



Aberdeen *Group*

Supply Chain Inventory Strategies Benchmark Report

*How Inventory Misconceptions and Inertia
Are Damaging Companies' Service Levels
and Financial Results*

December 2004

— Sponsored by —



Executive Summary

Inventory is one of the most valuable assets a company has, yet benchmark results show that most companies fail to manage it effectively. The majority of manufacturers and distributors rely on out-of-date, too simplistic, or overly localized inventory policies. By doing so, companies tie up working capital, harm customer retention, and hurt shareholder value-added. Faced with lengthening supply channels and tighter service-level demands from customers, many companies are now wholesale reexamining how to flow inventory across their supply chains and how to set inventory policies. In general, companies are finding they have been burdened with inventory misconceptions (including around Lean principles), oversimplification, corporate discomfort with changing inventory strategies, and significant underinvestment in breakthrough collaboration and optimization technology.

Business Benefits

A number of companies, however, have broken free of these constraints and are **driving 20%+ reductions in on-hand inventory and 20%+ improvements in time to market** from supply chain inventory initiatives. By changing how products are designed, how replenishment is triggered, and how inventory policies are calculated, these companies have dramatically improved financial performance and customer satisfaction.

Best-in-Class Processes Lead to Much Greater Cost and Service Improvements

| | 0-10% Improvement | 11-20% Improvement | More Than 20% Improvement |
|---------------------------------------|-------------------|--------------------|---------------------------|
| Reduced inventory carrying costs | 65% | 25% | 10% |
| Reduced lead times to customers | 68% | 15% | 17% |
| Increased perfect orders to customers | 65% | 21% | 14% |

*% of respondents achieving improvement level from their latest supply chain inventory initiative

Companies that stand out in adopting new, technology-supported processes include the HP Imaging and Printing Group, Seagate, Stryker Instruments, Deere's consumer and commercial equipment business, and a handful of consumer packaged goods firms.

Recommendations for Action

To optimize inventory investment, companies need to rethink how to stage inventory across their channels, how to use postponement and risk pooling strategies, and how to leverage the inventory capabilities of their trading partners. Technology support is critical to selecting and executing a supply chain inventory program. **Disturbingly, key supply chain inventory technologies are used by just 10-35% of companies today.** Companies should seek technology that allows them to optimize the positioning of inventory globally across supply chain tiers, rather than locally, and enables collaborative inventory processes with suppliers.



Table of Contents

| | |
|---|----|
| Executive Summary | i |
| Business Benefits | i |
| Recommendations for Action | i |
| <i>Chapter One: Issue at Hand</i> | 1 |
| Inventory Misconceptions | 1 |
| A New Opportunity for Inventory Savings | 3 |
| <i>Chapter Two: Key Business Value Findings</i> | 4 |
| How Old Is Your Inventory Strategy? | 5 |
| Supply Chain Inventory Controversies..... | 6 |
| Challenges to Inventory Improvement | 8 |
| Business Capabilities That Most Improve Inventory Management | 8 |
| <i>Chapter Three: Implications & Analysis</i> | 10 |
| The Critical Role of Technology in Inventory Management | 11 |
| Supply Chain Inventory Management: What's Working | 13 |
| Supplier Managed Inventory: What's New | 14 |
| Pull-Based Replenishment with Suppliers | 14 |
| High-Tech Supplier Example: Seagate..... | 14 |
| Moving From POs to Min/Max Replenishment | 15 |
| Medical Equipment Example: Stryker Instruments | 16 |
| Using a Virtual Inventory Bin..... | 16 |
| Postponement | 16 |
| Optimizing Inventory in Multi-Level Distribution or Manufacturing | 17 |
| New Bang for the Inventory Buck..... | 17 |
| High-Tech OEM Example: HP Imaging and Printing Group | 18 |
| Dealer Network Example: Deere & Company | 18 |
| CPG Planning Frequency Example: Hindustan Lever | 19 |
| Pressures, Actions, Capabilities, Enablers (PACE)..... | 19 |
| <i>Chapter Four: Recommendations for Action</i> | 21 |
| Laggard Steps to Success | 21 |
| Industry Norm Steps to Success | 22 |
| Best in Class Next Steps | 22 |



Table of Contents

| | |
|--|----|
| Featured Sponsors..... | 23 |
| Sponsor Directory | 25 |
| Author Profile | 26 |
| <i>Appendix A: Research Methodology</i> | 27 |
| <i>Appendix B: Related Aberdeen Research & Tools</i> | 30 |
| About Aberdeen <i>Group</i> | 31 |



Figures

| | |
|--|----|
| Figure 1: Top Pressures Causing Inventory Strategies to be Reexamined | 2 |
| Figure 2: How Companies Set Inventory Policies..... | 5 |
| Figure 3: Frequency with Which Companies Adjust Their Inventory Strategies ... | 6 |
| Figure 4: Techniques Viewed as Controversial Inside the Corporation..... | 6 |
| Figure 5: Best-in-Class Companies Achieve Better Results..... | 7 |
| Figure 6: Business Capabilities with the Greatest Positive Impact on Inventory Management..... | 9 |
| Figure 7: Adoption Rates of Supply Chain Inventory Tactics | 10 |
| Figure 8: Top Technologies for Supply Chain Inventory Management..... | 12 |
| Figure 9: Best in Class Use More Technology to Execute Their Inventory Strategies | 13 |
| Figure 10: Types of Supply Chain Inventory Strategies..... | 14 |

Tables

| | |
|---|----|
| Table 1: Cost Reduction and Service Improvement from Inventory Initiatives* | 3 |
| Table 2: Supply Chain Inventory Management Challenges and Responses | 8 |
| Table 3: Supply Chain Inventory Competitive Framework..... | 11 |
| Table 4: PACE for Supply Chain Inventory Strategies | 19 |
| Table 5: PACE Framework | 28 |
| Table 6: Relationship between PACE and Competitive Framework | 28 |
| Table 7: Competitive Framework..... | 29 |

Chapter One: Issue at Hand

Key Takeaways

- Inventory misconceptions are damaging companies' top and bottom lines.
- Best-in-class companies are achieving greater than 20% cost reductions and service improvements.
- New supply chain-oriented inventory approaches and technology are helping companies extract maximum benefit from their inventory.

Inventory is the lifeblood of supply chains. Properly managed, it drives revenue and efficiency for companies. But as the nature of supply chains changes, so must the policies used to manage inventory. According to Aberdeen's survey of supply chain professionals, companies are rethinking how they should flow inventory across their supply chains to ensure that their inventory strategies keep pace with the lengthening of supply channels and customers' tighter service-level demands.

This is resulting in a resurgence of interest in inventory management – and specifically in what Aberdeen calls supply chain inventory practices. Supply chain inventory practices involve managing the flow and positioning of inventory holistically across multiple stages in the supply chain, including suppliers and downstream partners.

As a result of this reexamination, supply chain executives are discovering that many of their preconceptions about managing and positioning inventory are dramatically wrong.

Inventory Misconceptions

- 1) **Simplistic inventory policies work well.** Companies that use ABCD inventory policies or simple weeks-of-supply rules frequently have 15-30% more inventory than they need *and* lower service levels. They hold too little inventory for items with lumpy demand and too much for items with steady demand.
- 2) **Holding all items at all levels in our finished goods network will give us the highest service levels.** Companies with multiple tiers of finished goods distribution frequently hold the wrong amount of inventory in the wrong locations and suffer out of stocks despite high inventory investments. Many of these companies should be holding some items just at their hub locations.
- 3) **It is fine for each location or tier in the supply chain to set its own service level targets and replenishment planning frequencies.** The lack of synchronized inventory policies across manufacturing stages and distribu-

Competitive Framework Key

The Aberdeen Competitive Framework defines enterprises as falling into one of the three following levels of practices and performance:

Laggards (30% of respondents) — practices that are significantly behind the average of the industry

Industry Norm (50%) — practices that represent the average or norm

Best in Class (20%) — practices that are the best currently being employed and significantly superior to the industry norm



tion tiers builds up unneeded inventory across the supply chain. In addition, firms with high-volume, high-variability environments often have replenishment planning frequencies that are too slow, creating unnecessary stock-outs *and* greater inventory costs.

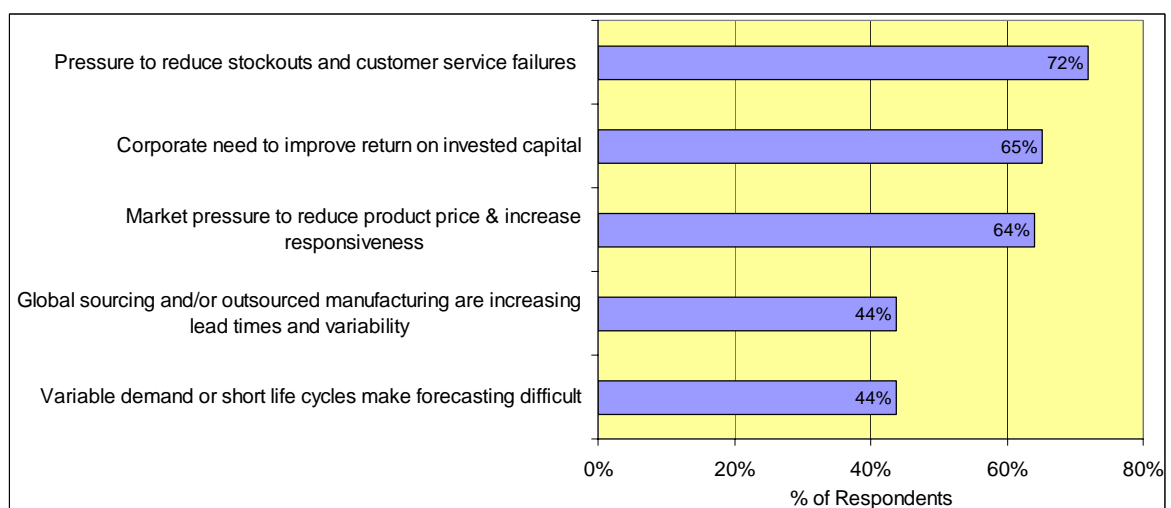
- 4) **Inventory minimization should be our goal.** Companies with strong Lean philosophies often suffer from longer-than-necessary order lead times, high total delivered costs, and service level issues because they hold too little raw material and in-process buffer stock.
- 5) **Using purchase orders or release notices for replenishment is efficient.** A growing number of companies that used to cut purchase orders or release notices for their suppliers are discovering it is more effective to ask suppliers to take responsibility for maintaining inventory between min/max levels.

