

FINAL YEAR PROJECT REPORT
Project on Android Base Home Automation System

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of
Bachelor of Science in Computer Science and Engineering

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APPROVAL

This Project titled “**Project on Android Base Home Automation System**”, submitted by Mostakim Islam ID:141-15-3337 to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering (BSc) and approved as to its style and contents. The presentation has been held on April, 2018.

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I hereby declare that, this project has been done by me under the supervision of **Ms. Refath Ara Hossain, Lecturer, Department of CSE** Daffodil International University. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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I would like to thank my entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, I must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

Education plays a great role in development of any country. Many of education organizations is trying to increase education quality. One of the aspects of this implementation allows learners to attend this paper currents the not in particular design of Home Automation System (HAS) with few value and Radio remote control. This system is designed to support and provide support in order to fulfil the needs of elderly and impuissant in home. Also, the smart home idea in the system developed the standard living at home. The main control system equipment's wireless Bluetooth technology to provide remote access from PC/laptop or Android Phone. The design remains the subsist electrical switches and provides more safety control on the switches with low voltage activating method. The switches status is synchronized in all the control system whereby every user interface indicates the real time existing switches status. The system intended to control electrical appliances and devices in house with relatively low cost design, user-friendly interface and ease of installation.

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CHAPTER 1

INTRODUCTION

1.1 Introduction:

Home automation is a automation of home house work or household activity .In other work, it gives an opportunity to use of computer to control panel infections .for example, It includes centralized control of lighting infections. It can include centralized control of lighting application security lack of gates and doors to provide flourish benefit case energy ability and security.

In present it world home automation is being popular due to comfort ability flexible means of monitoring and controlling the infections and other things according to users comfort and needs. The challenging part lies in simplify and cost of installing them in home and various with increasing number of services to be monitored and controlled . The project named “Home Automation” is idea of home automation using android phone

The popularity of home automation has been rising comprehensively because of considerable capability and simplicity through android phone and tablet connectivity. A home automation system integrates electrical devices with each other. The technique applied in home automation include those in building automation and the control of house old activities such as lighting control system and the use of other electrical appliance devices may be connected via a home network to offer the restraint by a pc and may permit remote access from the internet. Through the integration of information technologies with the home environment , method and appliance can be connected in as mobilized process which results in convenience power efficiency and security benefits.

Due to development of wireless technology. Various kind of bracing are initialed such as GSM, WIFI and Bluetooth. Each of the connection has their own unique specification and application. Among the four popular connection that often implemented in HA project. WIFI is being selected with its compatible capability. The capabilities of wifi are more than enough to be implemented in the design. Also most of the current of the notebook or smartphone come with built in WIFI adapter. It will indirectly help to alleviated the cost of the system.

The project onwards the design of home automation and security system using aprotic PI, a credit sized computer. Aprotic PI provides the specialty of a mini computer, additional with its GPIO pins where other elements devices can be connected. GPIO registers of aprotic PI are used for the output purpose. We need to design a power strip that can be easily connected to GPIO pins of the aprotic PI. The home appliances are connected to the input/output ports of aprotic PI along with the power strip and the status is passed to aprotic PI. The android running OS in any phone connected to a network can access the status of home appliance via an application. It displays the design and implementation of automation process that can guide and control home appliances via android phone or tablet. Just see the figure like simple smart home. Figure 1.1 shown the Home Automation by controlling Phone.



Figure 1.1: Home Automation System

1.2 Motivation

The motivation for radiating smart home systems comes from mores reasons, but maximum great are benefit, security, energy management, connectivity and luxury. Smart Home systems are one of the modern areas of test that have not been completely integrated into our society. This is because the test requires many other rules of test and engineering to generate a functional smart home. The additional cost of the install is from the fact that even though a majority of homes were built in the near past, technology has been growing exponentially. This means that most

homes were built before this technology was available, and this creates a defenses for the development and sales of smart home systems. However the technology is becoming better and cheaper, and this will help to make smart home systems a consumption worth having when upcoming homes are being built. The biggest motivation backward smart home systems is the benefit. Benefit is really another way of saying “time saver”, and into day’s world where everything is moving faster, every second has value. Most of the technology we use today is based of benefit, for example cars get us where we need to go faster, phones get us information from other people faster, and computer’s get work done faster. Smaller conveniences in the home will be charming because they allow the home to save the user time as well. There are already many convenient technologies in the home like the dishwasher, washing machine, and microwave ovens. These technologies are more mechanical in nature and often there are much less computerized conveniences in the home. A Smart home systems goal is to introduce the benefits of computerized technology. For example, when using the smart home system, the user will not need to walk around turning off lights, they can save that little bit of extra time by just pressing a button on their phone, or even have the lights programmed to shut off after a certain amount of time. Maybe there is some music on the user’s computer they would like to play on a sound system, smart home systems will allow the user to play the music from where ever they are without necessary to go to their computer, find the song, and make sure the song is in a playable format for their sound system. There are many other small conveniences provided from the smart home. Security is also a big factor in the uprising of smart home systems. With a sophisticated enough system, home security becomes a powerful tool that gives piece of mind and power to the user. Security systems are also a large deterrent for crime. The mere presence of a camera will put doubt in any criminals mind about committing a crime. However luxury is not as concerned with cost and will not lose its value as significantly due to high cost.

Year	KwH Usage	Global Rank
2004	3,920,613,000,000	#1
2003	3,854,767,000,000	#1
2002	3,785,096,000,000	#1
2001	3,717,663,000,000	#1
2000	3,857,277,000,000	#1
1999	3,706,014,000,000	#1
1998	3,632,496,000,000	#1
1997	3,510,984,000,000	#1
1996	3,460,615,000,000	#1
1995	3,370,975,000,000	#1

Table 1: Electric power consumption in KwH in US

1.3 Problem Statement

There is a huge energy exigency in the present situation of our country. Moreover, people become negligent in proper utilization of available energy. People often forget to turn of the light sources and home appliance while getting out from home. Even in those situation, application of home automation makes it possible to control them from a distant place in easy way with our smartphone.

People are early and late running from place to place, working to accomplish everything on our never ending to-do list. Because of the HA system. We never have to take tension about opening the door, switching off the appliances and so on. In short we can save valuable time and experiences more daily productivity.

1.4 Objectives

The main objectives of our object are as follows:

1. To remotely control home appliances and monitor them.
2. To save the time and utilize the energy efficiently.

1.5 Applications

The application include remote controlling of home appliances and lighting systems in an easy. Also home security and monitoring can be achieved.

1.6 Project Features

The features of our project can be highlighted in following point –

1. Remote control of home appliance from anywhere using app.
2. Continuous restraining and security of home with camera module.
3. Considerable reduction in
4. Mobile controlled fan (CPU fan)
5. Mobile controlled LED light
6. Gas alarm
7. Fire alarm

Electricity bills with efficient energy utilization.

1.7 Feasibility Analysis

The project can be implemented using affordable electronic and software technology making it economically, technically and operationally practicable.

1.7.1 Economic Feasibility

This project is founded on android phone founded low electronic elements same aprotic by my processor, camera modules, relay switch's etc. Which are affordable building it economically possible to implement.

1.7.2 Technical feasibility

This project is founded on wireless Radio, embedded way which are reasonably in phase left with presently used technology. Therefore, it is very much favored by the technology.

1.7.3 Operational feasibility

This software will have very easy to use, user friendly interface so it will be sweet much current by anyone having small experience of using android phone. It could be good for physically weak person too controlling home appliances with the click of a button.

So it is operationally feasible.

1.8 System Requirements

1.8.1 Hardware Requirements

Control electronics

1. Arduino uno
2. Bluetooth module
3. PIR sensor
4. Servo motor
5. Bread board
6. Smoke detector
7. Buzzer
8. LED
9. DC fan

1.8.2 Software Requirements

1. Android development tools (ADT)

To build the android application to send the control signal to control the HA

Way and to received the live video feed from the camera.

2 IDLE

-IDLE for python programming used to code the server side program.

3. RPI-GPIO library

-GPIO interface library for the aprotic Pi.

