

# Bitcoin Alert System Using Bolt Iot Integrated

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Submitted: 20-05-2022

Revised: 28-05-2022

Accepted: 30-05-2022

**ABSTRACT-** Bitcoin and other prominent cryptocurrencies have gained much attention since the last several years. Globally known as digital coin and virtual currency, this currency has gained popularity all over the world. Cryptocurrency can be considered as the future currency that might replace the current paper currency worldwide. Even though it has caught the attention of many users, but they are still not aware about its uses and the challenges for the future. The price of the cryptocurrency can be changed anytime. So, in order to be alert at anytime we have created this project. This project can be used to create the awareness among themselves about the price of the cryptocurrency. In this research paper, we will be writing a program using python. The program is used to check the current price of bitcoin whenever there is a change in the price of bitcoin. And at the same time it also compares the current price with the bitcoin price which is set as a selling price. It alerts through buzzer, email and message. For our project we have used the bolt IOT to give the capability to control our devices and collect data safely and securely no matter where you are and we have also used the Ubuntu software for the python program.

**KEYWORD-** Bitcoins, Bolt, Internet of Things (IOT), Python, Cryptocurrency.

## I. INTRODUCTION

A device or software is said to be smart when it is able to send or receive data when it is connected to the internet. The Internet of Things (IOT) refers to connecting devices to the internet and making them interactive. Cryptocurrency is nothing but a virtual currency and its usage is similar to the currencies that we use in our day to day life. Cryptocurrencies are secured by cryptography which makes impossible duplicating bitcoins and using the same coin twice. The transaction details of the users are represented by ledger entries inside the software. The concept of Internet Of Things (IOT) helps to find the value of

bitcoin during multiple transactions by using Bolt Internet of Things. So, the basic idea of this project is to alert the individuals regarding the cryptocurrency bitcoin status through buzzer. In section 2, we aim at defining a scenario and naming different components of the system and explaining system architecture. In section 3, our focus is on the python code and its work flow. In section 4, we intend to highlight the system arrangement and present the results obtained from the process before concluding.

## II. LITERATURE REVIEW

This research paper deals with the usage of Internet of Things for transaction application in a decentralized system. It ensures trusted transaction even though an unsecured network. Due to its high security level, it is an interesting topic among the developers and researchers. However there exists the issue of trust between the investors and clients when it comes to sharing the money virtually. Also, the paper states that the chances of hacking are near impossible. It will create a milestone in the fields of transaction and trading since it utilizes a decentralized structure: all the transaction details are visible for every other individual participating in the transaction which provides zero percentage of hope for cheating. In this digital mode of transaction all such inefficiencies are eliminated. All the unique characteristics of this technology make this user-friendly idea more popular because it uses a decentralized unchangeable ledger.

Cryptocurrency itself is highly difficult to hack.

## III. METHODOLOGY

### I. Scenario

A customer uses online trade transactions of cryptocurrency, in the form of bitcoins. The price of the bitcoin keeps changing so it's highly impossible for the customer to continuously monitor the value of bitcoin every 30 seconds and check with the selling price set by the customer. If

the value of bitcoin increases, it sends an alert message to the customer in the form of the buzzer.

II. System Components

a) Bolt Wi-Fi Module

Connects to the bolt cloud out of the box, comes with General Purpose Input/Output (GPIO), ADC, and Universal Asynchronous Receiver Transmitter, I2C and Serial Peripheral Interfaces via Arduino Adapter.

b) Universal Serial Bus-A to Micro-Universal Serial Bus Cable

Micro Universal Serial Bus cables are compatible with the Android device to charge and sync with. It

is a connector which is designed to carry data and power in universal serial bus.

c) Male/female jump wires

These are Jumper wire male to female, used in connecting female header pin of Arduino to other developing board having male connector.

d) Buzzer

When the voltage is applied, the customer will get a buzzing sound which completes the alert system.

e) Software apps and online services

- i. Bolt Internet of Things cloud and library
- ii. Microsoft Visual Studio Code
- iii. Twilio and Mailgun

