



# **Networks and Multi-party Solutions for Supply Chain— Understanding the Landscape**

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***Part Two***

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## Selecting a Partner

One of the greatest responsibilities the supply chain manager can have is selecting the right technology partner. The platitude that “we live in the information age” hides the fact that many companies still don’t understand the various architectural approaches and can select the appropriate technology for their needs.

The supply chain market is awash with tech companies and lots of market buzz. However, peering behind the curtain is tough and, frankly, requires a skilled eye. One can develop such an eye, but it requires spending time and exercising due diligence to make an informed choice.

In supply chain networks, not all players’ underlying architecture *works* the same. So although some companies have large asset bases (lots of software modules and lots of network members), it does not follow that *your problem* will be solved by *their* inventory of software.<sup>1</sup>

That is why, at ChainLink, we do not arbitrarily rate providers. Rather, we provide our subscribers a *differentiated view* of *what* these players do and *how* they do it.<sup>2</sup> Before you put a huge chunk of your capital—and, most importantly, your business success—in the hands of one of these players, take the time to understand the appropriate solution for *your problem*.

This is Part Two of a two-part report. In [Part One](#), we defined some of the nuanced approaches of supply chain networks. There are many varieties of networks. And yes, they play some role in the supply chain, but there are huge differences between these networks, which we will describe later. The technology has evolved over the decades from EDI to the current cloud multi-function platform that also blends many of the emerging capabilities such as geospatial complex event processing, AI/Machine Learning, Blockchain, and IoT. These are discussed in the context of supply chain requirements.

In this Part Two we focus on highlighting some of the different functional and industry sectors and solutions and some of the major networks and multi-party supply-chain solutions. You may not have been exposed to many of these companies, but many play a vital role in your global chains. Your partners or service providers may be relying on them and thus, directly or indirectly, you are using the data they create. There is such a diversity in supply chain service providers that knowing the right network category or segment is quite important in making the short list for your consideration.

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<sup>1</sup> Interestingly, the Journal of Commerce recently wrote about the challenges that companies are having selecting systems—[Shippers Challenged to Determine Best Tech Provider](#).

<sup>2</sup> And their inclusion in our reports is not based on a quid pro quo; that is, the vendor does *not* pay a fee to get attention from ChainLink.



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## More about Multi-party and Networks

*If you want a real picture of our supply chain, you need a lot of information*, not limited to the plans and instructions to build and ship (demand, fulfillment, etc.). You need to know what is happening in the environment and products, assets, people and partners. You also need to peer into the future in a very intelligent way.

No one provider has it all, but many are on an aggressive journey to capture any and all data that could affect the performance of your chain. This is why supply chain networks are so very important, as they are designed to be inclusive of many players, locations, and types of data in your industry. In fact, there are many types and functions of networks in the supply chain today and many approaches.<sup>3</sup> It is important to understand the distinction between the supply-chain-network solution that exists *between* enterprises vs. the enterprise/in-house system's approach. A network<sup>4</sup> is essential for participants in the supply chain today, and they run the gamut from B2B/EDI solutions and a single-process solution to a multi-functional solution that solves more complex supply chain problems on the platform.

### Platform

Critically important is understanding *how* the platform communicates, optimizes, and transacts. For example, a supply chain network may have millions of members, but there is a huge difference between a site that is visited by customers, distributors, or resellers to (potentially) make a purchase, and a fully-functional hub. To build on this, since we are almost all Amazon customers, we know Amazon has account information on us. But would we consider ourselves part of Amazon's network? No. Not by our definition.

A multi-party solution, as differentiated from a network, is an environment where the parties do work and share the processes, tasks, information and policies that enable planning and operating the chain. Here, we most often see *native* or *in-the-network* software. (GT Nexus and One Network are examples of this.) A multi-party solution sits on top of a network. In contrast, in a network that functions as an "integrator," the work, rules, and data are distinct and may not even be performed in the solution, but in a user's own environment, with the network used to translate, communicate and/or transact. A trucker looking for a load or a shipper looking for a carrier often uses these kinds of networks (as well as a TMS from another provider).

Having a network is a huge value. EDI/AS2 players have had high-value networks for decades and can translate almost anything we throw at them. Many of these players have significantly expanded their repertoire and have more B2B integration capabilities today such as A2A, APIs, workflows, and so on. In EDI the work is done elsewhere and the EDI carries the message.

But beyond these, users need functional capabilities. Thus, supply-chain tech portfolio strategies will often have a few technology solutions in the mix, since participation in the "outside world" often requires the support of a unique process or task, access to or reporting of unique data or content, as

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<sup>3</sup> As described in [Part One](#)

<sup>4</sup> or possibly several



well as adherence to the standards of the industry and trading block for a specific customer. Depending on these needs, the tech strategy may also require inclusion of unique functional attributes (Table One). There are many **excellent examples of systems in supply chain** to support these needs, which may augment the major supply chain suite. Some have already been integrated within the supply chain foundation. Below are some examples:<sup>5</sup>

