E-COMMERCE APPLICATION DEVELOPMENT

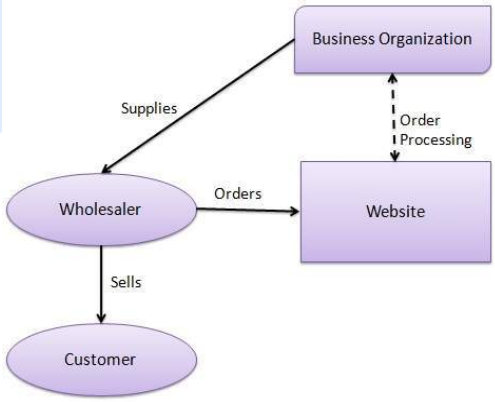
UNIT-2

E-commerce business models can generally be categorized into the 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)

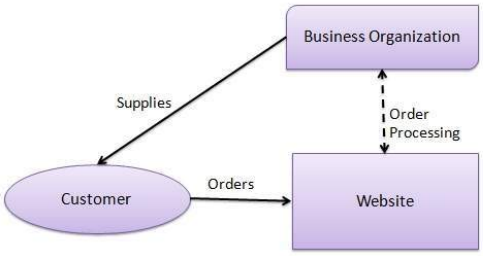
Business - to - Business

A website following the B2B business model sells its products 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 the final customer who comes to buy the product at one of its retail outlets.



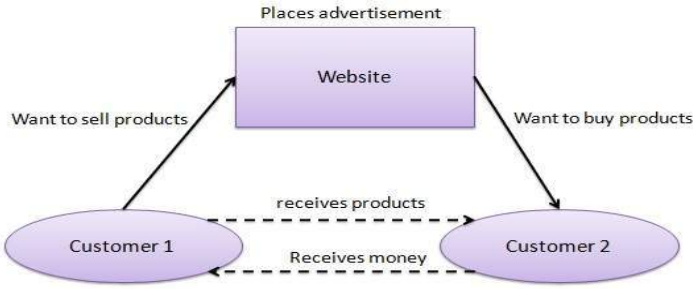
Business - to - Consumer

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



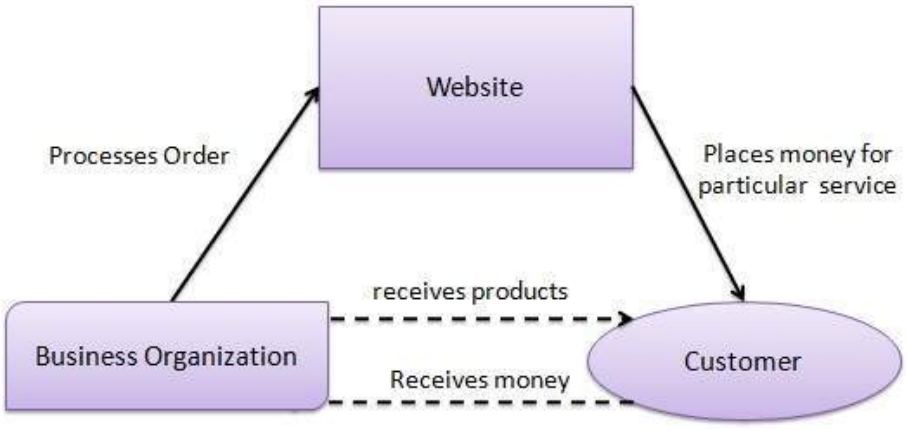
Consumer - to - Consumer

A website following the C2C business model helps consumers 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.



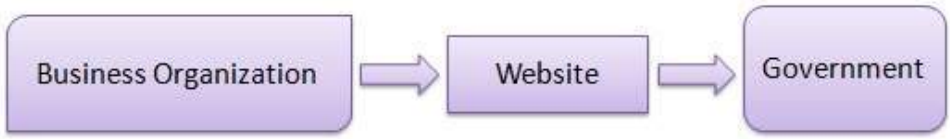
Consumer - to - Business

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



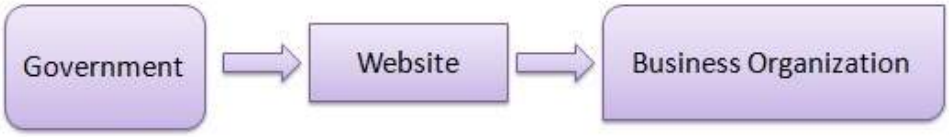
Business - to - Government

B2G model is a variant of B2B model. Such websites are used by governments 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

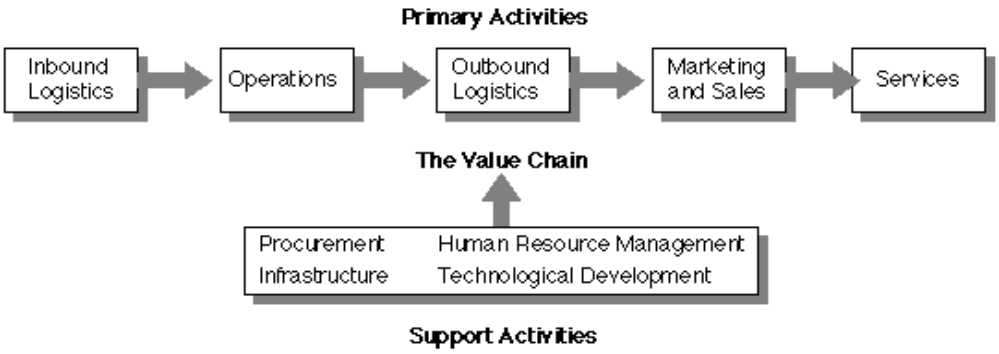
Governments use B2G model websites to approach business organizations. Such websites support auctions, tenders, and application submission functionalities.



