

Smart Home Automation Using Raspberry Pi

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ABSTRACT: In the present world, everything is automated. To switch ON the forced air system we require the remote control which we may ignore where we had set it the last time. To switch ON the fan and to manufacture the speed of the fan we have to do it physically. The proposed framework can help the client in controlling all the home machines by means of WiFi innovation. This home computerization framework can be incorporated with practically all home apparatuses (Fan, Light, AC and so forth) and can be utilized to control them remotely from any piece of the world. The home machines will be associated with the Raspberry Pi board with assistance of hand-off driver modules which will encourages us to remotely control the home application. This framework is worked with PIR sensor to do it switch ON consequently the machines at whatever point an individual goes into the room and turn OFF the apparatuses at whatever point the individual leaves the room. The framework will be associated with the web through WiFi and a cloud interface will be made to control the apparatuses from a remote area.

KEYWORDS: Raspberry Pi, Relays, PIR sensor, Home appliances.

I. INTRODUCTION

Home computerization is the control of any electrically and hardware gadget in our home and office without the human intercession. There are many items accessible that enable us to power over the gadgets naturally with utilizing raspberry pi demonstrate either by remote control or even by website page. For a considerable length of time, the web has been generally use for the procedures, for example, surfing on the pages, seeking data, talking, downloading and establishment. By the quick advancements of new innovations, checking, controlling administrations have been begun to be served alongside web as an instrument giving association hardware and gadgets. In this framework, the web is additionally use to guarantee remote control. This Home robotization framework give the client remote control of different lights and apparatuses inside their home. This framework is intended to be minimal effort and expandable enabling an assortment of gadgets to be controlled.

The presentation of home robotization during the 1970s neglected to improve the ways of life of clients for a few reasons. Right off the bat, deciding monetary advantages of home computerization innovations is troublesome. Also, the expenses of executing shrewd home innovation must be legitimized by the impacts achieved by their establishment. In 2003, Housing Learning and Improvement organize distributed a savvy home definition offered by Interotec. The proposed framework is a conveyed home computerization framework comprise of servers and sensors. The Server can be effectively designed to deal with more equipment interface module(sensors) and used to control and screen different sensors. Automation framework can be gotten to from the internet browser of any nearby PC in a similar LAN utilizing server IP or remotely from any PC or portable handheld gadget associated with the web.

WIFI innovation is chosen to be the system foundation that associates server and the sensors.

WIFI is picked to improve framework security (by utilizing secure WIFI association) and to expand framework portability and adaptability.

II. RELATED WORK

In this undertaking, we are planning a framework utilizing Raspberry PI, PIP sensor which will control electrical apparatuses by utilizing web. PIR sensor is utilized to detect status of the electrical appliance whether it is ON or OFF. At the point when the PIR sensor is detected, it sends the subtleties by means of IOT utilizing raspberry pi to the cloud. We have structured website page which brings the data from the cloud and show the status of the apparatus whether ON or OFF. This could be seen by the client in their versatile. He/she can control the electrical apparatuses by utilizing web. We are controlling three electrical machines ,i.e, light, fan and burden. Wifi run is between 10 to 100 meters. Raspberry Pi has inbuilt Wifi. Wifi can be given from closest broadband association or portable. This undertaking requires two Wifi association one at raspberry end and other at client end.

III. PROPOSED SYSTEM

The proposed machine is a dispensed domestic automation gadget include servers and sensors. Server controls and video display units the diverse sensors and may be easily configured to handle more hardware interface module(sensors).

Automation gadget can be accessed from the web browser of any neighbourhood PC inside the same LAN using server IP or remotely from any PC or mobile hand-held device linked to the internet.

WIFI technology is selected to be the community infrastructure that connects the server and the sensors.

WIFI is selected to improve system protection (via using comfy WIFI connection) and to boom machine mobility and scalability.

