Forecast Accuracy Myopia & the Need to Heed Inventory Optimization

Empirical Approaches to Prioritizing Enterprise Process Improvements

PRESENTED BY: BILL BENTON, CEO

AT THE GARTNER SUPPLY CHAIN EXECUTIVE SUMMIT

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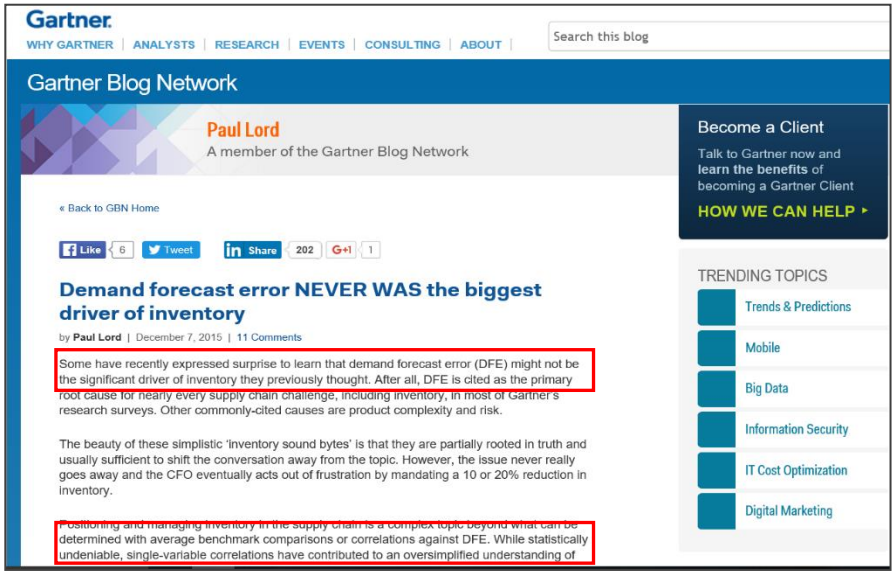
Theater Topic Inspiration

- Thorough Assessment of Received RFI/RFP Constructs and Observations of Engaged Organization Priorities
- Realizations Following Significant Number of Empirical Study Results Quantifying Demand Planning and Inventory Optimization
- Burgeoning Marketplace Awareness of Forecast Accuracy Myopia (such as the following Paul Lord blog)



Did You Know?

60% Proportion of Supply Chain Planning Improvement Initiatives & Related Requirements Observed focus Exclusively (or Predominantly) on Demand Planning

25% Percentage of Detailed Operational Improvements in Planning Achievable via Demand Planning Process Improvements (as distinct from high-level SI&OP benefits)

20% Estimate of Organizations Using at least Basic Statistical & Cost Methods to Determine Inventory Policy (versus Traditional, Single-echelon Safety Stock or Rules-driven approaches)

7% Proportion of Organizations Applying Advanced Demand Planning Algorithmically-Integrated via a Holistic-Model with Inventory Optimization

Source: GAINSystems Surveys

Presentation Objectives

Key Presentation Objectives

- Describe an objective means to derive prioritization of solution needs
- Provide a quantitative (non-subjective) method to weight importance of certain factors
- ***Not*** to diminish the value of SI&OP but to emphasize other proven-key areas

Introduce a Means of Measuring Incremental Impacts of Key Process Improvements in a Quantitatively-rigorous Fashion: Across a statistically-significantly sample of items and time horizon

Determine Key Measures of Performance

- Inventory (Turns)
- 'First-pass' Fill Rate (prior to Expediting or Substitution)
- Activity Cost (frequency/cost of replenishment)

Process/Algorithmic Improvements to ***Measure Independent Value-add of***

- ***Sophisticated/'Advanced' Forecast Modeling:*** *automatic selection from 40 models*
- ***Comprehensive Inventory Policy Optimization*** considering planning error (demand & supply), *stocking and stockout costs*, & profitability *across echelons*

Simulation Scenarios

The following scenarios were analyzed and evaluated based on inventory reduction and service level improvement

