**Electronic Commerce**

E-Commerce or Electronic Commerce means buying and selling of goods, [products](https://www.toppr.com/guides/business-studies/marketing/product/), or services over the internet. E-commerce is also known as electronic commerce or internet commerce. These services provided online over the internet network. Transaction of money, funds, and data are also considered as E-commerce. These business transactions can be done in four ways: Business to Business (B2B), Business to Customer (B2C), Customer to Customer (C2C), Customer to Business (C2B). The standard definition of E-commerce is a [commercial transaction](https://www.toppr.com/guides/business-economics-cs/money-and-banking/e-banking/) which is happened over the internet. Online stores like Amazon, Flipkart, Shopify, Myntra, Ebay, Quikr, Olx are examples of E-commerce websites. By 2020, global retail e-commerce can reach up to $27 Trillion. Let us learn in detail about what is the advantages and disadvantages of E-commerce and its types.

**E-Commerce or Electronic Commerce**

E-commerce is a popular term for electronic commerce or even internet [commerce](https://www.toppr.com/bytes/forms-of-commerce/). The name is self-explanatory, it is the meeting of buyers and sellers on the internet. This involves the transaction of goods and services, the transfer of funds and the exchange of data.

So when you log into your Amazon and [purchase](https://www.toppr.com/guides/accountancy/recording-transactions/purchases-journal-and-purchase-return-book/) a book, this is a classic example of an e-commerce transaction. Here you interact with the seller ([Amazon](https://www.amazon.in/)), exchange data in form of pictures, text, address for delivery etc. and then you make the [payment](https://www.toppr.com/guides/accountancy/accounting-for-not-for-profit-organisations/receipt-payment-account/).

As of now, e-commerce is one of the[fastest growing industries in the global economy](https://www.toppr.com/guides/general-awareness/economy/world-economy/). As per one estimate, it grows nearly 23% every year. And it is projected to be a $27 trillion industry by the end of this decade.

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**Types of E-Commerce Models**

Electronic commerce can be classified into four main categories. The basis for this simple classification is the parties that are involved in the transactions. So the four basic electronic commerce models are as follows,

**1. Business to Business**

This is Business to Business transactions. Here the companies are doing business with each other. The final [consumer](https://www.toppr.com/guides/economics/consumer-rights/) is not involved. So the online transactions only involve the [manufacturers, wholesalers, retailers](https://www.toppr.com/guides/business-studies/internal-trade/internal-trade-and-wholesale-trade/) etc.

**2. Business to Consumer**

[Business](https://www.toppr.com/guides/business-studies/nature-and-purpose-of-business/concept-and-characteristics-of-business/) to Consumer. Here the company will sell their goods and/or services directly to the consumer. The consumer can browse their websites and look at products, pictures, read reviews. Then they place their order and the company ships the goods directly to them. Popular examples are Amazon, Flipkart, Jabong etc.

**3. Consumer to Consumer**

Consumer to consumer, where the consumers are in direct contact with each other. No company is involved. It helps people sell their personal goods and assets directly to an interested party. Usually, goods traded are cars, bikes, electronics etc. OLX, Quikr etc follow this model.

**4. Consumer to Business**

This is the reverse of B2C, it is a consumer to business. So the consumer provides a good or some service to the [company](https://www.toppr.com/guides/business-laws/companies-act-2013/meaning-and-features-of-a-company/). Say for example an IT freelancer who demos and sells his software to a company. This would be a C2B transaction.

Examples of E-Commerce

* Amazon
* Flipkart
* eBay
* Fiverr
* Upwork
* Olx
* Quikr

Advantages of E-Commerce

* E-commerce provides the sellers with a global reach. They remove the barrier of place ([geography](https://www.toppr.com/guides/general-knowledge/general-physical-geography/what-is-geography/)). Now sellers and buyers can meet in the virtual world, without the hindrance of location.
* Electronic commerce will substantially lower the transaction cost. It eliminates many fixed costs of maintaining brick and mortar shops. This allows the companies to enjoy a much higher margin of profit.
* It provides quick delivery of goods with very little effort on part of the customer. [Customer](https://www.toppr.com/guides/business-communication-and-ethics/business-correspondence/handling-complaints/) complaints are also addressed quickly. It also saves time, energy and effort for both the consumers and the company.
* One other great advantage is the convenience it offers. A customer can shop 24×7. The website is functional at all times, it does not have working hours like a shop.
* Electronic commerce also allows the customer and the [business](https://www.toppr.com/guides/business-studies/emerging-modes-of-business/e-business/) to be in touch directly, without any intermediaries. This allows for quick [communication](https://www.toppr.com/guides/business-studies/directing/communication/) and transactions. It also gives a valuable personal touch.

