Implementation of Embedded system based Raspberry Pi for Hi-Tech Green India

Kaliappan S, Ramprabu J, B.Karunamoorthy, A.Ezhilarasi

Abstract: ***Indian government has initiated smart city program all over the country. This proposed project is helpful to monitor the residential area using Surveillance camera and the streetlight, garbage, drainage system details are exhibited on the site. Consequently, the corrective actions can be brought by the government agency. This proposed method the street light can be functioned from the website and the status of ON/OFF will also be exhibited on the network page. This can be possible because only by the LDR sensors. This system also indicates the part of waste filled in the garbage bins and drainage. Therefore, measurement can be conducted without any delay by an implanted system. For garbage bins status can find out using ultrasonic sensor and float sensors is used to draw out the drainage level. The some other important method is an image processing for security in the urban center. We are working to carry out this task by using Raspberry Pi and coding is done by python language. These are drawn over the cyberspace with the help of the IOT based embedded system.***

Keywords: LDR sensor, Ultrasonic sensor, the Float sensor, Raspberry Pi, Python, IOT, Surveillance camera

I. INTRODUCTION

It is the emerging trend in the 21st century. It is a web of connecting devices; those devices could be tracked, checked and monitored using remote processors that are connected up through the mesh. Picture 1 depicts the basic architecture of the IoT. Different protocols are used for communication between two devices. The cloud is the best technology to store the current data and information; it can also be sworn out for future reference. The processing speed is high compared to the normal secondary storage device like the difficult disk.

II. LITERATURE SURVEY

The internet of things is used to fine the condition of all smart dustbins cabs. It is monitored from anytime and anywhere. Also done by the authorized individual.

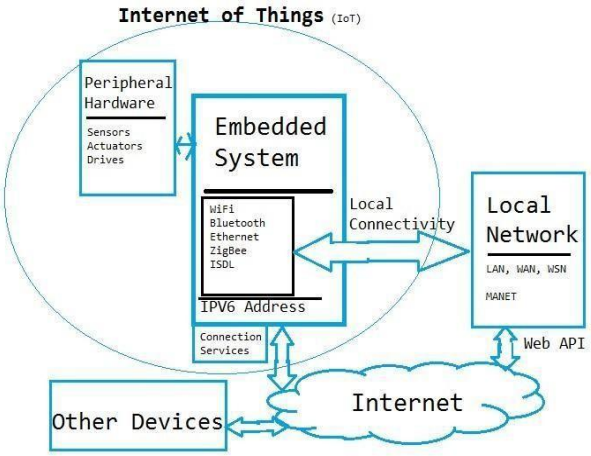

Fig. 1. IOT basic architecture

That someone can get a decision accordingly on the position of the dustbins in the urban centers. By implementing this agreement, the cost can be reduced and the optimal itinerary for the vehicle can also be produced. This system can cut traffic congestion and air pollution as well. In major urban cores, the garbage vehicle, visits the area every day or once in two days depending on the population in that peculiar area. This information on the dustbin status along with the optimized path can be shown along the web page with the help of internet. [1].

This story tells about performance comparisons between traditional human involvements with the smart garbage management system, in parliamentary procedure to find out an effective method to clean the scraps on a regular basis, based on the information details of the garbage tin. Based upon the threshold level mentioned in the garbage bin the corresponding person will be informed about the garbage level to maintain the hygiene environment. If that corresponding person is not acknowledging the information and responding to it, then the message will be beamed along to the highest person in position. This method is used to preserve a cleaner and a more hygienic environment. [2]

Increased this paper addresses all phases of the pragmatic evolution of an Underground Drainage and Manhole monitoring System (UDMS) through IoT applications for metropolitan cities. A genuine life, demanding application is picked out as a reference to guide. Aspects of sensor network platform considered are: flexibility, and reusability. It consider the platform structure, optimization of the communication, optimization of the sensor nodes, error

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recovery from communications and node operation, high availability of service at all tiers, application server reliability and the interfacing with its applications. [3].

This report deals with the invention of the drainage system and to maintain the status of the drainage in real-time at several levels in the system using wireless sensors. All the wireless detectors are interconnected and the data received is sent to the master hub and then sent to the swarm. The parameters monitored are water level in drainage, water discharge and rainfall conditions near that field. [4].

The big data act as a large data storage unit from the local vegetable producers to the end user. The output data is updated to the system through the mobile application and also the stock availability of the restaurant is also updated in the system. The primary aim is to improve the strength of the organization through specific big data analysis of the data at rest and in motion. [9]

III. SYSTEM OVERVIEW

In this proposed paper, we are going to implement our ideas, our idea is to integrate it with an embedded system for smart city management. In parliamentary law to master the basic difficulties which, we face in our daily life can be resolved by this organization. We are starting to use Raspberry Pi, LDR, ultrasonic sensor, the float sensor, LED, Surveillance camera and incorporate internet with this setup. We are dying to switch on/off the street lights based on the environment change and on/off can be done by website user itself and we are failing to display the level of the garbage bins and drainage level also on a web page. All these on the web page can be accessed by government agency. So that the concerning actions will be accepted at once without any time lag. A security camera is used for Surveillance and raspberry is used for picture processing. Altogether these are programmed using python language.