CHAPTER 2

BACKGROUND

2.1 Introduction

Home automation is anything that enables you to use your home's lighting, heating and appliances more conveniently and efficiently. It can be as simple as remote or automatic control of a few lights, or it can be a complete system that controls all major parts of your home, custom set to your own personal preference. [1]

Show the figure 2.1Control HA by Smart Phone. [2]

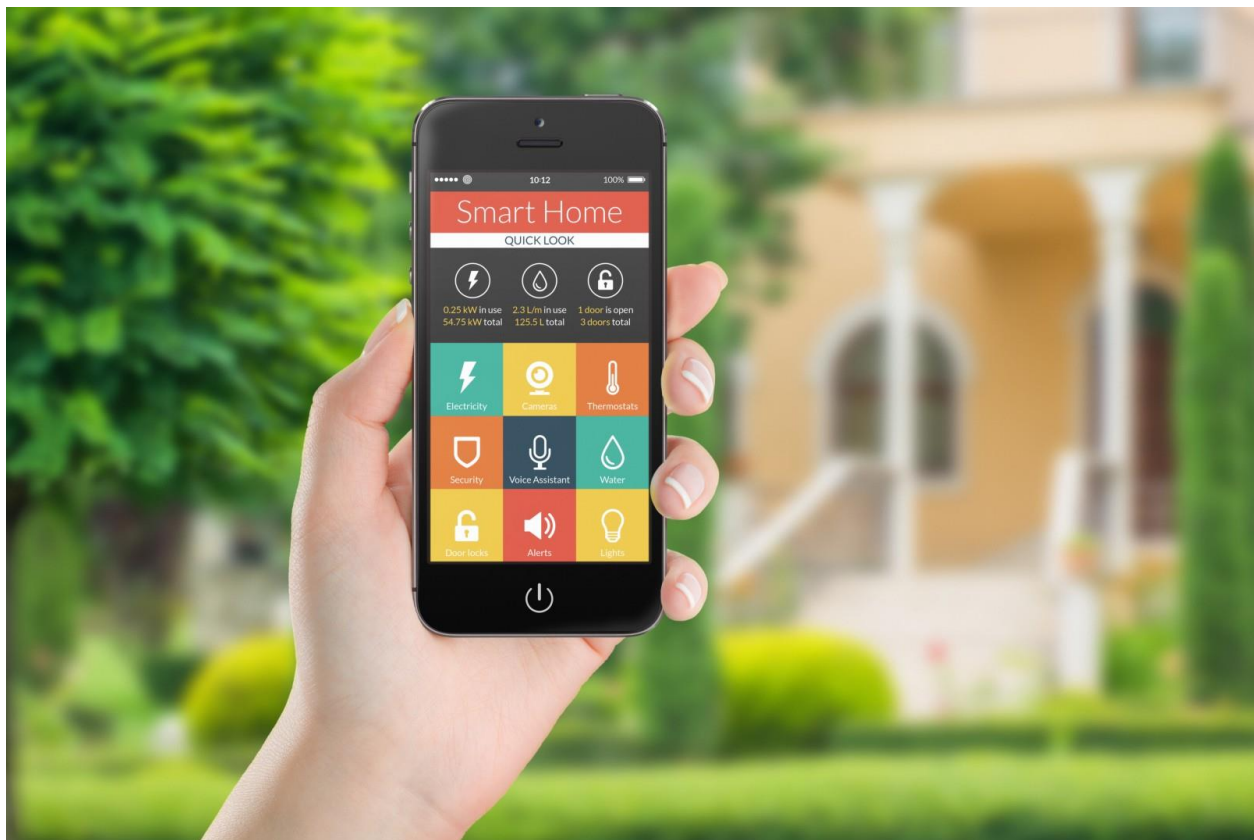


Figure 2.1 Introduction of HA control by Smartphone

2.2 Related Works

Home automation gives you access to control devices in your home from a mobile device anywhere in the world. The term may be used for isolated programmable devices, like thermostats and sprinkler systems, but home automation more accurately describes homes in which nearly everything -- lights, appliances, electrical outlets, heating and cooling systems -- are hooked up to a remotely controllable network. From a home security perspective, this also includes your alarm system, and all of the doors, windows, locks, smoke detectors, surveillance cameras and any other sensors that are linked to it. [3]

2.2.1 Home Automation Developments

Until fairly recently, automated central control of building-wide systems was found only in larger commercial buildings and expensive homes. Typically involving only lighting, heating and cooling systems, building automation rarely provided more than basic control, monitoring and scheduling functions and was accessible only from specific control points within the building itself.

Home automation is a step toward what is referred to as the "Internet of Things," in which everything has an assigned IP address, and can be monitored and accessed remotely.

The first and most obvious beneficiaries of this approach are "smart" devices and appliances that can be connected to a local area network, via Ethernet or Wi-Fi. However, electrical systems and even individual points, like light switches and electrical outlets, were also integrated into home automation networks, and businesses have even explored the potential of IP-based inventory tracking. Although the day is still far off when you'll be able to use your mobile browser to track down a lost sock, home networks are capable of including an increasing number of devices and systems.

2.2.2 Automation

Automation is, unsurprisingly, one of the two main characteristics of home automation. Automation refers to the ability to program and schedule events for the devices on the network. The programming may include time-related commands, such as having your lights turn on or off at specific times each day. It can also include non-scheduled events, such as turning on all the lights in your home when your security system alarm is triggered.

Once you start to understand the possibilities of home automation scheduling, you can come up with any number of useful and creative solutions to make your life better. Is that west-facing window letting in too much light? Plug your motorized blinds into a "smart" outlet and program it to close at noon each day. Do you have someone come by at the same time each day to walk the dog? Program your home automation system to unlock the front door for them, and lock it up again when they're done.

2.2.3 Remote Control

The other main characteristic of cutting-edge home automation is remote monitoring and access. While a limited amount of one-way remote monitoring has been possible for some time, it's only since the rise in smartphones and tablets that we've had the ability to truly connect to our home networks while we're away. With the right home automation system, you can use any Internet-connected device to view and control the system itself and any attached devices.

Even simple notifications can be used to perform many important tasks. You can program your system to send you a text message or email whenever your security system registers a potential problem, from severe weather alerts to motion detector warnings to fire alarms. You can also get notified for more mundane events, such as programming your "smart" front door lock to let you know when your child returns home from school. Show the figure 2.2 in Remote control home.

[4]



Figure 2.2: Remote control home.

2.3 Comparative Studies

Day by day the work and life of human beings are increasingly busy and complicated with the rapid growth in communications and information technology. As the economic expansion is growing rapidly, the standard of living also keeps on rising up and the people are requiring more living functions. The concept of smart home has focused the attention of researchers. A lot of efforts have been done for the development of home automation to control that remotely. Smart Home is an advanced technology to make a house to become intelligent and automated. Usually, that technology has automation systems for lighting, temperature control, security and many other functions. Here in this paper a comparative study has been done on different types of home automation system. We have gone through different techniques for the implementation of smart home such as; phone-based remote controller for home and office automation, PC remote control

of appliances by using telephone lines, Blue-tooth wireless technology based home automation, internet based wireless home automation system, remote home automation monitoring using mobile through spoken commands, GSM-based remote sensing and control system using FPGA, GSM-Bluetooth based remote monitoring and control system with automatic light controller. [5]

2.4 Scope of the Problem

Home automation devices typically don't solve any problems by itself, because most of them are usually single purpose devices. However, when it comes to a home automation system that connects different devices and processes the data from each one, it's a different story.

Just having smart devices installed does not necessarily mean you've got a smart home. It's what you do with this system, what you teach and program it to do and it takes some efforts and creative thinking to get good results. Ability to use your cell phone to view camera footage, unlock your door or turn lights on/off are just some basic connected home features. Teaching your home to react and adjust based on your preference is where the true potential is.

A basic home automation solves many simple problems effectively, from saving energy easily, to removing the possibility of being locked out by losing a physical key, from checking if you had locked your door or turned that appliance off after you actually leave, to informing you about the foot traffic on your porch when you're not home, - you name it.

The true potential though is in discovering the problems that you may not even think are there and solving them for you with the help of Machine Learning.

Think about the enormous success of Nest thermostat. With programmable thermostats before Nest, a person first had to track their own habits for some time to later implement the rules for automating their climate control to fit their habits. That is a highly manual process! Nest learns by itself suggesting and implementing these rules on your behalf. Continuous optimization was not even a problem, you just kept your thermostat always on and heated/or cooled your house whether it was needed or not, wasting the energy and money. [6]

2.5 Challenges

Manual thermostats, and dial-up connections that take too long to open a single email. With the available of reliable broadband connection, WiFi-connected gadgets, and smartphones that house every app that you need to control just about any device, smart homes are now easier to build.

With this technology, you can turn on or off your lights in the house or close the garage door wherever you are in the world. All you need is open an app in your smartphone and click few buttons.

Although smart homes offer a number of benefits, they also present challenges. For them to be efficient, it is important that you have a highly reliable internet connection. If your WiFi is down and you need to open the door to grant access to your kids, for example, while you are in the office, they might be sitting on the front lawn for quite sometime. Also, smart homes are vulnerable to hackers who can hack into your gadgets and gather information that they can use to harm or extort money from you.