Disadvantages of E-Commerce

* The start-up costs of the e-commerce portal are very high. The setup of the hardware and the software, the training cost of employees, the constant maintenance and upkeep are all quite expensive.
* Although it may seem like a sure thing, the e-commerce [industry](https://www.toppr.com/guides/geography/industries/introduction-to-industry/) has a high risk of failure. Many companies riding the dot-com wave of the 2000s have failed miserably. The high risk of failure remains even today.
* At times, e-commerce can feel impersonal. So it lacks the warmth of an interpersonal relationship which is important for many brands and products. This lack of a personal touch can be a disadvantage for many types of services and products like interior designing or the jewelry business.
* Security is another area of concern. Only recently, we have witnessed many security breaches where the information of the customers was stolen. Credit card theft, identity theft etc. remain big concerns with the customers.
* Then there are also fulfillment problems. Even after the order is placed there can be problems with shipping, delivery, mix-ups etc. This leaves the customers unhappy and dissatisfied.

**Electronic Data Interchange (EDI)**

Electronic Data Interchange (EDI) is growing in popularity with businesses worldwide. With EDI, you can automate processes, minimize errors, decrease response times, reduce costs and more!

This is a summary about EDI so you can see how your company can benefit from it.

**What is Electronic Data Interchange (EDI)?**

[Electronic Data Interchange](https://www.edibasics.com/what-is-edi/) (EDI) is the computer-to-computer exchange of business documents–such as purchase orders, delivery receipts and invoices, in a standard electronic format between business partners. Exchanging documents electronically increases the speed and visibility of the transaction and eliminates the need for faxes and mailing paper documents.

**What Are the Advantages to EDI?**

According to a market report by [Dart Consulting](https://www.dartconsulting.co.in/market-news/electronic-data-interchange-edi-global-market-and-its-applications-in-industries/), the estimated market size of EDI is projected to reach as high as $2.1 billion by 2020. Some advantages that might explain the sales growth of EDI software are:

* **Minimized Errors** – EDI software reduces document errors as much as 30 to 40%\* by automating the purchase order process and decreasing the chance for human error.
* **Decreased Response Times** – Response times can be cut by 61%\* by automating paper-based tasks.
* **Cost Savings** – Costs associated with purchasing and stocking paper as well as printing, storing and filing are minimized with EDI.
* **Automated Processes** – EDI reduces the time required to process and distribute documents and virtually eliminates the need for mail, fax and email.

EMERGING TRENDS IN INFORMATION TECHNOLOGY

Information Technology is the study, design, development, application, implementation, support or management of computer-based information systems. The Latest Trend of Information Technologies are: Cloud Computing, Internet of Things (IoT), Big data, Cyber security, Context-Rich Systems, Increased automation, Continued mobile pervasiveness, Web-Scale IT, 3D Printing.

Top 9 emerging technologies

1. Cloud Computing

The practice of using a network of remote servers hosted on the Internet to store, manage, and process data. Cloud computing offers 3 types of broad services mainly Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS)  
Some of the advantages of Cloud computing are it reduces IT infrastructure cost of the company, promotes the concept of visualization,which enables server and storage device to be utilized across organization. Cloud computing makes maintenance of software and hardware easier as installation is not required on each end user’s computer. Cloud is the new style of elastically scalable, self-service computing, and both internal applications and external applications will be built on this new style. While network and bandwidth costs may continue to favor apps that use the intelligence and storage of the client device effectively, coordination and management will be based in the cloud.” Disadvantages of Cloud computing are issues concerning privacy, compliance, security, legal, abuse, IT governance.

