

# Dynamic Status Tracking & Security System

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**Abstract** – In this dynamic life everyone is hurry and wants to save time and reduce unnecessary efforts of visiting closed shop. To avoid these efforts, an easy system is proposed in this paper to aid real time or dynamic status of nearby shop or outlet. The proposed solution takes advantages of three main features using mobile application. One provides dynamic status (open or closed) of shop using Arduino, Ultrasonic Sensor, Wi-Fi module, GSM. Second gives direction towards open shop using Google Map Services and GPS. And last gives security status of store to owner via text message. This system uses hardware kit fitted in shop and mobile application for user interface.

**Key Words:** Android, Arduino, Ultrasonic Sensor, Wi-Fi, GSM, GPS, Google Map

## 1. INTRODUCTION

Dynamic or real time status of nearby store or outlet is useful for visiting customer because if he or she visits the shop without knowing real time status (open/closed), time and efforts to reach store will be wasted. Real time security status to owner prevents theft activity.

Sometime in emergency case we have to visit medical store assuming shop is open for purchasing necessary medicine but unfortunately medical store is closed, in this case we are helpless. We have to visit another medical store which takes time and efforts to find an open medical store. At night we travel from work place towards home, a call from home gives reminder to bring required materials from store. We assume the shop near my apartment will have that material and will be open. When we visit the shop but shop is closed. We have to go to another shop to purchase required material. But we have no idea about the shop which will be open at that time and direction towards open shop.

Owner of shop is always concerned about shop's security. Sometime any third party person or theft opens the shop but owner is not aware about this theft activity. He/ She want dynamic status of shop security on his/her fingertips.

To avoid wasting of time and efforts of customer and persistent worry of shop owner about security of shop, the proposed system provides

solution using hardware kit and android application as user interface. System provides open/closed (real time) dynamic status of nearby shops, direction towards open shop and real time security status of shop for the shop owner.

## 2. LITERATURE SURVEY

### 2.1 Location based service in Android with Google Maps integration: <sup>[01]</sup>

LBS uses technology likes GPS, mobile network, Wi-Fi module to provide services like location tracking, navigating to particular location. Android application provides services to implement location based application. Application like location API, direction API, Google map which helps in making location aware application under android platform.

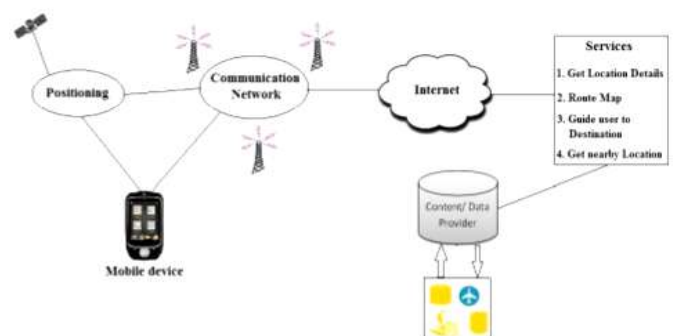


Figure 1: LBS Process

### Working steps:

1. User send request for service server using LBS application on mobile device.
2. The service request of user and user's current location retrieve form GPS component and send to service server using communication network.
3. Service server analyse the geo-specific information as the request of user.
4. Requested information send back to mobile device via communication network.

### 2.2 Real time tracking system using Google Maps API V3: <sup>[02]</sup>

In this system the GPS chip gives the output of positioning information which is further transferred over GPRS link to mobile operator's GGSN and then to a remote server over a

TCP connection. That server stores the incoming positional data. When user clicks on tracking page, user will give input using an HTML page with embedded JavaScript code. Then JavaScript retrieve the positional information into Google Maps through Google Maps API V3 which displays the position on map. The positional Information is retrieved every second. The general concept is described below.

