AN RIS WHITE PAPER

Is the Perfect Shopping Experience Attainable?

Tapping into the Power of Inventory Optimization to Reduce Costs and Boost Profitability

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HOUSTON, WE HAVE A REPLENISHMENT PROBLEM.

A consumer supply chain executive once noted that if his company had attained all of the inventory reductions promised from process and technology over the past decades, by now they'd have negative inventory, according to Supply Chain Digest, Sept. 7, 2006. Instead, their inventory is higher than ever.

Until recently, retailers have had very few tools to effectively align inventory targets with costs and service levels in an effort to "right size" their inventory. In many cases, the retailer is still relying on manually intensive, spreadsheet-based replenishment techniques, yet inventory is the most important asset a retailer owns. Retailers today have thousands of items in hundreds of stores, provided by countless suppliers, and distributed through dozens of warehouses via thousands of purchase orders. Each item has its own unique demand pattern for each location, cost, vendor lead-time, pack configuration, transportation cost, etc.

More than 60% of companies use overly simplistic inventory management methods. These companies frequently have 15-30% more inventory than they need and lower service levels.

However, current inventory replenishment systems lack the optimization capabilities necessary to find the optimal balance among many possible replenishment tradeoffs. This prevents retailers from maintaining an efficient supply chain at a time when connecting to the ever-changing local consumer has become even more critical to a retailer's success. According to Aberdeen Research's *Supply Chain Inventory Strategies Benchmark Report*, December 1, 2004, more than 60% of companies use overly simplistic inventory management methods. These companies frequently have 15-30% more inventory than they need *and* lower service levels.

ONE SIZE DOESN'T FIT ALL

Customers find out-of-stocks one of the most frustrating aspects of shopping, costing retailers lost sales and customer goodwill. The title of a May 1, 2004 Harvard Business Review article says it all: *Stock-outs Cause Walkouts*. Over-stocks create their own problems, not just in the cost of markdowns, but in taking space from desirable merchandise and giving the store a stale feeling. These problems persist despite a renewed interest in enhancing customer service, widely viewed as key to enhancing sales.

Solutions to balancing customer service and inventory have been peddled to retailers for years. These replenishment systems are based on strategies that vary from implementing general rules, such as weeks of supply, to ABCD allocation by store profile, to advanced planning and scheduling systems that compute inventory targets sequentially for each supply chain echelon, according to an April 11, 2006 Aberdeen Research Brief.

But balancing inventory with supply chain constraints, local customer demand and service levels requires a more sophisticated approach than simply setting static, one-time min/max levels by product and applying them across the enterprise. It requires a solution that can take into account the variability across consumers and the stores they shop. It demands a solution that can remove the hurdles preventing retailers from profitably managing their precious inventories in today's consumer-centric and demand-driven retail environment. It must take into account the need for localization, the dynamic nature of consumers with many alternatives, and a sophisticated infrastructure that supports their growing multi-tiered supply networks.

Clearly, better control of inventory pays off. "Public companies that are more responsive in inventory management are, on average, more profitable," according to December 2005 research by The Univ. of Pennsylvania's Wharton School, *Should Inventory Be Lean or Responsive?*

"Our findings indicate the importance of matching supply with demand when (i) the environment is volatile and (ii) demand is non-stationary, such that responsiveness in inventory matters more to profitability than do absolute inventory levels."

SHOW ME THE VALUE

Retailers that have migrated beyond the worksheet-based alternatives into the promised land of automated replenishment have made the journey only to realize that relief from manual processes and an increase in value have yet to be delivered. The worksheets may have gone away, but the excessive manual effort hasn't. These systems still require users to manually review and adjust the details, which is virtually impossible with the millions of store/SKU combinations, countless suppliers, dozens of warehouses and thousands of purchase orders typically maintained by many of today's retailers. Although these systems are an improvement from worksheet-based alternatives, unfortunately they lack the optimization capabilities necessary to dynamically optimize, recommend, and implement replenishment methods based upon real-time consumer demand at the item/store level and instead tend to over-generalize products and locations using assumptions that don't apply.

