# IOT BASED HOME AUTOMATION USING RASPBERRYPI3

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**Abstract**

**Now a days home automation systems attracts everyone's attention in this era of integrated technology. IOT is used because, the user interface is uniformly of wireless transmission range, friendly, low cost and robust. In IOT system the home appliances are controlled and monitor via the internet. The home appliance controlled and monitored using the prototype developed for smart home infrastructure. This paper proposes a design of internet of things (IOT) based home automation using raspberry pi3 mini computer platform. This project is intended to constrict a home automation system that uses web platform to control the home appliances. Raspberry pi is chosen for its computation capabilities and also equipped with different communication stacks like Ethernet, Wi-Fi module etc. This work is carried out in NOOBS platform embedded components are interfaced with python.**

**KEYWORD: IOT, Automation, Sensors**

## 1.INTRODUCTION

In modern world,we all are using smart devices such as mobile phones,washing machines,refrigerator,sensors internet and monitored and controlled from anywhere. All the smart machines can interact with each other to create smart environment.Home automation have been developed,some of them are commercial product and it is used in local and remote areas. In electronics world microcontroller plays a vital role, After the invention of the microcontroller electronics cost is decreased.The Home appliances are controlled by microcontroller collecting the data from sensors which are in built within the appliances.

These high cost household devices has to be monitored for better performance, this issue can be addressed through IOT based monitoring. Conventional monitoring techniques has short range devices such as Bluetooth, Zigbee and WiFi network. This system supports the controlling of applications when the user is present inside the home or within nearby region,[5] Whereas IOT is developed and it control the outdoor appliances and long range transmissions.

Raspberry Pi 3 is a simple mini computer as easy to work in arduino. The house owner can control the devices through AT commands if the mini computer is equipped with GSM module, Raspberry Pi3 also provides the flexibility of Controlling the device with the user created webpage , through which the status of the appliances can be monitored over online with internet as a medium, and the devices can be controlled from any part of the world.

**2. LITREATURE SURVEY**

In paper [AI-AliA.r], the monitoring system is automated which is easy to increase the performance, but it fall backs in providing a specific security platform for the connected devices in the network. [Q.Wang] Paper discuss on effective way to allocate this spectrum, hence all the devices can becontrolled properly,butthis paper doesn't concentrate on interfacing embedded devices [Ch.NagaKotiKumar] paper elaborates on controlling of household devices with the help of SMS, author designs a system which works on basis of AT commands, but this approach requires a uninterruped GSM/GPRS services. [R.A.Ramlee] Paper also discuss on home automation of household appliances but it controls the devices through Bluetooth, which is feasible for short range communication. [C.P.Jeba] Paper details an efficient home automation and control system, for an integrated approach implemented with zigbee technique. Though this method is efficient, zigbee module are restricted for long distance communication.

## 3. EXISTING SYSTEM

In the existing system Zig Bee based home automation has implemented. It used only for short range of application. There is a loss of power. When the machine goes abnormal condition, it indicated to the user via buzzer. There is huge loss of power, when the industry has a stage of energy in the running devices and contributing to the economic fall. Most importantly, in the existing system, the automation detection in the industry is less. The man power accidental conditions through which various load are future mishandled due to human error.

## 4. PROPOSEDSYSTEM

In this system, using IOT all the users are directly monitor and control the devices by mobile phones or laptops using IOT website the devices like fans, light are controlled. In this project we use 8 light, which can be controlled by IOT command. The command for the system is given by IOT website. Fire sensor detect the fire and send SMS to mobile, update

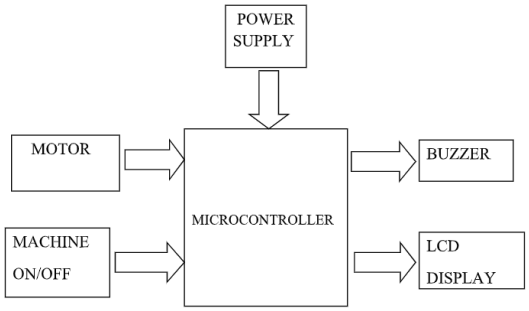


**Fig.1 Block diagram**

**4.1.2POWERSUPPLY**

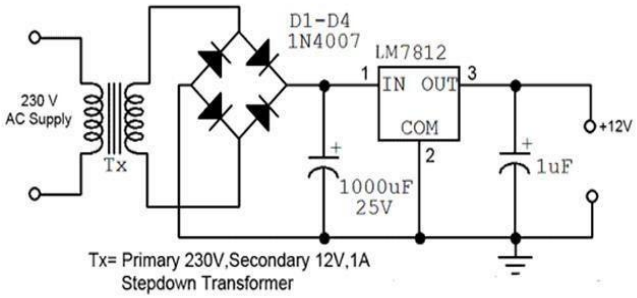


**Fig .2 Diagram of power supply**

It is the main source of electric power. Different types of energy is supplied to the load by the device is known as power supply unit. In electrical energy supplies it is commonly used but in mechanical and other it is rarely used.

**4.1.3 RASPBERRYPI 3**

It is like small computer with single board. It was developed by United Kingdom. The basic idea behind this is, in schools it teaches the computer science basics. The anticipated is not popular more than original model, it is used in robotics. There are peripherals, not involved in raspberry pi3. In official and unofficial bundle, some accessories are included. It has numerous version, but there is an variation in feature like the memory capacity and peripheral device support.

