

E-Commerce Tutorial

E-Commerce or Electronics Commerce is a methodology of modern business which addresses the need of business organizations.

This reference will take you through simple and practical approach while learning e-commerce principles.

Audience

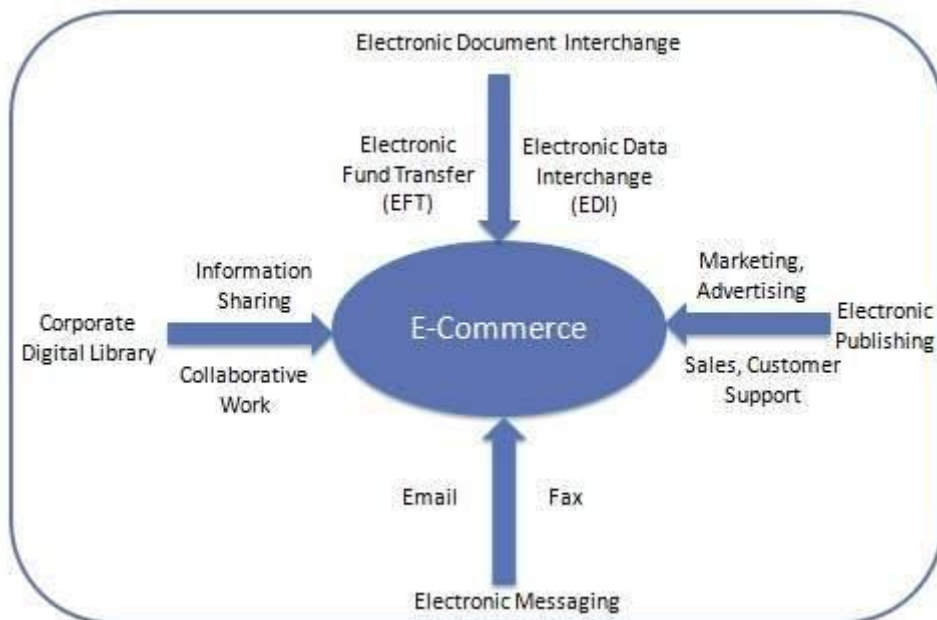
This reference has been prepared for the beginners to help them understand the basic to advanced concepts related to e-commerce.

Prerequisites

Before you start doing practice with various types of examples given in this reference, I'm making an assumption that you are already aware about what is a market, buyers, sellers, a traditional commerce.

E-Commerce or Electronics Commerce is a methodology of modern business which addresses the need of business organizations, vendors and customers to reduce cost and improve the quality of goods and services while increasing the speed of delivery. E-commerce refers to paperless exchange of business information using following ways.

- Electronic Data Exchange (EDI)
- Electronic Mail (e-mail)
- Electronic Bulletin Boards
- Electronic Fund Transfer (EFT)
- Other Network-based technologies



Features

E-Commerce provides following features

- **Non-Cash Payment** – E-Commerce enables use of credit cards, debit cards, smart cards, electronic fund transfer via bank's website and other modes of electronics payment.

- **24x7 Service availability** – E-commerce automates business of enterprises and services provided by them to customers are available anytime, anywhere. Here 24x7 refers to 24 hours of each seven days of a week.
- **Advertising / Marketing** – E-commerce increases the reach of advertising of products and services of businesses. It helps in better marketing management of products / services.
- **Improved Sales** – Using E-Commerce, orders for the products can be generated any time, any where without any human intervention. By this way, dependencies to buy a product reduce at large and sales increases.
- **Support** – E-Commerce provides various ways to provide pre sales and post sales assistance to provide better services to customers.
- **Inventory Management** – Using E-Commerce, inventory management of products becomes automated. Reports get generated instantly when required. Product inventory management becomes very efficient and easy to maintain.
- **Communication improvement** – E-Commerce provides ways for faster, efficient, reliable communication with customers and partners.



Traditional Commerce v/s E-Commerce

Sr. No.	Traditional Commerce	E-Commerce
1	Heavy dependency on information exchange from person to person.	Information sharing is made easy via electronic communication channels making little dependency on person to person information exchange.

2	Communication/ transaction are done in synchronous way. Manual intervention is required for each communication or transaction.	Communication or transaction can be done in asynchronous way. Electronics system automatically handles when to pass communication to required person or do the transactions.
3	It is difficult to establish and maintain standard practices in traditional commerce.	A uniform strategy can be easily established and maintain in e-commerce.
4	Communications of business depends upon individual skills.	In e-Commerce or Electronic Market, there is no human intervention.
5	Unavailability of a uniform platform as traditional commerce depends heavily on personal communication.	E-Commerce website provides user a platform where all information is available at one place.
6	No uniform platform for information sharing as it depends heavily on personal communication.	E-Commerce provides a universal platform to support commercial / business activities across the globe.

