Home Appliance Controlling and Monitoring by Mobile Application based on IoT

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Abstract - *IoT (Internet of Things) is rapidly growing technology which involves interaction among appliances linked to the Internet without human interference. It has made human living secure and more convenient. With the rapid rise in the number of users of the internet over the recent decade has made the Internet an Important portion of life, and IoT is the latest and developing internet based technology. Home Automation system using IoT is provide easy and wide range control to home appliances and gives security to home over the internet around the world. It saves the electric power and human energy and reduce the cost of bill.*

Key Words: Automation, Internet of Things, Android phone, Router, Wi-Fi.

1. INTRODUCTION

The IOT which means the internet of things. Internet which means device data information exchanging without any cable of connection. Things which means in which device can be operate (like fan, light, A.C. etc.). If combination of this two words that device to device controlling using internet without any cable connection. The IOT is wireless application which can start an innovation channel in human developing, building automation, autonomous automation etc.

It can control in home automation, industrial automation, filed automation and robotics. Home automation process is controlling in home appliances automatically having more control system techniques. All the electronic equipment can be operated by using this application. When wireless application use in equipment then it can be controlling by internet. Then internet is connecting with a gateway. The remote can also connected with the application of network. When remote can give the command then signal going in application then application can perform its work for operate the devices. IOT base home automation is can controlling WI-FI connection through android apps from any Node MCU based home automation using digital control. Wireless home automation using IOT is an innovation application of internet of things developed to control home appliances remotely over the cloud.

2. Internet of things

The Internet of Things is the internetwork of Things (known as "Smart devices"), buildings and other things like Electronics, Electrical, software, hardware, sensors, Actuate and network connectivity that enables it Things to collect and digital information. In 2013 Based on the Internet, the Global Standards Initiative (IOT- GSI) defines IOT as "no infrastructure" Information society "ITOT objects allow computer-based systems to create opportunities for more direct integration of the physical world, remotely consolidate and / or control existing network infrastructure, and as a result, reducing human intervention has increased efficiency, accuracy and economic benefits. Generally, there are IOTs Machines-to-machine (M2M) expects to provide advanced connectivity to devices, services and services that go beyond communication and cover different protocols, domains, and applications. Due to the consolidation of ubiquitous technologiesets perspective of items is including ubiquitous wireless communication, real-time analytics, machine learning, commodity sensors and embedded systems. [1]

3. Early history

The home automation system is the types of automation systems, which are typically used to control mechanical control systems, especially for home appliances and devices. And Microcontroller based IR, Bluetooth and infrared sensors. Home automation systems are used to control outdoor and indoor lights, heat, fan, mobile charger, and laptop charger air conditioning to control electric and electronic devices, so that the doors are locked or opened and used for various controls. Systems with decent sensors Start-up home automation started with self-saving machines. [2]
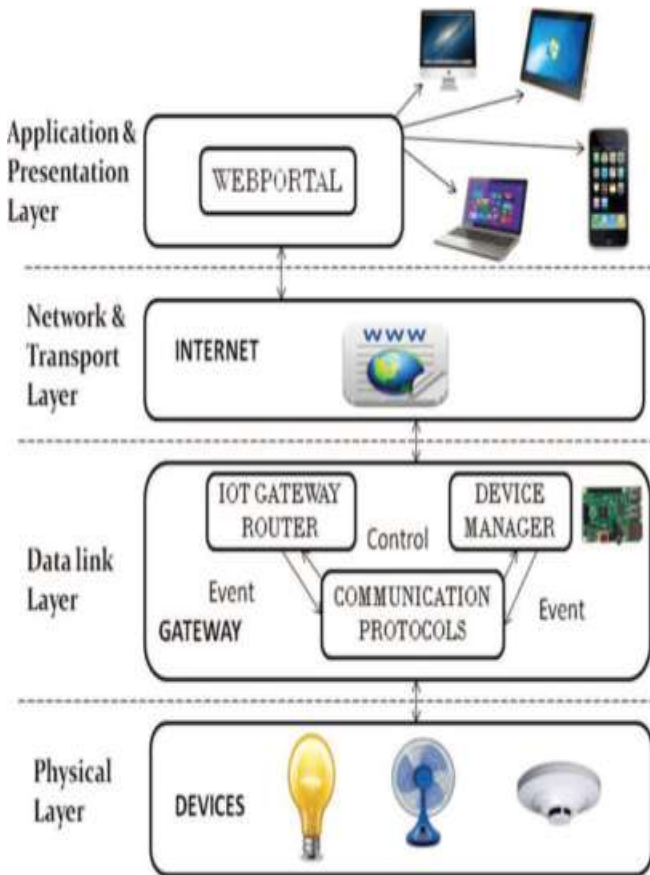
4. IoT architecture

