

Case for a **Leading Agro-holding**

# 80-90% Sales Forecasting Accuracy for a Leading Agro Producer\_

Machine Learning-based sales forecasting solution to optimize production planning, warehouse management and logistics

Industry: Agriculture

Location: Ukraine

Employees: 26,000+



## About the Client

Our client is one of the largest agricultural holdings in Ukraine and one of the leading poultry producers in Europe. The company owns top food brands with a focus on food quality and advanced manufacturing technologies.

## Executive Summary



### Goals

Our client aimed to improve production planning and stock management based on accurate prediction of sales volumes for each customer.



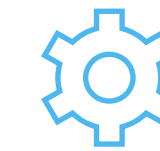
### Solution

Infopulse data engineers developed a Machine Learning-based sales forecasting solution with an average accuracy of 80-90% for weekly and monthly forecasts.



### Benefits

Optimizes production planning, improves warehouse stocks, space management, and logistics, and significantly accelerates time for sales forecasts from days to a few minutes.



### Services delivered

Innovation Services, Intelligent Business, Intelligent Automation, Smart Insights, AI/ML services, Predictive Analytics, BI & Data Analytics, and Advanced Analytics.

# Business Challenge

Our client, a large agriculture company, successfully collaborates with Infopulse on a number of projects within their digital transformation strategy. The solutions developed together with Infopulse help the company automate and streamline a variety of business processes.

Taking into account an extensive experience of Infopulse in developing prediction models for sales, our expertise in [business intelligence](#), and a portfolio of solutions designed specifically for the agriculture industry, the

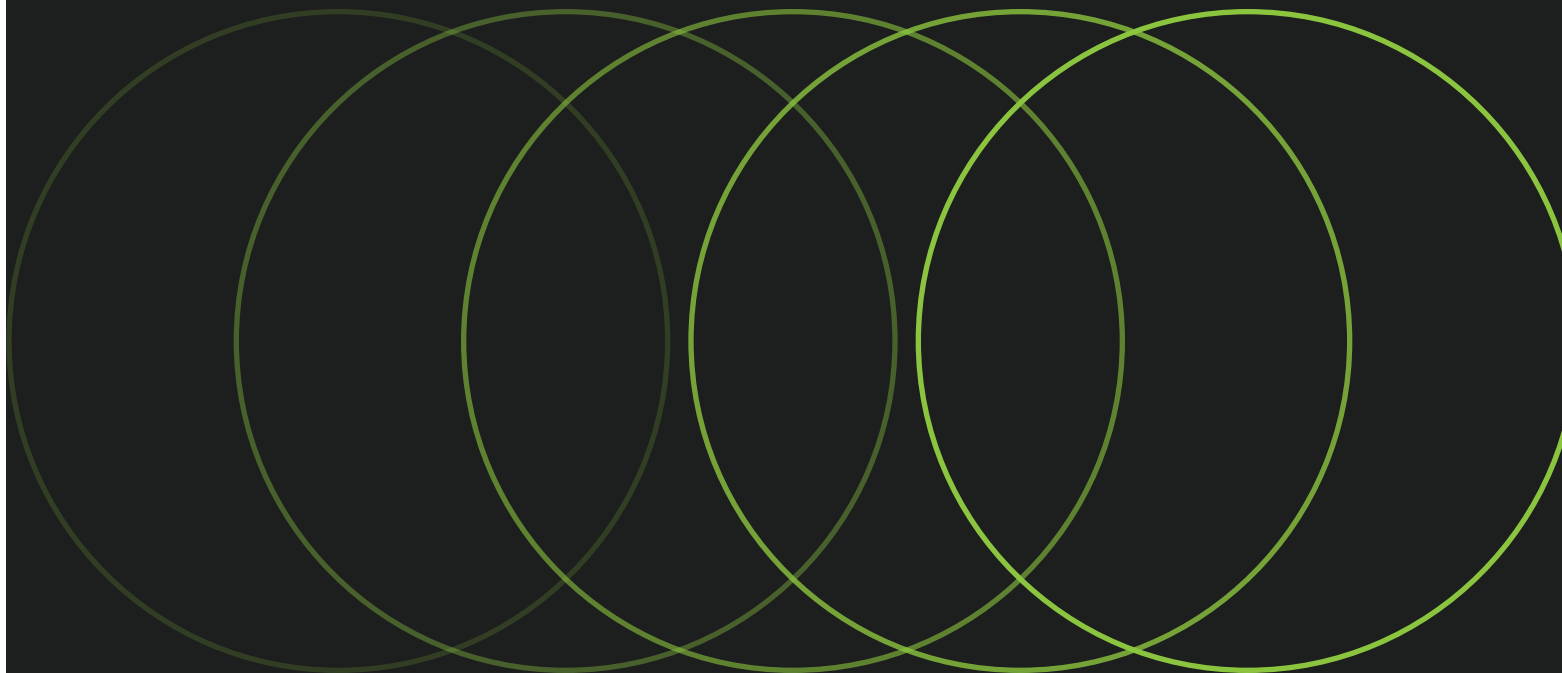
client selected our team for their next project – **a Machine Learning-based sales forecasting solution** that would help our client to:

