

Comparison between e-commerce and e-business

The main difference between e-business and e-commerce is e-commerce is related with revenue, transactions in which money is involved. Whereas e-business may be related to internal process like inventory control processes which do not directly give you revenue for the company, Second major difference is e-business is inside the firm and e-commerce takes its place as the transactions related to the outside firms with the firms are considered. Exchange of money changes the transactions of suppliers and customers from e-business to e-commerce. Still there is one similarity that is transactions are electronic or online. Both require same skill set.

E-commerce is used more by the service provider companies and data processing services. It is used less by other industries as well as security and investment companies, ISO 9000 companies will be using e-commerce in future. E-commerce is a very useful for business it allows buying and selling online with the use of World Wide Web and internet. E-mails, faxes and telephone are also used in e-commerce. It is not only the online shopping but it includes buying and downloading on the net plus maintaining stock and continuous transactions with customers and suppliers.

E-commerce System Design

The following table shows e-commerce system architecture in which there are total 6 layers and there services for each layer.

Table 1.1 E-commerce System Design: ^[4]

LOGICAL LAYERS	SERVICES IN LAYER
Application layer	B2B,B2C,C2C
Middleman Services	Hosting services, value added nets, payment services, Certificates
Secure messaging	Encryption, EDI, Firewalls
World wide web services	HTTP, HTML, XML, OLE Software agents
Logical Network	Intranet, internet, extranet
Physical network	PSTN, LAN, Bridges, routers,

International E-commerce growth

E-commerce growth is very high; people have started doing online shopping more than traditional shopping. The following table shows worldwide e-commerce growth in different countries. .

Table 1.2: International E-commerce growth ^[4]

	International E-commerce transactions (\$)					% sales in 2004
	2000	2001	2002	2003	2004	
Total(\$billion)	657.0	1,233.6	2,231.2	3,979.7	6,789.8	8.6
North America	509.3	908.6	1,498.2	2,339.0	3,456.4	12.8
United states	488.7	864.1	1,411.3	2,187.2	3,189.0	13.8
Canada	27.4	38.0	68.0	109.6	160.3	9.2
Mexico	3.2	6.6	15.9	42.3	107.0	8.4
Asia Pacific	53.7	117.2	286.6	724.2	1,649.8	8.0
Japan	31.9	64.4	146.8	363.6	880.3	8.4
Australia	5.6	14.0	36.9	96.7	207.6	16.4
Korea	5.6	14.1	39.3	100.5	205.7	16.4
Western Europe	87.4	194.8	422.1	853.3	1,533.2	6.0
Germany	20.6	46.4	102.0	211.1	386.5	6.5
United Kingdom	17.2	38.5	83.2	165.6	288.8	7.1
France	9.9	22.1	49.1	104.8	206.4	5.0
Italy	7.2	15.6	33.8	71.4	142.4	4.3
Netherlands	6.5	14.4	30.7	59.5	98.3	9.2
Latin America	3.6	6.8	13.7	31.8	81.8	2.4

The following figures of e-commerce sales of U.S. also reveal the fact that there is growth in e-commerce.

U.S. E-commerce sales of the year 2011

There is an increase in e-commerce sales per year. As given by the Census Bureau of the Department of Commerce U.S. retail e-commerce sales considering seasonal variations but not adjusted for price changes in third quarter of 2011 was \$48.2 billion which showed increase of 1.9 percent compared to second quarter. Also there was an increase of 1.1 percent in total retail sales and its value was \$1,052.7

billion. E-commerce total retail sales also increased to 8.2 percent and ecommerce estimate increased to 13.7 percent in the same third quarter.

Table 1.3: Estimated Quarterly U.S. Retail sales : Total and E-commerce (Estimates are based on data from the monthly retail Trade Survey and administrative records)							
Quarter	Retail Sales (Millions of dollors)		Ecom merc e as % of total	Percent Charge From Prior Quarter		Percent Charge from Same Quarter A Year ago	
	Total	E-com		Total	Ecom	Total	Ecom
Adjusted							
3 rd quarter 2011(p)	1.052,736	48,244	4.6	1.1	1.9	8.2	13.7
2 nd quarter 2011(r)	1,041,406	47,352	4.5	1.1	2.6	8.1	17.2
1 st Quarter 2011	1,029,575	46,131	4.5	2.6	3.6	8.6	17.8
4 th quarter 2010	1,008,112	44,517	4.4	3.1	4.9	8.1	16.3
3 rd Quarter 2010(r)	972,770	42,418	4.4	0.9	4.9	5.9	14.9
Not Adjusted							
3 rd Quarter2011(p)	1,049,067	44,495	4.2	-1.1	0.6	8.1	13.4
2 nd Quarter 2011(r)	1,061,124	44,224	4.2	10.0	1.2	8.4	17.2
1 st Quarter 2011	965,068	43,713	4.5	-8.3	-17.9	8.6	17.6
4 th Quarter 2010	1,051,917	53,225	5.1	8.4	35.7	7.8	16.5
3 rd Quarter 2010	970,155	39,230	4.0	-0.9	4.0	5.7	14.9

An E-commerce sale of third quarter of 2011 was 4.6 percent of the total sales. Whereas U.S. e-commerce retail total sales for not adjusted basis was \$44.5 billion. There was an increase of 13.4 percent estimate and 8.1 percent total retail sales from the third quarter of 2010 to 2011. An E-commerce sale in third quarter was 4.2 percent compared to total sales.

