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SAKHI
STAY SAFE STAY FASHIONABLE

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Abstract

Sakhi is a smart jewellery (necklace) which provides the new form of the security to the women. Simply this jewellery which comes with safety provider features in emergency situation like photo sharing, live location sharing, alert message etc. So many devices with these features are available in market but these products are more expensive like smart watches etc. sometime smart watches are failed to provide such feathers.

In this new era of technology, we are trying to create some new and handy device which can easy to wear and access. It is an IoT project in which we use network of sensor, controller and actuator to provide service which helps to keep women safe and secure. It takes the quick decision according to the situation and set of rules given to the system. It has taken decision are quick accurate and emotionless. So, there are less change of errors and provide better security

1. Introduction.

In this competitive world everyone wants to stay presentable. One of the best ways to keep themselves presentable; Mostly people refer wearing some jewellery like earrings, necklace, rings, bracelets etc. The Indian economy heavily depends on the gems and jewellery industry, which accounts for 15% of all exports and about 7% of India's GDP. Over 4.64 million people are employed there, with an expected increase to 8.23 million by 2023. It is one of the industries with the quickest growth rates, and it is very labour- and export-intensive. IoT is the network technology and the environment that things can connect with network, interact with each other, collect and share information by wired or wireless. Now the development of science and technology provides more possibilities for jewellery.

OBJECTIVES OF PROJECTS:

* To develop a reasonable jewellery(necklace) to achieve the safety of women in general. * To minimize the crime in country.
* To develop a jewellery(necklace) which can be easily accessible and wearable by women.
* Make collection of travelling memories/dairies easier.

In this project we are going to focus on necklace which is nothing but the **set of the pendants** which contain some components like push button, camera (input device), vibrator, battery for power supply and so on which help to achieved above objectives.

2. Problem statement.

- Increasing rate of corruption in various field.
- Increasing rate of kidnapping cases.
- Except mobile phone other device which is provide safety features are so expensive.
- Increasing rate of rape cases.
- Many cases have been filed related to molestation of women and men.

We know India is number one country in the world in population with 1,425.8M people. In that around 48.5% population is representing to female population. If we notice from an ancient time women faces so many problems in that "**Rape and molestation**" such dangerous activities held in every era. But that time the system which provide justice are work based on their own rule but now we are in an independent country, which provide human rights to each person in country.

But in spite of such a good governance system in our India, the raped women got justice after a 6-7years, for example Nirbhaya rape case. Why such a long period is passed to proof a crime ? Only because of the lack of evidence, the time taken to prove the crime of rape.

It is only because of the lack of evidence that these monstrous attitudes of men are at work. And I think "SAKHI" can help the victim women to get justice at the earliest. Increasing rate of corruption https://en.wikipedia.org/wiki/Corruption_in_India

Corruption in India is a problem that has serious implications for protecting the rule of law and ensuring access to justice. As of December 2009, 120 of India's 542 parliament members were accused of various crimes, under India's First Information Report procedure wherein anyone can allege another to have committed a crime.

Many of the biggest scandals since 2010 have involved high level government officials, including Cabinet Ministers and Chief Ministers, such as the 2010 Commonwealth Games scam (₹70,000 crore (US$8.8 billion)), the Adarsh Housing Society scam, the Coal Mining Scam (₹1.86 lakh crore (US$23 billion)), the Mining Scandal in Karnataka, and the Cash for Vote scams.

It is only because of the lack of evidence that these corrupt peoples protect themselves from punishments or Only because of the lack of evidence, the time taken to prove the crime of corruption.

Increasing rate of kidnapping https://www.thehindu.com/news/national/average-82murders-a-day-11-kidnappings-abduction-every-hour-in-india-in-2021-ncrbdata/article65833404.ece

myresearchgo Volume 2, Issue 1, January 2026, ISSN: 3107-3816 (Online)

Average 82 murders a day, 11 kidnappings, abduction every hour in India in 2021: NCRB data

