



IOT BASED HOME AUTOMATION SYSTEM

Mr. Siddalingesha G R

Lecturer,

Government Polytechnic,

Kudligi, Karnataka, India

Email:

siddalingesha.gr@gmail.com

Mr. Jagadeesha M C

Lecturer,

Government Polytechnic,

Kudligi, Karnataka, India

Email: jcktr.mc@gmail.com

Abstract: The home automation system is implemented for decades but due to the costing and budgeting of the paper, it remains a niche product for high-end consumers. The Intelligent Home Automation System, security is one of the major factors that does not the home automation system.

The hectic daily life routine sometimes makes them forgetful to switch off the devices at home. The clumsiness attitude plus with our packed daily routine life that sometimes makes ourselves such in hurry situation that sometimes makes us forgot to switch off the lamps.

It will cause the electricity bill rose sharply. Besides, it is one of the electricity wastage that will lead the earth became an unhealthy one.

The strength of this paper is to control the devices such as lamp and door at home using a smartphone. The system is related to home appliances using NODEMCU. Home appliances that can help the user to control the devices at home and develop a good condition of house area that will prevent any loss and damage to

the property of any organization. The hardware that is being used in this paper is a

relay, servomotor, bulb holder and bulb. Meanwhile for the software part is Telegram. Telegram is the main software that is being used in this paper. Telegram application is being used as a platform to give the command. Most of the paper that is related to home automation or known as home appliances most of it using the Blynk apps and rarely uses the telegram. This paper is using a smartphone to give command compare to another paper that is using tablet, laptop and others which is much more convenient to users.

Key Words: IOT, Home Automation, Node M C U

I. INTRODUCTION

A smart home incorporates sensors, actuators, middleware, and a network and has two major interacting components which is a smart network and a smart load. The Smart home known as House automation, with the use of new technology, to make the domestic activities more convenient, comfortable, secure and economical.

The Internet of things can be defined as connecting the various types of objects like smart phones, personal computer and Tablets to internet, which brings in very newfangled

type of communication between things and people and also between things.

With the introduction of IoTs, the research and development of home automation are becoming popular in the recent days. Many of the devices are controlled and monitored for helps the human being. Additionally various wireless technologies help in connecting from remote places to improve the intelligence of home environment.

An advanced network of IoT is being formed when a human being is in need of connecting with other things. IoTs technology is used to come in with innovative idea and great growth for smart homes to improve the living standards of life. Internet helps us to bring in with immediate solution for many problems and also able to connect from any of the remote places which contributes to overall cost reduction and energy consumption.

II. LITERATURE SURVEY

“Smart Energy Efficient Home Automation System using IOT”, by Satyendra K. Vishwakarma, Prashant Upadhyaya, Babita Kumari, Arun Kumar Mishra. This paper presents a step-by-step procedure of a smart home automation controller. It uses IOT to convert home appliances to smart and intelligent devices, with the help of design control.

An energy efficient system is designed that accesses the smart home remotely using IOT connectivity. The proposed system mainly requires, Node MCU as the microcontroller unit, IFTTT to interpret voice commands, Adafruit a library that supports MQTT acts as an MQTT broker and Arduino IDE to code the microcontroller.

This multimodal system uses Google Assistant along with a web based application to control the smart home. The smart home is

implemented with main controller unit that is connected with the 24-hour available Wi-Fi network. To ensure, that the Wi-Fi connection do not turn off, the main controller is programmed to establish automatic connection with the available network and connected to the auto power backup.

“IOT Based Smart Security and Home Automation”, by Shardha Somani, Parikshit Solunke, Shaunak Oke, Parth Medhi, Prof. P. P. Laturkar. This paper focuses on a system that provides features of Home Automation relying on IOT to operate easily, in addition to that it includes a camera module and provides home security. The android application basically converts Smartphone into a remote for all home appliances. Security is achieved with motion sensors if movement is sensed at the entrance of the house; a notification is sent that contains a photo of house entrance in real time. This notification will be received by the owner of the house via internet such that app can trigger a notification.