During e-commerce sales an order is placed online, terms and conditions are fixed on the net and negotiations are done on the net. Network can be internet; Electronic data interchange network, e-mail or any other online system while the payment is not necessarily online.

Business, technology and society model of e-commerce

The following table shows how e-commerce affects business, technology and society in different countries.

<p>Business</p> <ul style="list-style-type: none">• In retailing business consumer e-commerce percentage is increasing.• The online shopping rate is increasing.• New business strategies and internet use has increased the profits of online sites.• Many businesses have adopted online businesses. This includes books, music and air travel In addition eight businesses have changed into online business. These are television, telephones, jewelry, hotels, movies, bill payments, software and real estate• The main areas of e-commerce growth especially are travel, information clearing houses, entertainment, retailing, appliances and home furnishings.• The sites like Amazon, eBay and proposals developed by big industries are used by Small businesses and entrepreneurs.• Incorporated Policies with multiple channels introduced by J.C.Penny, Sears, L.L. Bean and Wal-Mart are growing due to internet.• Supply chain transactions in B2B and joint commerce is increasing; its growth is above \$1.5 trillion mark
<p>Technology</p> <ul style="list-style-type: none">• There are changes in the technology; Wireless Internet connections like Wi-Fi, Wi-max and 3G telephone are replacing the old technology.• New technology was developed for broadcasting for radio and user generated commentary.• Use of internet broadband became popular in houses and businesses. Its costs were also reduced.• Use of RSS (Really Simple Syndication) increased as a user controlled information distribution compared to e-mail in some applications.• Prices of computer and network peripherals lowered.• B2B transactions have increased due to .net and internet services.
<p>SOCIETY</p> <ul style="list-style-type: none">• There is increase in Blogs, wikis and social networks as a separate publishing section.• Newspapers and other traditional media became online with the use of interactive models.• With the use of e-commerce inconsistencies in copyright management and control are increasing.• Half of the internet users have joined social media group on internet.• Internet sales taxation was accepted by large online merchants.• Problems in content management and regulation controls increased.• Internet communications was inspected more than before.• Commercial and governmental privacy were taken care of more.• Problems such as internet fraud and abuse cases increased.

- First Amendment rights of free speech and association on the internet are tested
- Free speech spam is growing with the introduction of new technology.
- Marketers are adopting personal privacy on the web more and more.

Current Users of E-commerce in India

1) TATA MOTORS

E-commerce is used by TATA Motors for the management of Supply Chain Management on the Internet. This company is the largest commercial motor vehicle manufacturer from 1999. Company Group Tata Technologies Limited is also creating connections with backend ERP systems. The company has internet connections currently for three manufacturing units Pune, Jamshedpur and Lucknow and also head quarters in Mumbai. This company is also planning to make all its dealer contacts online. At the same time it also wants to bring passenger cars and commercial vehicle dealers online. It is also planning to create payment system in collaboration with banks.

2) Hindustan Lever

This company has a network of suppliers and 7500 distributors. Soon top retailers also will be added by the company in a network. Company plans to use internet for its transactions. E-tailing opportunities will be used by companies for its products and for bigger universal products. Its distribution system covers two million retail outlets and also company has plans to establish B2B and B2C businesses in the likely areas.

3) Financial Institutions, Banks

ICICI bank has online services to operate the bank account online. Some websites offer trade transactions online but the related tasks you have to do physically. ICICI bank offers online account to credit the shares and debit the money for completing the transaction. Electronic payment system is also provided by the bank. Using this system the biller can give his bills and customer can pay online.

Hence the banks are related with the B2B and B2C markets.

