

**SMART HOME AUTOMATION**

**BY**

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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 “**Smart Home Automation**”, submitted by Ayon Dey, ID No: 163-15-8284 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 and approved as to its style and contents. The presentation has been held on 14-09-2019.

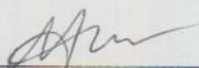
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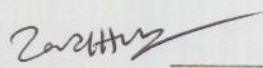


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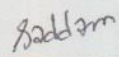


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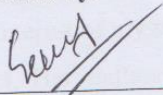
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## DECLARATION

We hereby declare that, this project has been done by me under the Co-supervisor supervision of **Md. Sazzadur Ahamed, Senior 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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## **ABSTRACT**

In this project presents style of good Smart Home Automation system (SHAS) with minimum value cost and wireless system. Using this system, it is meant to help and supply support to meet the wants of older also for everybody reception. Besides, the concept of good home system improves the living standard and quality. Two modes: switch mode and voice mode are engaged to manage the home appliances. To supply remote access control most system, use wireless technology using smart phone. With low voltage activating techniques it provides additional safety management on switch and the look remains the present electrical switches. The switches techniques are synchronal and told the system where each program indicates the period of time existing switches standing. The project supposed to manage electrical gadgets and devices and in every house with comparatively cheap style, safe installation and easy interface [1].

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

The “Smart Home Automation” thought has continued to exist for many years. “Smart Home” or “Intelligent Home” followed and has been begin the thought of networking appliances within the home. Smart Home Automation Systems (SHASs) provides a good investigation possibility in making new aspects in engineering and computing. SHASs consist of central regulation of light, fan, air conditioning, security locks of doors and some other methods, to improved comfort, generate energy power, and security system. SHASs changing the style now a day’s and become popular very fast in this rising market. In addition, customers, particularly the disabled and elderly because of their quality and price, don't forever settle for these systems. Due to high improvement of wireless system and many different connections square measure introduced like WIFI, Bluetooth and GSM. They have different requirements and specifications [3]. From all of these common wireless connections, for our project Wi-Fi is being selected for its special features. Besides, in all most all laptop, smart phone or in notebook has intrinsic Wi-Fi adapter and Wi-Fi is almost available now and this built in feature will reduce the price and availability of this project. In this project used Node MCU, Arduino UNO forwards the look of Smart Home Automation. Victimization Node MCU, Arduino UNO and its microcontroller pins wherever another elements and devices can be connected. Pins registers of Node MCU, Arduino UNO are used for output functions. We’ve designed an influence strip which will be simply attached with Pins of the Node MCU, Arduino UNO. All the dwelling appliances are connected to the I/O ports of Node MCU, Arduino UNO beside the ability strip and their standing is passed to the Node MCU, Arduino UNO. The running Operating system golem in associate cell phone connected to a system will contact the standing of house appliances via an application. It presents the look and implementation of an Automation system which will monitor and manage home appliances via golem phone [1] [3] [4].

## 1.2 Motivation of work

Smart technology has junction rectifier to the property of nearly everything in our daily lives. Improve technologies and growing time the continuous integration of web features in all electronic devices is must. The connectivity of device is known as “The Internet of Things” (IoT). Faster growth of technology, and different corporations have realized the need of extending their merchandise into the IoT, but present solutions are designed with specific technologies so the novelty of smart devices rather than given serious consideration [4]. There presents condition to provide evidence the worth of sensible equipment and supply the motivation for a quicker merge into the IoT given its potential to boost our lives.

## 1.3 Objectives of the Project:

Android Application and Wireless based smart home automation system should be ready to handle the dwelling appliances in a effective and efficient way.

**Control and Manage Appliances using switch or voice commands:** It develops an application that has the features of switches and voice modes. Switch Mode or Voice Mode is often management the switches of home appliances.

**Secured Connection of Node MCU and Arduino UNO with Application:** Using some secure protocols of Wi-Fi so that other devices cannot control the appliances. Option a secure connection with Wi-Fi and GSM.

**Run by any devices (Android, IOS, and Computer) with Wi-Fi:** To house appliances are adaptable very fast from any places, run quickly and can manage the house from remote locations.

**The extended platform for future enhancement:** In this project any features can be added in future and it is highly scalable.

## 1.4 Expected Outcome

Expected outcome from this project are given below:

**Safety Issues:** The ability to manage tiny devices using fingerprint from any place provide additional safety in our home.

**Improvement of Life Style:** By persecution good, IoT-enabled Smart Home Automation solutions, it'll enable you to create your home area with less anxiety and lower costs.

**Money Savings:** Saving money are the largest benefits of home automation systems. With the ability of control, the electrical devices whether or not dimming or turning on/off the light or fan on specific time can save the home-owner a good ton of money.

**Time Savings:** We are living in a fast-developing environment so worrying about home is quite waste of time and not feasible now. So, using, Smart Home Automation we can save time without present in our home but take care of everything. We don't have to concern whether the kids closed the door from school or turn on the lights when you get home.

**Convenience:** The ability to control everything together with fingertips is extremely convenient.

## 1.5 Report Layout

The total report arranged in following way:

**Chapter 1:** In this chapter motivation, objectives and the expected outcome of the project are discussed and provide report layout.

