

A Project on IOT Based Control Home Appliances

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Abstract—IoT-based home automation refers to the use of internet-connected devices to control and automate various household tasks and systems, such as lighting, heating and cooling, security, and entertainment. By using sensors, machine learning algorithms, and mobile applications, homeowners can remotely monitor and manage their home environment, while also reducing energy consumption and improving safety. This technology has the potential to make our lives more convenient, comfortable, and sustainable. However, it also raises concerns about data privacy and cybersecurity, which must be addressed to ensure that the benefits of IoT-based home automation are realized without compromising user safety and security.

INTRODUCTION

Smart home appliances are changing the way we interact with our homes, providing enhanced convenience, energy efficiency, and peace of mind. These devices are equipped with advanced sensors, internet connectivity, and sophisticated software that allow homeowners to control and automate various aspects of their living spaces, from lighting and heating to security and entertainment. With the rise of the Internet of Things (IoT), smart home appliances are becoming increasingly accessible and affordable, making it possible to transform any home into an intelligent living space. By using sensors and automation, these devices can optimize energy usage, resulting in lower utility bills and a reduced carbon footprint. Additionally, smart home appliances provide enhanced home security, enabling homeowners to monitor their homes remotely and receive alerts in the event of an intrusion or other security breach. The future of smart home appliances is exciting, and the potential for enhancing our homes and lifestyles is tremendous. With the rise of the Internet of Things (IoT), smart home appliances are becoming increasingly affordable and accessible. Today, it's possible to transform any home into an intelligent living space with devices like smart thermostats, lighting systems, security cameras, and more. These appliances can be controlled through a mobile app, voice command, or even programmed to operate autonomously based on preset preferences.

RESEARCH AIM

Arduino UNO reads the data and decides the switching action of electrical devices connected to it through Relays. The goal of this project is to develop a home automation system that gives the user complete control over all remotely

controllable aspects of his or her home. Abstract The Internet of Things (IoT) is aimed at enabling the interconnection and integration of the physical world and the cyber space. It represents the trend of future networking, and leads the third wave of the IT industry revolution. Design of an independent HAS To formulate the design of an interconnected network of home appliance to be integrated into the HAS. The objective to account for every appliance and its control to be automated and integrated into the network further formulated into the HAS. Wireless control of home appliances (Switch and Voice mode) To develop the application that would include features of switch and/or voice modes to control the applications. Monitoring status of appliances Being able to view the status of home appliances on the application, in order have a better has Secure connection channels between application and Node MCU Use of secure protocols over Wi-Fi so that other devices are prevented to achieve control over the HAS. Secure connections are obtained by SSL over TCP, SSH. Controlled by any device capable of Wi-Fi (Android, iOS, PC) To achieve flexibility in control of the home appliances, and device capable of Wi-Fi connectivity will be able to obtain a secure control on the HAS. Extensible platform for future enhancement With a strong existing possibility of adding and integrating more features and appliances to the system, the designed system needs to be highly extensible in nature.

RELATED WORKS

Home Automation System, user can control his home appliances from anywhere in the world by using the website or Android app. The System connects to the internet Wi-Fi and then makes a stable feedback connection with server and GUI continuously monitoring the commands sent by the user. and also user can control various commands on this server. Users can check the command history for every appliance. when the sensor detect fire that's when rises an alarm and sends the alarm message. user can make arrangements such as opening the door and various appliances. for an example users make full comfort without manually having to switch on the electrical appliances or his favorite T.V. channel. the limitation for security perouse not picture capturing. in future picture capturing, person moving around the house and storing it onto the cloud. [1]

The Internet should be utilized in home automation that offer the several decisions from economical by use of energy to additional console, protection and safety. many distance user can monitor and manage their home gate, various appliances and turn on/off the T.V without human. the advantages of home automation has however received extensive approval and an attention owing to its high significance and complexity. implement this to remotely controlling and monitoring system with smart phone. this system will be improve security and restricted areas. the system suitable for real time and monitoring and controlling home appliance using using Raspberry pi. make this system many place like bank, hospital lab etc. [2]

IOT usefull data by sensing and communication other devices. those devices are very helpfull in monitoring and analyzing various environment parameters. This devices monitoring understanding and analyzing the power consumption. electricity consuption is increased day by day so helpfull this. A zigbee contril modele used to circuite sensing the current. The introduction of smart systems will help the consumer to monitor and do an analysis of power consumption in order to adjust the usage that will in turn help in lowering the electricity bill. [3]

Home automation system can be designed and developed by incorporating a single controller. that is controlling and monitoring different interconnected appliances such as lights, power plugs, temperature, humidity sensors, smoke, gas and fire detectors as well as emergency and security systems. for control of home automation system by smartphone, laptop. By using a smartphone can remotely control home appliance and monitoring system in anywhere. some of the common features is appliance control, remote control lighting, security camera monitoring. [4]

IOT base home monitoring and controlling system its a process that can control and screen gadgets not only home but also real-life appliance. this provides facility of home appliance and ensure security. this project monitors all home appliances such as fan, light. project are allowing low cost. device controlling and monitoring the system without human. so that we can save energy and time, the system work three phases. in first monitoring and detect, second phase automatically detect, third phases control home appliance like fan, light. [5]

