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Home Automation System Using Internet of Things

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Abstract: With advancement of Automation technology, life is getting simpler and easier in all aspects. In today's world Automatic systems are being preferred over manual system. With the rapid increase in the number of users of internet over the past decade has made Internet a part and parcel of life, and IOT Is the latest and emerging internet technology. The advantages of IOT home automation system is there is less man power or only need the some hardware or an one mobile application which is connected to the hardware we have developed the system using raspberry pi we have to develop a home automation system that interfaces with Android mobile devices. The mobile device and system can communicate with each other via Wi-Fi. The mobile application can be loaded and interfaces with system from any compatible device. Commands to ON/OFF electrical equipment like lights, fans, air conditioners etc. This is very useful for the person who is away from the home because he handle his appliances using application. We can switch on off our home appliances anywhere in geographical locations.
Keywords: Raspberry Pi , cloud , mobile app, home automation, internet of things,

I.   INTRODUCTION

Internet of thing is one of the most upcoming technology which is used to manage and controlling any objects by connecting internet in this device all the appliances of the home and in other words all the electronic appliances and connected with the raspberry pi in which user can control all the appliances using this IOT things. The IOT system will convince and energy saving IOT have the potential to change the lifestyle of peoples. In day to day life people prefer more of automatic system rather than manual systems. The major element of iot based home automation system are raspberry pi. Home automation can be defined as a mechanism removing as much human interaction as process them with programmed electronic systems. In the home automation we have seen that all the things are controlled by the internet and in internet of things home automation is useful for the people in which they can save money , time and also there man power which is not necessary at the point. Using the cloud wi fi and raspberry pi we can made the system to control all the things using one mobile app.

II.   ABOUT RASPBERRY PI MODEL B

What is raspberry pi? Raspberry pi is the low cost computer and it is in the small size it is capable device that enables people of all ages to explore computing. it can do everything you'd expect a desktop computer to do form browsing the internet and playing high definition video to making spreadsheet , word processing , and playing games.

Raspberry pi 3model b is the earliest model of the of the third generation raspberry pi. It replaced raspberry pi 2 model B in feb2016

Quad core 1.2GHzbroadcom BCM2837 64 bit CPU
BCM43438 wireless Z and Bluetooth ow Energy (BLE) on board
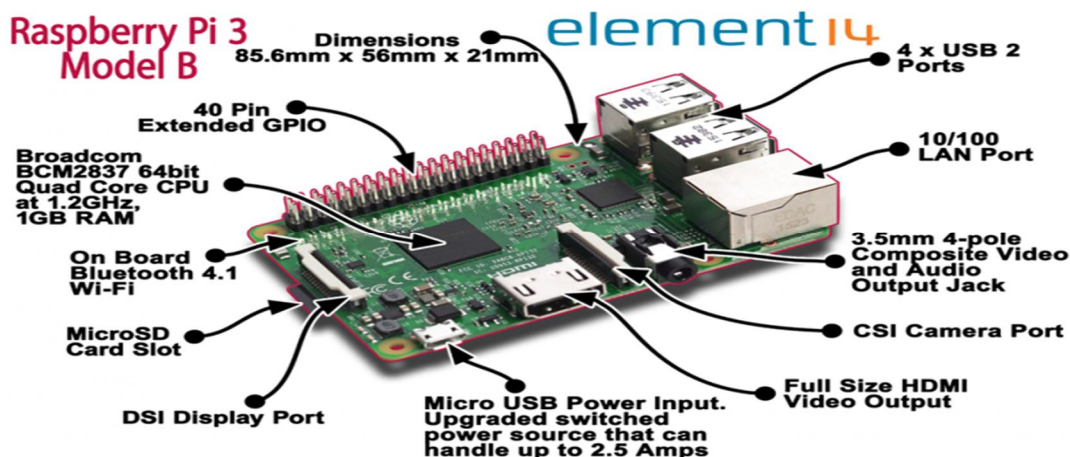100 Base Ethernet
40-pin extended GPIO
4 USB 2 ports
4 Pole stereo output and composite video port
Full size HDMI
Micro SD port for loading your operating system and storing data
Upgraded switched micro usb power source to 2.5A

III. CLOUD

The cloud refers to servers that are accessed over the internet and the software and databases that run on the servers that are located in data center all over the world. In cloud computing companies do not have to manage physical servers, in the information technology cloud computing is the mainstream.