Brief History of e-commerce:

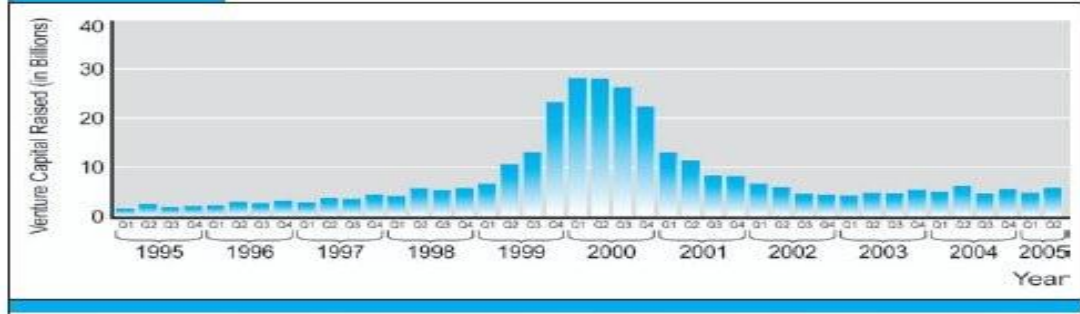
Even if exact date and time of first use of e-commerce is not known. There are many businesses which used e-commerce. In late 1970's Baxter Healthcare, a

pharmaceutical firm used e-commerce by using a telephone modem for reordering supplies from Baxter. This system was converted into PC based order entry system. This system was used to a large extent before the invention of internet. Electronic Data Interchange (EDI).

E-commerce trend started in the year 1990. The beginning period was of upgrading and growth. Internet was first used in 1995 for advertising products. E-commerce is a current trend of late 1990's and it has small messy history. The beginning of e-commerce was of growth and upgrading. In the year 1995, web was used for advertising of products. E-commerce is a recent phenomenon of late 1990's, it also has brief chaotic history. The early years were of growth and modernization. In 1995, web was first used to advertise products. Stock value of dot.com companies reached the highest and started decreasing in March 2000 due to this growth of e-commerce and web decreased. Actually, it was expected that e-commerce and web should be reevaluated in these days. But then the growth started improving strongly in the next years till today.

Many new dot companies from United States had highest financial capital of \$125 billion. The following graph shows the capital investment by different firms in the period 1995-2005 from which 80% were internet related industries. Investment in dot companies was highest as compared to other industries. Even if total investment in dot com companies and internet is lowered the rate of investment has doubled in 2005 in comparison with the year 1995.

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SOURCE: Based on data from MoneyTree™ Survey, 2005.

Graph 1.1: Quarterly amounts rose by Venture Backed Firms

In the year 2004 dot com IPOs were the toppers in business where as Google's IPO's stood second in the business and they earned \$1.67 billion. Price of Google shares increased from \$85 to \$300. In 2004-2005 shares of retailing companies had increase in share prizes by 80% compared to the year 2003.

It was concluded by the computer scientists and information technologists that the growth in E-commerce was due to the introduction of set of information Technologies which were developed in last forty years starting with internet up to the PC and till local area network. The objective of it was to provide a large amount of information to the people from different libraries, government and scientific institutes available on the websites which will be easy to obtain. Technologists viewed internet as a free and self controlled medium to access which will not be owned by any nation. Economists were of the opinion that ecommerce will the means to provide the business information of price, product and quality equally to form a perfect market which will be having global scope and customers can access worldwide information. Due to worldwide information access the search rates for prices, product information, settlement of payment and order execution would reduce. Search programs will be used for searching the required prices and quality in fewer prices while businesses will not require searching for customers and advertising the product. At the same time there will not be the requirement of

wholesalers and distributors reducing the price of the product. Manufacturers would be directly in contact with customers. The worldwide tough competition, reduction in intermediaries and lower transaction costs would in turn reduce product bands and the profits due to it and due to the geography or due to special access to factors of production. Prices will reduce as it would include only the cost of production plus market rate and payment industrial effort which will be reduced later. Competitive advantages only for one competitor will not be there and hence the market would be called friction free commerce. This came as a dream to the entrepreneurs worldwide. Marketers and customers benefited due to inexpensive, universal and powerful market. The marketers also can divide the market depending on the needs of the customers, prices and brands required and the related sponsorships. Marketers who in the market earlier would be benefited more. This would create a brand name, expanded customer base and would create a new channel and a website for the interface and the customers knowing switching prices. New technology for the online businesses would create informative and community features which will be difficult to copy. Once the user gets familiar with the interfaces and characteristics, he will not change to other merchandise easily. A website with different technologies and techniques will be created which will reach many customers increasing the value of the website. The firm will charge the fees to the customers for the used technology and will be profited more than other competitors.

WHY STUDY E-COMMERCE?

Uses of e-commerce

Application of digital technologies to business processes within the firm is called **E-business**. These technologies have deep impact on commerce more than ecommerce. E-commerce technology is powerful than any other technology which has left economic effect on the world. The evolving internet and other technologies will shape up 21st century.

The traditional process of marketing and sales was a lengthy process of selling and advertising. Branding required long term product observation of the customers. Selling was done in well insulated channels in a traditional manner

limited by social and geographical boundaries unable to search worldwide for the required price and quality. The information about the product was not available worldwide creating profitable information asymmetries. It was difficult to change the national or regional prices in traditional retailing. One national price was a norm and different regions had different prices for the same product. E-commerce has challenged this traditional thinking.

