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CREATING ABUNDANCE

**Case Study**
Industry: Dairy Product Distribution

# Custom AI Model
## for Precision Forecasting

## Quick Stats

**Project Build**
Custom AI-Based Order Forecasting Solution

**Technology Stack**
Python, XGBoost, Pandas, Databricks, Power BI

**Verticals Served**
AI | Data | Cloud

**Fixed or Ongoing Project**
Ongoing Project

**Forecasting Window**
One to Two Weeks

## Background

A leader in the dairy distribution industry, this partner delivers high-quality perishable goods across multiple delivery cycles. Their operations focus on balancing supply and demand to minimize order waste and stockouts, adapting to seasonal trends and promotional impacts, and leveraging automation and data-driven insights to streamline forecasting and planning.

With a scalable model that enables growth without increasing manual effort, they continue to accurately predict order counts, reduce costs, and maintain a strong commitment to customer trust and satisfaction.

## Key Results

**Saved 18+ Hours Weekly**
Time saved on manual forecasting frees team members to contribute to other areas.

**Reduced Missed Sales to Under 2%**
Reduced stockouts from 10–12% to under 2%, boosting sales and improving customer satisfaction.

**Improved Forecast Accuracy**
Trained AI model supports precise demand planning on customer, product, and order levels.

## The Challenge

Our dairy distribution partner struggled with accurately estimating customer-level product orders across multiple delivery cycles. This led to costly overstock and understock situations, a reactive approach to inventory management, and negative customer satisfaction. We worked closely with them to design a custom AI forecasting solution, consolidating historical data, engineering market-specific features, and building an automated, scalable system to improve accuracy, reduce waste, and recover lost revenue without adding headcount.

**They faced the following challenges:**

- Manual forecasting consuming over 20 hours per week
- Frequent overstock causing spoilage and increased costs
- Missed sales opportunities due to 10–12% stockout rates
- Inconsistent forecasts across customer–product combinations
- Limited ability to scale without additional staff

## The Process & Solution

We designed and deployed a customized AI forecasting engine tailored to the dairy distribution industry. Starting with a deep analysis of their historical data and buying patterns, we engineered market-specific features, built and deployed the model, and implemented a KPI dashboard with end-to-end technical documentation. The result is an accurate, scalable system delivering customer-, product-, and order-level forecasts that cut waste, recover revenue, and reduce manual effort.

**Key Steps**

- Consolidated and cleaned historical order data from multiple sources
- Engineered features for seasonality, lagged demand, and promotional impacts
- Built phased models, starting with ARMA for baseline accuracy
- Deployed a unified XGBoost model optimized for precision and scalability
- Automated a weekly retraining pipeline for ongoing accuracy
- Delivered KPI dashboards via Power BI for real-time decision-making

## The Results & Impact

### Improved Forecast Accuracy

Achieved a forecast accuracy of 23% MAPE, enabling precise, customer-specific demand planning that minimizes waste and ensures product availability across all delivery cycles.

### Reduced Stockout Rates

Lowered stockout rates from 10–12% to under 2%, ensuring consistent supply for customers and improving trust in delivery reliability.

### Gained Operational Efficiency

Reduced manual forecasting time from over 20 hours per week to under 2, freeing teams to focus on higher-value operational and strategic priorities.

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