Murder rate highest in Jharkhand; Delhi tops in kidnapping

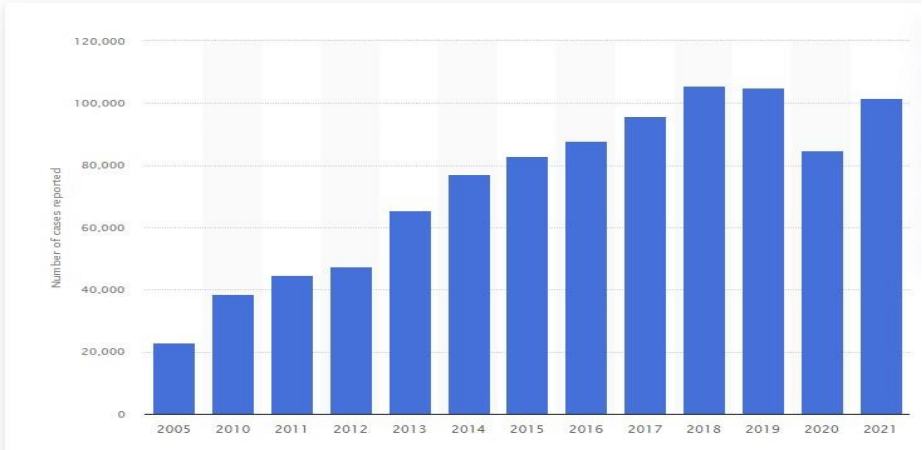
This is a headline of "THE HINDU" NEWSPAPER define the problem face by people. Yes, so many people have their own cell phone with them which provide so many safety features but in emergency situation sometime these devices fail to provide safety and alert the person. For example, A girl has cell phone and some one attack on her, that time she not even gets chance to dial phone number and call for help. And instead of cell phones other devices which provides safety features are more expensive for example smart watches etc.

3. Purpose of study.

- Increasing rate of corruption in various field.
- Increasing rate of kidnapping cases.
- Except mobile phone other device which is provide safety features are so expensive.
- Increasing rate of rape cases.
- Many cases have been filed related to molestation of women and men.

The points mention above states the problem, which can be solve by this project

In 2022, the reported kidnapping and abduction cases amounted to over 101 thousand cases across India. **Kidnapping and abduction** accounted to about three percent of the crimes reported under the Indian Penal Code. Following graph discuss the rate of kidnapping in India from last few years



Number of kidnapping cases in India.

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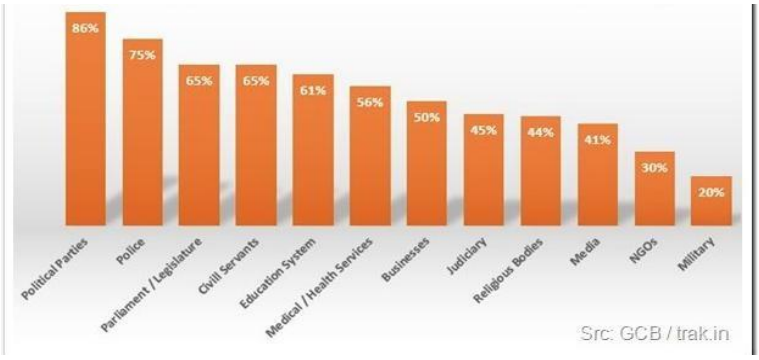
India registered 31,677 cases of **rape** in 2022 - an average 86 daily - while nearly 49 cases of crime against women were lodged every single hour, according to the latest government report on crimes in the country.

In India we can see in various field corruption is occur, to reduce it this project will help us. Following graph indicate the corruption rate in various field.



Corruption in various field

There are so many problems in society can be solve by this project and hence this project is need to invent.

4. Literature Review.

Venkat Ramesh Mamilla, Jan 2015

This paper explores the concept of digital jewellery, its history, and the various applications and benefits of this technology. The author discusses the different types of digital jewellery, including rings, bracelets, and necklaces, and how they can be used for communication, healthcare, and security purposes.

Asharani M1, Modupalli Pavani, May 2023

This paper provides a comprehensive review of communication through digital jewellery, covering the history of this technology, its various applications, and its potential impact on the way we communicate in the future. The authors discuss the advantages of digital jewellery for communication, including its portability, ease of use, and fashion appeal, as well as the challenges associated with this technology, such as battery life and security concerns.

