

# Internet of Things – Home Automation with the help of Raspberry Pi Kit along Android App and Chrome Extension

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**ABSTRACT:** Internet of Things (IoT) is an innovation that interfaces all things and the Internet in shrewd spaces. IoT has been broadly connected to various fields with the help of knowledge with detecting gadgets, for example, savvy homes, the application fields in smart homes consolidate brilliance into home area for safe, smart, secure, medicinal services, and vital protection. The requirement of a stable and sustainable life is particularly imperative in keen homes.

**KEYWORDS:** Internet of Things, Artificial Intelligence

## I. INTRODUCTION

The Future of Home Automation is looking for full control over your everyday home electrical appliances, thus giving user affordable lighting solutions, greater energy conservation with optimal use of energy. The concept of Internet of Things also further extends to have overall control over your home security as well as build a centralized home entertainment system and much more. The Internet of Things based Home Automation system, as the name sounds are looking to control all the devices of your smart home through internet connectivity and cloud-based operations. The IoT based Home Automation system offers a lot of flexibility over the wired systems as it comes with various advantages like ease-of-use, ease-of-installation, avoid the complexity of running through loose electrical connections, fast fault detection, and triggers and all it even offers mobility. Homes of the future 21st century will become smarter and smarter and automated due to the comfort it will provide, when employed in a private home. A home automation system is a means that allows users to control electric appliances of varying kinds. Maximum existing, some great home automation systems are based on wired communication. This will not become a problem until the system is planned very well and installed during the construction of the building. But for the current situation existing buildings, the implementation cost is very high. People believe in Ease of life; safety & security are the best reasons to choose IoT based devices. Various devices like motion sensors, smoke sensors, IP cameras help you know what is going on at home. When the devices interact with each other and act according to the instructions. When your motion sensor triggers the lights to glow deters intruders. Scheduling the lights to turn on/off based on schedule reduces the human effort as well reduces the power consumption. All these great features are there if and only if you have stable internet and electricity.

### I. Feasibility Study:

Looking at the possibility of this project there are numerous scopes for applications of this technology. Which are not costly, easily manageable and controlled with very small human interaction. The hardware components used in this project are easily available and not that costly. Also, looking at the software side, software used for the programming of this project is quite simple. No heavy language or proficiency in programming is required to write programs which are included in the project. On the other side, taking a look at the profitability such small-scaled projects can bring high change in society for the greater good. Its win-win situation on both sides. Also, your alacrity and creativity are put on the test. So, the feasibility study is very positive for IoT projects. We are going to implement An Android application, a chrome extension, and a working Raspberry Pi kit. Android app is voice-enabled so that your voice commands can be used to control home appliances. Moreover, chrome extension can be used on the desktop or laptop machine while you are working. It is used for giving notifications also. We are running this program over the raspberry pi kit which will act as a middle connector. Whenever a command is given first it will be sent to the raspberry pi kit then it will be recognized which operation is to be performed. After the operation is final raspberry pi kit will perform the following operation. And the changes will be reflected in the app and on a chrome extension. Here Raspberry Pi is the main component that is doing all the work, a continuous power supply should be supplied to the kit. In case if there is a power outage for some time then the kit will stop working. To restart we are using simple login one clicks method.

### II. RELATED WORK

Home automation is becoming very popular because of its numerous and countless applications. Home automation is an idea to control the home appliances by local networking or by remote control. Artificial Intelligence will be providing real-time decisions and automation. The Smart Home is concept for House automation, with the use of new technology, to make household activities more convenient, comfortable, secure and economical. This system includes main components which are a monitor, computer, or Phone, for example, that can give orders to the control System. Mode of transmission: wired connections (example Ethernet) or Wireless (radio waves, infrared, Bluetooth, GSM), etc. Central Controller: It is a hardware interface that communicates with the user interface by controlling domestic services. Home automation is a big challenge not only for the developers but also for the customer. The developer has to choose the component as per the customer requirement. Due to all the customer demands are not equal hence they have to compromise with the existing products. Looking at the “Home Automation Using Internet of Thing” authored by Shopan Dey, Ayon Roy and Sandip Das, it is clear that they have used the Raspberry Pi module to connect ESP8266-01 module for the connectivity with the internet. Through this module, various devices are controlled through web pages and also through android application.

### III. PROPOSED WORK

1. We have proposed An Android application, a chrome extension, and a working Raspberry Pi kit. Android app is voice-enabled so that your voice commands can be used to control home appliances.
2. Moreover, chrome extension can be used on the desktop or laptop machine while you are working. It is used for giving notifications also. We are running this program over the raspberry pi kit which will act as a middle connector. Whenever a command is given first it will be sent to the raspberry pi kit then it will be recognized which operation is to be performed.
3. After the operation is final raspberry pi kit will perform the following operation. And the changes will be reflected in the app and on chrome extension. Here Raspberry Pi is the main component that is doing all the work, a continuous power supply should be supplied to the kit. In case if there is a power outage for some time then the kit will stop working. To restart we are using simple login one clicks method.

### IV. RESULT

With the help of IoT network architecture, we were able to make this flowchart. In this flowchart fig 1(a), we can see that it is an almost parallel process where data is transmitted and received whenever a request is made. It will be six stage service having a relay system as the base which will be connected with Broadcom SoC which will provide Internet connectivity. Bridges will be used for the connection purpose which is enough to set up a Pi server. This server will be running over LAN/ WAN and will be integrated with the Android App and Chrome Extension to provide service to the request. For Example. If you want to start your TV then you can send the request through Android app or from chrome extension. The raspberry pi kit will receive the request and it will serve the request, as for the result part your TV will start.

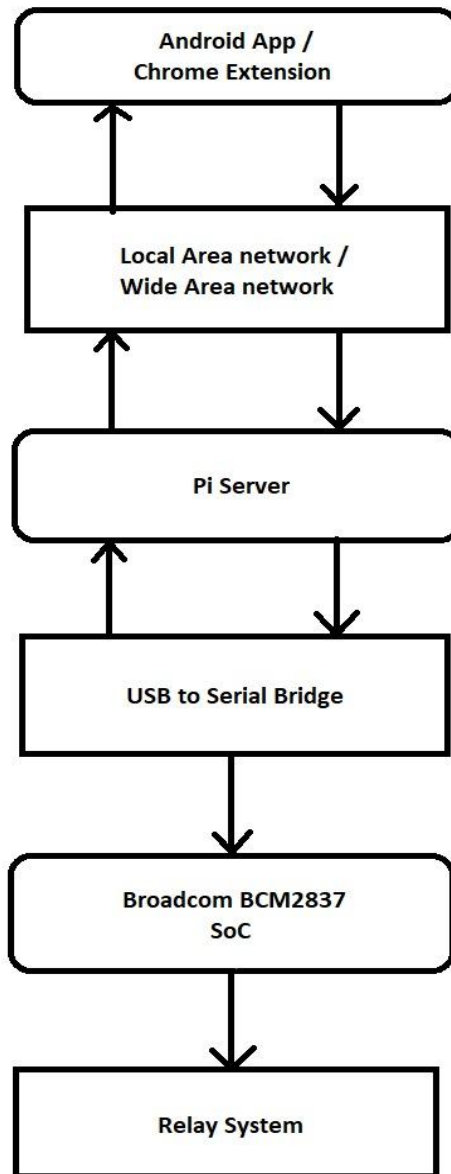


Fig 1(a) Flowchart of Proposed network architecture

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