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# INTEGRATING EDI INTO ACCOUNTING AND ERP SYSTEMS

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## INTRODUCTION

### Purpose of this Whitepaper

Most technology whitepapers are written by vendors who attempt to sway the reader towards choosing their product. Unfortunately, readers view these whitepapers with some level of scepticism or perceive them as too one sided. Alternatively, white papers written by a third party tend to be more acceptable because of their independent viewpoint. As a third party we have written this whitepaper in an unbiased manner with the readers' best interests in mind.

The purpose of this whitepaper is to educate you on Electronic Data Interchange (EDI); describe the different methods for integrating EDI into your accounting or Enterprise Resource Planning (ERP) software; and provide information on EDI integration vendors in the marketplace. It has been written with the novice end user in mind but will also benefit those who are technically minded. Regardless of your line of business or job function, we hope to teach you something valuable that you can apply to your next EDI project.

#### Who should read this whitepaper?

Accounting Managers

Accounting Firms

EDI Co-ordinators

EDI Managers

IT Managers

New EDI Users

Software Resellers

Systems Integrators

### Process Followed

To produce the content for this whitepaper we combined our knowledge and expertise on EDI with information that was gathered from the vendor community. A select group of EDI integration vendors were invited to provide input and to sponsor this whitepaper. We interviewed those vendors to gather information on how their products work with the accounting and ERP software they support. We viewed a demonstration of their software and gained insight into the workings of the accounting / ERP software products. Additional information was gathered from other web sites including integration vendors and software publishers. The sponsors had an opportunity to proofread and critique a draft of the whitepaper but we retained final approval and full control over the content.

This whitepaper will be updated every 12-16 months to reflect changes in the marketplace and major shifts in the technology. Intermittent updates will take place to accommodate minor changes.

## About Vantage Point & Associates

Vantage Point & Associates is an independent source for E-commerce and EDI resources, news and vendor information. We bring sellers of the technology together with buyers for mutual benefit. Our brand is 'EC▶EDI Vantage Point™' and our tag line is "Covering Your E-bases™". We provide information to help buyers educate themselves and make informed decisions while at the same time offering advertising, promotional and marketing support to sellers to help get their message out to buyers.



We pride ourselves on our knowledge of E-commerce and EDI technology and the industry as a whole. We understand how buyers and sellers of technology have different motivation and needs and we always have our customers' best interests in mind. Buyers and sellers may engage our expertise for a fee, but we do not accept a commission from any vendor for recommending their product. Our customers can rely on Vantage Point & Associates to conduct ourselves in a professional manner with honesty, integrity and confidentiality.

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## EDI CHRONOLOGY

Various forms of exchanging files electronically have been around since the 1960's. What we know as Electronic Data Interchange (EDI) today began in the mid 1980's and it formalized the process for exchanging files in a structured and standard format. Over time EDI has evolved to include a broader range of technologies under the umbrella of Electronic Commerce (EC)<sup>1</sup>.

EDI is used in just about every industry to a varying degree. The reason it has been adopted by so many industries is that it offers companies the ability to become more efficient and productive, and therefore more competitive. EDI gained wide acceptance during the 1990's backed by strong mandates from the retail, manufacturing and transportation industries. Some industries force EDI compliance on their trading partners while others are more casual at adopting the technology. Today's global economy is putting more pressure on everyone to bring their costs down and EDI is one of the ways to reduce those costs. While EDI is the backbone of EC technology it is by no means the only technology available for increasing productivity.

### EDI throughout the decades

- Pre 1980's - Exchanging files electronically only realistic for large companies
- Mid 1980's - PC technology makes EDI possible for any sized company
- Early 1990's - E.D.I. or D.I.E.
- Late 1990's - The Internet changes everything
- Early 2000's - EDI thrives once again
- Today - Still more to come

### Pre 1980's – Before there was EDI

Prior to the mid 1980's, exchanging computer files electronically was only realistic for large companies with mainframe computers and knowledgeable IT staff. It made economic sense to exchange files electronically only if you had large trading partners with high volumes of data. Data transmission lines were expensive which made reel-to-reel tapes the most practical medium. The structure of the files being exchanged was determined by one or both parties with no standards as a guide.

For all the other companies who didn't have the computing power, expertise or resources to exchange files electronically, paper was the only option for conducting business.

<sup>1</sup> The term 'E-Commerce' has wide spread meaning. In the Business-to-Business world, it's a catch-all term for doing business electronically in any format, including EDI. In the Business-to-Consumer world E-Commerce tends to mean paying for products and services on the Internet using a credit card.

### **Mid 1980's – EDI attracts attention**

The first EDI standards emerged in early 1980's. The advent of the personal computer (PC) made EDI a possibility for any sized company. The first EDI translation software vendors and Value Added Networks began offering services to help large companies bring their smaller suppliers onto EDI. It seems trivial today, but using a PC, modem, EDI translation software and an electronic mailbox instead of paper was a drastic step. The start-up cost for suppliers easily reached \$10,000 or more. What most ended up doing was 'rip and read' EDI which entailed receiving a document electronically, printing it on paper and re-keying it into their business application. To send a document back to their customer they would key the data into the EDI translation software. This process turned EDI into a glorified fax machine and integrating EDI into accounting / ERP software was the furthest thing from anyone's mind.

### **Early to Mid 1990's – E.D.I. or D.I.E.**

Various industries, especially retail, continued to drive the adoption of EDI. Retailers were hungry for more and their suppliers reluctantly complied. The phrase 'E.D.I. or D.I.E.' surfaced as a warning for companies to adopt EDI technology or face the consequences of losing customers and falling behind competitors.

Large companies, who integrated EDI with their business applications from the beginning, were growing weary of the 'rip and read' habits of smaller companies. As the number of transactions started increasing for small companies, thoughts of integrating EDI started to surface and new vendors who offered software and services began to emerge.

### **Late 1990s – The Internet changes everything**

EDI was no longer viewed as the only technology for doing business electronically. It became a 'bad word' to some and perceived as overly complicated and costly for small companies. The Internet and dot.com era spawned hundreds of new companies that were developing revolutionary applications for the Internet, some of which were going to replace 'old' technology like EDI. These applications were touted as drastically going to change the way companies do business.

The reality was that the companies who invested heavily in EDI were not about to throw away that investment and start all over again because of XML. Instead, new options including XML emerged from the Internet and made it possible for companies to achieve 100% adoption of E-commerce with their trading partners. Files could be transported via the Internet and web forms were an economic alternative for small companies to use.

Two significant developments in the late 1990's were the realization that integrating EDI into business applications was a necessity, and the development of HIPAA EDI standards. Large customers in the retail industry started imposing fines on their suppliers who made re-keying or other errors in their EDI data. This started to affect the profit margins of suppliers and one way to reduce errors was to integrate EDI with their accounting / ERP system.

The Health Insurance Portability and Accountability Act (HIPAA) of 1996 resulted in a set of EDI transactions being developed for the healthcare industry. This made a significant impact on the adoption of EDI in healthcare which is a large industry.

**Early 2000's – EDI thrives once again**

EDI survived the dot.com crash and was not going away any time soon. The Internet helped take EDI to a new level much like the PC did in the 1980's. Initiatives such as web EDI, EDI-INT and integrating EDI made significant gains. The developers of the most popular accounting / ERP applications also recognized the importance of allowing EDI and other data formats to be integrated with their products.

A new service that surfaced during this time was EDI outsourcing. Some companies became increasingly frustrated with EDI because they were always playing catch-up to new developments and demands from their trading partners and the costs were escalating. As a result, EDI outsourcing, service bureaus and web EDI grew in popularity as companies would rather pay someone else to deal with the EDI headaches.

