

# An IOT based Tracking and reporting System for Stolen Laptop

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**Abstract-** This paper explains the methodology to track a stolen laptop through the implementation of GPS, Wi-Fi, and Cloud Services. The methodology mentioned in the paper tracks the laptop even if it is in turn off mode. With the implementation of IoT, the owner will be able to track his or her stolen laptop and can trigger an alarm which can be embedded in the laptop. When the owner of the laptop trigger alarm, it will make noise audible up to 10 meters that will make the thief to think before carrying the laptop with himself. The owner can able to shut down the stolen laptop using mobile application. Then the owner will also be able to monitor the location of the stolen laptop through the mobile application installed on the phone by communicating with the GPS and Wi-Fi modules embedded in the laptop, through the cloud.

**Keywords –** GPS; Wi-Fi; cloud computing; tracking; alarm.

## 1.INTRODUCTION

Taking India is as an example with population of 1.3 billion people, around 10 million of the people have own laptop. Now-a-days it is almost impossible to imagine that one can live without laptop. They have become an electronic device of almost every day use for individuals of every age, and essential in almost all the business dealings. The laptop provides a storage to vital data and information which is very important to its owner. The theft of laptop will be a great loss for its owner. According to National Crime Records Bureau, around 1.3 lakh laptops are stolen but, the recovery rate was as low as 8%. It's tough and a tedious job for the police officials or crime department to track the laptop. Hence, not all laptops get tracked.

This research methodology provides the effective, efficient and economical way in which anyone could easily track the laptop using GPS module, Wi-Fi module, and cloud services in case of theft. The whole functioning of the system is entirely based on IoT. A lot software have been developed in the recent years but they are not much effective. They only help the owner of the laptop gets is to track the device only when they discover that their device has been stolen and that can only happen when there is a working internet connection. The real time laptop tracking and alert system notifies the user as soon as any fidgeting is done with the laptop. The owner of the laptop will be able to keep a track of his or her laptop through a mobile application installed on their phone. Owners will also have the privilege to set off a high intensity alarm in the laptop which might make the perpetrator think twice before carrying the laptop with himself.

## II. LITERATURE SURVEY

Real Time Tracking and Alert System for Laptop through Implementation of GPS, GSM, Motion Sensor and Cloud Services for Antitheft Purposes : With this system the owner will be able to track his or her stolen laptop

the moment it makes a small movement and can trigger an alarm that will be embedded in the laptop. the system implements the integration of the sensor stack and micro controller will be responsible for receiving data from the sensors processing it and forwarding it to the server over GPRS. The sensor stack includes a 3-axis accelerometer and a GPS chip. Accelerometer as it is capable of measuring motion changes in all three axes (X, Y, Z). The software aspects of the product include integration of the sensor stack, MCU and the Smartphone Application harnessing the Cloud. A web server handles data exchange between the device affixed to the laptop and the smart phone application. This data primarily latitude, longitude and a few conditional bits is processed by the server.

Android based vehicle tracking system : In this paper ,an efficient vehicle tracking system is proposed that is used to track the location of any equipped vehicle with the help of an android application. The SIM 808 module is used which incorporates GPS and GSM modules . The GPS module is used to get vehicles location coordinates .This coordinates are sent to the smart phone with help of GSM module. On a Smart phone, an android based application is developed to plot the location of a vehicle on a Google map. The Application also has the capability to keep the previous route history of the vehicles. The proposed system is implemented and tested in practical environment. Experimental results have proved tht the proposed tracking system is accurate and feasible for the vehicle owners.

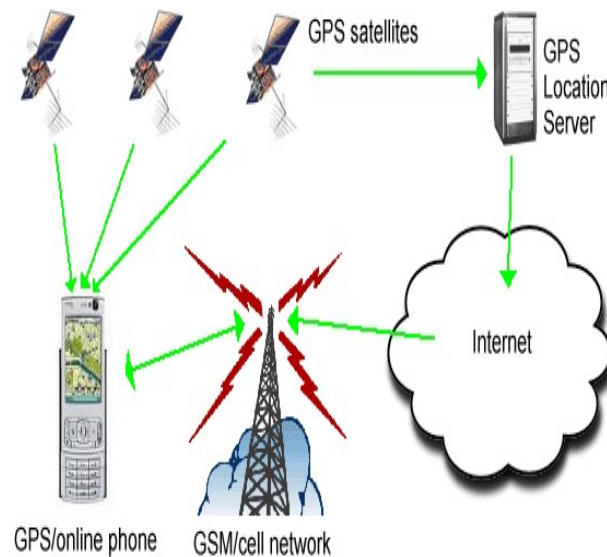
Efficient Interactive Control System based on GSM : The paper highlighted certain critical issues that have to be considered while developing a Home Automation System which range from reliability, robustness, usefulness, price to security factors. The study introduced an evaluation methodology for user interface based on certain factors. In another study , the authors have designed and implemented an internet based home automation system through wireless communication. The study viewed that the main purpose of home automation is to control home devices from a central control point. The study demonstrated that when the control of device is completely governed by machines, the operation of monitoring and reporting becomes essential. The system included a web page implemented on a web server used as an interface to control a number of devices and from which the whole system can be monitored. This module is connected to a master node through an RS232 cable. The master node controls a set of connected devices through RF link.

