Autonomous Supply Chain Planning

Artificial Intelligence To Support Small Supply Chain Teams

Horizon

Overview

Introduction | Supply Chain Planning in 2024

Almost every organization is dealing with **constant changes**, both internally (e.g. portfolio changes) and externally-driven (e.g. supply shortages). It should be clear by now that these changes and events are likely to continue to happen. **How should you plan**, taking into account both the stable demand patterns but also the impact of these more unpredictable factors?

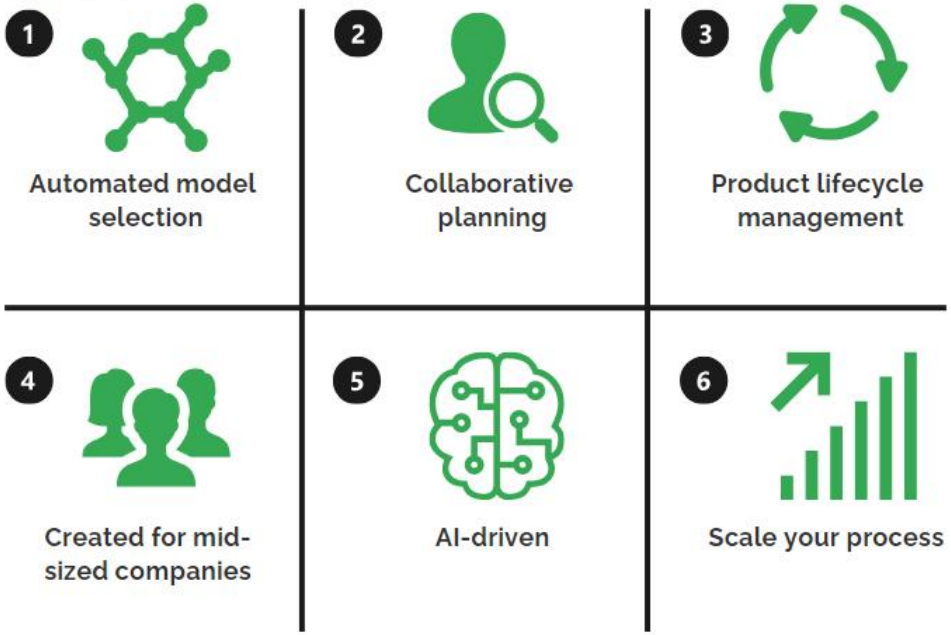
Strong supply chain planners are difficult to find and even more **difficult to keep**. How can technology **support supply chain teams** of companies with growth ambitions?

Autonomous Planning for Mid-Sized Companies

We believe the answer lies in **Autonomous Planning**.

Artificial Intelligence has advanced to a point where it can tremendously support small teams to conduct and scale their planning activities.

In this summary whitepaper, you'll learn more about autonomous planning and **the potential benefits for your business**.



Autonomous Demand Planning | What is it?

Autonomous Supply Chain Planning might sound familiar, but has not been implemented or offered by software providers so far. We're revolutionizing this by **starting with Demand Planning**, a relatable core planning element for all departments, which guides stock management & operations, and influences material purchases and production.

Demand Planning, challenged by **vast product ranges and changing portfolios**, becomes even more complex with factors like **sales fluctuations and marketing promotions**. AI helps organizations integrate these varied signals into accurate demand plans.

The planner's role evolves, akin to the transition from manual gear shifting to automatic shifting and lane control in a car. Planners can now **manage by exception**, free from manual tasks like model selection and outlier cleaning. The **collaborative input** from sales and marketing remains crucial.

Our mission with Horizon is to **transform manual demand planning** into a scalable, continuous process, adapting alongside your business growth.

AI in Demand Planning | The evolution of Demand Planning

Artificial Intelligence (AI) in Demand Planning refers to **software that emulates human-like problem-solving abilities for complex issues**. Unlike basic algorithms handling simple calculations, AI tackles intricate problems that typically require significant human time and **heuristic approaches**. Essentially, it's about **automating and enhancing decision-making processes** in demand forecasting and resource allocation.

