

E-Payment Systems

E-commerce sites use electronic payment, where electronic payment refers to paperless monetary transactions. Electronic payment has revolutionized the business processing by reducing the paperwork, transaction costs, and labor cost. Being user friendly and less time-consuming than manual processing, it helps business organization to expand its market reach/expansion. Listed below are some of the modes of electronic payments –

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

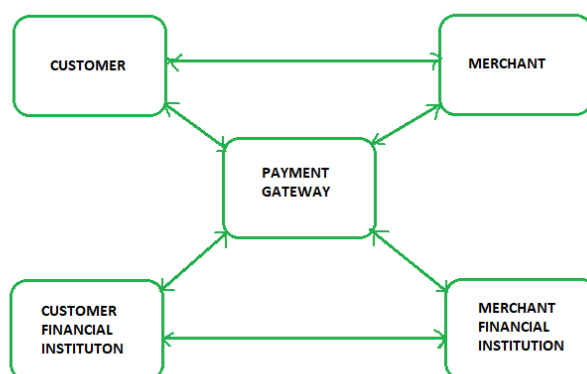
Secure Electronic Transaction (SET)

Secure Electronic Transaction (SET) is a system and electronic protocol to ensure the integrity and security of transactions conducted over the internet. E-commerce websites implemented this early protocol to secure electronic payments made via debit and credit cards.

SET blocks out all personal details on the card, preventing hackers and data thieves from accessing or stealing the cardholder's information. The merchant also cannot see these personal details, which are transferred directly to the credit card company for user authentication and verification.

SET is not a payment system or gateway, but a set of security protocols. It uses some aspects of a Public Key Infrastructure (PKI) to address concerns around privacy, authenticity and security in e-commerce applications.

The primary goal of SET is to protect credit/debit card transactions as they take place online. It provides a secure and confidential transaction environment for everyone involved in the e-commerce transaction, including the customer and merchant. It also authenticates users with the help of digital certificates.



Secure Electronic Transaction (SET) Protocol Features

To meet the requirements for secure electronic transactions, the SET protocol maintains several key features:

- **Cardholder Confidentiality:** Sensitive financial information is secured while it travels across the network. SET does not share cardholder account numbers with the merchant; it only provides them to the issuing bank.

- **Data Integrity:** SET mandates all order information, payment instructions, and cardholder data remain unaltered in transit.
- **Account Verification:** SET reassures the merchant by verifying the cardholder is the legitimate user of the card.
- **Merchant Verification:** SET permits the cardholder to verify that the merchant has a relationship(s) with the financial institution(s) accepting cards.

E-Commerce Payment Gateway

Payment Gateway is an online **payment** processing technology which helps businesses to accept credit cards and electronic checks. In other words, payment gateways are “Man-in-the-middle” which are located between e-commerce platforms and clients.

A payment gateway allows you to –

- Make and take payments quickly and easily.
- Keep your customer's data (information) and money secure.
- Gain trust of your customers, so they are willing to hand over their money.



To choose the right payment gateway, you should follow the following guidelines –

- You should finalize that payment gateway which is supported in your country, not all them operate globally.
- You should check what payment gateways are supported better from your ecommerce platform. For example, PayPal gateway is fully supported by Magento because the same group have created them.
- Payment gateway should be of 3.0 PCI data security standards.
- Do you need payment gateway and merchant account or an all-in-one payment service provider?
- You must see the charges and fees that will be deducted per transaction.
- What payment method do they support? For example, VISA is a payment method, Master Card is another.
- Do they support your type of business? For example, some of them don't deal with businesses that sell adult materials, betting, gambling, firearms selling, narcotics, etc.

Most Popular Payment Gateway Providers

Following is the list of the most widely used and popular payment gateway providers along with a brief history about them.

- **PAYPAL** – You can find all the terms and conditions of their business model on their URL – <https://www.paypal.com/>. PayPal is one of the longest established and probably the best-known service for transferring money online.

- **Amazon Payments** – The URL of this immensely popular payment gateway provider is – <https://payments.amazon.com/>. It was created in 2007, Amazon Payments provides your customers with the same checkout experience they get on Amazon.com
- **Stripe** – The URL of this payment gateway is – <https://stripe.com/>. No monthly fees, no extra charges for different cards and different payment methods, also for different currencies. Stripe also offers a great API (Application Program Interface) as well.
- **Authorize Net** – The URL for this popular payment gateway provider is <https://www.authorize.net/>. It is among the most powerful and well-known payment gateways. It is well-supported by e-commerce WordPress plugins.