**Table One: Supply Chain Network Markets and Major Functions**

Functional Attributes	Description		Examples
<b>Goods Tracking</b>	<ul style="list-style-type: none"> <li>Track and trace/condition monitoring and quality</li> <li>Serialization and traceability</li> <li>More advanced solutions have many logistics planning and analytic capabilities based on AI/Machine Learning</li> <li>Further Reading: <a href="#">IoT or RFID</a> for platform solutions</li> </ul>	RFID and sensors attached to products and conveyances	<a href="#">ACSIS</a> , <a href="#">A2B Tracking Savi</a> , <a href="#">Zest Labs</a> , <a href="#">Tracelink</a>
<b>Asset Tracking</b>	<ul style="list-style-type: none"> <li>Chassis, trailers, containers, bins, pallets</li> <li>Equipment</li> <li>Movement/location</li> </ul>	Wireless, GPS, ELD and satellite capabilities providing real-time feeds	Acsis, A2B Tracking, <a href="#">Blume Global</a> , <a href="#">Navis</a> , INTTRA <a href="#">Descartes/MacroPoint</a> (wGLN) <a href="#">FourKites</a> Savi
<b>Content/Curated data and analytics</b>	<ul style="list-style-type: none"> <li>Global trade content/commerce</li> <li>Consumer data and social analytics</li> <li>Geospatial and event monitoring</li> <li>Risk monitoring of goods and suppliers</li> </ul>	Cleansed data sources as well as analytics	<a href="#">Descartes Datamyne</a> <a href="#">CargoSmart</a> <a href="#">Esri</a> Flight Line Linescape Nielsen USDA/FDA Bloomberg Thomson Reuters TransVoyant INTTRA/E2open Resilinc Zest Labs
<b>Internet of Things platforms and apps<sup>6</sup></b>	Integrate to smart equipment and devices with specific business applications that leverage device data such as predictive maintenance  More at <a href="#">Internet of Things Platforms</a>		PTC Savi Verizon Siemens GE AWS/IoT One Network

<sup>5</sup> We should note that there are many other players who would qualify as networks; many have huge networks. So, in reality, this is a short list. As mentioned, above, the network is essential, but to operate a supply chain, the software solution needs to sit on top of—be part of—the overall platform.

<sup>6</sup> It must be said that taking the big leap into IoT, for a traditional solution, is no small feat. IoT data comes from a myriad of sources—equipment with its accompanying standards-based data, content, and analytics, GPS, mobile, internet feeds—and has a lot of messy and, often, temporal data that needs to be understood, translated, cleansed, and made relevant. And it is big! Hence, the receiving system has to handle multiple protocols. Also, the data has to be complete: What is the item, the owner, the location, the environment in which the thing interacts, the time and other factors that make the signal meaningful? The system managers declare that there are challenges in data storage and security in all this.



<b>Demand and/or fulfillment</b>	<ul style="list-style-type: none"> <li>• Forecasting, which can be from shelf through supplier</li> <li>• Inventory management</li> <li>• Order management and fulfillment</li> <li>• May include some warehouse (generally WMS is an enterprise instance)</li> </ul>		One Network GT Nexus JDA, E2open, Logility, JDA, Amber Road
<b>Logistics/ Transportation</b>	<ul style="list-style-type: none"> <li>• Typically includes transportation procurement/ carrier selection, route planning and optimization, freight pay and audit, spend management, customer management</li> <li>• Rating</li> <li>• Pooling</li> <li>• Optimization</li> </ul> <p>More at <a href="#">Transportation</a> More at <a href="#">Fulfillment</a></p>	Solutions vary based on mode and leg of journey, for example, air, courier, drayage, ground, ocean, and parcel.	<a href="#">Accelya</a> <a href="#">Blume Global</a> <a href="#">BluJay Solutions</a> <a href="#">Descartes</a> <a href="#">Catapult</a> <a href="#">CargoSphere</a> CargoSmart GT Nexus MercuryGate 3GTMs Cloud Logistics/E2open SMC3 TMW And many of TM solutions
<b>Global Trade Management</b>	<ul style="list-style-type: none"> <li>• Global import/export customs</li> <li>• Import/export standards and regulations</li> <li>• Trade commerce (actually goods movement and value)</li> </ul>	Integrates between suppliers, customers, carriers, ports, and government entities	Amber Road Descartes Integration Point (now part of Thomson Reuters) Precision (QAD) TradeBeam (Aptean)
<b>Sourcing and Procurement, Supplier Management</b>	Supplier information management Sourcing—vendor/supplier selection Procure-to-Pay (P2P) Supplier risk		Ariba (SAP), Coupa Software, Oracle Eloqua, Exostar, Resilinc, SciQuest (now JAGGAER), <a href="#">Tradeshift</a>
<b>B2B Communication<sup>7</sup></b>	EDI, AS2 API, Workflow Web forms Read <a href="#">Business Transformed</a>		Cleo DiCentral OpenText Informatica TIBCO Microsoft
<b>Blockchain<sup>8</sup></b>	<ul style="list-style-type: none"> <li>• Chain-of-custody tracking, traceability, anti-counterfeiting, provenance</li> <li>• Global trade enablement</li> <li>• Supply-chain finance/trade finance</li> <li>• Procure-to-Pay</li> <li>• Spot markets &amp; marketplaces, shared resources</li> <li>• Sustainability, socially responsible supply chains</li> <li>• Cargo security, personnel background check</li> </ul>		<a href="#">IBM Food Trust</a> , <a href="#">Everledger</a> , <a href="#">Bext360</a> , <a href="#">Provenance</a> , <a href="#">TrustChain</a> , <a href="#">TradeLens</a> , <a href="#">Global Shipping Business Network (GSBN)</a> , <a href="#">300cubits</a> , <a href="#">WAVE</a> , <a href="#">Skuchain</a> , <a href="#">Sweetbridge</a> , <a href="#">T-Mining</a> , <a href="#">Blockchain for Contracts</a> , <a href="#">Data Gumbo</a> ,

<sup>7</sup> The topic of, and need for, EDI never goes away. And in spite of all the talk about [migration to platforms](#), most of the world's commerce still floats through EDI/AS2 and logging into portals and commerce sites.

