Voice Controlled Home Automation System using Google Assistants

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Abstract— **One of the most rapidly developing technologies that helps reduce the amount of work done by humans is known as "home automation." People who are looking for luxury and sophisticated home automation platforms are the target audience for some home automation systems. On the other hand, some systems are designed to be user-friendly for people who have special needs, such as the elderly and the disabled. Home automation and the use of applications that are controlled by voice are becoming more common as a result of advancements in technologies such as Google Assistance and Amazon Alexa. Now, we have developed our own version of this project, which is called "Voice Controlled Home Automation Using Google Assistant." The goal of this paper is to design a home automation board that is both functional and aesthetically pleasing, and that can be concealed within the AC power units that are mounted on our walls. We are able to control all of the gadgets that are linked to the board by giving it a simple voice command such as "Okay, Google, turn on the lights." This will cause the lights to turn on. Because of this paper, we are able to control our household appliances online, manually, and using a timer.**

Keywords- Smart Home, Artificial Intelligence, Home Automations, Amazon

I. INTRODUCTION

The term "home automation" refers to the process of electronically and automatically controlling many aspects, activities, and equipment within a home. Through the use of the internet, we have the ability to simply control the utilities and features of our home. A home automation system is comprised of three essential components, which are the sensors, controllers, and actuators. The fact that technology is always improving is something that the entire globe can be proud of. The primary purpose of the technology is, first and foremost, to improve productivity while simultaneouslyreducing labour requirements. The Internet of Things is currently being accorded a great deal of significance in our modern world. In this regard, automation leads to substantiallygreater efficiency while also reducing the amount of labour required. We have achieved success in managing the appliances in a number of different domains by making use ofIoT. One of these domains is the control of home automation by making use of Node Microcontroller. Additionally, we are able to utilise additional boards like as Raspberry Pi, Beagle Bone, and others. Voice is the most efficient mode of communication available in the technology of the present day since the entirety of the task is performed through the mediumof communication.

II. RELATED WORKS

[1] made a proposal for the creationof a system that would be based on the Internet and would

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enable the monitoring of significant process variables from a distributed control system (DCS). It makes suggestions for hardware and software design considerations that, when implemented, will make it possible for the user to access the process variables on the DCS, both remotely and in an effective manner. [2] proposed the use of voice to communicate remotely with household appliances in order to carry out a certain activity on behalf of the user. This was donein order to save the user time and effort. The strategy is gearedtoward enabling people with disabilities to carry out real-life tasks at home by communicating with household equipment using speech. In order for speech recognition to make the most informed conclusion possible, a voice separation approach is chosen. A system titled "A System for Smart-Home Control of Appliances Based on Time and Speech Interaction" was proposed in the year 2006 by [3]. This system allows the user to control the appliances in their home by making useof a personal computer. This system was designed by utilisingthe Visual Basic 6.0 programming language as the primary language of development and the Microsoft voice engine tools as the primary tools for speech recognition[7]. Home appliances can be controlled either by a timer or by voice command. The researchers [4] propose the use of spoken commands in conjunction with remote monitoring by mobile phone[6].

Following the generation and transmission of the spoken orders to the control system in the form of text SMS, the microcontroller makes a determination regarding a specific activity based on the information included in the SMS[8]. In the year 2001, [5] was able to successfully finish the project titled "Remote Controlled Home Automation." A forerunner in the linked health revolution, consumer electronics manufacturer Withings is at the forefront of this movement. While the user is away from home, the homecamera will notify them if there is motion or noise. In additionto this, it monitors the quality of the air within the home and alerts the user if dangerous quantities of volatile organic compounds are found[9]. Through a partnership with IFTTT, which is a tool that enables rule-based actions and triggers to be exchanged between a variety of devices and services, it hasbrought home health, privacy, and security to a whole new level. Connecting the Withings Home HD security camera, which comes packed with environmental sensors, to the IFTTTapp enables users to automate their homes in a way that was previously only a dream[7].

Table 1 Literature survey

S.NO	Author Name and year of publication	Title Name and Journal name	Abstract or objectives	Techniques used	Limitations
1.	Prof.Era Johri(2001)	Remote controlled home automation	Development of home automation with remote controlled	Micro controllers and signal systems	It is not accurate.it doesn't have a good range because it works based on remote signals
2.	Tan,lee and soh(2002)	Internet based system	Development of internet based system to allow monitoring of process variables from DCS	Distributed control system	It does only work with DCS
3.	Potamitis,georgile,fakotas kis,and kokkinoss(2003)	Use of speech to interact with home appliances	To perform a particular action using speech with home appliances.	Voice separation strategy	It is not accurate and did not work in some cases.
4.	S.M.Anamul,Haque,S.M. Kamruzza man(2006)	A system for smart home control of appliances	Based on time and speech interaction that controls the home appliances using the personal computer	Visual basics 6.0,Microsoft voice command	It only works on pc and will not be accessible to handicapped.
5.	Javarkhar,ahmed,ladhake,t hakare(2008)	Remote monitoring through mobile phone	Remote control monitoring though mobile phone involving the use of spoken commands	microcontrollers	It only works with only with some commands.

