Electronic Data Interchange

EDI 101 Guide

1EDISource
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Contents

What is Electronic Data Interchange?

EDI is a set of standards developed in the 1960s that defines common formats for information to be exchanged electronically between two organizations that do business together—or "trading partners." In practice, it allows companies to speak the same language electronically and communicate more efficiently.

Before EDI was widely adopted, companies conducted business by sending paper documents using mail and couriers. Even with access to modern technology, some still operate using these paper-based processes. EDI eliminates much of that manual processing – and the inefficiencies that come with it – by automating the electronic flow of the same information in packets of formatted data. Documents exchanged through EDI may include invoices, purchase orders, advance shipping notifications, student transcripts, healthcare claims and many more.

EDI Standards

Trading partners communicating with EDI must first follow the same standards for formatting the data. This way they (or their computers) know where to find "elements" — individual data units that include dates, item numbers, prices, order quantities and other information within the message.

EDI standards define both what pieces of information are required and optional for a particular document, as well as the rules for the structure of the document. In the U.S., organizations traditionally follow standards set by the American National Standards Institute (ANSI), a private, nonprofit organization that oversees the development of voluntary consensus standards for products, services, processes and systems. An ANSI committee developed the most common standard for EDI, often referred to as "ASC X12" or just "X12."

Outside the U.S., the international EDI standard is Electronic Data Interchange for Administration, Commerce and Transport (EDIFACT), which was developed under the United Nations.

EDI Guidelines of Specifications

Individual trading partners have their own sets of rules and preferences for EDI, typically laid out in a manual called an "implementation guide." Guidelines often are based on a given EDI standard, with some additions, exceptions and changes based on a company's preferences. These differences are akin to local variations in language – both businesses speak EDI, but with different dialects. When creating EDI to send to a trading partner, companies should consider how data will be organized according to the EDI standard and the specific requirements of each, referencing their implementation guides.

EDI Formats

EDI transactions represent one or more individual documents. In the ASC X12 standards, each document type is referenced by a three-digit number.

EDI can include documents in many formats, such as XML, CSV, fixed length and even spreadsheets; however, EDI traditionally represents one formatting structure for data following industry standards.

EDI Data Structure

An EDI file contains data organized into groups and smaller units. This data represents particular transactions that replace traditional documents. EDI standards were developed at a time when the transmission of electronic data was very expensive, so the most widely adopted standards represent data in a very compressed format, limiting the size of the transmitted files.

Following the ASC X12 standard, each document represented in an EDI transaction contains a string of data elements divided into rows called "segments." The elements are separated by a symbol—known as a delimiter —used to distinguish data elements (element separators) or to indicate the end of a segment (segment terminators). Each segment begins with a segment identifier indicating what type of data is being presented. A block of segments containing related data that can repeat is called a "loop." The combination of data that forms a single message or document is called a "transaction set," according to the X12 standard. Multiple transaction sets can be grouped and transmitted together in a package called an "envelope." When the transaction sets are related in function, the grouping is called a "functional group envelope." Functional groups from the same trading partner are grouped into an "interchange envelope," and a series of interchanges from different trading partners form a "transmission."

Six Good Reasons to Use EDI

Companies often view EDI as a burden placed on them by trading partners, but implementing EDI can provide a number of tangible benefits. Your company may have little choice but to use EDI, as it's often required by many larger organizations, especially big retailers, manufacturers and government agencies. Integrating EDI allows companies to grow their business and provides:

1. **Cost Savings** – As EDI automates the flow of information, reducing human interaction, companies can save money in a variety of ways, including reduction of:

   - Overhead costs related to manual document management
   - Printing and paper costs
   - Data entry errors, leading to heightened customer satisfaction
   - Inventories and inventory carrying costs
   - Risk of penalties or chargebacks for errors or for not following guidelines correctly

2. **Accuracy** - Data sent via EDI is never physically "touched," reducing the likelihood of costly errors and promoting stronger relationships between trading partners. Manual and duplicate data entry is eliminated, and, with internal integration, orders received via EDI can flow through your entire process exactly the way they were prepared.

