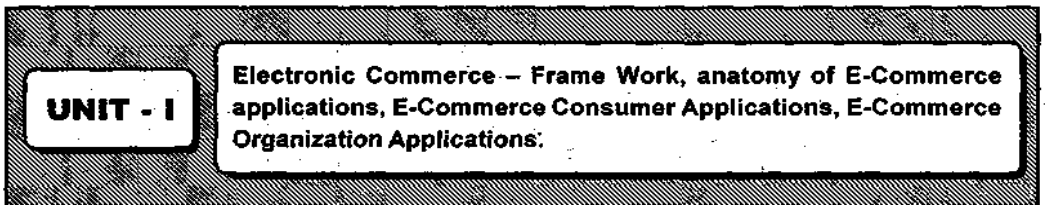


Electronic Commerce

E-commerce is associated with the buying and selling of information, products, and services via computer networks today and in the future via any one of the raid of networks that make up the Information Superhighway (I-way). Projections anticipate that the I-way will transform information transport technology for electronic commerce applications and provide an economic wind fall similar to what the interstate highway system did for productivity in the nation's manufacturing, travel, and distribution systems. The I-way is not a U.S. phenomenon but a global one, as reflected by its various labels worldwide.

The use of electronic transmission medium (telecommunications) to engage in the exchange, including buying and selling, of products and services requiring transportation, either physically or digitally, from location to location.

A key element of e-commerce is information processing. All steps of commerce, except for production, distribution, and delivery of physical goods, are forms of information gathering, processing, manipulation, and distribution, which computers and networks are perfectly suited to handle. This information processing activity is usually in the form of business transactions, for which several broad categories can be observed:

- Transactions between a company and the consumer over public networks for the purpose of home shopping or home banking using encryption for security and electronic cash, credit, or debit tokens for payment.
- Transactions with trading partners using EDI.
- Transactions for information gathering such as market research using barcode scanners, information processing for managerial decision making or organizational problem solving, and information manipulation for operations and supply chain management.
- Transactions for information distribution with prospective customers, including interactive advertising, sales, and marketing.

From a management perspective, all of these transactions require tight coordination and control among many participating organizations in order to minimize the exposure to risk.

Electronic commerce involves all sizes of transaction bases. As one would expect, electronic commerce requires the digital transmission of transaction information. While transactions are conducted via electronic devices, they may be *transported* using either traditional physical shipping channels, such as a ground delivery service, or digital mechanisms, such as the download of a product from the Internet. Those familiar with traditional **electronic data interchange** system (EDI) may be questioning what makes electronic commerce different from the EDI system that have been in place for the past

2-30 years. EDI is a subset of electronic commerce. A primary difference between the two is that electronic commerce encompasses a broader commerce environment than EDI.

Traditional EDI systems allow pre-established trading partners to electronically exchange business data. The vast majority of traditional EDI systems are centred around the purchasing function. These EDI systems are generally costly to implement. The high entry cost precluded many small and mid-sized business from engaging in EDI. Electronic commerce allows a marketplace to exist where buyers and sellers can "meet" and transact with one another.

Electronic Business

The term electronic commerce is restricting, however, and does not fully encompass the true nature of the many types of information exchanges occurring via telecommunication devices. The term **electronic business** also includes the exchange of information not directly related to the actual buying and selling of goods. These activities are not "commerce": activities; they are "business" activities. Thus, the term electronic business is broader and may eventually replace the term electronic commerce.

Potential Benefits of Electronic Commerce

The following are the potential benefits of E-commerce:

1. Internet and web-based electronic commerce is more affordable than traditional EDI;
2. Internet and web-based electronic commerce allows more business partners to be reached than with traditional EDI;
3. Internet arid web-based electronic commerce can reach a more geographically dispersed customer base;
4. Procurement processing costs can be lowered;
5. Cost of purchases can be lowered;
6. Reductions in inventories;
7. Lower cycle times;
8. Better customer service; and
9. Lower sales and marketing costs.

A **Value-Added Network** (VAN) is a service to which a firm can subscribe. VANs provide many services, including data transmission, EDI translation, and store and forward messaging of transaction data. VANs and the other services they provide are discussed in greater detail. Because of the low cost of connecting to the Internet, medium and small businesses can now afford, the connection cost.

Because of software developments that allow web-based EDI systems to interface with traditional EDI systems, businesses of all sizes can now transact with one another. This vastly expands the number of potential electronic business partners, some of which may be a substantial, geographical distance away. The Internet offers a greater choice of global partners with which to conduct electronic commerce.

Procurement costs can be lowered by traditional EDI system by consolidating purchases, developing relationships with key suppliers, negotiating volume discounts, and greater integration of the manufacturing process. Internet electronic commerce offers additional benefits and potential for cost reductions over traditional EDI. Procurement costs can be lowered for all companies, regardless of size, due to the increased ability to transact electronically with one another. Data transmission costs can be lowered. A wider net can be cast when searching for suppliers. Options for Partnering with other firms increase.

The **production cycle time** is the time it takes a business to build a product beginning with the design phase and ending with the completed product. Internet electronic commerce is enabling the reduction of the cycle time by allowing engineers and production teams to electronically share design specifications for initial approval and refinement processes. In addition to reducing the design and production phases, lower cycle times also reduce the amount of fixed overhead that needs to be allocated to each unit produced, thus positively affecting the ability to pass cost savings on to the customer or to achieve higher net earnings.

Customer service can be enhanced using Internet electronic commerce by helping the customer to access information before, during, and after the sale. Before the sale is made, customers can electronically retrieve product specifications, quantity, and pricing information. During the product/service fulfilment cycle, customers can electronically check on the status of the order.

Internet allows firms to reach many customers in a Very low-cost fashion. Some firms are able to shift some of their sales and marketing functions to electronic processes. This shift in communication mediums allows the firm to either reduce their overhead costs or better utilize their human resources to engage in building customer relations rather than performing tedious sales processing tasks.

Businesses are not the only benefactors of Internet electronic commerce; consumers may also reap benefits from using the Internet. Some benefits that consumers may expect

- Increased choice of vendors and products;
- Convenience from shopping at home or office;
- Greater amounts of information that can be accessed on demand;
- More competitive prices and increased price comparison capabilities and
- Greater customization in the delivery of services.

Customers have an increased choice of vendors because they are no longer geographically constrained by a reasonable walking or driving distance. Customers have a greater choice of services they can receive from global Internet companies.

Internet electronic commerce also offers customers the chance to customize many of the products/services offered by merchants. For example, many on-line news services allow their customers to "design" the look of their daily newspaper.

Electronic Commerce Framework

In general the e-commerce applications will be built on the existing technology infrastructure such as: a set of computers, communications networks, and communications software forming the Information Superhighway. Figure below shows a variety of possible e-commerce applications, including both inter organizational and consumer-oriented.

