



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Study of Internet of things in Smart Home Applications using Microprocessor (Rpi)

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Abstract : Today in every individual life automation plays a unique role. Every person on this world wants to get work done fast which indirectly saves efforts and time by making things automatically. Smart home automation is an idea thorough which home appliance would work automatically. This will save time of the user. The idea behind this paper is to control all the home appliances through smart phone. The user can increase or decrease the speed of fan, turn on or off light and many such appliances at home through smart phone. This paper also include smart door lock system. Some are using Raspberry pi, relay, Finger print sensor, RFID. WIFI or GSM is used to control devices.

Keywords – Smart Door, Radio Frequency Identification, Sensors, IOT, Raspberry pi, Relay circuit, Android, Wi-Fi configuration, User interface.

I. INTRODUCTION

The way wireless technologies has become a part of our daily life is undeniable and in this context the Internet of Things (IoT) technology is at peak. IoT interconnect our surrounding objects through wireless media such as Radio Frequency Identification (RFID). To improve the quality of life object must not only be interconnected with each other but also with the people. Due to this advanced technology and system connected through internet (IoT) the monitoring, automation and control of the house has become possible. In this work, we present door lock implementation along with home automation that is low-cost and user friendly based on Raspberry-pi kit, Sensors, Face Camera, Finger Print Sensor and some Connectors. The main advantage of this prototype is that it can be easily installed and is scalable on demand as devices work independently to each other. Security system is the top concern for those owns a home in apartment or are on rents or at office. In today's world safe and secure residential or office is the need of this world. Every home appliances can be operated through one devices which make it more useful. Many individual system of IoT are used in various offices but making whole system automated is the main idea behind this.

II. PROPOSED IDEA

The idea for this system is designed in such a way that it will avoid the drawback of existing system. System which is designed in this project is more secure, flexible and scalable. The connectivity between home automation and user is implemented using raspberry-pi kit and android application through which you can control the devices and relay circuit. The network connectivity of this system should be strong to control the appliances. Relay can also be used to control the appliances. The main motive of this proposed system is to provide a cheap, secure and open source automation system which is capable to control all home appliances through mobile devices. Lights and fans are controlled using sensors. The main advantages of home automation system will be the security and flexibility through mobile system, good range of scalability. This will help all the user to save his/her time and efforts. It will also help to save electricity when the appliances are not in use.

- Door lock system using RFID reader was also existed, In this model we have included face recognition with finger print scanner.
- Light are fully automated based on surrounding intensity so user don't need to operate using application.
- Fan are also automated based on surrounding temperature with help of DHT11 temperature sensor.

EXISTING

According to our survey, there are many systems which can control home appliances using android devices. Every system contains their own unique features. Many companies are providing a home automation system with advanced and better features containing in it. Following models describes the work being performed by other users.

- 1) The earlier proposed model using Bluetooth Via PC method. But unfortunately it does not support mobile technology.
- 2) There were many projects which designed a Web based electrical device control system. Also one server is there with automatically restart property if the server condition is falls off.
- 3) A telephone and PIC remote control device for controlling the devices using pin check algorithm has been introduced where it was with cable network but not wireless one.

III. FIGURES AND TABLES

In home automation there has been much more new inventions and normalized efforts have been done. So the concept of home automation is still younger one. The architecture include a wifi, relay circuits, sensors, mobile application and raspberry-pi basically is Mini computer use for remote access. With the help of wifi/network connection the user can communicate through raspberry pi and it can be assembled according to our system. The wifi/network connectivity should be strong so that the system is scalable and flexible. The wifi is the source through which devices can be communicated. It is also configured and secured. The serial data is connected to raspberry pi circuit. The main part of the proposed system is the raspberry pi circuit which is a smart card size computer and performs many tasks same as computers. For every home devices, the raspberry pi is configured and the corresponding relays will get switched on and the device will work. Home automation is system with simple installation steps. The project consist of 4 main modules which are as follows :

- 1) Raspberry-pi kit
- 2) Mobile Application
- 3) Wifi Connectivity
- 4) Breadboard and Relay

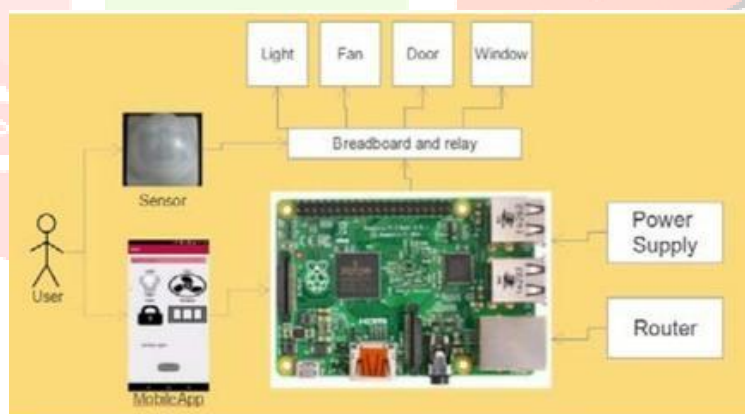


Fig. 1. System Architecture

IV. CONCLUSION

The main motive of this project is to automate our Home Appliances with Raspberry pi 3B. The model includes control of lights, main door, fans, AC. Here lights are control with the amount of light present in surrounding and fans with the help of temperature sensor which make this model fully automated. User can also control appliances with the help of mobile application. Network connection is required to operate home appliances. With some plus points system can reduce consumption of energy sources, cost of maintenance, and receiving real time information.

Acknowledgements

We are thankful to our entire team for all the support and motivation. At last but not least we are also thankful to Mr. Borhade B. M. (HOD), Mr. Shingote S.N. (Guide) for their proper advice at the correct time.

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