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The Evolution of B2B Integration in Supply Chain

Inside the EDI–API Partnership that Drives Enterprise Connectivity and the Agentic-First Approach Reshaping It

Why the next leap in enterprise connectivity won't come from a new protocol, but from AI agents that onboard partners, run pipelines, and resolve failures, all under human control.

In nearly every enterprise, a high-value customer can wait weeks or even months before placing a first order. Not because the product isn't ready, but because partner onboarding depends on scarce integration expertise and manual processes. That is the quiet tax on enterprise growth: integration work only humans can do, performed one partner and one exception at a time. In this paper, we will explore how human and AI agents can work together to solve this exact challenge.

In every global enterprise, there's an invisible infrastructure that keeps commerce alive. It's the machinery that connects suppliers to manufacturers, retailers to distributors, and logistics partners to customers — moving orders, invoices, and shipments across the world. On paper, the workflow seems linear. In reality, it's anything but, hundreds of formats, systems, and channels must align around a single business intent, and each brings its own variations and complexities. Integration teams now juggle multi-template structured, semi-structured, and unstructured inputs — EDI, XLS, TXT, JSON, XML, Parquet, ORC, ZIP files, DOCX documents, PDFs, images — sometimes multiple in the same workflow.Today, a single Purchase Order (PO) can arrive in almost any form: a classic EDI message from a major partner, an Excel sheet from a smaller distributor, a JSON request from a marketplace, a PDF attachment from a regional supplier or even a screenshot from a portal.

All of it must be interpreted and normalized before the PO can enter an ERP, warehouse management system, transport platform, billing engine, or analytics pipeline. In addition, all of this comes with overheads of maintenance, managing multiple configurations, issue resolutions etc.

In light of these changes, enterprise leaders are questioning the viability of Electronic Data Interchange (EDI), that has been the trusted backbone of enterprise communication for decades. "Isn't it outdated?" "Shouldn't APIs and event-driven systems have replaced it by now?" But despite these doubts, it is important to note that both EDI and APIs are equally important in the enterprise context with EDI being even more critical in specific industries, for instance in logistics, where 60-70% of transactions are EDIs/EDIFACT.

What is changing is not the role and importance of EDI and API but the intelligence that now surrounds it. A new operating layer, agentic AI, is beginning to take over the manual, repetitive work that has always slowed integration teams down: onboarding partners, building and testing maps, and resolving the same runtime exceptions repeatedly. This paper takes an agentic-first view of that shift and is deliberate about where it can credibly play a role, and where it does not.