Software as a service is hosted on cloud servers and users access them with the internet. There are three types of cloud deployments 1.private 2.Public 3.hybrid

A. Private

 In private cloud it can access by the specified organization a private clod is a secure cloud .

B. Public

Public cloud is mostly similar to private cloud the main difference between public and private is public cloud stored data can be shared with the other organization.

C. Hybrid

Hybrid cloud is the combination of private and public in which organization can be use private cloud for some servers and public cloud for others.

IV. SYSTEM DESIGN

A. Raspberry pi

The raspberry pi is a series of credit card-sized single board computers developed in the UK by the foundation Raspberry Pi with the purpose promoting the teaching of basic computer science. They developed free resources to help people learn about computing there is two model announced in 19 feb 2012 model A and model B model B+ was announced in july 2014. Pi3 model B is announced in 29th febraurary 2016. The raspberry pi 3 model B+ is is the latest product in the raspberry pi 3 range boasting a 64 bit quad core processor running at 1.4GHz dual-band and 5GHz wireless LAN , PoE capability , Bluetooth 4.2/BLE , faster Ethernet

B. Cloud Server

Cloud server is used for central storage. Centralization gives cloud service providers complete control over the versions of the browser-based applications provided to clients which removes the need for version upgrades . This is the remote user who wants to automate home appliances by using android mobile device r the client pc. Android is a linux based operarting system designed for mobile devices such as smart phones and tablets here some other devices is required to connect each other like keyboard , mouse , and monitor. After the devices the one thing is remain that is coding to connect cloud with android application and application to cloud and then connection between Raspberry Pi 3 model B to cloud and cloud to Raspberry pi . Here is the programming language is required like python. in this system user can access the device from any geographical location . In the android application you only need the internet connection and in raspberry pi you need wi fi to connect.

- The Internet of things (IOT) is the network of physical devices, vehicles, home appliances and other items embedded with electronics, software, sensors, actuators, and connectivity which enables these objects to connect and exchange data.
- The IOT allows objects to be sensed or controlled remotely across existing network infrastructure creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention.

V. ADVANTAGES OF HOME AUTOMATION SYSTEM

In the previous years the wireless systems have more common in our day to day life and it is useful , using wireless system we can see the differences and as well as the advantages.

A. Reduced Installation Cost
Installation cost are significantly reduced since no cabling is necessary . as well as the cost of the other thing is high therefore here only need for some equipment's.

B. Integration of Mobile Devices
This is the main advantage of home automation system is we can operate the electric appliances from anywhere with the help of mobile devices and also we can easily understood the application.

C. Use From Any Geographical Location
Through the cloud we can connect the mobile application with the home appliances. it only need the wi fi and some other things to connect properly .

There are many advantages of IOT in day to day life , we can use also use this technology in dangerous zone where everyone has the fear to do something on that place like electric department or in the farming where farmers want to on\off their water pump

VI. CONCLUSION

The internet of things can be described as the technology in which the actual physical entities (electronic devices) with data sensing, processing & self adoption capacity can be used to interact with other such device and process that data to take an intelligent decision which will prove useful for our daily day to day life. As per the paper the IOT is being formed from two words internet and things which combine means any object or person which can be distinguishable by the real world can be connected to global system of interconnected computer networks and governs by standard protocol.

We can switch on/off our home appliances though we are far away from our home or we are out of city by using Geographical location. We can switch on/off our home appliances from our mobile application too. Mobile application can interact with cloud and cloud interact with Raspberry Pi board which is connected to our home appliances. By using this, we can operate our whole electronic appliances easily.

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