

Direct Materials Collaboration: Lessons Learned from Best-Run Supply Chain Networks

Why Close, Deep Supplier Collaboration is Vital
and how to Achieve it



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In an ideal world, you plan and order direct materials, and fulfill orders on time and in full. Demand and supply are aligned across your supply chain to meet customer demand and trading partner relations are managed effectively. Visibility and assurance of supply are the cornerstones to efficient supply chain performance. If issues arise, you know who to call.

But we don't live or work in an ideal world.

About the Author



Greg Mekjian is an expert in procurement, supply chain management, manufacturing, value engineering, and supplier network design. He helps companies of all sizes leverage innovative software to automate best business practices and drive transformational change management.

Greg is a trusted advisor for organizations seeking expertise in strategy and best practices, focusing on the consumer packaged goods, life sciences, high tech, and automotive industries and on ERP, supply chain management and orchestration, and spend management technologies. He has spent the past 31 years with SAP. Greg currently leads an exclusive global product and consulting practice for direct materials sourcing and advanced supply chain orchestration for some of the largest manufacturers in the world.

Introduction

Over the years, supply chains across all industries have become very complex. While some industries have changed faster than others, major industries now have highly distributed and globalized supply chains. This makes these supply chains vulnerable to the risk of disruption arising from poor visibility and lack of control.

After the disruptive events of the COVID-19 pandemic and increasing geopolitical uncertainty, many executives are striving to make their supply chains more resilient. As a supply chain executive at SAP, I have spent decades working with supply chain leaders who have addressed these challenges successfully. These leaders excel by treating their suppliers as partners, collaborating effectively with contract manufacturers, copackers, maintenance, repair, and operations (MRO) suppliers, and other value-added third-party suppliers. While many forms of supplier collaboration exist, I have found that the best results and the most sophisticated supply chains run on solutions that meet five distinct characteristics:

1. Support for a comprehensive collaboration process, starting with product design and ending with invoice and payment.
2. Back-end integration for touchless processes and full alignment of processes, systems, and teams across the source-to-pay cycle.
3. Industry-specific network solutions that support the best practices and use cases required at an industry segment level (for instance, medical devices as part of the life sciences industry).
4. Intelligence that provides early visibility into potential supply chain constraints and empowers you to resolve them.
5. Global scale, scope, language, and expertise to support global operations and trading partners.

In this paper, I share examples of supply chain leaders who have achieved all this and more across many industries, including consumer products, industrial machinery and components, life sciences, and others.

Gregory P. Mekjian



Manufacturers Increasingly Depend on Complex, Extended Supply Chains

In an ideal world, supply chains run smoothly and, if there is a problem, it can be solved quickly. But in reality, we live in a complex, connected, and digital world. Manufacturers increasingly depend on a vast, multitiered network of partners to meet customer demand while focusing on core competencies.

For example, not long ago, most manufacturers were vertically integrated. They always knew what was happening with product supply because they owned the processes, and factory operations could rapidly shift if a problem or constraint arose.

But now, some manufacturers have divested themselves of factories and aligned with key suppliers to do the work that's core to their business – including manufacturing, assembly, and packaging – all while globalizing their supply chains. For example, one industrial manufacturing client has divested all of its specialized steel manufacturing factories and outsourced over half of its manufacturing requirements to certified contract

manufacturers, who then drop-ship the finished goods to yet another third-party consignee for fulfillment of the demand.

While such decisions can help businesses reduce costs, scale production, reach global markets, and more, they can also create a complex web of critical supply chain dependencies into which most manufacturing organizations have little visibility or control. And herein lies the problem. When these decentralized, global supply chains are disrupted, the business impacts can be profound. Manual and legacy modes of collaboration with these external partners just aren't enough. And they never will be again.

As the chief operating officer at an SAP customer put it, without “punching a digital hole between the walls of every business we depend on along our supply chains,” there's no way of really knowing what's going on regarding direct supply, manufacturing, quality, or delivery perspectives. As we'll see, this is what SAP® solutions make possible, every day.

New Collaboration Requirements for Multitiered Supply Chain Ecosystems

EMBRACE SUPPLIERS AS PARTNERS AND VIRTUAL EXTENSIONS OF YOUR BUSINESS

In most cases, there are no shortcuts in an extended network economy. You can't just rely on 'simple' cloud supply chain solutions, manual collaboration, or legacy tools to solve supply chain challenges or constraints, because unique requirements often make that impossible. Close and deep collaboration across multitiered supply chains is the way forward.