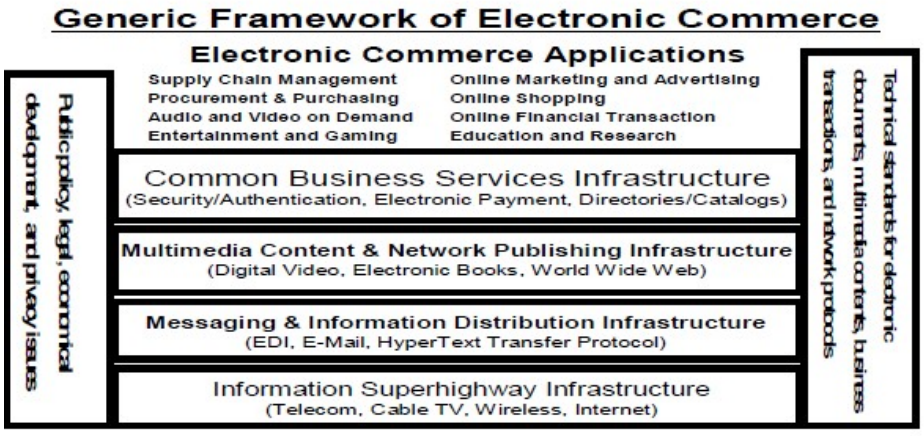
The users will be building the applications using the building blocks in the infrastructure.

- Common business services, for facilitating the buying and selling process
- Messaging and information distribution, as a means of sending and retrieving information.
- Multimedia content and network publishing, for creating a product and a means to communicate about it
- The Information Superhighway-way very foundation-for providing the highway system along which all e-commerce must travel.

The two pillars supporting all e-commerce applications and infrastructure are just as indispensable:

- Public policy, to govern such issues as universal access, privacy, and information pricing
- Technical standards, to dictate the nature of information publishing, user interfaces, and transport in the interest of compatibility across the entire network.

Any successful e-commerce application will require the I-way infrastructure in the same way that regular commerce needs the interstate high way network to carry goods from point to point. You must come across this highway, whether you are an organization purchasing supplies or a consumer ordering a movie on demand. Understand, however, that the I-way is not one monolithic data highway designed according to long-standing, well-defined rules and regulations based on well-known needs. Construction the I-way will be a mesh of interconnected data highways of many forms: telephone wires, cable TV wires, radio-based wireless-cellular and satellite.



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On the I-way, the nature of data / information traffic is extremely important. The information and multimedia content determines what type of media (vehicle) is needed. A breakdown of potential everyday e-commerce vehicles into their technological components shows that they vary widely in complexity and may even need to travel different routes on the I-way.

In the electronic "highway system" multimedia content is stored in the form of electronic documents. These documents are often digitized, compressed, and stored in computerized libraries or multimedia storage warehouses called servers that are linked by transport networks to each other and to the software/hardware clients that allow customers to access them.

On the I-way, messaging software fulfils the role, in many numbers of forms: e-mail, EDI_3 or point-to-point file transfers.

In information traffic, public policy issued deal with the cost of accessing information, regulation to protect consumers from fraud and to protect their right to privacy, and the policing of global information traffic to detect information pirating or pornography. Again the issues themselves, let alone the solutions, are just now evolving and will become increasingly important as more and more people with variable intent enter the electronic marketplace.

The final pillar on which the e-commerce framework rests is **technical standards,** without which the impact of this revolution would be minimized.

Standards are crucial in the world of global e-commerce, to ensure not only seamless and harmonious integration across the transportation network but access of information on any type of device the consumer chooses-PCs, portable hand-held devices or television, set-top boxes (cable converter boxes) and on all types of operating systems.

Impact of Electronic Commerce on Business Models

The outstanding growth rates, electronic commerce is now forcing on businesses to rethink their traditional business models:

> Nowadays the CEOs recognizes the challenge of e-Commerce as a strategic business issue, not just one more technical issue to be delegated to the IS department, perhaps the existing EDI group. Although a company may have, re-engineered its internal business process and perhaps painfully installed an ERP system to bring inefficiencies to the back office, e-Commerce is about re-engineering outward-facing processes - industry process reengineering.

Thus, electronic commerce is not just a technology; it is a way of conducting business that has the potential to impact every aspect of the firm's value chain. Implementing full-scale, innovative applications of electronic commerce requires management teams to view the marketplace beyond the typical physical boundaries.

The biggest problem that electronic commerce pioneers encounter is the limited set of mental models that constrain" our thinking. We tend to think of the, web in our "Industrial age" paradigm - where everything-must be; described and related to the physical world.

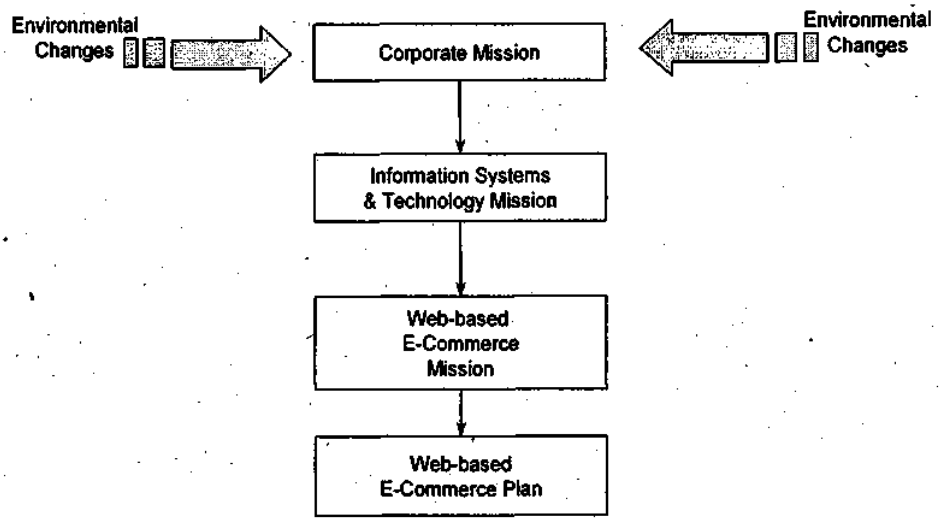

Fig. : Business and Electronic Commerce Goal Congruence.

If electronic commerce applications are not placed in the proper business context and the strategy aligned with the overall business strategy, then the electronic commerce application is likely to final. Thus, new business models are necessary that integrate electronic commerce initiatives with overall business goals.

Overall Business and E-Commerce Goal Congruence

Electronic commerce strategies need to be formulated so that they help a business achieve its overall business goals. Figure below illustrates the relationship between a firm's overall corporate mission and goals and its web-based electronic commerce plan.

Environmental changes may cause a business to rethinks or adjust its missions and goals, such as the entrance of "new" competitors into the marketplace. These "new" competitors may arise from previously unknown businesses, unknown perhaps because they are located in foreign countries. These "new" competitors may launch a web-based commerce site and have a newly found ability to cost-effectively draw customers away from the business.

Once the cooperate mission and goals are set, then the information systems and technology groups mission can be set to help accomplish that mission. Ultimately, a web-based electronic commerce plan can be set.

