



The Network Approach to Inventory Management

Getting Accurate Inventory Information Across the Entire Supply Chain Stream Creates Healthy Companies

The Inventory Challenge

The problem of balancing the right level of inventory—at the right location, at the right cost—is as old as trade itself. But modern pressures such as globalization, e-commerce, and extended, multi-tiered relationships between global trading partners have created many new inventory challenges.

Inventory today is often divided among many parties, business units, and technology systems. Keeping track of inventory from one system to another, often across trading partners, can be extraordinarily difficult. The financial stake, however is serious.

The average inventory value for companies with a market valuation of \$5 billion or greater in the manufacturing, retail, pharmaceutical, distribution, and other industries, is an astounding \$1.33 billion¹, which averages out to 33% of total current assets. When inventory accounts for that much capital, how you manage it efficiently becomes crucially important.

Having excess inventory hurts return on equity and assets by tying up working capital. Inventory shortages, on the other hand, can lead to plant shutdowns, lost sales, and a loss of customer confidence. Inventory is the buffer between supply and demand variability, at multiple nodes in a complex value chain. Emerging trends such as omnichannel fulfillment in retail segments and increased outsourcing of manufacturing are on the rise, and these initiatives are greatly dependent on shared control and visibility of inventory availability upstream in the supply chain. Managing inventory skillfully has become critical to staying profitable and finding growth opportunities.

The Best Laid Plans...

Inventory has been a growing priority for supply chain executives in recent years. In fact, even as far back as 2011, 76% of companies surveyed—from a variety of demographics—responded that ‘Inventory Management Excellence’ was a high supply chain priority.² In the same survey, 52.6% of respondents said “technology” was as important as “process” for effectively managing inventories across a full supply network.

Until now, the best technology efforts to optimize inventory focused on planning. Enterprise software systems would ingest a set of inventory-related parameters and run them through intense computing algorithms to deduce what a company’s inventory levels should be. All actions and management would then follow from this plan, falling into place like dominoes: the scheduled transportation of inventory from one distribution center to another, the allocation of stock from factories, methods of transport, last mile fulfillment, etc.

¹ GT Nexus.

² Five Strategies for Improving Inventory Management. CSCO Insights. http://www.scdigest.com/assets/repsexec_brief_network_inventories.pdf

The problem is, of course, that things don't always go according to plan. In fact, when you're dealing with complex multinational, multi regional supply chains, the smallest variables can produce really amplified effects downstream. One factory losing power for a day in Asia can cause massive shortages in North America at critical points in the production cycle. Being excessively wedded to a plan prevents you from being able to adjust quickly. In the most rigid plan-driven organizations, it can take, at minimum, two weeks to recover from a disruption event (one week to identify the impact, and another to wait for the new plan to be generated and shared).

When enterprise systems were static and installed, creating the best plan possible was the most viable strategy for managing inventory. And actually, many businesses did, and continue to do just that - improve their algorithms to create better and better plans. That's fine, and planning is necessary, but what modern companies really need is agility.

From Plan to Sense & Respond

Industry leaders are beginning to shift focus from planning to execution. The best laid plans often go awry. Instead of trying to devise the perfect plan, it makes more sense to become responsive in execution. That way, when disruptions do occur, a company can adjust instantly with corrective action, minimizing the damage.

This is the main idea behind 'agile supply chains', as opposed to 'lean supply chains.' Lean supply chains focus on minimizing waste at each step in a process, particularly within the four walls of manufacturing plants or distribution centers. Just in Time (JIT) replenishment pull-signals are often used to show the minimum level of supply needed to support the next few hours of work. Agile supply chains, on the other hand, recognize that true costs come in when things go wrong, and are spry enough to react quickly to changes so they can mitigate damaging losses.

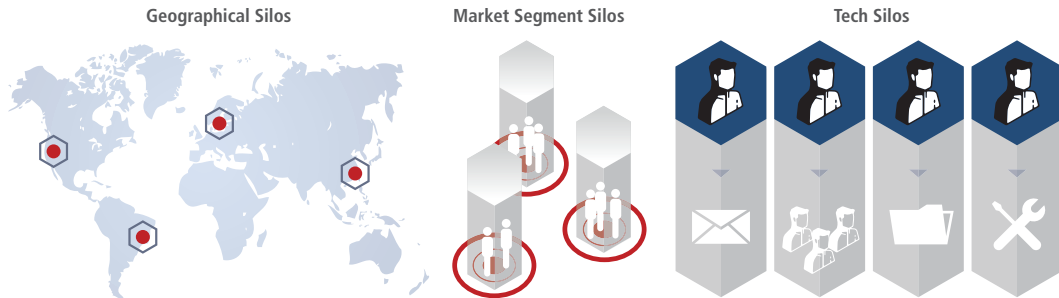
From an inventory perspective, an agile supply chain is one that can dynamically reallocate inventory where and when it's needed, in order to both prevent financial loss (as in the case of a disruption) and capitalize on fluctuating real-time demand. If a ship is delayed at a port, a business needs to be able to know, with enough time to reroute inventory from another location if needed to cover its future deficiencies. If the market for a product in Europe suddenly becomes hot, a company should be able to redirect inventory there to cash in on the demand. And true agility comes from empowering people and decisions at the edge of the network, as close to the source of supply or demand changes, instead of waiting for a centralized planning process to dictate new goals, a week later. There's a basic information model requirement to execute inventory with this kind of agility. And that's visibility.

