# P2P Networks
## for Digital Transformation

---

## *Direct Materials Procure-to-Pay*,
## Its Role in Strategic Competitiveness

# Table of Contents

# Direct Materials' Strategic Role

## Direct vs. Indirect Procure-to-Pay (P2P)

**Direct Materials P2P and Strategic Competitiveness**

Strategic competitiveness is achieved when a firm executes a *differentiated, value-creating* strategy that provides them with a competitive advantage. People often think of differentiation and value-creation as coming primarily from product engineering, marketing, and sales. Operational functions, such as procure-to-pay (P2P), are usually viewed as mundane necessities, whose main value is in cost-reduction. However, a company's direct materials P2P processes can also make meaningful contributions to strategic competitiveness.

Direct materials[1] are the lifeblood of manufacturing and retail supply chains. Manufacturers have historically put most of their sourcing and procurement efforts into direct materials, because those often constitute the firm's biggest expense, and they are core to keeping the company's production lines and revenue streams going. Starting in the late '90s, attention shifted to indirect[2] spend as e-procurement software started addressing rampant maverick spend.[3] Now, indirect spend has come to dominate the P2P (procure-to-pay) conversation in many cases. However, direct materials P2P is typically more mission critical, complex, multi-party, and challenging to manage than indirect goods procurement.

| | Direct Materials P2P | Indirect Goods P2P |
|---|---|---|
| **Types of Goods & Services** | **Includes all materials and components in the products sold by the company**. Often listed in a top-level BOM[4] or recipe/formula, these include parts and subassemblies, raw materials and ingredients, packaging, and subcontracted manufacturing services. For a retailer, it includes all products they sell. | **Includes all other goods needed to run the company**, other than what goes into the products being sold. This includes office equipment and supplies, facilities-related equipment, IT expenses, travel, and so forth. Note: in this table we are only including indirect goods, not indirect services.[5] |
| **Impact of Disruption** | **Medium to Very High**—Disruption may impact production and revenue. Risk mitigation strategies should be executed, such as predictive early visibility into disruptions and prequalifying alternate sources. | **Low to Medium**—Disruption of supply for most goods, such as office supplies, is just an inconvenience; it's easy to find alternate sources. (Note: disruption to indirect services may have a higher impact.) |
| **Supplier Relationship** | **Often Strategic**—For critical parts or materials, there is often a long-term strategic relationship with the supplier. | **Often Transactional**—Except for some service providers (IT, pro services, etc.), most indirect supplier relationships are not strategic. |
| **Cost Reduction Potential** | **Larger**—Direct materials spend is typically 40%-70% of revenue for a manufacturer, representing major cost-saving opportunities. | **Smaller**—Indirect goods for manufacturing, wholesale, and retail companies are usually less than 20% of revenue, sometimes less than 10%.[6] |
| **Change Orders** | **Common**—Long lead time components and complex subsystems will often be subject to change orders to quantities or specifications. | **Uncommon**—Indirect goods typically have shorter lead times. Changes to an order, particularly spec. changes, are not common. |

[1] Direct materials are all the components and materials that go into the products a company sells.
[2] Indirect spend consists of the goods and services needed to run the business that are not part of the products the business sells.
[3] Maverick spend refers to employees buying off contract, not taking advantage of the savings negotiated by the procurement team.
[4] BOM = bill-of-materials
[5] Indirect *services* have different characteristics than indirect *goods*. The impact of disruption in these services can be high (e.g. if telecoms or IT/SaaS goes out), sourcing is more complex, supplier relations more strategic, and transactions larger.
[6] Service-only firms typically have little to no direct materials costs and may have a higher percent of indirect goods cost.

| | Direct Materials P2P | Indirect Goods P2P |
|---|---|---|
| **Fulfillment/Logistical Complexity** | **Usually High**—Especially for custom long-lead-time parts, ship-from-factory, multi-stage, multi-party, international shipments. | **Usually Low**—Typically order from catalog, fulfill from DC domestically by truck or parcel. |
| **Transaction Size, Duration** | **Larger, Longer Lifecycle** Transactions—Orders tend to be larger and the lifecycle of an order longer and more complex. | **Smaller, Shorter Lifecycle** Transactions—orders for indirect goods[7] tend to be smaller and fulfilled more quickly. |
| **Industry-specific Processes** | **Yes**—P2P processes are usually different between different industries. | **No**—P2P processes are similar across industries, varying somewhat between categories. |
| **Internal Functions Involved** | **Many**—Planning, manufacturing, sourcing (or merchandising), procurement, logistics (global trade, transportation, and warehouse), insurance, quality, compliance, treasury, AP. | **Fewer**—Requisitioner, approver(s), sourcing, procurement, AP. |
| **External Parties Involved** | **Many**—Suppliers, brokers/freight forwarders, ground and ocean carriers, consolidators, local offices, banks and 3rd-party financiers, insurance companies, inspectors, customs. | **Fewer**—Supplier, ground carrier. |
| **Cost Accounting** | **Variable costs**. The costs increase or decrease in direct proportion to unit production volumes. | **Fixed costs**. Indirect costs do not change for each unit of production volume change.[8] |

**Table 1 - Indirect vs. Direct Materials P2P**

Figure 1 below illustrates a typical direct materials P2P lifecycle. By our definition, the P2P cycle starts with the issuing of a blanket PO (a.k.a. blanket purchase agreement or call-off order). Once the specifics of the timing, quantity, and exact materials needed are known and ready to be firmly committed, the buyer will issue a call off or material release or scheduled release against the blanket PO. In many industries, the material release is embedded in a rolling forecast. Alternatively, if this is a one-time order, the buyer may issue a standard PO. Note that some solutions call themselves P2P, but they are actually 'P2I' (Procure-to-Invoice), as they lack support for payment processing and settlement. Further, a P2I solution may have light or no coverage of forecasting and other activities that happen before the issuing of the material release or standard PO.