E-Commerce advantages can be broadly classified in three major categories:

- Advantages to Organizations
- Advantages to Consumers
- Advantages to Society



Advantages to Organizations

- Using E-Commerce, organization can expand their market to national and international markets with minimum capital investment. An organization can easily locate more customers, best suppliers and suitable business partners across the globe.
- E-Commerce helps organization to reduce the cost to create process, distribute, retrieve and manage the paper based information by digitizing the information.
- E-commerce improves the brand image of the company.
- E-commerce helps organization to provide better customer services.
- E-Commerce helps to simplify the business processes and make them faster and efficient.
- E-Commerce reduces paper work a lot.

- E-Commerce increased the productivity of the organization. It supports "pull" type supply management. In "pull" type supply management, a business process starts when a request comes from a customer and it uses just-in-time manufacturing way.

Advantages to Customers

- 24x7 support. Customer can do transactions for the product or enquiry about any product/services provided by a company any time, any where from any location. Here 24x7 refers to 24 hours of each seven days of a week.
- E-Commerce application provides user more options and quicker delivery of products.
- E-Commerce application provides user more options to compare and select the cheaper and better option.
- A customer can put review comments about a product and can see what others are buying or see the review comments of other customers before making a final buy.
- E-Commerce provides option of virtual auctions.
- Readily available information. A customer can see the relevant detailed information within seconds rather than waiting for days or weeks.
- E-Commerce increases competition among the organizations and as result organizations provides substantial discounts to customers.

Advantages to Society

- Customers need not to travel to shop a product thus less traffic on road and low air pollution.
- E-Commerce helps reducing cost of products so less affluent people can also afford the products.
- E-Commerce has enabled access to services and products to rural areas as well which are otherwise not available to them.
- E-Commerce helps government to deliver public services like health care, education, social services at reduced cost and in improved way.

E-Commerce disadvantages can be broadly classified in two major categories:

- Technical disadvantages
- Non-Technical disadvantages

Technical Disadvantages

- There can be lack of system security, reliability or standards owing to poor implementation of e-Commerce.
- Software development industry is still evolving and keeps changing rapidly.
- In many countries, network bandwidth might cause an issue as there is insufficient telecommunication bandwidth available.
- Special types of web server or other software might be required by the vendor setting the e-commerce environment apart from network servers.
- Sometimes, it becomes difficult to integrate E-Commerce software or website with the existing application or databases.
- There could be software/hardware compatibility issue as some E-Commerce software may be incompatible with some operating system or any other component.

Non-Technical Disadvantages

- Initial cost: The cost of creating / building E-Commerce application in-house may be very high. There could be delay in launching the E-Commerce application due to mistakes, lack of experience.
- User resistance: User may not trust the site being unknown faceless seller. Such mistrust makes it difficult to make user switch from physical stores to online/virtual stores.
- Security/ Privacy: Difficult to ensure security or privacy on online transactions.
- Lack of touch or feel of products during online shopping.
- E-Commerce applications are still evolving and changing rapidly.

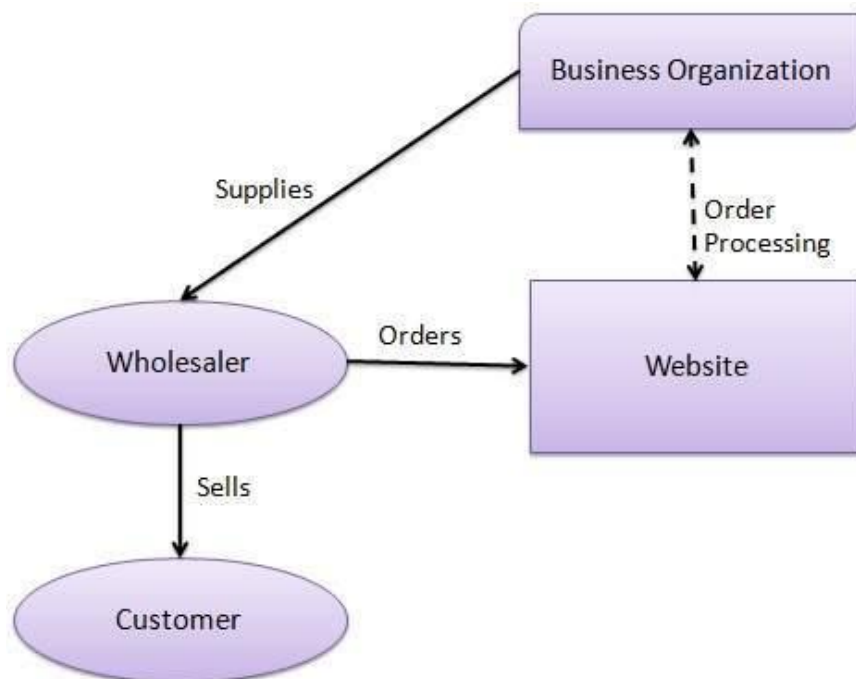
- Internet access is still not cheaper and is inconvenient to use for many potential customers like one living in remote villages.

