The X Future

Inventory IQ - Case Study

A Leading D2C/CPG Food Brand Witnessed a 20% Fall In Out-Of-Stock Losses

30%
Reduced Monthly Food Wastage

20%
Reduced Out-Of-Stock Losses

10%
Reduced Monthly Closing Inventory

Case Summary

The X Future worked with a leading ready-to-cook fresh food brand to analyze real-time data that included today's supply transactions, historical sales data, category promotions, price changes, wastage levels, and margins to fine-tune tomorrow's operations. The client used TXF's AI-powered demand sensing and inventory planning software - Inventory IQ, for daily demand predictions and replenishment planning at SKU x Channel x mobile distribution centers levels for their day-to-day operations. The exact predictions were used across their sales, trade promotion, and supply chain teams to align and plan production, inventory, and sales targets from a common base.

This level of granularity also enabled their field sales team to use the forecasts, combined with their on-ground knowledge to accurately decide how much quantity of each SKU should be carried by them daily in their mobile distribution centers to maintain a balance between the freshness of the products while also reducing stock-out losses. Inventory IQ successfully helped them move from pure human judgment-based decisions to AI + human intelligence-led choices.

About The Client

The client is one of the leading producers of ready-to-cook fresh food brands recognized globally. They sell over 100+ SKUs in over 30,000 stores in South Asia, West Asia, and America. With an unwavering commitment toward home food-like freshness, they need to ensure accurate demand predictions, an efficient supply chain, and interdepartmental collaboration to reduce stock-outs and connect top-level plans with bottom-level execution.