Anu Thomas, Oct 2023

This paper provides overall information about India's 1st smart jewellery (pendent) invent by company safer by leaf, here author discuss the journey of safer and aim behind it. How digital jewellery can help the people to keep themselves safe and secure.

Li Yin, Dong-Oun Choi, December 2015

This paper summarized the concept of smart jewellery and the related theories. Through the analysis of current situation of the development of smart jewellery, this paper predicted that in the IOT environment smart jewellery will develop rapidly and more intelligently. In the future, smart jewellery will occupy a larger market share in the jewellery market.

5. Research Methodology.

The research approach for the *Sakhi Smart Jewellery System* involves a combination of hardware integration, IoT communication methods, and real-time alert mechanisms designed to enhance women's safety. The project follows a user-centre design approach, where the primary focus is rapid emergency response through simple interaction gestures. The ESP32-CAM module functions as the core processing unit, receiving user input through a physical push button. Depending on the interaction pattern, the system executes different safety workflows: a single press triggers a feedback vibration to confirm activation and immediately initiates video capturing along with location sharing, while a double press activates the emergency buzzer and simultaneously captures video evidence and forwards it to predefined contacts through GSM-based messaging services. The GPS module supports real-time location tracking, ensuring accurate positioning data is included with every alert message. The research methodology includes requirements analysis, system design, component integration, testing under various scenarios, and evaluation of responsiveness, reliability, and usability. By combining IoT connectivity, sensor-based interactions, and wearable ergonomics, this approach seeks to create a discreet yet highly functional safety device tailored for emergency situations.

Hardware Technologies

- ESP32-CAM module – Microcontroller + camera for processing and video capture
- GPS Module – For location tracking
- GSM Module – For sending SMS alerts
- Camera Module – Integrated with ESP32 for video capture
- Push Button – For user input and SOS activation
- Buzzer – For audible emergency alerts
- Vibration Motor – For feedback vibration
- Power Supply (Battery) – For wearable operation

Software Technologies

- Arduino IDE / ESP-IDF – For programming the ESP32
- Embedded C / Micro Python – For firmware development
- GSM communication libraries – For SMS alerts
- GPS Parsing Libraries (NMEA libraries) – For extracting coordinates
- Email/Cloud Service APIs (optional) – For sending video files

IoT & Communication Technologies

- IoT-based alert transmission
- Wi-Fi communication (ESP32)

- GSM-based messaging (SIM module)
- GPS-based location tracking

System Design & Methodology

- Real-time data acquisition
- Emergency workflow automation
- User-interaction-based event triggering
- Video and location data transmission
- Hardware–software integration testing

6. Findings And Results.

As the device contain sensor and processors like esp32 cam module , GPS module, vibrator, ush button etc to provide significant way of security of user. the system is trigger when the push button manually triggered. There is 2 ways of handling system in 2 different situations, the cases are explained below:

Case 1: In emergency situation (i.e. if the girl or woman is in danger or unsafe situation it can be walking alone in scary nights or begin unsafe in public place i.e. unwanted touches, starring or stocking by unknown person) when internet is available, the system will send the live location, alert message, photos to her emergency contact it can be her parents or husband or friends etc. system will also vibrate the vibrator to alert the user about system working status.

Case 2: In normal situation where user just want to capture and store the current view user can clicked the button once to trigger this functionality . buzzer is placed in the system for awareness of this activity to the other people . buzzer functionality helps to prevent the device from malicious activities and misuse of device.

Case 3: In emergency situation when internet is not available there is a SD card which works like backup for user which helps to restore the capture pictures during situations.

1. Camera module starts capturing pictures when button clicked by user.
2. Vibrator is sounded when user alert system trigger.
3. Navigator provider system activated when push button long pressed.
4. Message provider system gets activated when push button long pressed.
5. Buzzer is sounded when user alert system trigger.

7. Conclusions.

The system involves the use of sensors and others IoT devices to capture photos, gathering live location of user and sent to their parents or friends ,as well as it provides alert message to the parents or friends of user in emergency situations. An IoT project is a crucial application of IoT technologies that can significantly improve safety and security of women. By leveraging IoT devices and technologies the parents of user can detect and respond to emergency situation quickly and effectively, reducing the risk of life and able to stay safe with fashion.

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