E-Commerce or Electronics Commerce business models can generally categorized in following categories.

- Business - to - Business (B2B)
- Business - to - Consumer (B2C)
- Consumer - to - Consumer (C2C)
- Consumer - to - Business (C2B)
- Business - to - Government (B2G)
- Government - to - Business (G2B)
- Government - to - Citizen (G2C)

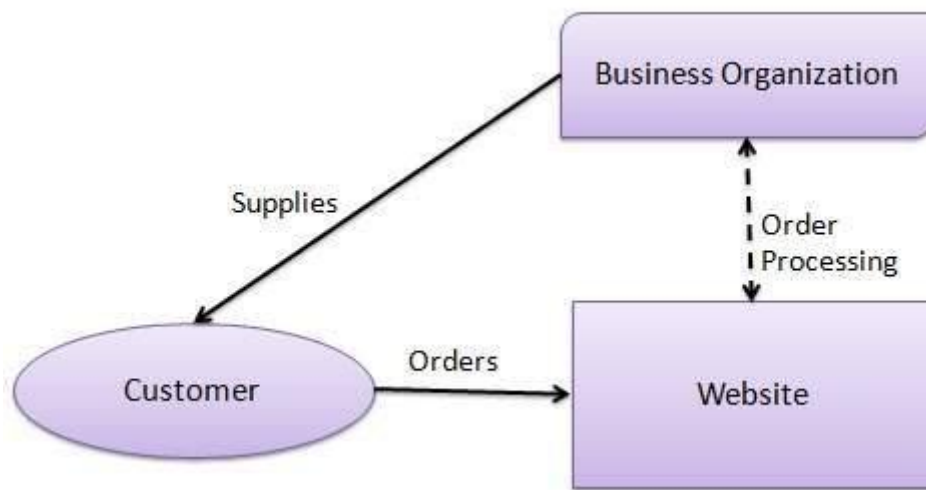
Business - to - Business (B2B)

Website following B2B business model sells its product to an intermediate buyer who then sells the product to the final customer. As an example, a wholesaler places an order from a company's website and after receiving the consignment, sells the end product to final customer who comes to buy the product at wholesaler's retail outlet.



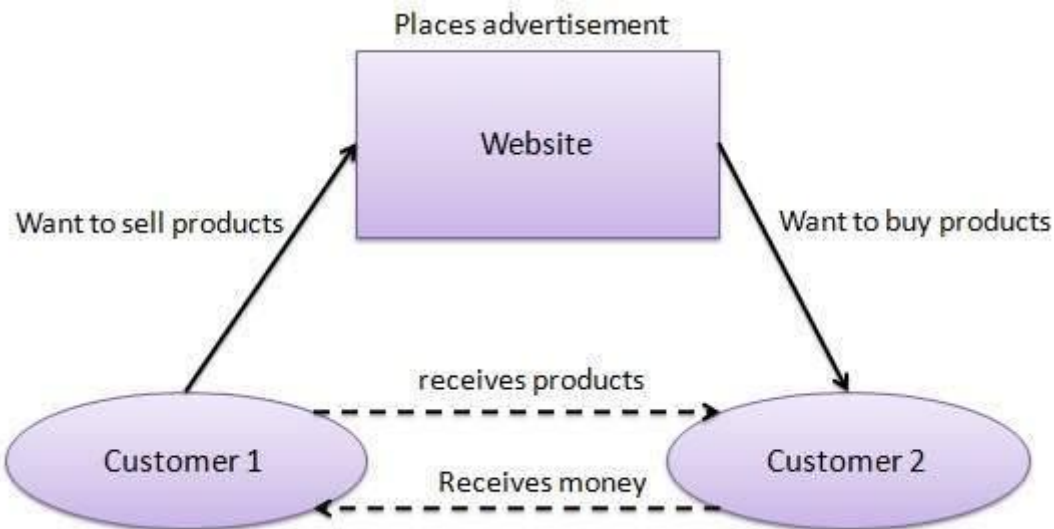
Business - to - Consumer (B2C)

Website following B2C business model sells its product directly to a customer. A customer can view products shown on the website of business organization. The customer can choose a product and order the same. Website will send a notification to the business organization via email and organization will dispatch the product/goods to the customer.



