PROJECT TITLE:

AI-Driven Smart Water Management System

COLIGO

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AI Design Challenge

Phase 1 Submission – “Five star”

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ABSTRACT

PROJECT TITLE: Driven Smart Water Management System

Urban water systems face growing challenges due to population growth, climate change, and outdated infrastructure. Traditional water management approaches are reactive and inefficient, lacking real-time adaptability and predictive insight. This presentation introduces an AI-driven smart water management system tailored for smart cities, aiming to transform how water is monitored, distributed, and conserved. The proposed system leverages IoT sensors, machine learning models, and cloud-edge computing to forecast water demand, detect leaks through anomaly detection, and monitor water quality in real time. Geographic Information System (GIS) integration enhances spatial awareness, while user-friendly dashboards offer actionable insights. Key technologies include LSTM networks, autoencoders, Raspberry Pi, and platforms like AWS IoT and Power BI. The anticipated benefits include a 30% reduction in water loss, improved emergency response, and sustainable urban water use. This proactive, data-driven solution fosters resilient infrastructure and empowers citizens, marking a crucial step toward sustainable smart city development.

Problem statement

- Leak detection.
- Real-time demand-supply balancing.
- Water quality monitoring.
- Water log detection.

AI-BASED SOLUTION USING COLIGO.AI

- IoT sensors for flow, pressure, and quality
- Machine learning for prediction and anomaly detection
- GIS integration for geospatial visualization
- Edge + Cloud architecture
- User dashboards for insights and control

HOW EACH OF COLIGO FEATURES WILL BE USED?

COLIGO Edge AIoT Software

COLLECT

- Deploy IoT Sensors
- Sensor Data Acquisition

Sensor used:

- Temperature
- Water flow
- Turbidity and pH

EXPOSE

- Edge Processing & Filtering
- Cloud Integration
- Data Storage

MONITOR

- Real-Time Dashboards
- Geospatial Monitoring
- User Access

ANALYZE

- AI/ML Model Application
- Performance Evaluation
- Decision Support & Insights

PRE-TRAINED MODELS

•**Edge Deployment**: Lightweight versions of models run on Raspberry Pi or local nodes for low-latency decisions.

•**Cloud Inference**: Heavy models are deployed on cloud for batch processing, analytics, and retraining.

•**APIs & Integration**: Pre-trained models are exposed via Coligo APIs to dashboards and monitoring systems.

With COLIGO, the user can implement, execute and benefit from different AI models without any AI expertise. Similar to using ChatGPT with prompts, the user's only task is to select the data that need to be analyzed. Thanks to the Streaming Learning Technology, COLIGO is able to train its models with live data and switch to inference when training is complete.

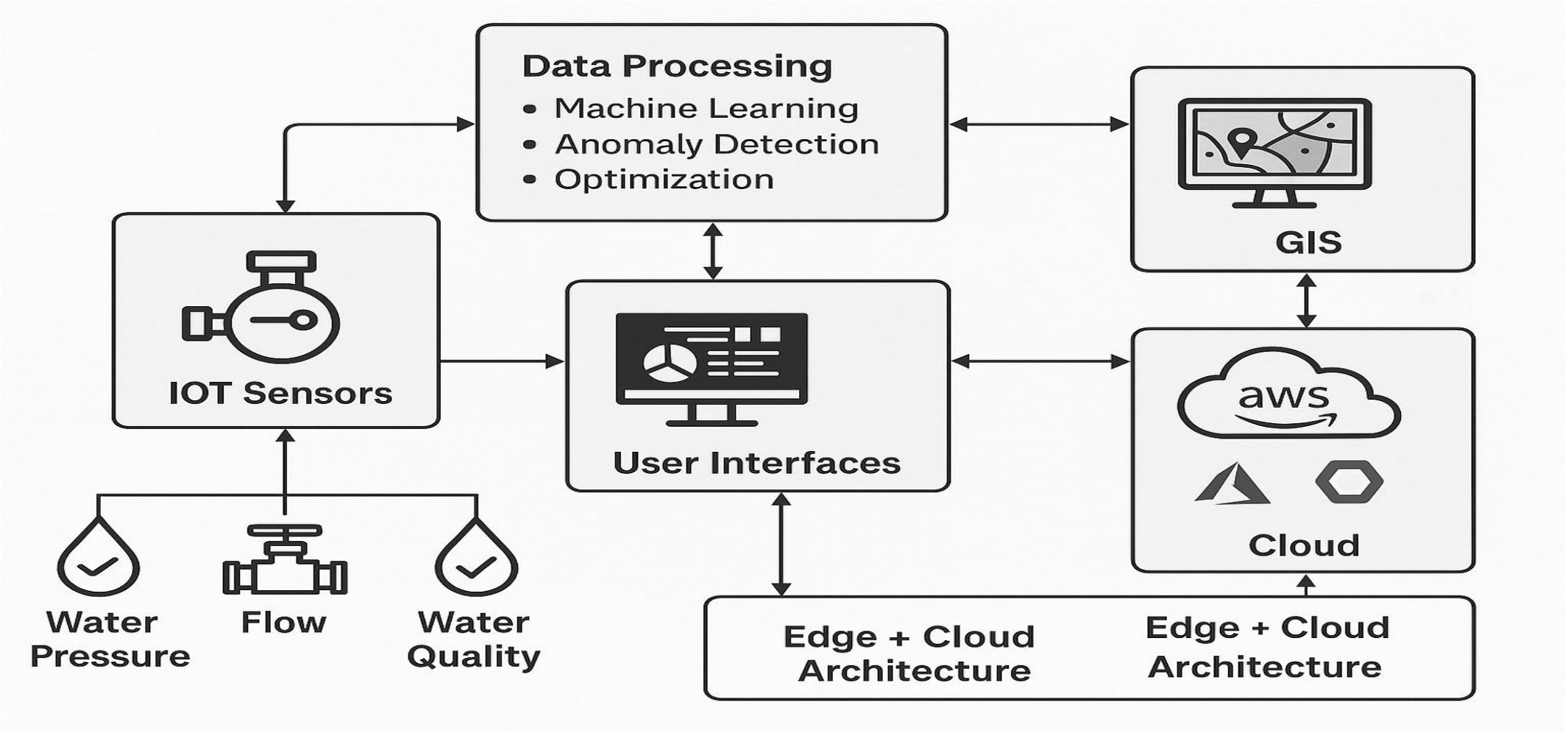
Anomaly Detection

Predictive Analytics

Object detection/recognition

Sound detection/recognition

ARCHITECTURE DIAGRAM



Expected Benefits

- 30% reduction in water losses
- Faster emergency response to leaks
- Data-driven infrastructure planning
- Sustainable urban water consumption
- Better citizen engagement and awareness


COLIGO
Edge AIoT
Software