Government - to - Citizen

Governments use G2C model websites 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. The main objective of G2C websites is to reduce the average time for fulfilling citizen's requests for various government services.

Potter's Value Chain Model:



The idea of the value chain is based on the process view of organizations, the idea of seeing a manufacturing (or service) organization as a system, made up of subsystems each with inputs, transformation processes and outputs. Inputs, transformation processes, and outputs involve the acquisition and consumption of resources - money, labour, materials, equipment, buildings, land, administration and management. How value chain activities are carried out determines costs and affects profits.

Most organizations engage in hundreds, even thousands, of activities in the process of converting inputs to outputs. These activities can be classified generally as either primary or support activities that all businesses must undertake in some form.

According to Porter (1985), **the primary activities are:**

1. **Inbound Logistics** - involve relationships with suppliers and include all the activities required to receive, store, and disseminate inputs.
2. **Operations** - are all the activities required to transform inputs into outputs (products and services).
3. **Outbound Logistics** - include all the activities required to collect, store, and distribute the output.
4. **Marketing and Sales** - activities inform buyers about products and services, induce buyers to purchase them, and facilitate their purchase.
5. **Service** - includes all the activities required to keep the product or service working effectively for the buyer after it is sold and delivered.

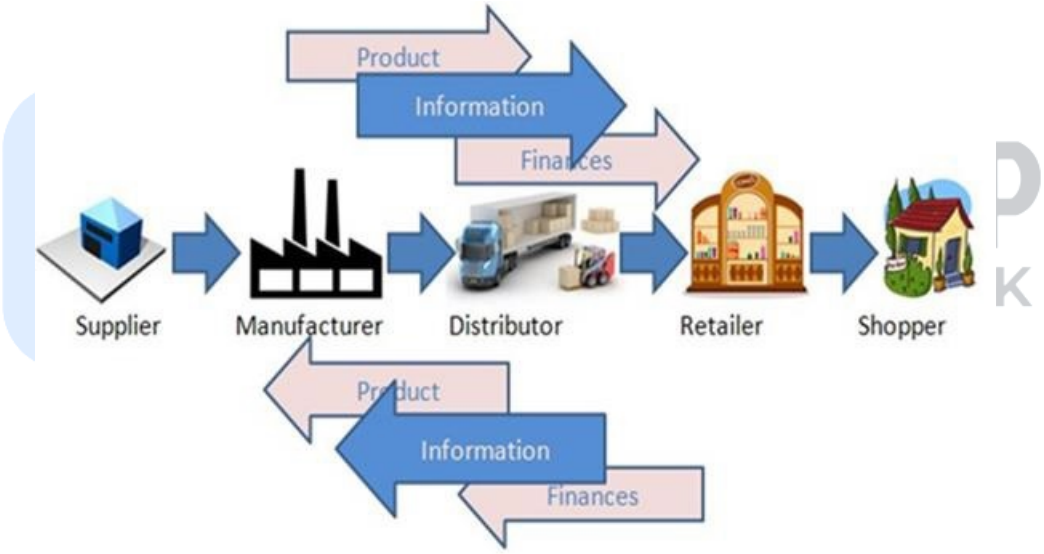
Secondary activities are:

6. **Procurement** - is the acquisition of inputs, or resources, for the firm.
7. **Human Resource management** - consists of all activities involved in recruiting, hiring, training, developing, compensating and (if necessary) dismissing or laying off personnel.
8. **Technological Development** - pertains to the equipment, hardware, software, procedures and technical knowledge brought to bear in the firm's transformation of inputs into outputs.

9. **Infrastructure** - serves the company's needs and ties its various parts together, it consists of functions or departments such as accounting, legal, finance, planning, public affairs, government relations, quality assurance and general management.

Supply Chain Management:

- In an organization, if a product is manufactured using raw materials from various suppliers and if these products are sold to customers, a supply chain is created.
- Depending on the size of the organization and the number of products that are manufactured, a supply chain may be complex or simple.
- Supply Chain Management refers to the management of an interconnected network of businesses involved in the ultimate delivery of goods and services to customers.
- It entails the storage and transport of raw materials, the process of inventory and the storage and transportation of the final goods from the point of manufacture to the point of consumption.



Different Links in the Supply Chain:

- **Customer -** The start of the supply chain is the customer. The customer decides to purchase a product and in turn contacts the sales department of a company. A sales order is completed with the date of delivery and the quantity of the product requested. It may also include a segment for the production facility depending on whether the product is available in stock or not.
- **Planning -** Once the customer has made his/her sales order, the planning department will create a production plan to produce the product adhering to the needs of the customer. At this stage, the planning department will be aware of raw materials needed.