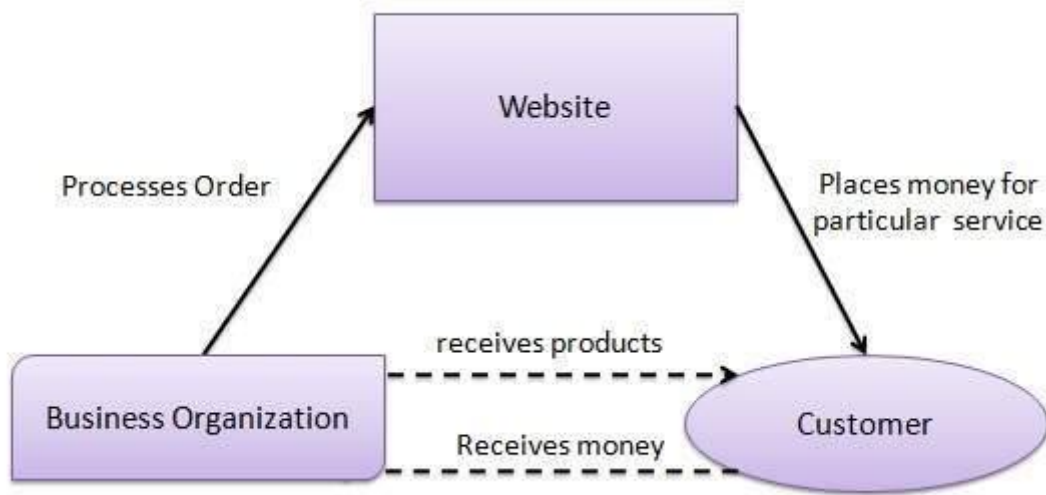
Consumer - to - Consumer (C2C)

Website following C2C business model helps consumer to sell their assets like residential property, cars, motorcycles etc. or rent a room by publishing their information on the website. Website may or may not charge the consumer for its services. Another consumer may opt to buy the product of the first customer by viewing the post/advertisement on the website.



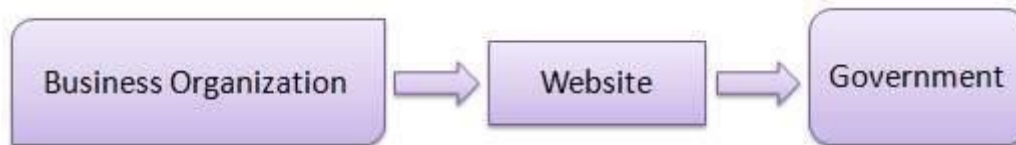
Consumer - to - Business (C2B)

In this model, a consumer approaches website showing multiple business organizations for a particular service. Consumer places an estimate of amount he/she wants to spend for a particular service. For example, comparison of interest rates of personal loan/ car loan provided by various banks via website. Business organization who fulfills the consumer's requirement within specified budget approaches the customer and provides its services.



Business - to - Government (B2G)

B2G model is a variant of B2B model. Such websites are used by government to trade and exchange information with various business organizations. Such websites are accredited by the government and provide a medium to businesses to submit application forms to the government.



Government - to - Business (G2B)

Government uses B2G model website to approach business organizations. Such websites support auctions, tenders and application submission functionalities.



Government - to - Citizen (G2C)

Government uses G2C model website to approach citizen in general. Such websites support auctions of vehicles, machinery or any other material. Such website also provides services like registration for birth, marriage or death certificates. Main objectives of G2C website are to reduce average time for fulfilling people requests for various government services.



E-Commerce or Electronics Commerce sites use electronic payment where electronic payment refers to paperless monetary transactions. Electronic payment has revolutionized the business processing by reducing paper work, transaction costs, labour cost. Being user friendly and less time consuming than manual processing, helps business organization to expand its market reach / expansion. Some of the modes of electronic payments are following.

- Credit Card

- Debit Card
- Smart Card
- E-Money
- Electronic Fund Transfer (EFT)

Credit Card

Payment using credit card is one of most common mode of electronic payment. Credit card is small plastic card with a unique number attached with an account. It has also a magnetic strip embedded in it which is used to read credit card via card readers. When a customer purchases a product via credit card, credit card issuer bank pays on behalf of the customer and customer has a certain time period after which he/she can pay the credit card bill. It is usually credit card monthly payment cycle. Following are the actors in the credit card system.

- The card holder - Customer
- The merchant - seller of product who can accept credit card payments.
- The card issuer bank - card holder's bank
- The acquirer bank - the merchant's bank
- The card brand - for example , visa or mastercard.

Credit card payment process

Step	Description
Step 1	Bank issues and activates a credit card to customer on his/her request.
Step 2	Customer presents credit card information to merchant site or to merchant from whom he/she want to purchase a product/service.
Step 3	Merchant validates customer's identity by asking for approval from card brand company.
Step 4	Card brand company authenticates the credit card and paid the transaction by credit. Merchant keeps the sales slip.
Step 5	Merchant submits the sales slip to acquirer banks and gets the service chargers paid to him/her.
Step 6	Acquirer bank requests the card brand company to clear the credit amount and gets the payment.
Step 6	Now card brand company asks to clear amount from the issuer bank and amount gets transferred to card brand company.