**Chapter 2** In this chapter discussed about the background conditions of my project. I also discussed about the related work, Comparative Studies, the scope of the problem, challenges of the project and time scheduling.

**Chapter 3:** In this chapter discussed about all the components used in project like ATmega328 Microcontroller, Relay, Node MCU, Arduino UNO and GSM module.

**Chapter 4:** In this chapter all the system design and diagram are shown such as System Layout, Block Diagram, Schematic Design and Flow Chart.

**Chapter 5:** In this chapter contains the implementation of design and coding test results of the project.

**Chapter 6:** In this chapter discussed about the advantages & limitations about the project.

**Chapter 7:** And finally discussed about the summary, final remarks and further modifications.

## **CHAPTER 2**

### **BACKGROUND**

#### **2.1 Introduction**

Now a day's Home automation system is very popular because it makes life simpler and smarter. Different attempts are made to enrich this arena. Modern technologies are used to make life simpler and easier. And for fulfilling this aim technology-based Smart Home Automation is selected. Internet is now available in almost every corner of the world and this concept arise the term Global Village. People use various devices to access internet. To facilitate this access, we have come forward to establish a system [2].

In this system developed to access and control our home from any place and any time. Wi-Fi is used as a network provider. Here used inverter logic gate to send digital signal to the microcontroller ATmega328. For controlling AC power sources, a Relay is used [2].

#### **2.2 Smart Home Automation**

##### **2.2.1 System of Smart Home Automation**

**Wireless Structures:** Wireless system eliminate the use of traditional cables. Wi-Fi networks are easily compatible with any existing home networks and it is easily compatible with existing home network such as network formed by any personal computer, router or any mobile devices. However, some wireless systems use a different radio frequency for making them incompatible with open networks [2].

##### **2.2.2 Worldwide Smart Home Automation**

Due to high global demand of Smart Home Automation technology is a large Smart Home Automation market already is set up. Revenues earned from shipments of Smart Home Automation systems in Europe and North America will enhance at a compound annual growth rate of 43 percent from US\$ 2.2 billion in 2012 to closely US\$ 12.8 billion in 2017 [2]. This statistical information tells us that automation provides an ample amount of effectiveness in the different sector globally. American Smart Home market also is going to generate a huge amount of revenues incoming in 2020. From different sources of information, it is informed that in 2013 the smart home market revenue was around 7.19 billion U.S.D. but the blessing of automation it will reach about 22.4 billion U.S.D. in ©Daffodil International University

2020 [2].

The main features of Smart Home Automation applications in control of lighting, heating, air-conditioning, safety and security, run entertainment equipment's such as audio devices and others. In current years, automation systems were nourished in residences, shopping malls, skyscrapers, hotels in colorful ways. Some organizations those leads the market of smart home automations are 2GIG Technologies, Siemens AG, Johnson Controls, Honeywell International Inc., I Control Networks Inc., Vantage Controls are leading the market of Smart Home Automation.

### **2.2.3 Scenario of Smart Home Automation in Bangladesh**

In Bangladesh Smart Home Automation still not used in every place compared with other developed countries the ratio of using this system in Bangladesh is very low. It's an emerging technology for Bangladesh perspective. But some offices and organization has started to implement these technologies because it makes our life easier and save our time. For example, Dutch Bangla Bank used an automation system at first in the banking sector in 2003 with the goal to minimize the cost of clients [2]. Besides that, Chittagong custom House Automation project used these technologies. This is high revenue earning sector in Bangladesh. From Chittagong custom House our government earns about BDT 15000+ core as profit each year which is due to automation. By using this project 42 steps long project reduced into 6 steps in data soft and bill of entry cost has waned BDT 180 to BDT 50 [2]. Some companies which provides Smart Home Automation services are AplombTech BD is one of the fastest growing High-Tech Companies in, Ezzy Automations, Bangladesh Automation Solution, Automation Engineering & Controls Limited etc.

### **2.3 Aim and Scope of the Project**

Lots of works have already done in Smart Home Automation. Advancement of technology forces to create new technologies and implanting that in this arena. Smart Home Automation includes implanting it for security purposes, automatic controlling devices [2]. Lowest cost and available device implementation are the aim of this project. To make the project friendly to use an easy interface has introduced. That's why we selected a network system. It can be controlled through anywhere with proper internet access. And it is not quite difficult to manage the whole arrangements.

This SHAs system can be implemented in any institutions like schools, colleges, and universities and offices as well. Because it is quite obvious for people to forget about keeping lights, fans and basic electrical devices off. In this regard, this system supports them to be relieved from such anxieties.

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This way the whole institution space can be brought under automation [2].

## **2.4 Challenges**

### **2.4.1 Hackers Attacks**

This is very common issues of Hacker attacks in digital world. So, this issue must be taken as a serious concern because if hacker attacks in the smart home it may threaten the security and safety of home owner as well as vendor too. Different types of attacks may arise such as, password-based Attacks, eavesdropping, buffer overloading, malicious modifications, denial of services, a man in the middle attack, phishing, etc. which may cause data loss. So, precautions must be taken to save home from any loss.