These misconceptions around inventory impact both top line and bottom line revenue.

- **Top Line Revenue:** 1) Revenue loss from stock-outs and late or incomplete orders that are cancelled; 2) customer retention issues because of service failures, long lead times, and flexibility challenges
- **Bottom Line Revenue:** 1) Too much working capital tied up in inventory (also impacts the balance sheet); 2) lost manufacturing productivity and higher warehouse, labor, and transportation costs (e.g., expediting costs) caused by inventory delays or shortages; 3) profit erosion and write-offs from obsolete or declining price inventory

As Figure 1 shows, the top reasons that companies are rethinking their inventory practices are to stem customer dissatisfaction and improve return on invested capital. Best-in-class companies are twice as likely as laggards also to feel pressure due to global sourcing and demand for customized products. This is mainly because most laggards have yet to figure out how to leverage worldwide resources to deliver tailored customer solutions.

Figure 1: Top Pressures Causing Inventory Strategies to be Reexamined



Source: AberdeenGroup, December 2004

A New Opportunity for Inventory Savings

Companies today have the opportunity to adopt a combination of proven supply chain inventory practices and a new generation of inventory collaboration and multi-echelon optimization technology. Companies following this approach are reducing inventory levels

| PACE Key |
|--|
| For a more detailed description, see Appendix A |
| <p><i>Aberdeen applies a methodology to benchmark research that evaluates the business pressures, actions, capabilities, and enablers (PACE) that indicate corporate behavior in specific business processes. These terms are defined as follows:</i></p> <p>Pressures — external forces that impact an organization's market position, competitiveness, or business operations</p> <p>Actions — the strategic approaches that an organization takes in response to industry pressures</p> <p>Capabilities — the business process competencies required to execute corporate strategy</p> <p>Enablers — the key functionality of technology solutions required to support the organization's enabling business practices</p> |

across their organization, while simultaneously improving service levels and productivity. Significantly, these companies are not pushing back inventory onto their suppliers, but are helping their suppliers reduce their inventory levels as well.

As Table 1 shows, 10-17% of companies we surveyed report greater than 20% improvements in key cost and service metrics from their inventory initiatives. These companies are breaking the inertia of their old ways of planning inventory and are adopting new, technology-

supported processes.

Table 1: Cost Reduction and Service Improvement from Inventory Initiatives*

| | Reduced Inventory Carrying Costs | Reduced Inventory Obsolescence Costs | Reduced Lead Times to Customers | Increased Perfect Order % (On Time and Complete) to Customers |
|---------------------------|----------------------------------|--------------------------------------|---------------------------------|---|
| 0-5% Improvement | 26% | 34% | 40% | 37% |
| 6-10% Improvement | 38% | 32% | 28% | 28% |
| 11-12% Improvement | 26% | 19% | 15% | 21% |
| More Than 20% Improvement | 10% | 15% | 17% | 14% |

*Percentage of respondents achieving improvement level from their latest supply chain inventory initiative

Source: [AberdeenGroup](#), December 2004



Chapter Two: Key Business Value Findings

Key Takeaways

- A wide and disturbing disconnect exists between companies' corporate inventory objectives and how they actually manage inventory today.
- Many supply chain inventory approaches that could dramatically improve performance are viewed as controversial.
- Companies that try to reduce inventory across the supply chain are twice as likely to have below-average inventory carrying costs.

Rather than monitoring and managing inventory at a local level, companies are increasingly adopting supply chain-wide inventory practices. Nearly half of companies surveyed strive to reduce inventory across the total extended supply chain; by comparison, 14% of companies try to minimize their costs by pushing inventory responsibilities to their suppliers, and 38% try to minimize inventory at the local level. Companies that try to reduce inventory across the supply chain are *twice as likely* to have below-average inventory carrying costs as their industry peers.

Overall, a wide and disturbing disconnect exists between companies' corporate inventory objectives and how they actually manage inventory today.

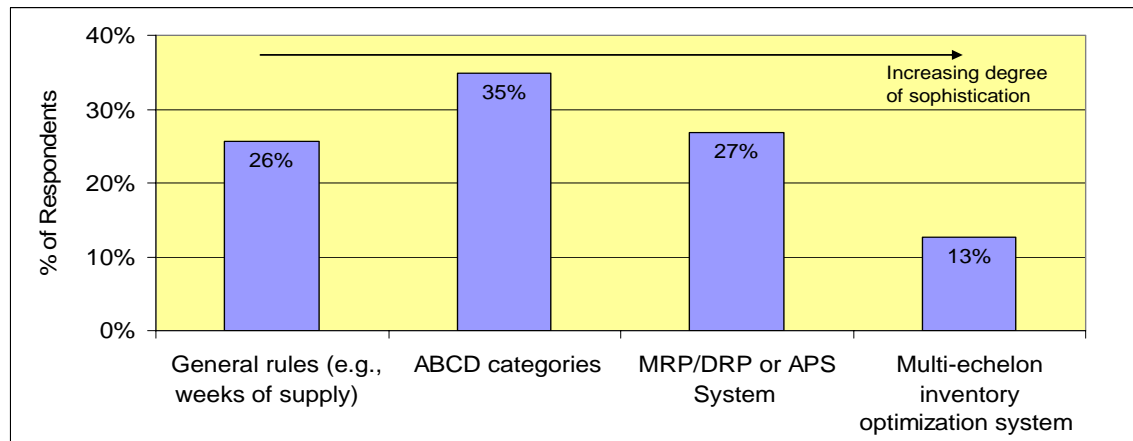
#1 Goal: Become more responsive and reliable to customers. Fully 82% of respondents say it is highly important to their company to increase service levels without increasing inventory investment. Because the amount of inventory needed to meet service levels is directly related to lead times and variability, 80% say reducing lead times and supply chain variability is also highly important to them.

Today's Disconnect: Despite companies' aspirations, *Aberdeen estimates that fewer than 5% of companies today are effectively factoring in variability across the supply chain when setting inventory policies.* Companies commonly use absolute lead times and monthly demand variation into their safety stock calculations. But other factors are also important to set optimum inventory policies, including supplier, transportation, and manufacturing lead time variability, and yield rate variability. Uncertainty in the supply chain drives inefficiencies – so to drive out inefficiencies, companies need to better understand uncertainty and its impact.

According to survey results, most firms use simple rules like weeks of supply or ABCD analysis determined by product throughput speed (Figure 2). Of firms over \$1 billion in revenue, 29% said they use general weeks of supply rules, 19% ABCD categories, and 38% an MRP/DRP or advanced planning system (APS) approach, which delivers somewhat better results. Only 13% set inventory policies using a system that simultaneously optimizes inventory policies across multiple echelons (also called levels, tiers, or stages) in the supply chain and factors in variability. Moreover, of these select companies, fewer than half take into account supply chain variability factors other than demand variability. Those that do typically report reducing on-hand inventory levels by at least 20%.



Figure 2: How Companies Set Inventory Policies



Source: AberdeenGroup, December 2004

#2 Goal: Improve financial performance. Of companies surveyed, 77% say it is highly important to their company's inventory management success to maximize profit contribution and net margin, and 76% say reducing manufacturing or distribution costs is highly important.

Today's Disconnect: Aberdeen's supply chain surveys consistently show that *companies want to optimize total delivered cost, yet respondents say they are handicapped by a lack of detailed supply chain information and enabling technology.* As a result, many companies instead become fixated on inventory cost as the key metric, with the thought that if they hold less inventory their financial performance will improve.

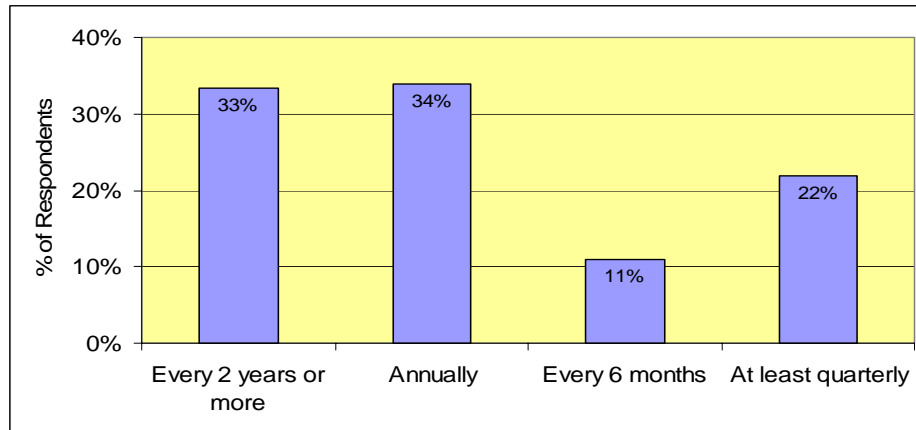
Especially in cases in which Lean processes are instituted, companies can take this "the lower the inventory, the better" philosophy too far. For one automotive manufacturer, its use of daily supplier milk runs for certain materials lowered its inventory investment, but its total costs actually increased because of higher transportation costs. For other companies, inventory levels that are too low drain financial performance by raising expediting costs, increasing manufacturing re-scheduling or downtime costs, and causing lost sales from uncompetitive lead times and stock-outs.

