A Creative Use of the Internet of Things to Improve Women's Safety Using GPS

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Abstract: Is it morally right to assert that in our people, women are unable to prime autonomous lives flat in the year 2020, when society is at its pinnacle of development? Every day, there are many reports of physical abuse, rape, and assaults on women, and these numbers are rising, especially in urban areas. Despite the limited assistance provided by CCTVs, there is no way to identify the guilty while the incident is taking place. This essay promotes women's technical independence in an effort to lessen crime in India against women and girls. The proposal document demonstrates an immediate, cost-effective, and portable technology that empowers women to lead secure, independent lives. The Neo6mv2 GPS module and the Force Sensing Resistor have been integrated into the suggested system that we have built and implemented, Pulse Sensor, Bluetooth Module, LCD, Resistors, Transistors, Diodes, and LEDs, as well as the Arduino UNO, Buzzers, PCB, and Breadboards because the IoT aims to unify everything. By dialling their preferred emergency number, a woman in pain can request assistance and give up her location using the proposed system's dual security function. There are moments when she feels unsafe or outside the house, so she may switch between the system's three settings as needed. The panic button or Bluetooth module might be used by the victim to turn on the gadget. The pulse sensor, GPS, and GSM modules incorporated inside the gadget all switch on immediately when it is turned on. The system then sends out a message alert to the relevant specified numbers, the police, and includes latitude and longitude measurements as well as a heart rate measurement. The buzzer will beep repeatedly at the same moment. in order for everyone nearby to hear what is happening. For protection against misuse or other wrongdoing of any type, this gadget has a Force Sensing Resistor fitted. Pepper spray and smart bracelets have become commonplace, this technology has shown to be more potent and successful at protecting lives against the savagery committed against women.
Keywords:- IOT's, an Arduino ATmega328P, a Neo6mv2 GPS module, a

Publication: 30 December 2020   GSM module, a force resistive sensor, a Bluetooth module, a pulse sensor, and a module for women's safety.

I INTRODUCTION

K.M.Rayudu,Narendra and siva all contribute significantly to the empowerment of women in the country. One of these essential six "S" that the modern world is becoming more and more concerned with is Self-reliance, or swavlamban. The woman ought to be independent. That is, it is acceptable to walk out alone and The situation of today, however, runs counter to what was just said. In honour of Global Safe Urban areas for Women Day, a survey from ActionAid UK stated that over nine out of 10 women have encountered some form of assault or harassment, and a third have been touched or groped in public. Nowadays, it's common for women to be assaulted, so it's imperative that they take responsibility for their own security and safety. In order to supplement the information obtained by actual objects with embedded sensors, actuators, and other components, the Internet of Things (IoT) refers to the usage of intelligently connected devices and systems (IoT).In the coming years, it's expected that IoT will expand significantly. This convergence will create new service opportunities that will further boost both consumer and business efficiency. A novel age and a novel level of security are currently being revealed by the IoT. In the current status of our nation, several actions are being done by various authorities and organisations to assist women feel more secure. Women support the growth of our country in a variety of ways. However, there have been several instances of cab drivers, taxi drivers, auto rickshaw drivers, and other individuals harassing, molesting, raping, or attempting to kidnap women in daily life the quickening growth in the rate of crime, particularly in the major areas, which leads to produce a sense of fear and concern about getting hurt both at work and in public. One of the key and defining characteristics that must be considered is location. By locating, simulating, and analysing the precise The police department and the subject can quickly resolve any form of misconduct or criminal act using the Global Positioning System (GPS) coordinates. As this is occasionally employed as a user-authenticated precaution, technology including security measures and GPS bands should be helpful to prevent them from being altered or removed. Because of this, the implementation of GPS will have a big impact on how criminals are caught by tracking their whereabouts.

II COMPLEMENTORY EFFORT

Utilizing their ideas and viewpoints, numerous people from various backgrounds have built innovative solutions to tackle this problem. Instead, the government has imposed stringent regulations and legislation on this scenario. Numerous programmes connected to codes have been launched by the police and organisations that support women, enabling women in need of get help. Women may find it challenging to call these numbers while the incident is happening.II.I. APSS (Amrita Personal Safety System)

A cutting-edge mechanism that protects women from the brutality of prospective sexual offenders and rapists. A covert, a wearable, user-friendly electronic gadget that enables women should establish contact with their families and their neighbourhood police station. at the first sign of an incident. The device was created with the goal of being hidden from the

offender's view.

