[Home](#)

High Flying Supply Chain Visibility

Creative solutions and collaborative approaches help push first-mile supply chain visibility to match the last mile capability.

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After decades of relying on a supply chain that consisted of amassing gargantuan amounts of raw materials in warehouses, and then accessing them as needed to build airliners at its Seattle facility, the Boeing Co. entered the 21st Century wanting to implement an entirely different kind of approach.

Instead of keeping its manufacturing process largely in house, as it had done since its founding by William E. Boeing in 1916, the aerospace giant was looking to break the mold of the classic Boeing assembly strategy and take a more global approach to sourcing components of its next generation of passenger liner, the 787.

As a result, major portions of the aircraft were built in Australia; Canada; Korea; Nagoya, Japan; Foggia and

Grottaglie, Italy; Derby and Gloucester, UK, and Tulsa, Oklahoma.

What's more, Boeing not only wanted to source components differently, it wanted them assembled at two different locations, Seattle and Charleston, S.C., all the while maintaining a level of supply chain visibility where checking on any element of the supply chain was as simple as walking across its campus in Seattle.

"There's no question that Boeing, with its 787 program, has done probably the most unique and complicated deployment of our specific platform solution," says Doug Russell, vice president, Supply Chain Solutions at Herndon, Va.-based Exostar, a supply chain solutions company specializing in the aerospace and defense industries.

"They're doing both single- and multi-tier visibility and have really pushed the edge of the envelope to leverage the capabilities of our solution to establish that visibility well down into their supply chain," Russell says.

"It extends, in some cases, all the way to the raw materials like titanium and other exotic metals that are part of the 787, and it definitely represents a new approach in the aerospace and defense industry."

Exostar was established as a consortium-funded, industry-specific supply chain platform, and over the years it has provided visibility solutions for a number of heavy-weight clients, including the aforementioned Boeing, along with Raytheon, Lockheed Martin, BAE and HII.

"As is true of any provider of this kind of service, our solution is a tool that allows the buyer community to transact business with the supplier community," Russell notes. "Among the things that are different is that our supplier network is very large, probably consisting of over 100,000 supplier organizations, and our job is to enable collaboration in an often secure environment."

Russell points out that, "Toward that end visibility is definitely something the large entities we work with want as part of the functionality of the total suite of supply chain solutions we offer them."

At the most basic level what Exostar does is repurpose what it considers state of the art supply chain solutions and crafts them to the specific and unique demands of the industry partners it serves. The base code of its principle solution comes from E2open, which shares a similar lineage to Exostar.

"They started around the same time we did, in the late 1990s/early 2000s timeframe, and we kind of grew up together," Russell says of E2open. "Along the way, they acquired some intellectual property that they built on top of, and then when we partnered with them, we relicensed the IP (intellectual property) and sensitized it to the needs of our clients in the aerospace and defense industry."

Boeing calls the complicated choreography that is the 787 supply chain — five or six tiers of managed supply and demand — Partner Managed Inventory or PMI. In practice what that means is the company buys its raw materials and, figuratively speaking, places that raw material in a warehouse at the beginning of the supply chain.

Then, as a simplified example, when the need arises, it will order a titanium hinge from supplier A, who orders the machined part from supplier B, who orders the forging from supplier C, who orders the raw material out of the stock Boeing has already acquired.

"Essentially what you're doing [in a process like that] is shoring up your raw material, triggering demand from the top of the supply chain, and then monitoring the demand flow," Russell explains. "This way Boeing can watch the entire supply chain process through various updates and alerts, and have visibility into inventory at each step along the way."

"Having two assembly plants doubles the complexity of the supply chain, but having this kind of detail in their platform enables Boeing to predict the inbound impact of any delays well in advance or to demonstrate their confidence in the supply chain schedule," he adds.

Visibility and Risk Management

Of course, when one talks about "visibility" what they're talking about is something more akin to risk management and supplier risk avoidance.

Another professional helping some of the world's biggest companies do just that is Cindi Hane, vice president, Product Management at Elemica, a logistics and supply chain service provider based in Atlanta, Georgia.

Hane leads Elemica's product management team for customer management, supplier management and sourcing management solutions.

"We adhere to a purely software-as-service model and our specific focus is on two or three key areas: the chemical industry and the tire and rubber industry, along with their associated trading partners, suppliers, carriers and customers," Hane says.

The current company is the end result of a merger between Elemica, which once focused solely on chemicals, and The Rubber Network, which was a tire and rubber consortium. Elemica benefited from the synergies that exist in the two sectors, while its customers benefited from the enhanced services of a "21st Century EDI company," Hane comments.

"I think when most people think about visibility, what they really want is as much information as they can get for those periods when their inbound raw materials or their outbound finished goods are out of their control," she says.

"Regardless of the industry, the questions are the same: 'Where in the world is my stuff?' 'How much is there?' and 'When is it going to get here?'"

Typically, when a customer calls on Elemica, it's looking for an answer to a specific problem: Perhaps they're finding they expend too much manual effort in a particular part of the supply chain. On the other hand, it may be that they're simply spending too much time on the phone or exchanging emails with a supply chain partner.

"That's when we'll come in and create a solution for them. But over time, as we've matured, what we've seen are that these individualized solutions are kind of merging together to become more of a package of end-to-end supply chain solutions," Hane says.

"I think of it as our creating modular solutions that ultimately fit together as an integrated whole," she adds.

When it comes to visibility, Hane says most of Elemica's customers have attacked the lowest of the low-hanging fruit, making sure all of their trading partners adhere to the 80/20 rule and that they all have some capability for sending messages, whether it is via EDI, XML iDoc from their SAP system.