Seven Unique Features of E-Commerce Technology

1) Ubiquity

It is available everywhere at any time. The result is called a **market space**—a marketplace extended beyond traditional boundaries and removed from a temporal and geographic location. It saves transaction cost and time. In traditional commerce, you have to visit physically to a market place in contrast you don't have to visit anywhere for e-commerce market.

2) Global Reach

Due to e-commerce technology commercial transactions have crossed all the cultural and national boundaries. The potential market size of e-commerce merchants is roughly equal to the world's online population (over 1 billion in 2005). Whereas traditional commerce can not cross national boundaries.

3) Universal Standards

Technical standard for conducting internet and hence e-commerce has become universal. They are shared by all the nations. While traditional technologies differ from one nation to the next. For the merchants market entry cost is same all over the world and it is lowered due to internet. For the customers price and product search is lowered. The prices are constant throughout the world and can be searched from any part of the world.

4) Richness

Information of any product is available easily. Traditional markets, national sales forces and the retail stores are able to provide the prompt audio and visual information very easily which makes it a powerful selling and commercial environment. The messages are spread evenly not depending on the distance. The

richness of the message is spread evenly i.e. complexity and the content of the message are same throughout the world.

5) Interactivity

It allows two way communications between merchant and customer, No other commercial technology of the Twentieth century except telephone has this feature. E-commerce can be used for both giving and receiving the information from the net using different websites.

6) Information Density

The information available on the web is more accurate and reaches the person fast in a timely manner. The information is complete and is available to consumers, merchants and participants. In addition the information need not be stored and processed; saving the storage, processing and communication cost. Consumer can easily find all the cost in the world.

7) Personalization/Customization

E-commerce technologies allow personalization by targeting their marketing message to a specific person by adjusting a message to person's name, interests, and past purchases. The technology also permits customization by changing the product according to the user's requirement. A lot of information about the customer's requirement, its past purchases can be stored due to information density.

Scope of e-commerce:

Parts of e-commerce

Basically e-commerce means commercial transactions on the net. Depending on the type of commercial transaction e-commerce is classified into different parts □
Electronic Markets:

It is mainly about searching for a particular product or service. Airline Reservation system is the biggest example of this type.

- Electronic Data Interchange (EDI):

EDI is exchange of all the commercial documents between different commercial organizations. It is widely used by the retailers and vehicle assemblers when trading with their suppliers.

- **Internet Commerce:**

It is generally used for once off trading transactions. It is used for advertising goods and services. It is used both for B2B and B2C transactions.

E-commerce and the trade cycle:

E-commerce can be applied to all phases of trade cycle. The values trade cycle depends upon:

- Type of the organization
- The frequency of transactions between the partners who want to exchange the goods
- The type of goods or services getting exchanged The trade cycle supports following activities:
- **Presale activity- Search & negotiate Phase** - Searching the goods or services as per the requirement and agreeing the terms of trade
- **Execution and settlement Phase** – Execution phase includes placing the order and delivery of the product while settlement phase includes presenting invoice and making payment
- **After sales activities** - such as warrantee and service etc

There are various versions of the trade cycles depending upon the online factors above and for many transactions, further complicated by the complexities of international trade. Three general trade cycles are as follows:

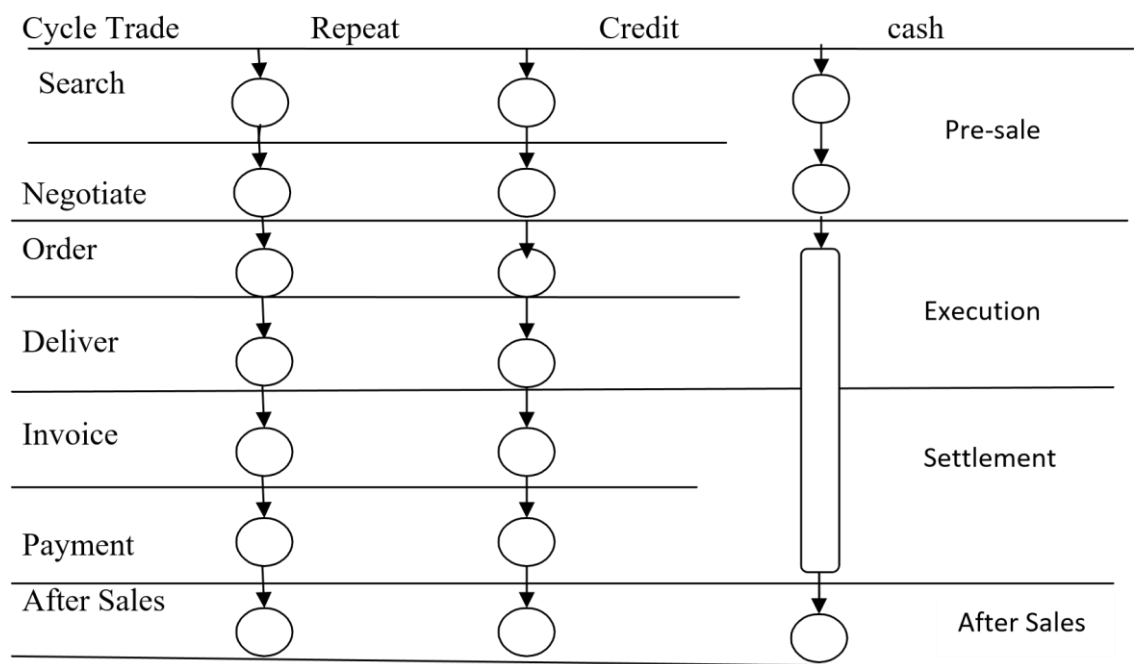
- **Repeat trade cycle** – This are regular, repeat transactions between commercial trading partners for e.g. transactions between supplier and manufacturers. If the supplier supplies goods many times to the same manufacturer, these transactions are regular and repeat transactions.
- **Credit transactions** –These are irregular transactions between commercial trading partners where execution and settlement are separated. In this case the goods are