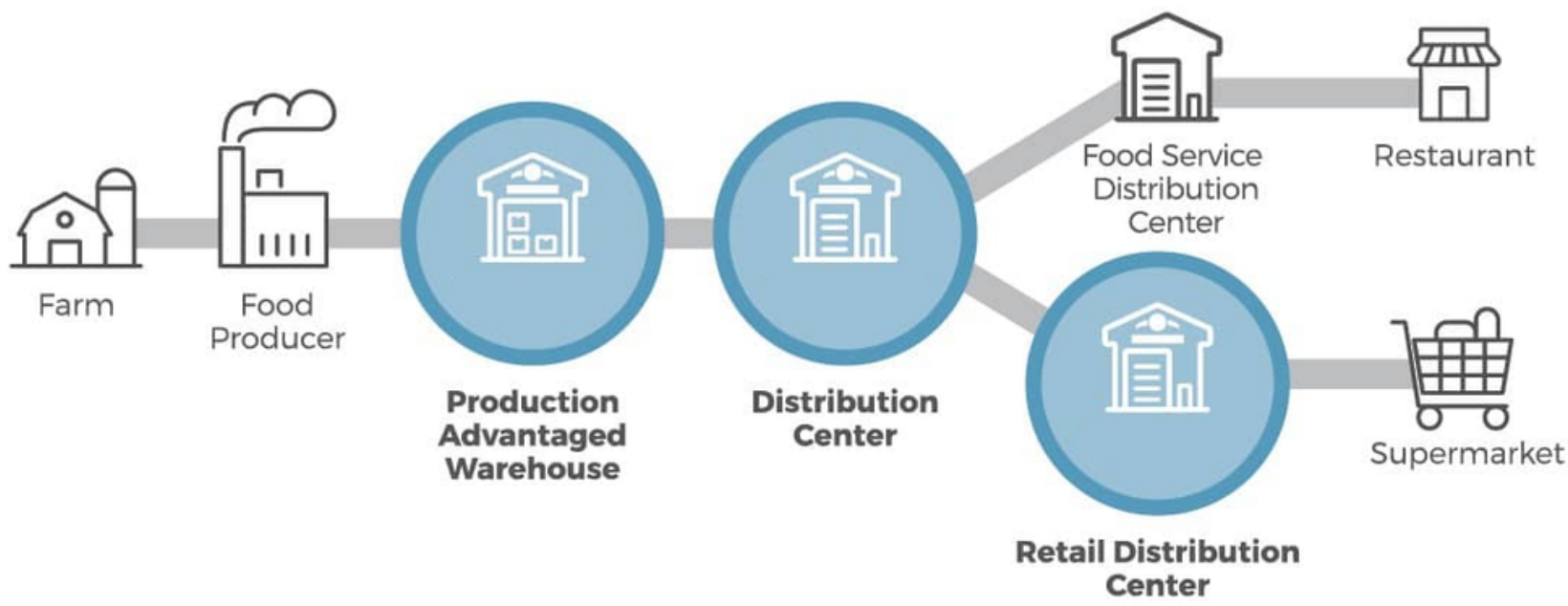

Illustration: A Typical Supply Chain Of The Client

Business Challenges

Lack of automated inventory planning leading to low fill rates

Disconnect between top-level plan with bottom-level execution

Persistent cases of out-of-stock losses and excess inventory wastage

The client primarily sells its products through e-commerce, general stores, modern stores, and restaurants through its mobile distribution center. The client wanted to predict accurate demand for its general trade and restaurant channels. The client follows a vendor-managed inventory system and is obligated to replace unsold inventory that has crossed half its shelf life, which is then sold to restaurants.

- **Lack Of Automated Inventory Planning Leading To Low Fill Rates:** There was a general lack of scientific sophistication in the overall demand prediction approach and the approach to setting overall sales targets. The on-ground sales team was influencing demand predictions and would often face stock-outs as other demand drivers were not considered, resulting in carriers taking lesser inventory in their loadout.

- **Disconnect Between Top-Level Plan With Bottom-Level Execution:** There was a disconnect between the top-level targets and day-to-day replenishment cycles. Manually translating the top-level targets to bottom-level demand predictions often led to weak replenishment plans and overall execution.

- **Out-Of-Stock Losses:** The production, replenishment, and sales teams were working in silos with a minimal view of the actual demand. Manual demand prediction provided an incomplete picture of actual demand which lead to weak replenishment plans and stock-outs for the mobile distribution centers.

- **Excess Inventory:** As a result of the ad hoc way of demand prediction and owing to the VMI model of business, there were a high number of cases of products that had to be taken back by the client from the general store channel once they crossed half of their shelf life, resulting in excess inventory and wastage.

In order to overcome these challenges, the client chose to adopt an AI-based demand sensing and inventory planning system.

The X Future Comes Into The Picture

TXF worked with the client and helped them overcome their challenges with the help of its AI-powered demand sensing and inventory planning system - Inventory IQ. Inventory IQ accurately predicted demand and replenishment plans at the most granular levels, i.e. SKU x Channel x Mobile distribution center level.

- **Demand Sensing:** Inventory IQ's powerful AI engine accurately predicts demand at the SKU x Channel x Mobile distribution center level. This demand prediction model is augmented by incorporating primary level demand drivers from the client like focus brands, promotions, price changes, business goals, targets, and even seasonality; to accurately sense demand at the most granular levels. Moreover, sales teams can utilize their expertise to edit the system-generated numbers to factor in sales intelligence for greater accuracy.

- **Replenishment Planning:** Once accurate demand sensing is done, Inventory IQ then uses its TOC principles to dynamically adjust days on hand to suggest optimal replenishment loadout quantities for every SKU X Channel X Mobile distribution center.

- **Ease Of Setting Monthly targets:** Inventory IQ's accurate demand predictions are made by setting up monthly revenue targets by translating the daily increase/decrease in demand level of each SKU.

- **Collaboration:** The system-generated demand predictions are now being used across sales, trade promotion, and supply chain teams to align and plan production, inventory, and sales targets from a common base and achieve the top-level numbers with bottom-level targets.