**Today – Still more to come**

The EC/EDI technology developments of the past two decades have made it possible to conduct business in ways that couldn't have been imagined prior to the 1980's. The Internet had the greatest impact and made it possible for any sized company to do business anywhere in the world. With all the technology options available, there is no reason why any company large or small, can't use EC/EDI technology in their business. In fact, it's mandatory if a business is going to survive.

## WHAT DOES EDI LOOK LIKE?

An EDI document is the electronic equivalent of a paper document such as a purchase order or invoice. Standards govern how EDI documents are structured and define the rules for their use. North American companies follow the X.12 standard while other parts of the world follow the EDIFACT standard.

The X.12 standard is made up of hundreds of documents called ‘Transaction Sets’. Transaction sets are made up of ‘Data Segments’ and ‘Data Elements’ of which there are hundreds and thousands respectively in the standards dictionary. By putting various combinations of data segments and data elements together in a structured format, you end up with a transaction set that has meaning.

### Transaction Sets

The following table shows a portion of X.12 transaction sets from the 800 and 900 series.

Set Number	Description
810	Invoice
820	Payment Order/Remittance Advice
830	Planning Schedule with Release Capability
832	Price/Sales Catalog
833	Mortgage Credit Report Order
834	Benefit Enrollment and Maintenance
835	Health Care Claim Payment/Advice
837	Health Care Claim
840	Request for Quotation
843	Response to Request for Quotation
850	Purchase Order
855	Purchase Order Acknowledgment
856	Ship Notice/Manifest
857	Shipment and Billing Notice
858	Shipment Information
859	Freight Invoice
860	Purchase Order Change Request - Buyer Initiated
862	Shipping Schedule
865	Purchase Order Change Acknowledgment/Request - Seller Initiated
869	Order Status Inquiry
870	Order Status Report
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
997	Functional Acknowledgment

### Data Segments and Data Elements

This example shows what an 850 purchase order looks like. Each line is called a *Data Segment* and begins with the *Segment Name*. For example, 'N1' represents name and address line 1 while 'PO1' represents purchase order line 1.

Following the Segment Name is a number of *Data Elements*. In the N1 segment the code 'BT' means it's a bill-to name and address. Data elements are separated by a single character, usually an asterisk (\*). A segment ends with a single character and in this example a tilde (~).

Other EDI documents such as an 835 Health Care Claim will have its own set of data segments and data elements. Segments such as the N1 overlap many transaction sets but the 835 will have its own segments and elements that are unique to healthcare.

Any number of data segments come together to form a transaction set. In this example there are 32 as shown in the control counter stored in the very last segment (SE). You will notice that the PO1, PID and PO4 segments repeat multiple times, just like it would on a paper-based purchase order.

There is flexibility in how an industry or company uses the EDI standards. For example, a purchase order going from a retailer to its supplier will look very different from a purchase order going from a mining company to their supplier. The drawback is when one supplier receives purchase orders from five different customers and they each structure their 850 differently. The supplier is burden with the task of handling the five different 850 layouts.

Example of an 850 Purchase Order

- ① Each line is called a Data Segment
- ② Each Segment begins with a Segment Name
- ③ A number of Data Elements follow the Segment Name
- ④ Data Elements are separated by a single character such as '\*'
- ⑤ A Segment ends with a single character such as '~'

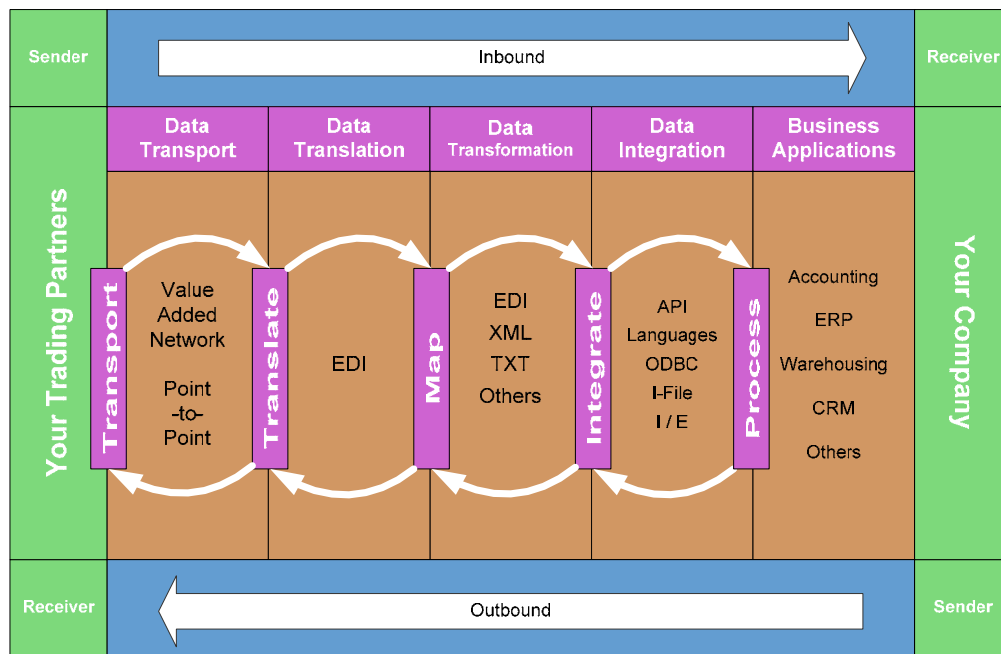
```

BEG*00*SA*A14578**20070112~
REF*VR*54863~
ITD*01*3*1**15**16~
DTM*002*20070131~
N1*BT*Buy Snacks Inc.*9*3456 Main St.~
N4*Temple*TX*76503~
N1*ST*Buy Snacks Inc.*9*1000 Highway 27 N.~
N3*Regional Distribution Center~
N4*Athens*GA*30603~
PO1**16*CA*12.34* *CB*0001111111*UA*002840022222~
PID*F***Crunchy Chips~
PO4*48*7.89*LB~
PO1**13*CA*12.34* *CB*0005555555*UA*002840033333~
PID*F***Nacho Chips~
PO4*48*8.9*LB~
PO1**32*CA*12.34* *CB*0006666666*UA*002840044444~
PID*F***Potato Chips~
PO4*72*6.78*LB~
PO1**51*CA*12.34* *CB*000874917*UA*002840055555~
PID*F***Corn Chips~
PO4*48*8.9*LB~
PO1**9*CA*12.34* *CB*000874958*UA*002840066666~
PID*F***BBQ Chips~
PO4*48*4.5*LB~
PO1**85*CA*12.34* *CB*000874990*UA*002840077777~
PID*F***Large Bag Chips~
PO4*48*4.56*LB~
PO1**1*CA*12.34* *CB*000875088*UA*002840088888~
PID*F***Small Bag Chips~
PO4*48*4.56*LB~
CTT*7~
SE*32*000000001~
    
```

# HOW EDI WORKS

There are many components involved in an EC/EDI relationship between two trading partners. This diagram depicts the flow of data between components and the remainder of this whitepaper explains each step.

**Components of an EC/EDI Relationship**



## Sender (Outbound) and Receiver (Inbound)

EDI is a batch process in which transactions are grouped together into one or more files and transmitted all at the same time. One trading partner is the *sender* (outbound) and one trading partner is the *receiver* (inbound). Both trading partners become senders and receivers throughout the relationship.

