

## IOT BASED HOME AUTOMATION SYSTEM USING RASPBERRY PI KIT

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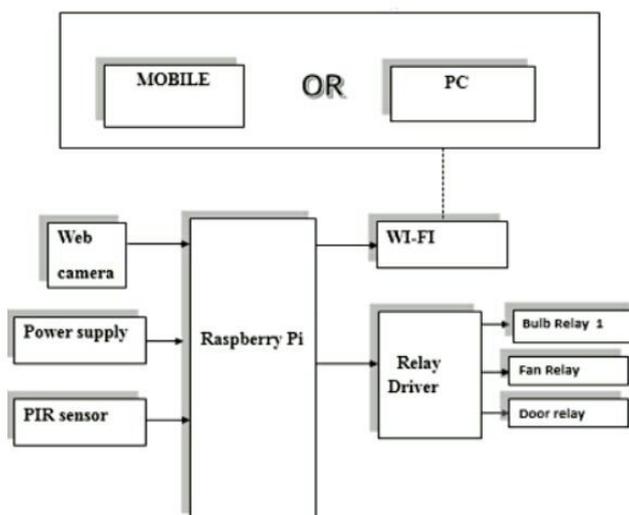
**ABSTRACT** - IOT stands for Internet of Things and home automation helps to control all the home appliances.IOT covers a very wide range of area.The components which are used to make a complete hardware of Home Automation using raspberry Pi kit are Raspberry Pi Kit,relay driver,diode,PIR sensor,etc.The main objective is to control all the electrical appliances from everywhere either office cabin or any other places by using internet.Software language can be used in different programming languageg and can be controlled via the internet using web page protected with a username and password and to make sure that password cannot be hacked by anyone.Raspberry Pi Kit is interfaced with PIR sensors and PIR sensor helps to sense atmospheric conditions.Raspberry Pi Kit also interfaced with relay driver which helps to do ON/OFF the appliances by using IOT.[1] Home automation based on IOT using Raspberry Pi Kit helps to comprises of a two way communication where electricity and information are exchanged by the consumer and utilise a maximum efficiency.[2]

**KEYWORDS** - Home Automation, Raspberry Pi Kit, InternetofThings (IOT), PIR Sensor, Relay Driver.

### INTRODUCTION

In this project,we are designing a home automation system using Raspberry Pi kit which helps to control all the electrical appliances by using smart phone and laptop operated android app.For making the complete hardware we use Raspberry Pi Kit,Relay Driver,PIR Sensor, Diode,Resistor,Smart phone,android.There are different-different units are used like input unit,wifi unit,control unit,output unit.Here relay driver is used to ON/OFF the appliances.PIR Sensor is used to help the senses all the conditions like atmospheric conditions and other signals.Everyone use this home automation system easily and can control all the electrical appliances by using laptop and smartphone for android app.In this project we can easily control all the LEDs and bulbs of our home.These are the specific appliances which are controlled in this project and the controls of bulbs and LEDs are in given in the app.If PIR sensor detects the images or signals then it display on android app via raspberry pi kit.After this user selects commands for control all the appliances.We can control light via android app.[1]

### PROPOSED SYSTEM:



Block Diagram of the Systems. Fig.1

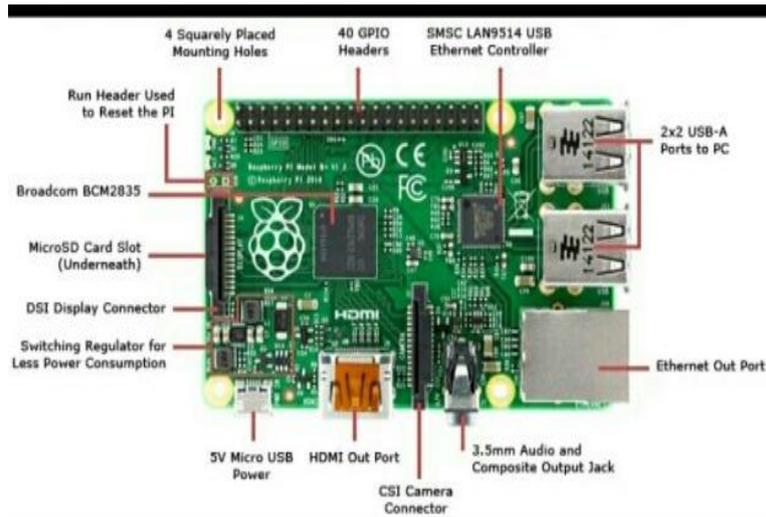
In this Raspberry pi kit is main kit and other components like relay driver IC ULN2803APG, PIR Sensor are connected through the Raspberry Pi kit. This System works on 3.3V and 5V DC supply.PIR Sensor is used to sense the human beings and objects .Web camera is used to capture the image of objects and send it to android phone via Raspberry pi kit. When the image displayed on the app is authenticated by the user android phone then the person enter inside the door otherwise door will not open.When the door is open the user used his/her android phone and send the signal to the app to start the light and fan and all these functions are operated using the smart phone. [1]

