

Smart Home Automation Using Internet of Things

Vignesh.A¹, Vignesh.B¹, Selva Bharathi.B¹, Vetrivel.S¹, N.RamyaRani²

U.G Students, Department of Electrical & Electronics Engineering, Sri Krishna College of Engineering and Technology, Coimbatore, India.¹

Assistant Professor, Department of Electrical & Electronics Engineering, Sri Krishna College of Engineering and Technology, Coimbatore, India²

ABSTRACT: Internet of things is a growing network of everyday object-from consumer home appliances to industrial machine that can share information and complete tasks. In this work home appliances are interfaced with Arduino UNO and with the help of WiFi module named ESP8266.Using this WiFi module, home appliances and information about the status of security system can be obtained. Information about home appliances and their data can be logged in the cloud server and this data can be accessed anywhere and can be remotely controlled using android app. By using this method, home appliances can be monitored efficiently and can even reduce extra electricity charges.

KEYWORDS: IoT, Arduino UNO, ESP8266, cloud server, sensors.

I. INTRODUCTION

The Internet of Things(IoT) can be described as the technology in which the actual physical entities (electronic devices) with data sensing, processing & self adoption capacity can be used to interact with other such device and process that data to take an intelligent decision that are useful for our daily day to day life .In this paper, IoT is defined as an environment in which objects (devices) are given unique identifiers and the ability to transfer data over a network without having human-to-human or human-to-computer interaction. The IoT is being formed from two words, internet and things which combine means any object or person which can be distinguishable by the real world can be connected to global system of interconnected computer networks and governs by standard protocol. Accordingly, IoT is defined as “An open and comprehensive network of intelligent objects that have the capacity to auto organize, share information, data and resources, reacting and acting in face of situations and changes in the environment”. The internet of things is a new era of intelligence computing and it is providing a privilege to communicate around the world

II. LITERATURE SURVEY

Vinay Sagar K N (2015) suggested the advancement of Automation technology, life is getting simpler and easier in all aspects. With the rapid increase in the number of users of internet over the past decade has made Internet a part and IoT is the latest and emerging internet technology. Home Automation system (HAS) using IoT is a system that uses computers or mobile devices to control basic home functions and features automatically through internet from anywhere around the world, an automated home is sometimes called a smart home. It is meant to save the electric power and human energy. The home automation system differs from other system by allowing the user to operate the system from anywhere around the world through internet connection.

Shwetha Singh(2014) proposed that, The IoT aims to unify everything in our world under a common infrastructure, giving us not only control of things around us, but also keeping us informed of the state of the things. Home automation with the proliferation of IoT is becoming a reality now. In Light of this, present study addresses IoT concepts through

systematic review of scholarly research papers, corporate white papers, professional discussions with experts and online databases. The main objective of this paper is to provide an overview of Internet of Things and their usages in domestic aspects in our daily life.

Rageev Priyare(2013) presented a low cost and flexible home control and monitoring system using an embedded micro-web server, with IP connectivity for accessing and controlling devices and appliances remotely using Android based Smart phone app. The proposed system does not require a dedicated server PC with respect to similar systems and offers a novel communication protocol to monitor and control the home environment with more than just the switching functionality. To demonstrate the feasibility and effectiveness of this system, devices such as light switches, power plug, temperature sensor and smoke sensor have been integrated with the proposed home control system.

Kaushik Ghosh(2015), suggested one of the latest, emerging and trending technologies is the 'Internet of Things'. This technology is expected to rule the world within a few years. Home Automation System uses the technology of Internet of Things for monitoring and controlling of the electrical and electronic appliances at home from any remote location by simply using a Smartphone. Implementation of a low cost, flexible home automation system is presented. It enhances the use of wireless communication which provides the user with remote control of various electronic and electrical appliances.

