IoT based Intelligent Monitoring System for Smart City

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Abstract : Commercial organizations and housing societies in cities needs energy saving system with security alert. As population is increasing day by day, the environment should be clean and hygienic. In most of the cities the overflowed garbage bin are creating an unhygienic environment. This will further lead to different type of diseases. To overcome these situations an efficient smart garbage management method has to be developed by using IR sensor. The garbage alert will be updated on to server.

The objective is to implement an IOT based monitoring system for smart city which can monitor the real time system parameter and upload data on web server.

Index Terms - **Raspberry-pi, IOT, sensors**

I. INTRODUCTION

Cities with heavy populations escalate burden on energy, water, buildings, public places, transportation and many other things. Therefore, we need to find out solutions that are ‖smart‖ which means they are efficient and feasible for economic growth of the city and society as well. The smartness of a city describes its ability to bring together all its resources, to effectively and seamlessly achieve the goals and fulfil the purposes it has set for itself. The perfect solution for this is mobility of all resources and adapting to new technologies as and when they come. The smartness of the city is incorporating the technologies that can be infused into commercial applications implied on intelligent products and services. Smart homes, smart buildings, airports, hospitals, universities or communities equipped with mobile terminals and embedded devices with sensors or actuators which can be interconnected. 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. This is the concept of basically connecting any device with an ON and OFF switch through the internet.

II. LITERATURE SURVEY

Nagender Kumar Suryadevara, Subhas Chandra Mukhopadhyay, Sean Dieter Tebje Kelly and Satinder Pal Singh Gill [1] have proposed WSN-Based Smart Sensors and Actuator for Power Management in Intelligent Buildings The design and development of a smart monitoring and controlling system for household electrical appliances in real time has been reported in this paper. The system principally monitors electrical parameters of household appliances such as voltage and current and subsequently calculates the power consumed. The novelty of this system is the implementation of the controlling mechanism of appliances in different ways. The developed system is a low-cost and flexible in operation and thus can save electricity expense of the consumers. The prototype has been extensively tested in real-life situations and experimental results are very encouraging**.** Thus, the real-time monitoring of the electrical appliances can be viewed through a website. The system can be extended for monitoring the whole intelligent building. The aim is to determine the areas of daily peak hours of electricity usage levels and come with a solution by which we can lower the consumption and enhance better utilization of already limited resources during peak hour.

H. Arasteh, V. Hosseinnezhad, Shahid Beheshti, A.C.Tehran, Iran V. Loia, A. Tommasetti, O. Troisi [2] has proposed Iot-based Smart Cities: a Survey. The recent literature was reviewed to investigate variant features and characteristics of the IoT systems as well as the effective motivations of using them. Since

implementation of the IoT infrastructures could enable a number of opportunities, firstly the highest research motivations are described and then some useful applications outlined. It is described how daily activities can be developed and enhanced by utilizing them. Also, the challenges which arise when implementing the IoT system were thoroughly explained. In this regard, the combination of the IoT platform with other autonomous and intelligent systems for providing smart and widespread applications is one of the most interesting future trends. Furthermore, providing a mechanism to overcome some of the essential challenges like the privacy right of the citizens is still an area of interest. The IoT with its functionality and features should, in fact, utilize intelligent systems and sensors to preserve the rights of the smart city citizens.
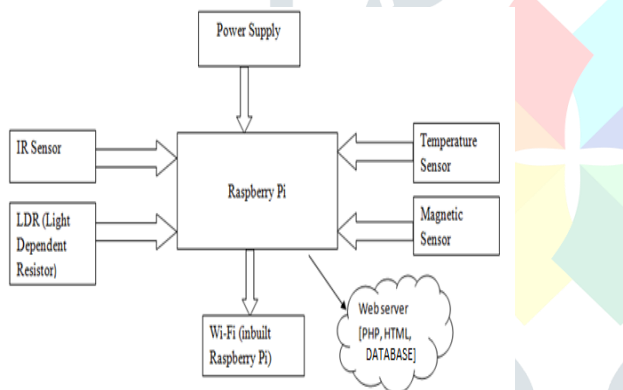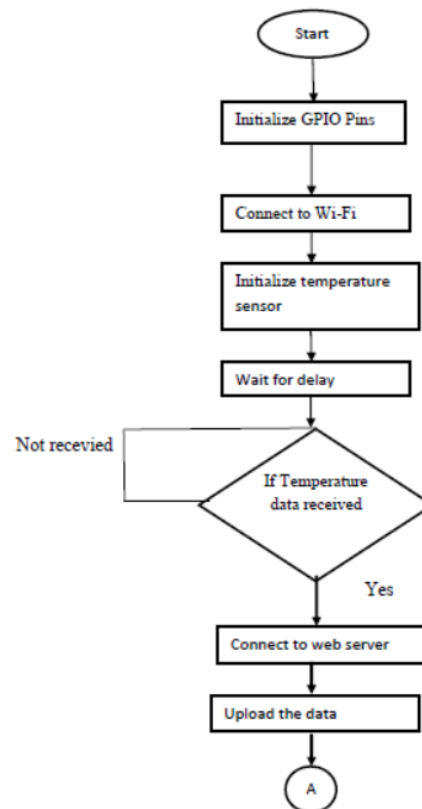
III. PROPOSED SYSTEM