## II. PROPOSED SYSTEM

This system uses the GPS module, Wi-Fi module and cloud services to track the stolen laptop. This is based on entirely IoT for the communication between the laptop device and mobile application. The software on the mobile phone app will be designed in such way that if the laptop's coordinates are outside the bounds of the user or the laptop's position is changed whilst not in the proximity of the user, the user will be immediately informed on the smart phone application.

When the laptop gets turn on, the user should enter the username and password. If the username and password is wrong, a notification will send to the mobile application. Now, if the user thinks that his or her laptop under threat, using the mobile application he can trigger alarm or he can shut down his laptop. Thus triggering alarm will be in the hand of the owner of the laptop as he or she will be controlling the activation and deactivation of alarm remotely through the mobile application on his phone.

This paper describes the design of a tracking and monitoring system that can be used to address insecurity across several problem domains. The system innovatively and intelligently integrates wireless sensor networks, mobile phones, biometric readers and mobile phone technologies to deliver a real-life application that is to be used to curb laptop theft



Advantage:

- The existing system to track the stolen laptop only tracks the laptop, with this system the laptop's owner can shut down the stolen laptop.
- The system also provides the information of Whenever the laptop gets turn on.
- If any unknown person turn on our laptop , the system will send SMS to the registered mobile number with link to the laptop's location.

GPS:

GPS is a device that is capable of receiving information from GNSS satellites and then to calculate the device's geographical position. Using suitable software, the device may display the position on a map and it may offer routing direction. A satellite navigation device or GPS device can retrieve (from one or more satellite systems) location and time information in all weather conditions, anywhere on or the earth.

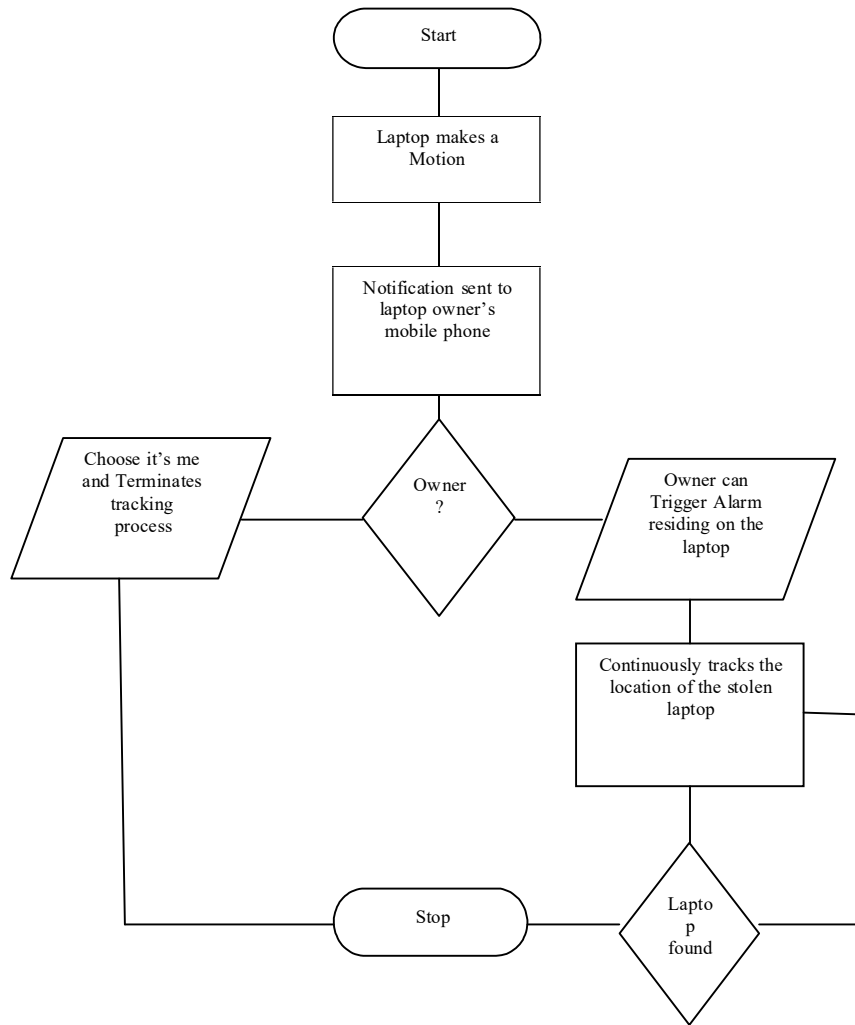
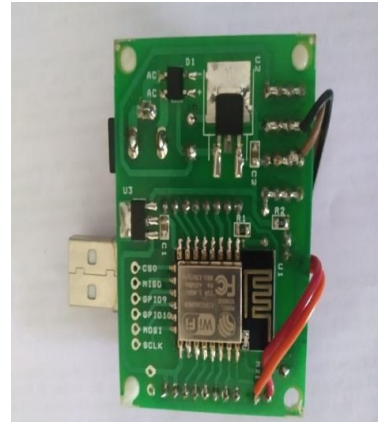
GPS chips and modules provide users with instantaneous and time data anywhere on earth. the global positioning system(GPS) is a spaced based navigational system that provides exact location and time information to any GPS receiver.