The Impact of Electronic Commerce on the Value Chain

The traditional view of the value chain, depicted in figure below is no longer rich enough to encompass the true relationships underlying the flows of information between a firm, its customers, and its suppliers. The traditional **value chain** typically depicts the information system data as flowing sequentially through the processes with inputs/outputs to the supplier at the back-end stage and to the customer at the front-end stage. In reality, firms engaging in electronic commerce may share information with their customers and supplies at many stages of the value chain.

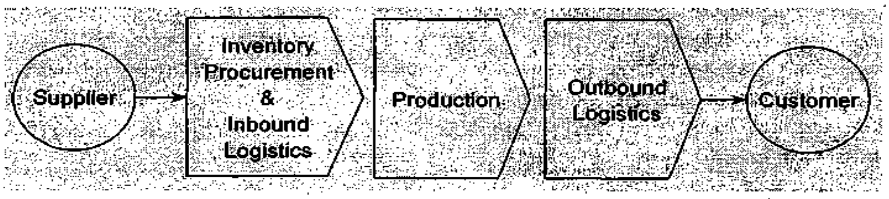

Fig. : Traditional Value Chain.

Figure below depicts a new view of-the value chain with the customer set as the centre of focus to a firm. The firm's information system is the "glue" that links all phases of its processes together. This **customer-oriented value Chain** enables the customer to access the firm's (the supplier's) information system at virtually every phase in order to assess the progress of the order. A customer may link to the firm's inventory data such as price, quantity, and availability, prior to entering into a sales contract.

The customers can also check the shipping status of orders placed with a supplier that have, been completed and are in the shipping process. The customer's use-of the supplier's information system to help provide better customer service after the sale is complete is another positive use.

The customer may be able to access the firm's information system and request a return slip, which the customer can then printout and use to send the item back to the supplier at the cost of the supplier. The supplier benefits by knowing in advance that defective goods were sent to a customer and when to expect to receive them back. These are just some of the many ways in which customers and suppliers-may advantageously share the information stored in the supplier's information system.

The customer-oriented value chain illustrated in figure below also needs to link its procurement information systems to those of the firm's supplier. The supplier needs to access its supplier's information system in order to best serve its own customers.

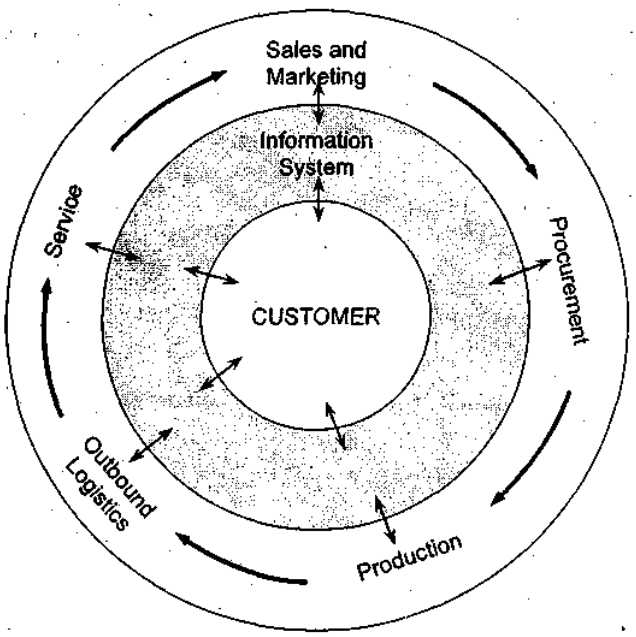

Fig. : Customer-Oriented Value Chain.

Electronic Commerce and Media Convergence

Pooling several resources through alliances and merging with other resources by way of sharing the resource or independently acquiring the resource. Many companies are pooling their resources and talents through alliances and mergers with other companies to make the electronic marketplace a reality. Part of their motivation may include reducing their risk in light of the uncertainty about what form this eventual global marketplace and e-commerce applications will take.

The term e-commerce has become irrevocably linked with the idea of convergence of industries centred on information that has been isolated-content, storage, networks, business applications, and consumer devices. Convergence, broadly defined, is the melding of consumer electronics, television, publishing, telecommunications, and computers for the purpose of facilitating new forms of information-based commerce.

Multimedia convergence applies to the conversion of text, voice, data, image, graphics, and full-motion video into digital content. Cross-media convergence refers to the integration of various industries-entertainments, publication, and communication media based on multimedia content.

- Convergence of content translates all types of information content-books, business documents, videos, movies, music-into digital information. Once converted into digital form, that information can easily be processed, searched, sorted, enhanced, converted, compressed, encrypted, replicated, transmitted, and so on, in ways that are conveniently matched to today's information

processing systems.

- Convergence of transmission compresses and stores digitized information so it can travel through existing phone and cable wiring. New switching techniques and other technological breakthroughs enable all types of information to travel to the home.
- Convergence of information access devices have the sophistication to function as both computers and televisions. Other examples are the telephone, with internal fax machine, modem, and video monitor, capable of receiving fax, e-mail, and video.

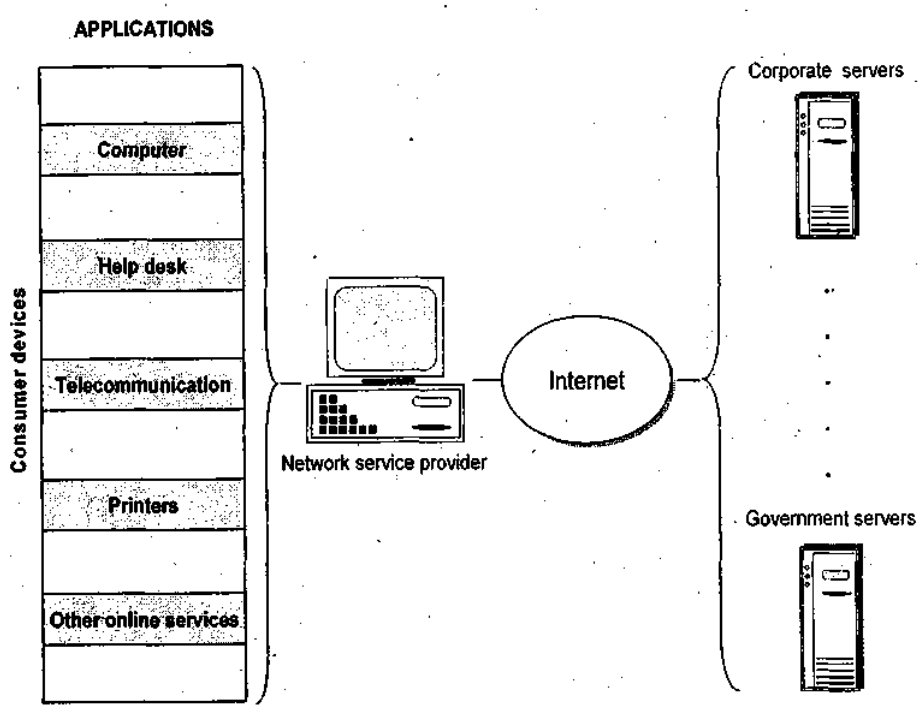

Fig. : Elements of electronic commerce applications.

