To Study the Implementation of Women's Safety Device in Crucial Situations

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Abstract:- *The concern for the safety of women is a legitimate issue and crime rates against women are significantly rising (NCRB 2021). The main purpose of this research is to introduce a new protection device for women safety. A women's safety device called Shakthi band has been proposed that can be used as an emergency device for women who are in potential and actual danger of being attacked. The bracelet is connected to a mobile app which displays essential information such as the location, audio, video, and other real time information. The activation of this emergency switch on the device sends the instant location with a distress message to the police pre-set numbers. These utilities will be able to assist the authorities or the relatives to extract the data after a crime scenario involving the user.*

Keywords:- *Crime, Women Safety, Safety Band, Safety Bracelet, Women Safety Device.*

I. INTRODUCTION

Despite global pacts, new laws and gender activism, women remain extremely vulnerable to violence. Almost two decades since countries across the world adopted United Nations Security Council (UNSC) Resolution 1325 (Landmark resolution on Women, Peace, and Security), a formal expression which calls on all parties in a conflict to protect women and girls from violence, barely anything has changed for women. They feel frightened while travelling alone, stepping out at night, and wearing clothes of their choice because of their concern about the lack of safety. The increasing cases of women trafficking, dowry deaths, domestic violence, child marriage, female feticides, forced evictions and exclusions, sexual harassment and rapes are prevalent all across India (UN Women supported survey). The most unsafe cities for women in India are Delhi, Assam, Lucknow, Indore, Jaipur, and Jharkhand. These situations are being tackled by the government by introducing new initiatives such as the Nirbhaya Fund, 181 Helpline and the Cyber Crime Prevention against Women and Children (CCPWC) Scheme. Apart from the government initiatives, there are many devices and apps made regarding women safety. Some of these are Eyewatch SOS, iGoSafely, Safelet, Noonlight and Shake2Safety (Doria, N.Ausman 2021). A research paper based on women safety devices and application, FEMME claimed to create a user-friendly technology, specially designed for women in stressful scenarios (Monisha, D.G 2016). Another journal article based on the safety of women in the University Environment reported a study where, for most women, fear of assault and concern for personal safety is much more a part of their everyday lives than men (Grace Katunge Jonathan 2016). The report from the FIA Foundation summarized global research on women's safety while using public transportation. BMC (Bio Med Central) Public Health reviewed women's experiences of safety apps for sexualized violence. Although there are numerous safety initiatives aimed towards helping women feel safer, women are still feeling scared and frightened due to perhaps the failure or flaws of the initiatives and devices. Therefore, we have proposed a device to assist women in an emergency and defend them from the perpetrators. Our model product is a user-friendly accessory opposing the hard to use, bulky and heavy devices. The data collected by a survey shows that working women, (Bangalore-56%, Chennai-28%, Hyderabad-35%, Mumbai-26%) feel insecure and terrified of crimes, especially in night shifts. Overall, 86% of working women in India, facing hurdles, are in Delhi, Mumbai, Hyderabad, Kolkata, and Pune. Shakthi can play a significant part by offering women and girls a healthy environment in all possible scenarios. Examples of such situations are physical threatening, harassment, theft, stalking and even assault. Implementing a cloud-based application and technological advancement, solutions can be provided to a large extent. This project is a wearable accessory (bracelet). We believe that our solution will provide help and protection to every single woman and girl in danger.

II. MATERIAL AND METHODOLOGY

The women's safety bracelet is designed with a purpose to alarm pre-set numbers about the crime scene. The hardware components of the device are prescribed below:

2.1 High-definition Camera (Walksnail Avatar micro/nano camera)

The Walksnail avatar micro and nano camera has a 1/2.7-inch image sensor with a resolution of 1080P/60fps,720P/120fps,720P/60fps. Its lenses' length is exactly 2.1mm and the maximum field of view, FOV, is 170°. It has a weight of 3.5g and its dimensions are 14*14*17mm. The camera is surrounded by an aluminum shell so that no harm could be done to the lens. It is also a night vision camera with better picture quality. The camera records and takes pictures 24/7, it will be connected to a 6mm cable which will be attached to the microchip.

2.2 Microchip and E-SIM

The microchip will be attached to all the components used and would transmit all the data stored to an E-SIM. The E-SIM will be connected to the Shakthi App Via Wi-fi or Bluetooth. Therefore, all the data would be stored in the ID of the user and the process of transmitting data would repeat in a cycle of 24 hours.

