# Dynamic Context Building for ROOF

Presented By

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# What does Context Building mean?

- The real world scenarios are objectified by machine(things) in the form of data(raw) that defines an environment for context-building i.e., real-time analysis of the current situation.
- Context-building rules and associated actions

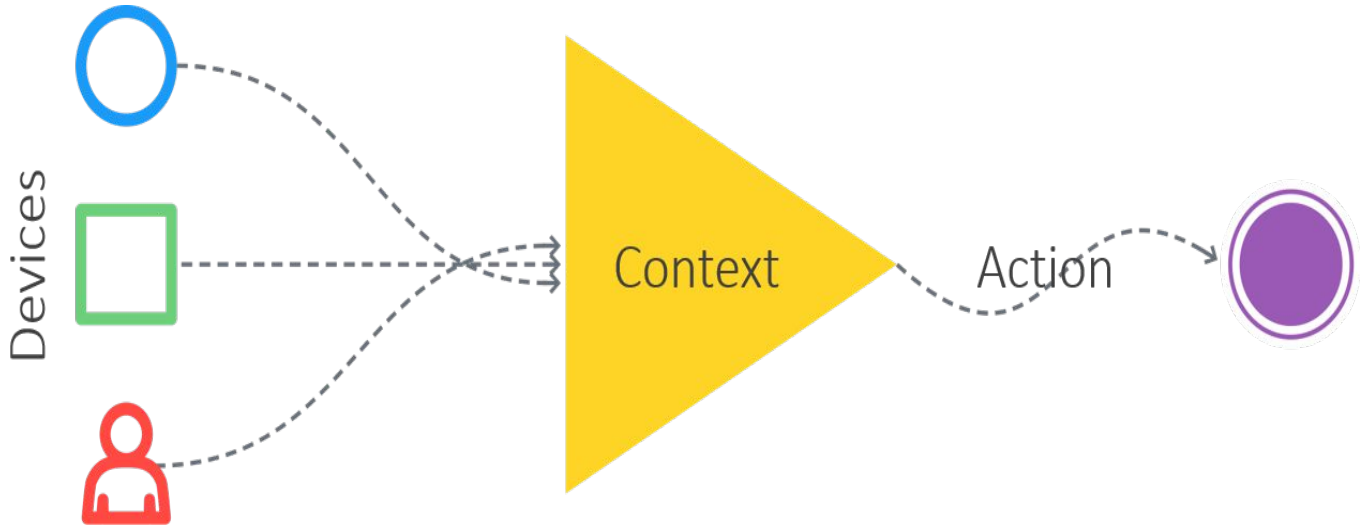



**Fig 1 : Context Building Rules and Associated Actions**

# What is the need of Context Building ?

- For ‘n’ services, a (2^n)-1 contexts are possible i.e suppose n = 25 , then possible contexts are 33,554,431 .

- **It is difficult to build ,understand or the need of every context while deploying the IOT application**

- In this project , a context-building framework is developed and implemented for a basic Smart Home IoT application

# Objectives of Dynamic Context Building

The system will allow the user to

- Make agile decisions
- Trigger immediate actions
- Real-time Computing and Offline Support

