SECP1513 Technology and Information System

Proposed Idea for the Design Thinking Project:

The Green Bin

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1. The Problem That Lead To The Proposed Idea

Traditional waste management systems face challenges in monitoring waste fill levels. This leads to inefficient waste collection routes and resource allocation, causing unnecessary fuel consumption, traffic congestion and increased operational costs.

Other than that, overflowing bins are a common sight, contributing to environmental pollution. This also negatively impacts the overall aesthetics of the area, creating visual eyesores.

Lastly, traditional waste management systems do not prioritise recycling. Due to lack of effective sorting mechanisms, recyclables are often contaminated, making it challenging and costly to extract valuable materials.

2. The Solution To The Problem

The suggested solution is to use the Smart Bin. The Smart Bin is equipped with sensors that can detect the level of waste within them. Once the bin reaches a certain capacity, the sensor triggers a notification to alert waste management authorities.

The Smart Bin also incorporates machine learning algorithms to analyse historical data and predict future fill levels more accurately. This helps in optimising collection routes and resource allocation, preventing overfilled bins.

The Smart Bins has a sorting mechanism within the bin that separates recyclables from general waste. This reduces the need for manual sorting and improves the efficiency of the recycling process.

Finally, the Smart Bins utilises a user-friendly mobile application. The application provides notifications, updates and an intuitive interface for both waste management authorities and users to actively engage with.

3. Existing Products In The Market That Is Similar To The Proposed Idea

a. Bigbelly Products

Bigbelly provides waste bins such as Bigbelly Element, Bigbelly Sense, Bigbelly Smart, etc. The waste bins include sensors to monitor fill levels and utilise compactors to increase capacity. Any data collected is sent to Bigbelly's CLEAN™ Software, a tool for system setup, management, monitoring, and optimization.

b. Ecube Labs Products

Ecube Labs provides products such as the CleanCUBE, a solar-powered trash compactor, and the CleanFLEX, a wireless fill-level sensor. The products then send data to CleanCityNetworks, Ecube Lab's cloud-based platform which provides the monitoring environment, smart dashboard, analytics and control centre.

4. The Difference Or Uniqueness Of The Proposed Idea

Feature/Aspect	Smart Bin	Bigbelly Products	Ecube Labs Products
Fill Level Measurement	✔️	✔️	✔️
Compacting Technology	❌	✔️	✔️
Waste Sorting Technology (Recycling Feature)	✔️ (Real-Time Image Recognition, Sorting Mechanisms and Multi-compartment Design)	❌	❌
User Interface	✔️ (Allows both waste management authorities and the public to interact with the Smart Bin)	✔️ (Allows waste management authorities to oversee their products)	✔️ (Allows waste management authorities to oversee their products)