2.3 Nano Recorder

It will capture high-quality audio with the nanoRec voice digital recorder. The maximum measurement is 0.8cm*2cm. The recorder will be surrounded by an aluminum shell and its approximate weight is around 0.28 ounces. The recorder will be activated at all times, and it will be connected to the microchip by a 4mm cable.

2.4 GPS Tracker

The tracker will monitor real-time events like motion, location, and speed of the user. It will be directly synched to the ID of the user.

2.5 Distress Signal

A distress signal would be available for the users in case of sudden emergency. The user would activate it; first, a loud noise would be heard from the bracelet which can be heard at a distance of 0.5km, second, the bracelet would find nearby police station and send an alert or SOS.

2.6 App

The app functions as a user-friendly interface that provides users with critical information such as location, audio, video, and other forms of real time data. The data from the device is transmitted to the cloud and hence it can be accessed anytime and anywhere.
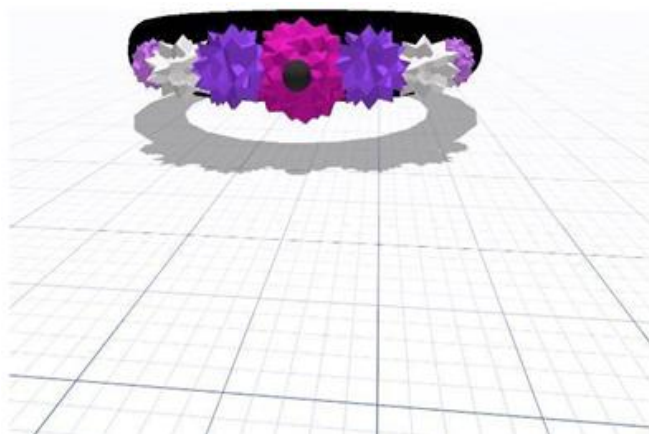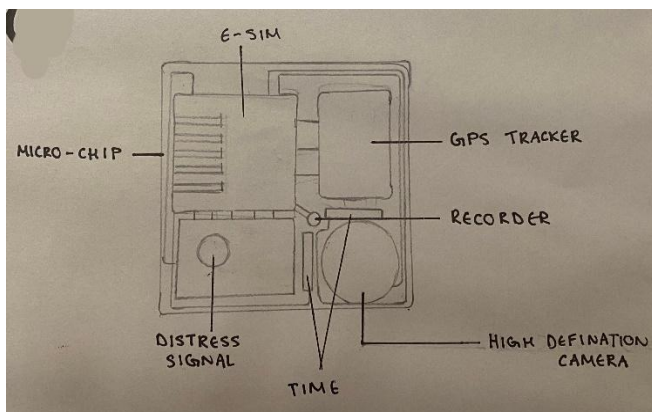

Fig 1 Bracelet design

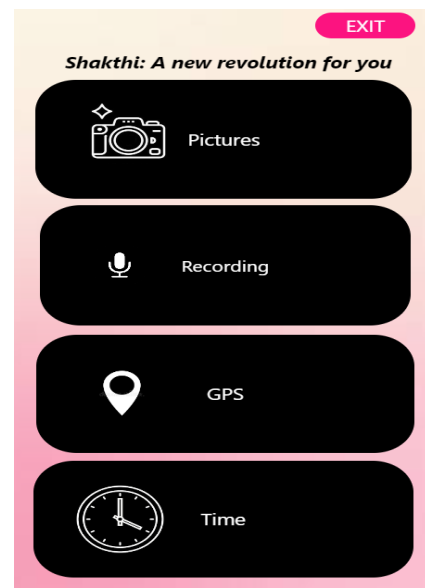*Fig 2 Components of the Bracelet*

Fig 3 Main page and Home page

The activation of the distress signal can be done by pressing the emergency sensor in the middle of the bracelet. Once activated, it sends the instant location along with an SOS message to the local police stations. Apart from this, a significant feature is to alert the locality in the radius of 0.5km. Due to its hardware features, the bracelet records the user's surroundings through auditory and visual means. All this data contained in the bracelet is stored in an E-SIM inside a microchip. Bluetooth connection is also compatible with our device in order to provide all the amenities in the loss of data. The data in the bracelet is connected with the application downloaded to the user's mobile phone through cloud sync which transmits real time data.