Digital certificate

A digital certificate, also known as a *public key certificate*, is used to cryptographically link ownership of a public key with the entity that owns it. Digital certificates are for sharing public keys to be used for encryption and authentication.

Digital certificates include the public key being certified, identifying information about the entity that owns the public key, metadata relating to the digital certificate and a digital signature of the public key the certificate issuer created.

The distribution, authentication and revocation of digital certificates are the primary functions of the public key infrastructure (PKI), the system that distributes and authenticates public keys.

How are digital certificates used?

Digital certificates are used in the following ways:

- Credit and debit cards use chip-embedded digital certificates that connect with merchants and banks to ensure that the transactions performed are secure and authentic.
- Digital payment companies use digital certificates to authenticate their automated teller machines, kiosks and point-of-sale equipment in the field with a central server in their data center.
- Websites use digital certificates for domain validation to show they are trusted and authentic.
- Digital certificates are used in secure email to identify one user to another and may also be used for electronic document signing. The sender digitally signs the email, and the recipient verifies the signature.
- Computer hardware manufacturers embed digital certificates into cable modems to help prevent the theft of broadband service through device cloning.

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 Proces

Step	Description
Step 1	Bank issues and activates a credit card to the customer on his/her request.
Step 2	The customer presents the credit card information to the merchant site or to the merchant from whom he/she wants to purchase a product/service.
Step 3	Merchant validates the customer's identity by asking for approval from the card brand company.
Step 4	Card brand company authenticates the credit card and pays the transaction by credit. Merchant keeps the sales slip.
Step 5	Merchant submits the sales slip to acquirer banks and gets the service charges 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 the card brand company asks to clear the amount from the issuer bank and the amount gets transferred to the 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 a debit card and a credit card is that in case of payment through debit card, the amount gets deducted from the card's bank account immediately and there should be sufficient balance in the bank account for the transaction to get completed; whereas in case of a credit card transaction, there is no such compulsion.

Debit cards free the customer to carry cash and cheques. Even merchants accept a debit card readily. Having a restriction on the amount that can be withdrawn in a day using a debit card helps the customer to keep a check on his/her spending.

Smart Card

Smart card is again similar to a credit card or a debit card in appearance, but it has a small microprocessor chip embedded in it. It has the capacity to store a customer's work-related and/or personal information. Smart cards are also used to store money and the amount gets deducted after every transaction.

Smart cards can only be accessed using a PIN that every customer is assigned with. Smart cards are secure, as they store information in encrypted format and are less expensive/provides faster processing. Mondex and Visa Cash cards are examples of smart cards.

E-CASH

It is cryptographic electronic money cash system designed in 1983 used as micropayment system.

It combines computerized convenience with security and privacy that improve on paper cash. E-Cash is based on cryptographic systems called digital signature. This method involves a pair of numeric keys that work in tandem; one for locking and the other for unlocking. It focuses on replacing cash as the principal payment vehicle in consumer oriented payments system. Customers open an account with bank and either buy or receive free special software for their PC's.

Two approaches to holding electronic cash are online storage where the consumer does not personally have possession of it and off-line where the consumer does have physical control. A smart card is an example of off-line electronic cash storage.

PROPERTIES OF E-CASH

1.Monetary value: It is back by either cash, a bank authorized credit, or a bank certified cashier cheque. When e-cash created by one bank is accepted by others, reconciliation must occur without any problem.

2.Interoperable: It is exchangeable as payment for other e-cash, paper cash, goods or services, lines of credit, deposit in banking account, bank notes or obligation, electronic benefit transfer and the like. Most e-Cheque proposal use a single bank.

3.Storable and retrieval: Remote storage and retrieval would allow user to exchange e-cash from home or office or while traveling. The cash could be stored on the remote computer memory, in smart cards or special purpose devices. It is preferable that cash is stored on a dedicated device that can't be altered and should have suitable interface. To facilitate personal authentication using passwords or other means.

4.Security: E-Cash is not easy to copy or temper with while being exchanged. This includes preventing or detecting duplication or double spending. Detection is essential in order to audit whether prevention is working or not or to know the tricky issue of double spending.