3. **Efficiency** - Sending information via EDI takes minutes – sometimes only seconds. Trading partners can act on received data immediately with less manual work, meaning more efficiency for you and for them. Furthermore, integrating EDI with your internal business or accounting system makes for a more streamlined workflow. Incoming transactions can automatically convert to actionable items (i.e. orders or claims) with minimal human intervention, saving a significant amount of time.

4. **Security** - EDI makes the exchange of critical business or personal information more secure since many communications protocols for transferring data include encryption and other security measures, like digital signatures. This is one reason why HIPAA, the U.S. Federal health insurance law of 1996, encourages the widespread use of EDI in the healthcare system.

5. **Visibility** - EDI allows users to share valuable information with trading partners, including product sales data, inventory status of products and component parts, demand forecasts and more. They can then share similar information with their trading partners, and so on, all the way down the supply chain. Improving visibility across the supply chain allows suppliers to plan and respond to changes in demand, better moderate inventory levels and prepare for larger orders before they ever arrive.

6. **Actionable Management Information** - EDI also provides a data trail. Orders, shipments, claims, loan applications, inventory status and other business functions can more easily be tracked and compiled for further manipulation and analysis. Data can be mined and specific functions, while transactions and information on trading partners can then be assessed for trends, errors or redundancies providing actionable information to help guide business management decisions.

The Process of Exchanging EDI Data

Most EDI-based transactions are the same as those you would traditionally handle with paper documents, the lone difference being that all EDI information is sent and received electronically. This Chapter explains the steps in the process.

1. Sender extracts data from a back end business or accounting system
2. Sender maps that data into the proper EDI format to be transmitted
3. EDI file is translated in preparation for transmission
4. Sender transmits the message – the outbound data – to the recipient
5. Recipient translates the inbound data and provides the sender with a digital receipt called a “functional acknowledgment.”

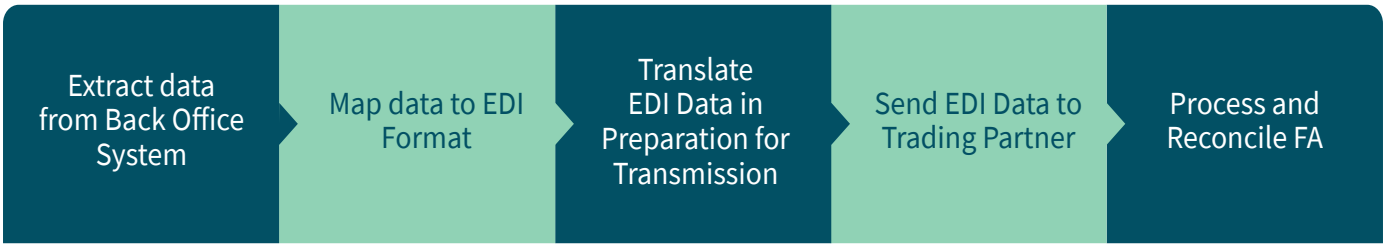
Three major processes involved in the mapping of EDI data:

Mapping
Involves transforming an EDI document into another format (such as XML, a flat file, a delimited file, etc.) or vice versa

Translation
The process of accepting in bound EDI data, or preparing an outbound file for transmission

