A Review Paper on Home Automation

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***Abstract*- Automation of a device has a wide scope for this Generation as well as in the upcoming generation due to the enhancement and rapid growth in technology. Mobile communication technology is playing a major role in the field of automation. The rate at which mobile technology is growing, communication is becoming faster and more powerful. This review paper is based on low cost and reliable home control monitoring system for accessing and controlling devices and appliance using Android based Smart phone application. This system improves the living standard at home, reduces human effort, is energy efficient and time saving and thus makes a smart home .And also it was very helpful for providing support to disabled people and fulfill their needs in home and thus they leads a normal life. This system uses android mobile, Arduino Uno board, Wi-Fi module and a relay circuit. We are using Wi-Fi technology to monitor the device because of its accuracy, high range, easy availability and instant connectivity.**

INTRODUCTION

Home automation has become very important and useful because of its safety, easy of use and security. It is gaining its importance with time as it has become more advanced and precise to monitor home appliances. Home Automation system is very energy efficient and highly approachable smart home technique. [1] This system uses a combination of Android smartphone setup with Arduino Uno Board, Wi-Fi Module and Relay circuit. In this paper, we have used a Wi-Fi wireless technology to monitor the device. An android application is installed in a mobile device i.e. android smart phone and it has inbuilt switch interface of all the appliances set up in it. Through which all the respective devices can be controlled and monitored individually and easily. The Wi-Fi module receives the command from mobile phone and passes it to the relay circuit. As per the given signal from the user, the relay circuit is switched ON/OFF. The main purpose of using Wi-Fi wireless technology is to provide a better extent to range and better feasibility.

Home Automation is a unique system that control and establish communication between nearly all appliances of your house. [1] Home Automation is a term used to describe the working together of all household amenities and appliances which can be controlled and monitored through your smartphone. For example, a centrally microcontroller panel has the capacity to control everything from heating, air conditioning, security system, lighting and overall electrical appliances. [3] Home automation includes controlling all aspects of your home remotely through a computer or any mobile equipment. For example To control lights in and around your house from one central location so there is no need to get out of to that place or go to downstairs to turn OFF or ON any appliances. [5] It is essential that the different controllable appliances be interconnected.

LITERATURE SURVEY

A. IMPLEMENTATION OF INTERNET OF THINGS FOR HOME AUTOMATION

Mamata Khatu, Neethu Kaimal, Pratik Jadhav and Syedali Adnan Rizvi [1] presented a research paper on the implementation of Internet of things for home automation. This paper mainly focused on IoT coverage that connects all the devices like smart phone, tablets, digital cameras and sensors through the internet and provides many services and huge amount of data and information. It also consists of Cloud based platform to help in connecting the devices that surrounds so that we can easily access anything at any time and in any place. When Security concern is raised it is overcome through this model since we are using Wi-Fi Wireless Equivalent

Privacy (WEP) and Wi-Fi Protected Access (WPA) are two most used security accesses used in Wi-Fi spectrum.

B. BLUETOOTH BASED WIRELESS HOME AUTOMATION SYSTEM USING FPGA:

B.Murali Krishna, V.Narasimha Nayak, K.Ravi Kishore Reddy, B.Rakesh, P.Manoj Kumar and N.Sandhya [2] presented a review paper on the Bluetooth based Wireless Home automation system using FPGA technology.They primarily focused on the Bluetooth technology. With the help of the Bluetooth module type (HC-05) and Android Phone, we can control the home appliances, which are thus eventually all connected to FPGA board. Home Automation reduces the human efforts,and is also energy efficient and time saving. Moreover, this technology is very helpful to the handicapped and old aged people to control the home appliance without any difficulties.

C.HAND GESTURE BASED HOME AUTOMATION FOR VISUALLY CHALLENGED:

Smitha M, T.AyeshaRumana and Sutha P [3] have published a paper entitled Hand gesture based Home Automation for Visually Challenged People. They have designed a device for the visually challenged people to help them in operating the basic home appliances. They have used MEMS (Micro electromechanical Systems) accelerometer which senses the accelerations of a hand in corresponding three perpendicular direction that is (x y z) and thus transmit the signals to wireless protocol using Radio frequency. These gesture templates are stored in a microcontroller at the receiver end. The received gesture and the hand gesture are compared by the templates and if the corresponding gestures are matched with the templates then accordingly home appliances are controlled. In addition, these devices are also useful for the old aged persons.

D. HOME AUTOMATION USING ATmega328 MICROCONTROLLER AND ANDROID APPLICATION

S.Anusha, M.Madhavi and R.Hemalatha [4] presented a review Microcontroller and Android application. In this paper they have designed and developed a remote household appliance control system using the ATmega328 microcontroller and android mobile through the GSM technology. In addition, this appliances use the SMS-based system that satisfies user needs and requirements. Thus, all electrical household devices can be controlled by sending a text message from an Android mobile or a computer based system.

MAIN AUTOMATION CONTROLLER

1) ARDUINO UNO BOARD

The 8-bit AT mega 328P microcontroller is based on Arduino UNO which is used to control the different components like Wi-Fi module and relay circuit networks. The advantage of having a separate controller is to focus only on the desired task.

2) INTERFACES:

An Interface is a surface designed to interact with the Home automation controller. There are many types of interfaces like Touch Panels, Keypads, Remotes, Mobile Devices and Internet which can vary according to the budget and use. We can use a Android smart phone which can further be connected to the software linking appliance controller. In addition, within the mobile interface it can be able to control all the appliances of the home.

3) CONTROL METHOD

The main use of the controller is that it provides a medium of communication between the appliances and interface. The sensors notify the controller about all the changes happening in the surrounding. Some of them are mentioned here like IP (Internet Protocol), Wi-Fi, Bluetooth, Zig -Bee, IR, Serial Data.

Wi-Fi technology:

Wi-Fi can be agreat option when you cannot get Ethernet wiring to your desired locations. It acts a good medium for communicating and allows large bits of information for processing. It can thus make the appearance look good and serve the cause.

ADVANTAGES

1. Appliances can be placed anywhere irrespective of their location or size.
2. No wires running n side your house
3. Provides wide range and is more efficient

The proposed system implementation follows a standard procedure listed below

1. Start
2. System will be initiated.
3. Initially all control devices will be OFF after power-on.
4. Wi-Fi module will be initiated.
5. Open mobile application on Android smart phone.
6. Connect to the Wi-Fi module and mobile application on Android Smart phone.
7. Wait for the control command to be received from Android mobile application.
8. Send control command (ON/OFF device) from Android mobile application.
9. Check received control command format.
10. If received command is "ON" turn ON the particular Device.
11. If received command is "OFF" turn OFF the particular Device.
12. Stop

CONCLUSION

Today, Android is the world's powerful mobile platform open source operating system to fit easily whatever we had in our mind. This article is about wireless home automation using Android mobile which helps you to implement such a fantastic system in our home at a very reasonable price using cost-effective devices. Thus, it overcomes many problems like costs, inflexibility, security etc. In addition it will provide greater advantages like it decreases our energy costs, it improves home security. In addition, it is very convenient to use and will improve the comfort of our home thus serving as a betterment for the society.

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