Delivery Management System

zonda health

Background

An efficient delivery system is critical for all industries and essential in the health sector. We are confident that a well-designed system can help overcome two key issues in the healthcare system: inequity, by facilitating access to remote areas, and quality, by ensuring the timely delivery of medical services and pharmaceutical products. An efficient delivery system also optimizes healthcare professionals' time and reduces operating costs by improving delivery routes and reducing wait times. This approach improves healthcare efficiency and directly benefits patients by providing faster and more reliable access to healthcare services.

Nuestro desafío

Interdom Argentina provides home care services to patients in San Juan, Argentina.

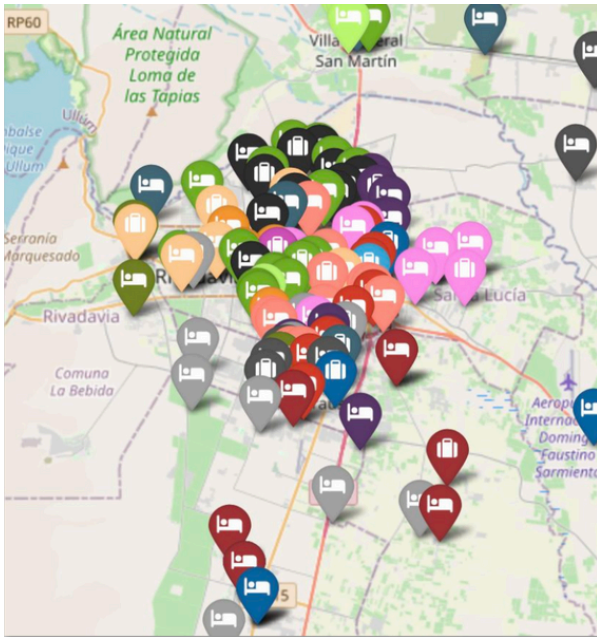
In just one day, the company's system must manage the logistics of hundreds of visits distributed over 89,000 m2.
Each visit involves a patient waiting for medical care and a medical professional eager to complete their visits effectively and promptly.
The logistics of these visits were previously managed manually but are now managed by advanced models that have become the core of the Operations team.

Our Approach

The implementation of these models can be broken down into three steps:

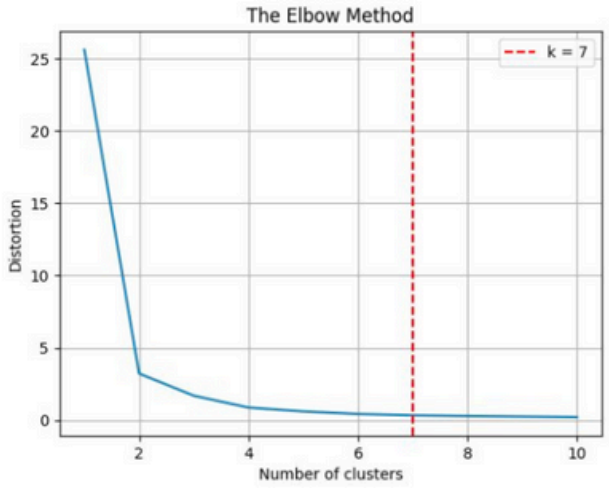
1. Calculate the optimal number of clusters.