So owner can raise an alarm in case of any intrusion or he/she can toggle the appliances like opening the door if the person is a guest. The system uses Raspberry Pi, a small sized computer which acts as server for the system. The smart home consist two modules. Home automation that consists; fan light and door controller, and security module that consists; smoke sensor motion sensor and camera module. “A Dynamic Distributed Energy Management Algorithm of Home Sensor Network for Home Automation System”, by Tui-Yi Yang, Chu-Sing Yang, Tien-Wen Sung. [1] proposed a system about Efficient Sensor Network for Vehicle Security. Today vehicle theft rate is very high, greater challenges are coming from thieves thus tracking/ alarming systems are being deployed with an increasingly popularity .As per as security is concerned today most of the vehicles are running on the LPG so it is necessary to monitor any leakage or level of LPG in order to provide safety to passenger.

Also in this fast running world everybody is in hurry so it is required to provide fully automated maintenance system to make the journey of the passenger safe, comfortable and economical. To make the system more intelligent and advanced it is required to introduce some important developments that can help to promote not only the luxurious but also safety drive to the owner. The system "Efficient Sensor Network for Vehicle Security", introduces a new trend in automobile industry. [2] discussed about Intelligent Sensor Network for Vehicle Maintenance System. Modern automobiles are no longer mere mechanical devices; they are pervasively monitored through various sensor networks & using integrated circuits and microprocessor based design and control techniques while this transformation has driven major advancements in efficiency and safety. In the existing system the stress was given on the safety of the vehicle, modification in the physical structure of the vehicle but the proposed system introduces essential concept in the field of automobile industry. It is an interfacing of the advanced technologies like Embedded Systems and the Automobile world. This "Intelligent Sensor Network for Vehicle Maintenance System" is best suitable for vehicle security as well as for vehicle's maintenance. Further it also supports advanced feature of GSM module interfacing. Through this concept in case of any emergency or accident the system will automatically sense and records the different parameters like LPG gas level, Engine Temperature, present speed and etc. so that at the time of investigation this parameters may play important role to find out the possible reasons of the accident. Further, in case of accident & in case of stealing of vehicle GSM module will send SMS to the Police, insurance company as well as to the family members. [3] discussed about an eye blinking sensor. Nowadays heart attack patients are increasing day by day. "Though it is tough to save the heart attack patients, we can increase the statistics of saving the life of patients & the

life of others whom they are responsible for. The main design of this project is to track the heart attack of patients who are suffering from any attacks during driving and send them a medical need & thereby to stop the vehicle to ensure that the persons along them are safe from accident. Here, an eye blinking sensor is used to sense the blinking of the eye. spO2 sensor checks the pulse rate of the patient. Both are connected to micro controller. If eye blinking gets stopped then the signal is sent to the controller to make an alarm through the buffer. If spO2 sensor senses a variation in pulse or low oxygen content in blood, it may results in heart failure and therefore the controller stops the motor of the vehicle. Then Tarang F4 transmitter is used to send the vehicle number & the mobile number of the patient to a nearest medical station within 25 km for medical aid. The pulse rate monitored via LCD .The Tarang F4 receiver receives the signal and passes through controller and the number gets displayed in the LCD screen and an alarm is produced through a buzzer as soon the signal is received. [4] discussed about a system, GSM based AMR has low infrastructure cost and it reduces man power. The system is fully automatic, hence the probability of error is reduced. The data is highly secured and it not only solve the problem of traditional meter reading system but also provides additional features such as power disconnection, reconnection and the concept of power management. The database stores the current month and also all the previous month data for the future use. Hence the system saves a lot amount of time and energy. Due to the power fluctuations, there might be a damage in the home appliances. Hence to avoid such damages and to protect the appliances, the voltage controlling method can be implemented. [5] discussed about a project, in this project an automatic meter reading system is designed using GSM Technology. The embedded micro controller is interfaced with the GSM Module. This setup is fitted in home. The energy meter is attached to the micro controller. This controller reads the