taken on credit and the payment is done later which separates execution and settlement phase.

- Cash transactions – These are irregular transactions in once off trading relationships where execution and settlement are normally combined. In cash transactions order, delivery and payment are combined i.e. carried out at the same time.

The trade cycle of these three categories are shown below –

Figure 1.2: Repeat, credit and cash Trade Cycle



Electronic Market:

It is a type of electronic market which has internal organizational information system which allows buyers and sellers to exchange information about prices and product. It is associated with the search phase of trade cycle. When the same product is sold by different organizations it becomes difficult to choose a product from a particular company. The benefits of e-market are it reduces the searching cost and increases the variety of products; Increasing the efficiency of the market.

It also reduces the profit possibility of the suppliers and sellers.

Electronic market and electronic information is used for getting product and price information which is used in product exchanges, financial markets and in air line industry for booking air tickets. The search for the available ticket with the required date and time is done for the customer. If he seat is found the ticket is given and payment is done which is nothing but execution and settlement phase. If the ticket availability is not there then the process may stop after search phase only and the execution and settlement phase is not carried out. It may also be used by the intermediaries.

Travel agents are using Airline booking System for booking the air tickets. Malone predicted that the overall effect of this technology is to increase the proportion of economic activity synchronized by markets. It is observed that there is growth and use of market has increased in already working areas of ecommerce but in new areas there is no improvement.

Advantages of Electronic Commerce:

- The messages and important information can reach the world in no time which makes the process effective and cheap for suppliers and customers.
- An online store works 24 hours a day, 7 days a week, 365 days a year or via an EDI system.
- The cost required to set up an office is very high in comparison with the cost of setting a website which in turn can be integrated with less efforts.
- A website can be easily modified for the new products in comparison with catalogues and brochures.
- New market segments can be explored with the use of internet.
- Business processes are automated and with increased efficiencies as there is no need to re-key in orders into order entry system.
- Easy search of required quality product and wide choice and no wastage of time.
- Easy Buying/selling of items with the use of internet using a computer
- Use of financial and legal services, medical advice etc. from proper portals.

- No need of personal visit and searching, large variety of goods accessible easily without spending time and money

The major advantages to the business:

- A website helps the business to reach out to worldwide customers at a very low cost.
- As all the documents are exchanged electronically, the business speed is increased with the reduction in order processing cost as manual data entry is greatly reduced.
- Reduction in transaction time reduces inventory size
- Fast funds transfer
- Use of search engines and e-mail correspondence makes it easy to find large number of potential business partners.
- As manufacturers can directly contact retailers, middleman such as retailer can be eliminated. E.g. Dell computers sells PCs in USA directly to customers) to reduce cost and delays.

Disadvantages of Electronic Commerce:

- One psychological barrier is that customers can not touch and feel the product as the selling is online. This is removed when the customer becomes familiar.
- People don't socialize much as people do not have to go to the market all the work is done on the computer with e-commerce and computer based technologies.
- Many companies do not know how to set up online store because there is a fear of dissatisfied and annoyed customers as the customers do not know whom to contact. In addition online stores do not exist for very long.
- Use of computer systems is not safe as money transactions are intercepted by hackers. Both the customers and companies are harmed.
- The use of internet is limited with only young and highly educated man using internet. Women and elderly people do not use internet and hence can not be the customers for the internet based business.
- In India internet is not available in small villages.

- Payment by credit card is not trusted. Customers do not trust vendors to give their credit card number as the vendors are online and are unknown to the customer.
- For the increase of B2B e-commerce, EDI standards need to be updated. Small businesses will not be able to follow these standards.
- Social contacts by the customers will be totally stopped as the customers need not have to go to the market. Testing the product by touch and feel will no more exist resulting in not knowing the quality of the item.
- One of the problems is of security on the net. Credit card transactions are not safe, hackers can steal the credit card number if care is not taken.
- Hackers attack shopping portals. One of these problems is rejection of service on the portal. This happens because a large number of enquiries are made on the portal, which makes it inaccessible to the legitimate customers.
- Portals have to be protected from viral attacks and other electronic damage and surveillance by special security system.