Customer demand varies from market to market, store to store and item to item. Most replenishment systems fall short due to their reliance on simple demand forecast models that are incapable of providing repeatable accuracy because they fail to account for a multitude of factors that affect true sales levels, such as SKU/store seasonality, promotional life and price elasticity. Usually these forecasts are based upon store shipment history and lead to stock outs and excess inventories. Some may leverage POS data, but POS data alone isn't enough to achieve proper service levels and productivity goals, since quantities are also driven by store-level shortages/surpluses which don't take into consideration critical constraints such as pack sizes, order minimums, transportation cost, and so on.

Most replenishment systems set inventory levels in isolation, by location, rather than taking a broad view to determine at what stage inventory is best held. Changes in one location often have an inadvertent effect on other nodes. "Single echelon solutions are suboptimal because they do not take a holistic approach to network inventory optimization," according to ARC Advisory Group, in *Advanced Inventory Optimization Market to Grow 13% Annually*, January 17, 2006.

The poor inventory distribution and inaccurately targeted replenishment points produced by these overly simple applications lead to out-of-stocks, frustrated customers and lost sales, as well as excess inventory and markdowns.

REPAIRING THE REPLENISHMENT INEFFICIENCIES WITH INVENTORY OPTIMIZATION

Inventory Optimization is a new evolution of scientifically based, mathematical processes that applies advanced predictive and simulation techniques to balance store/item level demand and supply constraints, while determining optimal replacement methods to improve in-stock conditions, reduce inventory costs, and deliver superior service levels.

The adoption of inventory optimization (IO) is exploding as retailers push to become more demand driven and localize their assortments. According to AMR Research's *Optimizing Inventories—A Network Design, Inventory Configuration, and Inventory Policy Vendor Landscape*, January 2005, revenue from the sale of inventory configuration and

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policy-setting applications and services was projected to grow 50% in 2005, ten times the rate of the overall supply chain software market.

A study by ARC Advisory Group, *Advanced Inventory Optimization Worldwide Outlook: Market Analysis and Forecast through 2010,* predicts the worldwide market for Advanced Inventory Optimization (AIO) to grow at a Compound Annual Growth Rate of 12.6% over the next five years. The market was $99.2 million in 2005 and is forecasted to reach $179.6 million in 2010.

Inventory optimization solutions are capable of simultaneously calculating where and how much inventory should be held across a network of locations.

"To get service right, companies must make inventory decisions based on both the desired service levels and demand/supply variability. Leaders know that inventory policies need to vary both by product and by customer, and that they can no longer guess at inventory targets — it is just too complex," according to *Redefining the Role of Inventory for Demand-Driven Supply Networks,* AMR Research, January 2005.

Inventory optimization solutions can handle that complexity by taking the entire range of variables and business rules into account and, using complex algorithms, set specific target inventory levels according to the unique characteristics of a product and location. They are capable of simultaneously calculating where and how much inventory should be held across a network of locations, including stores, distribution centers and, if applicable, supplier locations, to determine optimal locations.

The result can be layered onto existing replenishment systems including Inforem, E3, or other commercial or homegrown applications, with the Inventory Optimization solution setting the correct algorithms, and the current replenishment system applying them.

"Inventory optimization tools typically are not a replacement for existing ERP or APS tools. Rather, they are an extension that helps these solutions work better by providing them with improved safety stock and economic order size parameters," according to the April 11, 2006 Aberdeen Research Brief.

GETTING STARTED WITH INVENTORY OPTIMIZATION

Implementing inventory optimization begins with a complete understanding of a retailer's business models and strategic goals: being fashion-forward, high/low, promotion-oriented, and so forth, as well as how the optimization algorithms will be used, and with which merchandising, forecasting and inventory management systems they will be integrated.

