Node-MCU based Package Tracking System

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ABSTRACT
Misplacing your luggage at the airport is a very common problem in today's time. Through this project, we want to take a step toward solving this problem. We aim to provide an easy-to-use system with excellent technology and also make it cost-effective for users. In this, the sensor will be placed in the user's bag and the user can easily track the location for the same.
Keywords:-*GPS, RFID, Sensor, Arduino, GSM.*

INTRODUCTION
For a passenger going for a trip locally or across the globe, carrying their luggage is also a tedious task. Loss of luggage creates discomfort for the passenger and getting it back is a difficult and costly process. Seeing the problems faced by the passengers we have designed our project as a stepping stone to solving this problem. The tracking process takes place through RFID, which is placed inside the baggage.

The project comprises of a GPS-Based module, which tracks the location, and the location coordinates of the luggage can be received by the GPS hardware. There have been several attempts made before to solve this problem, for example, Konas. This user could track the bag through a mobile app, but with the limitation of distance.

On the other hand, the GPS-based tag model that has been made comes with its own defined limitations, for example, the tracking rights are only restricted to the manufacturing companies. In our proposed system the user can directly track the luggage through a web server without any limitations. Other advanced apps like Google Map, etc. can also be integrated for the same. After retrieval of the baggage, the verification process takes place through RFID-RC522RF IC.

PROPOSED SYSTEM
So, the given project is a smart GSM Luggage Tracing System, the prototype is designed to track the Luggage, specifically using the GPS module. The coordinates of the luggage will be sent to the user and in turn be displayed on google maps, through which the user can get the exact location including the area code, and Hence, we can track our luggage using the prototype. The flowchart for the same is shown in Fig. 1.

At the heart of the module is ublox's NEO6M GPS chip. with a surprising number of features, the NEO6M GPS chip. The chip is smaller than a stamp, but it's small to frame and is packed basically consisting of four-pin VCC, RX, TX, and GND. An antenna is required to use the module for any kind of communication. So, the module comes with a patch antenna having -161 dBm sensitivity. So in order to make the GPS work, we need to connect the four pins of the GPS with the pins of Nodemcu. In this the Vcc of the GPS is connected to the 3v of Nodemcu Tx pin is connected to the D2 (GPIO4) pin of the Nodemcu Rx is connected to the D1(GPIO5) pin of the

Nodemcu and finally, Gnd pin of the GPS is connected to the Gnd of the Nodemcu.

Now to turn on the GPS we need to connect the nodemcu microcontroller with the power supply so to supply power to nodemcu we are using the Nodemcu USB cable which is connected to the desktop. After supplying the power and uploading the code to the Nodemcu microcontroller the GPS takes about 5-10 minutes to respond and give coordinates to the Nodemcu microcontroller which in turn can be displayed on the serial monitor of the Arduino software. Once the coordinates are displayed on the serial monitor they can be sent to the server which will generate a website that will indicate the coordinates of the website including the unique link for Google Maps.

REQUIRED COMPONENTS
- NodeMcu.
- GPS Module.
- Jumper wires .
- Soldering Wire.
- Solder pins.
- Beard board.

NodeMcu: It is an open-source firmware that is also helpful for prototyping board designs. The name "NodeMCU" is derived from the words "node" and "MCU" (micro-controller unit). The combination of both firmware & prototyping board is open-source. Prototyping hardware is a circuit that acts as a dual in-line package that connects a USB controller with a smaller surface-mounted board containing the MCU and antenna.
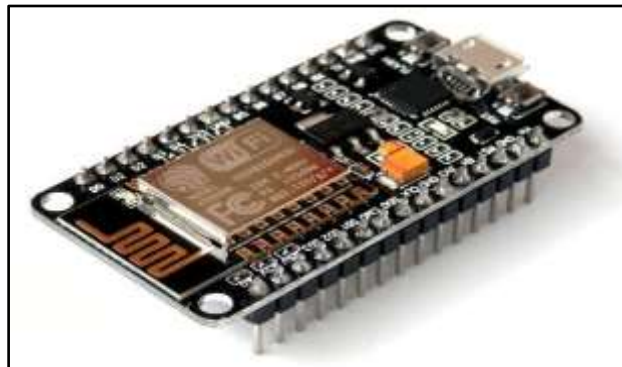

Fig.1:-*NodeMcu [5]*

GPS Module: It comprises of both a GPS receiver and an Antenna. The coordinates of the location are received by NodeMcu as and when required by means of a GPS receiver.

Fig.2:-*GPS Module [6]*

Jumper Wires: Comprising connecting pins at both ends, jumper wires are used to connect two points to each other. In order to change a circuit to generally used with a breadboard, prototyping tools, etc.