Communications
Refers to the transmission of the EDI transaction

Send EDI Data to your Trading Partner

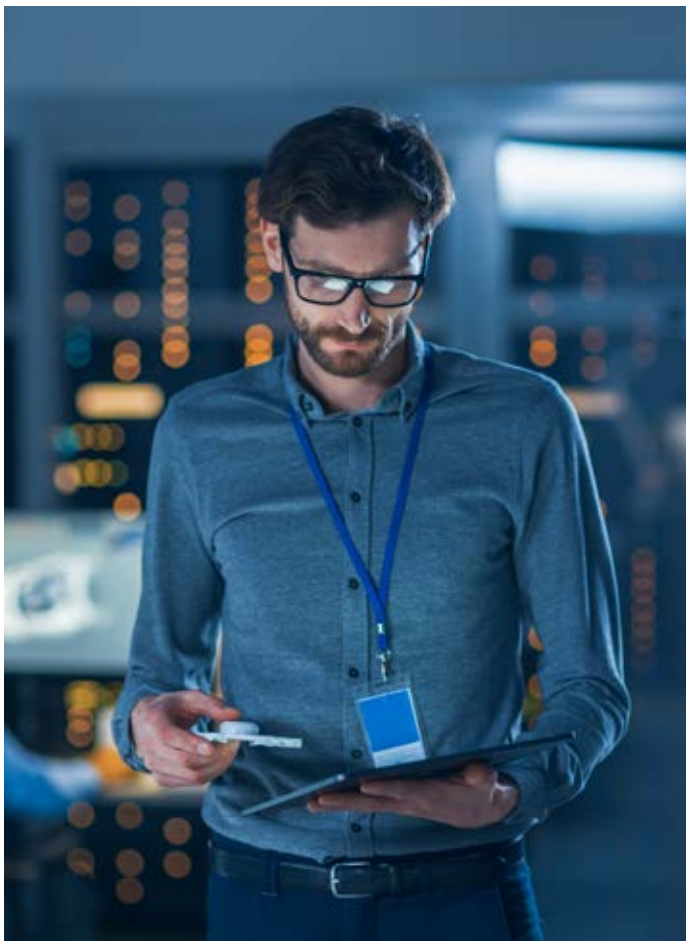


Receive EDI Data from your Trading Partner

Understanding Functional Acknowledgments

Functional Acknowledgments (FA) 997 and 999 are digital receipts meant to confirm the successful transmission of EDI data and notify senders that it is structurally acceptable, with three possible outcomes:

- **Accepted:** The EDI message conforms to all agreed upon EDI standards
- **Accepted with Errors:** The EDI message does not meet the EDI standards, but is sufficient to be processed by the trading partner
- **Rejected:** The EDI message does not meet the EDI standards and is not being processed by the trading partner



Three Major Processes Involved in the Exchange of EDI

Mapping

Electronic information typically resides within a software application on a computer or mainframe. As long as it is possible to import and export files from that application, (such as XML, a flat file, a delimited file, etc.), pertinent information can be extracted and mapped to an EDI transaction.

The function of mapping outbound data involves establishing what information from the business or accounting software, (the data source), goes where in an EDI file (the data destination). EDI software allows you to map EDI data and then save that map like a template to use repeatedly, allowing for quick conversion of information in the future. Multiple data maps can be created to accommodate each trading partner's unique specifications or data requirements.

When inbound data is received, it also must be converted to a format your business or accounting system can understand. Through system integration, the EDI data can be mapped to automatically and seamlessly load into your internal system.

Translations

When an inbound transmission is received by the EDI software, the file must be broken down, or "parsed", to identify everything it contains and what actions should be taken. EDI translation software will determine what trading partners and individual transactions are included in a transmission, and whether there are any duplicates. The senders of each transaction are validated as legitimate trading partners and the file structure and individual data fields of each are analyzed for compliance with EDI standards. If required, an FA is sent to the trading partner. Only then is the data mapped and applied to your internal business system.

A similar process occurs when preparing an outbound file for transmission. The translator will prepare the transaction(s) and await receipt of the appropriate acknowledgment(s).

Communications

The actual transmission of EDI data requires a communications connection which come in both direct and indirect varieties.

Indirect connections with trading partners are done through a value added network (VAN). Often referred to as the "electronic post office," a VAN is a third-party service that transmits and stores data in an "electronic mailbox" until it is picked up by the appropriate party. Since the EDI message contains addressing information, the VAN routes the message to the mailbox of the recipient.

Direct connections allow trading partners to transmit data directly to each other over the Internet via:

- EDIINT, commonly known as applicability standard 2 (AS2)
- A virtual private network (VPN)
- FTP, sFTP or FTPs

Core Functionality of an EDI Translator

Successful EDI translators provide features such as:

- Validation of the document's adherence to EDI standards as agreed upon with your trading partner
- Document checking to flag redundant EDI messages and help ensure that duplicate documents don't create unnecessary work or confusion.
- Functional acknowledgment reconciliation that alerts EDI teams when inbound and outbound documents don't match up with corresponding FAs.