There are various techniques to control home appliances such as IOT based home automation over the cloud, home automation under WiFi through android apps from any smartphone, Arduino based home automation, home automation by android application based remote control, home automation using digital control, RF based home. The lineup of IoT home appliances is increasing at an exponential rate – such as air conditioners, refrigerators, washing machines, air purifiers, and microwave ovens. Most IoT devices are configured and managed through a software application. For example, an app on your smartphone to control the lights in your home. Some devices also have integrated web servers, which eliminates the need for external applications. For example, the lights switch

on immediately when you enter a room. [6]

This IOT based device surveillance and control system is exclusively used to keep surveillance on the electrical devices working condition and also to control the on/off functionality from a central remote location. The designed system works efficiently for both indoor and outdoor lighting. These connected objects (also called nodes) exchange data over the internet. There will be 22 billion connected devices in the world by 2025. IoT technology can be used in sectors like Manufacturing, Agriculture, Healthcare, Transportation, Media/Advertising, Retail, Water and Waste Management, Power Distribution, etc. [7]

The IoT based home automation consist of several smart devices for different applications of lighting, security, home entertainment etc. Home automation is a network of hardware, communication, and electronic interfaces that work to integrate everyday devices with one another via the Internet. Smart homes allow you to have greater control of your energy use, all while automating things like adjusting temperature, turning on and off lights, opening and closing window treatments, and adjusting irrigation based on the weather. Home Automation is creating new automation technologies for houses that will make them smart using internet-based technologies. These homes/houses that use home automation technologies are smart Homes. This field of home automation is fastly emerging in technology making homes safer and better places to live. [8]

The users can merely provide voice commands or text messages through which they will be able to turn the appliances ON or OFF depending upon the necessity. The users can schedule the status of the appliances when they are not physically present in the environment. Using voice activation can be significantly more convenient than typing something out on a keyboard or smartphone or manually completing a task. Of the Americans who use digital assistants, 55 claim that being able to use their devices hands-free is a major reason they use voice activation at all. Technological advances are making voice assistants more capable, particularly in AI, natural language processing (NLP), and machine learning. To build a robust speech recognition experience, the artificial intelligence behind it must become better at handling challenges such as accents and background noise. [9]

In this paper, smart energy efficient home automation system is proposed that can access and control the home equipments from every corner of the world. For this system, Internet connectivity module is attached to the main supply unit of the home system which can be accessed through the Internet. IoT-based energy management systems use real-time power consumption data to help optimize the use of electricity, dynamically switch towards more cost and resource-efficient regimes, and work out effective and sustainable energy consumption strategy based on usage patterns. By using IoT devices such as smart thermostats and lighting systems to monitor the real-time energy consumption of a building, facility managers can change the schedule of energy use by some

of the electronics in a building to reduce demand during peak hours. Studies have shown that green homes sell faster and for more money than homes without energy-efficient designations. [10]

The so-called smart home using house as a platform, connects with various devices related to home life by adopting the advanced network communication technology, electrical automation technology, computer technology and wireless technology. The emergence of the Internet of Things (IoT) provides a new direction for the development of the smart home. [11]

The emergence of the Internet of Things (IoT) provides a new direction for the development of the smart home. This Proposed Home Automation Technology Provides Smart Monitoring And Control of The Home Appliances as well as Door Permission System for Interaction Between the Visitor and home/office Owner This Paper Presents a Low cost and flexible Solution to The Smart Home. It Improves the Security of the Building and the person can Alert as well as can Take Necessary steps Toward Family Safety. This System can Also be used for Reducing the Wastage of Electrical energy in the house by Proper Scheduling and Monitoring of The Appliances. [12]

The Internet of Things, IOT, is upon us in a huge way and people are rapidly inventing new gadgets that enhance our lives. In today's world Automatic systems are being preferred over manual system and IoT is the latest and emerging internet technology. Finally the commands to control the appliances in the house are sent by a central control unit such as a computer, remote controller Smartphone (IOS Android). Further, the study presents the implementation of a smart home using Arduino and Android open platforms and Wireless communications (Bluetooth and Wi-Fi). This project can be further developed by integrating it with the internet to monitor your home while sitting in a remote area. By doing this, one can keep an eye on his or her home through an internet connected to the user's mobile phone or PC or laptop. [13]

Hence, this project aims to develop an alternative smart fan tackled from a comfort and cost perspectives. This project is done using as minimum budget as possible by using a combination of the already-available parts of the market. Automation has become one of the key interests in the modern-day technology. Initially, the automation systems were limited to industries as it required significant investments, but with the development of the technology, automation has become available to everyone. [14]

Internet of Things (IoT) conceptualizes the idea of remotely connecting and monitoring real world objects (things) through the Internet. This IoT project focuses on building a smart wireless home security system which sends alerts to the owner by using Internet in case of any trespass and raises an alarm optionally. The alerts and the status of the IoT system can be accessed by the user from anywhere even where Internet connectivity may not be readily available (since it is not necessary for the mobile phone to be connected to internet

only board is required to have an access to Wi-Fi). [15]

