

EDI- Electronic Data Interchange

The electronic data interchange is the first stage of electronic commerce development. EDI is the structured transmission of data between organizations by electronic means. It is used to transfer electronic documents or business data from one computer system to another computer system, i.e. from one trading partner to another trading partner without human intervention. The only

| Purchase Order (850 PO) | | | | | |
|-------------------------|--------------------------|---------------------|---------------------|--------------------------|-------------------------------|
| Purchase Order | | | | | |
| Status | Original | Transportation Type | | | |
| P.O. Number | 97793101 | Payment Terms | | | |
| P.O. Date | 07/30/2009 | | | | |
| Delivery Date | | | | | |
| Pickup Date | | | | | |
| Shipment Information | | | Billing Information | | |
| Name | ABC corporation | | Name | ABC corporation | |
| Address | N.102, Industrial estate | | Address | N.102, Industrial estate | |
| City | Chennai | | City | Chennai | |
| State | Tamil nadu | | State | Tamil nadu | |
| Zip | 600096 | | Zip | 600096 | |
| Line Item Detail | | | | | |
| UPC | Quantity | Unit | Price | Item Name | Allowance Rate Allowance Type |
| 9JA1AU-571 | 105 | Units | 0 | | 0 |
| Summary | | | | | |
| | | | Total | | |
| | | | Weight | | |
| | | | 0 | | |
| | | | | Total | |
| | | | | Volume | |
| | | | | 0 | |

Figure 2.2: Purchase order sample EDI transaction

precondition is that the sender and receiver should agree on standard for EDI message. In 1960s the cooperation between industrial groups produced common electronic data formats.

The data formats were only for purchasing, transportation and financial data, and were used primarily for intra industry transactions. A sample purchase order that is transmitted through EDI is illustrated in figure 2.2.

The advent of internet in 1970s and development of new communication and software technologies provided many ways to transmit data in EDI format. In 1990s the national EDI standards were developed to make EDI transactions independent of communication and software technologies. EDI documents generally contain the same information as in paper documents used for the same transaction purpose. The EDI documents are transmitted through private telecommunication networks called as value added networks (VAN) and recently are moving towards internet protocols. Figure 2.3 illustrates the EDI document transmission through a value added network.

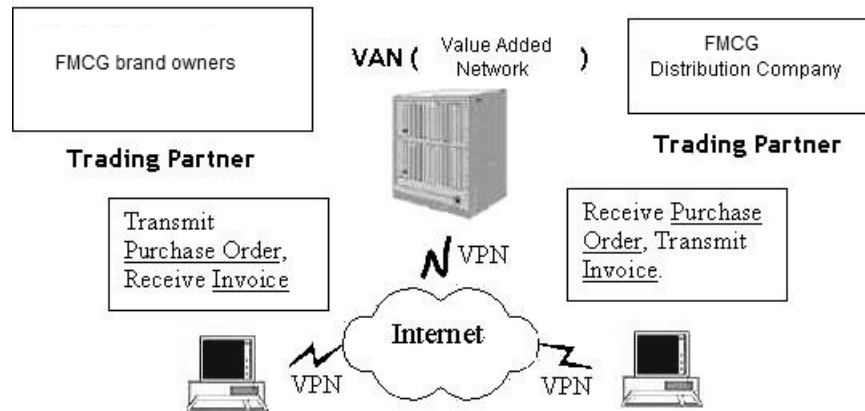


Figure 2.3: EDI data transmission

Value added networks (VAN): A valued added network is a private network provider that facilitates transmission of EDI documents between trade partners. In addition to transmission of EDI messages, they also provide additional value added services like data transformation (EDI to XML, EDI to EDI...), retransmission of messages, management reporting, telecommunication support and translation. In general, the VAN service providers focus on specific industries and business processes like VAN for healthcare industry - order processing EDI. VANs are operated by various entities like telecom companies, industry group consortia, and large companies interacting with suppliers. Satyam info way is an example of private VAN service provider in India.

EDI standards

EDI specifications for several hundred transaction sets are available corresponding to each type of business document such as invoice, purchase order, advanced shipment notice, etc. Two important standards of EDI include ANSI X.12, proposed by American National Standards Institute) and EDIFACT (Electronic Data Interchange for Administration Commerce and Trade), proposed by United Nations Economic Commission for Europe for international trade. EDIFACT is used in India for government transactions like customs and central excise.