This requires a supply chain integration and collaboration solution that:

- Supports deep process integration and data sharing across your multitiered supply chain
- Gives you deep visibility into and across your extended supply chain with early warning alerts
- Enables you to run your business with confidence, knowing that your supply chain partners will fulfill orders on time and with expected quality
- Helps you navigate future geopolitical events, climate-related disasters, public health crises, and other uncertainties that can impact your extended supply chain

Yet, consider the results of a recent study by SAP and Oxford Economics that surveyed 1,000 executives, nearly 500 of whom are responsible for direct spend, across 10 major industries.¹ Nearly one-third (32 percent) of these executives said their organizations still use phone, e-mail, and spreadsheets as their primary means of collaborating with external partners on key supply chain processes. Another 48 percent use legacy technologies such as on-premises supplier portals and EDI. That's a serious concern, because with 80 percent of enterprises relying on manual collaboration and legacy technologies, business performance is suffering. It's no surprise that only 26 percent of executives say their organization's collaboration with top suppliers is highly effective in remediating potential shortages or overages.

The resulting lack of visibility and control leads to uncertainty around the supply of critical materials, demand volatility for goods and services, and constrained capacity in manufacturing and logistics. This, in turn, wreaks havoc with forecasts, production schedules, delivery time frames, and even the quality of goods.



80%
of enterprises rely on manual collaboration and legacy technologies.²



Only 26%
of executives say their organization's collaboration with top suppliers is highly effective.³

1.-3. "[Close Collaboration That Goes Beyond Transactions: Direct Spend Leaders Engage with Essential Suppliers to Improve Performance](#)" agile procurement insights research by SAP in collaboration with Oxford Economics, 2021.

The Intelligent Nervous System can Connect your Extended Supply Chain

An intelligent nervous system is one where supply chain leaders create digital bridges into and across their extended supply chains.

Companies, brand owners, and other channel masters should embrace external manufacturing organizations, packaging partners, and other direct spend and MRO suppliers as partners and virtual extensions of their businesses.

This includes enabling these supply chain leaders to share their 'crown jewel' data, such as product designs, detailed production forecasts, and customer data, so they can collaborate with their partners.

Many industry leaders are going a step further by adopting intelligent business networks to collaborate with their suppliers to regain supply chain visibility. These companies are driving impressive business results. Our research with Oxford Economics⁴ revealed that by using network-based collaboration:

- 82 percent of leaders report five percent or more improvement in on-time, in-full performance
- 69 percent of leaders report ten percent or more improvement in inventory turns
- 64 percent of leaders report ten percent or more improvement in on-time delivery from suppliers

- 63 percent of leaders report ten percent or more faster time to market

These findings confirm the need for network-based trading partner collaboration to build responsive, resilient, and interconnected supply chains using advanced digital planning, execution, and financial systems. These digital solutions run in the cloud, operating together as an intelligent nervous system that reaches into and across the supply chain organizations you do business with, giving you:

- A full view into extended source-to-pay scenarios across your multitiered supply chain network
- Visibility through rich, real-time supplier collaboration
- The ability to accelerate time to market and gain early visibility into product costs by collaborating with suppliers on business networks
- Insights and data to understand what's happening now and what potential problems could be around the next corner so you can deal proactively with them

4. ["Close Collaboration That Goes Beyond Transactions: Direct Spend Leaders Engage with Essential Suppliers to Improve Performance"](#)

Harnessing Intelligent Collaboration Technologies

WHAT SUCCESS LOOKS LIKE

The most forward-thinking organizations are harnessing the latest business network technologies to transform their direct materials source-to-pay processes to support extraordinary collaboration with external trading partners. Here are some examples of that in action.

MULTITIERED SUPPLY CHAIN ORCHESTRATION

Overview

A global consumer electronics company that manages tens of thousands of active SKUs and produces and ships hundreds of millions of products annually outsources much of its manufacturing. This company needed to orchestrate a multitiered supply chain of contract manufacturing organizations, component suppliers, and other upstream suppliers.

Challenges

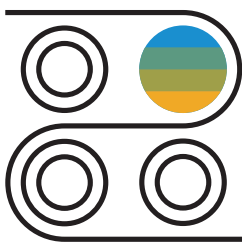
Several years ago, this company embarked on a digital transformation to improve its responsiveness to fast-growing consumer demand. Manual collaboration with suppliers and contract manufacturing partners, which

involved spreadsheets and frequent planning conference calls, did not enable the production agility needed to address rapidly shifting demand across different product configurations.