Debit Card

Debit card, like credit card is a small plastic card with a unique number mapped with the bank account number. It is required to have a bank account before getting a debit card from the bank. The major difference between debit card and credit card is that in case of payment through debit card, amount gets deducted from card's bank account

immediately and there should be sufficient balance in bank account for the transaction to get completed. Whereas in case of credit card there is no such compulsion.

Debit cards free customer to carry cash, cheques and even merchants accept debit card more readily. Having restriction on amount being in bank account also helps customer to keep a check on his/her spendings.

Smart Card

Smart card is again similar to credit card and debit card in appearance but it has a small microprocessor chip embedded in it. It has the capacity to store customer work related/personal information. Smart card is also used to store money which is reduced as per usage.

Smart card can be accessed only using a PIN of customer. Smart cards are secure as they store information in encrypted format and are less expensive/provide faster processing. Mondex and Visa Cash cards are examples of smart cards.

E-Money

E-Money transactions refer to a situation where payment is done over the network and amount gets transferred from one financial body to another financial body without any involvement of a middleman. E-money transactions are faster, convenient and save a lot of time.

Online payments done via credit card, debit card or smart card are examples of e-money transactions. Another popular example is e-cash. In case of e-cash, both customer and merchant both have to sign up with the bank or company issuing e-cash.

Electronic Fund Transfer

It is a very popular electronic payment method to transfer money from one bank account to another bank account. Accounts can be in same bank or different bank. Fund transfer can be done using ATM (Automated Teller Machine) or using computer.

Now a day, internet based EFT is getting popularity. In this case, customer uses website provided by the bank. Customer logs in to the bank's website and registers another bank account. He/she then places a request to transfer certain amount to that account. Customer's bank transfers amount to other account if it is in same bank otherwise transfer request is forwarded to ACH (Automated Clearing House) to transfer amount to other account and amount is deducted from customer's account. Once amount is transferred to other account, customer is notified of the fund transfer by the bank.

Security is an essential part of any transaction that takes place over the internet. Customer will lose his/her faith in e-business if its security is compromised. Following are the essential requirements for safe e-payments/transactions –

- **Confidential** – Information should not be accessible to unauthorized person. It should not be intercepted during transmission.
- **Integrity** – Information should not be altered during its transmission over the network.
- **Availability** – Information should be available wherever and whenever requirement within time limit specified.
- **Authenticity** – There should be a mechanism to authenticate user before giving him/her access to required information.
- **Non-Repudiability** – It is protection against denial of order or denial of payment. Once a sender sends a message, the sender should not be able to deny sending the message. Similarly the recipient of message should not be able to deny receipt.
- **Encryption** – Information should be encrypted and decrypted only by authorized user.
- **Auditability** – Data should be recorded in such a way that it can be audited for integrity requirements.

Measures to ensure Security

Major security measures are following –

- **Encryption** – It is a very effective and practical way to safeguard the data being transmitted over the network. Sender of the information encrypt the data using a secret code and specified receiver only can decrypt the data using the same or different secret code.
- **Digital Signature** – Digital signature ensures the authenticity of the information. A digital signature is a e-signature authentic authenticated through encryption and password.
- **Security Certificates** – Security certificate is unique digital id used to verify identity of an individual website or user.

Security Protocols in Internet

Following are the popular protocols used over the internet which ensures security of transactions made over the internet.

Secure Socket Layer (SSL)

It is the most commonly used protocol and is widely used across the industry. It meets following security requirements –

- Authentication
- Encryption
- Integrity
- Non-reputability

"https://" is to be used for HTTP urls with SSL, where as "http://" is to be used for HTTP urls without SSL.

Secure Hypertext Transfer Protocol (SHTTP)