### **2.4.2 Risk of Data Ownership**

Biometrics is the most popular and trustworthy for authentication and simple security solutions rather than the number of passwords used for managing smart homes. Based on the Intel's security survey 2015, 54 percent opted for fingerprints, 46 percent for voice recognition and 42 percent for eye scans. But despite all, there is decision conflict among data ownership to where should be store data, whether it should store on the local server to get the advantage of locality reference of data or store on a trusted vendor's server to get more security. In both cases, there is a risk of cyber threats. Saving data from hackers is still now not possible properly. So that owners have to take proper action to keep system save by subscribing to a good server security system and stores sensitive data in secure sever or can use the VPN in case use remote server of the vendor.

## **2.5 Time Scheduling**

Analysis	1 month
Design of modules	1 month
Coding	4 months
Testing and Implementation	1 month
Total	7 months

## **CHAPTER 3**

### **COMPONENT USED**

#### **3.1 ATmega328 Microcontroller**

To control the whole system of Smart Home automation here need a microcontroller and, in this project, Atmega328 is selected [5]. This microcontroller is selected for several reasons. It is very popular in electronic fields because of low power consumption (2.7-5.5 V), high performance, easy to understand and simplicity in use. Besides that, it is highly popular and mostly used in Arduino. Furthermore, this device cost is low than compared to other products of this series and its user-friendly features and incredible applications decided to select this to dealing with this project. It is manufactured by Atmel Corporation. Till now, this 8-bit family is dominating 32-bit digital devices. In this mega family, many developments have been upgraded. It is RISC based microcontroller and it executes program 10 times faster than the CISC based Architecture devices [5]. It has 32 KB flash memory and 1 KB EEPROM with maximum 23 I/O pins. Moreover, on-chip debugging can be possible through JTAG [5].

The core combines 32 general-purpose registers with the rich instruction set. These registers are directly connected with ALU (Arithmetic Logic Unit) which allows single instruction executed in 2 independent registers with one clock cycle. With various power saving modes, it can work on mobile embedded system and also used for temperature sensors. To work with this device user, need to give instruction using programming and controller executes the program which is provided by users. This programming can be done in ARDUINO IDE [5].

For providing expediency Atmega328 has an Oscillator embedded in it and users do not need to connect a Crystal Oscillator to generate clock pulse. Additionally, an external clock can be generated for the purpose of the work. Furthermore, in standby mode keeping clock running only, it allows low power consumption. On the other hand, in extended standby mode oscillator and asynchronous counter continues to run. The development tool includes a C compiler. For writing program, AVR STUDIO can be used.



Figure 3.1.1: ATmega328 microcontroller

### 3.1.1 Pin Descriptions

- It has 28 dual in-line package pins and 3 ports (Port A, Port B and Port C) [6].
- It has 8 Pin for analog-to-digital converter operations, The ADC needs its own power supply in order to work. GND pin is for the ground power supply [6]
- It has 3 built-in Timers, two of them are 8 Bit timers at the same time as the third one is 16-Bit Timer [6].
- Input voltage range from 3.3V to 5.5V but normally we use 5V as a standard. Clock speed is 16 MHz
- 2 of the pins are for the crystal oscillator. With external 16MHz the clock is controlled by a Crystal Oscillator.
- **ATmega328P** is used in Arduino Uno boards [6].
- 32kb flash memory where programs are loaded and 0.5 kb is used for boot loader.
- Thousands of applications for ATmega328P such as digital embedded systems, Peripheral Interface system, motor control systems, display units [6].



## ATmega328P-PU

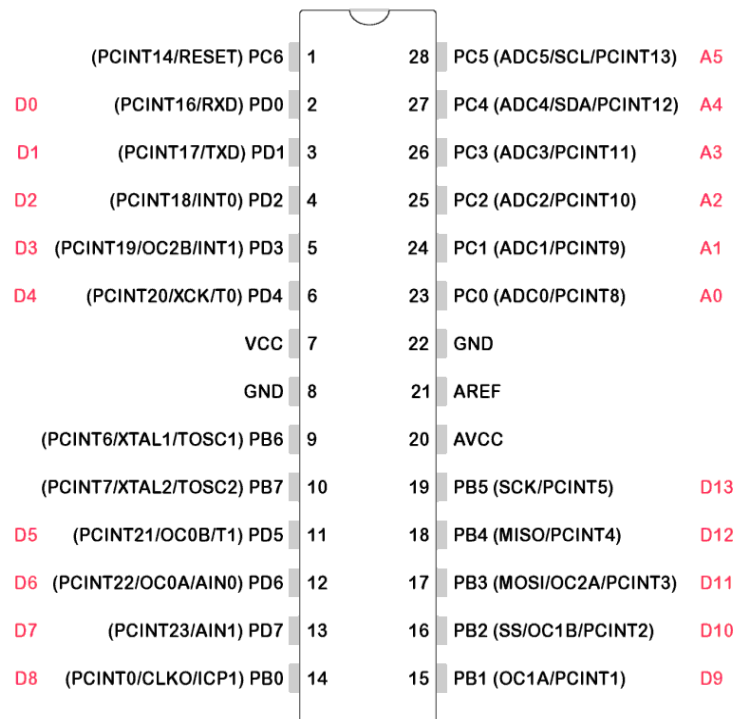


Figure-3.1.1: Pin diagram of ATmega328 microcontroller

### 3.1.2 Features

- Provide high performance and needs low power.
- Improved RISC Architecture which make device faster.
- External interrupt included
- Two modules for data transfer one is USART, and other is Serial Peripheral Interface.
- Total 3 inbuilt timer/counters for real time timer two 8-bit timers and one 16 bit timer
- Analog comparator available on the chip

