

Voice-Based Home Automation

¹S. Jyothi, ²V. Bhuvaneshwari, ³V. Madhurima,
⁴R. Vasanthalakshmi

^{1,2,3,4}UG Student, Department of Electronics and Communication Engineering,
Dr K V Subba Reddy College Of Engineering For Women, Kurnool, Andhra Pradesh, India

Abstract

Houses are becoming smarter as technology advances. IoT-controlled switches are gradually replacing conventional switches in modern homes in favor of centralized, controlled systems. At the moment, conventional wall switches can be found in a variety of rented areas of the house. It is difficult for the user to operate in close proximity to them. Even more so, it becomes more challenging for physically disabled or elderly individuals to do so. The Internet of Things is used to achieve smart control. On the phone, a graphical user interface (GUI) application sends ON/OFF commands to the receiver where loads are connected. Through this technology, the specified loads can be turned ON/OFF remotely using voice commands

1. Introduction

The Internet of Things (IoT) is a network of physical "things" that can collect and exchange data. These "things" are embedded with software, electronics, a network, and sensors. The Internet of Things (IoT) aims to connect standard devices like computers, smartphones, and tablets to the internet, even relatively insignificant ones like toasters.

By harnessing the power of data collection, AI algorithms, and networks, the Internet of Things makes virtually everything "smart." A person with an implanted diabetes monitor, an animal with tracking devices, and so on are all examples of IoT objects. The fundamentals of IoT sensors and devices are covered in this beginner's IoT tutorial: When it comes to obtaining real-time information from the surrounding environment, sensors or devices are an essential component. There may be various levels of complexity in all of this data. It could be a straightforward temperature sensor or it could be the video feed.

A number of different kinds of sensors, in addition to sensing, may be present in a device. A mobile phone, for instance, has multiple sensors like a camera and GPS, but your smartphone cannot sense these things. Connectivity: A cloud infrastructure receives every piece of information gathered. The sensors ought to be connected to the cloud through a variety of communication channels. Mobile or satellite networks, Bluetooth, Wi-Fi, WAN, and other similar communication methods are examples. Processing of Data: The software processes the gathered data once it has been collected and transferred to the cloud. This can be as simple as reading the temperature on appliances like air conditioners or heaters. However, there are times when it can be extremely difficult, such as identifying objects using computer vision on video.



Fig.1 Internet of Things

2. Literature Review

In collaboration with WellPoint, Memorial Sloan Kettering Cancer Center in New York City's lung cancer treatment, IBM announced in February 2013 that the Watson software system would be the first commercial application. According to ManojSaxena, the business chief of IBM Watson in 2013, 90% of nurses in the field who use Watson now follow its instructions.

After the crisis, IBM started working with industry leaders like Memorial Sloan Kettering Cancer Center, Cleveland Clinic, MD Anderson Cancer Center, and WellPoint to build Watson's real-world capabilities in the health care industry. This oncology solution will help doctors find personalized treatment options for their patients.

In addition, IBM is collaborating with MD Anderson Cancer Center at the University of Texas to develop a Watson-powered technology that facilitates the expansion of treatment options, the matching of patients with clinical trials, and the acceleration of novel discoveries in the fight against cancer, beginning with leukemia.

The IBM Watson Engagement Advisor, a commercial breakthrough that aids businesses in deepening customer engagement by quickly addressing questions, providing advice to guide purchase decisions, and troubleshooting issues, was unveiled in May 2013 by IBM.

IBM made significant technological advancements while putting Watson to use, such as reducing the number of systems required to operate Watson by 75% and increasing its performance by 245 percent. The day-to-day difficulties that people face in interacting with their banks, insurance companies, retailers, telecommunications providers, and a plethora of other institutions are now addressed by Watson, which has expanded to new markets across industries.