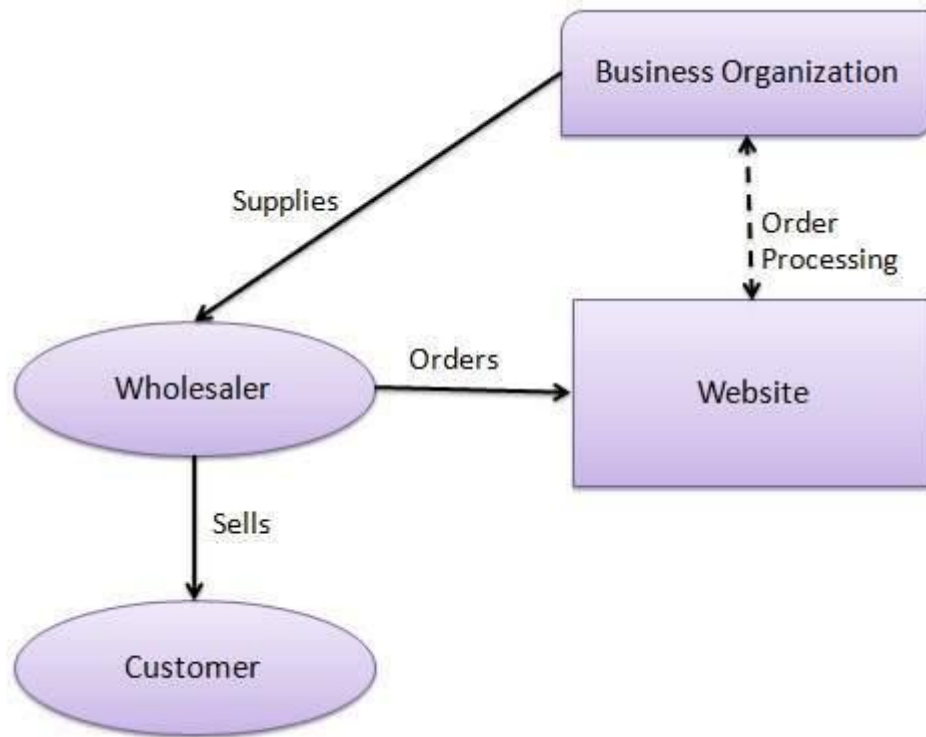
SHTTP extends the HTTP internet protocol with public key encryption, authentication and digital signature over the internet. Secure HTTP supports multiple security mechanism providing security to end users. SHTTP works by negotiating encryption scheme types used between client and server.

Secure Electronic Transaction

It is a secure protocol developed by MasterCard and Visa in collaboration. Thereoritically, it is the best security protocol. It has following components –

- **Card Holder's Digital Wallet Software** – Digital Wallet allows card holder to make secure purchases online via point and click interface.
- **Merchant Software** – This software helps merchants to communicate with potential customers and financial institutions in secure manner.
- **Payment Gateway Server Software** – Payment gateway provides automatic and standard payment process. It supports the process for merchant's certificate request.
- **Certificate Authority Software** – This software is used by financial institutions to issue digital certificates to card holders and merchants and to enable them to register their account agreements for secure electronic commerce.

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B2B implies that seller as well as buyer is business entity. B2B covers large number of applications which enables business to form relationships with their distributors, resellers, suppliers etc. Following are the leading items in B2B e-Commerce.

- Electronics
- Shipping and Warehousing
- Motor Vehicles
- Petrochemicals
- Paper
- Office products
- Food
- Agriculture

Key technologies

Following are the key technologies used in B2B e-commerce –

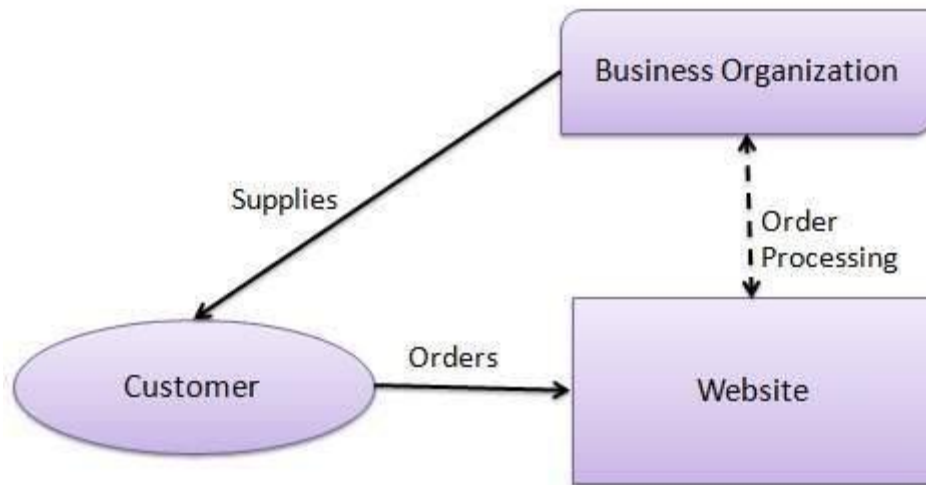
- **Electronic Data Interchange (EDI)** – EDI is an inter organizational exchange of business documents in a structured and machine processable format.
- **Internet** – Internet represents world wide web or network of networks connecting computers across the world.
- **Intranet**
 - Intranet represents a dedicated network of computers within a single organization
- **Extranet** – Extranet represents a network where outside business partners, supplier or customers can have limited access to a portion of enterprise intranet/network.
- **Back-End Information System Integration** – Back End information systems are database management systems used to manage the business data.