Functions of Electronic Commerce:

The four functions of e-commerce are:

Communication 2) Process management 3) Service management 4) Transaction capabilities process effective and cheap for suppliers and customers. Figure 1.3: Four main Functions of E-commerce

	This is related with applying technology to improve the quality of service .E.g. Federal Express website. It allows customers to follow shipment and schedule picks up 24 hours a day with a world wide network automatically without taking the help of service representative. Customer service is improved because of sites
Communication Functions	It is related with exchange of information or documents for carrying out business transactions. E.g.E-mail
Process Management Function	It includes computerization and improvement of business processes. e.g. Connecting two computers in networking to share and transfer data instead of manually copying information from one computer to another.

Service Management Function	
Transaction Capabilities	It allows buying and selling on the internet or allows to carry out any online service E.g. Retail website of Amazon.com and REI

Electronic Commerce Systems:

- Online point of sale (POS) transaction processing
- Web retailing and wholesaling
- EDI (Electronic Data Interchange)
- EFT (Electronic Fund Transfer)
- Electronic Banking
- Interactive marketing
- SCM (Supply Chain Management)

E-commerce Technologies Used:

- Electronic Data Interchange (EDI)
Computer to computer exchange of structured information in a standard electronic format
- Bar Codes
For automatic product identification by the computer Bar codes and bar code scanners are used as a direct data entry device. The bar code scanner reads bar information. It is made up of bars of different widths and spacing that gives alphabetic and numeric information about products or addresses. The bar code information is converted to electronic form which is then processed by a computer. Bar codes are scanned with hand held rod or a built in scanner. There are different types of barcodes in use.
- E-mails
- Digital form of messages which are written on computer and sent and received in the digital form on the internet using email id of the person.
- Internet
- World wide web
- Product data exchange

- Electronic forms
- A digital, analogue image appearing on the computer screen which looks exactly like a form.

Mobile commerce or m-commerce: This model is concerned with the wireless digital devices to carry out transactions using web. M-commerce uses wireless networks to connect cell phones and handheld devices such as blackberries. These networks also connect personal computers. Mobile consumers after connection can conduct transactions including stock trades, in-store price comparisons, banking, travel reservations, etc. M-commerce is mostly used in Japan and Europe (especially in Scandinavia), than in United States where cell phones are used more. Thus far, m-commerce is used most widely in Japan and Europe, especially in Scandinavia, where cell phones are more common than in the United States. But it is expected that m-commerce will grow rapidly in United States within next five years

The barriers to E-commerce

CommerceNet20 (a non-profit consortium of business, technology, academic and government leaders who develop and implement e-commerce technology and business practice) have conducted an annual survey of visitors to the Commerce Net website, to identify the barriers to e-commerce. They are as follows –

- ***Internet infrastructure*** is concerned with problems such as accessibility and quality of the Internet in terms of speed and consistency. This barrier is a major fear and should be looked carefully by SMEs and B-to-C organizations.
- ***Technology infrastructure*** It is related with the problems in system standardization and applications in case of larger organizations which should be implemented such as value chain integration and e-supply chain management.
- ***Security*** is the main barrier of e-commerce Identified as *Security and Encryption; Trust and Risk; User Authentication and Lack of Public Key Infrastructure; Fraud and Risk of Loss*. It is a main problem for companies in the B-to-C e-commerce

retail sector, since it shows the worries and views of users and probable customers doing financial transactions on-line.

- **Issues of *organizational structure and culture*** are most significant for large organizations that have to deal with change management issues. For e.g. there is a feeling that a lot of work needs to be done for designing correct organizational structure and corporate culture and will enhance the benefits of widespread ecommerce applications.
- ***Commercial infrastructure*** This is related with the problems of taxation laws, international trade agreements and other legal agreements. These problems are related to all kinds of online trading transactions. Hence is a barrier to all kinds of trading transactions.
- ***Lack of qualified personnel*** This is a barrier which should implemented in house and third party e-commerce systems. In case of SME's this is a main problem which should be looked after as they are not having enough resources to retain their own staff which will develop complicated technology infrastructure.
- ***Lack of proven business models*** is one barrier which results in insecurity and poor performance dot coms on the world's stock exchanges in late 1999 and early 2000 after the shaky heights to which dot com companies rose in 1998–9.
- ***Interoperability of systems*** is a major barriers for large US-based B-to-B corporations. This is a problem of implementing and making the systems compatible with the existing legacy systems with new e-commerce applications and also relating resources within organizations.

E-commerce Implementation

E-commerce implementation is divided into two parts:

1) Technical Implementation:

Technological implementation is dependant upon the factors such as -1) objective of business 2) requirements of the business 3) selected technologies for the business.