<sup>8</sup> To note, Blockchain applications in supply chain show the most interest in the Maritime space where the industry has, somewhat, stayed stubbornly attached to some confusing and archaic practices. This makes it a fertile ground for stakeholders to try and leverage a leap-over technology like Blockchain to catalyze some change. In areas such as ground transportation, where most of the solution providers are keeping up, and better still, leading their customers into newer solutions, there is probably less of a foothold for Blockchain.



	<ul style="list-style-type: none"><li>• Marine insurance, cargo insurance</li><li>• Asset management and tracking</li><li>• Contract management</li><li>• Client ID/Know your customer</li></ul>		<a href="#">Insurwave</a> , <a href="#">SOLAS VGM</a> , <a href="#">KYC-Chain</a> , <a href="#">Sovrin/Evernym</a> , <a href="#">Leia 2</a>
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For all networks, as we have mentioned, keeping up with standards and, most importantly, the compliance and data formats of the network members is key.

Foundational multi-party platform solutions have within them functions as well as networks. In these networks, they have mastered the art of being totally inclusive to incorporate variations in data models, yet be highly collaborative to allow sharing across diverse data models. These multi-party models allow organizations to leverage unique rules that may be used for one scenario or customer, and which can be configured (turned on or off) to use under specific circumstances. Importantly, data, workflows, and so on can be supported system-wide common or *locally*, i.e., applied to only a subset of all participants on the network. That subset could be *industry-specific, ecosystem-specific, or enterprise-specific data or processes*. The diversity of customers and supply chain issues requires *highly dynamic adaptive*<sup>9</sup> capabilities to meet all eventualities.

Though there are many tasks and processes within a chain that may benefit from a multi-party platform, not everyone will really require it. For example, a single warehouse operation mostly exists as an enterprise instance, whereas for a process like drop-ship, the warehouse may need to support multiple parties (warehouse operation, channel partner, end customer, and carriers) and/or a retailer or OEM who many need to source from several suppliers.

In a broader context, many firms just need connections to *their* partners. For example, in demand collaboration a retailer or OEM and their suppliers who share highly secure information don't need a broad network—*just their partners*. Conversely, some networks have a more speculative/just-in-case approach to building out their network populations, which becomes useful in many use cases.<sup>10</sup>

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<sup>9</sup> Convening traditional standards bodies is not efficient enough to keep up with the pace of change and dynamic nature of today's supply-chain networks. Automated and centralized decision-making approaches are required to keep up with the incessant changes to data and process models.

<sup>10</sup> For example, a B2B/EDI network secures connections to the top companies in an industry such as the top 25 retailers, since the assumption is if you are a consumer product company, you will be selling to one or many of these retailers; or a freight broker or shipper who is looking to find carriers; or a buyer/procurer who is looking for competing suppliers for a new widget.



## The Integration Dilemma

In all types of platforms, as you may [recall from Part One](#), data standards adherence and translation is managed by the supply chain provider, ensuring that transactions are successful. That is foundational.

But behind—or within—the environment is the challenge of integration. I truly wish we could find some hierarchy of integration levels. At one extreme (which is often in practice) is a labyrinth of integrations—APIs, EDI, inter-enterprise workflows, and so on. In spite of what goes on in the solution to harmonize, there is still disjointing between parties due to segmentation of user environments. At the other end is an all-inclusive platform where all the supply chain work is done within the platform (in the cloud) and, subsequently, other systems like ERP and accounting are updated. More and more, this is a model that the larger multi-party tech companies seek to provide, adding more functionality and capabilities to their platform (note the many recent acquisitions in the market<sup>11</sup>).

The idea in these networks and multiparty is this: *There is nowhere else to go*. It is all in one platform. But for that approach to work, the multi-party solution would also have to have the *in-network* software, rather than a side-by-side software modular approach (with an integration layer on the top). We do see, and there will continue to be, a mix of approaches, since so many companies have already heavily invested in their existing software, which they often work well with. Hence, most adoptions are of a single function/process. But not all! The more virtual and dynamic the environment is, the more a robust network becomes essential.

Furthermore, even if a single network has all the functionality a company needs, it will never be the case

### Rich Data Examples for Today's Complex Chains:

- Video
- Voice
- Social
- RF, Mobile, GPS
- Sensor data: vibration, temperature
- Unstructured data
- Geospatial
- Weather
- Location data for vehicles, goods and/or people, asset moves/directionality, altitude of assets and/or people
- Foot traffic
- Traffic
- Geo/environmental conditions
- Remote Machine conditions, such as:
  1. Time Phased Vibration Data
  2. Time Phased Pressure and Temperature Data
  3. Time Phased Humidity Data
  4. Time Phased Orientation Data
  5. Time Phased Speed and Acceleration Data
  6. Time Phased Rotational Speed and Acceleration Data.
  7. Time Phased Flow Rates
  8. Time Phased Electrical Data (Voltage, Current, ...)
  9. High Frequency Telematics Data Collection for GPS and Elevation Data
  10. High Frequency Telematics Data Collection for Equipment Performance (Energy Output, Energy Consumption, Carbon Consumption and Generation, Usage, etc....)
  11. Quality Metrics such as Test Metrics, Test Results, Test Programs and Procedures, Quality Violations, etc.
  12. Non-discrete tracking such as blending, fluid, and gas consumption tracking

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<sup>11</sup> Such as E2open's foray into transportation with their acquisitions of Cloud Logistics and INTRTA; as well as Descartes' continuous ingestion of acquisitions, expanding beyond their logistics capabilities.





that all companies are running on the same network.<sup>12</sup> Consequently, the concept of inter-network integration will become increasingly important.