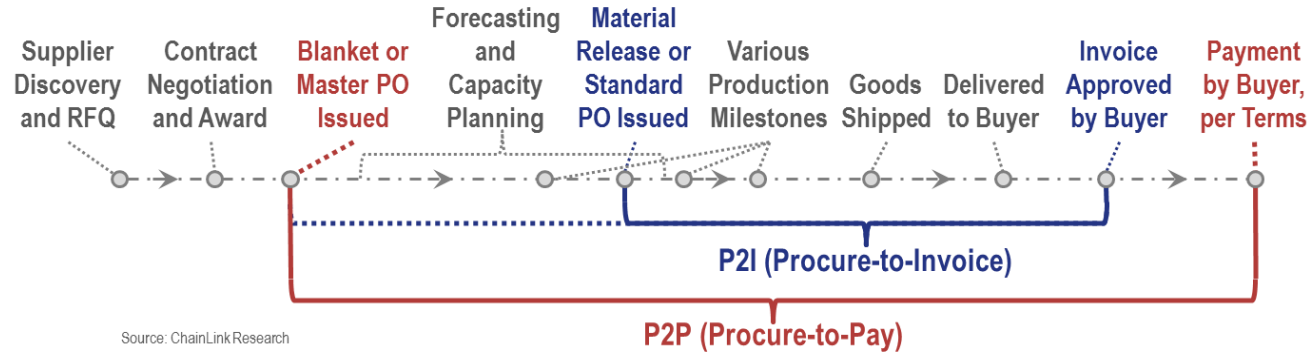


**Figure 1 - Procure-to-Pay Lifecycle**

[7] In contrast to indirect goods, orders for some indirect services, especially enterprise-wide services such as telecommunications, IT infrastructure, and facilities management, can be large, complex, and long lifecycle.
[8] Of course, indirect costs will increase or decrease as the corporation grows and shrinks in size, but they do not change in a 1:1 proportion to units of production. Hence, for accounting purposes, they are fixed costs to be allocated across the number of units of production made in an accounting period (e.g. quarter or year).

# Digital Transformation with Direct Materials P2P

Many companies strive to achieve digital transformation, moving from manual, paper-based processes to becoming a digital enterprise with a fully digital supply chain (see sidebar). Direct materials P2P (procure-to-pay) plays a central role in this transformation. The flow of goods and materials into the enterprise starts with the sourcing process, leading to creation of an agreement and blanket PO, and eventually to individual call-offs/material releases against the blanket PO, and finally an invoice. The original data from each stage should be 'reused' in subsequent stages, without having to rekey that data for related transactions. For example, data from an RFQ can be used to create the contract; data from a contract can be used in creating the PO, and data from the original PO reused directly in the invoice from the supplier, eliminating data entry labor, time, and rekeying errors. This drives the supply chain closer and closer to the ideal of zero data entry redundancy. Process improvements, supported by P2P automation,[9] increase visibility and speed, freeing up human resources from manual activities to work on more strategic activities.

## The Visibility Challenge

Visibility for direct materials is more critical and more difficult than for indirect goods. Early warning of production or delivery delays is critical for direct materials because the consequences of delay or disruption can be so high. It is more difficult because of the number of parties involved. Often status information from external parties is hard to obtain, delayed, out-of-date, not specific enough, inaccurate, and/or incompatible (like different document formats, different

**Attributes of a Fully Digital Supply Chain**

The fully digital supply chain is an ideal to strive for—a journey that never ends. Here are some key characteristics of that ideal:

- *Zero data entry redundancy*—All data is entered only once, at its origin. Data is never rekeyed as it flows through different parties and systems across the supply chain.
- *Instrumented*—Data about various events in the supply chain is automatically generated via instrumentation such as bar code scan, RFID, GPS, and IoT sensors. This data is used to trigger alerts, kick off processes, enrich transactional information, feed analytic engines, and more.
- *Management-by-exception*—As many steps as possible in a process are automated and/or decisions made by rules engines (encoded policies) and algorithms (machine intelligence judgement calls). People handle only exceptions that require human judgements and decision-making.
- *Person-to-person interactions fully integrated*—Wherever people get involved, their decisions, communications, and interactions are captured and integrated into transactional flows. Notes, email, phone, and text messages are linked to their relevant transactions and data. Systems may provide a social networking paradigm to share information in context.
- *Auditability*—All decisions and changes are captured, enabling after-the-fact audits and review.
- *Intelligence engines fed by fine-grained data*—Fine-grained data about all supply chain processes—including sourcing, procurement, logistics, manufacturing, service, and risk management— is captured and fed into analytic/machine learning engines, to uncover insights and improve processes.
- *Capture and digitize best practices*—Institutional learning and best practices are encoded into workflows and rules engines. This helps preserve lessons of the past, reduce reliance on a few senior individuals, and provides the framework for continuous improvement. A network platform extends workflows and best practices across the supply chain to trading partners and back.

(continued next page)

[9] Large reductions in errors and cycle times, and increased visibility, comes from automation of mundane tasks. Improving manual processes can help up to a point, but you can go further, faster, more consistently, with automation.

 

part numbers, unnormalized). Companies thus have incomplete or inaccurate information about the true status of critical inbound flows of materials feeding the engine of their business. They may not know anything is wrong until the order doesn't show up. Ideally, a company has enough specific, timely information to allow complex event processing and machine learning engines to continuously scan and give alerts much earlier. Most firms do not yet have this capability.

**Attributes of a Fully Digital Supply Chain** (cont'd)

- *Continual improvement, agile methods & infrastructure*—The digital supply chain is designed so that systems, processes, teams, and capabilities can evolve and respond quickly, incrementally, and autonomously in response to daily fluctuations, mergers and acquisitions, market shifts, catastrophes, and other events. Rapid adjustability is key. Highly efficient automation that is unable to adjust quickly does not survive. Experimentation and the use of company-specific, differentiating, business processes is facilitated.

