

# FACILITY VOLUME PREDICTION

E-Commerce giant enhances its facility's efficiency using Altysys' advanced analytics solutions

## About the company

A reputed US-based consumer electronics company.

## BUSINESS NEED

Freight, Distribution, and Routing (FDR) facilities handle vast parcel volumes from multiple sources, but fluctuating inflows often lead to inefficient staffing, delays, and higher costs. To improve efficiency and ensure compliance, organizations are turning to AI-enabled solutions to implement data-driven forecasting of next-day volumes. This helps optimize workforce planning, reduce costs, and enhance resource utilization.

Therefore, the client reached out to Altysys to develop a predictive modeling solution that would -

- ◆ Manage the flow of parcels
- ◆ Streamline staff allocation

## SOLUTION

The Altysys team conducted a detailed assessment of the client's needs and developed a structured solution roadmap. The team executed the plan through the following key initiatives:

- ◆ Built four predictive models for each channel—Manifest, Returns, and Inter-Facility—to enhance volume forecasting and operational efficiency.
  - Model 1 - Developed a cycle time prediction model using CatBoost Regressor to estimate parcel transit time from source to destination and aggregate shipment volumes.
  - Model 2 - Designed a volume forecasting model to predict the next day's incoming shipments by analyzing past induction volumes and in-transit parcel data.
  - Model 3 - Implemented a time-series forecasting model using ARMA-GARCH to estimate incoming facility volumes based on historical induction trends.
  - Model 4 - Deployed a Monte Carlo simulation model with Geometric Brownian Motion to account for uncertainties in volume predictions and improve planning accuracy.
- ◆ Utilized Python-based modeling frameworks to build, test, and optimize the solution, ensuring seamless integration into the existing logistics workflows.

## TECH STACK

Azure ML Pipeline, Azure Cosmos DB, Azure Storage account, MS Azure, Python

## BUSINESS IMPACT

Built an ML model with 90% accuracy and 84% precision

Cost savings per facility of over 20% as a result of optimized staff allocation

### ABOUT ALTYSYS:

Altysys is a trusted cloud, data, and AI partner for businesses pursuing small to large transnational digital transformation programs. From data engineering to AI enabled solutions, we have the capabilities you need to realize key business outcomes with enterprise data across your technology initiatives.

## CASE STUDY