A SOLAR POWERED SMART ANTI THEFT TROLLEY BAG

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ABSTRACT: As a snatch theft has become a serious problem to the society, it is required an immediate action to put an end to this problem. One of the solutions is to develop Smart Trolley Bag system using Radio Frequency (RF) signal and location tracker as the main component. This project is implemented using an Arduino nano microcontroller, RF transmitter and receiver module, SIM900 Global System for Mobile Communications (GSM) and Global Positioning System (GPS) module. The system is also able to track the location of the trolley bag by using GPS. The location tracked by the GPS module will be sent to the victim by using Short Messaging Service (SMS).If anyone try to theft and open this bag the location of the bag will be sent to the bag owner also by SMS. Hence, this successfully developed Smart Trolley Bag project is expected to help people to prevent this crime from spreading.

Keywords: Arduino, GPS, GSM, LCD Display, Solar Panel, Smart Trolley Bag.

I. INTRODUCTION

Today Snatch theft is a criminal act of forcefully stealing from a pedestrian's person while employing rob-and-run tactics. Statistics show that most of the victims are women.
A growing problem in India, some instances of snatch theft have caused fatalities, when the person holding onto the bag has been dragged by the motorbike or through subsequent acts of violence. The crimes have caused severe injury to head and let them to death. This, combined with the apparent lack of police control over crime, has prompted outrage among its citizens enough to take justice into their own hands in apprehending thieves. To solve this problem, there are initiatives that have been done by the engineers. This includes on developing a special smart trolley bag to avoid from snatch theft to happen.

II. GOALS AND OBJECTIVES

The main purpose of our project is to provide safety to the people from the dangerous zone. In this project we are providing facility to secure the people's by providing this kit. This project provides safety to the owner if they left it somewhere. GPS will calculate the latitude and longitude coordinates of that area. The controller read this value and sends those data to the pre-defined number which is already saved in program.

III. METHODOLOGY

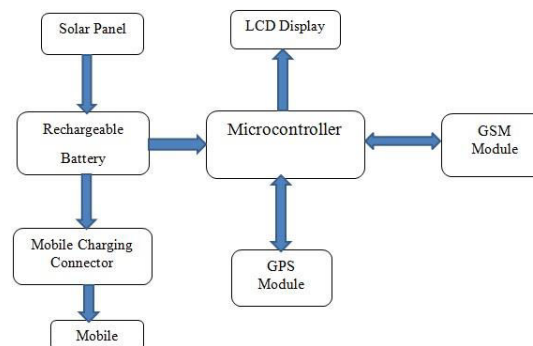The Block diagram of our proposed system is as shown below:

Figure-1: Block diagram of smart Trolley bag system with location tracking.

This system consists of following component which are listed below.

1. Arduino (ATMEGA328P)
2. LCD Display (16×2)
3. GSM Module (SIM900A)
4. GPS Module
5. Power supply

Arduino:

This development board provides small plate with the same powerful microcontroller as Arduino Uno. The Arduino Uno is small that uses ATMEGA328P Microcontroller. It lacks only a DC Power jack so its work with a Mini-B USB Cable instead of standard one. It operates on 5V DC supply. All remaining component interfaces with this device. The RX and TX pin of this device is connected to the TX and RX of the GSM modem of SIM900 Module. D10 Pin is connected to the TX of The GPS module.D2 to D7 Pin is connected to the LCD Display. Then by given a proper power supply and system ground the Arduino is ready to do their job.

LCD Display (2 X 16):

Figure-2**:** LCD displays latitude and longitude.

This display contains two internal byte wise resistors, one for the commands (RS=0) and second for character to be displayed (RS=1). It also contains a user programmed RAM area (the character RAM) that can be programmed to generate any desired character that can form using a dot matrix. To distinguish between these two data areas. The display takes varying amounts of time to accomplish the functions. D4-D7 pin is connected to the D2-D5 Pin of Arduino. RS and EN Pin of display is connected to the D6, D7 Pin Respectively also by giving a proper supply and system ground LCD is ready to display the data.

Global System for Mobile Communication (GSM):

GSM is a standard developed by the European Telecommunication Standards Institute (ETSI) to describe protocols cellular networks used by mobile phones and has become the default global standard for mobile communications. The GSM standard originally described a digital, circuit-switched network optimized for full duplex voice telephony. This expanded over time to include data communications, first by circuit-switched transport, then by packet data transport via GPRS (General Packet Radio Services) and EDGE (Enhanced Data rates for GSM Evolution or EGPRS). Subsequently, the 3GPPdeveloped third-generation (3G) UMTS standards followed by fourth-generation (4G) LTE Advanced standards, which do not form part of the ETSI GSM standard.

In this project, GSM is needed to send the location of the snatcher that has been tracked by Global Positioning System (GPS) to the user or policemen by Short Service Messaging (SMS).