Cloud computing is becoming the hub for operational infrastructure. Big data, generated through IoT, is an important driver for organizations to move to the cloud.The reason behind the movement to cloud-based operations are numerous, from IT agility to IT innovation and employee collaboration. Technologies such as software-defined networking (SDN) and network functions visualization (NFV) are being looked into to give greater agility to cloud investments.

2. The Internet of Things (IoT)

Rapid increase in IoT solutions being deployed to advance business intelligence. ABI Research reported a 20% increase in IoT connected devices in 2014 from 2013. This year, Cisco predicts there will be 25 billion connected devices, which will double to 50 billion by 2020. Information Age suggests IoT will revolutionise business by allowing companies to improve value propositions, engage with customers on levels previously unavailable and build entirely new revenue streams.  
Investment in IoT has mainly come from the IT and telecoms industry, which will naturally benefit from the increase in data generated and application capabilities for mobile devices. In 2015, spectators predict investment in IoT will increase outside this industry. The retail industry is one sector in particular that is looking to tap into sensor data generated via wearable technology to provide highly targeted products and services to their customers. As businesses look to IoT technologies to provide more insight, there is an ever-increasing demand for analysts capable of transforming IoT data into actionable business intelligence. IoT will become the next critical focus for data and analytics services with IDC predicting 30% CAGR over the next five years.

3. Big data

Big data as a concept is ever evolving as the capacity to mine structured, semi structured and unstructured data increases. In 2014, organizations were making more informed business decisions and becoming more intelligent as they interact with their customers. More sophisticated ‘recommendation engines’ anticipating users’ interests more accurately for services such as Netflix, Amazon and Google. Further, credit reference agencies have been using big data to inform on lending decisions by developing the algorithms used to generate credit ratings. Retail, logistics and budget planning have all seen significant advancement last year due to greater business intelligence.

The increasing influx of data available to organizations will require the infrastructure being used to house, process, analyze and visualize intelligence to expand. The IDC predicts that rich media analytics will be the driver behind many big data projects, expecting this area to at least triple in size.The increased demand for greater sophistication in analysis and data consumption will require organizations to refine talent acquisition strategies to compete in the skills gap.

4.Cyber security

IT security is an obvious priority in an environment infested by spam, bugs, bots, browser holes, exploits, spyware, adware, denial of service (DoS) attacks, viruses and phishing. IT security breaches are serious business problems that can often result in significant financial loss and collateral damage. Organizations need to be proactive in protecSecurity weaknesses have been marked down to a number of key areas such as mis-configuration issues, third party providers, lack of network diversity and most worrying of all, lack of qualified security talent.  
The cyber security skills gap is perhaps the underlying issues having a knock-on effect on industry and the economy. Cyber security skills are a global priority but, with a lack of consistency in accepted career definitions, organizations are experiencing difficulties in attracting new talent and progressing existing professionals. To offset the skills deficit, talent from the ‘gaming’ industry are being brought into the security sphere and their skills adapted for this arena.

The information security industry has an opportunity to re-define itself and build on the negative global coverage it observed last year to attract new talent. The Internet Systems Security Association (ISSA) identified the need for an internationally accepted framework that would define the cyber security career for individuals in the profession. To attract new entrants and so that pros can advance in their career, ISSA have developed the Cybersecurity Career Lifecycle (CSCL). This pro-active approach to industry development could go a long way to help fill the estimated 300,000 to 1,000,000, and rising, currently vacant global cyber security positions.

All roads to the digital future lead through security. However, in a digital business world, security cannot be a roadblock that stops all progress. Organizations will increasingly recognize that it is not possible to provide a 100 percent secured environment. Once organizations acknowledge that, they can begin to apply more-sophisticated risk assessment and mitigation tools. On the technical side, recognition that perimeter defense is inadequate and applications need to take a more active role in security gives rise to a new multifaceted approach. Security-aware application design, dynamic and static application security testing, and runtime application self-protection combined with active context-aware and adaptive access controls are all needed in today’s dangerous digital world. This will lead to new models of building security directly into applications. Perimeters and firewalls are no longer enough; every app needs to be self-aware and self-protecting.

