

Generation of Forecasts on the behavior of Global Imports by type of product.

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Highlights

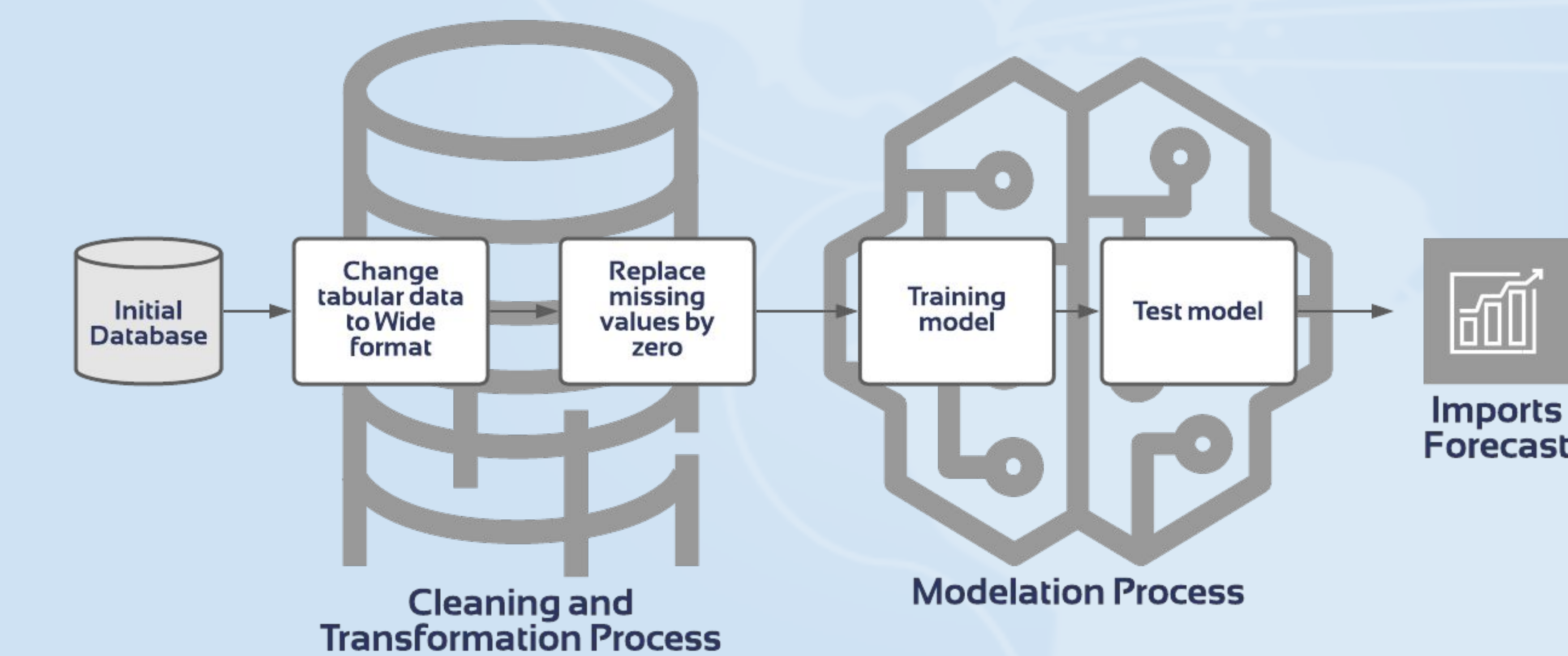
- Currently, a manual investigation of the behavior of sales abroad is being carried out, which requires a lot of time and staff. Furthermore, the decisions that are made tend to be subjective.
- Many marketers rely on this entity to make production and sales decisions according to forecast conclusion.
- Develop a model that predicts the sales of a certain type of product in a country or hub.

Background

Our client is a government entity, responsible for the commercial promotion of non-mining-energy exports, international tourism, foreign investment in Colombia and promoting the country brand in the world. In its mission to promote exports, having forecasts of sales abroad by type of products allows making decisions on time and defining strategies to maintain the growth of Colombian exports.