### 3.1.3 Microcontroller in Project

For facilitating digital input/output ATmega328 have 3 ports. In each port 3 registers are available. One is DDR (Data direction register), another one is port and final one is pin. In our project Port A and Port B is used for incoming and sending signals. For incoming signals DDR, A, Port A and Pin 1, Pin 2 used. On the other hand, for sending signals to the desired circuitry DDR B, Port B and Pin1 is used [6].

### 3.2 Relay

Relay is used to make connection between electronic circuits with electrical circuit because electronic circuits need low voltage to run and electrical circuits need high voltage so Relay works as a switch to control these circuits. Relay means passing something from one source to other [7].



Figure-3.2 Relay

There are many other types of relays which work on different ways such as Electro thermal relay, Electromechanical relay, Solid State relay, Hybrid relay etc.

#### 3.2.1 Operation of Relay

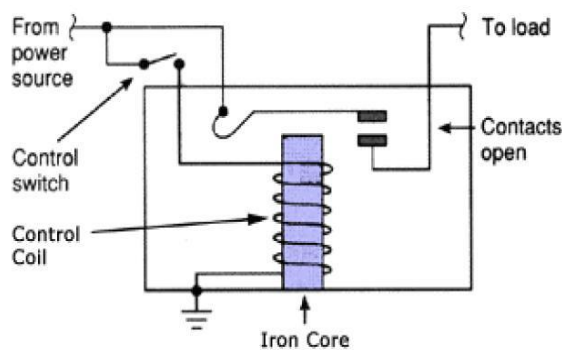


Figure-3.2.1: Working procedure of relay

Basically, a relay switch has two parts input and output, a core with copper windings, a movable armature [8]. The input port has a coil which generates a magnetic field when no voltage is applied to the core, it unable to generate any magnetic field and it doesn't act as a magnet. When current passes throughout the coil it produces a magnetic field that activates the armature. Moreover, changeable contacts either create or smash a connection with a permanent contact. Total arrangement depends upon construction. In contrast, the production part includes three contractors such as normally open (NO), normally closed (NC) and common (COM). The common is connected with normally closed (NC) if there is no input. Relay coil becomes energized when voltage is input. Therefore, normally open (NO) is connected with and COM changes its position. 5 pin relay has one

control circuit and two different current paths [8]. In one path is that when the relay there is no current flow through the coil and in another path is that when the current flowing into the control coil. In this figure when the device has no current flow, there be presents connection between pins 4 and 5. Conversely, when the relay has current flow there has connection between pins 3 and 5 [8].

### 3.2.3 Applications of Relay

- It uses logic functions and supply time delay functions. It can be used to implement Boolean logic.
- To handle high voltage circuits with low voltage signals or to manage high current circuits with the assistance of low current signals relays are used.

### 3.2.4 Relay in Our System

In our system relay needs almost 220V voltage which is really high but relay can make a 5V DC battery circuit to 220V AC main circuit. Therefore, 5V relay is used in our system which provides some extra advantage and more protection than usual relay which has no shield.



Figure- 3.2.4: 5V relay shield

### 3.3 Node MCU

It is an open source IoT platform which referred as a firmware and helps us to model our product.[9]

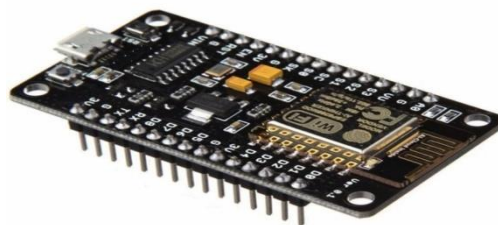


Figure- 3.2.4 Node MCU

### 3.4 Arduino UNO

In some Arduino Uno boards that have a surface mount ATmega328 chip. In this case it is a small square chip soldered on top of the Arduino. Microcontroller is the main part of Arduino and it does all work. When Arduino powered up or reset after programming microcontroller then executes. [10]

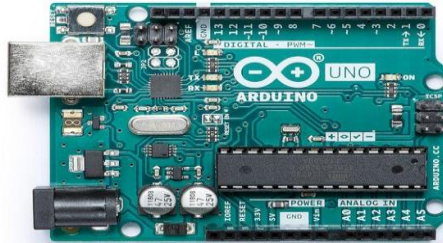


Figure-3.4 Arduino UNO

### 3.5 GSM Module

Global System for Mobile Communication (GSM) is used for mobile communication using SIM card to activate communication with network. The chip which enables this establishment with mobile device and computing devices is called the GSM Module.