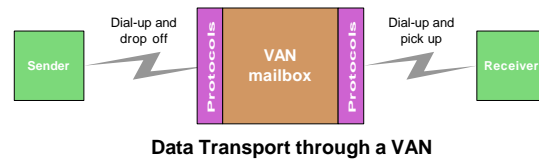
In most situations one trading partner is the *driver* of the EC/EDI relationship and the other trading partner is the *follower*. The driver can be a customer, industry association or government department while the follower is a supplier, member of an association or an organization that deals with the government.

The driver will publish an implementation guide, companion guide or web site that describes their EDI program, procedures and expectations. Someone who is a supplier or deals with the government must become compliant by following the instructions set out in the guide. Members of an industry association are not mandated to use EDI but they must follow the guide if they are going to implement EDI.

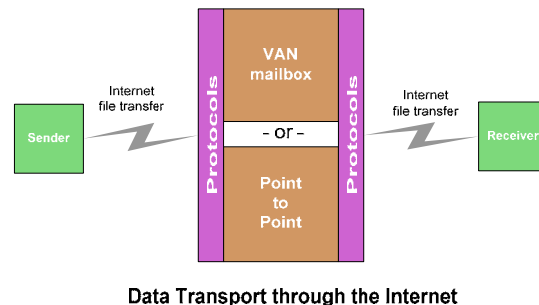
## Data Transport

**Data Transport** is the process of electronically transferring files to/from your trading partners.

Traditionally a **Value Added Network (VAN)** is used as the go-between for trading partners. The sender's computer dials-up and drops off a file to the VAN who in turn stores it in an electronic mailbox. When the receiver's computer is ready, it dials-up the VAN to pick up their files from the mailbox. Protocols such as Async and Bisync were used to securely transmit files to/from the VAN.



Nowadays the Internet is used to make the connection to the VAN. It is also used to connect **Point-to-Point** to a trading partner thus bypassing the VAN entirely. The computer dial-up step isn't necessary if the Internet connection is always active, although some small businesses still use a dial-up Internet connection.



These are the most common protocols used to transmit files to/from a VAN or Point-to-Point:

**File Transfer Protocol (FTP)** – is initiated by *either trading partner* to transfer files to/from the VAN's computer or Point-to-Point on the trading partner's computer. It usually requires a log-in to gain access but it is not fully secure because files are sent in clear text and could be intercepted and deciphered. **File Transfer Protocol Secure (FTP/S)** solves the problem by adding a level of security to thwart eavesdropping.

**Hyper Text Transfer Protocol (HTTP)** – is initiated by *one trading partner* to request files to be transferred from the VAN's computer or Point-to-Point from the trading partner's computer. The receiver's computer must acknowledge the request before sending the file.

**Hyper Text Transfer Protocol Secure (HTTP/S)** is the same as HTTP with an added level of security to encrypt files.

**EDI-INT** – is a set of standards for transferring EDI files through the Internet more securely than e-mail, FTP/S or HTTP/S. **Applicability Statement 1 (AS1)** defines the standards for using e-mail to transfer files, **Applicability Statement 2 (AS2)** defines the standards for using HTTP to transfer files and **Applicability Statement 3 (AS3)** defines the standards for using FTP to transfer files. While FTP/S and HTTP/S offer security, EDI-INT adds another layer of security involving public and private keys.

## Which Data Transport Method should you use?

There are various factors surrounding cost, security and compliancy that will determine which Data Transport method you should use. *If you are the follower in a trading relationship, the Data Transport method will most often be determined by the driver.* Followers have little say in the matter and will have to bear any added costs to comply.

If your trading partner is indifferent to the Data Transport method, choose a protocol the offers an acceptable level security for your data. FTP and HTTP would not be considered secure, FTP/S and HTTP/S are considered secure and EDI-INT is considered very secure.

Taking into account all your trading partners, it is likely that you will end up using a mix of Data Transport methods.

## How much does Data Transport Cost?

### Value Added Network

Many of the VANs have different pricing structures that make it difficult to compare prices when shopping around. Generally, you can expect

1 KC=1,000 characters of data

to pay a setup fee, monthly subscription fee and transaction fee. The setup fee can be hundreds of dollars; the monthly subscription fee ranges from \$25 to \$100; and the transaction fee will vary depending on volume in kilo-characters (KC). A kilo-character is 1,000 characters of data transmitted at a cost ranging from 5¢ to 25¢ or more per KC. Some VANs charge by the number of documents transmitted instead of kilo-characters. Pricing from VANs is very competitive and some will offer a low monthly flat rate for guaranteed volume under a multi-year contract.

The VAN will determine the protocol to use and will provide the parameters to log-in to your mailbox on their network. Most VANs interconnect with each other meaning you only subscribe to one VAN. However, it is common to subscribe to more than one VAN because your trading partners will not allow you to exchange files using an interconnection.

### Point-to-Point

Point-to-Point connections eliminate the need for a VAN and the associated costs<sup>2</sup>. If security is not an issue then the FTP or HTTP protocol can be used. FTP/S or HTTP/S should be used to keep the contents of your files secure. Using FTP/S requires software that can be purchased for a few hundred dollars or less. Using HTTP/S does not require additional software but you must know how to program in the HTTP language.

<sup>2</sup> Unless all your trading partners are willing to go Point-to-Point, you will still need a VAN.

## EDI-INT

The EDI-INT protocols (AS1, AS2, AS3) are used by companies seeking the most secure Point-to-Point connection to their trading partners. While there are no transaction fees associated with EDI-INT, you will have to purchase software that can cost \$500 to \$5,000 or more for a standard PC installation. The cost is usually scaled by the number of trading partners with some 'lite' versions being available at a lower cost if you only use EDI-INT with one or two trading partners.

## Data Translation

If you look at an EDI transaction in its raw format, most of the data is meaningless until it is passed through an EDI translator. **Data Translation** is the process of interpreting EDI data to ensure it conforms to the EDI standards (X.12 or EDIFACT) and performing checks and balances before the data reaches the intended business application. An EDI translator performs the following functions:

### Compliance Checking

Each EDI transaction is checked against the EDI standards dictionary to ensure it conforms to formatting rules. The term for this is called 'compliance checking'. If an EDI transaction does not comply with the rules, the translation fails and the transaction should not reach the business application. These are some examples that would cause a transaction to fail EDI translation:

```
PO1**51*CA*12.34* *CB*000874917*UA*002840055555~
```

Every segment must be formatted properly

- A line item on a purchase order has no number in the 'Qty Ordered' field
- The date on an invoice is formatted as 'DDMMYYYY' when it should be 'YYYYMMDD'
- A shipping manifest is missing the 'Total Weight' field
- A trading partner's accounting / ERP software underwent an upgrade and caused a field to be formatted incorrectly

### Control Number Checking

The purpose of control number checking is to track the transmission of EDI documents to ensure duplicates are not sent or received. Sequential numbers are assigned to each transmission (ISA segment), each group of documents (GS Segment) and each transaction set (ST segment). When a transmission is sent or received and a control number is duplicated or out of sequence, it indicates a problem that requires immediate action. This safeguard ensures missing transmissions are noticed and that duplicate transactions don't reach the accounting / ERP application.

```
ISA*00* *00* *ZZ*Sender ID *14*0073268795005 *070112*1548*U*00401*000000020*0~
GS*PO*Sender ID*007326879*20070112*1548*000001*X*004010~
ST*850*000000001~
```

Control numbers appear in the ST, GS and ISA segments

### **Trading Partner Management**

It would be difficult to manage EDI trading relationships without a trading partner management function. This function keeps track of attributes that differ from one trading partner to the next. Following are some examples:

- Contact information for the business person responsible for EDI.
- Contact information for the technical person responsible for EDI.
- Data transport method used and account information to connect to a VAN or Point-to-Point.
- The severity level (critical or warning) if control numbers are out of sequence.
- E-mail address of the person to alert when errors are found.
- EDI standards version number being used.

