Smart Home Automation via Telegram Chatbot and Android Application

Akash Kasote[1], Priyanka Kolage[2], Nikita Sadgir[3], Gayatri Avhad[4], Dr. P.G.Vispute[5]

[1,2,3] Student, Department of Computer Engineering, Shatabdi Institute of Engineering & Research, Agaskhind, INDIA

[4] Professor, Department of Computer Engineering, Shatabdi Institute of Engineering & Research, Agaskhind, INDIA

Abstract

IoT refers to the devices or things connected to the Internet, so that one or more devices can share or monitor the data to another over the internet. With the rapid improvements, in the field of Internet of Things (IoT), home automation and security systems are gaining high popularity. In Internet of Things (IoT) based Home automation system is implemented using Raspberry Pi3 processor that can be controlled using the developed web page and the telegram bot. User can access to the household devices anytime by connecting to the network and can control them using Android App and telegram bot. Devices such as lights, fans, Camera access are used in this system. The Android Application and telegram bot allows user to control the home appliances through any internet enabled device such as smart phone or laptop. The access to the control Android Application is secured by providing a login for access. The proposed system also provides home security using a camera which can take photo through telegram bot message when nobody is at home. The system sends an real time captured image to the user on demand.

Keywords:- Home automation, Home security, Internet of Things, Python language, Raspberry Pi3, Android, Telegram Bot

I. INTRODUCTION

Presently, automation plays a crucial role in all places, from work to living homes. The techniques are implemented either using microcontrollers or computers. However, microcontrollers cannot run multiple programs at a time it is difficult to control two or more appliances at a time, so we are using the Raspberry Pi module to eliminate this. Raspberry Pi is a microcomputer development board that can be used to make Do It Yourself (DIY) projects on the Internet of Things (IoT). Over here, we are using a Raspberry Pi board along with the relevant modules and switches to create a simple home automation project.

Smart Home automation can include controlling aspects of our home remotely through your phone (via telegram bot and Android Application). The control of home appliances can be done from a remote area with an option from a local server, using the Internet of Things. Overall, home automation is nothing but the interconnection of physical devices embedded with sensors and software. Where we can switch lights on or off. We can turn fans on or off through our mobile phones.

A very important part of this security virtue of home automation is keeping surveillance through cameras and surveillance on the entryway automated and which can be only open by certain identities which are granted permission to enter with the help of login credentials we can get the access.

In the proposed scheme, we will get the live pictures from the camera in our homes in the from of images. Through Telegram bot we fire a command and get the desired output.to make it simple an Android application is also developed where we can ON and OFF light through this Application. To make it user friendly Android Application is developed.

Here, we have used Raspberry Pi 3 as the main module of the system, it is a low-cost credit-card-sized minicomputer which consists of an ARM-compatible central processing unit (CPU) and an on-chip graphics processing unit. The whole system is unique because of the use of the Internet of Things (IoT) . All the data and information received from the Raspberry Pi and the circuitry needs to be stored at someplace from where it can be easily accessible to the user. Internet of Things enables the feature of using the commands from anywhere in the world. Therefore, it is possible to operate home appliances from any part of the globe.

II. LITERATURE REVIEW

- The aim of our project is to make the easy to control gadgets such as home application and etc.
- We can control the fans, air conditioners, lights, etc using the application in mobile phones that can be based on android system ,IOS , or windows .
- The mobile phones will have the application through which we can control all these gadgets.
- With one touch, dim the lights, play music, turn up the heat, lock the doors and arm the security system.
- Check in on your home from your smartphone, no matter where you are.

