

# International Journal of Innovative Research in Science, Engineering and Technology

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## Voice Control IOT Based Smart Power Management System

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**ABSTRACT:** Our project's primary goal is to build a fully functional voice - based home automation system that uses the Internet of Things to provide an efficient and cost - effective way of working with household appliances. There are many smart home solutions on the market that aim to automate these home appliances ' basic operations using various technologies such as GSM (Global Mobile System), NFC (Near - Field Communication), etc. Most of these systems, however, focus on mimicking the electrical switch's basic operation. Our program is designed to provide our users with a completely automated voice - based solution to execute more than just switching on / off appliances. The user sends a command to the mobile device through speech, interpreting the message and sending the appropriate command to the specific device. For this project, which includes fan, light, we plan to implement four basic home appliances as a "Proof - of - Concept." The user's voice command is interpreted through the mobile device. The mobile device acts as a central console ; it determines by which device to fulfill the user's request which operation must be completed. The central console could also be a smartphone application, as the cloud can process almost all the data transferred.

### I. INTRODUCTION

Industrial automated system is characterized by the system's ability to perform tasks in Industrial to initiate or control equipment or devices. Nowadays, as days passed, the appliance available on the market is increasing. Thus, more and more attention is being paid to controlling such devices. Most of the controls are done manually from a long time ago, such as walking to the switch and switching it on. But as time went by, the arrival or remote control that would give the user an alternative way to control such an appliance without the user having to walk to the appliance. From the above, there is some further progress in the research - related method of controlling. The advancement mention uses the voice as the controlling medium for initiating or controlling the appliance. For example, a security door can only be activated with the authorized staff's voice if the door is unlocked. The voice is also used as the medium in this project to perform electrical appliance control in Industrial. In this project, the same concept applies compared to the security door where the different is controlled by the electrical appliance.

### II. METHODOLOGY

Home automation (also known as domotics) is the "building automation" residential extension. It is home automation, housework or activity in the household. Home automation may include centralized lighting control, HVAC (heating, ventilation, and air conditioning), appliances, and other systems to provide enhanced comfort, energy efficiency, and safety. Home automation for the elderly and disabled can provide a higher quality of life for people who might otherwise need caregivers or institutional care A home automation system integrates electrical devices with each other in a house. The techniques used in home automation include building automation as well as controlling domestic activities such as home entertainment systems, home plant and yard watering, pet feeding, altering the "scenes" atmosphere for various events (such as dinners or parties) and using domestic robots. Using a computer network, devices can be connected to allow personal computer control and remote internet access. Typically, due to the accessibility of the walls, outlets and storage rooms, and the ability to make design changes specifically to accommodate certain technologies, a new home is equipped for home automation during construction. When equipping

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a pre - existing house, wireless systems are commonly installed as they reduce cable changes. These communicate with a central controller via the existing power wiring, radio, or infrared signals. Network sockets like AC power receptacles can be installed in every room.

**AC VOLTAGE SENSOR:** The voltage sensor that converts measured voltage between two points of an electrical circuit into a voltage - proportional physical signal. According to Magnetic Modulation, the AC voltage sensor works and is designed for measuring AC voltage.

**AC CURRENT SENSOR:** A current sensor (CT1270) is a device that detects and generates a signal proportional to the electrical current (AC or DC) in a wire. The signal generated may be analog values.

**RELAYS:** Relay is an electrical switch that, under another electrical circuit, opens and closes. The main supply phase is linked to relays. OFF condition relay contacts are open, contacts are in a closed position under ON condition.

**Microcontroller Board:** This includes the microcontroller (ATmega328) and the circuit of the timeout generator. This is the system's major module. Text words are checked with predetermined format upon receipt of the SMS message, which includes the desired device ON / OFF commands. The microcontroller sends the corresponding AT command to the receiver GSM modem via UART to read a message. The modem will then reply with the message and the microcontroller will store the message in the RAM. There's no way to know the microcontroller when the message ends. The time - out generator circuit performs the vital function of being able to detect the end of a message from the mobile GSM receiver to the microcontroller board.

**ARDUINO:** Arduino is an open - source electronics prototyping platform / environment. The Arduino Uno can be programmed using the Arduino software IDE. The Atmega328 on the Arduino Uno comes pre - burned with a bootloader that allows you to upload new code to it without using an external hardware programmer.