- **Purchasing -** If raw materials are required, the purchasing department will be notified and they in turn send purchasing orders to the suppliers asking for the deliverance of a specific quantity of raw materials on the required date.
- **Inventory -** Once the raw materials have been delivered, they are checked for quality and accuracy and then stored in a warehouse till they are required by the production department.
- **Production -** Raw materials are moved to the production site, according to the specifics laid out in the production plan. The products required by the customer are now manufactured using the raw materials supplied by the suppliers. The completed products are then tested and moved back to the warehouse depending on the date of delivery required by the customer.
- **Transportation -** When the finished product is moved into storage, the shipping department or the transportation department determines when the product leaves the warehouse to reach the customer on time.

The **key benefits of supply chain management** are as follows −

- Develops better customer relationship and service.
- Creates better delivery mechanisms for products and services in demand with minimum delay.
- Improvises productivity and business functions.
- Minimizes warehouse and transportation costs.
- Minimizes direct and indirect costs.
- Assists in achieving shipping of right products to the right place at the right time.
- Enhances inventory management, supporting the successful execution of just-in-time stock models.

Competitive Advantage:

To achieve a competitive advantage is the goal of all business strategy. It means that a company either provides a better solution to a specific problem than its competitors or offers a similar kind of solution for a lower price and is a marketing concept. A business unit is said to have achieved competitive advantage when it “sustains profits that exceed the average for its industry”. **Michael E. Porter** who formed the term ‘competitive advantage’ with his book Competitive Advantage: Creating and Sustaining Superior Performance in 1985, differentiated two basic types of competitive advantage: **cost strategy** and **differentiation strategy**.

1. ## Cost Advantage:

Selling a product (or service) for a lower price than the competitors and being perceived as the cheapest provider (if the price is really the lowest or not) are both strategies to reach cost advantage through price leadership, i.e., to offer the lowest price for comparable products on the market. To achieve competitive advantages through price leadership cost leadership is a prerequisite. This means that a business unit must be able to produce a product at lower cost than its competitors. To achieve this, a cost benchmark can be conducted to detect reasonable alternatives for cost reduction.

2. **Differentiation Advantage:**

pursue differentiation advantage through quality leadership means to provide features that other providers don't and thus to differentiate oneself from other providers. Choosing this way to gain competitive advantage, it is essential to find out which features matter most to the customer and how customers aggregate these judgments to an overall evaluation. As, for customers, it is not possible to assess the quality of a product before buying it, e.g. taste or tenability, quality surrogates are advisable for "experience products" and "trust products ". Competitive advantages must be both effective and efficient. Effectivity refers to customer, whereas efficiency refers to the provider.

Four characteristics of a competitive advantage:

1. Significance

Competitive advantages can only be achieved if the customer finds the improvement made important. It is thus vital to find out what the priorities of the customers are and to make sure one works on something that is meaningful to the customer. Improving a special feature of a product or service without cognition of the customer's priorities 20 and needs can easily lead to misconceptions of what one needs to work on to provide a better, i.e. a more often asked for and bought product than the competitors.

2. Perceptibility

Similar to the characteristic 'significant', it is important that the superiority of a feature into which has been put effort is perceptible to the customer. Attention might have to be drawn to the additional value via advertising.

Even better would it be to push on features which are perceptible at first sight as customers will be more willing to pay more if they know (or see) what has been improved or are more likely to choose a product which obviously has features that others do not.

3. Profitability

There is no use to offer products which outperform every other of its kind on the market if – at the end of the day – it does not also make sense financially for the provider. Profit must exceed costs to be financially profitable.

4. Defensibility

A competitive advantage must be defensible and thus sustainable to ensure that it not taken over by competitors. As competition is a principle of our economy comparative advantages are permanently challenged and to protect and strengthen advantages competitors must be impeded from imitating the innovation.

This can be achieved through the methods of:

a) concealment, i.e., hindering the competitors to get insights in the details of the business concept and the evolvement of competitive advantages

b) deterrence, i.e. to convey the message, that you are unbeatable in a specific category (e.g. price leadership)

c) blockade, i. e. to secure the exclusive access to raw materials etc.

Business Strategy:

Business strategies sometimes defined only as a firm's high-level plan for reaching specific business objectives. Strategic plans succeed when they lead to business growth, a strong competitive position, and strong financial performance. When the high-level strategy fails, however, the firm must either change its approach or prepare to go out of business. The brief definition above is accurate but, for practical help, many businesspeople prefer instead a slightly longer explanation: Business strategy is the firm's working plan for achieving its vision, prioritizing objectives, competing successfully, and optimizing financial performance with its business model.

Types of Business Strategy:

1. Growth Strategy:

A growth strategy entails introducing new products or adding new features to existing products. Sometimes, a small company may be forced to modify or increase its product line to keep up with competitors. Otherwise, customers may start using the new technology of a competitive company. For example, cell phone companies are constantly adding new features or discovering new technology. Cell phone companies that do not keep up with consumer demand will not stay in business very long.

A small company may also adopt a growth strategy by finding a new market for its products. Sometimes, companies find new markets for their products by accident. For example, a small consumer soap manufacturer may discover through marketing research that industrial workers like its products. Hence, in addition to selling soap in retail stores, the company could package the soap in larger containers for factory and plant workers.