Convergence is also being driven by certain market conditions:

- Entrepreneurs who are feeding on anticipated end-used demand for new applications-both products and services-that rely on the aforementioned enabling technologies
- The widespread availability of increasingly low-cost, high-performance enabling component technologies, includes specialized resources such as, storage and display devices, communications systems and operating systems, etc.,
- Aggressive regulatory actions that are introducing competition in monopoly markets-local and long-distance communications, telecommunication and cable equipment, and right-of-way to customer's curb-and that serve to facilitate the rapid deployment of these new applications.

THE ANATOMY OF E-COMMERCE APPLICATIONS

No one can predict what applications of electronic commerce will be useful /successful in the long run, the potential payback for those who hold the winning hand which is a powerful driving force behind the development of the infrastructure and the convergence of numerous industries.

E-commerce applications constitutes for different types of elements which are:

1. Multimedia content
2. Multimedia Storage Servers
3. Client-server architecture
4. Internal processes of Multimedia servers
5. Video servers
6. Information delivery/transport
7. Consumer Access Devices

In figure below, we will examine now how electronic commerce applications, multimedia content and multimedia storage serves as well as the information delivery system, the network service providers that serve as access points, and the devices that function as interfaces for various e-commerce applications.

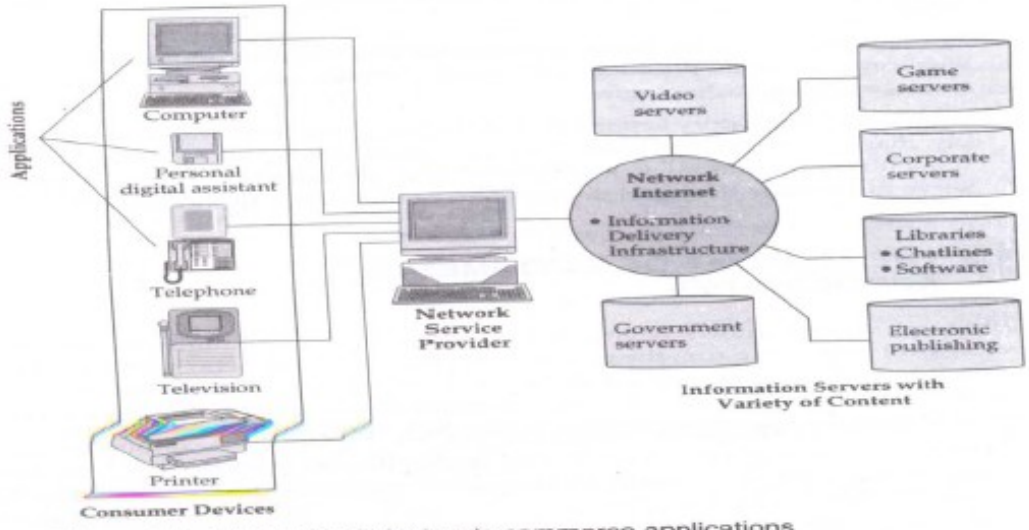

Figure 1.2 Elements of electronic commerce applications

1. Multimedia Content for E-Commerce Applications

The technical definition of multimedia is the use of digital data in more than one format, such as the combination of text, audio, video, and graphics in a computer file/document. Multimedia content can be considered both fuel and traffic for electronic commerce applications.

Multimedia its purpose is to combine the interactivity of a user-friendly interface with multiple forms of content. The multimedia is associated with the hardware convergence taking place in the telecommunication, computer, and cable industry as the next generation of digital, interactive home entertainment nears technical completion. From this perspective, multimedia has become to mean the combination of computers, television, and telephone capabilities in a single device.

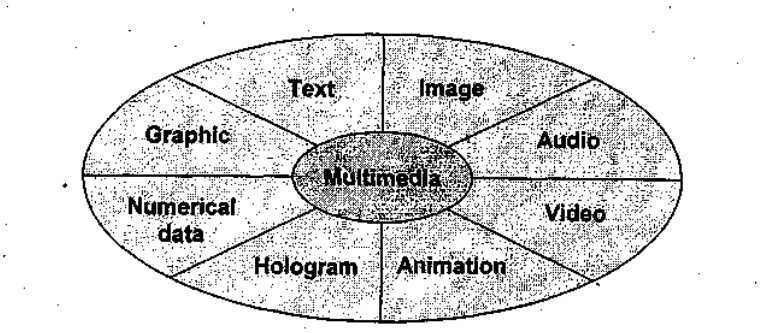

Fig. : Possible components of multimedia.

Multimedia represents the next generation of computing, few have a clear idea of what multimedia is all about, what it can do, and where it is heading. The term multimedia covers so many things that it is often difficult to conceptualize and adding to this, telecommunications, cable/broadcasters, computer software and hardware providers each have a different view of what multimedia means.

Access to multimedia content depends on the hardware capabilities of the customer. For a long time, the capability of the computer hardware was well ahead of the needs of software applications available to run on it. This gap is narrowing rapidly, however, with resource-hogging "application software" rich in multimedia content: electronic books, real-time information, movies, videos, and interactive services such as CD-ROM titles.

Telecommunications and cable companies, now aware of the importance of content for the future of e-commerce applications, have begun to acquire right to the content they believe will have great value.

Industry	Content Produced
Entertainment producers	Cartoons, games, movies Video, Music
Broadcast television productions	Game shows, documentaries, Entertainment Programs
Print publishing catalogs	Books, reference collections,, directories,
Computer software	Software programs: animation, games, productivity-enhancing tools

Table: Traditional Division of Content by Industry.

The success of e-commerce applications also depends on the variety and innovativeness of multimedia content and packaging. The advantage goes to the current providers (or packagers) of multimedia content-to entertainment, broadcast television productions, traditional print publications, and software and information services.

Supporting these content providers are the hidden brigade of small businesses or individuals producing content-writing articles,-creating videos, developing software programs, and other important entrepreneurial activities.

2. Multimedia Storage Servers and Electronic Commerce Applications

Electronic commerce requires robust servers to store and distribute large amounts of digital content to content to consumers. These multimedia storage servers are large information where house capable of handling various content, ranging from books, newspapers, advertisement catalogs, moviies, games, and x-ray images. These servers, deriving their name because they serve information upon request, must handle large-scale distribution, guarantee security, and complete reliability.

Digitized content eliminates the bulkiness and mechanical unreliability fond in past equipment. Steady advances in digital memory technology are making mass-storage devices technologically feasible and increasingly cost effective.

3. Client-Server Architecture in Electronic Commerce

Almost all e-commerce applications follow the client-server model. Clients are devices plus software that request information from servers. The client-server model replaces traditional mainframe-based models that worked will for a long time.