### **Tracking and Auditing**

Problems will arise no matter what form of electronic commerce is used. With EDI, trading partners need the ability to track the whereabouts of an EDI transaction that did not make it to the accounting / ERP application. EDI translation software provides various logs and reports to trace a transaction throughout the process.

An inherent audit feature in EDI translation software is the functional acknowledgement, which is known as the 997 transaction. Every EDI transaction that is sent by a trading partner requires an acknowledgment of receipt from the other trading partner using the 997. A positive 997 means the original transaction was received and passed EDI translation. A negative 997 means the original transaction failed translation. Not receiving a 997 means there was a transmission problem between the two trading partners.

### **Document Repository**

A document repository is a place to store all incoming and outgoing EDI and non-EDI transactions alike. Transactions are stored in a database in their original form and all activity against each transaction is logged. This makes it possible to trace a transaction from all points between Data Transport and Data Integration into the business application. When it becomes necessary to re-send a transaction due to operational problems, the original can be retrieved from the repository.

Another function of the document repository is to facilitate an EDI document 'turnaround'. Many accounting / ERP applications do not have a home in their database for fields that arrive on an incoming EDI document. The trading partner expects the data in those fields to be sent back in another EDI document later. An example is a purchase order (850) that is 'turned around' into a purchase order acknowledgement (855). Since the accounting / ERP application does not store some of the EDI data, the original 850 document can be retrieved from the repository to select data to place into the 855.

## How much does Data Translation cost?

The cost for EDI translation software will vary depending on your computing platform. A low-end, PC-based translator that can handle a few trading partners will cost \$1,500 - \$3,500. A mid-range PC or server based translator costs \$4,500 to \$15,000. An enterprise system that includes Data Transport, Data Transformation and Data Integration modules in one product will cost \$25,000 to \$150,000 or more.

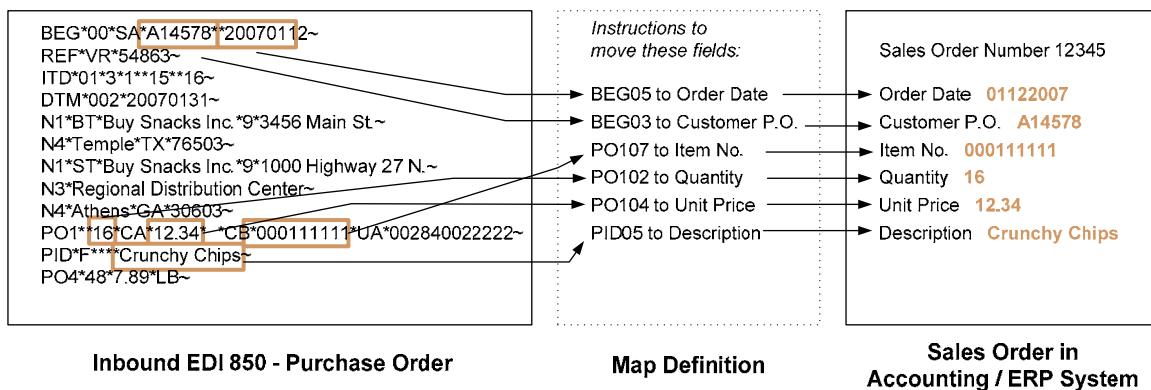
EDI translation software vendors may charge extra for trading partner kits, the cost of which ranges from \$250 to \$1,000. (See 'Sender's Layout #1' on page 14 for more information on kits.)

Annual software maintenance is 15% - 20% for support and upgrades. EDI education and software training is extra if you require it. The cost can be an hourly rate (up to \$150 per hour) or a flat rate per workshop, per student.

For more costs associated with Data Translation, see the paragraph at the end of 'Data Transformation' (page 15) and the paragraph at the end of 'Data Integration' (page 29).

## Data Transformation

**Data Translation** and **Data Transformation** sound similar but are not the same thing. As explained earlier, Data Translation is the process of interpreting EDI data to ensure it confirms to the EDI standards. Data Transformation is the process of taking data from an inbound record layout and moving it to an outbound record layout. Another term for this is called 'mapping'. The layout of the inbound/outbound record is determined by the application that created or uses the data. Any data format, EDI, XML, TXT etc. can be transformed (mapped), but only EDI data is translated. This diagram illustrates how mapping works:

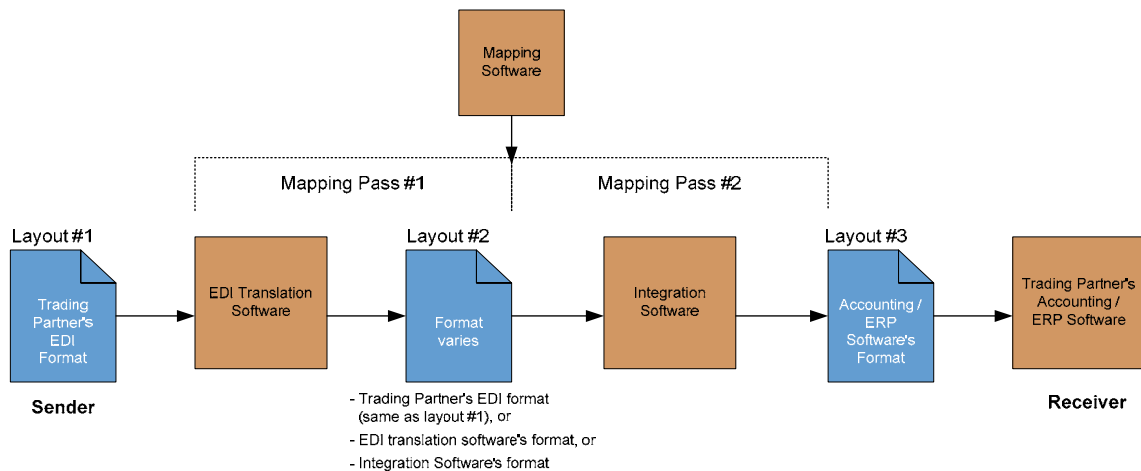


The inbound layout appears on the left hand side and the outbound layout on the right hand side. The layouts on either side can be in any format. In this example an EDI 850 is being mapped to a sales order in the accounting system. A map definition sits in the middle and defines where to move each piece of data, left to right. If necessary the map can alter the data before moving it. For example, the Order Date was changed from YYYYMMDD format to MMDDYYYY when creating the sales order.

## The Mapping Process

Receiving a transaction in EDI or any other format is of little use unless you can map it to something else. Even a 'rip and read' scenario requires a map to define where to put the data on a piece of paper. Mapping is an essential component of integrating EDI into an accounting / ERP system. One anomaly in the process is that mapping must take place more than once before a transaction is successfully integrated.

This diagram illustrates the flow of an EDI transaction once it has been received by a trading partner. A transaction must pass through one or two mapping steps before it reaches the accounting / ERP software.



### Sender's Layout #1

EDI translation software comes with a full set of EDI standards that contains hundreds of transaction sets, hundreds of data segments and thousands of data elements. A trading partner will only use a small percentage of the dictionary in their adoption of the standards. Therefore, most EDI translation software vendors will offer kits that match the trading partner's use of the standards. There is one kit for every trading relationship that contains several transaction sets.