Smart Home is a side of IoT. Which is controlled by internet, it offers wifi at low cost, WiFi is used to make this system, it is used to monitor temperature, humidity and motion of the house, HAS is used in the house to control it, it is easy to control, to improve and increase the quality of life. Plays a role, benefits the economy, quality of life Safe and easy system to upgrade. Used in household work, meter, television, AC, oven, sensor, fan, temperature, bulb, control. It monitors IP address, anywhere, it is used for depositing money, it controls lighting, lights turn on and off when a person leaves the room, lower power consumption, controls room temperature, notifies when fan is forgotten to turn off. Can, by stopping the smoke, can tell if the house is dangerous, the house It is used to control machinery. This service is improving day by day in keeping with the world. [16]

Our future is in our hands so we have to think about it, we introduce different methods like home automation method which is 21st. By this method we are improving day by day The more technology improves, the more we advance, technology can change not just one person but the whole nation, we have to use technology in everything, the more technology improves, the more we advance step by step. Today the world is at hand through the internet, which we realize, in the future only touch the modern world. [17]

IoT technology has gained everyone's attention. This technology has created various network functions. Brings many environmental and economic benefits. One fact is that sensing requires communication technology to exchange information and control data between all electrical devices. This technique has very good performance in terms of applicability, generalizability and accuracy. Functionality of the features varies depending on the data. The selection must be specific to different datasets. To apply this technology to a different home, the classifier models still need to be retrained. [18]

IoT is to control the Internet through various devices, currently many industries are being controlled by it, 71 out of 100 is controlled by industry and the remaining 29 is controlled by IoT, the Internet has changed people's lives, it is used to store and analyze information, large Because of diversity Smart systems are very complex. Devices, sensors, actuators, network connection protocols and data transfer protocols and their services, these elements have played an important role such as a design and implementation. In the case of smart home, which is a good integration. Devices can also communicate and control within the home. Apps act as a thin client to allow accessibility Routers must be connected to the system to collect devices and nodes. The level of security of the home network should be increased. The default name given by the manufacturer or the name is associated with the user or his address. Similarly, this type of system can protect the smart home system Computing plays a very important role for time sensitive. Reduce costs and increase reliability and maintain continuity of smart home systems. Allows connection of network nodes. [19]

IoT is a system that can make the home into a variety of facilities, modernize all the devices in the home. This technology protects the house from many problems, connecting different lines such as - power lines. Many changes can be made using this technology. The two stations are being connected to further improve the technology. 1. Base Station 2. Satellite station. If this technology is introduced, if we use it properly, we will benefit more, we will go one step further. [20]

The project is centered on the creation of a machine learning algorithm, followed by the home's forecast outcomes. With intelligent, programmable, and human-interactive items, the data can be used to anticipate how a user would behave. This gives the customer remote access to operate their home appliances. [21]

On the IoT-powered smart home system this project is using an Arduino board and Arduino Wi-Fi advantage. The application developed will enable users to manually turn on and off the lights by using temperature sensors to identify high temperatures. This provides a significant temperature and will alert the user's device. Energy use on Android devices is optimized. [22]

A system called qToggle connects sensors, actuators, and other data sources for various home automations. The majority of qToggle's devices are built on Raspberry Pi boards and/or ESP8266/ESP8285 chips. Users of a smartphone application now have access to a variety of home gadgets and sensors. [23]

Smart houses powered by the Internet of Things (IOT) make life easier and more comfortable. Smart houses have a variety of possible uses, such as remote control of lighting, security, and safety features. The implementation of an inexpensive and user-friendly IOT-based smart home model utilizing an Arduino microcontroller and other sensors is demonstrated. [24]

Researchers have created an Android-based smart home with wireless device connectivity that will lead to the Internet of Things and renewable energy. The system also continues to calculate the daily power usage of the appliances that the user uses and contributes to power generation. The majority of them focus on managing the system that initially includes equipment like fans and lights. [25]

Setting up of a smart home requires fundamental technology including protocols and all the hardware and software. Besides, you need smart devices that can be connected to the internet on the home network. For example, cameras, motion sensors, LED lights, devices with built-in web servers, etc. This paper presents the design and implementation of a Smart Home Controller wherein the user can control their devices using the Android Application running on a Smart Phone. [26]

Internet of Things privacy is the special considerations required to protect the information of individuals from exposure in the IoT environment, in which almost any physical or logical entity or object can be given a unique identifier and the ability to communicate autonomously over the Internet or similar network. The devices themselves: Often, cyber criminals exploit IoT device vulnerabilities that exist

in its memory, firmware, physical interface, web interface and network services. Additionally, other aspects such as unsecure default settings, outdated components and unsecure update mechanisms are also exploited. [27]

The applications of IoT in environmental monitoring are broad environmental protection, extreme weather monitoring, water safety, endangered species protection, commercial farming, and more. In these applications, sensors detect and measure every type of environmental change. In this paper, we have reported an effective implementation for Internet of Things used for monitoring regular domestic conditions by means of low cost ubiquitous sensing system. [28]

Most IoT devices are configured and managed through a software application. For example, an app on your smartphone to control the lights in your home. Some devices also have integrated web servers, which eliminates the need for external applications. For example, the lights switch on immediately when you enter a room. The advent of industrial automation has brought about a substantial change in the human lifestyle and the way human interaction with machines. One of the major technological interventions in day-to-day life is the role of automation, which has uplifted the living standards in developed countries and fostered humans' dependency for accomplishing recurring tasks. [29]