- Predict the sales volumes for the company customers with the maximum possible accuracy
- Improve the logistics operating quality
- Optimize the production planning by regions
- Improve the stock management

One of our client's key goals was to ensure the maximum possible accuracy of sales forecasting, which would be critical for effective planning and business processes optimization.

# Solution & Business Value

Infopulse data engineers developed **a sales forecasting solution** based on the Prophet model for weekly predictions and the XGBoost for monthly predictions.



## The ML-based sales forecasting models implemented by Infopulse introduced a multitude of benefits for our client:

- **Better sales planning:** high sales forecast accuracy helps avoid over- or underproduction and minimizes stockout risks.
- **Streamlining production and sales processes:** accurate sales predictions help optimize the required production volumes and simplify logistics.
- **Optimized warehouse stocks and space:** minimized remainders, waste, and storage.
- **Improving the level of service** (if not out-of-stock): ensuring the delivery of required product volumes to customers on time.
- **More efficient use of capital and higher profits:** as the production is fully coordinated with accurate sales predictions, the resource waste is minimized.
- **Faster forecasts:** compared with manual sales forecasting, our solution reduced the time for obtaining a sales forecast from a few days to a few minutes.
- **Better accuracy of predictions** due to automated data processing, choosing a more precise model. The prediction accuracy also improves with each new dataset processed by our models.

## The quality of weekly and monthly sales predictions

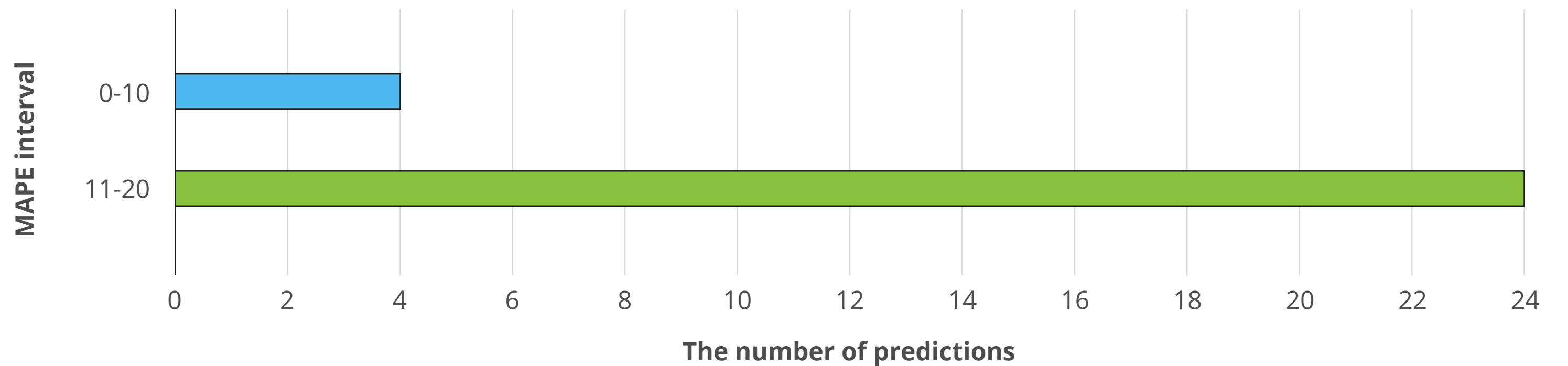
## Technical Details

Infopulse data scientists began the development of the sales forecasting solution with an in-depth analysis of the data set received from the client. We selected a standard but effective technology approach, using Python and Jupyter Notebook for prediction model development. To save development time and re-ensure the results, we also used Azure ML to train our models with AutoML.