Impact Delivered

Enabled AI + human intelligence for real-time demand prediction and increased prediction accuracy by almost 20-30% for 30,000 stores

Reduced food wastage by 30% every month with AI-based demand sensing clubbed with TOC-based supply planning

Enabled 20% reduction in out-of-stock losses and a 10% reduction in closing inventory every month

The X Future successfully implemented an AI-powered demand prediction and replenishment planning system for the client. Inventory IQ's accurate demand predictions increased the client's revenue and reduced their end-of-day closing inventory, thereby ensuring fresher stocks on the shelf. Our approach for operation planning increased prediction accuracy by almost 20-30% for 30,000 stores, enabling up to a 20% reduction in stock-out losses and over 10% reduction in closing inventory, and a 30% reduction in food wastage every month.

About The X Future

We are a team of finance, business and tech evangelist with an experience of working with some of the biggest financial and tech organizations in the world. We have first hand experience of solving the core business challenges with an indept understanding of business logic, coupled with knowledge of latest technology solutions. This enables us to deliver top-notch automation and enterprise performance management solutions that helps our clients make sense of their enterprise data, and drive value across their organization.

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Inventory IQ - Case Study

A Fortune 500 CPG Brand Reduced Its Out-Of-Stock Losses By 20% Per Month

$2M

Increased Revenue Generated Per Month

20%

Reduced Out-Of-Stock Losses

Case Summary

The X Future worked with a Fortune 500 CPG brand to overcome the persistent problem of out-of-stock losses and working capital loss with overstocked inventory by implementing VMI with Inventory IQ - TXF's AI-driven demand and inventory planning software.

Inventory IQ factored in secondary sales data and demand drivers like focus brands, promotions, price changes, business goals, targets, and seasonality to sense demand at the SKU, channel, and distributor level. Inventory IQ then suggested dynamic safety stock norms and optimal inventory levels by factoring in TOC logic and DOH norms at the distributor levels for every SKU.

About The Client

The client is one of the Fortune 500 CPG player, with a wide array of products like daily essentials, cosmetics, toiletries, and food products in its offerings. The supply chain for this brand comprises thousands of small distributors which procure products from the client's warehouses (primary sales) and sell them across various other channels like retailers, E-commerce retailers, modern trade, and general trade directly (secondary sales).

Business Challenges

Stock-outs at distributor levels leading to lower fill rate and loss of revenue

Inaccurate demand predictions by distributors with limited technical proficiency in advanced analytics & technology

Excess inventory buildup due to rigid inventory norms based on fixed min-max rules

The client was simultaneously facing the challenge of stock-outs for some SKUs and the overstocking of other SKUs in their distributor's supply chain. Demand predictions were made by the distributors for their regions as they had a closer view of the market. Nevertheless, the distributors lacked the technology, technical knowledge, and skill to implement sophisticated demand prediction and replenishment planning systems independently.

- **Disconnect between monthly planning and day-to-day operations**: There was a disconnect between monthly planning and day-to-day operations. The distributor's internal processes were not equipped to adapt to the ever-changing demand patterns at the SKU + Channel + Store level, often leading to stock-outs or overstocking.
- **Intuition-based adjustment for Demand Drivers**: Their rule-based demand estimations with intuition-based adjustments for demand drivers and bias from manual adjustment for pricing, and promotions often provided low prediction accuracy, resulting in revenue loss.
- **Heuristics-based rigid Replenishment**: Distributors often used rigid inventory replenishment norms based on min-max rules and conducted replenishment by using historical daily average sales data.

To overcome these challenges, the client wanted to adopt the model of a Vendor Managed Inventory (VMI) to take control of the inventory management decisions from distributors.

The X Future Comes Into The Picture

TXF worked with the client to leverage their secondary sales data to implement VMI by accurately predicting demand at the most granular levels with the help of Inventory IQ. Inventory IQ then suggested dynamic safety stock norms and optimal inventory levels by factoring in TOC logic and DOH norms at the distributor levels for every SKU. Inventory IQ is an AI-powered Demand Sensing and Inventory Planning cloud-based software that can considerably reduce out-of-stock losses and waste, ensuring optimal stocking throughout the supply chain.

