ISSN:2348-2079

Volume-5 Issue-1

International Journal of Intellectual Advancements and Research in Engineering Computations

Iot based unified power management system with economic feature

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Abstract- The advancement in Automation technology, life is getting flexible and easier in everyaspect. In today's world Automatic systems are being preferred over many manual operations. With the gradual increase in number of customers of internet over the recent decade had made Internet a part and parcel ofdaily life, and IOT is the latest and emerging technology. Internet of things is a increasing network of everyday object-from industrial machine to certain consumer goods that can share information and complete tasks while you are busy with othermanual activities. Wireless Home Automation system(WHAS) using IOT is a system that uses computers and mobile devices to control basic home functions and features automatically through internet from anywhere around the globe, an automated home is always called a smart home. It is meant to save the electricity and human interface.

Index Terms— WHAS, IOT,Motion Sensors

I. INTRODUCTION

A. Overview

Homes at present are becoming more self-controlled and automated due to the comfort it provides, mainly when employed in a private home. Large existing, well-established home automation systems are depending on wired communication. This does not pose a problem until the system is planned well in advance and attached to the buildings when it is constructed. But for already existing buildings the implementation cost goes very high. In contrast, Wireless systems can be of great help for automation systems. With the improvement of wireless technologies such as Wi-Fi, cloud networks in the past, wireless systems are used in daily activities and everywhere.

B. Advantages of Home automation systems

In previous years, wireless systems like Wi-Fi have become more commonin home networking. The use of wireless technologies gives several advantages that could not be achieved using a wired network only.

1) Reduced installation costs: The first point to be remembered, installation costs are significantly reduced since no cabling is necessary 2) System scalability and easy extension: employing a wireless network is especially beneficial when, due to new or changed requirements, extension of the network is necessary. In contrast to wired installations, in which cabling extension is tedious. It also deals with the seminal investments.

II. RELATED WORK

This paper narrates a Home Automation system that employs the integration of many devices that are to be connected together, cloud networking, wireless communication, and power-line communication to provide the user with remote control of various lights and appliances within their home. This system uses a combination of a cellular application, handheld wireless remote.The main objective of this Paper is to design and implementing a controlling and monitoring system for smart house. Smart house system consists of many systems that controlled by manysoftware as the main control system in this papers. Also, the smart house system was supported by remote control system as a sub controlling system.

III. SYSTEM ANALYSIS

A. Problem Definition

Home automation systems face four main challenging tasks; these are high cost of ownership, inflexibility, poor manageability, and difficulty in achieving security. The main objectives of this research is to designing and implement a home automation system using IoT that is capable of controlling and automating most of the house appliances through an easy manageable web interface. The implemented system has a great flexibility by using Wi-Fi technology to interconnect its varied sensors to automation server.

B. Proposed System Feature

The applied system is a distributed home automation system, consists of servers, sensors. Server controls and monitors the all sensors, and can be easily configured to handle many hardware around the system.

IV. SYSTEM DESIGN AND IMPLEMENTATION

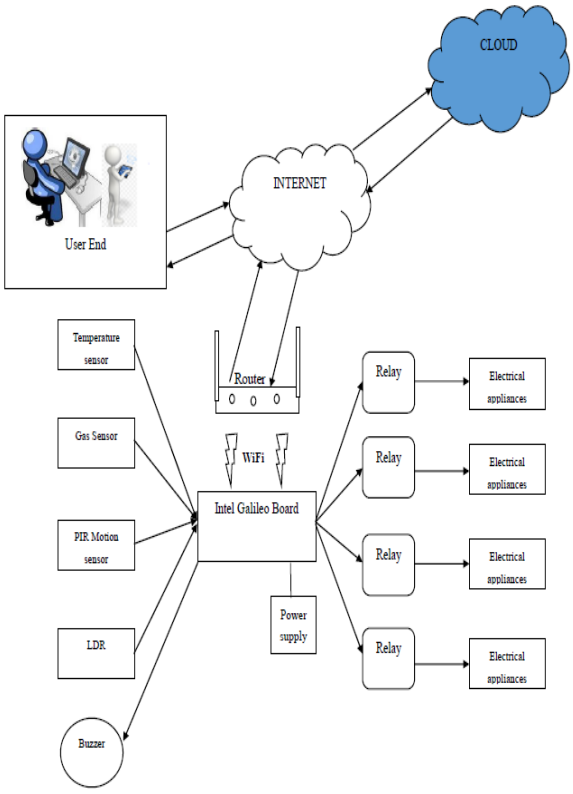


Fig.1: Home Automation System

A. Proposed Home Automation System

The proposed model of the home automation system is as shown in the above figure. The model consists of different sensors like temperature, gas, motion and LDR. Initially the Intel Galileo connects to the internet through WiFi. When the connection is established it will start reading the parameters of sensors like p1, p2, p3 etc. The threshold levels for the required sensors are set as t1, t2, t3 etc. The sensor data are sent to the web server and stored in the cloud. The data can be analyzed anywhere any time. If the sensor parameters are greater than the threshold level then the respective alarm a1, a2, a3 etc. will be raised and the required actuation is done for the controlling of the parameters. In the proposed model the temperature, gas leakage, motion in the house is monitored. The temperature and the motion detection is stored in cloud for analysis. If the temperature exceeds the threshold level then the cooler will turn on automatically and it will off when the temperature comes to control. Similarly when there is a leakage of gas in the house alarm is raised giving the alert sound.