ADVANTAGES OF E-CASH:

1. More efficient than cash, checks or credit cards for both the consumer and the merchant.
2. Lower transaction costs and perhaps product costs related to increases in efficiency.
3. The distance which electronic cash must travel in a transfer does not effect the transmission costs or the time as it does with traditional payment methods.
4. Electronic cash does not require any special authorization, so anyone may use it for almost any kind of transaction, large or small.

DISADVANTAGES OF E-CASH:

1. Potential collection problems if an Internet tax is ever enacted.
2. Since electronic cash does not leave an audit trail, it could be used in money laundering operations or as a medium of exchange in other illegal activities.
3. Electronic cash is susceptible to forgery and double spending abuses.

E-CHEQUES

Electronic Cheques are designed to accommodate the many individuals and entities that might prefer to pay on credit or through some mechanism other than cash.

In e-Cheque system, consumer possesses an e-Cheque book on a Personal computer memory card International Associations (PCMCIA Card). The buyers must register with a third party account server before they are able to write e-Cheque. As needed, Cheques are returned electronically from an e-Cheque book on the card. They are then sent over the internet to the retailer, who in turn sends the e-Cheque to the customer's bank. Settlement is made through a financial network such as ACH. E-Cheque method was deliberately created to work in much the same way as a conventional paper Cheque.

ADVANTAGES OF E-CHEQUE:

1. They work in the same way as traditional Cheques, thus simplifying customer education.
2. E-Cheque is well suited for clearing micro payments; their use of conventional cryptography makes it much faster than e-cash.
3. E-Cheque creates float and the availability of float is an important requirement for commerce.
4. Financial risk is assumed by the accounting server and may result in easier acceptance. Reliability and scalability are provided by using multiple accounting servers.

Digital Token-based payment system

The digital token-based payment system is a new form of electronic payment system which is based on electronic tokens rather than e-cheques or e-cash. Electronic tokens are generated by the bank or some financial institutions. Hence we can say that the electronic tokens are equivalent to the cash which are to be made by the bank.

Categories or types of Electronic Tokens:-

1. Cash or Real-Time:-

In this mode of electronic tokens, transactions take place via the exchange of electronic currency (e-cash).

2. Debit or Prepaid:-

In this electronic payment system, prepaid facilities are provided. It means that for transactions of information users pay in advance. This technology is used in smart cards, electronic purses, etc.

3. Credit or Postpaid:-

These types of electronic tokens are based on the identity of customers who issue a card, their authentication, and verification by a third party. In this system, the server authenticates the customers and then verifies their identity through the bank. After all this processing the transaction takes place. An example is E-Cheques.

Magnetic Stripe Card

A **magnetic stripe card** is a card embedded with magnetic technology that allows personal information to be read when swept through a card reader.

Definition and Examples of a Magnetic Stripe Card

In its most simplified form, a magnetic stripe card is a card embedded with magnetic stripe technology that stores information. This information can include account numbers, identifying information, security functions, and other relevant data. When combined with a point-of-sale (POS) retail system, data networks, and transaction-processing computers, information is read instantly and transactions can be approved or denied on the spot.¹

Alternate names: Magnetic strip card, swipe card, magstripe

Some examples of magnetic stripe cards include:

- Credit cards
- Bank cards
- ATM cards
- Transit cards
- ID cards
- Hotel key cards
- Library cards
- Access cards
- Gift cards
- Loyalty cards
- Membership cards

Online or Internet Banking

Internet banking, also known as online banking or e-banking or Net Banking is a facility offered by banks and financial institutions that allow customers to use banking services over the internet. Customers need not visit their bank's branch office to avail each and every small service. Not all account holders get access to internet banking. If you would like to use internet banking services, you must register for the facility while opening the account or later. You have to use the registered customer ID and password to log into your internet banking account.

Features of Online Banking

- Check the account statement online.
- Open a fixed deposit account.
- Pay utility bills such as water bill and electricity bill.
- Make merchant payments.
- Transfer funds.
- Order for a cheque book.
- Buy general insurance.

- Recharge prepaid mobile/DTH.

