S&OP forecasting analytics

Automotive accessories manufacturer

Streamlined sales forecasting by leveraging advanced forecasting algorithms and automated the S&OP reporting to get better visibility into its supply chain processes

Automotive accessories manufacturer needs a sales forecasting model

Picture this…

You're looking to build an automated sales forecasting model for all active SKUs and setup automated reporting on Power BI to provide visibility into S&OP processes. Currently, due to lack of a sales forecasting model, there is limited visibility into company-level supply chain operations to take timely and corrective actions.

You turn to Accordion.

We partner with your team to streamline sales forecasting by leveraging advanced forecasting algorithms and automate the S&OP reporting to get better visibility into the supply chain processes, including:

1) Developing SKU-Entity level sales forecast at a monthly level using advanced algorithms based on the past 3-years historical data
2) Incorporating models with self learning ability, i.e., to learn from latest sales data and uncover sales patterns and forecast for new SKUs as well
3) Leveraging advanced forecasting models such as FbProphet, ARIMA, SARIMA, Holt's etc. to forecast monthly demand at customer-SKU over next 1 year
4) Establishing automated data extraction pipeline and developing PowerBI dashboard to understand the sales forecast, inventory and performance metrics
5) Analyzing the inventory broken down by WIP, Raw Materials, and Finished Goods by entity, location, product category and SKU along with days of sales, fulfillment metrics to quantify the inventory at hand, Inventory turnover, on time delivery to guide decision making
6) Estimating labor productivity at an entity level and warehouse utilization at the plant-level to aid capacity planning based on the forecasted sales

Your value is enhanced.

- You have achieved an aggregated monthly accuracy of approximately 90% in forecasting unit sales for the next 12 months across a portfolio of ~ 125,000 SKUs and reduced manhours required for baseline forecast generation from 3 weeks to 1 day that enabled swift, dynamic and responsive decision-making
- You have also provided visibility into supply chain processes through an automated Power BI dashboard and helped track and build real time strategy for inventory planning, production planning, and optimizing fulfillment metrics. The integrated forecasts with BOM to optimize procurement process by optimizing raw materials requirements lead to additional cost savings of ~15%

S&OP FORECASTING ANALYTICS

KEY RESULT

- ~90% accuracy in annual forecasting of unit sales across ~125,000 SKUs
- Reduced manhours from 3 weeks to 1 day
- ~15% additional cost saved

VALUE LEVERS PULLED

- Demand forecasting
- S&OP dashboard development

Demand forecasting for automotive accessories manufacturer

S&OP forecasting analytics

Situation

- Client lacked a sales forecasting model and had limited visibility into company-level supply chain operations to take timely and corrective actions
- Partnered with the client to build an automated sales forecasting model for all active SKUs and setup automated reporting on Power BI to provide visibility into S&OP processes

Accordion Value Add

- Developed SKU-Entity level sales forecast at a monthly level using advanced algorithms based on the past 3-years historical data
- Incorporated models with self learning ability, i.e., to learn from latest sales data and uncover sales patterns and forecast for new SKUs as well
- Leveraged advanced forecasting models such as FbProphet, ARIMA, SARIMA, Holt's etc. to forecast monthly demand at customer-SKU over next 1 year
- Established automated data extraction pipeline and developed PowerBI dashboard to understand the sales forecast, inventory and performance metrics
- Analyzed the inventory broken down by WIP, Raw Materials, and Finished Goods by entity, location, product category and SKU along with days of sales, fulfillment metrics to quantify the inventory at hand, Inventory turnover, on time delivery to guide decision making
- Estimated labor productivity at an entity level and warehouse utilization at the plant-level to aid capacity planning based on the forecasted sales

Impact

- Achieved an aggregated monthly accuracy of approximately 90% in forecasting unit sales for the next 12 months across a portfolio of ~ 125,000 SKUs.
- Reduced manhours required for baseline forecast generation from 3 weeks to 1 day and enabled swift, dynamic and responsive decision-making
- Provided visibility into supply chain processes through an automated Power BI dashboard and helped business track and build real time strategy for inventory planning, production planning, and optimizing fulfillment metrics
- Integrated forecasts with BOM to optimize procurement process by optimizing raw materials requirements leading to additional cost savings of ~15%