Dhakahad Kunal(2016) described IoT (Internet Of Things) as the fast emerging technology which involves interaction among things through internet without human interference. It has made human life easier and comfortable. Now-a-days digital devices in home are increasing rapidly due to which there is a need of accessing and controlling the devices remotely. This paper represents an affordable and flexible home control system using an Arduino UNO, web server with IP connectivity for interacting with devices and appliances remotely using Android based Smart phone app. It demonstrates the usefulness of the system using devices such as light switches, temperature sensors, and smoke sensors. In addition to remote control it also provides reminders, voice commands functionality. This project is very useful for people with physical disability. It also plays a vital role in maintaining living standards and provide secure and flexible environment.

H.Shanthi(2014) suggested that smart Building not only refers to reduce human efforts but also energy efficiency and time saving. In this work, ESP8266 is used in which appliances are connected to sensors and sensors give status of appliances to the web. Here electric appliances are operated by the website. The main objective of home automation and security is to help handicapped and aged people that will enable them to control home appliances and alert them in critical situations. The various appliances connected to the micro controller and sensor is connected using wireless network.

Pooja Patel(2012) suggested that one can achieve home automation by simply connecting home appliance and electrical devices to the internet or cloud. The reason for this surge in demand of network enabled home automation is reaching the zenith in recent days for its simplicity and comparable affordability. Hence, cloud acts as a front end to access IoT. In addition to that, with the never-ending growth of the Internet and its applications, there is much potential and scope for remote access and control and monitoring of such network enabled appliances. Even so, the exciting opportunities to increase the connectivity and relationship of home devices for home automation purposes to the internet are yet to be.

III. WORKING

In this paper, for smart home automation Arduino UNO is acting as the brain of the work .The supply for Arduino UNO is driven from step down transformer that step downs 230V AC to 12V AC and it is bridge rectified to provide 12V DC.By using filter circuit output is filtered to reduce the noises and converted into 5V supply using IC7805.The IC which liberates the heat is reduced by using heatsink.The output pins of Arduino UNO is connected to sufficient relay(four channel relay).The connection is given according to schematics of Arduino. The program was uploaded to Arduino UNO board using Arduino UNO IDE by using serial USB host.Home appliances such as light, fan etc is

controlled by relay in a Arduino UNO board. Moreover, the security is kind of lacking in our day to day basis especially in homes. Due to this reason an IR sensor is implemented in this work. If person is entering an unauthorized IR module connected to relay in which when intruder enters the door by breaking, the IR sensor activates and the program which corresponds to the relay activates the alarm. The temperature sensor is connected to the Arduino UNO in which the sensor reads data and the temperature is calibrated using Arduino UNO program. If the temperature exceeds the given temperature, that particular relay is on in which the fan or ac is controlled by this method that efficiently reduces power.

Due to smoking many fire accidents are happening in order to avoid that, smoke sensor is used and range of smoke density given in Arduino UNO is detected. If the density of smoke is more than the given range the particular relay module is activated which activates the buzzer. As per the technology of IoT, ESP8266 WiFi module is used in which it connects internet using WiFi hotspots, so that internet with cloud access is obtained, and the data can be continuously uploaded to the server of that cloud and by accessing cloud server. Home appliances are controlled using android apps such as google a very good open source the most commonly used platform. By using data from cloud AC, FAN can be turned ON and OFF easily. Even in the absence of person availability in our home, the sensor data locks our security system and this way security can be perfect and at the same time usage of electricity can be minimized by temperature logs and preventing unknowing waste of electrical power. By using the cloud server, these data logs can be accessed and relay anywhere. In this way smart home automaton is done and used efficiently as the world is constantly evolving

