

Automation of the Home Using Android within the Concept of the IoT

Dr. Rajalakshmi V.¹, G. Padmakumar²

Professor¹, Student²

Department of CSE

SN Gurukulam College of Engineering Kadayiruppu

Corresponding Author's Email: - padmakumarg8584@gmail.com

Abstract

The Internet of Things (IoT) is a network of electronic devices, devices, and physical items. Every house or structure contains a variety of technological gadgets. This article describes the comprehensive architecture of a home automation system using a low-cost Android phone and wireless internet connectivity. As we live in the twenty-first century, the internet plays an increasingly important part in human existence. Thanks to the Internet, we can share information and access items remotely. The Internet may be used to control household appliances from any location on the planet. Home automation makes life easier. The main purpose of this system is to use an Android phone to access home appliances and house status. Android is the most user-friendly operating system platform. Android is also a user-friendly operating system. After getting a command, the microcontroller (AVR atmega328) looks at the data it has been given and sends a response over the internet.

Keywords: - *IoT, AVR atmega328, Home Automation, Smart home, Android OS, Driver Circuit.*

INTRODUCTION

Home automation systems are highly common these days, and their popularity has grown dramatically in recent years due

to their ease of use through Smartphone and connectivity. The goal of this system is to provide people with special needs with a system that can respond to orders

from an Android device through the internet and regulate the on/off state of electrical items like lighting. The system should be economically priced, simple to set up, and simple to use. It also provides information on home environmental parameters such as temperature and humidity. In this project, an Android app is used to give the user a way to control different appliances and see how the home is doing.

The Android app produces codes for each command and sends them to the microcontroller through the internet. The incoming data is then processed by the microcontroller, which switches the corresponding appliances using associated driving circuits. SSR (Solid State Relay) and SSR drive equipment comprise the driver circuit.

BLOCK DIAGRAM

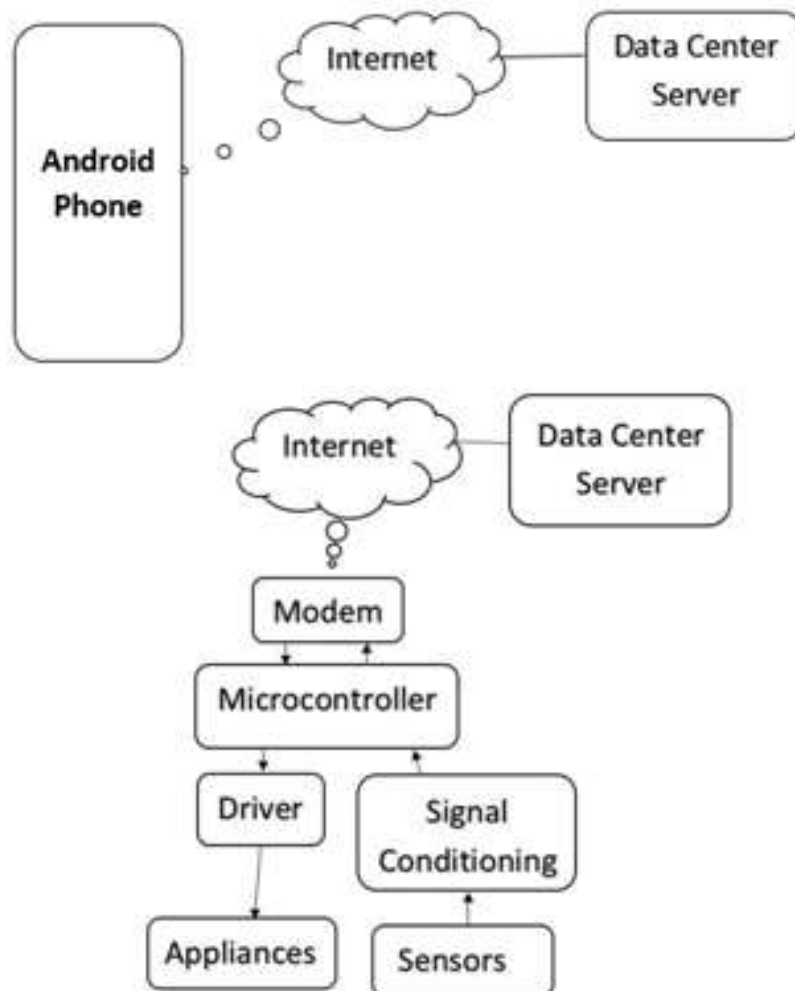


Figure:- 1

Android device: android phone Ethernet modem

Microcontroller: AVR Atmega328 Driver circuit: Relays

Sensors: Temperature sensor, Pressure Sensor.

