A Survey on IoT Applications in Women Empowerment and Security

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Abstract:

In the current scenario there is a highest priority issue of women's security. There are different aspects, areas and scopes of women. Living conditions of women should be better so that they can live in a better way. Since the old times women safety has been a major issue and it has always been stressed upon. In our country over 37% of women had experienced harassment, violence, sexual assault and violation. These incidents demand some applications or devices to be developed for women safety, these devices or applications will help anyone who is in immediate danger or need help. We have developed many new technologies and devices that can make our society safer for women. But this also makes us think about how reliable these devices are and how well this can work at the time of need. So, after ensuring all the perspectives, the developers had recommended these devices for women safety and security.

Keywords: Women empowerment; Internet of Things.

Introduction

This paper includes descriptions of some devices and applications that can prevent women from facing difficulties in their day-to-day life. It doesn't emphasize the justice that are to be given to the women of our society. The safety of women is not fully secured but many devices could help them in their daily life. It is not possible that there will always be a cop with every woman in our country at all times, but there are many safety measures that can help a woman in their hours of need and let their close ones like friends, family, relatives know that they are in trouble and they need help. For the sake of women's safety a lot of gadgets have been discovered which will serve the purpose of safety, here we will talk about a few of these in this paper.

Ref. [1] recommends portable gadgets which are similar to a belt which anyone can wear. The device is designed after analysing a few applications and devices like the VithU app, the device called SHE (Society Harnessing Equipment) gives electric shock to the culprit then gives some time to the victim so that she can escape from that place. This disoriented the attackers. The device consists of Arduino board, GSM shield, Global Positioning System module, loud triggered sounds and bulky movement sensor. This global positioning system delivers current date and time, current position in terms of longitude and latitude, and directs whenever the victim moves from one place to another. The pressure sensor is activated when pressure is being applied to the sensor. A resistance value for bulky movement sensors is empirically taken, and after crossing the threshold value, the gadget is triggered and sends the current position of the person to the registered contacts as well as emergency services such as police control room and it updates the location by itself every 2 minutes. The loud alarm activates then and lets others know that the victim needs help, and something is wrong with them. Anybody can wear it as a belt so that they can carry it around with them all the time.

Ref. [2] The pre-existing social, economic and legal standards are being constantly challenged by The Internet of Things & wearable technology. The technology elevated the privacy and safety concerns prevalent amongst the women of all ages in the society. Problems arising over the technical issues, incompetence of the system to cope with the purposes & accessibility to the proper spectrum to increase the provision of wireless networking are not entertained here. Another very useful way to deal with such problems is to amalgamate the educational efforts, technological advancement devices, societal

standards, public & watchdog preference, industrial practices, self- regulation, impartial implementation of preset legal norms as per the requirement. This paper presents the solutions.

Ref. [3] recommends a gadget called FEMMEE using AMR which is developed for women safety. People can buy this device or install an application in the smartphone and can use it whenever needed. FEMMEE provide an easy way to contact for help when any of the women is in problem. When the audio switch and the I/O switch is clicked at the same time, the program it shows 4 fundamental options: - sound recorder, SOS text, movie recorder and secret camera locator. Relying on the options that is selected, it either sends message and recording to the already selected contacts or notices the secret cameras. The gadget gets connected to our smartphone and gives 2 switches, one is for the urgent requirement and the other is to turn on secret camera detection system. If the urgent button is clicked, then the current area is traced and informed to the selected contacts in every 2 minutes via text. When the button is pressed two times in a row the audio tape sends the recording to the contacts with alert text. When it is clicked for a comparatively more than a single time, then the application immediately calls the already select contact. The gadget gives more efficient performance in low energy consumption.

Ref. [4] recommends the safety measure for females. The gadget includes a receiver of the phone and transmitter that acts as Global Positioning System, Global System for Mobile telecommunication, Liquid Crystal Display, Microcontroller. Whenever a victim is in danger, she can tap the key to activate the gadget. Whenever a button is pressed, it takes the value of the longitude and latitude, and sends notification to the preset contact as well as to the emergency room via Global System for Mobile. It also gives an electric shock to the attacker so that the victim could escape from the situation. The buzzer alerts everyone about that ongoing incident whereas the LCD light shows the messages that are coming from the device. The microcontroller of this system uses less power and makes it more efficient. The device is portable so anyone can carry it in a purse, which will help them to feel safe whenever they are alone. The device becomes easy to use in day to day situations.

Ref. [5] recommends a convenient gadget comprising Global Positioning System, Global System for Mobile telecommunication, Liquid Crystal Display and a button that can be easily accessible to the women. The gadget has been created by “ARM 7 Microcontroller LPC2148”. The gadget consumes less power and is more efficient as it notifies the authority to take strict actions against the offender. The gadget becomes much more efficient if we could implement a camera to capture the image of the attacker. The system will boost confidence to move around freely at night knowing that they are safe and if something happens then they would get help in less time.