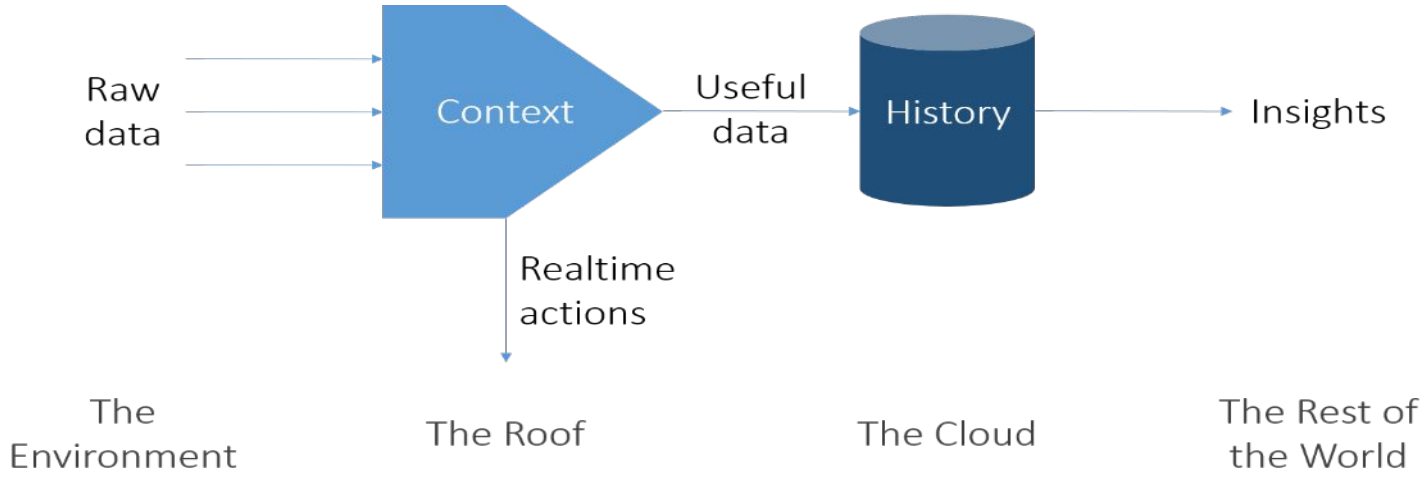



**Fig 2 : Context Building for IOT Applications**

# System Architecture

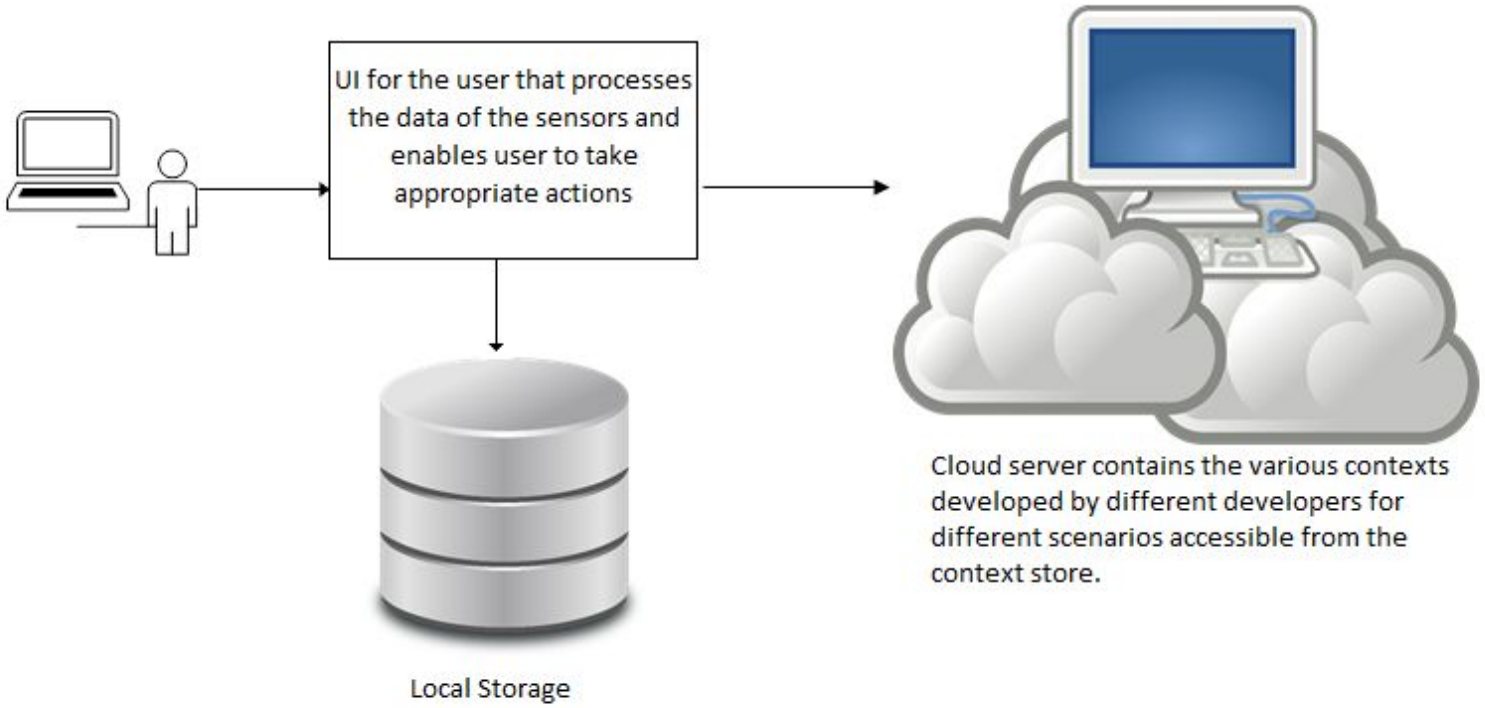



**Fig 3: System Architecture**

# Implementation Setup

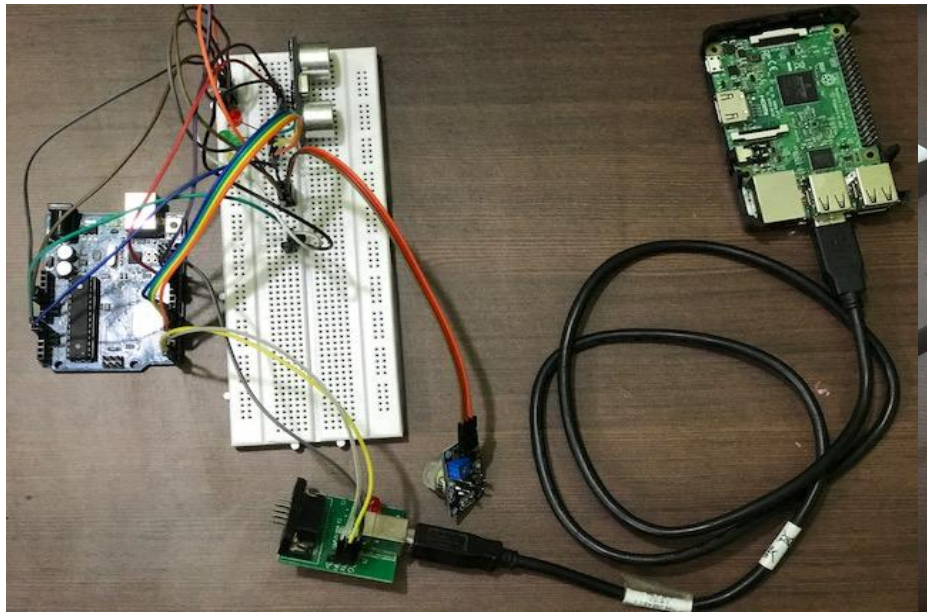


**Fig 4: Hardware Connections**

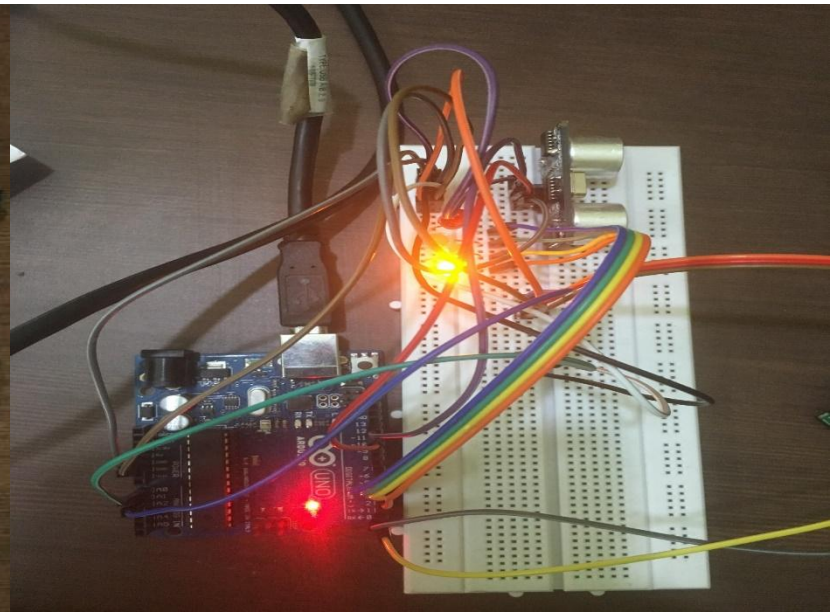


**Fig 5: Context Implemented for Switching on light**

# Platform and tools used

- **Software**

Platform :

Windows 10 Enterprise (64bit, A8 processor , 1.65GHz, 4GB RAM)

Language and Tools :

Node.js, MongoDB, Ajax, Angular.js, jQuery, HTML, CSS and Mocha script

- **Hardware**

Platform :