Architectural Models

Following are the architectural models in B2B e-commerce –

- **Supplier Oriented marketplace** – In this type of model, a common marketplace provided by supplier is used by both individual customers as well as business users. A supplier offers an e-stores for sales promotion.
- **Buyer Oriented marketplace** – In this type of model, buyer has his/her own market place or e-market. He invites suppliers to bid on product's catalog. A Buyer company opens a bidding site.
- **Intermediary Oriented marketplace** – In this type of model, an intermediary company runs a market place where business buyers and sellers can transact with each other.

In B2C model, business Website is a place where all transactions take place between a business organization and consumer directly.



In B2C Model, a consumer goes to the website, selects a catalog, orders the catalog and an email is sent to business organization. After receiving the order, goods would be dispatched to the customer. Following are the key features of a B2C Model

- Heavy advertising required to attract large no. of customers.
- High investment in terms of hardware/software.
- Support or good customer care service

Consumer Shopping Procedure

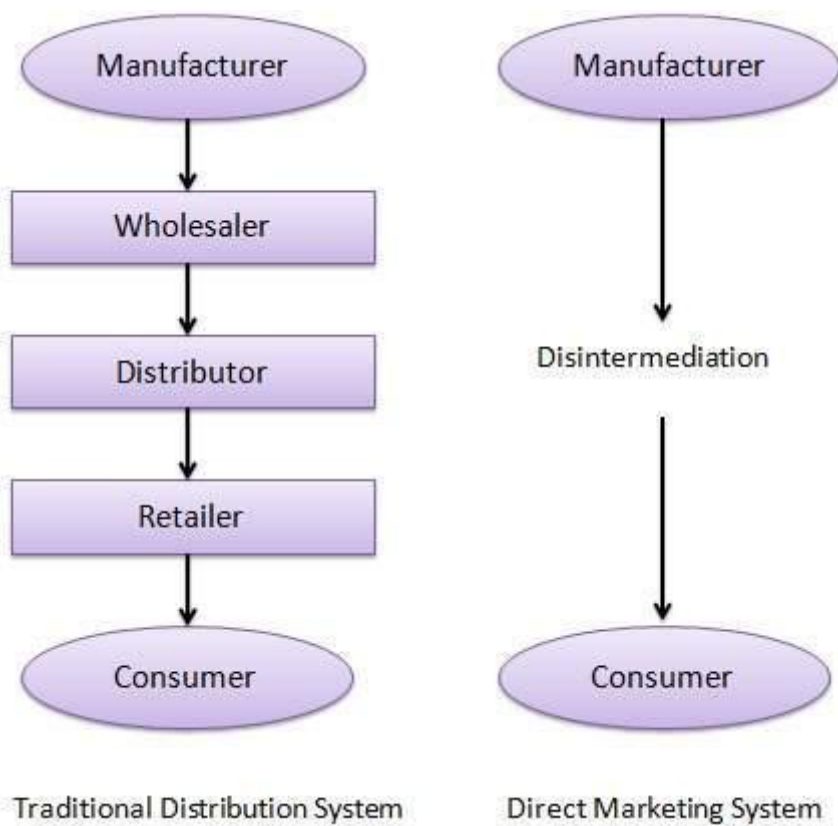
Following are the steps used in B2C e-commerce –

A consumer

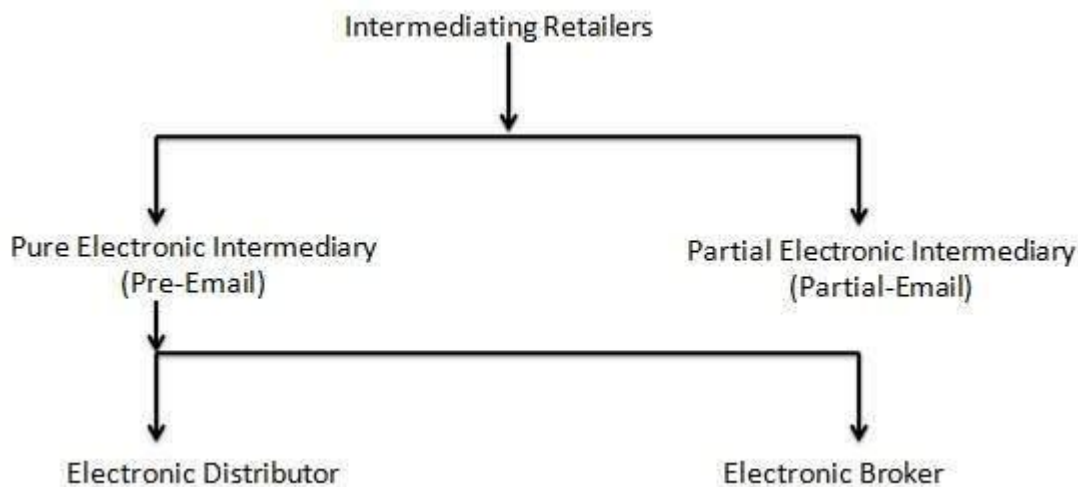
- determines the requirement.
- searches available items on the website meeting the requirement.
- compares similar items for price, delivery date or any other terms.
- gives the order.
- pays the bill.
- receives the delivered item and review/inspect them.
- consults the vendor to get after service support or returns the product if not satisfied with the delivered product.