Approach

To meet this need, the company adopted the SAP Integrated Business Planning for Supply Chain solution along with SAP Business Network for Supply Chain. This technology helps them orchestrate supply chain planning and execution processes together with multiple tiers of suppliers to increase assurance of supply. As shown in Figure 1, these solutions enable the company to collaborate on forecasts, external manufacturing visibility, subcontract component consumption, and purchase orders.

These solutions support deep ecosystem collaboration, which brings valuable visibility to the company. In the first part of the process, the company's supply chain planners create their plans, send them to contract manufacturers, and receive commitments back. Contract manufacturers can see changes to the plans in real time.



Intelligent collaboration solutions can help improve **manufacturing flexibility** and **responsiveness to demand** and support close-coupled contract manufacturers in a lot-size-of-one manufacturing environment.

In the second part of the process, the company obtains manufacturing visibility from its tier-1 contract manufacturers to support its component planning, which it can share with tier-2 suppliers for commitment. The real-time visibility and automated collaboration improve supply assurance, which ultimately results in improved on-time, in-full performance and upside revenue.

In the third part of the process, the company procures components from tier-2 suppliers and provides the contract manufacturer with visibility into incoming components. Suppliers confirm this, and both the contract manufacturer and the company have comprehensive supply chain visibility. This makes it possible to see whether suppliers can fulfill orders and what quantity the supplier has confirmed in those orders.

In the final part of the process, shared shipping and goods receipts help ensure that the company has full visibility into this multitiered supply chain. The result is an innovative, multitiered collaboration effort that improves supply continuity for key components that the company procures directly from upstream suppliers and drop-ships to tier-1 component manufacturers that build finished products.

This collaborative environment has helped the company move from an allocation-driven supply chain to a responsive, demand-driven (lot-size-of-one) supply chain. The company has eliminated substantial working capital requirements while increasing on-time, in-full performance.

