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Home Automation for Physically Challenged and Elder people

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Abstract - The Internet of things (IoT) is a system of attached computing devices, objects, animals or people that are provided with exclusive identifiers and the ability to transmission data over a network without hard human-to-human or human-to-computer interaction. The internet and technology become very high and the usage of the internet also increases day by day among the people. IoT plays a vital role in industries. IoT devices are controlled from any place via the internet. The Next Industrial Revolution is going to change our lives in ways never imagined. By using IoT the object can be controlled from one place. Smart Home Automation is developing widely for the people and it can be controlled through the internet. But the demand is for Home Automation for physically challenged. Physically challenged people and elder peoples are suffering a lot in their day to day life particularly in their homes mainly in electrical issues. The physically impaired person needs the help of another fellow men / women to fulfil their basic requirements such as ON / OFF of the electrical appliances.

***Key Words*: Internet of Things, Arduino UNO, Home Automation, ESP8266, Arduino IDE**

1. INTRODUCTION

Internet of Things (IoT) connect many objects to the Internet. It enables the exchange of data never available before, and brings users the information in a more secure way [4]. The home automation systems are gaining popularity day by day due to their ease of use and use in several applications. Normal people require home automation to fulfill their needs and ease while for physically challenged people it is a social challenge. It can provide great assistance. There have been several kinds of research and developments on the home automation systems [1]. The main aim of this project is to control the home applications remotely by using Android OS smart phones with an Arduino board applicable especially for the physically disabled persons. This system is enhanced to control the home applications through an Android application of smart/ tablet phones by entering the selected number for corresponding load/appliances [3]. By using the Internet of Things (loT), the development of home automation is going to become simpler and more popular. 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"[2]. While the innovations are becoming recognized, there is potential to make a difference in fields other than business and security, and focus on how the Internet of Things can make a significant impact in health care, especially in field of helping disabled people. The things which can be connect to internet to help the disabled people in any manner comes under this category [4].The physically challenged people can able to use and they are not supposed to suffer while using the home automation.

2. METHODOLOGY

In this project, we are working to make an IOT Based Home automation for physically challenged and elder people to control the home appliances easily through their mobile phone. Based on their need we will provide the hardware to control the home appliances.

3. HARDWARE COMPONENTS

3.1 Arduino UNO

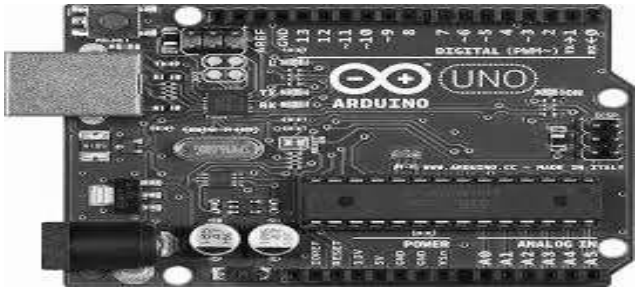

Fig -1: *Arduino UNO*

Arduino is a hardware and software company which a open source. It contains Microchip ATmega328P microcontroller. It is an 8 bit Microcontroller preprogrammed with a boot loader that aids in uploading of object files directly into microcontrollers flash memory. Arduino has lot of other features like readily available Bluetooth shields/modules that can be directly interfaced using on board serial communication facility of Arduino, undemanding accessibility of I/O ports, regulator IC on Board, etc...[3]

3.2 Node MCU (ESP8266*)*

Fig -2: *Node MCU ESP8266*

Node MCU is Very popular in Home Automation. Node MCU 8266 is meant for Wi-Fi and hotspot to connect with the internet and access the home automation. The hardware is very tiny and contains many digital I/O pins Serial communication and 12C communication. Arduino does not have any wireless construction that's why we are using Wi-Fi module for wireless message. ESP8266 Wi-Fi module is used for communication between android mobile app and Arduino bo7ard.

3.3 Bluetooth HC 05

Fig -3: *Bluetooth HC05*

Bluetooth HC 05 is a wireless communication protocol it is used in two devices as a transfer and delivery the information. The Transmitter pin [TX] of Arduino should be connected to the receiver pin [RxD] of Bluetooth shield HC-05 and the receiver pin [Rx] of Arduino is to be connected to the transmitter [TXD] pin of HC-05.

3.4 IR Receiver TSOP1738

Fig -4: *IR Receiver TSOP1738*

The TSOP-1738 is an IR Receiver Sensor, which can be used to collect IR signals of 38 KHz. The sensor operates on 5V and consumes around 5mA to control. The TSOP1738 series are reduced receivers for infrared remote control systems. TSOP1738 is the standard an IR remote control receiver series, supporting all major transmission codes. The sensor can be used for Proximity detection application along with an IR led in robotics and security systems. It receives an IR signal at 38 kHz frequency.