Amazon Alexa is a voice service from Amazon with which you can not only call up information, but also control numerous appliances (such as Home Connect appliances) using your voice. Amazon Alexa is based on skills which make voice interaction with products and services more intuitive. Alexa is capable of voice interaction, music playback, making to-do lists, setting alarms, streaming podcasts, playing audiobooks, and providing weather, traffic, and other real-time information. Alexa can also control several smart devices using itself as a home automation hub. [30]

METHODOLOGY

- Identify the objectives and requirements of the system: This involves determining the specific tasks and systems that will be automated, the devices and sensors needed, and the desired outcomes.
- Design the system architecture: This involves creating a detailed plan for how the devices will be interconnected, how the data will be collected and analyzed, and how the system will be controlled and monitored.
- Select the hardware and software components: This involves choosing the specific devices and sensors that will be used, as well as selecting the appropriate software and networking protocols.
- Develop and test the system: This involves building and testing the software and hardware components, and verifying that they work together to achieve the desired outcomes.
- Install and configure the system: This involves installing the hardware components, configuring the software, and setting up the network connections.

- Train users and provide ongoing support: This involves providing training to users on how to use the system, as well as providing ongoing support and maintenance to ensure that the system continues to operate effectively over time.
- Design the IoT-based home automation system, including selecting appropriate hardware and software components, developing the necessary software and networking protocols, and configuring the system.
- Conduct a larger-scale study to collect data on the performance and effectiveness of the IoT-based home automation system.
- Analyze the collected data using appropriate statistical and data analysis techniques.
- Present the research results in a report or paper, including a discussion of the implications of the findings.

Throughout the process, it is important to consider factors such as data privacy and cybersecurity, as well as to conduct appropriate testing and quality assurance to ensure that the system is reliable and secure.

Flow Chart

This section is describe iot based home appliances flow chart. that will be many section and stage. first start this system and connect Blynk app or Blynk website. if connect Blynk this will show light and signal else no connection that will go on previous section. after that connect Blynk then control devices. control fan, light, charger and also AC. Then here one device on this confirmation on light that is device in on and off . At end control devices ON and OFF easily.

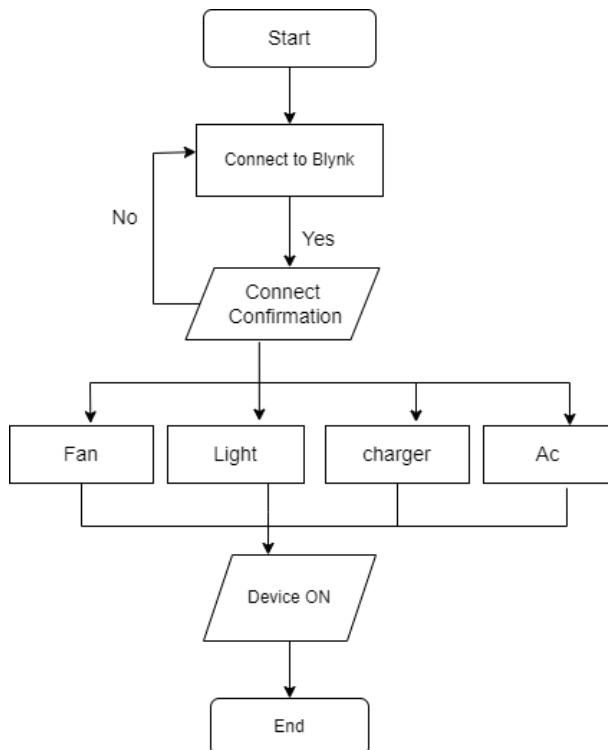


Fig:1 Flow Chart

Architecture Design

The supporting architecture could be categorised into many forms, depending on which part the focus lies. One of the categories is based on whether it is a hardware or software.

Hardware architecture including but not limited to the gateway, cloud infrastructures, and even connectivity to the cloud interfaces. Software architecture including device management, the operating system of any hardware infrastructures, and also including communication protocol. Although there are many components which exists in the supporting architecture, we will focus more on the elements which are the core of IoT applications.

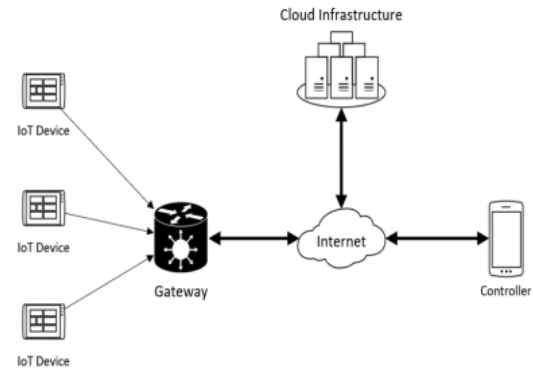


Fig:2 Architecture

1. IoT Device This device acts as the main element of the IoT applications. IoT device is a device which connects the whole IoT application to the physical world. Some examples of this connection are a temperature sensor, motor controller, building alarm, or even a webcam.
2. Gateway The gateway acts as a middle layer service between IoT devices, with the internet or another type of communication carrier to the cloud infrastructure. This device is usually also capable of communication processing, and also device management. Depending on the gateway design, this device could reach all layers in the OSI model. So, the function of the gateway is various; it depends on the applications and the system's requirements.
3. Cloud Infrastructure This element stores and process the data for/from the IoT devices. Depending on the application, this element could function as a database, or even as a smart decision server.
4. Controller This element acts as the user interface for the system. Users could control and manage the behaviour of the applications.