2. Product Differentiation Strategy:

Small companies will often use a product differentiation strategy when they have a competitive advantage, such as superior quality or service. For example, a small manufacturer or air purifiers may set themselves apart from competitors with their superior engineering design. Obviously, companies use a product differentiation strategy to set themselves apart from key competitors. However, a product differentiation strategy can also help a company build brand loyalty.

3. Price-Skimming Strategy

A price-skimming strategy involves charging high prices for a product, particularly during the introductory phase. A small company will use a price-skimming strategy to quickly recover its production and advertising costs. However, there must be something special about the product for consumers to pay the exorbitant price. An example would be the introduction of a new technology. A small company may be the first to introduce a new type of solar panel. Because the company is the only one selling the product, customers that really want the solar panels may pay the higher price. One disadvantage of a price-skimming is that it tends to attract competition relatively quickly. Enterprising individuals may see the profits the company is reaping and produce their own products, provided they have the technological knowhow.

4. Acquisition Strategy:

A small company with extra capital may use an acquisition strategy to gain a competitive advantage. An acquisition strategy entails purchasing another company, or one or more of its product lines. For example, a small grocery retailer on the east coast may purchase a comparable grocery chain in the Midwest to expand its operations.

EDI MODEL:

EDI stands for **Electronic Data Interchange model.** It is the exchange of documents between companies through computers in a standard format using networks, such as the internet. It replaces the paper-based exchange of business documents. In EDI a standard format is used because the computer will be able to read and understand the documents as it is a computer-based data exchange method. It is widely used for ecommerce purposes.

The Various benefits of this model are:

- This model reduced the cost.
- It increased the processing speed.
- This model provides information security.
- This model reduced errors.
- This model helps in improved relationship between business partners.

EDI Documents:

EDI Documents Following are the 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 a file that contains the processed document.
- The document is converted into an agreed standard format.
- The file containing the document is sent electronically on the network.
- The trading partner receives the file.
- An acknowledgement document is generated and sent to the originating organization.

Types of EDI:

These are the following types of Electronic Data Interchange:

1. Direct EDI/Point-to-point
2. EDI via VAN
3. EDI via AS2
4. Web EDI
5. Mobile EDI

1. Direct EDI /Point-to-point

In the direct connection approach, we can connect our business partner connect directly through the internet using the same communication method. It establishes a single connection between partners, so we also called it point-to-point EDI.

2. EDI via VAN

Value-added networks (VAN) are private networks where electronic business documents are exchanged between partners. The VAN provider handles the network and provides companies with mailboxes with the help of this they can send and receive EDI documents.

3. EDI via AS2 (Applicability Statement 2)

AS2 (Applicability Statement 2) is an internet communication protocol that enables data to be transmitted securely over the internet. EDI via Applicability Statement 2 delivers the functionality of EDI with the ubiquity of internet access.

4. Web EDI

Unlike EDI via Applicability Statement 2, Web EDI conducts EDI using a standard internet browser. Organizations use different online forums to exchange information with business partners. Web EDI makes EDI easy and affordable for small and medium-sized organizations and companies that have only an occasional need to utilize such a service.

5. Mobile EDI

Users have commonly accessed EDI either by a private network such as value-added network or the internet in the order to send and receive EDI-related business documents. Mobile EDI has had limited acceptance, therefore due to security issues with mobile devices across an EDI infrastructure, but mainly due to the mobile devices themselves. The quality and size of the screen of most devices have been relatively poor until recently. There is a growing industry for developing software applications or apps for downloading onto mobile devices and it will only be a matter of time before you will be able to download supply chain add EDI-related apps from private and corporate app stores.

EDI Standards:

EDI standards are very broad and general because they have to meet the need of all businesses.

EDI share a common structure: -

1. Transaction set is equivalent to business document, such as purchase order. Each transaction set is made up of data segments.
2. Data segments are logical groups of data elements that together convey information, such as invoice terms, shipping information or purchase order line.
3. Data elements are individual fields, such as purchase order number, quantity on order, unit price.

The need for EDI standards:-

EDI provides on electronic linkage between two trading partners. To send documents electronically to each other, firms must agree on a specific data format and technical environment.

National standards:-

1. **ODETTE:-** an EDI format developed for European motor industry. ODETTE stands for organization for data exchange by tele transmission in Europe.
2. **TRADACOMS:-** it is UK national standard, which is developed by ANA (Article number association) in 1982.
3. **NSI ASC X12 (American national standards – X12):-** X12 is a standard that defines many different types of documents, student loan applications, injury and illness supports and shipment and billing notices.

International standards:-

1. **EDIFACT –** (Electronic data interchange for administration, commerce and transport) was developed during 1990's with a subset of EANCOM, which is the most widely used dialect of EDIFACT in international retail and distribution sector.
2. **UN/EDIFACT –** (united Nations/electronic data interchange for administration commerce and transport) is an international set of EDI standards that are published by United Nations trade data interchange (UNIDID).

Implementing EDI:

Pugsley has defined six steps to successfully implement EDI technology in an organization:

• Complete understanding of EDI:

The depth of knowledge a company acquires on EDI depends on the internal efforts spent. If no external consultants are hired then the level of knowledge should be high. One method to gain knowledge is to join one of the groups developing standards. (e.g. EDI Council of Australia)

• Agreed on standards with business partners:

After finding a suitable business partner, agreements should be made concerning standards, transactions to be exchanged, message syntax, file transfer protocol etc.