Communications Protocols Defined

- FTP—transferring files over a TCP-based network such as the Internet
- FTPs—FTP secure is FTP with support for encryption protocols TLS or SSL
- sFTP—SSH-FTP is using FTP with the SSH (secure shell) security protocol
- AS1—EDIINT standard for sending EDI data encapsulated within MIME email messages (SMTP)
- AS2—EDIINT standard for EDI transmissions over the Internet (HTTP) with SIMIME encryption
- AS3—EDINT standard for using FTP with SIMIME encryption

Four Ways to Implement & Manage EDI

There are a number of ways to implement EDI in your organization. You can choose to manage it yourself in-house or outsource the entire function. Here are your options:

Web-Based EDI Solutions: Great for small companies that are new to EDI and need to make a quick, inexpensive initial connection. The platform mimics email where EDI messages are imported into an inbox and responded to with a pre-populated data forms.

Managed Services: A fully outsourced option designed to serve larger organizations that do not want to invest in additional personnel to manage the day-to-day EDI operation. Managed services handles all routine activities and trading partner onboarding, while providing ongoing support for every party involved.

Installed Software: Best option for companies with many trading partners and high monthly transaction volumes that want full control over their EDI operation. Requires an investment in hardware and software; full integration with back-end business and accounting systems; and EDI and IT personnel to manage and support the function.

Cloud-Based EDI Solution: Best option for companies that want to maintain all the flexibility and control that an installed software option provides, but don't want to manage the IT infrastructure.

7 Questions to Help Determine The Best Solution for You!

Take a moment to answer these questions:

1. How many trading partners will you need to exchange EDI with?
2. What types of transactions do these trading partners require?
3. How often do you expect to receive a transaction from these trading partners?
4. For each trading partner, will you need to send transactions to a single specified location, or multiple facilities?
5. Do you intend to integrate the EDI data with your back office systems?
6. Are you able to provide data from your back office system for all of your trading partner needs, or will you need a system that allows you to manually create EDI data?
7. Do you have the resources to manage an ongoing EDI operation inclusive of new trading partner onboarding and operational data management responsibilities?

Five Steps to Empowering EDI

The value of EDI does not stop at the initial connection. In fact, EDI can help you to transform your business and achieve operational excellence. Following these steps can get you there.

Lelev 1: Connect

AWhen the goal is to make an initial connection and the transaction volume is low, it's best to employ a Web-based EDI solution. This satisfies trading partner requirements and allows you to do business with them, but EDI remains a manual process for you.

Level 2: Automate Volume

As the number of documents increases to more than 100 per month or your trading partners expand beyond three, you should explore automation opportunities. This involves mapping the EDI data to a format that can be integrated into your back-office system, giving you the ability to automatically send data to trading partners with little or no human interaction. Automation can save your company money and time through reduced manual processing while improving data accuracy.

Level 3: Automte Integration Rules

Even after integrating data with your back-office systems, you may still find yourself reviewing the EDI data manually. Perhaps ship-to locations are not yet set up in your ERP, causing errors when loading the order. Or maybe the price a customer included on their order doesn't match the internal price that you have in your ERP, forcing you to override the trading partner's expectations or undermine your internal price controls. You can solve this problem by building business rules right into your data integration process, enhancing order accuracy and limiting unnecessary friction with trading partners. Best of all, it increases efficiencies, since you won't need to manually check orders anymore.

Level 4: Empower Collaboration

Prior to EDI, sales teams handled orders manually, shipments were loaded onto trucks by the fulfillment team with bills of lading, and invoices were sent by accounting personnel. Everyone involved was intimately familiar with transactions.

With automation, cross functional teams can easily lose visibility into the process. To keep customers and trading partners happy and improve supply chain visibility, empower everyone in the organization to re-engage with the most critical business processes by exposing them to EDI data.

Level 5: Apply Intelligent Levers

EDI documents sent to your trading partners represent milestones within your own internal business processes, so information about these documents can also describe the effectiveness of your different internal teams. In addition to the contextual business rule validation, companies are now able to track trends over time to assess issues in their internal business processes that can be improved in an effort to transform business operations.