Further, these systems can be extremely expensive and learning how to use them could be a huge challenge, especially for older users who are not tech-savvy. [7]

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Business Process Modeling

First of all you need to know about the home automation market insights. Get a industry reports which will help you to obtain clarity about their business environment and enable them to undertake strategic growth initiatives

The global home automation market is expected to reach USD 39.88 billion by 2024, driven by rising necessity of consumers for protection against fire and break-ins. Availability of automated systems that can be operated over high-speed Wi-Fi, powerful smart phone ubiquitous, and growing popularity of Internet-connectable gadgets is expected to drive market growth. Moreover, reduced energy consumption and availability of a broad range of products is anticipated to boost the home automation market. [8] Show the figure 3.1 in Global HA marketing chat.

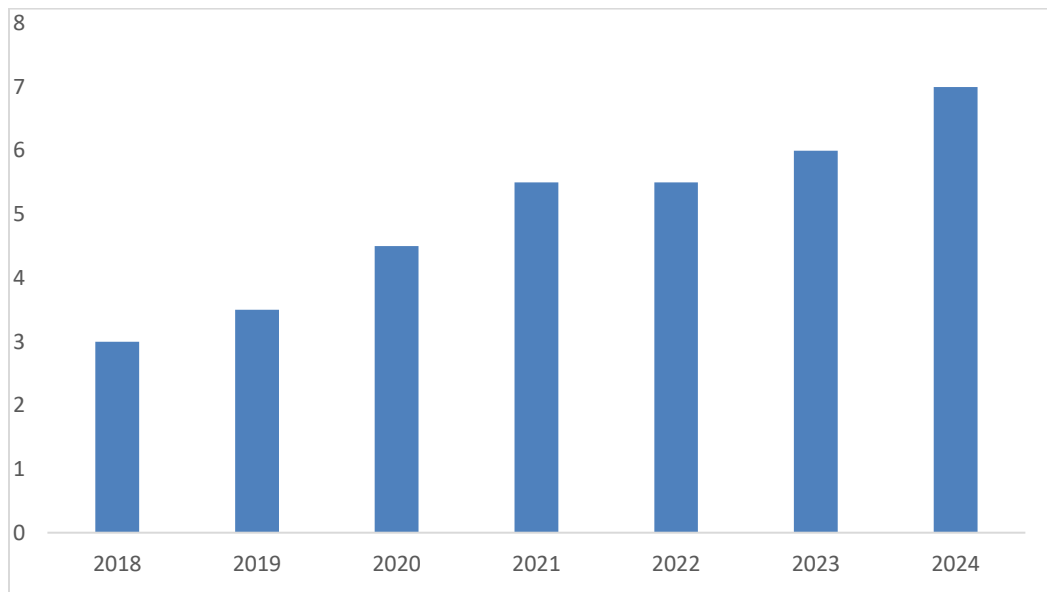


Figure 3.1: Global HA marketing Chat

3.1.1 From business field, I'd say

Understand the new tech and be up to date with all the trends. Be up to date.

- Goal a customer: today Smart Homes are not just to the top income in the country. It now is a reality and you can definitely goal middle class.
- Like an equipment to work that is not too complex, because on your instruction curve you can screw up with your customers and it will not be good for your business' image. Do a training! And keep all the data in a safe place to use it in the long term.
- Like a technology that shows your differential for the end-consumer but that is also good for you to save time as doing remote maintenance and so on.
- Choose technologies that are already in the market but not the ones that are saturated, because if so, all your competitors will work with the same thing as you. This way your competition will be stronger than if you have something different. Be different.[9]

This section of the report explains about what are we going to do and how are we going to do it. We will be following incremental improved model for the completion of this project which is discussed below briefly.

3.2 Incremental development model

Incremental development is founding on the idea of developing initial implementation exposing this to user comment and evolving through several version until a complete system has been develop. It interleaves the activity of specification development and validation. Development as a series of version with each version adding functionalities to the previous one. Show the figure 3.1 (Incremental development model).

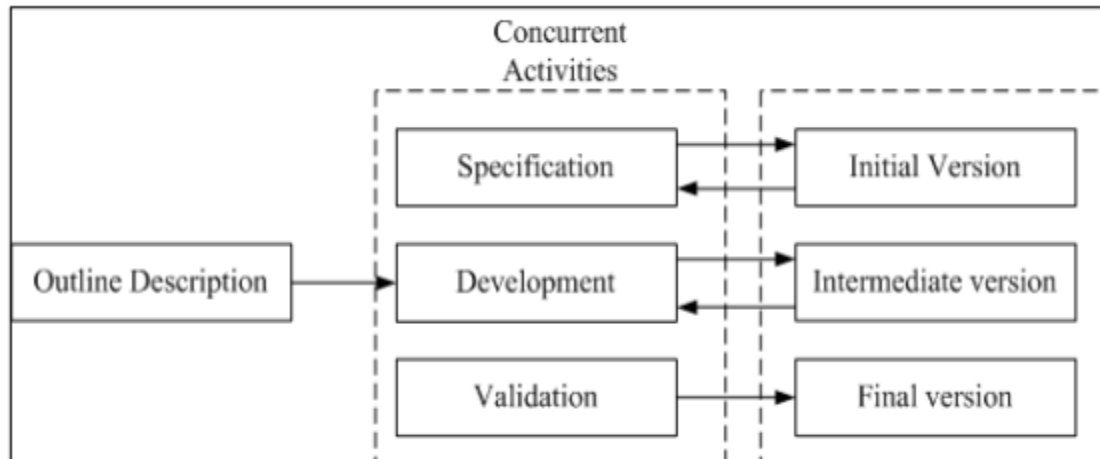


Figure 3.2: Screen shot Incremental development model

We have closely followed this model of software development in our project. As the requirements change or new features are to be added to enhance the functionality as a whole, we integrate them as they come up. As for the hardware aspect of the project, there is limited flexibility in design and implementation. We cannot go on producing and then redesigning the end products upon changes or failures, so we model the complete design conceptually in diagrams plus in temporary, easy to integrate and disintegrate bread boards.

Version 1.0

At first, we developed an app with basic facility of making Http requests to the local Apache server hosted on the PC. This version could make changes to the MySQL database on the server.

Version 1.1

Next, we uploaded and hosted the MySQL database on the Apache server on the Raspberry Pi. And, both android app and Raspberry pi were connected over a LAN. Further, server script was coded on the Raspberry pi to react to the changes made on MySQL database.

Version 1.2

After that, we integrated the live streaming part to the android app and also on the Raspberry pi to capture and stream live video to the YouTube server. Similarly, we designed and fabricated PCB to interface Raspberry pi with AC appliances.

Final Version

After all these intermediate version, at last, the final version of system was developed. This version facilitated the database on the cloud and both android app and Raspberry pi could communicate with each other over the internet. Hence, android app facilitated remote controlling of appliances with live video streaming.