The dominant model of client-server architecture links PCs to a storage (or database) server, where most of the computing is done on the client. Even existing client-server models based on PC servers, while providing back-end technology for scalable and flexible database management, have to be reengineered to accommodate new data type.

The client-server model, allows the client to interact with the server through a request-replay sequence governed by a paradigm known as message passing. The server manages application tasks, handles storage and security, and provides scalability-ability to add more clients as needed for serving more customers-and client devices (from personal digital assistants to PCs) handle the user interface. In effect, the multimedia server handles the critical elements (distribution, connectivity, security, accounting), and so is expected to simplify and make scaling more cost-effective.

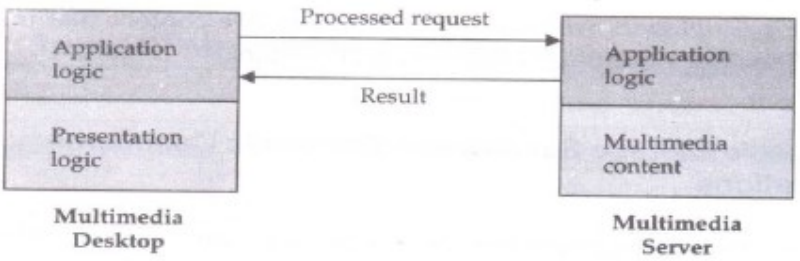

Figure 1.4 Distribution of processing in multimedia client–server world

4. Internal Processes of Multimedia Servers

The internal processes of a multimedia servers involves the storage, retrieval, and management of multimedia data objects are integral to e-commerce applications.

A multimedia server is a hardware and software combination that converts raw data into usable information and then "dishes out" this information where and when users need it. These servers have different uses:

1. It captures, processes, manages, and delivers text, images, audio, and video.
2. Most multimedia servers provide a core set of functions to display, create, and manipulate multimedia documents;
3. To transmit and receive multimedia documents over computer networks, and to store and retrieve multimedia documents.

To make interactive multimedia a reality, a server must do the following: handle thousands of simultaneous users; manage the transactions of these users (e.g., purchases, specific information requests, customer billing); and deliver information streams to consumers at affordable costs.

5. Video Servers and Electronic Commerce

The need for large-scale video storage has led to a unique business partnership between technology/transport and media companies in interactive TV trails and has resulted in the development of new video servers.

Video servers are an important link between the content providers (entertainment/ media) and transport providers (telcos/wireless/cable operators). One important difference between video servers and the current client-server computer systems used extensively for data processing is that video servers are designed to deliver information to hundreds of consumers simultaneously via public telecommunications and cable networks.

Video servers tackle the "simultaneous overlapping" supply problem that arises when providing on-demand services to large numbers of home. Numerous households will want to watch the film either simultaneously or at overlapping times. This problem can be approached from either the hardware or software end.

All video servers need not be hardware-based. Rather than looking at the delivery of continuous media on-demand (e.g., audio and video) as a hardware problem solved

with massive parallel machines, Microsoft has approached the problem as a customizable software issue. The goal is to provide the power, functionality, and scalability to give users split-second access to thousands of media files and to allow laser disc-type functions such as pause, reverse, fast-forward, and jump-ahead to user-specified locations.

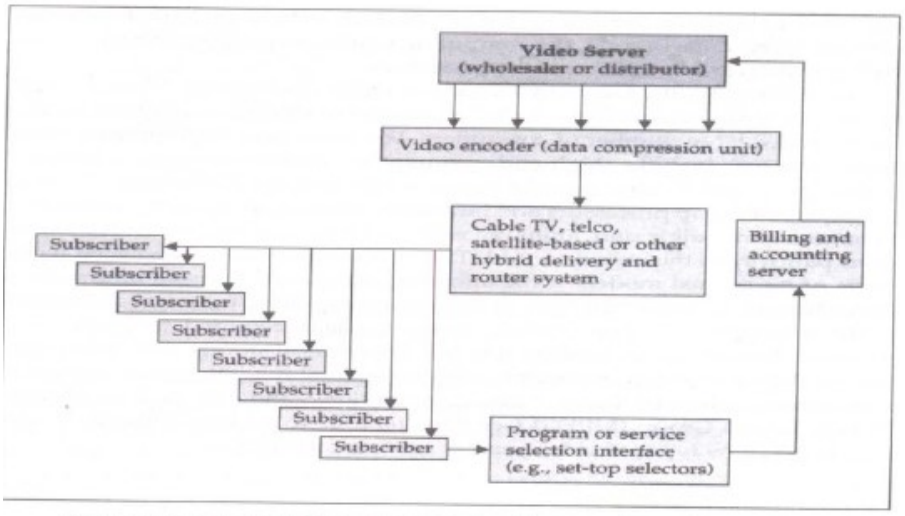

Figure 1.5 Block diagram of a generic video on-demand system

6. Information Delivery/Transport and E-Commerce Application

Information Delivery / transport in e-commerce application involves how the data is moved through the media and the type of transport providers. Transport providers are principally telecommunications, cable, and wireless industries; computer networks including commercial networks such as CompuServe or America Online; and public networks such as the Internet.

Each highway route provider faces a different but no less daunting set of challenges:

- ***Telecom Based***: These providers, the most visible of all competitors, include long-distance and local telephone service providers.
- ***Cable-based***: These providers depend on coaxial cable as transport roads and will, help determine which broadband applications and services the viewing public prefers. All leading cable providers are conducting trials with a variety of hardware and software, and most are expected to use fiber optic cable and coaxial wire as the delivery medium.
- ***Computer network-based*** : These providers are often dial-up linkage of lower bandwidth when compared to telecom and cable highways. Bandwidth is analogous to the number of lanes on a highway.
- ***Wireless***: These operators are typically radio-based-cellular, satellite and light-base-infra-red. In fact, some of the most exciting transport architectures are invisible. New wireless-based systems require new ways of thinking about information delivery.

7. Consumer Access Devices

How the majority of users will access e-commerce applications, as yet unknown, is heavily linked to the access device they opt to use. A myriad of devices can provide

access to information: videophones, PCs capable of handling multimedia, personal digital assistants like Apple's Newton, televisions capable of two-way transmission, cellular phones, mobile and portable computers.

Consumer access devices focuses on two important processes

1. Different types of customers for different information.
2. Devices required for customers for different information.

The four main types of information customers and different access devices required by them are shown in below table :

Information Consumers	Access Devices
Computers with audio and video capabilities	Personal /desktop computing (workstations, multimedia PC) Mobile computing (laptop and notebook) CD-ROM-equipped computers.
Telephone devices	Videophone
Consumer electronics	Television + set-top box Game Systems
Personal digital assistants (PDAs)	Pen-based computing Voice-driven computing Software agents.

Almost everyone has a TV, and everyone is far more comfortable using a TV than a PC. Does this sound like the argument advanced by radio manufacturers after TV was introduced. Just as improvements in TV made it far more appealing and affordable, advances in computers are making it much easier to operate, much more useful, and much less expensive. The newest generation of PCs, for example, operates microprocessors powerful enough to run video with the resolution of a television picture. All access devices need not be hardware based, moreover. A new breed of software-based devices called software agents is being created that will act as the consumer's personal digital assistants.