During the nighttime, Streetlight are the major requirement in today's spirit of transportation for safety purposes. It also used to avoiding accidents. Despite that, in today's busy life, no one worries to switch it off/on when not needed. This task presents a solution to cut power consumption and manpower. Street light monitoring requires LDR, sensors and a microcontroller. In this newspaper, we have designed an automatic street light control system utilizing a simple, light dependent resistor (LDR).

This task will serve to eliminate or minimize the garbage disposal problem. In real time the status of each and every dustbin will inform by the system. So that the concerned authority can send the food waste collection vehicle only when the dustbin is full. For this function, the ultrasonic sensor is employed. It is utilized to show whether the garbage is filled or non. Thus, the garbage bin can be discharged immediately.

In this project drainage management system is primarily targeted at supervising the stream of urine in the drain system. The float sensor is used, and it monitors the capacitance of the drainage water and displays the percentage amount of the water filled on the internet site. So that, the blockage can be solved right away by the actors.

Therefore, it helps to facilitate the operation of basic things In the residential area with the help of real-time data which are displayed on the site, so that the current status of the bits of stuff can be viewed and, thence, the measurements can be rented at the right time.

A. Raspberry Pi 3

The Raspberry pie is a minicomputer and also used for the real- time operating system. Compared to all real-time systems is more powerful, high- speed and multitasking device. Interfacing of all real-time sensors and actuator is very simple. It also has GPIO pins to feed the input to the pi process and also give output to the user.

B. L D R

Light Dependent Resistor is used to measure the intensity of light. LDR is a photoresistor the resistance can be decreased with increasing the strength of illumination. It converts light energy into electrons for processing the information in real time.

C. ULTRASONIC SENSOR

The ultrasonic sensor is used to detect the presence of the object or not by scaling the output value. Ultrasonic ranging module HC-SR04 provides 2cm t o 400cm non-contact measurement function, the ranging accuracy can reach to 3mm. The modules include ultrasonic transmitters, receiver and control circuit.

Fig. 2. Ultrasonic Sensor

D. FLOAT SENSOR

Float sensor is one of the level sensors to measure a n y liquid system in a tank and float sensor is divided into two main things one is a floating switch sensor and another one is the floating level sensor.

Fig. 3. Float Sensor

E. LED

Light Emitting Diode is a two lead semiconductor light source. It will drive at 3V. It is mainly used for indication some output. In older days the only low-intensity red light is used for indication but now days led has multicolor in one single led to the status of the process in the diligence.

F. SURVEILLANCE CAMERA

A surveillance camera is used in the system to seize the video or image in all portions of the metropolis. That captured image is processed by Raspberry pie and save it on the hard disk for future usage.

Fig. 4 Surveillance Camera

IV. BLOCK DIAGRAM

Fig. 5 is the block diagram of the system. The sensing elements such as an ultrasonic sensor, float sensor, LDR sensor and power LED are interfaced with the raspberry pi 3. The inputs are fed by the sensors to the raspberry pi GPIO pins and the program is written to process the inputs and the outcomes are displayed on the website correspondingly.

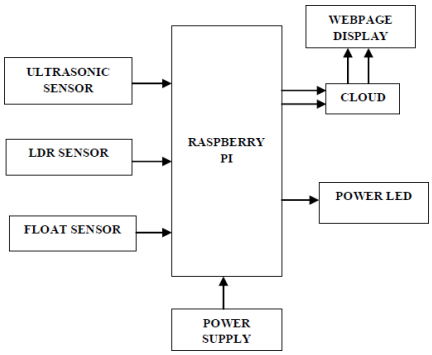

Fig. 5 Block diagram of the proposed system

V. FLOW CHART

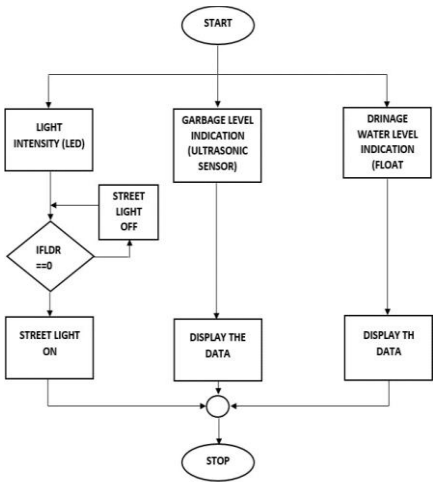

Fig. 6 Flowchart of the system

Fig. 6 explains the process involved in the model in a flow chart process.

STEP 1: Initialize the ultrasonic sensor, LDR and float sensor. STEP 2: LDR is used to measure the intensity of light.

