

SMART VILLAGE

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Abstract:IoT (Internet of things) is a future of technology. The logic in its working is the combination of information of mobile web and information and communication technology. The increasing population facilitates villages to function smartly. The aim of this paper is to bring smartness in village by smart garbage management, intensity based street light monitoring, and digital water supply system. Hence, the system consists of Raspberry pi interfaced with many sensors and whose data is analyzed to take appropriate action. It helps in improving the life in village.

IndexTerms - IoT, Information and Communication Technology, Raspberry pi, Sensors.

I. INTRODUCTION

Smart Village does not have a single definition or plan. Based on their need each country can state their definition for smart village. In Indian villages distribution of water, street light monitoring and garbage disposal technique is done manually. Hence removal of garbage is managed by trucks visiting the streets at a particular time of a day, due to which waste can be found strewn all around leading to environmental pollution. Another issue is the street light monitoring which would require manual switching of light.

Hence innovative technologies are adapted in these sections to reduce man power and their wastage. Pritesh says the development of smart villages reduces the migration of people from village to urban areas as well as increase the population flow from urban areas to rural areas [5]. Our paper concentrate on smart garbage management, digital water supply, intensity street light monitoring system and water quality monitoring system.

IoT is a recent communication model in which the objects in future will be equipped with microcontrollers for digital communication, helping them to communicate with each other and the users. Hence, the concept of IoT intents in making the internet more immersive. Additionally, by allowing easy access and interactions with variety of devices like street lights, monitoring sensors displays and so on. The IoT will advance the development of various applications which would make use of large and variety of data generated to provide assistance to citizens and public administration.

Therefore, this paper describes the execution of the model and flowchart. It also explains different modules used to gain their desired output.

II. LITERATURE SURVEY

A literature survey is the section which shows various analysis and research made in the field of interest and the results already published, taking into account the various parameters of the project and extends of the project.

- The competence of the street light is improved by the zig Bee and Sensors. But the zig Bee range of communication is 50 meters so it is not suitable for street light monitoring system. To overcome this ultrasonic sensor are used for monitoring [1].
- In India majority of people lives in village. A lot of works need to be done in making the village clean. There are different aspects of clean village such as water supply, indoor air quality, solid waste management. Keeping in touch with technology clean village project should integrated technology and digital design which will make village clean and smart [2].
- The idea of IOT is the future aspect of technology. The rationale behind its working is the amalgamation of web, mobile and communication technology. The rising populations of world makes it necessary to facilitate the cities and village to function in a smart way. Hence the idea of smart cities came into being.
- This paper illuminate the research and implementation of IOT based smart village. In recent years, due to climatic change air pollution, scarcity of water and human power for agriculture threatened for human life. Hence water quality monitoring ensures the quality of surface and

underground water. The M2M communication opens up completely for new possible applications in smart water quality monitoring system.

III. PROPOSED SYSTEM

Fig 1 shows the model which includes Raspberry pi interfaced with various sensors for different functions.

In garbage monitoring system: The IR sensor is positioned at the top of the bin. Hence when the garbage is filled, IR sensor becomes high. It senses that the garbage is filled and it intimates to the authorized person through web app and hence he sends the truck to collect the garbage.

In automatic street light control: LDR sensor is used which works according to the intensity of light. During day time when the intensity of light increases the resistance increases hence the current decreases. Due to which the street light is turned off. Similarly, when the intensity of light decreases the resistance decreases and the current increases hence the street light is turned on.

In digital water control system: An Ultrasonic sensor and a relay is used. Here the Ultrasonic sensor is placed on top of the tank due to which it measures the level of water in tank and intimates it to the authorized person. The authorized person checks the status of the water level according to which he turns on the relay to supply water to the villagers.

