

WHITE PAPER

Supply chain visibility: Illuminating the path to responsive, agile operations

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In Brief

Supply chain visibility is not a new concept. In fact, it's been a topic of discussion and research by supply chain experts for at least 15 years. But lately you cannot open a trade magazine, or scan your inbox without tripping over a new reference or product that offers to enable total visibility for your operation.

The purpose of this paper is to take a step back and look at what visibility really means in supply chain operations, and what it can do for you—using real world case studies—along with an outline of the conditions you need to achieve it. We are not offering a simple one-step application, nor are we trying to debunk the concept.

We intend to show how supply chain visibility is not an end, but a tool. It is the means to achieving true supply chain effectiveness, agility and ultimately, corporate profitability. In keeping with the notion of vision, supply chain visibility is like a light. It's not where you are going, it's what you use to get there. Visibility illuminates the path to continuous decision-making and allows for truly effective, agile supply chain operations.

That always-on decision-making ability is the true power of supply chain visibility, and it is the result of the availability of data and the ability to use it. To have visibility you need reliable information, constantly flowing, that is relatable into action. You need the correct tools to collect that data. And, you need integration within your own organization and with your partners.

Using real-world cases, we will show how true visibility leverages integrated, active and agile technology to enable continuous, real-time decision-making.

1. What is supply chain visibility?

With everybody talking about it, supply chain visibility has become a buzzword carrying little common meaning. It gets used to mean anything from tracking of containers to inventory control to supplier management and more.

But it is much more than any of these discrete pieces; it encompasses all of them.

“Real-time visibility is more than knowing the location of parts or products along the supply chain. Visibility should also provide you with actionable information that can help support customers, remove redundancies and improve processes,”

says Jan-Willem Adrian, vice-president of global supply chain and business development at ActiveViam, a company that offers business analytics. [1] Using a definition from a 2013 study published in the *Journal of Operations Management*, [2] supply chain visibility is: Access to high quality information that describes various factors of demand and supply.

The authors of the study elaborate: "In order for information to be of high quality it must be accurate, timely, complete and useable." [2] In addition, it must come from multiple sources, including both market level and partner level data. Market level information includes aggregated supply and demand. Partner-level data comes from supply chain partners, both sellers and suppliers. On the downstream,

or seller side it includes information such as sales data, demand forecasts and actual inventory positions. Upstream, supplier side information includes inventory levels, lead times and delivery dates, and shipment information.

You may also have heard the term 'control towers' used in relation to supply chain visibility. While this is not an area that we will explore in depth here, it bears noting that research firm Aberdeen describes a control tower as "*an end-to-end holistic view of the supply chain and near real-time information and decision making.*" [3] (For a look at some of the specific requirements, pitfalls and hype about instant decision-making, this [Kinaxis blog](#) is an interesting read).

While having all of this information at your command might seem like the ideal, you can achieve visibility step by step. You don't need the whole big picture at once; gaining insight into operational areas one at a time can deliver immense returns if that data is used proactively to generate decisions that enhance the effectiveness of operations.

2.

Why you need it?

In a single word, supply chain visibility gives you agility. Business operations today move lightning fast: consumers are fickle, e-commerce and omni-channel distribution demand the ability to switch directions instantly. Likewise, global networks expose the business to greater risks of operational disruption.

Once upon a time you could review reports monthly—then it was daily—and make a decision based on comparing and contrasting historical data. Now you don't have time to review anything—the data flows in constantly and an algorithm makes a decision for you based on sophisticated business rules and overarching strategies.

But only if your supply chain is visibility-enabled. If it's not, even having the full fire hose of data pointed right at the problem will not allow for real time decision making; you'll still be making calls about important inflections based on gut reactions and only partially crunched numbers. (3)

Let's look at some of the actual business demands that visibility will help you meet.

E-commerce

Online is approaching 12 percent of all retail sales in the US and is climbing at a rate of about 15 percent a year. [4] The changes that e-commerce requires of supply chains are immense, from meeting rapidly shifting demand, to ensuring you have the means to fulfill

customer orders—whether through home delivery or pick-up—to being able to process returns in a way that satisfies the customer.

These challenges break down into so many additional pieces: How do you manage deliveries? Whether outsourced or in-house, you have to contend with scheduling, missed appointments, traffic congestion – all the logistical issues that can make or break a distribution operation. It's a pressure-cooker unless you leverage the technological tools available to collect useable data and act on it.