Today's supply chains also require richer sources of data to fulfill their vision (see sidebar). That points to new partners and data sources and types of data feeds, such as streaming video, sensor data, and analogue information (that needs to be transformed to digital). Robust data quality measures need to be applied to all of these streams, as well.

Innovative approaches in the supply chain provider's portfolio include data quality cleansing, monitoring of data streams, remapping and translating, the use of canonical data models and, today, also, the application of machine learning to not only evaluate the quality of the data, but to sense for important changes that might need to be included in that ever-changing supply-chain data model. This is Master Data Management at its most dynamic. ([AdapLink](#) from Logility is an example of this.)

## Some Examples

We offer a look at some of these multi-party supply chain solutions today. Many go beyond the concept of traditional planning and execution systems. Some are included to point out that there are essential elements—stages in the supply chain process—that are being performed, often without the recognition of the supply chain many users.

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<sup>12</sup> This is similar to the fallacy pushed by ERP providers in their early days—that they could solve a company's internal integration problems, since they could run everything on a single platform. In fact, no company of any size runs everything on a single system, no matter how comprehensive the ERP functionality is. They all have to integrate multiple best-of-breed and, often, multiple instances of ERPs. Similarly, there will never be a single network that all of a company's trading partners are running all their functionality on, in network. Therefore, integration is a perennial problem that must be solved. However, it is still true that including more and more functionality in the network itself reduces the disconnects and differences that arise when optimization and execution are run on individual enterprise systems, with the network providing only message-based interconnectivity.



**Table Two: Supply Chain Multi-party Network Example**

Provider	Overview	Recent Acquisitions	Industries
<a href="#">Amber Road</a>	<p>Amber Road provides global trade management applications covering logistics, compliance, supplier quality management, sourcing and more.</p> <p>The platform provides <i>visibility</i> into sourcing, purchasing, manufacturing WIP, quality, logistics, trade compliance, finance, and product development.</p>	<p>The acquisition of ecVision in 2015 broadened the platform scope beyond GTM/transportation to include visibility to activities that begin early in the product lifecycle—sourcing, supplier management, risk and quality testing, factory production and order management, and shipment preparation.</p> <p>We may see more acquisitions in the future as Amber Road is looking to grow beyond its roots in logistics and compliance into a broader multi-enterprise supply-chain business network.</p>	<ul style="list-style-type: none"> <li>• Retail/CPG</li> <li>• Healthcare/Pharma</li> <li>• Oil and gas</li> <li>• High technology</li> <li>• Automotive</li> <li>• Electronics</li> <li>• Transportation</li> <li>• Manufacturing</li> </ul>
<a href="#">Blume Global</a>	<p>Blume Global offers integrated solutions for asset lifecycle management, logistics execution, end-to-end visibility, supply chain optimization, and freight audit &amp; pay to help retailers, manufacturers, and CPG companies orchestrate their global supply chain networks. Blume provides visibility at the shipment level and at the SKU level of inventory at-rest and in-motion for proactive planning and issues management; multi-mode transport visibility for road, ocean, rail, air, barge, etc.; and multi-mode connectivity for real-time tracking for API, EDI, IoT and data streaming.</p>	<p>Blume Global was formerly known as Rez-1. Rez-1 acquired International Asset Systems in 2016. Blume is owned by the Swedish private equity group EQT.</p>	<ul style="list-style-type: none"> <li>• Logistics for global shippers including <ul style="list-style-type: none"> <li>• Retail</li> <li>• High tech</li> <li>• CPG</li> </ul> </li> </ul>
<a href="#">Descartes</a>	<p>Descartes System Group was an early innovator of SaaS and cloud-based logistics. They developed and still sustain the largest multi-modal logistics network, the Descartes Global Logistics Network (GLN), which is core to all the other logistics applications they provide. Descartes' capabilities span end to end across all modes: ocean, air, and ground, warehouse and logistics services, pool operations, and ecommerce fulfilment. A unique focus in global trade analytics and data as well as customs processing (import/export compliance). Descartes is the foundation cloud solution for IATTA for the air carrier sector.</p> <p>Descartes has a parallel network, the wGLN (Wireless Global Logistics Network), which includes ELD, GPS, mobile and other devices. This supports/feeds information into planning, routing, optimization, tracking, and various reporting requirements.</p>	<p><a href="#">MacroPoint™</a> expands the carrier network and carrier visibility. This is beyond the EDI signals of the carrier's "business office." It uses the on-board electronic logging devices, smartphones and other technology to track actual vehicles.</p> <p>Velocity Mail™ also expands the GLN by connecting commercial airlines and their logistics partners with government postal authorities around the world. Using Velocity Mail's network, global air carriers leverage mobile devices to accurately track shipments and deliveries in real-time. Velocity Mail automates the entire shipment process from route generation to accounting reconciliation, simplifying operational processes for the air carriers, ground handlers, and postal authorities.</p> <p><a href="#">Datamyne™</a> and <a href="#">CustomsInfo™</a> were significant acquisitions, making Descartes the leader in Global Trade Management and Trade Data. With Datamyne, users can develop commercial intelligence for businesses, principally in the transport sector that supports trade, and in vertical industries that operate on a global basis.</p> <p>More acquisitions here:  <a href="https://www.descartes.com/descartes/global-leader-uniting-logistics-intensive-businesses-commerce/recent-acquisitions">https://www.descartes.com/descartes/global-leader-uniting-logistics-intensive-businesses-commerce/recent-acquisitions</a></p>	<ul style="list-style-type: none"> <li>• Apparel and Footwear</li> <li>• Retail</li> <li>• Wholesale/Distribution</li> <li>• Food &amp; Beverage</li> <li>• Chemicals</li> <li>• Manufacturing</li> <li>• Airlines/Air Carriers</li> <li>• Ocean Carriers/NVOCC</li> <li>• Freight Forwarders</li> <li>• Customs Brokers</li> <li>• 3PL</li> <li>• Trucking</li> <li>• Parcel Carriers and Couriers</li> </ul>