AS2 (applicability statement 2) protocol is the draft specification standard for EDI transmission over internet that provides security for the transport payload through digital signatures and data encryption and ensures reliable, non-reputable delivery through the use of receipts. This is being used by WALMART and its trade partners.

The transmission of EDI documents through Internet provided an economical option for small businesses. Over the internet, the XML/EDIFACT (Extensible markup language) format is being used for business transactions and email services instead of VAN services.

The electronic commerce and business

The usage of internet for business transactions beyond traditional EDI documents provided basis for electronic commerce business model. The descriptions of ecommerce include:

1. Electronic trading of physical goods and information
2. Many steps involved in trade like online marketing, order placement, order payment and support for delivery
3. Online services delivery like after sales support and legal advice
4. Facilitation of collaboration through collaborative online design and engineering

The e-business models are classified into three categories: brick and mortar businesses (Example: all traditional businesses without online presence), virtual or e-commerce businesses (Example: purely online stores like eBay .in, naptol.com, flipcart.com) and click and mortar businesses (Example: traditional traders with ecommerce abilities and virtual businesses with traditional stores – futurebazlandmarkonthenet.com, archiesonline.com).internal functions of the focal enterprise for efficiencies, timeliness and privacy. The *extranet* are extended intranets to include focal enterprise authorized supply chain partners. An example of extranet application can be observed inthe new product development process where the focal enterprise requires collaboration with select supplier(s). Figure 2.4 highlights the scenario of intranet and extranet applications in supply chain management.

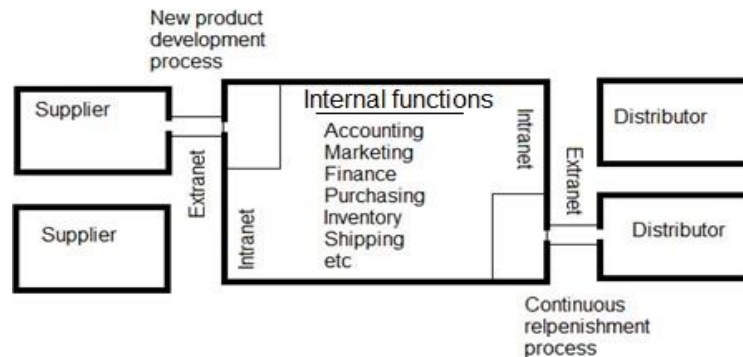


Figure 2.4: Intranet and Extranet scenarios in supply chain management

Understanding Ecommerce Transactions

The ecommerce transactions (products, services or information) can be classified with the following framework:

| From / To | To Business | To Consumer | To Government |
|----------------------|---|--|---|
| From Business | B2B Examples: e-procurement, online commodity trade, online recruitment | B2C Examples: Online retail stores, online ticketing, online recruitment | B2G Examples: Webhosting services, data storage services, software as a service |
| From Consumer | C2B Examples: Does not exist | C2C Examples: Blogs, consumer auction sites like ebay.in, online matchmakers | C2G Examples: Does not exist |

| | | | |
|------------------------|--|--|--|
| From Government | G2B (e-governance) Examples: Online filing for compliance, rules and regulations information, tax and duties payment portals | G2C (e-governance) Examples: Online filing for compliance, rules and regulations information, tax and duties payment portals | G2G (e-governance) Examples: Online exchange of trade related information for law enforcement, regulatory purposes and security monitoring |
|------------------------|--|--|--|

Though there are nine categories in the classification, most of the supply chain transactions fall into the categories of B2B, B2C and B2G. The evolving cooperation in international trade practices are resulting in three other categories of transactions with governments –G2B, G2G and G2C.

The e-market places / exchanges

The B2B and B2C e-commerce models created new efficient online market places and exchanges. Physical *market places* are public places where buyers and sellers make transactions, directly or via intermediaries.

An *exchange* is a marketplace in which securities, commodities, derivatives and other financial instruments are traded. The core function of an exchange is to ensure fair and orderly trading, as well as efficient dissemination of price information for any securities trading on that exchange.

The fundamental market mechanisms are *aggregation* and *matching*.