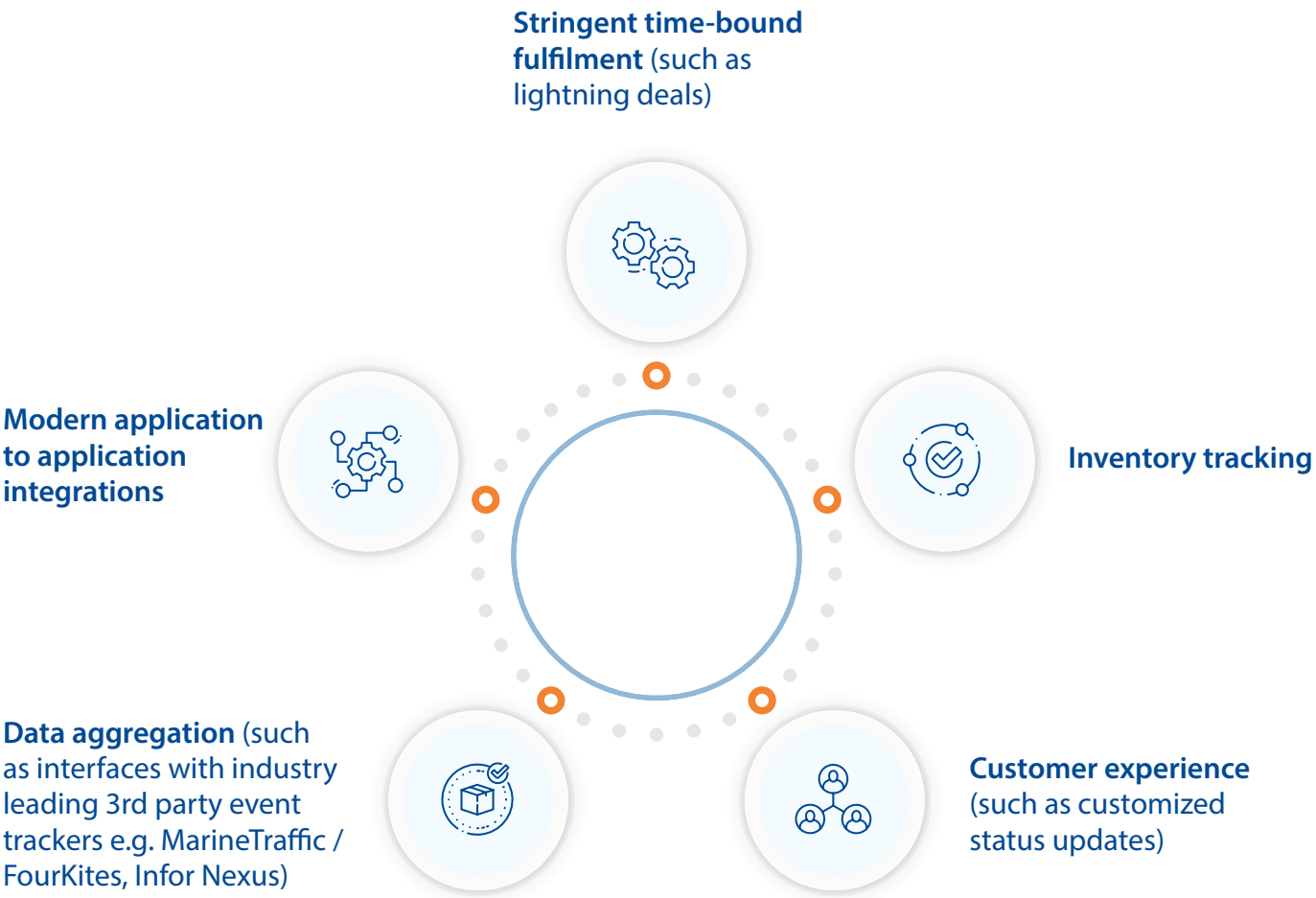
The Integration Paradox

While EDI is thought of as a lumbering, legacy technology that's moving toward obsolescence, the reality tells a different story. Not every exchange in the enterprise ecosystem demands the same kind of speed or interaction. EDI isn't so much vanishing as it is evolving.

In fact, it continues to manage some of the most critical, legally binding transactions between enterprises today, with a level of stability and standardization that makes it indispensable to global supply chains.

A large chunk of well-established business documents — such as Purchase Orders, Shipment Notifications, and Compliance Documents — that must move securely and predictably across enterprises when specific events occur, still depend on EDI. They may not require the synchronous, request-and-response model that APIs are designed for (unless there are specific contractual SLA commitments requiring stricter time-bound responses).

API, however, is critical for enterprises for business scenarios that demand real-time responsiveness and event-driven architectures with instantaneous data exchange, especially in the context of:



Therefore, a balance between EDI and API integrations is critical to reap the benefit of both in context of the use case requirement.

The Core Case for Modernization and Consolidation

For many organizations, integration has become patchwork. Legacy EDI platforms coexist with custom scripts, API middleware, and manually configured partner workflows. Data moves at a managed pace navigating multiple hops and traffic constraints, partner onboarding takes months, and teams spend more time maintaining connections than building innovation. And now, as AI begins to reshape how decisions are made, enterprises are realizing their integration core isn't ready for the speed of intelligence.

Modern integration demands both real-time context-rich data and batch-based integrations to seamlessly co-exist. Meanwhile, the sprawl of disparate tools, many born out of a need to solve a niche purpose in the labyrinth of data traffic variances, makes it nearly impossible to bring this to reality leading to multiple specialized systems and duplication of effort across systems.

This results in delayed new partner onboarding, latency in handling change requests, high-complexity code depth and skilled resource dependencies, and in many cases loss of business to the competition.

In practice, onboarding a single new trading partner can still take weeks of specialist effort, and once live, teams spend a large share of every day triaging the same recurring failures manually. In a market where a new channel or a single large partner can define a quarter, that lag is not an IT inconvenience, it is deferred revenue, and ground ceded to faster competitors. That's why modernization has shifted from an IT project to a business necessity. Enterprises are consolidating their integration landscape and unifying EDI, non-EDI, and API flows into single, intelligent, multi-featured platforms.

To summarize, for a logistics company that processes thousands of shipments every day, EDI systems are what keep all their transactions compliant and traceable. But its customers now also expect to transact, such as tracking their shipments, in real-time. That's where APIs go to work. They augment the primarily batch-mode EDI system, adding a layer of real-time responsiveness and visibility.

This has created what we call the integration paradox. Enterprises now find themselves having to reconcile the stability of EDI and the speed of dynamic, event-driven APIs. In such hybrid systems, AI further accelerates automation by streamlining mapping, validation, and onboarding without breaking business continuity.

Where earlier generations of AI only assisted a human, agentic AI now executes multi-step work end-to-end under human oversight. It can plan a partner onboarding, generate and test a map, or resolve a failed transaction, turning the integration core into something that can finally keep pace with the expected speed of execution from business teams from IT teams.