data from the meter output and transfers that data to GSM Module through the serial port. The embedded micro controller has the knowledge of sending message to the system through the GSM module. Another system is placed in EB office, which is the authority office. When they send “unit request” to the microcontroller which is placed in home. Then the unit value is sent to the EB office PC through GSM module. According to the readings, the authority officer will send the information about the bill to the customer. If the customer doesn't pay bill on-time, the power supply to the corresponding home power unit is cut, by sending the command through to the microcontroller. Once the payment of bill is done the power supply is given to the customer. Power management concept is introduced, in which during the restriction mode only limited amount of power supply can be used by the customer. [6] discussed about Positioning Of a Vehicle in a Combined Indoor-Outdoor Scenario, The development in technology has given us all sophistications but equal amounts of threats too. This has brought us an urge to bring a complete security system that monitors an object continuously. Consider a situation where a cargo vehicle carrying valuable material is moving in an area using GPS (an outdoor sensor) we can monitor it but the actual problem arises when its movement involves both indoor (within the industry) and outdoor because GPS has its limitations in indoor environment. Hence it is essential to have an additional sensor that would enable us a continuous monitoring /tracking without cutoff of the signal. In this paper we bring out a solution by combining Ultra wide band (UWB) with GPS sensory information which eliminates the limitations of conventional tracking methods in mixed scenario(indoor and outdoor) The same method finds application in mobile robots, monitoring a person on grounds of security, etc. [7] discussed about Nanorobots Control Activation For Stenosed Coronary Occlusion, this paper presents the study of nanorobots

control activation for stenosed coronary occlusion, with the practical use of chemical and thermal gradients for biomedical problems. The recent developments on nanotechnology new materials allied with electronics device miniaturization may enable nanorobots for the next few years. New possibilities for medicine are expected with the development of nanorobots. It may help to advance the treatment of a wide number of diseases: cardiovascular problems, neurosurgery, cancer, diabetes and new cell therapies. The implementation of new methodologies to help on manufacturing analyses and system design for the development of nanoscale molecular machine is one of the most important fields for research. The use of 3D physically based simulation in conjunction with clinical data may provide ways to design practical approaches for control and transducers development. [8] proposed a novel method for secure transportation of railway systems has been proposed in this project. In existing methods, most of the methods are manual resulting in a lot of human errors. This project proposes a system which can be controlled automatically without any outside help. This project has a model concerning two train sections and a gate section. The railway sections are used to show the movement of trains and a gate section is used to show the happenings in the railway crossings. The scope of this project is to monitor the train sections to prevent collisions between two trains or between humans and trains and to avoid accidents in the railway crossings. Also an additional approach towards effective power utilization has been discussed. Five topics are discussed in this project : 1) Detection of obstacles in front of the train;2) Detection of cracks and movements in the tracks;3) Detection of human presence inside the train and controlling the electrical devices accordingly 4) Updating the location of train and sharing it with other trains automatically 5) Controlling the gate section during railway

crossing. This project can be used to avoid accidents in the railway tracks.

This paper proposes an optimization of home power consumption based on PLC (Power Line Communication) for an easy to access home energy consumption. This also proposes a Zigbee and PLC based renewable energy gateway to monitor the energy generation of renewable energies. ACS and DDEM algorithm are proposed for the design of an intelligent distribution of power management system to make sure ongoing power supply of home networks.

To provide efficient power management the power supply models of home sensor network are classified groups viz. main supply only, main supply and backup battery, rechargeable battery power and non-rechargeable battery power. Devices with particular features are assigned to these groups. It targets to establish real time processing scheme to address variable sensor network topologies.

III. FLOW CHART

This flow chart shows the working of the paper. The process starts by initializing the Wi-Fi, the network name and password are written in the code and uploaded to Node MCU. The android device is connected to Node MCU over Wi-Fi. The Blynk server is set up and connection is made, the device is identified in the Blynk server using the generated authentication token. The command for controlling the load is given to the application, and this command, over Wi-Fi network is sent to the Node MCU.