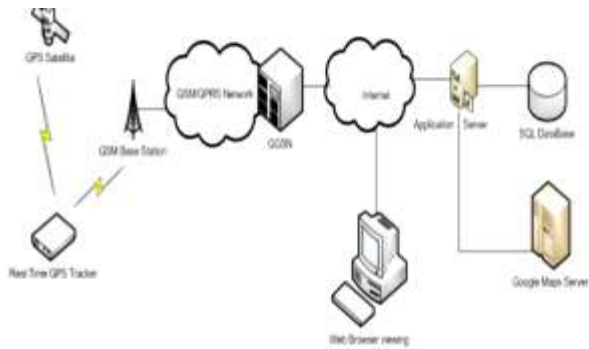


Figure 2: Architecture Diagram

**2.3 Design and implementation of an accurate real time GSP tracking system:** [03]

This paper presents an accurate and reliable real time tracking system using global positioning system and global system for mobile communication services. GPS tracking system contains portable tracked device attach to person, vehicle or any moving object and provides tracking center where portable device location monitored. The mobile tracked device receives its co-ordinates from GPS and sends these co-ordinates as SMS via GSM modem to tracking center. The tracking center is personal computer with many interface programs to display location on google maps using free version of google map API's.

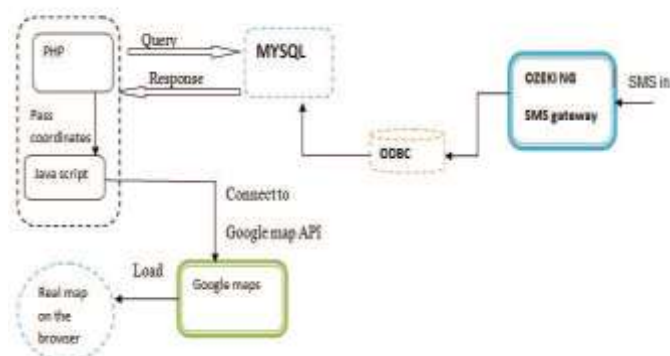


Figure 3: Architecture of Accurate real time system

**3. SYSTEM DISCRIPTION**

**3.1 Technologies used to develop system.**

Dynamic Status and Security using hardware kit and mobile application we have used following technics and general overview is shown in figure.

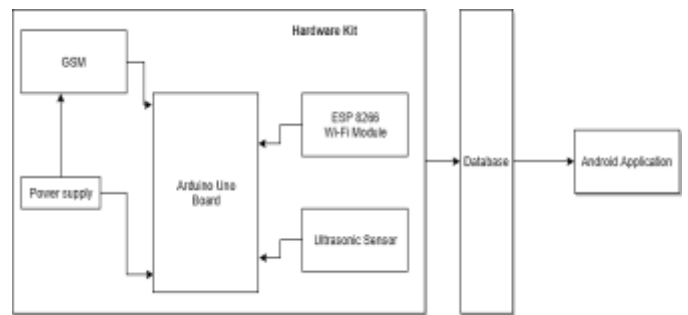


Figure 4: General Overview

**3.2 Arduino Uno** [04]



Arduino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

In our system Arduino is used to coordinate other devices used and send signal given by ultrasonic sensor towards database.

**3.3 Ultrasonic Sensor** [05]



Ultrasonic sensors (also known as transceivers when they both send and receive, but more generally called transducers) work on a principle similar to radar or sonar which evaluates attributes of a target by interpreting the echoes from radio or sound waves respectively. Ultrasonic sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor. Sensors calculate the time interval between sending the signal and receiving the echo to determine the distance to an object.

Ultrasonic sensor in our system is used to detect the status (open/close) of shop using ultrasonic waves.

### 3.4 GSM [06]

GSM (Global System for Mobile communication) is a digital mobile network that is widely used by mobile phone users in Europe and other parts of the world. GSM uses a variation of time division multiple access (TDMA) and is the most widely used of the three digital wireless telephony technologies: TDMA, GSM and code-division multiple access (CDMA). GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 megahertz (MHz) or 1,800 MHz frequency band.

In our system Arduino sends signal in the form of Open/Close status, GSM module sends text message to owner.

### 3.5 ESP 8266 Wi-Fi Module [07]

The ESP8266 Wi-Fi Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre-programmed with an AT command set firmware, meaning, you can simply hook this up to your Arduino device and get about as much Wi-Fi-ability as a Wi-Fi Shield offers (and that's just out of the box)! The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community.

ESP 8266 Wi-Fi module provides internet access to Arduino to update status signals in database.