<p><a href="#">Exostar</a></p>	<p>While other networks focus on the commerce side of supply chain (plans and execution), Exostar has expanded from a supplier network to include the critical policy issues that are the underpinning of global chains in highly regulated industries. Examples of these strategic requirements include:</p> <ul style="list-style-type: none"> <li>• Rich identity management &amp; greater security of sensitive information, personally identifiable information, and intellectual property through access management and digital rights management</li> <li>• Compliance/sustainability</li> <li>• Risk management to ensure supplier viability and adherence/supplier compliance with buyer/corporate, and global and national standards and regulations</li> <li>• Robust unstructured collaboration and information-sharing capabilities that extend and support core structured buyer/supplier collaboration</li> </ul>	<p>Organic development augmented by partnerships</p>	<ul style="list-style-type: none"> <li>• Aerospace and Defense</li> <li>• Life Sciences/ Pharmaceuticals</li> <li>• Healthcare</li> <li>• Other highly regulated industries</li> </ul>
<p><a href="#">E2open</a></p>	<p>Founded by a consortium of 10 major high-tech firms, it was an industry marketplace at the height of the dot com boom. Evolved into a set of supply chain solutions built around the E2open network. Through acquisitions, branched out into process industries and transportation.</p> <ul style="list-style-type: none"> <li>• Rich multi-tier supply chain visibility, planning execution, optimization, and collaboration applications</li> <li>• Platform enables rapid integration of acquired platforms</li> <li>• Networks connect internal and external partner ecosystems</li> <li>• Internal ecosystems—major OEM and brand manufacturers</li> <li>• Channel ecosystems—distributors, resellers, retailers</li> <li>• Supplier ecosystems—suppliers, contract manufacturers and co-packers</li> <li>• Logistics ecosystems—trucking and ocean transportation with carriers, freight forwarders, and shippers</li> </ul>	<p>Acquisitions to support demand/sell side include:</p> <ul style="list-style-type: none"> <li>• Zyme</li> <li>• Entomo</li> <li>• Birch Worldwide</li> <li>• Steelwedge</li> <li>• Orchestro</li> <li>• Terra Technology</li> </ul> <p>Recent acquisitions expanding E2open into transportation include:</p> <ul style="list-style-type: none"> <li>• INTTRA</li> <li>• Cloud Logistics</li> </ul>	<ul style="list-style-type: none"> <li>• Manufacturers</li> <li>• High Tech</li> <li>• Retail/CPG</li> <li>• Food/beverage</li> <li>• Industrial</li> <li>• Chemicals</li> <li>• Life sciences</li> <li>• Energy</li> <li>• Freight Forwarders and carriers</li> <li>• SMBs</li> </ul>
<p><a href="#">GT Nexus</a></p>	<p>GT Nexus was founded to manage global ocean transportation and visibility. In parallel, TradeCard was founded to connect retailers, suppliers and, ultimately, their financial institutions to support their procurement, trade, and financing. Post-merger, GT Nexus has grown to accommodate rich supply-chain functionality in many industries. Due to their unique many-to-many <i>in-network data and software</i>, they can orchestrate complex activities across the network. A growing, sophisticated Machine Learning foundation utilizes both operational and geospatial information. True many-to-many network, providing multi-party functionality in:</p> <ul style="list-style-type: none"> <li>• Global ocean transportation</li> <li>• Transportation management<sup>13</sup> and optimization</li> <li>• Supplier collaboration of capacity, forecasts, orders, etc., supplier shipping automation (ASN, label generation, scan and pack)</li> <li>• Procure-to-pay order management</li> <li>• End-to-end supply chain visibility of demand, shipments, orders, products and capital, including current and projected inventory at locations</li> <li>• Supply chain finance<sup>14</sup></li> </ul>	<ul style="list-style-type: none"> <li>• TradeCard merged with GT Nexus in 2013</li> <li>• Acquired by Infor in 2015</li> </ul>	<ul style="list-style-type: none"> <li>• Retailers</li> <li>• Brand Mfg.</li> <li>• Logistics Service Providers</li> <li>• Industrial Mfg</li> <li>• Industrial machinery</li> <li>• High Tech</li> <li>• CPG/food and beverage</li> <li>• Chemicals/life sciences</li> <li>• Apparel/footwear</li> <li>• Distribution</li> <li>• Automotive</li> </ul>

<sup>13</sup> As mentioned earlier, transportation management is a key function in global or local supply chain management. Here are some key functions: multi-leg, multi-mode transportation management including sourcing, rating, planning, optimization, booking, tendering, end-to-end shipment visibility (including planned, pre-shipment, and in-transit), and freight audit and pay. More on [transportation management](#), and here [Transportation archives and reports](#).