Graph

There are more than 170+ million smart homes around the globe. It means that people are accepting modern means of living and accepting IoT-based home automation devices.

Countries like the USA have the highest number of smart houses in the world. It is believed that by the end of 2022, the USA will have 63 million smart Wi-Fi homes. India is also increasing, and society owners and builders are appreciating the smarter means of living. Smart home devices used for control and connectivity worldwide from 2017 to 2023

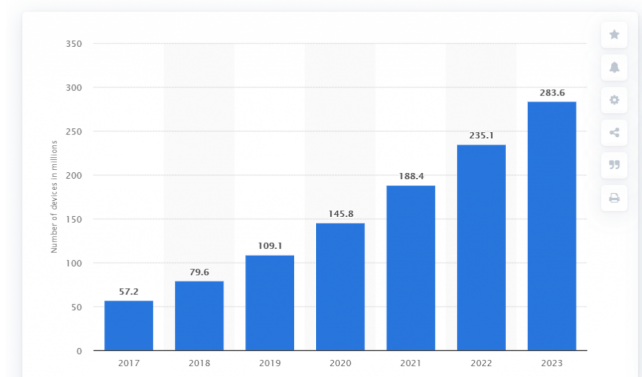


Fig:3 graph

Design

In This design section, it will define full control design. An IoT-based control home Appliances in Blynk app and Blynk web server. it will connect on cloud. information and all resource transfer in iot cloud and then mobile app access this cloud . Connect Blynk App on mobile. after connecting mobile then control the home all Appliances. suppose before the fan, light ON/OFF by using a switch after Iot based control Home appliances using that will be control on your phone and anywhere. Connect sensors and actuators to the Arduino board using the appropriate circuitry and programming. Sensors can detect environmental conditions such as temperature, humidity, or motion, while actuators can control appliances such as lights, fans, or locks.

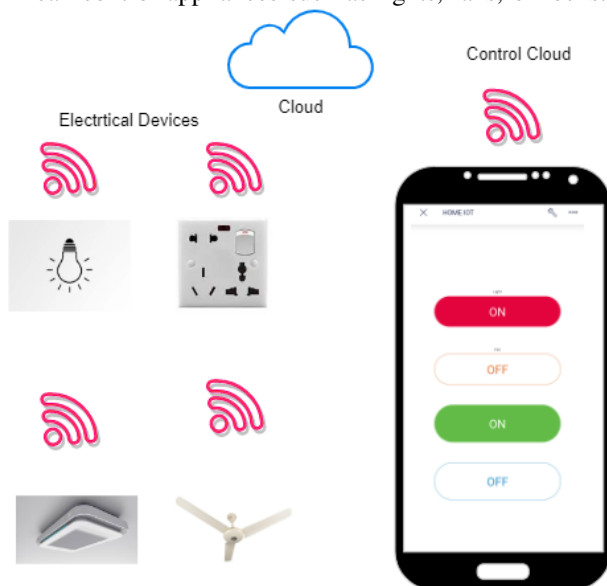


Fig:4 Design

IMPLEMENTATION

Implement IOT based smart home Appliances by Arduino, Blynk Apps and Relay Module. Identify the tasks that you want to automate in your home, such as turning lights on/off, controlling the temperature, or monitoring security. Select the appropriate Arduino board based on the requirements of your home automation project. Arduino boards come in different sizes, shapes, and capabilities, and you should choose the one that best fits your needs and budget.

A. Arduino

Arduino is an open-source hardware and software platform that enables users to create and program their own electronic devices and projects. It consists of a microcontroller board, software, and a community of users who share knowledge and resources. The Arduino board is a small computer that can be programmed to control different types of electronic devices, such as sensors, motors, and lights. It has a variety of input and output pins that allow it to interact with the external world. Arduino boards come in different shapes and sizes, and can be used in a variety of applications, from robotics to home automation.

In this project Arduino Use for control appliances. Arduino Contains digital pins and analog pins. also contains power 5v and TX, RX. TX and RX mainly use for Bluetooth modules.



Fig:5 Arduino

B. Blynk Web

Blynk has a website where users can access various resources related to the Blynk platform. The website can be found at blynk.io. The Blynk website provides information about the platform, its features, and its compatibility with different hardware platforms. It also provides access to the Blynk Community, where users can share their projects, ask questions, and get help from other users.

In this project use Blynk cloud. at first create an account in Blynk website . web site name BIYnk.io. then crete template ,switch and configure.