### 3. FEATURES OF THE PROPOSED SYSTEM

#### RASPBERRY PI:

Raspberry Pi Kit is developed by Eben Upton IN the United Kingdom by Raspberry Pi foundation. Raspberry Pi Kit is made in a Sony factory in PencoedWales.Raspberry Pi is a series of credit card seized in a single computer.(**Raspberry Pi 1 Model B**) was released in February 2012.**Raspberry Pi Model 1 B+**was released in 2014.**Raspberry Pi 2** which added more ROM was released in February 2015.**Raspberry Pi-3 model B** was released in February 2016 is bundled with on-board Wifi,USB Boot capabilities and Bluetooth.**Raspberry Pi Zero W** was developed in 28 February 2017.**Raspberry Pi ZeroWH** was developed in 12 January 2018.Processor speed ranges from 700 MHz to 1.4 GHz for the Pi 3,on-board memory ranges from 256 MB to 1 GB RAM.In this kit Secure Digital (SD) cards are used to store the operating system and program memory in either SDHC or microSDHC sizes.In Rasperry Pi kit gave one to four USB ports.The 0.1” spaced 40-pin GPIO header on the Pi gives access to 27 GPIO Pin,UART,SPI as well 3.3V and 5V power source. In Raspberry Pi 3 powering is very easy; just plug any USB power supply into micro-USB port. [2]

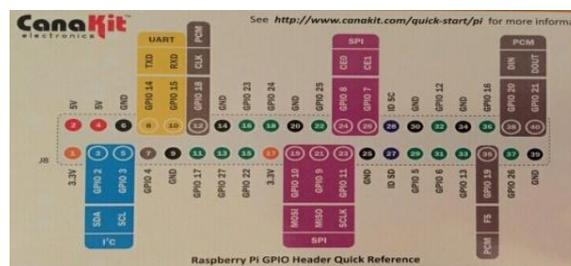
#### Specification of Raspberry PI Model 3 B:



Raspberry Pi Kit.Fig.3

Board	Raspberry Pi 3 Model B
Processor	Broadcom BCM2837
CPU Core	Quad core ARM Cortex-A53,64Bit
Clock Speed	1.2GHz (Roughly 50% faster than Pi2)
RAM	1 GB
GPU	400 MHzVideoCore IV®
Network Connectivity	1 x 10 / 100 Ethernet (RJ45 Port)
Wireless Connectivity	802.11n wireless LAN (Wi-Fi) and Bluetooth 4.1

#### PIN DIAGRAM:



Raspberry Pi Kit Pin Diagram.Fig.3

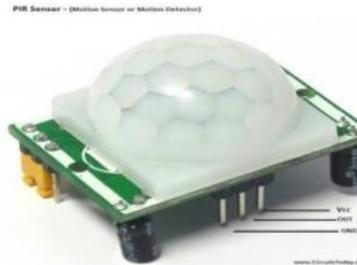
#### **PIN DESCRIPTION:**

In Raspberry Pi Pin diagram 40 pins are present. In this Relay1 is connected to Pin5, Relay2 is connected to P6, Relay3 is connected to P12, Relay4 is connected to P13. GPIO may be configured to be in one of eight different modes named as input, output, ALT0 to ALT5. GPIO7 and GPIO8 is under the (SPI) Serial bus protocol because there are more wires and it can operate in full duplex. [2]

#### **PIR SENSOR:**

**PIR** sensor stands for Passive infrared radiation. Passive infrared radiation is used to sense the object and human beings. In PIR sensor some layer are made with single segment mirror which is used to sense changes in infrared energy over one hundred feet over the PIR. [2]

- Led indication.
- Module Dimension: 25mm length, 32mm width, 25mm height and 5V supply voltage. [1]



#### **RELAY:**

Relay is an electrically operated switch and mainly it is used to turn on and off the electrical appliances. Many relays use an electromagnet to mechanically operate a switch. When the relay is open normally open (NO) contacts connect the circuit and when the relay is inactive the circuit is disconnected.

- 12A at 120V AC for RW & 12A at 240V AC for RWH are UL approved. [1]
- High voltage output: 50V
- Output Clamp Diodes
- 500-mA-Rated Collector current
- Input compatible with various types of Logics. [1]

#### **MOBILE:**

For operating the functions requires an Android phone which has a feature of internet. [2]

#### **RESULTS:**

In this project we are turning ON/OFF our home appliances using internet with the help of an Android phone which really reduces the energy costs.

#### **REFERENCES:**

- [1] International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 P-ISSN: 2395-0072.
- [2] International Conference on Engineering trends in Engineering, Science and Sustainable Technology (ICETSST-2017).