Scenario	Forecasting Method	Inventory Parameters	Service Level Target
Baseline	Traditional (Moving Average)	Traditional	N/A: Result (not Input)
Adv Fcst w/Trad'l Inv Params	Advanced	Traditional	N/A: Result (not Input)
Adv Fcst w Opt Inv Params (SL Neutral)	Advanced	Optimal	Neutral
Adv Fcst w/Opt Inv Params (SL Improve)	Advanced	Optimal	Improvement

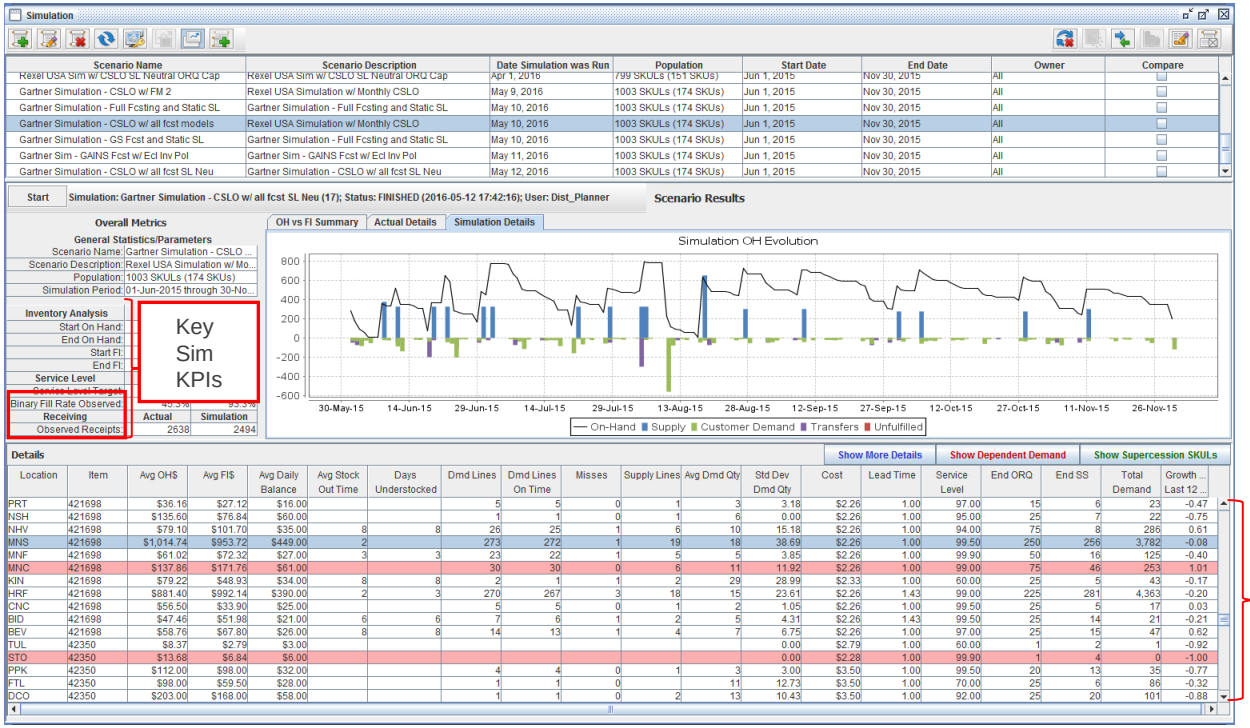
Empirical ‘Black-Box’ Simulation Process Overview

Process

- Demand from periods prior to the simulation date is used for forecasting each day iterated
- The records demand fulfillment and activities occurring during the specified interval without intervention or expediting
- Includes distribution ‘parents’ and BOM materials for multi-echelon measurement