Global Risk

Do you have insight into the upstream sections of your supply chain? Do you know when orders are leaving your offshore supplier's facility? When transportation links are broken, whether by natural disaster, political violence, strikes, port congestion, or trade disputes (to name only a few possibilities), how do you find out?

With world trade representing some 31.5 percent of Canada's GDP[5], and 58 percent globally[6], doing business in our globalized era means you need insight into activities in far-flung places. If there is a problem on the far side of the world, you need to know about it and must be able to act quickly to find an alternative transport route, or source of supply.

Having visibility tools in play can shine a light on the darkest, dirtiest corners of the world and give you a commercial advantage when trouble is brewing.

Regulations and Accountability

Partly thanks to global trade, supply chains are subject to increasing regulations governing sources of supply, chain of custody and chain of responsibility [For more information in Chain of Responsibility, see our [White Paper: Understanding Chain of Responsibility in the Supply Chain](#)]. You need to be able to prove your crop was produced organically, or that your factory doesn't employ child labor. You need to demonstrate that you are exercising a duty of care in your operations—from one end of your supply chain to the other. Keeping track of

all the I's to dot and T's to cross is impossible in a complex operation without technological assistance.



Asset Utilization

Capital assets are not cheap to acquire, and having to explain to senior management why they need replacing before their lifecycle should end, or explaining how you lost others, is not a conversation you want to have. But with large, complex operations, keeping tabs on assets is a challenge.

Where ARE your trucks, containers, forklifts, tools and other equipment right now? What are they doing? When were they last maintained? Are they being used efficiently, or are they sitting idle because they are lost or broken? All these questions have answers that can improve efficiency, if you know how to get them.

Human Resources

Have you heard? There is a labor shortage. Transportation rates are climbing as a result of the lack of truck drivers[7] and it is hard to find staff to work in your distribution centers. Visibility helps you to use workers more efficiently by enabling accurate dock scheduling, for example. It also makes your company a better place to work, and that translates into lower turnover and higher productivity.

Technology

Advances in technology are in many ways the driver behind the current state of global commerce. Georgia Tech, which is a leader in supply chain education notes: "Since the 1980s, computer technology has advanced at such a phenomenal rate that it is currently far ahead of the ability of the supply and logistics field to adequately utilize the new technologies." [8] Technology makes e-commerce possible, makes rapid fulfillment a reality and allows for the kind of instant communication that makes a global supply chain function at all.

Technologies like cloud computing, web services integration, mobile devices (including smartphones and voice or virtual- or enhanced-reality applications for fulfillment operations), electronic logging for truckers, and sensors that monitor the condition of product in transit are all making for a more competitive logistics environment.

Early adopters are creating their own supply chain success by leveraging technologies like these to make their operations more efficient. They are putting together the pieces that when fully integrated create the conditions for supply chain visibility.

Those who lag, resist and stand still are running the risk of being left behind. They will no longer be able to compete in the brave new world if they don't have the tech to make it happen.

3. The old way: Silos, analysts and paper

Since you are reading this paper, it's probably safe to assume you are not all the way there with supply chain visibility. Like the laggards mentioned above, you have not (yet) adopted (all) the technologies and systems that will give you the ability to responsively make decisions as they need to be made: **NOW**.

Let's take a look at how your organization might be structured:

- Do your information systems take a top-down approach to data? In other words, do things need to happen in a prescribed order for a decision to occur? Traditional sales and operations planning and ERP systems work this way, leaving no way to deal with exceptions or to adapt to unique process flows.
- Do you use manual spreadsheets and databases alongside your main information systems? Is there a lot of data being processed that's not part of the main system? Are significant resources of time and labor being spent crunching the numbers?
- Is it a nightmare to reconcile your data? Does getting the information together from all your disparate systems – ERP, WMS, TMS etc. – require a large staff of logistics analysts who do nothing else?

- Does each department operate in a self-serving way because the system rewards departmental results? Is the overall productivity and profitability of the business compromised because of this adversarial rather than cooperative environment? "The typical siloed supply chain setup leads to sub-optimal decisions, moving the problem from one area to the next," says Jan-Willem Adrian. [1]



4. Necessary conditions

Even if you answer all of these questions in the affirmative, and you feel your organization is hopelessly out of touch, the necessary conditions for gaining visibility are not out of reach.