### III. EXISTING SYSTEM

In this respect, the existing technologies are far outdated from what we proposed. Most existing smart home automation systems only automate the basic process of switching appliance status to ON / OFF. There are many home automation mechanization systems on the market that aim to automate these home appliances ' basic operations using different technologies such as GSM (Global Mobile System), NFC (NearField Communication) and Wi - Fi. The existing smart home systems that were either implemented or proposed have an elaborate interaction procedure with home appliances. Some of them include pressing a button in a static location while others include giving commands via a mobile device. Since a decade ago, various technology companies have tried to create amazing products in the home automation system department. The Internet of Things, however, has only recently become a briskly growing field. Various technology giants are selling many viable consumer products to bring the technology to the common man. Over the course of this year, most of these gadgets have been released, including: Amazon Echo, Apple HomeKit and Google Home.

### IV. PROPOSED SYSTEM

Our project aims at giving voice commands in human (natural) language the easiest and most efficient way to interact with home appliances. We plan to eliminate the tedious process of clicking with just one voice command through different application screens. Processing the project's natural language provides a personal connection to our system. The user is primarily authenticated by entering in the mobile device the specified username and password. The user sends the mobile device a voice command that interprets the message and sends the appropriate command to the specific device. The user's voice command is interpreted by the mobile device using the processing of Natural Language. The mobile device acts as a central console ; it determines which operation to accomplish the user's request

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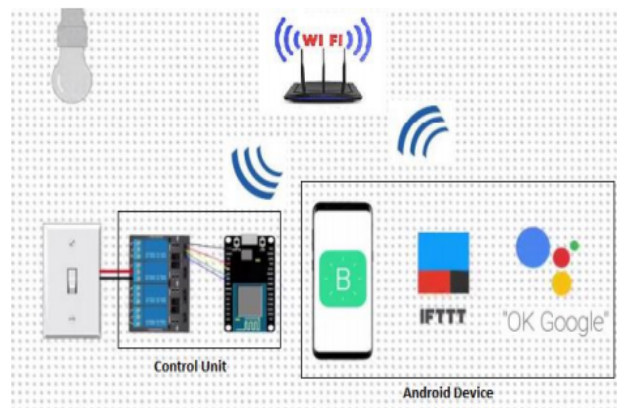
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by which appliance. Also, the central console can be either a desktop application, a web application or a smartphone application, as the cloud can process all the data transferred. However, we will use a smartphone in this project for the convenience of the user and increased mobile capabilities. The appliances are connected to the mobile device via an Arduino board setting up the Internet of Things concept. The Arduino boards are interfaced with the devices and are programmed to respond to mobile inputs. Our project automates the operation of every single appliance in the house, which significantly reduces power consumption due to excessive use / wastage of the services provided by the appliance.

## V. WORKING PRINCIPLE

Such a relatively cheap system is proposed by this kind of project. It uses the Google Assistant, the IFTTT application, the Blynk application and the NodeMCU microcontroller as the main components along with a 4/8 relay board and ULN 2803 IC. Natural language voice is used to give the Google Assistant instructions. All components are connected through the internet. **SYSTEM DESIGN AND IMPLEMENTATION** There are two main categories of system design, i. The hardware- is capable of connecting to the router. Specified devices, such as lights and fans, could also be turned on / off. It's called the Unit of Control. ii. That's right. The software - The design software is the Blynk app, the IFTTT app and the Google assistant. The control unit consists of the NodeMCU microcontroller and the relay board of the 4/8 stream. Using ULN 2803 IC, the relay board controls the relays. The Blynk app on an Android device communicates with the microcontroller and sends through the internet the desired signal. The basic system design architecture is shown