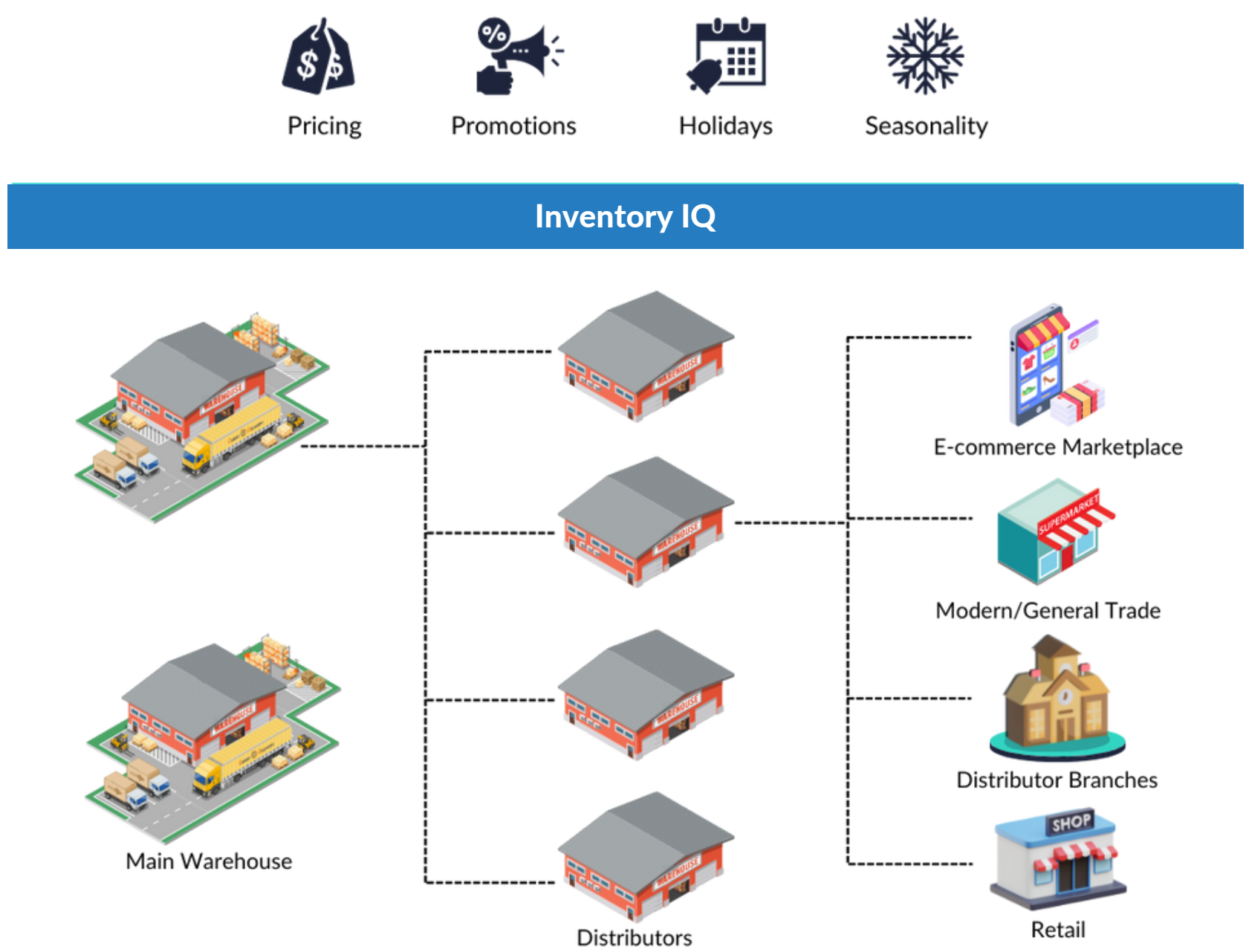

Illustration: Inventory IQ ensures optimal inventory at each node

- **Demand Sensing**: Inventory IQ's powerful AI engine utilizes this secondary data gathered from the client to accurately predict demand at the SKU + Channel + Distributor level for every channel. This demand prediction model is augmented by incorporating primary level demand drivers from the client like focus brands, promotions, price changes, business goals, targets, and even seasonality; to accurately sense demand at the most granular levels.
- **Replenishment Planning**: Once accurate demand sensing is done for each node of the supply chain, Inventory IQ then uses its TOC principles to dynamically adjust safety stock buffers and days on hand to suggest optimal replenishment quantities at the distributor level for every SKU.

