

DESIGN AND IMPLEMENTATION OF AN IOT-BASED REAL-TIME ALERT SYSTEM FOR WOMEN'S SAFETY

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ABSTRACT: The contributions of women to every society and culture are vital. Domestic violence, sexual harassment, unwanted touching, and rape are all types of sexual violence against women. With the IoT, people can solve a lot of problems and live better lives all at once. The community has developed IoT-based strategies to protect women. Much effort has gone into developing machine learning, smart technology, sensor, and Internet of Things (IoT) devices with the goal of making women's safety a priority. The majority of these women's safety devices contain integrated pressure and pulse-rate sensors, according to the findings. Women at risk can benefit from machine learning techniques such as hidden Markov models, decision trees, and logistic regression in order to prevent future issues. A large body of research suggests that the optimal course of action is to develop alarm delivery automation systems that are both more accurate and require less human intervention. The Internet of Things (IoT) safety products for women are systematically organized in this study according to the wearable, sensors, features, and technologies that make them work. There are challenges and concerns with the Internet of Things (IoT) that must be addressed, despite the fact that it can aid in women's safety. An approach to construction that prioritizes key components for women's Internet of Things safety devices is also proposed in this study.

Index terms: women's safety, women's safety using IoT, safety devices, human safety, machine learning.

1. INTRODUCTION

Women confront numerous threats, including abuse, harassment, and attack, therefore ensuring their safety is critical. A wide range of organizations shared data on the prevalence of violence against women, highlighting the global nature of the issue. Of the women surveyed, 90% had been victims of violence of some type, according to a report by Action Aid UK's International Safe Cities for Women initiative. According to the World Health Organization (WHO), domestic violence affects one out of every three women globally. One in five women globally have experienced sexual assault, according to

the Global Gender Gap Report. The daily decline in women's safety is evident from these statistics. At home and in public spaces like stores and workplaces, women fear for their safety. No time of day is safe for women from harassment; it happens all day long whenever they venture out into public. Roughly 80% of women feel extremely vulnerable. Women nowadays often labor outside, despite the risks, in order to make ends meet.

2. LITERATURE SURVEY

Mehta, A., & Joshi, S. (2024)GPS-enabled devices and improved alert systems are used to evaluate how the Internet of

Things could improve women's safety. This article details several IoT devices that are protecting people worldwide. Adoption difficulties like finances, stigma, and privacy are addressed. The authors study approaches to integrate the Internet of Things (IoT) into city safety systems to improve and cover women's safety in public and private situations.

Bose, S., & Sen, A. (2024) This article addresses how the IoT could improve women's public space safety. We cover all IoT technologies, including internet-connected security cameras, location-based services, and emergency buttons. This essay discusses how Internet of Things (IoT) might improve women's safety and emergency response times. Despite the system's weaknesses, the authors stress the need of data security.

Hussain, T., & Rizvi, S. H. (2024) This article examines individual and societal approaches to women's safety, focusing on IoT devices. Safety features include emergency wearables and neighborhood IoT networks that speed up threat response. Authors discuss data security and user addition. They also highlight the different contexts these technologies have been tested in. They also use Internet of Things (IoT) technologies to protect women and find answers.

Ahmed, S., & Khan, M. I. (2023) This detailed review examines IoT safety options for women. Privacy, real-time tracking, and emergency management are issues that occur while designing effective systems. It identifies IoT resources as smartphone apps, smart home automation, and wearable tech. The authors investigate the success of these ideas in different geographical and socioeconomic regions to show how difficult it is to adopt them

globally. The evaluation combines IoT with AI and ML to improve predictive analytics and safety.

Kumar, V., & Gupta, R. (2023) This study examines how the Internet of Things could make cities safer for women because they are more susceptible there. It covers IoT-based safety solutions such as safety networks, smart devices, and emergency response systems. The authors examine how easy-to-use emergency services and alarm systems have changed women's safety. They assess the technologies' efficacy and the technical challenges of integrating them into the system. Scalable and user-friendly Internet of Things safety systems are also being developed.