• Modifying existing systems:

The host computer applications should be modified so that EDI information is incorporated or integrated directly into the applications. Good EDI software should provide an application interface to many different applications.

• Translate data:

Various translation modules are required to translate transactions into EDI messages according to the EDI standard being used. The translation is required of the data into the EDI format as well as translation of data from an EDI package into a format compatible with the in-house application.

• Prepare communications:

A network connection to various trading partners is required via either a Value-Added Network (VAN) or direct connection.

• Management and audit of the whole process:

Consistent management and auditing of the entire process must be established and maintained. The tasks include archiving transactions, inspecting error logs and ensuring security of the system.

Direct computer-to-computer communications with a trading partner requires that both firms use similar communication protocols; have the same transmission speed; have telephone lines available at the same time and have compatible computer hardware. If these conditions are not met, communication becomes difficult, if not impossible. A Value- Added Network (VAN) can solve these problems by providing services that enhance the basic telecommunication network.

Security & Privacy issues in EDI:

For the EDI to be widely accepted in commercial trading, users must be assured that the electronic system provides them with the equivalent protection against mistakes, misinterpretation and fraudulent activities that is offered by the paper and signature system to which they are accustomed. The following security issues related to EDI are discussed in view of the security offered in the present-day systems.

1. Password Guessing Attacks

Most of the present-day systems rely on passwords to gain access but, passwords are easy to guess and this makes the system vulnerable to password guessing attacks. Users are very poor in choosing good passwords. An intruder can capture a quantity X that is derived from a password in a known way.

Then the intruder can use an arbitrate amount of computing power to guess passwords, convert them in a known way and see if X is produced. The best source of selecting such passwords is the dictionary and hence it is also called as dictionary attack.

2. Cross Vulnerability

Generally, EDI systems work on a point-to-point basis or have a limited number of trading partners. The security and control features incorporated in the system are as strong as the weakest link in the EDI chain. A potential exposure or cross vulnerability due to technical limitation in one EDI system can compromise the integrity of the other dependent EDI systems. Cross-vulnerabilities exists between systems that rely on common values for user identification and authentication, such as IDs and passwords.

3. Multiple Standards

Trading partners usually work on a variety of standards such as UN/EDIFACT, ANSI X12, ODETTE etc. Problems arise when the two trading partners adhere to different standards. The security features offered in a particular standard may not be comparable to the other standard.

4. Authentication

The extensive use of open networks and distributed systems poses serious threats to the security of end-to-end communications and network components themselves. A necessary foundation for securing a network is the ability to reliably authenticate communication partners and other network entities.

Authentication is the most important of the security services, because all other security services depend upon it. Authentication relates to a scenario where a claimant has presented a principal's identity and claims to be that principal. Authentication enables a verifier to verify the identity of the principal.

5. Non-Repudiation

In EDI, non-repudiation services provide a communication user with protection against another user who later denies that some communication exchange took place. While these services do not prevent a user from repudiating another user's claim that something occurred, they provide evidence to resolve any such disagreement. In general, the evidence must be proved convincingly to the third-party arbitrator.

6. Disclosure of Information

With the introduction and use of EDI, additional security risks arise apart from those which exist for the conventional electronic information systems. The computers of a trading partner can initiate transactions inside another partner's accounting systems which are processed in a totally automatic environment. By its very nature, EDI requires that the system be continuously open to receive incoming transactions.

7. Lack of Hard Copy

With EDI, the information concerning predetermined subject matter that could be conveyed on paper is transferred as a set of electronic messages in standardized formats. The information may remain in electronic form and may never be printed. The lack of hard copy records and manual signatures creates new risks that must be carefully considered in any EDI implementation.

EDI Format:

An EDI document is comprised of data elements, segments and envelopes that are formatted according to the rules of a particular EDI standard.

When you create an EDI document, such as a purchase order, you must adhere to the strict formatting rules of the standard you are using. These rules define exactly where and how each piece of information in the document will be found. That way, when the EDI translator on the receiving computer reads an incoming EDI purchase order, it will immediately understand where to find the buyer's company name, the purchase order number, the items being ordered, the price for each item, etc. Then, that data will be fed into the receiver's order entry system in the proper internal format without requiring any manual order entry.

The graphic below shows a sample purchase order in printed form and how it would look once it's translated into the ANSI and EDIFACT EDI formats.

ANSI and EDIFACT Purchase Order:

In the EDI language, a single business document, such as a purchase order, invoice or advance ship notice, is called a "transaction set" or "message." And, a transaction set is comprised of data elements, segments and envelopes.

The data elements in an EDI Transaction Set are the individual items of information within the document.

For example, within many documents, such as the purchase order and invoice, you will find data elements such as city, state, country, item number, quantity and price.

Each data element in a transaction set is defined in the EDI Standard by the type of data it represents. For example, it would be important to distinguish numeric data from text data or calendar dates.

The data element definition will describe:

- Data type of numeric, alphanumeric, date or time
- Minimum and maximum length
- Code values, if applicable, that must be observed with a particular type of data.

EDI document transmission uses a system of three "envelopes" to house your transaction sets – Message envelope, Group envelope and Interchange envelope.