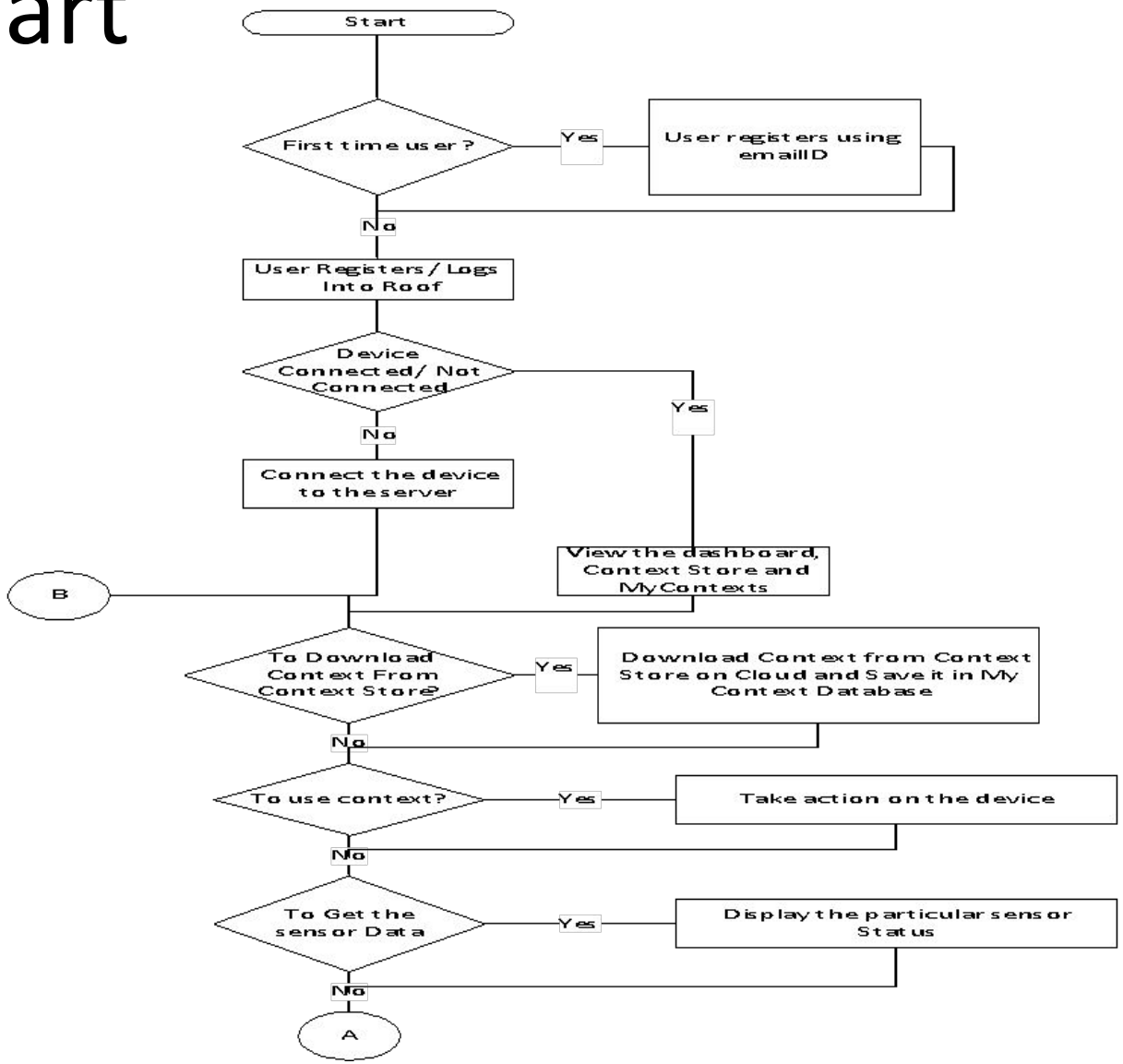
Ubuntu Mate OS on Raspberry Pi 3 Model B

Arduino CC IDE on Windows for Arduino Uno R3

Language:

