Women Safety Device using Raspberry Pi

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Article Information	ABSTRACT

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Women's safety has always been a concern, even in current times with so much technological innovation. Women are not safe anywhere, but they are especially vulnerable while traveling alone on lonely roads or in uninhabited areas. Existing women's hand-held safety gadgets require human intervention to activate, such as pressing a button or shaking the device after detecting a threat. We offer a strategy that will address the shortcomings of current systems while also providing women with false assurances of protection. The suggested project attempts to create a safety device that focuses on providing security to women through devices that interact with authorities simply by pressing a button. The technology also takes video and records voices for additional inquiry. The location of the woman is also communicated to the authorities via the message. The shocking circuit was also created to protect her from the perpetrator in this system. The system consists of a Raspberry Pi as the main component, a signal push-button, a camera and microphone to record video and voice, respectively, and a buzzer to inform the approaching party.

1. INTRODUCTION

Women's standing in India has evolved tremendously throughout millennia. In modern India, women face societal issues and are frequently victims of abuse and violent crimes. As per a Thomson Reuters poll, India is the "4th most hazardous country" for women in the world, and the worst among G20 countries [1]. In India and other countries, women's safety is becoming increasingly important. The police's main problem in dealing with these incidents is that they are limited in their ability to respond swiftly to distress calls. These limits include not knowing where the crime is taking place or even that it is taking place at all: reaching the police in a secure and discrete manner is difficult at the victim's request. This project mostly focuses on a security system that is entirely meant to keep women safe and secure, so they never feel helpless. while confronted with such social issues The most powerful incentive for this initiative was the Delhi "Nirbhaya" case, which sparked outrage across the country. It was past time for us, the women, to make a change. In this method, we will design an IoT-based women's safety gadget to clear away these limits. The Raspberry Pi serves as the platform's

controller, while GSM is used to send and receive messages, and GPS is used to find the women. The user can swiftly and discreetly activate the device's EMERGENCY button; if the switch is pressed once, the video and voice recording begin. The video and sound are recorded via the camera and microphone, respectively. The user must hit the button again if the risk is more serious. The system will automatically send a SMS to the respective authority and current location of the user through GSM. GPS system records the current location of the user. The system also recorded the video through USB camera and audio through the mic connected to the Raspberry Pi.

2. LITERATURE SURVEY

Basavaraj Chougula et al [1] presents a new perspective on how technology may be utilized to protect women. When the system is activated, it uses GPS to track the victim's location and sends emergency alerts to three emergency contacts and the police control center through GSM. The device also features a shrieking alarm that uses a real-time clock to summon help and emits an electric shock in self-defense to injure the offender. A GSM shield

(SIM 900A), an Arduino ATMega328 board, GPS (GYGPS6MV2), shrieking alarm (APR 9600), activation pressure sensors, and a power supply unit make up the system.

Poonam Bhilare et al. [2] suggested that the Women's safety is a critical issue in today's society, and everyone should do something about it. This article suggests a GPS and GSM-based car tracking and security system for female employees, which use a combination of GPS devices and proprietary software to track the vehicle's location, send warnings and messages, and activate an emergency button. Google maps may be used to examine the device's automobile location information. IT companies are anticipating a security problem and are looking for a solution that can swiftly analyze the security condition of female employees working night shifts.

Dr. Sridhar Mandapati et al. [3] presents the procedure of numerous terrible situations in women's instances has been documented in this literature. Problems can arise from anywhere, such as ladies strolling alone on the street after work, going to the grocery, or for a variety of other reasons. People at home are concerned about their safe return. Another concern is that women die for no apparent cause while participating in organization-sponsored vacations and industrial trips. It occurs as a result of attacks on women, but not as a result of suicides. With the suggested system, users may inform chosen contacts that they are in danger and disclose their position with the click of a button. You'll never walk alone with this personal protection app. In order to be reached in an emergency, the unique safety application demands the name and phone number of the person to be contacted. Multiple persons can be added to the emergency contacts list. In the event of a crisis, these are the persons who will get alerts via SMS. It just takes the user's action to activate an SOS button, and it sends messages as quickly as the device can handle. When the SOS button is pressed, a message such as "I am in an emergency" is sent to the emergency contacts, followed by another message with the mobile phone's precise or estimated GPS position. Audio and video calls are also available to the user. This software also includes the required first-aid procedures to be followed in an emergency.

J. Jijesh et al. [4] presents the methodology for personal safety. Every individual feels at ease when they are allowed to travel freely on the streets at all hours of the day and night. Women, children, and the elderly are more likely to be involved in accidents because they believe they require assistance to move around. Individuals can utilise modern technology to create a simple device that can be used anytime they are in an unusual situation

to establish contact between police and family. The gadget is meant to be a portable device that may be activated according to the needs of the user who will use GPS to find the victim and send emergency messages to the designated places via GSM. The device includes an alert system, a call for assistance, and an electric shock to incapacitate the assailant. The technique ensures the person's safety and empowers them to face their fears. Future research may be able to bypass the GPS system's Distance Limitation, as well as give alternatives in the event that the sensor fails.

