IoT based Smart Village using Raspberry Pi

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Abstract: **The project aims to bring smartness in five different aspects of any village such as Digital Display of the Government Subsidies and offers to farmers, smart garbage management using IR sensor, E-learning for the students in schools, soil PH level monitoring, generation of electricity using piezoelectric sensor and weather monitoring using temperature sensor. The Internet of Things (IoT) is able to inculcate clearly and smoothly a many number of different and heterogeneous end systems, while providing access to particular subsets of data for the development of a plethora of digital services. Raspberry pi is the application development platform used to develop this paper.**

Keywords: **IoT, Sensors, Raspberry Pi**

1. Introduction

The system consists of a centralized microchip interfaced with several sensors for creating the villages cleaner smarter. The project aims to bring smartness in 5 totally different aspects of any village like alphanumeric display of the govt. Subsidies and offers to farmers, sensible garbage management, E-learning for the scholars at school, soil pH level detector system, electricity generation exploitation electricity detector.

The IoT may be a recent communication paradigm that envisions a close to future during which the objects of lifestyle are equipped with microcontrollers, transceivers for data communication, and appropriate protocol stacks that may build them able to communicate with each other and with the users, changing into associate integral a part of the web. The IoT construct, hence, aims at creating the web even a lot of immersive and pervasive. moreover, by enabling quick access and interaction with a large sort of devices like, for example, home appliances, police work cameras, watching sensors, actuators, displays, vehicles, and so on, the IoT can foster the event of variety of applications that build use of the possibly huge quantity and sort of information generated by such objects to produce new services to voters, companies, and public administrations. This paradigm so finds application in many alternative domains, like home automation, industrial automation, medical aids, mobile health care, older help, intelligent energy management and sensible grids, automotive, traffic management and plenty of others.
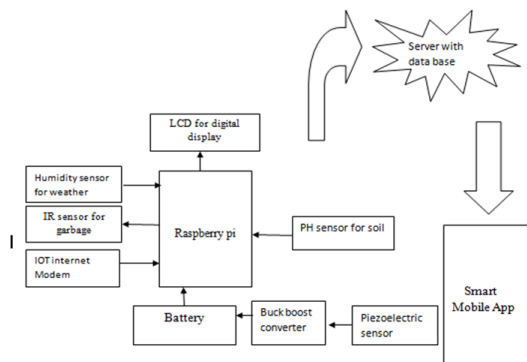
2. Experimental section

A. Block diagram

Fig. 1. Block diagram of IoT Based Smart Village Using Raspberry Pi

B. Working principle

Basically the system consists of a centralized microchip interfaced with several sensors for creating the town smarter. The project aims to bring smartness in 5 totally different aspects of any town. alphanumeric display of the govt. Subsidies and offers to farmers, sensible garbage management, E-learning for the scholars in colleges, weather observance and electricity generation victimization electricity detector.

A set of IR sensors area unit interfaced with the processor that area unit successively mounted on the mud bins therefore on monitor the rubbish level. Whenever the extent reaches to the most then data are passed to the involved authorities for fastactions.

Since the full village is connected with web electronic equipment and show alphanumeric display all the govt. offers and schemes for the farmers are displayed on the display system employing a wireless app utilized by the govt.

Advanced E-learning for the college youngsters is introduced victimization an equivalent technology wherever the agricultural students can also get the standard education beneath Edu-sat IOT based mostly Learning.

PH detector offers {the data|the knowledge|the data} concerning soil fertility and also the information concerning the varieties of best crops which might be grownup within the lands.

Humidity detector offers the data concerning future forecast to the farmers victimization net app. The electricity sensor's generates the ability provide by its own and stores it within the battery so all the villages will harvest the energy by themselves.
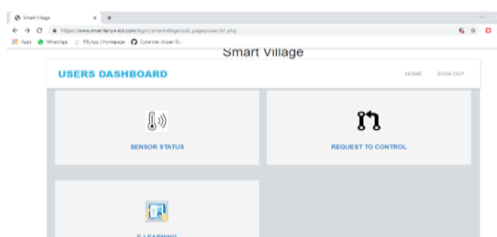
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3. Results and discussion
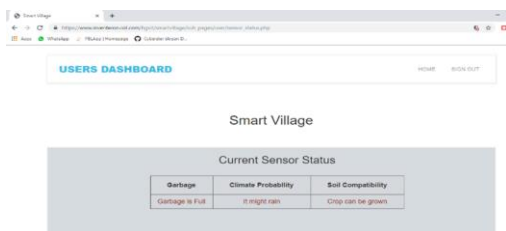
Step 1: Users Dashboard

It consists of
1. Sensor Status
2. Request to Control
3. E-learning

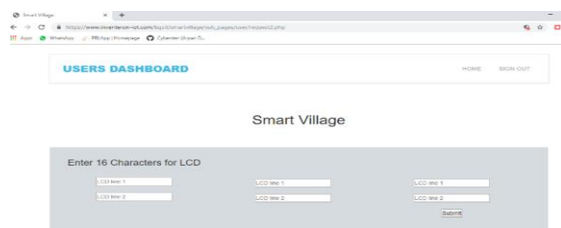User can manually control the required option when necessary.

Step 2: Sensors Status

The status of each sensor is measured and displayed on the command window.

Step 3: Display of Crop Status on LCD

The characters entered must be of 16 characters. The status that must be displayed should be uploaded by the village head or the user.

Step 4: E-Learning for Students

Step 5: Digital Display

The output from various sensors like IR sensor, temperature sensor, ph sensor are sent to the raspberry pi module and to the web application and LCD screen. Also the electricity generated from piezo-electric sensor is sent to the battery. This paper helps the farmers and other beneficiaries for their agriculture and development.

4. Conclusion

A few years past, the concept of web of Things and sensible cities won't to be considered as a future chance. However, it's become a reality nowadays, because of the technological advancements. Several countries have deployed the work of turning their cities into sensible cities to several organizations. The optimum use of accessible resources is that they would like of the hour. Ever-increasing population has restrained the resources and their usage. IoT combines the advantages of multiple technologies to understand the concept of intelligent devices in a city. This idea will be extended to the villages further, up the standard of lifetime of the residents. Because the villages have slightly completely different needs than the cities, this paper focuses on those variations and aims to supply solutions for an equivalent. Varied areas of Interest are explored and suggestions are provided.

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