Integrating EDI data with back office systems and providing the needed visibility into the process for your stakeholders can position your company to leverage the full potential of EDI data. As EDI is a standard with common data structures, reusable business rules may be leveraged to help ensure that data is integrated successfully and that the actual content and context of the data is correct. Checking the EDI data for content issues may illuminate a variety of opportunities to improve trading partner relationships, such as making sure prices on invoices and customer orders match and that Advanced Ship Notices are being sent on time.

Glossary of Terms

ANSI (American National Standards Institute): A voluntary committee that coordinates standards. Its subcommittee, the ANSI Accredited Standards Committee (ANSI ASC) recommends a standard referred to as ANSI ASC X12 or simply X12.

AI (Artificial Intelligence): Ability for computer systems to be able to perform certain human tasks such as being able to translate between languages, make new decisions based upon prior training, and interrupt visual imagery. AI uses a large data set to train the software algorithm and then introduce it to new situations to make interferences based upon its prior training.

ASN (Advance Ship Notice or Advance Shipping Notification) (EDI 856): A notification of forthcoming delivery details of product.

AS2 (Internet Applicability Statement 2): Specifies how to transport data and the means to connect, deliver, validate and reply to data in a secure and reliable manner. AS2 Software specifically supports transmissions using the AS2 protocol, such as AS2 Complete from 1 EDI Source.

Blockchain: List of records or blocks that are linked together using cryptographic technology with each block containing transaction record data, a unique timestamp, and a cryptographic hash of the previous block. Blockchain technology is used to design a distributed ledger where all nodes (devices) in the network have an identical, decentralized copy of the ledger that are written to independently instead of a centralized data repository.

Cloud: Cloud software is the means of storing and accessing data and applications from a vendor's servers instead of being installed on the client's own servers and computers on premise.

Communications Session: The uninterrupted flow of data from one computer system to the other.

Compliance Checking: A process for ensuring that the EDI transmissions comply with the established rules.

CSV File (Comma Separated Values File): A File format in which the data elements are separated with commas, also known as a Comma Delimited File.

Data Element: The smallest unit of EDI information. A data element could be a code, a name, a quantity or any other individual piece of information.

Data Mapping: The method by which information in one format is restructured into a different format.

Data Warehouse: Type of data repository that contains structured data from different sources that can be used for reporting and analytics to gain new data insights.

EDIFACT (Electronic Data Interchange For Administration, Commerce and Transport): International EDI standard developed under the United Nations with strong adoption in European countries and the automotive industry. EDIFACT serves as an alternative standard to the ASC X12 EDI standard widely adopted in the United States. EDIFACT can also be called the United Nations Rules for Electronic Interchange for Administration, Commerce and Transport (UN/EDIFACT)

EDIINT (EDI over the INTernet): The ability to send EDI data directly over the Internet without the use of a VAN provider.

Electronic Mailbox: Term referring to the place (located within a third party's provider system) where an EDI transmission is stored for pickup or delivery.

Fixed Length: Term that describes a data field with an established number of characters.

Flat File: Alphanumeric and/or numeric files with no control characters, used for transferring data.

Functional Acknowledgment (FA) (EDI 997): An EDI transaction set sent from the receiver of the EDI transmission to the sender. The EDI 997 indicates receipt and acceptability of data and allows the receiver to notify the sender if problems have been encountered within the data.

FTP (File Transfer Protocol): Standard Internet protocol for transferring files. FTPs (File Transfer Protocol secure) uses FTP with support for encryption protocols TLS (transport layer security) or SSL (secure socket layer) to provide greater security in transferring files.

Glossary of Terms

GS1-128 (formerly UCC-128): Application standard using the Code 128 barcode specification to generate a scannable, barcoded label located on the outside of a shipping carton enabling the exchange of data between companies on physical goods. GS1 is the organizational body that manages the standard.

IoT (Internet of Things): Interconnection of computing devices to send/receive information via the Internet. The computing devices are everyday objects from sensors to wearables to anything that has a processing chip that can communicate over the Internet. This is extended to industrial IoT or IIoT that focuses on the application of IoT technology to industrial and manufacturing processes.