How Old Is Your Inventory Strategy?

Another drain on financial performance is that companies' inventory strategies are rarely kept up to date with real-life conditions. Two-thirds of companies say they update their inventory strategies on an annual or less frequent basis (Figure 3), with 13% of companies updating them every five years or more. This frequency of analysis is not sufficient given today's global sourcing and contract manufacturing strategies, which create more variability. **Survey results show that best-in-class and industry norm companies are more than 2.5 times as likely as laggard companies to update their inventory strategies and policies multiple times a year.**



Figure 3: Frequency with Which Companies Adjust Their Inventory Strategies

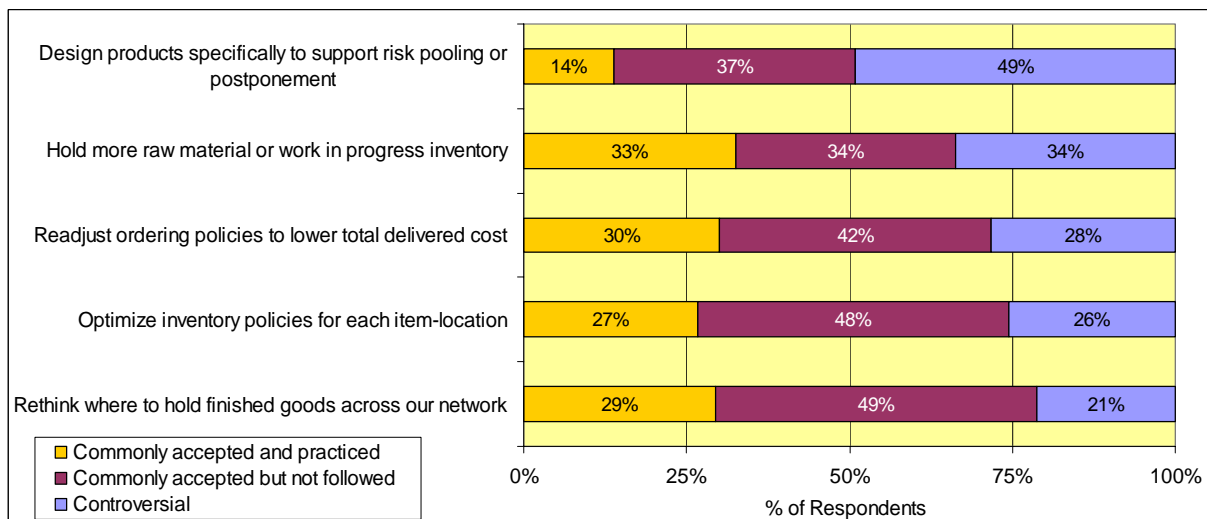


Source: AberdeenGroup, December 2004

Supply Chain Inventory Controversies

As shown in Figure 4, supply chain professionals are handicapped in their inventory management initiatives by misperceptions (blue bars) and corporate inertia (red bars). **Half of respondents say it is controversial in their company to suggest that products be designed specifically to support postponement** (in which inventory is held in a generic state until a true demand pull) or component risk pooling (in which a safety stock buffer is calculated once for a common component instead of for each of its independent demand streams), both which can lower overall inventories. A third of respondents find it controversial to consider increasing raw material or work in progress inventory, even though this may lead to shorter customer lead times and lower total delivered costs.

Figure 4: Techniques Viewed as Controversial Inside the Corporation



Source: AberdeenGroup, December 2004

For more than 10% of respondents, at least 4 out of 5 of these techniques are viewed as controversial in their organization, and 70% say at least one of these methods is considered controversial. But a lack of controversy still doesn't translate into action: Of the 30% of companies that say all these statements are commonly accepted in their organization, a third *still don't use any* of these methods. Overall, just 4% of total respondents use all these techniques, while 36% of companies employ none of them.

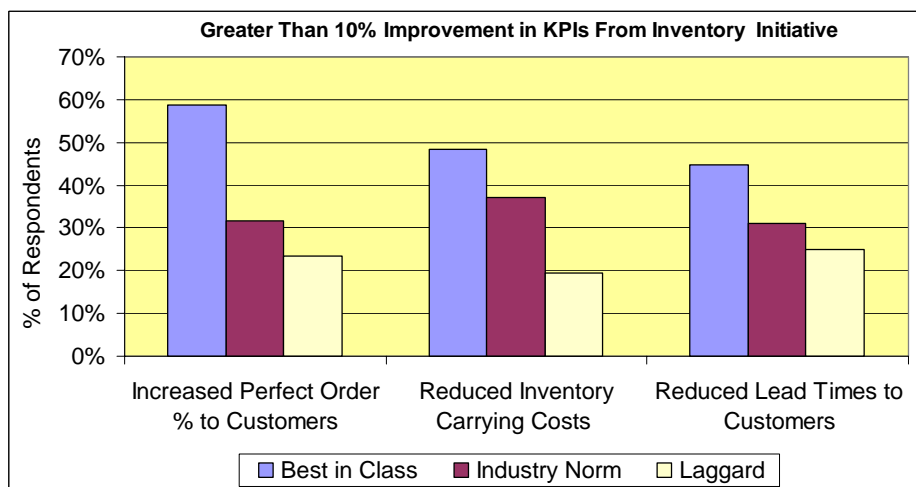
The problem is that little real analysis is done to determine the right strategies. Inventory management is largely driven by perception rather than fact – and the real answers are counterintuitive in many cases. Yet few companies employ tools beyond basic spreadsheets to validate their opinions or alternatives. As a result, many corporate strategies are too simplistic, not based on complete-enough analysis, or simply a replication of past experience in a world that has dramatically changed.

Best in Class Performance

Best-in-class companies hold much different attitudes toward supply chain inventory management than do their peers. Best-in-class organizations are half as likely as their peers to view the statements in Figure 4 as controversial and twice as likely to have adopted these practices.

Best-in-class companies achieve higher improvement rates as a result of their better inventory management practices (Figure 5). These improvements are even greater when companies apply technology to these practices, such as supplier collaboration technology or multi-echelon inventory optimization tools. These technology-enabled companies are achieving 20-30% improvements in these KPIs from their inventory management initiatives.

Figure 5: Best-in-Class Companies Achieve Better Results



Source: AberdeenGroup, December 2004



Challenges to Inventory Improvement

Table 2 shows the top challenges supply chain executives face when they try to improve inventory management. A lack of senior management support across the organization is the top-rated barrier. Without executive support that includes changes in measurement systems, programs are doomed to fail. Metrics need to be changed so that local staff members are measured on how well they follow the optimal inventory and service level policies that have been set, not on how much they can decrease inventory or increase service levels in their individual location or function.

Best-in-class respondents are much less likely than their peers to be struggling with a lack of a senior executive mandate; in fact, 50% of them report having an executive with end-to-end ownership of inventory in their company.

Companies also report having difficulty assessing the costs, risks, and benefits of changing their inventory strategies. Because inventory directly impacts customer satisfaction, revenue, and costs, companies are wary of making changes. The good news is that new modeling tools are helping companies more accurately and easily simulate the impact of making inventory strategy changes. These tools can also optimize around business objectives, such as meeting a service-level target for the customer while minimizing working capital or maximizing margin.

Table 2: Supply Chain Inventory Management Challenges and Responses

| Top-Rated Challenges | % Selected | Top-Rated Responses | % Selected |
|---|------------|---|------------|
| 1. Lack cross-functional management support to implement new inventory strategy | 58% | 1. Improve inventory, consumption, and forecast visibility with suppliers | 64% |
| 2. Hard to assess costs, risks, and benefits of changing inventory strategies | 57% | 2. Top executive mandate with cross-functional process & metric alignment | 55% |
| 3. Complexity of setting optimal service policies at item-location level | 46% | 3. Use inventory strategy and service-level optimization tool | 54% |
| 4. Difficult to collect lead-time variability and other data needed for inventory strategy analysis | 46% | 4. Improve data quality and implement continual data collection process | 53% |
| 5. Our current technology doesn't support new inventory strategies | 33% | 5. Deploy new operational-level technology (e.g., Lean manufacturing system or WMS with final assembly) | 34% |

Source: [AberdeenGroup](#), December 2004

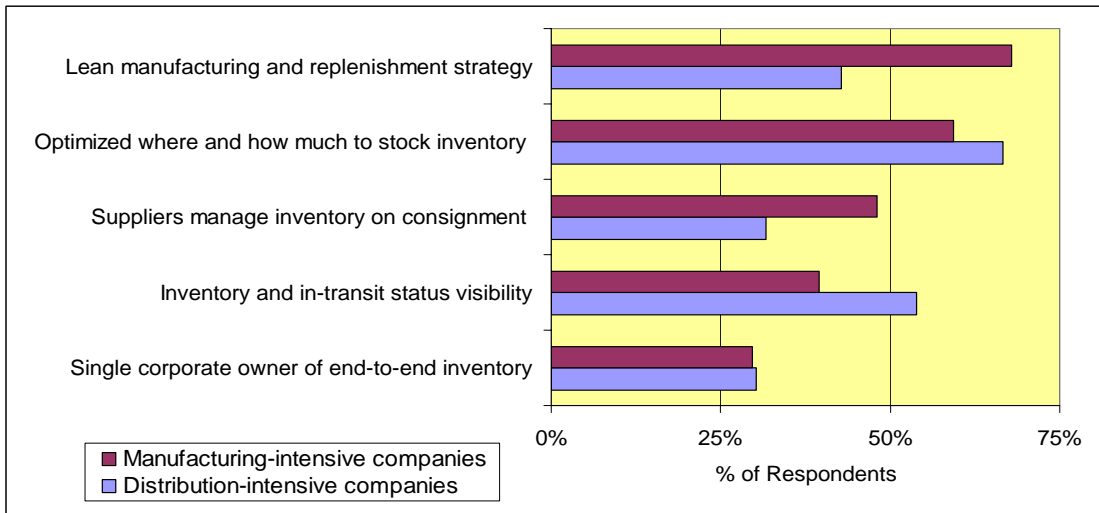
Business Capabilities That Most Improve Inventory Management

Two classes of organizations were surveyed about their inventory management practices: distribution-intensive companies and manufacturing-intensive companies.

