



IOT based Advanced Home Automation using Node MCU controller and Blynk App

Miss. Aboli Mane¹, Miss. Pooja Pol², Mr. Amar Patil³,

Prof. Mahesh Patil⁴

^{1,2,3,4}Nanasaheb Mahadik Collage of Engineering, Peth
Shivaji University, Kolhapur (India)

ABSTRACT

The project discuss in this paper is target to solve problems of common peoples in day to day life. Atomizing home with using node MCU which is Wi-Fi model and using blynk app. Blynk app is used as third party app. It provide open source to user make to design automation in less price. Different sensors are connected to node MCU and can operate from any part of world with help of Blynk app. This makes life of common man very easy.

Key Words: Blynk app, Home automation, Internet of Things, Node MCU

I.INTRODUCTION

Its era of technology world is becoming faster and easier due to this reason our homes also should become part of it. Setting in any part of world we can operate our home just by our smart phone. Isn't it a great idea, yes with the help of node MCU and Blynk app it's possible.

Here we use the concept called IOT. Using the concept of internet of things we design our project to make human life reliable. With the help of IOT things can be too easy. Main aim of this project is to atomize ruler homes in less cost.

II. PROBLEM STATEMENT AND SIGNIFICANCE

Now days all have busy life for e.g. person staying somewhere for job and another someone comes and if you having an important meeting can't pick them and they don't have keys of home. This will put you in trouble. So with help of this project sitting in office person can open home for our people.

If you are working whole day in office and after your office work you don't want to do household works then home will do its own works like task of filling water, charging devices in absence of home owner.

If you come home and your freeze will tell you what you can make in eating without opening it from the contents of food which are present in is then how awesome. If our daily life will become easily and less complex it will be than the golden era of technology.



III. LITERATURE REVIEW

Smart home's based on IoT technology are becoming more and more popular. Main moto of IoT is to connect hardware world to internet. Then, Web of Things (IoT) emerged to easily connect sensors to the web, get the data and exchange data on the web that has been produced by the devices [5]. We have gone thoroughly through number of journals, research and conference papers and project reports to thoroughly understand the concept of IoT technology. Similarly, we have researched various IoT based projects that have been designed and developed in the past. Some of the proposed and existing smart homes platforms are as follows. The READY4SmartHomes [6] aims at reducing complexity of human face in his home due to lack of time. This project is intended to generate and provide different models which are been working using internet nothing but IoT etc. But it doesn't encompass vital IoT domains like home automize in less price etc. and neither does it mention need to integrate a reasoning engine to analyse IoT data.

The STAR-HOME project is deployed in various city's [7]. As per their design different sensors like gas detection, IR sensor, Fire sensor etc are used to protect our home from various ways and make home high secure.. The project is mainly focused on the home security and easy application./

1. Node MCU

IoT platform node MCU is open source . Language used in it is lua scripting language. It is based on the eLua project, and built on the ESP8266 SDK 0.9.5. It uses many open source projects, such as lua-cjson, and spiffs. It includes firmware which runs on the ESP8266 Wi-Fi SoC, and hardware which is based on the ESP-12 module. NodeMCU was created shortly after the ESP8266 came out. In December 30, 2013, Espressif systems began production of the ESP8266.The ESP8266 is a Wi-Fi SoC integrated with a Tensilica Xtensa LX106 core, widely used in IoT applications. NodeMCU started in 13 Oct 2014, when Hong committed the first file of NodeMCU - firmware to GitHub. Two months later, the project expanded to include an open-hardware platform when developer Huang R committed the gerber file of an ESP8266 board, named devkit 1.0. Later that month, Tuan PM ported MQTT client library from Contiki to theESP8266 SoC platform, and committed to Node MCU project, then Node MCU was able to support the MQTT IoT protocol, using Lua to access the MQTT IoT protocol, using Lua to access the MQTT broker. Another important update was made on 30 Jan 2015, when Devsaurus ported the u8glib to NodeMCU project, enabling NodeMCU to easily drive LCD, Screen, OLED, even VGA displays.

2. Blynk App

Blynk is a Platform with iOS and Android apps to control Arduino, Raspberry Pi and the likes over the Internet. It's a digital dashboard where you can build a graphic interface for your project by simply dragging and dropping widgets. It's really simple to set everything up and you'll start tinkering in less than 5 mints. Blynk is not tied to some specific board or shield. Instead, it's supporting hardware of your choice. Whether your Arduino or Raspberry Pi is linked to the Internet over Wi-Fi, Ethernet or this new ESP8266 chip, Blynk will get you online and ready for the Internet of Your Things.