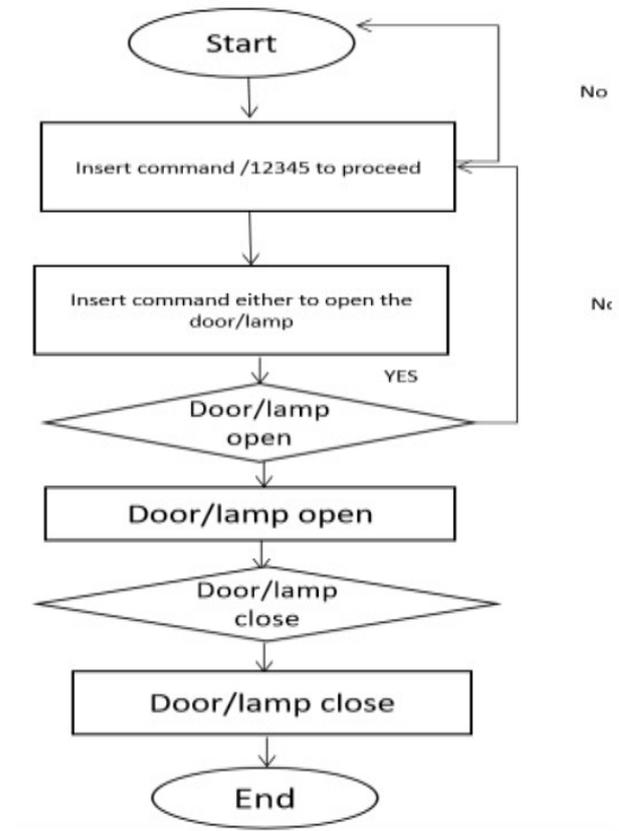


Fig 2: Flow chart

IV. PROTOTYPE DEVELOPMENT

For prototype development, we have completed some of these papers by doing a mini-paper. The mini-paper includes relay and servo motor. The prototype development of the paper is shown below



Fig 3: Circuit of Prototype Development

V. HARDWARE AND SOFTWARE

As mentioned in the previous chapter, the main controller is NodeMCU. In NodeMCU, it contains an ESP8266 module. ESP8266 is a WiFi module; it is one of the leading platforms for the Internet of Things. It can transfer data to the IOT cloud.

Schematic Circuit

When the power supply is fed to the NodeMCU, first it will go through a step-down transformer. This is because the operating voltage of NodeMCU is 3.3V, which means when the voltage is more than 3.3V, it will cause the NodeMCU to burn. From the NodeMCU, the relay or servomotor will be moved.

depends on the command given.

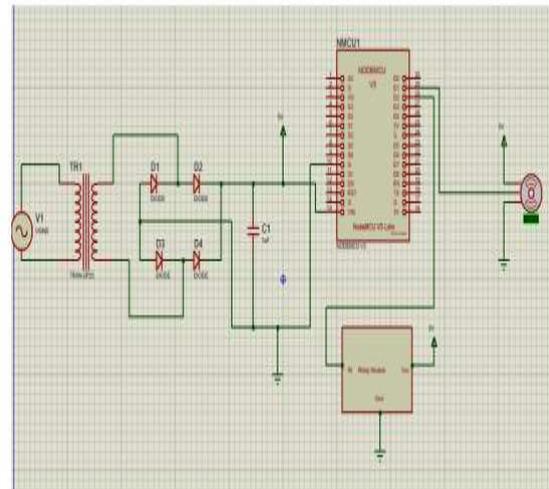


Fig 4: Circuit Diagram

SOFTWARE

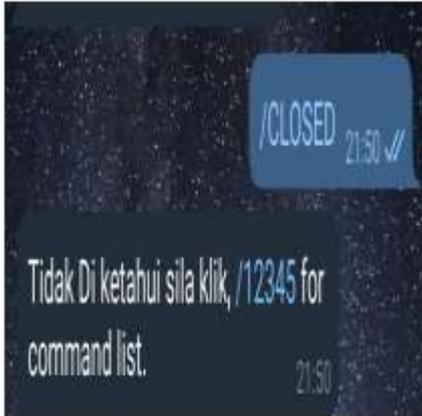
When the power supply is fed to the NodeMCU, first it will go through a step-down transformer. This is because the operating voltage of NodeMCU is 3.3V, which means when the voltage is more than 3.3V, it will cause the NodeMCU to burn. From the NodeMCU, the relay or servomotor will be moved, depending on the command given.