The basic operation of GPS is as follows: signals transmitted from at least here satellites are used to calculate the position of the receiver on earth and a fourth satellite is used to calculate the altitude in respect to the surface of the earth. GPS satellites broadcast their location and time, trilateration measure distance to pin point their exact position on earth.



WI-FI MODULE

This system uses ESP8266 module for connectivity. The ESP8266 is a low-cost Wi-Fi microchip, with a full TCP/IP stack and microcontroller capability. This small module allows microcontroller to connect to a Wi-Fi network and make simple TCP/IP connections using Hayes-style commands. This module can work both as a access point and as a station, hence it can easily fetch data from internet. This module is a self contained SOC with integrated TCP/IP protocol stack, that give any microcontroller access to your Wi-Fi network.



Flow diagram of tracking and alert system

### III. MODULES

#### Login :

The Login Module is a portal module that allows users to type a user name and password to log in. You can add this module on any module tab to allow users to log in to the system. If you allow users to create accounts and turn on Portal Direct Entry, a Create Account link appears in the Login Module.

A login may include other information, such as a PIN number, passcode, or passphrase. Some logins require a biometric identifier, such as a fingerprint or retina scan. A login is a set of credentials a user. Most often, these consist of a user name and password. However, a login may include other information, such as a PIN number, passcode, or passphrase. Some logins require a biometric identifier, such as a fingerprint or retina scan.

#### Notification

The Message Notify module extends the Message module by providing a system for forwarding messages. The module uses a plugin system to define *message notifiers*. It comes with a default email notifier plugin and an SMS notifier plugin that is available when the SMS Framework module is installed.

A notification is a message that Android displays outside your app's UI to provide the user with reminders, communication from other people, or other timely information from your app. Users can tap the notification to open your app or take an action directly from the notification.

#### Shut down

Shut down is a term used to describe the process of closing all software programs in preparation to turn off a computer's power. The operating system is the last program to be closed as part of a computer's shut down process. Shut down, to close, especially temporarily; end or suspend operations, services, or business activity. To stop operating or stop the operation.

#### Restart

Press and hold the power button until a slide down to power off message appears on screen then, swipe down. There are various situations where you will have to look for different ways of restarting the device. It is important to know various ways of restarting our laptop through the mobile.