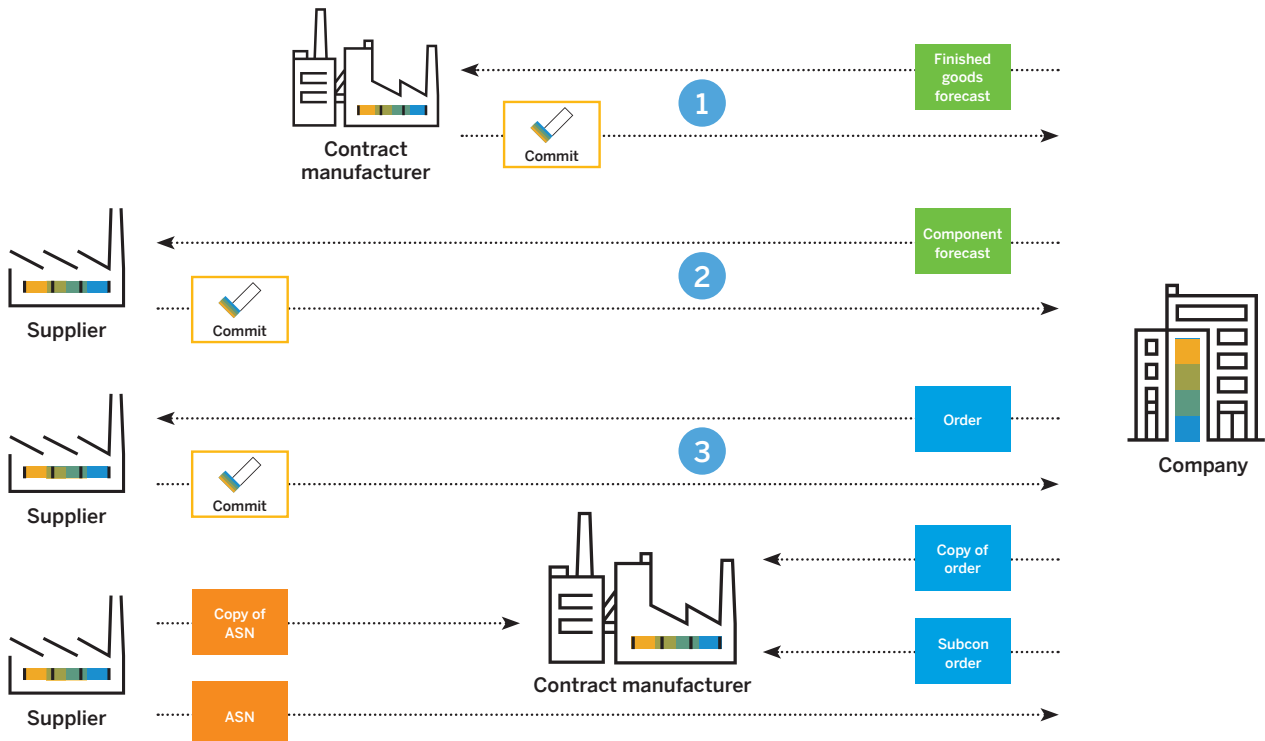


Figure 1: An Innovative, Multitiered Collaboration Strategy at Work

ACCELERATING TIME TO MARKET WITH SOURCING, ENGINEERING, AND SUPPLIER COLLABORATION

Overview

Another leading supply chain and procurement team is using advanced business network technologies to enable and streamline production at the global facilities of a major manufacturer of material handling equipment.

Challenges

Procurement leadership at this company recognized that customers have recently tended to carry less inventory and demand faster product delivery and spare parts replenishment. In an engineer-to-order production environment, product design can go through quick iterations driven by customer feedback. Accelerating cycle times, therefore, requires strong internal collaboration between product development, sourcing, and commodity management teams, as well as external collaboration with suppliers. To meet these expectations, this manufacturer transformed its procurement function with new solutions and processes.

Approach

The manufacturer decided to extend an existing procurement transformation project by adopting

SAP solutions and SAP Business Network. This helped the company's sourcing team share engineering change orders and notifications with suppliers. Now engineering change requests for quotation (RFQ) are managed together with sourcing, which allows changes to be implemented expediently. To achieve this, the manufacturer integrated key systems. As shown in Figure 2, the company has connected its sourcing systems to product lifecycle management (PLM) and ERP systems. This supports an efficient engineering change request process and timely communication of changes to suppliers.

This company achieved nearly full adoption of its collaborative strategic sourcing processes. In addition, it vastly reduced cycle time for its engineering change notice (ECN) and engineering change order (ECO) processes by employing RFQ processes that connect PLM, sourcing, and ERP from start to finish. Engineering change requests go through the sourcing solution with a 40 percent efficiency gain. This is a truly innovative integration of product development and sourcing that provides a competitive advantage to this manufacturer and a superior customer experience.

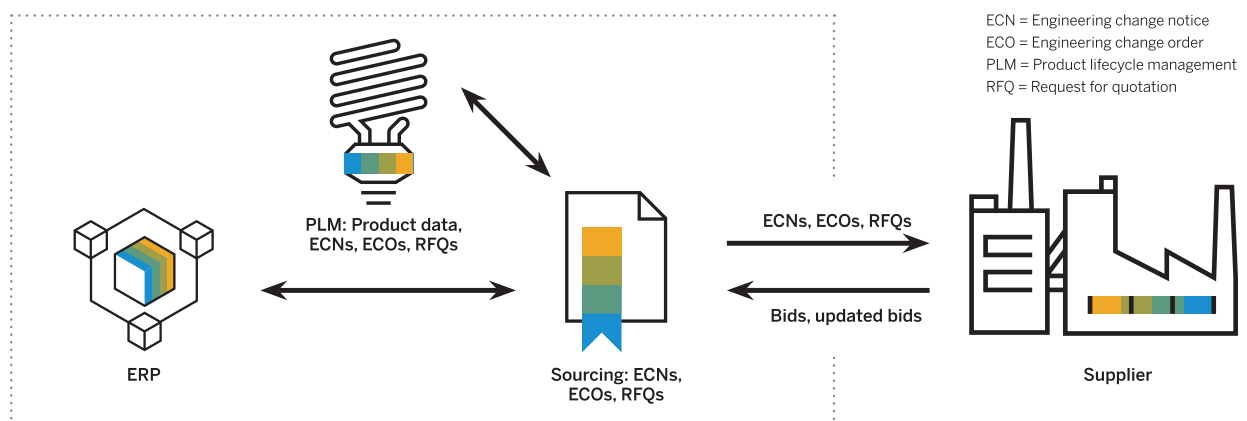


Figure 2: Communicating Change Requests to Suppliers Through Integrated Sourcing Processes

HARMONIZING NEW PRODUCT INTRODUCTION AND PRODUCTION PARTS APPROVAL

Overview

A major international industrial and energy equipment manufacturer has transformed its direct materials supplier collaboration and source-to-pay processes to support rapid growth.

