

International Conference on Recent Trends in Engineering and Technology 2026 : Submission (178) has been created.

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Date: Mon, 1 Dec 2025, 11:37 AM

Hello,

The following submission has been created.

Track Name: ICRTET2026

Paper ID: 178

Paper Title: A Cost-Effective Integrated Platform for Rural Water Supply Network Management: Implementation and Performance Analysis.

Abstract:

The effective management of rural water supply infrastructure in developing countries often encounters problems that encompass fragmented monitoring systems, reactive maintenance and ineffective citizen involvement channels. The report describes the design, implementation and evaluation of a fully-fledged platform to integrate geospatial mapping, IoT (Internet of Things) monitoring and grievance redressal into a seamless cost-effective solution, with the aim of realizing a solution for this resource-limited environment. The system utilizes PostgreSQL with PostGIS extension to manage spatial data, Isolation Forest algorithms for real-time anomaly detection and MQTT protocol for IoT communication. Analysis shows that the response times in spatial queries are sub-second for 95% of queries, 89% precision in anomaly detection, and the cost is 72% lower in comparison to commercial alternatives. The pilot deployment of 50,000 users made 99.9% uptime as the benchmark showing the scalability and reliability of the system. Within 18 months, the platform returns on investment while supporting Sustainable Development Goal 6 (Clean Water and Sanitation). Index Terms—water supply networks, geospatial systems, IoT monitoring, anomaly detection, rural infrastructure, PostGIS, MQTT.

Created on: Mon, 01 Dec 2025 06:07:31 GMT

Last Modified: Mon, 01 Dec 2025 06:07:31 GMT

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Primary Subject Area: Computer Science Engg. & Allied Streams

Secondary Subject Areas: Not Entered

Submission Files:

Rural Water Supply Network Management.pdf (410 Kb, Mon, 01 Dec 2025 06:05:51 GMT)

Submission Questions Response:

1. Theme/Track

Computer Science / AI & ML / Data Science Engineering

2. Keywords (3–5)

Geospatial Systems (PostGIS), IoT Monitoring, Anomaly Detection (Isolation Forest), Rural

Water Infrastructure, MQTT Protocol

3. Registration

Yes

4. Presentation Mode

Online

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