The Agentic-First Approach to B2B Integration

For most of its history, integration has been a craft practiced by specialists: an integration engineer reading a partner's spec, manually building a map, running test files, and babysitting the first production runs. Agentic AI changes the unit of work. Instead of a single model answering a single prompt, a small team of specialist agents plan and execute multi-step work, calling tools, checking their own results, and escalating to a human when it is required.

It works like a small team: an onboarding agent that sets up new partners, an operating agent that watches production and clears exceptions, and a governance layer that enforces policy and keeps the business compliant. Each has a specified job and a human it answers to. For instance, we see the two use cases below as immediate win for agentic AI application in B2B integration.

Use Case One: Agentic Onboarding

Partner onboarding remains one of the most time-consuming and resource-intensive activities in enterprise integration. It is also one of the most suitable areas for agentic automation because the work follows repeatable patterns with clear approval checkpoints.

Today, a senior engineer opens a partner's spec, struggles to find the closest old map or worst case ends up building the entire map again, rebuilds it field by field, and trades test files back and forth for a fortnight. This can be automated through an Onboarding Agent.

The work decomposes cleanly into steps an agent can take, each with a natural point for human review:

Faster connection setup: the onboarding agent reads the partner's ISA/GS envelope headers, resolves sender and receiver identifiers, provisions the right endpoints (AS2, SFTP or API), and selects the appropriate pipeline template, collapsing days of manual configuration into minutes.

AI-assisted pipeline generation: from the detected format and partner profile, the agent scaffolds the end-to-end ingestion-to-canonical pipeline, so integration teams start from a working draft rather than a blank canvas.

Closest mapping-spec match: rather than mapping from scratch, the agent searches the enterprise's library of previously configured mapping specifications and proposes the nearest match (same document type and version, similar partner or trade lane) as a starting point, reusing what already works.

Any-to-any format and rule configuration: given a partner's mapping guide or requirement specification, whether it arrives as a PDF, spreadsheet or Word document, the agent extracts the field-level rules and configures the transformation and validation logic across formats (EDI, XML, JSON, flat file, and more), keeping a human in the loop for anything ambiguous.

AI-assisted map testing: the agent generates representative test payloads and edge cases, runs the map, compares the output against the expected canonical result, and flags discrepancies, iterating until the map is clean and compressing test cycles that once ran for weeks.

None of this removes the integration engineer; it changes what they spend time on. Every step that writes to a partner passes through an approval gate, and the human reviews, corrects and signs off rather than assembling everything manually. Industry practitioners applying this pattern report that partner onboarding has been compressed from months down to a matter of days/weeks, with the honest caveat that results depend on partner complexity and how much mapping history the system has to learn from.

Use Case Two: Agentic Operations, Auto-Resolution of Runtime Exceptions

The second high-value use case is ongoing operations. Every EDI and API environment generates a steady stream of runtime exceptions: a malformed segment, a missing mandatory field, a rejected acknowledgment, a dropped connection. Most are not novel; they are the same handful of failures that support team resolves manually against an SOP document, day after day.

An Operations agent watches every pipeline run, diagnoses failures, and where the fix is known with a documented procedure, executes the standard operating procedure (SOP) automatically. In practice that means:

SOP-based fixes: reprocessing a transaction, re-dropping a corrected file, retrying a transient connectivity failure, or applying a known correction for a recurring segment error. These are the same deterministic steps an L1/L2 engineer performs manually today.

Automated RFI for missing information: detecting a missing mandatory value and raising a structured request-for-information to the partner or internal team, rather than letting the transaction sit in an error queue.

Operational queries: answering "why did this partner's PO fail last night" with the full trace behind it, so teams stop reverse-engineering logs.

The governing principle is conservative by design: agents automate the resolutions that are already written down and deterministic, and escalate anything ambiguous, high-risk or partner-facing to a human. The result is fewer transactions stuck in queues, faster mean-time-to-resolution, and specialist engineers freed from repetitive triage.

Where Else Agents Can Add Value

Beyond these two anchors, several adjacent applications are credible today, provided they are scoped tightly:

Proactive monitoring and SLA protection: spotting anomalies, volume drops, and emerging SLA breaches before they become chargebacks or missed commitments.

Continuous learning: improving mapping and resolution suggestions from every human accept or reject creating a feedback loop, so the system gets measurably better with use.

Automating integration documentation: auto-generating mapping documentation and partner SOPs as a by-product of the work, addressing the perennial gap of stale or missing documentation.

Persona co-pilots: assisting build, test, deploy, and operate personas with context-aware guidance, without taking irreversible action on their behalf.

Trust, Control, and Governance by Design

Agentic AI does not replace compliance and auditability. Autonomy is only acceptable when it is governed. An agentic B2B platform earns trust the same way a well-run operations team does: through least privilege, human approval where it matters, and a complete record of what happened.

