

ABSTRACT

Technology is always evolving, a new concept has been shown in the internet field which is the Internet of Things. IoT is the latest and emerging internet technology, it is the network of physical things (smart home appliances, electronic circuits, sensors, etc.). In this paper we will use this technology to present a solution for Security and safety in home which has always been a basic necessity for urban population. The system is based on sensor, actuators, microcontroller, gateway and Cloud technologies, it allows the users to control, monitoring and receive data in the Real-time via internet using web interface and smartphone. It can detect the theft, fire, leakage of gas and gives immediate notification to the owner and security services like police station or fire brigade at the time.

Key words: IoT, Cloud, Smart home, Security , Real-Time.

INTRODUCTION

With the advancement in technology and the Appearance of Internet of things (IoT). The concept of smart home (home automation) has been so popular now-days due to its great benefits., security systems have also changed a lot during the course of time .

Safety and Security system is an essential part for any living or working place. which can keep the occupants and their possessions secure from various hazards such as fire, theft, leaking of raw gas..etc. A Smart home can be viewed as an intelligent or automated home where the home appliances can be automated and monitored remotely. **So, the question we should be asking is how to make smart home secure and protected from any kind of threats without homeowner intervention in a real time ?.**

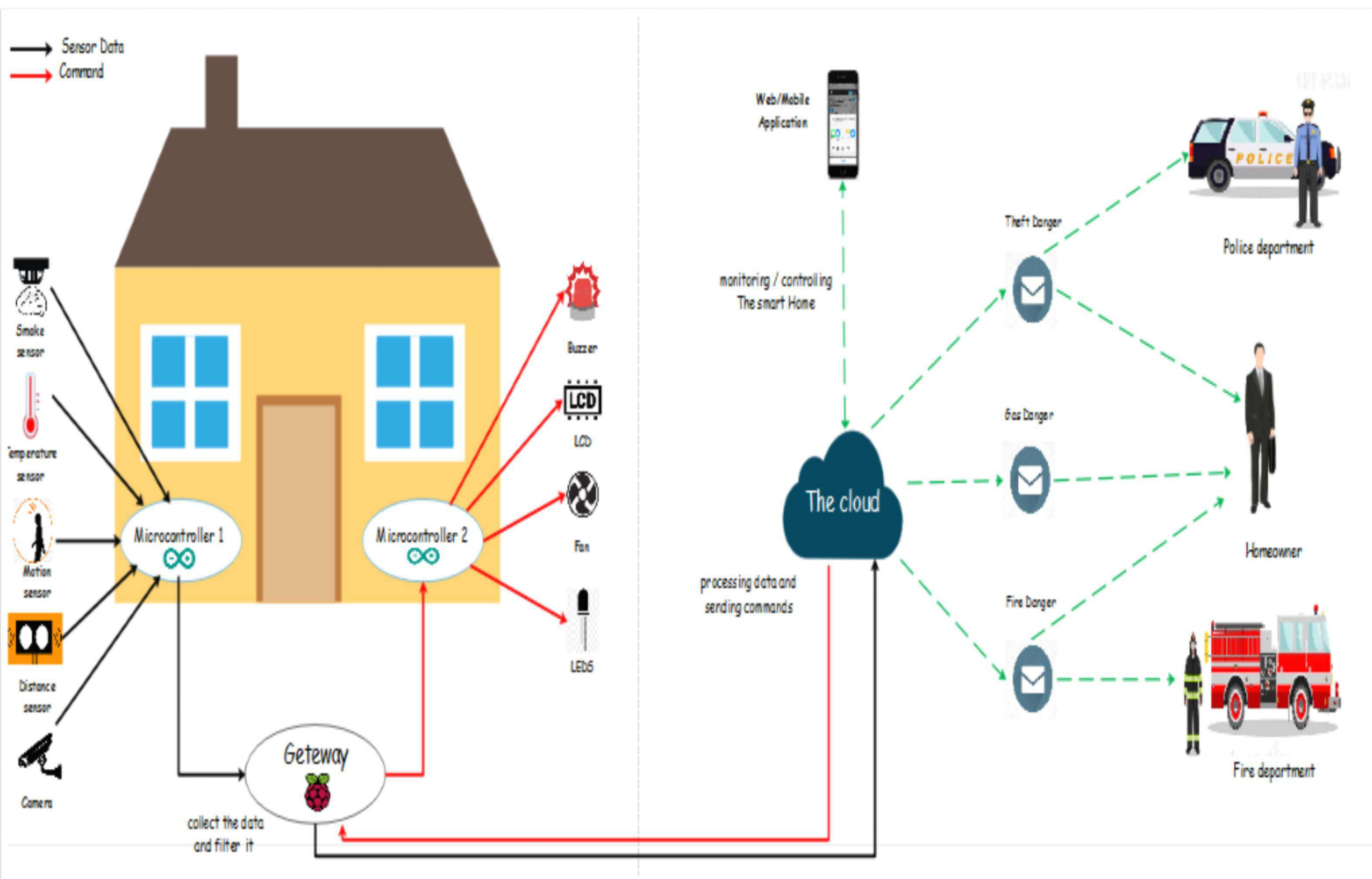
1.OBJECTIVES:

