Smart Waste Management System

ICE Fiesta Idea Showcasing - 2025

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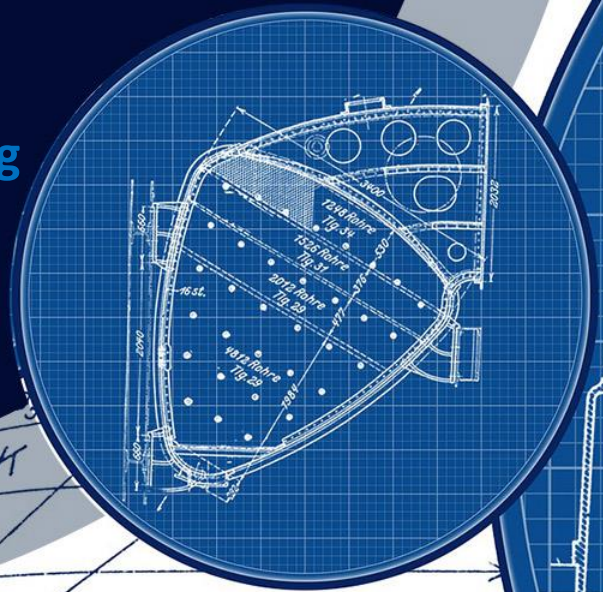
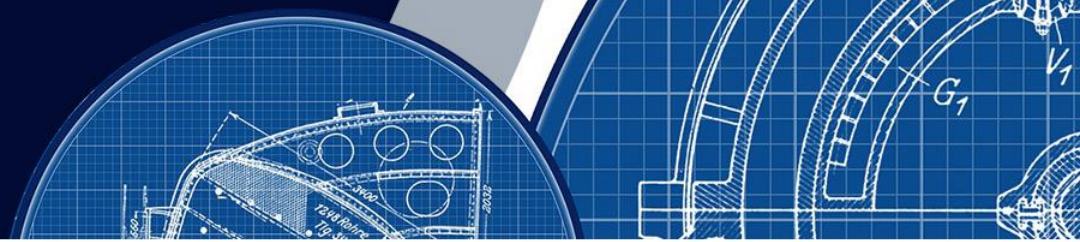


Short Description



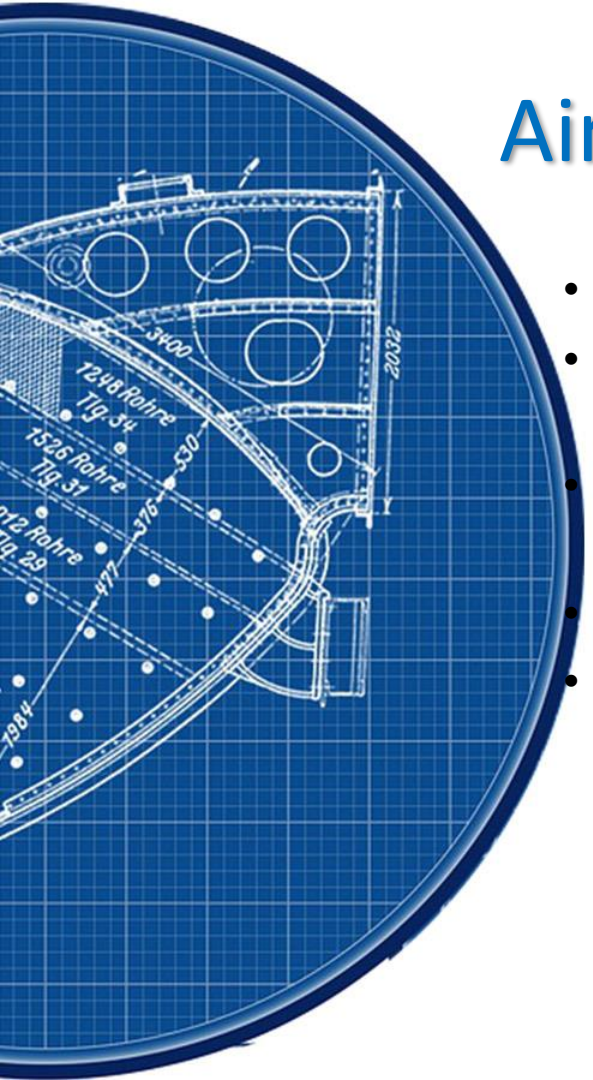
- **AI-Integrated IoT Solution**: Optimizes waste collection and recycling.

- **Smart Bins with AI Sensors**: Classify waste into biodegradable, recyclable, and non-recyclable categories.

- **Real-Time Monitoring**: Tracks waste levels for efficient collection.

- **Predictive Analytics**: Forecasts waste generation trends.