Just as paper business documents are sent in envelopes and it's possible to mail many documents in a single envelope, EDI documents are exchanged using several envelopes.

- Each transaction set is placed in its individual envelope
- A group of transaction sets – e.g., a group of purchase orders – is placed in a group envelope.
- All group envelopes being sent from one sender to one receiver are placed in an Interchange envelope.

Electronic Catalogue:

An electronic catalogue is an online publication, that is to say a graphic interface - generally an html page in which the products and services offered by a company are showed. Digital catalogues can store great quantities of items, which can be organized and classified into different categories for users to search in a more rapid and effective way.

There are different types of catalogues according to their functions. The simplest catalogues show only descriptions of the products and price lists, and do not enjoy a purchase and payment online method. Others have shopping carts, order forms and offer payment methods. The number of functions an online catalogue has will determine the price of its development.

Advantages:

1. Low costs:

Unlike conventional catalogues, these e-catalogues allow you to save money, since you will not need to spend on paper and printing. For this reason, they are perfect for small and medium-sized companies, which will have, with them, the possibility of getting into the world market.

2. Market expansion

Thanks to the possibilities that the Internet provides, people around the world will be able to gain access to your online catalogues any time. With these catalogues, different companies gain new customers, providing a faster and more comfortable service to consumers. By using these catalogues, users will be able to search for products and services, place orders, make payments by credit cards or payment portals, and clear up their doubts. In this way, sales increase considerably.

3. Interaction

Unlike printed catalogues, digital catalogues allow a direct relationship between the company and its clients. With an e-catalogue, a company can inform about its products and services to its clients, who will contact the company's representatives to clear up their doubts, to make comments or suggestions. Because of this, company will be permanently updated about the fluctuating necessities of their target.

4. Information for customers

With these catalogues, each company will be able to provide information on the products and services it offers and links to other websites for customer to get complementary information on the subjects the company's website leads with.

5. Regular update

E-catalogues content is stored on a server to which navigators from all over the world have access. They can be updated from the server in a regular, fast and easy way. What is more, the

changes made are immediately available for customers to see. In this way, catalogues show the latest about new products, prices, points of sale, new technology incorporations, etc.

Digital library:

A digital library is a collection of documents in organized electronic form, available on the Internet or on CD-ROM (compact-disk read-only memory) disks. Depending on the specific library, a user may be able to access magazine articles, books, papers, images, sound files, and videos.

On the Internet, the use of a digital library is enhanced by a broadband connection such as cable modem or DSL. Dial-up connections can be used to access plain-text documents and some documents containing images, but for complex files and those with animated video content, a downstream data speed of at least several hundred kilobits per second (Kbps) can make the user's experience less tedious, as well as more informative. Internet-based digital libraries can be updated on a daily basis. This is one of the greatest assets of this emerging technology.

On CD-ROM, the amount of data is limited to several hundred megabytes (MB) per disk, but access is generally much faster than on an Internet connection. Several CDROMs can be combined in a set, and because the disks are small, a large library can be accommodated in a reasonable physical space. The main limitation of CD-ROM is the fact that updating cannot be done as frequently as on the Internet. In addition, producing and distributing CD-ROMs involves overhead costs that are largely nonexistent in Internet-based libraries.

Some institutions have begun the task of converting classic books to electronic format for distribution on the Internet. Some files can be viewed directly in HTML format; others can be downloaded in PDF format and printed. Some publishers keep electronic files of books and produce them one unit at a time in printed and bound form on demand.

Electronic distribution of intellectual and artistic property has authors, agents, and publishers concerned about the possibility of copyright infringement. It is much easier to copy a CD-ROM, or to download an electronic book and make unauthorized copies of it, than it is to reproduce bound volumes and distribute them illegitimately. Fundamental changes in copyright law - and/or changes in the way in which the laws are enforced - are likely to occur as digital libraries expand and their use becomes more widespread.

E-Payment System

An e-payment or Electronic Payment system allows customers to pay for the services via electronic methods.

They are also known as online payment systems. Normally e-payment is done via debit, credit cards, direct bank deposits, and e-checks, other alternative e-payment methods like e-wallets, bitcoin, cryptocurrencies, bank transfers are also gaining popularity.

Types of e-payment system:

1. **Internet banking –** In this case, the payment is done by digitally transferring the funds over the internet from one bank account to another.

Some popular modes of net banking are, NEFT, RTGS, IMPS.

2. **Card payments –** Card payments are done via cards e.g. credit cards, debit cards, smart cards, stored valued cards, etc. In this mode, an electronic payment accepting device initiates the online payment transfer via card.
3. **QR payments** – QR code-enabled payments have become immensely popular. QR code stands for 'Quick Response' code, a code that contains a pixel pattern of barcodes or squares arranged in a square grid.

Each part of the code contains information. This information can be merchant's details, transaction details, etc. To make payments, one has to scan the QR code with a mobile device.

4. **Contactless payments** – Contactless payments are becoming popular for quite some time. These payments are done using RFID and NFC technology.

The customer needs to tap or hover the payment device or a card near the payment terminal, earning it a name, 'tap and go'.

5. **UPI payments** – NPCI (National Payment Corporation of India) has developed an instant real-time payment system to facilitate interbank transactions.

