

## HOME AUTOMATION & VEHICLE SPEED DETECTION USING IoT WITH GOOGLE ASSISTANT

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### **ABSTRACT:-**

In this project represents the entire design of Home Automation System & Vehicle Speed Detection with minimum cost and wireless system. It focuses specifically on developing one IoT-based home automation system that can control or control various components over the internet automatically programmed to work at ambient conditions. In this project we design the development of a firmware for intelligent control that can be successfully minimized human interaction to maintain the integrity of entire household electrical appliances. We used NodeMCU, a popular open source IoT platform, to run the automation process. Different Components of the system use different transmission modes that are implemented to communicate user control of devices through the NodeMCU to the actual appliance. The main control system implements wireless technology to allow remote access from Smart Phone. We use cloud server based communication which would increase the practicality of the project by giving the user full access to the appliances regardless of distance factor. We have deployed a data transmission network to create more automation. That System for controlling electrical appliances and devices in the house with a relatively low cost design, user-friendly interface and easy installation. The status of the appliance would be available, along with the controller, on an Android platform. This system is designed to support and Provide support to meet the needs of elderly and disabled people at home. Also the smart one home concept in the system improves the standard of living at home.

### **INTRODUCTION:-**

Internet of Things (IOT) is a concept where each device is assigned an IP address and through this IP address makes this device identifiable on the Internet. The mechanical and the digital machines are provided with unique identifiers (UIDs) and the ability to transmit data over a network without requiring human-to-human or human-to-computer interaction. Basically it is started as the "Internet of computers". Research studies have predicted explosive growth in the number of "things" or devices that are connected to the Internet. The resulting network is the so-called "Internet of Things" (ToT). Recent technological developments affecting the using wireless control environments such as Bluetooth and Wi-Fi, which have different functions devices that have the ability to connect to each other. Using a WI-FI shield to act as a mic Web server for the Arduino that eliminates the need for wired connections between the Arduino board and computer, reducing cost and allowing operation as a standalone device. The Wi-Fi Shield requires a connection to the internet from a WiFi router or WiFi hotspot and this would act as a gateway for the Arduino to communicate with the internet. With that in mind, an internet-based home automation system for remote control and status monitoring of household appliances designed. Due to the advancement of wireless technology, there are different types of connections such as GSM, WI-FI and BT are introduced. Each of the connections has its own uniqueness specifications and Applications. This is often the case among the four popular Wi-Fi connections implemented in the Home Automation & Vehicle Speed Detection project, WI-FI is chosen with his appropriate ability. The capabilities of WI-FI are more than enough to be implemented in it the design.

addition, most current laptops/notebooks or smartphones have integrated WI-FI Adapter. It will indirectly reduce the cost of this system.