Challenges

As its product portfolio and demand for its products grew, this manufacturer expanded its global supplier base and its internal and external manufacturing presence. This expansion created challenges in two areas:

1. New product introduction and supplier alignment.
2. Visibility into supply during production.

In the company's new product introduction processes, internal and external collaboration on production parts approval processes (PPAPs) were done manually using shared spreadsheets and e-mail. These manual processes could not scale with the company's rapid growth, creating risk around whether suppliers fully understood and could comply with design specifications and quality requirements. Similarly, during production planning, supply chain planners lacked visibility into the status of orders, including whether they had been confirmed or delayed for delivery. Further, buyers had to track down confirmations and incur expedited logistics costs.

Approach

To address these challenges, this manufacturer migrated its global PPAPs to SAP Strategic Sourcing Suite, a cloud-based sourcing solution that provided workflows and checkpoints for key PPAP steps (see Figure 3). This helps provide its suppliers with consistent PPAP requirements across their different quality and engineering teams, simplifying the process for suppliers and significantly reducing PPAP time. It has also helped increase supplier compliance with PPAP documentation and deliverable requirements and created the ability to capture any deviations and engineering changes that take place during a PPAP.

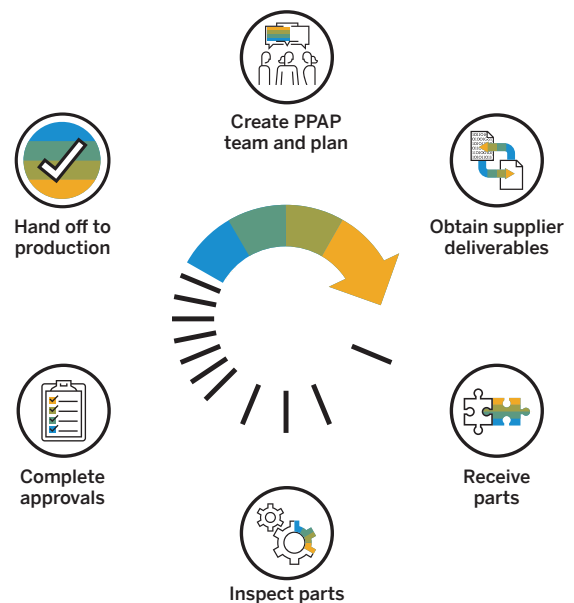


Figure 3: Example of a Production Parts Approval Process (PPAP)

The organization has also improved the handoff from new product introduction and sourcing to production procurement. This helps ensure that the new parts, having successfully undergone PPAPs and having been negotiated to the best total cost, are fully transitioned and prepared for production level procurement. Formal workflow notifications have replaced informal e-mail or in-person communications about when a component is complete, including during the design, testing, and full PPAP. The manufacturer can also help ensure that phase out activities are completed at product launch and monitor compliance.

The new capabilities enable the sourcing team to calculate total landed costs. These costs consider not just the material and labor costs of the product being sourced, but also the weights,

dimensions, transportation modes, and more. This enables commodity managers to take a total-costs approach to their sourcing decisions.

This company has also addressed its challenges with supply chain visibility by managing its direct materials supplier collaboration, which has helped it regain visibility into the status of orders. It has also increased visibility into ship dates and the location of materials in transit. In addition, this company can generate reports to help identify supplier plants at risk around the world, including where problems are likely to occur. This early insight gives the company time to create a mitigation plan – often in just a few hours. As a result, the company has reduced expedited logistics costs and related expenses associated with poor visibility into materials in the supply chain.



In rapid-growth environments, advanced business network technologies can help to **reduce risks** and rapidly **realize efficiencies**.

VENDOR-MANAGED INVENTORY AND SUPPLIER COLLABORATION

Overview

A global healthcare and consumer products company is transforming its supply chain by collaborating more effectively with contract manufacturers and raw materials suppliers.

Challenges

Like many of the procurement and supply chain leaders that SAP and Oxford Economics surveyed, this company had been collaborating with its suppliers through various legacy supplier portals. However, it is nearing completion of a multiyear initiative to migrate its business units to the SAP ERP application, which provided an opportunity to modernize its approach to supplier collaboration. In addition, like many other enterprises, the company's supply chains were becoming more extended as it increasingly worked with external manufacturers and divested factories that became key suppliers.