Where is Everything?

The ability to rapidly take action requires knowing, instantly, what's happening. Where is your inventory at all times? When is it going to get somewhere? What is the current work-in-process status at key suppliers or outsourced manufacturers? What is the projected view across all open and planned inbound shipments? Getting this kind of granular real-time visibility isn't easy. It requires an information model built on transparency and, importantly, shared communication.

Communication is vital because that's usually where visibility disappears—transferring information between systems. In a complex global supply chain, there are many trading partners orchestrating together, and therefore, many systems. Visibility between supply chain partners is a prerequisite for tracking inventory throughout the supply chain, and being agile enough to handle disruptions deftly.

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Real time knowledge of inventory is normally split across many partners, regions, market segments, and technological systems, impeding global visibility.

With the rise of cloud networks, long-standing communication gaps between businesses and internal departments are disappearing. Cloud supply chain platforms connect all partners—buyers, suppliers, distributors, financial and logistics services providers—together in a centralized business network. Communication—in the form of production updates, shipment notifications, vessel tracking, warehouse locations, etc.—occurs seamlessly and automatically, without gaps. There’s no need to request information by email, phone, or fax. There’s no need to manage countless versions of spreadsheets. Every organization is tied into one, centrally-available “single source of truth”, and has the level of visibility it needs to make shared decisions about exceptions and related trade-offs between cost and service levels.

By using a cloud supply chain platform as the infrastructure for shared visibility and operational execution, inventory management becomes radically more effective.



Network inventory management via a cloud platform enables a shared “system of state” for on hand, in-transit, and projected inventory across all key trading partners in the entire network, regardless of ownership.

Inventory Data, Stage 1 - Sensing

One major way a cloud supply chain platform can deliver inventory visibility is by taking data from various sources (ports, vessels, warehouses, GPS, social media, etc.) and combining them to make predictions that inform stakeholders.

For instance, a company can track the progress of ocean shipments as they move across the sea, with hour-by-hour reconfirmations and revalidations about a given shipment's ultimate time of arrival. And if a delay occurs, the system can project how late the shipment is going to be and raise a red flag, which will appear as a notification to all parties on the cloud platform. It can also use this information to indicate when inventory changes hands, from suppliers to buyers, to optimize working capital. The system can do this granularly, with individual orders and transactions, because it's getting data from a variety of partners - enough data that it can intelligently and dynamically recalculate the ETAs of transactions as they progress.

Knowing how late something is going to be is the first step in being able to make a business decision about it. But in order to truly manage inventory well, across the globe, companies need a better picture of what a shipment delay actually means in terms of inventory and impacted service levels.

Inventory Data, Stage 2 - Responding

Let's say you look at the most current, up-to-date information about a particular shipment, and see that it's flagged to be 3 days late. What does that mean from an inventory availability perspective? What does it represent from a demand-fulfillment perspective? Does 3 days late mean you need to sound the alarm and scramble to expedite goods to a customer? Or transfer inventory from one distribution center to another? Or do you have enough inventory that you can withstand the delay? If you have buffer stock, you can probably deal with a shipment being 3 days late without major concerns. If you operate leaner, 3 days could be devastating – your warehouse might not be able to ship a key customer's order on time.

Visibility to see that your shipment is late is necessary. But in order to make proactive decisions, you need context. You need to know what an update means for your inventory.

Inventory management that's truly revolutionary uses real-time supply chain data to translate current order status into future inventory consequences. This idea of network inventory management makes use of data to provide actionable inventory context for the supply chain. By knowing what inventory levels exist in what places, network inventory management can forecast and dynamically predict what inventory levels will be based on real-time events. You can identify a potential supply-demand mismatch with as much lead-time as possible to resolve it effectively. By knowing the true state of business today, you can predict what it will be tomorrow.

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Network inventory management takes real-time supply chain information and translates it into predicted impact on service levels, working capital, and revenue.