Fig.5. Blynk App

3. Blynk Server

Blynk Server is an Open-Source Netty based Java server, responsible for forwarding messages between Blynk mobile application and various microcontroller boards (i.e. Arduino, Raspberry Pi. Etc). Blynk Cloud is software written on Java using plain TCP/IP sockets and running on our server. Blynk iOS and Android apps connect to Blynk Cloud by default. Access is free for every Blynk user. To run Blynk Server, all we need is Java Runtime Environment.

IV. DESIGN'S

The design consists of two main part hardware and software. The hardware contains microprocessor , microcontroller, different sensors, actuator's etc.

Software consists of different programming concept which are used in our project. With the help of IoT this hardware and software can link to each other.

V. IOT ARCHITECTURE

The Internet of things (IOT) is a rapid explained technology that is shaping up to bring the next revolution in computing and information technology. IOT system has application across industries through their unique flexible and ability to be suitable in any environment.

The physical layer consists of the devices that are to be controlled. The sensors to sense the surrounding environmental conditions are also connected to this layer. The data link layer consists of IoT gateway router (here, we have used NodeMCU as router gateway), device manager and various communication protocols. This layer links the home appliances to the webserver or cloud via Wi-Fi communication. The application and presentation layer consist of web protocol. This layer constitute either designing of a webpage for accessing the devices connected to the perception layer via PC or laptop computer, or building an android or iOS mobile application if the devices are to be controlled and monitored via smartphones.



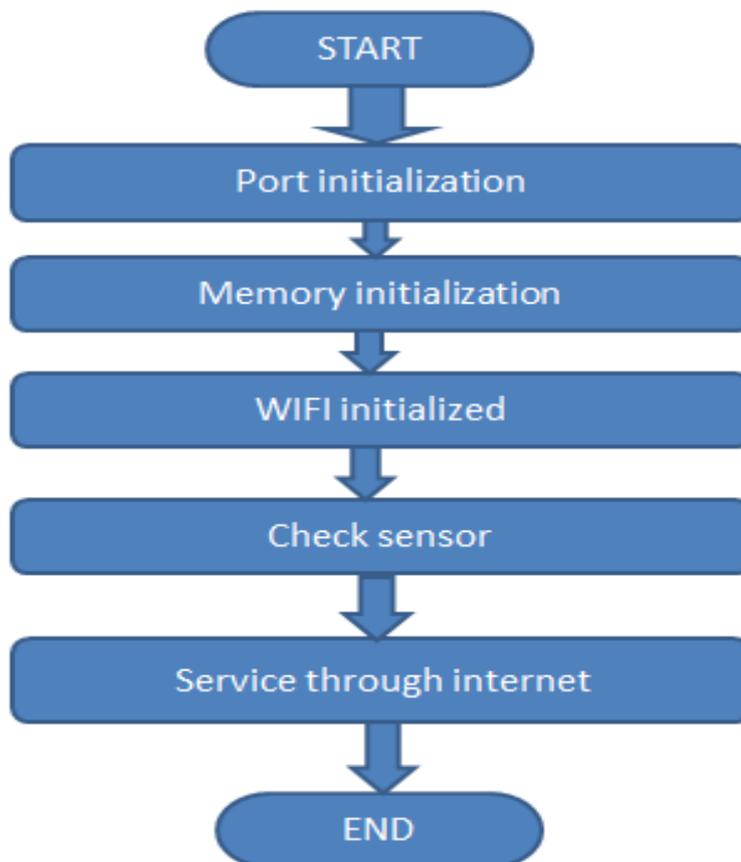
VI. SENSOR UNITS

The different sensors are been used in this project, such as IR sensor which is been used for motion detection. Gas leakage sensor is used to check whether the gas in home on which we cook food is leaked or not this sensor plays virtual role as its used for safety purpose. Fire detection sensor as its use is to detected fire in shelter. Temperature sensors which detect temperature of shelter. The main moto is safety so all sensors plays their duty towards safety.

VII. PROPOSED WORKING

When all sensors are connected to node MCU will use blynk app its used as third party app. Blynk app is open source for all . Creating an app is tough think so we take help of blynk app . With help of WIFI Node MCU will be connected to blynk app.

When will on it will get messages on our screen which ever sensor will act we will get report on our screen. For e.g. When in home fire will take place then fire sensor will work on with the help on internet we will get all information on our screen.





