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Home Automation and Security System Using IoT

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ABSTRACT

In this paper we used the IOT platform for our system. In IOT application has becomes the state of the technology among the researcher to the internet available anywhere. This system related to the smart home automation and friendly for people. The Multi-modal application is based in home automation system operate voice recongnition command to user using Google assistant or any web application. This system can be controlled by our smart phone or web. This system is helpfully for security purpose. This concept can be incorporated to make smarter, automated and safe. Home security is very useful application based on IOT and We using to create inexpensive security system for home as well as industry. This system will inform the owner about any unauthorized entry or whenever the door is opened by sending the notification , then owner will take the action. Our main objective the work is to make the home automation system more secure and intelligent.

Keywords: Home-Automation, Relay, Node MCU(ESP8266), IFTTT, Adafruit , Internet of Things (IOT), Google Assistance, Voice Control, Smart-phone.

I. INTRODUCTION

India, share about the 18% of the world population has Limited energy resources and share roughly 0.6%, 0.4% and 6%, for world gas, oil and coal reserves respectively. However, in India, the electricity consumption due to Information and Communication Technologies (ICT) Usage has increased from 24TWh to 31TWh in the last few years. Automation makes not only an efficient but also an economical use of the electricity and reduce much more wastage. The main target is the application is to connect anything through the internet that can be accessible from anywhere.This system is wireless home automation system using IOT platform is a system that user computer or mobile devices to control basic home function and feature automatically through internet form anywhere around the world. It is meant to save the electrical power and human energy also save time. The IOT platform will be used for minimize the electricity. IOT is not limit for any particular field or platform. The system will provides the safe and secure home automation also home security for protection. It will reduce the time consumption. In IOT technologies are different application so, home automation is one of the application using IOT technology. This system can be controlled by mobile phone using Google assistant or web application.

II. SMART HOME AUTOMATION AND SECURITY SYSTEM

In smart home automation the system is more secure and friendly. As per the demand of electricity is increase the day-to-day life, so will provide the smart home automation is upcoming area of research will provide the remote access to controlling using IOT for home appliance. The IOT platform will provided

the old aged people and handicapped people to safely use this technologies. This devices can controlled the electrical appliances like fan, light etc, without using any physical connection. In home automation research conducted report are the previous system based on this technology like Bluetooth system . This Bluetooth system is use for short range communication that require the appliances in range.

In home automation for sending/receiving data used the MQTT for the sensor. in this system to measure the temperature and humidity of room to used the DHT11 sensor. In another method is based on raspberry pi is to control by home appliances using web-based interfaces. In home automation using mobile the system will be designed by Zigbee. IOT will provided the electrical appliances to the non-smart device into smart device, which allows the user the device through the internet.

The home will converted into smart home and also provide the more strong method for controlling the electrical appliances. We also installed the camera for security purpose in home automation with the help of internet. The user will monitor the home and turn ON/OFF appliances to save the electricity and electric bills. In this system will also add the sensor for fire alarm and smoke sensor for air filter. For the security will be used for protection the home can prevent the intruder form enter the home and system is more intelligent, that can be light easy on/off and fan of the room as possible to detect the presence of person.

This system will develop the IOT based home automation system will used the voice command as well as web-based services for control the electrical appliances. Also security the user define the command will set for the operate the system.

III. DESIGN AND IMPLEMENTATION

In system the most important input is speech for man-to-machine interaction therefore, the system make smart home more friendly. We used the Google assistance with the help of web based application for control the home automation.

The main advantage of this system is multimodal in presence of noisy background surrounding the performance of the Google assistance doesn't interrupt .so, the web based application can be helpful to controlling the home appliances for the system. The proposed model is more flexibility and the system more secure.

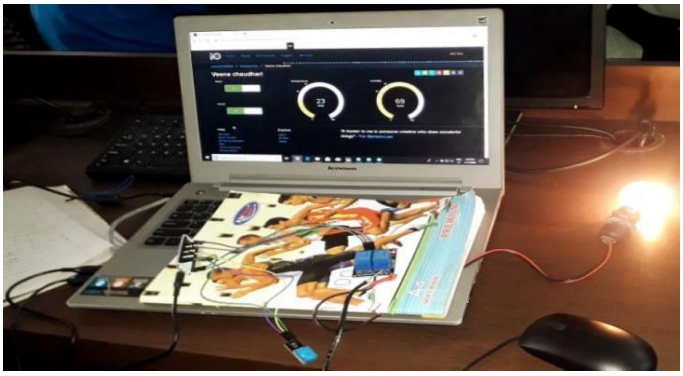

Fig 1 : IOT home automation dashboard developed on adafruit

The smart home automation can be implement with the help of controller unit that can be connected with the Wi-Fi network is available for 24-hours. The main controller is programmed to accepted the condition and automatically connect the available network and also connect the power backup.