## Cost Reduction and Beyond

Major benefits can be realized by making improvements to existing direct materials P2P processes and systems and leveraging a networked P2P platform:

- *Cost Reductions*—P2P process improvements can lower total cost via lower cost of execution, fewer errors, fewer disruptions, lower cost of transportation, financing, and more consistent realization of volume discounts. Suppliers' costs can be reduced by networked P2P systems providing supply chain finance, and production-, quality-, and shipping-related functionality within the suppliers' factories.
- *Speed and Agility*—Beyond cost reduction, P2P process improvements can increase speed and agility: reduced cycle times, less inventory with improved service levels, change products and direction quickly, realize postponement later, find and fix quality problems sooner. Direct, fine-grained control of suppliers' actions allows buyers to change suppliers' execution precisely and rapidly. Agility is the cornerstone of competitiveness. This should be a main goal of direct materials P2P improvement initiatives.
- *Risk Reduction*—Direct materials P2P improvements bolster continuity of supply by providing earlier warnings of issues and, if all parties are connected on the network, coordinate rapid early response to problems. In addition, better supply chain financing options can strengthen suppliers' financial viability.
- *Best Practice/Continuous Improvement*—Digitization of P2P processes enables standardization across the enterprise and supply chain. Operational decisions are made locally, but the development and continual improvement of best practices can be curated centrally and spread across the enterprise, rather than being left as 'an art' for each individual to figure out. This may involve harmonizing and synchronizing practices across the supply chain, and benchmarking and tracking the performance of different locations and individuals to better understand who has best practices to be emulated, and where improvements are needed. A supply chain-wide networked platform allows best practices and continuous improvement to be propagated out to suppliers and service partners (logistics, packaging).
- *Supplier Relationship*—P2P improvements can build stronger supplier relationships. Both parties gain trust and concrete financial value thru better bi-directional visibility; more reliable, earlier payments; and more strategic relationships. Investments in continuous improvement of key suppliers, and the buyer's practices, can benefit both sides and the competitiveness of the end-to-end supply chain.

Many of these improvements are dependent on or better leveraged by running the company's P2P processes on a P2P Network.

# The Role of a Networked Platform in the Digital Supply Chain Journey

## End-to-End Visibility and Single Version of the Truth Across the Network

A network platform lays the foundation for the digital supply chain journey. Direct materials P2P involves many steps, documents and transactions, and parties including buyer, seller, logistics providers, finance providers, expeditors, customs brokers, inspectors, insurance companies, and others. Having a single unified network connecting all those players, processes, and data provides a single version of the truth, reducing or eliminating rekeying of data and reducing disputes, and speeding up end-to-end processes. It provides a chain-wide view of orders, with visibility at each step, including visibility within the factory. The network helps harmonize data formats and processes.

However, that is true only if the networked platform has mechanisms to keep each trading partners' ERP and other relevant enterprise systems-of-record/execution, precisely in synch with the data on the network, with minimum synchronization delays. With those synchronization capabilities, the network platform provides the vehicle to extend an enterprise's digitization outside of the four walls, to create a fully digital supply chain.