This approach to inventory management – using network data - has another major advantage: it's vastly scalable. The data input into the prediction and inventory-translation engines can come from any source. It doesn't have to be in a certain format or come from a relational database. Any system – regardless of how it generates information – can integrate into a network-based inventory engine.

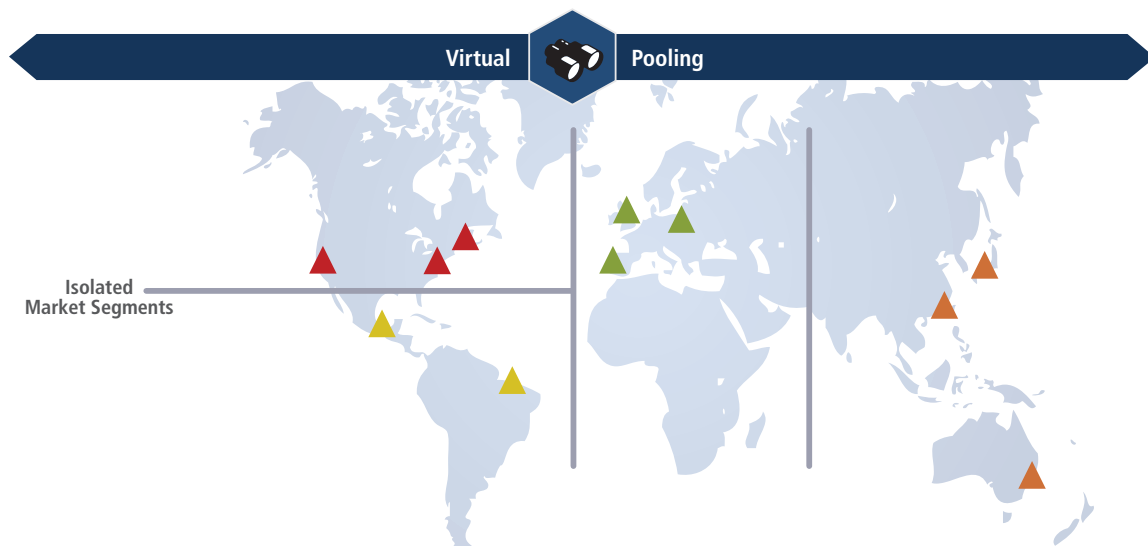
This is a more insightful way to model future inventory levels. Instead of standard analytics approaches, which use past data to predict future trends, network-based inventory management combines real-time data about current transactions with inventory information, and projects expected inventory availability into the future. If a given shipment's ETA changes, it can tell you what your new inventory levels will look like.

But perhaps the biggest value with this approach is that it allows companies to 'virtualize' their inventory into a global pool, eliminating traditional barriers and constraints.

Virtual Inventory in a Global Pool

In the past, different organizations and business units across the supply chain were separated by different technology systems, functional partitions, and geographic partitions. The supply chain cloud removes those partitions and allows them to share data about their inventory availability. In doing so, a platform can consolidate these inventory-holders across geographic, organizational, and technological boundaries to provide a single global picture of inventory.

That single global picture can then allow companies to create virtual pools of inventory. So instead of hard-allocating inventory to a specific channel, or a region, or a distribution center, companies can "soft-allocate" inventory so that it can be readily available to dynamically fulfill demand. Rerouting, mixing, expediting, and consolidating inventory becomes a fluid and flexible process that raises profitability.



Virtual inventory pooling relies on visibility into all nodes of a supply chain network. It allows businesses to pull from all available resources to fulfill demand more efficiently.

Conclusion:

Value Through Networked Collaboration and Shared Data

There is empirical data that suggests a positive correlation between good inventory management and financial returns. In fact, over 50% of companies operating complex supply chains believe they can reduce their inventory carrying costs by at least 10%³. For businesses with billions of dollars of inventory, the savings opportunity is tremendous.

By connecting with partners through the supply chain cloud, businesses can manage their inventory far more efficiently, without barriers and communication gaps. With a network platform that translates real-time supply chain data into inventory insight, businesses can allocate their resources more efficiently, in virtual pools, and respond effectively to all kinds of disruptions.

Business leaders across industries seek to shift away from adhering to pre-planned schedules. Instead, they aim to operate responsively to customer demand. With the power of community-fed big data, the supply chain cloud stands poised to radically reinvent the way businesses manage inventory. With network inventory management, the age old problem of what to carry, where, and how much is closer than ever to revealing its answer. To find out the solution, businesses need to thoroughly connect.

³ Five Strategies for Improving Inventory Management. CSCO Insights. http://www.scdigest.com/assets/repsexec_brief_network_inventories.pdf