This information is then utilized to systematically model and simulate the retailer's replenishment environment. This process uses data about past inventory, price and supply chain activities to create algorithms that enhance the functionality of the replenishment system. Analysis of historical sales and inventory history produce excellent algorithms that make a strong impact on right-sizing inventory, but the addition of any of several other types of data helps further fine-tune the results, such as:

- Sales for every item at every location
- Inventory history for each item, including excess and stock-outs by location
- Current and historic cost and price information to determine and weigh product profitability
- Supply chain data, including lead time and ordering parameters
- Historical forecast data

The analysis process results in a profile of the retail business and where the biggest inventory pain points are and recommends opportunities for quick wins. These might be:

- Modifying current legacy configuration
- Modifying presentation stock settings
- Changes to warehouse sourcing
- Reviewing frequencies
- Removing unprofitable, substitutable SKUs

Inventory optimization provides an automated, exception-driven approach to achieving optimized inventory, removing from planners the overwhelming requirement to manually set and monitor inventory targets by store and SKU. Instead, IO focuses the user on the key performance measures. IO automatically monitors SKU/location demand and supply chain variables to determine optimal inventory for greatest return. It recommends replenishment settings, either automatically approving the changes or raising alerts, for example, to higher-impact items. The new optimal replenishment settings may be used to update parameters in the current replenishment application, turbo-charging its effectiveness and boosting the value of the existing solution.

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Inventory optimization is often implemented in a phased approach to maximize value and minimize disruption to the organization. For example, a retailer might start by implementing single-tier optimal inventory levels (target locations in isolation), and then later begin simultaneous optimization across all locations within the enterprise.

To keep algorithms in tune with the retailer's overall business goals, IO systems monitor settings to maintain optimal inventory and recommend updates, usually on a monthly basis. If the recommended changes fall within a retailer's defined boundaries, the new settings are approved. The remaining recommendations are presented to the user for review and approval.

A more comprehensive annual review will help accommodate more radical changes, such as new usage patterns, new integrations, or new business strategies, merchandise types or locations.

"Above average inventory performers are more than 2.5 times as likely as other companies to update their inventory strategies and policies multiple times a year," according to Aberdeen Research's *The Technology Strategies for Inventory Management Benchmark Report*, September 2006.

INVENTORY OPTIMIZATION BOOSTS RETAILER SHAREHOLDER VALUE

Some of the largest and most complex retailers, including **Best Buy, Nordstrom, Office Depot, Gap Inc., Family Dollar, Old Navy, NEXCOM** (Navy Exchange), and **AAFES** (Army and Air Force Exchange Service), are turning toward inventory optimization as a means to quickly impact their top and bottom lines and significantly increase their shareholder value.

Inventory optimization is a quick win that can substantially improve the performance of replenishment systems, whether home grown or provided by a third party.

The Army and Air Force Exchange Service, for example, reaped $90 million in inventory

savings in its warehouse operations by applying Oracle's inventory optimization layered on top of its existing replenishment solution, according to Dale Linebarger, CIO. "The inventory optimization piece helped validate and get quick and easy visibility to what we know is happening," Linebarger says. Implementing Oracle IO early on also showed AAFES how its business processes needed to change as it continues its 11-module Oracle ERP project, slated for completion in fiscal 2007. Among the changes is centralization of SKU management.

AMR Research says companies that have deployed inventory optimization technologies report that these tools can improve inventory by 12% to 25%, with service-level improvements of 0.5% to 2%.

"Instead of an individual replenishing the DC and stores pulling what they need, that individual will be responsible for replenishment of the DC all the way through to store level," Linebarger says, and will make those decisions based on yesterday's sales. "We expect multiple millions of dollars in savings," once the entire infrastructure is in place.

In a May 2006 Chain Store Age Retail Technology story titled *Wall Street's Darling – A Technology Overhaul Helped Nordstrom Get Analyst and Investor Attention,* the rollout of Oracle's Inventory Optimization solution raised Nordstrom's in-stock percentage by 500 basis points, and enabled a reduction in its inventory by 3% despite an 8% increase in sales.

According to the July 13, 2006 Government Computer News article, *Navy Exchange Buys Into Inventory Control*, NEXCOM CIO Dick Garza claimed NEXCOM deployed inventory optimization in an effort to reduce inventory and costs, and to drive additional sales by improving in-stock conditions. "In fiscal year 2003, we successfully reduced inventory in our distribution centers by 13% and improved in-stock position by two-plus percentage points," said Garza. In 2005, the system helped the Navy improve retail sales by 5.2%, partly because of improved product availability.