<sup>14</sup> So what is Supply Chain Finance? You can read [Reinventing Supply Chain Finance](#).



<p><a href="#">Logility</a></p>	<p>Logility is a full-suite supply chain solution well suited to collaborative relationships within exclusive supply chain networks. Logility was an early pioneer in collaboration initiatives within the retail industry. They were also an early adopter of Machine Learning/Neural Networks in their forecasting and planning solutions, and continue to expand this portfolio with methods to support dynamic trading partner exchanges through their machine-learning-based MDM and integration capabilities.</p> <p>In addition, their acquisition of Halo BI, an AI/Machine-Learning based analytics suite, provides the market with already developed applications and analytics so users can ease their way into the new AI environment.</p>	<ul style="list-style-type: none"> <li>• AdapChain</li> <li>• Halo BI</li> </ul>	<ul style="list-style-type: none"> <li>• Retail</li> <li>• CPG</li> <li>• Apparel and Footwear</li> <li>• Industrial products</li> <li>• Wholesale Distribution</li> <li>• Manufacturing</li> <li>• Food and Food packaging</li> <li>• Media and Telecommunications</li> </ul>
<p><a href="#">One Network</a></p>	<p>Unlike many of the other software companies today, One Network is an organically developed solution. This affords them many advantages when it comes to model inclusion to optimize across trading partners and traditionally stove-piped processes (demand and transportation, for example).</p> <p>Each industry they support has an industry data model based on the unique requirements of that industry's regulations and standards, as well as the rules of participating companies. One Network built on their scalable multi-party foundation to include AI, IoT Bots and Intelligent Agents, Blockchain, and other advanced visibility and analytics, as well as rich data beyond the traditional planning data (see sidebar). For some functions, can operate autonomously.</p> <p>Supply chain functions include:</p> <ul style="list-style-type: none"> <li>• Demand management</li> <li>• Transportation with a worldwide trucking network</li> <li>• Inventory management</li> <li>• Procurement</li> <li>• Service management</li> <li>• IoT</li> </ul>	<p>Organically developed with integration to partners</p>	<ul style="list-style-type: none"> <li>• Retail</li> <li>• Grocery</li> <li>• Military Application and Military Logistics</li> <li>• High-tech Mfg</li> <li>• Food Service</li> <li>• Automotive/Industrial</li> <li>• Logistics Service Providers</li> <li>• NGO/Non profit</li> </ul>

As we look closer at these solutions, we need to understand the network types as well as some key characteristics. For example, unique data that supports a specific industry's or task's needs should be supported (Table Three, below). Does the network have IoT data for remote service management? Or does the network have ELD, mobile, and GPS data for carrier tracking or RFID/sensors for goods tracking/condition?

As mentioned earlier the network size may be relevant for certain use cases, but for others the key is, does this network include *my* trading partners.<sup>15</sup> Size does point to scale, but rest assured, these solution providers have supported vast user bases with ever more depth of data (than you probably would ever require). And now with carrier, driver, goods and IoT data, these companies' support environments and their infrastructure have grown to support it all.

<sup>15</sup> There are other dimensions to size and scale besides the number of connected parties, such as dollars of trade transacted on the network, percentage of each participant's business processes that are running on the network, and amount and depth of data being fed into the network. In some cases, One Network may have many trading partners transacting small dollar amounts for indirect goods, whereas another network has far fewer trading partners on the network, but transacts an order of magnitude more value per account for direct materials. These should be considered an indication of scale or marketing boasts. Again, the evaluation process should consider relevance to your needs.



