

IOT Based Home Automation Using RASPBERRY PI

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Abstract:- KITCHEN environment monitoring is one of the important measures to be closely monitored in real-time for safety, security and comfort of people. With the advancements in Internet technologies and Wireless Sensor Networks (WSN), a new trend in the era of ubiquity is being realized. Enormous increase in users of Internet and modifications on the internetworking technologies enable networking of everyday. The paper proposes a Raspberry pi based kitchen monitoring system. Raspberry Pi is used as a Embedded Web Server, User can control Set of devices from Phone/PC Web Browser. We have designed and implemented a compact wireless sensor network with internet capability. The system can monitor the status of kitchen and send an alert SMS via GSM network automatically to users. The system has the capability to control through internet, where the subject of received email is read by the developed algorithm fed into Raspberry pi and then the system responds to the corresponding instruction with high security. The user can directly log in and interact with the embedded device in real time without the need to maintain an additional server.

Here the project also proposes the sensors interfacing with the controller and GSM modem too. If there is the Gas detection or fire the message will be sent through the GSM.

The system is modularly built, allowing different modules to be added. In addition, it is flexible to accommodate a wide range of measurement devices with appropriate interfaces. It has a variety of features such as energy efficient, intelligence, low cost, portability and high performance.

Keywords- RASPBERRY PI, Fire Sensor, Temp Sensor, Gas Sensor, LCD.

I. INTRODUCTION

Today the technology is getting improved and used for the ease in our day to day life. The life is getting automated for the simplicity, security, saving electricity and time. In this, home automation is the major things to automate the home appliances. Home automation can be done without human efforts. In home automation we can control the devices which can be ON and OFF with a single switch like fans, tubes, air conditioner, security of door lock system, also the sensor helps in gas leakage and saves electricity. It provides convenience, comfort, security and saves energy. The idea of home automation is been coming from many years ago, it was started with connecting two wires to the battery and close the circuit with the load. Later many of the organization developed it with devices like actuators, sensors, microcontroller, buses and interfaces. Also it came with the two types of system depending on hardware systems and wireless systems. In hardware systems it includes the Ethernet, fiber optics, telephone lines and coaxial wires. This comes under the part of home automation. Now in wireless systems includes radio frequencies, Bluetooth, Wi-Fi. Now a days there are many new systems for home automation which includes hardware and wireless systems, as it is the combination of both the systems. This system will be having the hardware part and the software programming setup for the knowledge systems. The home automation is getting expanded because of the new techniques, easiness and

straightforwardness through the smart phones, internet and wireless communication. Quality of services is getting improved by automation facilities provided through the Internet of Things.

II. Literature Survey

Raspberry Pi based Interactive Home Automation System through E-mail “Sarthak Jain, Anant Vaibhav, Lovely Goyal”

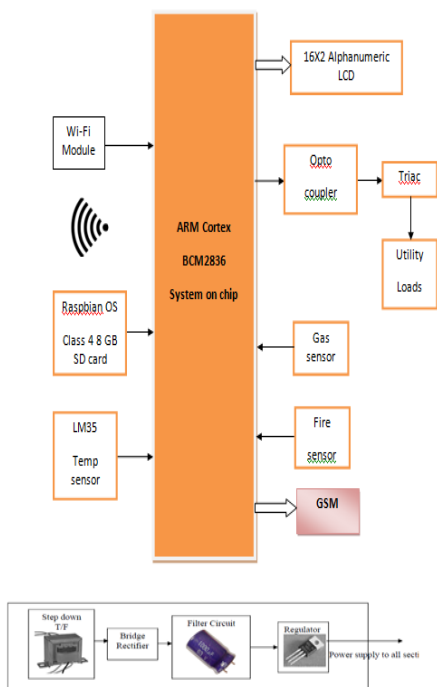
Home automation is becoming more and more popular day by day due to its numerous advantages. This can be achieved by local networking or by remote control. This paper aims at designing a basic home automation application on Raspberry Pi through reading the subject of E-mail and the algorithm for the same has been developed in python environment which is the default programming environment provided by Raspberry Pi. Results show the efficient implementation of proposed algorithm for home automation. LEDs were used to indicate the switching action.

