

Survey on: Home Automation Systems

Pratik Waghmare¹, Mayur Chandgude², Prafull Chaur³,
Abhay Chaudhari⁴ & Prof. Shinde H. B⁵.
Department Of Computer Engineering, Keystone School of Engineering.
Savitribai Phule Pune University. Pune, India.

Abstract: -Internet of Things (IoT) is nothing but connecting different real world objects to provide proper communication, synchronization, and inter-connecting between various devices or physical appliances is also known as "Things". The Home Automation System (HAS) is extension of current activities performed inside the home and this Home Automation System (HAS) can be developed easily now a day's, because of powerfull computational devices and wireless sensor network(WSN), to provide user friendly and cost fairly home automation system. In home automation system (HAS), different technologies like WiFi, Bluetooth and ZigBee are used for communication, and different devices like smart phone, tablet and laptop used for controlling various appliances. In this paper we detailed a survey on different home automation systems considering parameters like type of communication, cost, technology and efficiency of system. A comparative analysis of home automation systems is done.

In future this system may have high demand and usage for automation of the "Things". Using Home Automation System (HAS) our home will be smart home that can operate without any physical interference of human being.

Keywords: - IoT, SMS, GSM, Cloud, HTML, FPGA, Android.

1. Introduction

The purpose of this survey paper is to present the Home Automation Systems (HAS) currently available over the world. It is very useful to the user for control and handle all the appliances that are connected to the system, from a controlling devices. "EASY USE OF APPLIANCES" is main motive of this system. In this system home appliances can be monitored and controlled, and the user can interact with the system through a user friendly interface. The home appliances like fans, lights, switches are remotely controlled through a main control board. It becomes too tedious to every time manually turn the switches ON or OFF. According survey we found that this is a big problem in case of disabled or handicapped people. For that reason home automation system is useful.

2. Literature survey

According to survey we found that some systems are working with the help of internet, cloud server, web browser.

2.1. Sensor Based Home Automation and Security System.

This is a web based home automation system in which user can interact with the system through a web-based user interface over the Internet. Home appliances like lights, door locks, air conditioners and gates are remotely controlled through a user-friendly web page.

Functions of web based system

- Remote control over lights and door locks.
- Lights and doors are displayed through a web page that can be controlled through web browser.
- The system monitoring of the house in real-time.
- If a threat is detected, with the help of appropriate wired and wireless motion sensors alarm system will be starts. Alarm system will alerts the user and security personnel through Short Message Service (SMS) messages.

- Highly extensible and customizable.

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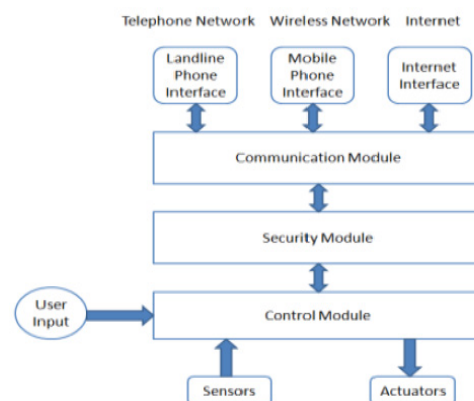


Figure:1

The system connected to home appliances. This system is developed as a custom-designed processor

in Field Programmable Gate Array (FPGA). The system is implemented on a Nios development board cyclone II edition components and interfaces. The main processor interacts with external components, viz. sensors, appliances and devices by using C programming language. User interface is developed by using socket programming, hypertext mark-up language (HTML), JavaScript and Personal Home Page (PHP). The user able to communicate directly with the board through a web browser. [1]

2.2. i-Learning IoT: An Intelligent Self Learning System for Home Automation Using IoT

In this system, Home automation is working on cloud principle. With the help of different sensors, monitoring is done. A computer is kept permanently active at home. That computer is there to control the operations with home appliances. Home PC is kept to continuous monitor sensor output. If there is any problem found with the output given by sensors, Home pc is going to report that problem to Cloud Server. Home PC is responsible for conveying messages towards cloud server. Cloud server will store the information into the database and will take actions according to output. Working of cloud server is to mine the data from database, and convey the relevant message to the HAS owner by a initiating a call/ SMS, and the intelligence part in this system is to call and send SMS to the Technician and report the detailed problem occurred in the appliances.