3.3 Use Case Diagram

Show the figure 3.3 Use case Diagram of Home Automation

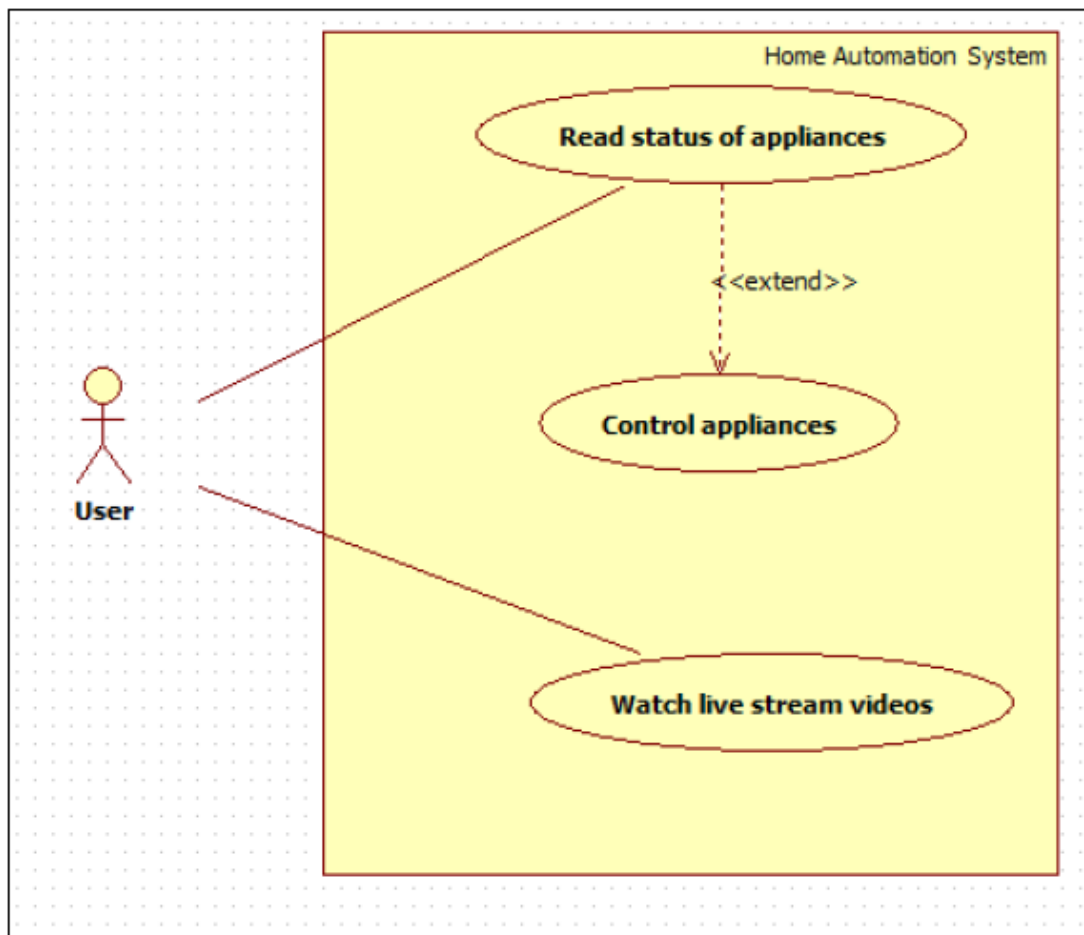


Figure 3.3: Screen shot Use Case Diagram of Home Automation

In our system, user acts as a primary actor who can read status of appliances either in "ON" state or "OFF" state through the database. Further, the user may change the state of appliances and control them according to the need by sending the status signals to the database and raspberry pi gets access to the database and send control signals to the appliances. Also watching the live stream video can be done by the user through the YouTube stream server whenever required

3.4 Class Diagram

Show the figure 3.4 Class Diagram of Home Automation

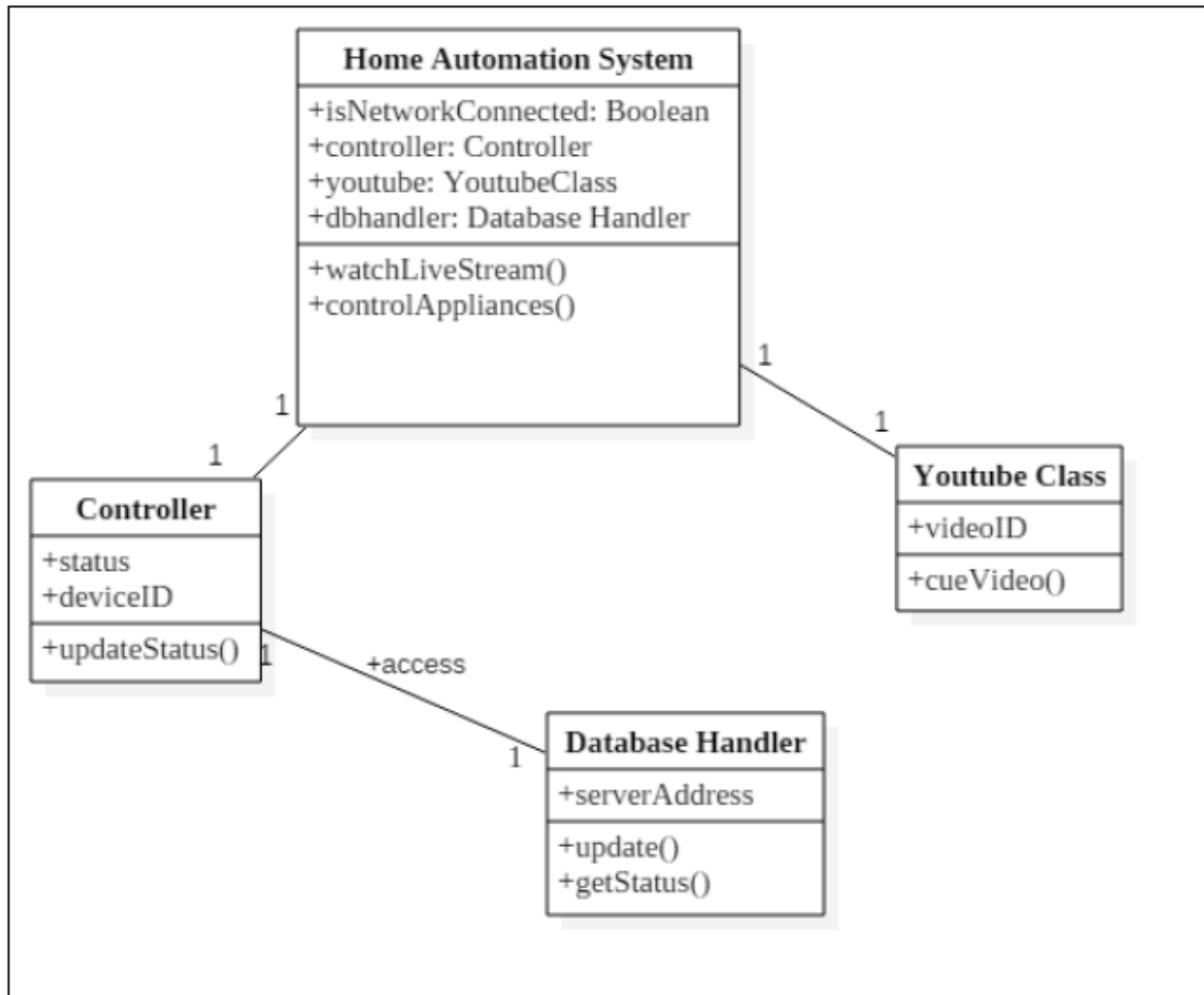


Figure 3.4: Screen shot of Class Diagram of Home Automation

3.5 Activity Diagram

The Activity diagram below shows the flow of activities or actions that occur when user tries to interact with the system and tries to access the functionalities provided by the system. Show the figure 3.5 Activity Diagram of Home Automation