Figure-3.5 GSM Module

## CHAPTER 4

### SYSTEM ARCHITECTURE

#### 4.1 System Layout

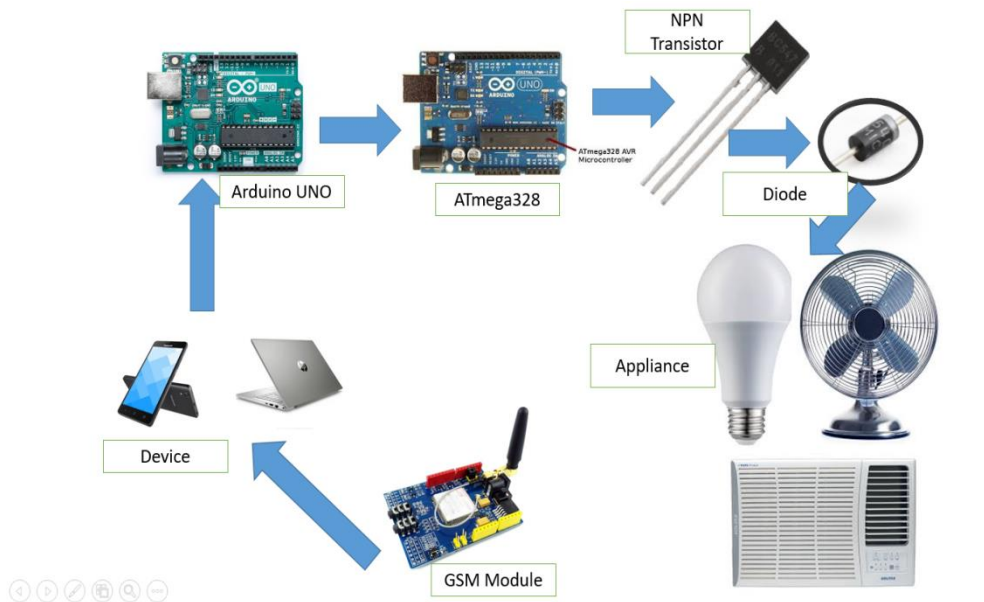


Figure-4.1: System layout [11]

This layout reveals the actual operating of all parts. Basically, this layout shapes the concept of the overall operating system. Here, employing a Mobile / Notebook the information is accessing. Local area network defend is functioning as a network supplier to the circuit. The signal from the information is passing to the circuit through a local area network defend [11]. That signal beside motion detector signals each is processed in the microcontroller. From the microcontroller, the sign goes to NPN semiconductor device. And high current energizes the relay. The semiconductor device additionally works as a switch. The diode is employed to forestall reverse direction current flows [11].

## 4.2 Block Diagram

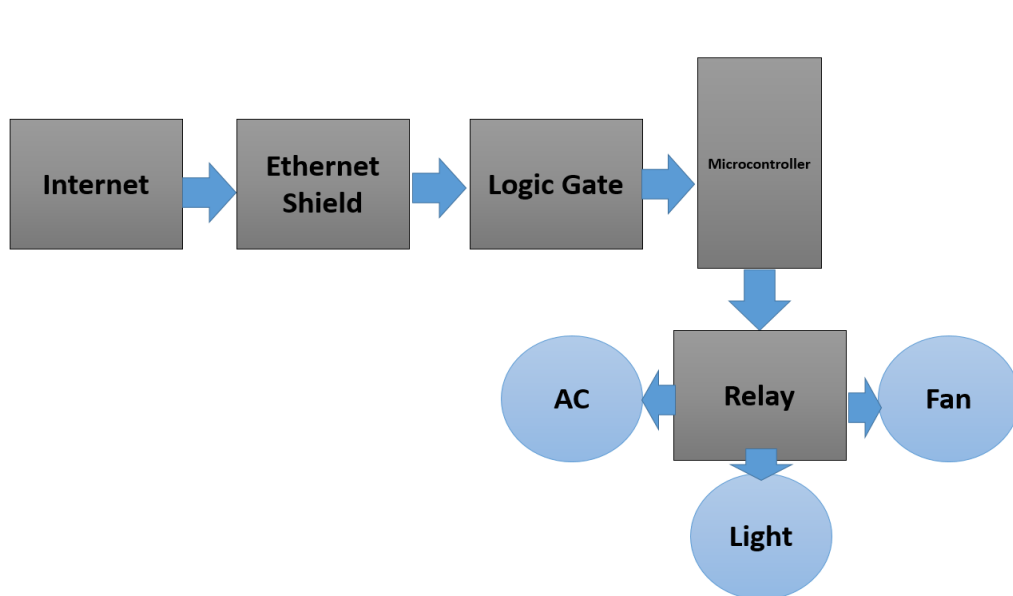


Figure- 4.2: Block diagram of overall system

Here, every element is employed as a block. With the arrow mark and correct block, the system sequence is shown. The microcontroller is employed within the system for taking multiple logics from the system and eventually to send one logic to the output circuit. As appliances any general appliance like lightweight, the fan will simply be controlled with this method [12].