Technical implementation depends upon business objectives, requirements and the technologies which are selected. Different E-commerce systems are combined together instead of designing them newly.

- The end users operating the system – Here the problem of computer literacy comes into picture as new system requires many computer literate people.
- The functionality of the system should be according to the users needs. It should not be like how organization thinks.
- The problem with the e-commerce users is they can not be interviewed just like the traditional IS development.
- ***The back office systems:*** Fast working of the e-commerce systems should be matched with the requirements for this it is necessary to integrate the front end of the IS systems.
- Each transaction stage of the life cycle should be properly evaluated to ensure that all the requirements should be included.

2) Business implementation

For business implementation it is required to create an e-shop and for this the organization needs to –

- To set up new business infrastructure for supporting the new e-commerce technology.
- This new technology should be provided to the intended users.

E-commerce evaluation:

Care should be taken to evaluate the systems for the users which are outside the company.

Proper evaluation of all the systems should be done for the users which are outside the company including the internal stakeholders. A system should be capable of knowing customer reaction. In this case those customers who give a system before completing the transaction are inaccessible. Evaluation process has three levels -

Improve it: No proper method exists for this only testing of the system can decide if any changes are required in the system and whether the site can be improved.

Revise it: The planning can be modified. The planning and implementation can be done on the basis of results of previous use of e-commerce.

Update it: Changes in the company policy, competitive position or evolving of new technologies of e-commerce can update the planning.

Security of E-Commerce

PCI Data Security Standard

E-commerce business is conducted over internet; because of this the business suffers from the virus attacks. Hackers may change or steal the files while the important files are passed over the internet. E-commerce websites should be protected according to the PCI Data Security Standard (PCI DSS) and best methods for information security. Visa reports that statistical document is divided into physical and web stores in 2007.

. Visa has given some indications of the security violation.

- Unexpected or unknown transaction on the network from the card holder
- Unexpected IP addresses on the wireless network
- Unexpected or unknown transactions between store and headquarter location.
- Presence of unexpected services and applications configured to launch automatically on system boot
- Anti virus program is disabled or is not running properly without any reason. Failed login attempts in system authentication and event logs
- Card holder suffers from unknown third party connections without prior intimation.
- In web server event logs , SQL injection attempts are seen
- Unexpected event logs are detected
- Presence of .zip, .rar, .tar files type of compressed files containing card holder data.

A compromise may be detected by the merchant, a service provider or Visa common point of purchase fraud investigations. The card organizations (Visa®, MasterCard®, etc.) expect merchants to follow PCI DSS standard. The merchants not following the standard are charged fines, loss of tiered interchange data, legal liability and also the problem of reputation and business loss. If PSI DSS standards

are not followed they are charged fines up to \$500,000 by Visa, in addition will have to pay for fraud losses from compromised card account details. Recovery charges may exceed PCI non-compliance fines.

1 To overcome these problems there are certain Do's and Don'ts which need to be followed for payment card security.

DO's and Don'ts for the payment card security are given below -

1. Follow the PCI Data Security Standard (DSS).
2. Protection of the card data should be done in storage and transmission. Card numbers should not be disclosed to others (DSS requirement 3.4). For security of storage methods like strong encryption, truncation, and hashing should be used. During public network transmission strong encryption should be used to safeguard card data (requirement 4.1). Card data should be regularly encrypted while transmission across internal networks between web application and database servers. Merchants having limited security resources and expertise should do outsourcing of processing, transmission, and storage of cardholder data from PCI compliant service provider which will reduce the security risk for the data. But this will not reduce the need of being alert regarding card holder data security.
3. Do not store the data which is banned. For further transactions E-commerce merchants allow customers to store their card numbers. PCI standard, does not allow to store CVV2 data (the three digit number on the back of a card). Hackers may use CVV2 data along with the card numbers to carry out fraud transactions. CVV2 is used initially for authorization request Per Visa, to set-up a recurring transaction for an Internet or telephone order. However, for the further transactions CVV2 is not required.
4. A check should be made on the data flow for the appropriate controls whether they are placed and where they are placed whenever card data is stored, processed and transmitted. This is a critical DSS standard for keeping the data secure.
5. Network security should be of world class. Routers and firewall configurations are used for demilitarized zone networks. World class network security should be applied. DSS uses firewall and router configurations for network security in

demilitarized zone networks, databases on an internal network, etc. To isolate card data always network segmentation should be used.