- Distribution-intensive companies have a large percentage of supply chain costs tied up in finished goods inventory and distribution networks. These include consumer packaged goods, distribution, wholesale, and retail organizations.
- Manufacturing-intensive companies have a large percentage of supply chain costs tied up in manufacturing processes, including the management of contract manufacturers and component suppliers. These include auto, high tech, industrial equipment, metal products, and aerospace manufacturing.

Each group was asked which business capabilities had the greatest positive impact on inventory management at their company (Figure 6). For distribution-intensive companies, the most important capabilities have been inventory placement optimization and visibility of inventory and in-transit status. Manufacturing-intensive firms say they have gained the most from Lean strategies, inventory placement optimization, and supplier managed inventory (also called vendor managed inventory or VMI in some industries).

Figure 6: Business Capabilities with the Greatest Positive Impact on Inventory Management



Source: [AberdeenGroup](#), December 2004



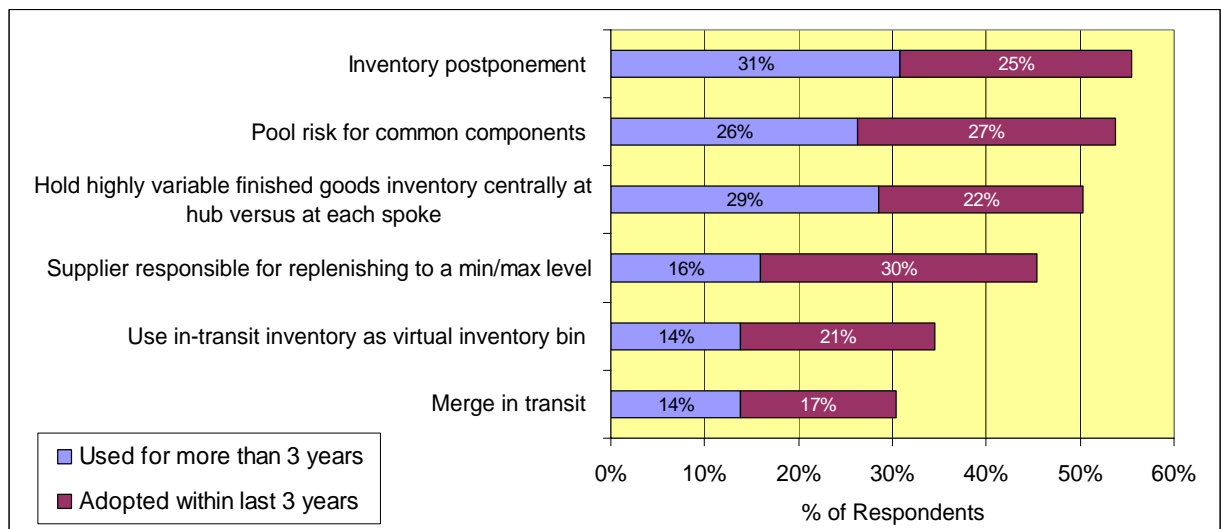
Chapter Three: Implications & Analysis

Key Takeaways

- Survey respondents doubled their adoption of supply chain inventory tactics in the past three years.
- Best-in-class companies are 50-70% more likely to use a supply chain inventory tactic.
- Companies adopting multi-echelon inventory optimization and supplier collaboration technology are achieving the greatest business benefits.

Supply chain inventory tactics such as postponement, risk pooling, and merge in transit have been around for years, but more organizations are now embracing these practices across more product types and geographies. **Survey respondents report they have roughly doubled their adoption of supply chain inventory tactics since 2001** (Figure 7). The level and sophistication of these tactics are also growing. Some 14% of firms use supply chain inventory principles along the entire life cycle of a product, including the design process. These companies maximize inventory flexibility and efficiency by designing products specifically to support potential risk pooling and postponement strategies.

Figure 7: Adoption Rates of Supply Chain Inventory Tactics



Source: AberdeenGroup, December 2004

Best-in-class companies are 50-70% more likely than their peers to use these inventory tactics. For instance, 8 out of 10 best-in-class companies perform risk pooling today, compared with fewer than half their peers. And roughly 50% more best-in-class firms use



merge in transit, which involves the simultaneous delivery of shipments from different origin points.

As shown in Table 3, survey respondents fell into one of three categories – Laggard, Industry Norm, or Best in Class — based on their characteristics in four areas: 1) process (supplier replenishment process, inventory customization process); 2) organization (inventory ownership); 3) knowledge (inventory analysis level); and 4) technology (inventory policy setting tool).

Table 3: Supply Chain Inventory Competitive Framework

| | Laggards | Industry Norm | Best in Class |
|--------------|---|---|--|
| Process | <ul style="list-style-type: none"> Hold finished goods. Treat each product separately. Send purchase orders to suppliers. | <ul style="list-style-type: none"> Some product postponement and component risk pooling. Supplier-managed min/max replenishment. | <ul style="list-style-type: none"> Postponement, risk pooling, and supplier-managed inventory strategies are a fully integrated process from product design through delivery. |
| Organization | <ul style="list-style-type: none"> Inventory handled by function and location. | <ul style="list-style-type: none"> Some cross-functional collaboration on inventory strategies. | <ul style="list-style-type: none"> Single owner of end-to-end inventory. |
| Knowledge | <ul style="list-style-type: none"> Analysis performed at an aggregate product level. | <ul style="list-style-type: none"> Some analysis by product or product family. | <ul style="list-style-type: none"> Some analysis at the item-location level. |
| Technology | <ul style="list-style-type: none"> Inventory policies set using general rules (e.g., hold 8 weeks of supply for all products). | <ul style="list-style-type: none"> Inventory policies set by ABCD categories or by MRP/DRP or APS system that evaluates one echelon at a time. | <ul style="list-style-type: none"> Inventory policies set using a multi-echelon inventory optimization system that considers variability. |

Source: AberdeenGroup, December 2004

The Critical Role of Technology in Inventory Management

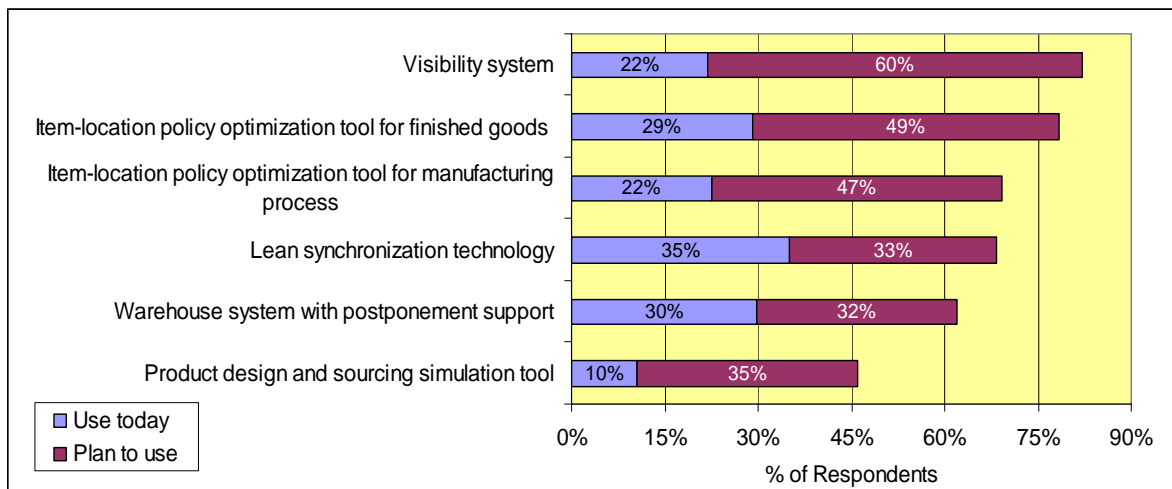
Improving supply chain inventory practices calls for a high degree of collaboration and visibility across the supply chain, as well as more sophisticated optimization. Companies that do not use technology to enable their supply chain inventory initiatives will not achieve the same level of performance. Spreadsheet methods are not sufficient in today's demanding environment because they are incapable of evaluating all of the trade-offs.