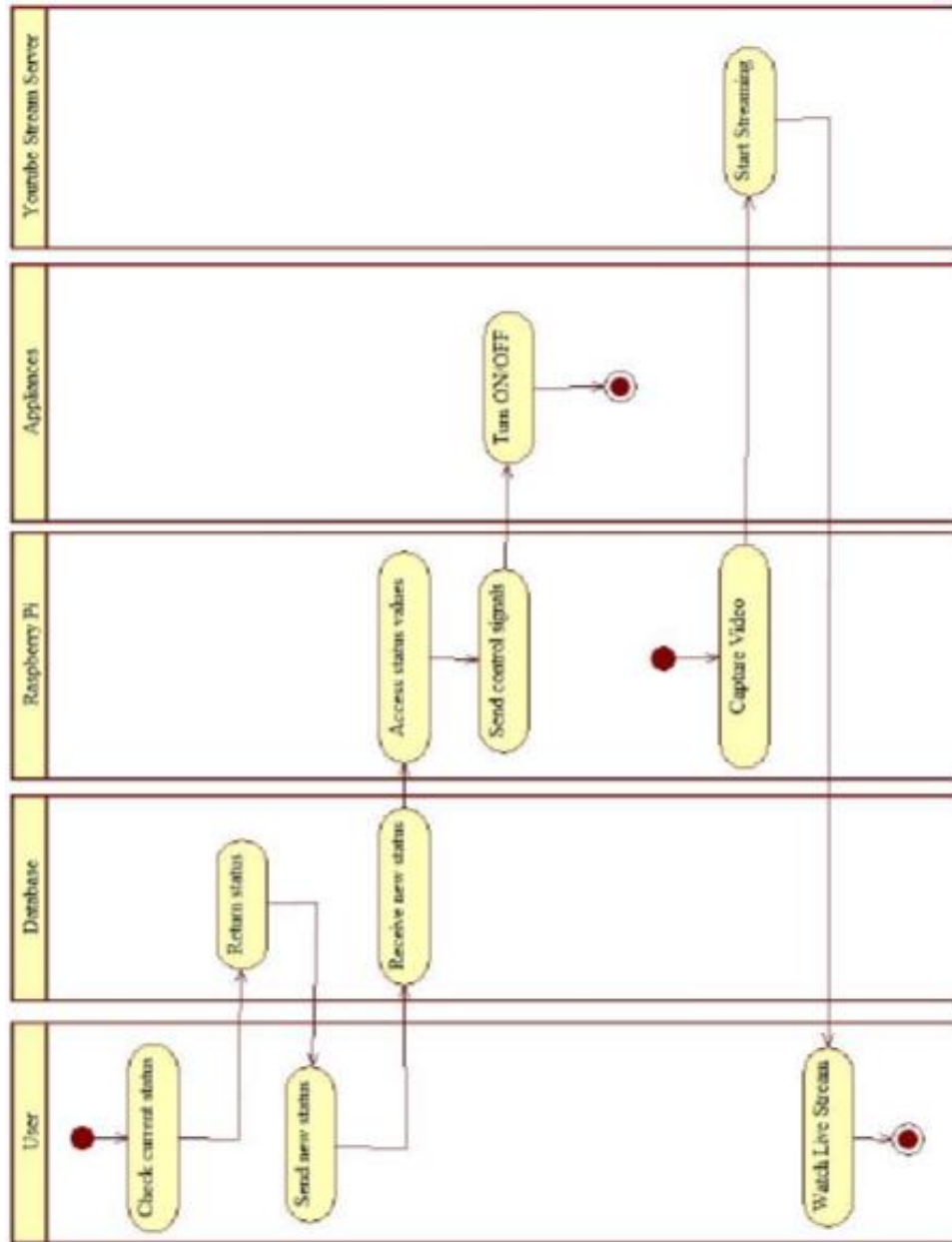


Figure 3.5: Screen shot of Activity Diagram of Home Automation System

3.6 Sequence Diagram

Show the figure 3.6 Sequence Diagram of Home Automation

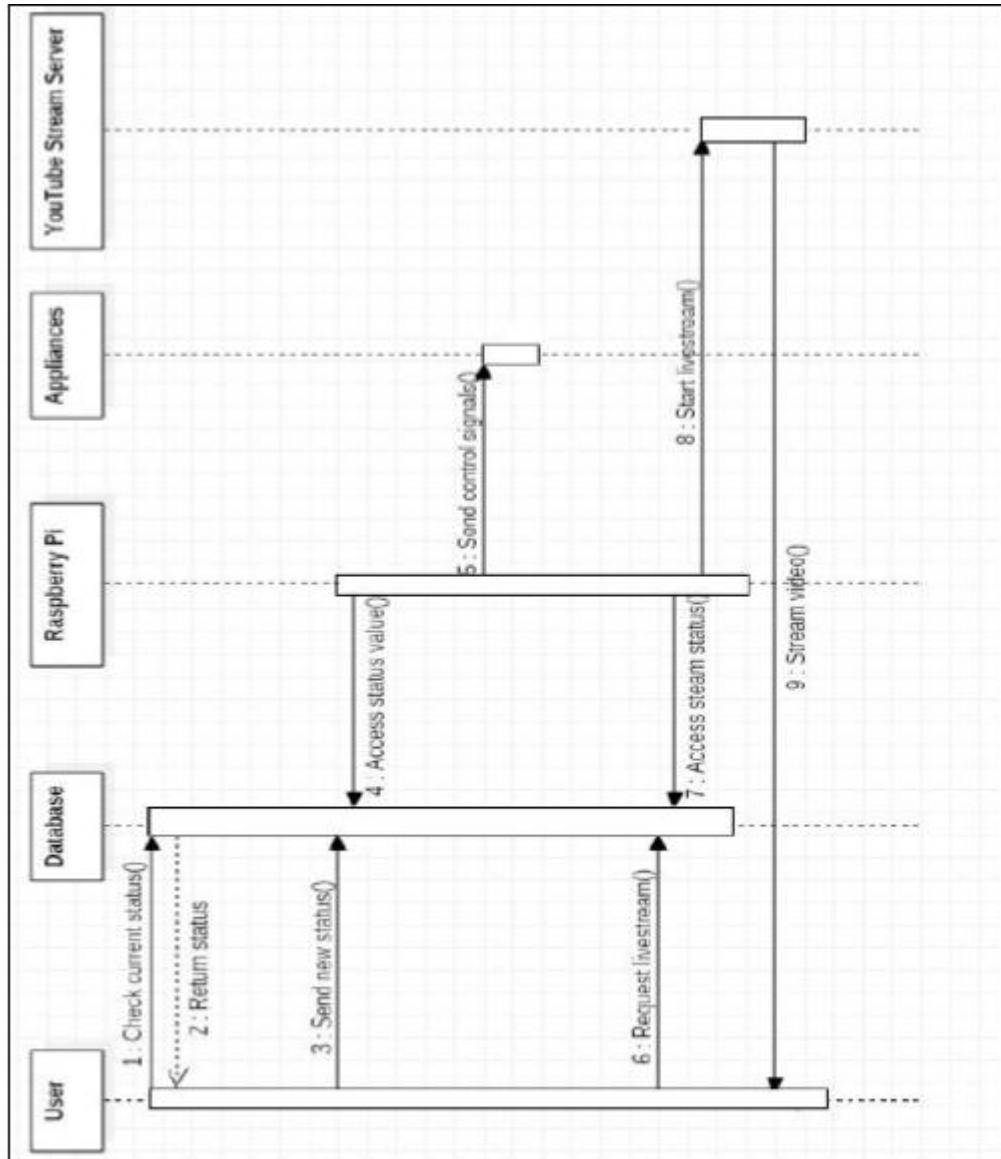


Figure 3.6: Sequence Diagram of Home Automation System

First of all, the user checks the current status of home appliances in the database and then the user can send new status for controlling appliances to the database. Raspberry pi continuously checks the status values in the database and as soon as new status gets stored in the database, the pi sends control signals to the concerned appliances. Further, required for monitoring purpo.

3.7 Working

Show the figure 3.7 Block Diagram of Home Automation

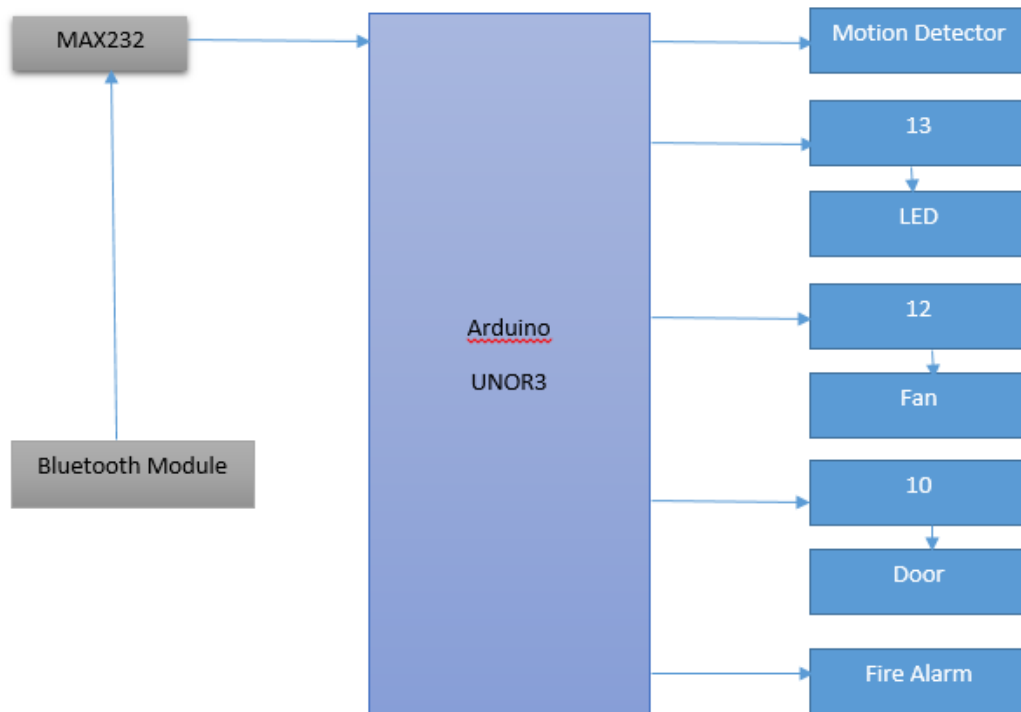


Figure 3.7: Block Diagram of Home Automation System

The android OS provides the flexibility of using the open source. The inbuilt sensors can be accessed easily. An application with the feature to control the home appliances and watch the live stream of the site for monitoring purposes is developed. Android Phone acts as a client and data are sent via sockets programming. The app has two basic modes: control mode and video streaming mode. Control mode uses the toggle buttons that are used to control the home appliances. The toggle button sends the status of the switch. Video streaming mode shows the live stream of the room. The captured video is streamed on the android application.

All the devices are connected to a common network either through LAN or Internet. Smartphone, raspberry pi and camera are connected to the common network. Router is used to create a common network. Raspberry pi is used to maintain the web server. The pi collects the data, analyses it and further activates GPIO pins as necessary. The GPIO pins of raspberry pi are connected to the relay. Relay switch are used to connect the home appliances.