Tight toolboxes: agents can call only the specific actions they are granted, with no shell access and no arbitrary outbound calls.

Approval gates: mapping changes, override stacks, and any write to a partner require explicit human approval before they take effect.

Per-partner isolation and key control: data is isolated per partner, with customer-held keys for sensitive payloads.

Signed, exportable audit log: every agent action, including its prompts, tool calls, and responses, is signed and exportable for audit and compliance.

In our experience, decision governance — approval tiers, escalation paths, and audits are a must before scaling to operations and beyond. Adopted this way, an agentic AI-first integration approach can be a measurable game changer and a differentiated advancement to an integration core the enterprise depends on.

With a solid foundation and governance in place around integrations and AI agents, the question stops being architectural and becomes commercial: what must a modern platform promise the business?

Three Key Promises of a Modern (AI-ready) Integration Platform

Cost-neutral migration: In the current volatile market landscape, many enterprises are faced with margin and cost pressures. A modern platform must have the key capabilities to drive migration at zero additional cost to the customer and facilitate IT teams to build a business case for modernization agenda.

Simplification and consolidation of disparate tools: Managing B2B and EAI integrations seamlessly on a single platform not only eliminates technical complexity and overheads but also reduces duplication of efforts. A one-stop solution to integrate internal and external data enables significant business and operations analytics opportunities.

AI and agentic-AI first approach: Modern integration platforms must move beyond connectivity and become execution platforms. By combining co-pilots, intelligent automation, and governed agents, enterprises can accelerate onboarding, reduce operational effort, resolve issues proactively, which unlocks greater value from integration data that a team of specialist agents can then carry a task to completion on their own and asking for approval where needed.

While a few players in the market today offer the modular, extensible architecture required to achieve this, the ideal approach consists of a natively integrated, low-code/no-code, and AI-model-agnostic platform that enables enterprises to develop, monitor, and scale such solutions with ease. Built-in observability and proactive KPI and exception management capabilities in such a platform ensure actionable visibility across data flows no matter where they run, whether on premises, on cloud or across Hyperscalers.

What Impact Does Modern Integration Deliver at Scale?

Recently, a global logistics organization replaced its legacy integration stack with a unified hybrid platform. The result? Their order update speed improved by 90%, they experienced zero downtime during migration, and were able to more effectively create real-time coordination across multiple partners.

Similarly, a leading consumer goods retailer managed a 66% reduction in technical onboarding time, while reducing their integration costs by 50%. How? Simply by consolidating its EDI gateways, API middleware, and custom connectors into one platform. In both cases, modernization didn't disrupt business continuity but rather worked as a rapid efficiency and innovation enabler. And by allowing EDI and API systems to coexist on a common foundation, these enterprises turned integration from a back-office burden into a front-line differentiator that delivers a clear competitive advantage.

Layering agents onto that same foundation is where the next step-change is emerging. The consolidation would reduce onboarding time, agentic onboarding would compress it further by generating pipelines, matching mapping specs, and testing maps automatically. A unified platform gave teams visibility with operations agents resolving routine exceptions against standard procedures instead of routing all of them to the support engineer.

The Leadership Agenda for Integration in 2026

Since its elevation from basement function to boardroom imperative, integration now sits at the intersection of strategy, technology, and transformation. And for leaders looking ahead, four imperatives stand out.

Prioritize hybrid systems

With a hybrid-first approach, the enterprise focus stays firmly on designing systems where the best of traditional dependable EDI, latest real-time penetrative API, and comprehensive end-to-end integration capabilities can co-exist with increasingly greater adoption of AI to fast-track on-boarding and support.

Consolidate for visibility and feature-rich offerings

Push past the era of fragmented tools and sprawling solutions toward unified platforms that offer up a single view and one-stop action center of any-to-any capable partner and data connections.

Design for intelligence and agency

Architect integrations that are future-proofed with in-built AI enablers, making it easier to leverage predictive insights and automated workflows. The intelligence and comprehensiveness of tomorrow's connected systems need not be limited by the way their data moves. The stronger, more agile and robust the integration core, the faster and deeper each system can think, process, and drive results. Increasingly, that means designing not just for insight but for action, AI agents that can onboard a partner or resolve an exception end-to-end, within guardrails.

Adopt AI agents deliberately

Treat agentic AI as a governed capability, not a science experiment — start with a pilot on a single high-friction workflow such as onboarding, insist on approval gates and signed audit trails, and scale only on measured results. Enterprises that pair their agentic ambition with this discipline will move fastest, precisely because they will move safely.

The enterprises that win the next decade will not be the ones with the most AI. They will be the ones whose integration core is ready for it, quietly onboarding partners, running pipelines and clearing issues in the background while competitors are still reading the spec.

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