- ✓ **On the technology side, you need fully integrated systems.** This means not only within your own operations, but also with your suppliers and vendors. There can be no system silos. You need to be able to share the identical information in real time with all the parties to the chain so that decision making is in sync. [9]

Integrated supply chains require more than just technological alignment, however. They require agreement on objectives, on metrics and lots of face-to-face collaboration.

- ✓ **You need to be relying on cloud systems.** [For more discussion of the value of the cloud see our white paper on [SaaS Supply Chain Management Systems](#)]. Cloud-based systems are the best means to a collaborative, connected supply chain, as they permit true cooperation between supply chain partners. Essential supply chain applications like transportation management (TMS), warehouse management (WMS),

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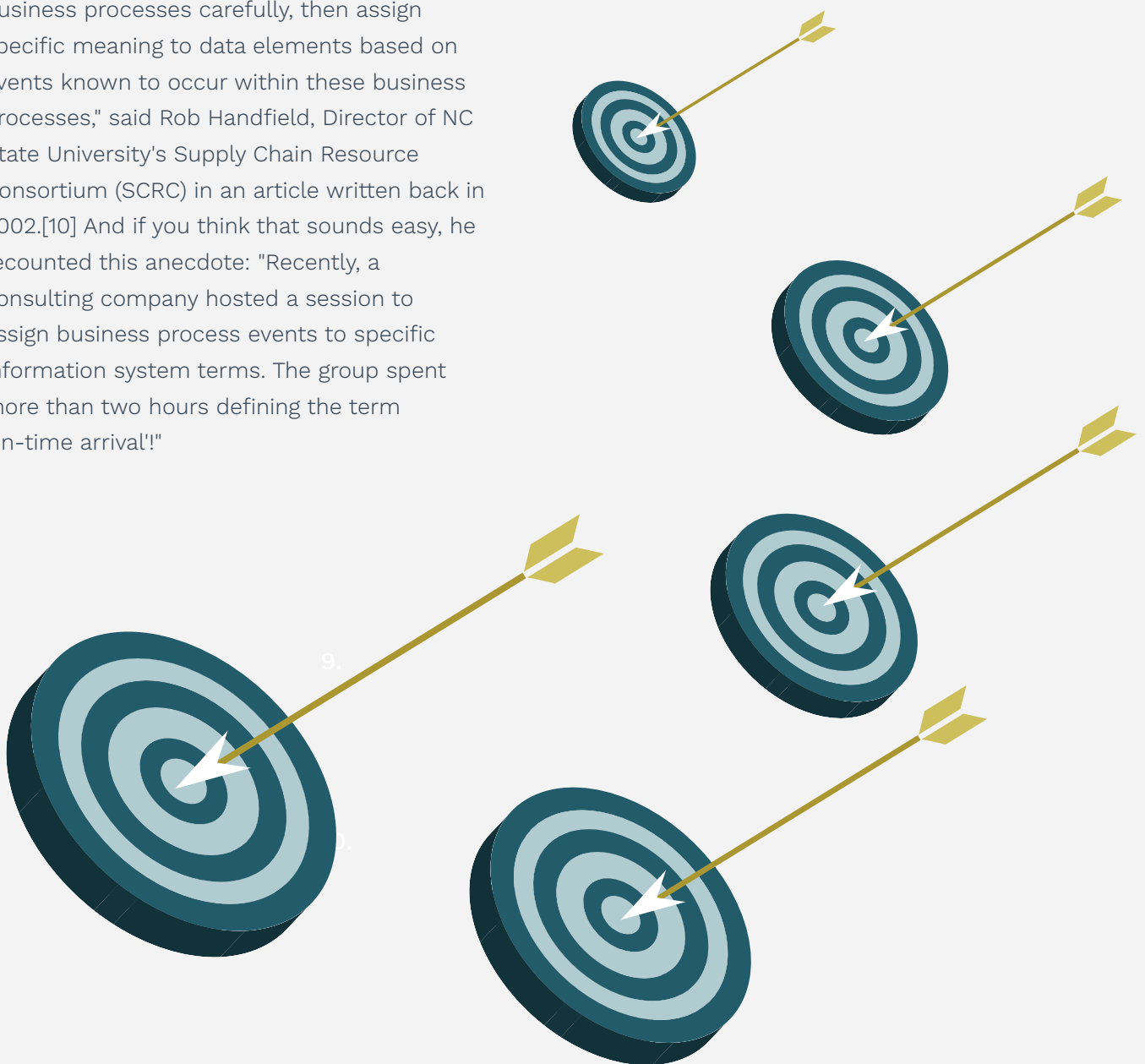
[dock scheduling and yard management](#) (YMS) are all delivered on a software-as-a-service (SaaS) model now. They offer cost-effective solutions that are scalable, easy to integrate and quick to implement. The more businesses look for visibility across their operations and beyond the more reliant they will become on cloud-based apps.