**Table Three: Supply Chain Networks Fast Facts**

Company	Number of Network Members	Types of Networks Networks may include a large range of industry and enterprise sectors	Unique Data This is data above and beyond traditional data for: product planning, procurement, and transportation
<i>Amber Road</i>	Participants include: <ul style="list-style-type: none"> <li>• 200+ brand owners</li> <li>• 20,000+ suppliers</li> <li>• 500 logistics providers</li> </ul>	<ul style="list-style-type: none"> <li>• Visibility for manufacturers to their suppliers</li> <li>• Device network (partner with Project44 and Savi)</li> <li>• Global Trade Network of shippers, freight forwarders, customs brokers and customs agencies</li> </ul>	<ul style="list-style-type: none"> <li>• Factory compliance inspections</li> <li>• Factory sustainability index scores</li> <li>• Import and export trade compliance</li> <li>• Denied party listings</li> <li>• IoT feeds for in-transit visibility</li> </ul>
<i>Blume Global</i>	Participants include: <ul style="list-style-type: none"> <li>• Over 300 intermodal marketing companies</li> <li>• 6 US Class 1 railroads</li> <li>• 5,000+ motor carriers (drayage)</li> <li>• 900+ terminals &amp; depot operators</li> </ul>	<ul style="list-style-type: none"> <li>• Supply-chain-wide asset tracking</li> <li>• Drayage commerce and payment</li> </ul>	<ul style="list-style-type: none"> <li>• Port and rail ramp locations &amp; status</li> <li>• Drayage move proof of delivery (POD) &amp; milestones</li> <li>• Direct integration with carriers (rail, ocean, road)</li> <li>• Driver app available in 22 languages</li> </ul>
<i>Descartes</i>	Network members include: <ul style="list-style-type: none"> <li>• Millions of parties across many industries</li> <li>• wGLN/Devices numbering in the millions</li> </ul>	The GLN connects all Descartes members and applications: <ul style="list-style-type: none"> <li>• Transportation/logistics</li> <li>• Ecommerce/reseller</li> <li>• Global Trade Management</li> <li>• Consumer/retail</li> <li>• Descartes Community has "subnetworks" for unique communities (trading partners)</li> </ul>	<ul style="list-style-type: none"> <li>• Commercial carrier and private/dedicated fleet; real-time tracking including the status of shipments and goods</li> <li>• Global trade import/export and security filings</li> <li>• Trade/sales data</li> <li>• Device data</li> <li>• Supports unique community connections/preferences</li> </ul>
<i>Exostar</i>	150K connected trading partners	Industry-specific global, multi-tier supplier applications that include: Compliance documentation and validation/regulatory adherence (data is validated against multiple third-party and industry organizations)  Identity and access management, identity proofing and credentialing  Supplier Management (procure-to-pay, source-to-pay)	<ul style="list-style-type: none"> <li>• Industry-specific process flows and regulatory content</li> <li>• Compliance documentation</li> <li>• Supplier data (for performance, risk, compliance)</li> <li>• Access-control, data for personnel, contractors, suppliers, customers, and secure partners</li> </ul>
<i>E2open</i>	Unique industry networks supported by Harmony integration platform: High-tech network: 44K Retail/CPG network: 15K Transportation: <ul style="list-style-type: none"> <li>• 3K land carriers</li> <li>• 60+ ocean carriers and their partners/customers: ~20K</li> </ul> Reseller Network: 2.3M	<ul style="list-style-type: none"> <li>• OEMs and their suppliers/contract manufacturers</li> <li>• Retailers and their suppliers</li> <li>• Channels: distributors, resellers, retailers</li> <li>• Transportation/carrier networks</li> </ul>	<ul style="list-style-type: none"> <li>• INTTRA ocean data</li> </ul>
<i>GT Nexus</i>	Over 65,000	<ul style="list-style-type: none"> <li>• Integrating retailers, suppliers and their financial institutions</li> <li>• Procurement and trade finance for retailers or brand manufacturers and their suppliers and carriers, and financial institutions.</li> <li>• Carriers: ocean, trucking applications, and visibility</li> <li>• LSPs: freight forwarders, customs brokers, 3PLs, freight brokers, agents</li> </ul>	<ul style="list-style-type: none"> <li>• AI/IoT geospatial data</li> <li>• Financial institutions and trade finance</li> <li>• SDK/open-development platform, enabling companies to build custom apps which house additional data</li> </ul>



<p><b>One Network</b></p>	<p>Over 40,000 retailers, manufacturers, suppliers</p> <p>+US DoD network members</p>	<ul style="list-style-type: none"> <li>• Retailer/supplier</li> <li>• USTRANSCOM/carrier network<sup>16</sup></li> <li>• Trucking network including many international regions (SA, Africa, and North America)</li> <li>• Manufacturer/supplier network</li> <li>• Departments of DoD (Marine Corps, Air Force)</li> </ul>	<ul style="list-style-type: none"> <li>• IoT</li> <li>• Defense ammunition</li> <li>• Defense inventory</li> <li>• Blockchain</li> <li>• Asset/machine condition data</li> <li>• SDK/development</li> </ul>
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Any company participating in a supply chain needs to find more ways to connect to their trading partners, often, across multiple business processes. These applications require tremendous flexibility to respond to ever-changing requirements. Users need trusted networks that guarantee security and identity management to ensure all the touch points are valid, accurate, and shielded from unwanted eyes.

### Discoverability

One thing also to note here in our discussion of the differences between multi-party network approaches is their “public” vs. “private” nature. Some aspects of these networks are designed almost as an industry utility. For example, as a carrier you can join/sign-up on a variety of transportation networks like Descartes; or as a chassis owner or drayage service you can sign-up for Blume; as a reseller you may find a partner on E2open’s Zyme; or suppliers may find companies they want to sell to and join an Ariba network.

But other aspects of these solutions are exclusive to the select trading partners. They are not “discoverable.” For example, on Exostar’s supplier network for Aerospace and Defense manufacturers, you would not be a member without a process whereby you had already been selected as a supplier. Or in a Logility, E2open, or One Network forecast collaboration process, only existing partners have access to these secure environments.

In the last four years there has been a profusion of start-ups in supply chain, and logistics in particular. Many of these have very promising futures building new paradigms for supply chain. Many others are living on the funds of their investors and may flame out. Many of the viable ones will also find themselves as acquisitions (and we see the above firms as the acquirers). Thus, the long-term viability of the network operator/company is a key consideration when looking for a solution provider.

<sup>16</sup> [USTRANSCOM](#) includes: network users—government agencies and US DoD and NATO departments that have access to the USTRANSCOM services. “1,203 aircraft and 379 vessels in the Civil Reserve Air Fleet (CRAF) and Voluntary Intermodal Sealift Agreement (VISA)” respectively, plus US commercial carriers in air/sea and ground: +20,000.