STEP 3: Based on the intensity the sunlight the operation of street light changes.

STEP 4: Ultrasonic sensor is employed to find out the garbage waste level.

STEP 5: The corresponding waste level is exposed on the web page.

STEP 6: Float sensor is employed to find out the degree of drainage flow.

STEP 7: The drainage level also displayed on the webpage. STEP 8: Stop the process.

VI. EXPERIMENTAL RESULTS

The proposed system is practically done as a working model. Fig. 7 shows the working models along with the component.

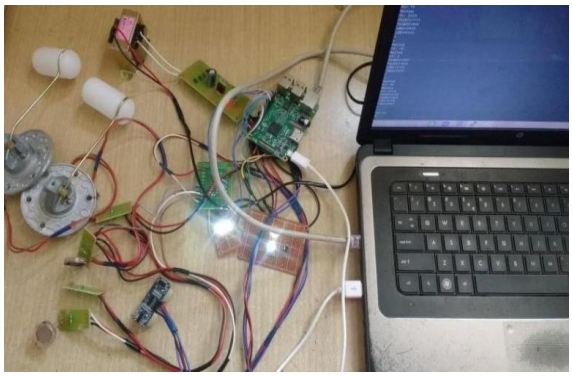

Fig.7 Connected model of the system

Number 7 is the simulation results of the proposed scheme. Light 1 is OFF, light 2 is ON, ultrasonic sensor 1 is at high stage (which means the garbage has no place to accommodate wastes), ultrasonic sensor 2 is at a low grade (which means the garbage has more distance to accommodate wastes), float sensor 1 is empty (which means the drainage is empty) and float sensor 2 is half full (which means the drainage is half full).

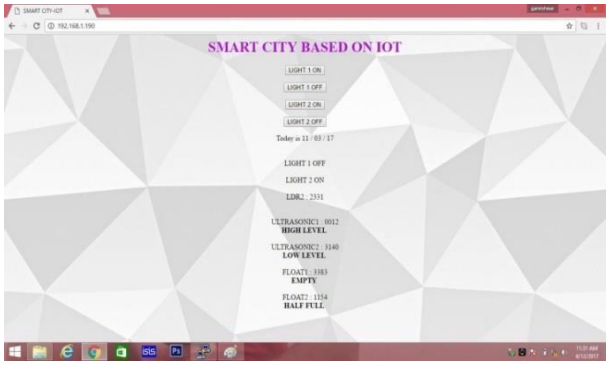

Fig 8 Yield 1 in a web page

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Thither are many instances where the value changes, and then the outcome will be monitored continuously in the web page. Fig. 8, fig.9 and in fig. 10 displays the different fonts.

Fig 9 Output 2 in a webpage

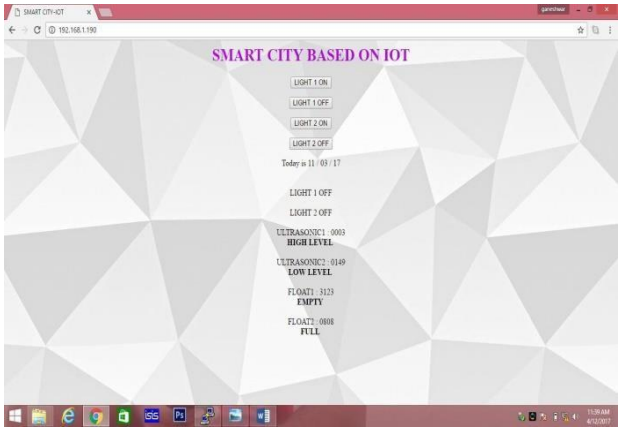

Fig 10 Output 3 in a webpage

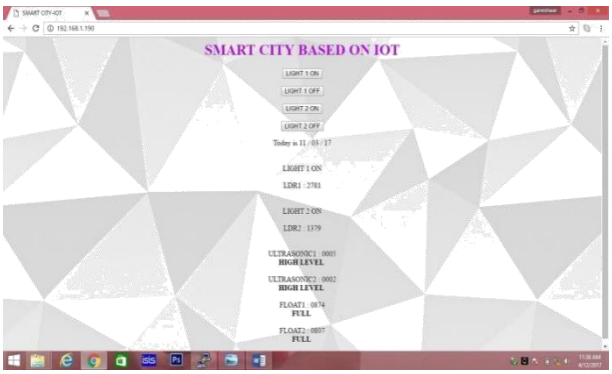

Fig 11 Output 4 in a webpage

The production values are exposed on the webpage and the values change continuously in real time, which will be reflected on the web site too.

VII. CONCLUSION

By the above-proposed system the street light, garbage, and drainage system can be effectively held by the government using the implanted system and IoT. The security problem is solved by this system in an effective way. That the current condition can be viewed parallel to the website and the actions can be taken immediately by the government authority with the help of this system. This helps a very effective method to monitor the residential area and provide a better environment. They also have a proper database for future reference.

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