INTRODUCTION

E-commerce stands for *Electronic Commerce* and caters to trading in goods and services through the electronic medium such as desktop computer, Laptop, mobile with the help ofInternet. It involves the use of Information and Communication Technology (ICT) and Electronic Funds Transfer (EFT) in making commerce between consumers and organizations, organization and organization or consumer and consumer. With the growing use of Internet worldwide, Electronic Data Interchange (EDI) has also increased in larger amounts and so has flourished e-commerce with the prolific virtual Internet bazaar inside the digital world which is termed as e-mail. We now have access to almost every need of our daily lives at competitive prices on the Internet. No matter one is educated or illiterate, an urban or a countryman, in India or in U.K; all you need is an Internet connection and Net Banking/Credit CardlDebit Card. In fact, some companies also do Cash On Delivery (COD). With e-commerce then, you can buy almost anything you wish for without actually touching the product physically and inquiring the salesman. From pizza to pair of shoes, we have everything on sale on the Internet available with tempting offers. The most popular websites are Snapdeal.com,
Amazon, eBay, Naaptol, Myntra, etc.

E-Commerce: Meaning

E-Commerce or Electronics Commerce is a methodology of modern business which addresses the need of business organizations, vendors and customers to reduce cost and improve the quality of goods and services while increasing the speed of delivery. E-commerce refers to paperless exchange of business information using following ways.
Electronic Data Exchange (EDI)
Electronic Mail (e-mail)
Electronic Bulletin Boards
Electronic Fund Transfer (EFT)
Other Network-based technologies
The concept of e-commerce is all about using the internet to do business better and faster.
E-commerce is the process of buying and selling over the Internet, or conducting any transaction involving the transfer of ownership or rights to use goods or services through a computer-mediated network without using any paper document.
Electronic commerce or e-commerce refers to a wide range of online business activities for products and services. It also pertains to "any form of business transaction in which the parties interact electronically rather than by physical exchanges or direct physical contact."
Business transacted through the use of computers, telephones, fax machines, barcode readers, credit cards, automated teller machines (ATM) or other electronic appliances without

the exchange of paper-based documents. It includes procurement, order entry, transaction processing, payment authentication, inventory control, and customer support.
E-commerce is subdivided into three categories: business to business or B2B (Cisco), business to consumer or B2C (Amazon), and consumer to consumer or C2C (eBay) also called electronic commerce.
E-commerce the phrase is used to describe business that is conducted over the Internet using any of the applications that rely on the Internet, such as e-mail, instant messaging, shopping carts, Web services, UDDI, FTP, and EDI, among others.
A type of business model, or segment of a larger business model, that enables a firm or individual to conduct business over an electronic network, typically the internet. Electronic commerce operates in all four of the major market segments: business to business, business to consumer, consumer to consumer and consumer to business.
Ecommerce has allowed firms to establish a market presence, or to enhance an existing market position, by providing a cheaper and more efficient distribution chain for their products or services.

Definition of E-commerce:
Sharing business information, maintaining business relationships and conducting business transactions using computers connected to telecommunication network is called E-Commerce.

Electronic Commerce-Technology & Prospect –

E-Commerce or Electronics Commerce is a methodology of modern business, which addresses the requirements of business organizations. It can be broadlydefined as the process of buying or selling of goods or services using an electronic medium such as the Internet.

Ecommerce refers to the paperless exchange of business information usingthe following ways –

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

E-Commerce Categories:
1. Electronic Markets
Present a range of offerings available in a market segment so that the purchaser can compare the prices of the offerings and make a purchase decision.
Example: Airline Booking System
2. Electronic Data Interchange (EDI)
• It provides a standardized system
• Coding trade transactions
• Communicated from one computer to another without the need for printed orders and invoices & delays & errors in paper handling.
• It is used by organizations that a make a large no. of regular transactions
Example: EDI is used in the large market chains for transactions with their suppliers
3. Internet Commerce

• It is use to advertise & make sales of wide range of goods & services.

• This application is for both business to business & business to consumer transactions.