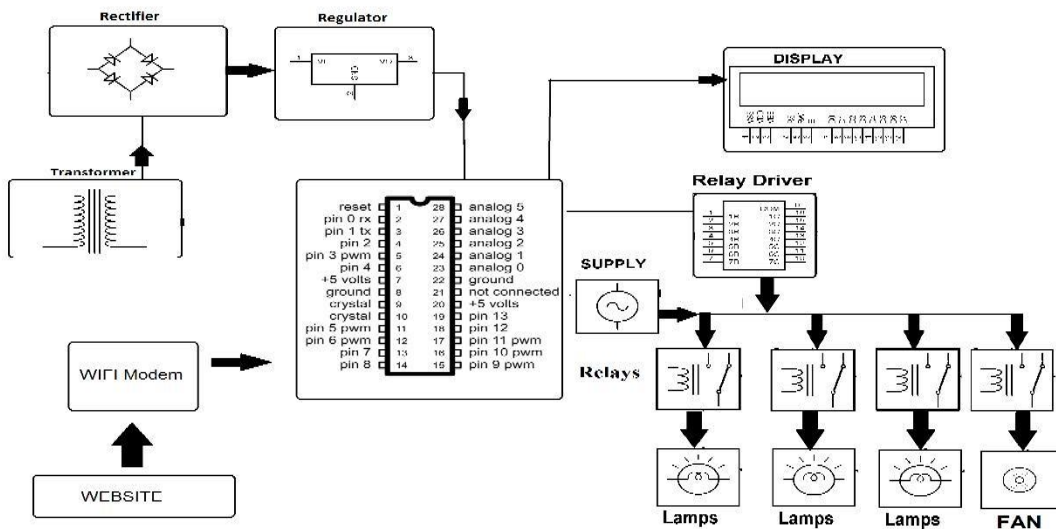


Fig 3.1 Block Diagram

IV. EXPERIMENTAL RESULTS

The outcome of project obtained is nearly successful and capable of implementing in all our homes. This gets a maximum efficiency and there is no loss that can be detected in this project.

In this work, 12 volt AC supply is given to relay which is an input and it controls all appliances in our work.

This is done with the help of Arduino UNO which is coded and uploaded in the Atmega board and it controls all the appliances using the relay. The command was given by using android app.