- **Reduce Inventory levels for C-Class SKUs**: Inventory IQ maintains adequate service levels by classifying each SKU into ABC classifications. Class A products bring in the most revenue, and >95% of service levels are maintained. For Class B, the service level suggested by the system is between 80%-90%, and for Class C service level is 75%-80%. C-class SKU inventory levels were reduced to free the locked-up working capital through this inventory optimization.

Impact Delivered

The X Future successfully implemented a VMI system for the client, resulting in a reduction in out-of-stock losses and losses through overstocking for every distributor level. When extrapolated to the entire distributor ecosystem, these savings have resulted in substantial revenue boost for the client.

Successfully implemented a Vendor Managed Inventory approach for the client by using secondary sales and dynamic replenishment

Consistently provided an uplift in demand sensing accuracy of at least 30%, at the SKU + Distributor levels

Enabled revenue boost of $2,00,000 for over 50 depots per month by reducing out-of-stock losses by 20%

Inventory IQ also enabled the distributors to run a more sleek operation by reducing their inventory to optimal levels and leveraging their working capital more efficiently.

Moreover, with Inventory IQ, TXF filled a significant gap by purposefully utilizing the secondary level sales data to predict demand and replenishment quantities. It augmented the capabilities of the existing inventory management systems by providing critical insights for more robust inventory requirements at each stage of the supply chain.

About The X Future

We are a team of finance, business and tech evangelist with an experience of working with some of the biggest financial and tech organizations in the world. We have first hand experience of solving the core business challenges with an indept understanding of business logic, coupled with knowledge of latest technology solutions. This enables us to deliver top-notch automation and enterprise performance management solutions that helps our clients make sense of their enterprise data, and drive value across their organization.

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Inventory IQ - Case Study

US Meat Brand Witnessed a 2% Increase In Revenue

2%

Additional Annual Revenue

38%

Reduced Out-Of-Stock Losses

Case Summary

The X Future worked with one of the largest online craft meat brands in the USA. TXF's AI-powered Inventory IQ helped them tackle the challenge of the cycles of out-of-stock losses and excess inventory pile-up-related losses by enabling unconstrained demand sensing and inventory planning. It factored in sales data and other demand drivers like focus SKUs, promotions, price changes, business goals, target margins, and seasonality to sense demand at the SKU, categories, and warehouse while excluding stock-out events data. It then suggested inventory levels and dynamic safety stock norms by factoring in the Theory Of Constraints (TOC) logic at the warehouse levels for every SKU.

About The Client

The client is one the largest brands of craft meat farms, with customers across the USA, offering the best craft beef, truly pasture-raised chicken, heritage pork, and sustainable seafood available anywhere — shipped to the customer's doorstep from the website. Their motto is to provide radical transparency to the consumers of their products about their origin, breed, feed, and quality standards at the ranch.
The client is part of the larger meat industry of the USA, which is projected to grow from $172.94 billion in 2021 to $215.76 billion by 2028, exhibiting a CAGR of 3.21% in the forecast period, 2021-2028.

Business Challenges

Low inventory availability leading to out-of-stocks

Volatility in inventory holding levels

- **Overall impact on revenues from operational complexities**: The client was simultaneously facing the challenge of stock-outs for some SKUs and overstocking for other SKUs in their supply chain. The demand prediction process was manually intensive and heuristics in procurement decision outcomes. This led to overall suboptimal planning across the portfolio of SKUs.

