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Automation of Home with the Help of Solar Energy

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ABSTRACT: Technology means easiness towards any work, there has been everything becoming automated day by day. Advancement in automation technology, the life of a user or every other person goes on simpler day by day in every manner. Because of the ease in automated systems everyone prefers automated systems rather than manual operated systems. IOT stands for internet of things. This research paper has two main parts first is the solar panel on the roof and the motion detection light switching system in the room. The solar panel is controlled using a stepper motor which is controlled by a microcontroller. Solar panel will always face the sum at a perpendicular angle to absorb maximum energy. From here a signal can pass to the room light switching system to turn on or off the light by the amount of solar radiation present outside, or by tracking the stepper motor angle, i.e. give signal when the angle goes above some degree. The second part consist of PIR (passive infrared) sensor which detects motion in a room are controlled by microcontroller, when it detects human presence it will turn on the light of the room when it stops detecting motion i.e. The human is asleep not moving or no human presence in the room it will turn off the light after a threshold time limit. The threshold time limit can be 10 to 20 minutes based on any instinct.

KEYWORDS: Automated, Electronic, Electrical, Home, Energy, Internet of thing, Wireless, Office, Controller, Embedded system.

I. INTRODUCTION

Home automation stands for working at home and its applications via the internet, also the internet of things has vast use and application in the field of engineering disciplines such as electrical, electronics and computer science, also home automation is becoming more useful in many aspects and this is good in use because of its safety and security, with the help of smart home automation we can save electricity bill and also this is beneficial with respect to intruder. Nowadays, home automation and controllers attached with home make its field vaster. Also home automation has become more advanced and useful in many fields and many aspects because it helps to monitor all the home appliances and it provides control of home appliances according to the requirement of the user.

Home automation systems become energy efficient and highly approachable smart home techniques, also automation have been used in office also for the same purpose and for accurate and real time data of the work and employees. There are so many features in home automation which makes it stand out among other technologies such as it involves basic features to maintain the user's satisfaction and comfort also it operates smartly to alert for any malfunction. In this paper a system is made which is controlled via AVR controller and used on off of the appliances and home automation of the applicant. In this embedded system with AVR microcontroller, mobile phone, led bulb for alert and stepper motor, solar panel used to store energy and battery used to store energy and rectifier used to convert ac to dc, inverter used to convert dc into ac, a LDR sensor used to sense light intensity[1].



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What is home automation?

Home Automation is a unique system that can control and establish communication between nearly all aspects of your house appliance such as fan, led light, bulb, AC fridge and many more. Home Automation is a term used to describe the working together of all household entities and appliances. For example, a centrally microcontroller panel can have the capability to control everything from heating, air conditioning, security system, lighting and overall electrical appliances. Home automation can include controlling aspects of our home remotely through a computer or any mobile equipment, programming electronics devices to respond automatically to some conditions or scenarios or centralizing the control of a variety of appliances in our home into a single control center. For example, Control of lights in and around our house from one central location so there is no need to get out of that place or go downstairs if we forgot to turn OFF or ON any appliances, just we can control remotely[2].



Figure 1: Home Automation using Arduino

Home Automation is a term used to describe the working together of all household entities and appliances. For example, a centrally microcontroller panel can have the capability to control everything from heating, air conditioning, security system, lighting and overall electrical appliances. There has been some main controller used to control many automated process either in home, office or in any other industry, some main controller such as Arduino Uno board, this is very useful and most popular controller of the industry, ArduinoUno interfaces shows and explains an Interface which is the method by which home automation controller attracts with user requirement. There are many types of interfaces like Touch Panels, Keypads, Remotes, Mobile Devices and Internet. In this paper the control method used by the controller also explains different control methods: a controller, interfaces to interact with the controller, and sensors that tell the controller what things are occurring in the house. In this paper also discussed about the wifi module and its advantage and disadvantage, proposed block diagram of wifi module and its application, also explain how we can implement wifi in our daily lives[3].