Society Harnessing Equipment

Woman is a 3800KV electric circuit equipped with a garment-enclosed device that supports the sufferer in their attempt to escape the precarious circumstance.

VithU App

The most watched web series "Gumrah" has undertaken an unprecedented project. This programme requires the victim to push a button two times in succession, after which an alarm message is broadcast to the predetermined contacts informing them of the incident.

Negative Effects of Complementary

All systems has advantages and disadvantages when it is developed and put into use. The complimentary attempts also have a few flaws. among which some are given below.

1.   Single mode activation; if this fails, the device

2.   Internet connectivity is required

3.   There may occasionally be no response to codes.

4.   No voice or camera confirmation is used.

5.   Device needs to be reliable and well-matched

III PROPOSED SYSTEM

Practicable architecture

In order to address the existing demand-side issue, the article elaborates on the system design and underlying operating concept in this part. The system was created with "Economically Feasible Women Safety Device" as its primary goal. The system includes a Force Sensing Resistor, a Buzzer, a Panic Button, a GSM (SIM900A) Module, a Neo6mv2 GPS Module, a Bluetooth Module, a Pulse Sensor, a Force Sensing Resistor, an Arduino ATmega328P Microcontroller, and more. There are three main ways that the system can be initialized. The reason for having various modes on a single device is that it is evident that when a person is in a panicked condition, the system's startup may not function, placing the victim in danger. Pressing a panic button, turning on pairing a force-sensing resistor with Bluetooth are the three ways to start the system. In the first scenario, which involves pressing a panic button, the system needs a manual press of the button as input. With a Bluetooth module, the gadget connects wirelessly to a phone or tablet. Simply speaking the specified word—sort of like "HELP"—on the phone will activate the mechanism. The final scenario, a Force Sensing Resistor, was used to account for scenarios when the device was attached but slipped off before any of the aforementioned scenarios happened, or when the offender seized it and flung itIn these cases, the device would turn on automatically as a result of a change in resistance brought on by the application of force or pressure to the device. Extending a

helping hand to the victim despite their dire circumstances. After the system is turned on, The device's Neo6mv2 GPS Module turns on and transmits the precise latitude and longitude coordinates that pinpoint the location of the victim. With the GSM module integrated, it makes it easier to send SMS alerts with the victim's current coordinates and pulse rate to the designated numbers, station, and ambulance, as needed. The GSM module transmits an SMS every ten seconds to determine the victim's position. The Arduino ATmega328P microcontroller is used by this gadget to process the supplied data and display it on the LCD. The victim has a chance to run away when the buzzer begins to make noise, alerting anybody nearby to what is happening.
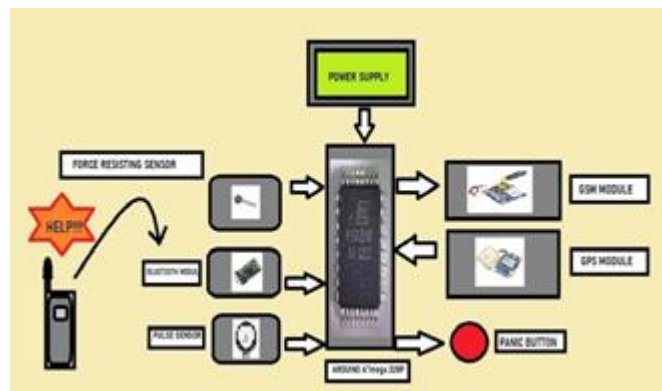
PROPOSED MODEL

Fig. 1: - Block diagram of the suggested model

Hardware Implementation

3.3.1 Power Supply

A device that converts electricity from one kind of energy to another with the main goal of supplying the flow of electricity between a load and a source

3.3.2 Voltage Rectifier

By changing the current in an electrical circuit from AC to DC, a rectifier resolves inconsistencies (direct current). The necessary voltage adjustments are displayed using LED indicators.