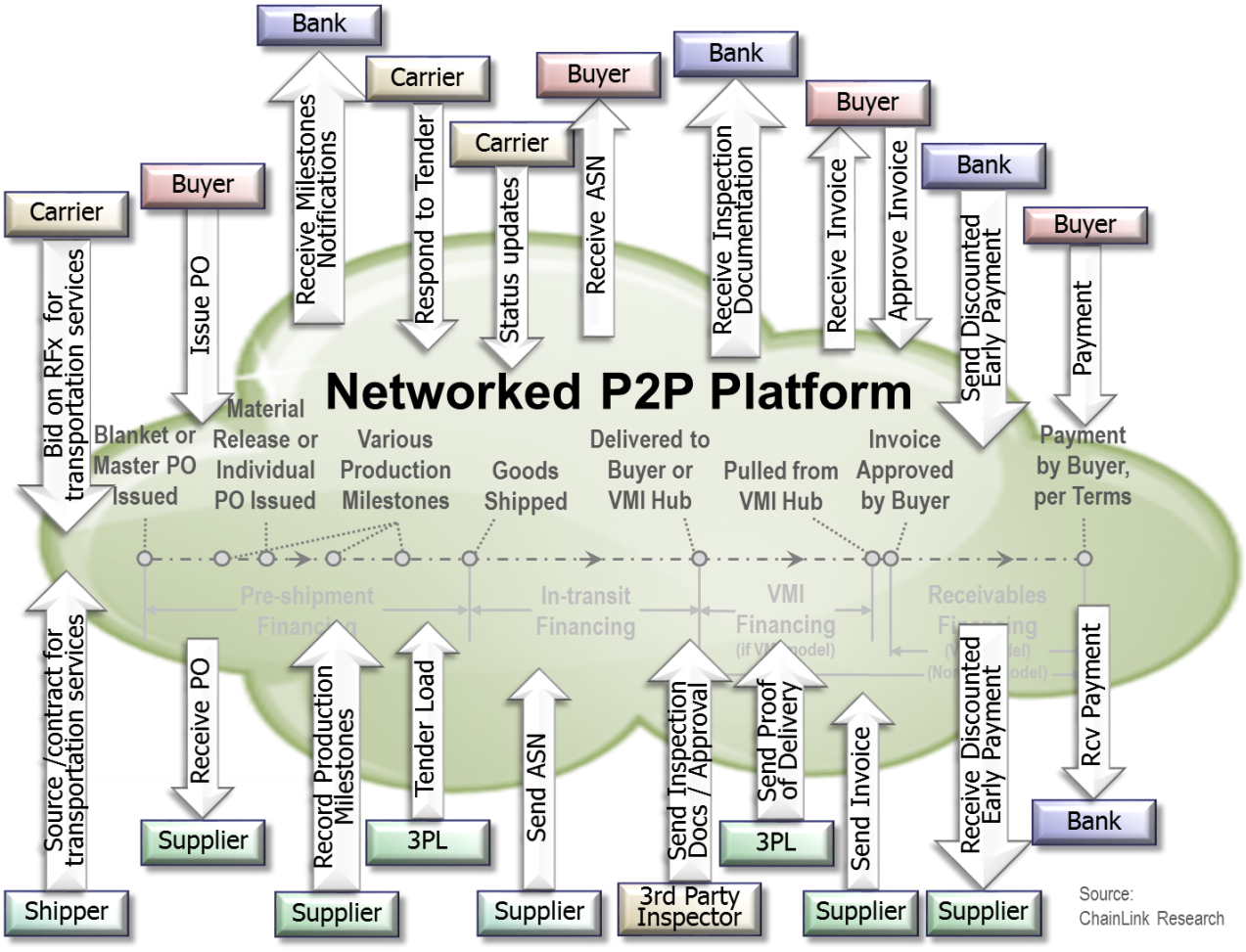


**Figure 2 – A Networked P2P Platform Provides a Shared Single Version of the Truth with Chain-wide Visibility**

## Network-enabled Improvements

P2P Networked Platforms enable myriad capabilities not possible with point-to-point solutions. This includes reuse of data across the chain and across the end-to-end process, thereby dramatically speeding up cycle times and eliminating the majority of data entry errors; providing better end-to-end visibility and orchestration with fine-grained control over suppliers' execution; more flexible supply chain finance options, often at lower cost; faster and more effective collaboration and negotiations on capacity and demand, ensuring mismatches are spotted and resolved early; improvements to inspection and quality; effective postponement strategies with trading partners across the network; compliant duty optimization; and dramatic reductions in disputes and increases in straight-through processing of invoices, freeing up AP resources to work on value-adding activities.

These capabilities generate significant performance improvements across a wide range of metrics such as time and cost to process an invoice, PPV,[10] cost of capital, % of invoices processed straight through ('touchless'), cash-to-cash cycle times, order cycle times, inventory and service levels, duties and tariffs, and continuity of supply. Consider the improvements Crocs realized by leveraging the GT Nexus platform: they reduced the average time to match a supplier invoice to the PO from 26 days down to 0.6 days, reduced the new hire AP clerk learning curve from 6 months to 3 weeks, and reduced the number of AP clerks from five to less than one.

## Assurance of Supply

A networked P2P platform can help reduce supply chain risk and assure supply. Giving suppliers more supply chain finance options at lower cost makes for financially healthier suppliers, less prone to failure and more able to deliver on time. Having a platform that provides early warning of shortfalls or potential issues whenever the forecast or available capacity changes, or shipments are going to be late, allows trading partners to respond in time to avert disruptions. The network enables a more coordinated and rapid response to these and other issues, such as quality problems.

With platform-driven creation of customs filings and documentation, shipments are less likely to be held up at customs. Unauthorized outsourcing or changes to the location of manufacturer are less likely to occur and will be detected if they do. Direct visibility into factory and status of WIP provides earlier warnings of potential delays in delivery. The ability to exactly specify and direct supplier's operations, with precise instructions and execution, dramatically reduces non-compliant shipments that may have to be rejected. Taken altogether, these improvements can have a profound impact on the continuity of supply.

## Support for Complex Legal Entities

Since a network is designed to connect multiple parties and players, it provides support for complex, multi-entity legal structures and relationships, such as:

- *Trading Companies*—Such as Honda Trading Corp., sole manufacturer's trading company in Honda Group's 442 affiliated companies, provisions materials, equipment, steel processing, dies & molds, metal alloys, sales of completed products, and recycling between the various trading partners.
- *OEM/CM/Supplier*—Some OEMs use a contractor manufacturer, but the OEM continues to buy the materials used by the contract manufacturer, creating tri-lateral relationships.

[10] PPV=Purchase Price Variance. In this context, PPV is the difference between the invoiced price and the price on the PO.

 

- *Complex Logistics*—In international logistics, there are often a dozen or more parties involved. A 4PL or Lead Logistics Provider may coordinate multiple 3PLs, forwarders, carriers, inspectors, customs, etc.
- *Multi-tier Supply Chains*—In some industries, such as apparel, automotive, and high tech, OEMs have relationships beyond tier 1 suppliers and want visibility and some control over the sub-tiers' decisions.

### Reducing the Need for Letter of Credit

A P2P network can reduce or eliminate the need for documentary letters of credit (LC). LCs are expensive and slow; physical documents need to be delivered from various parties to the paying bank (buyer's bank). Some P2P networks provide non-revocable payment protection at a lower cost and without the delays inherent in an LC. Payment assurance can be requested by the supplier at the time an invoice is submitted. If approved, the buyer gives irrevocable permission to the network platform to withdraw the amount owed automatically at the due date of the payment and transfer it to the supplier's account. The rates charged for this guarantee are based on the buyer's creditworthiness and their issuance doesn't impact the buyer's balance sheet. This provides the supplier with extremely low risk collateral against which to borrow money.

The network may also provide guaranteed payment triggered by a set of verified conditions (such as an inspection report from a third-party inspector meeting agreed criteria). This is roughly analogous to a digital letter of credit, but at a lower cost and executed nearly instantaneously and automatically. This is possible because all the necessary data—such as verification that specific items were received in good order and passed inspection—will be on the network already in electronic form.

## Collaboration and Automation Through P2P Phases

Besides automated processes, a digital supply chain also integrates collaborative human-to-human interactions that are critical to the smooth running of supply chains. Figure 3 (next page) illustrates five phases of the procure-to-pay process, mapped onto the P2P lifecycle. Each phase has opportunities for automation *and* human-to-human collaboration and dialog. For example, a scheduled release is issued automatically,[11] based on forecasted material requirements and lead times, and the order acknowledgement is issued automatically by the supplier,[12] based on an automated check of available capacity and inventory.