Statistical foundations

While **robust** in deciphering trends and seasonality, statistical models falter in adapting to dynamic inputs. They lack the ability to learn autonomously, **relying heavily on human intervention** for outlier cleaning.

Machine Learning

ML algorithms, autonomously learning from historical data, enhance forecast accuracy by **identifying complex relationships** and by constantly **revising which models work best.**

Artificial Intelligence

Tasks traditionally requiring human intelligence can be solved by the engine, ranging from **estimating the impact** of sales pipeline, promotions, or new product introductions to **prioritizing tasks for the team.**

Initially, demand planning used **simple statistical methods** for trend analysis. The **shift to ML brought the ability to learn from large data sets** and recognize complex patterns, improving forecast accuracy. AI further enhances this by being able to **integrate diverse inputs**, **offering deeper insights and guiding planning teams** in which actions to undertake.

A Strong Demand Plan | The Components

Historical data, sales input, marketing plans, competitor activities, economic indexes, weather data, customer forecasts,... All of these inputs and more can be used to create an accurate plan. Some companies want to include all of these data sources because they think it's needed to create a good demand plan. This is not how it works - **some inputs contribute a lot more** towards a good demand plan than others.

Therefore, **focusing on those first and treating those signals correctly** will create a lot of initial benefits. Only then should the focus shift to these other signals to see how much added value these still have. Simplified, these signals can be divided into the following categories:

Historical data & model selection

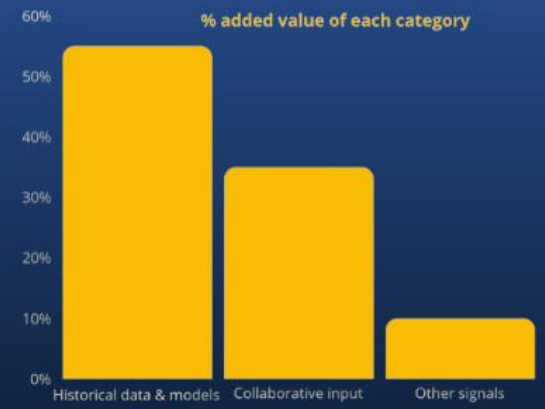
Provides **strong baseline, seasonality** (and trend) predictions. Selecting the **right model & parameters** for different product categories/countries is crucial.

Collaboration: Sales & Marketing input

A major upcoming promotion, a large deal that will come/fall through, or a different market trend for a whole product category. **Some factors can never be anticipated** by a model based on historical data alone.

Other signals

Indexes, weather data, social media sentiment,... These signals can provide extra accuracy **when the other categories are exhausted**. Which signal and their value is very **company-specific**.



A strong base | Automated Best Model Selection

Traditional methods often rely on **manual selection, which can be time-consuming and prone to error.**