Advantages of Internet Banking

- **Availability:** You can avail the banking services round the clock throughout the year. Most of the services offered are not time-restricted; you can check your account balance at any time and transfer funds without having to wait for the bank to open.
- **Easy to Operate:** Using the services offered by online banking is simple and easy. Many find transacting online a lot easier than visiting the branch for the same.
- **Convenience:** You need not leave your chores behind and go stand in a queue at the bank branch. You can complete your transactions from wherever you are. Pay utility bills, recurring deposit account instalments, and others using online banking.
- **Time Efficient:** You can complete any transaction in a matter of a few minutes via internet banking. Funds can be transferred to any account within the country or open a fixed deposit account within no time on netbanking.
- **Activity Tracking:** When you make a transaction at the bank branch, you will receive an acknowledgement receipt. There are possibilities of you losing it. In contrast, all the transactions you perform on a bank's internet banking portal will be recorded. You can show this as proof of the transaction if need be. Details such as the payee's name, bank account number, the amount paid, the date and time of payment, and remarks if any will be recorded as well.

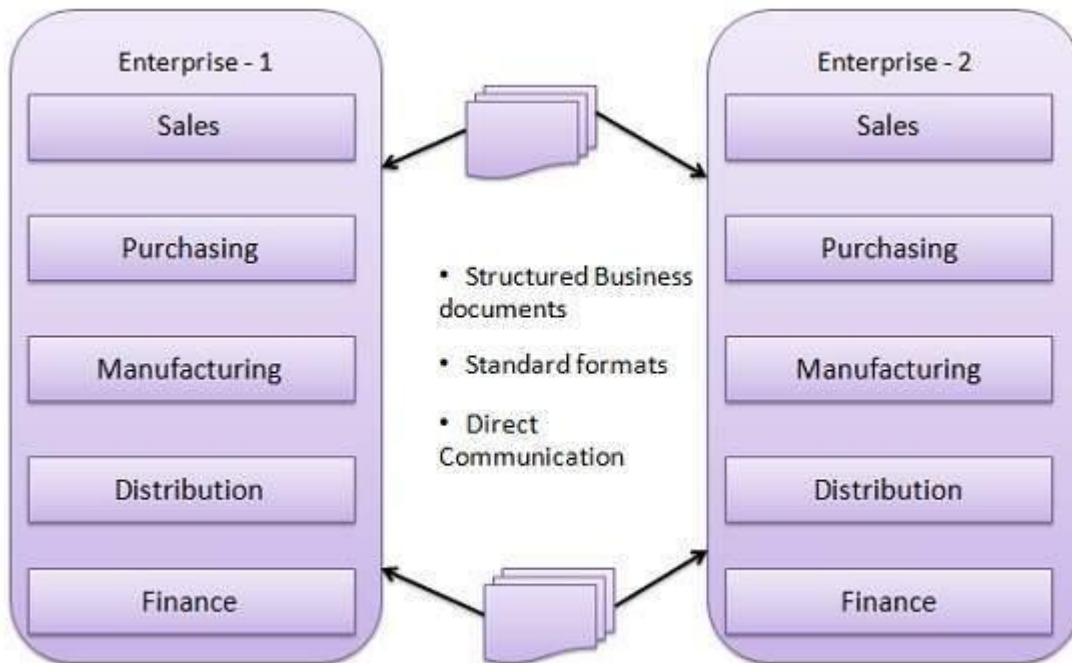
Disadvantages of Internet/Online Banking

- **Internet Requirement:** An uninterrupted internet connection is a foremost requirement to use internet banking services. If you do not have access to the internet, you cannot make use of any facilities offered online. Similarly, if the bank servers are down due to any technical issues on their part, you cannot access net banking services.
- **Transaction Security:** No matter how much precautions banks take to provide a secure network, online banking transactions are still susceptible to hackers. Irrespective of the advanced encryption methods used to keep user data safe, there have been cases where the transaction data is compromised. This may cause a major threat such as using the data illegally for the hacker's benefit.
- **Difficult for Beginners:** There are people in India who have been living lives far away from the web of the internet. It might seem a whole new deal for them to understand how internet banking works. Worse still, if there is nobody who can explain them on how internet banking works and the process flow of how to go about it. It will be very difficult for inexperienced beginners to figure it out for themselves.
- **Securing Password:** Every internet banking account requires the password to be entered in order to access the services. Therefore, the password plays a key role in maintaining integrity. If the password is revealed to others, they may utilise the information to devise some fraud. Also, the chosen password must comply with the rules stated by the banks. Individuals must change the

password frequently to avoid password theft which can be a hassle to remember by the account holder himself.