3.8 Hardware Description

The major hardware required for this project are Raspberry Pi, camera module, router, android phone and the power strip circuit. Raspberry pi is the central part of the whole system and pretty much acts at the core processing and control system. The camera module is used to capture video and stream it online. Likewise, router is used to create a LAN, which connects pi and the android phone to a common network. Similarly, android phone is necessary to run the android app and finally power strip connects the electrical appliances to the electronic control logic of the system. The power strip is designed on a PCB and it contains various electronic elements like capacitors, resistors, LEDs and relays. One end of the power strip is connected to the electronic logic part of the raspberry pi while next end to the electrical home appliances. So, basically it controls the home appliances based on the logic of GPIO pins of pi. Show the figure 3.8 Block Diagram of the power strip.

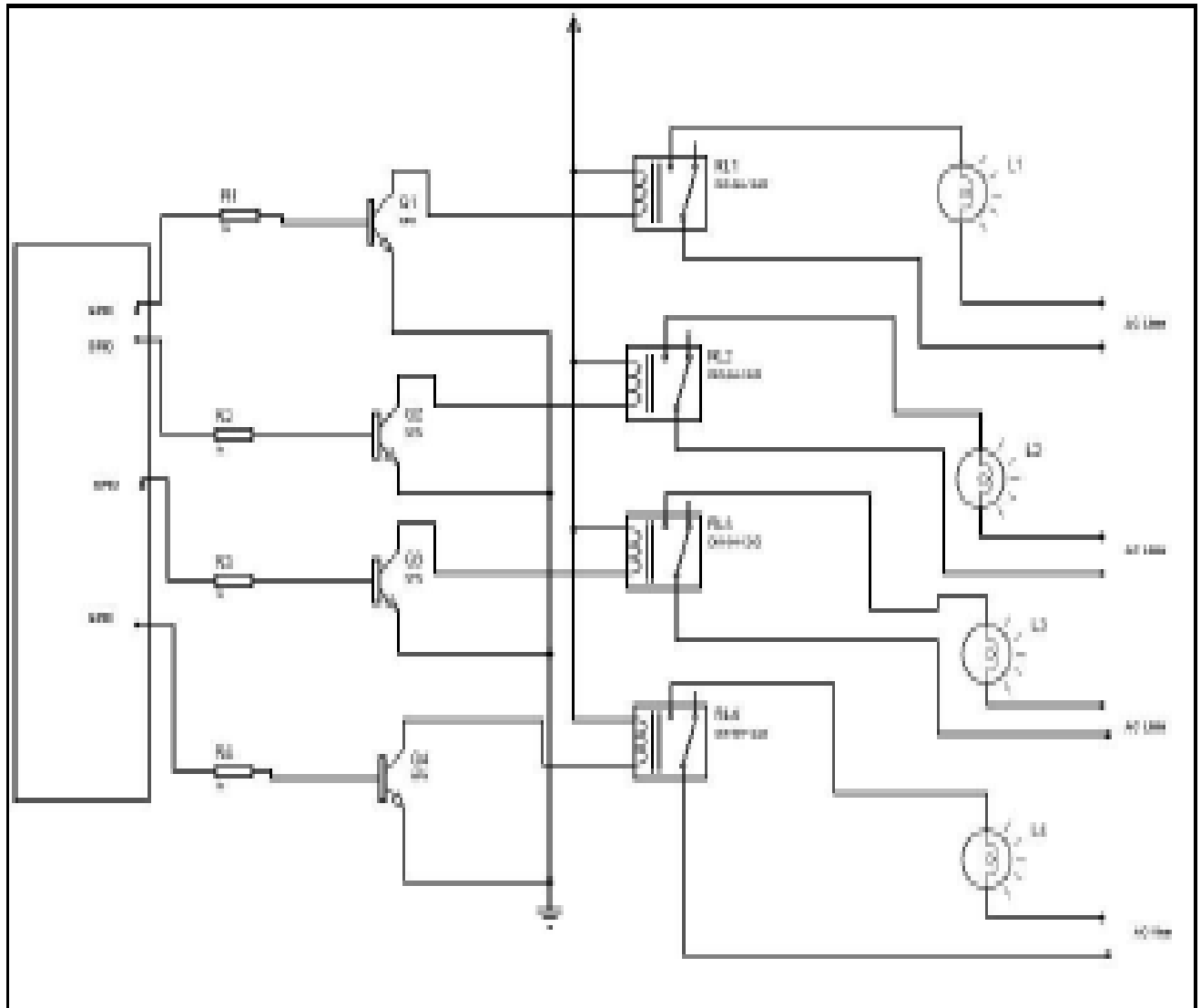


Figure 3.8: Block Diagram of the power strip

CHAPTER 4

DESIGN SPECIFICATION

4.1 Front- End Design

Figure 4.1 shown the Front end design of Home Automation. Figure 4.1 (a) show the simulation & figure 4.1(b) show the front design.

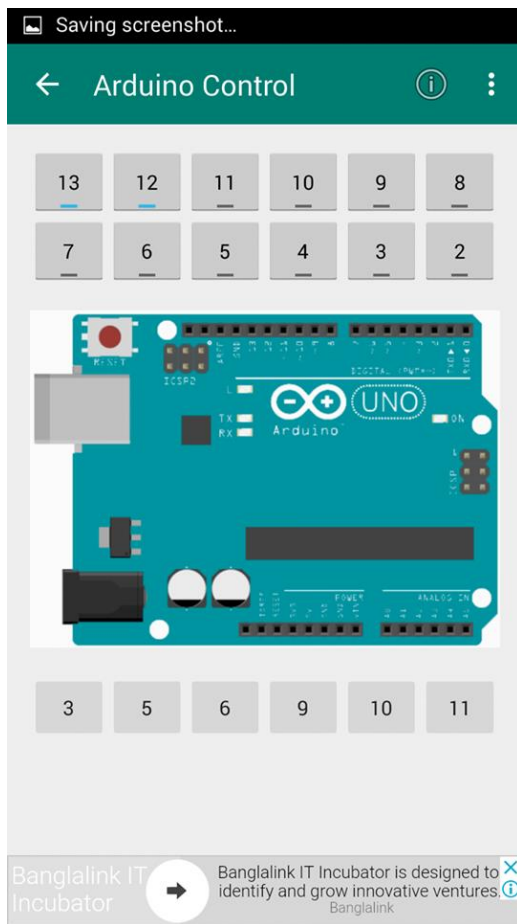


Fig 4.1(a)

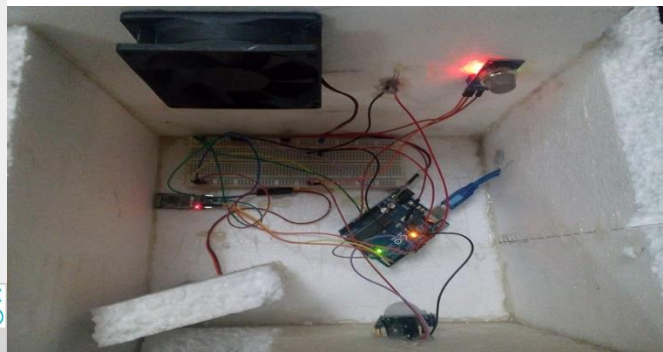


Fig 4.1(b)

Figure 4.1: Design of Front End

Using Transformer, Rectifier, Regulator, Bluetooth Device, Arduino programming Language for the front end design.

The push buttons of loads or home appliances are interfaced to 8051 series microcontroller through which the command signals transmitted through RF transmitter after encoding command signals. The RF transmitter end is an RF remote can be used by the user as a remote control for operating home appliances. The receiver end consists of the RF receiver circuit which consists of a decoder to decode the encoded command signals received from the transmitter. The decoded signals are fed to the microcontroller and then the commands are sent to operate loads through Opto-Isolators.

4.2 Back-end Design

Figure 4.2 shown the back-end Design.

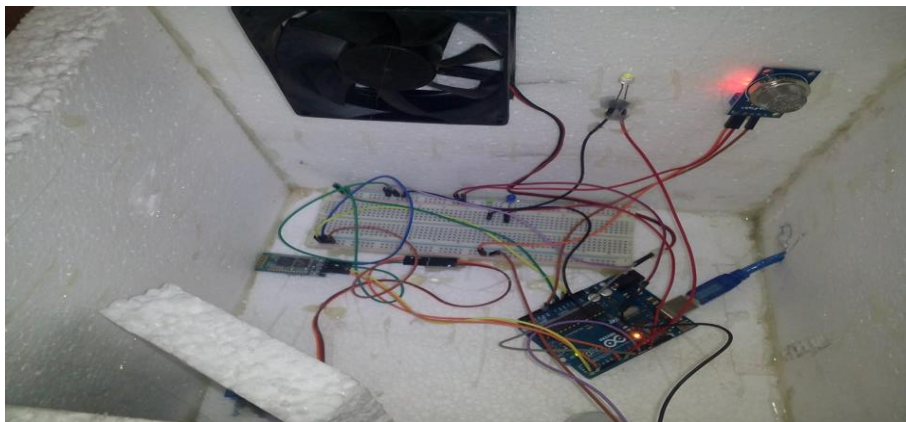


Figure 4.2: Back-end Design

4.3 Implementation Requirements

Arduino

For making the project (Home Automation System) must be needed an arduino board. **Arduino** is an open source computer hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world.