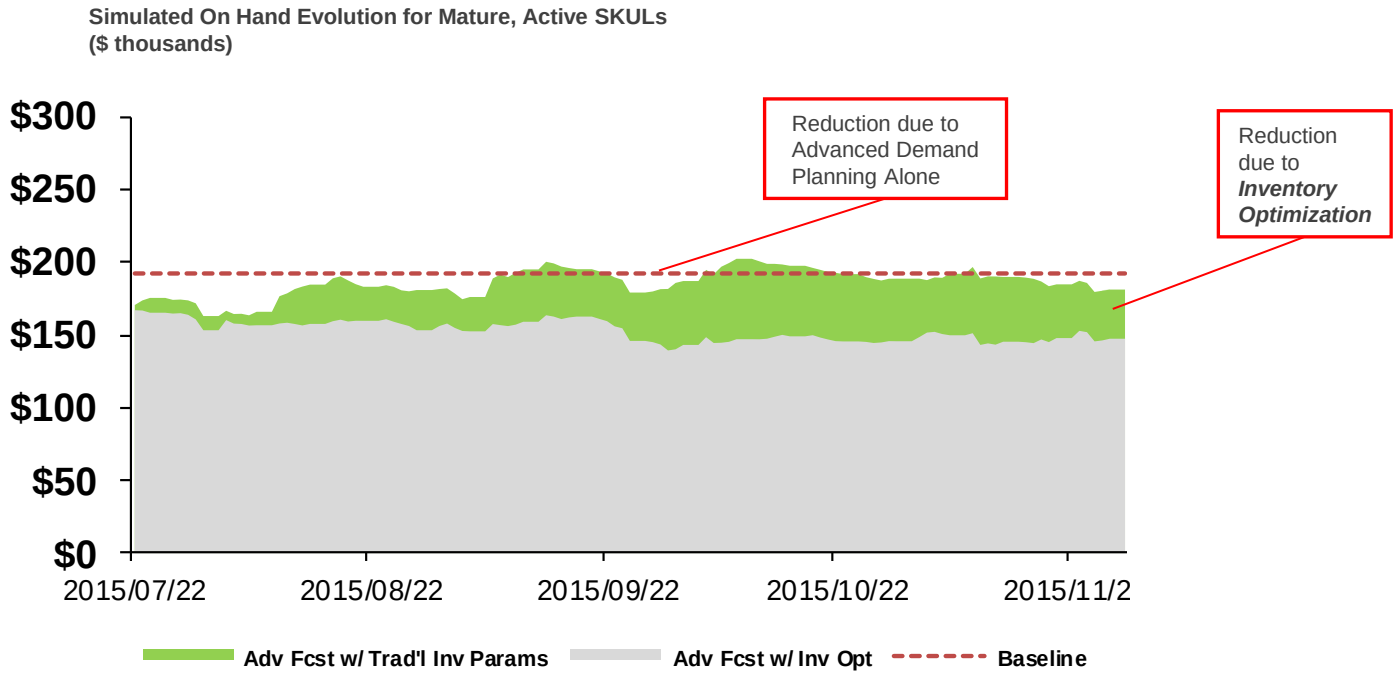
Test Sample and Parameters (results are typical of dozens tested)

- Statistically-significant sample size (1,000 after eliminating new/unprecedented items) selected randomly but matched ‘demographically’ for Inventory Turns and Service Level to the Population
- Extended (6-month) horizon to cover multiple replenishment cycles (lead times) and peak season