HARDWARE DESIGN

A. Internet modem

In this project, another Android phone serves as a terminal. That is, one phone communicates with another phone through

the internet, much like WhatsApp or any other messenger.

After receiving a command from the user phone, send it to the remote phone. Because the remote phone is Bluetooth-connected to the microcontroller, the identical command is carried forward to the microcontroller.

B. AVR Atmega328

We utilized an arduino uno board for this project. It is a microcontroller development board containing the ATmega328 microcontroller IC.



Figure:-2

It features 14 digital I/O pins. There are six PWM outputs, six analogue inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, a UART, and a reset button.

C. Driver Circuit

Basically for Driving high voltage relays or power MOSFETS are used. We used SSR, and to drive relay we used ULN2003 driver ic.

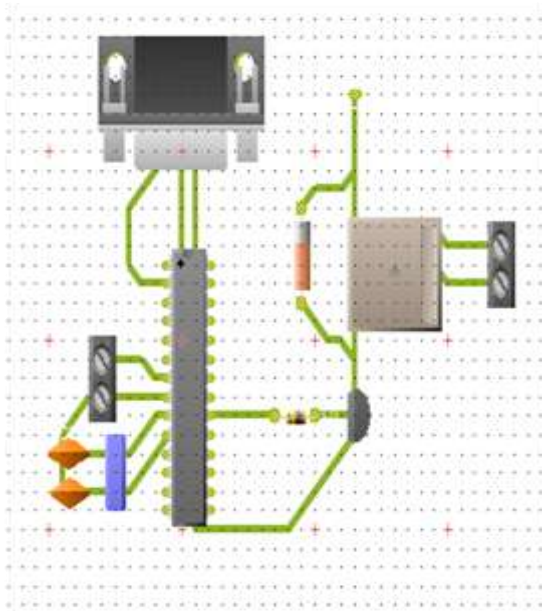


Figure:-3

SOFTWARE DESIGN

Software design is divided into three sections

1. Main function of the system designed in Atmega328 microcontroller
2. Designing of Android application
3. Design of server

A. Embedded programming for Atmega 328

Essentially, data is communicated or received by the microcontroller and the Android phone over the internet. Embedded programming is the rationale underlying command interpretation that is received from a distant phone. After receiving a command, the microcontroller will process it and then conduct the required action.

For example, if I want to switch on the lights, I will push the "lights on" button, and a certain code will be sent to a server through the internet. That code will be sent to the system as soon as it connects to the server. Following the verification of that code, a certain light will be switched on.

B. Android Application Development

Android applications serve as a bridge between humans and computers. MIT AppInventor2 was used to create the Android application. App Inventor for Android is a Google online application that is now managed by the Massachusetts Institute of Technology (MIT). It enables novice programmers to construct software apps for the Android operating system (OS).

C. Design of server

A web server is just storage medium for storing data on the internet or in the cloud. A web server is required because if we wish to transmit a command over the internet, that command must first be stored in a web server and then accessed by a distant machine. To make it possible we are going to use the web server provided by MIT APP INVENTOR. “appinvtinywebdb” it is a free web database. And it can be used to store particular data in it.



Figure:-4

The definition of a mobile phone is given below. Another word for mobile phones is the handheld telephone. Which calls and receives calls through a radio link. Conversion from telephone to mobile phone. We can use mobile phones more

easily than telephones. We can transfer voice, video, or other data very easily and in a short time using the internet. We connect mobile phones to the public switched telephone network (PSTN). This is usually divided into two parts: the other is the cellular telephone system called the Global Satellite-Based Telephone.

A mobile phone that uses a radio instead of a cable to connect to the phone system where its signal can be accessed. Finally, we can say that a mobile phone is a device that we can use in a wide area with the help of a network without any kind of physical connection.