VIII.RESULTS

It has been observed that smooth output has been seen , when sensors play their role its been observe on screen easily and hence proper calculation are been done.

Below shown figure seems that how application works on screen and gives us proposed results.

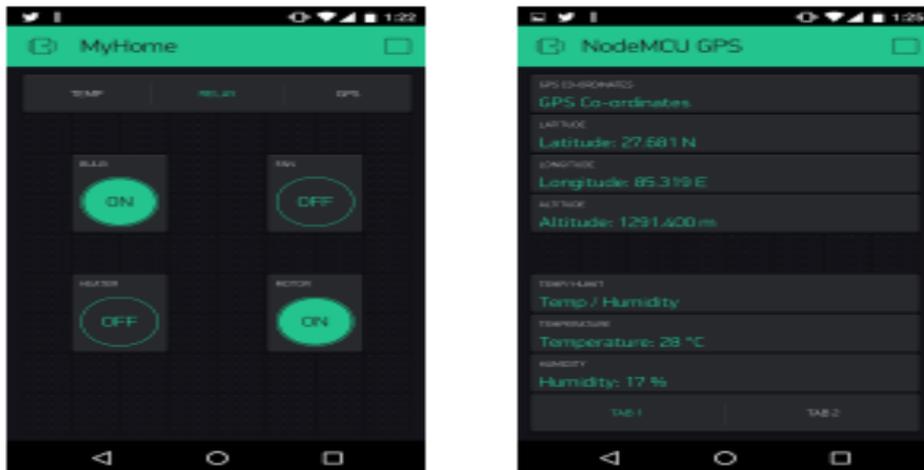


Fig:- Screenshots showing appliance switches and sensor output

IX. CONCLUSION AND FUTURE WORKS

In this paper we have introduced advance era for home management system and security to make human life more easy and luxuries. This paper deals with problem faced by peoples in day to day life, main Moto of this paper is to make things less complex and available in low prices.

The future work include:-

1. To make it available in very less cost to ruler area peoples and schools.
2. Reducing more complexity of things and easily available to people.
3. Increasing security of the system.

X.ACKNOWLEDGEMANTS

We would like to thank Asst. Prof. Mahesh. A. Patil for guiding us throughout this research project . We will also like to thank Mr. Swapnil Khandagale to help us regarding this project. We are also very much thankful to Blynk organization for granting us permission to access it's cloud server along with its resource and library files



REFERENCES

- [1] "Home", Blynk. [Online]. Available: <http://www.blynk.cc/>. [Accessed: 23-May-2016].
- [2] LPaudel, "Loadshedding Schedule," Nepal Electricity Authority. [Online]. Available: <http://nea.org.np/loadshedding.html>. [Accessed: 16- May- 2016].
- [3] L.Dan et al., "Intelligent Agriculture Greenhouse Environment Monitoring System Based on IOT Technology." in 2015 International Conference on Intelligent Transportation, Big Data and Smart City (ICITBS), pp. 487-490. IEEE, 2015.
- [4] D. Pavithra and R. Balakrishnan, IoT based monitoring and control system for home automation, 2015 Global Conference on Communication Technologies (GCCT), 2015.
- [5] D. Pavithra and R. Balakrishnan, IoT based monitoring and control system for home automation, 2015 Global Conference on Communication Technologies (GCCT), 2015.
- [6] R.Garca-Castro, A. Gmez-Prez, and O. Corcho "Ready4Smartcities: ICT roadmap and data interoperability for energy systems in smart cities", in 11th Extended Semantic Web Conference (ESWC14)., 2014.
- [7] F. Lecue et al. "Star-city: semantic traffic analytics and reasoning for city", in Proceedings of the 19 th International Conference on Intelligent Users Interfaces. ACM, 2014, pp. 179-188
- [8] P. Barnaghi et al., "Citypulse: Real-time IoT Stream Processing and Large-scale data analytics for smart city applications", in 2014 European Semantic Web Conference, 2014.
- [9] L. Sanchez et al., "Smartsantander: The meeting point between future internet research and experimentation and the smart cities", in Future Network & Mobile Summit, 2011, IEEE, 2011, pp. 1-8
- [10] D. Zuehlke, SmartFactoryTowards a factory-of-things, Annual Reviews in Control, vol. 34, no. 1, pp. 129-138, 2010.
- [11] C. Floerkemeier et al. (eds.), "The Internet of Things" in First International Conference, IOT 2008, Zurich, Switzerland, March 26-28, 2008, Proceedings. Vol. 4952. Springer, 2008.