C

# Flowchart



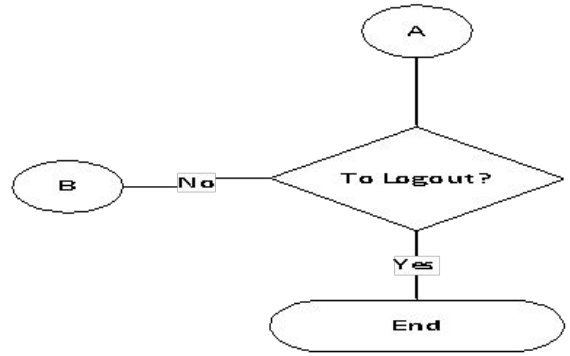
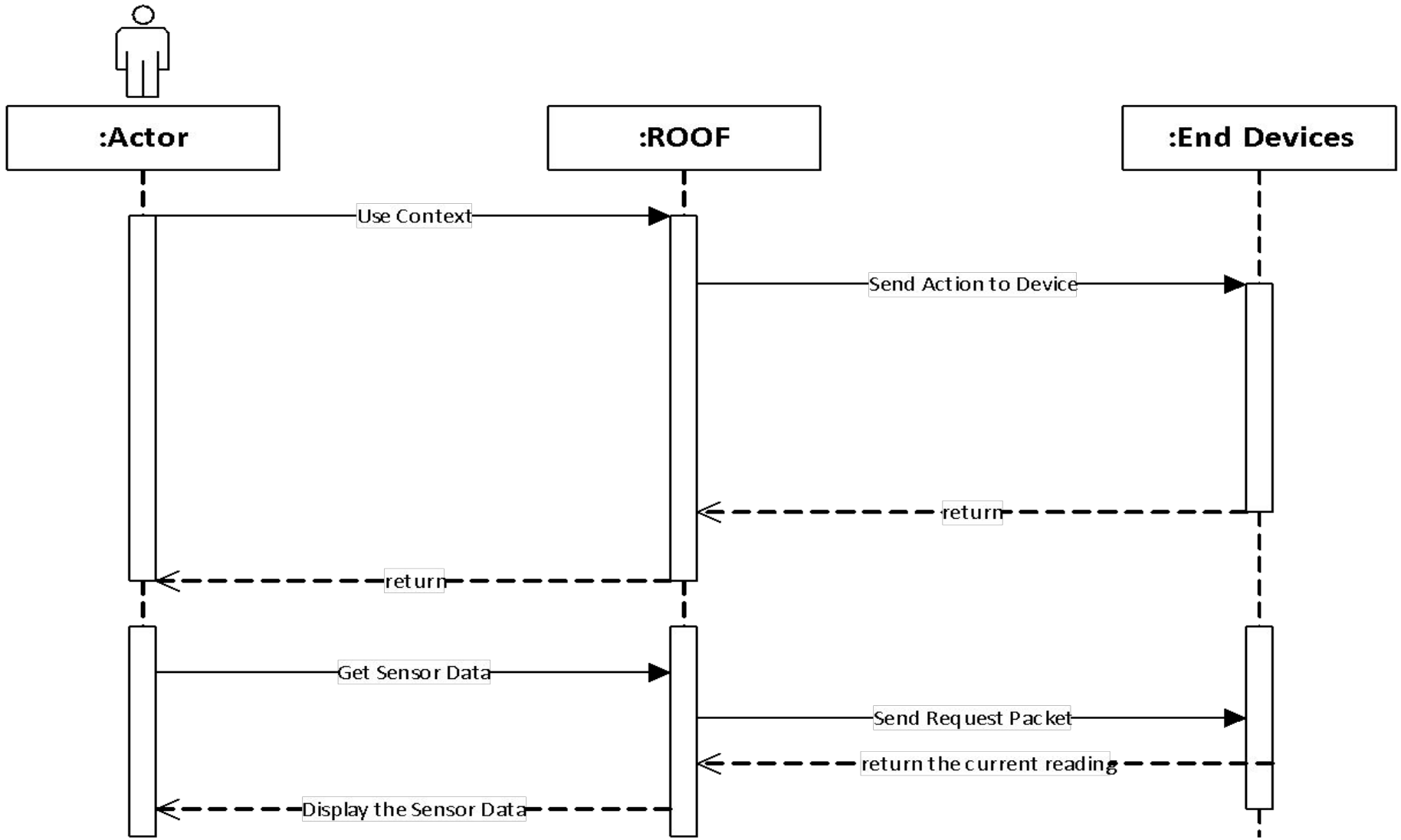
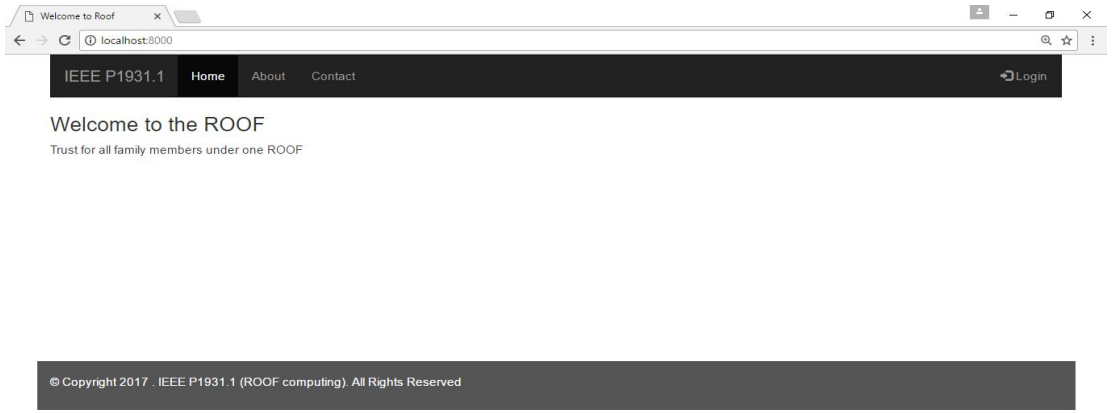