Development of GSM system:

The GSM module needs to be connected toArduino in order to read location by GPS. There are many GSM modules that can be integrated with Arduino in the market, but there are 4 types of module that suitable with this project, which are:
1- GSM Module A000043.
2- GSM Module with Antenna A000044.
3- SIM900 GSM Module.
4- SIM908 GSM and GPS Module.
After further research on the above models, SIM900 is chosen to be installed in this project due to its special features to integrate with GPS module.

GPS Global Positioning System (GPS):

GPS is a navigational system that can pinpoint our position anywhere on the globe. The satellites transmit signals that can be detected by anyone with a GPS receiver. GPS receivers take this information and calculate the user's exact location. GSM is used for sending message about current location it consists of six wires out of which three wires are used for connection. The TX pin of this module which is connected to the D10 pin of the microcontroller. Voltage supply is about 3.3V to 5V.When anyone theft and try to open the bag, GPS starts receiving signals from 4 satellites out of the 24 satellites in the

orbit. Once if the connection is established the latitude and longitude values of the current location are obtained. The GPS acts as a transmitter. The 5V supply is given to the GPS from the controller.

Power Supply:

In this project, front part of bag is covered with solar cell. Which will continuously produce power through day light while we travel and inside it the rechargeable battery for latter a usage like charging mobile phone or tab, laptop.

IV. DISCUSSION AND RESULT:

Figure-3**:** Smart Trolley Bag

Looking at digital era, this project has been designed and developed to efficiently utilized natural resource i.e. solar energy. This smart bag consists of inbuilt circuit which provides mobile battery to individual at cheapest cost. Battery will be charged during day time with the help of solar energy and can be utilized to charge electronics devices when required whether it is smart phones or laptop or any other device.

Short messaging service (SMS) :

Short Messaging Service is used as a medium for the user to be informed about the location of the trolley bag. It contains longitude, longitude, as well as a hyperlink to the Google Maps application to show the location directly from the phone.
The location tracker is operated according to the following steps:
1- A message ('Track Trolley') sent from the victim to the number phone fixed in GPS/GSM module.
2- After around 30 seconds, an SMS will be received by the victim as shown in Figure-4.
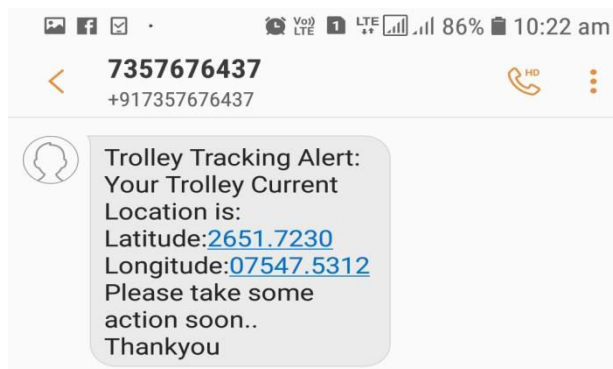3- Click the hyperlink to show the instant location of the handbag in Google Maps as in Figure-5.
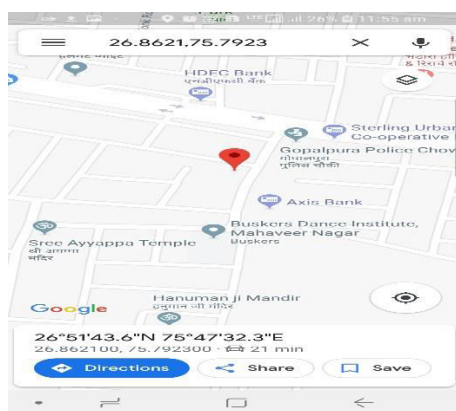
Figure-4:The received SMS.

Figure-5:Location of the Trolley bag is shown in Google maps.

V. APPLICATIONS:

1. It will be used for safety of women.

2. It will be used for child tracking during school time.

3. It will be used in vehicle tracking & safety system.

4. It will be used for safety of elderly aged people.

VI. FUTURE SCOPE:

In future, system can be interface with the Camera for capturing image and recording live video also.We are planning to include some interesting features like automatic object avoidance, stair case climbing and some extra woman safety features. These extra features make the bag more powerful and user friendly.

VII. CONCLUSION:

The functionality of "Smart Bag" is it charge the all kind of gadgets through rechargeable battery. And battery is automatically recharged through the solar panel. Apart from this it's also show the location of person on the LCD screen

which is placed on the front part of the bag. Smart trolley bag is an innovative carry on suitcase that makes life easier and smoother. Carrying luggage is the main difficulty faced by each passenger. Here we try to solve the dragging of luggage difficulty and providing better security and intelligent features that suitable for modern era.

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