Android App

Java Programming Language

Transformer

Bluetooth module

Arduino Programming Language C

Rectifier

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of Front-end Design

Show the figure 5.1 present in my project Front end design

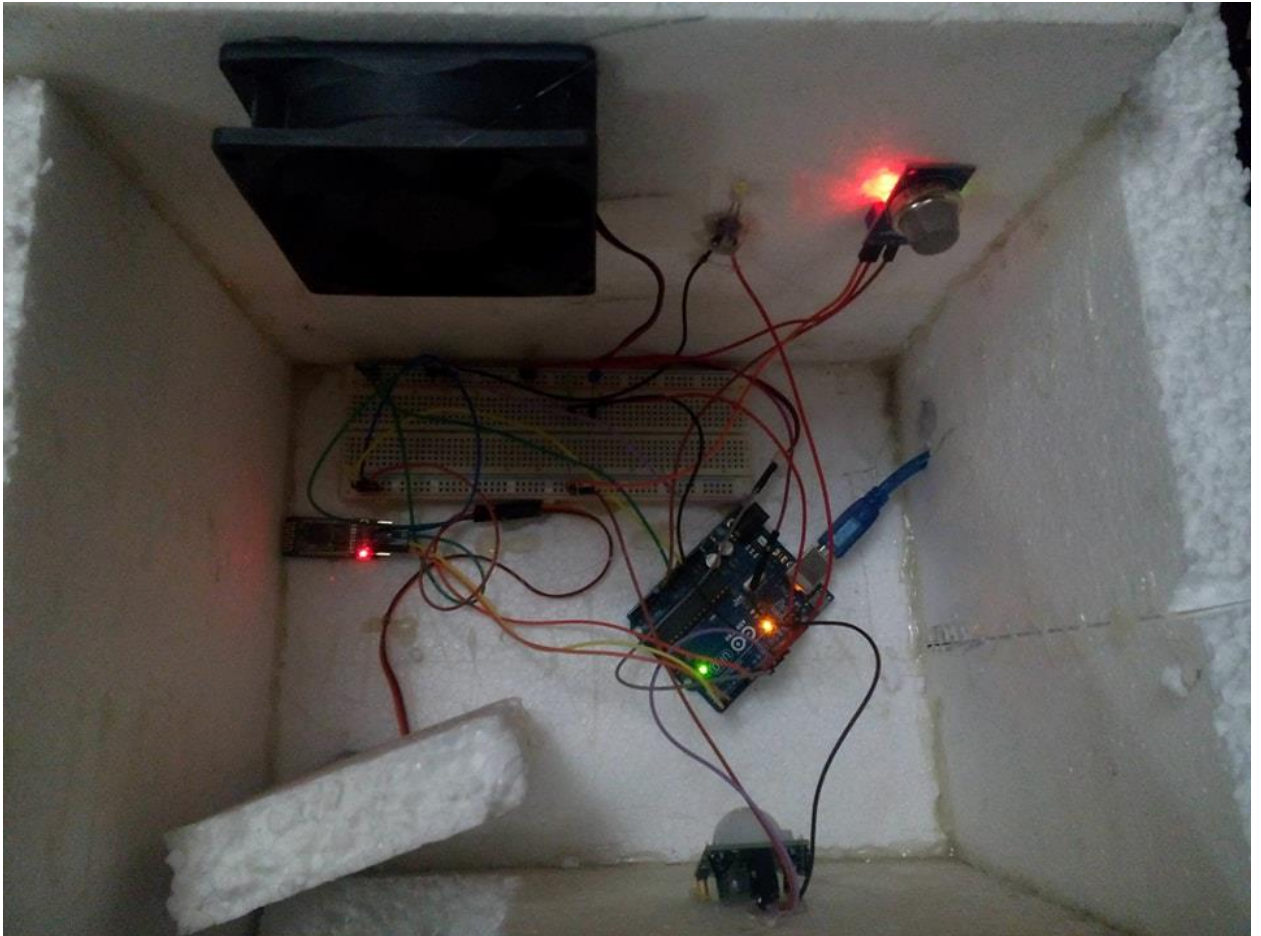


Figure 5.1: Front-end Design

Most of the hardware components are modules by the virtue of the integrated design and development adopted for the work. Therefore, standards data bus and jumper wires are used in routing all the network paths for the embedded hardware. Also, at each stage of construction, the modules were tested and each was confirmed to work as required independently as well as

conjointly. There are two major pieces of software in this project. First one is the android application, which is front end and next is the server side software running on the software.

Android Studio

Android Studio is the comprehensive IDE for the android application development by Google. We developed our android app entirely in android studio.

5.2 Procedures

In this section of the report, we discuss how we achieved the aforementioned targets

For setting up YouTube live stream

We created a YouTube account and using live streaming option got a private key and the server address to which the video is to be streamed. This combination is later supplied to the Ffmpeg encoder to start the streaming.

For the designing of android application

We used the Android Studio IDE for the design and development of android application which is used to communicate with the Raspberry Pi and control the home appliances. Further, it streams the live video feed from the raspberry pi camera using YouTube API. This process involves the layout design of the app to give the look and feel of the android app and the coding part that does the actual task behind the scene in the background.

5.3 Testing Implementation

This figure only can show the testing time. When I set my project then my project can only mood off. Figure 5.3(a) shown the testing picture & the 5.3(b) figure shown the code run.



Figure 5.3: Project testing.

5.4 Test Results and Reports

The final outcome of this project is a prototype for a simple home automation system which can control home AC appliances with a touch of a finger and is equally capable of monitoring with live stream video feed of the site. On the front end, there is an android app to control the home appliances and PCB board to which a number of home appliances are connected. Figure 5.4(a) shown the output result & figure 5.4(b) , 5.4(c) shown the Android app home page.

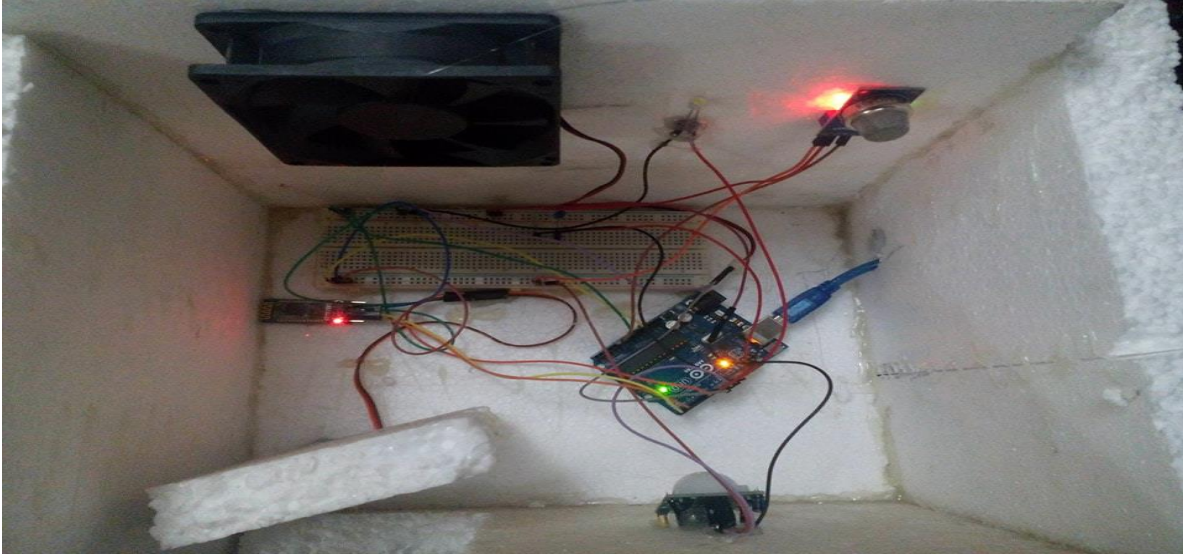


Figure 5.4(a): Output result.