### Mapping Pass #1 and Layout #2

Each EDI translation software product in the marketplace will have its own way of doing things. In order to get a transaction into your accounting / ERP system you have to get it out of the EDI translation software's database first. The simplest method is to export a transaction in EDI format (layout #2) exactly as it looked when it arrived in layout #1. Some products will only allow exporting to a layout that is predetermined by the EDI translation software. In other software you can map a transaction to a layout of your choice which might as well be the integration software's format (layout #3).

### **Mapping Pass #2 and Layout #3**

Each integration software product in the marketplace will have its own way of doing things too. To ultimately get a transaction into your accounting / ERP system, it has to pass through the integration software. If the integration software requires its own layout (#2), the transaction can be mapped during pass #1 (if permitted by the EDI translation software) or it will have to be mapped again in pass #2. Regardless of where it is mapped, the end result is the creation of layout #3 that your accounting / ERP software expects.

### **Why is there so much mapping going on?**

The reason there is so much mapping going on is that EDI translation, mapping, integration and accounting / ERP software could all be purchased from different software vendors. This creates confusion as there are hundreds, possibly thousands of combinations of products that could be used together. This doesn't even include Data Transport software discussed earlier or software add-ons discussed later, that can add hundreds of more combinations. The only realistic way for all these products to 'talk' to each other is through mapping.

### **Who provides the Mapping Software?**

Mapping software can be purchased from sources: 1) the EDI translation software vendor; 2) the integration software vendor; 3) an independent mapping software vendor. It is common for EDI translation and integration software vendors to sell mapping software but it is uncommon to have EDI translation software, integration software and mapping software all rolled into one product. The exception being large enterprise applications that combine Data Translation, Data Transformation and Data Integration into one product that is expensive to purchase.

### **How much does Data Transformation Cost?**

Mapping software has similar cost patterns to EDI translation software reviewed on page 13 including the initial purchase, annual maintenance, education and training.

An added cost involving Data Translation and Data Transformation is professional services. Unless you have IT staff that is trained and prepared to use the software, you will incur an expense for someone to do all the mapping. At a cost of up to \$250 per hour, the total outlay for professional services could equal or surpass the one time purchase of the software. Every time you add a new trading partner or a new transaction set for an existing trading partner, there is a cost.

If you have purchased low-end EDI translation software that works with one or two trading partners, it is possible that there will be no additional costs for professional services.

## Add-on Technologies for Companies Involved in the Supply Chain

*If your company is not a manufacturer or distributor involved in the supply chain in your industry, you can ignore this section. Otherwise, you should read about these 'add-on' EC/EDI technologies that may become necessary to purchase if mandated by your trading partners.*

### **Advanced Ship Notice**

The most complicated EDI transaction used in the supply chain is the 856 – Advanced Ship Notice (ASN). Companies use the ASN to manage just-in-time deliveries from their suppliers. An ASN is sent by the supplier to the customer and tells them exactly what to expect in the shipment when it arrives. Creating the ASN occurs on the warehouse floor where the goods were packed, which is a different location from where the EDI operations take place. Using a third party logistics company for warehousing and shipping makes the distance between the two locations even greater.

EDI translation, mapping and integration software vendors handle the complexity of the ASN with software that is an 'add-on' to their base product. This module is accessed in the warehouse where the actual packing and shipping data is keyed. The base software located in the EDI operations department takes the data, builds the ASN and sends it to the trading partner.

### **Bar Code Label Printing and RFID**

Many customers expect their suppliers to label packages, cartons and skids according to the customer's specifications when shipping orders. Since much of the data originates from an order placed through EDI, it makes sense to have the EDI translation, mapping or integration software facilitate the creation of the labels.

EDI translation, mapping and integration software vendors facilitate the printing of labels within their base product or through an add-on. Their software provides the data that goes on the label, but it does require another piece of software from a third party to actually format and print the labels. A label printer is necessary although some products allow the labels to be printed on 8½ x 11 sheets using a laser printer.

Radio Frequency Identification is a technology that allows miniature transmitters to be embedded in shipping labels. It's very similar to a bar code label but doesn't require scanning by hand. When a shipment arrives at the customer's warehouse, scanners read the labels on packages and skids as they pass through the doors. The scanned data is then uploaded to the host computer for processing. Large skids with multiple packages can be scanned in one pass compared to scanning one package at a time by hand.

### **Global Data Synchronization**

One of the inefficiencies in global trade is that a single product could have hundreds of different numbers to identify the same thing. A company in North America could identify a product as number 123 while another company in Europe could identify the same product as 456. Both companies purchase the product from a supplier in Asia who identifies it as 789. Global Data Synchronization (GDS) is a process that companies anywhere in the world can use to identify a product consistently and share that data throughout the supply chain.

GDS is accomplished by assigning a Global Trade Identification Number (GTIN) to every product manufactured and making it accessible through the Global Data Synchronization Network (GDSN). The GDSN allows companies to quickly and efficiently exchange product data that is accurate, up-to-date and compliant with universally supported EAN.UCC standards.

### **How much do Add-on Technologies Cost?**

Depending on the vendor, the cost for ASN software might be included with the Data Translation, Data Transformation or Data Integration software. For a PC-based installation the add-on will range from a few hundred dollars to several thousand dollars.

For bar code label printing you will have to purchase software at a cost of up to \$1,500 plus a label printer for \$1,500 to \$3,000. The Data Translation, Data Transformation or Data integration software vendor should be able to recommend a vendor for the label printing software and printer.

A pricing model for GDS is too varied to present in this whitepaper at this time.

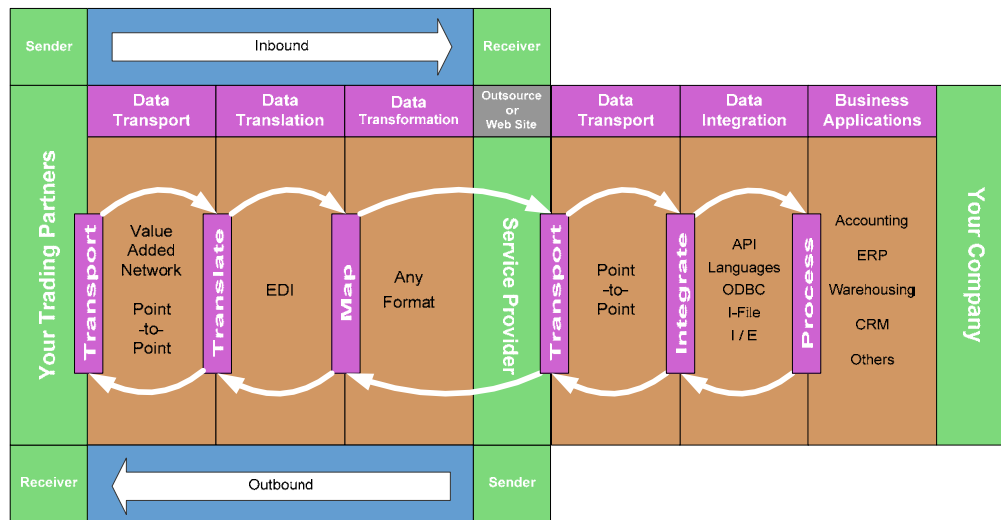
## EDI Outsourcing and Web EDI: Alternatives to Data Transport, Data Translation and Data Transformation

An EC/EDI relationship with your trading partners can be overwhelming and complex. With global trade and technology changing so rapidly, it can be difficult to keep up and will likely become more complex over time, not less. The alternative for many companies is to outsource their EDI operation or subscribe to a web EDI service.

EDI outsourcing and web EDI are growing in popularity. The service providers are in direct competition with vendors who offer software and services for Data Transport, Data Translation and Data Transformation. Both approaches are viable but it is beyond the scope of this whitepaper to delve into the pros and cons of one method versus the other<sup>3</sup>.