### 4.3 Flow Chart

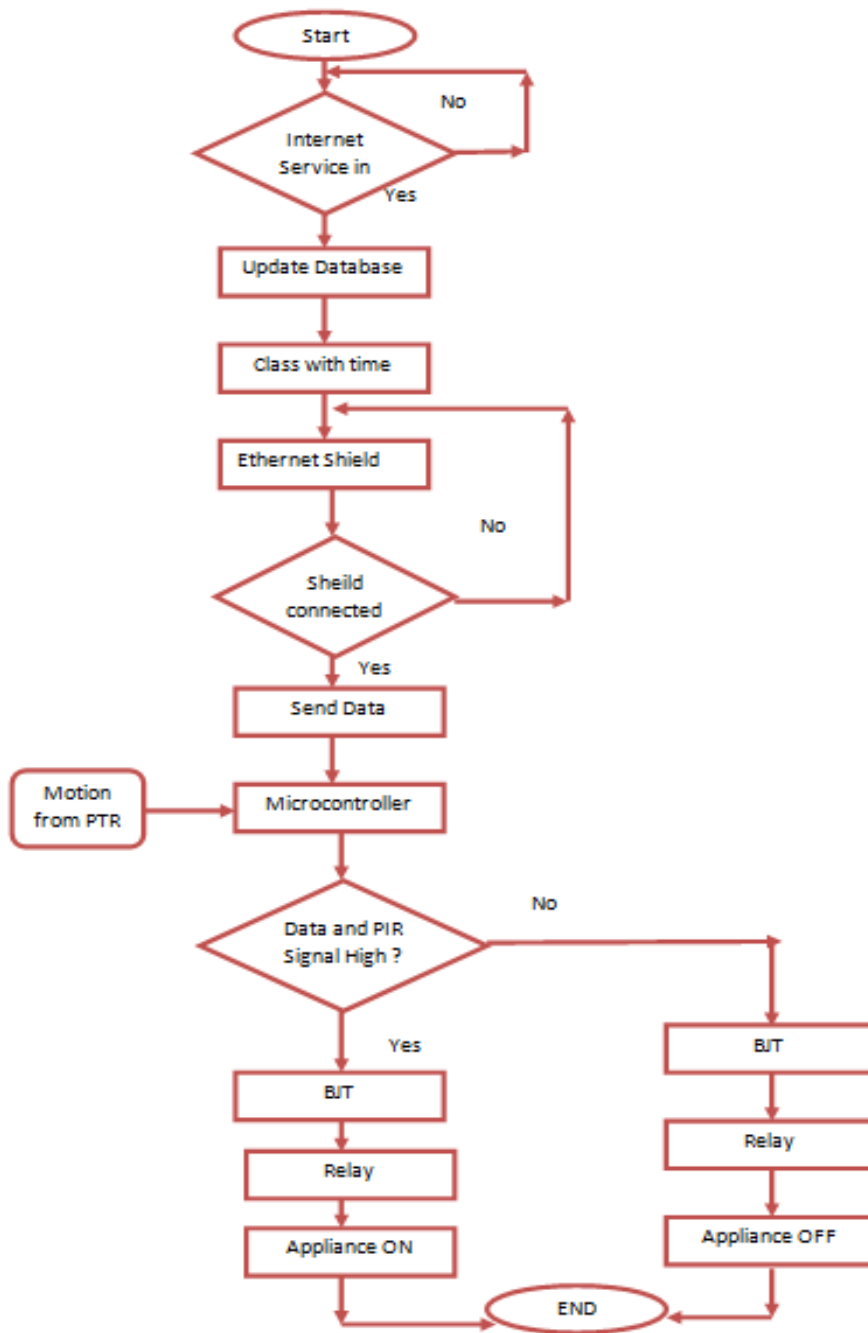
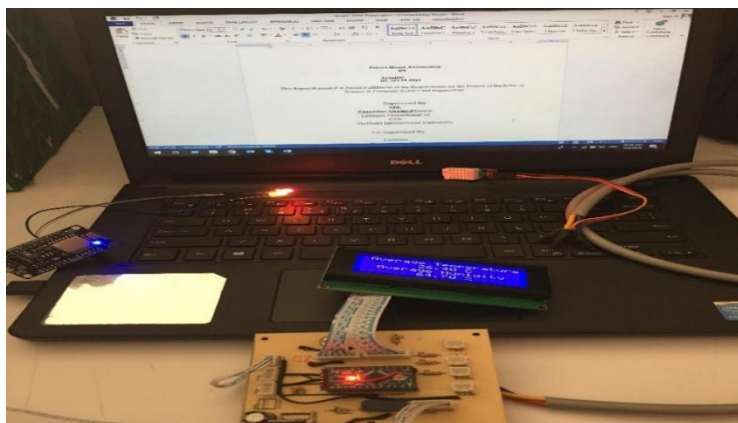


Figure-4.3: Flowchart of the system

## CHAPTER 5 IMPLEMENTATION

### 5.1 Implementation

We selected Friday to implement the developed system. We've an inclination to mount the time from four.40 pm-4.42 pm at intervals the afternoon. Throughout this era, the high signal was strolling back from the data. And via the local area network defend, as a result of it's a network provider, that prime signal destines to the computer circuit. The signal from the Pin7 of the defend passes to Associate in Nursing convertor gate. This signal is inverted double times to flow the initial signal. Besides, from the PIR motion detector signal was returning too. Once among its twenty feet vary the notice was able to observe any motion then it fully was inflicting a high signal. In contrary, once no motion can be detected, then the low signal was sent from the motion detector. The signals from a PIR motion detector and thus the amount of your time server finally come to ATmega328 microcontroller. In microcontroller code, it's provided such logic that if any of the signals space units throughout a coffee state, the final word appliance as Associate in nursing output will not get on. On the other hand, solely the incoming signals to the microcontroller would be at intervals the high state the connected appliance would get on. For driving the relay power is applied from Associate in a very nursing external battery. Since the relay was 5v relay that's why a 7805 electrical device was accustomed supply 5v to the relay. Besides, the conductor is utilized to make flowing high current to the relay for energizing its coil. Throughout our implementation quantity, light-weight as a result of the appliance was glowing once the circuit got every high signal. And it fully was off whereas throughout the mounted time vary from the surrounding the circuit was did not get any motion signal.