Example: The purchase of goods that are then delivered by post or the booking of tickets

that can be picked up by the clients when they arrive at the event.
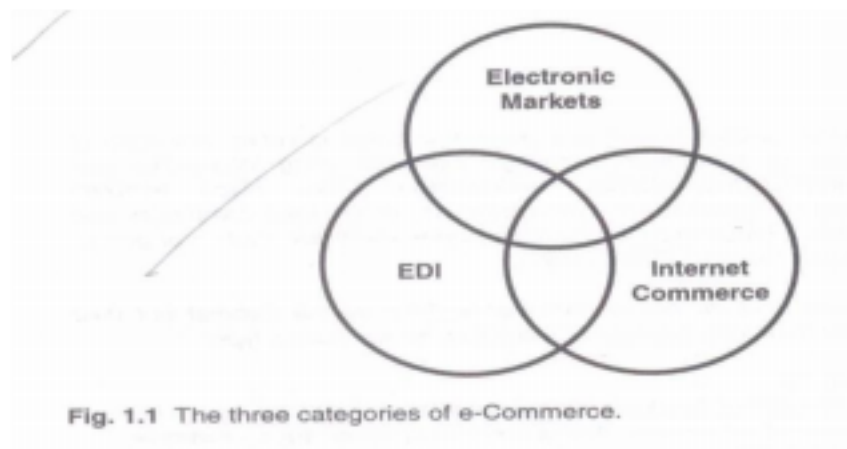

Fig. 1.1 The three categories of e-Commerce.

Advantages Of E-commerce:

➢ Buying/selling a variety of goods and services from one's home or business

➢ Anywhere, anytime transaction

➢ Can look for lowest cost for specific goods or service

➢ Businesses can reach out to worldwide clients - can establish business partnerships

➢ Order processing cost reduced

➢ Electronic funds transfer faster

➢ Supply chain management is simpler, faster, and cheaper using ecommerce

   - Can order from several vendors and monitor supplies.

   - Production schedule and inventory of an organization can be inspected by cooperating supplier who can in-turn schedule their work

Disadvantages Of E-commerce:

➢ Electronic data interchange using EDI is expensive for small businesses

➢ Security of internet is not very good - viruses, hacker attacks can paralisee-commerce

➢ Privacy of e-transactions is not guaranteed

Features

E-Commerce provides the following features

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

- **24x7 Service availability** – E-commerce automates the business of enterprises and the way they provide services to their customers. It is available anytime, anywhere.

- **Advertising / Marketing** – E-commerce increases the reach of advertising of products and services of businesses. It helps in better marketing management of products/services.

- **Improved Sales** – Using e-commerce, orders for the products can be generated anytime, anywhere without any human intervention. It gives a big boost to existing sales volumes.

- **Support** – E-commerce provides various ways to provide pre-sales and post-sales assistance to provide better services to customers.

- **Inventory Management** – E-commerce automates inventory management. Reports get generated instantly when required. Product inventory management becomes very efficient and easy to maintain.

- **Communication improvement** – E-commerce provides ways for faster, efficient, reliable communication with customers and partners.

Business models of e-commerce:

There are mainly 4 types of business models based on transaction party.

Business-to-Consumer (B2C)

In a Business-to-Consumer E-commerce environment, companies sell their online goods to consumers who are the end users of their products or services. Usually, B2C E-commerce web shops have an open access for any visitor, meaning that there is no need for a person to login in order to make any product related inquiry.
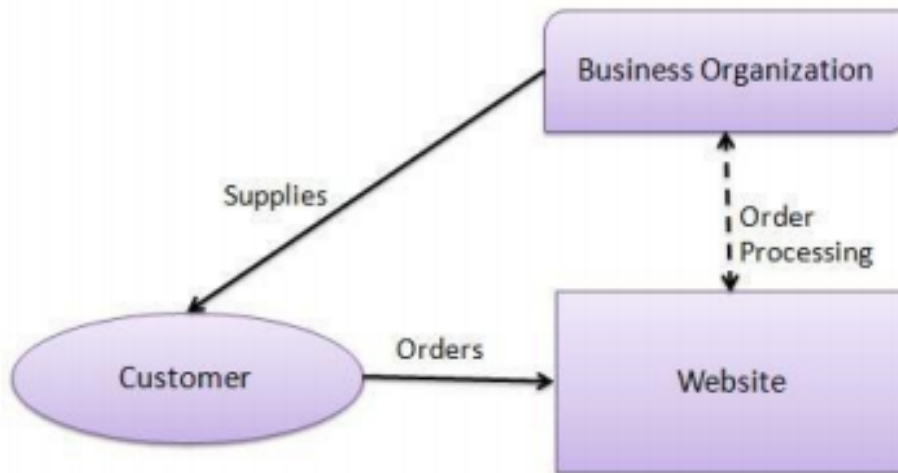
Business-to-Business (B2B)