This payment system is titled UPI (Unified Payment Interface). Payments via UPI can be made via an app on a mobile device.

6. **Biometric payments** – Biometric payments are done via using/scanning various parts of the body, e.g. fingerprint scanning, eye scanning, facial recognition, etc.

These payments are replacing the need to enter the PIN for making transactions making these payments more accessible and easier to use.

7. **Payments are done via Wearable devices** – Wearable devices are rapidly becoming popular among customers.

These devices are connected to the customer's bank account and are used to make online payments.

An example of a wearable used for making an online payment is a smartwatch.

8. **AI-based payments** – As machine learning and Artificial Intelligence is creating a revolution all around the world, AI-based solutions are becoming more popular.

Payments based on AI such as speakers, chatbots, ML tools, deep learning tools, etc are making it easier for businesses to maintain transparency.

E-Cash:

In its simplest form, E-Cash can be defined as electronic cash. It's a way of paying for goods and services that isn't in physical cash. There are two forms of E-Cash, an online form and an offline form.

Online E-Cash:

The term E-Cash was originally used by a company called DigiCash, founded by David Chaum. DigiCash went bankrupt in 1998. The idea of E-Cash, however, lived on. It was the idea that started online transactions, as well as cryptocurrency. It worked for all types of transactions.

With online E-Cash, information regarding currency is downloaded to a hard drive. It stays there until it is transferred to another person or business online. This is the basis of cryptocurrency, in a very simple way.

Offline E-Cash:

The idea behind offline E-Cash has its roots in credit cards and debit cards. Offline E-Cash would function similarly to a debit card. Funds from a hard drive would be linked to a digitally encoded card. This card would replace paper money (like a debit card). However, the main difference here is that physical money no longer exists to begin with. With a debit card, physical money is still present, in a way.

Benefits:

- Globalization
- Sensible Transaction Fees
- Smart Card Utilization

E-Cheque:

E-Cheque is short for an electronic cheque. It's a method of payment between two parties that mimics a cheque.

It's a way to send money from a sender's current account directly to the recipient. It contains the information that a paper cheque would.

Normally, an e-cheque is processed as a payment request that the sender makes to their bank. They include the payment amount and account details of the recipient. They then authorize the

payment via an e-signature. Each bank has a different way of doing this. It could be a special code, telephone line or biometric signature.

E-cheques are governed by the same banking laws as paper cheques. Therefore, you can use e-cheque payments anywhere they're accepted. They use the same sending system as traditional bank transfers so they're much faster than their feeble paper equivalents.

Generally, businesses use e-cheques to send large payments.

Benefits of E-Cheques:

- E-Cheques Save Money
- E-Cheques Save Time
- E-Cheques Are Cheaper Than Other Payment Processors

Smart Card:

An intelligent card is a physical card with an embedded, built-in chip serving as a security token. You link to a reader either through direct physical contact or a short-term wireless networking protocol like recognition of radio frequencies or close-field communication. A microcontroller or a built-in memory chip may be the chip on a smart card.

Smart cards have been designed to be immune to manipulation and use encryption to secure in-memory information. The microcontroller-chip cards can perform processing functions on-card and can access the data in the memory of the chip. Smart cards are used for a variety of uses but are mainly used for credit cards and other payment cards.

Uses of Smart Card:

- In general, smart cards are used to make fast and safe transactions and protect personal information including credit cards and other forms of cards, company, and government identification cards, and transit fare cards.
- Electronic passports and visas are several times used for the purposes.
- Intelligent cards, for example, are mostly intended for use as ATM cards or debit, using a Lock.
- Organizations also use it for security purposes, the cards can also be used to authenticate individual sign-on users in addition to their use as multifactor automation tokens.

Advantages:

- It can provide better protection than magnetic stripe cards because microprocessors can process data directly without remote access, even memory-only smart cards can be safer since more authentication and account data are stored safely than conventional stripe cards.

- In general, smart card technology, unlike magnetic stripe cards, is free from electronic interference and magnetic fields.
- Apps and data on a card may also be updated through secure channels to prevent issuers from automatically issuing new cards when an update is required.

Credit Card:

A credit card is a thin rectangular piece of plastic or metal issued by a bank or financial services company that allows cardholders to borrow funds with which to pay for goods and services with merchants that accept cards for payment. Credit cards impose the condition that cardholders pay back the borrowed money, plus any applicable interest, as well as any additional agreed-upon charges, either in full by the billing date or over time.

Credit cards typically charge a higher annual percentage rate (APR) vs. other forms of consumer loans. Interest charges on any unpaid balances charged to the card are typically imposed approximately one month after a purchase is made, unless previous unpaid balances had been carried forward from a previous month—in which case there is no grace period granted for new charges.

Types of Credit Cards:

Most major credit cards—which include Visa, Mastercard, Discover, and American Express—are issued by banks, credit unions, or other financial institutions. Many credit cards attract customers by offering incentives such as airline miles, hotel room rentals, gift certificates to major retailers, and cash back on purchases. These types of credit cards are generally referred to as rewards credit cards.

Debit Card:

A debit card is a payment card that deducts money directly from a consumer’s checking account when it is used. Also called “check cards” or "bank cards," they can be used to buy goods or services; or to get cash from an automated teller machine or a merchant who'll let you add an extra amount onto a purchase.

