Case Study 12

SAFETY

NariRaksha: Gender-Responsive AI for Women's Safety

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Overview

Background & Problem Statement

Women in urban areas of the Global South continue to face significant safety challenges that restrict mobility, access to employment and education, and participation in public life. In Indian cities, underreporting of incidents, delayed institutional responses and fragmented safety systems limit the effectiveness of traditional interventions. Existing non-AI approaches rely largely on reactive mechanisms, such as helplines and manual surveillance, which are insufficient in dense and complex urban environments. The absence of integrated data analysis further constrains authorities' ability to identify high-risk locations and recurring patterns. These gaps create systemic barriers for women, underscoring the need for a proactive, scalable and gender-responsive approach that strengthens institutional capacity while improving women's confidence and safety in public spaces.

Solution Summary

NariRaksha is a deployed AI-based early warning and support system that combines geospatial analytics, computer vision and multilingual natural language processing to detect safety risks, support faster institutional responses and improve women's safety in urban environments.

The AI Solution

Solution Description

NariRaksha operates as a decision-support system for urban safety authorities while remaining accessible to women users. The system analyses location-based risk indicators, closed-circuit television feeds and user-generated inputs to identify emerging safety concerns. Machine-learning models detect anomalous behavioural patterns in public spaces, while natural language processing models interpret distress-related inputs across multiple local languages. Gender-responsiveness is embedded through the use of gender-disaggregated data, bias monitoring during model development and participatory co-design with women users and frontline officials. Outputs are presented through explainable dashboards, enabling transparent and accountable decision-making by non-technical users.

Deployment & Implementation

The solution was deployed between 2023 and 2025 across selected urban districts of Chennai and Bengaluru in India. Implementation involved collaboration between technology developers, municipal authorities and law enforcement agencies. The system integrates with existing surveillance infrastructure, command-and-control platforms and patrol-planning workflows without requiring major hardware upgrades. Standard urban connectivity, secure servers and dashboard access for officials are required. Local institutions play a central role in governance, monitoring and operational use of the system.

Users & Scale

Primary beneficiaries include women commuters and residents in urban districts; institutional users include city police units and urban safety administrators. The system supports decision-making across multiple districts, indirectly benefiting thousands of women through improved response mechanisms and preventive safety planning.

Impact & Outcomes

Measured Gender Impact

During deployment, the system processed more than two million surveillance frames and analysed 18,000 verified incident records. Comparisons with pre-deployment conditions showed reduced response delays, improved credibility of reported incidents and more targeted allocation of patrol resources. Authorities were able to identify high-risk micro-locations and implement preventive interventions, such as adjusted patrol schedules and infrastructure improvements. Women users reported increased confidence in reporting incidents due to visible institutional follow-up. Together, these outcomes contributed to safer public spaces, enhanced mobility and progress towards gender equality, aligned with Sustainable Development Goal 5.

Ethics, Governance & Safeguards

Ethical safeguards were embedded throughout the system life cycle. Personal data were anonymized, and only aggregated insights were used for decision-making. Consent mechanisms governed user-generated inputs, and strict access controls limited system use to authorized personnel. Bias mitigation checks were conducted during model training to reduce disproportionate impacts. Explainable outputs supported transparency, while institutional oversight committees and feedback from women representatives strengthened accountability and responsible deployment.

Lessons & Replicability

What Worked

Strong institutional partnerships, integration with existing safety infrastructure and participatory design with women users were key success factors. Explainable dashboards enabled adoption by non-technical officials and improved operational decision-making.

Challenges Encountered

Challenges included uneven data quality across locations, connectivity limitations in certain areas and initial trust barriers among users. Continuous engagement and capacity-building were required to address these constraints.

Key Lessons for Replication

Successful replication requires institutional ownership, reliable urban data infrastructure and early community engagement. Solutions must be adapted to local contexts rather than directly replicated. Ethical governance should be established from the outset.

Conclusion & Future Directions

NariRaksha demonstrates how ethically governed and gender-responsive AI can strengthen urban safety systems in the Global South. The solution shows strong potential for geographic expansion and adaptation to additional public service contexts, contributing to inclusive and accountable AI ecosystems.

References

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