Smart Disaster Alert Device (SDAD)

An Inclusive, Multi-Sensory Lifeline for Disaster-Prone Communities

Big Idea:
Disaster Resilience

Essential Question:
How can disaster warnings be made impossible to miss for people beyond digital systems?

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ENGAGE (Challenge Identification)

What challenge does our project address?

Many people miss disaster warnings during cyclones, floods, landslides, heatwaves, and earthquakes because alerts depend mainly on mobile phones and internet connectivity.

Why did we choose this challenge?

We live in a disaster-prone region and noticed that elderly people, children, persons with disabilities, and rural families often do not receive or understand phone-based alerts, especially at night or during power failures.

Why is this a real-world problem?

Missed alerts lead to delayed evacuation, panic, injuries, and loss of life. This problem affects entire communities, not just individuals.

ENGAGE (Who Is Most Affected)

Who is most impacted by this challenge?

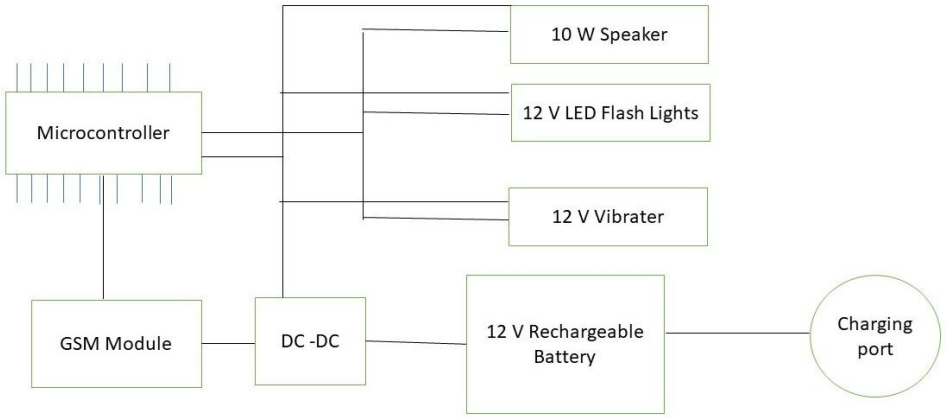
- Children
- Elderly people
- Persons with disabilities

- Low-literacy communities
- Rural and disaster-prone populations

These groups are least protected by digital-only warning systems but face the highest risk during disasters.

INVESTIGATION (What We Researched)

What did we investigate?



How disaster alerts are currently issued

Why people miss warnings during emergencies

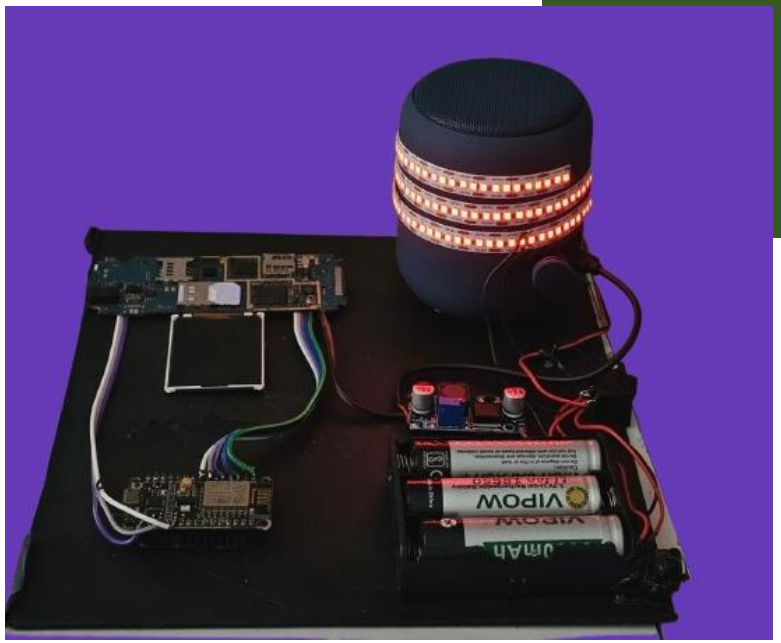
Limitations of phone-based alert systems

Needs of vulnerable community members

We studied real disaster events, observed community responses, and analyzed gaps in existing alert mechanisms.

INVESTIGATION (What We Discovered)

Key findings from our investigation



Phones are often on silent or switched off

Messages may be unread or not understood

Internet and power fail during disasters

Sirens alone are not inclusive.

We learned that alerts must be physical and multi-sensory to be effective for everyone.

INVESTIGATION (Learning & Insights)
What insights guided our solution?

Alerts must be **heard, seen, and felt**

Solutions should work **without smartphones or internet**

Inclusive design is essential for safety

Simple, reliable technology can save lives

These insights shaped our solution design.

ACTION (Our Solution Concept)
What is our solution?

The **Smart Disaster Alert Device (SDAD)** is a student-designed early warning system that converts disaster alerts into **multi-sensory signals** that are impossible to ignore.

SDAD ensures warnings reach everyone, including those missed by digital systems.

ACTION (How SDAD Works)

How does SDAD function?

1. Disaster alert is received
2. Controller processes alert level
3. Siren, light, voice, and vibration activate
4. People respond and move to safety

✓ Works during power cuts
✓ No internet or smartphone required

ACTION (Key Features)

Multi-Sensory Alert Features

- Loud siren
- Bright flashing LED lights
- Voice alerts in local languages
- Vibration alerts
- SOS emergency button

Designed so alerts are impossible to miss.

ACTION (Design & Form Factors)

Where can SDAD be used?

- Homes
- Schools and hospitals
- Village-level alert hubs
- Wearable devices

One core technology, multiple real-world applications.

ACTION (Why Our Solution Is Different)

How SDAD improves on existing systems

Feature	Phone Alerts	Sirens	SDAD
Works during sleep	✗	✗	☑
Inclusive design	✗	✗	☑
Local language	✗	✗	☑
No internet needed	✗	☑	☑

ACTION (Impact)

What impact can SDAD create?

- Faster evacuation
- Reduced panic
- Fewer preventable injuries
- Improved community preparedness

SDAD turns warnings into immediate action.

ACTION (UN SDG Alignment)

Sustainable Development Goals

- **SDG 3:** Good Health and Well-Being
- **SDG 11:** Sustainable Cities and Communities
- **SDG 13:** Climate Action

Our project directly supports community safety and climate resilience.

ACTION (Innovation & Originality)

Why is SDAD original?

SDAD is a **student-designed and developed solution**.
The originality of the project is reflected in the fact that the **three student team members are listed as the first inventors in a published Indian patent application** for this device.

Patent Details
https://drive.google.com/file/d/1xfXgrQ2RR2dlSgXRE5xOx3At_RGpp1VT/view?usp=drive_link
Student ID:
https://drive.google.com/file/d/1gPm_rnChiKQRMrgjOLdcLMiWXA-V8nm6/view?usp=drive_link
Prototype Video:
https://youtu.be/e2pmXagx4bI

ACTION (Reflection & Conclusion)

What did we learn?

Through building SDAD, we learned electronics, programming, teamwork, and how technology can protect lives. This project showed us that **inclusive design is not optional — it is essential**.

Conclusion

SDAD ensures disaster alerts are **heard, seen, and felt**, helping protect communities when every second matters.