3.METHODOLOGY

This section explains the methodology of the proposed women safety system
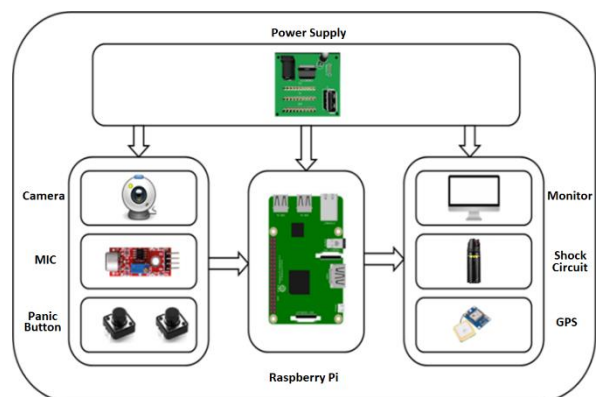
A) Block Diagram

Fig. 1. Block diagram of the proposed women safety system

When the Panic button is manually pressed by the lady, the mechanism is activated. This switch1 sends a signal to the Raspberry Pi, which turns on the MIC and the shock circuit as well. As proof for legal actions, video and audio are saved on a micro-SD card. The Raspberry Pi then sends SMS messages with the location to the pre-determined phone numbers. The system will be turned off if the safety button is pressed.
The detailed explanation of the hardware of the system is explain below.

a) Raspberry Pi

The Raspberry Pi is a computer controller board based on the Broadcom BCM2837 chip, which is found in many smartphones. The BCM2837 has a 1.2GHz quad-core ARM Cortex-A53 processor, 1GB LPDDR2 (900 MHz) RAM, and a Broadcom Video Core IV GPU. The Raspberry Pi 2 board has

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four USB ports, a 3.5mm analogue audio-video jack, Ethernet, Camera Serial Interface (CSI), and Display Serial Interface (DSI) and is powered by a 5V 2A DC supply (DSI).
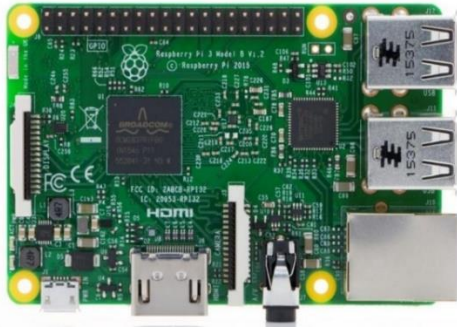

Fig 2. Raspberry Pi module

b) Push Button

A push-button is a simple switch that allows you to influence how a machine or process behaves. Plastic or metal buttons are commonly used. For easy use, push buttons can be curved to accommodate fingers or hands, or they can simply be flat. It all relies on the design of the individual. The push-button can be set to open or close normally.

Fig 3. Push Button

c) MIC Module

To detect the sound, the sound detector is employed. It's a little circuit board with a microphone and some processing circuits on it. The sound detector outputs audio as well as a binary signal of sound existence and an analogue representation of sound amplitude.

Fig 4. MIC Module

d) USB Camera

A webcam is a video camera that feeds or streams an image or video in real time to or through a computer network, such as the Internet. Webcams are small cameras that sit on a desk, connect to a user's monitor, or are built into computer hardware. With live audio and video conversations, webcams may be used during video chat sessions between two or more people. Apple's insight camera, included in many Apple laptops, iMacs, and iPhones, may be utilised for video live chats using the iChat instant messaging software. Users may capture or transmit video over the Internet using webcam software.

Because video streaming over the Internet consumes a lot of bandwidth, compressed formats are commonly used. Because larger resolutions will be degraded during transmission, the maximum resolution is also lower than most hand-held video cameras. Webcams are less expensive than most video cameras due to their lesser resolution, yet the impact is sufficient for video chat conversations.

Fig.5 USB Camera

4.RESULT

The goal of this project was to create a smart, low-cost technology that would make women feel secure and prevent rape, harassment, and other harmful circumstances. All despondent and harassed women and children would benefit from the program which would help to improve their safety and security. This program aids in the live tracking of the victim's position via GPS, as well as one of the registered contacts and one of the root devices. In risky situations, women should be protected, and occurrences or crimes should be recorded as proof.

The core component of the system, which processes all operations, is the Raspberry Pi. The entire action is controlled by two pushbuttons. The first push-button is for a panic button in a perilous circumstance. The following are the functions of the system:

When the woman presses the Panic button by hand, the system is activated. This switch, when pressed once, sends a signal to the Raspberry Pi, activating the microphone and video camera, as well as sending SMS messages to the pre-determined phone numbers with the location. As proof for legal actions, video and audio are saved on a micro-SD card.

The system sends a safe message if Switch 2 is pressed.

5.CONCLUSION

The system may be said to promote gender equality by providing a safe environment for women and

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enabling them to work late. Anyone thinking about committing a crime against a woman will be stopped, and the rate of crime against women will drop. In some situations, the system may be able to produce useful evidence. Because the system can record audio and video of incidents, it can be used as evidence.

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