5. Increased automation.

There is no escape that people costs continue to be a big part of total IT costs. The use of cloud services will continue to reduce this (with cloud service providers achieving lower costs through both economies of scale and the use of automation) but there is still a need to reduce human touch points, and the associated costs, within corporate data centers and operational environments – with speedier delivery and fewer human errors secondary benefits. 2015 will see even greater automation adoption by corporate IT organizations under pressure to reduce costs and better demonstrate business value.

6. Continued mobile pervasiveness

Continued improvements in anytime, anywhere, any device access to data and services will continue to drive the need for better mobile apps and experiences, and the use of personal devices for work purposes. Not only will this dictate the need for better service and app design and delivery, and more intelligent approaches to BYOD, but also the need to consider the security implications of mobility such as data segregation issues – with personal and business data and applications isolated from each other on the same device.

7. Context-Rich Systems

Ubiquitous embedded intelligence combined with pervasive analytics will drive the development of systems that are alert to their surroundings and able to respond appropriately. Context-aware security is an early application of this new capability, but others will emerge. By understanding the context of a user request, applications can not only adjust their security response but also adjust how information is delivered to the user, greatly simplifying an increasingly complex computing world.

8. Web-Scale IT

Web-scale IT is a pattern of global-class computing that delivers the capabilities of large cloud service providers within an enterprise IT setting. More organizations will begin thinking, acting and building applications and infrastructure like Web giants such as Amazon, Google and Facebook. Web-scale IT does not happen immediately, but will evolve over time as commercial hardware platforms embrace the new models and cloud-optimized and software-defined approaches reach mainstream. The first step toward the Web-scale IT future for many organizations should be DevOps — bringing development and operations together in a coordinated way to drive rapid, continuous incremental development of applications and services.

9. 3D Printing

Worldwide shipments of 3D printers are expected to grow 98 percent in 2015, followed by a doubling of unit shipments in 2016. 3D printing will reach a tipping point over the next three years as the market for relatively low-cost 3D printing devices continues to grow rapidly and industrial use expands significantly. New industrial, biomedical and consumer applications will continue to demonstrate that 3D printing is a real, viable and cost-effective means to reduce costs through improved designs, streamlined prototyping and short-run manufacturing.

**Purchase Orders: Traditional Document Exchange Versus EDI**

***Purchase Order Process with Traditional Document Exchange***

The average time to process a purchase order is approximately three to five days, and requires the buyer to mail the purchase order to the supplier and wait for the supplier to receive it and enter it into their system.

***Purchase Orders with EDI***

The EDI purchase order process typically takes less than an hour, and sometimes just minutes! With EDI software, the buyer creates the purchase order and automatically transmits it to the supplier where it is entered immediately into the supplier’s order entry system.

**Internet Protocol Television (IPTV)**

Internet Protocol television (IPTV) is the process of transmitting and broadcasting television programs through the Internet using Internet Protocol (IP). IPTV gives dynamic features to the user to improve the user experience compared to a traditional television transmission such as radio frequency broadcast, satellite broadcast and/or cable television. A broadband connection is used as the medium of transmission for IPTV, which is very efficient compared to earlier transmission modes.

There is continuous development in the transmission of television broadcasts. The most efficient transmission mode is IPTV, a collection of protocol, hardware, infrastructure and software. A series of IP packets encoded for the delivery of video streaming is broadcast in IPTV.  
  
In general, IPTV sends only the program requested by the viewer. A new stream is transmitted to the viewer when the channel is changed. Traditional TV, however, broadcasts all the channels simultaneously.  
  
IPTV services have three main features:

1. VOD: Video on demand (VOD) is an option available to the users of IPTV. Each user is given the option to choose from a catalog of videos and watch them as many times as required. This feature uses unicast transmission, whereas normal TV broadcasts use multicast transmission. Real Time Streaming Protocol is used for VOD.
2. DVR: IPTV allows users to watch TV shows broadcast in the past using digital video recorder (DVR), which is also known as time shifted programming. Providers of IPTV allow users to watch recorded shows without DVR devices. There is a live DVR system at the provider’s end, making DVR more cost effective and efficient. Users can watch replays or start a TV program over from an interactive menu.
3. Live Television: IPTV allows users to watch live transmissions with minimal latency. It provides live television broadcasts either with or without interactivity, without being just like traditional TV broadcasts. The protocol used for live television is Internet Group Management Protocol (IGMP) version 2.