Data

We use data of the imports made by the countries or group of countries (hub) with which Colombia has the greatest commercial exchange. They are disaggregated by product chain, sector and subsector.



8
Hubs

87
Countries

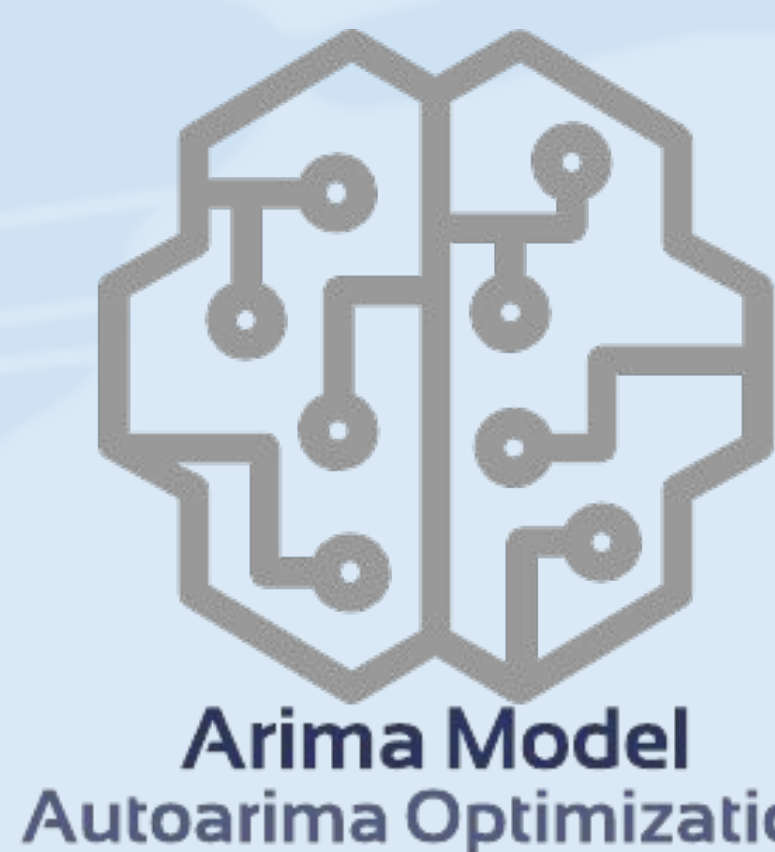
7
Products Chains

45
Sectors

213
Subsectors

Model

To address this problem we tried out 3 different approach: Two differents Arima model implementations and prophet model. According to the results we decided go on with Arima model, using *pmdarima* library and *Autoarima* optimization.



24,600+
trained models

This particular problem requires a useful time series model.

We agreed with the client to make the forecast for chain, sector and subsector per country, hub and global market.

- 1 We chose this type of model given the large number of models that we must train.
- 2
- 3 According to AIC value, this model got the best performance, also for the most models developed with autoarima the parameters p-values was under 0.05 and not larger than 0.09
- 4
- 5