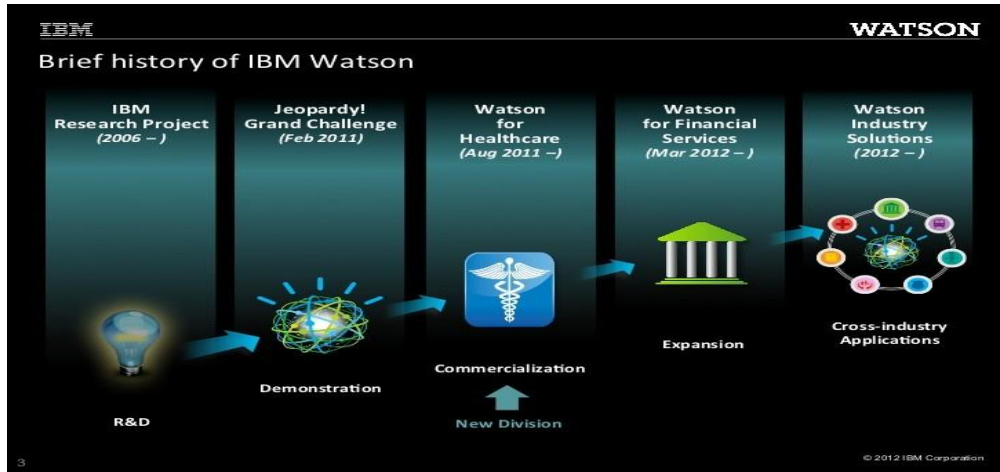


Fig.2 Evolution of watson

3. Proposed System

Relays are used to connect the home appliances to the Arduino BT board at the input and output ports of a Bluetooth-based home automation system. The high-level, interactive C language of microcontrollers serves as the foundation for the Arduino BT board's program; Bluetooth is used to make the connection. The appliances are secured with a password so that only authorized users can access them. For wireless communication, the Arduino BT board and phone establish a Bluetooth connection. The Python script is used in this system, and it is portable and can be installed on any Symbian OS environment. The system uses Zigbee to monitor and control home appliances. One circuit is designed and implemented for receiving feedback from the phone, which indicates the device's status. Network coordinators record and store the device's performance. The four-switch port standard wireless ADSL modern router is used for this Wi-Fi network. Both the security Wi-Fi parameter and the network SSID are preconfigured. The virtual home algorithm processes the message first for security reasons, and once it is deemed safe, it is re-encrypted and sent to the real home network device. The Zigbee controller sent messages to the end over the Zigbee network. the safety and security of every message that the virtual home algorithm receives. GSM-based home automation is attracting research due to the mobile phone and GSM technology. This makes it easier to reduce the system's cost and the intrusiveness of its installation. We looked at the SMS-based, GPRS-based, and dual tone multi frequency (DTMF)-based options for home automation primarily for GSM communication. The work of A. Alheraish is depicted in the figure as a logical diagram that demonstrates how home sensors and devices communicate via GSM and SIM (subscriber identity module) with the home network. The system makes use of a transducer, which turns machine functions into electrical signals that are sent to a microcontroller. The physical properties of the system, such as sound, temperature, and humidity, are transformed into another quantity, like voltage, by the system's sensors. All signals are analyzed by the microcontroller, which then turns them into commands that the GSM module can understand. Based on the command that was received by the GSM module, select the appropriate communication method from SMS, GPRS, and DTFC. Figure. A. Alherais's work as a source for mobile-based home automation

