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Inventory Optimization is Different than Traditional Supply Chain Planning

Taking into Account All the Various Dependencies and Sources of Variability of the Network

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The following article is taken from our recent **Supply Chain Digest Letter** on Inventory Optimization. A downloadable copy of that Letter, along with an array of other resources, is available at out Inventory Optimization Resources page.

Inventory Optimization is one of the hottest areas of supply chain software right now.

What is it?

Gartner analyst **Andrew White** explains it this way: "For complex distribution networks where source and recipient locations can be dynamically determined, the inventory level in one location can affect the ability to achieve goals in another — to the point that you get into a circular argument: "If I set inventory levels at location 'A' to 'X,' what do I need to set inventory levels at 'B' to achieve 'Y' when 'B' is a source of inventory for 'A'?" The only way to correctly answer this question is to determine the total inventory level for all locations simultaneously, taking into account all the various dependencies and sources of variability of the network."

That's what Inventory Optimization software does.

Though most companies thought they were doing Inventory Optimization with traditional supply chain planning or APS tools, there really are some important differences, though in fairness recent advances on both sides are causing the solutions to blur.

The table on the next page provides a summary of key differences between traditional approaches to inventory optimization and the techniques used with most multi-echelon tools.

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While a growing number of companies offer Inventory Optimization solutions, the field is still confined to a relatively small number of players.

Inventory Optimization is Different than Traditional Supply Chain Planning (Con't)

Process	Traditional Inventory Management Approach	Multi-Echelon Inventory Optimization Approach
Optimization Objective/Function	Not true optimization; objective is to provide net requirements upstream to determine replenishment needs	Meet end-customer service goals at minimum inventory
Optimization Approach	Some heuristics combined with traditional optimization, sometimes using constraint-based models	Can also use heuristics and traditional optimization, but many solutions also use the more recent tools around stochastic/ probabilistic optimization
Demand Forecasting	Forecasted demand per period with little processing of demand variability	Forecasts based on lowest echelon's primary demand signals and other information; demand variations also are forecasted and used in optimization run
Lead Times	Static lead times that often look only one level back	Uses all lead times and lead time variations of upstream suppliers
Internal Bullwhip Effects	Generally not considered	Effects measured and accounted for in overall replenishment strategy
Network Intelligence	Little visibility or consideration of inventory levels and demand beyond immediately connected supply chain levels	All echelons have complete visibility into other echelons; inventory/ demand data is used in the replenishment logic across all tiers
Differentiated Customer Service	Generally not supported/ manual	Often supported, as orders out of a higher echelon location to a lower echelon are fully controllable; allocation schemes using set-aside inventories per customer can be configured
Cost Implications Across Echelons	Generally not well considered	Fully modeled so true network optimization can be achieved

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