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From Digital Readiness to Agentic Work: The Next Operating Model for External Manufacturing

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External manufacturing has become one of the most strategically important—and operationally complex—areas of the life sciences supply chain. Pharmaceutical and biopharmaceutical companies now rely more heavily than ever on contract manufacturers, contract packagers, suppliers, logistics providers, and other external partners to bring medicines to market. But while the external manufacturing model has expanded, the operating model used to coordinate it has not kept pace.

The biggest challenge in external manufacturing is not a lack of data. It is the growing amount of cross-company coordination required to keep supply moving. The result is a supply chain environment where teams spend too much time chasing updates and not enough time acting on them. When demand shifts, supply constraints emerge, quality events occur, or logistics delays threaten supply continuity, teams need trusted information and the ability to coordinate decisions across organizations in near real time.

That is why the conversation around AI in supply chain operations must begin with digital readiness.

AI is not a standalone technology that can magically solve fragmented processes. Agentic work depends on trusted, contextual, real-time multienterprise operational data. If data remains buried in emails, spreadsheets, and isolated systems, organizations may achieve a level of automation—but they will struggle to scale agentic operations across their internal teams and companies across their manufacturing ecosystem.

The future requires a new model: an Agentic Supply Chain Operating Model that combines human expertise with agentic work across linked companies, systems, suppliers, customers, business transactions, collaborative processes, Agentic Control Towers, and governed agents.

Digitalization Delivers Measurable Value Today

Digital readiness is not an abstract concept. It delivers measurable business value.

In one real-world example discussed during our recent webinar with Nubinno, a global biopharma company with more than 70 contract manufacturing partners, depended on those CMOs for roughly 30% of annual sales revenue. Before digitalizing external manufacturing collaboration, the company was carrying nearly $800 million in finished goods inventory and safety stock, while CMO on-time delivery was below 60%.

By establishing a collaborative information exchange environment with its CMOs, the company digitally exchanged forecasts, purchase orders and confirmations, inventory balances, batch documentation, batch master data, and delivery notices. The outcomes were significant: CMO on-time delivery improved by 10%, safety stock was reduced by 3% in a relatively short period, and manual labor-intensive activity was reduced by roughly 50%.

Just as importantly, inventory balance information that had previously arrived every three to four weeks was now available daily, helping teams make faster and

more accurate decisions. The benefits extended beyond external manufacturing to planning, customer service, logistics, and finance teams that could use the same trusted information in different ways.

Digital Readiness Creates the Operational Layer for Agentic Work

Digital readiness means creating an integrated operational environment where data can flow reliably across enterprise systems and between organizations. It means standardizing and contextualizing information so teams and systems can understand not only the data itself, but also the relationships between purchase orders, production orders, inventory, shipments, invoices, quality events, forecasts, and other business transactions.

It also means digitally orchestrating processes across planning, manufacturing, quality, logistics, finance, and partner collaboration. This is not simply a technology integration exercise. It requires governance, operating-model readiness, process ownership, onboarding strategy, and clear accountability for how information is exchanged and used.

In external manufacturing, this operational layer is especially important because so much coordination happens outside the four walls of the enterprise. Without trusted multienterprise data, companies cannot maintain accurate visibility into inventory, orders, production status, shipments, exceptions, or supply risk. And without that visibility, it becomes difficult to improve service levels, reduce costs, protect working capital, and respond quickly to disruption.

Why Scaling Is the Hard Part

Many companies can successfully complete a pilot or integrate with a small number of carefully selected partners. The challenge begins when they try to scale beyond the top 5-10%.

As organizations move from one or two integrations to dozens—or even hundreds— they encounter differences in systems, formats, technical maturity, data definitions, and business practices. Each company may operate differently. Each transaction type may introduce new complexity. Without a scalable integration model, companies can find themselves rebuilding and maintaining point-to-point integrations repeatedly.

That is where TraceLink's Integrate-Once Agentic Business Network provides the foundation for network-scale execution. Instead of requiring every company to build and maintain custom integrations with every other company, TraceLink enables the entire supply chain to integrate once to the network and exchange information across systems, formats, transactions, communication channels.

This creates the shared environment and real-time network context that human teams and AI agents need to monitor supply network conditions, identify issues, prioritize work, and coordinate action.

How Human-Agent Teams Change External Manufacturing

Once the foundation is in place, organizations can begin to introduce OPUS Agents into well-defined operational processes. These agents are not replacements for human teams. They are governed digital teammates that work under human direction, with defined intent, objectives, tasks, decisions, and rules.

In external manufacturing, agents can support repeatable operational work such as monitoring business transactions, identifying exceptions, escalating issues, recommending actions, and helping teams coordinate shared processes. Human managers remain accountable for judgment, oversight, and strategic direction, while OPUS Agents help improve speed, consistency, precision, and scale.