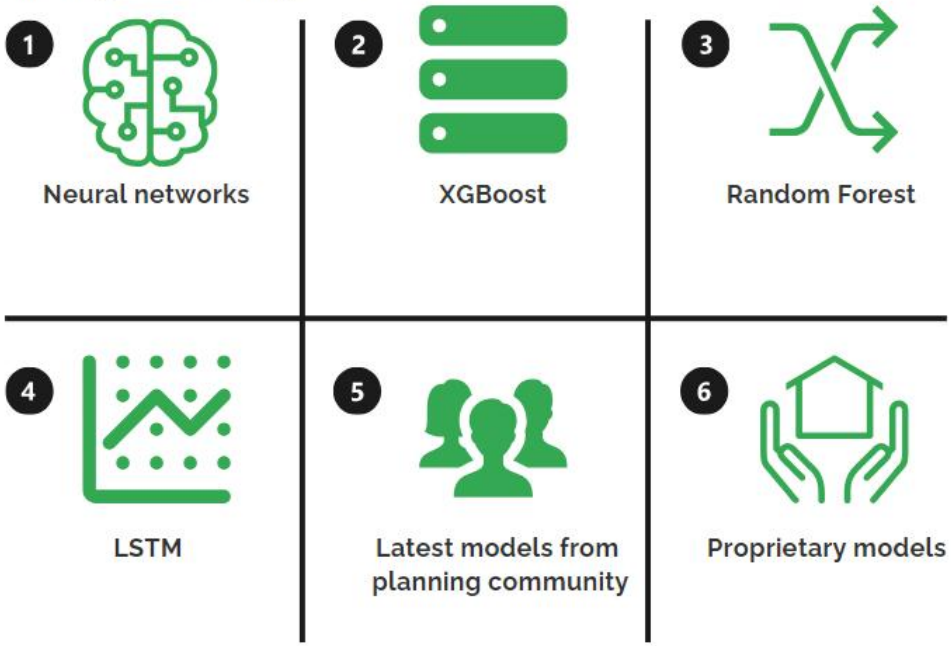
However, the integration of Machine Learning (ML) into this process revolutionizes demand planning by **automating model selection and providing explainability for its choices**.

Demand planning requires **different models** for various levels of the **product-customer-location hierarchy**. Each level has unique characteristics and data patterns, necessitating a tailored approach.

The right model for the right product

Automated model selection in Horizon enhances forecast accuracy by **choosing the most effective model for each scenario.** This not only streamlines the process but also **frees planners to focus on collaboration**.

A crucial aspect is the system's **ability to explain its choices of models**, fostering trust and understanding.



Collaboration | Enhancing the base forecast

In advanced stages of demand planning, it's crucial to **balance robust modeling with collaborative input**. Models provide a solid baseline, accounting for seasonality and trends, while sales input offers insights into specific deals or customer behavior.

Sales and marketing insights are critical for identifying changes in **market trends and consumer preferences**. This information, combined with data-driven models, leads to a more **accurate and responsive demand planning process**.

Sales

Sales teams, aiming to fulfill orders, benefit from higher inventory levels to avoid stockouts. Typically, they are **hesitant to share forecasts at a granular level**.

Supply Chain

Supply Chain **owns the demand planning component** in most companies. **Interaction with the other departments is crucial** for understanding the latest trends.

Marketing

For instance, a **promotional campaign** can temporarily spike sales. If the supply chain is unaware of these initiatives, the demand plan may fall short, leading to stockouts.

The key is to **have an accessible manner** for sales & marketing teams to share their insights. The S&OP process is very cumbersome. With Horizon and a new way of collaboration, sales & marketing departments can **easily add their insights and understand the value** it has for their own job/incentives as well.

Product Lifecycle Management | The constant struggle

Product Lifecycle Management (PLM) is a critical aspect of effective demand planning. In today's fast-paced market, **understanding and managing the various stages** of a product's lifecycle – from introduction to phase-out – is essential for optimizing inventory levels, meeting customer demand, and maximizing profitability.

Automation in PLM, especially in **phase-in/phase-out decisions and creating ramp-up profiles for new products**, plays a pivotal role in streamlining this process.

Today's tools provide a way to manually add information such as when something will be discontinued or when something new will be introduced.

Horizon also **proposes who will buy a new product and who will first stop buying a product**. Horizon can also propose the time it will take to deplete your inventory for a discontinued product and **propose initial launch quantities** for a new customer based on a similar customer's buying behavior.

The benefits | Autonomous Demand Planning

Not only does a better demand plan improve **supply chain metrics**, but it also translates into **significant financial advantages** for companies.

Improved demand planning leads to **more accurate inventory levels**, **reducing both overstock and stockouts**. This balance is crucial for **maintaining high service levels and customer satisfaction**.

Benefits for Supply Chain Teams

AI is a game-changer for small supply chain teams, facilitating autonomous demand planning and **allowing these teams to manage more with less**.

By embracing AI, small teams can **achieve higher efficiency and scale their planning processes** much more easily.