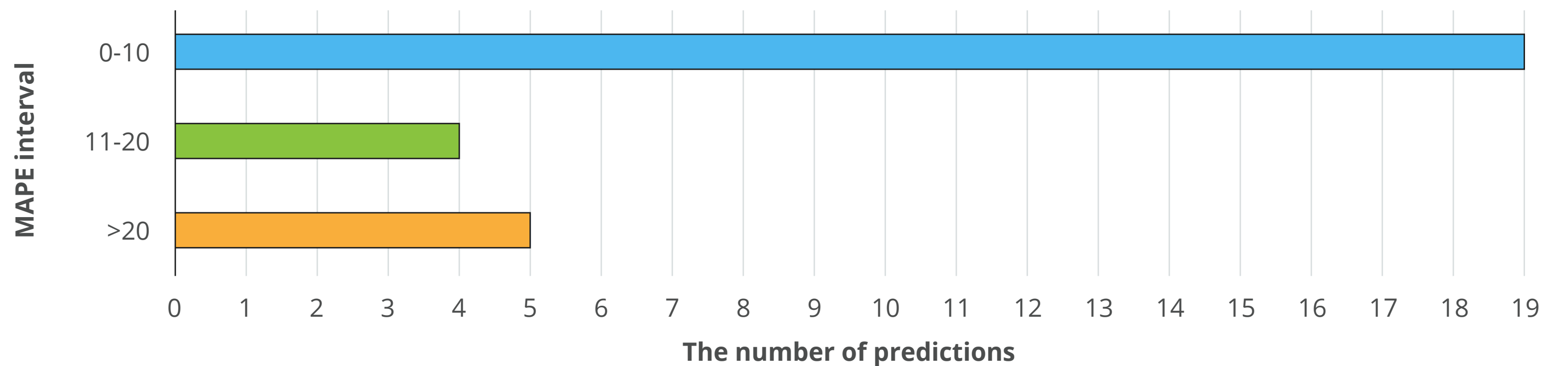
Upon analyzing the obtained results, the team selected the best-performing models, built the analytical reports, and presented results using Microsoft Power BI:

