

# A Cheaper Home Automation Solution using Bolt-IoT

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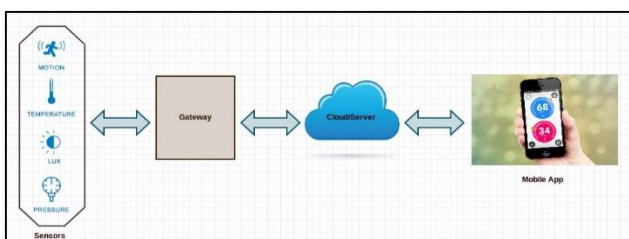
**Abstract**— This paper aims at presenting a low budget & trustworthy ‘Home-Automation’ solution via Internet of Things (IoT) using Bolt IoT as cloud platform and Bolt-ESP8266-12E as the MCU and Android Mobile App. The Home devices like Ceiling fans, Tubelights etc can be controlled from a mobile device with IP connectivity through Wi-Fi. The Home Appliances like Fan, Tubelights can be accessed through the internet from any part of the world. The strategic importance of this project is to control electricity consumption and lessen human-efforts. This is a cost efficient system. The Home appliances are controlled via Mobile App and connected through IP connections.

**Keywords:** Internet of Things (IoT), Bolt-IoT, Home Automation, Wifi, Cloud Computing

## I. INTRODUCTION

The Internet of things (IoT) builds a linkage of devices/objects/things that can connect, act together and collaborate together for a common objective. IoT devices/objects/things can boost our day-to-day life, as now all devices like Refrigerator, T.V, Fan, Oven etc are interconnected over the Internet and start working as a team. The data received from the above devices can be used for analysis and decision-making. Also we can monitor our devices/objects/things from anywhere in the world via Internet. Say for example, someone wants his room to be pre-cooled by Air-Conditioner before he/she reaches home, then he can simply do this by turning the A.C ‘ON’ via his Mobile Phone from his office. If someone wants to monitor the CCTV camera of his home then this is possible through IoT. The present day technology also enables Refrigerators to read the RFID of the items kept inside it and sound alarm whenever the items expires. The burglar alarm can now be made more proficient by IoT, the house owner can be alarmed via IoT in his/her mobile phone about any security breach by motion detectors. This Paper aims at one of the paradigm of IoT by automating the Ceiling Fans and Tubelights via Mobile Apps through IoT. This Paper explains how IoT can help to Switch Off/On a Ceiling Fan and Tubelight through Mobile App. This won’t change the behavior of switch boards and both will be workable with an OR condition, i.e if either of them in true then the appliance will run, if both IOT device trigger and individual switch both are false then only appliance will stop

## II. IOT AND ITS WORKING



Devices/Equipment possess Sensors like motion-sensors, temperature sensors etc. These sensors are connected to IoT Platform/Cloud through a Gateway, the cloud stores the data gathered from these devices and us if for analysis and decision making.

## III. TOOLS & SOFTWARE’S USED

### A. Tools Used

- 1) Sensors
- 2) Multi-meter
- 3) Bread board
- 4) Jumper cables
- 5) Plastic box
- 6) Double end tape