Methodology/ Approach

Data Understanding & Scope finalization

- Analyzed historical sales data trends
- Outlier identification
- Investigation on similarity of SKUs

Exploratory data analysis

- Highly volatile data
- Availability of limited business context
- Ambiguous SKU Naming

- **Selected Top 25% SKUs by RSD* Data Availability Matrix**

Modelling

Models leveraged:

- ARIMAX
- SARIMAX
- FBProphet
- NeuralProphet
- Holt's
- Holt Winters

Additional regressors

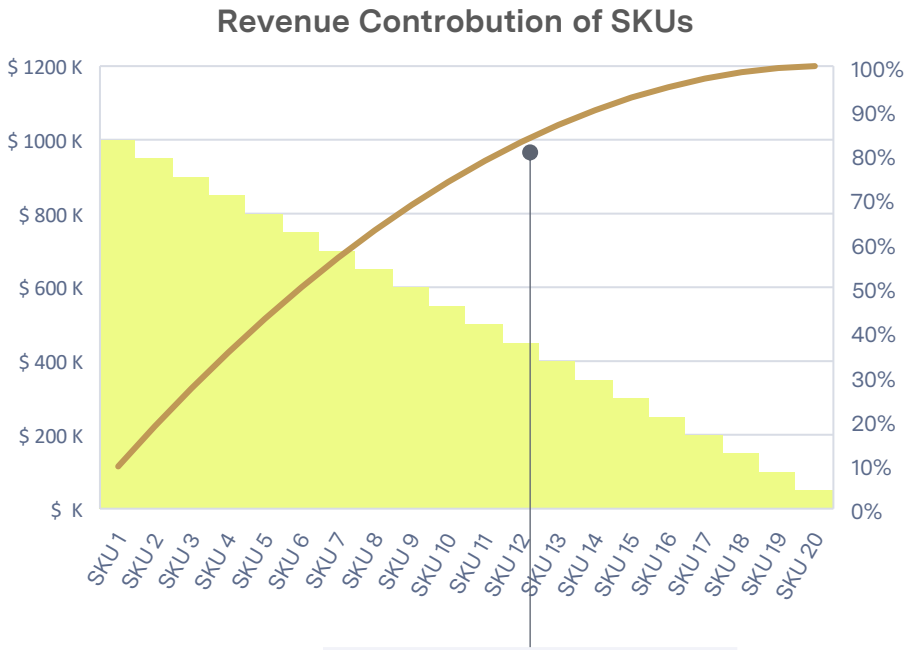
- Artificial Out of stock regressor
- External Business confidence Indicators
- Industry Forecast data

Dashboard

- Provide visibility into S&OP processes with the help of a Power BI dashboard to visualize the monthly sales forecast and track supply chain performance.