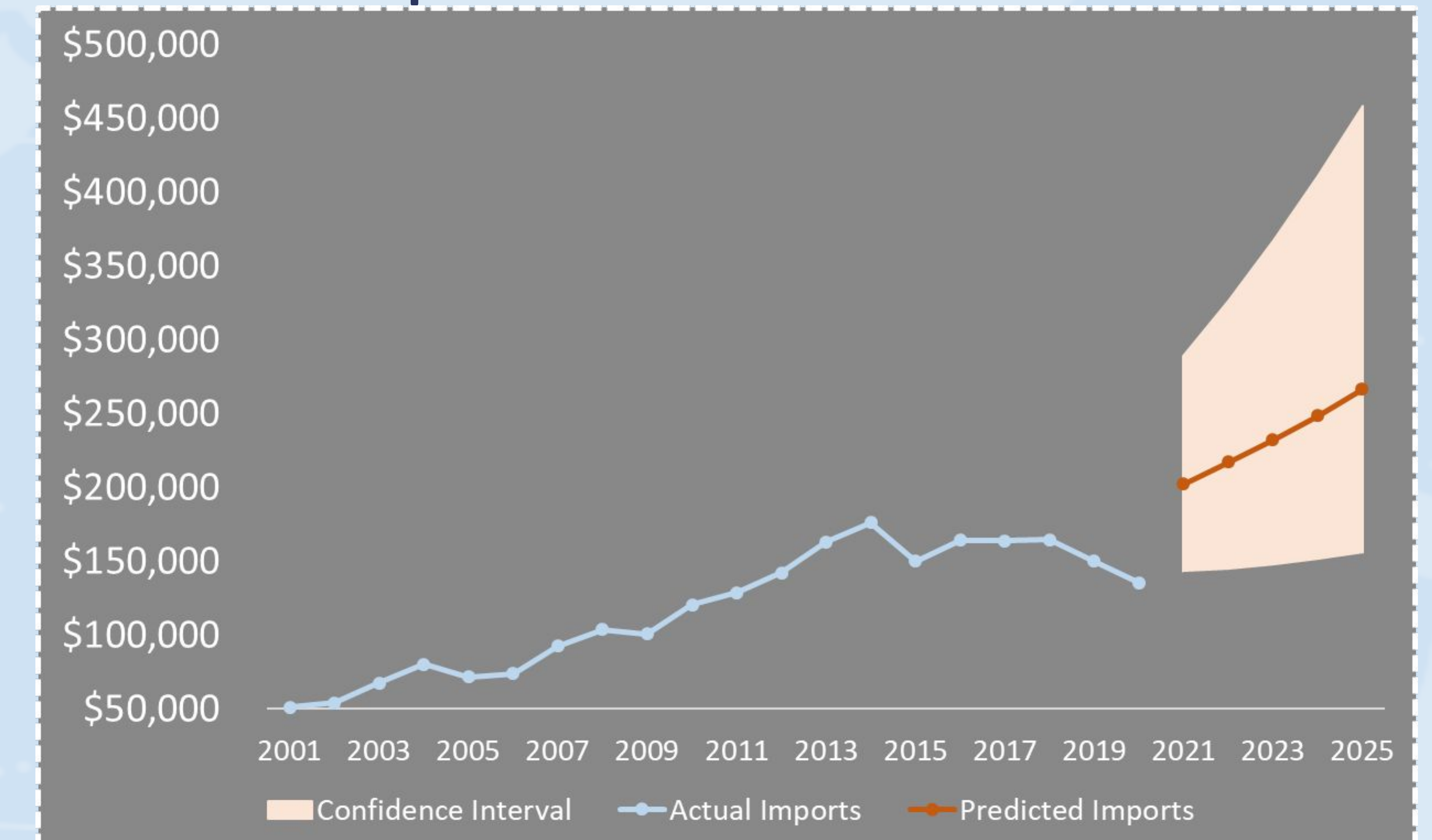
This approach has the following limitations:

- The database has too many zero values.
- We decided leave out of the training the pandemic years since with this years the output and performance were poor.
- We had at most 20 data points per product/country

Results

The app is located on: <http://procolombia.us-east-2.elasticbeanstalk.com/>
The output of the models provide procolombia, companies and the industry with an upper and a lower bound forecast for the imports, this is due to the confidence interval. With this information the industry will know a range of production in which they can maximize the profits. Notice that above the upper bound, the offer is higher than the demand and as a consequence the price will drop, which implies a lost in the sells.

Import Amount Forecasts



Country	Product Chain	Sector	Subsector
China	Metalworking and other industries	Auto parts	Other Auto Parts

The imports forecast help the Colombian sellers to decide production and sales strategy. Also to reduce resources on research the market behavior by the entity.