B. Proposed Home Automation System Functions

The proposed home automation system has the capabilities to control the following components in users home and monitor the following alarms:

- Temperature and humidity
- Motion detection
- Fire and smoke detection
- Light level

The proposed home automation system can control the following appliance:

- Lights on/off/dim
- Fan on/off
- On/off different appliance

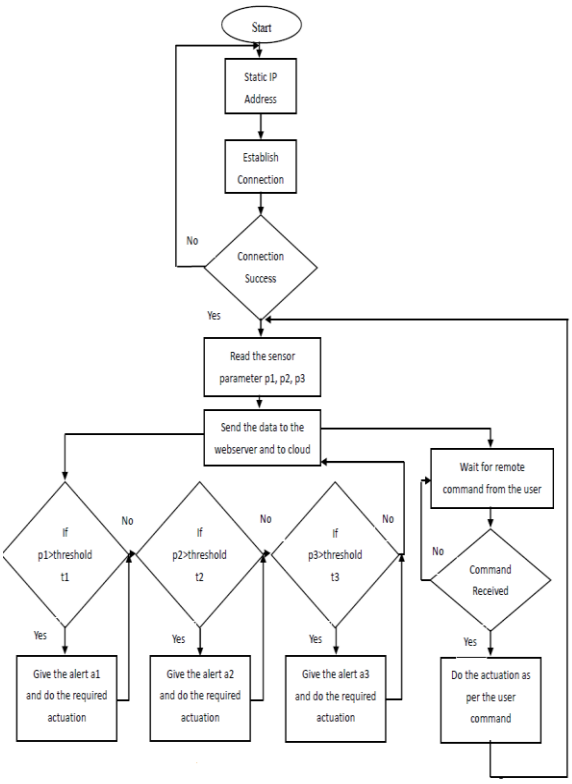
C. Software design

Front End Design: HTML is a format that tells a computer how to display a web page. The documents themselves are plain text files with special "tags" or codes that a web browser uses to interpret and display information on your computer screen.

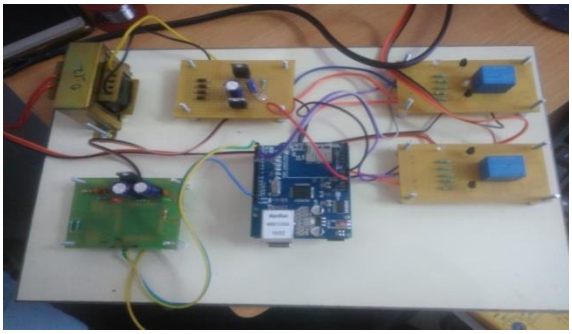
Cloud Storage: Cloud computing is the practice of using remote servers on the internet to manage, store and process data instead of using a personal computer. Cloud computing is a general term that is

better divided into three categories: Infrastructure-as-a-Service, Platform-as-a-Service, and Software-as-a-Service. IaaS (or utility computing) follows a traditional utilities model, providing servers and storage on demand with the consumer paying accordingly

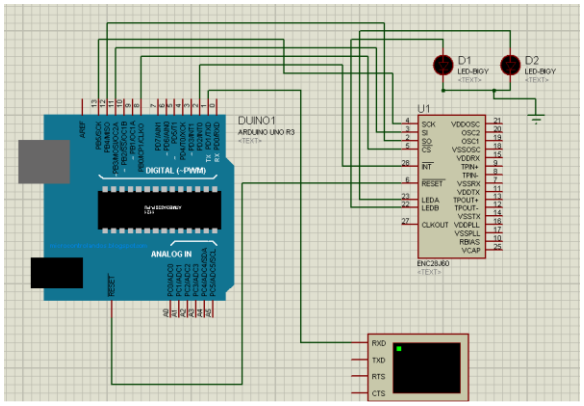
D. Implementation Setup



The above figure illustrates the following actions. When the connection is established it will start reading the parameters of sensors like p1, p2, p3 etc. The threshold levels for the required sensors are set as t1, t2, t3 etc. The sensor data are sent to the web server and stored in the cloud. The data can be analyzed anywhere any time. If the sensor parameters are greater than the threshold level then the respective alarm a1, a2, a3 etc. will be raised and the required actuation is done for the controlling of the parameters.



V. RESULTS



VI. CONCLUSION AND FUTURE WORK

A. Conclusion

The home automation using Internet of Things has been experimentally proven to work satisfactorily by connecting simple appliances to it and the appliances were successful control remote through internet. The designed system not only monitors the sensor data, like temperature, gas, light, motion sensors, but also actuates a process according to the requirement, for instance turning on the light when it gets dark. It also stores the sensor parameters in the cloud (Gmail) in a timely manner. This will help the user to analyze the condition of various parameters in the home anytime anywhere.

B. Future work

Using the system as framework, the system can be expanded to include various other options which could include home security feature like capturing the photo of a person moving around the house and storing it onto the cloud. This will reduce the data

storage than using the CCTV camera which will record all the time and stores it. The system can be expanded for energy monitoring, or weather stations. This kind of a system with respective changes can be implemented in the hospitals for disable people or in industries where human invasion is impossible or dangerous, and it can also be implemented for environmental monitoring.

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