At that year's Consumer Electronics Show, the all-encompassing home monitoring solution was introduced for the very first time. Withings Home is one of the most comprehensive home monitoring solutions now available on the market. It enables customers to remain connected to their homes and families no matter where they are in the world. The IFTTT app can be used in conjunction with the camera to create a variety of recipes that automate interactions between the camera and other connected services. For example, the camera can be programmed to turn on when the user's phone isusing geolocation or when the door is locked, or it can be programmed to turn on the air purifier when it detects poor air quality. Baby Monitor Mode provides parents with the peace of mind that comes with having advanced features such as continuous monitoring, alarms, and interactive push-to-talk capabilities.

III. EXISTING ARCHITECTURE

Users are given the ability to exercise control over a wide variety of electric appliances when they install a home automation system. Wired communication is the foundation of a great number of already existing and highly developed home automation systems. This will not be a problem as long as the system is planned sufficiently in advance and is installed when the building is being physically constructed. The Internet of Things (IoT) is a technology that enables users to control fundamental aspects and functions of their homes automatically from virtually any location in the globe by means of computers or mobile devices connected to the internet. Communication in home automation systems that is based on the Internet or an IP protocol is almost usually the preferred option. Interoperability can be defined as the ability of a product or system to communicate with other products or systems using a standard protocol. The existing system has the disadvantage that the graphical user interface (GUI) is not supplied to the user, therefore in order to operate the devices

that are connected, the user will need to commit all of the AT instructions to memory. Additionally, the system makes use of functions that are java-based. The use of mobile devices is becoming less common these days. However, with the system that has been proposed, we are controlling all of the devices through an android mobile and a web server; the user will not need to memories any of the commands. Some of the components, such as the cooler, the fan, the light, and the electric motor, are automated.

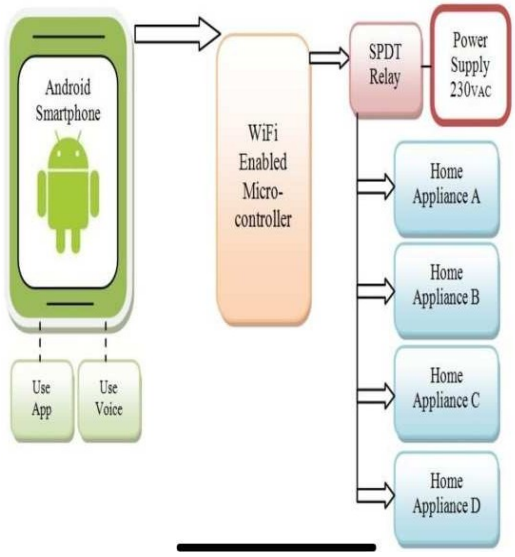

Figure 1: Existing Architechture

IV. PROPOSED ARCHITECTURE

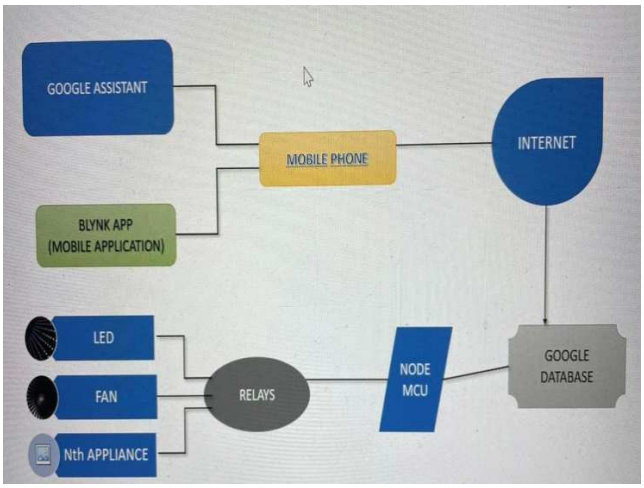

Figure 2: Proposed Architechture

A. Working of the Proposed Method

In the event that wired automation is used, the proposed solution does away with the complications caused by wiring. There is also the possibility of supplying a sizeable amount of power. Greater than that of Bluetooth in terms of operating range. Because of the way the system is now designed, remote monitoring and control of appliances is not possible. On the other hand, in the system that has been proposed, which is a Wi-Fi-based home automation system, it is possible to monitorand operate the various appliances.