RSD - Data availability matrix

80-20 Approach to select SKUs



Selection of major customers/ SKUs for ease and optimal forecasting

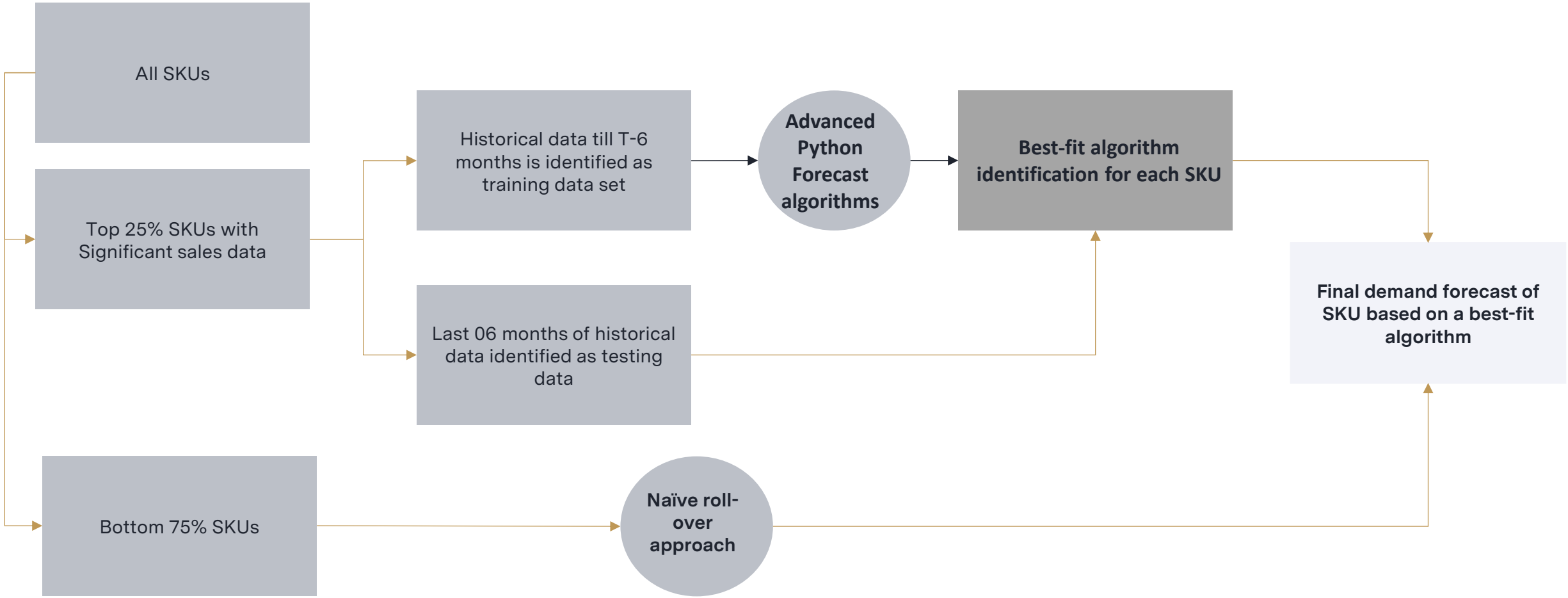
RSD-Data availability matrix

RSD vs Data Availability	>100% RSD	60-100% RSD	<60% RSD
> 24 Months			
12-24 Months			
<12 Months			

