CASE STUDY

STRATEGIC AI/ML FORECASTING AND INVENTORY RECOMMENDATIONS

Yielded +$10 MM in potential revenue growth for a major beverage company

CUSTOMER CONTEXT

A major global beverage manufacturer with a market cap of ~$270 billion struggled to accurately develop future demand scenarios and maintain optimal inventory levels during marketing campaigns. This hindered the company's ability to fully realize the return on investment from its marketing efforts. This was due to a lack of data visibility between the company, its bottlers, and its eCommerce partner. This resulted in recurrent overstocking and out-of-stock situations, further exacerbated by the manual communication of inventory risks and out-of-stock situations between the eCommerce organization and the bottlers.

In addition, the client struggled to forecast demand effectively, leading to wasted resources due to overproduction or underproduction of certain products.

> **The client partnered with Tredence to develop an AI-/ML-powered forecasting engine to reduce out-of-stock occurrences, improve inventory health, and optimize and automate their end-to-end inventory and fulfillment processes.**

OUR SOLUTION APPROACH

We started by analyzing data from the e-commerce customer portals, marketing supply chains, and sales & distribution channels.

This data included information on previous marketing campaigns, past performance, discount coupons, and more. Using this data, we developed four ML-based models that enabled the client to make informed decisions about their future sales strategies, supply plans, and inventory levels.
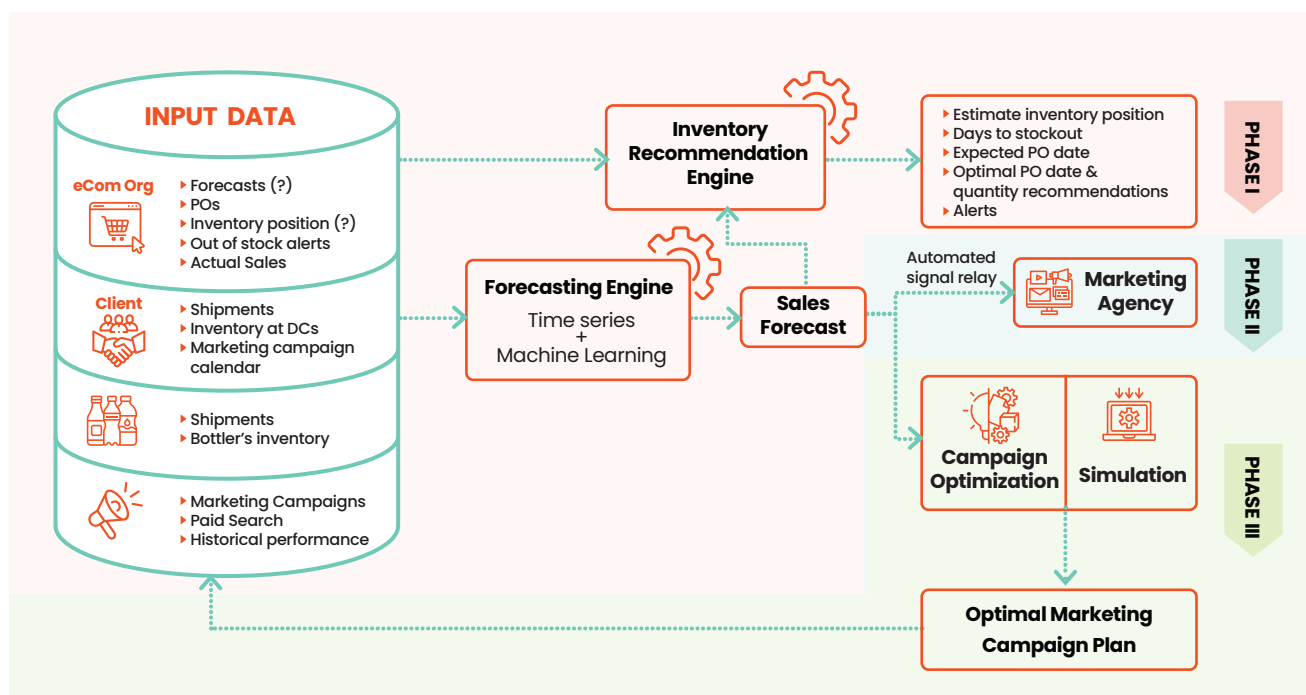

Fig 1: Solution architecture

Our first model focused on predicting sales and purchase orders for the **next 13 weeks,** considering factors like customer behavior, seasonality, and promotional campaigns. This gave our client a glimpse into what their sales might look like in the coming months.

But we didn't stop there. Our second model extended the outlook (sales + PO) to a full **52 weeks,** allowing our client to plan more effectively and make more informed decisions about stock management and sales over a longer period.