III. PROPOSED ARCHITECTURE

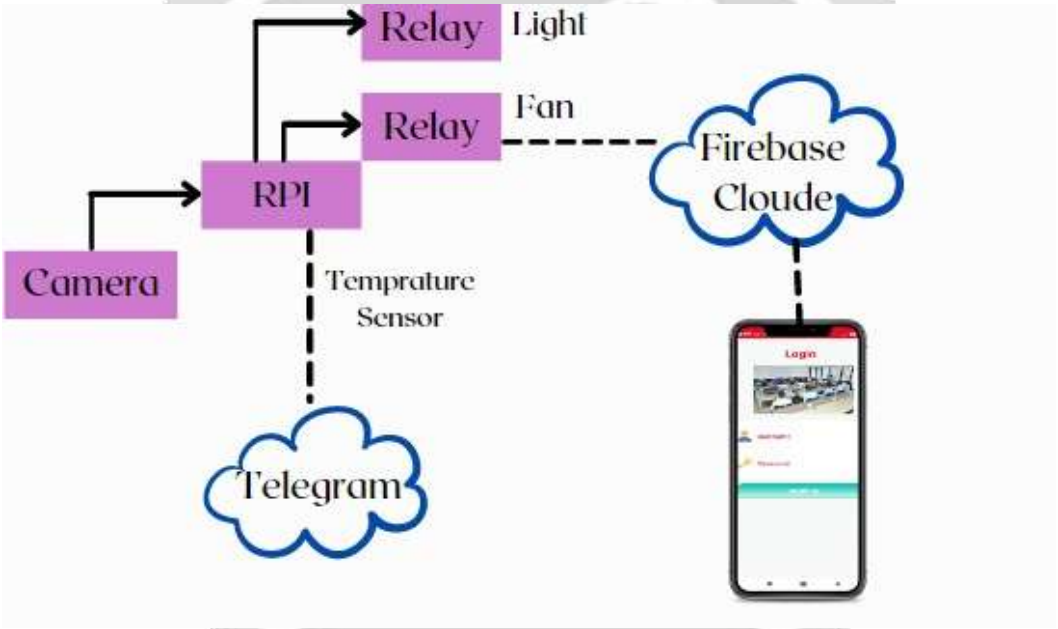

Figure 1 System Architecture

The proposed system provides home security using a camera which can take photo through telegram bot message when nobody is at home. The system sends a real time captured image to the user on demand. The system also provides room temperature and calculates the humidity of the room. with the help of Raspberry pi and Relay we can switch On or Off Fan and lights.

Telegram: Telegram is a freeware, cross-platform, cloud-based instant messaging software and application service. The service also provides end-to-end encrypted video calling, VoIP, file sharing and several other features. It was initially launched for iOS on 14 August 2013 and Android in October 2013.

Telegram bot : Bots are simply Telegram accounts operated by software – not people – and they will often have AI features. They can do anything – teach, play, search, broadcast, remind, connect, integrate with other services, or

even pass commands to the Internet of Things. Bots are third-party applications that run inside Telegram. Users can interact with bots by sending them messages, commands, and inline requests. You control your bots using HTTPS requests to our Bot API.

Bot Father : Bot Father is the one bot to rule them all. It will help you create new bots and change settings for existing ones.

The Raspberry Pi : The Raspberry Pi 3 Model B is the latest version of the Raspberry Pi computer. The Pi isn't like your typical machine, in its cheapest form it doesn't have a case, and is simply a credit-card sized electronic board of the type you might find inside a PC or laptop but much smaller. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python. The Raspberry Pi 3 Model B was launched with a faster 1.4 GHz processor, a three-times faster gigabit Ethernet (throughput limited to ca. 300 Mbit/s by the internal USB 2.0 connection), and 2.4 / 5 GHz dual-band 802.11ac Wi-Fi (100 Mbit/s) Other features are Power over Ethernet (PoE) (with the add-on PoE HAT), USB boot and network boot (an SD card is no longer required).

