

# Electronic Data Interchange

(PhD- Cyber Security)

## What is EDI?

EDI, which stands for electronic data interchange, is the intercompany communication of business documents in a standard format. The simple definition of EDI is a standard electronic format that replaces paper-based documents such as purchase orders or invoices. By automating paper-based transactions, organizations can save time and eliminate costly errors caused by manual processing.

In EDI transactions, information moves directly from a computer application in one organization to a computer application in another. EDI standards define the location and order of information in a document format. With this automated capability, data can be shared rapidly instead of over the hours, days or weeks required when using paper documents or other methods.

Today, industries use EDI integration to share a range of document types — from purchase orders to invoices to requests for quotations to loan applications and more. In most instances, these organizations are trading partners that exchange goods and services frequently as part of their supply chains and business-to-business (B2B) networks.

## How EDI works

All EDI transactions get defined by EDI message standards. It is vital to have proper governance processes for data quality. When information is missing or in the wrong place, the EDI document might not be processed correctly.

Standards are the basis of EDI conversations.<sup>1</sup> Several organizations define the EDI message standards, including ODETTE, TRADACOMS, GS1, Peppol and the Accredited Standard Committee X12 (ASC X12).

In general, there are two basic types of EDI transmission:

- Point-to-point or direct connections: Two computers or systems connect with no intermediary over the internet, generally with secure protocols.
- Value-added network (VAN): A third-party network manages data transmission, generally with a mail boxing paradigm.

EDI internet transmission protocols include Secure File Transfer Protocol (SFTP), Applicability Statement 2 or AS2, an HTTPS-based protocol, Simple Object Access Protocol (SOAP) and others. EDI data elements include items such as sender ID and receiver ID. Data segments combine two or more related elements to give them greater meaning. For example, FNAME and LNAME can combine to form CUSTOMERNAME. Envelope's structure different types of data and carry the sender and receiver address information. EDI document flow or message flow

describes the movement of EDI messages to various inbound and outbound addresses and departments to execute a business process or transaction.

Metalanguages such as Extensible Markup Language (XML) or JavaScript Object Notation (JSON) complement rather than replace EDI. Companies must be ready to handle an ever-increasing number of document formats and transmission options. One global manufacturer routinely exchanges about 55 different document types with nearly 2,000 partners.

“As many as 20% of our B2B transactions were producing an error before we began using IBM Supply Chain Business Network. We have fewer errors now — for example, we used to have issues with transfer orders because a client would submit a wrong code, which was painful for our client service team. It happens probably 80% less now because all of that used to be done manually.” Read what other EDI managers tell IDC about how they drive strategic value with IBM Sterling Supply Chain Business Network.

## **Benefits of EDI**

EDI transactions are essential to B2B processes and continue to be the preferred means to exchange documents and transactions between businesses both small and large.

There are five key business benefits that EDI technology delivers through automation and B2B integration:

- EDI technology saves time and money through automation of a process previously manually executed with paper documents.
- EDI solutions improve efficiency and productivity because more business documents are shared and processed in less time with greater accuracy.
- EDI data transfer reduces errors through rigid standardization, which helps to ensure information and data are correctly formatted before they enter business processes or applications.
- EDI integration improves traceability and reporting because electronic documents can be integrated with a range of IT systems to support data collection, visibility and analysis.
- EDI automation supports positive customer experiences by enabling efficient transaction execution and prompt, reliable product and service delivery.

For large organizations, EDI enables standards to be instituted across trading partners to achieve benefits consistently. For smaller organizations, adherence to EDI offers greater integration with larger firms that have big budgets and strong influence.

## **EDI implementation**

For some enterprises, EDI can be difficult to implement. One reason is the need to keep pace with shifting government regulations, standards and updates. It is also inherently complex, as it needs to accommodate the complexities of global business needs. For example, each trading partner in a B2B network can present individual requirements. Even though two partners may

agree on which EDI document to use, each can have unique formatting requirements that need to be supported. These factors, and others, have led many organizations to outsource their EDI solutions.

Whether in-house or outsourced, there are some basic conditions, capabilities and resources needed to implement EDI effectively. In addition to factors such as agreement on document types, secure transmission methods, and requisite hardware and software, an effective EDI implementation should consider:

### **Translation or mapping software**

This type of transformation software takes fields such as names, addresses, currency amounts, part numbers and quantities, and maps them from business application formats into standardized documents and vice versa.

### **Batch enveloping or de-enveloping capabilities**

These capabilities support large EDI message batches by enabling senders and receivers to wrap and unwrap transactions. The transactions can then be grouped from or split into several divisions or areas of a trading associate's business.

### **Message routing mechanisms**

After a message is de-enveloped, routing mechanisms are required to sort the messages for different groups and deliver them to the appropriate targets. Message transformation may also be required to get the message into the correct format for its destination.

### **Trading partner agreements (TPA)**

TPA clarifies terms and conditions, establishes standards for business documents and defines communications and business protocols between trading partners.

## **The future of EDI**

Consider this scenario: a chargeback related to a damaged shipment is triggered using an EDI 214 document — a Transportation Carrier Shipment Status Message. The material in the shipment is unusable or unsaleable. Disputes will most likely arise based on the chargeback.

In future supply chains, EDI will be the core document exchange capability to support innovations such as the Internet of Things (IoT), blockchain and artificial intelligence (AI)<sup>3</sup>. Future EDI will use:

- **IoT sensors** incorporated into a shipment's packaging and tied to periodic EDI 214 messages to improve package condition visibility in near real time.
- **Blockchain technology** underpinning EDI information flows for shipments to offer a shared version of the truth that can quickly resolve and even avoid chargeback disputes.

- **An AI agent** that monitors all relevant events and information connected to a shipment and can identify a non-compliant event. AI agents can also determine if a reshipment is required, analyze the most efficient source of replacement, initiate a new shipment and accept an authorized return.