

A HANDBOOK OF E-COMMERCE



ISABELLA HILTON

A Handbook of E-commerce

A Handbook of E-commerce

Isabella Hilton

A Handbook of E-commerce
Isabella Hilton
ISBN: 978-1-9790-0134-6

© 2022 University Publications

Published by University Publications,
5 Penn Plaza,
19th Floor,
New York, NY 10001, USA

This book contains information obtained from authentic and highly regarded sources. All chapters are published with permission under the Creative Commons Attribution Share Alike License or equivalent. A wide variety of references are listed. Permissions and sources are indicated; for detailed attributions, please refer to the permissions page. Reasonable efforts have been made to publish reliable data and information, but the authors, editors and publisher cannot assume any responsibility for the validity of all materials or the consequences of their use.

Trademark Notice: All trademarks used herein are the property of their respective owners. The use of any trademark in this text does not vest in the author or publisher any trademark ownership rights in such trademarks, nor does the use of such trademarks imply any affiliation with or endorsement of this book by such owners.

The publisher's policy is to use permanent paper from mills that operate a sustainable forestry policy. Furthermore, the publisher ensures that the text paper and cover boards used have met acceptable environmental accreditation standards.

Table of Contents

Chapter 1	ELECTRONIC COMMERCE AND CONSUMER ORIENTED ELECTRONIC COMMERCE	1
Chapter 2	ELECTRONIC PAYMENT SYSTEMS AND INTER ORGANIZATIONAL COMMERCE	30
Chapter 3	INTRA ORGANIZATIONAL COMMERCE	54
Chapter 4	CORPORATE DIGITAL LIBRARY	62
Chapter 5	CONSUMER SEARCH AND RESOURCE DISCOVERY	81
Chapter 6	MULTIMEDIA	89

WT

WORLD TECHNOLOGIES

ELECTRONIC COMMERCE AND CONSUMER ORIENTED ELECTRONIC COMMERCE

Electronic Commerce- Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications. Consumer Oriented Electronic commerce - Mercantile Process models.

1.1 Electronic Commerce

Introduction:

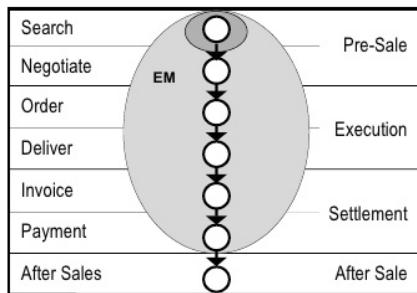
- It is a general concept covering any form of business transaction or information exchange executed using information and communication technologies (ICT's).
- It includes electronic trading of goods, services and electronic material.
- It takes place between companies, between companies and their customers, or between companies and public administrations.

They can be classified by application type:

1. Electronic Markets

- Electronic Markets present a range of offerings available in a market segment so that the purchaser can compare the prices of the offerings and make a purchase decision.
- It increases the efficiency of the market.
- It reduces the search cost for the buyer and makes it more likely that buyer will continue the search until the best buy is found.
- It exists in commodity, financial markets and also used in airline booking system.
- It has an irregular transaction trade cycle.

Example: Airline Booking System



Electronic markets and trade cycle

2. Electronic Data Interchange (EDI)

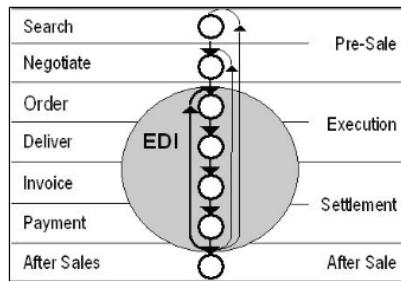
- It provides a standardized system.
- Coding trade transactions.
- Communicated from one computer to another without the need for printed orders and invoices & delays & errors in paper handling.
- It is used by organizations that make a large no. of regular transactions.

Example: EDI is used in the large market chains for transactions with their suppliers.

Applications are sending test results from the pathology laboratory to the hospital or dispatching exam results from exam boards to school.

- It is used for trade exchanges.
- Users are vehicle assemblers, ordering components for the supermarkets.
- It is used for regular repeat transactions.
- It takes quite lot of work to set up systems.
- It is part of schemes for just-in-manufacture and quick response supply.
- Mature use of EDI allows for a change in the nature of the product or service.