However, if the supplier is unable to deliver the quantity on the requested schedule, they may propose an alternative (like '*how about half on the requested date, half a week later*'). We have just jumped out of the automated transactional flow and into human-to-human collaborative dialog. This involves some combination of phone, email, and text, usually completely independently from the execution system. Once an agreement is reached, the execution system is manually updated. In this example, a PO change request is sent by the buyer, with new quantities and schedule, agreed between the parties 'out-of-band' in their person-to-person dialog.

[11] Even when a call-off is generated automatically, some companies have a buyer double-check all orders before they are sent, just in case something doesn't look right. Suppliers may double-check auto-acknowledgements before they're sent.
[12] Supplier side automation is less common and can be challenging. A P2P network can help.

 

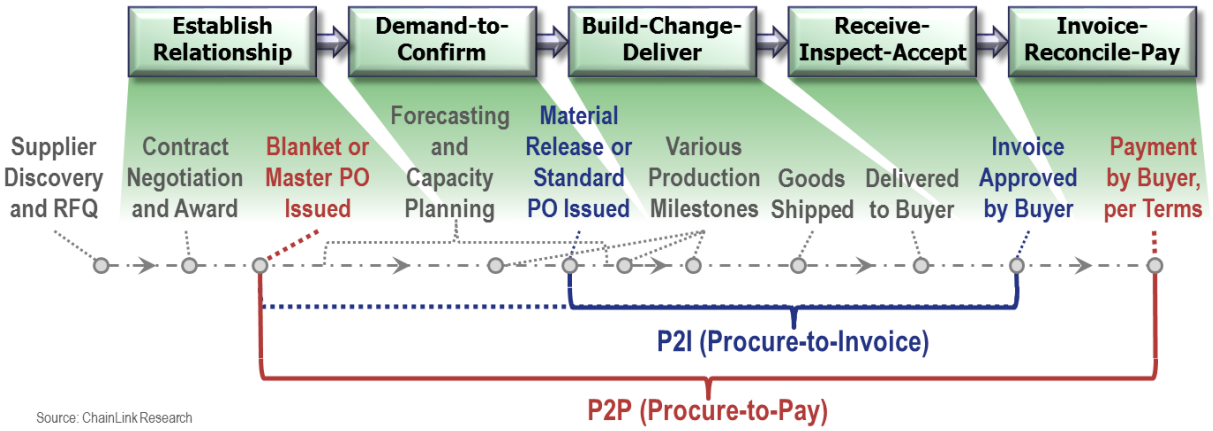


**Figure 3 - Five Phases of Direct Materials P2P**

## Integrating Transactional and Collaborative Flows

Typically, these collaborative dialogs are completely unintegrated with the execution systems. But, we are starting to see the use of 'enterprise social networking' paradigms and systems that integrate email and phone conversations to bridge this gap between person-to-person dialogs and machine-to-machine transactions.

Consider the above scenario where the supplier proposes alternative delivery dates and quantities. If the supplier uses a network platform, entering the reasons for the changes as well, the proposed modifications can link to the original order, and the buyer could simply click 'accept' to automatically create the change request, ensuring that no errors occur in keying in the changes. Or they could counter-propose on the system. If both sides go back and forth a few times, they are always viewing the same latest version or proposal, with a history of the back and forth exchanges. The system could help them understand the consequences of each proposal as well, such as its impact on the supplier's capacity or buyer's production. Anyone (with proper access rights) can go in after the fact and see how the decision was arrived at, with the collaborative dialog attached to the actual transaction. A system might also facilitate phone conversations, allowing shared views of the transactions, forecasts, schedules, available capacities, and so forth, and allowing shared note-taking and capture the data used to make the decision.

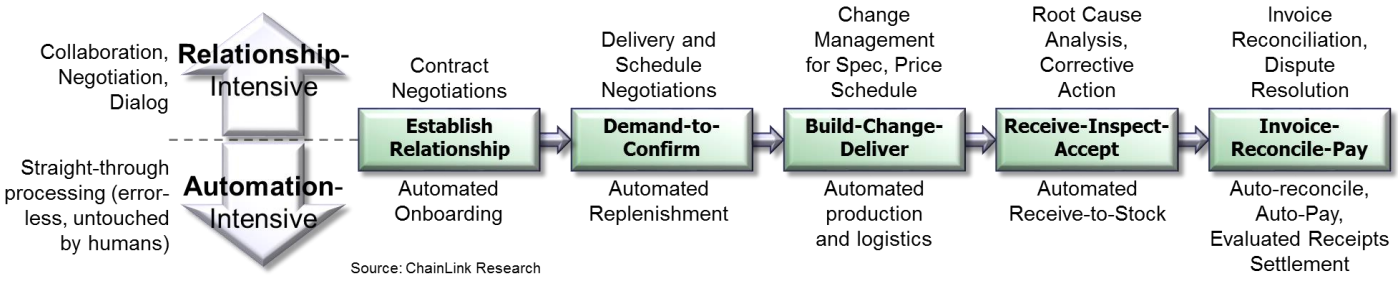


**Figure 4 – Relationship/Automation Intensity of the Five P2P Phases**

Below we explore the automation- and relationship-intensive sides of each of the five phases. These vary greatly depending on the industry and materials being exchanged. Buying nuts and bolts is radically different from buying a jet engine, which is different from buying fresh produce, or active pharmaceutical ingredients.

# Establish Relationship

Before a call-off or material release is sent, a lot of work supporting the procure-to-pay process will already have been done, including discovering potential suppliers, evaluating and selecting suppliers, negotiating contracts, potentially creating a blanket PO or purchase agreement, forecasting of demand, and reserving of capacity. Parts of the pre-PO phase, such as supplier onboarding, are amenable to automation. In contrast, contract negotiations typically require more human-to-human back-and-forth discussions. Even there, there are some opportunities for semi-automation, such as system-generated pricing or auto-evaluation of bids.

