, electric motors and almost any device. All these devices or components can be controlled either using smart phone application or using web pages designed for this purpose. The IOT is a giant network o connected “things”. The IOT can be applied to things like transportation networks, waste management, water management,home automation, intelligent parking system and many more things thus converting an urban city into a “smart city” which can help us reduce waste of time and improves the efficiency for thing such as energy use.

Raspberry Pi has selected for the processing unit of the system because of its user friendly features and economical benefits. It is work on python language. Python coded algorithm has been fed into the raspberry Pi and is connected to the internet through Wi-Fi or Ethernet to access web UI.The raspberry pi is used to control all the inputs and outputs & it updates the information on web UI using the cloud storage.

The main objective of this paper is to create an urban IOT system that helps to reduce human interaction and to achieve the smart city vision by exploiting the most advanced communication technologies. This paper also focuses on solving the domestic problems. The smart cities provide effective and efficient handling of resources. Due to the rapid growth of the population in urban cities, infrastructure and services are required to provide the necessities of the city residents. On the basis, there is a significant increase for digital devices, since all devices can interconnect and communicate with each other on the Internet.

## II.BLOCK DIAGRAM AND DESCRIPTION

In implemented system is designed to control following three parameter.

1. Smart parking system
2. Smart water management
3. Smart public garden

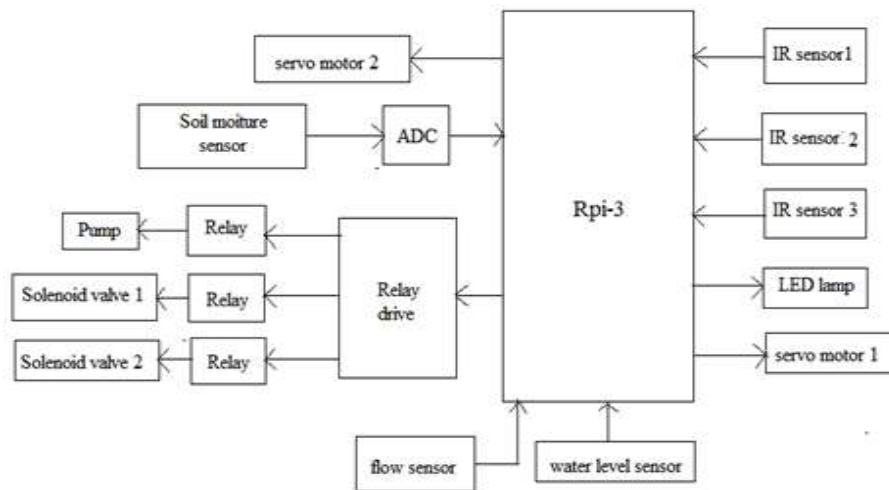


fig.(a) Block diagram

**Smart parking system:** In the smart parking first driver should check availability of parking slot from the web UI using mobile phone or PC. If the parking slot is available it shows information to user then after parking user should fill the details (i.e: name, mobile no, car no, parking time) on web page. Then before 10 min from completion of slot availability it informs user to remove a car or renew the slot. At the night time the lamps will turn on. IR sensors are used to detect the slots are free or not & it continuously updates that information to the web server through the Raspberry Pi controller. By using this type of parking system less time will be consumed to find the parking slots and it is very useful to new comers or tourists in the city.

**Smart water management:** In the public area water management the central tank of water will connect to the solenoid valves. The tank has a water level indicator to show the content of water in it. Automatically the valves will turn ON alternately by using the time period and also the user can control the water flow from the web page. The water flow sensor is connected to the relay or tank to measure the flow of water distributed to each area from each solenoid valve. It will show to the user that how many liters of water are consumed by that area. The information of the water consumption on each area is continuously updated on the web page through the Raspberry Pi controller. If sometime any area requires more water they should be able to turn ON the solenoid valve from the web page.

**Smart public garden:** In the management of public garden there is a soil moisture sensor placed in the soil. It detects the moisture of the soil and on that basis it turns on & off the water flow for the garden. The gate is automatically opened & closed through a servo motor on a given time period or the user can operate it using the web page. The light lamps will turn on & off on time. The user can operate it using the web page. This smart garden system has advantages because it does not have human resources to operate & control it.

### III.EXPERIMENTAL SETUP



Fig.(b)

Fig.(c)

Above fig.(b) and fig.(c) shows experimental setup of parking system and garden automation. IR sensor use to indicate parking slot is empty or full and displaying LCD screen. soil moisture sensor is use to indicate dryness or wetness of soil and to display the value of inversely proportional to soil quality.

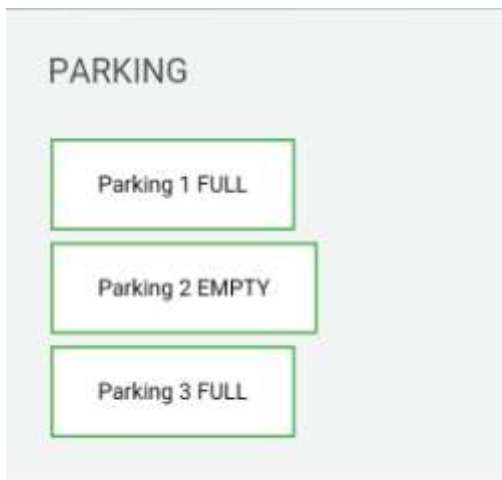


Fig.(d)



Fig.(e)

Fig.(d)shows the experimental setup display on the webpage which displays the parking status rather parking slot is full or empty. Fig.(e) shows the value of soil moisture sensor.

#### **IV.CONCLUSION**

IOT is applicable for monitoring and detecting regular smart city application by means of sensing and controlling parameters of smart city which will be more accurate ,reliable and low cost as compare to manual operating system

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