Electronic Commerce Consumer Applications

The Electronic applications what the Consumer desires are very hard to predict as we cannot pinpoint, or decipher as they consider lot of things before they get involved in electronic markets whose shape, structure, and population are still in the developing stages. Needs envisioned include entertainment on-demand, including 500 channel TV, video on-demand, games on-demand, and news on-demand; electronic retailing via catalogs and kiosks and home shopping networks; interactive distance education; collaboration through desktop video conferencing; medical consultations, and many more.

Video on-demand is seen as part of an overall long-term trend from the passive delivery vehicles or movies, radio, and TV to "consumer-interactive" platforms.

Consumers will be given greater control over scheduling these activities. The changing trends in consumer choice can be seen in other areas of entertainment besides movies, namely, in the consumption of sports, TV shows, and educational programs.

The following are the various e-commerce consumer applications :

1. Consumer applications and social interaction.
2. Needs of the customers
3. Customers willingness to pay to satisfy their needs
4. Delivery of products to customers
5. Consumer research and electronic commerce

1. Consumer Applications and Social Interaction

The e-commerce application winners will be those that can change the way consumers think and the way they do business.

Television, the most successful technological miracle since the automobile, quickly became so vital that people, even those who couldn't even afford shoes, bought sets in the millions.

Penetration was slower for the telephone than for TV because of the effort needed to set up the wiring infrastructure. Both technologies are equally significant in their impact. The impact of the telephone on business and social communications is without doubt one of the most significant events of the twentieth century.

Social revolutions have bearing on the e-commerce applications. For instance, the current trends in radio and television talk shoves can be seen replicated in the on-line news groups.

Social interactions were also promoted by the introduction of the 800 toll free service around 1968. By 1993, AT&T's 800-number business represented 40 percent of total calls made-some 12 billion 800 calls. Providing contrast to the toll free services is the caller-paid 900 service known as audio text, which allows callers to access a live, prerecorded, or interactive program.

The four major 900 services are fax-back, interactive, recorded-sports scores, financial services and weather, opinion polling, and conferencing or simultaneous conversation using Group Access Bridging (GAB). In the corporate world, marketers are exploring 900 services as a way to offset costs in areas like customer service by getting callers to pay. The nature of these audio text services may change as computers are used to access the information with modems doing the dialing.

2. Needs of the customers

Before starting any business, one should always keep in mind the needs of the customers. Suppose you are doing an internet business, the various features the customers will look for are,

1. Speed of the internet connection
2. E-mail facility/voice chat facility

3. Webcam chat
4. Privacy

Even if one of the above mentioned features are not available, the customer preference will become low. So you have to be very careful regarding the needs of the customers.

3. Customer willingness to pay to satisfy their needs

Other than the needs of customers, one should also consider the economy of various customers as well, i.e., one should value his products in such a way that people always give preference to his product. The motto of your business should be such that the quality/ quantity is directly related to the cost. It should not be inversely proportional where low quality/quantity leads to high cost. The other thing one must also keep in mind is not to sell genuine lower rate products at high costs.

Consider an example of low quality/quantity and high cost. Suppose you go to a cafeteria and want to order a small sized pizza. When ordering, you ask the rate. Normally small sized pizzas ranges from Rs. 30 to Rs. 40. But if one charges the pizza double the expected rate, then no one would prefer to that place again.

4. Delivery of products to customers

Packaging and distribution play important roles in e-commerce applications. Their significance can be explained as follows :

Let us take a classic example of a cafeteria. There are some customers who will be living far away from the restaurant and could not come to the place regularly. So, they will place an order from the list of items, by some means like telephone, internet etc. Therefore, there should be a home delivery system where placed orders can be delivered to the customers on time.

Consumer Research and Electronic Commerce

Evaluating customer preference is the main uncertainty facing application designers. What mix of voice, data, video, entertainment, education, information, geographic coverage, mobility, and interactivity will consumers demand. How much time and money will they be willing to spend to use these networks. How much will regional or cultural difference influence application architectures. The answers to these queries lie in consumer research. Many businesses are navigating the electronic marketplace without proper consumer and market research. This can be disastrous, given that even preliminary research shows some surprising results. Let's look at one specific example: interactive television. Surveys by Chilton Research Services and New York Times suggest some degree of consumer interest and perhaps a willingness to pay less than $20 a month for a selection of interactive television services. Movies on-demand attract the most interest, followed by news, which fares relatively well. ACNN/poll of consumer opinion about interactive TV yielded the following results :

- 46 percent would be "willing to pay for personalized news summaries"; on an interactive television service.
- 39 percent want video phone calls.

- 63 percent would pay for movies on-demand.
- 57 percent would pay for television shows on-demand.
- 78 percent said their greatest worry about interactive TV is that they will have to pay for something that they previously received free of charge.
- 64 percent are concerned that interactive television will make it harder for viewers to protect their privacy.
- 41 percent are concerned that it will be too confusing to use.

In 1994 note, Macworld magazine reported a telephone survey of consumer interests that showed people are more interested in facts than in the growing number of entertainment services envisioned for the electronic marketplace. The eight-month investigation showed that in the sample of 600 adults (375 randomly selected and 225 Macworld subscribers) consumers rate high-tech entertainment and shopping network slower than information access, community involvement, self-improvement, and communication computer services, only 28 percent rated a video on-demand service as highly desirable. The most desirable on-line capability was voting in elections, with half the sample in favor. The public also favours taking part in on-line public opinion polls and interactive electronic town hall political meetings. The poll dramatically demonstrates that gaining access to reference and government information and educational courses is preferable to entertainment services. Movies and television-on-demand services were ranked only tenth among 26 possible on-line capabilities.

Commerce Net

Commerce Net is a consortium of companies which is promoting the use of Internet for EC. It is also making it happen through the establishment of a number of working groups to address specific issues confronting the implementation.

The objective of Commerce Net is to help companies stream-line their procurement and development cycles by performing transaction online. It attempts to overcome impediments to Internet Commerce by making new interfaces, security mechanisms and indexing tools. The solutions are based on the WWW technology, with websites serving as a mall for large and small businesses.

The working groups set up by Commerce Net address among others, the following subjects Connectivity, Network Services, Payment Services, Electronic Catalogues/ Directories, Internet EDI, Engineering Databases, Internet Marketing, Collaborating Tools, and Public Policies. The working groups examine these issues from various angles; evolve new standards and business processes.

The aim is to allow everyone to communicate with every-one, secure Internet transactions, Electronic payments over the Internet, Intelligent Search options, Internet for EDI instead of VANs, increase Internet marketing and to improve inter-networking among organizations through the Internet.

The key enabler for EC is transaction security. The openness of the Internet which is its major strength is also its greatest weakness compared to VANs in so far as security of transactions is concerned. Displaying of products and fulfilling of orders over the

Internet is one thing; completing the transaction with respect to payments using credit card numbers and other bank accounts of customers over the open Internet is another.