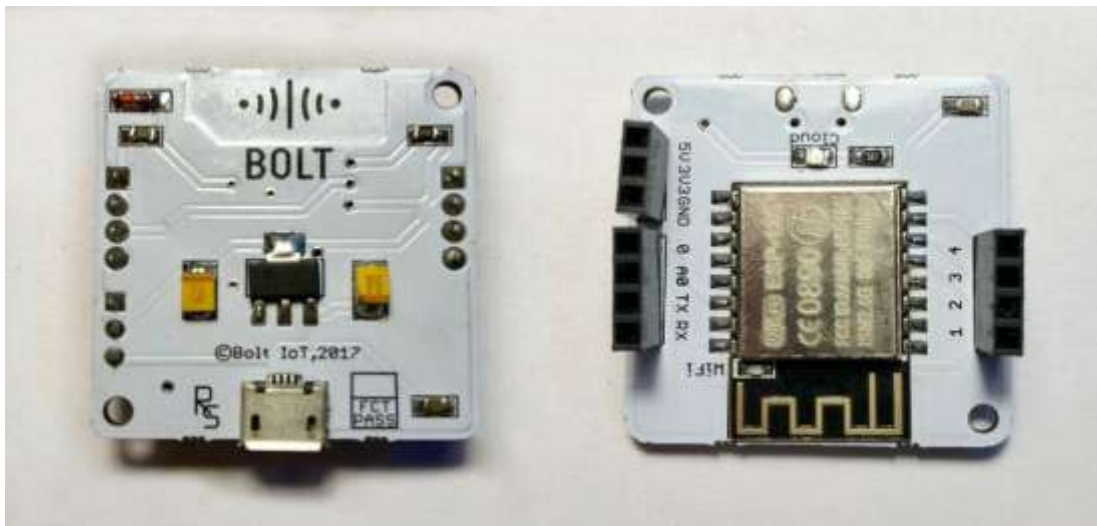


ILLUSTRATION OF BOLT WIFI MODULE

IV. SYSTEM ARCHITECTURE

The following script gives a description of the hardware and software setup.

a. Hardware setup

Connect the longer end of the buzzer in the pin 0 of the Bolt Wi-Fi and the shorter end to the ground.

b. Software Setup

Registration

STEP 1: Open [www.cloud.bolttiot.com](http://www.cloud.bolttiot.com) on web browser