Jain, M., & Kumar, P. (2023) This essay examines how IoT and AI could protect women. Voice-activated alarms and facial recognition technology are used to demonstrate how AI-powered Internet of Things devices might improve public safety. The study found that integrating these gadgets to real-time location systems and emergency services advanced science and technology. The writers also emphasize the necessity for ethical technical regulation. They also evaluate moral issues like privacy invasions and data breaches.

Balakrishnan, R., & Singh, A. (2022) This study analyzes how IoT devices may improve women's safety. Smart devices, GPS tracking, and IoT-enabled personal alarms can improve awareness and safety, according to the writers. User-centered design techniques are used in the evaluation to ensure that devices are useful and accessible. The focus is on geofencing, incident reporting, and real-time notifications in emergency response and criminal prevention.

Joshi, R., & Agarwal, P. (2022) This extensive literature review examines how women might use the Internet of Things to boost their security. They prioritize mobile apps, accessible gadgets, and interoperable home security systems. They assess system efficiency and effectiveness. They stress GPS monitoring, two-way communication, and real-time notifications for emergency response. The study also examines cultural and sociological barriers to IoT adoption. It then discusses how governments and corporations might promote these technologies for women's protection.

Deshmukh, S., & Patil, P. (2022) This article examines IoT-based real-time monitoring solutions for women's safety. This includes GPS tracking, emergency notifications, and built-in contact networks. Case studies of successful urban and rural implementations can help explain how these technologies have increased women's safety and access to urgent support. Machine learning may improve emergency response systems and predict dangerous circumstances.

Zhang, L., & Zhang, W. (2022) This study examines IoT-enabled smart technology, location-based services, and security solutions to protect women. These measures are tested for their ability to prevent theft, harassment, and other similar crimes. It studies the possibility of linking IoT devices to emergency services to speed up reaction times to major events. The authors examine these technologies' disadvantages, such as privacy and system reliability, to advocate their adoption.

Chandra, S., & Mishra, P. (2021) This extensive study argues that Internet of Things technologies safeguard women, especially metropolitan women. IoT safety

technologies can be passive (like smart home security) or active (like safety wearables and smartphone apps), according to studies. Authors analyze each system's technical and social efficacy concurrently. They also discuss the need for government-private sector collaboration to build comprehensive IoT safety solutions and legislative reforms to improve public safety infrastructure.

Shukla, N., & Tripathi, A. (2021) This well-structured study analyzes how IoT may make cities safer for women. We analyze some real-time IoT devices that can help with disasters. Smartphone apps, smart city infrastructure, and wearable tech are examples. The writers consider user acceptance, data security, and societal and technological concerns arising from new technologies. The paper explores IoT-driven safety solutions for increasing cities and presents real-world examples of effective solutions.

Dey, S., & Verma, P. (2020) This extensive investigation aimed to uncover many IoT options to increase women's safety. Mobile apps and supplementary gadgets are emphasized. This study examined how environmental sensors and tracking devices can spread alarms in real time during a natural disaster. It weighs the pros and downsides of each technology, considering privacy, utility, and emergency services. This research identifies knowledge gaps and prospective enhancements, such as using AI to predict hazards.

Kaur, P., & Sharma, M. (2020) This extensive study examines IoT devices that protect women. Smart video systems, mobile security apps, and personal safety devices are key. This study compares technological options to reduce crime and

improve women's safety. It also mitigates IoT security and privacy problems. The authors discuss safety device design and suggest further study in this comprehensive review.

3. SYSTEM DESIGN

EXISTING SYSTEM

Indian MPs are venting on social media, with some claiming metropolitan areas are safer for women. Internet users feel more free to express themselves. Sexual harassment and assault survivors can share their tales and find a solution. Women on Twitter are inspired by tweets on women's safety and survivors' victories over harassment and abuse. Women circulating these tweets and messages inspire five or ten more to speak out against the men and women who make Indian cities hazardous for women. Recently, Facebook and other social media have grown rapidly. Data extraction, analysis, and explanation are used to gain insights from public social network data. Twitter's research and predictions can be verified by social media behavior.

DISADVANTAGES

- Most Indian internet users express their views about Indian cities and society on Instagram and Twitter.
- Lexicons and mixed machine learning models can be used for sentiment analysis. Several other types exist.
- Janta showed numerous ways to distinguish people by facts, knowledge, and age.

