EY Inventory Optimization

Automating decision-making for inventory management using machine learning, simulation and optimization

Retail clients struggle to find the balance between demand and supply at the store and product level

Clients are finding it difficult to:

▸ Reduce redundant inventory while timely meeting customer demands
▸ Deploy an automated predictive analytics system
▸ Rapidly change assumptions according to business needs
▸ Gain visibility into forecast variances and key indicators
▸ Make faster, informed business decisions

EY Inventory Optimization solution can help you:

Improve customer experience with the right inventory

▸ Incorporate customer-specific demand forecasting with predictions at the location and product level
▸ Capitalize on previously unmet customer demands and untapped sales, and improve customer satisfaction by maintaining sufficient supply

Order the right amount of inventory at the right time

▸ Utilize best-fit machine learning models to increase forecasting accuracy and holding a more precise inventory
▸ Reduce human bias through automation and incorporating external/internal factors

Simulate inventory strategies before deploying at scale

▸ Prevent supply chain gaps by simulating seasonal demand and ordering variability
▸ Tweak inventory strategy to determine the optimal inventory approach to balance supply and demand

Leverage vast amount of data utilizing Microsoft Azure cloud technology

▸ Quickly analyze and incorporate large volumes of customer and inventory data in machine learning models and augment existing inventory management systems

Integrate with current inventory system

▸ Offer flexibility with solution add-ons and development
▸ Incorporate the best market tools specific to the client

Automating decision-making with distributed machine learning

EY Inventory Optimization builds a trusted data pipeline to standardize, reuse and scale data and models by using predictive data analytics to improve decision-making for inventory optimization. This allows for accurate forecasting, scenario analyses, visualization and incorporation of the following attributes:

▸ Individual customer predictions incorporate customer history, stock keeping unit (SKU) information, and customer/location demographics to better predict demand and optimize target inventory levels through machine learning capabilities.
▸ Forecasting models utilize eight different forecasting techniques to find the best-fit model at the location-SKU level. A blended approach of repeat orders and new orders cuts out unnecessary inventory while maintaining service to customers.
▸ Simulation engine that estimates inventory improvement, prevents unexpected supply chain gaps and performs a driver analysis to optimize ordering.
▸ Scaled computation and storage efficiently distributes artificial intelligence (AI) models and data over multiple clusters. It allows for the calculation of hundreds of thousands of SKUs and locations.

Leveraging data velocity, variety and volume

Features	Functions
Machine learning demand forecasting	▸ Repeat customer demand predictions: Using a machine learning classification model, predict each customer's timing and probability of demand. ▸ New customer demand time series: Find the best-fit model and parameters for every SKU location.
Simulation and scenario planning	▸ Leverages the forecasts, forecast error, demand variability, lead-time variability and evaluates the impact of different replenishment policies on inventory level and customer service to determine the optimal levels of inventory to maintain customer service.
Databricks scaling	▸ Azure Databricks is a critical component of the solution, as computationally intensive models and simulations can be deployed over hundreds of thousands of SKU-location combinations. Python UDFs are used in Spark to run the models and simulations in a distributed manner. ▸ EY teams help clients to materialize a data fabric to support inventory optimization, allowing business teams to innovate and scale solutions more effectively, while keeping user experiences in mind.

Seamless integration built with EY experience and capabilities

The EY Inventory Optimization solution is built upon other foundational and EY capabilities.

▸ Data fabric that utilizes existing data platform investments to support inventory optimization
▸ Supply chain technology integration that capitalizes on existing inventory management systems
▸ Microsoft Azure Databricks enablement that provides a scalable and computationally efficient platform

Microsoft

Customer success story: EY Inventory Optimization in action

A national retail client had an inventory system where multiple customer and store demographics were not being leveraged in inventory optimization. By using EY Inventory Optimization system to predict the need from existing customers and new orders, a significant decrease of capital cost and a great improvement of service level were achieved.

Client challenges

The need for action was driven by the following factors:

▸ The client wanted to have an automated system that could predict the product demand and improve the customer services while minimizing the working capital.

▸ The client had sufficient customer and store demographics, and historical transaction data that could be leveraged.

▸ The client wanted to be able to make business decisions on inventory levels based on the replenishment data.

Client benefits

The client was able to:

▸ Leverage EY Inventory Optimization system to predict up-to-date product demands per store and reduce working capital costs by over US$100m in six months

▸ Maintain the customer service by ordering products with predicted demand in advance

▸ Accurately simulated more than 16 scenarios to determine optimal replenishment strategy before going into production

EY and Microsoft: Your Digital World. Realized.

The digital technologies that are impacting your business today – social, mobile, analytics and cloud – are rapidly expanding to create new employee and customer experiences, fundamentally changing how your organization works, interacts and competes. The EY and Microsoft alliance combines EY deep insights and experience in disruptive industry trends, new business models and evolving processes with Microsoft's scalable, enterprise cloud platform and digital technologies. EY and Microsoft can help accelerate digital transformation with advanced solutions that support enterprise strategy, transform customer and workforce experiences, create new, data-driven business models, build intelligent, automated operations and bring confidence that these innovative solutions are secure, compliant and trusted. Together, we can help accelerate digital strategy and amplify your business performance to thrive in a digital world.

For more information, visit: ey.com/Microsoft.

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