ODBC (Open Data Base Connectivity): A standard software interface for injecting and extracting data to and from computer systems, such as business or accounting software applications.

Protocol: Rules that determine the format and transmission of data between the sender and the receiver.

REST (Representational State Transfer): Software architectural principles that defines a set of constraints when creating web services over a standardized interface such as the HTTP protocol. REST doesn't contain a messaging layer and instead focuses on best practice rules when creating stateless services.

SaaS (Software as a Service): SaaS software is a model where customers access a cloud hosted application over the internet. In this model, the customer is typically always running the most current version of software and doesn't have to manage the software infrastructure / hosting requirements.

Segment: A grouping of one or more data elements that appears as a line of information within an individual EDI message.

SOAP (Simple Object Access Protocol): XML-based message protocol using HTTP or SMTP as the transport communication protocol. SOAP uses a WSDL (web service description language) file to describe the functions that can be implemented or exposed.

sFTP (SSH File Transfer Protocol): Using FTP with the SSH (Secure Shell) security protocol provides a secure connection for file transfer encryption both the authentication information and data files being transferred.

Trading Partner: The business with which you are exchanging data.

Transaction Set: The electronic version of a written document.

Translator: A software tool that accepts or converts data from irregular, enterprise-specific formats into an ordered and standardized structure that is compliant with EDI standards.

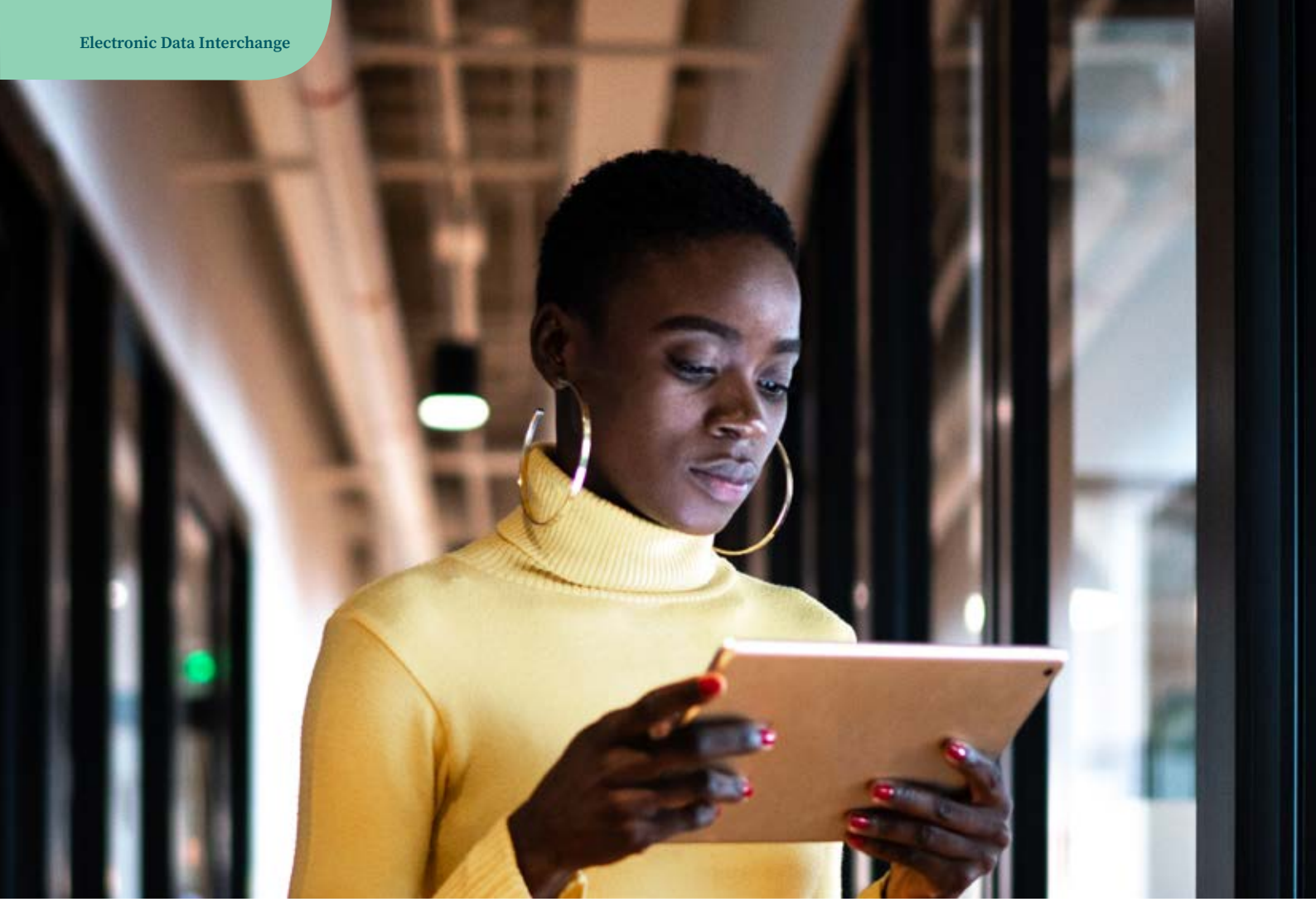
VAN (Value Added Network): A third-party EDI service provider that supplies a communication link between companies so they may exchange electronic transmissions.