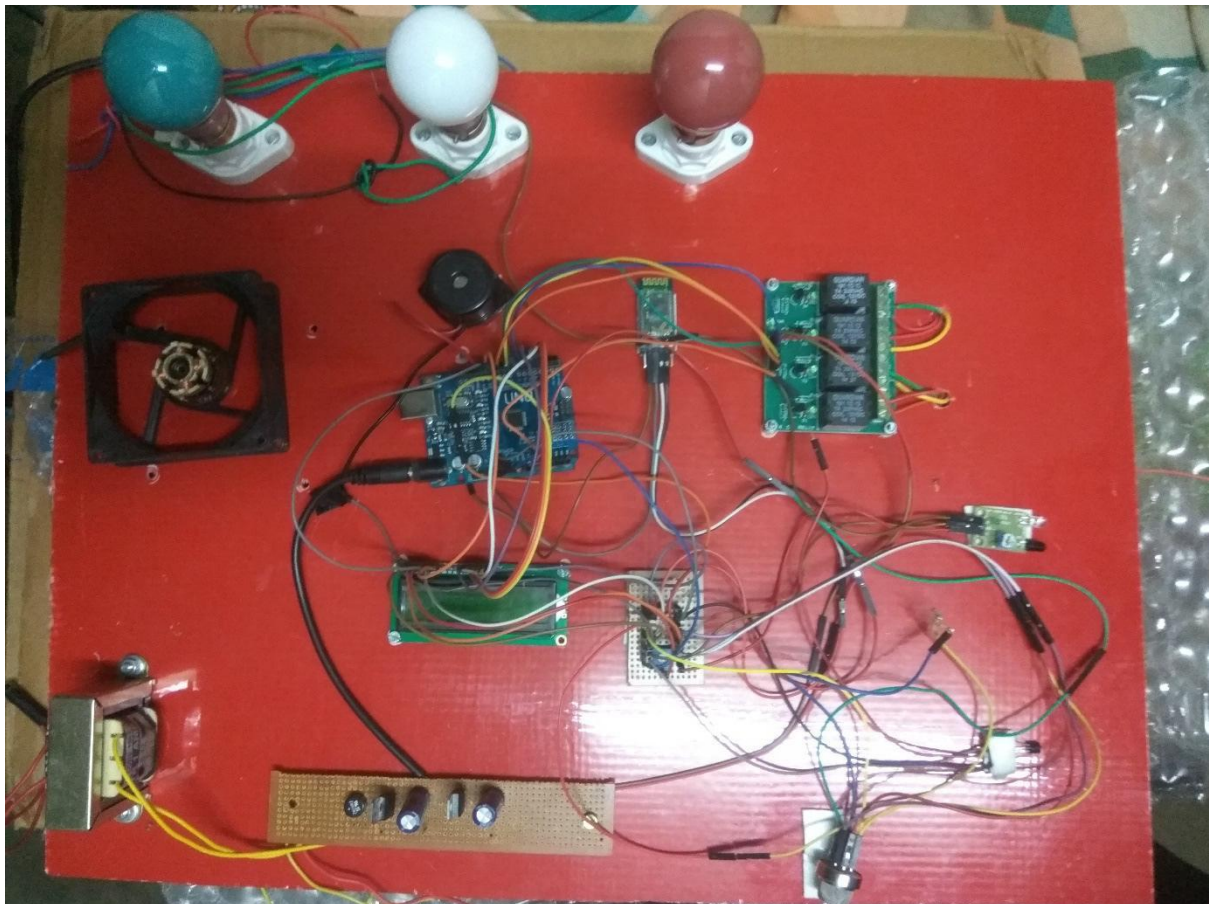


FIG 4.1 HARDWARE SETUP OF AN PROPOSED MODEL

IV. CONCLUSION AND FUTURE WORK

We have proposed an approach to address the optimal management of real time life, our daily works and the payment of electricity charges. The intuition behind our project is it makes our daily life easily and save our precious time. Moreover we have also investigated the case for electrical energy demand and by using various techniques we guarantees the finite solution for our future generation. We assure that our smart home using IoT will provide the necessary option for the brightest future. By using our proposed techniques, we can achieve close to the optimal cost with increased efficiency.

International Journal of Innovative Research in Science, Engineering and Technology

An ISO 3297: 2007 Certified Organization

Volume 6, Special Issue 14, August 2017

Two Days National Conference on Modernization in Engineering Science (NCMES 2K17)

23rd-24th March 2017

Organized by

Dept. of EEE, Sri Krishna College of Engineering & Technology, Coimbatore 641 008, Tamil Nadu, India

In future, We can use this work in industries which can be operated using any microcontroller such as Arduino UNO, Raspberry Pi etc..

The truth behind this is we can control any appliances up to 440v using the relay and this can be done by android app.

REFERENCES

- [1] Vinay sagar K N, Kusuma S M ,“Home Automation Using Internet of Things,” International Research Journal of Engineering and Technology (IRJET), Volume: 02 , Issue: 03, June-2015.
- [2] Shweta Singh, Kishore Kumar Ray,“Home Automation System Using Internet Of Things”, International Journal of Computer Engineering and Applications. Issue: 09, march-2016.
- [3] Rajeev Piyare, “Internet of Things: Ubiquitous Home Control and Monitoring System using Android based Smart Phone”,International Journal of Internet of Things 2013, 2(1): 5-11.
- [4] Pooja N.Pawar, Shruti Ramachandran, Nisha P.Singh, Varsha V.Wagh, “A Home Automation System using Internet of Things”,International Journal of Innovative Research in Computer and Communication Engineering,Vol. 4, Issue 4, April 2016.
- [5] Kaushik Ghosh, Rushikesh Kalbhor, Disha Tejpal, Sayali Haral, “Wireless Home Automation Technology (What) Using Internet Of Things (Iot)”,International Journal of Technical Research and Applications, Volume 3, Issue 6,November-December, 2015.
- [6] Dhakad Kunal, Dhake Tushar, Undegaonkar Pooja, Zope Vaibhav, Vinay Lodha, “Smart Home Automation using IOT”,International Journal of Advanced Research in Computer and Communication Engineering Vol. 5, Issue 2, February 2016.
- [7] H. Santhi, Gayathri.P ,“A Review of Home Automation using IoT Applications”,International Journal of Computer Science & Engineering Technology (IJCSET). Issue: 31, January-2012.
- [8] Patel, Mitesh Patel, Vishwa Panchal and Vinit Nirmal, “Home Automation Using Internet of Things”, Imperial Journal of Interdisciplinary Research, Vol no.2, Issue-5, 2016.