3. 3.3. Push Button

Push buttons have incredible functions. When activated, the device sends a signal to the microcontroller, which then uses the GSM module to send the GPS coordinates to the predetermined to the police station or at (numbers). If the microcontroller detects an abnormally high or low pulse rate, it will also send a message to the closest hospital.

3. 3.4 LED

When current passes through a light-emitting diode, or LED, it emits light. It is utilised in this model to learn when the system is activated or during an alert to determine whether the system is operating properly. LEDs are never very monochromatic or spectrally coherent.

3. 3.5 LCD Display

LCDs, also known as Liquid Crystal Displays, are frequently used with Arduino. These display data quickly, especially for reading and debugging data, and they have a range of shapes, textures, and colours. 16x2 LCD interface and 16x2 LCD pins combine to make it. GND, VCC, VO, and RS are the pins 1 through 4, with pin 1 being the ground. called R/W pin 5 allows one to send commands to the LCD and stands for read-write. One can choose among transmitting semi-commands or semi-characters to the LCD using register pick. The latitude and longitude coordinates that must be transmitted at the moment of the incident by the victim to the receiver are displayed on the screen using LCD and Arduino.

3.3.6 Pulse Sensor

A heart rate sensor that is plug-and-play and easy to use. GND, VCC, and A0 are the three pins of the pulse sensor. VCC stands for three or five volts, GND for ground, and A0 for analogue. By just placing a placing a finger on top of the pulse sensor will automatically trigger the detection of the change in light caused by the growth of the capillary blood vessels. which is how the heartbeat is detected. An LED that can be used to monitor heartbeat can be found in the centre of this sensor module.3.

3.3.7 F R Sensor

Force Sensing Resistor, also known as a Force Resistive Sensor, is a static component that is frequently used in electrical and electronic circuits. Force Sensing Resistor is defined in terms of the change in resistance value that is brought on by the application of force or pressure to it. Low resistance is the outcome of high force. The force sensor returns to its previous value, which is greater than 1Mohm, when no pressure is applied. When it reaches its maximum value, or when the pressure applied is at its highest level, it will have a value of 2.5 kohm.

3. 3.8 Bluetooth Module

Arduino with the Bluetooth Module HC-05 are utilised for a variety of tasks. The inclusion of This extremely cold module enables dual way full duplex wireless capabilities to the required project. Depending on the needs, this is utilised to achieve the goal of communicating with a dual microcontroller, such as an Arduino, a mobile device, or a laptop.

3.3.9 Controller ATmega 328P

The enormously powerful The 32KB ISP Flash memory of the pico Power 8 bit AVR with RISC-based microprocessor has simultaneous read and write capabilities.Three flexible modules with equivalent modes, SPI serial port, 32 general-purpose working registers, 23 general-purpose input-output lines, 1024B EEPROM, 2KB SRAM, and many other features are included with the ATmega328P. The power source needed to operate this gadget ranges from 1.8 to 5.5V. The ATmega328P is the most frequently used implementation of the

Arduino platform, notably the Due of this, there are many uses for Arduino Uno and Arduino Nano.

3.3.10 Neo 6mv2 GPS Module

Four connections—RX, TX, VCC, and GND—make up the NEO6MV2 GPS Module, which is integrated with Software Serial on an Arduino UNO. A GPS module called NEO-6MV2 is mostly used for navigation. It is used to determine one's location on the planet and subsequently provides latitude and longitude coordinates. Its tiny architecture, power, and memory options are part of an inventive and creative design. It is a outside GPS receiver with EEPROM and battery backup, as well as anti-jamming technologies.

3.3.11 GSM Module (SIM900A)

The SIM900a is a readily available GSM module that is frequently used in a wide range of applications, including mobile phones and PDAs. Dual band GSM/GPRS engine operating on EGSM 900MHz and DCS 1800 MHz, as well as a multislot class allowing MIC and audio input, are features of the SIM900A. GSM is used for a variety of things, including calling, sending SMS, and accessing the internet. GSM modules rely on a single power supply with a voltage range of 3.4 to 4.5 V. It has a display, a keypad interface, and a real-time clock. Additionally, it supports the UART interface, AT instructions, and a single SIM card

3.3.12 Buzzer

Upon system activation, a buzzer is an alarming device that immediately activates, alarmingly alerting nearby people to what is happening and giving the victim ample time to run..