STEP 2: Click on “Sign up” as shown below

STEP 3: Enter the details in the sign-up page

STEP 4: Verification of the account

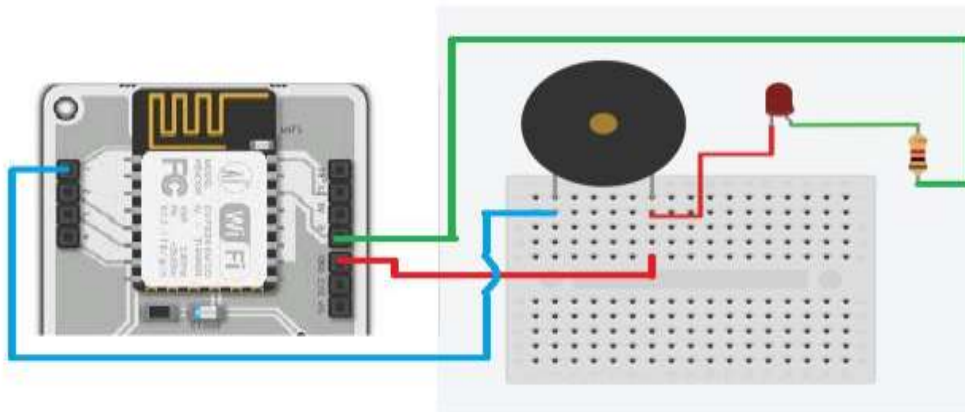


ILLUSTRATION OF HARDWARE SETUP



SIGNING-UP TO BOLT

## V. SYSTEM OPERATION

The below code is written in python language. It fetches the price of the bitcoin from the cryptocompare website and whenever the price rises above a given threshold, it alerts the user

```
import json
import time
import requests
from boltiot import Bolt
selling_price = 600000.00
api_key = "0bedea9c-9859-4a0c-8980-cfdc06194a15"
device_id = "BOLT1350134"
mybolt = Bolt(api_key,device_id)

def price_check():
    url = "https://min-api.cryptocompare.com/data/price"
    querystring = {"fsym":"BTC","tsyms":"INR"}
    response = requests.request("GET",url,params=querystring)
    response = json.loads(response.text)
    current_price = response['INR']
    return current_price

while True:
    market_price = price_check()
    print ('market price is: ', market_price)
    print ('Selling price is: ', selling_price)
    time.sleep(10)
    if market_price > selling_price:
        mybolt.digitalWrite("0","HIGH")
    time.sleep(60)
```

ILLUSTRATION OF PYTHON CODE

Downloading the android app and following the steps mentioned above will help the customer to connect the bolt device to the cloud. Next the customer must log in to cloud.boltiot.com and note the device ID of the Bolt Wi-Fi Module, and click on the Application Programming Interface tab and then under the section for Generate Key, click on Enable for finding the Uniform Resource locator of Application Programming Interface.

#### A. WEBSITE LINKS AND APIs

To build the bitcoin price alerting system, we will require a method to find the current price of bitcoin by writing a Python Program. We will use steps mentioned below to get the price of bitcoin. It is a very popular site that provides Application Programming Interfaces using which we can fetch various cryptocurrency related data. On this website all currencies are called Single Symbol Price Application Programming Interface to get the price of Bitcoin in United States Dollar.

1. To get the price of bitcoin: <https://min-api.cryptocompare.com>
2. The documentation of the Single Symbol Price Application Programming Interface: <https://min-api.cryptocompare.com/documentation?key=Price&cat=SingleSymbolPriceEndpoint>

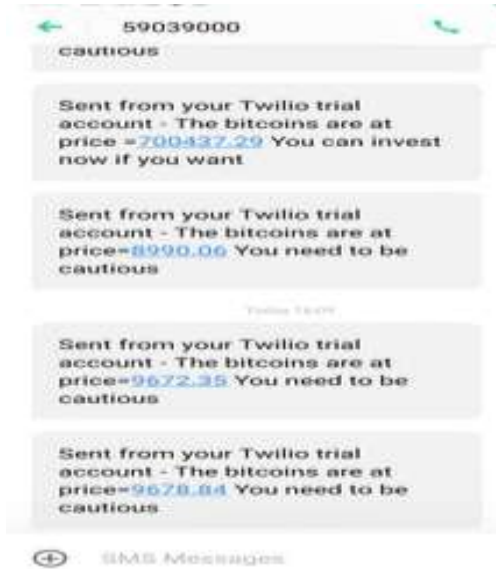
#### B. BUZZER CONNECTION

The buzzer is connected to the bolt module. The buzzer will be switched ON when the current price of the bitcoin is greater than the selling price defined by customer.

#### C. TWILIO

Twilio comes under another domain named cloud computing. This specific cloud service provider enables us to send notifications via SMS and make phone calls when the current bitcoin value in the market changes. Twilio provides a platform as a service (PAAS) infrastructure for the developers. All the notifications are sent via web service APIs. Steps to create account on Twilio:

- STEP 1: Go to <https://www.twilio.com/> using a browser or search.
- STEP 2: Fill in the sign-up form by entering the necessary details.
- STEP 3: Give your contact number and click "Products". Click on the checkboxes to enable SMS service.
- STEP 4: Create a project by providing a name. If you want to know your project and account information, click on "Project Info".
- STEP 5: Choose "Programmable SMS" from the menu and click on "Get a number" followed by choose this number button. Finally, a final number will be created and displayed for you.