This system as stated it is energy efficient but it takes lots of energy in sensing the environment as well as to kept a Home PC continuously ON, energy supply to PC is required. As this system required cloud server, one Home PC the system is also more costly than other HAS. This system can be more useful for that who are more living outside and who need to access the appliances from remote location.

Functions of cloud based system

- System is using no of sensors to monitor different parameters like light, temperature, humidity to get information about current surrounding area.
- One computer at home is kept continuously ON to observe the output given by sensors. This computer will give the information to Cloud server side.
- For storing the phone no's and relative contact details of the User and the technical persons, their work address, work time, and services they offered there is one module for Registration which helps to store data at server side.
- In operational state Cloud server is going to mine the Data gathered from no of sensors, and going to

realtime. The target home appliances are controlled by the system Main Control Board [3].

perform the actions like Sending mail/SMS/call to HAS User.

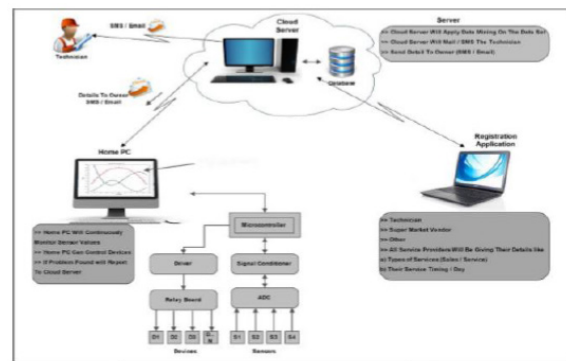


Figure:2

This system basically works via a cloud server which is responsible for taking actions on the basis of results provided by sensors situated in home. This system doesn't require any remote like machine for e.g. Mobile Phone or remote controller to give actions to system, instead of that it acts automatically according to the conditions specified in it which is more useful to have a device free walk and have actions performed by the controller by taking decision by their own [2].

2.3. Smart Home System Using Android Application.

In SMS based Smart home concept has the main control which implements GSM to provide remote access from PC/laptop. The design consists existing electrical switches and with low voltage activating method provides more safety control in the switches. The switches status is synchronized in all the control system whereby the real time existing switches status is indicated by every user interface. The purpose of system is to control electrical appliances. This design of the system contains the mechanical switches with the modified low voltage activating method, in order to provide safer control to the user. The connection in this system is established by GSM module. This GSM module directly receive/ transmit commands from/to PC/Laptop

The System is placed and deployed on the wall or any empty area in user's surrounding. The system is capable with communicating with the user's computer/laptop/smart phone using the Bluetooth wireless connection. Deployed system comes with GUI which is installed on the one of this device.

GUI capable of updating the status from the main control board. This whole process will be happening

3. Comparative analysis

System	Technology	Drawbacks	Cost(Appr.)	Speed
System 1	Web browser	1. Need of internet connection 2. Not efficient in rural areas.	20,000	Slow speed (because of internet speed).
System 2	Cloud server	1. Maintenance of cloud. 2. Continuous internet connection required.	25,000	Slow speed (because of internet speed).
System 3	GSM/Bluetooth module	1. Hard to install. 2. Less operational area.	20,000	Slow due to delivery issues.

4. Conclusion

According to this survey, we understand that existing system has some problems and requires some of resources that cause system costly. Systems working on different environments and different resources causes user to adjust with the system. It is not as much popular in Asian countries, to increase the scope of these systems needs to be implemented with some user friendly interfaces which will help users and gives more efficient access to system.

5. Acknowledgment

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