The biggest limitation is that IPTV broadcasts requires a certain amount of consistent bandwidth for data to be streamed in order to deliver right number of moving pictures frames. So for providers with high IPTV customer base, customer could experience packets loss and delays in transmission.

Introduction to Mobile Communication

**Mobile Communication** is the use of technology that allows us to communicate with others in different locations without the use of any physical connection (wires or cables). Mobile communication makes our life easier, and it saves time and effort.

**A mobile phone** (also called mobile cellular network, cell phone or hand phone) is an example of mobile communication (wireless communication). It is an electric device used for full duplex two way radio telecommunication over a cellular network of base stations known as cell site.

Features of Mobile Communication

The following are the features of mobile communication:

* **High capacity load balancing:** Each wired or wireless infrastructure must incorporate high capacity load balancing.  
  High capacity load balancing means, when one access point is overloaded, the system will actively shift users from one access point to another depending on the capacity which is available.
* **Scalability:** The growth in popularity of new wireless devices continuously increasing day by day. The wireless networks have the ability to start small if necessary, but expand in terms of coverage and capacity as needed - without having to overhaul or build an entirely new network.
* **Network management system:** Now a day, wireless networks are much more complex and may consist of hundreds or even thousands of access points, firewalls, switches, managed power and various other components.  
  The wireless networks have a smarter way of managing the entire network from a centralized point.
* **Indoor as well as outdoor coverage options:** It is important that your wireless system has the capability of adding indoor coverage as well as outdoor coverage.
* **Network access control:** Network access control can also be called as mobile device registration. It is essential to have a secure registration.  
  Network access control (NAC) controls the role of the user and enforces policies. NAC can allow your users to register themselves to the network. It is a helpful feature that enhances the user experience.
* **Mobile device management:** Suppose, many mobile devices are accessing your wireless network; now think about the thousands of applications are running on those mobile devices.  
  How do you plan on managing all of these devices and their applications, especially as devices come and go from your business?  
  Mobile device management can provide control of how you will manage access to programs and applications. Even you can remotely wipe the device if it is lost or stolen.
* **Roaming:** You don't need to worry about dropped connections, slower speeds or any disruption in service as you move throughout your office or even from building to building wireless needs to be mobile first.  
  Roaming allows your end-users to successfully move from one access point to another without ever noticing a dip in a performance.  
  For example, allowing a student to check their mail as they walk from one class to the next.
* **Redundancy:** The level or amount of redundancy your wireless system requires depends on your specific environment and needs.
* **For example:** A hospital environment will need a higher level of redundancy than a coffee shop. However, at the end of the day, they both need to have a backup plan in place.
* **Proper Security means using the right firewall:** The backbone of the system is your network firewall. With the right firewall in place you will be able to:
  + See and control both your applications and end users.
* **Switching:** Basically, a network switch is the traffic cop of your wireless network which making sure that everyone and every device gets to where they need to go.  
  Switching is an essential part of every fast, secure wireless network for several reasons:
  + It helps the traffic on your network flow more efficiently.
  + It minimizes unnecessary traffic.
  + It creates a better user experience by ensuring your traffic is going to the right places.

Advantages of Mobile Communication

There are following advantages of mobile communication:

* **Flexibility:** Wireless communication enables the people to communicate with each other regardless of location. There is no need to be in an office or some telephone booth in order to pass and receive messages.
* **Cost effectiveness:** In wireless communication, there is no need of any physical infrastructure (Wires or cables) or maintenance practice. Hence, the cost is reduced.
* **Speed:** Improvements can also be seen in speed. The network connectivity or the accessibility was much improved in accuracy and speed.
* **Accessibility:** With the help of wireless technology easy accessibility to the remote areas is possible. For example, in rural areas, online education is now possible. Educators or students no longer need to travel to far-flung areas to teach their lessons.
* **Constant connectivity:** Constant connectivity ensures that people can respond to emergencies relatively quickly. For example, a wireless device like mobile can ensure you a constant connectivity though you move from place to place or while you travel, whereas a wired landline can't.