- *Companies using a tool to optimize item-location level planning were five times more likely to have inventory carrying costs below industry average than those companies that had no plans to adopt such a tool. They were also three times as likely to have cash-to-cash cycles below industry average.*
- *Companies using a visibility or supply chain event management system were twice as likely to have below average inventory carrying costs as those companies that had no plans to adopt such a solution.*



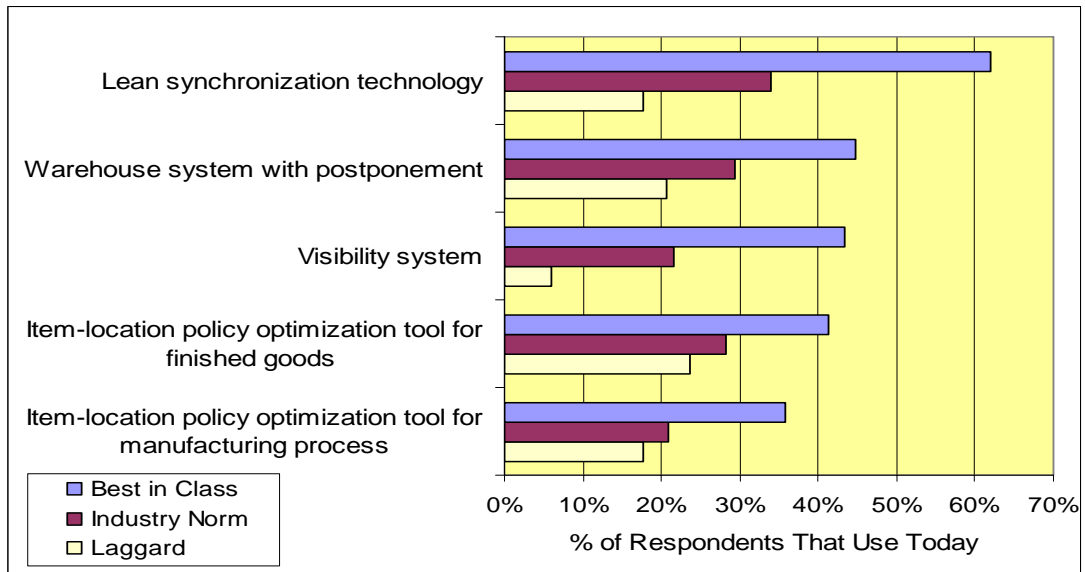
Disturbingly, key supply chain inventory technologies are used by just 10% to 35% of companies today (Figure 8). Future adoption plans, if executed, would raise that to 60% or more of companies. As shown in Figure 9, best-in-class companies are much more likely than their peers to already be applying technology to supply chain inventory management. Even when technology is used, however, most is homegrown and does not deliver the collaboration and optimization capabilities of current commercially available solutions. For instance, of the respondents that do multi-echelon optimization today, only a fraction use a tool that takes into account multiple elements of variability or time-varying demands and capacities, which are critical to achieving significant cost savings.

Figure 8: Top Technologies for Supply Chain Inventory Management



Source: AberdeenGroup, December 2004

Figure 9: Best in Class Use More Technology to Execute Their Inventory Strategies



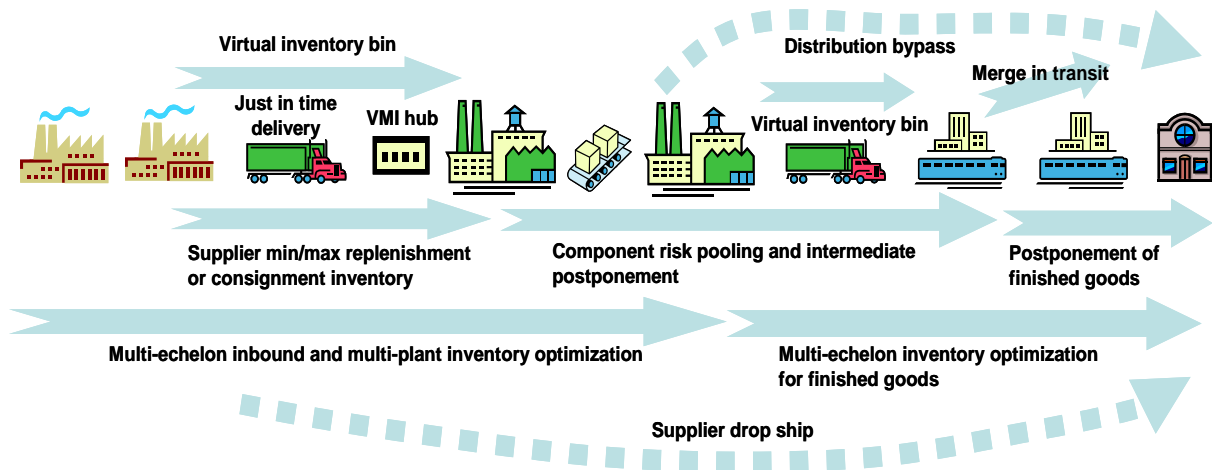
Source: AberdeenGroup, December 2004

Supply Chain Inventory Management: What’s Working

An abundance of strategies exists on how to flow and position inventory along the supply chain (Figure 10). Different product families and distribution channels will have different characteristics and respond best to different strategies. Companies will need to synchronize these strategies by channel to achieve the performance they desire. The following sections discuss strategies experiencing high degrees of innovation or adoption acceleration, such as supplier managed inventory, postponement, and multi-echelon inventory optimization, along with case studies of company success.



Figure 10: Types of Supply Chain Inventory Strategies



Source: AberdeenGroup, December 2004

Supplier Managed Inventory: What's New

Supplier managed inventory is a long-established practice that continues to grow in popularity. Fully 84% of respondents at companies with more than \$1 billion in revenue say they have suppliers manage consignment inventory for them, as do about two-thirds of mid-market respondents. However, some newer twists on this practice are providing greater benefit and lower risk for the suppliers.

Pull-Based Replenishment with Suppliers

In the traditional consignment supplier managed inventory model, the supplier builds product to a forecast and pushes product to an inbound VMI hub or other location. In this model, the supplier still owns the inventory at the hub until the buyer pulls product down. This creates higher inventory carrying costs for the supplier, as it has to own an additional bucket of inventory – and higher inventory risk.

Buyers always want more than enough inventory in the hubs. As a result, when a buyer provides a forecast, and when the forecast is off, the hub is typically left with excess inventory, which is the supplier's liability. Moving to a pull-based (rather than a forecast-based) replenishment process, as used by Lean operations, can reduce that liability. Forecasts should still be shared, but suppliers build to actual demand pulls instead.

High-Tech Supplier Example: Seagate

Seagate, a hard disc drive manufacturer, has a strategy of global manufacturing and operational efficiency. Inventory ownership and responsibility is being pushed upstream to them by their customers, and the rule of thumb for their industry is that price declines 1% per week. To increase agility and lower costs, Seagate implemented an inbound VMI program managed by third-party logistics (3PL) providers. Seagate sends kanban demand pull signals to the 3PL in real time along with a daily consumption report. The 3PL sends



a current inventory report daily to each supplier and to the Seagate plants. The 3PL also sends a hub receipt report four times a day.

To execute this information synchronization and visibility process, Seagate uses a Web-based collaboration platform that supports both browser-based data entry and access, and system-to-system messaging (in Seagate's case, RosettaNet messaging is used). All replenishments are done from pull, and lead times range from two days to two hours. As a result of this process, Seagate now owns no component inventory and no warehouses, and it has been able to generate new revenue through faster time to market.

Seagate now owns no component inventory and no warehouses, and it has generated new revenue through faster time to market.

Moving From POs to Min/Max Replenishment

Nearly half of respondents report shifting from using purchase orders and release notices to trigger supplier replenishment to having some suppliers do min/max replenishment instead. To do this, a company sets the minimum and maximum target levels for an item at a plant or other company location, and then asks the supplier to take responsibility for ensuring that inventory is maintained within that range.

Supplier collaboration technology is helping companies execute these strategies by: 1) Providing real-time views to suppliers of information, such as on-hand inventory, forecasts, current and future production schedules, and order commitments – this helps suppliers plan efficient replenishment processes. 2) Providing shared status dashboards to warn of impending problems, such as red (under the minimum), blue (over the maximum), and green (in range) indicators for inventory positions. 3) Letting a company's materials managers and purchasing agents see shipment notifications and perhaps even supplier in-process activities. With visibility to in-transit inventory, for instance, a materials manager can understand that even though on-hand inventory has dipped below its minimum target, a shipment is on its way so no action needs to be taken.

Supplier min/max replenishment can be done with or without the supplier owning the inventory at the customer. It will generate inventory savings and service level improvements to a company, while helping its supplier minimize inventory excesses and create more efficient production schedules and transportation moves.

Keep in Mind: Emerging practice is to readjust min/max targets for the supplier on a quarterly basis. Some companies that have tried weekly or daily readjustments have found that this does not give suppliers the stability they need to meet target levels and drive internal efficiencies, and that it leads to payment and performance disputes. Also, in cases where a quarterly adjustment would lead to a large drop in the inventory targets, consider implementing the reduction in steps over time, so that the supplier can more easily manage its cash flow and revenue.

Being successful with the min/max approach requires inventory accuracy and good planning systems and planners. For instance, a standard kanban process may be more appropriate if on-hand inventory accuracy is an issue.



Medical Equipment Example: Stryker Instruments

Stryker, one of the world's largest medical device manufacturers, has implemented min/max replenishment, without consignment, in its surgical instruments division. Through this program, Stryker has reduced inventory by over 30%, and some of its suppliers have seen associated inventory reductions of 25% or more, while drastically reducing stockouts.