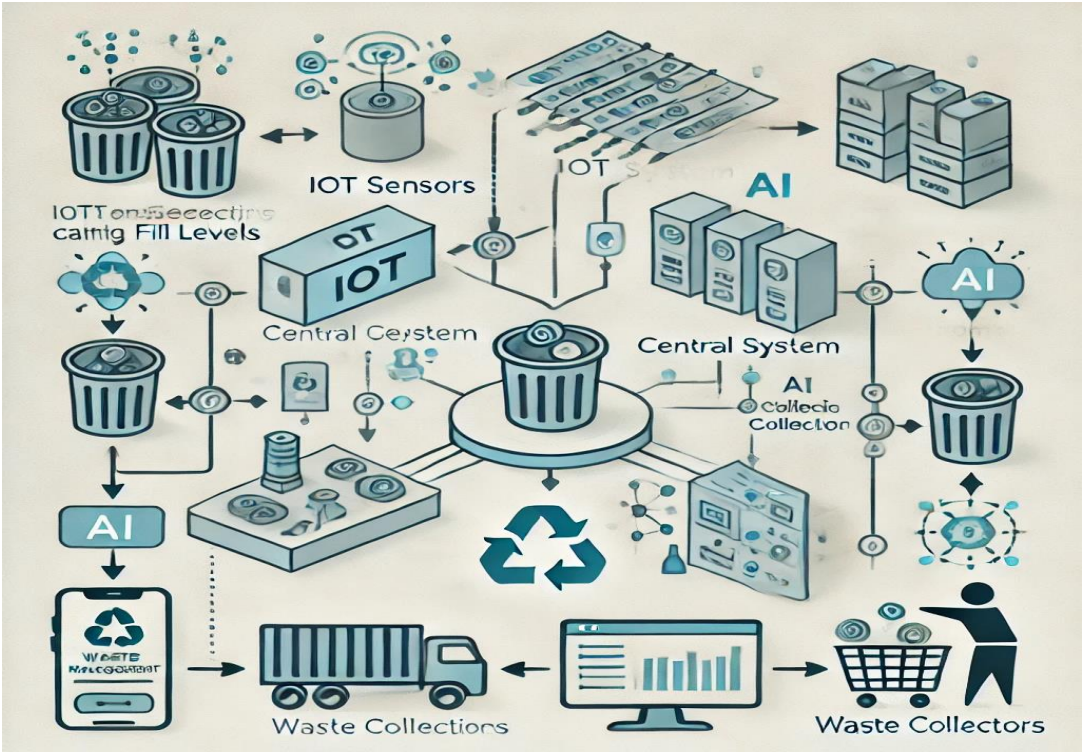
- **Route Optimization**: Reduces operational costs and environmental impact.



Aims and Objectives

- To **automate waste classification** using AI and IoT sensors.
- To **reduce environmental pollution** by promoting efficient waste recycling.
- To **improve public health** by ensuring cleaner urban environments
- To reduce **landfill** usage
- To **optimize waste collection routes**, minimizing fuel consumption and costs**.**

Working Principle & System Architecture



Data Collection

- IoT Bins
- Data Transmission

Analysis & Optimization

- Central System
- AI Algorithms

Action & Communication

- Waste Collection
- Waste Management App

Required Technologies/Components

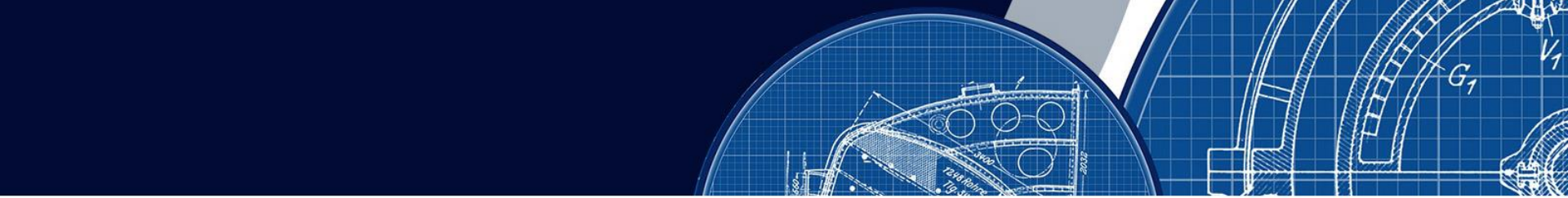
Hardware and Software

- **IoT** Smart Bins
- **AI/ML Models** for waste classification (TensorFlow, OpenCV)
- **Cloud Computing** for data storage & analytics (AWS, Google Firebase)
- **Mobile App & Web Dashboard** (Flutter, React, Node.js)
- **IoT Communication Protocols** (MQTT, LoRaWAN)

Cost and Benefit Analysis

- Initial Setup Cost: Moderate investment

- Long-term Benefits:
- • Significant savings in waste management costs
- • Increased efficiency in waste collection
- • Higher recycling rates
- • Positive environmental impact



THANK YOU ALL