The user can be assure and controlled the smart home appliances using Google assistance and web based service using IOT platform that can use the Adafruit and IFTTT to maintain the communication website or links.

IV. SYSTEM REQUIREMENT

- Node MCU
- IFTTT
- Adafruit
- Google assistance
- Arduino software(IDE)
- Relay

1.NODUMCU :

NODUMCU is a low-cost open source IOT platform . The firmware run on the ESP8266 Wi-Fi form the system . The hardware which based on the ESP-12. Memory of NODEMCU is 128 bytes. This software will be leading the platform for the various modules and developing board including NODEMCU. Thus making the devices to operates much faster and making it as first choices for IOT application. It also require less computation time to perform the task and use Lua script[2].

Fig 1 : NODEMCU

The ESP8266 in low cost Wi-Fi chip with full TCP\IP stack and micro-controller unit.
The different feature of ESP8266 WIFI module are follows:-

1. 64 KB of instruction RAM, 96 KB of data RAM
2. External QSPI flash:512KB to 4MB
3. WPA\WPA2 authentication or open network.
4. 16 General purpose input\output pins.
5. Serial peripheral Interface Bus.
6. Inter Integrated circuit.
7. Inter IC sound interface with sharing pins with general purpose input output pins.
8. 10 bits Analog to Digital converter.

2 .IFTTT:

IFTTT stand for “if this then that”, is an interface which provide the web based service in which device are connect with the mobile app . Thus, making it much easier for the device to work based on mobile application using conditional statements[3].

3. ADAFRUIT:

Adafruit is a library that supports the MQTT (message queue telemetry transport). It acts an MQTT broker. MQTT is based on protocol services that can provides the sending and receiving data for feed. The main advantage of MQTT is that provides a faster rate of transmission of data and require less data byte for connectivity. It require 80 byte for connection between the device to server and 20 byte from server to device. Arduino IDE software is used for the complete the code from[3].

4 .Google assistant:

The Google Assistant is a software which allows its users to control all apps in there device to be controlled directly through it. It allows users to

control and command most of the apps in their devices using voice command. This provides more conveniences,to the people as they only have to command the Google assistant through voice command using smart phones.

5 .Arduino software(IDE):

In this system we used the arduino integrated development environment (IDE) is cross platform application. This software is usually use for c and c++ programming. The arduino IDE supplies a software library from the wiring project which provide many provide many common input and output procedure we written code for function or command arduino board by a loader program in the board's firmware[4]. The IOT platform is not support only arduino board but many other board using raspberry, ESP32, ESP8266 and many other. The IDE support all features you would expect like code completion and so on.

6. Relay:

A Relay is electrically operated switch. It consist of a set of input terminals for single or multiple control signals, and set of operating contact terminal . A relay is generally used for the control high voltage using very low voltage as an input. The relay is a fundamental device which used for on off conditions, much like a toggle switch or a limit switch. But a relay is operated based on an electrical control signal, as opposed to a hand or a limit switch triggered by equipment contact or condition.IOT power relay is a controllable power relay equipped with output that can help to create the internet of thing can safe or reliable power control. The IOT relay can be used the easily control the power going to a devices with arduino. Relay were the used to expensively in telephone change in computer to perform the logical operation.

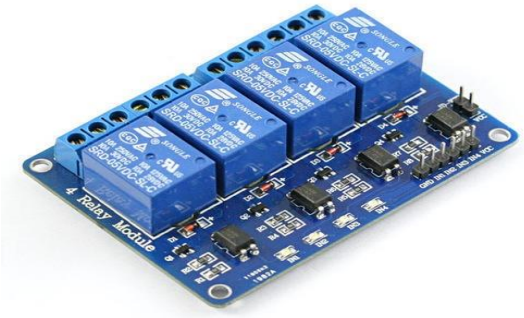

Fig: Relay

V. CONCLUSION

Home automation converted into smart and intelligent device using IOT. In home automation different technologies used to implement the system.but we used the IOT platform . We conclude that the simplicity, low cost and reliability home automation system is marking its position in day to day market .