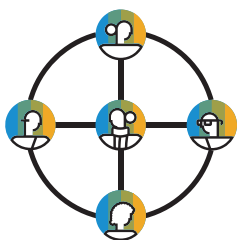
Approach

To work effectively with its extended supply chain, the company needed a new supplier collaboration tool that enables a true network – not a point-to-point connectivity tool – so that suppliers could leverage existing connections. This solution needed to integrate closely with its existing ERP solution as well.

Using SAP Business Network for Supply Chain, the company is now collaborating with its suppliers on forecasts, supplier-managed inventory (also known as vendor-managed inventory), purchase orders, and advanced shipping notices (ASNs). It has begun engaging its suppliers in vendor-managed inventory programs. Programs like these can offer buyers and their suppliers a mutually beneficial method of managing inventory, where the supplier assumes responsibility for supplying the buyer when items are needed.

Collaboration with suppliers occurs on forecasts, purchase orders, confirmations, and ASNs. SAP Business Network for Supply Chain enables the company's planners to send demand forecasts to its suppliers and then purchase orders. Suppliers send confirmations and issue ASNs, which the company responds to with goods receipts notices once product is received. The solution also enables collaboration with external manufacturers on subcontracting orders and processes.

This company is beginning to realize its business case around visibility and achieve the productivity gains that come from moving from manual to automated processes, as well as the IT benefits of migrating from legacy to cloud technologies.



Organizations in every industry around the world realize that close and **deep collaboration** across multitiered supply chains is the way forward.

Five Requirements for Collaboration Success

These examples of successful collaboration with extended, multitiered supply chains point to five critical success factors relevant to manufacturers dependent on their extended supply chains:

1. Choose a Solution with full Collaboration Process Support

Direct procurement and supply chain collaboration are about so much more than just ordering SKUs from a catalog and e-invoicing – and yet that's all many niche procurement and collaboration vendors offer. Consider what engineering-oriented direct material procurement teams in our client base are doing, such as:

- Utilizing a bill of materials to create product sourcing events
- Collaborating with external manufacturers and suppliers to improve design for manufacturability
- Building production plans and collaborating with suppliers
- Executing quality and inventory management programs with suppliers

Customers tell us that comprehensive, intelligent collaboration solutions give them greater

manufacturing flexibility and responsiveness to demand and support their close-coupled contract manufacturers in a lot-size-of-one manufacturing environment.

Choosing to run your business with anything less than a comprehensive set of collaborative processes built specifically to manage the complexities of multitiered supply chain collaboration can lead to manual processes or 'swivel chair integration' that reintroduces errors and weakens the value of collaboration.

2. Invest in Solutions that Integrate Deeply with Back-End Systems

Integration is another requirement for any supply chain collaboration and direct procurement initiatives. Integration to multiple systems is required, including links to PLM, supply chain planning, ERP, product information management, and other systems. This integration yields significant benefits. For example:

- Bill of materials integration from PLM to sourcing accelerates time to market and supports cost avoidance during the new product introduction process

- Deep integration to the material master speeds up sourcing cycles and eliminates manual data entry and the errors associated with it
- For the retail industry, integration to retail IT systems can speed up the sourcing process, as it enables importation of characteristic and variant information directly into sourcing events
- Companies in many other industries use these integrations to generate detailed preproduction cost analyses from suppliers, which can help drive cost savings
- When sourcing award decisions are integrated back to the ERP, suppliers adhere to terms more consistently and procurement of components is done with the preferred supplier per the negotiated terms

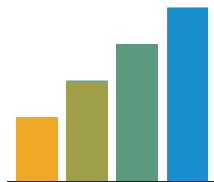
Equally important, without deep back-end system integration, you lose the benefits of touchless processes, such as improved accuracy and higher team productivity. Even in simple purchase orders, this is a big loss because plan-driven purchase requisitions should be touchless as an industry best practice.

3. Gain Access to Experts and Solutions with Deep Industry Expertise

Each industry deploys different processes in a source-to-pay cycle. These processes vary due to industry dynamics such as regulatory requirements, the nature of the manufacturing it does (for example, process, batch-oriented manufacturing versus high-volume, repetitive discrete manufacturing), and the extent that outsourced manufacturing has been embraced.

