

# AI Enabled Demand Management

Leverage artificial intelligence to detect market trends and predict forecasts to dramatically improve forecast accuracy

## Problem With Traditional Forecasting

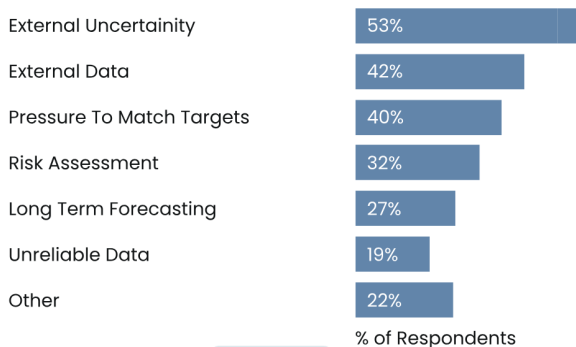
Traditionally forecasting was based mostly on internal data residing in enterprise systems and managers' knowledge of external data. Demand planners made manual corrections to forecasts based on marketing inputs related to external data (Market trends, Weather, Local events etc.). Often the process created a huge lag with forecast accuracy.

While forecasts worked to a degree at aggregate level, they had had huge errors that were hard to explain at the SKU level. The statistic from CFO research services in Fig 1, provide an independent view on how external factors influence on forecast errors and inventory.

Forecasting is mostly a monthly process and any major deviations within the month has been a challenge both from process and systems Demand & Inventory Managers have to make complex and costly decisions inventory decisions based on forecasts that could be inaccurate. The loop between demand planning and supply planning is often broken making the role of supply chain managers in their ability to make supply chain trade off decisions complex and tedious. (Fig 2)

Very few organizations today have clear and robust capabilities to co-relate the impact of external variables on their forecasts.

### Reasons For Forecasting Errors



### How Much is Your Stock Impacted Due to Forecasting Errors?

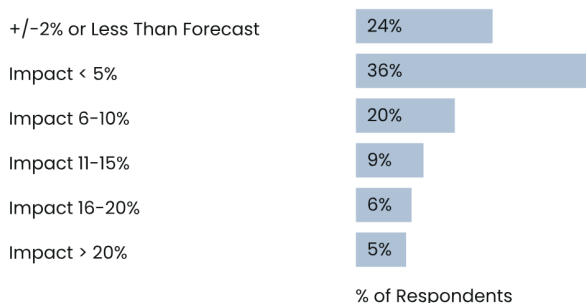


Fig 1

Source : CFO Research Services

## Role Impacted

Demand Manager / Supply Chain Manager

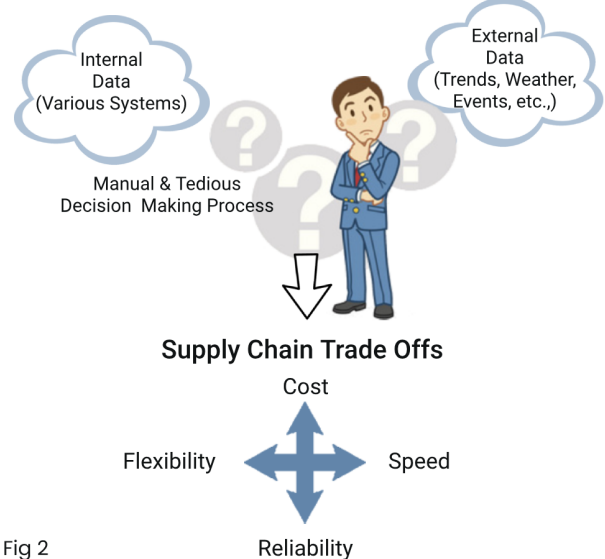
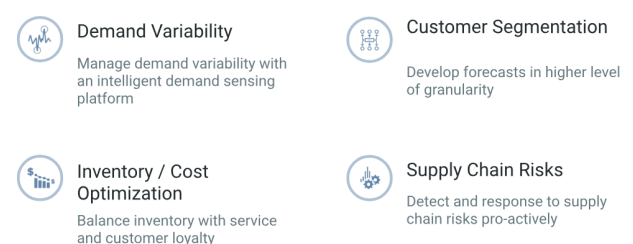