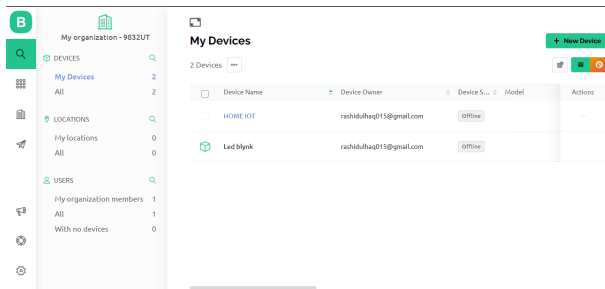


Fig:6 Blynk Web



Fig:8 Relay Module

C. Blynk Apps

Blynk is a mobile app that allows users to remotely control and monitor their IoT devices and projects. It is designed to work with a variety of hardware platforms, including Arduino, Raspberry Pi, ESP8266, and others. The Blynk app enables users to create a customized dashboard of buttons, sliders, and other widgets that can control their IoT devices. For example, users can create a button that turns on a light, a slider that controls the temperature of a room, or a gauge that displays the level of a water tank. To use Blynk, users need to first create an account and download the app on their mobile device. They then need to connect their IoT hardware to the Blynk cloud server using the Blynk Library, which provides a set of code and functions for the hardware to communicate with the app.

In this project Blynk Apps use for controlling appliances like fan, light, AC, charger port. create template in blynk website and then this template added blynk apps.



Fig:7 Blynk App

D. Relay Module

A relay module is an electronic device that allows an electrical circuit to be controlled by a separate circuit. It consists of a switch that is operated by an electromagnet, which can be controlled by a low-voltage signal from a microcontroller or other electronic device. Relay modules are commonly used in home automation and IoT projects to control high-voltage devices such as lights, fans, and appliances. They can also be used to switch between different power sources or to isolate sensitive electronic circuits from high-voltage signals. A relay module typically consists of a relay switch, a set of input pins, and a set of output pins. The input pins are used to control the relay switch, while the output pins are connected to the circuit being controlled. In this project use relay module for ON/OFF light, fan etc. its work like switch. use 4channel module. if pin low fan, light is off. module pin high then ON module.

CODE IMPLEMENTATION

Code Explain:

- define blynk print debugserial: This line sets the Blynk print macro to debugserial. This is used later to print debug information to the serial monitor.
- define BLYNK_TEMPLATE_ID :These lines define the Blynk template ID, name, and authentication token. These are used to connect project to the Blynk cloud.
- This includes the SoftwareSerial library and creates a new instance of it called DebugSerial. This is used for debugging purposes and allows to print debug information to a separate serial port.
- include BlynkSimpleStream.h: This includes the BlynkSimpleStream library, which provides a simple way to connect to Blynk via a serial connection.
- Blynk Auth Token connect project to the Blynk Cloud.
- void setup: This is the setup function, which is run once when the program starts. It initializes the DebugSerial and Serial ports with a baud rate of 9600. It then calls the Blynk.begin function to start the Blynk connection using the Serial port and the authentication token.
- void loop: This is the loop function, which is run repeatedly while the program is running. It calls the Blynk.run function, which handles all of the communication between the device and the Blynk cloud. This allows you to receive commands and send data to on IoT project through the Blynk app on smartphone.

Code

```

#define BLYNK_PRINT DebugSerial

/* Fill-in your Template ID (only if using Blynk.Cloud) */

#define BLYNK_TEMPLATE_ID "TMPLs4P32VZ-"
#define BLYNK_TEMPLATE_NAME "HOME IOT"
#define BLYNK_AUTH_TOKEN "8TDE2lgxVWh2GPZGYK5yCzElfKH9_X6z"

#include <SoftwareSerial.h>
SoftwareSerial DebugSerial(2, 3); // RX, TX

#include <BlynkSimpleStream.h>

char auth[] = "8TDE2lgxVWh2GPZGYK5yCzElfKH9_X6z";

void setup()
{
  // Debug console
  DebugSerial.begin(9600);

  // Blynk will work through Serial
  // Do not read or write this serial manually in your sketch
  Serial.begin(9600);
  Blynk.begin(Serial, auth);
}

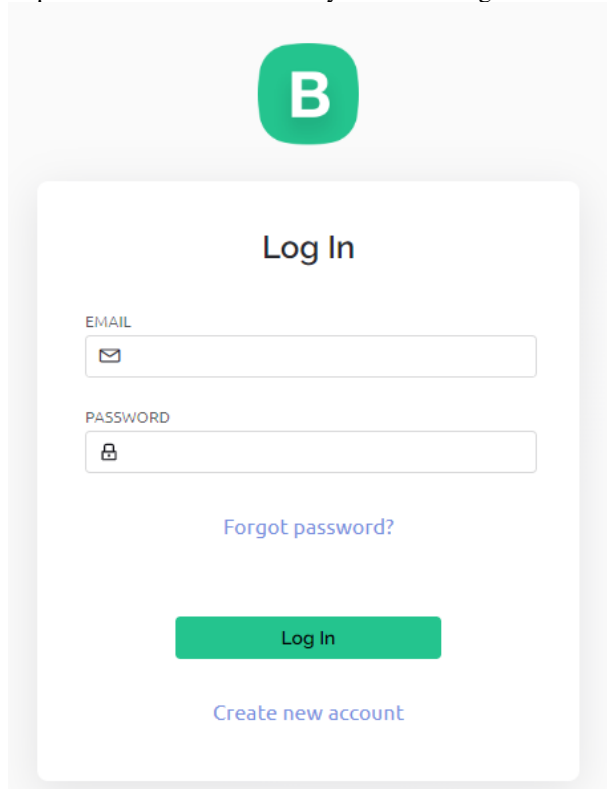
void loop()
{
  Blynk.run();
}

```

Fig: Arduino Code

IMPLEMENTATION STEPS

- Step 1: Create an Account Blynk.io then login web site.