### LITERATURE SURVEY:-

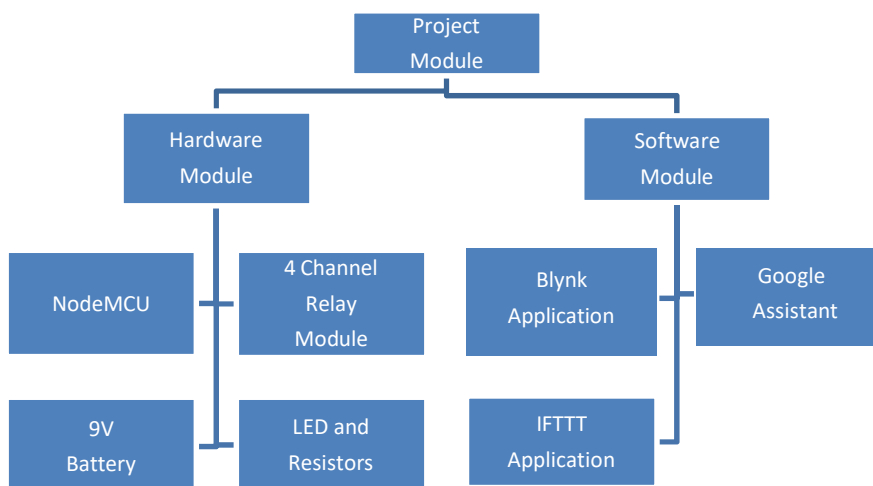
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"Smart Energy Efficient Home Automation System using IOT", by Satyendra K. Vishwakarma, Prashant Upadhyaya, Babita Kumari, Arun Kumar Mishra[1]. The smart energy efficient home automation presents a step-by-step procedure of a smart home automation 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[2]. The IoT based smart security and home automation 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 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 or he/she can toggle the appliances like opening the camera module. "Visual Machine Intelligence for Home Automation", by Suraj, Ish Kool, Dharmendra Kumar, Shovan Bartender[3]. The visual machine intelligence for home automation is vision-based machine intelligence system for detecting the on/off status of an ordinary household appliance. The proposed methods for detecting the status of devices lead to a new type of home automation system. That the accessibility of the set of devices in the house over a remote network is facilitated by the IP Addressing procedure in the IOT. This project uses two boards viz. Raspberry Pi and Intel Galileo Gen 2. The communication between the user devices, Raspberry Pi and the Intel Galileo boards happens over a wireless network. The UDP protocol is provided to facilitate wireless communication of the nodes present in the home automation network. A Pi Cam and a USB a Logitech camera attached to the rotating shaft of two different servomotors captures snapshots they take are passed as inputs to the machine learning-based models trained with dlib-C++ to perform the operating status of the devices. The proposed method uses a visual modality for automation the devices, as privacy concerns may arise when using the images of certain individuals to counteract this problem, an SPDT switch is added to the Raspberry Pi, which when switched off ensures that even if the pictures are taken by the webcams, they are simply passed on as is inputs into the machine learning models and are not displayed on the website when users access the website using the server address given to you by the Raspberry Pi. "Voice controlled home automation system with Natural Language Processing and Internet of Things", by Mrs. Paul Jasmin Rani, Jason Baktha kumar, Praveen Kumar.B, Praveen Kumar.U, Santhosh Kumar[4]. The voice controlled home automation system with natural speech processing and the Internet of Things focus on constructing a fully functional voice based home automation system using internet of things, artificial intelligence and natural Language Processing (NLP) to provide a cheap and efficient way to collaborate Household appliances using various technologies such as GSM, NFC, etc. it implements a seamless Integration of all devices on a central console, the mobile device. The prototype used Arduino MK1000, known as Genuino MKi000. The NLP in this project gives the user the Freedom to interact with the household appliances using his/her own voice and normal language than complicated computer commands. The devices are connected to the mobile device through an Arduino board that establishes the concept of the Internet of Things. The Arduino Boards are

connected to the devices and programmed to respond to them mobile entrances. "A home sensor network dynamically distributed power management algorithm Automation System", by Tui-Yi Yang, Chu-Sing Yang, Tien-Wen Sung[5]. The dynamics home sensor network distribution power management algorithm for home automation systems proposes an optimization of home power consumption based on PLC (Power Line communication) for easily accessible energy consumption at home. That also suggests a Zigbee and PLC-based renewable energy gateway for monitoring renewable energy power generation energies. ACS and DDEM algorithms are proposed for the design of an intelligent distribution of Power management system to ensure the continuous power supply of home networks. Provide Efficient power management Home Sensor Network power supply models are classified Groups respectively main supply only, main supply and backup battery, rechargeable battery power and non rechargeable battery power. Devices with special properties are assigned to these groups. It aims to create a real- time processing scheme to address variable sensor network topologies. "Data encoder-decoder pipelined architecture design for on-chip interconnect power reduction in very deep submicron technology" by v shavali, Sree rama Reddy G.M, P. Ramana Reddy. Journal – Design engineering, Pages 11768-11786, 2021 [6]. "Reduction of Coupling Transitions by using Encoding Techniques Methadology And its Time Delay Analysis" by v shavali, Sreerama Reddy G.M, P. Ramana Reddy. Journal – International journal of research, Pages 1752-1756, 2018 [7]. "Reduction of coupling Transition By Using Multiple Encoding Technique In Data Bus And Its Power Analysis" byv shavali, Sree rama Reddy G.M, P. Ramana Reddy. Conference – Innovation in electronic engineering Lecture notes in network and system 65, Pages 345-353, 2019 [8]. "Reduction of coupling Transition By Using conditional varying code for data a data bus circuits" by v shavali, Sree rama Reddy G.M, P. Ramana Reddy. Journal – MERGING TECHNOLOGY AND INNOVATION RESEARCH, Pages 351-355, 2019 [9].