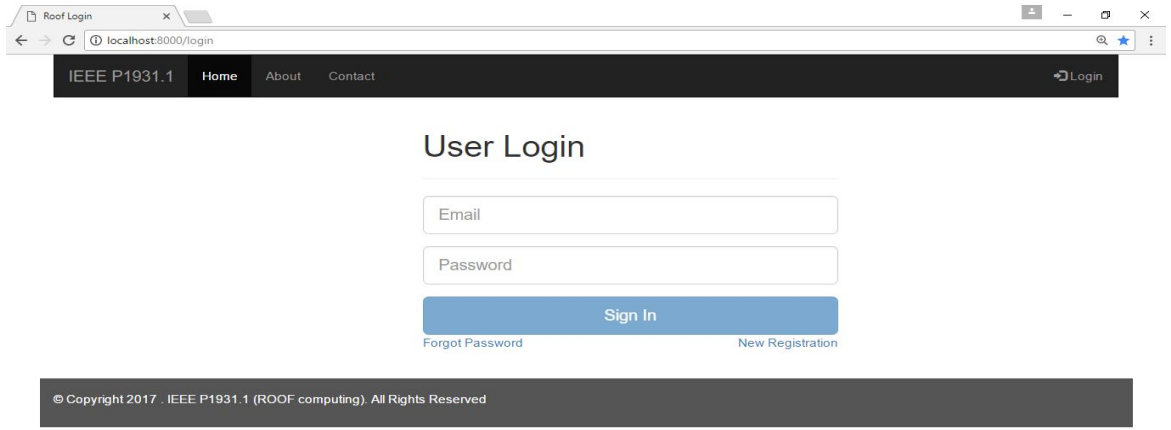

**Fig 6: Flowchart**

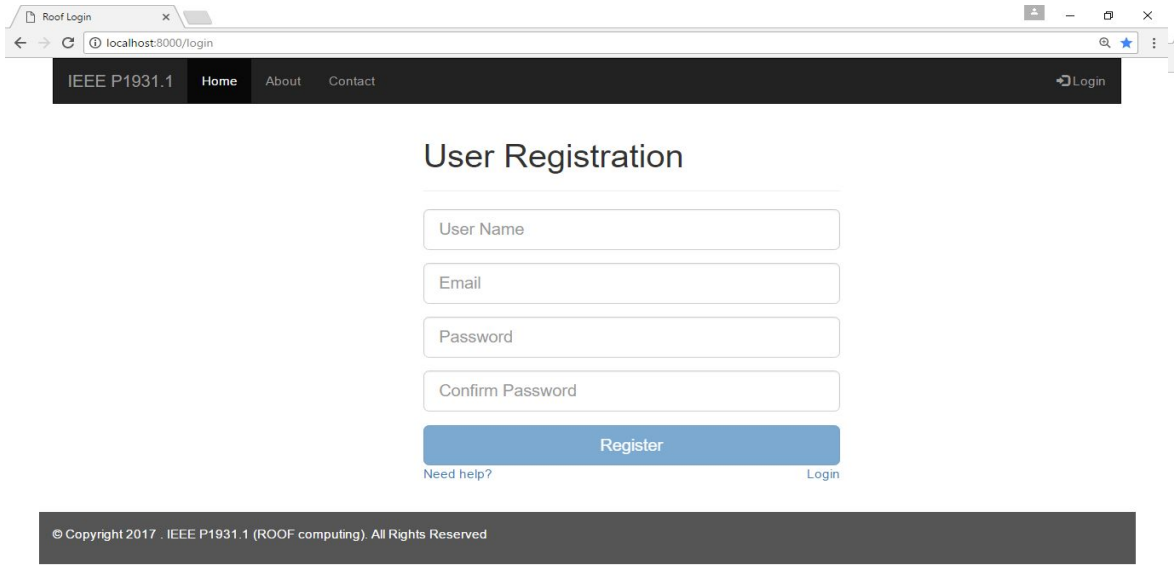
# Sequence Diagram

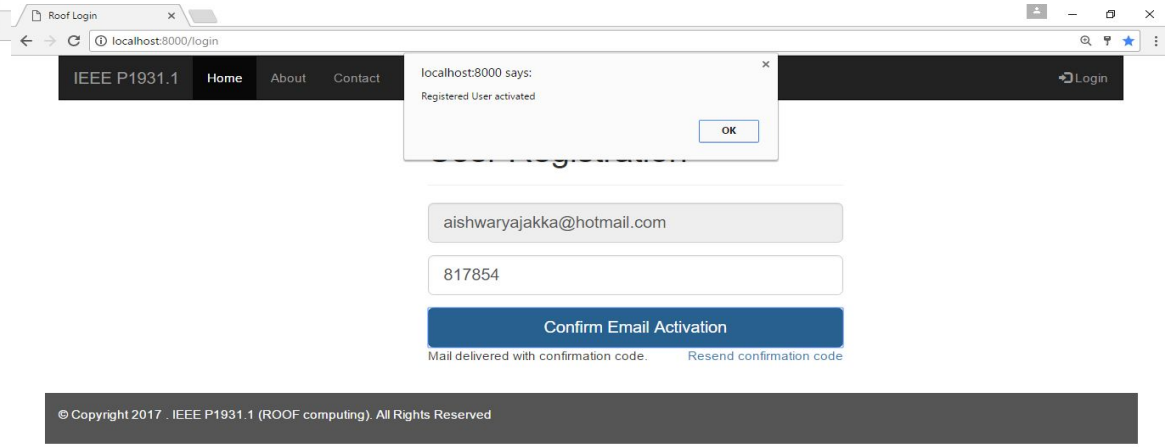