3.5 Passive Infrared Sensor

Fig -5: *Passive Infrared Sensor*

A passive infrared sensor (PIR sensor) is an electrical sensor that procedures infrared (IR) light burning from articles in its pitch of sight. They are most frequently used in PIR-based motion detectors. PIR sensor gives the digital output. The device is used to the detect human moving around within approximately 12m from the sensor and the sensor used to change from room temperature to human temperature.

3.6 Relay

Fig -6: *Relay*

The relay module act as the series of electrically operated switches. A circuit can be turned on or turned off using relay module. Relay module handles voltage and current much better than the microcontroller. It can be used to switch various utilizations and utensils with large current. It has a customary interface that can be controlled straight by microcontroller.

4. SOFTWARE REQUIREMENTS

4.1 Blynk

The Arduino is an Integrated Development Environment (IDE) or Arduino Software has a text editor for writing programs. It also has a message area, text console, a toolbar with buttons for functions and a series of menus. It links to the Arduino hardware to upload programs and connect with them.

4.2 Thing speak

Thing Speak is an Internet of Things (IoT) platform that lets you gather and hold sensor records in the cloud and develop IoT applications. The Thing Speak IoT platform delivers apps that let you study and visualize your value.

5. SYSTEM DESIGN

5.1 BLOCK DIAGRAM

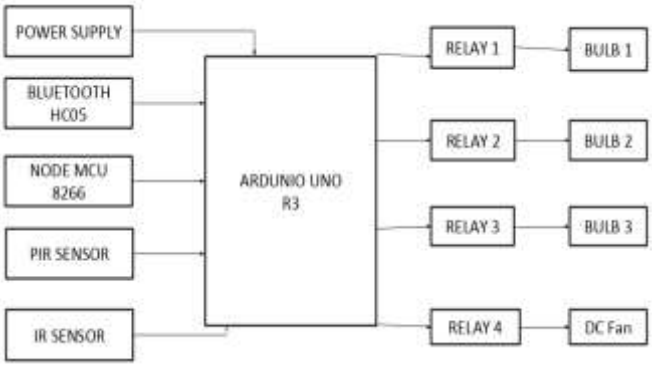

Fig-7: Represents the arrangements of components.

5.2 Schematic Diagram

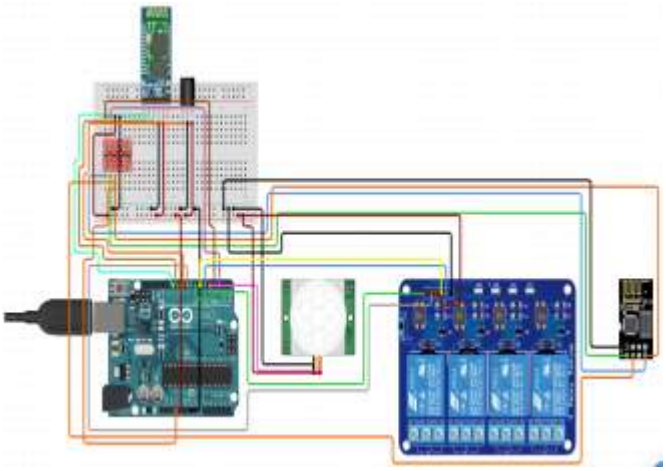

Fig -8: Flow diagram.

6. Working procedure

1. The above sensors can be used for controlling home appliances.
2. When we will join it to Arduino microcontroller then we will able to control the all electrical devices which we want to control.
3. Then our project is based on the wireless that is stored in the cloud database.
4. For that, we have to require some programming concepts to run the project that's why we have to create a code using Aurdino1.6.10. Software.
5. In this software, the code should be written in simple C language with all descriptions of sensors, and another operating system in which the code explains how the sensor, Wi-Fi module, LCD, and so on should be connected.
6. The whole program is dumped into the Arduino microcontroller.
7. With this ESP 8266 is used for Trans receiving the data from hotspot from another device.
8. And the other sensor like PIR is working through detection of motion, TSOP works by remote control.

7. RESULT AND DISCUSSION

In the Home Automation system the disabled people and elder peoples are able use according their need. Thing-speak is an open-source application programming interface that needs to store and recover data from interconnected things using the hypertext protocol over the internet or via a local area network. It also offers access to a wide range of embedded devices and web facilities.

8. CONCLUSIONS

The system utilizes the physically challenged people to fulfill their needs by own. The Physically challenged people are different from their abilities. Blind people and Bed ridden people can use Tsop and remote control the electric appliances. Handicapped people can use motion sensor, by the movement in the front of motion sensor it detects the motion and it helps to on or off the home appliances. Node MCU is used by the older people who having android phone with internet connection. Bluetooth device is also used bed ridden and handicapped peoples. By using all these sensor one can able to control their home appliances from their own place according their needs and use of the people. It will help for all the people and it can also able to use in the hospitals for the patients who attempted in the hospitals.

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