We are focuses mainly on the security aspect of home automation .Our main objective is to make smart Home security system which can provide security and safety from almost every perspective and which can be accessible remotely

Specifically, here we can state the objectives of the system are as follow:

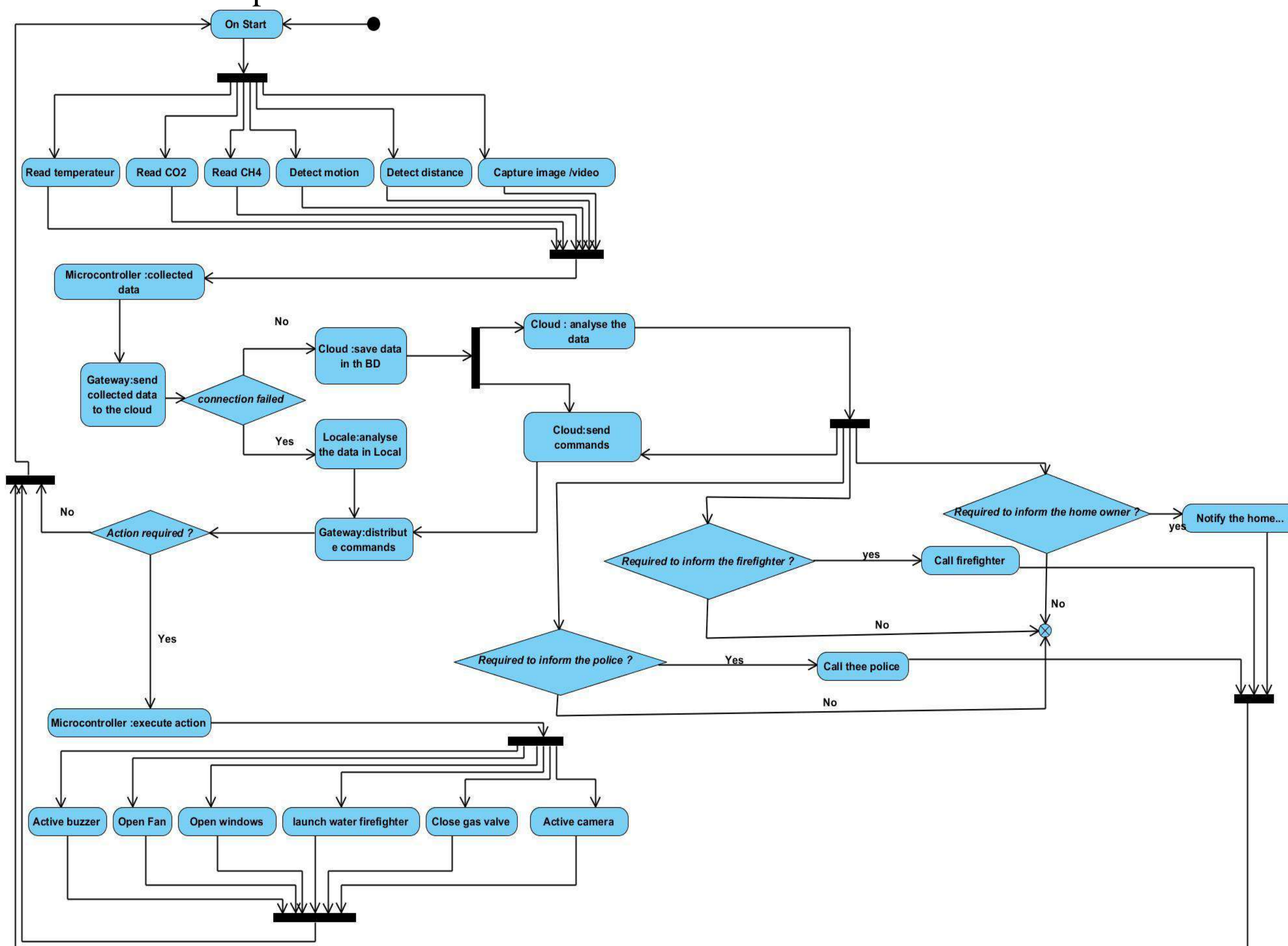
- ✓It provides safety from any kind of risk or intrusion related activities
- ✓protect individuals and property from various hazards such as leakage of gas and fire
- ✓It provides remote access to the home appliances for reduce human work
- ✓provides peace of mind when we are away