A debit card is usually a rectangular piece of plastic, resembling any charge card. It is linked to the user's checking account at a bank or credit union. The amount of money that can be spent with it is tied to the account size.

In a sense, debit cards work as a cross between ATM cards and credit cards. You can use them to get cash from a bank's automated teller machine, as with the former; or you can make purchases with them, like the latter. In fact, many financial institutions are replacing their plain vanilla, single-purpose ATM cards with debit cards that are issued by major card-payment processors such as Visa or Mastercard. Such debit cards come automatically with your checking account.

Debit Card Fees:

By and large, debit cards don't cost anything extra: There are no annual membership fees or cash-advance charges.

However, they don't always allow you to escape fees completely: If you withdraw cash from an ATM that's not from—or affiliated with—the bank that issued your debit card, you may be well charged an ATM transaction fee.

What if you use the card to spend more than you have in your account? You can get hit with insufficient funds charges, similar to those incurred by a bounced paper check. If you've registered for overdraft protection, you will incur overdraft fees.

Difference Between Debit Card & Credit Card:

Parameters	Debit Card	Credit Card
Definition	Deducts money directly from your saving's bank account or your current account.	Allows you to borrow funds to pay for goods and services.
Source of funds	Your savings bank account or current account.	Credit extended to you by your card issuer. It gives you access to money you otherwise do not have (like a very short-term loan).
Spending advantage	You can only spend how much you have.	Can spend more than what you have.
Who pays for the purchase	You pay for your purchase.	The credit card company pays the vendor for your purchase. You pay the credit card company.
Bill	There is no bill or statement	You get a bill or statement each month with details of the transactions you have made.
Payment	There is no payment that needs to be made since you are using your own money.	A bill needs to be paid each month since it is being borrowed.
Fees and charges	Annual fees and PIN regeneration fees are applicable.	Credit cards have multiple fees applicable. These include joining fees, annual fees, late payment fees, and bounced cheque fees among others.

Interest	There is no interest that is charged.	Interest is charged on the outstanding amount if it hasn't been paid by the due date.
Limit to funds that can be accessed	You can access any amount up to what is currently available in your savings bank or current account.	You can use the card only up to the pre-set credit limit on your card.
Rewards	Typically, the rewards you get are minimal	Get to enjoy cashback, air miles, and reward points which can be redeemed.
Privileges	Doesn't come with many privileges.	Come with numerous dining, retail, entertainment, and travel privileges (depending on the type of card you have).
Lost card liability	Protection from theft or loss of the card is minimal.	Most cards offer 100% lost liability protection. So, you are not liable for any unauthorized transactions made.

E-Purse:

Electronic Purse (E-Purse) is the storage of cash in the form of electronic Wallet. E-Purse is a highly secure mode of payment where the amount is loaded onto a Smart Card with multiple usage capabilities. The re-usability of the card for unlimited number of loads and debits makes it convenient to end users.

The cardholder simply needs to present the E-Purse card at the time of payment, where the cashier will deduct the required amount by inserting the card in the EFTPOS terminal or simply card reader (Just like a debit card). A cardholder receipt is printed for every transaction with an updated balance, and a copy is printed for the outlet's reference (Merchant copy). The e-Purse solution helps in promoting a secure environment while enhancing the overall customer experience.

Typically, loading the E-Purse card with cash takes places at banks or authorized Loading stations while the 'debit' transactions occur at merchants' stores.

The advantages of the e-Purse are as follows:

- Payments secured in advance – avoid payment defaulters, credit card frauds etc.
- Ease of payment, the cashier counters can go cashless

• Dedicated cash points / appointed staff handling cash
• Detailed transaction reports available for reconciliation
• The card can have multiple purposes i.e. member card / ID & can double up as a loyalty solution using the same platform

Payment Gateway:

A payment gateway is a technology used by merchants to accept debit or credit card purchases from customers. The term includes not only the physical card-reading devices found in brick-and-mortar retail stores but also the payment processing portals found in online stores. However, brick-and-mortar payment gateways in recent years have begun accepting phone-based payments using QR codes or Near Field Communication (NFC) technology.

- Payment gateways are the consumer-facing interfaces used to collect payment information.
- In physical stores, payment gateways consist of the point of sale (POS) terminals used to accept credit card information by card or by smartphone.
- In online stores, payment gateways are the “checkout” portals used to enter credit card information or credentials for services such as PayPal.
- Payment gateways are distinct from payment processors, which use customer information to collect payments on behalf of the merchant.
- There are also payment gateways to facilitate payment in cryptocurrencies, such as Bitcoin.

How Payment Gateways Work:

The payment gateway is a key component of the electronic payment processing system, as it is the front-end technology responsible for sending customer information to the merchant acquiring bank, where the transaction is then processed.

Payment gateway technologies are always evolving to reflect new consumer tastes and technical capacities. In the past, terminals would accept credit cards using magnetic strips and required paper signatures from the customer. With the development of chip technologies, the signature phase could be removed in favor of a personal identification number (PIN) entered directly into the payment gateway hardware. Today, contactless purchases are also available, with many customers now using their phones as a payment device instead of plastic credit cards.

CODECHAMP
CREATED WITH ARBOK