E-Commerce – EDI

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. In EDI, paper documents are replaced with electronic documents such as word documents, spreadsheets, etc.

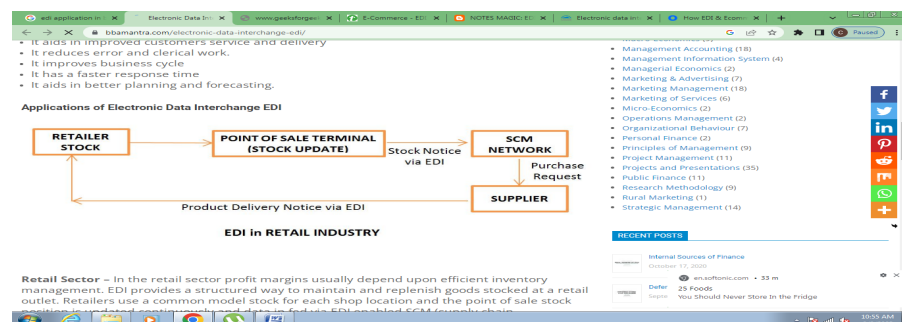


EDI Documents

Following are the few important documents used in EDI –

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

EDI applications



Retail Sector – In the retail sector profit margins usually depend upon efficient inventory management. EDI provides a structured way to maintain and replenish goods stocked at a retail outlet. Retailers use a common model stock for each shop location and the point of sale stock position is updated continuously and data is fed via EDI enabled SCM (supply chain management) network. The EDI software monitors all the logistics and makes updates in the original stock.

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graph TD
    OEM["OEM (Original Equipment Manufacturer) Inventory"] -- "Inventory Request" --> Supplier["SUPPLIER"]
    Supplier -- "Advanced Shipping Notice (ASN)" --> Manufacturer["MANUFACTURER"]
    Manufacturer -- "Inventory Update" --> OEM
    
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EDI in MANUFACTURING INDUSTRY

Manufacturing Sector – EDI ensures effective and efficient management of materials required for production of a commodity. In manufacturing sector EDI facilitates Material requirement planning and just in time manufacturing. The Inventory position of OEM is constantly updated

Manufacturing Sector – EDI ensures effective and efficient management of materials required for production of a commodity. In manufacturing sector EDI facilitates Material requirement planning and just in time manufacturing. The Inventory position of OEM is constantly updated through EDI and the supplier is notified about shortage of materials. This helps the supplier to plan and schedule supply according to requirements of the manufacturer. The suppliers respond via EDI with an ASN to identify the parts/materials to be delivered and the approximate delivery time and as soon as the shipment is delivered at the production plant the inventory is updated again.

Automobile Sector – In automobile sector EDI is used to keep customers updated with the current product and pricing information during the purchase cycle. An advance shipping notice is transmitted through EDI to the customers to prepare a loading schedule and to ensure proper receipt of the product. The customer may also make payment on receipt of goods via EDI to speed up the payment process.

Financial Sector – In the financial sector EDI replaces the labour intensive activities of collecting, processing and dispersing payments with an electronic system. It facilitates the flow of payment between the bank accounts of trading partners without requiring any human intervention. A payee's bank account is electronically credited and the payer's account is electronically credited on the scheduled day of payment; such an exchange is known as electronic fund transfer (EFT).

Laws Governing E-Commerce Information Technology Act, 2000 ("IT Act")

- There are different provisions under the IT Act that guide the working of e-commerce. Section 84A of the IT Act cast a duty on the Central Government the promotion of e-governance and e-commerce.
- It also has to provide for the secure use of electronic means. Provisions regarding data protection are contained in Section 43A of the IT Act.

- Section 66A of the IT Act imposes a penalty in case of theft of identity and provides that whosoever person dishonestly uses the password, or identity of another shall be punished with imprisonment that may extend to 2 years or with a fine of INR 1,00,000/- or both.
- Consumer Protection Act, 2019 and Consumer Protection (E-Commerce) Rules, 2020 The Ministry of Consumer Affairs, Food and Public Distribution has recently notified the Consumer Protection Act, 2019 (CPA 2019) and the Consumer Protection (E-Commerce) Rules, 2020 (E-Commerce Rules).
- The CPA 2019 introduced significant changes to the 1986 consumer protection law, to address unique issues arising in this era of digitization and e-commerce. The E-Commerce Rules provide a framework to regulate the marketing, sale, and purchase of goods and services online.