What is a Smart Card?

A smart card is a special type of card like device which contains an integrated circuit chip embedded on it. The IC chip can be a microprocessor with memory or just simple memory circuit. In simple layman’s words, a smart card is the card with which we can exchange the data, store it and manipulate data.

How does the Smart Card Works?

A smart card is connected to the host computer or controller via a card reader which gets information from the smart card and accordingly passes the information to the host computer or controller.

What is a Smart Card Reader?

A smart card reader is a device to which the smart card is connected either directly or indirectly using RF communication. It interfaces with the PC or a microcontroller using USB port or RS232 serial ports. It can be a contact or contactless reader.

Types of Smart Card based on Connection to the Smart Card Reader

Contact Smart Card:  This type of smart card consists of electrical contacts which are used to connect to the card reader where the card is inserted. The electrical contacts are deployed on a conductive gold plated coating on the card surface.

Contactless Smart Card: This type of [smart card communicates](https://www.elprocus.com/working-of-smart-card/" \t "_blank) with the reader without any physical contact. Rather it consists of an antenna with which it is used to communicate using Radio Frequency band with the antenna on the reader. It usually receives power from the reader via the electromagnetic signal.

Types of Smart Cards based on their Functionalities and Configuration

Memory Cards: These are cards which only consist of memory circuits. It can only store, read and write data to a particular location. The data cannot be processed or manipulated. It can be a straight memory card which is only used to store data or a protected memory card with a restricted access to the memory and which can be used to write data. It can also be a rechargeable or a disposable card which contains memory units which can be used only once.

Microprocessor Based Cards: These cards consist of microprocessor embedded onto the chip in addition to the memory blocks. It also consists of specific sections of files with each file associated with a particular function. The data in files and the memory allocation is managed via an operating system which can be a fixed operating system or dynamic operating system. It allows for data processing and manipulations and can be used for multi functioning.

 4 Steps to Construct a Smart Card

* The first step involves designing. The designing involves specifying the chip for the memory size, clock speed, volatile memory types, type of operating system and specifying the application software, specifying the card type, size and functioning and additional features.
* The second step involves chip fabrication. This involves mounting the silicon chip on an epoxy glass substrate with gold plated connectors, using a die. The silicon chip is bonded to the connectors using connecting wires (wire bonding technique) or using flip chip technology (using a solder). The chip on board substrate is then sealed using epoxy resin and glued to the card substrate. The card substrate can be PVC based plastic card or Polyester based card.
* The third step involves loading the code to the memory using special commands.
* The fourth step involves data loading into the PROM memory such that the data pertains to the single person.

Advantages of Smart Card:

* Might be promptly reconfigured
* Reusable
* Secure transactions
* Gives more security
* More tough and dependable
* Permit numerous provisions to be saved in one card

Areas of Smart Card Applications:

Telecommunications: The most prominent use of [smart card technology](https://www.elprocus.com/working-of-smart-card/" \t "_blank) is in the development of SIM card or Subscriber Identity Module. A SIM card provides unique identification to each subscriber and provides network access to each subscriber and manages its authentication.

Domestic:  The most frequently used smart card in domestic field is the DTH smart card. This card provides authorized access to the information coming from the satellites. In simple words the card with which we can get access to the Direct to Home TV services is nothing but a smart card. The information is encrypted and decrypted within a smart card.

Ecommerce and Retail: Smart card can be used to store information like a person’s account details, the transaction details and can be used in purchasing goods online by acting as a credit card. Some retailers can also use smart cards to store points for a particular customer and provide necessary incentives to repeated customers.

Banking Application: The most prominent use of smart card in banking application is the replacement of the traditional magnetic stripe based credit or debit card. An example is the MasterCard and VISA.

Government Applications: Smart cards are being used by Government to issue identity cards to individual, which contains all the details of the individual. An example is the recently started Adhar card scheme in India.

Secured Physical access: Smart cards can be used by Organizations or differed public areas to provide authorized access to the employees (members of the organization) or other persons to the secured areas. The smart card generally contains identity details of the individual which is scanned and checked.