This diagram shows how the flow of data changes through EDI outsourcing or web EDI:

EC/EDI Relationship through EDI Outsourcing or Web EDI



The service provider assumes responsibility for managing the Data Transport, Data Translation and Data Transformation components of the relationship with your trading partners. You don't have to understand how these components work or worry about day-to-day operations. However, you must still operate the Data Integration component alongside your business application.

<sup>3</sup> Look for whitepapers on EDI Outsourcing and web EDI to be published by Vantage Point & Associates later in 2007

### **What's the difference between EDI Outsourcing and Web EDI?**

In an EDI outsourcing scenario the service provider acts as your IT department and EDI operations department all in one. You interact with the service provider and they deal with your trading partners at the operational level. You are still responsible for managing the business relationship with your trading partners.

Integrating EDI with your business application works in the same manner as a non-outsourced solution. Files are exchanged between you and the service provider using a Point-to-Point connection (Data Transport) and you integrate the data with your application.

In a web EDI scenario the service provider acts as your IT department and the EDI operations are somewhat shared. They provide you with access to their system through a web browser to process EDI transactions in real time. After your activities are completed, the service provider will translate and transport files to/from your trading partners.

Integrating EDI with your business application works in the same manner as a non-web EDI solution. Files are exchanged between you and the service provider using a Point-to-Point connection (Data Transport) and you integrate the data with your application.

EDI outsourcing is ideal for companies who have medium to high EDI activity and want someone else to handle the complexities and operations. Web EDI is ideal for companies who have low to medium EDI activity and no resources to handle the complexities internally.

### **What does EDI Outsourcing and web EDI Cost?**

#### *EDI Outsourcing*

There are many EC/EDI vendors who offer outsourcing services in North America. Their pricing models are too varied to discuss in this whitepaper. One can assume that the overall costs will be similar to what it would cost to manage an in-house EDI operation. These are some considerations when evaluating the cost for EDI outsourcing:

1. You will not have to purchase any Data Transport or Data Translation software.
2. You will have to purchase Data Integration software and possibly Data Transformation software.
3. The costs to integrate EDI with your business application will be the same whether you outsource your EDI operations or not.
4. There is still a cost associated for someone in your organization to manage the business relationship with your trading partners and the relationship with your service provider.
5. If you require bar coded labels to be printed you will have to purchase software at a cost of up to \$1,500 plus a label printer for \$1,500 to \$3,000.

6. The fee structure from the service provider will include a combination of the following:
  - One time setup fee
  - Monthly management fee
  - Transaction fees
  - VAN charges
  - New trading partner or transaction setup fees
  - Mapping fees (for integration)

#### *Web EDI*

There are also many EC/EDI vendors who offer web EDI services in North America. The pricing model is similar among vendors and these are some considerations when evaluating the cost:

1. Points 1 to 5 under EDI outsourcing also apply to web EDI
2. The fee structure from the service provider will include a combination of the following:
  - One time setup fee – flat rate or up to \$750 per trading partner
  - Subscription fee – \$25 to \$75 per month
  - Transaction fees – \$1 to \$3 per transaction based on volume.
  - VAN charges – If your trading partner still uses a VAN, the service provider will connect to the VAN on your behalf. They will pass the cost on to the customer at a rate of 5¢ to 25¢ or more per KC. Some service providers will bundle the VAN charges into their transaction fees.
  - New trading partner or transaction setup fees – variable\$
  - Mapping fees for integration – up to \$250 per hour

## Data Integration

### Why you should Integrate EDI

Whether you're a small business using accounting software such as BusinessWorks or a global company using an enterprise system such as MAS 500, it is viable to integrate EDI with your application. Integrating EDI increases productivity which means it costs you less to run your business. This has a positive effect on customers and fends off competitors. These are the reasons you should integrate EDI, most of which relate to productivity:

*Penalties imposed by customers.* In the supply chain process for example, manufacturers and distributors must follow strict rules imposed by their customers. Failure to do so will result in unilateral fines being assessed for errors or missed schedules. These are some examples when fines occur:

- Keying errors
- Incorrectly formatting an EDI transaction
- Data missing on a transaction
- Failing to acknowledge a transaction (997)
- Sending a duplicate document
- Not adhering to Data Transport schedules

*Save time.* EDI will always be faster than re-keying data. The more activity through integration, the less it will cost compared to manual processes.

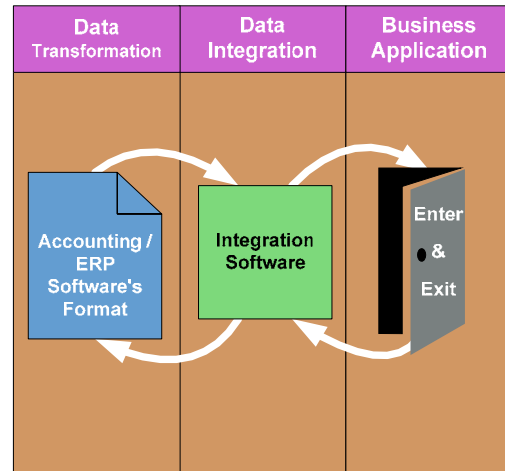
*Handle data only once.* The fewer number of times a person has to handle a piece of data the better. Integration reduces the likelihood of costly errors.

*Adding new trading partners becomes easier.* Once the integration infrastructure is in place, it becomes easier to add new trading partners to the process. The productivity benefits multiply with each new trading partner added.

*Trading partners have time restrictions.* If you are a manufacturer or distributor in the supply chain, customers will impose time restrictions for certain tasks and transactions. An integrated process is the only way to ensure you comply with your customers' schedules.

## How Integrating EDI Works

Few, if any, accounting / ERP systems will accept an EDI transaction in its raw format for processing. This means there has to be integration software in the middle that will map the EDI transaction into the format that the accounting / ERP software will accept. (Review the section ‘The Mapping Process’ on page 14.) This diagram illustrates the integration process using a doorway analogy.



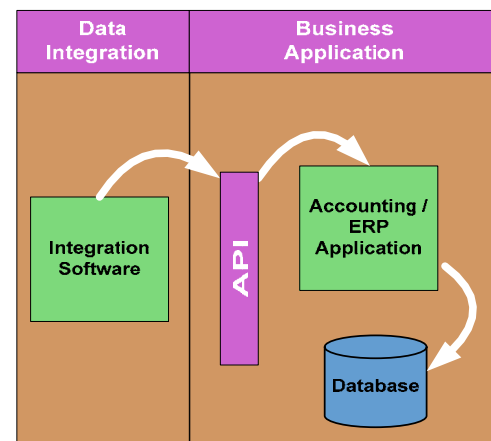
The accounting / ERP software will provide the ‘doorway’ to allow a transaction to ‘enter’ in one of two ways: 1) the integration software will ‘walk through the door’ and interact with the application directly; 2) the integration software will hand-off the transaction at the ‘door’ and the accounting / ERP software will take over. Both ways are acceptable but the accounting / ERP software ultimately decides which one must be used.

## Methods for Integrating EDI

This section describes the different methods that the accounting / ERP publishers will accept for integrating EDI. It may seem overly technical but it illustrates the disparity among the software publishers and integration software vendors.