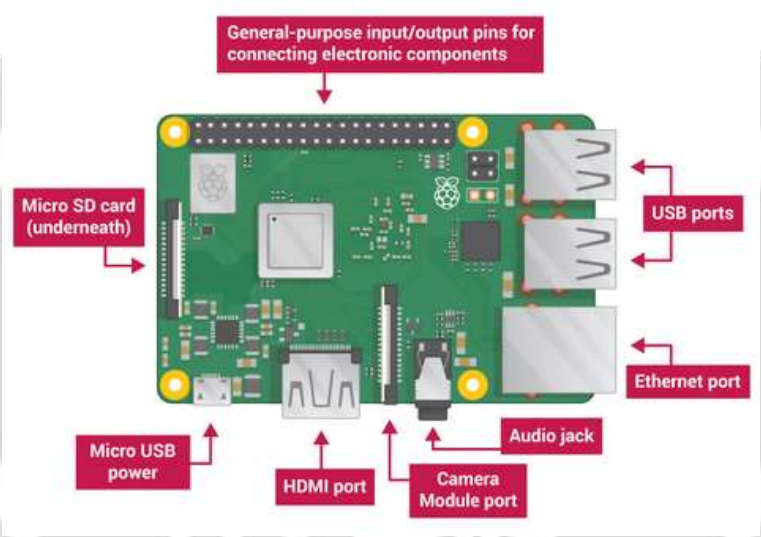

Figure 2 Raspberry Pi 3B

Temperature sensor DHT11: The DHT11 is a basic, ultra-low-cost digital temperature and humidity sensor. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air and spits out a digital signal on the data pin (no analog input pins needed). It is fairly simple to use but requires careful timing to grab data.

Pi Cam: The Pi's camera module is basically a mobile phone camera module. Mobile phone digital cameras differ from larger, more expensive, cameras (DSLRs) in a few respects. The most important of these, for understanding the Pi's camera, is that many mobile cameras (including the Pi's camera module) use a rolling shutter to capture images. When the camera needs to capture an image, it reads out pixels from the sensor a row at a time rather than capturing all pixel values at once.

IV. CONCLUSION

In In this paper, an internet based smart home system that can be controlled remotely upon user authentication is proposed and implemented. The Android based smart home app communicates via internet using the REST fully based web service. Any android supported device can be used to install the smart home app, and control and monitor the smart home environment. The Android Application and telegram bot allows user to control the home appliances through any internet enabled device such as smart phone or laptop. The access to the control Android Application is secured by providing a login for access. The proposed system also provides home security using a camera which can

take photo through telegram bot message when nobody is at home. The system sends a real time captured image to the user on demand.

V. REFERENCES

[1] *IFTTT: https://ifttt.com/discover https://www.pocketlint.com/SmartHome/SmarHome news*

[2] *IoT:https://internetofthingsagenda.techtarget.com/definition/ IoT-device*

[3] *https://www.raspberrypi.org/*

[4] *https://webiopi.trouch.com/*

[5] *"Bots: An introduction for developers", https://core.telegram.org/bots/*

[6] *M. R. Kamarudin, M. A. F., and M. Yusof, "Low Cost Smart Home Automation via Microsoft Speech Recognition," International Journal of Engineering & Computer Science, vol. 13, pp. 6-11, June 2013.*

[7] *R. D. Caytiles and B. Park, "Mobile IP-Based Architecture for Smart Homes," International Journal of Smart Home, vol. 6, pp. 29-36, 2012.*

[8] *A. Z. AAlkar and U. Buhur, "An internet based wireless home automation system for multifunctional devices," IEEE Transactions on Consumer Electronics, vol. 51, pp. 1169- 1174, 2005.*

[9] *N.-S. Liang, L.-C. Fu, and C.-L. Wu, "An integrated, flexible, and Internet-based control architecture for home automation system in the Internet era," in IEEE International Conference on Robotics and Automation, Washington, DC 2002, pp. 1101 - 1106*

[10] *A. Rajabzadeh, A. R. Manashty, and Z. F. Jahromi, "A Mobile Application for Smart House Remote Control System," World Academy of Science, Engineering and Technology, vol. 62, 2010.*

[11] *U. Sharma and S. R. N. Reddy, "Design of Home/Office Automation Using Wireless Senosr Network," International Journal of Computer Applications, vol. 43, pp. 53-60, 2012.*

[12] *K. P. Dutta, P. Rai, and V. Shekher, "Microcontroller Based Voice Activated Wireless Automation System," VSRD Internation Journal of Electrocal, Electronics & Communication Engineering, vol. 2, pp. 642-649, 2012.*