5 E-commerce FDI Policy

- There are two models of E-Commerce Laws as defined in the Indian FDI Policy: Marketplace Model: Ecommerce business registration on a digital and electronic network to serve as a facilitator between buyer and seller is known as the marketplace-based model of e-commerce.
- The marketplace charges sellers a commission for the service it renders. The largest online marketplaces now operating in the nation are Naaptol and Shopclues.
- Inventory Model: A business that engages in online commerce using an inventory-based model possessing a supply of products and services that are sold directly to customers. Likewise, the seller is an online retailer that stocks it straight from brands and sellers.
- One such example is Myntra. 6 Sales, Shipping, Refunds, and Returns under E-commerce The Sale of Goods Act, 1930 regulates what information the entity's sales and shipping policy must provide.
- Moreover, such as the guarantees, terms, and the transfer of ownership in commodities. In addition, the policy must state whether return/refund options are available or not.

What is a contract?

The term "Contract" is defined under Section 2 (h) of the India Contract Act, 1872 (hereinafter referred to as "the Act"). According to Section 2(h) of the Act, an agreement enforceable by law is a contract. Also, as per Section 2 (j) of the Act a contract which ceases to be enforceable by law becomes void when it ceases to be enforceable. A contract could be written formally or informally or could be entirely verbal or in writing. Important sections (Section 10 of the Act) to be considered in order to constitute a valid contract are as follows:

- Offer and acceptance is described under Section 2(a) and (b) respectively,
- Lawful consideration is explained under Section 23 and Section 25,
- Condition to be competent for parties is stated under Section 11, and
- Section 14 of the Act deals with free consent and factors that would deem a contract invalid.

Types of E-Contracts

E-contracts and their types are discussed in detail as under:

1. Shrink-wrap agreements

Typically, shrink wrap contracts are a licencing agreement for software purchases. In the event of shrink-wrap agreements, the terms and conditions for access to such software goods should be enforced by the person purchasing it, with the start of the software product's packaging. Tightening-up agreements are just the agreements that consumers accept, such as Nokia pc-suite, at time of installing the software on a CD-ROM. Additional terms may only be viewed after installing the programme into your computer, and if the customer disagrees, he has the option to return the software package. The Shrink-wrap Agreement protects the product maker by absolving the manufacturer of any infringement of copyright or intellectual property rights as soon as the customer rips the product or the covering for the goods. However, there is no firm decision or precedent in India regarding the legality of shrink-wrap agreements.

2. Click or web-wrap agreements

A Click-wrap contract refers to a web-based contract that needs approval or assent of the user via the "I Accept," or "OK" button. With the clickwrap agreements, the user must accept the conditions before using a specific software. Users who do not agree with the terms and conditions will be unable to use or purchase the product following cancellation or rejection. Someone nearly always abides by web-wrap agreements. Before users agree to the terms of service, they must be written down. For example, online shopping, software download or installation, to purchase airline tickets or music online, using websites, registering an account on a social media website, etc.

3. Browse-wrap agreements

A browsing wrap agreement is a contract that is binding on two or more parties through the usage of a website. In the event of a browsing agreement, an ordinary user of a particular website is required to accept the terms and conditions of use as well as other website rules for continued usage. Such internet contracts are very common in our daily lives. Other nations have dealt with such online agreements and determined that both Shrink-wrap Agreements and Click-Wrap Agreements are enforceable as long as the contract's general principles are not breached.

4. E-signatures

After the parties have formed the contract to suit their interests, the stage of execution by affixing an e-signature is the following step. The IT Act recognises two types of signatures: digital signatures generated by an asymmetric crypto-system and hash function, and electronic signatures defined in its second schedule, wherein the user of an Aadhar card is assigned a unique identification number via which they can electronically sign documents via third-party forums (often through generation of a one-time-password). Section 5 of the IT Act defines e-signatures as a broad range of ways for signing a document, whereas a digital signature is a type of e-signature that employs cryptography.