To implement best practices and relevant functionality in the direct spend solutions marketplace, companies need:

- A team with rich experience in building and deploying products across key manufacturing industry segments to provide guidance
- Deep knowledge of industry-specific processes and idiosyncrasies, which must be embedded into the standard product and supported by experts in these industries
- Expertise in change management, which is valuable to trading partners in the supply chain



Companies are driving **impressive business results** by adopting intelligent business networks.

For example, organizations in the automotive supplier industry must adhere to specific use case standards. These standards are needed to support automotive customers with receiving and processing scheduling agreements and daily ship schedules, along with detailed bar coding and ASN processes with quality specifications. Similarly, in the medical devices industry, businesses must comply with unique regulatory requirements that satisfy federal quality standards – for example, to secure traceability and document signatures prior to shipment.

SAP is relied upon to support these types of complex, granular, industry-specific use cases with best practices, innovative solutions, and infrastructure that's ready to deploy.

4. Enable Early Visibility Through In-Network Intelligence

In-network intelligence is vital for enabling planners to quickly identify any potential supply chain disruptions and rapidly resolve them. Transactional and event data is pulled from SAP systems into SAP Business Network, along with data from external third-party systems. This creates a common data model that:

- Abstracts data from various data sources
- Enriches and normalizes the data using graphics, artificial intelligence, and machine learning services
- Provides a high level of context around how buyers and suppliers manage their daily business with goods and services moving between companies, as well as how the flow of those goods is influenced by external factors

One customer recently explained how it is using network-generated reports to assess the impact of COVID-19-related disruptions on fulfillment needs across certain regions, commodities, and even specific suppliers in its supply chains.

Similarly, a customer in the chemicals industry described how it uses unique intercompany business rules and validations to help ensure required documents such as ASNs are provided before invoices are issued. It is also able to quickly reconcile those invoices so price, quantity, and other terms match those in orders and goods receipts notices.

Still others are using dashboards to identify potential shortages early and assess supplier performance with in-network analytics.

While these examples illustrate how in-network intelligence benefits buyers, it's worth noting how it benefits suppliers. For example, time-phased forecasts allow suppliers to see a steady demand stream from their customers. This can help reduce the bullwhip effect and gives the supplier the opportunity to not only provide higher service levels but also obtain a higher share of wallet.

5. Choose a Partner with Global Scale, Scope, and Experience

Most companies using advanced supply chain solutions have global operations, with plants and facilities all around the world. Likewise, their trading partner networks are global. Supporting supply chain collaboration for these multinational customers requires:

- A substantial global infrastructure and teams that can handle multiple languages and currencies, facilitate compliance with various tax codes, and support a variety of regulatory requirements through a team that offers supplier onboarding, integration enablement, sourcing support, and benchmarking in many different locations worldwide
- A global network of partners that deliver expertise in processes and systems to help ensure client success
- Hosting facilities in various locations around the world to meet regulatory, data security, and privacy requirements

SAP: An Industry Leader in Multitiered Supply Chain Collaboration Solutions

Enabling Granular Supply Chain Visibility and Deep Process-Level Collaboration

As explored in this paper, companies are increasingly relying on external and even global manufacturing firms and suppliers for production and inventory management. But without advanced, right-sized supplier collaboration processes and best practices designed to support real-time visibility, deep process collaboration, and real-time information processing, companies are effectively operating blindly.

SAP, an industry leader in global supply chain collaboration solutions, has been helping companies achieve granular supply chain visibility and deep process-level collaboration for decades.

As a global company with a truly worldwide presence, we fulfill these requirements by offering the scalability, deep industry expertise, and supply chain collaboration support and integration to meet even the most complex requirements for major industries.

We run SAP Business Network, a cloud-based collaboration network that unifies points of interaction and integration across your trading partners and can eliminate supply chain fragmentation – even across third-party systems. It can help you transform disconnected supply chains into unified, collaborative, and intelligent networks that remove barriers and centralize data.

LEARN MORE

To learn more about how companies are transforming their supply chains by using SAP solutions, use the following resources. We'll show you how we can help you collaborate with suppliers across the source-to-pay cycle for direct materials and optimize key services such as external manufacturing, packaging, and MRO:

- A [webinar series](#) where customers share their successes with SAP solutions and services
- Information about SAP Business Network solutions on www.sap.com



SAP helps companies achieve **supply chain visibility.**