The following are the major security issues which are being addressed by various organizations including some of the projects launched by Commerce Net:

- Authenticity of trading partners for transactions.
- Integrity of the message sent and received by trading partners.
- Confidentiality of message.
- Non-Repudiation of Origin: the sender cannot deny sending the message.
- Restricting access only to authorized users.

With digital signatures and encryption techniques the transaction is secured, and forms the basis for payment systems.

A number of products have arrived in the marketplace for secure Internet transactions which seamlessly integrate at the protocol and application level into commerce. Public key cryptography now has been developed to such a level that it indeed provides solutions for EC. However, the institutions required as the key infrastructure for distributing and certifying the validity of public keys have yet to shape up. Commerce Net, for example, has assumed this role in some experiments of financial transactions over the Internet. However, it does not accept the responsibility of any fraudulent loss of money.

ELECTRONIC COMMERCE ORGANIZATION APPLICATION

Corporations do not buy information and communications technology simply because it is new or because it is interesting to writers in the press. Companies adopt technology to save money and improve the bottom line. Before buying any product from the market, various thoughts/questions will come to the manager's mind.

1. How can electronic markets be utilized to further such organizational goals as better internal coordination, faster problem solving, and improved decision making?
2. How can it help us better serve our customers?
3. How can we use it to better interact with our suppliers and distributors?
4. How will these new applications impact business process currently established internally?

Developers of organizational electronic commerce applications must address these questions if they are to be successful.

The following are the various electronic commerce organizational applications:

1. Changing business environment
2. Electronic commerce and the retail industry

3. Marketing and electronic commerce
4. Inventory management and organizational applications
   - ♦ Just-in-time manufacturing (JIT)
   - ♦ Quick response retailing
5. Supply chain management
6. Work group collaboration applications

1. Changing Business Environment

The traditional business environment is changing rapidly as customers and businesses seek the flexibility to change trading partners, platforms, carriers, and networks at will. Many companies are looking outside their organization as well as within when shaping their business strategies. These activities include establishing private electronic connections to customers, suppliers, distributors, industry groups, and even competitors, to increase the efficiency of business communications, to help expand market share, and to maintain long-term viability in today's business environment.

The Information Superhighway will expand this trend to another level all together: It will allow business to exchange information among constantly changing sets of customers, suppliers, and research collaborators in government and academic on a global basis. It will indeed become a powerful business tool that no organization can do without.

Inter-networking, whether internally or externally with customers and business partners, can be a useful tool to facilitate time-based competitive strategies. "Internetworking via a public network infrastructure provides a firm with the pathways to conduct e-commerce between trading partners, support collaboration with partners who can supply needed capabilities, and stay close to the customer.

The following are the factors that lead to changes in business environment:

1. Competitive pressures
2. Pressure from stakeholders for improved financial performance.
3. Pressure to reduce inventories and production costs.
4. Demanding customer requirement.
5. Global regulatory changes
6. Reduced product life cycles making new product development and introduction a priority.
7. Problems of keeping up with changing information and communication technology.

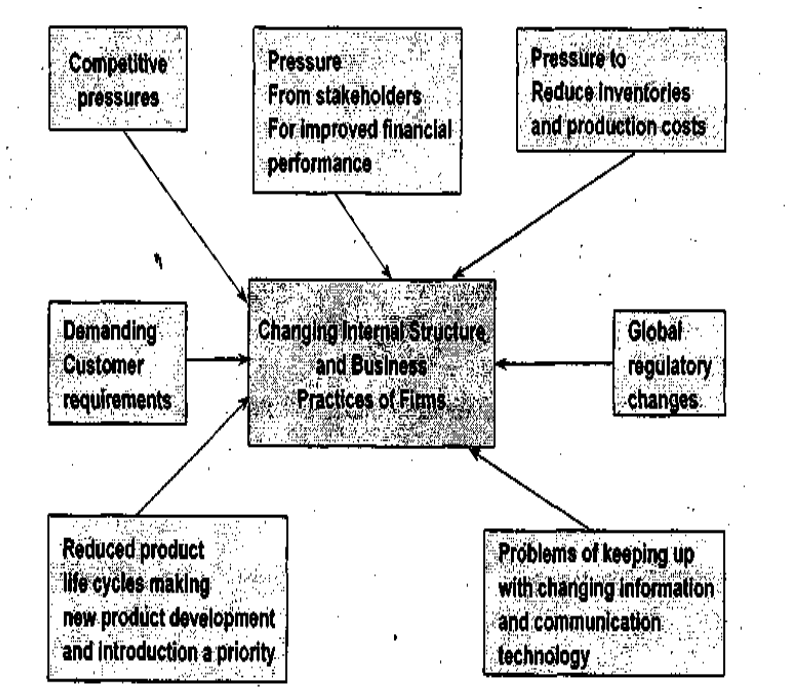

Fig. : Pressures influencing business.

2. Electronic Commerce and the Retail Industry

Retailers are in the immediate line of fire and were first to bear the brunt of cost cutting. They are putting that pressure on the manufacturing and supplier end of the pipeline. At the same time, the quest for efficiencies has led to turmoil and consolidation within the retail industry. The pressure experienced by retailers and suppliers can be seen in the disappearance of jobs, in mergers, and in the increase in business failures in the manufacturing sector.

3. Marketing and Electronic Commerce

Electronic commerce is forcing companies to rethink the existing ways, of doing target marketing (isolating and focusing on a segment of the population), relationship marketing (building and sustaining a long-term relationship with existing and potential customers), and even event marketing (setting up a virtual booth where interested people come and visit).

The most common marketing strategies that are in use by various companies are:

1) Target Marketing -A marketing strategy where companies advertise their product in selected segments of the market for only a limited set of people.
2) Relationship Marketing — It is a strategy where companies advertise this product in a selected market in such a way that a good relationship is built up and maintained with their customers.
3) Event Marketing -- A marketing strategy where companies are not interested in targeting, any set of people or establishing any relationship with them. In this strategy, companies advertise their product into the market in such a way that if people are interested, they can buy the product.

Interactive marketing is accomplished in electronic markets via interactive multimedia catalogs that give the same look and feel as a shopping channel. Users find moving images more appealing than still images and listening more appealing than, reading text on a screen. Those are two powerful reasons why every text-based and still-picture-based interactive experiment like videotext has failed in the past.

4. Inventory Management and Organizational Applications

One often-targeted business process is inventory management. Solutions for these processes go by different names.

- In the manufacturing industry, they're known as just-in-time inventory systems.
- In the retail industry as quick response programs, and
- In the transportation industry as consignment tracking systems.

Just-in-Time Manufacturing

Just-in-time (JIT) is viewed as an integrated management system consisting of a number of different management practices dependent on the characteristics of specific plants. The JIT management system, an evolution of the Japanese approach to manufacturing and initially introduced for the Toyota production system, is based on two principles: elimination of waste and empowering workers. The first principle refers to the elimination of all waste (time, materials, labor, and equipment).in the production cycle.