In the home automation system that was in use in the 1990s, people in every home had electronic gadgets that were operated manually. However, in the home automation system that we have presented, we are controlling all electronic appliances by remote control. The widespread use of the internet, the development of increasingly sophisticated mobile device technologies, and improved methods of mobile communication are largely responsible for the meteoric rise in popularity of IoT applications in the 21st century.

During this phase of the proposed system, spoken instructions are provided to the Google assistant. Voice instructions have been integrated into Google Assistant via the IFTTT website, and the Blynk account has been connected to it as well. In this instance of home automation, the user has provided the Google assistant with commands. Home appliances such as light bulbs, fans, and motors, amongst others, can be controlled according to the commands that are given. The relays are operated based on the decoded commands that are received through the Google assistant. These commands are forwarded to the microcontroller after they have been decoded. The gadget that was linked to the appropriate relay responded to the user's request made to Google Assistant by turning itself on or off. Wi-Fi is utilised to facilitate communication between the application and the NodeMCU (ESP8266) microcontroller thatis in use. As a result, it provides solutions to a wide range of issues, including pricing, lack of flexibility, security, and so on.Additionally, it will bring additional advantages, such as a reduction in our energy bills and an improvement in the safety of our home. In addition to this, using it is really hassle-free, and it will make our house a cosier place overall. The concept of "smart homes" that are able to handle a wide variety of home automation technologies was proposed by the project. Microcontrollers at each node were employed to make the connection between the sensors circuit and the house.

V. IMPLEMENTATIONS

The implementation of the proposed system on programming node microcontrollers that use the Arduino IDE to create applications for augmented reality cameras.

VI. RESULTS AND EVALUATIONS

The below figure 3 shows the prototype circuit board of our augmented reality home automation project. This circuit can switch on /off the relays through augmented reality camera application, IOT application and manual switches which means this will work with and without internet also. We also included a smart fan regulator which can regulate the speed of fan through mobile app and manually also. The below figure 4 shows the home automation system with led, bulb, manual switches and circuit board. The appliance is connected to

circuit board relay pins, manual switches, connected to GPIO pins esp-32 microcontroller. we have place target image which shows in figure i.e., shows the virtual pop-up buttons in augmented reality camera application the overall board is connected to 220AC supply.

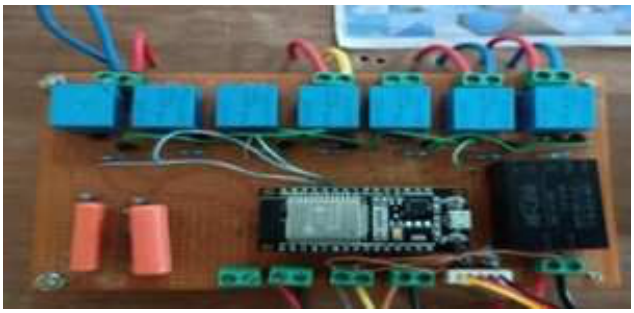

Figure 3 Prototype Circuit Board

Figure 4. Home automation system connected circuit board

Figure 5. The Proposed Connection with IOT

The figure 5 shows the bulb is on position, now which we can switch off the bulb manual switch, IOT application and camera application.

The below figure 6. shows the user interface of IOT application. In this we used three appliances buttons and with one fan regulator speed gauge this application shows the status switch weather the appliances is on or off position . whenever we switched on appliance through AR camera or manual switch immediately status of appliances in ON or OFFposition shows in this application. This cloud network application where we can switch ON/OFF the appliance's from anywhere in this world.

Figure 6. The User Interface Home Automation Application

VII. CONCLUSION

Our paper describes the use of augmented reality for taxpayers when changing everyday electronics such as fans, rope lights, and air conditioners. As a result of our research, the taxpayer augmented reality we see has proven to be the easiest way to automate. This program is designed primarily for a user-friendly interface. The easy-to-use visual interface is also useful for less educated groups. This method can be used to control and monitor energy consumption in our daily lives andavoid dangerous situations. It can be used for industrial and facility maintenance. Given all the characteristics, users needto have access to the right system in real time everywhere, and the proposed model is the same good candidate.

In the future, we would like to develop a smarter industrial Internet of Things (IIoT). Use smart sensors and actuators to increase the productivity of your industry. Also known as Industry 4.0, IIoT leverages the capabilities of intelligent machines and real-time statistics to leverage the "dam machines" that have been manufactured for many years in the industrial environment. The purpose behind this IIoT is that smart AR devices are better than humans and are also better at

analyzing information. You can imagine a fully automated world in AR.

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