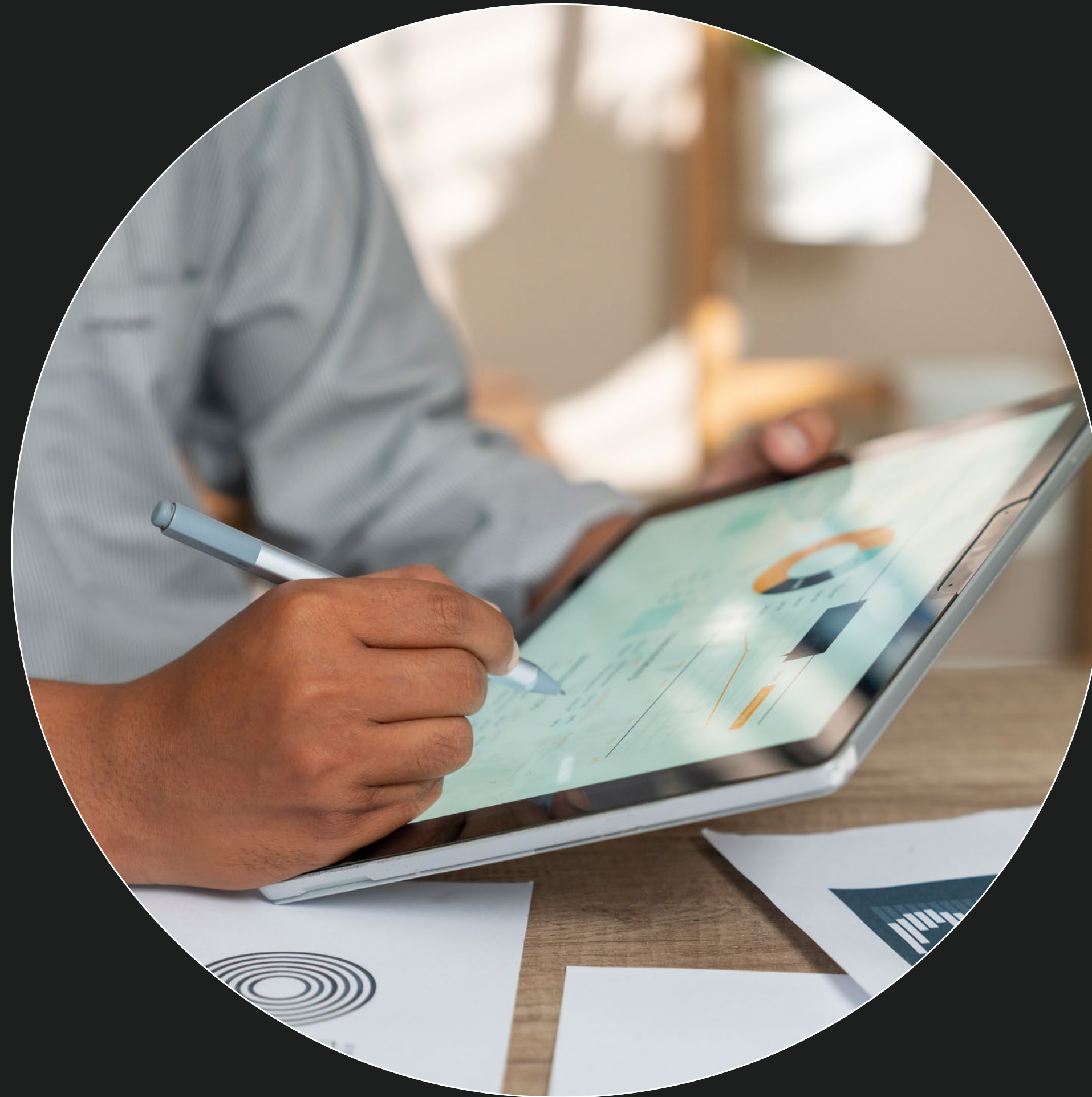
- Based on the model training results, the Infopulse data scientists chose the Prophet model for weekly forecasting. 4 of 28 predicted cases showed up to a **90%** accuracy, while the remaining 24 cases had **80-89%** accuracy.
- As for the monthly forecasting, the best model is XGBoost, producing up to **90%** accuracy for 19 of 28 predicted cases, while 4 cases had **80-89%** accuracy, and the rest 5 had an accuracy of less than **80%**.

### Distribution of weekly forecasts by the quality ("client-SKU")



### Distribution of monthly predictions by the quality ("client-SKU")



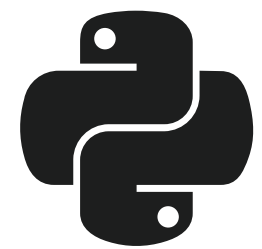


Thus, the Infopulse team developed **ML-based sales forecasting models** that provide the following:

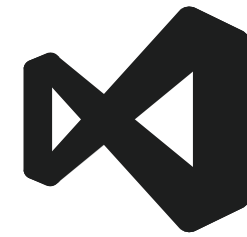
- Over 80% accuracy of sales forecasts
- Ability to make forecasts for two months ahead
- Ability to create weekly and monthly predictions for every product in a specific retail chain.

The project took three months to implement. Together with the client, we decided to move in short sprints to ensure the transparency of our progress. We also wanted to provide our client with the ability to evaluate the results on the go and make decisions regarding further development and improvements.

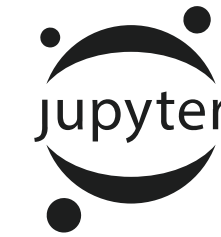
# Technologies & Tools



Python



VS Code



Jupyter



Power BI



Azure ML



LightGBM

*XGBoost* XGBoost and others



## About Infopulse

Infopulse, part of the leading Nordic digital services company TietoEVRY, is an international vendor of services in the areas of Software R&D, Application Management, Cloud & IT Operations, Cybersecurity, and Business Intelligence solutions to SMEs and Fortune 100 companies across the globe.

Infopulse provides intelligent solutions to automate anomaly detection, inspection management, customer support, inventory price and sales forecasting for manufacturing, construction, logistics, agriculture, retail, travel & tourism, professional services, and other industries.

Infopulse is trusted by many established brands, such as Allianz Bank, BICS, Bosch, Credit Agricole, Delta Wilmar, ING Bank, LMT, Microsoft, Metinvest, Offshore Norge, OLX, OTP Bank, Santander, SAP, UkrSibbank BNP Paribas Group, Vodafone, Zeppelin, and others.

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