MESSAGE NOTIFICATION TO CUSTOMER

D. MAILGUN

Email notification can be sent using mailgun. Steps to create account on mailgun and enable Email notification are as follows:

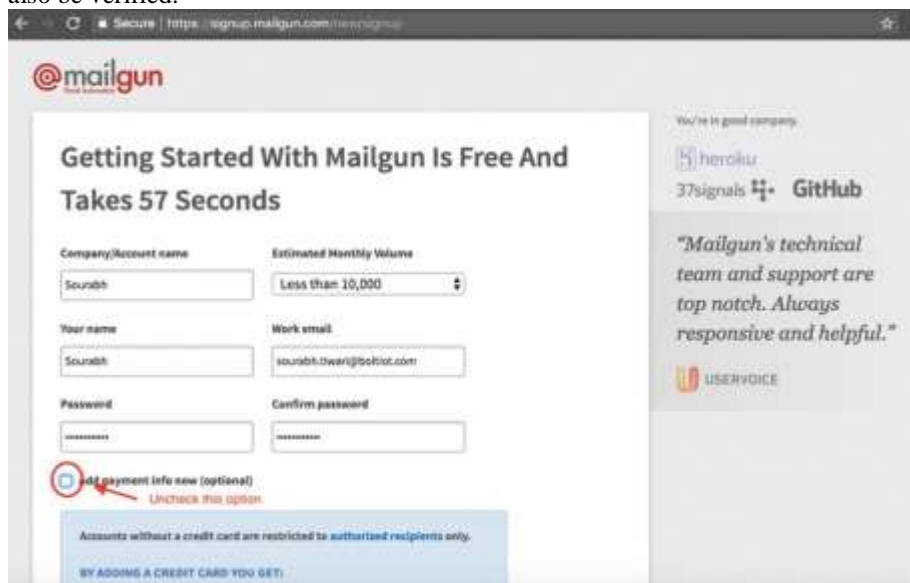
STEP 1: Go to <https://www.mailgun.com/> using a search engine or a browser. Fill up the sign-up form with relevant details.

STEP 2: A verification mail will be sent, and the phone number is also verified.

STEP 3: Scroll down to Sandbox Domain section and click on Add Recipient button to enter the Mail id of the recipient.

STEP 4: Now, a new sandbox will be generated. Click the ID of the newly generated sandbox.

STEP 5: Then a new screen will be displayed which contains all the credentials that you want to send an email



SIGNING IN TO MAILGUN

E. ALERT SYSTEM ALGORITHM

Python program will do the following

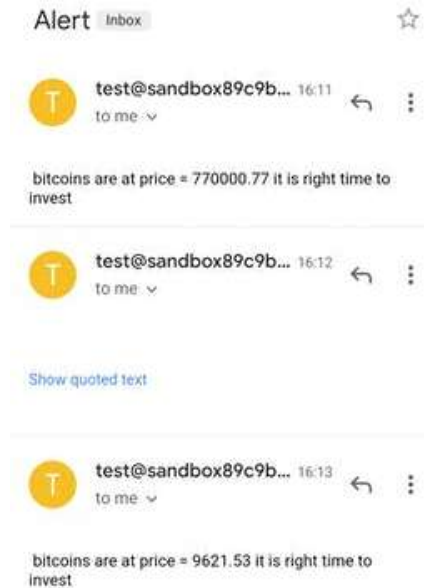
1. Fetches the current price of bitcoin every 30 seconds using the Single Symbol Price

Application Programming Interface in United States Dollar.

2. Checks if the current price returned by the Application Programming Interface is greater than the selling price defined by user.

3. If the current price is greater than the set selling price, the program will trigger the Bolt Cloud Application Programming Interface to switch on the buzzer connected to the Bolt module for 5 seconds and then switches it off after that.