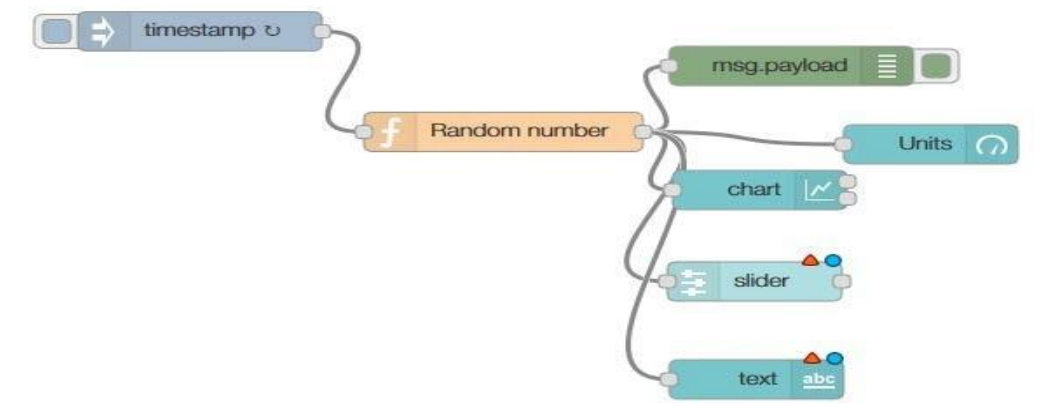


Fig.3 Random number pattern

A smart home has middleware, sensors, actuators, a network, and two main interconnected components: a smart load and a smart network. With the help of cutting-edge technology, the smart home, also known as house automation, makes household chores easier, safer, and less expensive. The term "Internet of things" refers to the process of connecting a wide range of devices, including tablets, personal computers, and smart phones, to the internet and enabling a brand-new form of communication between them and humans. The research and development of home automation is gaining popularity these days thanks to the Internet of Things. For the benefit of humans, many of the devices are controlled and monitored. Additionally, a variety of wireless technologies facilitate remote connection, enhancing the home environment's intelligence. When a person needs to connect with other things, an advanced Internet of Things network is formed. The Internet of Things (IoT) is being used to develop smart homes that will raise people's quality of life. The Internet enables us to quickly find solutions to many issues and allows us to connect from anywhere, reducing overall costs and energy consumption.

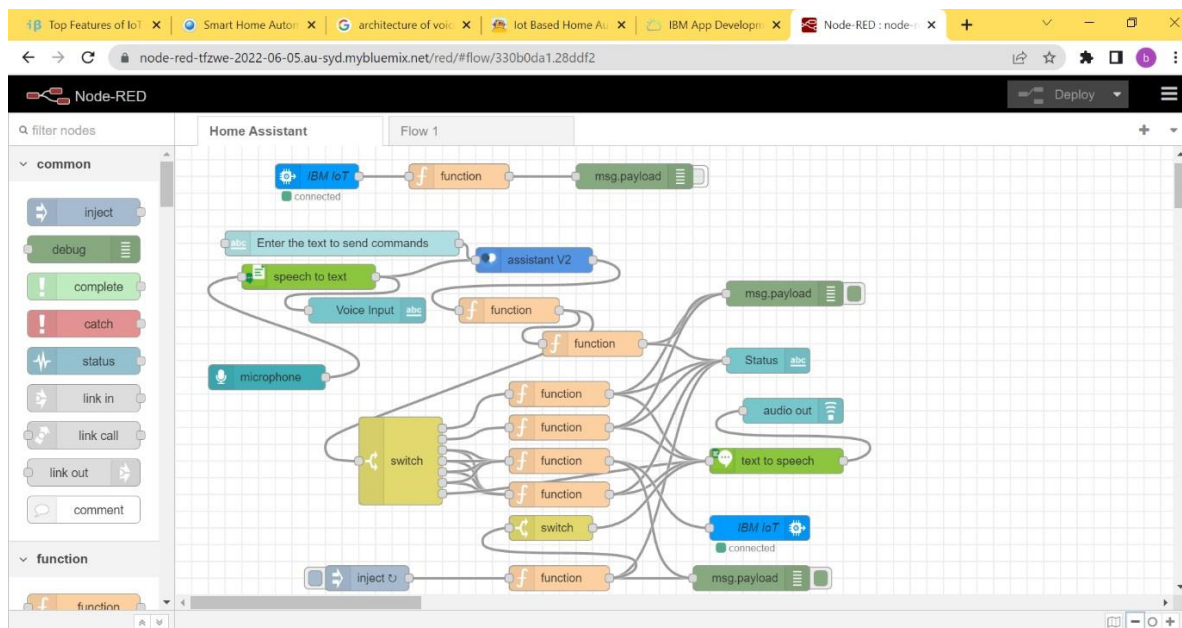


Fig.5 Output of the Project

4. Conclusion

Houses are becoming smarter as technology advances. IoT-controlled switches are gradually replacing conventional switches in modern homes in favor of centralized, controlled systems. At the moment, traditional wall switches are located in various rented areas of the house. It is difficult for the user to operate in close proximity to them. Even more so, it becomes more challenging for physically disabled or elderly individuals to do so. The Internet of Things is used to achieve smart control. ON/OFF commands are sent to the receiver where loads are connected by a GUI application. Through this technology, the specified loads can be turned ON/OFF remotely using voice commands. Additionally, this project can be automated to operate without a human interface.

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