Stryker sets monthly min/max targets for each part number and uses a supplier collaboration platform to exchange information and provide views of inventory status. Suppliers enter in promises for future ship dates with projected quantities, and they also provide advanced shipment notice (ASN) information for products shipped. A red-blue-green dashboard allows proactive, exception-based management by Stryker planners, unit managers, and the suppliers.

Switching to supplier min/max replenishment cut Stryker Instruments' inventory by 30%.

Stryker's instruments division now uses this process successfully to control 90% of its direct material purchases, including small machine shops with unsophisticated internal systems, as well as with internal distribution centers in Europe and Japan.

Using a Virtual Inventory Bin

Fully a third of respondents report using in-transit inventory as a virtual inventory bin, reallocating and redirecting in-transit inventory. By comparison, 10% of companies in Aberdeen's 2004 China Trade Benchmark Report said they reallocate and redirect in-transit inventory. Virtual inventory bins can be used both in a multi-stage manufacturing process and for finished goods inventory distribution. Using a virtual inventory bin can take a number of forms, including allocating orders while in-transit, assigning new shipping instructions to divert in-transit inventory to higher-demand destinations, and holding unallocated inventory at a deconsolidator until there is a true demand pull.

Virtual Inventory and VMI: Companies replenishing to a customer's VMI hub where there is low lead-time variability but long transit times should seek to renegotiate their contracts to enable in-transit inventory to be treated as available inventory. By providing excellent in-transit visibility and shipment reliability to the customer, firms can operate with fewer days of supply at the hub and thus lower their total inventory costs. Seagate, for instance, replenishes to its customers' just-in-time hubs and has arranged so that the available quantity in the hub incorporates both in-transit and on-hand inventory.

Postponement

Postponement is considered highly important to inventory management success by 41% of manufacturing-intensive companies and 19% of distribution-intensive companies. Postponement strategies can occur in upstream processes or in the final configuration of finished goods. Although often associated with the high-tech industry, postponement is being used across a variety of businesses, such as tractor manufacturing, in which dealers attach buckets, shovels, and other attachments based on customer orders, and tomato canning, where unlabeled cans (called "brights") are held, and customer-specific labels are applied when orders come in.



Instead of storing ready-to-ship product, warehouses supporting postponement must be capable of light assembly, kitting, or customized packaging before an order can be filled. Companies may need to upgrade their warehouse management technology to support this. Inventory modeling tools can be used to determine where, when, and how to postpone and for which product groups.

Optimizing Inventory in Multi-Level Distribution or Manufacturing

Longer, more globalized supply chains are driving interest in determining where just-in-time processes should be used, where inventory should be buffered, how much should be held, and in what state (e.g., generic product or finished good). To support these objectives, **a new generation of commercial inventory optimization technology has been created since the late 1990s.** These tools use probabilistic (stochastic) methods, taking into account the distribution of variability, rather than the traditional deterministic methods. For instance, in a lead-time distribution, 80% of shipments might have been on time, 12% may have taken an extra week, and another 8% an extra three weeks.

Multi-echelon inventory optimization tools often come up with surprising answers that may be heretical to a company's existing inventory philosophy.

- A Lean-focused equipment manufacturer had uncompetitive customer order lead times of 28 days because it was fixated on not having work in progress or raw materials. These lead times meant it could not respond to upside market demand. By holding slightly more in-process inventory, it was able to cut lead times, improve customer satisfaction, and capitalize on unexpected demand.
- A company with facilities in the U.S. and China thought it should make 80% of its items in China, but the optimal policy turned out to be to make just 18% in China.

These new multi-echelon optimization solutions differ from traditional MRP/DRP and APS systems in important ways. These include running a simultaneous optimization for all items at every individual location over multiple echelons of the supply chain. The optimization can take into account where to position inventory across tiers to take advantage of pooling and postponement opportunities, while meeting a business objective such as minimizing inventory investment or maximizing margin. These tools can also optimize the mix of customer service levels assigned to items so that the sum of all items will meet the overall objective with far less inventory expense.

New Bang for the Inventory Buck

Multi-echelon inventory optimization tools commonly drive 20-30% reductions in on-hand inventory and 10-20% improvements in time to market. For instance, within three months of adopting a multi-echelon tool, a consumer products company reduced its average finished goods inventory in one of its business segments by 25% and improved customer service levels (fill rates) to more than 99%. The improvement was across the entire supply chain, not concentrated in one set of products or at one location. The system, which runs daily, identifies optimal safety stock and inventory targets for each item and location in the multi-echelon distribution network. It sends the targets to an ERP planning system for daily planning.

Multi-echelon inventory optimization solutions are useful for doing strategic inventory flow design, tactical what-if analysis, and operational inventory policy setting.



- **Strategic-level decisions** for a manufacturer might include whether to carry inventory at a supplier and use a just-in-time pull process; identifying risk pooling or postponement opportunities; and determining the impact of moving to a contract manufacturing model. For a distribution-intensive company, decisions might include hub and spoke inventory placement and customer-specific service level policies. (For instance, if Wal-Mart asks to have service levels increased from 97% to 98%, what is the best way to provide that service level, and how much will it cost? What if the same level of service was provided to Home Depot?)
- **Tactical decisions** might include: How should inventory positions be changed to account for West Coast port delays? What would happen to inventory costs if a supplier had less variability or if we cut manufacturing processing time? If a product is in allocation mode, should we reserve inventory back at our hub for a higher-value customer and direct ship it to them? Or should we replenish inventory at the spokes?
- **Operational inventory policy setting** includes identifying optimal safety stock and inventory targets for each item and location in the multi-echelon network.

High-Tech OEM Example: HP Imaging and Printing Group

HP's Imaging and Printing Group is the global leader in inkjet supplies and printing products. In its initial employment of a multi-echelon tool, the Inkjet Supplies organization slashed on-hand inventory by 20-30%. HP uses the tool to factor in time-phased forecasts, forecast accuracy, manufacturing yields, stage times, and other variables to generate target safety stock at an item-location level, as well as total pipeline levels. Updated parameters are fed back once a quarter into HP's ERP system for execution.

Previously, a general practice was to assign all products at a location similar weeks of supply if they had similar volume or were at a similar life cycle stage. With the multi-echelon tool, HP found it was carrying too little inventory for items with special packaging, which had lumpy demand, and too much inventory for low-variability, high-volume packaging operations. The group also found that for items with long lead times, it had to increase buffer inventory at certain points in the supply chain, but that by doing this the overall service levels to customers could be improved. In aggregate, this new approach both reduced inventory *and* improved customer satisfaction.

HP's inkjet group slashed overall inventory by 20-30% by using a multi-echelon optimization tool.

Dealer Network Example: Deere & Company

Deere's Commercial & Consumer Equipment Division makes lawn equipment and utility vehicles, among other products. The division has 100 product families that it distributes to 2,500 North American dealers, five plants and associated warehouses, and several retailer consignment warehouses. Dealers had large inventories and less than two inventory turns, but they often did not have the right products in stock.

To improve its financial performance, the division adopted a multi-echelon inventory optimization tool to set time-varying inventory targets

One of Deere's divisions reduced inventory by \$550 million and avoided another \$340 million in inventory investment.



for each item at each location. Stocking levels are dynamically calculated for millions of item-locations every week, and these recommendations are automatically integrated into Deere's legacy systems each week without manual intervention. During 2003, the division reduced actual inventory by \$550 million and avoided another \$340 million in additional inventory that would have been held under the previous planning process. **This improved annual shareholder value-added by \$107 million.**

CPG Planning Frequency Example: Hindustan Lever

Driving operations and replenishment planning frequency also helps companies, especially in high-volume, high-variability environments. Hindustan Lever, a subsidiary of Unilever, is India's largest fast-moving consumer goods company, with a four-level supply chain. It moved two of its planning processes from good to great using a comprehensive multi-tier supply chain planning system. It moved its monthly operations planning process to a weekly cost-optimized process to adjust the supply chain based on changes in supply constraints and demand. It also moved from weekly manual spreadsheet replenishment plans to daily replenishment planning. The multi-tier planning technology coupled with greater planning frequency enabled the company to have a unified system that simultaneously optimized not just how to distribute available stock but also how to manufacture stock.

A CPG company increased customer service levels by more than 30% by using a multi-tier supply chain planning system and increasing planning frequency.

Hindustan Lever was able to increase its customer service levels by more than 30%, enabling it to hit 95%+ service levels. **In tandem with increasing service levels, the company was able to close down four distribution centers by removing an intermediary inventory point.** In the process, Hindustan Lever was also able to reduce its product inventory levels from 8-10 weeks of supply down to 6 weeks.

Pressures, Actions, Capabilities, Enablers (PACE)

Aberdeen's PACE (pressures, actions, capabilities, enablers) analytical framework can be used by companies to map their pressures and their current and planned strategic actions, process capabilities, and technology enablers. Compare your company's personal PACE to the PACE identified by survey respondents to see how you can adjust your plans to accelerate value for your corporation (Table 4). The survey revealed that best-in-class companies are much more aggressive in attacking the pressures by adopting multiple supply chain inventory practices and using enabling technology.