## Capacity and Forecast Collaboration

Before issuing a call-off, schedule release, or standard PO, the buyer and supplier will often collaborate on reserving capacity against a forecast. This is especially true in long lead time industries, such as custom semi-conductors, automotive parts and assemblies, pharmaceutical ingredients, fashion clothing, and furniture. The ability to accurately forecast and share expected demand, and then secure capacity, is critical to the success of P2P, especially during periods of tight capacity that all these industries experience from time-to-time.

A network platform can be invaluable for this collaboration. It allows buyers to share capacity needs and rolling forecasts projecting out for 26 or 52 weeks (more in some industries), and suppliers to commit capacity, with-out complex EDI capabilities. Data from the forecast and agreed capacity plan is used in generating blanket purchase orders and individual material releases or standard POs. Ideally the system captures the history of changes to the plans along with the reasoning and notes from the back and forth negotiations. On an ongoing basis, the platform can alert both parties to capacity issues in advance, which is especially critical as demand and available capacity fluctuate. AI/machine learning systems are emerging that can provide smarter predictions and propose options and alternatives to fix shortfalls and demand-supply mismatches.

## Multi-Tier Collaboration

In some industries, capacity and forecast collaboration between multiple tiers can be very useful. It allows synchronization of the tiers and gives the OEM visibility into capacity issues further upstream. These types of collaborative systems may extract a BOM from a PLM system to explode the finished goods forecast into raw materials components by tier. In addition, the tools can aggregate the use of components and materials across different products, allowing planning and negotiation to be done on the aggregate demand. To make this work, the supplier needs the ability to peg capacity and materials to specific customers and orders.

## Integrating Pre-PO Data into the P2P Process

Data from forecasts, capacity plans, RFQ responses, and contractual agreements should be integrated downstream into P2P execution. The simplest reason is to ensure that purchase orders match the previously agreed commitments and contracts. In addition, by integrating this data into the execution platform, it can ensure contractual commitments—such as capacity commitments by sellers and volume commitments by buyers—are monitored and integrated into execution. This helps the supplier or buyer remember and honor their contractual commitments and volume pricing opportunities (for the buyer). The ability to bring together all the multiple decisions and commitments made by the different parties and functions across the phases of sourcing and contracting, and share that on the network platform, is another step to having a single version of the truth, which can be used to dramatically reduce disputes and misunderstandings later in the process.

 

# Demand-to-Confirm

The issuing of a material release or standard PO is a request for a specific quantity on a specific date. This is followed by confirmation from the supplier that they can fulfill the request. Often this is simple and uneventful. However, even if capacity and forecasts have been agreed on prior to the order, by the time the order is placed, things may have changed. Changes are inevitable, but it is very helpful to have a single version of the truth, so that everyone is on the same page when changes happen and there is unambiguous alignment on what the current agreed plan is. The same system used in pre-order capacity and forecast collaboration can be used to provide visibility into shortfalls, track and record changes and dialogs behind the parties, and compare the actual order vs. forecast (and later on, shipments vs. orders). Having both the supplier and buyer involved reduces the 'whack-a-mole effect,' where problems keep getting pushed to the other party. This process is facilitated by a platform providing shared visibility, a way to collaborate, and the intelligence to evaluate different options. Ideally the system should be able to not just track changes, but also to calculate the total cost implications of last minute changes, such as the cost of expedited delivery, so that everyone understands the full consequences of changes.

# Build-Change-Deliver

## Change Collaboration

The next steps after order confirmation depends a lot on whether the manufacturing model is ship-from-stock, assemble/build-to-order, or engineer-to-order. These different models, as well as the differences in order lead times, have a big influence on the degree and types of change orders that occur once the order is placed. Changes to the quantity and timing of delivery can use many of the same collaborative processes and tools described above for negotiations during the pre-order phase. Changes to specifications (e.g. ECOs)[13] will require manufacturing and production engineers to collaborate on what is feasible, sharing specifications, engineering drawings, test results, and other documents, as well as people from production and supply chain to understand existing inventory at various stages, anticipated demand, and assess the impact and timing of the change. In any case, complete visibility throughout the process is needed: WIP production updates, warehouse status, tracking of shipments, and precise ETA updates. These provide early alerts to potential issues.

## Visibility and Orchestration at the Supplier's Factory

It is often highly desirable for the buyer/OEM to have fine-grained visibility and control over what is happening in their supplier's factory for a variety of reasons. For example, if a buyer wants their supplier to execute personalization/mass customization of ecommerce orders, potentially on the same lines that are serving bulk orders and mixed size orders, they need a way to send precise, per-order instructions, interleave them, and ensure those are executed properly, with the right labeling and shipping instructions. Another example; a brand owner that has many different retailer customers, each retailer dictating their own precise compliance requirement with details about custom packaging, required pack sizes and mixes, required labeling and positioning, routing guides, bundling of shipments, container loading sequences, documentation, and more. A shared networked platform between buyer and supplier allows compliance rules to be centrally defined and input at the OEM and then used to drive automated operations at the supplier, and potentially at packaging,

[13] ECO = Engineering Change Order

 

logistics, and fulfillment partners. Hence, each player in the chain performs their step(s) precisely to create a fully compliant end-to-end fulfillment process.

## Postponement of Differentiation

Postponement (a.k.a. delayed differentiation) enables manufacturers to postpone decisions until they have better information about actual demand at a more granular level. For example, one sunglass manufacturer has an order-to-shelf lead time of 120 days and a selling season of only 140 days. In the past, they had to place orders for the entire season before they sold a single pair, with no visibility into which styles would be hot sellers and which ones 'dogs.' By designing everything with common raw materials and parts, the manufacturer now places blanket orders for the entire aggregate demand[14] much earlier. The supplier secures the raw materials earlier and the manufacturer can postpone decisions about which models to build until just 50 days before the required delivery. As a result, the manufacturer places smaller model-specific orders at the beginning of the season, then sees what styles are selling well or poorly, and is able to order larger quantities only for those models that are selling well. This dramatically reduces both stock-outs and over-buys.