**Fig .3 Raspberry pi3**

### 4.1.4 FIRE SENSOR

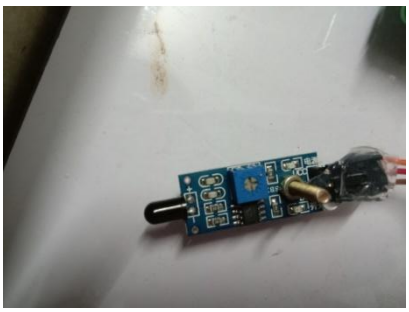

**Fig .4 Diagram of Firesensor**

If there is an fire or flame, the sensor is detected. It is mainly designed for this purpose. If the fire is detected, then it is responded to this by surrounding alarm.If there is an fire, the fire light is incident on the photodiode. Here an OPAMP is used to the check the voltage change across the IR receiver. Then if the fire is detected , then the output pin is low (0v) and the no detection of fire the output pin is high (5v)

### 4.1.52*16LCDDISPLAY

It is a flat panel display. It is like visual display and it uses light modulating properties of liquid crystal. It does not emit light directly.


**Fig.5 2*16 LCD Display**

### 4.1.6 RELAY

With the use of another electrical circuit, the switch is open and closed. It is like electrical switch. The electromagnet is used to operate the switch to open or close or other contacts.

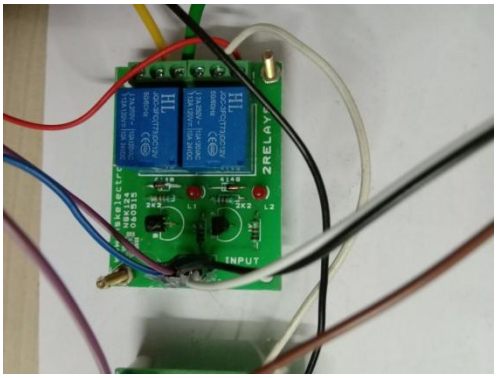


**Fig .6 Diagram of Relay**

**4.2 WORKING**

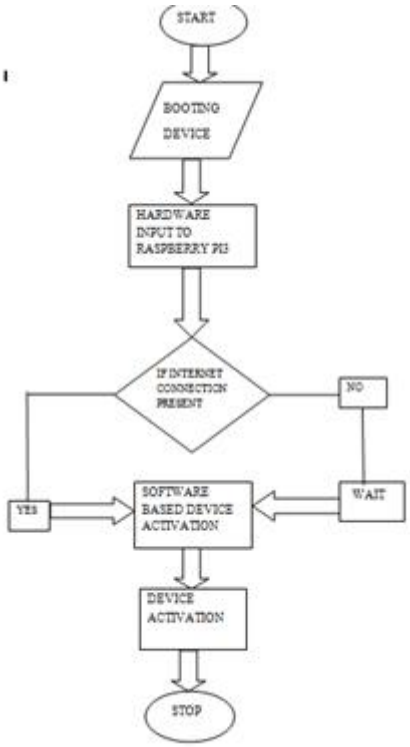


**Fig.7 Working Diagram**

First, the python program is dumped into the raspberry pi 3 board. The HTML cable of raspberry pi 3 is connected to the monitor and the keyboard and mouse is also connected. The light and fan is also connected together. After finishing the connection the load from the transformer is going to power supply. And from the power supply it goes to raspberry pi 3 and then it goes to relay. The relay control the light, fan and fire sensor. After the program will be run, the light and fan is switched on and off based on the user command.

**5.OUTPUT**

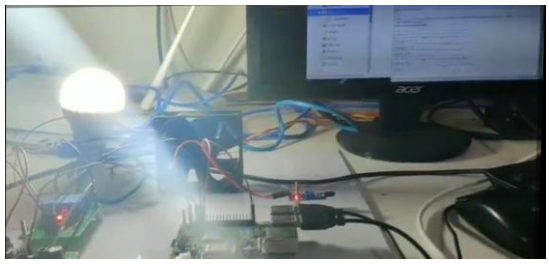

**Fig .8 Output Hardware setup1**

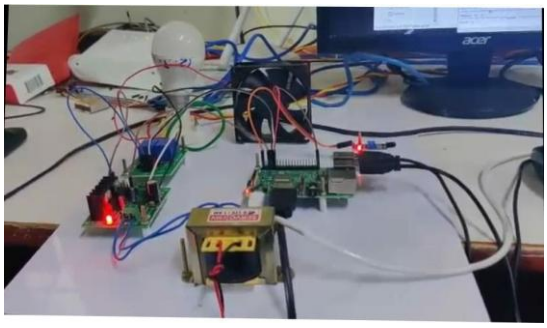

**Fig .9 Output Hardware setup 2**

**6. CONCLUSION**

In this work, the home automation is implemented using fitted sensors and also by IoT activation of the actuators that are fixed in the home. Based on the IOT command the household appliances are controlled with the use of IOT technology. IoT based protocols like MQTT and COAP can be utilized to control the devices over internet as a medium.

**7. FUTUREWORK**

This ideology can be extended with power consumption monitoring of each devices connected in the network, Work can also be focussed on implementing cryptography based security over existing IOT protocol, this method may increase authentication on household devices and reduces cyber threats. In concern to cryptography lightweight cryptography is suggested for better implementation

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