This is the power of the human-agent workforce: people and agents working together through Agentic Business Processes, supported by trusted operational

context from linked partners, standardized business transactions, and a shared multienterprise environment.

Agentic AI becomes especially powerful when it helps teams move away from manually chasing updates and reconciling information, and instead focus on exceptions, root causes, strategic decisions, supplier performance, and collaboration. But governance is essential. In a regulated industry like life sciences, agents must operate with permissions, auditability, decision boundaries, escalation paths, and human oversight.

The goal is not uncontrolled autonomy. The goal is trusted, governed execution where humans remain accountable and agents help teams perform work with greater speed, consistency, and productivity.

What Agentic Business Processes Can Make Possible in External Manufacturing

As companies digitalize critical business transactions and create trusted operational context across their supplier networks, they can begin moving from manual coordination to Agentic Business Processes: governed processes where human teams and agents perform operational work together with shared context, defined roles, clear rules, and measurable outcomes.

These should not be viewed as standalone AI experiments. They are examples of the types of repeatable, cross-company processes that become possible when organizations have reliable multienterprise data, standardized business transactions, and a shared operating environment:

Supply Planning

- **Forecast-to-CMO Commit Alignment:** Human teams and agents coordinate forecast sharing, CMO responses, commit gaps, capacity constraints, and follow-up actions so planners identify supply risk earlier and

improve alignment between demand, capacity, and production commitments.

- **Capacity Balancing:** Agents monitor demand changes, CMO capacity signals, production constraints, and available supply options to help teams identify capacity gaps and determine where work should be prioritized, shifted, or escalated.
- **Material Shortage Resolution:** Agentic Business Processes identify supply constraints, assess affected orders and production plans, coordinate responses across contract manufacturers and suppliers, and recommend next-best actions to reduce failure-to-supply risk.

Production & Quality

- **Batch Release Readiness:** Human teams and agents track batch documentation, batch master data, quality dependencies, and release blockers to ensure required information is complete, available, and ready for release decisions.
- **Quality Event Coordination:** Human teams and agents link quality events to affected batches, orders, shipments, inventory, and accountable organizations so teams can prioritize response, manage risk, and maintain stronger process control.
- **Production Schedule Adherence:** Agents monitor production milestones, schedule changes, CMO updates, material availability, and exception signals to help teams identify delays earlier and protect supply commitments.

Inventory & Supply Assurance

- **Inventory Reconciliation:** Agents compare inventory balances across enterprise systems and external manufacturer-reported data, identify discrepancies, and route exceptions for investigation before they affect planning, service, or working capital.
- **Supply Risk Monitoring:** Agentic Business Processes monitor commitments, inventory positions, production status, quality dependencies, and shipment

activity to surface emerging supply risks before they become customer-impacting issues.

- **Allocation Management:** Human teams and agents assess available supply, demand priorities, customer commitments, and shortage scenarios to support faster, more consistent allocation decisions.

Logistics & Fulfillment

- **Shipment Delay Response:** Agentic Business Processes monitor delivery notices, shipment status, and logistics events, detect delays, assess downstream impact, and coordinate action across logistics, planning, customer service, and external manufacturing teams.
- **Delivery Milestone Monitoring:** Agents track planned versus actual delivery milestones across shipments, receiving events, and partner updates to identify missed handoffs and trigger follow-up before delays escalate.
- **Exception Management:** Human teams and agents identify, prioritize, route, and resolve cross-company exceptions by linking issues to the affected orders, batches, inventory, shipments, and accountable teams.

Start Small, Then Scale

Companies do not need to digitalize every process before getting started. The best approach is often to choose one process where the pain is clear—purchase orders, inventory, shipment tracking, forecasting, or another high-value area. That first use case helps establish repeatable patterns, build confidence, and create the readiness layer for broader transformation.

For some organizations, the starting point may be inventory reconciliation. For others, it may be PO confirmation, forecast-to-CMO commit orchestration, shipment tracking, or supplier performance governance. What matters is choosing a process with clear operational pain, linking the right partners, digitalizing the relevant business transactions, and then expanding from there.

At **FutureLink Barcelona 2026**, we will continue exploring how life sciences and healthcare companies can move from fragmented, manually coordinated execution to an Agentic Supply Chain Operating Model. The opportunity is not simply to add AI to existing processes. It is to rethink how supply chain work is performed across companies—with trusted data, linked partners, real-time operational context, governed agentic execution, and human expertise at the center.

The companies that begin building this readiness now will be best positioned to improve productivity, service, inventory, working capital, cost, compliance, quality, resilience, and revenue performance—while advancing the industry's most important mission: ensuring patients receive safe medicines on time.

BlogMINT for External Manufacturing
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