2.ARCHITECTURE



3. SYSTEM IMPLEMENTATION

The activity diagram below show how the system function and the action that can the system do in order to keep the house secure and safe



4.HARDWARE & SOFTWARE TOOLS:

raspberry pi 3



The raspberry pi 3 model comes with :

- A 1.2GHz 64-bit quad-core ARMv8 CPU
- 1GB of RAM / 4 USB ports
- 802.11n Wireless LAN/ Bluetooth 4.1
- Bluetooth Low Energy (BLE)
- HDMI port...[1]

The raspberry pi represent IoT gateway which aggregates sensors data and report it using the internet to a remote location , also it do local treatment of the data.

Arduino Uno

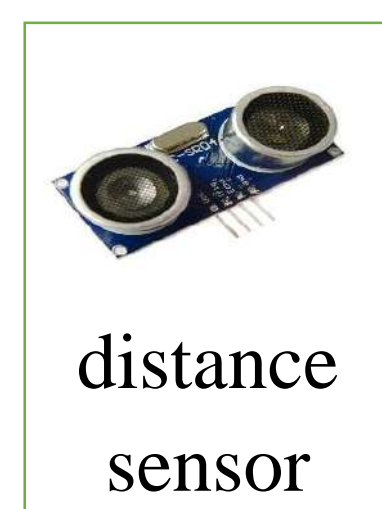


Arduino Uno (as microcontroller)

Summary of technical characteristics :

- Input voltage 7- 12V /Input voltage 6 - 20V
- operating voltage 5V
- Pins for digital I/O 14 Flash memory 32KB [2]

Its role is to read sensors data and send them to the gateway, or it turn on/ off actuators, depending on the received command

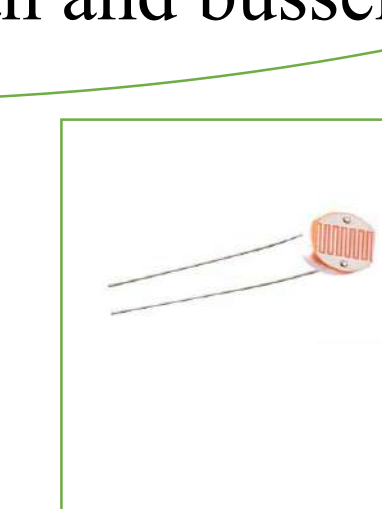


Sensors

sensor is a electronic device that detects and responds to a physical phenomenon. In our solution we have use A variety of sensors to detect threats like smoke sensor , PIR sensor (Motion) ,distance sensor ... etc.

Actuators

An actuator is something that converts energy into motion. The main role of an actuator is to eliminate the threat or warning the house owner in case of danger . some of the actuator that we use is “fan and busser “



IBM Bluemix

IBM Cloud is a suite of cloud computing services from IBM that offers both platform as a service (PaaS) and infrastructure as a service (IaaS).

With IBM Cloud PaaS developers can use IBM services

to create, manage, run and deploy various types of applications [3].



Node-RED

Node-RED is a flow-based programming tool, original developed by IBM's Emerging Technology Services team, for wiring together hardware devices, APIs and online services as part of the Internet of Things, and now is a part of the JS Foundation. [4]



CONCLUSION

In the light of our objective from this project which is implementing a smart home security system by using Internet of things technology. Our solutions have tried to solve almost every problems related to the security of homes and its assets, reduce the danger to humans life and property and helps to keep residence secure.

REFERENCES

- [1]Raspberry Pi. (n.d.). Raspberry Pi 3 Model B - Raspberry Pi. [online] Available at: <https://www.raspberrypi.org/products/raspberry-pi-3-model-b/> [Accessed 2 Apr. 2018].
- [2] Génération Robots. (n.d.). Arduino UNO Rev3. [online] Available at: <https://www.generationrobots.com/fr/401867-arduino-uno-rev3.html> [Accessed 2 Apr. 2018].
- [3] Margaret Rouse (May 2017) TechTarget [Search Cloud Computing [online] Available at <https://searchcloudcomputing.techtarget.com/definition/IBM-Bluemix> [Accessed 2 Apr. 2018].
- [4] Node-RED/About [online] Available at <https://nodered.org/about/>[Accessed 3 Apr. 2018].