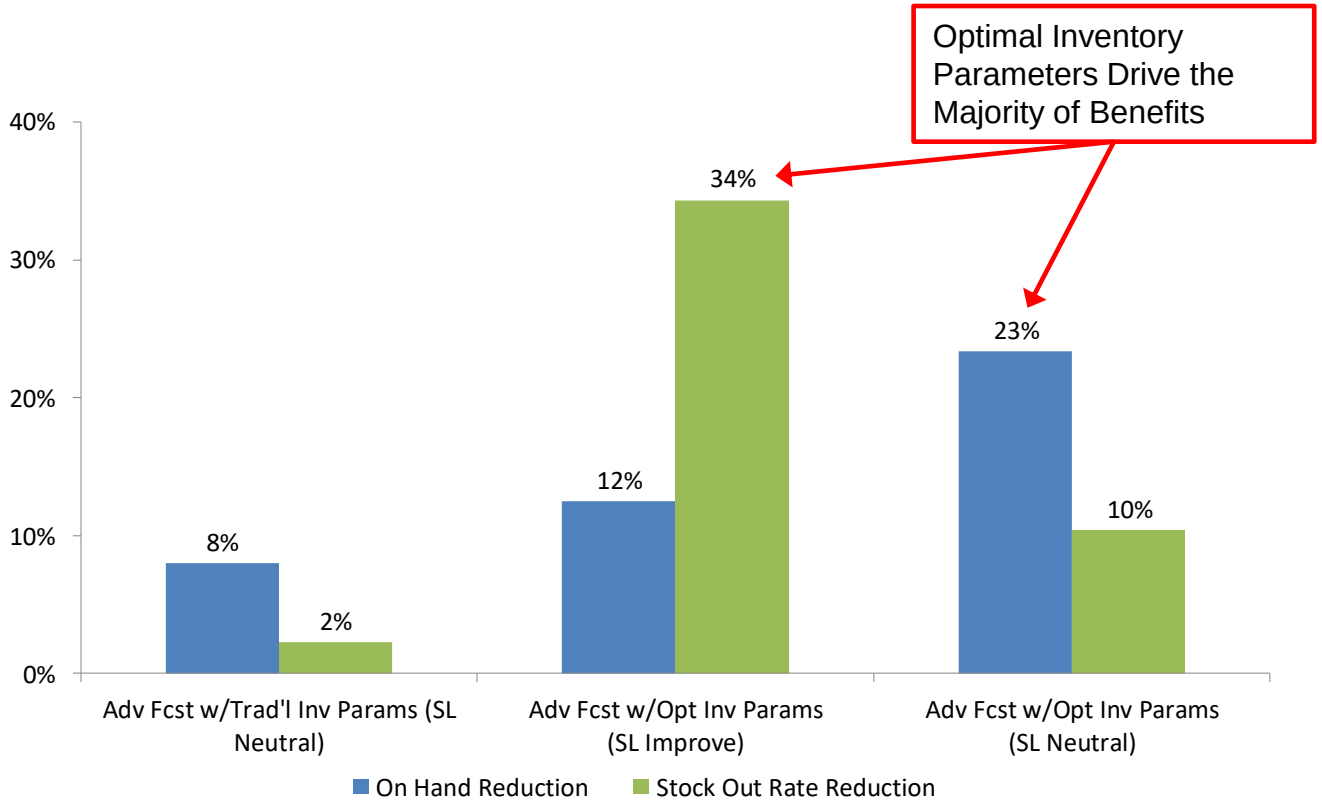


Simulation Results: On Hand Evolution

For a service level neutral scenario, the following shows the opportunity for inventory reduction due to inventory optimization



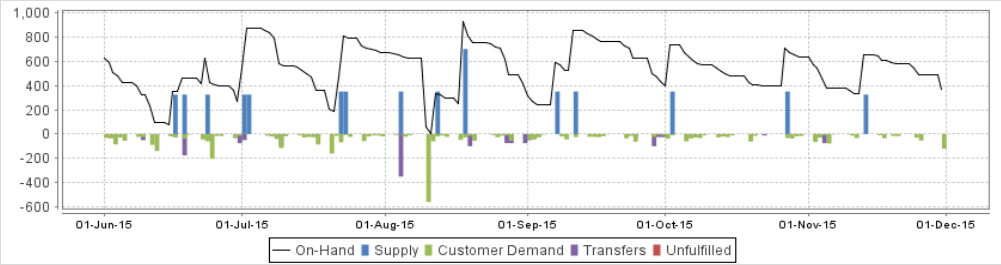
GAINS Empirical Simulation Summary



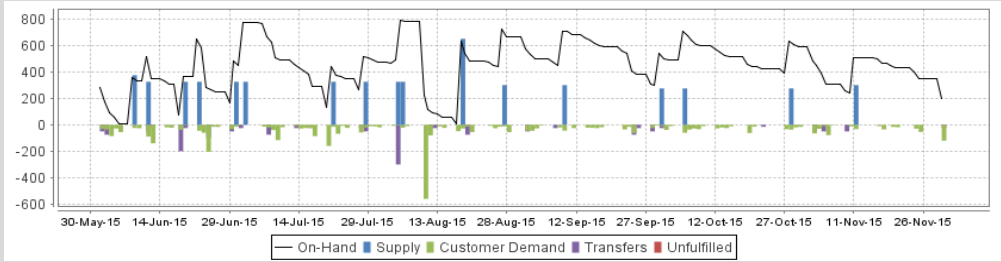
Inventory Reduction Example

Traditional inventory parameters fail to recognize that inventory coverage above-and-beyond a 100% observed Service Level provides no incremental benefit