Increasing confidence in forecasting

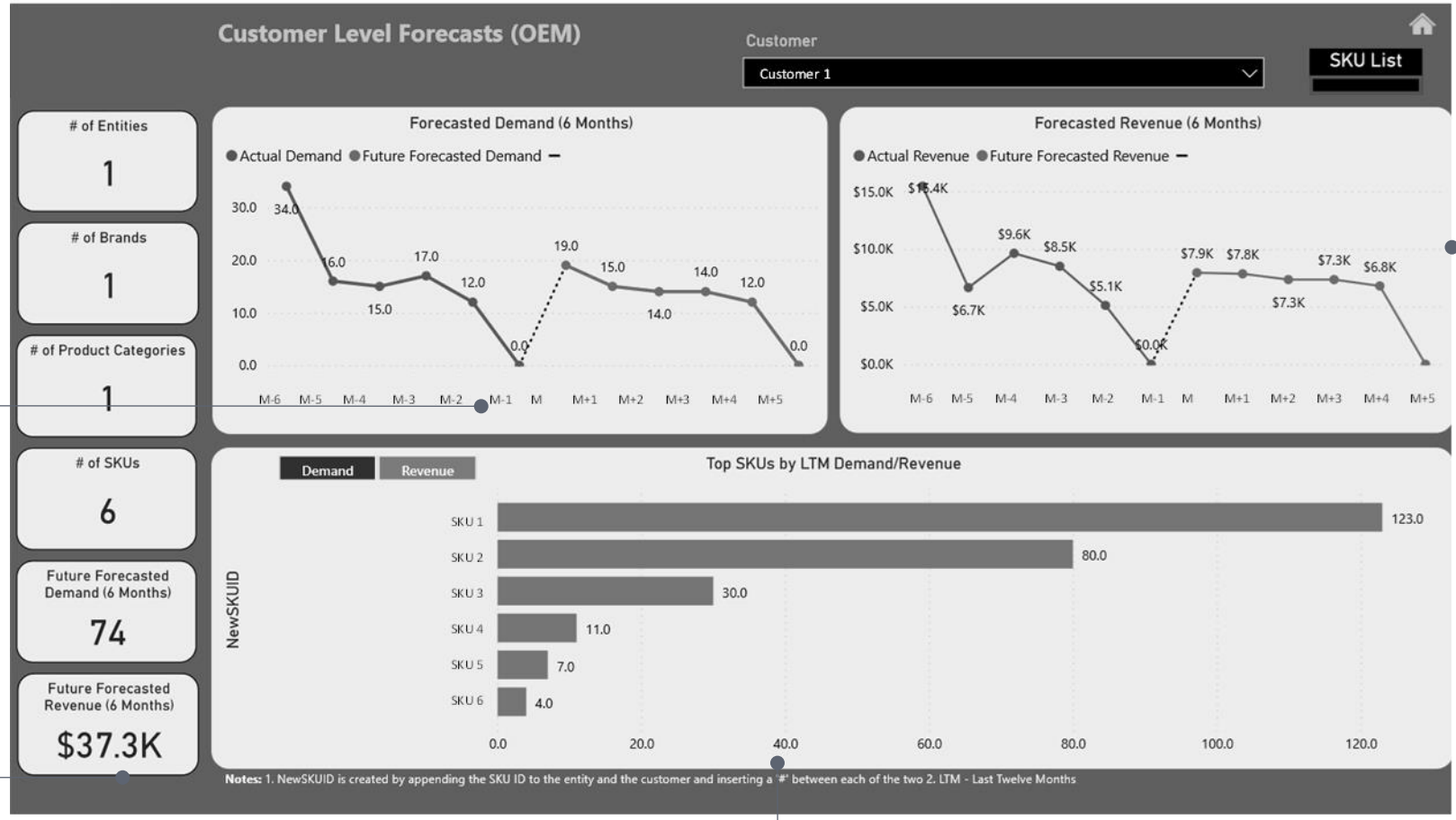
Extremely huge volume of SKUs which require massive computational resources, necessitates prioritizing SKUs based on Revenue contribution and RSD-Data availability Matrix

Methodology



1. Algorithm considered include ARIMA, Holt-Winters –Seasonal, Holt-Winters – Non-seasonal, Simple Exponential Smoothening and FB Prophet, Neural Prophet Best-fit algorithm is identified based on the MAPE of each algorithm