Ref [6] The writer suggests that there must be an efficient way of keeping track of vehicles so that their real time location can always be tracked. This can be achieved by combining the smartphone's technology with a microcontroller. This system is not only user friendly in terms of expenditure but also easy to make. The entire concept of vehicular tracking procedure can be further accomplished by making use of Global Positioning System (GPS) and Global System for Mobile Communication/General Packet Radio Service (GSM/GPRS) technology which is supposed to be pre-installed inside a vehicle to determine its real time location. The purpose of having a microcontroller is to control the GPS & GSM/GPRS modules where the GPS modules will enable the users to receive the geographical coordinates of the vehicle in due time and GSM/GPRS modules will update the location from time to time and send it back to the database from where on the smartphone's application will keep this whole process of tracking in progress through constant monitoring. The vehicle will become visible on the map in smartphone's application with the assistance of Google Maps API thus helping the users to keep a track on all the moving vehicles on demand that are using this particular application at large

which in turn will allow them to measure the expected time and distance required by the vehicle to reach the particular destination. Therefore, in order to represent the practical viability and efficiency of the proposed system, this paper will show the experimental outcomes of this vehicle tracking system and ventures on its real-life implications all the same. This technology will help women in case they are travelling late in their car on a very long stretch of road by themselves. Also, if it is implemented in all cabs then travelling becomes easier for women in their day-to-day life.

Gaps Found in the Literature

In paper [3] By minimising a size of FEMME gadget, females could wear it as a watch or pendent in terms of easy wearing. "Voice recognition" feature should be added in the device which will immediately forward a message to the pre-registered contacts. In paper [1] the gadget becomes beneficial if the feature- "Safeguard" is added to the gadget in terms of self-defence as back up option when the victim is getting late for help. In paper [2] The gadget has both advantages and disadvantages. As battery consumption is high, so battery backup will enhance the efficiency of the gadget. In paper [6] The gadget is very efficient, and this will become very useful in many situations. This device can be more useful if this works with every vehicle not only with cars but like auto, bus, and even small modes of travel, so that every time we can ensure women security. In paper [4] Most of the victims fails to get justice due to lack of evidence. So, the gadget could become more effective if two major features get added such as :- "Sensor" and "Re coding System" so that the gadget gets activated immediately when the victim is in danger and records the incident which will lead her to get justice against evils. In paper [5] The device should share the real time location of the victim to the preset contacts because there is a high chance of misleading the victim while running away from the attacker.

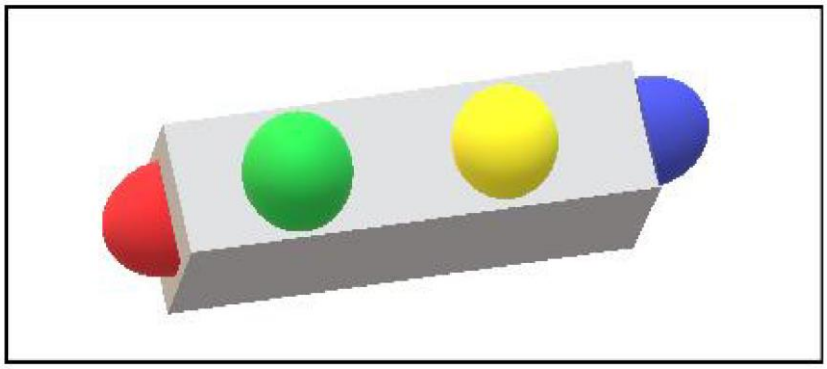

Fig-1. The proposed device

Conclusion and Future Possibilities

- The application and device are based on women safety but the technology that is modified is difficult for the women in rural areas to accustom as most of them are illiterate. Moreover, the new updated versions of various smartphones make it more complicated. So, to end this problem we have come up with an idea where we designed the device with 2-3 different coloured buttons, each button with different objectives. E.g. if a threat arrives one clicks a button asking for rescue. These buttons are developed in a way that will fulfil the necessary requirements of the user/victim. In this device, we are proposing to have four coloured buttons (red blue yellow green), each with a different function. As follows: -

- The red button will initiate a trigger alarm
- The blue button will send a SOS message to preset contacts
- The green button will record audio
- The yellow button will embark on finding the hidden camera(s)

The problem with the smartphone cannot be solved as it possesses too many good points and no other device or gadget will be able to suffice these criteria needed for smooth running of this application as such or even link the device itself. A smartphone can be used till its battery dies so companies these days are coming with good battery backups but still sometimes it doesn't last till end of the day. So, we propose them to opt for various other devices imposed with the components of the application. The gadget can be made available in various sizes and forms, viz-

- wrist bracelets
- belt
- cosmetic products like a lipstick stick gun that will give a sudden shock to the attacker when the lid is removed etc.

These various options of devices serve another purpose, it will confuse the attacker as no one would suspect a lipstick to be a device that sends emergency signals and calls for help without the knowledge of the attacker.

References

[1] Chougula, B., Naik, A., Monu, M., Patil, P., & Das, P. (2014). Smart girls security system. International Journal of Application or Innovation in Engineering & Management, 3(4).

[2] Jain, R. A., Patil, A., Nikam, P., More, S., & Totewar, S. (2017). Women's safety using IOT.

[3] Monisha, D. G., Monisha, M., Pavithra, G., & Subhashini, R. (2016). Women safety device and application-FEMME. *Indian Journal of Science and Technology*, *9*(10), 1-6.

[4]Narasimha, D., Uddin, M.A., Subhan, M., Khan, M.A.A. and Yaseen, M.A., 2018. Women Security Assistance System with GPS Tracking and Messaging & Calling System with Audio Recorder. *International Journal of Scientific Research in Science, Engineering and Technology*, *4*(7).

[5]Panwar, S., Ganesh, S. and Kulkarni, R.K., Advanced Intelligent Security and Self-Defence System for Human Beings.

[6]Sunitha, D. And Chandana, M.U., Design and Implementation of Women Safety System Based On IOT Technologies, vol.7,3 April, 2019.