In a Business-to-Business E-commerce environment, companies sell their online goods to other companies without being engaged in sales to consumers. In most B2B E-commerceenvironments entering the web shop will require a log in. B2B web shop usually contains customer-specific pricing, customer-specific assortments and customer-specific discounts.
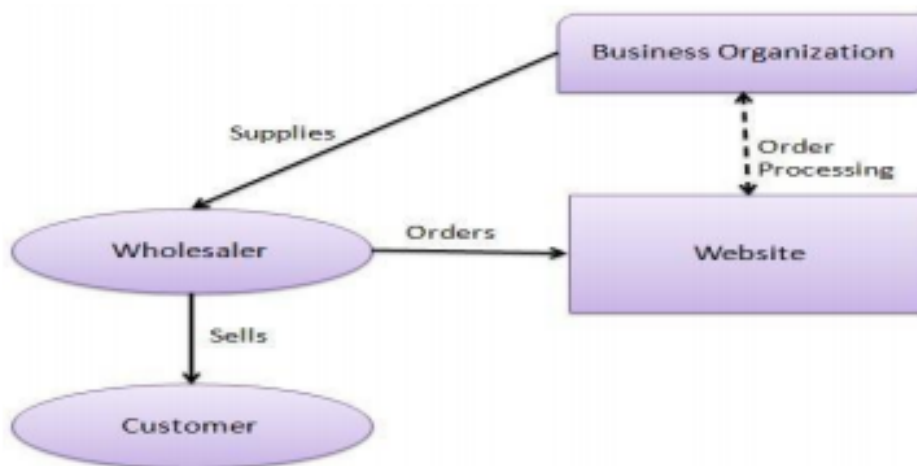

Consumer-to-Business (C2B)

In a Consumer-to-Business E-commerce environment, consumers usually post their products or services online on which companies can post their bids. A consumer reviews the bids and selects the company that meets his price expectations.
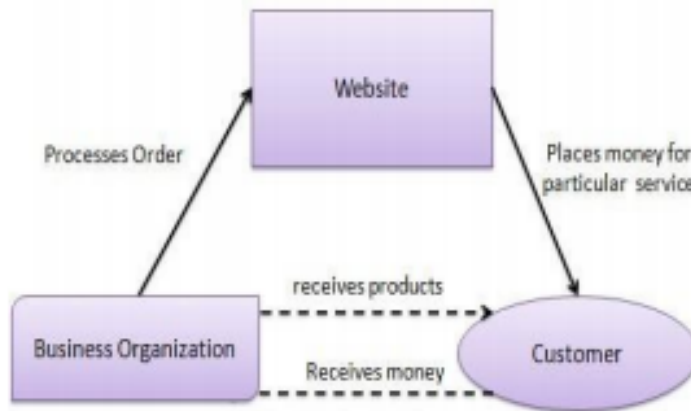
Consumer-to-Consumer (C2C)

In a Consumer-to-Consumer E-commerce environment consumers sell their online goods toother consumers. A well-known example is eBay.
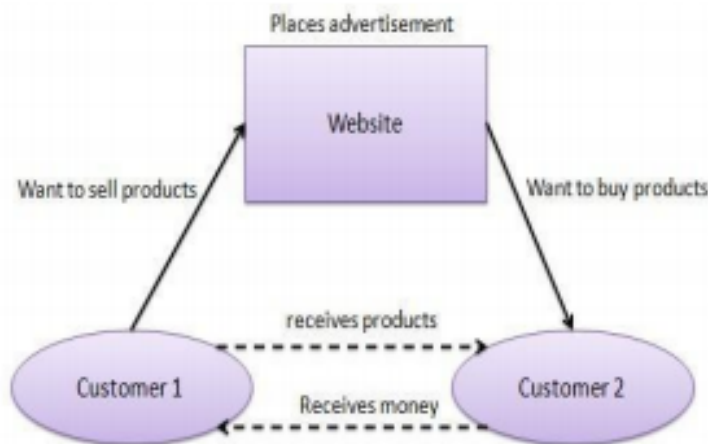

E-Governance:

E-governance is the application of information and communication technology (ICT) for delivering government services, exchange of information communication transactions, integration of various stand-alone systems and services between government-to-customer (G2C), government-to-business (G2B), government-to-government (G2G) as well as back office processes and interactions within the entire government framework.