**Figure-5.1 Implementation Full Setup**



## CHAPTER 6

### ADVANTAGE & LIMITATIONS

#### 6.1 Advantages

The effective blessings of this sensible Home Automation project are often mentioned beneath the subsequent headings;

- **Reduced installation value**

First and foremost, installation value is least to ascertain the system. Simply want an online network and tiny electronic equipment for developing the system.

- **Straightforward preparation**

For developing the system users have to be compelled to install the tiny circuit card containing an affordable microcontroller, motion device, a relay with the ultimate appliances.

- **Accessibility**

For either commanding or change info, it's doable to create access from any type of device like itinerant, notebook, tablet pc, desktop. Moreover, obtaining access from far-flung build the system additional fruitful to users.

- **Availableness**

A period sensible Home Automation project vanish availableness. Aside from the utilization of classroom-based physics devices; associate degree one will \_switch off 'any domestic physics device like a cooling system, lights, fan, etc. that are still switched on once these aren't in use.

- **Energy savings**

By means that of the delicate sensible Home Automation it's doable to chop down electricity bill; since it saves energy. {This is often this will be} fairly doable as a result of as once anyone doesn't 't need keeping the physics devices switched on or off; he can simply have management over the devices, and this effectively saves energy. That ensures the optimum use of energy.

- **Saves time:**

It is obvious that today 's world is busier than in days what went before. Folks are perpetually running from place to place; work to accomplish everything on the unending —to-doll list. simply because of the current character of a house mechanization system, they ne'er ought to agonize concerning running house to open the door for his or her youngsters once faculty or creating a quick discontinue reception so as adjusting home items.

In conclusion, finance in an exceeding space automation system can profit in many ways. It efficient, ensures optimum use of your time and energy. Most significantly, it'll reclaim life feature and keeping North American country far away from any electrical vulnerability.

## 6.2 Limitations

Several limitations square measure discovered throughout our project. Our project is totally internet-based. We've got an inclination to square measure dominant our system through net access. As we've got an inclination to square measure dominant this through {the net |the net} thus we'd prefer to substantiate the higher speed of the net. If the speed becomes low system delay will occur. To avoid the delay, we'd prefer to produce positive of the higher speed of the online.

- This project depends all on power. If associate influence failure happens then net affiliation goes to be halted.
- Though' it wants less equipment value is not in borderline vary. For getting facility users to require to expense for this.
- If the durable network does not exist, then the native space network protects will not be operative as a network provider to the circuit. Finally, the system goes to be halted.
- this era base system is restricted to one who means at a time only one user can operate the wise Home Automation system.
- It's no covert that setting up a wise Home Automation system is to a particular extent dear. But it all depends on the instrumentality you'd prefer to possess a place in. Remember, the extra refined the system you'd prefer to possess in your home the dearer it will be.
- If there is any break thanks to rupturing of cables or the fibers the general system gets crashed. This might not be the case of radio signals or alternative signals.
- If the individual does not handle the instrumentation safely or if he/she does not produce use of the precise keys to carry out the operations, human errors might occur. Human faults square measure collectively direct to destructions of the device. Then there will be a large system collides.
- Each invents has a pair of sides. Wise Home Automation collectively has varied drawbacks. Varied people deem it's accomplishable to form people lazier. That ultimately may end up making immense injury to human social and professional life.

## **CHAPTER 7**

### **CONCLUSION**

#### **7.1 Summary**

Now a day's different types of equipment and machinery are used by home and offices. For that reason, we've got bring up a system that may be used from all fashions of devices and from anyplace info can be updated. Besides that, most of our electrical equipment 's that used here are light, fan and air conditioning. Lightweight is incredibly common. So that experimental devices we used in project for experimenting tend to lightweight. If this specific device works on, the opposite suggests that devices are simply operated. The system is very simple to install in support of this, simply would like to have an online association. To build a home under automation it requires some IoT devices to make our livings good. People can give operate their electrical devices using commands via SHAs and explored the dominant factions within the digital computer. We expect this device features a high achievable for selling within upcoming days.

#### **7.2 Final Remarks**

SHA is portable and accessible from anyplace under active internet. This feature gives special benefit within the system. Besides, SHA gives pace with latest technologies. Therefore, with the advancement of technology, the system will offer higher effectiveness.