This system will be controlled by mobile for secure and friendly approach for home automation . With the help of this system we can increase the efficiency of appliances and we can the complete control over the home appliances form a long distance. This increase the comfortability of human being and it will reduce the human effect.

VI. REFERENCES

[1]. P. Upadhyaya, O. Farooq and M. R. Abidi "Mel Scaled M-band Wavelet Filter Bank for Speech Recognition," International Journal ofSpeech Technology, vol. 21, no. 4, pp. 797-807, 2018.

[2]. ModeMcu,Online]-Available: http://www.nodemcu.com/

[3]. IFTTT, Online]. Available: https://ifttt.com Adafruit, Online]. Available: https://learn.adafruit.com

[4]. Arduino IDE, Online]. Available: https://www.arduino.cc

[5]. Y. Upadhyay, A. Borole and D. Dileepan, "MQTT based secured home automation system," Symposium on Colossal Data Analysisand Networking (CDAN), Indore, 2016, pp. 1-4

[6]. T. Wang, Y. Li and H. Gao, "The smart home system based on TCP/IP and DTMF technology," 2008 7th World Congress on Intelligent Control and Automation, Chongqing, 2008, pp. 7686-7691.

[7]. Raj Sharma, Chirag, Pranjalkatara, Vishnu Shankar "Proceedings of IEEE TechSym 2014 Satellite Conference VIT University, Paper on Advanced Low-Cost Security system using sensors, Arduino and GSM communication module".

[8]. DeepaliJavale, Mohd. Mohsen, Shreerang Nandewar, MayurShingate, "Home Automation and Security using Android ADK", March, 2013.

[9]. E. Yavuz, B. Hasan, I. Serkan and K. Duygu. "Safe and Secure PIC Based Remote Control Application for Intelligent Home", a. Volume 7, No. 5, May-2007

[10]. N. Sriskanthan and Tan Karand. "Bluetooth Based Home Automation System". Journal of Microprocessors and Microsystems, Vol. a. 26, pp.281-289, 2002.

[11]. Kusuma S M, Assistant Professor, Department of telecommunication, MSRIT, Bangalore, India. "Home Automation Using Internet of Things" July 1999

[12]. NiharikaShrotriya, Anjali Kulkarni, PritiGadhave, International Journal of Science, Engineering and Technology Research (IJSETR), "SMART HOME USING WI-FI" December 1996.

[13]. BakiKoyuncu, "PC Remote Control of Appliances by Using Telephone Lines", 1995, IEEETransactions on Consumer Electronics,Vol. 41(1), pp. 201-209.

[14]. Greichen, J.J., "Value based home automation or today's market," IEEE Transactions on Consumer Electronics, vol. 38, no. 3, pp.34-38, Aug. 1992

[15]. Alheraish, "Design and Implementation of Home Automation System," IEEE Transactions onConsumer Electronics, vol. 50, no. 4, pp.1087-1092, Nov. 2004.

[16]. Sushant Kumar and S.S. Solanki, "Voice and Touch Control Automation", 3rd Int'l Conf. on Recent Advances in Information Technology, 2016

[17]. Aml A. Arriany and Mohamed S.Musbah, "Applying Voice Recognition Technology for Smart Home Networks", IEEE 2016

[18]. Yash Mittal and Sonal Sharma, "A Voice-Controlled Multi-Functional Smart Home Automation System", IEEE Indicon 2015

[19]. Mukesh Kumar, Shimi S.L. ,"Voice Recognition Based Home Automation System for Paralyzed People", International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE) Volume 4, Issue 10, October 2015.

[20]. D. Gann, J. Barlow, and T. Venables, "Digital Futures: making homes smarter". Citeseer, 1999.

[21]. J. Picone, "Fundamentals of speech recognition: A short course," Institute for Signal and Information Processing, Mississippi State University, 1996.

[22]. L. J. Kaila, "Technologies enabling smart homes," Tampereen teknillinen yliopisto

Julkaisu-Tampere University of Technology. Publication; 846, 2009.

[23]. Mitali Patil, Ashwini Bedara, Varsha Pacharne, "The Design and Implementation of Voice Controlled Wireless Intelligent Home Automation System based on Zigbee"; Volume 2, Issue 4 April 2013