4. The program will repeat the step 1,2,3 continuously every 30 seconds.



#### ALERT MESSAGE

#### F. OUTPUT SCREEN

In the below image user is asked to enter the corresponding country currency in which he/she wants to invest.

```
ubuntu@ubuntu:~$ cd crypto
ubuntu@ubuntu:~/crypto$ sudo python3 bitcoin_alert.py
[sudo] password for ubuntu:
Select any currency input
USD
INR
JPY
EUR
Enter the above currency from which you have to invest:
```

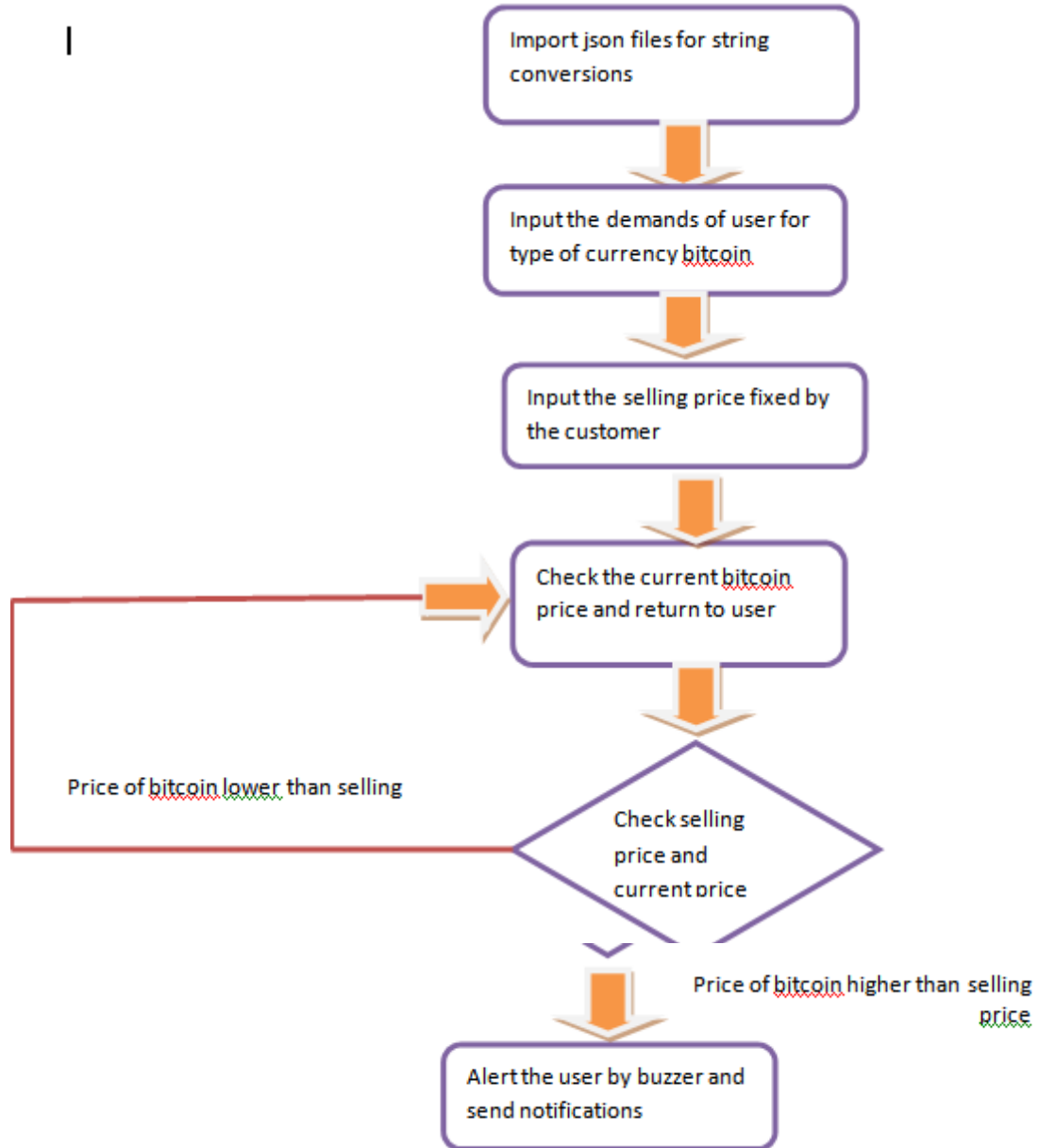
In the below output window after enter the selling price he/she can get current bitcoin market value directly and after comparison of current bitcoin market value with selling price the output message and mail are sent to the user and displayed on the breadboard.

```
Enter the above currency from which you have to invest:INR
Enter your selling price800000
market price of bitcoin is 770000.77
selling price is 800000.0
Status of Sms at Twilio :queued
market price of bitcoin is 770000.77
selling price is 800000.0
```