Fig -1: IoT Architecture

Internet-based architecture provides high level of flexibility and in this system, the application level layer above the application layer is the first layer of the application and the third is the data layer and the last is our Home Application Physical Layer. The IOT project aims to use IPv6 and other related standards to remove disadvantages using the Internet of Internet access control (MAC) items. The IOT is fully studying all the sensor functions, mechanisms and various operations which are used for the construction of IOT architectures, although all interconnected inter-connected IOT applications occur between them. In the information networking sector, where, in his childhood, some solutions to leave common software, TCP / IP protocol suite. [3]

5. Implementation setup

Components required [4]
1) Microcontroller board
2) Accessible Wi-Fi
3) Temperature Sensor
4) Display
5) Relays is connected home appliances.
6) Mobile phone (Android OS)

6. Setup

First programmer to the microcontroller and use to GPOI pin of various sensor and relay, display second dc supply to the microcontroller board and relay tray of your system of the 5A, 12A. and relay connected to your homme appliance of the 230 AC and 50 HZ sources The temperature sensor is connected to analog digital in-out pin of Microcontroller board. The board is power on DC 12Volt battery or DC 12Volt from rectification Process of 230V AC. The electrical devices are connected to mains through relay is connected to another GPOI pin of the microcontroller board. The MCU board is programmed to authenticated Router access to Wi-Fi and his password.

System is turn on to the local Wi-Fi is connected and send the message to smart phone your system is ready to monitoring and controlling. [4]

7. User Interface

User interface is that the user will easy to use and custom edit the smart phone program. Use the third party application During this system the android operating phone makes control of the house automation system. android operating based Smartphone application pre-build algorithm and program controls that enables us to create the graphical program for our app. And real time monitoring of the android smart phone and your third party server Android also provides other User interface application for special interfaces such as upgraded version of android. notifications, and menu also provided. The interface should enable the user to look at the device status and to monitoring to your device easy to modify your color and theme. [3]

8. Working of sensor

Here in this system to use the DHT 11 Sensor sense the atmospheric temperature and humidity in respective order of 50'c and 100%. Of the initial values. Each DHT 11 sensor is high performance calibrated in the laboratory. And accurate on humidity calibration. The signals wire one in the called data wire and other two ground and 3.3 DC voltage The component is 3-pin single row pin package. It is connect and special packages can be provided users' request.
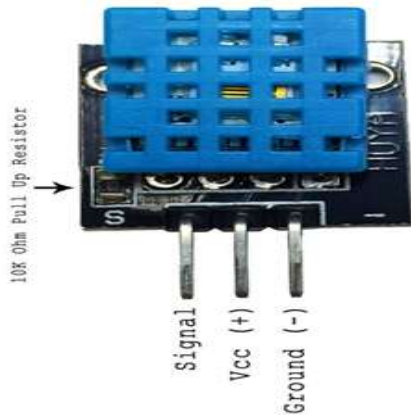
9. Image of the DHT 11