Table 4: PACE for Supply Chain Inventory Strategies

| Priorities | Pressures | Actions | Capabilities | Enablers |
|------------|---|--|---|---|
| 1 | Pressure to reduce stockouts and customer service failures | Increase service levels without increasing inventory investment | Optimized where and how much to stock inventory and where to use pull processes | Tool to optimize item-location stocking policies for finished goods |
| 2 | Corporate need to improve return on invested capital | Maximize profit contribution/ net margin | Lean manufacturing and replenishment strategy | Lean technology to enable pull-based supplier synchronization |
| 3 | Pressure to reduce product price and increase responsiveness | Reduce manufacturing or distribution costs and lead times | Suppliers manage inventory on consignment | Tool to optimize inventory policies across multi-stage manufacturing |
| 4 | Global sourcing or outsourced manufacturing increases lead times, variability, and inv. costs | Reduce lead times and supply chain variability | Inventory and in-transit status viewable across supply chain | Visibility/ supply chain event management system |
| 5 | Variable demand or short product life cycles makes forecasting difficult | Componentize product design to optimize risk pooling or postponement | Single corporate owner of end-to-end inventory | Product design and sourcing tool to evaluate product componentization and logistics options |
| 6 | Increased demand for option-intensive or customized products | Hold inventory in a less-expensive generic state | Partner performs final assembly, kitting, or packaging close to consumption point | Warehouse management system that supports final postponement activity |

Source: [AberdeenGroup](#), December 2004



Chapter Four: Recommendations for Action

Key Takeaways

- Companies need to buck conventional wisdom about how to manage inventory.
- Companies should seek technology that lets them optimize globally across supply chain tiers and that enables supplier-managed processes.
- Change management and metric realignment need to be part of the program.

To stay competitive, companies need to buck conventional wisdom about how to manage inventory. Companies need to redesign how they manage inventory across their supply chains to lower costs and improve customer service levels. Technology support will be critical to selecting and executing a successful supply chain inventory program. In particular, companies should seek solutions that let them optimize globally across supply chain tiers, rather than locally, scale for item-location policies, and enable supplier-managed processes such as min/max replenishment. Change management and metric re-alignment also need to be part of the program.

Below are recommendations for action based on a company's current maturity stage. Whether a company is trying to move its supply chain inventory practices from "Laggard" to "Industry Norm," to move from "Industry Norm" to "Best in Class," or to remain at "Best in Class" status, the following actions will help improve performance:

Laggard Steps to Success

1. *Increase supplier-managed practices that use Lean principles.*
Share more information with suppliers and give them more responsibility for keeping your company optimally supplied with inventory. Some 70% of manufacturing-intensive companies use supplier-managed inventory today, along with 56% of distribution-intensive companies. Investigate the benefits of moving to pull-based processes and just-in-time delivery as part of the program.
2. *Rethink hub-and-spoke inventory placement.*
Fully 60% of large companies surveyed report holding highly variable finished goods inventory centrally at a hub versus at each individual spoke. This method frees up working capital while improving overall service levels. Supply chain modeling tools can uncover these opportunities.
3. *Move away from simple weeks of supply and ABCD inventory policies.*
Simplistic methods lead to flabby supply chains. Companies facing high customer service levels, short product life cycles, or multi-tier manufacturing or distribution networks have the most to gain from moving toward item-location level inventory policies. Look to APS or multi-echelon optimization solutions and simultaneously look at increasing replenishment planning frequency.



Industry Norm Steps to Success

1. *Appoint a single end-to-end owner of inventory.*

Less than a quarter of companies have created a single owner for inventory across the supply chain. Without this level of accountability, local inventory reduction and service level programs will thrive. Locally optimized programs, despite their good intentions, almost always lead to higher working capital costs and service level challenges. Make sure metrics are changed so that local staff members are measured on how well they follow the optimal supply chain inventory and service level policies that have been set, while central inventory planners are compensated on how much they have been able to improve customer service levels and take out cost from the total supply chain.

2. *Act on merge in transit, postponement, and risk pooling opportunities.*

The competition is becoming much smarter in how it pools inventory and flows product, so every corporation should be re-examining its product portfolio for additional opportunities. Nearly a quarter of manufacturing-intensive companies, for instance, say they plan to adopt new postponement or merge-in-transit strategies in the next 18 months. Inventory optimization tools that allow for scenario planning help define and quantify the opportunities. Third-party logistics firms are being used by 41% of respondents for execution and planning support for strategies such as these.

3. *Accelerate Lean supply chain benefits with collaborative technology.*

Implement a supplier collaboration platform that uses a red-blue-green or similar metaphor to enable information sharing and proactive exception management. Also look at the benefits of moving to a min/max supplier replenishment model, without requiring consignment inventory. In addition, remember to readjust metrics – suppliers should be measured in red-blue-green percentages rather than on-time delivery percentage.

Best in Class Next Steps

1. *Actively manage in-transit inventory.*

Enterprises with long transit times should investigate the different ways to use in-transit inventory as a virtual inventory bin to lower safety stock levels, reduce total delivered costs, and maximize revenue opportunities.

2. *Use a commercial multi-echelon optimization solution.*

The new generation of commercially available multi-echelon optimization solutions at last enables companies to properly account for variation in the supply chain. Companies with multi-echelon manufacturing or finished goods distribution networks should not delay in investigating these solutions.

3. *Make supply chain inventory goals part of the product design process.*

Maximize inventory flexibility and efficiency by designing products specifically to support potential risk pooling and postponement strategies. Component-based design should be a tenant of your organization.



Featured Sponsors



E2open is the leading provider of software to manage inter-company processes. Companies engaged in outsourced manufacturing use E2open for cross-company inventory management, order management, demand/supply synchronization and multitier visibility to integrate trading partners across multiple tiers of distributed global supply and demand networks.

E2open software on demand for Multi-Company Process Management is the industry's only solution to combine inter-company process management functionality, event management tools, performance management capabilities and an open B2B integration platform delivered in an on demand, software-as-a-service model that results in lower total cost of ownership and shorter deployment cycles.



LogicTools (www.logic-tools.com) a leading provider of supply chain planning solutions was founded in 1995 by David Simchi-Levi, Professor of engineering systems at MIT. LogicTools provides the expertise, software, services and support that enable comprehensive supply chain planning processes in a variety of industries. LogicTools' suite of supply chain planning solutions includes network design, inventory planning, and multi-site production sourcing. LogicTools is an SAP software partner and "certified for SAP NetWeaver" for Inventory Analyst 4.0™, its inventory planning solution. LogicTools' customers include Del Monte, General Motors, IBM, Kraft Foods, Ryder System, The Timken Company, True Value Hardware, UPS, United States Postal Service, Welch's, Yankee Candle and many others.



SmartOps™

SmartOps Corporation is the market leading provider of enterprise-class supply chain software solutions that help Fortune 500 companies improve their approach to inventory planning and optimization. Based on academic advancements in supply chain modeling and algorithms, SmartOps' inventory and replenishment optimization solutions offer companies the ability to improve critical key planning targets in the presence of multi-stage complexities, inherent supply and demand uncertainties, and the need for frequent, dynamic and automated decision support. SmartOps serves customers in the petroleum/chemicals, pharmaceuticals, food and beverage, manufacturing, consumer products, wholesale, and retail industries. For additional information on the company, please visit our website at www.SmartOps.com



ToolsGroup offers the world's best inventory optimization software for the finished goods distribution supply chain. We help businesses optimize their customer service levels, while reducing inventory and operating costs.

Our 80+ customers span 28 countries, making us one of the most experienced inventory optimization software providers worldwide. Our customers are found in nearly all “distribution intensive” businesses, including consumer packaged goods, aftermarket parts, downstream process, wholesale and retail. They include such industry leaders as Colgate-Palmolive, British Petroleum, Barilla, Delphi, Dixons Group, and Castrol.

ToolsGroup stochastic optimization solutions “bolt on” to most large supply chain and ERP suites including SAP, i2, Manugistics, JDA, Oracle, JD Edwards and PeopleSoft. They are particularly powerful for optimizing challenging distribution environments requiring any of the following:

- Aggressive customer service levels (95% or more)
- Slower moving products
- Short life cycle or fashion items
- Multi-echelon distribution networks



Sponsor Directory

E2open

1600 Seaport Blvd., 5th Floor
Redwood City, CA 94063
(650) 381-3700
www.e2open.com
information@e2open.com

LogicTools

200 S. Wacker Drive, Suite 3100
Chicago, IL 60606
(888) 265-4706
www.logic-tools.com
info@logic-tools.com

SmartOps

One North Shore Center, Suite 400
12 Federal Street
Pittsburgh, PA 15212
(412) 231-0115
www.smartops.com
sales@smartops.com

ToolsGroup

246 Commonwealth Avenue
Boston, MA 02116
(617) 236-8665
www.toolsgroup.com
us-info@ToolsGroup.com



Author Profile

Beth Enslow
Vice President, Enterprise Research
AberdeenGroup, Inc.

Beth Enslow is vice president of enterprise research for AberdeenGroup. Enslow focuses on how supply chain initiatives can add value to enterprises. Her research investigates the strategies and technology necessary to increase the productivity, flexibility, and control of manufacturing and logistics operations in today's business environment.

Prior to joining Aberdeen, Enslow was senior vice president of strategic development for Descartes Systems Group, a global supply chain software company. At Descartes, she led initiatives in such areas as RFID, wireless-enabled delivery, and inventory performance management. Before that, Enslow was research director at Gartner, Inc., where she ran its supply chain planning and logistics advisory practice on a global basis. She has worked for a number of other research and consulting organizations, including the Conference Board, a leading business think tank and economic forecasting organization. Enslow is also a lecturer on transportation technology at the Center for Supply Chain and Logistics Management at York University's Schulich School of Business in Toronto.



Appendix A: Research Methodology

In November 2004, **AberdeenGroup** and *Supply Chain Management Review* magazine benchmarked the supply chain inventory management procedures, experiences, and intentions of 178 enterprises.