Through e-governance, government services will be made available to citizens in a convenient, efficient and transparent manner. The three main target groups that can be distinguished in governance concepts are government, citizens and businesses/interest groups. In e-governancethere are no distinct boundaries.

Business - to - Government (B2G)

B2G model is a variant of B2B model. Such websites are used by government to trade and exchange information with various business organizations. Such websites are accredited by the government and provide a medium to businesses to submit application forms to the government.
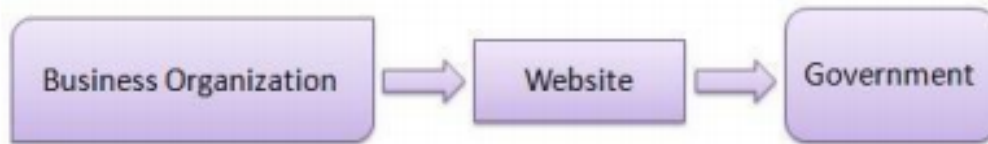
Government - to - Business (G2B)

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

Government - to - Citizen (G2C)

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

ARCHITECTURAL FRAMEWORK OF E COMMERCE

The software framework necessary for building electronic commerce applications is little understood in existing literature. In general a framework is intended to define and create tools that integrate the information found in today's closed systems and allow the development of e-commerce applications. It is important to understand that the aim of the architectural frame-work itself is not to build new database management systems, data repository, computer languages, software agent based transaction monitors, or communication protocols Rather, the architecture should focus on synthesizing the diverse resources already in place in corporations to facilitate the integration of data and software for better applications. The electronic commerce application architecture consists of six layers of functionality, or services:

(1) Applications;

(2) Brokerage services, data or transaction management;

(3) Interface, and; support layers"

(4) Secure messaging, security and electronic document Interchange;

(5) Middle ware and structured document interchange; and

(6) Network infrastructure and basic communications services

Application services	Customer- to- business Business- to- business Intra-organizational
Brokerage and data management	Order processing Payment advances-electronic cash Virtual mail
Interface layer	Interactive catalogues Directory support functions Software agents
Secure messaging	Encrypted e-mail, EDI Remote programming
Middle ware services	Structured documents (SCML,HTML) Compound documents
Network infrastructure	Wireless - cellular, radio, PCs Wire line – POTS, coaxial, fibre optic

These layers cooperate to provide a seamless transition between today's computing resources and those of tomorrow by transparently integrating information access and exchange within the context of the chosen application. As seen in table above, electronic commerce applications are based on several elegant technologies. But only when they are integrated do they provide uniquely powerful solutions.

Electronic Commerce Application Services

Three distinct classes of electronic commerce application can be distinguished: customer to business, business-to-business, and intra organization.

Consumer-to-Business Transactions

This category is also known as **marketplace transaction**. In a marketplace transaction, customers learn about products differently through\ electronic publishing, buy them differently using electronic cash and secure payment systems, and have them delivered differently. Also, how customers allocate their loyalty may also be different. In light of this, the organization itself has to adapt to a world where the traditional concepts of brand differentiation no longer hold-where "quality" has a new meaning, where "content" may not be equated to "product," Where "distribution" may not automatically mean "physical transport." In this new environment, brand equity can rapidly evaporate forcing firms to develop new ways of doing business.

Business-to Business Transactions

This category is known as **market-link transaction**. Here, businesses, governments, and other organizations depend on computer –to- computer communication as a fast, an economical, and a dependable way to conduct business' transactions. Small companies are also beginning to see the benefits of adopting the same methods. Business-to-business transactions include the use of EDI and electronic mail for purchasing goods and services, buying information and consulting services, submitting requests for proposals, and receiving proposals. The

current accounts payable process occurs through the exchange of paper documents. Each year the trading partners exchange millions of invoices, checks, purchase orders, financial reports, and other transactions. Most of the documents are in electronic form at their point of origin but are printed and key-entered at the point of receipt. The current manual process of printing, mailing is costly, time consuming, and error-prone. Given this situation and faced with the need to reduce costs, small businesses are looking toward electronic commerce as a possible saviour.