Buyers may have multiple points of postponement in the process, *provided they have precise visibility into factory status and milestones*. They buyer needs to know with precision when each of the key postponement decisions is required. For example, an apparel OEM sends an order specifying the number of shirts to make, but not yet the colors or sizes. The outsourced factory buys the undyed gray fabric. If the OEM knows exactly when the material is ordered, arrives, and is scheduled to be dyed, they know exactly when they need to make the color decisions, based on what is actually happening on the ground at the outsourced factory, rather than some average, estimated schedule. Later, the OEM knows when the size decisions must be made, based on exactly when the cutting and sewing will start. Near the end of the process, the OEM knows when it must tell the contract manufacturer how many of each size, color, and style to ship and where. In fact, the decision on final destination can be postponed further until the shipment arrives at the deconsolidator at the destination port. This allows key decisions to be postponed until location-specific demand is better understood. All of this requires fine-grained visibility into the factory, logistics status, network-wide inventory levels, and actual end demand.

### Dematerialization and First Sale Programs for Duty Optimization

Companies that buy from overseas suppliers may be paying higher duties than is necessary, particularly when there are multiple components being shipped and invoiced as one unit and/or when there is a middleman. A platform that can 'dematerialize' the components, and generate separate commercial invoices for each, can save unnecessary duty payments. For example, one jacket brand owner imports jackets which consist of the outer liner, the shell, hangers, and hang tags. The duties are different on all of those. By separating them out, they are compliantly saving about $300,000/year on duties. As well, in the U.S., the First Sale for Export (FSFE) rule for multi-tiered transactions (i.e. with a middleman involved) allows the cost paid at the factory to be used, rather the price charged by the intermediary. These require a system that has accurate data and documents throughout the supply chain and handoffs, including an exact copy of the customs form and original invoice. A networked platform, with all the players connected, is well suited to providing this functionality.

[14] Aggregate demand (across models) for a market for a whole season is much easier to predict with accuracy than per-model demand, especially in a fashion-driven industry.

 

**Automation and Acceleration of Global Trade Processes**

Another benefit of a network platform is the potential to ensure fewer errors and faster clearing through customs. Because all the data is already on the network, the platform can generate accurate, timely, compliant documentation and filings. These can be generated and submitted automatically, shortening the cycle time significantly and dramatically reducing delays caused by missing or incorrect documents.

# Receive-Inspect-Accept

Many buyers have eliminated the need for inbound inspection, by improving supplier quality and pushing the inspection responsibility back to the source factory. This also gives the supplier more immediate feedback in fixing their quality issues and reduces unnecessary shipment and subsequent return (or disposal) of non-compliant materials; a win-win for both sides. The buyer may work directly with the supplier to improve quality if there is a strategic relationship. Those kinds of programs need quality information and visibility.

## Shared Quality/Issue Tracking System

Whether inspection is done by the buyer or the supplier, a shared system for recording inspection test results, noting defects, tracking issues, determining root cost, and resolving the problem can greatly speed up the resolution process and ensure nothing falls between the cracks. Issues could be recorded by either the buyer or supplier, with ability to attach supporting materials such as pictures of the issue, test reports, and other documents. For the buyer, this provides one common system for issue tracking and resolution, across suppliers and their own operations, regardless of where and how an issue was uncovered. This also allows the buyer to adjust the level of inspection rigor at the supplier based on the circumstances. For example, a new supplier might start off with more frequent and rigorous inspections until they are proven to be reliable. 100% inspection might be implemented right after a problem is discovered, then inspection rates ramped back down as confidence increases that the problem has been resolved.

When issues are found at receiving, rather than the receiving clerk or inspector simply entering '*10 broken,*' they are prompted to enter the precise details, provide pictures, and other relevant information or documentation. Having a shared system, with all the correct required documentation shared between the parties allows faster and less disputed chargeback recovery. Furthermore, having all this data on the platform enables ongoing analysis of problems to highlight and address systemic problems, such as problems with a specific production line, location, or carrier, or insufficient packaging causing breakage in transport.

## Preventing Unauthorized Outsourcing

Companies often spend a lot of time and effort inspecting and qualifying their suppliers' manufacturing plants, for quality, safety, and compliance. However, when a supplier has more orders than they can handle, it is very tempting for them to simply move or outsource a portion of their production to a different (not yet approved) factory, hoping the customers won't notice. This can have serious consequences, not only for quality, but for the reputation of the buyer, if it turns out the new location has abusive labor practices and/or unsafe working conditions. A fully digital supply chain, with systems and instrumentation in the suppliers' factories, can detect a change in location, preventing unauthorized outsourcing or relocation of production.

 

## Invoice-Reconcile-Pay

At this final stage of the P2P process, the goal is to get as close as possible to 100% automation with 100% straight-through processing of invoices. If the previous steps were all digital, with verification and point-of-delivery reconciliation, then the invoice reconciliation step should be nearly 100% straight-through, because the data in the invoice has come from the PO, the ASN, and the goods receipt. Any damage of goods or discrepancies between the ASN and actual goods received would have already been identified and resolved at the time of receipt at the loading dock (or other point of inspection). With all-digital, linked P2P processes, the invoice reconciliation process goes smoothly and there are few exceptions for the AP department to deal with. This dramatically reduces non-value-add time and effort spent resolving disputes and hunting for the data to try and piece together what actually happened well after the fact.

Ultimately, as confidence in the relationship and system increases, it enables evaluated receipts, where the supplier doesn't even issue an invoice, but is simply notified that the goods were accepted and payment will be sent.