According to Dr. Steve Banker in the ARC advisory, "When I asked one company how long their payback period was following implementation, they said they had received full payback prior to the implementation. When asked how that could be, they explained that the AIO [advanced inventory optimization] supplier came in and entered their data into the software to do an analysis of potential savings. Once the 'bake off' was done, the supplier hosted the solution and provided inventory targets while the implementation began. Twelve weeks later the implementation was complete, but the solution was already paid for prior to the company's version of the software going live."

Companies deploying inventory optimization applications report return on investment within weeks or a few months, with a 2% to 10% improvement in service based on orders shipped complete, according to AMR's *"Optimizing"* report. In a companion AMR report, *Redefining the Role of Inventory for Demand-Driven Supply Networks*, January 2005, the participants studied increased order fill rates by 2% to 13%, dramatically improving customer service levels. "The companies we interviewed reported an ROI in weeks or one to two months, with many mentioning they had never had such a fast return from a supply chain planning project."

Inventory optimization delivers dramatic results in all verticals, from fashion to hard goods to grocery. Optimized inventory provides cascading benefits, including:

- Increased inventory turns
- Improved revenue from service-level improvements
- Reduced costs from lowering excess inventory and ordering expenses
- Maximized financial objectives, such as profit and margin
- A more efficiently run supply chain

- Increased customer loyalty
- Limited planner effort required to manage inventory by exception
- Better visibility to inventory trends, at a very low level of detail
- Management-by-exception design focuses the user on the key performance measures

"Inventory optimization is one of the most attractive DDSN [demand-driven supply network] investments for three reasons," says AMR's "*Redefining*" report: quick ROI, dramatic service improvements and the movement from push to pull supply chains. "The use of probabilistic technologies for inventory optimization is clearly helping leaders gain competitive advantage in these three areas."

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Adopters of inventory optimization gain a competitive advantage over those using less-sophisticated methods, by servicing customers better while carrying less inventory.

According to the *RIS News* 16th Annual Retail Technology Study, "Advanced inventory management is critical to topline results by enabling stores to maximize sales and promotional events. Also, since it can be a way to achieve cost reductions by eliminating excessive in-stock levels it can make a major contribution to the bottom line." Inventory management applications lead the list of the merchandising applications retailers plan to deploy.

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DEMAND-DRIVEN RETAILING REQUIRES INVENTORY OPTIMIZATION

Current replenishment systems are failing on their promises. To compete in today's demand-driven retail environment, retailers must turbo-charge their replenishment systems to ensure they are right-sizing their inventories while reducing their costs and improving their service levels down to the local store. Current replenishment systems are incapable of doing this alone.

Inventory optimization is the tool that can accomplish these goals. By applying sophisticated algorithms that take into account multiple variables and multiple echelons of the supply chain, these solutions can automatically recommend balanced, targeted inventory levels that deliver the results retailers need. Companies that have already deployed inventory optimization technologies report that these tools can improve inventory by 12% to 25%, with service-level improvements of 0.5% to 2%.

"Any company that has a considerable inventory investment or is under pressure from customers to improve service levels and fill rates should be reexamining its approach to setting inventory targets and looking at how optimization tools can help," states Aberdeen Research in its April 11, 2006 Research Brief.

Inventory optimization solutions are low-hanging fruit for retailers across any market segment, with many adopters seeing a return on investment in a matter of weeks. Retailers seeking a customer-responsive, demand-driven approach should carefully consider the impact inventory optimization might have on their organizations. ■

About Oracle

Oracle Retail Inventory Optimization can help retailers balance all of the variables and constraints to create the optimal inventory balance to maximize sales and minimize inventory. Inventory Optimization uses advanced forecasting and simulation techniques to determine optimal supply chain parameters, including vendor minimums, pack size, how often an item should be ordered, and whether it should be stocked in a warehouse, cross-docked, or shipped directly from a supplier. It takes into account data such as sales volume, volatility, forecast data, seasonality, client business rules and constraints, and financial objectives. Visit www.oracle.com/retail for information on this and all of Oracle's industry-leading retail products.