The login page features the Blynk logo at the top. Below it, the text "Log In" is centered. There are two input fields: "EMAIL" with an envelope icon and "PASSWORD" with a lock icon. A link "Forgot password?" is positioned below the password field. At the bottom, there is a green "Log In" button and a link "Create new account".

Fig: Login

- Step 2: Create a template to Quickstart template.

Templates

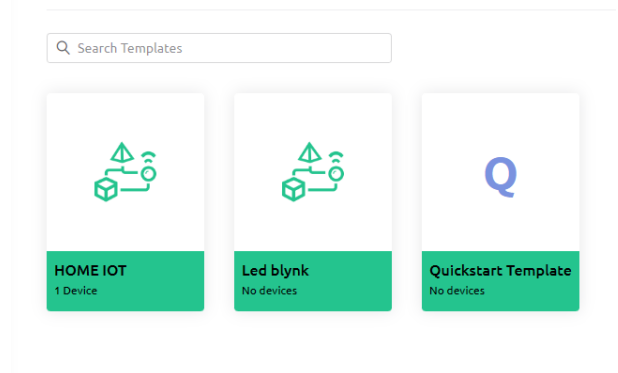


Fig: Create template

- Step 3: Setup Information in "info".

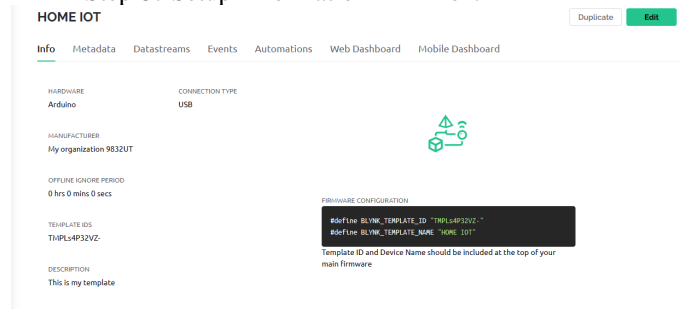
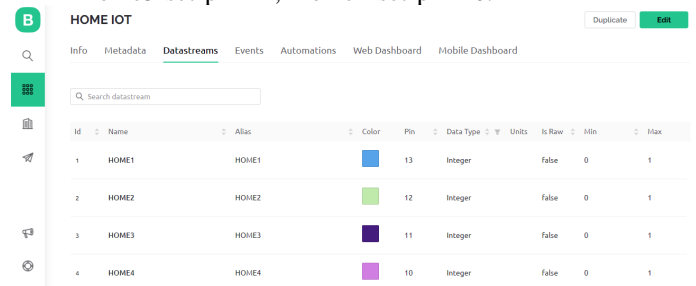


Fig: Template Info

- Step 4: Set DataStreams. and configure pin number. Home1 set digital pin 13, Home2 set pin 12, Home3 set pin 11, Home4 set pin 10.



The "HOME IOT" Datastreams page shows a table of datastreams. The table has columns for ID, Name, Alias, Color, Pin, Data Type, Units, Is Raw, Min, and Max. There are four datastreams listed: HOME1 (pin 13), HOME2 (pin 12), HOME3 (pin 11), and HOME4 (pin 10).

ID	Name	Alias	Color	Pin	Data Type	Units	Is Raw	Min	Max
1	HOME1	HOME1	Blue	13	Integer		false	0	1
2	HOME2	HOME2	Green	12	Integer		false	0	1
3	HOME3	HOME3	Purple	11	Integer		false	0	1
4	HOME4	HOME4	Pink	10	Integer		false	0	1

Fig: Datastreams

- Step 5: In web dashboard -switch drag and drop in console then configure switch.

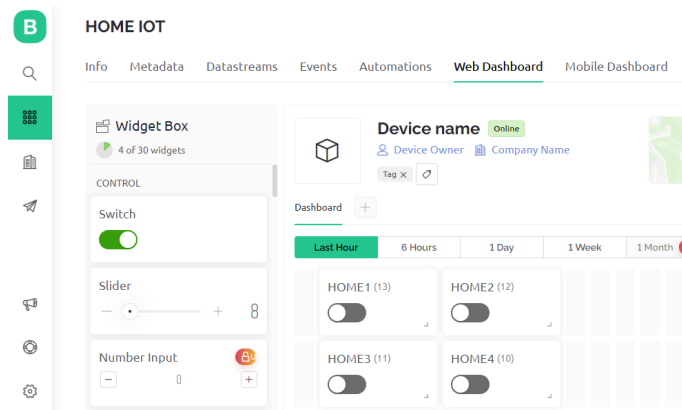


Fig: web Dashboard

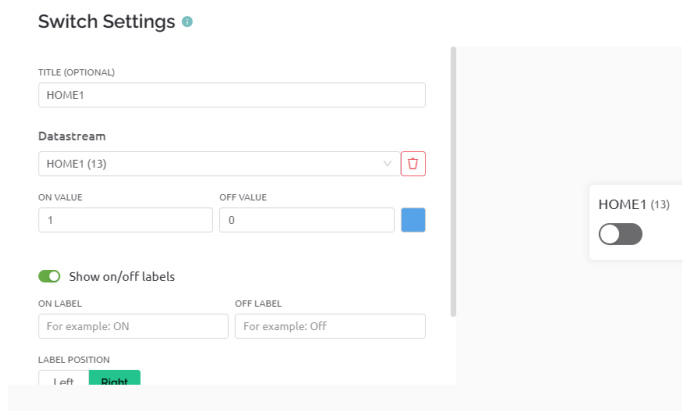


Fig: Switch

- Step 6: Go search option then click New Device for create template to add home screen. Then from Template add HOME IOT template.