#### **7.3 Future Modifications**

With time the sensible Home Automation System puzzled out to manage electrical devices in an exceedingly bound timeframe to form devices either on or off within the close to future, our set up is comprehensive to form gadget wise management. For that reasons, completely dissimilar gadgets are likely to be within the output ports. More than one device would be connected in this case. In our time period info, such arrangements are going to be on the market that may on or off any of the appliances inside a timeframe. Therefore, appliance dominant is going to be a lot of machine-controlled. Furthermore, the work toughen security by cope investigation has changed. Besides, by matching many routines it is often categorized. In that case, the SHA can efficiently work for more than one person sharing the same area. With this, the system is often incorporated in an exceedingly whole building of any establishment or housing. Like this, the advantages of Smart Home Automation are often a lot of avails.

## REFERENCES

- [1] Get Idea from<[https://en.wikipedia.org/wiki/Home\\_automation](https://en.wikipedia.org/wiki/Home_automation)> last accessed 07.02.2019 at 3:40 pm
- [2] ARAFAT JAHANGIR RABBI , TAMANNA JAHAN , S.M SHAMSRAJ ISLAM, ABU RAIHAN PERVEZ , Smart home: Integrating internet of things with web services and cloud computing. In Cloud Computing Technology and Science (Cloud Com), last accessed 08.04.2019 at 12:10 pm.
- [3] Types of Home Automation < [https://hipages.com.au/article/types\\_home\\_automation](https://hipages.com.au/article/types_home_automation) > last accessed 9.04.2019 at 10:00 pm.
- [4] History of Home Automation < <https://www.iotevolutionworld.com/m2m/articles/376816-history-smart-homes.htm>> last accessed 2.02.2019 at 11:00 pm.
- [5] ATmega328Microcontroller< <https://www.microchip.com/wwwproducts/en/ATMEGA328>> last accessed 10.02.2019 at 10:00 am.
- [6] ATmega328pin description< <http://www.learningaboutelectronics.com/Articles/Atmega328-pinout.php>> last accessed 15.02.2019 at 09:00 pm.
- [7] Relay < <https://en.wikipedia.org/wiki/Relay> > last accessed 17.02.2019 at 11:00 am.
- [8] Operations Relay < <https://www.explainthatstuff.com/howrelayswork.html> > last accessed 10.03.2019 at 12:30 am.
- [9] Node MCU < [https://www.nodemcu.com/index\\_en.html](https://www.nodemcu.com/index_en.html) > last accessed 15.04.2019 at 5:00 pm.
- [10] Arduino UNO < <https://store.arduino.cc/usa/arduino-uno-rev3> > last accessed 18.04.2019 at 08:00 pm.
- [11] System Layout < <https://premier-group.com/galleries/smart-home-layout> > last accessed 22.04.2019 at 11:00 pm.
- [12] Block Diagram <[https://www.researchgate.net/figure/Block-diagram-of-Smart-Home-Automation-System\\_fig1\\_321502885](https://www.researchgate.net/figure/Block-diagram-of-Smart-Home-Automation-System_fig1_321502885) > last accessed 10.05.2019 at 07:00 pm.
- [13] Flowchart<[https://www.researchgate.net/figure/Flowchart-of-Home-Automation-System\\_fig2\\_320192495](https://www.researchgate.net/figure/Flowchart-of-Home-Automation-System_fig2_320192495) > last accessed 12.05.2019 at 11:00 am.

## APPENDIX

### Code of Microcontroller

```
#include <avr/io.h>           // Standard AVR header that controls input & output pins

#include <util/delay.h>       // defining delay

int main(void){              // execution starts

DDRA &= ~(1<<DDA1);          // declaring port A as input

DDRA &= ~(1<<DDA2);          // declaring port A as input

PORTA &= ~1<<PINA1;          // defining Pin1 of PortA as input

PORTA &= ~1<<PINA2;          // defining Pin1 of PortA as input

DDRB |= 1<<DDB1;            // declaring Pin1 of PortB as output

while(1){ //do forever

if (PINA & (1<<PINA1) && PINA & (1<<PINA2)){ // Pin1 & Pin2 of Port A are both high

PORTB |= 1<<PINB1;          // PortB Pin1 is high

_delay_ms (500);           // wait for 500 ms

} else {

PORTB &= ~1<<PINB1;        // Pin1 of PortB is low } } }
```

## Code of Ethernet Shield

```
#include <Ethernet.h>           // library for ethernet functions
#include <SPI.h>                 // for serial communication
byte ip[] = { 192, 168, 1, 177 }; // IP address of ethernet shield
byte dns[] = { 8, 7, 8, 9 };    // IP address of URL
EthernetClient client;         // Ethernet shield as client
char server[] = "192, 168, 2, 184"; // IP address of website
String location = "HTTP/1.0";  // version of URL
char inString[];              // declaring variable

int stringPos = 0;            // initializing variable

boolean startRead = false;

void setup() {                 // indicating Pin status
  Ethernet.begin();           // Ethernet initialization
  pinMode(7, OUTPUT);        // declaring Pin7 of shield as output
}

void loop() {                  // main program executes from here
  String pageValue = connectAndRead(); // intializing function
  Serial.println();           // declaring output
  delay(5000);                // wait 5 seconds
}

String connectAndRead() {     // calling the function
  Serial.println("...");
  if (client.connect()) {     // whether ethernet shield is connected
    Serial.println("connected"); // shield is connected

    client.println();
    return readPage();        // return to database
  } else {
```



# Smart Home Automation

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