- ✓ **Along with cloud systems, you need to adopt mobile technology.** Rapid development has been the hallmark of mobile devices, to the point that the average person now carries in their pocket the equivalent of what was a supercomputer as recently as the mid-1980s [See our whitepaper: "[The Internet of Things and the Modern Supply Chain](#)"].

Mobile allows for on-the-ground communication among remote supply chain partners, as well as reliable, real-time data collection and transmission. Devices are cheap, powerful and reliable and seamlessly link up with cloud-based apps. They create the conditions for more informed and [faster decision making](#).

- ✓ **Last, to make this all work you must have reliable data.** You need to know what to collect, how often and where. It can't be random, late or intermittent. You have to be able to define specific business processes in order to get the data back you need for analysis. Otherwise it's back to that old programmer's nightmare, GIGO (garbage in, garbage out).

"Before deploying any B2B system, companies must begin at the basic level...define their business processes carefully, then assign specific meaning to data elements based on events known to occur within these business processes," said Rob Handfield, Director of NC State University's Supply Chain Resource Consortium (SCRC) in an article written back in 2002.[10] And if you think that sounds easy, he recounted this anecdote: "Recently, a consulting company hosted a session to assign business process events to specific information system terms. The group spent more than two hours defining the term 'on-time arrival!'"



5.

What it will do for you

As we noted above, there are many supply chain pitfalls and risks that visibility can help you avoid. Here are some real-world examples showing how various organizations have improved supply chain operations by employing visibility tools.

Example 1: Regulations and Accountability

Compliance with regulations is vital for a smooth-running, cost effective supply chain. Tripping over regulatory hurdles can cost you in many ways, from financial penalties to increased red tape to delayed shipments and even legal proceedings. New rules are constantly coming into effect; electronic logging for truck drivers is just one of the newest requirements in North America. Visibility tools can ensure that you have the data required to meet the regulatory requirements, while at the same time offering additional benefits.

In this [webinar](#), a consumer products manufacturer ships to destinations around the world from one central distribution center in the United States. A mix of containers and trailers come inbound and there are many outbound carrier loads. Importing and exporting represent a significant part of their business, so trade compliance and safety go hand-in-hand as the key to smooth operations.

Their challenge? Manage the risk without slowing down the pace of logistics. They achieve it by using a cloud-based system that all supply chain partners can access in order to collaborate.

Specifically, they utilize a scheduling system that was instrumental in helping them achieve step one of their C-TPAT (Customs-Trade Partnership Against Terrorism) certification. The system forces accountability through managed user access, and digital copies of shipping manifests are linked with the load/appointment data. Audits and any faults found are executed and dealt with in real time.

With an external portal for access, suppliers, clients and carriers all have real-time visibility into activities. They also get alerts on delays, faults and amendments. The central database makes it simple to execute audits.

Example 2: Site productivity

Ensuring you know what's coming and going from your docks is crucial to supply chain efficiency. Visibility into your own site's operations is key to productivity. If you know what's coming, and when, it means you have control over your inventory and can use that information to ensure you have product on the shelf or on your customer's doorstep when it's promised. Likewise, if you know where your assets are within your own yard, you can use them effectively. It also allows you to improve planning and know what your production priorities are for outbound freight. Finally, you have the ability to see and manage exceptions, in real time.

Our first case in this category involves a fruit and vegetable supplier that was experiencing daily wait times for drivers at its distribution center. Although they had a structured appointment scheduling processing place, it wasn't preventing the delays.