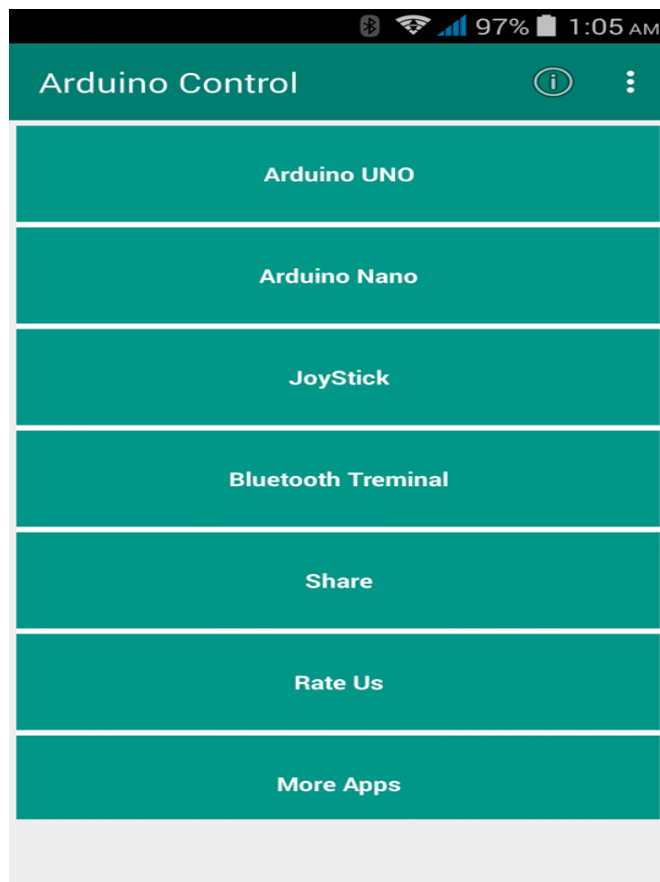


Figure 5.4(b) Android home page

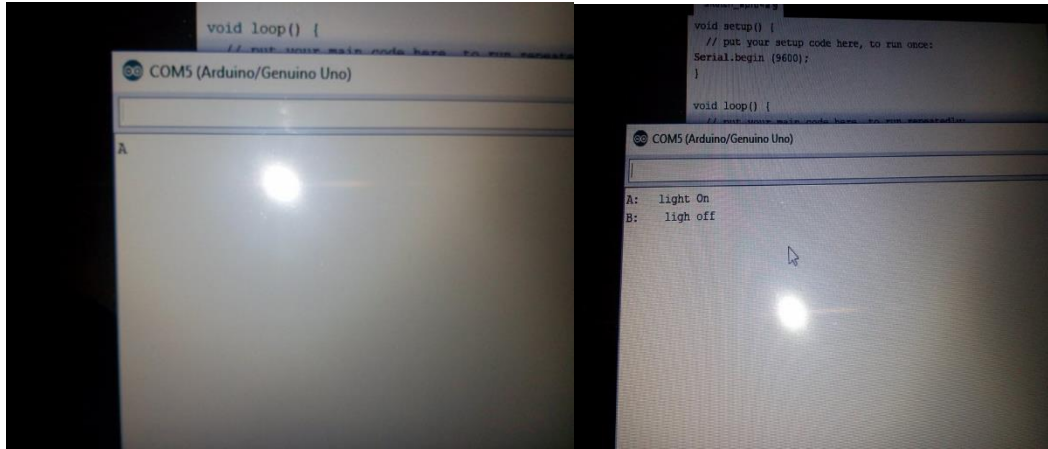


Figure 5.4 (c) Test Result & Code run result.

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Discussion

The final outcome of this project is a prototype for a simple home automation system which can control home AC appliances with a touch of a finger and is equally capable of monitoring with live stream video feed of the site. On the front end, there is an android app to control the home appliances and PCB board to which a number of home appliances are connected. Then on the backend, there is raspberry which has been programmed to control the status of GPIO pins and thereby controlling the appliances, and also capture video using camera module and stream it live to YouTube server.

6.2 Conclusion

Hence, the idea to create a fully working home automation system with facility to control and monitor appliances has been finally realized. The output of this project is an array of home appliances that are controlled over the smartphone with connection to Bluetooth module. This project is a successful outcome of continuous and tireless effort from all the project members, supervisors, college faculty, colleagues and other helping hands. This project has been a really great experience and opportunity to learn and to experiment. Moreover, the authors got the chance to closely experiment and learn about what goes into designing and developing home automation systems. We are very much delighted that we explored this topic as our major project title and in a way, created a version of home automation system of our own, and to be closely related with the technology that is of a great interest of study and research today and is sure to revolutionize the way of living of people in the days to come.

6.3 Future Scope

By interfacing various sorts of sensors, we can program the automatic controlling of the appliances. As for example, using temperature sensors to log the current temperature of a room, we can control the automatic turning ON/OFF of the heater or fan. Likewise, for the continuous

streaming of video, we can set up our own video server. This is surely to cost a lot. We could also interface Arduino to raspberry pi so that we can increase the number of appliances that can be controlled remotely.

As per our survey, there exist many systems that can control home appliances using android based phones/tablets. Each system has its unique features. Currently certain companies are officially registered and are working to provide better home automation system features. Following models describes the work being performed by others.

N. Sriskanthan [10] explained the model for home automation using Bluetooth via PC. But unfortunately the system lacks to support mobile technology.

Muhammad Izhar Ramli [11] designed a prototype electrical device control system using Web. They also set the server with auto restart if the server condition is currently down.

Hasan [10] has developed a telephone and PIC remote controlled device for controlling the devices pin check algorithm has been introduced where it was with cable network but not wireless communication. Amul Jadhav [12] developed an application in a universal XML format which can be easily ported to any other mobile devices rather than targeting a single platform.

Pratik Gadtaula of Telemark University College, Faculty of Technology has done a Master's thesis on "Home Automation" [13].

6.4 Budget Analysis

The following section consists of the budget analysis of the project, that is, the total budget for the development of the project and the operational and maintenance cost that follows after the implementation of the project.

6.5 Development cost

The development cost can be categorized into software and hardware development cost.

Software design and development cost:

Development cost = tk.100 per hour

Working hours = 5 hrs per day

Total working days = 30 days (1 months)

Total cost = tk.100*150 = tk.15, 000

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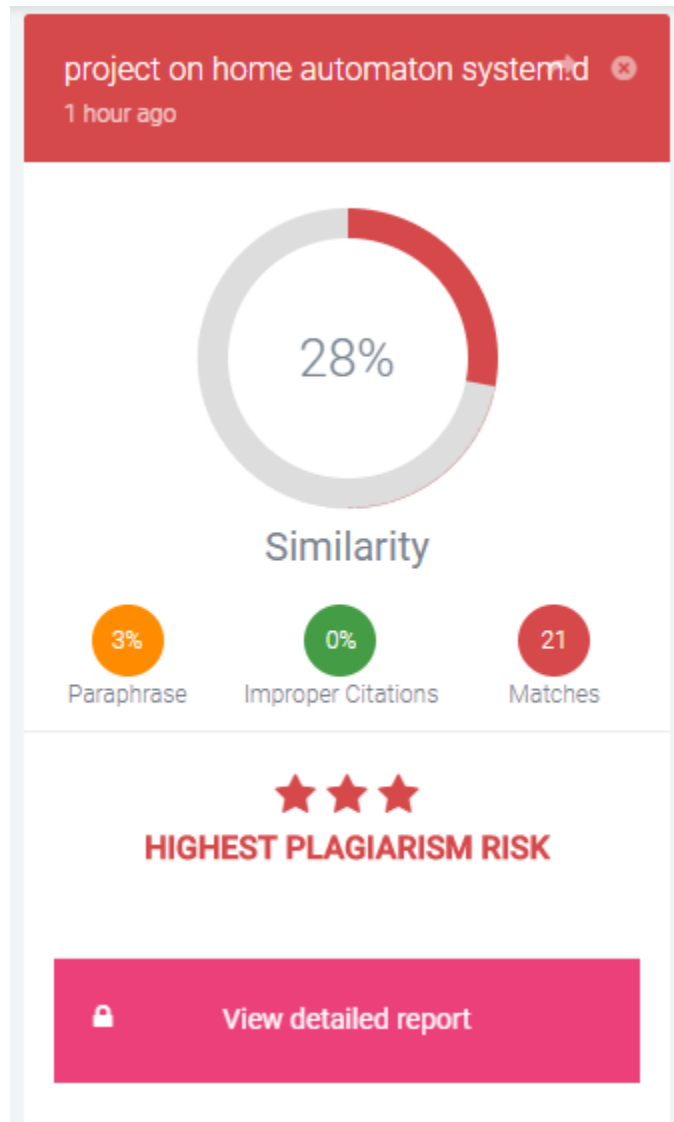


Figure6.0: A Screen shot of Plagiarism