Fig 2

## Digital Supply Chain

As industries move towards Industry4.0, the volume, velocity and variety, value and veracity of supply chains data become all the more significant for increased supply chain risks. One of the key hedges to prevent digital disruption is to have world class forecasting process that is intelligent, dynamic and constantly adapting to changing markets. Customer expectations in the digital world are dynamic with expectations of highly individualized products driving a trend towards mass customization. Forecasts in the digital supply chain need to be more granular segmented at a customer level allowing the customer to choose 'exactly' what fits their needs. Forecasts needs to be carried out dynamically on multiple time frames timeframes i.e monthly, weekly or even daily based on the product velocity. Inventory levels need to be adjusted accordingly in a digital supply chain to ensure the right product is at the right place at right time in right quantities.



## Solution Overview

AI enabled demand planning framework (Fig 4) engages demand managers by sensing and analyzing hundreds to thousands of internal as well as external demand influencing variables ( Fig 3, e.g., weather, trends from social networks, machine data, Enterprise systems data) with machine learning, optimization and Bayesian approaches to uncover and model the complex relationships and predict an accurate and granular forecasts. These advanced algorithms provide probability distributions of the expected demand volume rather than a single forecast number. These new technologies enable a significant improvement of demand forecast accuracy, often reducing the forecasting error by 30 to 50 percent.

The AI framework also enlightens demand managers by connecting the dots between structured and unstructured data of Supply chain allowing for targeted discussions, including upside potential and downside risks in the S&OPs, and advanced inventory management approaches. The framework also enables planning into a flexible, continuous process. Instead of using fixed safety stocks, each replenishment planning considers the expected demand probability distribution and replenishes to fulfill a certain service level - the resulting implicit safety stocks are therefore different with every single reorder. The framework enables demand and inventory managers to quickly and easily integrate the safety stock decisions in their Enterprise systems.

The benefits of the AI enabled demand management can result in (1) Improved forecast accuracy (2) Minimize Inventory holding costs (3) Maximize service levels.

## Internal & External Data Impacting Demand Mangement

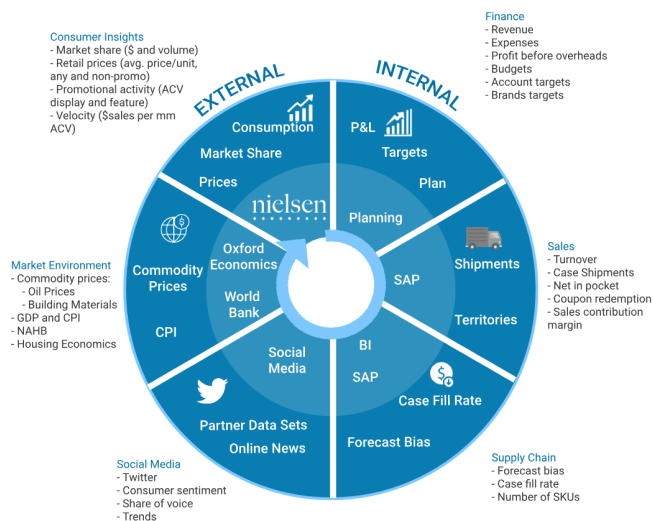


fig 3

## About Us

Randomtrees is an AI company with a mission to create a climate that empowers enterprises to realize business outcomes. Our advisory services help clients to embark on business excellence journey using AI with a proven methodology. Our delivery services provide the know-how across AI platforms, data engineering and process expertise to build, run and operate AI solutions. We also play key engineering role in AI market places to promote responsible AI

## AI Solution Framework

Leverage external market factors (quantitative) with AI and improve forecasting process



Fig 4

- 1 Sense**  
Demand Sensors  
External and Internal (Structured data)
- 2 Action**  
Generate Probabilities  
Demand
- 3 Optimize**  
Cost Optimization  
Inventory
- 4 Think**  
Machine Learning  
Big Data Processing
- 5 Predict**  
Predictive Models  
Generate Corrected
- 6 Cognitive**  
Cognitive APIs / Unstructured Data  
Visibility to Supply Chain Risk Factors  
Generate Contextually Corrected Demand

## Benefits

Improved Forecast Accuracy



Improve Forecast Accuracy



Minimize Inventory



Maximize Service Levels



Fig 5