IV. SYSTEM BLOCK DIAGRAM

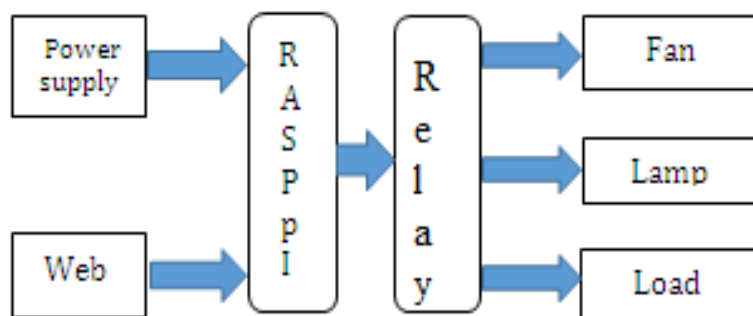


Fig: 4.1 system block diagram

V. MECHANISM

The main hardware component is Raspberry Pi. It is connected with three relays. The relays are interfaced with GPIO (General Purpose Input Output) pin. That pin is assigned as an output pin. The relay is single throw double put. The common input is 230V. Initially, when the pulse is given to the relay it gets tripped (or) switched and turns normal close to open. We have connected two lamps and one plug Point in our project, the three appliances were normally open. When the pulse is given from the raspberry pi the circuit gets an open circuit. We have used CGA script for ON/OFF. The Current sensor is used to calculate the amps rating or reading depending on the load. It consists of a current transformer, amplifier IC, ADC converter IC. The

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converted data digitally Enabled in SPI pins in raspberry pi. The three appliances are directly connected to the GPIO pins. The step downs 230v initial input. A bridge rectifier is used in our project to connect 230v and separated into +12v and +5v for current sensor and ADC converter. Raspberry Pi has a separate input source.

VI. EXPERIMENTAL RESULTS

The undertaking acquired results can be divided into two elements namely:

- 1.Experimental setup
- 2.Website access

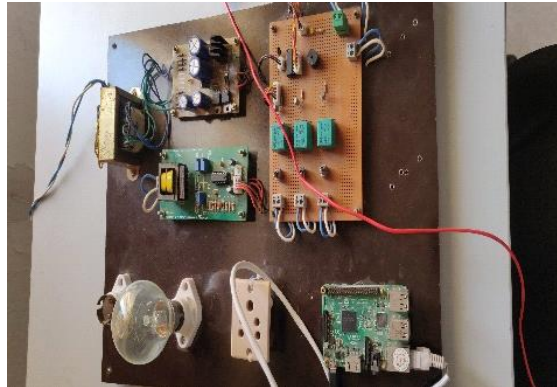


Fig 6.2: Experimental setup



Fig 2: Raspberry pi3

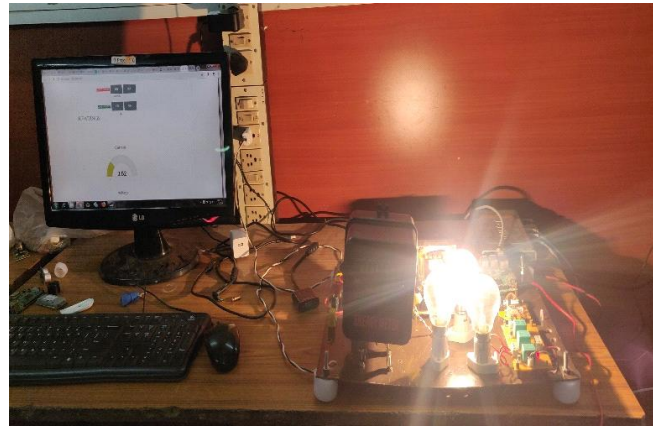


Fig 6.4.: Webpage access and output

VII. CONCLUSION

In this paper, the home automation system is improved by using a PIR sensor. The system integrates various electrical appliances in the home and automates them with no or minimum user intervention. The system consider various environment variables present and instruct the appliances to work based on the user's need. With the above features, we have developed the prototype by using the Internet of Things technologies and tested. With this system, we can make a low cost, flexible and energy saving, efficient automated system for better future.

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