## Supply Chain Finance and Global Payments

A P2P Network can provide several options for supply chain finance programs, including early payment discount programs and pre-invoice financing, at lower costs than traditional approaches. With early payment discount programs, the supplier has the option to get paid sooner, at a discount from the full payment. These programs can be buyer- or bank-funded.

**Networked P2P Platform Example: Patagonia**

Patagonia is an environmentally passionate, responsible private-label, outdoor clothing and gear retailer. They are using GT Nexus' networked platform in a number of ways:

- *Supplier Factory Integration*—Patagonia's suppliers' factories are also on the GT Nexus Commerce Network, enabling Patagonia to receive milestone status of WIP (material received, died, cut, sewn, etc.) and precisely control their suppliers' pick, pack, ship operations. This has enabled mixed size runs per location, automated sending of the ASN, and reduction in receiving times by over 10X.
- *Integrated Supplier Inspection*—Suppliers use GT Nexus' mobile quality control application to inspect goods before shipment. The system pulls information directly from the PO (saving a lot of data entry for the inspector), lets them select the items being inspected down to specific sizes and colors, and then provides the detailed step-by-step inspection form, ensuring that nothing is missed.
- *First Sale for Export*—The platform maintains first sale costs, verified by the supplier, and generates the required paper-work, ensuring compliance and reducing duties and tariffs.
- *Replacing Letters of Credit*—Patagonia was able to move suppliers off of expensive letter credits by leveraging GT Nexus' payment protection capabilities.
- *Dramatic Reduction in Purchase Price Variance*—Patagonia submits POs on the platform and uses it with suppliers to negotiate and mutually agree on price, quantity, and delivery dates. As suppliers ship goods to fulfill those orders, the agreed data from the PO is used to create ASNs and invoices, virtually eliminating pricing discrepancies and enabling automatic invoicing. The vendor can't make changes to prices or anything without prior agreement from Patagonia. The process is largely automated, with invoices flowing into Patagonia's ERP system, and the banking transaction automatically orchestrated by GT Nexus on Patagonia's behalf.
- *Global Payments*—Patagonia has a division in Korea which buys products from the parent company. In the past, they would have to take the commercial invoices to the bank and submit payment in person. This is because of regulations in Korea (China and other countries have similar restrictions) designed to maintain close control of money flowing out of the country. Now Patagonia has a bank account that GT Nexus can withdraw from, acting on behalf of Patagonia, to disburse funds. That turned a labor-intensive payment process into an automated electronic process.

The discount rate is usually substantially less than rates charged by factors[15] because the network automates most of the work involved and (for bank-funded programs) provides a competitive global marketplace for funding. A global lending marketplace is possible because of the connectivity to banks, as well as the data and payment assurance mechanisms required to lower risks for lenders. The platform also enables global payments to be made faster and easier. Procure-to-Invoice (P2I) solutions stop at the reconciliation of the invoice. A true P2P platform goes all the way through to settlement of the payment.

### Lowering Suppliers' Cost of Capital and Use of Credit Lines

Early payment discount programs are non-recourse and an alternative funding source for suppliers. By eliminating account receivables, rather than tying up short-term bank credit lines, suppliers can improve their cash flow and their balance sheet. Suppliers can use early payment discounts for short term working capital needs e.g. buying material, and bank lines for long term investments e.g. growing their business. Foreign exchange risk can be minimized by getting paid earlier when rates are fluctuating.

With a confirmed Purchase Order, a P2P network also enables pre-invoice and pre-shipment financing at lower rates than a supplier can typically get from their local lenders. Rates are lower because A) the network maintains a history of supplier performance, the main risk for lenders, B) the network can maintain a history of logistics success/failure and buyer credit-worthiness, and C) the network can provide a global marketplace of competing lenders. For more on leveraging a network to get lower cost of capital, see *Reinventing Supply Chain Finance*.

# Journey to a Digital Supply Chain

## Achieving a Win-Win Across the End-to-End Supply Chain

Getting to a true end-to-end digital supply chain requires reaching outside the four walls of your own enterprise, and connecting trading partners on a common networked platform. A point-to-point approach to integrating the supply chain won't get you there. It is important that this journey is a win-win for suppliers as well, so that they are eager to adopt, rather than having to be coerced. Unless suppliers embrace the initiative, it won't succeed. Providing suppliers with precise instructions (thereby reducing mistakes and chargebacks), self-inspection, certainty of payment, and early payment programs are examples of win-win capabilities.

Mature P2P Networks are available and in wide use today. Decades of development, use, and refinement provide rich functionality, tuned to real world needs. Practically every manufacturer, wholesale distributor, or retailer should consider using this approach to improve their direct materials P2P performance and ultimately their company's competitiveness.

[15] Many elements go into the rate that factors charge, including the amount paid up front (some is always held back to cover fees and default risk), monthly factored volume, invoice size, industry, and the credit-worthiness of the buyer. A typical rate might be a 3% processing fee, plus 1%/week. If terms are 60 days (8.5 weeks) and the supplier is paid at 2.5 weeks instead, that comes to a 9% fee (3% + 6% for 6 weeks to the buyer payment), equivalent to a 78% annual interest rate.

 

About ChainLink Research

ChainLink is a recognized leader in custom research and advisory services, with a focus on supply chain, Internet-of-Things, and blockchain. Founded in 2002, our emphasis from the start has been on inter-enterprise interactions and architectures ('the links in the chain'). We have conducted over 75 primary research projects, interviewing and surveying over 10,000 executives and professionals. Much of our research focuses on industry-specific use cases, business cases and ROI, and drivers/inhibitors of technology adoption, and business change. As a result, we have developed a deep, multi-industry practice, founded on real-world, validated, supply chain-wide, end-to-end perspectives that have helped our clients understand, plan, and succeed as they move into the future.


For more information, contact ChainLink Research at:

321 Walnut Street, Suite 442, Newton, MA 02460-1927

Tel: (617) 762-4040. Email: info@clresearch.com Website: www.clresearch.com