The problem? Both the scheduler and the carrier booking the appointment were missing critical data. They did not know how the trailer was loaded, or what type of trailer it was. To fill this void they integrated scheduling software with the WMS. The relevant information tied to the purchase orders was made available to the scheduling software. The carrier went online to complete the required information before the appointment could be approved. Using rules and algorithms, the scheduling software now calculates the best available time slots for the carrier to select. Driver wait times have been all but eliminated and dock door turnaround times have been vastly improved because the right load is arriving in the right part of warehouse at the right time.

In a second example, a manufacturer has a plant in Monterrey, Mexico and a DC in Laredo, Texas. The two sites are only 180 miles apart, but the company lost sight of its product as soon as it left Monterrey. They were unable to plan because they didn't know when the truck would get to Laredo.

This is a situation created by manual processes. The paperwork for the hand-off at the plant to the carrier, then to the Customs broker, then to the US carrier is all manual, robbing the Laredo DC of any insight into the shipment's whereabouts or projected arrival time.

With a cloud-based system now in place, the Monterrey plant enters the information about the load destined for Laredo, uploads the documentation and assigns the carrier. The departure time is captured. The broker is able to monitor the state of the load and update the system, giving the Laredo team the real-time data they need to plan for the load's arrival. A bonus: everyone is accountable and nobody can say they didn't know.



Example 3: Interaction among all parties

As we have noted, supply chain visibility is not just about sourcing and sorting your own information. At some point you also need the cooperation of your partners if you want to extend your visibility upstream and downstream. Issues such as privacy and security need to be addressed, and alignment of goals is essential.

Our first case study illustrating collaboration is a retailer managing inbound containers at a seaport. The retailer receives emails with spreadsheets containing lists of containers and POs arriving at port. Then another set of emails for clearing Customs, and another one for delivery to their distribution centers.

To address the duplication of efforts, eliminate spreadsheets and waiting for emails to arrive, the Customs broker was given access to the scheduling system. The broker uploads the information and updates it directly in the cloud-based system.

The retailer is thus able to see the load information in real time instead of waiting for the daily spreadsheet dump. Now it's easy to schedule shipments to the various DCs and assigning carriers is simplified. Users don't have to wait for the trickle-down of information after the broker emails the spreadsheet. Everything happens at once, and everybody is in the loop.

A second example involves a 3PL. Their mission is to provide warehousing and transportation services more efficiently and provide superior visibility for their clients. How do the leaders achieve this? By leveraging a collaborative platform.

A multi-tenant third-party warehouse operator wants his clients to have real-time insight into the status of inbound loads from suppliers, and outbound loads to the final customer or store. But they need to ensure that each client has complete data security and privacy. Luckily, cloud-based collaborative systems are now sophisticated enough that this is possible.

The 3PL can manage the roles and permissions of users so that carriers, suppliers and the 3PL's clients all see their own data and interact within their respective boundaries. Adding data integration feeds, supplying important shipment data such as POs, can help to further enhance productivity.

In a final example, a national retailer uses an appointment portal to schedule all the deliveries to its stores.

Suppliers receive alerts when the carrier delivers the load to the store. They can follow the progress of the delivery from the moment it leaves their facility, allowing them to avoid late deliveries and receive confirmation that the product has been received without anomalies.



Conclusion

In this paper we've looked at what visibility means in the context of supply chain. With the information included here, you now have an understanding of the conditions needed to gain visibility into your supply chain operations. Hopefully you also now have an idea of the scope of challenges that it can help to address, along with a sense of the immense power it can deliver as a tool to enable real-time, continuous decision-making.


To sum up, we do not want you to feel that visibility is the nirvana of supply chain. It is NOT the mythical end state that many aspire to but nobody achieves.

Rather, visibility should be seen as the light you shine to find your path to supply chain enlightenment. Perhaps it is the control tower we mentioned at the top—only outfitted with a lighthouse beacon.

It is the tool you use to achieve better supply chain performance. Like any light, it matters not if you are at the very beginning of the road or well on your way to the goal of supply chain efficiency and agility, visibility tools are available to help you succeed on the journey.

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Since its founding in 2000, C3 has gained the confidence of clients around the world and across many industries including retail, grocery, distribution, manufacturing and parcel post.

Headquartered in Montreal (QC), Canada and privately owned, C3 is dedicated to developing, implementing and supporting the most complete yard management and dock scheduling products on the market today.

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