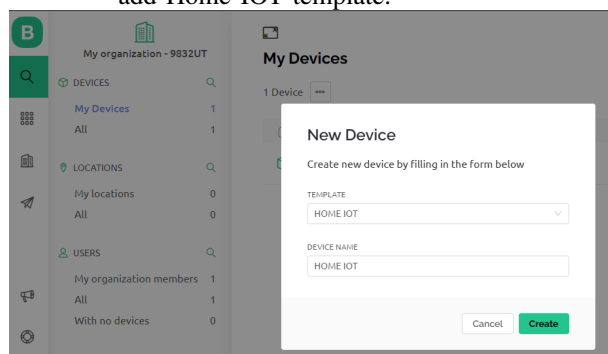


Fig: New Device

- Step 7: At last after create HOME IOT template. then Showing Home screen on Blynk website.

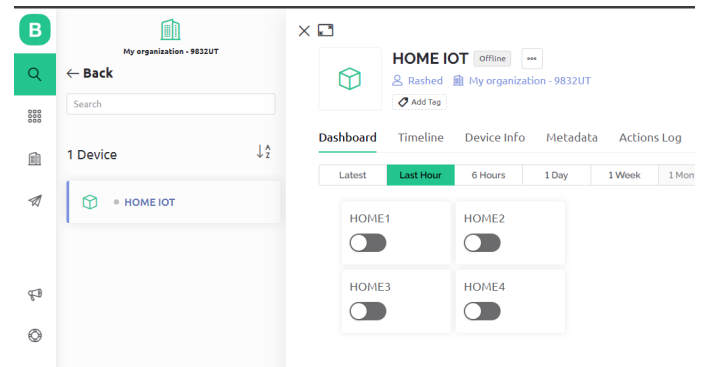


Fig: Show Template

- Step 8: Blynk Template ID and Token include in Arduino code. copy FIRMWARE CONFIGURATION paste in arduino code.

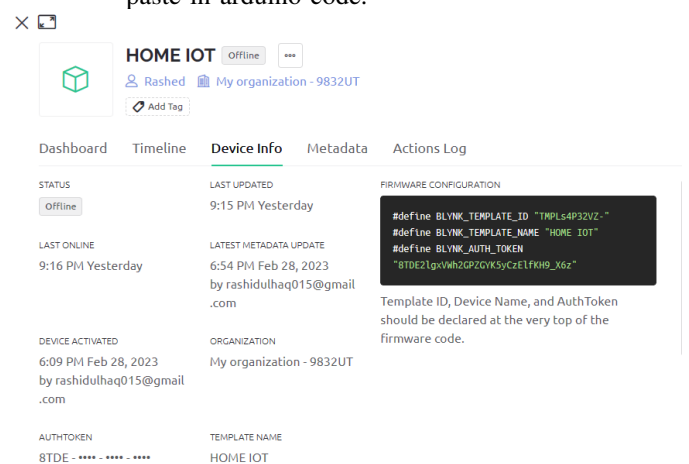


Fig: FIRMWARE CONFIGURATION

```
#define BLYNK_TEMPLATE_ID "TMPLs4P32VZ-"
#define BLYNK_TEMPLATE_NAME "HOME IOT"
#define BLYNK_AUTH_TOKEN "8TDE2lgxVWh2GPZGYK5yCzElfKH9_X6z"

#include <SoftwareSerial.h>
SoftwareSerial DebugSerial(2, 3); // RX, TX

#include <BlynkSimpleStream.h>

char auth[] = "8TDE2lgxVWh2GPZGYK5yCzElfKH9_X6z";
```

Fig: Arduino code

- Step 9: Configure Blynk apps on mobile. Download app from play store. login to app at the same gmail and password. Show HOME IOT template add template, add switch then configure all switch port number at same Blynk web.

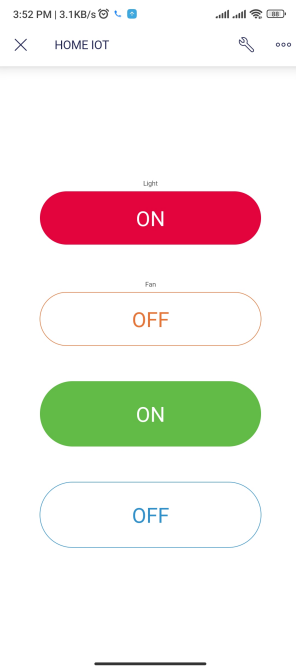


Fig: Blynk App

SCREENSHOT

CONCLUSION

IoT-based home automation has the potential to greatly improve the convenience, efficiency, and safety of our daily lives. By connecting various household devices to the internet and enabling them to communicate and automate tasks, we can reduce energy consumption, enhance security, and create a more seamless living experience. However, it is important to also consider the potential privacy and security risks associated with IoT devices and to implement appropriate safeguards to protect against them

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