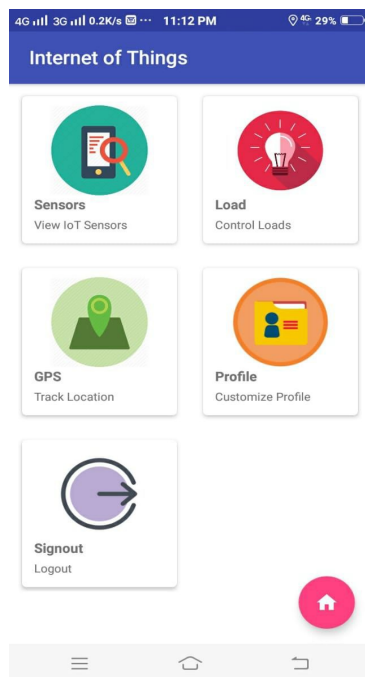
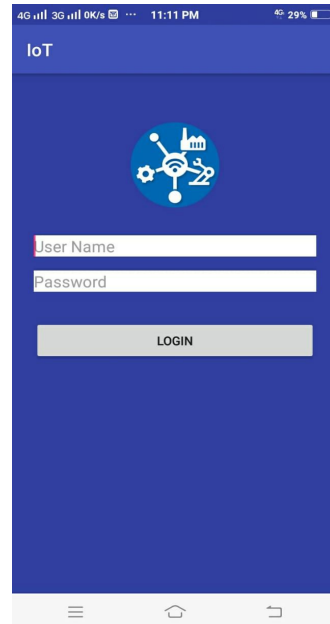
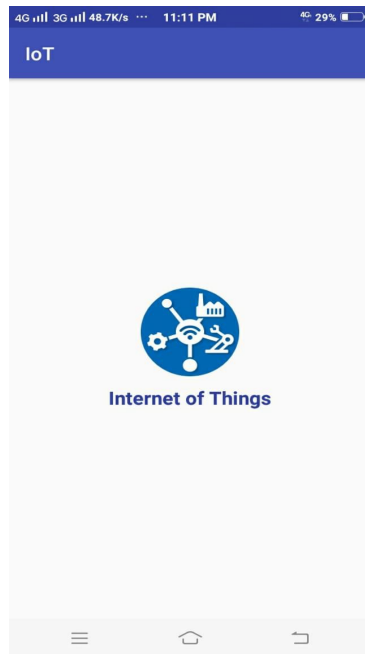
#### AlarmOn

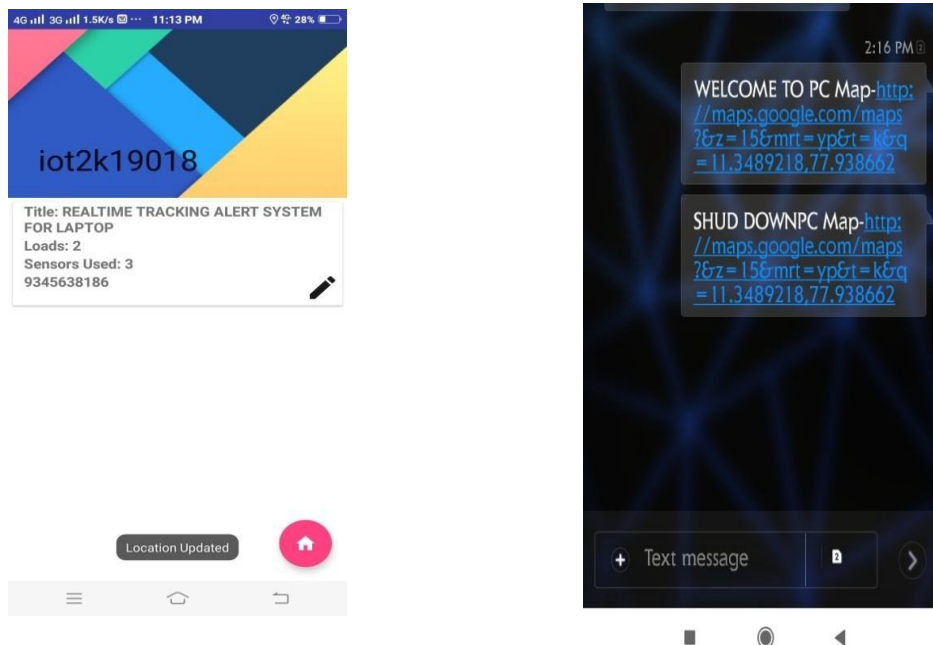
Alarm signifies an undesirable state in a resource that requires corrective action. Not events in general. The alarm levels are: Warning, Alert and Alarm. These functions that trigger the alarms are defined for each level. If an alarm is active, notifications can be sent indicating changes in the alarm level or status. The user can configure which action to take when the alarm level changes.

#### Sign out

Alternatively referred to as log, log off, and sign out, sign off is the process of disconnecting from a network or account voluntarily. For example, to check your credit card balance, you log into your account. When you are done reviewing the information, you log out, which is the same as signing off.

III.EXPERIMENT AND RESULT





Screenshots of mobile application

#### IV.CONCLUSION

Laptops are always important for their owner. It contains important and vital data and information of its owner. It becomes a huge problem for the owner of the laptop if it gets stolen. Laptop tracking techniques present in the current market are inefficient and not worth the money, since they only are able to track the laptop if it is switched on and is connected to the internet. The methodology mentioned in the paper is an efficient way to track the laptop since it notifies the owner the moment anyone fiddles with the laptop. Also the laptop will be continuously tracked even if it is switched off or not connected to the internet.

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