Fig.3:-Jumper Wires [7]

Soldering Wire: It is a fusible metal alloy that is used to connect the wire to the pin. The metal is heated in order to create a bond between a pin and the wire with the help of the soldering iron.
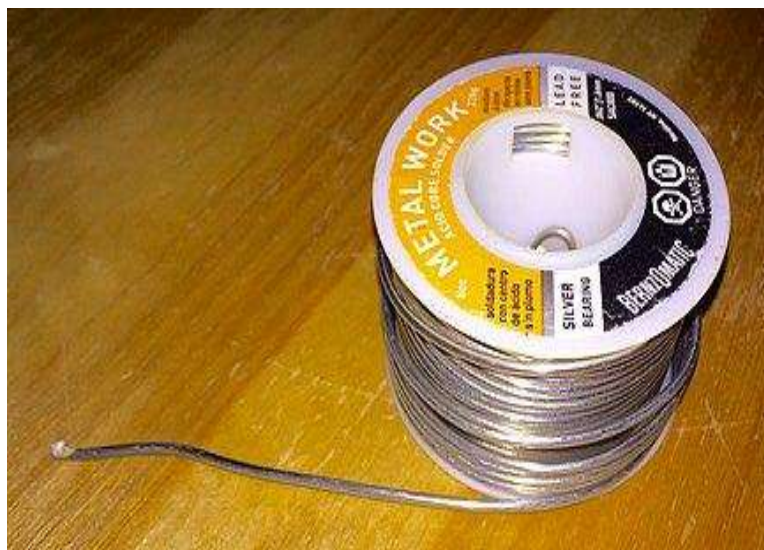

Fig.4:-Soldering Wire [9]

Bread Board: It is a prototype with a white rectangular board along with small holes that are useful in connecting electronics parts and also act as a construction base for electronics. It comes under the category of solderless boards, and are reusable.
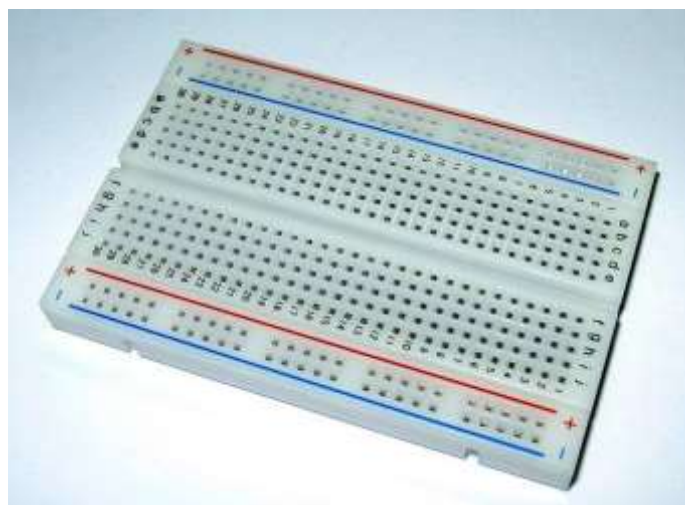
HBRP PUBLICATION
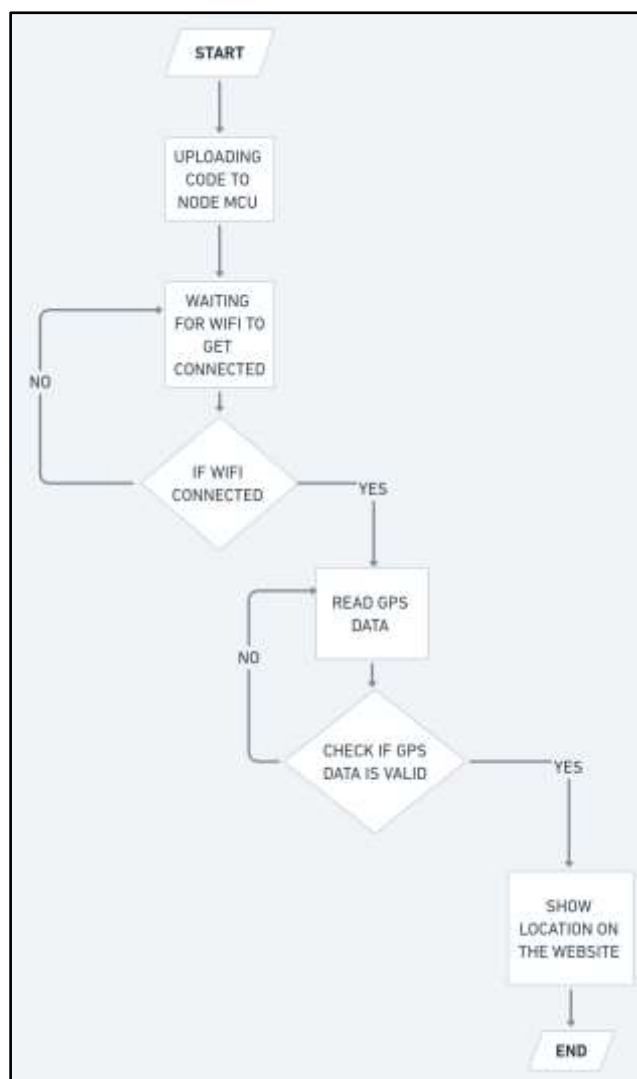

