



شركة ابتكارات حادة
Sharp Innovations
Innovating The Tech Experience

CLEANLINESS MONITORING SYSTEM



OVERVIEW

The Cleanliness Monitoring System by Sharp Innvotech is a centralized, AI-powered platform designed to digitize public hygiene management. It enables municipalities and private operators to track, monitor, and manage street cleanliness, litter presence, and waste bin status through a unified digital interface.



CHALLENGES

- 1. Manual & Reactive Processes:** Relying on citizen complaints or random, scheduled cleaning routes leads to neglected areas, slow response times, and an inability to address waste issues before they become public health hazards.
- 2. Lack of Real-Time Visibility:** Without integrated sensor data or live scanning, operators face "blind spots" in urban hygiene, struggling to identify overflowing bins or litter-heavy streets until after public dissatisfaction arises.
- 3. Operational Inefficiency:** Fixed-route collections often result in wasted fuel and labor when visiting empty or near-empty bins, while high-priority areas remain unserved due to poor route optimization.
- 4. Data & Accountability Gaps:** The absence of a centralized digital system makes it difficult to track fleet performance, verify route completion, or provide the verifiable data required for environmental audits and compliance reports.



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ANALYSIS

- 1.** Centralized Hygiene Intelligence: Transitions urban cleanliness management from reactive, complaint-based models to a unified digital ecosystem, acting as a "single source of truth" for real-time litter and waste data.
- 2.** Proactive Urban Sanitation: Leverages AI computer vision and sensor telemetry to identify overflowing bins and litter accumulation, allowing teams to intervene before issues escalate into public health hazards.
- 3.** Dynamic Operational Optimization: Replaces fixed, inefficient cleaning schedules with data-driven route optimization, ensuring crews are dispatched exactly where and when they are needed most.
- 4.** Transparent Performance Accountability: Provides objective, time-stamped records of sweeper coverage and collection tasks, ensuring compliance with environmental standards and facilitating accurate performance audits.

SOLUTIONS



- 1.** AI-Powered Litter Detection: Uses advanced computer vision to automatically identify litter categories, monitor street sweeper performance, and detect overfilled waste bins in real time.
- 2.** Dynamic Route Optimization: Replaces inefficient fixed-cleaning routes with data-driven pathing, ensuring cleanup crews are dispatched precisely where and when they are needed.
- 3.** Real-Time Sensor Integration: Connects smart bin sensors and vehicle-mounted cameras to a central database, providing instant visibility into urban hygiene "blind spots."
- 4.** Automated Alerting & Dispatch: Triggers high-priority cleanup alerts the moment litter density thresholds are exceeded, ensuring rapid intervention before issues escalate.
- 5.** Operational Accountability: Generates detailed historical logs and coverage maps, allowing managers to verify route completion, monitor fleet efficiency, and simplify environmental reporting.

KEY FEATURES



Pristine Public Spaces

Improves hygiene in streets, parks, and tourist zones by ensuring rapid, targeted response to litter accumulation.



Public Health & Safety

Prevents pest attractions and public health hazards by addressing bin overflows before trash spills onto streets.



Reduced Operational Costs

Optimizes waste collection by prioritizing full bins, which saves on fuel and labor costs compared to fixed-route collections.



Data-Driven Accountability

Offers total transparency regarding fleet performance, ensuring collection crews fulfill their routes and providing verifiable data for environmental compliance reports.

END RESULT

- **Pristine Public Spaces:** Maintains high standards of hygiene in streets, parks, and tourist zones by ensuring rapid, targeted response to litter and waste.
- **Reduced Operational Costs:** Optimizes waste collection by prioritizing full bins, significantly saving on fuel, vehicle maintenance, and labor costs compared to fixed-route collections.
- **Proactive Public Health:** Prevents pest attractions and potential hazards by addressing bin overflows before trash spills onto streets.
- **Operational Accountability:** Provides objective, time-stamped proof of route completion and fleet performance, ensuring collection crews meet service expectations.
- **Data-Driven Urban Planning:** Delivers actionable cleanliness indices and coverage maps that help municipal managers allocate budgets and resources with high precision.



TECHNOLOGY



Angular



Nodejs



Postgres



Express



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