The following management practices are typically associated with JIT systems:

- focused factory,
- reduced set-up times,
- group technology,
- total productive maintenance,
- multifunction employees,
- uniform workloads,
- JIT purchasing,
- Total quality control, and quality circles.

JIT purchasing, considered and integral part of JIT. has received considerable attention in electronic commerce. It allows a manufacturer to incorporate its suppliers' efforts, toward eliminating waste in the upstream portion of the manufacturing cycle. it purchasing focuses on the reduction of inventories throughout the logistical systems of the manufacturing firms involved and provides a careful audit of the production process. Basically, it optimizes supplier and. customer relations.

To achieve JIT savings, many large corporations have installed private communications networks.

The I-way makes this practice more affordable and easily available to a number of small firms.

Quick Response Retailing

Quick response (QR) is a version of JIT purchasing tailored for retailing. Most often, keeping a store filled with merchandise is a task most shoppers never consider-until the product they want is out of stock. The process is quite complex, given that a single retailer may purchase merchandise from thousands of vendors in a global market. The failure to stock merchandise that matches customer demand can be extremely costly.

To reduce the risk of being out of stock, retailers are implementing QR systems. QR provides for a flexible response to product ordering and lowers costly inventory levels. QR retailing focuses on market responsiveness while maintaining low levels of stocks. It creates a closed loop encompassing the retailer, vendor, and consumer chain, and as consumers make purchases the vendor automatically orders new deliveries from the retailer through its computer network.

The bar-coded articles are logged by the cash registers at the point of sale, the inventory system of the store then determines the needed supply, and the system transmits an order message to the retailer. The availability of accurate information with respect to the current sales enables sophisticated marketing capable of responding to consumers' preferences. Figure below illustrates the various steps of the quick response chain.

5. Supply chain management

Inventory management strategies were implemented through very expensive computer systems and private networks. The cost was insurmountable barrier (overburdened) for many small business, and these new business strategies created many side effects.

For instance, because of the vast investments needed to implement JIT/QR, the manufacturer/retailer tended to reduce the number of its suppliers and move toward single sourcing - an undesirable outcome.

Inventory management solutions (QR and JIT) address only part of the unresponsive supplier for key components.

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

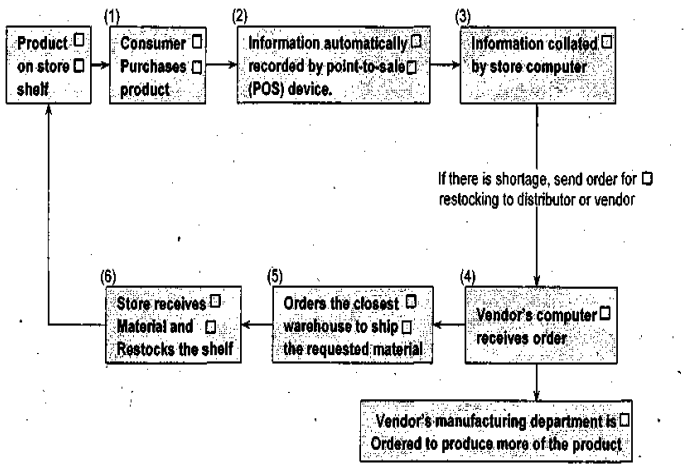

Fig.: The quick response chain.

the manufacturer and finished products to the consumer. Most companies fail to integrate their supply chain strategies for a number of reasons, among them a lack of system integration and the broader concept of supply chain management, firms might be missing an opportunity to cut costs and boost customer service. SCM rests on the premise that product excellence alone fails to guarantee corporate success. In fact, customers expect many services, including the prompt delivery of products, to precise locations with near-perfect administrative and physical quality.

Supply chain management includes the following functions :

1) ***Supplier management:*** The goal is to reduce the number of suppliers and get them to become partners in business in a win/win relationship. The benefits are see in reduced purchase, order (PO) processing costs, increased numbers POs processed by fewer employees, and reduced ordered processing cycle times.
2) ***Inventory management:*** The goal is to shorten the order-ship-bill cycle. When a majority of partners are electronically linked, information faxed or mailed in the past can now be sent instantly. Documents can be tracked to ensure they were received, thus improving auditing capabilities. The inventory management solution should enable the reduction of inventory level, improve inventory turns, and eliminate out-of-stock occurrences.
3) ***Distribution management:*** The goal is to move documents related to shipping (bills of lading, purchase orders, advanced ship notices, and manifest claims). Paperwork that typically took days to cycle in the past can now be sent in moments and contain more accurate data, thus allowing improved resources planning.
4) ***Channel management:*** The goal is to quickly disseminate information about changing operational conditions to trading partners. In other words, technical, product, and pricing information that once required repeated telephone calls and countless labor hours to provide can now be posted to electronic bulletin boards, thus allowing instant access. Thus electronically linking production with their international distributor and reseller networks eliminates thousands of labor hours per week in the process.
5) ***Payment management:*** The goal is to link the company and the suppliers and distributors so that payments can be sent and received electronically. This process increases the speed at.which companies can compute invoices, reducing clerical

errors and lowering transaction fees and costs while increasing the number of invoices processed (productivity).

6) ***Financial management:*** The goal is to enable global companies to manage their money in various foreign exchange accounts. Companies must work with financial institutions to boost their ability to deal on a global basis. They need to assess their risk and exposure in global financial markets and deal with global information as opposed to local market information.

7) ***Sales force productivity:*** The goal is to improve the communication and flow of information among the sales, customer, and production functions. Linking the sales force with regional and corporate offices establishes greater access to market intelligence and competitor information that can be funneled into better customer service and service quality. Companies need to collect market intelligence quickly and analyze it more thoroughly. They also need to help their customers (relationship management) introduce their products to market faster, giving them a competitive edge.

The supply chain management process increasingly depends on electronic markets because of global sourcing of products and services to reduce costs, short product life cycles, and increasingly flexible manufacturing systems resulting in an variety of customizable products.

6. Work Group Collaboration Applications

Work group applications, e-commerce represents the Holy Grail of connectivity: a internet work that enables easy and inexpensive connection of various organizational segments to improve communications and information sharing among employees and to gather and analyze competitive date in real-time.

E-commerce also facilitates sales force automation by enabling salespeople to carry product and reference information in one portable device. Other applications, such as video conferencing, document sharing, and multimedia e-mail, are expected to reduce travel and encourage telecommuting.

Video conferencing is now the best-established application, and is expected to grow in the coming years. Video conferencing allows distant business colleagues to communicate without the expense, time, and inconvenience of travelling.

Video conferencing is beginning to penetrate the desktop PC market, although technical limitations will limit that growth. What is needed are faster chips for processing video-namely, compressing and decompressing.

Organizational applications of electronic commerce have to meet the challenges of the new business environment where the emphasis is on service quality, flexibility, and customization of production to meet customer needs.