# Screenshots of the User Application



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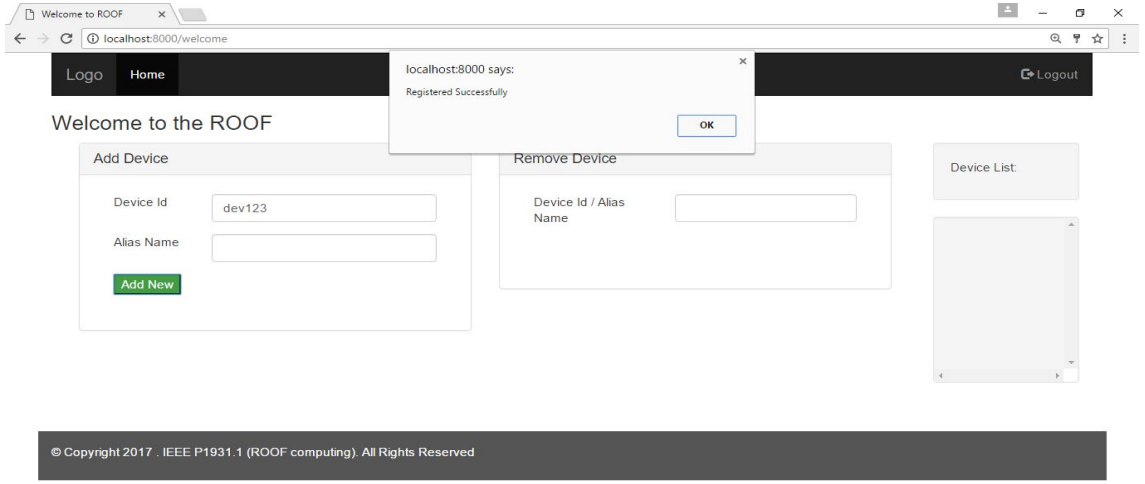