Fig -2: Sensor Image

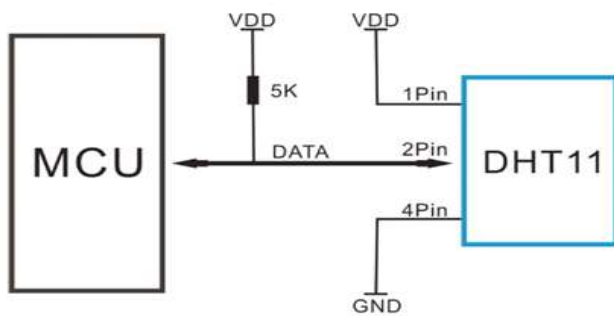## 10. Interfacing of sensor to Node MCU

Fig -3: Interfacing of Sensor to Node MCU

11. System design

1) Connect your relay in home appliance
2) Programming to use digital GPIO pin in the Micro-controller
3) Microcontroller to connect local Wi-Fi router
4) Make an android application of the suitable system
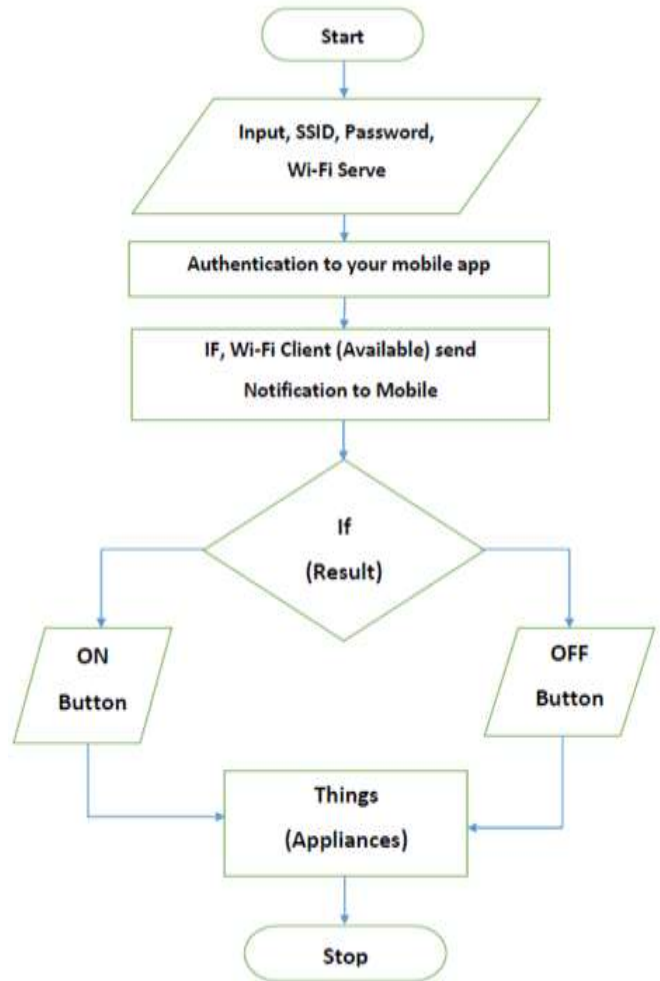5) Controlling the home appliance

12. Flow chart

Fig -3: Flow Chart

13. Further scope

Different future applications can be used by the Internet to monitor and control the various home appliances devices of the homes with inter-net, industrial automation and management by monitoring and controlling the Internet. Systems and Improve Security Problems in Our System. [3]

14. CONCLUSION

In this paper, we conclude that introduced a home event of controlling and monitoring systems using the IoT Technology. The system is suitable for real-time home appliance monitoring and remote control of home appliances. Many people can get jobs in this system Places like medical, office, banks, college, labs etc. The proposed project provides a home automation system that uses Wi-Fi and also internet technology using the Android application the user commands through the Android app that is connected to Microcontroller with the help of internet there may be enthusiastically home appliances Controlled. [3]

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[5] Fig. 2 Mybtechprojects.tech (https://mybtechprojects.tech/temperature-data-to-thingspeak/dht11-pinout-for-three-pin-and-four-pin-types-2-1024x742/)