## Your Supply Chain Is Calling You! Challenges in Implementation

Think of this: Almost every supply chain *execution* process between partners requires rapid (may we say real-time) response. The implied promise in orders, appointments, and commitments of various types is that they are being provided to a customer *while the latter is still online*.<sup>17</sup> So inventory accuracy across multiple parties, such as a retailer and supplier; a delivery window appointment between a carrier and their customer; and so on, requires precise, accurate information for order promising. If we want to be players in the most commercially viable trading networks, then we have to be connected and able to make critical, up-to-the-minute operations processes and data available to partners and customers.<sup>18</sup> At the same time, we must ensure that the person/user touching our products, logging into our networks, etc. is authorized to do so. There is no getting around the fact that that cannot be achieved by ERP-centric instances.

Even with the desire for an enterprise to have a full-fabric supply chain, there is a tug of war between competing issues. That challenge exists in all the approaches and applications out there. For most companies, even basic blocking and tackling require multiple platforms within a process or industry. Ocean is the best example of this issue. A shipper may need a direct carrier connection, a freight forwarder connection, a transportation management solution, a rating/quoting platform, a booking platform, a tracking platform, connectivity to other intermediaries like drayage, warehouse operators, and, of course, a Global Trade Management solution.<sup>19</sup>

There are only a very few supply chain multi-party solution providers that include all those functions for the diversity of carriers and logistics service providers, and have automatic connections to relevant parties (customs, port operator, and so on). For many providers, having a full supply chain suite with all-inclusive data is still aspirational, but many are working on closing the gaps, whatever the specific process/task areas they support—demand, fulfillment, traceability, commerce, procurement, product lifecycle management, etc. Providers like Descartes, E2open, Infor/GT Nexus and Logility have been on buying sprees to fill in the gaps, and One Network is aggressively coding their way through this mega-functionality checklist.

No matter what the third-party provider offers, though, those mega-enterprises within your industry still build private/portal-type solutions with the philosophical attitude that all roads lead to them. (Examples here would be Walmart, Target, Boeing/Airbus, EXXON, Maersk and other wealthy industry-dominating players.) Additionally, within the enterprise there is a whole portfolio of other applications that may be relevant to supply chain. Hence, integration as part of a multi-party suite, or a domain-specific integration player is required.<sup>20</sup>

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<sup>17</sup> Read [Optimizing the Customer Experience](#) and [Always On](#).

<sup>18</sup> Read [Your Supply Chain Is Calling You](#).

<sup>19</sup> There are also technologies like GPS; mobile; IoT/RFID; EDI; other internet connectivity; potentially, Blockchain networks in the future, and so on.

<sup>20</sup> Examples here are Informatica, Dell Boomi, MuleSoft, Cleo, and others. Read [The World of Integration](#).



### **Key Lessons/Conclusion: Supply-Chain Networks and Multi-Party Solutions:**

1. ERP-type architectures are not suited to supply chain challenges, which inherently involve multiple companies. ERP was designed to solve the problem of “one.” Supply chain was designed to solve the problem of the “many.”
2. The idea that ERP is *the* system of record, or the master generator of business activity, or creator or manager of rules and data specific to supply chain also is not accurate, since supply chain plans and transactions are generated, collaborated on, and also appended to the database *in the supply-chain systems* first. Then they are maintained to support analytics and learning engines.
3. ERP just does not have the data model for today’s diverse data requirements in supply chain, which may include wireless, IoT, geospatial and social data types, as well as temporal event and tracking data.
4. Most multi-party systems are managing all the transaction and master data translation on behalf the whole network. So this removes a huge onboarding, data quality, and data maintenance burden from the enterprise and reduces friction in the supply chain.
5. B2B communication and integration tools may often be included within the multi-party platform. Supply chain technology firms have some innovative approaches today to address the ever-changing rules and data that are essential for our, often, real-time continuous exchange of information. These B2B tools managed by the technology provider also reduce the burden of maintaining so much integration by each enterprise.





## Conclusion: A World of Millennial Complexity

In the coming decade, the Internet will grow to a trillion or more connected devices. And that will require more than one network solution.<sup>21</sup> This has profound implications for how we integrate across communities. Decades of work have gone into establishing modes of operation that streamline business processes, reduce latency, and ensure successful execution of complex business activities.<sup>22</sup>

Now we are entering another world of data and knowledge, and in supply chain, a world of *highly dynamic connections*, if you will. Yes, many customers, partners, and community participants will want their rules, profiles, locations, and so on “saved.” However, in this world of *dynamic connections*, parties can establish, on demand, a trusted connection between a process or some thing or person; or a request for information that needs to be responded to, and then the connection is dissolved. Rich data streams, location-aware, *thinking* systems based on AI and identity management are essential in this new world. More and more of the multi-party platform provider’s dollars are spent on maintaining that trust through cyber security and finding ways to manage those dynamic connections.

The modern virtual enterprise, supported by these networks, needs to embrace the rapidly evolving complexity, since this is the way the world is working.<sup>23</sup> It is leaving old modes of operating behind and with it, organizations that do not understand and embrace our new world.

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<sup>21</sup> I want to keep emphasizing this to you, our reader, since, as mentioned, no one will have all the needs of even today.

<sup>22</sup> And more ambitiously, processes may become an autonomous operation. Autonomous is yet to be achieved, but if current predictions hold true, we will be seeing a greater percentage of task-level work go on “auto pilot” as tech companies and their customers become more deft at leveraging Machine Learning. Demand Planning is an area in which we are already seeing customers begin to leave some of the driving to their systems or, as [Logility](#) calls it, “augmenting human insight.”

<sup>23</sup> Anyone can witness how rapidly consumers and merchants are embracing the innovation of the hyper-scale organizations (Amazon, Google, Alibaba, et al).



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