- **Constrained Demand Prediction leading to Demand Cannibalization on similar SKUs and inventory stock-out**: The existing demand prediction process was purely backward-looking in informing future planning. This meant that even historical sales points constrained by low inventory availability were considered true demand, while in reality, the demand for those points could likely have been higher. The resultant demand forecast, when used in planning, led to more stock-outs. One additional effect observed as a result of stock-outs on some popular SKUs was that similar SKUs experienced an inorganic spike in demand, leading to even more unreliable demand behaviors.

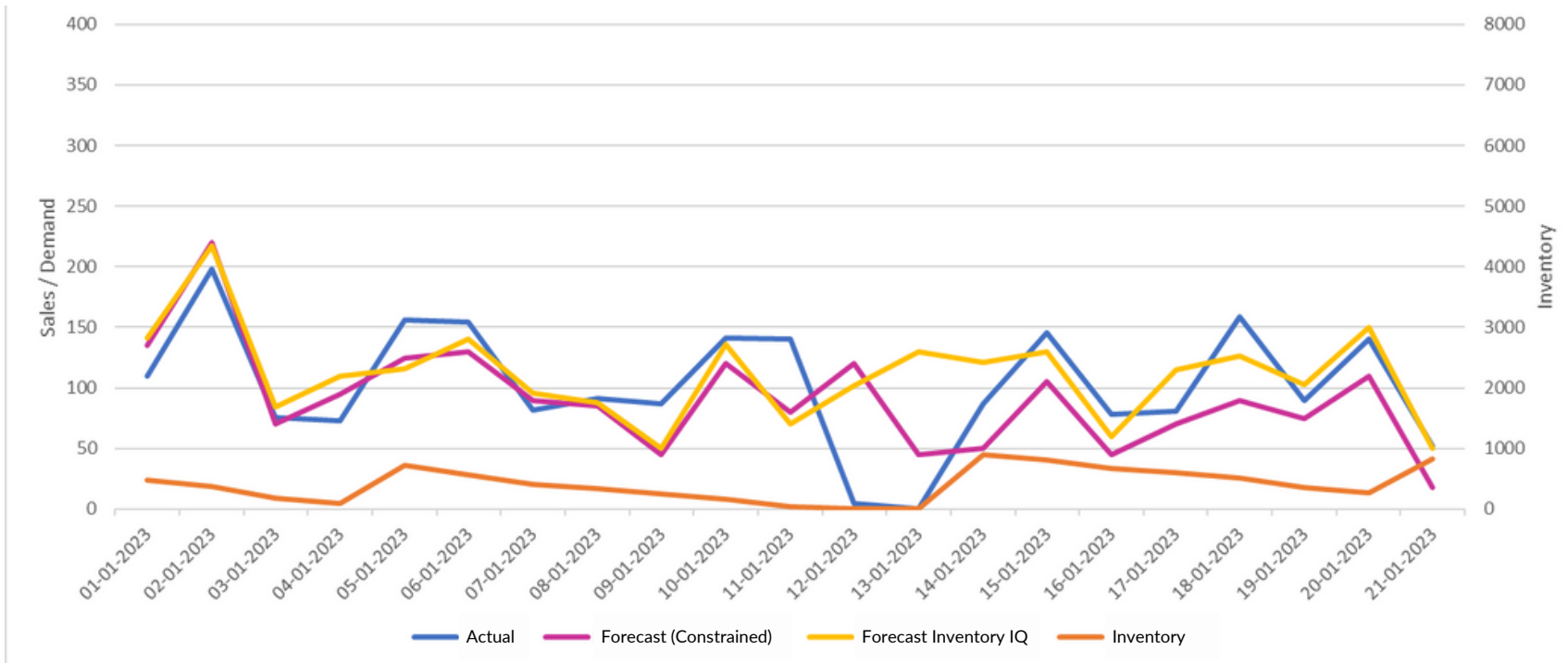
- **Volatility in inventory holding levels leading to a reactive supply chain**: Periods where demand was higher than sales, would lead to acute stock shortage, resulting in over-ordering from suppliers followed by an extended period of stockpiling. This cycle would repeat across the SKU portfolio, leading to high variabilities in supply planning, transportation planning, and cold storage planning.

