

EPG's Route Planning and Execution Suite Greenplan Develops Smart Sectorization for Post & Parcel Operations

EPG (Ehrhardt Partner Group) has developed a new capability for its route planning and execution solution Greenplan. While the capability is impactful across industries, it promises significant benefits for one in particular: Post and Parcel. The product's newest algorithm solves the complexities of managing combined and parcel-only delivery networks, optimizing parcel split, computing intelligent routes, and ultimately designing sectors for data-driven efficiency.

Drawing delivery areas has always been an inexact science for the post and parcel industry. Networks with distinct strengths and weaknesses – which require different route optimization – further complicate the sectorization problem. While parcel-only networks provide more flexibility for time-sensitive packages, combined networks are more cost effective, and assignment to one network or the other impacts resource usage and delivery quality. Traditional operations struggle to split parcels between groups, but Greenplan leverages cooperative game theory - specifically the "Happy Nucleolus" model – to assign parcels with mathematical precision for smarter route and sector design.

The Five-Step Process

EPG's Greenplan follows a five-step process to solve the sectorization dilemma. Here's how it works:

1. Create Area Groups

Delivery regions are divided into clusters of 10-50 addresses. These groups are designed to balance workloads while maintaining sector compactness and delivery density. This simplifies the logistics of large regions and lays the groundwork for efficient routing.

2. Calculate Area Group Cost Using the "Happy Nucleolus"

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The algorithm applies the "Happy Nucleolus" model – a discrete mathematics concept co-developed with Greenplan's partners at the University of Bonn - to calculate the cost of assigning an area group to each delivery network. The calculation considers time constraints, distance from depot, delivery density, and operational constraints among other factors. The resulting value is decisive for the parcel split between the two networks.

3. Define the Parcel Split Between Networks

Once costs for both networks are defined, the algorithm strategically assigns area groups to the combined-only or parcel delivery network based on their cost-effectiveness, taking limitations to the combined delivery fleet and inter-dependencies of area groups into account.

4. Calculate Routes and Design Sectors

Greenplan's core routing algorithm calculates intelligent routes for each network, using fixed routes for combined deliveries and dynamic routes for parcel deliveries. This hybrid approach accommodates fluctuations in parcel volume and optimizes resource use during peak times. The resulting routes ultimately determine the boundaries of the sectors.

5. Evaluate and Refine the Model

This stage conforms to the unique requirements of each customer. Tours are customized to individual delivery days, but additional customizations, analyses, and refinements are highly dependent on the business goals and agility of individual customers.

Benefits for the Post and Parcel Industry

Smart sectorization reduces the effort and expense of delivery in multi-network operations. The ability to split parcels between networks based on advanced cost calculations ensures that resources are used more efficiently. Strategic allocation combined with intelligent routing provides the data needed to design optimized sectors, empowering fleets to deliver more shipments in less time at minimized cost.

With reliable delivery performance and lower operational expenses, customer satisfaction grows and budgets benefit. Greenplan's newest capability promises significant savings for the post and parcel industry. As parcel volumes grow, a data-driven strategy for assignment and dispatch design is critical – and smart sectorization is the solution.

Press release



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EPG – Smarter Connected Logistics

EPG is a leading international provider for a comprehensive Supply Chain Execution Suite (EPG ONE™) and employs 1,000 people at 23 locations around the world. The company group provides its more than 1,600 customers with WMS, WCS, WFM, TMS and voice solutions to optimize logistics processes – from manual to fully automated logistics environments. EPG solutions cover the entire supply chain: From warehouse and road to ground and cargo handling solutions at airports. Logistics consulting, cloud services, managed services and logistics training courses at the company's own academy round out the comprehensive list of solutions from EPG.

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