Adv Fcst w/Trad'l Inv Params



Adv Fcst w/Opt Inv Params



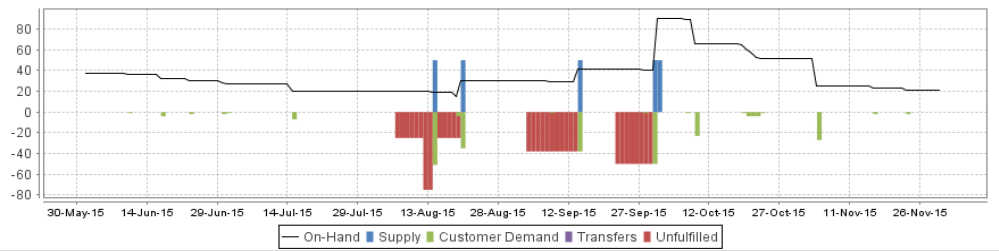
Incremental Benefits

29%	Less Inventory
50%	Fewer Stock Outs

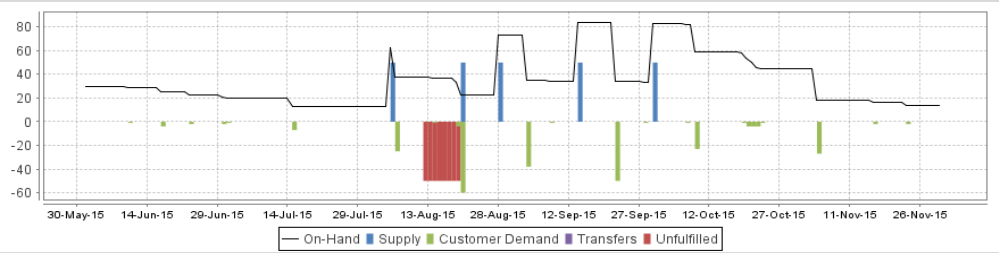
Service Level Improvement Example

An optimal inventory policy approach is required to achieve a high Service Level in a lumpy demand pattern environment while maintaining efficient inventory levels

Adv Fcst w/Trad'l Inv Params



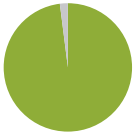
Adv Fcst w/Opt Inv Params



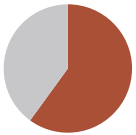
Incremental Benefits

75%	Fewer Stock Outs

You Probably Already Knew…



98% Proportion of Organizations that would Benefit from Empirically-driven Prioritization of Operational Improvements



60% Reduction in Elapsed Time versus Subjectively Debating Supply Chain Improvement Priorities when Shifting to an Empirical Methodology

40% Proportion of audience likely leaving with more questions than were answered…

We'd thoroughly enjoy continuing these discussions and how these concepts could apply in your organization at Booth 718

Source: Unabashed Speculation

The GAINS Solution Overview: Single & Multi-Echelon Planning

1. **Auto-selects the optimal forecast model** over lead time given historical patterns
2. Synchronizes top-down/bottom-up changes in various units-of-measure (supporting SI&OP)
3. Automatically applies **Leading Indicator Analysis** to predict changes not yet reflected in history

Demand Planning/Forecasting

Starting Point

1. Coordinate & **Collaborate with Suppliers**
2. **Optimize** planning **with Production** (for in-production parts)
3. Enables robust **scenario simulation**
4. **GAINS Mobile** allows for broad-based & accessible collaboration (iPad)
5. **KPI Dashboard** for graphical performance management 'drill-down'

Sales & Operations Planning (S&OP)

Inventory/ Stocking/ Source Policy Optimization

1. Determines the **optimal Service Level** and stock **policy** for each SKUL
2. Automatically & dynamically **determines** the **Order Quantity & Buffer**/Service **Stock minimizing total costs**
3. Determines the **optimal source for each SKUL**

Replenishment Optimization

1. Provides **automated** &/or exception-based, **profit-prioritized purchase recommendations**
2. Recommends **optimal** and feasible transfers and **re-distribution** across the network
3. Automatic order-minimum-adherence, price break, substitute, & alternate suppliers decisions

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