The X Future Comes Into The Picture

TXF started to work with the client in July 2022 to accurately predict demand at the most granular levels by implementing their tool - Inventory IQ. Inventory IQ is an AI-powered Demand Sensing and Inventory Planning cloud-based software that can considerably reduce out-of-stock losses and waste, ensuring optimal stocking throughout the supply chain.

- **Unconstrained Demand Sensing:** Inventory IQ's powerful AI engine utilizes sales data gathered from the client to accurately predict demand at the SKU + Channel + Warehouse level for every channel. Inventory IQ detects low-inventory affected sale points and excludes them from learning to predict true unconstrained demand. This demand prediction model is augmented by incorporating primary level demand drivers from the client, like focus brands, promotions, price changes, business goals, targets, and even seasonality, to sense demand at the most granular levels accurately.

To explain this with the help of a graphical representation:



The graph represents the sales and inventory levels of a hypothetical product over 20 days, with line graphs representing Actual Sales (blue), Constrained Forecast (purple), Inventory IQ Demand Forecast (yellow), and Inventory Levels (orange). In the days leading to the 11th of January, both the constrained demand prediction and the Inventory IQ unconstrained demand prediction follow the actual demand very closely. On the 11th, there is a spike in demand that leads to much higher sales numbers than forecasted by either model. This event resulted in stock-outs and a sharp drop in actual sales on the 12th. This is where Inventory IQ's unconstrained demand prediction came into play. Inventory IQ analyzed the sales and the inventory data and found out that the low sales was not an independent event but was caused by stock-outs. It then penalized learning from this event in its demand prediction. Therefore, the unconstrained demand prediction remains close to the actual demand. In contrast, the constrained demand veers off by under-forecasting demand and constraining future inventory planning, which became even worse with each event of low inventory triggered.

- **Replenishment Planning**: Once accurate demand sensing is done for each node of the supply chain, Inventory IQ then uses its TOC principles to adjust safety stock buffers dynamically to account for additional variability in market demand and days on hand to suggest optimal replenishment quantities at the warehouse level for every SKU.

- **Reduce Inventory levels for C-Class SKUs**: Inventory IQ maintains adequate service levels by classifying each SKU into ABC classifications. Class A products generate the most revenue, and >95% of service levels are held. For Class B, the service level suggested by the system is between 80%-90%, and for Class C service level is 75%-80%. C-class SKU inventory levels were reduced to free the locked-up working capital through this inventory optimization.