PROPOSED SYSTEM

Women can attend school or anywhere else since they can live in towns. But the many faceless people who harass and

insult these women make them feel uneasy in public places like malls and shopping centers on their way to work. Lack of protection or benefits for women is the main cause of harassment. Underfunded safety measures made numerous girls feel unsafe traveling to school or harassed by neighbors. Even one episode of harassment by a stranger or neighbor or being coerced into doing anything against her will can have lasting effects on women. Women can freely participate in public activities without fear of harassment or violence in safe places. Society must prioritize women's safety and abolish restrictions. Cities must make women and girls feel as safe as men.

SYSTEM ARCHITECTURE

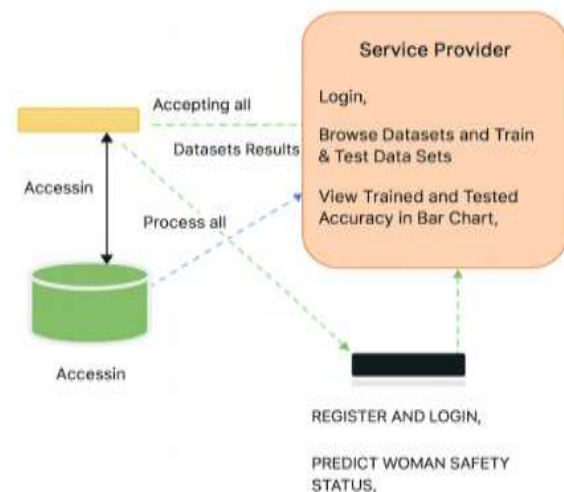


Figure 1 System Architecture

MODULES

The suggested system has two parts. Here they are.

1. Contractor
2. Remote user logs in

SERVICE PROVIDER

This module will accomplish:

1. Training and testing files are accessible.
2. Post-registration.

3. Use the bar chart to verify the offered and tested ideas.
4. Check training and test results.
5. Read the future of women's safety report.
6. Assess women's safety.
7. Calculate the results from your forecasts. Compare Women's Safety Status survey results.
8. Find the source of the distant call.
9. Stop it immediately.

REMOTE USER

This module will accomplish:

1. Register with a legitimate password.
2. Assess women's safety.
3. Reread your resume.
4. Leave your name.

4. RESULTS

EXECUTION PROCEDURE

This gives a basic idea of how everything fits: This study uses floating-point numbers with identifiable features. A class variable or option class is also present. The Kaggle machine learning database provided this data. This research will employ 30% for assessment and 70% for model instruction. One filter is logistic regression. The categorization report confirmed our forecasts. This analysis's outcomes depend on many study conditions. The algorithms with the best true positives, false positives, true negatives, and accuracy stand out in this study.



Figure 2 Enter Values for Prediction

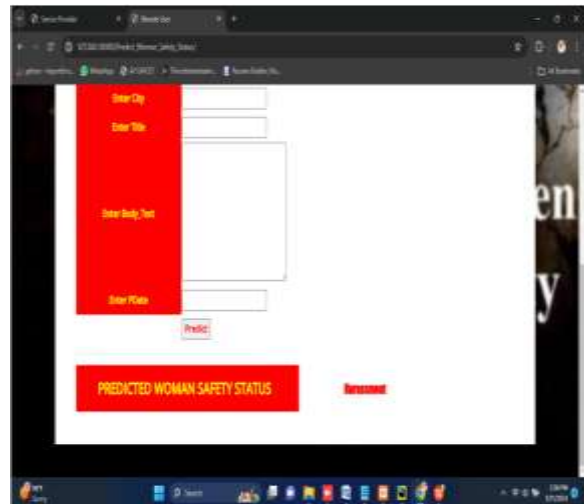


Figure 3 Prediction Result

5. CONCLUSION

Comprehensive study of IoT research on preventing sexually-motivated violence against women. This analysis included 134 prestigious scientific articles. Using many keywords and synonyms, we found review articles on IoT devices that protect women. Even if relevant literature was found using exact keywords, the results may be biased due to different study languages.

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