

Watson Supply Chain

The Future of EDI: An IBM Point-of-View



The world as we know it runs on and depends on EDI. But the world is changing, and with it the future of EDI. Over a period of decades EDI has steadily gained mainstream adoption throughout businesses worldwide as the preferred means to exchange documents in the B2B transaction process. During this time the emergence of Internet B2B, including new transport protocols like AS2, numerous flavors of XML-based B2B document standards, API-based B2B integration, have mostly complemented EDI rather than replaced it. EDI has grown and matured and today, like ERP systems, remains a backbone for global business.

Across many industries and supply chain networks a core set of EDI transaction types has been widely adopted. These are basic document types like Purchase Order, PO Acknowledgement, Advanced Ship Notice (ASN), Shipment Status, Invoice and Payments. Most industries universally exchange these document types with suppliers and some have adopted certain additional document types, with the document set continuing to expand as supply chains scale in size and scope.

For example, one leading manufacturer routinely exchanges about 55 different EDI document *types* with nearly 2,000 partners, including customers, suppliers, logistics providers, banking services and customs across the globe.

While overall only a subset of possible EDI document types has been widely adopted, its success has nevertheless been unqualified worldwide.

EDI has facilitated “frictionless” commerce, helped to eliminate archaic manual paper processes, and delivered significant and persistent broad supply chain efficiencies through automation.

Although the overall volume of EDI message traffic worldwide continues to grow, organizations typically are not expanding their use of “classic” EDI formats, such as X12 and EDIFACT, to new use cases. When organizations deploy new applications of these EDI formats it is normally to support an additional common document type, such as an ASN, with one or more specific partners.

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EDI is Naturally Evolving

However, EDI is not standing still. As new government mandates and industry initiatives emerge, EDI formats are evolving in concert. XML-based formats are the focus of many of these projects. For example, to enable cross-border Business-to-Government eProcurement, the European Union (EU) has mandated the Pan European Public Procurement OnLine (PEPPOL) standard. We're now seeing a large uptake of PEPPOL in general B2B usage as businesses realize they can re-use the PEPPOL connection established for B2G and increase their ROI from the synergy. Countries outside of the EU are also adopting or considering how to apply PEPPOL standards to their local and international requirements. Similarly, requirements for e-invoicing continue to evolve with more tax administrations demanding real-time access and approval of invoices, and new laws on invoice data retention, integrity and authenticity becoming more prevalent in various geographic regions.

Other XML B2B standards bodies continue to evolve their specifications too. Examples include the GS1 XML 3.3. specification, introduced in 2017 with a planned update targeted for 2019, and the Open Application Group's OAGIS 10.4 release, introduced in early 2018. OpenPEPPOL and the OASIS UBL standards body are working concurrently on plans for migrating from AS2 to AS4-based UBL to facilitate even wider PEPPOL usage.

Time will tell how these competing requirements and standards interact and

either align with interoperability, or strive to compete and replace each other. Whichever way it plays out, the fact remains that

despite EDI's historical success, it still leaves gaps in addressing today's emerging digital business supply chain challenges.

There is good reason for this. EDI is perceived as complex and arcane, requiring scarce specialty expertise or engagement with providers offering these capabilities as a service.

Classic EDI was designed in an era of batch business processes so even today it is uncommon to use these formats for near real-time B2B communications – which firms increasingly require. Although newer XML B2B standards and government mandates can offer improvements, the information shared between two parties is still focused on supply chain “milestones” for core business processes, such as notifying that a PO was just sent, a Shipment was just started, or an Invoice was just sent. EDI is not designed to handle more sophisticated events from new kinds of “users” like IoT sensors or a digital camera noticing a damaged part received on the factory floor and triggering a notification. Finally, as an asynchronous, point-to-point, document exchange protocol that is normally file-based, EDI enables firms to periodically exchange data but not to engage in emerging, continuous digital business processes.

Modernizing B2B Integration with IoT, Blockchain and AI

IBM believes that EDI in its various formats will remain highly useful and widely used in its established areas for years to come. However, it will not be the primary tool to solve *new* challenges in supply chain that require more than B2B document exchange.

Instead, emerging technologies like IoT, blockchain-based networks and AI will drive those investments, with EDI working alongside.

Chief Supply Chain Officers (CSCOs) seeking to drive true business innovation while continuing to drive down costs, will succeed primarily through the imaginative and synergistic application of these “Big 3” emerging technologies, but in ways that build on existing investments in proven, business-critical technologies like EDI.

Research by IDC projects that organizations will gain a 308 percent return on investment with

modernized B2B integration – or more than \$4 in benefits per \$1 invested.¹ What will CSCOs seek to achieve from their investments in IoT, blockchain and AI technology and how will these technologies complement EDI? The application of these technologies is far ranging, but IBM believes it is ultimately rooted in business outcomes driven by a renewed emphasis on multi-party supply chain *collaboration*. As usage and interoperability across trading partners expands, CSCOs can also capitalize on a much faster ROI compared to traditional EDI usage models.