Home Automation through E-Mail using Raspberry Pi “M.P.Sathish, Dr. S.A.K.Jilani, Mr.D.Girish kumar”

In present days, as the technology improves day by day, every one seems to automate most of the possible things to take advantage in providing ease in life, secure and saving

electricity. The main objective of this paper is to develop an interactive home automation system based on Raspberry Pi through reading the message body of E-mail which we are send. Here the message body of the received E-mail is read by the developed algorithm fed into Raspberry Pi and it will re-send the acknowledgement to that mail_id, if it is successfully sent or not. This algorithm is developed in python language, which is default programming language provided by Raspberry Pi. Store these results in internet by creating new channel API in thingspeak, which is an IoT application.

III. BLOCK DIAGRAM



BLOCK DIAGRAM DESCRIPTION

- Here we are using RASPBERRY PI as a controller.
- At the input side IOT MODULE Use to control the loads automatically by giving the commands.
- Various sensor are used fire sensor, gas sensor, temp sensor, temp sensor.
- If any sensor is detected then by using the GSM900 module send an message on a particular mobile number.
- All information will be display on LCD.

IV. HARDWARE REQUIREMENT

RASPBERRY PI
 LCD
 GSM
 IOT MODULE

TEMP SENSOR
 GAS SENSOR
 FIRE SENSOR

RASPBERRY PI



A brief overview

Dual step-down (buck) power supply for 3.3V and 1.8V
 5V supply has polarity protection, 2A fuse and hot-swap protection
 New USB/Ethernet controller chip
 4 USB ports instead of 2 ports
 40 GPIO pins instead of 26. The top/first 26 pins match the original layout, 9 additional GPIO and 2 EEPROM Plate identification pins
 Composite (NTSC/PAL) video now integrated into 4-pole 3.5mm 'headphone' jack
 MicroSD card socket instead of full size SD
 Four mounting holes in rectangular layout
 Many connectors moved around

LCD



V. ADVANTAGES

- Safety Through Appliance and Lighting Control
- Increases Awareness through Security
- Saves Time
- Saves Money and Increases Convenience
- Contributes to Economy
- Increases Peace of Mind

VI. APPLICATIONS

- Appliances react automatically to changing environmental conditions and can be easily controlled through one common device.
- This wireless technology is especially useful in home environment, where there exists hardly

any infrastructure to interconnect intelligent appliances.

- To control application wirelessly
- We can control devices from anywhere.

CONCLUSION

In this highly developing era, where directly or indirectly, everything is dependent on computation and information technology, Raspberry Pi proves to be a smart, economic and efficient platform for implementing the home automation. This provides a basic application of home automation using Raspberry Pi which can be easily implemented and used efficiently. The code provided is generic and flexible in a user friendly manner and can be extended for any future applications like power control, surveillance, etc, easily.

REFERENCES

- [1] Jain, Sarthak, Anant Vaibhav, and Lovely Goyal. "Raspberry Pi based interactive home automation system through E-mail." *Optimization, Reliability, and Information Technology (ICROIT), 2014 International Conference on.* IEEE, 2014.
- [2] Gill, Khusvinder, et al. "A zigbee-based home automation system." *IEEE Transactions on Consumer Electronics* 55.2 (2009): 422-430.
- [3] Narender, M., and M. Vijayalakshmi. "Raspberry Pi based advanced scheduled home automation system through E-mail." *Computational Intelligence and Computing Research (ICCIC), 2014 IEEE International Conference on.* IEEE, 2014.
- [4] Balasubramanian, Karuppanan, and Akin Cellatoglu. "Improvements in home automation strategies for designing apparatus for efficient smart home." *IEEE Transactions on Consumer Electronics* 54.4 (2008): 1681-1687.
- [5] Suryawanshi, Shruti G., and Suresh A. Annadate. "Raspberry Pi based Interactive Smart Home Automation System through E-mail using Sensors."