Figure 1. Block Diagram of Intelligent Monitoring for Smart City

In this system Raspberry pi is a main heart of system which has many advanced features to control different parameters. This Raspberry pi 3 acts as main processor. A wireless sensor network containing the raspberry pi as master controller along with the various sensors such as temperature sensor, magnetic sensor, IR sensor, light dependent resistance (LDR).There are various slots to the raspberry pi processor for connecting the various external devices such as keyboard, mouse, etc. A memory card can be inserted into the one of the available slot. A regulated power supply is providing to the overall system as shown in

figure. All the sensors sense the respective data in the plant and send this data towards the controlling unit such as raspberry pi. The sensors which are included in system are real time monitors and upload the data on to web server. The web server is designed by HTML, PHP and database technology. The web server will provide effective real time monitoring for all these sensors. Thus personal computer will continuously monitor all the data from remote processing unit and also control or monitor the different parameters via Wi-Fi technology.
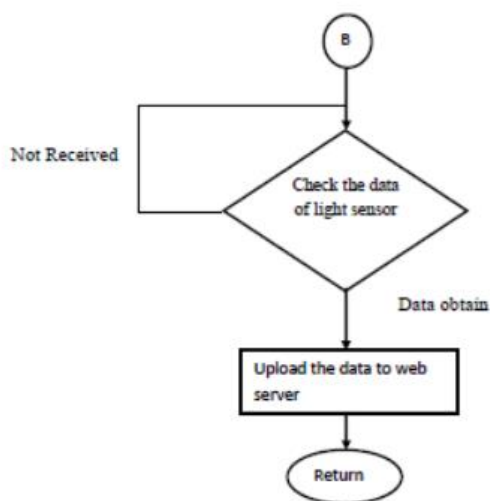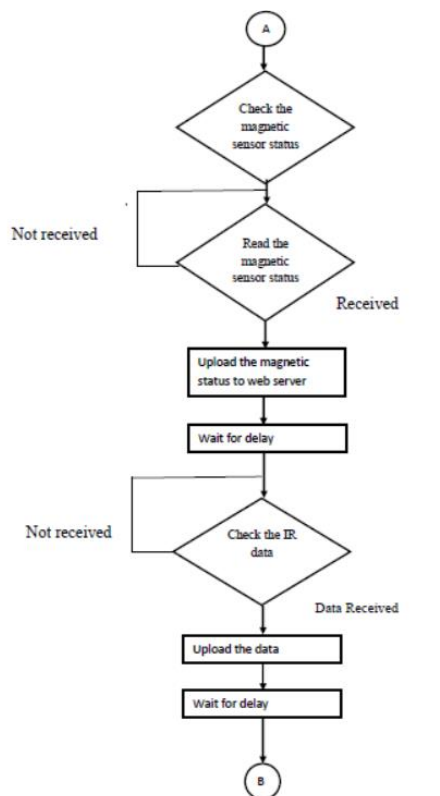
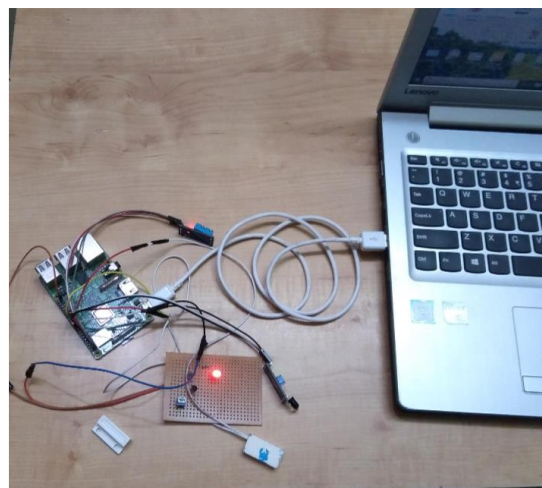The flow chart of system is shown in Figure 2.