6. Network systems should be strong enough to withstand the attacks. Operating system and commercial applications should be configured to meet industry standard of security. Antivirus and malware should be used with appropriate options to protect the data.
7. Software development should be done according to the industry standard. Security awareness program should be arranged for the developers. Developers who can do secured coding are only appointed. Include security tools while developing software.
8. Web applications are utilized. DSS requirement 6.6 has two options 1) use of application firewalls 2) conduction of code reviews. Manual review of application source code
 - Accurate use of scanning tools for automatic source code analyzer tools.
 - Weaknesses of the manual web application security.
 - Proper use of automated web application security weaknesses scanning tools The list can be adjusted according to the requirement of the security above and beyond minimum DSS requirements. E.g. conduction of code reviews and use of an application weakness scanning tool
9. Execution of penetration testing.
10. Carrying out network scans
11. Utilize secure payment applications
12. Analyze the list of non-compliant payment applications.
13. Detective control should be carried out. For detecting attacks there should be a layered monitoring program and to provide forensic information for incident response. The program should be able to detect the incident in earlier stages to stop further data compromise. The damage will be high if the incident is not detected for years. Detective controls are - centralized audit logs, log monitoring, file integrity monitoring and intrusion detection software.

14. New threats and weaknesses should be monitored. New weaknesses are detected daily.
15. Care should be taken while finding service providers. Liable merchants are only considered when card data is shared with the service provider. Therefore it is necessary to find the security control based on the service provided. If the organization name is not listed on Visa's List of Compliant Service Providers, then ask to review a PCI Report on Compliance. If PCI report is not available then provider should be chosen depending on the PCI requirements and security controls and the one which is associated with their custody of card data.
16. Evaluate custom application functionality by considering the evaluation of card applications. Care should be taken to access authorized data depending on the business needs.
17. Fraud detection methods should be implemented. Access should be denied for the card with fraud. Normal business activities create a pattern with its behavior. Normal business activities have an expected pattern of behavior. Alert message should be given whenever fraud is detected. For example, if authorized user accesses twice the normal amount of data then alert message is flashed.
18. Incident response program should be utilized.
19. Find the threats and weaknesses and identify emerging threats and weaknesses to reduce the risk as appropriate.

E-commerce security needs technology and variety of disciplines. If the organization is lacking specific skill set then qualified persons should be hired or choose a service provider with the required qualities. Payment cards are attacked by organized crime. Hence do not disclose card data to increase the risk.

2 Network Security with the use of Firewall

Firewall is a device used for security of the organization's data on the network from unauthorized external access. It links intranet with internet and filters the traffic and provides security by not allowing the harmful programs to enter the internet. Packet filtering Firewalls are the simple firewalls which are used in some networks they filter

the data according to the specified criteria such as – - Type of access such as email, ftp, telnet as determined by TCP port number

- Traffic path
- IP address of source or destination
- Time of day

3 Data Encryption with Secret Keys

Data which is passed from the public network may be accessed by unauthorized person. In encryption process the data is modified in a specific format so that it is not accessed and read by unauthorized person. Similarly data stored in databases should be mixed up. Method of changing data from readable (intelligible) to unreadable (unintelligible) format is known as encryption. Method of converting the data from unreadable format to readable format is known as decryption. The data in the readable format is called as plain text and the data in the unreadable format is called cipher text.

4 Digital Signature

1. It is used to ensure that message received from sender is not changed it is the original message sent by the sender only.
2. Digital Signature should be attached to the message sent by sender using private key.
3. The hashed message in Digital Signature system is decrypted using sender's public key.

Certificate Authority for Digital Signature

- As the sender's public key decrypts the hashed message, it should be certified as belonging to the sender by some independent authority.
- Public keys need certificate of authenticity, as they are used to verify the digital signature.
- Database of public keys of the organizations are used in e-commerce transactions to verify the digital signature.

- Business partners can send request to certifying authority for the authentication of public keys. Certifying Authority grants request and charges a fee for his services.

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Supply Chain Management

1. QR and JIT address only part of the overall picture
2. Supply Chain Management (SCM) is also called “extending”, which means integrating the internal and external partners on the supply and process chains to get raw materials to the manufacturer and finished products to the consumer
3. It includes following functions

Supplier management: The goal is to reduce the number of suppliers and get them to partners

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Inventory management: The goal is to shorten the order-ship-bill cycle. When a majority of partners are electronically linked, information faxed or mailed

Distribution management: The goal is to move documents (accurate data) related to shipping

Channel management: The goal is to quickly disseminate information about changing operational conditions (technical, product, and pricing information) to trading partners

Payment management: The goal is to link company and the suppliers and distributors so that payments can be sent and received electronically

Financial management: The goal is to enable global companies to manage their money in various foreign exchange accounts

Sales force productivity: The goal is to improve the communication flow of information among the sales, customer & production functions

In sum, the supply chain management process increasingly depends on electronic markets

Work group Collaboration Applications:

1. A internetwork that enables easy and inexpensive connection of various organizational segments
2. It is to improve communications and information sharing and to gather and analyze competitive data in real-time
3. Videoconferencing, document sharing and multimedia e-mail, are expected to reduce travel and encourage telecommuting
4. Improves the distribution channel for documents and records to suppliers, collaborators and distributors