Intra-organizational Transactions

This category is known as market-driven transactions. A company becomes market driven by dispersing throughout the firm information about its customers and competitors; by spreading strategic and tactical decision making so that all units can participate; and by continuously monitoring their customer commitment by making improved customer satisfaction an ongoing objective. To maintain the relationships that are critical to delivering superior customer value, management must pay close attention to service, both before and after sales. In essence, a market-driven business develops a comprehensive understanding of its customers' business and how customers in the immediate and downstream markets perceive value.

Three major components of market-driven transactions are

· Customer orientation through product and service

· Customization; cross-functional coordination through enterprise

· Integration; and advertising, marketing, and customerservice.

Information Brokerage and Management

The information brokerage and management layer provides service integration through the notion of information brokerages, the development of which is necessitated by the increasing information resource fragmentation. The notion of information brokerage is used to represent an intermediary who provides service integration between customers and information providers, given some constraint such as a low price, fast service, or profit maximization for a client. Information brokers, for example, are rapidly becoming necessary in dealing with the voluminous amounts of information on the networks. As on-line databases migrate to consumer information utilities, consumers and information professionals will have to keep up with the knowledge, and owner-ship/of all these systems. Who's got what? How do you use it? What do they charge? Most professionals have enough trouble keeping track of files of 1 interest on one or two database services. With all the complexity associated with large numbers of on-line databases and service bureaus, if it is impossible to expect humans to do the searching. It will have to be software programs information brokers or software agents, to use the more popular term-that act on the searcher's behalf. Information brokerage does more than just searching. It addresses the issue of adding value to the information that is retrieved. For instance, in foreign exchange trading, information is retrieved about the latest currency exchange rates in order to hedge currency holdings to minimize risk and maximize profit. With multiple transactions being the norm in the real world, service integration becomes critical. Taking the same foreign exchange, further,service integration allows one to link the hedging program (offered on a time-sharing basis by a third party) with the search program (could be another vendor) that finds the currency rates from the cheapest on-line service to automatically send trades to the bank or financial services company. In effect, a personalized automated trading system can be created without having to go to any financial institution. This is just one example of how information brokerages can add value. Another aspect of the brokerage function is the support for data management and traditional transaction services. Brokerages may provide tools to accomplish more sophisticated, time-delayed updates or

future compensating transactions. These tools include software agents, distributed query generator, the distributed transaction generator, and the declarative resource constraintBasewhich describes a business's rules and-environment information. At the heart of this layer lies the work-flow scripting environment built on a software agent model that coordinates work and data flow among support services. Software agents are used to implement information brokerages. Software agents are mobile programs that have been called "healthy viruses," "digital butlers/" and "intelligent agents." Agents are encapsulations of users' instruction that perform all kinds of tasks in electronic marketplaces spread across networks. Information brokerages dispatch agents capable of information resource gathering, negotiating deals, and performing transactions. The agents are intelligent because theyhave contingency plans of action. They examine themselves and their environment and if necessary change from their original course of action to an alternative plan. For example, suppose you send an agent to an on-line store with a request to order a bouquet of roses for kshs.25 or less. If the shop offers roses starting at kshs.30, your agent can either choose a different bouquet or find a different store by consulting an on-line "Yellow Pages" directory, depending on prior instructions.

Interface and Support Services

The third layer, interface and support services, will provide interfaces for electronic commerce applications such as interactive catalogues and will sup-port directory services-functions necessary for information search and access. These two concepts are very different. Interactive catalogs are the customized interface to consumer applications such as home shopping. An interactive catalog is an extension of the paper-based catalog and incorporates additional features such as sophisticated graphics and video to make the advertising more attractive. Directories, on the other hand, operate behind the scenes and attempt to organize the enormous amount of information and transactions generated to facilitate electronic commerce. Directory services databases make data from any server appear as a local file. In the case of electronic commerce, directories would play an important role in information management functions.

The primary difference between the two is that unlike interactive catalogs, which deal with people, directory support services interact directly with soft-ware applications. For this reason, they need not have the multimedia glitter and jazz generally associated with interactive catalogs. From a computing perspective, we can expect that there will be no one common user interface that will glaze the surface of all electronic commerce applications, but graphics and object manipulation will definitely predominated. Tool developers and designers might incorporate common tools for interface building, but the shape of catalogs or directories will depend on the users' desires and functional requirements.