III. RESULT AND DISCUSSION

To understand the device better, authors will weigh real life scenarios and the visual interpretation on how the device will act.

➢ *First Scenario*

Let us assume that there is an assailant following the user. Let us assume that there is an assailant following the user. Due to panic, the user's first action would be to activate her distress signal. The activated signal will result in the production of a loud noise which can be heard at a distance of 0.5km radius. Apart from that, it would also do an internal calculation and send an alert to the nearby police station, based on the GPS location. This alerts the police as well as the people in a radius of 0.5km.
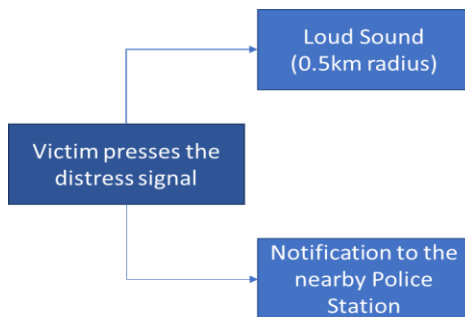

Fig 4 First scenario

➢ *Second Scenario*

Let us assume that the user reaches a dead end. The GPS tracker in the bracelet is monitoring and tracking her movements and sending across SOS alerts to the nearby police stations due to her unsteady and paced movements. The location would be sent to the police along with the alert. This will increase the police arrival efficiency and hence, the assailant would be caught.
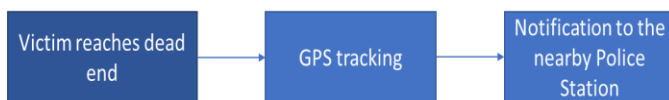

Fig 5 *Second scenario*

➢ *Third Scenario*

Let us assume that the user is dead, and that the assailant has destroyed the bracelet. Due to interrogations and inspections, the police will be informed of the destroyed device. Upon checking the user's ID, the police will be able to investigate all the data such as recorded conversations and images which were transmitted before the destruction of the bracelet in the application. This would assist them to catch the assailant.
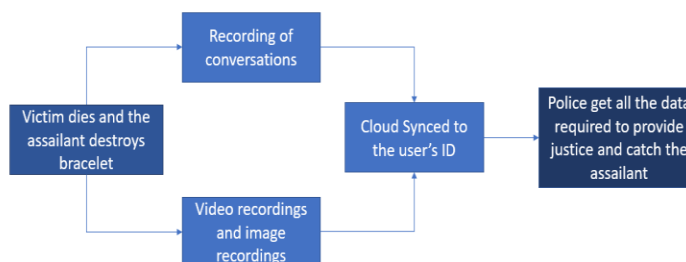

Fig 6 Third scenario

After the finalization of this proposed idea and product, authors continued to make a prototype of the bracelet and a user-friendly app on thunkable.com. This app is being continuously experimented on.

The next step would be to patent and support it through crowd funding. Once it is funded and secured, authors will connect to various organizations and provide them with data samples of our product. This will enable them to test our product and provide us with valuable feedback.

Authors will start marketing the bracelet through organic (free digital marketing) and inorganic marketing (paid digital marketing). Using digital platforms and marketplaces such as Amazon, Instagram, YouTube Advertisements, Facebook, and sponsorships, app will be able to reach a large number of customer base. Apart from that, app will set up a direct to customer selling channel to stay connected directly with the users so that valuable feedback can be gathered to continuously improve the device. To access remote and underdeveloped areas, authors will use print media such as flyers, posters, brochures, pamphlets and more. Specific Organizations in India such as OxFam India, Anzac Foundation, Bharatiya Grameen Mahila Sangh and Angala will help us connect with women in slums and rural areas.

The amount for the purchase of the device can be paid as the complete amount or as EMI. Payment methods that will be accepted are cash, credit, or UPI. People below the poverty line will be given the advantage of getting it free through organizations but under a set of conditions.
The certain conditions are:
- Salary under 2000 INR per month
- Land under 500 square feet

IV. CONCLUSION

The main purpose of the study includes proposing a women's safety bracelet as the foremost economical solution for the safety issues faced by women in India. A women safety device called Shakthi band has been proposed that can be used as an emergency device for women who are in potential danger of being attacked. It provides trusted pre-set contacts with real time location followed by a distress message that makes it possible to prevent many major casualties. It is ensured with the use of rechargeable batteries and a fashionable look to use safely and hide its identity.

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