Next, we developed a model to forecast the recommended supply plan. By combining predicted sales figures with projected purchase orders, this model helped our client determine how much stock they should keep on hand to meet consumer demand without incurring excess inventory costs due to overstocking.

Finally, our fourth ML model provided an inventory outlook for the next 13 weeks, which enabled our client to better manage their assets over time by ensuring they always have the right amount of SKUs available at any given moment without wasting resources through unnecessary stocking or storage fees.

AI/ML MODELS PROCESS FLOW

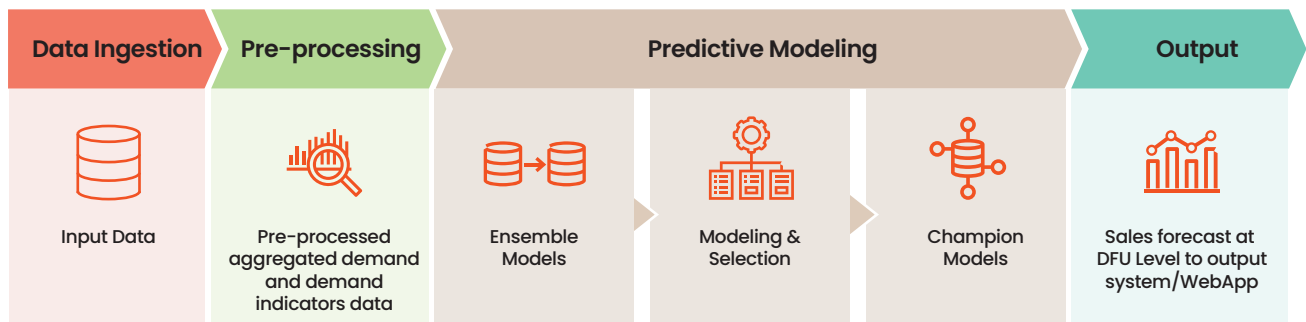| Data Ingestion	Pre-processing	Predictive Modeling			Output
Input Data	Pre-processed aggregated demand and demand indicators data	Ensemble Models	Modeling & Selection	Champion Models	Sales forecast at DFU Level to output system/WebApp

Fig 2: Predictive modeling pipeline

SOLUTION FEATURES

The AI-/ML-powered forecasting and recommendation engine improved the client's inventory position. This platform included several features, such as:

Forecasts for bottlers/warehouse direct

These weekly forecasts helped bottlers plan for additional inventory in case of potential out-of-stock.

Inventory forecasts at the eCommerce company's fulfillment center

These predictions included estimates for the number of days a specific SKU would be out of stock, the arrival date of purchase orders, the optimal date to place a purchase order to avoid out-of-stock, and alerts for the eCommerce company and bottlers.

End-to-end visibility

This feature provided a holistic view of SKU performance on the eCommerce site, including SKU ID, units sold, predicted sales, units in stock, predicted out-of-stock, and inventory recommendations.