VI. RESULTS

To find out more about the results, testing and running the whole process of the paper have been made. The purpose is also to observe the performance and how well the paper works.

As for the result, this paper is managed to control light and door using a smartphone. Telegram is a platform to give a command either to control the lamp or door.

This happened when we entered the wrong command. It is supposed to enter /12345 first before we are going to give the command.



This is happened when we gave a command through telegram. After the paper make a movement then telegram will notify us like show in a diagram above.



This will happened when we are giving more than one command at the same time. The message that Telegram notify us are not same as the action that is taken by the paper. The



solution is we need to clear the conversation and start all over again.

VII. CONCLUSION

Nowadays, technologies are growing rapidly and it is same going to the home automation. As for this paper it highly recommended for everyone in this world especially for a user who is with disabilities and for the householder too. This recommendation will lead to a green world which is it can help to save and reduce on electricity bills. Plus, it will help and lead the disabilities person can work independently and help them to manage their house safety in more organized way. It will help to prevent any loss to a user or unwanted circumstances to a user.

REFERENCES

- [1] Christo Ananth, I.Uma Sankari, A.Vidhya, M.Vickneshwari, P.Karthiga, "Efficient Sensor Network for Vehicle Security", International Journal of Advanced Scientific and Technical Research (IJST), Volume 2, Issue 4, March-April 2014, pp – 871-877
- [2] Christo Ananth, C.Sudalai@UtchiMahali, N.Ebenesar Jebadurai, S.Sankari@Saranya, T.Archana, "Intelligent sensor Network for Vehicle Maintenance system", International Journal of Emerging Trends in Engineering and Development (IJETED), Vol.3, Issue 4, May 2014, pp-361-369
- [3] Christo Ananth, S.Shafiq Shalaysha, M.Vaishnavi, J.Sasi Rabiyyathul Sabena, A.P.L.Sangeetha, M.Santhi, "Realtime Monitoring Of Cardiac Patients At Distance Using Tarang Communication", International Journal of Innovative Research in Engineering & Science (IJIRES), Volume 9, Issue 3, September 2014, pp-15-20

[4] Christo Ananth, G.Poncelina, M.Poolammal, S.Priyanka, M.Rakshana, Praghash.K., "GSM Based AMR", International Journal of Advanced Research in Biology, Ecology, Science and Technology (IJARBEST), Volume 1, Issue 4, July 2015, pp:26-28

[5] Christo Ananth, Kanthimathi, Krishnammal, Jeyabala, Jothi Monika, Muthu Veni, "GSM Based Automatic Electricity Billing System", International Journal Of Advanced Research Trends In Engineering And Technology (IJARTET), Volume 2, Issue 7, July 2015, pp:16-21

[6] Christo Ananth, S.Silvia Rachel, E.Edinda Christy, K.Mala, "Probabilistic Framework for the Positioning Of a Vehicle in a Combined Indoor-Outdoor Scenario", International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE), Volume 2, Special Issue 13, March 2016, pp: 46-59

[7] Christo Ananth, R.K. Shunmuga Priya, T.Rashmi Anns, S.Kadhirunnisa, "NANOROBOTS CONTROL ACTIVATION FOR STENOSED CORONARY OCCLUSION", International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE), Volume 2, Special Issue 13, March 2016, pp: 60-76

[8] Christo Ananth, K.Nagarajan, Vinod Kumar.V., "A SMART APPROACH FOR SECURE CONTROL OF RAILWAY TRANSPORTATION SYSTEMS", International Journal of Pure and Applied Mathematics, Volume 117, Issue 15, 2017, (1215-1221).