Initial Distribution

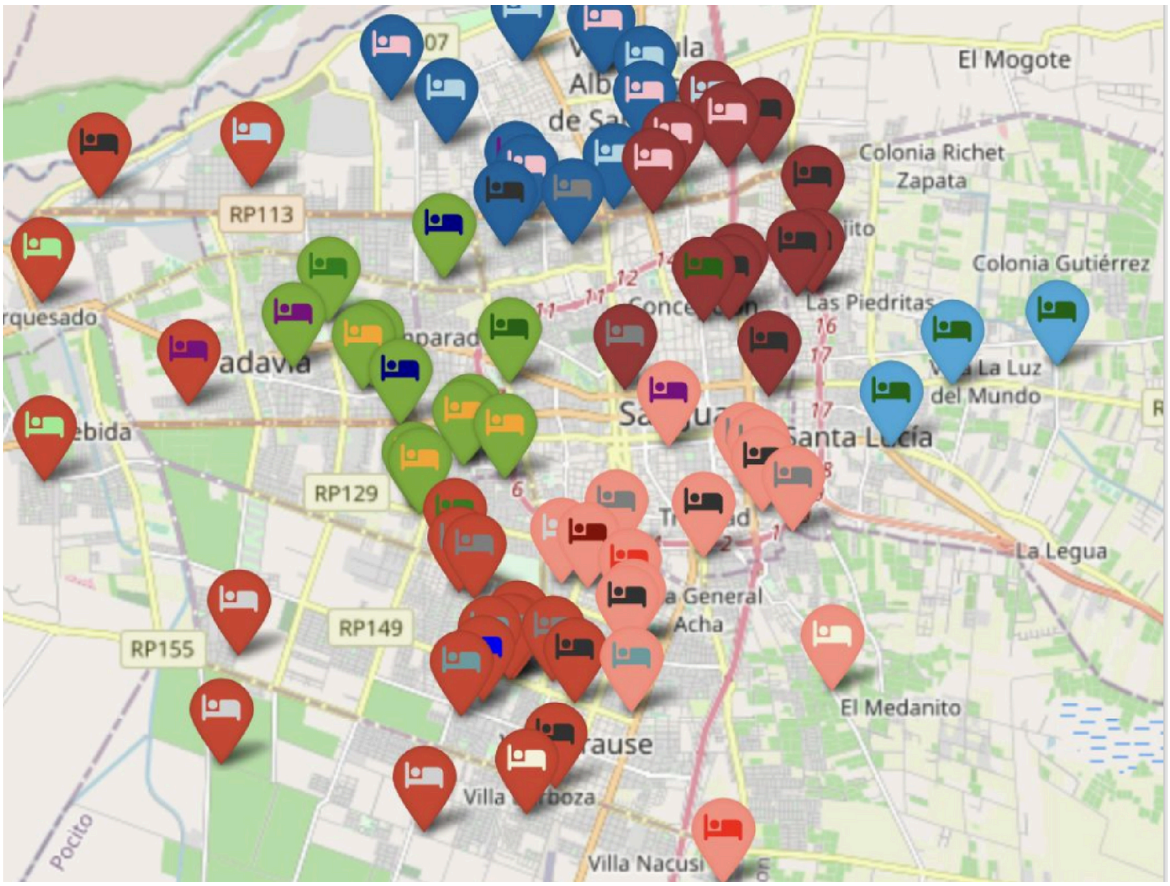


Cluster Optimization

Once the capacity and route restrictions are applied, the data suggests that seven clusters is optimal.



2. Clusterization

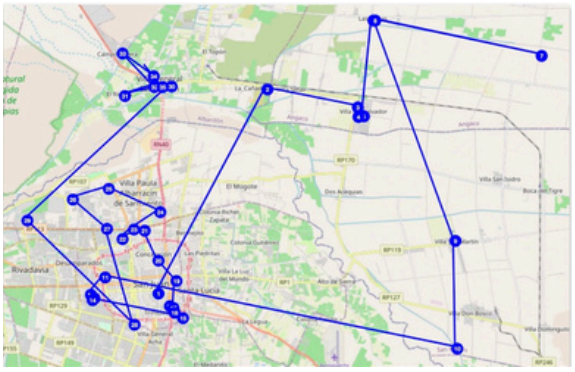


Given that the path optimization process is NP-hard, we implemented a clustering process to simplify the problem and avoid processing problems.

3. Optimizing routes

Optimization was done using CVRP models (Google OR-Tools) to optimize visits to the same addresses. The outcomes for a single route were as follows:

Traditional Daily Route



127 kilometers traveled

Optimized Daily Route

96 kilometers traveled

Resultado

<5% CANCELED APPOINTMENTS

All homes were visited daily and on time.

>20% COST SAVINGS

Optimization led to a reduction in the number of kilometers traveled, resulting in more significant fuel savings and fewer on-call hours.

SCALABILITY

The models are easily scalable, so the company can optimize routes for 10, 100, or 1000 patients.

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