Fig.5:-Bread Board [10]

PROJECT FLOW

Fig.6:-Smart Luggage Tracing Flowchart

The proposed Smart GPS Luggage Tracking System uses a GPS module. The microcontroller receives coordinates that are to be displayed on the web browsers and an explicit google link will be generated for user baggage. In addition to coordinates Date, time will also be displayed on the website. Earth gets an enormous measure of signs from the satellite.

The signs have a colossal span broadly spread across the globe and get tremendous adaptive signs. The signs are shipped off the trans-collector which is associated with the GPS module after the location of the signs. Crafted by disentangling signals is finished by trans-beneficiary. The decoded or changed over signals are as scope and longitude. Information is shipped off to the client through a microcontroller that is important for the GPS module associated with the trans-collector. The information client gets is scope and longitude through GSM as an SMS and the area is given as result.

WORKING
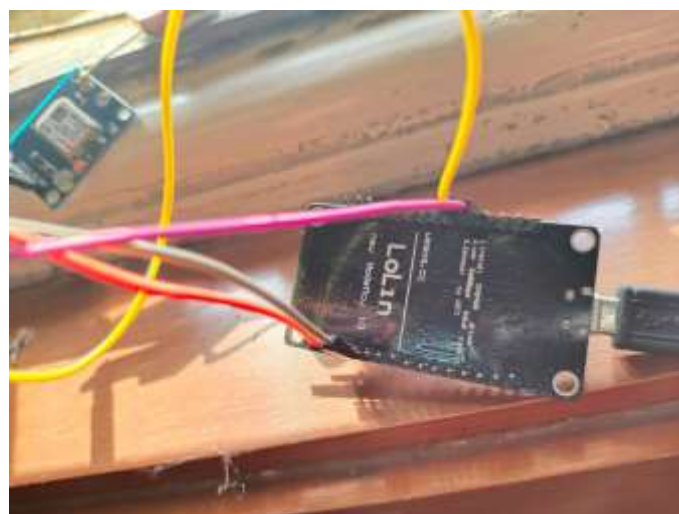The following image shows the working of the project:

Fig.7:-GPS connection with NodeMcu

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GPS Data:
48
GPS Data:
54
GPS Data:
13
GPS Latitude:
19.048700
GPS Longitude:
72.910583
GPS Data:
10
```

Fig.8:-*ARDUINO Serial Monitor*

As seen in the above images, the data that is being sent by the GPS can be displayed on the Serial monitor of the Arduino software This can also be seen on the website as shown below with a google map link for the luggage.
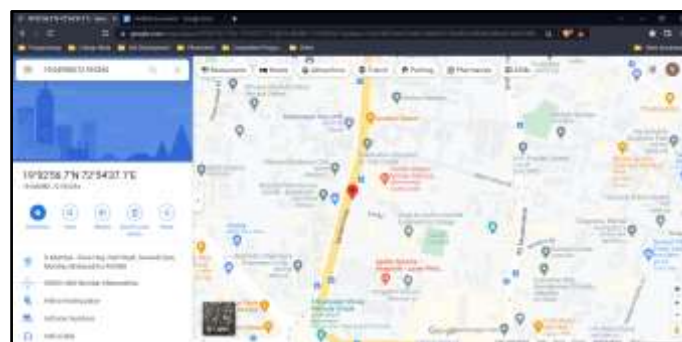

Fig.9:-*GPS server*

Fig.10:-*Google Maps*

FUTURE SCOPE

The future extent of this venture can be broader. As of now, the GPS framework sends directions to the Microcontroller and the directions will be shown and the area can be found on Google Maps straight by tapping on the connections given on the Website. The upgrade should be possible by including a GSM which will coordinate the area of the stuff as a portable message through which we influence the preinstalled

foundation to get the area of the bundle anytime just by alluding to the informing application and this makes the framework exceptionally secure and simple to utilize.

CONCLUSION
Misfortune/Theft of baggage/Bags is very normal out in the open spots like railroad stations, vacationer places, and so forth. Individuals spend a lot of their energy, time, and cash on localizing the sacks, what's more, to follow the most common way of localizing the packs.

This prompts a horrendous excursion and, hence, individuals are unsatisfied as they lose their important things alongside their archives which, subsequently, can force a gamble on their protection. Thus, to be at the troubles looked by individuals observing their baggage, we utilized a GPS-based pack global positioning framework and, subsequently, the task.

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