IBM believes that in coming years organizations must take a fresh look at and “double-down” their investments in working together with partners to achieve shared goals and outcomes that ultimately deliver on a superior end-customer experience. Despite billions of dollars in IT investments over many years and numerous industry studies on the

Organizations will gain a **308 percent** return on investment with modernized B2B integration

value of collaboration, supply chain collaboration remains in many respects “unfinished business” with tremendous upside opportunity to drive new levels of supply chain excellence.

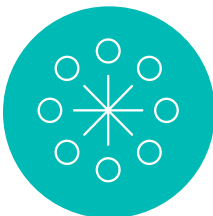
For example, those business processes that today can breed distrust in a business network – such as unexpected chargebacks – will be re-imagined as collaborative.

Organizations will be able to share more data through IoT mechanisms, based on a single shared version of the truth enabled through a blockchain “backbone,” and facilitated by AI technology that can streamline root cause analysis and introduce new forms of automation. Let’s examine this use case.



EDI provides basic core electronic document exchange, and a path to scale this dramatically with standardization.

Imagine the present situation of a chargeback related to a shipment of goods that was delivered damaged or in otherwise unsaleable condition. During the shipment process, a carrier might use an EDI 214 document to send periodic shipping status notices at selective points in-transit. Potentially well after the product has been received, the damage or unsaleable condition is discovered.



Introduce IoT to provide the possibility for a dramatically enriched near real-time event generation and delivery environment.

Today, low cost IoT sensors offer *condition monitoring* at the appropriate level – pallet, parcel, case, item, etc. These sensors can measure thresholds such as temperature or humidity, or events like a dropped parcel. Shipment tracking can be enhanced when periodic EDI 214 messages are time-sequenced with IoT messages to deliver an enriched, synthesized view more closely revealing actual real-world events.



Add Blockchain to provide a new distributed ledger backbone, a tamper-proof record of relevant events that deliver a “shared state” for all supply chain participants.

IBM believes that one of the best ways to exploit blockchain for supply chain is to leverage already existing B2B flows that use EDI, XML B2B or API-based B2B, enriching those flows with IoT and other relevant data, and providing a “blockchain-powered” underpinning. To this end, IBM is investing in adding blockchain technology to the IBM Supply Chain Business Network. Rather than starting a blockchain network “from scratch,” this large global network of nearly 7,000 organizations that already regularly exchange B2B documents can start to easily take advantage of blockchain.

A blockchain-powered B2B Network adds the concept of a “shared version of the truth” for information flows exchanged across participants of the network. Blockchain provides a tamper-proof record of all supply chain events. Returning to our example, if EDI, IoT and potentially other kinds of events can be synthesized on a blockchain, with appropriate access permissions, the traditional chargeback submission process can be streamlined; parties can avoid disputing “the facts” of a given situation and the conversation can more quickly turn to root cause and improvement.

A more imaginative goal is enhanced multi-party collaboration. If an IoT-enabled exception event is detected in near real-time and logged to a blockchain, the manufacturer can proactively initiate a recovery process, such as a re-shipment of the affected product, thereby possibly eliminating the need to undertake the “late stage” chargeback process in the first place, although a return of the defective product might still be needed of course. Root cause analysis of the problem and continuous improvement can then be handled more collaboratively without the undercurrent of distrust bred by the chargeback mechanism, which is after all, a kind of *punishment* for sub-par supply chain performance.



Finally, add AI technology to provide predictions, recommendations and advanced automation to augment human productivity.

We can advance B2B integration even further if we notice that the business goal in our example is not merely to reduce chargeback events or streamline chargeback processing. Instead, supply chain buyers are increasingly demanding “on time in full” (OTIF) delivery compliance. Technologies that can give early warning of and quick response to supply chain exceptions, can help automate supply chain compliance.

In our example scenario, we can task a *multi-party AI agent* to *watch* the shipment process as it occurs, meaning the AI tool is instrumented to see all relevant events occurring across multiple parties as those events occur. The AI agent will *notice* the non-compliance event, *know* that this implies a re-shipment of the affected product, *analyze* the most efficient source of a replacement and *initiate* a new shipment. A returns authorization can be automated as well as the returns process. Of course, the AI agent is also registered to record *its* activities on the blockchain for a tamper-proof record of its automation actions.

Conclusion

Multi-party collaborative automation is technically feasible today, but requires innovation in business practices, such as using AI agent technology to perform multi-party process orchestration, leveraging blockchain and multi-party application integration. It also presumes that proven technologies like EDI as well as ERP and supply chain management applications like order management, warehouse management, and transportation management are already in place and performing their well-proven roles to support the higher order collaborative process.

So, back to answering the question:
What is the future of EDI?

EDI is alive and well and will remain critical to business for many years to come.

However, the true future lies in using and evolving EDI alongside disruptive technologies such as IoT, blockchain and AI, to deliver innovative levels of multi-party supply chain collaboration. IBM is at the forefront of driving this innovation.

[Learn](#) how to enable scalable, secure always on B2B connectivity

[See](#) how you can streamline B2B connectivity and deepen visibility with AI

Footnotes:

1. 'Driving Strategic Value with IBM Supply Chain Business Network', IDC, January 2018

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