Following illustration highlights the trading community interactions with e-marketplace or exchange as a hub:

| | | |
|--|---|--|
| Goods ⇌ ↑ | 2. Buyers <ul style="list-style-type: none"> • Supplier queries • Order tracking • Requisition approval • Receipt and payment | ⇌ Cash ↓ |
| 3. Specialized services providers <ul style="list-style-type: none"> • Optimize carriers • Process consolidated payments • International services | *Marketplace / Exchange* <ul style="list-style-type: none"> • Order broker • Data analysis • Order tracking • Catalog standardization • Auctions | 4. Banks / Financial services providers <ul style="list-style-type: none"> • Credit • Financing • Settlement • Aggregation |
| ↑ Goods ⇌ | 1. Sellers <ul style="list-style-type: none"> • Order processing & confirmation • Shipping • Catalog maintenance | ↓ ⇌ Cash |

Figure 2.5: Trading community interactions in marketplace / exchange

As illustrated in the above figure, the trading community includes four different parties interacting with market place / exchange (over the internet). The transactions begin with sellers updating

catalogs for publishing the same in the marketplace for buyers view. The marketplace reviews the credentials of the sellers and publishes sellers/ suppliers catalogs in the marketplace for buyers view. The buyers match their requirements with sellers' catalogs and places order for required quantity with delivery dates with the exchange. The payments process is facilitated by banks / financial services providers associated with the exchange. This would provide the buyers with a very important support for enabling transactions and builds trust. The sellers' process orders and confirms shipment to the buyers via exchange. The special service providers are also associated with exchanges enabling smooth flow of goods from sellers to buyers. The specialty services enable efficient and effective delivery of orders executed through marketplace.

The marketplaces / exchanges are classified based on *ownership* and *trading* models as follows:

Marketplace / exchange classification based on ownership models:

Independent public trade exchanges (ITX) or public marketplaces: These are public exchanges that are created by third party venture (neutral) to serve particular industry or a product.

group. The value proposition is to provide a global marketplace to discover trading partners and visibility of price. Indirect materials and commodity purchases are traded in these exchanges. The sellers generally trade surplus inventory through these marketplaces. Multi Commodity Exchange of India Limited (MCX), National Commodity and Derivatives Exchange Limited (NCDEX), National Multi Commodity Exchange Limited (NMCE) are examples of independent public exchanges in India. Research⁴ indicates by March 2001 about 400 e-marketplaces closed down or were acquired by others. Internationally prominent e-marketplaces Chemdex, Promedix, Petrocosm, Metal spectrum, Metal site, Aluminum, Freight wise, Paper X, Asphalt Exchange, Build Net, Heavy ware, and Aero span closed down.

Industry sponsored marketplaces / consortia trade exchanges: These are typically created by group of enterprises who represent a substantial portion of trading volume in a given industry. The idea is to marginalize potential competitors from supply side. Covisint is an example in automotive industry-sponsored exchange and Exostar in aerospace industry-sponsored exchange. TISCO, SAIL and Visakhapatnam steel plant are three major steel producers in India. Metaljunciton.com is an e-marketplace promoted by TISCO and SAIL together who command major market share for steel in India.

Private marketplaces / exchanges: Private exchanges leverage existing enterprise systems to enable supply chain collaboration and visibility. Dell, Cisco, Motorola, Wal-mart and others use private exchanges to achieve level of integration with their trading partners that is not possible by public exchanges. A private exchange can be created by a buyer or supplier. The buyer-based private exchanges are aimed to improve supply chain efficiency and effectiveness. For example Wal-mart makes a two year history of customer transaction available to suppliers through private exchange. In return, suppliers analyze the data and provide appropriate recommendations. The seller-based private exchanges are aimed to add value to key buyers (customers). For example Cisco's private exchange reminds its buyers to order certain regularly purchased items. In some

cases, it even examines buyer's inventory and replenishes it.

⁴ T.R.Madanmohan, Successful e-marketplaces: institutional perspective, IISc, 2005

Marketplace / exchange classification based on trading models:

Vertical exchanges: These exchanges are industry specific and demand good industry knowledge. They optimize buyer-seller relationships in focus industries like chemical, metals, energy and telecommunications. Example: metaljunciton.com, linkapparel,

Horizontal exchanges: These exchanges facilitate trade across industry verticals. They are also known as *functional marketplaces* because they tend to optimize specific functions in an enterprise like human resources, procurement, logistics and marketing. Examples: indiatrade.com

SELF-ASSESSMENT QUESTIONS

1. Examine the role of communication networks in the growth of retail industry in India.
2. Discuss the classification of data networks with examples.
3. What are the risks that arise with sharing of information with supply chain partners? Discuss the data security framework.
4. What is EDI? How is it helpful in improving supply chain efficiency and effectiveness?
5. How do you classify e-commerce transactions? Discuss with example.
6. What are electronic marketplaces / exchanges? Discuss classification of e-marketplaces?