SOFTWARE SPECIFICATION

MC programming Language

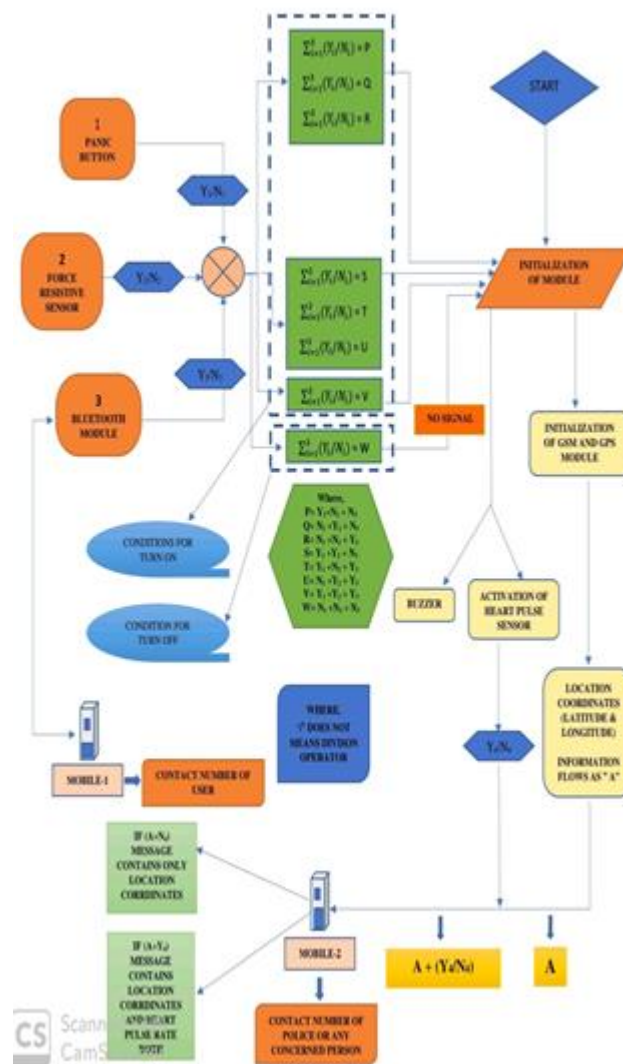C Programming language enables the Arduino to be programmed.

Fig 2: FLOW ALGORITHM

IV AN ANALYSIS OF THE PROPOSED MODEL'S ECONOMIC COSTS

Purchasing a women's safety gadget is quite affordable. Currently, in order to maintain our standards, we all spend a sizable sum on mobile phones, clothing, accessories, make-up, and other items. Therefore, investing in women's protection must rank as a top priority.

Fig.3:- Cost evaluation for the suggested model

According to the calculations, the round estimated amount is Rs. 4500. If one must purchase something from the marketplace, it will charge between 5000 and 6000 depending on where you get it. However, there are already a large number of other devices with various features and a focus on women's safety available on the market. The first aspect we considered when developing our proposed model was "Economically Feasible Women Safety Device." Whether she is a high class princess or a lowly low class girl, every woman matters.The cost of each component used in its production is clearly shown in the above table. The delivery of this device to the underprivileged can also begin with a warning to those who help them acquire basic necessities, securing their protection and freedom in the future.

V. RESULT AND DISCUSSION

1. In a short amount of time, the device can be triggered.

2. The gadget can function without an internet connection.

3. There is no need to carry several devices because the device itself provides multiple options for initiation.

4. A multifunctional device that is inexpensive, practical, and portable.

5. GPS module-based real-time location tracking.

6. Using a GSM module to send SMS alerts.

7. This device also has a bell to inform anyone around to what is happening.

8. The gadget is also useful for keeping kids safe.

9. The device features a Bluetooth module capability that enables activation even if the user leaves it at home.

10. That thing features a pulse sensor that can track the rate of the heartbeat and transmit the information to the predetermined, authenticated numbers.

11. When this gadget is hurled with a specific amount of force, causing device activation, its force resistive sensor is taken into account.

Fig.4; Connecting Iot Device

Fig.5 Taking input from user

Fig.6 sending the message

Fig 7: SMS acknowledgement

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