### Method 1: Application Program Interface (API)

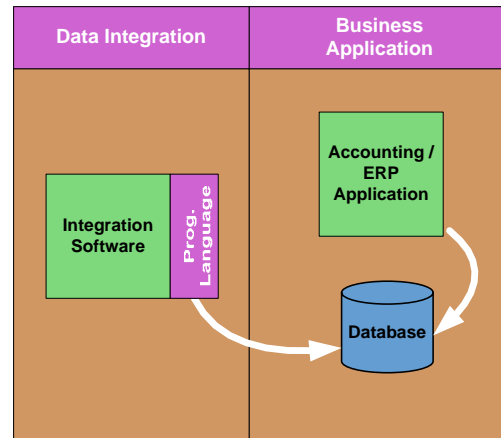
An API is a program provided by the accounting / ERP publisher that controls an external program’s access to their system. It enables the two programs, the integration software and the accounting / ERP software, to communicate with each other using the API as the go-between. The integration software ‘calls’ the API and passes the data to the accounting / ERP software. If the data is incomplete or contains errors, the API will not allow the data to be written to the database and an error message is returned to the integration software. An API is a two-way process that allows the integration software to both read and write data to the accounting / ERP system’s database.



Method 1: Application Program Interface

## Method 2: Programming Languages

Integration software vendors have a variety of programming languages at their disposal to develop software that will bypass the accounting / ERP software altogether and work directly with the database. To ensure the integrity of the database is maintained, the accounting / ERP software vendor will publish a Software Developer's Kit (SDK) that tells the integration software vendor the rules to follow when updating their database. The language chosen by the integration software vendor is often the same language used by the accounting / ERP publisher.



Method 2: Programming Languages

Following are examples of languages used by integration software vendors:

### *ProvideX*

ProvideX is both a computer language and a database structure for developing computer applications. Two of the most popular accounting applications, Sage MAS 90 and Sage MAS 200, are developed using ProvideX.

### *Dexterity*

Dexterity is Microsoft's programming language for developing software to interact with Microsoft Dynamics GP (Great Plains).

### *C/Front*

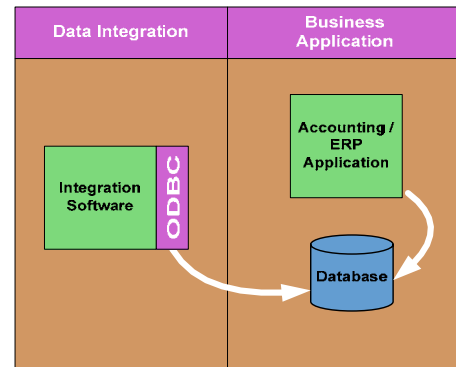
C/Front is Microsoft's programming language for developing software to interact with Microsoft NAV (Navision).

### *SQL*

SQL (pronounced 'sequel') is a universal computer language that permits computer programs to access any SQL database. SQL database technology is widely used in computer applications and many accounting / ERP publishers have built their applications around an SQL database.

### Method 3: Open DataBase Connectivity (ODBC)

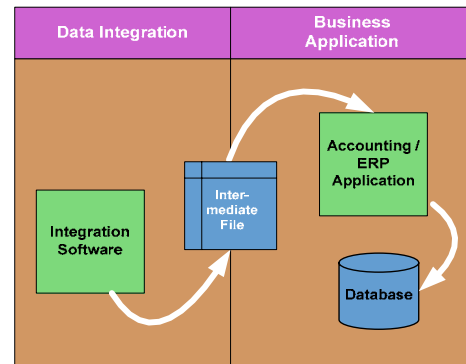
This method is a combination of an API (method #1) and SQL (method #2). ODBC is a standard way for accessing a database from a Microsoft program. (JDBC is the equivalent from a Java program.) ODBC contains a set of APIs written in SQL that define how to move data in and out of a database that supports ODBC. When integration software uses ODBC, it bypasses the accounting / ERP software altogether and goes right to the database to read and write data.



Method 3: ODBC

### Method 4: Intermediate File

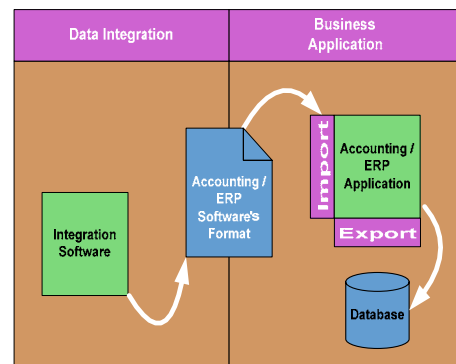
With this method, the integration software will map an EDI transaction to a format specified by the accounting / ERP software and create an intermediate file on the server. The intermediate file could be a text file or a separate database belonging to the application. The accounting / ERP software 'polls' the server regularly to see if there are any transactions in waiting. If so, a process is initiated to import those transactions into the accounting / ERP software. The application will edit the transactions and reject any that contain errors. This process is automated without the need for a user to intervene.



Method 4: Intermediate File

### Method 5: Import / Export (I / E)

With this method, the accounting / ERP software provides an option to import data using a predefined format. The integration software will map an EDI transaction to the format required and create a text file containing the transactions. A user of the accounting / ERP software must go into their software and choose the 'Import' function on one of the menus and select the location of the text file to be imported. During the import, the application will edit the transactions and reject any that contain errors. The export function is opposite of the import function in that it takes data from the database and writes it to a text file.



Method 5: Import / Export

## Additional thoughts on Integration

*Inbound and outbound processing.* Integration is a two-way process. While posting an EDI transaction such as an order into the accounting / ERP software (inbound) is most common, there is a necessity to get a transaction such as an invoice out of the application (outbound) too.

*Any data format will work.* While EDI is the primary format discussed here, the integration principles apply to other data formats such as XML and TXT too. If your company has a web site that accepts orders from customers, the same principles and technology can be used to integrate your web site with the accounting / ERP software.

*Using EDI Outsourcing or web EDI.* Regardless of whether you have an EDI operation in-house or use a third party for EDI outsourcing or web EDI, the integration process is the same.

*Do It Yourself versus buying integration software.* If you have IT personnel that are proficient in EDI and your accounting / ERP software, they can do the integration without purchasing integration software. For most companies it is more economical to purchase software than to do it yourself.







*Home grown accounting / ERP software.* If you have an accounting / ERP system that was developed by your IT staff, the integration process is the same. The only difference is that you determine how EDI will be integrated into your system.












## How the Accounting / ERP Publishers Accommodate EDI

The accounting / ERP publishers accommodate EDI using one or more of the methods described earlier. They will also accept formats other than EDI to accomplish the same thing.

Integration software vendors are often certified by the accounting / ERP publishers to ensure they meet a level of development standards. Certification also ensures the integration software vendor has been trained on their software and has the technical expertise to support their mutual customers. Certification however, is neither mandatory nor necessary as long as the integration vendor follows the publisher's SDK.

This table lists many of the popular accounting / ERP software and the method they use to accommodate EDI integration:

Publisher	Product Name	Method	#
	Accpac ERP	API I / E	1 5
	BusinessVision	ODBC	3
	BusinessWorks Accounting	I / E	5
<b>Microsoft</b>	Dynamics AX (Axapta)	API	1
<b>Microsoft</b>	Dynamics GP (Great Plains)	Dexterity	2
<b>Microsoft</b>	Dynamics NAV (Navision)	C/Front	2
<b>Microsoft</b>	Dynamics SL (Solomon)	SQL	2
<b>ORACLE</b>	e-Business Suite	I-File	4
<b>EPICOR</b>	Enterprise	API	1
<b>ORACLE</b>	JD Edwards Enterprise One	I-File	4
	Macola Progression	ODBC	3
	MAS 90	API ProvideX I / E	1 2 5
	MAS 200	API ProvideX I / E	1 2 5

Publisher	Product Name	Method	#
	MAS 500	API	1
	MYOB	ODBC	3
	Peachtree	API	1
	PeopleSoft Enterprise	I-File	4
	PFW	ODBC	3
Intuit		API	1
	Pro ERP	ODBC	3
	SAP Business One	I-File	4
	Simply Accounting	API	1
SYSPRO		ODBC	3
Open Systems		ODBC	3

### What if your application is not listed?

There are other accounting applications, many industry specific ERP applications and older releases of products that are not mentioned above. This does not imply that they do not accommodate EDI integration. The best way to find out is to contact the vendor and ask.

