Poster Specifications for Presenters

1. **Institutional Logo:** The institutional logo must be placed in the top-left corner. The logo can be downloaded at: https://s.id/logo_icmse_ismei_2026
2. **Poster Dimensions & Size:** A1 size
3. **Orientation:** Portrait (Vertical)
4. **Print & Material Specifications:** Albatross or Luster paper, Matte (Doff) lamination, File resolution of 50 DPI to 300 DPI at a 1:1 scale while designing (using CMYK color mode).
5. **Typography Guidelines:** Use Sans-Serif fonts, adhering to the following rules:
    - **Main Title:** 72 pt – 120 pt (Use bold text; must be legible from a distance of 5 meters).
    - **Author Names & Institution:** 36 pt – 48 pt.
    - **Subheadings:** 36 pt – 40 pt (Introduction, Methodology, Results, etc.).
    - **Body Text:** 24 pt – 32 pt (Avoid overly long paragraphs; use bullet points).
    - **Captions (Figures/Tables):** 18 pt – 20 pt.
6. **Layout & Content Structure:** Organize your poster systematically using columns (typically 2 columns for portrait), following a left-to-right, top-to-bottom reading flow:
    - **Header:** Research title, full names of presenter/authors, affiliation, and university/company logo (typically placed in the top-left or top-right corner).
    - **Introduction:** Brief background and research objectives.
    - **Methodology:** Flowchart or workflow diagram (make it as visual as possible, avoiding dense text).
    - **Results & Discussion:** Graphs, tables, or experimental photos (this is the most crucial section and should dominate the poster layout).
    - **Conclusion:** Concise bullet points answering your research objectives.
    - **References & Acknowledgments:** Keep this section brief using a small font size (around 14 pt – 16 pt).

Example:

INSTITUTION LOGO
(Top-Left Position)

DEVELOPMENT OF AN IoT-BASED EARLY WARNING SYSTEM FOR NATURAL DISASTERS

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1. INTRODUCTION

- **Background:** Delays in disaster response cause severe economic losses and human casualties every year.
- **Problem Statement:** Traditional monitoring systems suffer from high data transmission latency and restricted coverage.
- **Research Objectives:**
  - Design a low-power, field-deployable IoT sensor node architecture.
  - Accelerate real-time early warning dispatches to under 5 seconds.

Core Focus: Enhancing wireless communication efficiency using LoRaWAN technology in remote regions.

2. METHODOLOGY

The architecture adopts a modular workflow structured across three sequential phases:

- **Hardware Specs:** ESP32 Microcontroller, MPU6050 Accelerometer, 5W Solar Module.
- **Testing Protocol:** Simulated seismic vibrations and field range tests up to 5 km.

4. CONCLUSION

- The proposed IoT-based system successfully reduced alert transmission latency down to **3.8 seconds**.
- Hazard detection accuracy achieved a high rate of **94.2%** across field trials.
- Solar-assisted power management enabled autonomous field operation exceeding **30 consecutive days**.

3. RESULTS & DISCUSSION

65%	94.2%
Latency Reduction	Detection Accuracy

A. Transmission Latency Evaluation

Empirical evaluations confirm that the LoRaWAN framework significantly accelerates warning dispatches compared to legacy cellular systems.

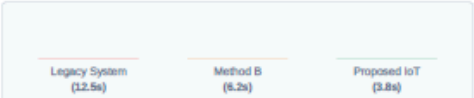

Figure 1. Early Warning System Response Time Comparison (seconds)

B. Power Efficiency & Coverage Range

- **Power Consumption:** Under deep-sleep mode, the sensor node draws only **15 µA**.
- **Transmission Range:** Maintains stable communication up to **4.8 km** under Line-of-Sight conditions.

REFERENCES

1. Prabama, A., & Wijaya, B. (2024). *Internet of Things for Natural Disaster Mitigation*. Journal of Computer Systems & Tech, 12(2), 45-50.
2. Zhang, L., & Smith, R. (2025). *Low-Power Wireless Sensor Networks in Remote Monitoring*. IEEE Trans. Ind. Inform., 88, 102-115.

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