Figure 3. Project Module

Project Module of Intelligent Monitoring System for Smart City is shown in figure. The measured temperature is displayed on the web server. Magnetic sensor is used to door access control for security purpose. If someone is open the door then this IoT Based Intelligent Monitoring System for Smart City will be displayed on web server. Also we are using infrared sensor to check the status of garbage box. The status of garbage box that is garbage box is full or not full is uploading on to the web server. Light dependent resistor is used to indicate whether the light is on or off. For that we are used the LED as shown in above figure. And this all system is monitoring and uploads on web server.

Figure 2. Flowchart of Proposed System

IV. SYSTEM IMPLEMENTAION
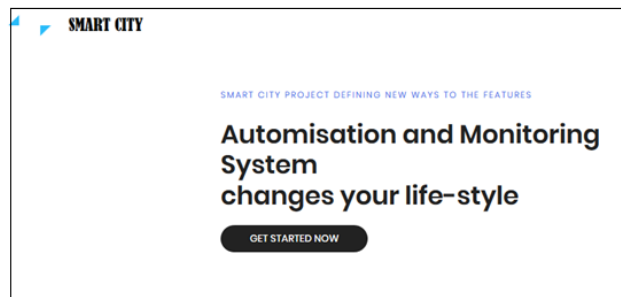
V. RESULTS AND DISCUSSION

Web Server

Figure 4. Web Page Input window

We will develop the website of smart city. This web browser displays a web page on a monitor or mobile device. On a network, a web browser can retrieve a web page from a remote web server. This web server access to a private

network such as a corporate intranet. The web browser uses the Hypertext Transfer Protocol (HTTP) to make such requests to the web server.
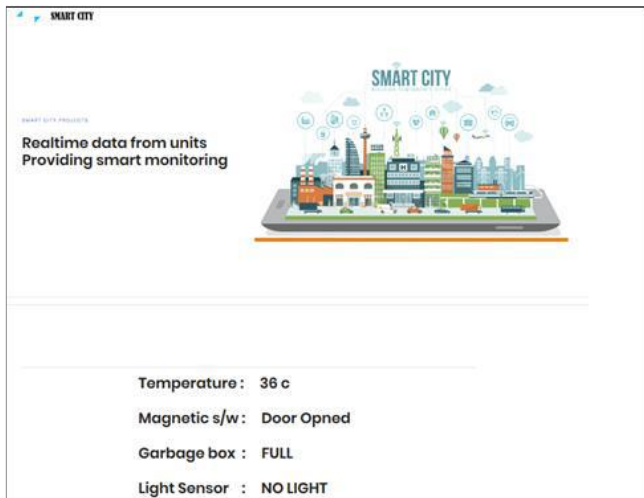

Figure 5. Web Page Output Window

On this website we will get the all information about the devices placed into the smart city. Smart city monitoring system provides advanced system for economic growth as well as society. The system shows us a real time data which is upload on the web server. One can watch it from anywhere because of internet of things. LM35 temperature sensor is used to indicate the temperature. The changes in temperature are displayed in terms of digits. The door is open or close is show by using magnetic switch. Infrared sensor indicate the garbage box full or empty. And light is present or not is show by using light dependent resistor that is light sensor. This all information is control and monitoring the data and display into the output window of web page.

VI. References

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