Monthly demand forecast view for next 12 months



Customer/ Entity Level Demand Forecast to provide broader level view

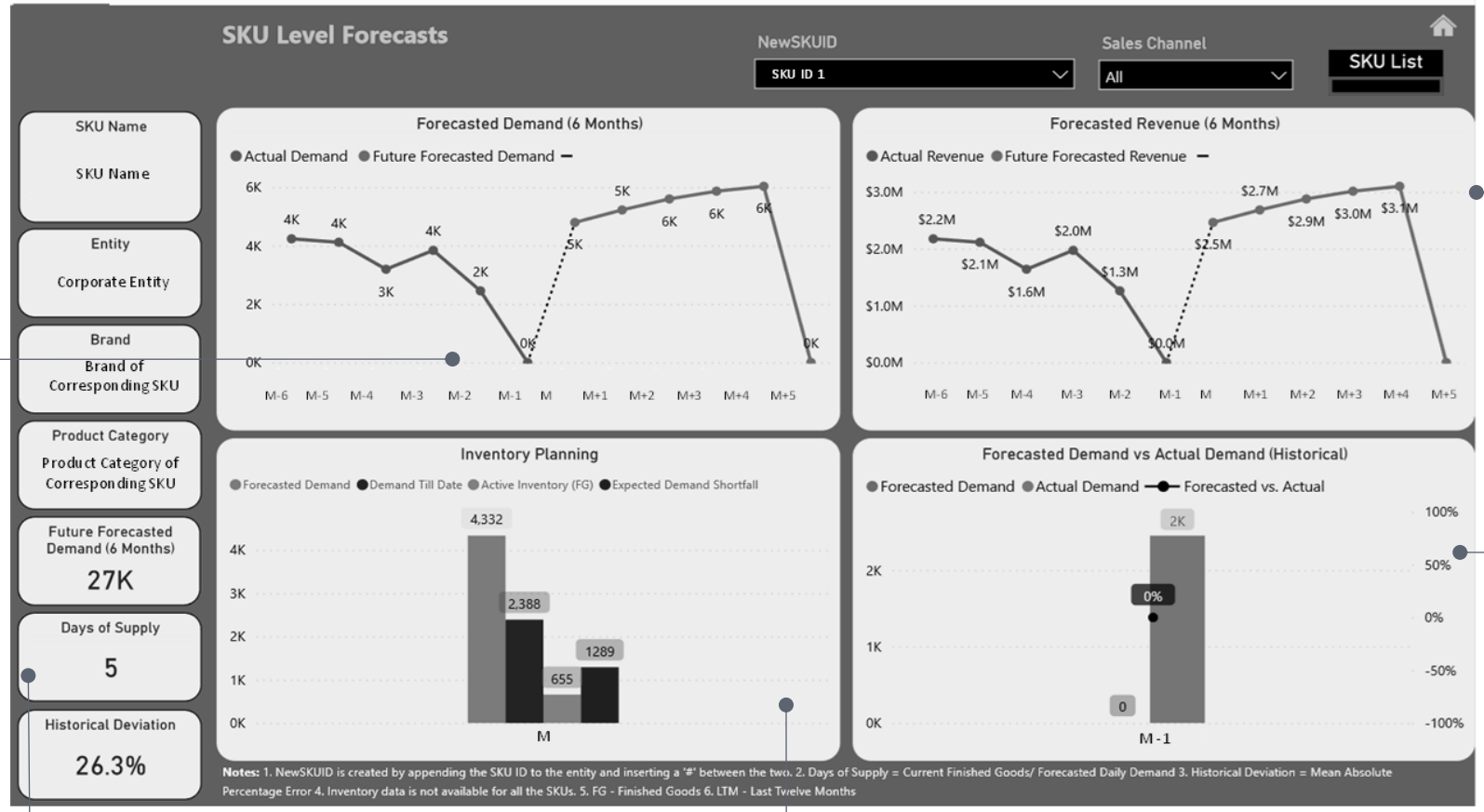
Customer/Entity Characteristics and Summary Metrics provides visibility into key attributes and performance indicators for better decision-making.

Customer/ Entity Level Revenue Forecast in Dollar value to help in strategic planning and financial decision-making, providing insights into expected revenue streams and helping businesses allocate resources effectively.

Identified and optimized the top-performing SKUs for the customer to maximize profitability and customer satisfaction.

Monthly demand forecast at SKU level with inventory details

SKU Level Demand Forecast provides granular sales predictions for individual products, aiding in inventory management and optimization.