Secure Messaging and Structured Document Interchange Services

Electronic messaging is a critical business issue. Consider a familiar business scenario:

In **Integrated Messaging**: a group of computer services that through the use of a network send, receive, and combine messages, faxes, and large data files. Some better-known examples are electronic mail, enhanced fax, and electronic data interchange. Broadly defined, messaging is the software that sits between the network infrastructure and the clients or electronic commerce applications, masking the peculiarities of the environment. Others define messaging as a frame-work for the total implementation of portable applications, divorcing you from the architectural primitives of your system. In general, messaging products are not applications that solve problems; they are more enablers of the applications that solve problems. Messaging services offer solutions for communicating non formatted (unstructured) data-letters, memos, reports as weft as formatted (structured) data such as purchase orders, shipping notices, and invoices. Unstructured messaging consists of fax, e-mail, and form-based systems like Lotus Notes. Structured documents messaging consist of

the automated interchange of standardized and approved messages between computer applications, via telecommunication

Another **advantage** of messaging is that it is not associated with any particular communication protocol. No pre-processing is necessary, although there is an increasing need for programs to interpret the message. Messaging is well suited for both client server and peer-to-peer computing models. In distributed systems, the messages are treated as "objects" that pass between systems. Messaging is central to work-group computing that is changing the way businesses operate. The ability to access the right information at the right time across diverse work groups is achallenge. Today, with the messaging tools, people cancommunicate and work together more effectively-no matter where they are located. The main **disadvantages** of messaging are the new types of applications it enables-which appear to be more complex, especially to traditional programmers and the jungle of standards it involves. Because of the lack of standards, there is often no interoperability between different messaging vendors leading to islands of messaging. Also, security, privacy, and confidentiality through data encryption and authentication techniques are important issues that need to be resolved for ensuring the legality of the message-based transactions themselves.

Middleware Services

Middleware is a relatively new concept that emerged only recently. Users in the 1970s, when vendors, delivered homogeneous

Over the years, there developed the need to solve all the interface, translation, transformation, and interpretation problems that were driving application developers crazy.With the growth of networks, client-server technology, and all other forms of communicating between/among unlike platforms, the problems of get-ting all the pieces to work together grew from formidable to horrendous. As the cry for distributed computing spread, users demanded interaction between dissimilar systems, networks that permitted shared resources, and applications that could be accessed by multiple software programs. Middleware is the ultimate mediator between diverse software pro-grams that enables them talk to one another. Another reason for middleware is the computing shift from application centric to data centric i.e. remote data controls all of the applications in the network instead of applications controlling data.

To achieve data-centric computing, middleware services focus on three elements: transparency, transaction security and management, and distributed object management and services

Architecture of e-commerce applications

1. **Two-tier Architecture (client server)**
   Here, data reside on a server. Business logic and user interfaces reside on clients
   Drawbacks:
   - Clients sustain the main load and consequently result to be monolithic and heavy weight
   - Excessive overhead
   - Simple but unsuitable for e-commerce applications
2. **Three-tier architecture**
   It separates the business logic of the application from user interfaces and from data access. Middle tier can be further be divided
   In this case it's called **multi-tier architecture**: it is Easier to modify one component and has lower cost to deploy and maintain.
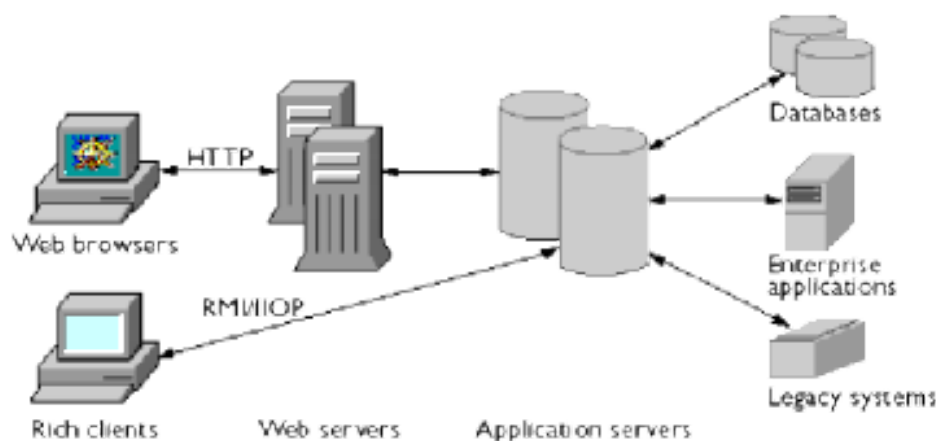
Application server

Software that runs on the middle tier of a three-tier environment. In multi-tier environments it is often a distributed and complex software

Commercial implementations exist:

Microsoft Commerce Server 2000

Sun I Planet

IBM Web Sphere Application Server

Forces behind E-commerce –

The evolution and growth of e-commerce can be attributed to a combination of technological, marketing and economic forces. Let us discuss some of the driving forces of e-commerce.