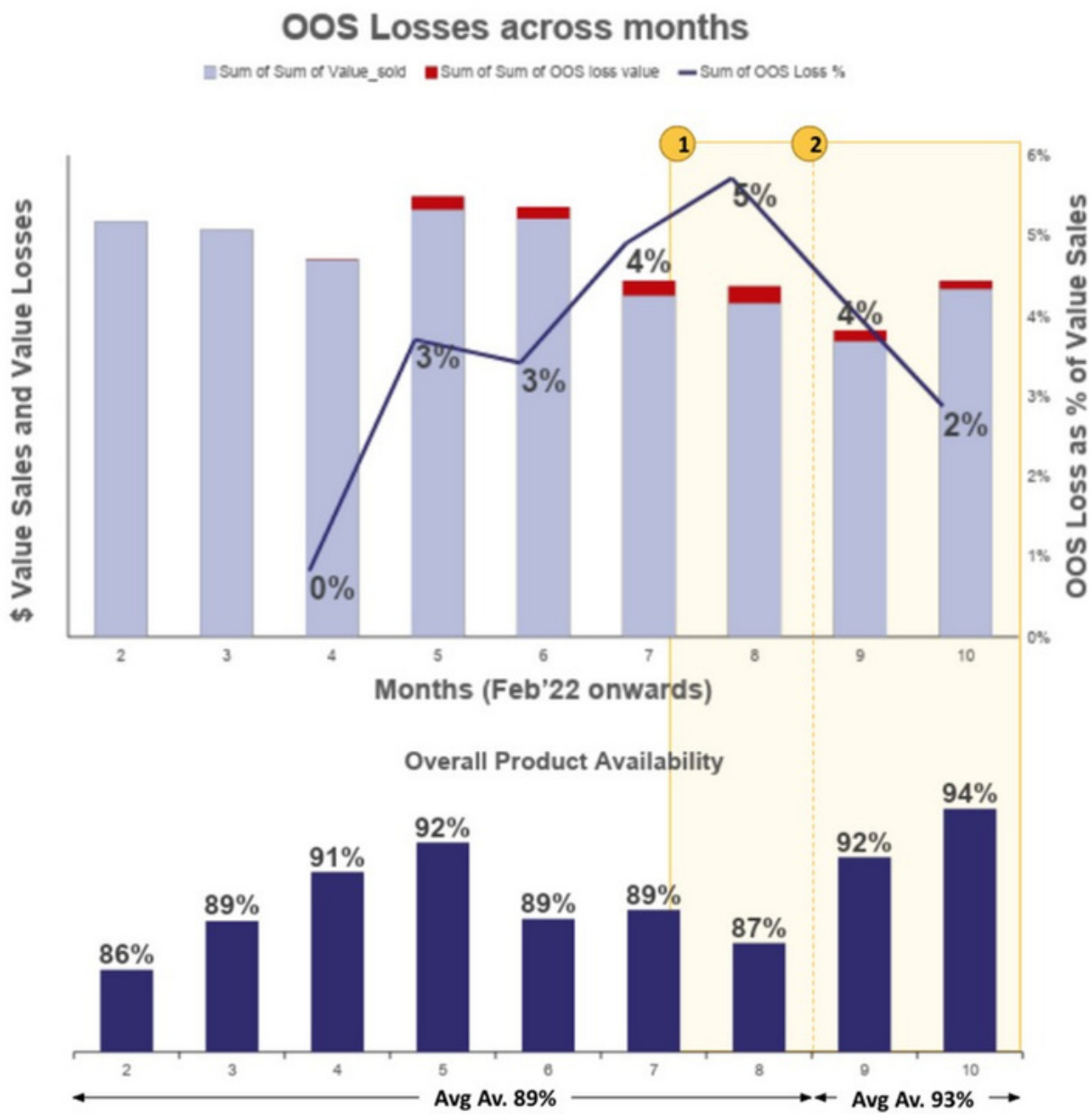
Impact Delivered

Availability-based unconstrained demand prediction reduced out-of- stock losses by 38% post-implementation of Inventory IQ

Enabled additional annualized revenue of 2% from out-of-stock losses

Increased availability rates from 89% to 93%

With an increased level of demand, Inventory IQ suggested higher stock planning, resulting in lower stock-out losses leading to an increase in revenues. The engagement showed results within two months, increasing the average availability rates from 89% pre-Inventory IQ implementation to 93% post-Inventory IQ implementation, simultaneously reducing out-of-stock losses from 5% to 2% during the same period.



When annualized, additional revenues due to out-of-stock loss savings result in 2% in additional revenues post-Inventory IQ implementation period.

	Pre consumption	Post consumption	Normalized* Post consumption
OOS Loss Value **(Avg./M)**	$ 132,904	$78,936	$82,604
OOS Loss Reduction in Post consumption period (Avg./M)			**$50,299** **-37.9%**
Additional Revenue due to OOS Loss savings as % of Sales in Post Kronoscope Period			**+ 2%**

Annualized Additional revenue of $603.6K at current trajectory of OOS loss savings

***Normalization for Sales**: Sales reduction in Post Inventory IQ period factored into the OOS loss savings to enable comparison between Pre/Post periods Sales reduction adjustment to OS Losses: **4.6%**

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