Hence all these scenarios are loaded to the web app through the IOT

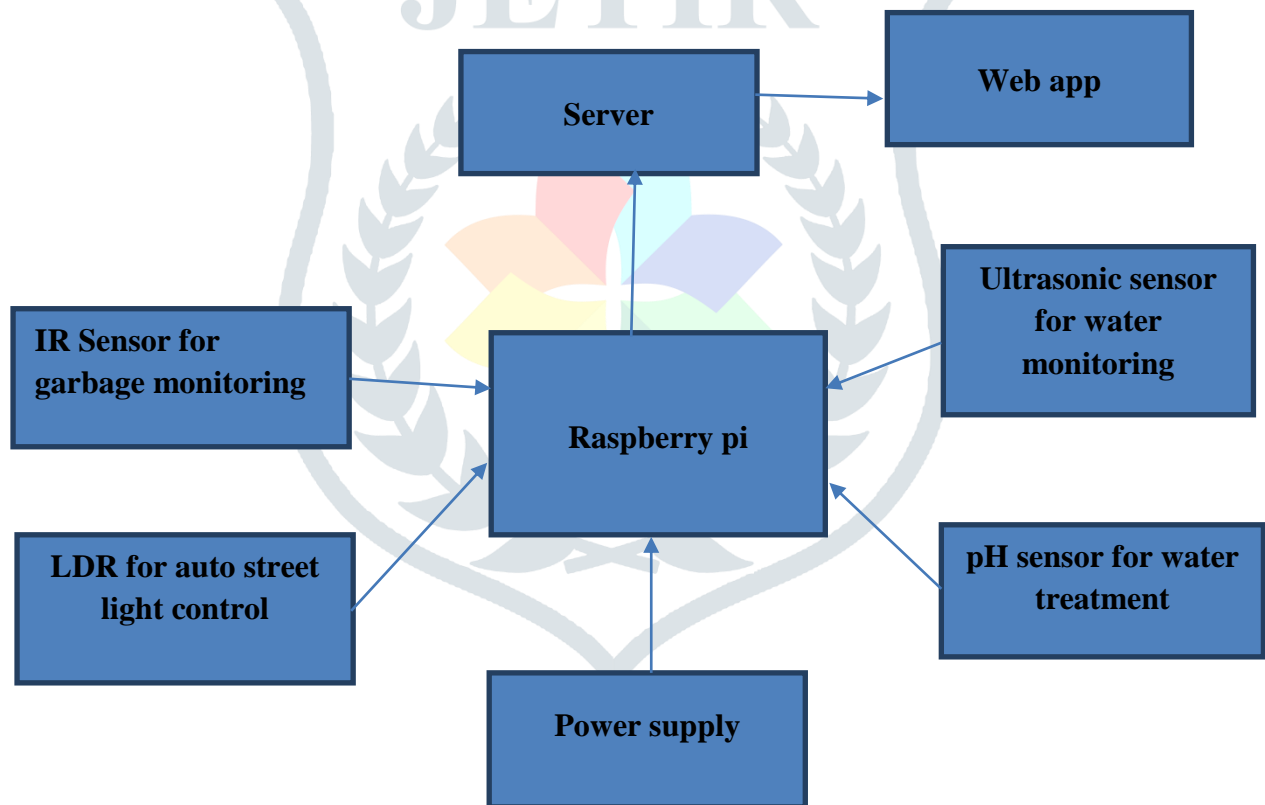


Figure1: Block diagram of proposed system

- Raspberry Pi:** Raspberry Pi 3 model B is the latest controller and simply a credit –card sized electronic board to which I/O devices are interfaced. It has a 40 GPIO pins, 1.45 Hz 64 bit quad –core ARM cortex and memory of 1GB RAM. It is powered by 5.1V /2.5 A supply.
- IR sensor:** IR sensor is an electronic device, that emits the IR radiations which is invisible to human being. It consists of emitter and detector. The emitter is an IR LED and detector is photodiode. It is used to detect an object up to 2 cm.

- c. **Ultrasonic Sensor:** An Ultrasonic sensor is a device that can measure the distance to an object from 2 cm to 4cm by using sound waves. It has trigger and echo pin, these pins are used to calculate the distance of the object.
- d. **Light dependent resistor: LDR** sensor is used to detect the intensity of light, whose resistance varies according to the amount of light falling on a surface. Raspberry Pi 3 model B does not have analog pin and LDR is an analog sensor so ADC (MCP3008 IC) is used for converting analog signals to digital signals.
- e. **pH sensor:** It measures the pH (acidity or alkalinity) of an aqueous solution in industrial and municipal process application. The normal pH range is 0-14 pH. A neutral solution has a pH of 7, while acidic solution has a pH less than 7, and solutions with pH greater than 7 are alkaline.
- f. **Relay module:** It is an electrically operated switch, which can be triggered by an electric current. Relay can be controlled with low voltage of 5V by the Raspberry pins.
- g. **Power supply:** 12V power supply is used in this project. 5V is required for relay operation and Raspberry pi.



Figure 2: Proposed System

IV. CONCLUSIONS

This paper supports the concept of SMART VILLAGE which is helpful for monitoring and controlling water quality, garbage disposal and street light monitoring automatically. This model reduces the human intervention and faults caused during manual operation of the system. It helps in providing better future for a better tomorrow.

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