### 3.6 Database WAMP [09]

Stands for "Windows, Apache, MySQL, and PHP". WAMP is a variation of LAMP for Windows systems and is often installed as a software bundle (Apache, MySQL, and PHP). It is often used for web development and internal testing, but may also be used to serve live websites.

The most important part of the WAMP package is Apache (or "Apache HTTP Server") which is used run the web server within Windows. By running a local Apache web server on a Windows machine, a web developer can test webpages in a web browser without publishing them live on the Internet.

In this system we used wamp sever as local database used to store shop details, and status send by Arduino. It updates status in UI.

### 3.7 Android Application

Android is an open source and Linux-based Operating System for mobile devices such as smartphones and tablet computers. Android was developed by the Open Handset Alliance, led by Google, and other companies. Android offers a unified approach to application development for mobile devices which means developers need only develop for Android, and their applications should be able to run on different devices powered by Android.

Android App is used as User Interface in our system.

## 4. SYSTEM IMPLEMENTATION

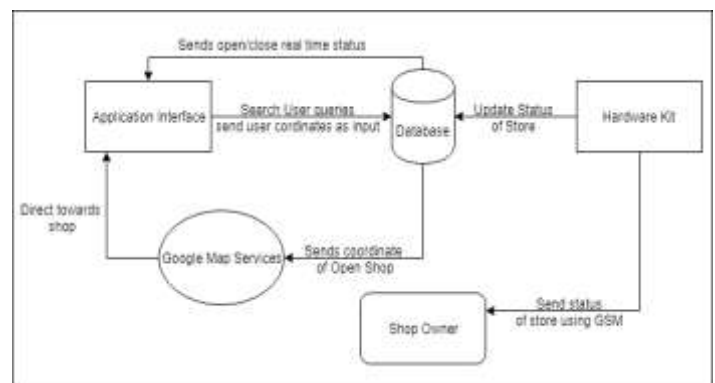


Figure 5: Architecture Diagram

This system is based hardware kit contains ultrasonic sensor to detect open close activity of the store ,GSM module to send text message to owner of the shop , ESP8266 WI-FI module to provide internet access to hardware, local database to send to update status on Android application and Arduino UNO as microcontroller. This is Android based application having hardware kit for transfer of data between device and external peripheral.

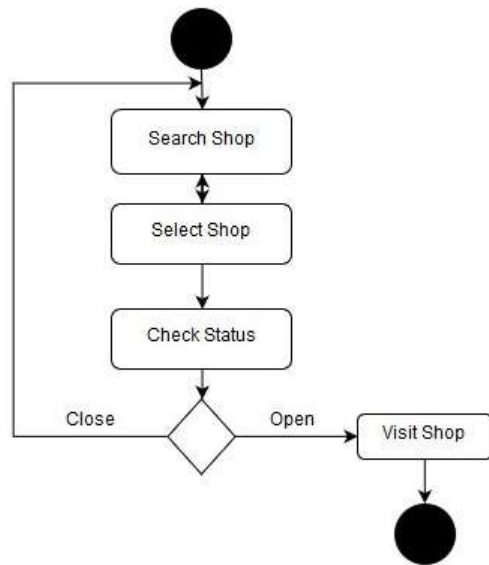
### 4.1 Working Steps:

1. User search nearby shops using android application.
2. Android app sends users coordinates to database as input using GPS.
3. Using coordinates of user query is fired to search nearby which have already registered by shop owner. And results are display on UI.
4. User selects one shop from list of nearby shop.
5. For every shop registered hardware kit update status (Open/Close) in database continuously.
6. Database search for selected shop status and gives to UI.

7. If Status of selected shop is open then using Google Map Services direction is given in Mobile Application to user.
8. Hardware kit send text message to shop owner if status is change.

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### 5. ACTIVITY DIAGRAM



**Figure 6:** Activity Diagram

### 6. FUTURE SCOPE

- Using security module of stores, advanced security options can be provided.
- Automation can be done using open-close action detection.
- Can be used for E-commerce purposes.

### 7. ADVANTAGES

- User can easily access the status of the shop.
- Reduces user’s time and effort to go to wrong shop.
- In emergency cases user can save his time and effort.

### 8. CONCLUSION

The implemented system can save the time of users and can be useful to increase the business of stores. This will be helpful in emergency cases as it gives real time status of the shop using Android application.

### REFERENCES

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