Why Mobile Phone is Important

A mobile phone is a device called a long-distance, portable, and wireless electronic communication device. A few years ago when we had nothing but mobile phone imagination. Back then mobile phone devices were expensive and it used to cost a lot to use a mobile phone. But in the last few years, the use of mobile phones has increased and the prices and purchases of mobile phones have become easier and the cost of using mobile phones has come down a lot.

The importance of the mobile phone is immense to us because the mobile phone is

very much involved in our daily life. Mobile phones have brought everything into our hands. We can now use mobile phones in a very short time to do long-distance work. We can communicate in different places in a very short time. While mobile phones help you find a friend or get acquainted with a new friend, mobile phones help you connect with people from all over the world. Our mobile companies are constantly developing new mobile-phone models to meet the needs of consumers.

Mobile phones have become the first choice gadget for every boy or girl. Be it an adult or a teenager. Mobile phone use has now become a status; everyone wants to have the new model of this magic gadget in their hands. Especially the young generation is very interested in new model gadgets. The younger generation loves the latest features offered in the new handset. Likes new ring tones, hello tunes, and wallpapers. Mobile phones with mp3 and video recording facilities, MMS, and internet facilities have attracted more and more youngsters.

Mobile users have now become such that they cannot imagine their world without their handsets. Given the importance of people's mobiles, it is safe to assume that

their magic gadgets would be kept separate from them for a day. But it will be difficult for them to survive. In Japan, mobile phone companies alert their customers to natural disasters, providing companies with free earthquake and instant notification of natural disasters. In emergencies, disaster relief workers use their mobile phones. Mobile phone signals can help identify injured people.

There is no doubt that mobile phones have made life easier and more comfortable in our modern age. Now people from all walks of life are communicating with their family members, friends and other acquaintances using mobile phones very easily. Now if we want to communicate with someone, we don't need to use a letter and we don't have to wait for the letter to reach the receiver.

We just need to know the number of the receiver and give the number to the mobile phone and start talking. A mobile phone is a gadget that stands as a comfortable way to communicate over long distances. With the advent of mobile phones, our lives have become easier and faster. So we can say that the importance of the mobile phone is immense to us.

History of the Mobile Phone

In 1983 the world's first transportable mobile phone was called the Motorola DynaTAC 8000X. It cost \$4000 to build. The first mobile phone call to land in the United Kingdom two years later was made by Sir Ernest Harrison, then chairman of Vodafone. Following the DynaTAC with the Motorola 9800X or Microtrac in 1989, it came with a fold-down keyboard cover.

At the beginning of the story of the mobile phone, many cell phones were considered "car phones" because they were too big to look at and difficult to carry in a pocket or purse. However, in 1983, the Motorola DynaTAC 8000x came on the market. Although it was huge by today's mobile phone standards, it was considered the first real mobile phone because it was transportable and small enough. Although the mobile phone was very expensive, it became a symbol of pop culture.

Craig Jones, art designer and art design professor at the Philadelphia Art Institute, said: "These were initially marketable and used in the business world, but were often not for personal use, as mobile phones have become in our lives today.

DynaTac's later models were small in size but flawed. But Nokia Mobira Talkman

and Motorola 2900 mobile phones were heavier, but with longer battery life and longer talk time, these features made the phone more popular. With the betterment of technology, cell phone companies are making mobile phones smaller and more affordable to increase their customer base.

If you want to know more about the history of mobile phones, you can see that the history of mobile phones dates back to 1908 - there was a 'wireless telephone' in Kentucky - a patent was issued there and this mobile phone was the mobile phone we use now. Completely different from this phone was like a two-way radio. Technology has always been used a lot in our modern society but no other technology in the world has made such an impact as a single device like a mobile phone.

One study found that the average person touches their phone 2,617 times a day. In this modern world, people use mobile phones more than toilets. As you can see, most of the people in the world use mobile phones for most of the day and this statistic are ever increasing. Since the advent of smart mobile phones, people have become more and more addicted to them.

In the early days of the invention of the mobile phone, the mobile phone was used only for making calls, and later the facility of sending a text was added to the mobile phone. Which, of course, made the video an overnight sensation.