"However, what we found is, that wasn't enough automation for our customers. So we developed web portals to smooth communication even further," she recalls.

This has proven particularly beneficial to Elemica's clients who source from emerging markets.

"I think out of almost 300 suppliers, only two of them are actually sending messages. The rest are communicating with the rest of the supply chain through our web portal," Hane says.

But Elemica found that for trading partners who already had a robust data sharing system, having them also use the portal would unnecessarily force them to duplicate their data entry efforts.

"Any time you can reduce the number of times people have to enter data, you minimize the potential for error," Hane says. "So our response was to say, 'Let's give them as many different creative ways to get the data to us as possible.' We developed tools that allow trading partners to email formatted documents, which we'll then map and put in the system. So in essence, we try to insulate our customers from their partners' systems or lack thereof."

As an example, Hane points to the tire and rubber sector. "Because natural rubber is sourced from remote places in the world, global tire companies have a lot of difficulty knowing where the raw materials they've purchased are at any given time," she explains. "In response, we developed an inventory visibility system that uses ocean vessel status messages as a way to calculate the amount of inventory and use that to update our client's production planning system."

Hane continues, "Essentially, what you are doing is acknowledging that the remotest end of the supply chain is unavoidably outside the technology loop, and you're looking for the earliest possible point in the chain where electronic data is available and using that."

"But that's only the beginning of that process. Our customers still want 100 percent supply chain visibility, we still need to come up with creative and very efficient ways to get them connected."

Hane offers, "It might be saying, 'Can you email me a PDF?' 'How about you ftp us an Excel spreadsheet? Can you print to a print server?'"

"The first step in enhancing supply chain visibility is making the sharing of data as easy as possible; the next step is accelerating the rate at which we bring new partners on," Hane points out.

Building Blocks

Christopher Mazza, senior vice president of business development for International Asset Systems Ltd., describes his company as essentially being the linkage between ocean carriers and forwarders (and others with goods in transit) and the drayage trucking community.

"On the most basic level, we use technology and service to take transport work orders from the originator, an

NYK or Hamburg Süd, and give them to the trucking company," he explains. "We do that as a true SaaS provider, either through our online portal or through integration of their software systems."

He notes, "Either way, the net result, is "true visibility wherein the customer, having set out the work order, can expect to receive confirmed acceptance from the drayage motor carrier, an appointment time, and an actual delivery time.

"Then we complete the cycle by making sure invoicing is done properly and by providing them with business intelligence reporting so they can better monitor and execute their work," he adds.

Mazza says if there is a trend in visibility at the moment, it's that now that people have grown accustomed to last-mile visibility, they want the first mile of their supply chain covered as well. "As you can imagine, that's mainly Asia - China," he says.

Asked whether he too has had to find creative ways to compensate for variations in technical know-how and technological penetration in emerging markets, Mazza says, in his experience, internet access is nearly a given, as is at least some knowledge of how to use software.

"That's not a big struggle," he explains. "I remember back when we were connecting our first facilities in Indonesia. We did wonder whether or not it was going to work. Back in the day, of course, people had to have a dedicated computer and software and the like; now, with the SaaS model and internet connectivity, it's a lot easier."

But that's not to say visibility is a "slam dunk" in this second decade of the 21st Century. As has always been the case, details matter, and every region — even within the United States — presents people in Mazza's role with wrinkles they need to address.

"The first reality we have to acknowledge is that even here [in the U.S.], each company you deal with executes drayage in its own way. So as you design a visibility solution, you have to account for that distinct flavor or twist to their operation. The same is true in Europe," he says.

"Now, we've done some proofs of concept in China, and the interesting thing there was the input we received from our partners on the ground," Mazza continues. "They told us, 'Don't go after the truckers; go after these little barge operators, which are the equivalent of truckers in the U.S.'"

He explains, "When you look at the Pearl River Delta, it quickly becomes evident that drayage there isn't like drayage here. It's little barges that come up alongside the terminal where they can get two, 10 or 20 boxes, and then move them to the next stage of the supply chain.

"Now, when we looked at that, we said, 'We can do that.' The drayage process is the same, and ultimately, the container needs to be picked up and delivered at a particular location. You're going to be interacting, ultimately, with an ocean carrier or a 3PL, so the ability to leverage our capabilities was still there. It was just a matter of realizing that first mile of the supply chain wouldn't necessarily be on a road, and on the back of a truck."

He advises, "You have to figure out how people work," he added. "Once you know that, you can determine the best practice in that region for getting the information you need."

A Common Look

"I'm waiting for the day when supply chains look enough alike that I can call something the norm when it comes to a supply chain visibility challenge," says Exostar's Russell.

"The aerospace and defense industry is not state-of- the-art compared to the automotive, textiles, and maybe others, but we still have a pretty strong focus on collaborating with the supplier electronically," says Russell.

"You know, the legacy challenge for the supply chain manager is his asking, 'Where did that piece of paper from the supplier end up that said they were going to do something on a certain date?' Visibility, at the most basic level, is really about having accountability in your supply chain," he continues.

As an example, Russell points to Raytheon, which call's its Exostar-crafted solution, "Collaborative MRP."

"While they talk a lot from a futuristic standpoint of having real visibility into actual inventory, what they are more focused on in reality is visibility in terms of promises from the supplier," Russell explains. "We'll do short- and long-term planning forecasts from which to draw down blanket orders, and then get suppliers to commit against those ... because they need to know that all of the discreet components they order — resistors, transistors, diodes, capacitors — are still going to make it to the production floor when they need them. And, equally important, that they'll be there the next week and the week after that."

He adds, "At the same time, if there's going to be a hiccup in the supply chain, they need to start planning for that today. And again, that makes visibility a vital component of supply chain management."