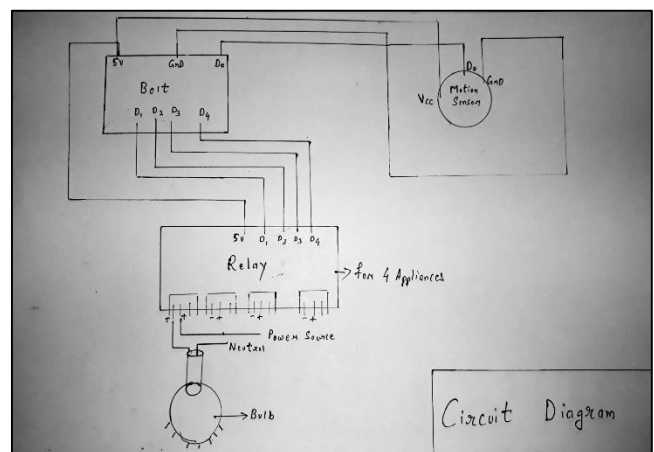
### B. Software’s used

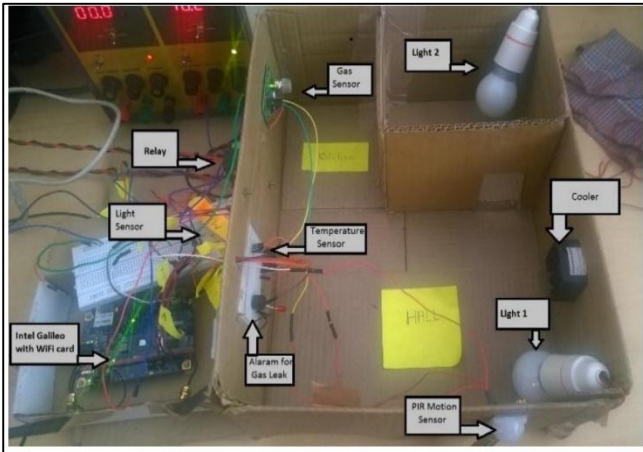
- 1) VSCode
- 2) Ionic Framework 4
- 3) Javascript
- 4) Nodejs
- 5) Typescript
- 6) Bolt-iot-wrapper (created by me only) - <https://github.com/pranaydutta89/bolt-iot-wrapper>
- 7) Apache Cordova

## IV. PLATFORM AND MICROCONTROLLER USED

- 1) Cloud platform - Bolt cloud service
- 2) Name of microcontroller -Bolt IOT

## V. CIRCUIT DIAGRAM





## VI. SOURCE CODE AND USAGE

### A. GitHub Repository Link

- 1) <https://github.com/pranaydutta89/bolt-iot-wrapper>
- 2) <https://github.com/pranaydutta89/bolt-iot-mobile-app>

### B. Usage

#### 1) Nodejs:

```
npm i bolt-iot-wrapper
// import module
import {Devices,Enums,PubSub} from 'bolt-iot-wrapper';
```

#### 2) Browser

```
<!-- CDN script tag-->
<script src="https://unpkg.com/bolt-iot-
wrapper/umd/boltIotWrapper.min.js"></script>
```

#### 3) API

```
// 1) Register devices
Devices.add({deviceName},{deviceKey});
// 2) Read Device
const instance =Devices.read({deviceName},{deviceKey});
// A) Analog
instance.Analog.read();// reads analog pin data return a
promise
instance.Analog.loopRead({milliseconds},{callback}) //
reads analog pin continuously in particular interval
//B) Digital
instance.Digital.read({pin |pins[]}) // read Digital signals of
single of multiple pins returns a promise
```

```
instance.Digital.write({IDigitalparams | IDigitparams[]}) //
write digital signals
```

```
instance.Digital.loopRead({pin |
pins[]},{milleseconds},{callback}) // read digital signals in
particular interval
```

#### //C) UART

```
instance.UART.begin({baudRate}) //sets the baud rate
instance.UART.read({till})
```

```
instance.UART.write({data})
instance.UART.readWrite({data},{till})
```

#### //D) utils

```
instance.Utility.isOnline();// returns a promise with resolved
valueas true/false
```

```
instance.Utility.restart()
instance.Utility.version()
```

```
//E) Api Callback
```

```
PubSub.api({cb}) // the callback will get fired with phases
of api calls
PubSub.message({cb}) // the callback will get fired when
library would send some message to client
//same api follows for browser just it is inside window
object as
boltApi.Devices.add({deviceName},{deviceKey})
```

## VII. CONCLUSION

IoT is hot cake in the present day world and Home Automation is perhaps the most useful application of IoT. Home Automation eases the human life and reduces his/her workloads at home. The purpose of this paper is to represent how IoT can be used for Automating day to day life process using cloud technologies. The aim is not only to provide a relaxed way of life but also to help the disabled people so that they can simply handle jobs on their own. In this paper we have also used Android App to control the household devices. Android is the world's dominant mobile platform open source operating-system. This paper is about cordless home-automation by means of Android mobile. Hence, it incapacitates many problems like expenses, obstinacy, safety etc. In addition, it provides better benefits like it reduces our energy bills, it advances home security.

## VIII. FUTURE WORK

Going ahead in future the following use cases can be incorporated:

- 1) To automate entire house with different boards as needed and with different functionalities according to the room.
- 2) Minimizing the time-delay to turn On/Off the device.
- 3) Using Speech Recognition to operate the system.
- 4) Automatically locking / unlocking doors based on the face-recognition.

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