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II. LITERATURE REVIEW

Automation in everything become trend and there has been many paper published in the field of home automation among all those paper a paper titled A review paper on home automation by Nikita Baidya, 2Prem Kumar S discussed what is home automation in which he discussed that home automation refers to a specific function which can be able to control and build a online connection between home appliances and network either any controller such as AVR, arduino, or IOT etc. Home Automation is a term used to describe the working together of all household entities and appliances [4]. For example, a centrally microcontroller panel can have the capability to control everything from heating, air conditioning, security system, lighting and overall electrical appliances. In this paper examples based on automation explained such as implementation of internet of things for home automation, bluetooth based wireless home automation system using FPGA, hand gesture based home automation for visually challenged, home automation using atmega328 microcontroller and android, these examples based on home automation and use of wireless techniques and internet of things for different automation things, in which also shown different controller and their structure [5].

There has been some main controller used to control many automated process either in home, office or in any other industry, some main controller such as arduinouno board, this is very useful and most popular controller of the industry, arduinouno interfaces shows and explains an Interface which is the method by which home automation controller attracts with user requirement [6]. There are many types of interfaces like Touch Panels, Keypads, Remotes, Mobile Devices and Internet. In this paper the control method used by the controller also explains different control methods: a controller, interfaces to interact with the controller, and sensors that tell the controller what things are occurring in the house. In this paper also discussed about the wifi module and its advantage and disadvantage, proposed block diagram of wifi module and its application, also explain how we can implement wifi in our daily lives. IC stands for integrated circuit which is used in many electronics applications. In this paper ULN IC has been explained, application of IC and its advantages and disadvantages also explained in this paper[7].

In a research paper titled Home Automation Systems - A Study by Satish Palaniappan, Naveen Hariharan, Naren T Kesh, Vidhyalakshmi S, Angel Deborah S discussed the GSM based home automation in which he discussed system which is discussed in this paper provides three means to control the gsm based home automation, in home automation real time image and monitoring has been main feature that is important part of gsm based home automation [8]. In this paper the control method used by the controller also explains different control methods: a controller, interfaces to interact with the controller, and sensors that tell the controller what things are occurring in the house. Discussed GSM based HAS also explain its diagram, home automation can be done with different different controller in this paper explains the Bluetooth base home automation, explain phone based home automation in which explains that some systems are described as an enabling system that can be used to provide a common framework for home automation. It provides a system for a smart home that includes facilities such as a system controller, house wide wiring and a common interface[9]. This will enable using the existing system for home automation. Explains the ZigBee Based Home Automation and shows block diagram of transmission unit, in this paper also explains the wireless communication system and block diagram of transmission unit, in this paper. And explains what is remote control HAS and its block diagram.

III. CONCLUSION

In this century internet become very important and many applications has been working on internet of things, worlds is full of occupied with mobile phone users and android becomes the most used and successful mobile devices and that is also very flexible to implement any new function into it and it became open and growing source which can be able to operate any advancement technology in it. Human brain is so innovative to think and mobile applications are used to fulfil the innovation of the mind. In this paper discussed the home automation using solar tracker in which controlling



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of the process is via AVR microcontroller, this helps us to regulate and control home smartly, also installing such system in our house can save energy and its installation cost is also very cheap. There are many advantages of installing such systems in house which can help to reduce electricity cost, this is inflexibility, also helps in security etc. Also it provides a decrease in energy usage which results in less electricity bill and it improves security also it increases the comfort level of our house. There have been many applications which are based on iot or any other controller which makes that system smart and automated so taking care of all those work in this paper discussed what should be an ideal system of home automation with remote access. This paper explains what an ideal system is and how it should work in real time and gives real time data on the user device if users want to see the update. Also explain what a GSM system and how it will be helpful in home automation, in GSM one data channel which is used to provide internet access. The Internet becomes very fast and very much in use. Also, there are many works everywhere depending upon the internet provider, the internet allows application. So that people of all kinds can access the system.

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