X12: A standard of EDI that has been widely adopted in North America and is governed by the ANSI standards committee.

XML (Extensible Markup Language): A simple and flexible text format designed to meet the needs of electronic publishing.

Web Service: A service that enables electronic data transfer between applications or electronic devices using a web connection with HTTP being the most widely used protocol.

Common web services use SOAP, REST, and XML-RPC. Web API (Application Programming Interface): Programmatic interface of clearly defined, exposed endpoints enabling external systems to communicate with the software to request data from or post new data to the software.



Common Transaction Sets

Manufacturing/Retail

810 - Invoice
850 - Purchase Order
855 - Purchase Order Acknowledgment
856 - Advance Ship Notice
864 - Text Message

Procurement

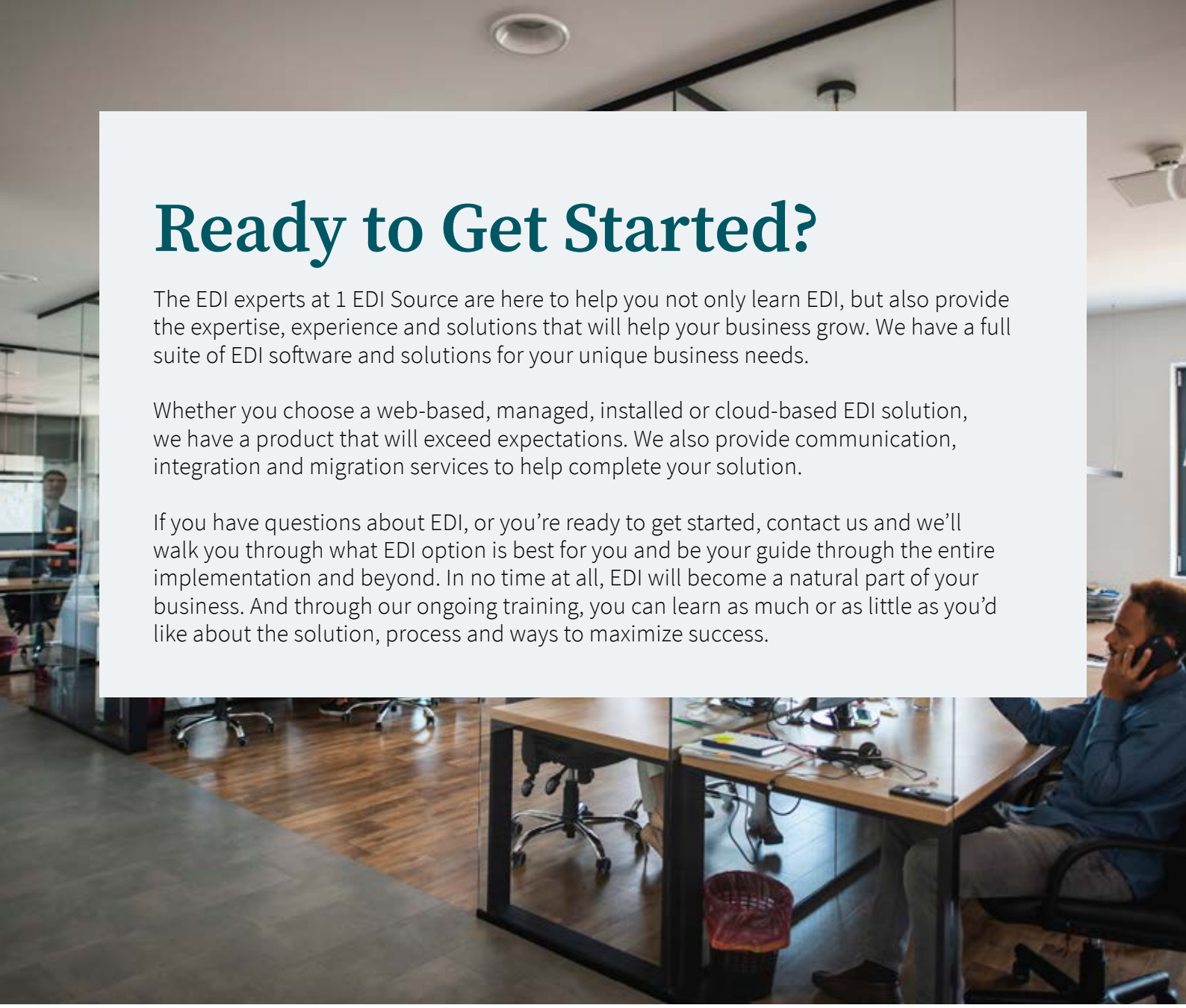
940 - Warehouse Shipping Order
943 - Warehouse Stock Transfer Shipment Advice
944 - Warehouse Stock Transfer Receipt Advice
945 - Warehouse Shipping Advice
947 - Warehouse Inventory Adjustment Advice

Healthcare

270 - Eligibility, Coverage or Benefit Inquiry
271 - Eligibility, Coverage or Benefit Information
276 - Health Care Claim Status Request
277 - Health Care Claim Status Notification
834 - Benefit Enrollment and Maintenance
835 - Healthcare Claim Payment Advice
837 - Healthcare Claim

Freight, Trucking and Logistics

204 - Motor Carrier Shipment Information
210 - Motor Carrier Freight Invoice
211 - Motor Carrier Bill of Lading
212 - Motor Carrier Delivery Trailer Manifest
214 - Transportation Carrier Shipment Status Message Other
753 - Request for Routing
754 - Routing Instructions
811 - Consolidated Service Invoice/Statement
812 - Credit/Debit Adjustment
820 - Payment Order/Remittance Advice
997 - Functional Acknowledgment



Ready to Get Started?

The EDI experts at 1 EDI Source are here to help you not only learn EDI, but also provide the expertise, experience and solutions that will help your business grow. We have a full suite of EDI software and solutions for your unique business needs.

Whether you choose a web-based, managed, installed or cloud-based EDI solution, we have a product that will exceed expectations. We also provide communication, integration and migration services to help complete your solution.

If you have questions about EDI, or you're ready to get started, contact us and we'll walk you through what EDI option is best for you and be your guide through the entire implementation and beyond. In no time at all, EDI will become a natural part of your business. And through our ongoing training, you can learn as much or as little as you'd like about the solution, process and ways to maximize success.

EPICOR

We're here for the hard-working businesses that keep the world turning. They're the companies who make, deliver, and sell the things we all need. They trust Epicor to help them do business better. Their industries are our industries, and we understand them better than anyone. By working hand-in-hand with our customers, we get to know their business almost as well as they do. Our innovative solution sets are carefully curated to fit their needs, and built to respond flexibly to their fast-changing reality. We accelerate every customer's ambitions, whether to grow and transform, or simply become more productive and effective. That's what makes us the essential partners for the world's most essential businesses.

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