Responding supply chain, logistics, and operations executives completed an online survey that included questions designed to determine the following:

- The degree to which supply chain inventory management impacts corporate strategies, operations, and financial results
- The structure and effectiveness of existing supply chain inventory strategies
- Current and planned use of technology to aid these activities
- The benefits, if any, that have been derived from supply chain inventory management initiatives

Aberdeen supplemented this online survey effort with telephone interviews and additional follow-up surveys with select respondents, gathering additional information on supply chain inventory strategies, experiences, and results.

The study aimed to identify emerging best practices for supply chain inventory management and provide a framework by which readers could assess their own capabilities.

Responding enterprises included the following:

- **Job title/function:** The research sample included respondents with the following job titles: C-level officer or vice president (29%), director/manager (47%), internal consultant (16%), or staff (8%). Roughly 90% were responsible for supply chain, logistics, manufacturing, or procurement functions. The remaining respondents were in finance, customer service, or sales functions.
- **Industry:** The research sample included respondents from manufacturing, distribution and retail industries. Consumer packaged goods, consumer durables, distribution, and retail/wholesale represented 36% of the sample. Automotive, industrial equipment manufacturing, and aerospace/defense accounted for 17% of respondents. High tech, telecommunications, and medical equipment also accounted for 17%. Some 13% were in chemicals, pharmaceuticals, and metals industries. Other sectors responding included construction/engineering, mining/oil/gas, and paper/lumber/timber.
- **Geography:** Nearly 60% of study respondents were from North America. Remaining respondents were split primarily between Europe and the Asia-Pacific region, including India. Some large multinationals also had respondents from other regions.
- **Company size:** About 31% of respondents were from large enterprises (annual revenues above US\$1 billion); 42% were from midsize enterprises (annual revenues between \$50 million and \$1 billion); and 27% of respondents were from small businesses (annual revenues of \$50 million or less).



Solution providers recognized as sponsors of this report had no substantive influence on the direction of the *Supply Chain Inventory Strategies Benchmark Report*. Their sponsorship has made it possible for *AberdeenGroup* and *Supply Chain Management Review* magazine to make these findings available to readers at no charge.

Table 5: PACE Framework

| PACE Key | |
|---|--|
| Aberdeen applies a methodology to benchmark research that evaluates the business pressures, actions, capabilities, and enablers (PACE) that indicate corporate behavior in specific business processes. These terms are defined as follows: | |
| <p><i>Pressures</i> — external forces that impact an organization's market position, competitiveness, or business operations (e.g., economic, political and regulatory, technology, changing customer preferences, competitive)</p> | <p><i>Actions</i> — the strategic approaches that an organization takes in response to industry pressures (e.g., align the corporate business model to leverage industry opportunities, such as product/service strategy, target markets, financial strategy, go-to-market, and sales strategy)</p> |
| | <p><i>Capabilities</i> — the business process competencies required to execute corporate strategy (e.g., skilled people, brand, market positioning, viable products/services, ecosystem partners, financing)</p> |
| | <p><i>Enablers</i> — the key functionality of technology solutions required to support the organization's enabling business practices (e.g., development platform, applications, network connectivity, user interface, training and support, partner interfaces, data cleansing, and management)</p> |

Source: *AberdeenGroup*, December 2004

Table 6: Relationship between PACE and Competitive Framework

| PACE and Competitive Framework: How They Interact |
|---|
| Aberdeen research indicates that companies that identify the most impactful pressures and take the most transformational and effective actions are most likely to achieve superior performance. The level of competitive performance that a company achieves is strongly determined by the PACE choices that they make and how well they execute. |

Source: *AberdeenGroup*, December 2004

**Table 7: Competitive Framework**

| Competitive Framework Key |
|---|
| <p>The Aberdeen Competitive Framework defines enterprises as falling into one of the three following levels of FIELD SERVICES practices and performance:</p> <p><i>Laggards (30%)</i> — Supply chain inventory practices that are significantly behind the average of the industry, and result in below average performance</p> <p><i>Industry norm (50%)</i> — Supply chain inventory practices that represent the average or norm, and result in average industry performance.</p> <p><i>Best in class (20%)</i> — Supply chain inventory practices that are the best currently being employed and significantly superior to the industry norm, and result in the top industry performance.</p> |

Source: [AberdeenGroup](#), December 2004



Appendix B: **Related Aberdeen Research & Tools**

Related Aberdeen research that forms a companion or reference to this report includes:

- *The Outsourced Manufacturing Strategies Benchmark Report* (September 2004)
- *The Lean Strategies Benchmark Report* (June 2004)
- *The Quiet Revolution in Supplier Management* (June 2004)
- *Supplier Performance Management: What Leaders Do Differently* (June 2004)
- *The China Trade Management Strategies Benchmark Report* (September 2004)

Information on these and any other Aberdeen publications can be found at www.supplychainaccess.com or by e-mail at sca@aberdeen.com.



About AberdeenGroup

Our Mission

To be the trusted advisor and business value research destination of choice for the Global Business Executive.

Our Approach

Aberdeen delivers unbiased, primary research that helps enterprises derive tangible business value from technology-enabled solutions. Through continuous benchmarking and analysis of value chain practices, Aberdeen offers a unique mix of research, tools, and services to help Global Business Executives accomplish the following:

- **IMPROVE** the financial and competitive position of their business now
- **PRIORITIZE** operational improvement areas to drive immediate, tangible value to their business
- **LEVERAGE** information technology for tangible business value.

Aberdeen also offers selected solution providers fact-based tools and services to empower and equip them to accomplish the following:

- **CREATE DEMAND**, by reaching the right level of executives in companies where their solutions can deliver differentiated results
- **ACCELERATE SALES**, by accessing executive decision-makers who need a solution and arming the sales team with fact-based differentiation around business impact
- **EXPAND CUSTOMERS**, by fortifying their value proposition with independent fact-based research and demonstrating installed base proof points

Our History of Integrity

Aberdeen was founded in 1988 to conduct fact-based, unbiased research that delivers tangible value to executives trying to advance their businesses with technology-enabled solutions.

Aberdeen's integrity has always been and always will be beyond reproach. We provide independent research and analysis of the dynamics underlying specific technology-enabled business strategies, market trends, and technology solutions. While some reports or portions of reports may be underwritten by corporate sponsors, Aberdeen's research findings are never influenced by any of these sponsors.



AberdeenGroup, Inc.
260 Franklin Street, Suite 1700
Boston, Massachusetts
02110-3112
USA

Telephone: 617 723 7890
Fax: 617 723 7897
www.aberdeen.com

© 2004 **AberdeenGroup, Inc.**
All rights reserved
December 2004

Founded in 1988, **AberdeenGroup** is the technology-driven research destination of choice for the global business executive. **AberdeenGroup** has over 100,000 research members in over 36 countries around the world that both participate in and direct the most comprehensive technology-driven value chain research in the market. Through its continued fact-based research, benchmarking, and actionable analysis, **AberdeenGroup** offers global business and technology executives a unique mix of actionable research, KPIs, tools, and services.

The information contained in this publication has been obtained from sources Aberdeen believes to be reliable, but is not guaranteed by Aberdeen. Aberdeen publications reflect the analyst's judgment at the time and are subject to change without notice.

The trademarks and registered trademarks of the corporations mentioned in this publication are the property of their respective holders.

THIS DOCUMENT IS FOR ELECTRONIC DELIVERY ONLY

The following acts are strictly prohibited:

- **Reproduction for Sale**
- **Posting on a Web Site**
- **Transmittal via the Internet**

Copyright © 2004 Aberdeen Group, Inc. Boston, Massachusetts

Terms and Conditions

Upon receipt of this electronic report, it is understood that the user will and must fully comply with the terms of purchase as stipulated in the Purchase Agreement signed by the user or by an authorized representative of the user's organization.

This publication is protected by United States copyright laws and international treaties. Unless otherwise noted in the Purchase Agreement, the entire contents of this publication are copyrighted by Aberdeen Group, Inc., and may not be reproduced, stored in another retrieval system, posted on a Web site, or transmitted in any form or by any means without prior written consent of the publisher. Unauthorized reproduction or distribution of this publication, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent necessary to protect the rights of the publisher.

The trademarks and registered trademarks of the corporations mentioned in this publication are the property of their respective holders.

All information contained in this report is current as of publication date. Information contained in this publication has been obtained from sources Aberdeen believes to be reliable, but is not warranted by the publisher. Opinions reflect judgment at the time of publication and are subject to change without notice.

Usage Tips

Report viewing in this PDF format offers several benefits:

- **Table of Contents:** A dynamic Table of Contents (TOC) helps you navigate through the report. Simply select "Show Bookmarks" from the "Windows" menu, or click on the bookmark icon (fourth icon from the left on the standard toolbar) to access this feature. The TOC is both expandable and collapsible; simply click on the plus sign to the left of the chapter titles listed in the TOC. This feature enables you to change your view of the TOC, depending on whether you would rather see an overview of the report or focus on any given chapter in greater depth.
- **Scroll Bar:** Another online navigation feature can be accessed from the scroll bar to the right of your document window. By dragging the scroll bar, you can easily navigate through the entire document page by page. If you continue to press the mouse button while dragging the scroll bar, Acrobat Reader will list each page number as you scroll. This feature is helpful if you are searching for a specific page reference.
- **Text-Based Searching:** The PDF format also offers online text-based searching capabilities. This can be a great asset if you are searching for references to a specific type of technology or any other elements within the report.
- **Reader Guide:** To further explore the benefits of the PDF file format, please consult the Reader Guide available from the Help menu.