SKU Level Revenue Forecast to optimize supply chain

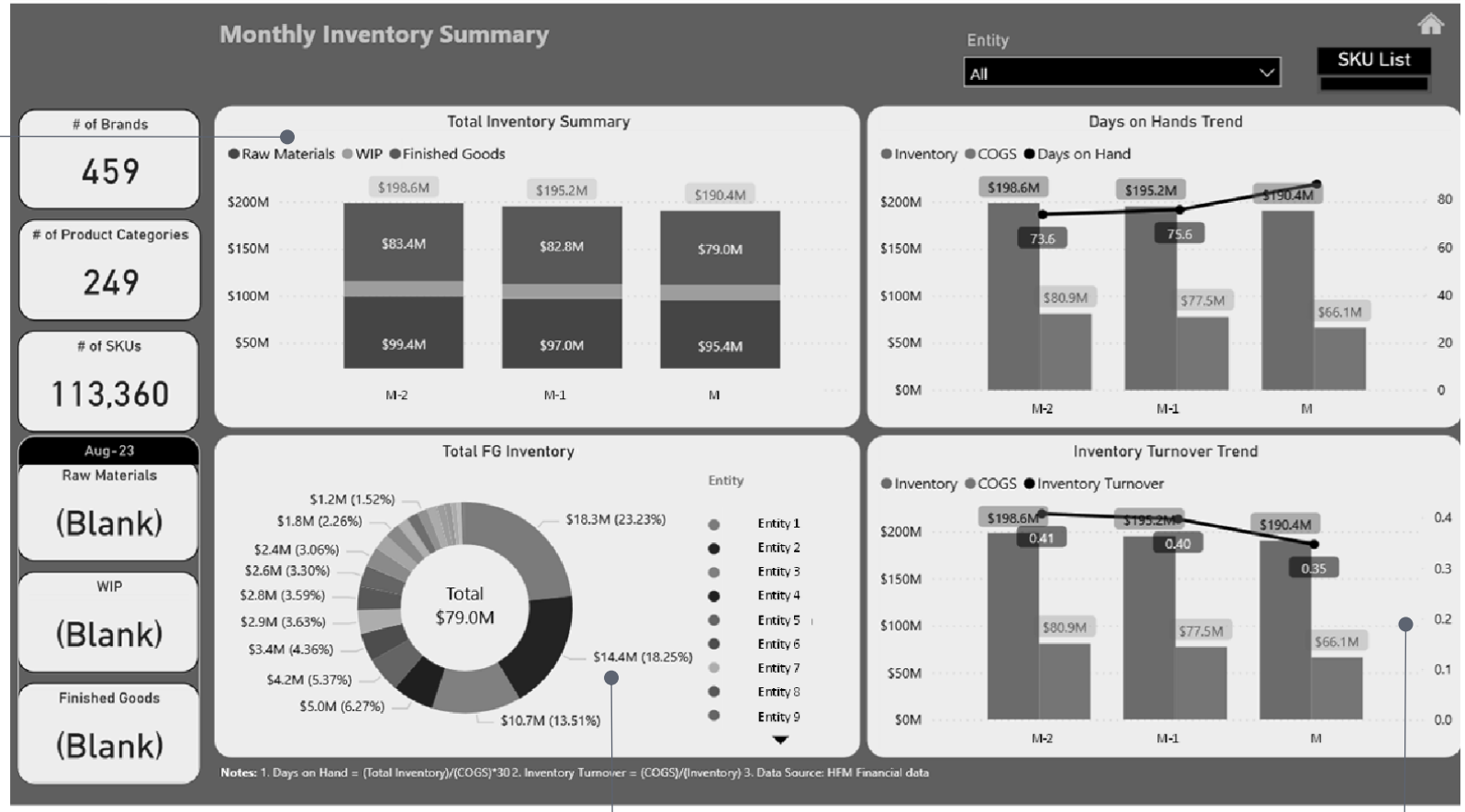
Historical SKU level model performance informs future strategy and optimization.

SKU Characteristics and Summary Metrics provides a comprehensive overview of product attributes and performance indicators, aiding in efficient inventory management and decision-making.

SKU level inventory analysis provides detailed insights into product performance and availability, aiding in efficient inventory management and informed decision-making.

Inventory performance metrics

Total Inventory Analysis provides a comprehensive view of raw materials, work-in-progress, and finished goods across all levels to optimize supply chain management and cost efficiency.



Corporate Entity-wise Finished Good Inventory Analysis to enable data-driven decision-making and optimize inventory management across different corporate entities.

Historical Inventory turnover analysis to enable data-driven insights into past inventory performance for informed decision-making.