**PROPOSED METHOD:-** The Android operating system offers the flexibility to use open source. The built-in sensors can be easily accessible. The application used to control the system has the following characteristics. Android the phone acts as a client and data is sent via socket programming. The application takes time command from user in two different modes. **Switch mode:** Switch mode uses the radio buttons that control the home appliances. The radio button sends the status of the switch. **Voice Mode:** Voice mode is used to control the home appliances by voice command. Using the smartphone's built-in microphone, the application creates an intent that retrieves the speech data to the Google server, which responds with a character string. The string data is further analyzed and then processed.

**PROJECT LAYOUT:-**



**Figure 1:- Project Layout of Proposed System**

**NodeMCU:** NodeMCU is the microcontroller unit in the prototype. It has a built-in Wi-Fi module (ESP8266), which makes wireless remote switching of home appliances.

**Four Channel Relay Module:** The four-channel Relay module consists of 4 individual relays that are physically connected between nodesMCU and the home appliances. It takes signals from GPIO pins of the node MCU and accordingly connects or disconnects household appliances from the mains. They act as a switching device.

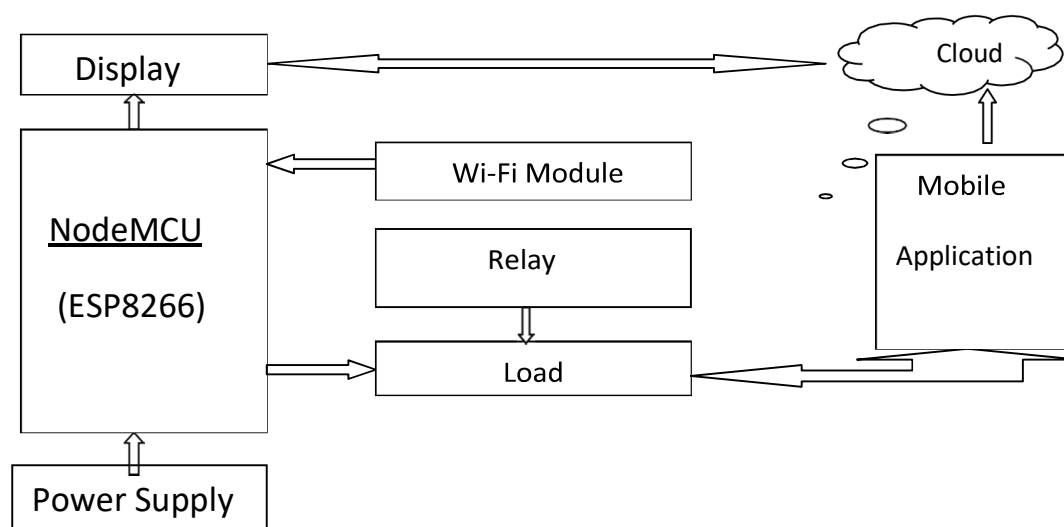
**LED and Resistors:** LED and resistors are used in this prototype to replace real devices. They show power turn devices on and off. In real-time operation, they would be replaced by actual ones domestic appliances.

**Blynk Application:** The Blynk application was built for the Internet of Things. It can remotely control hardware, it can display sensor data, save data, visualize, etc. The prototype mainly uses Blynk Application to capture commands from user to hardware over wireless network.

