

Smart Container System for Last-Mile Delivery

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Elevator Pitch

Logistics and delivery companies face high costs and inefficiencies in last-mile delivery. The Smart Bin System optimizes this process by integrating IoT with smart storage, automating package management. Advanced routing algorithms and real-time tracking ensure timely deliveries, enhancing overall efficiency.

Objectives

The goal of the Smart Bin System is to optimize last-mile delivery by integrating smart storage and advanced routing algorithms. The system aims to:

Achieving Delivery Optimization



Specifications

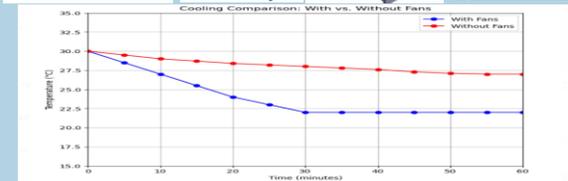
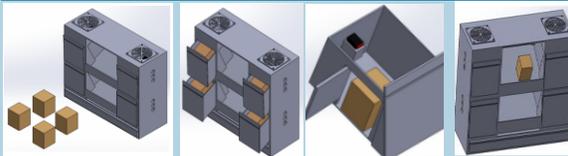
- Max Packages: 35 packages
- Avg Delivery Time: ≤ 5 Hours
- Customer Interactions: 1 per delivery (automated) Rescheduling Time: ≤ 5 minutes
- Routing Calculation Time: ≤ 3 minutes

Prototype Development

The Smart Bin System integrates both software and hardware to optimize last-mile delivery.

- The software component uses advanced routing algorithms, Machine learning, real-time data, and customer notifications, ensuring efficiency.
- The hardware includes a scalable smart bin with IoT sensors for real-time tracking of packages and automated package delivery.
- The system features a ventilation system designed to control temperature and humidity, ensuring the safe storage and transport of sensitive packages.
- The system is designed to handle 35 packages, ensuring scalability and adaptability for varying delivery volumes, and can be customized based on customer preferences.

Hardware



Automatic Release

Facilitates seamless package handling and retrieval.

IoT Integration

Enables real-time tracking and data processing for route optimization.

Adjustable Compartments

Optimizes space by holding up to 35 packages efficiently.

Ventilation System

Maintains optimal temperature and humidity for sensitive packages.

Software

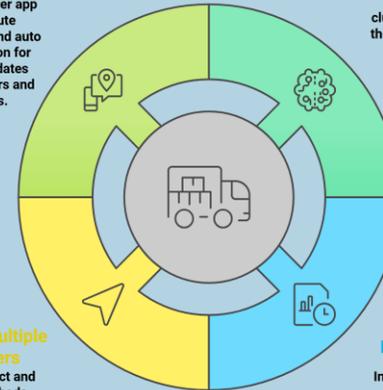
Delivery System Optimization

Diver Application & Auto Communication

Provides a driver app for easy route management and auto communication for seamless updates between drivers and customers.

Machine Learning

Uses K-Means clustering to determine the optimum number of vehicles for trips, handling up to 200 locations.

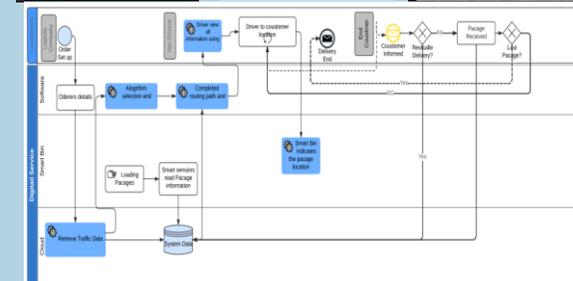
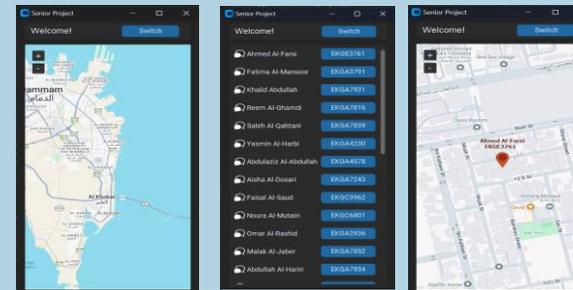


Routing & Multiple Parameters

Combines exact and heuristic methods, optimized based on customer preferences for multiple parameters like time and distance.

Real-Time Data

Incorporates real-time data and street conditions to optimize routes dynamically.

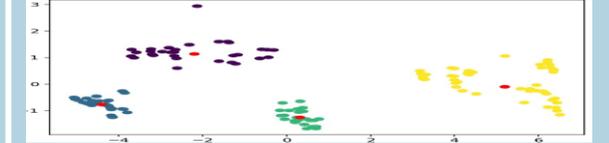


Features

Dynamic Traffic Monitoring



ML-Based Van Allocation



Software	Max Waypoints	Real Time Data	Sub-Optimization	Customizability	Dynamic Algorithms	Pricing
RouteXL	20	No	No	low	No	35\$ (Up to 100 Waypoint)
mapquest	50	limited (Basic updates)	No	Moderate	No	15\$
Google Maps	10 (API up to 50)	Yes (Traffic Data only)	No	low	No	5\$ per 1000 Requests
ON THE WAY	40+ (Scalable)	Yes (Both Traffic and logistic data)	Yes	High	Yes	9.9\$

Validation and Verification