Economic Forces:

1. E-commerce enables businesses to interact with suppliers, customers and with players in the distribution channel at a lower cost.
2. The cost of installing and maintaining a website is much cheaper than owning a physical store. This motivates the growth of e-commerce.

3. E-commerce generates greater profits due to less human intervention, lower overhead cost, few clerical errors and more efficiency.

4. The cost of advertising is cheaper and provides access to global market at low cost. This is

something which encourages people engaged in business to promote their business through electronic medium.

5. Reduction in communication cost and technological infrastructure expense drive business towards e-business.

Technological Forces:

1. Technological advances have made business communication faster, easier, economical and efficient. It has enabled the business to switch over from the local market to the global market.

2. The growing popularity of cyber cafes has created a big role in attractinginternet population towards e-commerce.

3. Technological changes have given confidence to consumers to makeelectronic payments in settlement of financial obligations.

Market Forces:

1. Business organizations are able to reach international markets by usingelectronic medium for enhanced customer support and service.

2. E-commerce enables customers to make product comparison, place orders, track orders and make payments at ease. Due to convenience, customers prefer to purchase their desired goods or services over internet in the online marketplace.

3. E-commerce also allows the customers to choose and order products according to their personal and unique specifications. It paves way for mass customization.
4. The growing internet population stimulates business to switch over from anadditional business to e-business.

5. The great variety of commodities available online and reliable paymentmethods are regarded as contributors to the increase of e-business.

Traditional Commerce v/s E-Commerce

Sr. No.	Traditional Commerce	E-Commerce

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

Inter organizational E-commerce

Inter-organizational e-commerce refers to the full spectrum of e-commerce that can occur between two organizations. It is the e-commerce between businesses i.e. the businesses focus on selling to other businesses in the B2B e-commerce.

It includes companies doing business with one-another with a goal to save money on purchases that can be negotiated easily. Companies are now mutually buying and selling products and services on the internet.

Inter-organizational *e-commerce* many reduce the transaction costs, increase the availability of products and suppliers and reduce dependencies on a few trading partners and products.

Moreover, they offer many secondary services towards integrating purchasing, distribution, and inventory processes, streamlining the entire transaction process. Thus, it allows better inventory management, quality control and supply chain processes.

Business organizations are constantly buying and selling goods and services. Shops buy products in bulk from their suppliers and sell those goods in small quantities to their customers.

Manufactures buy raw material or components from their suppliers, assemble them into new products and sell them to their customers. Retailers make a great number of transactions and the whole operation of their business is dependent on their effective execution.

Other business service sector organizations such as accountants may be less dependent on a constant flow of goods but they still need supplies and they are careful to account for the transactions with their transactions.

Intra organizational *e-commerce*

When e-commerce exchange does not include numerous organizations, at that point, it is also named as Intra-business e-commerce. Intra-business e-commerce is another kind of e-commerce business plan.

It is a developing field that encourages data gathering and exchange within an organization for a quick review of complaints of common people.

Intra-business eCommerce is where parties involved with the electronic exchanges are from within a given business firm, thus, the name intra-business e-commerce.

As noted before as well, one basic distinction between eCommerce business and intra-business eCommerce is that e-commerce business includes a business organization's collaboration with its providers, wholesalers, and different business firms.

While intra-business e-commerce is a lot more extensive-term and furthermore incorporates the utilization of intranet for overseeing connections and dealings among different departments and people inside a firm.

Intra-business e-commerce is a great way for e-commerce business development. It is to a great extent because of the utilization of intra-business commerce that today it has become possible for organizations to go for flexible manufacturing.

With computer-based eCommerce application development, it is easy for the marketing people to communicate constantly with the production department and get the customized items made according to the prerequisites of the individual client.

It makes it possible for the company to glean benefits of efficient inventory and cash management, greater use of facility and machinery, efficient handling of customers' orders, and good human resource management.