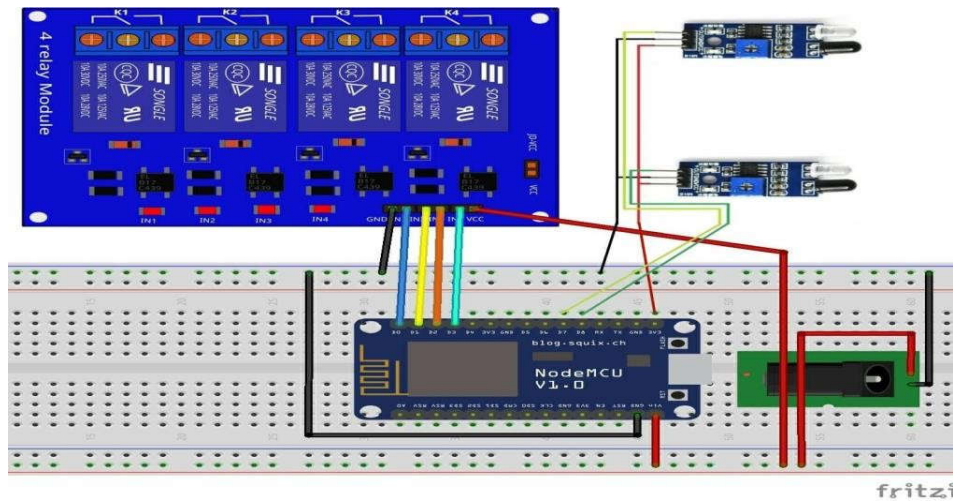
**Google Assistant:** Google Assistant is a system software that is present on the Android phone. It interprets the voice user commands to turn a device on or off.

**IFTTT:** IFTTT application The voice commands interpreted by the Google Assistant are not understandable therefore, the Blynk application cannot send to the hardware. IFTTT is an intermediate application which interprets commands from the Google Assistant and sends an on and off signal to the Blynk application about Blynk Server.

#### **BLOCK DIAGRAM:-**



**Figure 2:- Block Diagram of Proposed System**

**Circuit Diagram:-****Figure 8:- Circuit Diagram of Proposed System**

- ❖ The proposed system uses relays to connect the electrical devices to NodeMcu.
- ❖ The WiFi module in the NodeMcu chipset helps the system connect to the cloud.
- ❖ All controls can be done using the Blynk application and Google Assistant. 5v relays are used to control home appliances.
- ❖ IR sensors are used to detect vehicle speeds and door lock monitoring.
- ❖ The whole system is powered by a 9V power supply.

**RESULT:-**

Examining different home automation systems shows that there are different types of technologies used to implement this type of system. All proposed systems have been presented and compared in this paper, which shows some advantages and disadvantages of the systems. This review explained various home automation systems e.g. web-based, bluetooth-based, Mobile Based, SMS Based, ZigBee Based, Arduino Microcontroller Based, Android App Based, IOT-based and cloud-based. Home due to its performance, simplicity, low cost and reliability automation system makes its position in the world market, this day is not so far, when every house becomes the smart home.

The Home automation Internet of Things has been using experimentally proven to work satisfactorily by connecting simple appliances to it and the appliances were successfully controlled remotely through internet. The designed system not only monitors the sensor data like temperature, gas, light, motion sensor but also actuates a process according to the requirement. For example, the switch gets dark. It also stores the sensor parameters in the cloud (Gmail) in a timely manner. This will help the user to analyse the condition of various parameters in the home anytime anywhere.

Home automation using the Internet of Things has been experimentally proven works satisfactorily by connecting simple devices to it and the devices have been successful remotely controlled via the Internet. Home automation is undeniably a resource to make a home environment automated. People can control their electrical devices through this home automation devices and setting up control actions via mobile devices. In the future, this product have high marketing potential. In addition, it can be demonstrated from the computer mobile phones to control equipment in large places such as industries, hospitals, Institutions, etc.,.

**CONCLUSION:-**

The main outline for the project is to be able to communicate with various electrical devices wirelessly within the home. IOT or Internet of Things is an upcoming technology that will allow us to do this controlling hardware devices over the Internet. Here we suggest to use IOT for control household appliances and thus the automation of modern households via the Internet. This system uses two loads to demonstrate as house lighting. Our user-friendly interface allows the user easy control these home appliances over the Internet. For this system we use a NodeMCU. That NodeMCU is connected to a 4-channel relay module to receive user commands over the Internet. Relays are used to switch loads. After receiving user commands over the internet, the microcontroller processes these instructions to operate these loads accordingly. So this system enables efficient home automation over the Internet.

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