The first mobile phone sold for, 000 4,000, but now the iPhone 13 Pro Max is priced at \$ 1,399 each! Technology is advancing rapidly due to the huge demand for mobile phones, the prices are constantly falling.

However, the use of mobile phones is making our lives exciting. Mobile phones have filled our lives with comfort and ease.

Application of the Mobile Phone

The a highly efficient communication device because it has made life easier. It helps to make new friends, make connections, coordinate with family, and much more. Due to the increasing advancement of mobile technology, we are constantly getting high-speed internet service. Today, the availability of mobile apps has increased in such a way that it is helping people with everything like computers.

A few years ago, computers had to be used to work on the Internet, to check and read mail, to know various information but

today it has changed because computer work can now be done on mobile phones and mobile is a device that can do it. Can be carried. Importance of mobile phones in our daily life and daily necessities is immense. Because mobile phones are no longer a common device like before, now mobile phones are helping us with various tasks. The mobile phone has proven to be Mobile phones are now a favorite of all educators and students. Mobile phones help with eBooks, e-libraries, educational videos, educational games, etc.

Below are some uses that will help you highlight the importance of mobile phones:

Contact

The main function of the mobile phone is to make it easier for people to communicate. Mobile phones facilitate people to communicate without any physical contact. Communication can be done with just one click. The mobile phone allows the user to connect with friends and family in different countries thus reducing the geographical distance.

The Importance of Mobile Phones in Student Life

Mobile phones are gaining popularity among young and old alike. Mobile phones provide the most support to the

youth in their educational and personal life. Recently, smart phones have a variety of technological features such as photography, internet browsing, video games, text messaging, e-mail, multimedia messaging, video chatting, video calling, voice communication, and Bluetooth. Which is helpful for students.

The Importance of Mobile Phones in Society

The mobile phone of the present age has become very important for society. This is because the smart phone is not only used to bring together family and friends but also helps the society as a whole to organize meetings and conduct social work for businessmen and professionals with the help of this gadget. Mobile phones help in bringing various information about society to the public. So we can say that mobile phones are not less important for the betterment of our society.

Business

Today, mobile phones are used in many different ways in business. We know that the main purpose of business is sales processing, which can easily communicate with buyers, suppliers, employees, or customers with the help of mobile phones. Mobile phone transactions have made it much easier to work and buy and sell.

Mobile phone helps the seller to easily get various news including import, sale, and export in the market.

Banking

The role of mobile phones in our banking sector is no less. This is because, with the advent of mobile phones, we can do all kinds of banking from home without having to go to the bank with the help of various apps. So mobile phones reduce our travel costs and reduce our physical discomfort.

Entertainment

Mobile phones have proven to be a tool for entertainment, not just for communication. The latest smart phones have a music player, video recorder, internet service, video songs, various online games, and various other facilities. Mobile phones have become an entertainment platform in our modern life.

CONCLUSION

Smartphone's have become an important part of daily life. The number of users of Smartphone's is increasing every year. In various studies concluded, it reveals that the majority of the population is using mobile phones in their daily life for various purposes which varies from for

communication, Social Media uses, watching movies, and so on.

The population who uses mobile phones varies in the duration of time they use from nearly half of the day. So, sometimes it affects sleep and psychological health significantly.

REFERENCES

1. Agar J: 'Constant Touch: A Global History of the Mobile Phone', Icon Books, Cambridge (2003).
2. Culkin, John M. 1967. A schoolman's guide to Marshall McLuhan. The Saturday Review, March 18, 51-53 and 70-72
3. ITU: 'World Telecommunications Development Report: reinventing telecoms', (2002).
4. Haddon L: 'The Social Consequences of Mobile Telephony', Framing, Oslo (2000).
5. Townsend A M: 'Life in real-time city: mobile telephones and urban metabolism', Journal of Urban Technology, 7, No 2, pp 85-104 (2000).
6. Klemens, Guy. 2010. The Cellphone: The History and Technology of the Gadget That Changed the World. Jefferson, NC: McFarland & Company.
7. "A Comprehensive Survey on Study of Big data and its Challenges" MR Hasan, Journal of Research in Computer Science and Engineering version 6 (1), pp. 1-14.
8. History of mobile phones in wikipedia
https://en.wikipedia.org/wiki/History_of_mobile_phones