## Shopping for an EDI Integration Solution

### **Scenario #1 – Your company is new to EDI**

If your company is venturing into EDI for the first time, hopefully this whitepaper has enlightened you on the process. As you shop for a Data Integration solution, you have to consider the need for Data Transport, Data Translation and Data Transformation as well. EDI outsourcing and web EDI are viable options too. Most integration software vendors will offer an end-to-end solution.

### **Scenario #2 – You already have Data Transport and Data Translation software**

Since your company is already using EDI, Data Transformation and Data Integration are the next logical steps. As you shop for a Data Integration solution, you will want to leverage your investment and ensure the integration software vendor can work with your existing software. Contact your Data Translation software vendor to see if they sell Data Transformation and Data Integration software as well. However, take these precautions:

- 1) They may recommend a custom programming solution that could become very expensive.
- 2) They may suggest mapping software as a workable solution for Data Integration, which is only partially true. They are correct if your accounting / ERP software supports integration method #4 or #5. However, mapping software alone will not work without integration software if your accounting / ERP system uses method #1, #2 or #3.
- 3) Many Data Translation vendors state that their software will integrate with any business application. This is true to the extent that their product will translate and transform an EDI transaction into any format and deliver it to the ‘front door’ of the accounting / ERP software. It still relies on Data Integration software to take the transaction ‘through the door’ and into the application.

### **Scenario #3 – You want to replace your current integration software**

If you’re dissatisfied with your current integration software provider or the product you are using is outdated, you may have no option but to replace it. Beware that the costs could escalate since you will be starting all over again. If the other components (Data Transport, Data Translation, and Data Transformation) need replacing too, you should take the time to research all the options and carefully choose a new vendor.

## How much does Data Integration Cost?

Integration software has similar cost patterns to Data Transformation software reviewed on page 15 including the initial purchase, annual maintenance, education and training.

The initial purchase price will vary and is often relative to the complexity and cost of your accounting / ERP software. Integration software for use with small business accounting packages can cost less than \$1,000 but ironically, costs more than the accounting software itself. Integration software for the mid-range accounting / ERP packages costs \$2,500 to \$10,000 or more.

There will be a cost for professional services to do integration. The costs might be included in the Data Translation or Data Transformation tasks rather than here, but not in more than one place.

## Vendors who offer an EDI Integration Solution

There are numerous EC/EDI vendors that can do integration with back-end applications. This section highlights those who approach EDI from the accounting / ERP software perspective versus an EDI translation software perspective. Many accounting / ERP products mentioned on pages 26-27 are covered by these integration vendors. For more detailed information you are encouraged to contact the vendor and ask for the document titled **“Integrating EDI into your Accounting / ERP System using {vendor’s product name}”**.

If one of the integration vendors listed does not support your accounting / ERP software, visit [www.ec-edi.biz](http://www.ec-edi.biz) for additional resources to locate a vendor.







Kissinger Associates, Inc.  
 2117 Main Street  
 Centerport, PA 19516

**Contact:**

EDI Advantage Sales Manager  
 800.562.5456  
 610.926.8344 (fax)  
 www.kissingerassoc.com  
 edisales@kissingerassoc.com

Contact Kissinger Associates to request the document titled "Integrating EDI into your Accounting / ERP System using EDI Advantage"

**Accounting / ERP Software Supported:**

Publisher	Product Name	Method	#
	MAS 90	API ProvideX	1 2
	MAS 200	API ProvideX	1 2
	MAS 500	API	1
	SAP Business One	I-File	4
Various	Products built on an SQL database	SQL	2
Various	Products built on an ODBC compliant database	ODBC	2

**Product Categories:**

Integration: Software  
 ASN & Labels  
 Mapping Software  
 AS1 / AS2 / AS3  
 Translation Software  
 VAN

**Products:**

EDI Advantage 500  
 EDI Advantage  
 EDI Advantage SB  
 EDI Advantage CTI

(con't)

***Description:***

**For Sage MAS 90, 200 or 500:** EDI Advantage solutions are the most widely-used integrated EDI solutions for MAS 90, 200 and 500 ERP systems because they offer workflow integration: seamless processing conducted as part of the standard workflow procedures you follow in MAS 90, 200 or 500. Most users consider workflow integration to be far superior to the limited import/export methods offered by competing products. And, implementing an EDI Advantage solution is worry-free, thanks to our unique Guaranteed Success Program.

**For Other Accounting / ERP Systems:** EDI Advantage CTI provides integrated EDI processing for Accounting / ERP systems that are SQL, XML, IDOC or ODBC accessible, or that have native integration tools.

**For VAN Services and Unique Integration Needs:** Kissinger can help you significantly reduce your VAN service fees: some customers have saved up to 67% annually. In addition, our Professional Services team can provide XML integration and web site Data Integration solutions.







SWK Technologies, Inc  
 5 Regent Street  
 Suite 520  
 Livingston, NJ 07039

**Contact:**

Dane DeSantis  
 Channel Sales Manager  
 973.758.6105  
 973.758.6120 (fax)  
 www.mapadoc.com  
 dane.desantis@mapadoc.com

Contact SWK Technologies to request the document titled "Integrating EDI into your Accounting / ERP System using **MAPADOC**"

**Accounting / ERP Software Supported:**

Publisher	Product Name	Method	#
	BusinessWorks Accounting	I / E	5
	MAS 90	ProvideX	2
	MAS 200	ProvideX	2
	MAS 500	API	1

**Product Categories:**

Integration: Software  
 Integration: Services  
 ASN & Labels  
 Mapping Software  
 Consulting: Integration  
 VAN

**Products:**

MAPADOC  
 MAPADOC SBE

**Description:**

MAPADOC® is a fully integrated electronic data interchange (EDI) solution that allows MAS 90®, MAS 200® and MAS 500® users a feature-rich product that is easy to use. Most notably, MAPADOC is able to provide a seamless integration that is compliant with all MAS standard features. This helps to dramatically decrease data entry time by reducing duplicate entries and eliminating the printing of purchase orders and invoices. It also eliminates redundant steps, paper and postage costs. MAPADOC creates efficiencies that allow better service to customers and better communication with vendors. MAPADOC provides the user the ability to self-manage EDI and to provide a level of independence that saves time and money.







True Commerce, Inc.  
 12330 Perry Highway,  
 Suite 200  
 Wexford, PA 15090

**General Contact:**

724.940.5520  
 412.586.2240 (fax)  
[www.truecommerce.com](http://www.truecommerce.com)  
[marketing@truecommerce.com](mailto:marketing@truecommerce.com)

**Accounting / ERP Software Supported:**

Publisher	Product Name
<b>Microsoft</b>	Dynamics GP (Great Plains)
<b>Microsoft</b>	Dynamics NAV (Navision)
<b>Microsoft</b>	Dynamics SL (Solomon)
	Peachtree
Intuit	
	Pro ERP
	SAP Business One



**vSync**  
625 E. North Broadway  
Columbus, OH 43214

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***Accounting / ERP Software Supported:***

Publisher	Product Name
<b>Microsoft</b>	Dynamics GP (Great Plains)