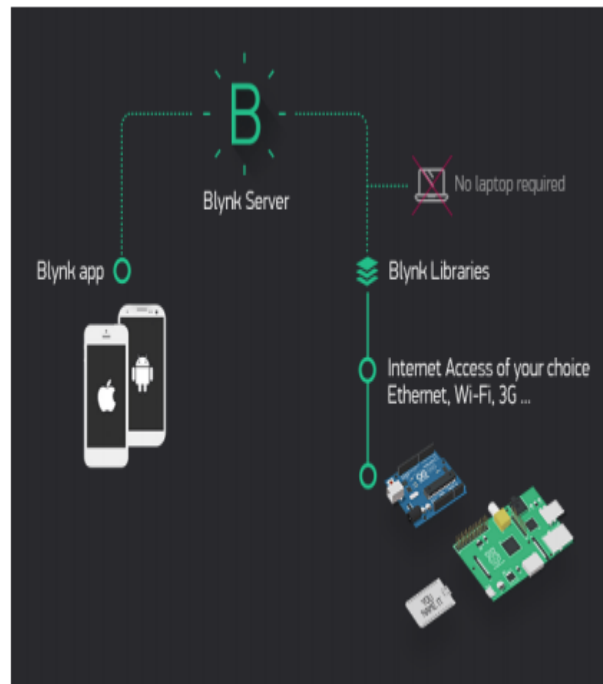
The hardware also known as the Control Unit includes the microcontroller NodeMCU and the Relay board. The digital output pins of NodeMCU are connected to the Relay board's Relay pins. Finally, an appliance is connected to each Circuit. The second relay is attached to a bulb .Blynk [ 2 ] is a platform for manipulating Arduino, Raspberry Pi, NodeMCU and several other internet boards with iOS and Android apps. Blynk has been designed for the Things Internet. It can remotely control equipment, display sensor data, store data, view it, and do a lot of other cool things. The setup of the Blynk App is required ; we set it up as required. We start by creating a professional. After that we create the toggle buttons associated with the microcontroller's digital pins for each relay. Once this has been done, Blynk will send an authentication token for this particular project to the registered email I d. When programming the NodeMCU and setting up the IFTTT application, this token should be noted and saved for use.

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IFTTT[1] derives its name from the conditional programming statement 'if this is so.' IFTTT is both a website and a mobile app launched in 2010 with the slogan 'Placing the Internet to work for you.' The idea is to use IFTTT to automate everything from your favorite apps and websites to smart devices and app-enabled gadgets. What the company provides is a platform for software. Here, the IFTTT app bridges the gap between the Google Assistant commands and the Blynk app. Setting up the IFTTT application first requires logging in, after which we need to create an applet, and then "This," i.e. the trigger, where we select the Google Assistant and then type in the commands to which the Google Assistant should respond. <http://www.iotclouddata.com/wilog/012/> Then we select 'PUT' and the content type is 'Application / JSON'[8] and ['1'] to turn on and ['0'] to turn off in the body. This creates the trigger action, i.e. the command Google Assistant. The action it takes is simply to send a message to either turn on or off the connected device in question to the Blynk app. Finally, after receiving the signal from the Blynk application, the microcontroller is programmed with the actions it needs to do. Before that, the Blynk and the microcontroller should communicate and communicate via the internet, and since the microcontroller comes with the built-in Wi-Fi module, NodeMCU is programmed to connect to the desired network once it is connected.

### VI. LITERATURE SURVEY

There are different methods of electronic voting system by using block chain.

R. Piyare[1]: This paper presents a low-cost, yet adaptable and safe home automation system based on cell phones.

S. V. A. Syed Anwaarullah [2]: This paper introduces a low-cost yet compact and secure home automation system based on Android smartphones.

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QaziMamoon Ashraf[3]: This work proposes an autonomous IoT architecture based on the autonomous framework of IBM. There is also an associated service communication protocol.

S. Correia, S. F.Pinto[4]: This work proposes an autonomous IoT architecture based on the autonomous framework of IBM. There is also an associated service communication protocol.

Jinhong Yang, [5]: This paper shows that IoT gadgets are hosting at home on the wireless AP (Access Point).

SoumyaKantiDatta[6]: The paper advocates the use of the Internet of Things (IoT) in intelligent homes for personalized healthcare.

## VII. CONCLUSION

In order to interact with their home appliances, most existing automation systems follow a specific set of commands or procedures. These complicated procedures distance users from the technology. Our project proposes voice commands to interact with home appliances using Arduino and a mobile device to overcome all existing problems and address the solution. These voice commands that Natural Language Processing processes help users build a better connection with the technology and encourage them to use it more. It also eradicates the worldly task of manually operating home appliances.

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