Disintermediation and Reintermediation

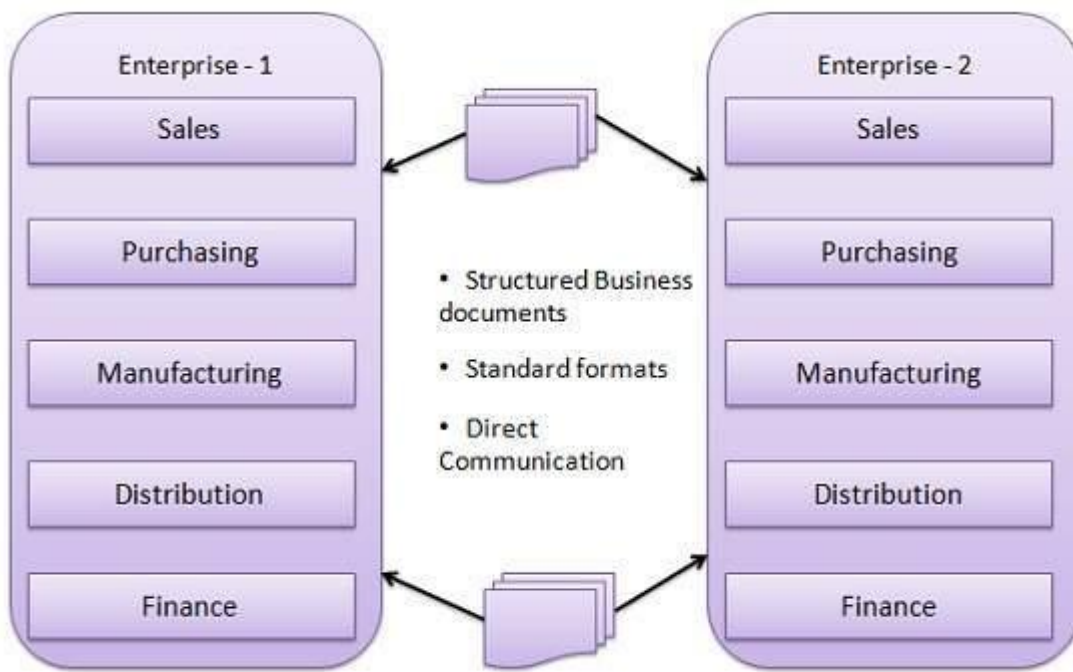
In traditional commerce, there are intermediating agents like wholesalers, distributors, retailers between manufacturer and consumer. In B2C website, manufacturer can sell products directly to consumers. This process of removal of business layers responsible for intermediary functions is called Disintermediation.



Now-a-days, a new electronic intermediary breed is emerging like e-mall and product selection agents are emerging. This process of shifting of business layers responsible for intermediary functions from traditional to electronic mediums is called Reintermediation.



EDI stands for Electronic Data Interchange. EDI is an electronic way of transferring business documents in an organization internally between its various departments or externally with suppliers, customers or any subsidiaries etc. In EDI, paper documents are replaced with electronic documents like word documents, spreadsheets etc.



EDI Documents

Following are few important documents used in EDI –

- Invoices
- Purchase orders
- Shipping Requests
- Acknowledgement
- Business Correspondence letters
- Financial information letters

Steps in an EDI System

Following are the steps in an EDI System.

- A program generates the file which contains the processed document.
- The document is converted into an agreed standard format.
- The file containing the document is send electronically on network.
- The trading partner receives the file.
- An acknowledgement document is generated and sent to the originating organization.

Advantages of an EDI System

Following are the advantages of an EDI System.

- **Reduction in data entry errors.** – Chances of errors are much less being use of computer in data entry.
- **Shorter processing life cycle** – As orders can be processed as soon as they are entered into the system. This reduced the processing time of the transfer documents.
- **Electronic form of data** – It is quite easy to transfer or share data being in electronic format.
- **Reduction in paperwork** – As lot of paper documents are replaced with electronic documents there is huge reduction in paperwork.
- **Cost Effective** – As time is saved and orders are processed very effectively, EDI proves to be highly cost effective.
- **Standard Means of communication** – EDI enforces standards on the content of data and its format which leads to clearer communication.