G. WORK FLOW OF THE SYSTEM

In the above block of code we have imported important files like json for converting python dictionaries to javascript object notation strings, and for time to return the number of seconds passed since epoch. Conf is the file containing private application program interface keys and tokens.

To get the data from Bolt Cloud, we have to create an object called 'bolt' which can be used to access the data on the Bolt Cloud. This input is demanded by the user for bitcoin. The main code block incorporates the function price checks and checks whether the selling price entered by user is less than or greater than the current bitcoin market value. When the market price becomes higher than the selling price the buzzer sends an alert.



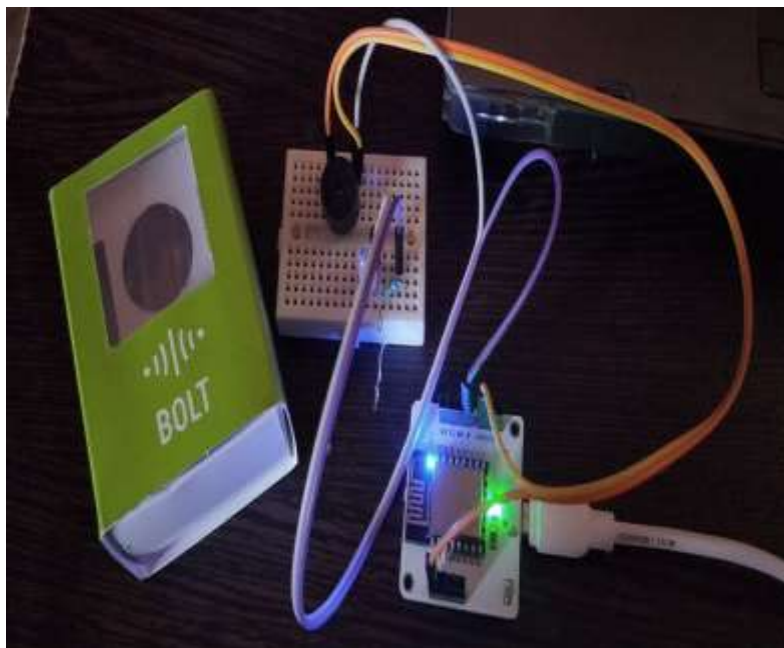
VI. RESULT

The below picture is the final hardware setup which sends the alert message through buzzer when the price of bitcoin becomes greater than selling price. As per the above mentioned hardware

setup instructions, the devices are connected, and software setup is done in Bolt cloud. And so, the user is alerted using buzzer.



ILLUSTRATION OF VARIATION OF BITCOIN PRICES



FINAL SETUP AND IMPLEMENTATION

## VII. CONCLUSION

The basic idea of our project is to alert the individuals regarding the cryptocurrency bitcoin status through the means of buzzer, text message and electronic mail. Bitcoin is going to be the king for payment through online modes in the very next few years. Already in developed nations like United States many Data Scientists and the other investing individuals started investing in bitcoin. Cryptocurrency has the hope for the future. For proper trading and being alert on time is necessary for a trader to be successful in transaction trading using bitcoin.

## VIII. FUTURE WORKS

The main idea of Internet of Things (IOT) is to make the world smarter and in course of time the smartest. Yet there are some difficulties and challenges that need to be overcome as in the field of privacy and security.

## REFERENCES

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