SOLUTION DELIVERY

Our AI-based forecasting and inventory recommendation engine helped the client streamline operations and make informed inventory and sales strategy decisions. To ensure we delivered maximum value to the client, we implemented our solution in three phases.
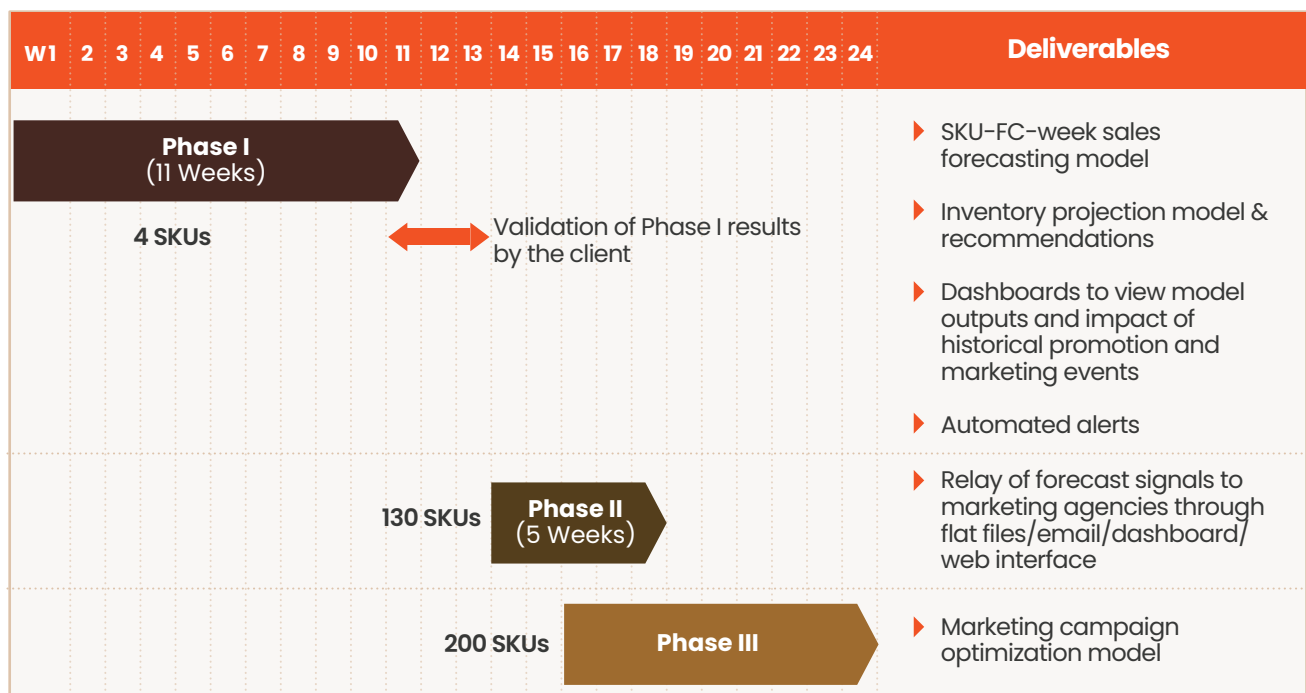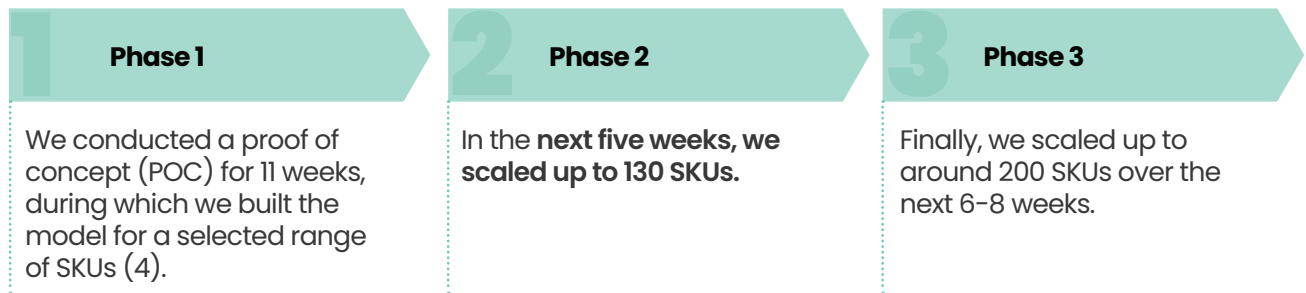
1 Phase 1	2 Phase 2	3 Phase 3
We conducted a proof of concept (POC) for 11 weeks, during which we built the model for a selected range of SKUs (4).	In the **next five weeks, we scaled up to 130 SKUs.**	Finally, we scaled up to around 200 SKUs over the next 6-8 weeks.

W1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	Deliverables
Phase I (11 Weeks) — 4 SKUs — Validation of Phase I results by the client	• SKU-FC-week sales forecasting model • Inventory projection model & recommendations • Dashboards to view model outputs and impact of historical promotion and marketing events • Automated alerts
130 SKUs — **Phase II (5 Weeks)**	• Relay of forecast signals to marketing agencies through flat files/email/dashboard/web interface
200 SKUs — **Phase III**	• Marketing campaign optimization model

Fig 3: Three-phased solution implementation

BUSINESS IMPACT

Our solution had a far-reaching impact on various aspects of the client's business operations, impacting ~450 SKUs across more than 20 popular brands in the US and Canada. In addition, it delivered a rolling forecast every week, including 13-week and 52-week projections for demand and purchase orders.

84%
average demand forecast accuracy for the highest 80% of SKUs

75%
average inventory forecast accuracy for the top 75% volume SKUs

BOTTOM LINE:

The client unlocked new levels of forecasting accuracy and ~ $10MM in additional revenue with Tredence's AI/ML forecasting & inventory recommendations

Our AI-/ML-powered forecasting and inventory recommendation solution was a resounding success for our client.

The solution is able to effectively handle supply constraints and provide an accurate forecast of demand, allowing for more accurate sales projections.

As a result, the client began to use the generated forecasts in their monthly business reviews, resulting in a remarkable ~ 20-25% improvement in forecast accuracy. This had a significant financial impact; it translated into approximately $10 million in additional revenue for the client each year.

Overall, the solution we created allowed the client to anticipate customer demand, manage inventory more efficiently, optimize sales strategies, and streamline operations. It also provided comprehensive analytics reports, giving visibility into customer behavior and buying trends.

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