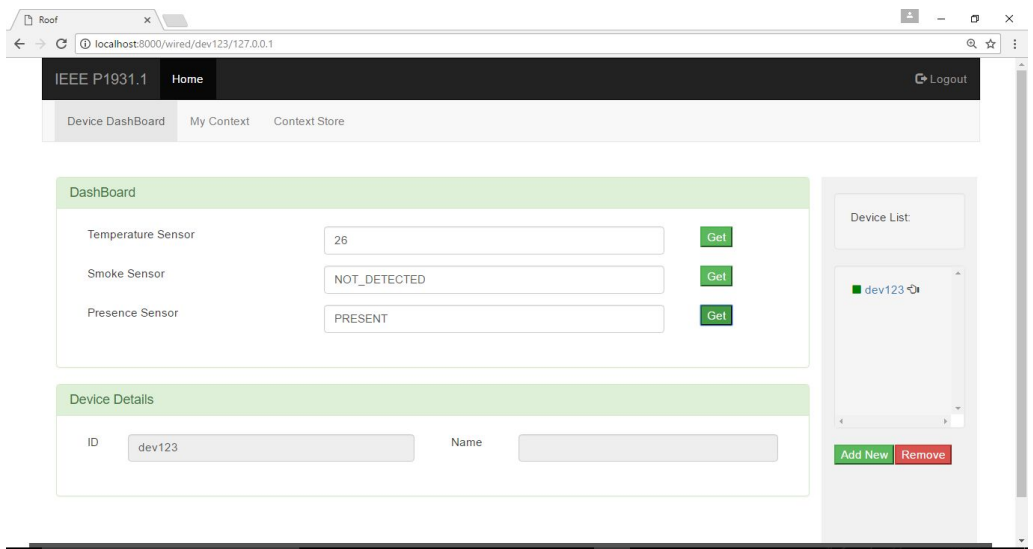


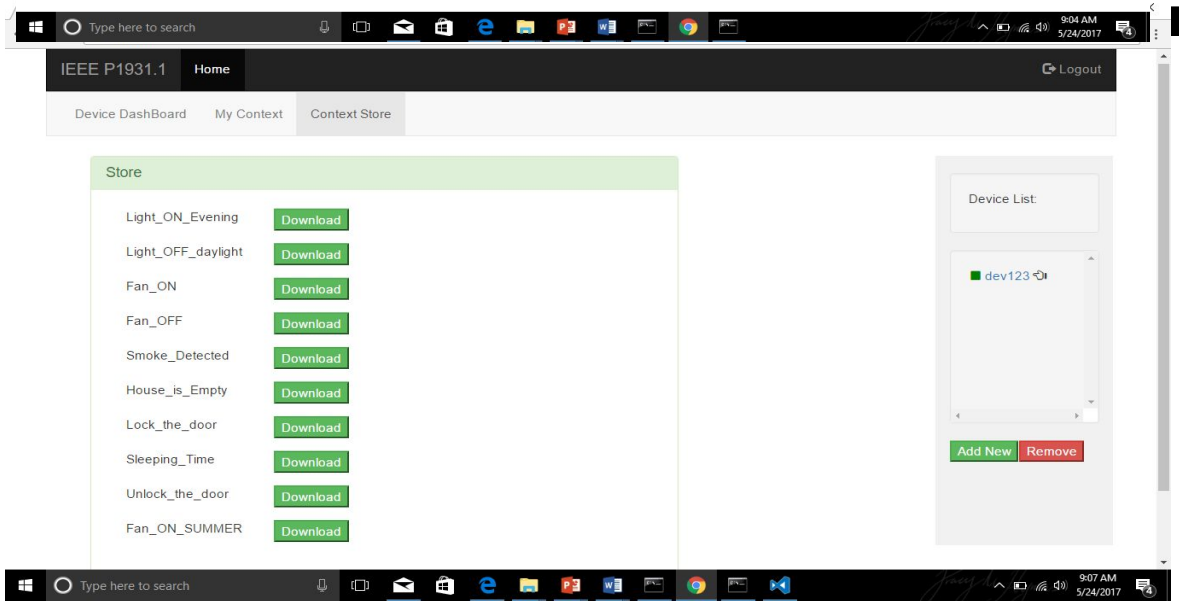


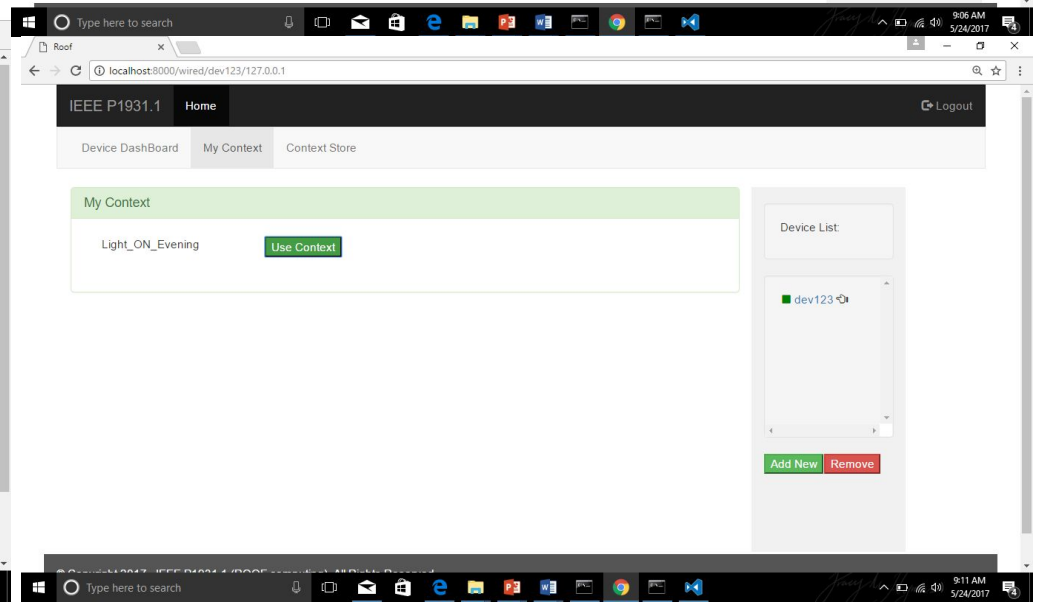

# Results

Downloading of a new Context

The sample context in JSON format specifying the rules and the device action that is to be taken

Result : the LED for Fan and Lock glow

SAMPLE CONTEXT FOR THE ACTION TO BE TAKEN DURING SLEEPING HOURS


```
{
"name": "Sleeping_Time",
   "rules": {
       "ir_s": "PRESENT",
        "time_r": [
          "22:30",
          "06:00"
       ]
   },   "action": {
"fan": "ON",
       "lock": "ON"
   }
}
```

# Conclusion & Future work

- The dynamic context building application makes an IOT deployment not only easier but also cost effective
- The application can be scaled to implement contexts up to 25 services
- It has be enhanced to have a collaborative environment for both the users and developers