Example: Mass Customization



EDI and the trade cycle

3. Internet Commerce

- It is used to advertise and make sales of wide range of goods and services.
- This application is for both business to business and business to consumer transactions.

The first stage

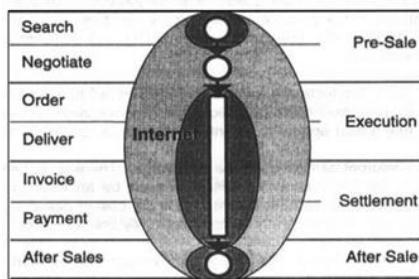
- Advertising appropriate goods and services.
- Internet sites offer only information and any further steps down the trade cycle are conducted on the telephone.

The second stage

- An increasing number of sites offer facilities to execute and settle the transaction.
- Delivery may be electronic or by home delivery depending on the goods and services.

The final stage

- After-sales service.
- On-line support & On-Line services.

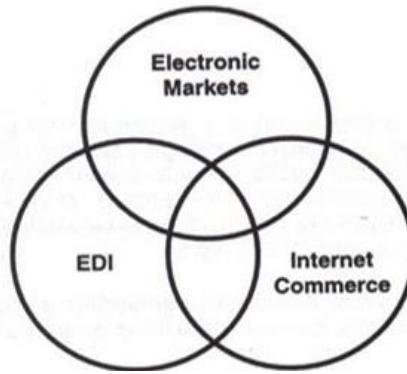


Internet and the trade cycle

Example: The purchase of goods that are then delivered by post or the booking of tickets that can be picked up by the clients when they arrive at the event.

Scope of E-Commerce:

- Internet e-commerce is one part of the overall sphere of e-commerce.



Three stages of E-Commerce

Electronic Commerce and the trade cycle:

It can be applied to all or to different phases of the trade cycle. The trade cycle depends on:

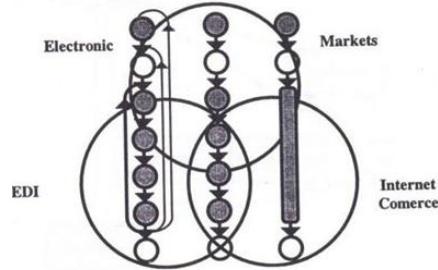
- The nature of the organization.
- Frequency of trade between the partners to the exchange.
- The nature of goods and services being exchanged.

Trade cycle support

1. Finding goods and services (referred to as a search & negotiation).
2. Placing the order, taking delivery & making payment (execution and settlement).
3. After sales activities such as warranty, services etc.

The three generic trade cycles can be identified:

1. Regular, repeat transactions (repeat trade cycle).
2. Irregular transactions, where execution & settlement are separated (credit transactions).
3. Irregular transactions where execution & settlement are combined (cash transactions).



E-commerce technologies and generic trade cycles

1.2 Framework



Generic framework of e-commerce

E-Commerce application will be built on the existing technology infrastructure such as:

- A myriad of computers
- Communication networks
- Communication software

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 the information.
- Multimedia content and network publishing, for creating a product and a means to communicate about it.
- The information superhighway for providing the highway system along which all the e-commerce must travel.

Two pillars supporting all e-commerce applications & infrastructure

- 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 will require the I-way infrastructure in the same way that regular commerce needs. I-way will be a mesh of interconnected data highways of many forms.

- Telephone, wires, cable TV wire
- Radio-based wireless-cellular & satellite

Building the highway is not enough. Transport vehicles are needed, routing issues must be addressed and the transportation cost must be paid. On the i-way, the nature of vehicular traffic is extremely important. The information and multimedia content determines what type of vehicle is needed.

- Movies = Video + Audio
- Digital games = Music + Video + Software
- Electronic books = Text + Data + Graphics + Music + Photographs + Video

In the electronic 'highway system', multimedia content is stored in the form of electronic documents. These 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 of moving the vehicles from one distribution warehouse to another.

- It is done in any number of forms such as e-mail, EDI, or point-to-point file transfers.

Encryption & authentication methods have been developed to ensure security of the contents while traveling the I-way and at their destination. Electronic payment schemes developed to handle complex transactions.

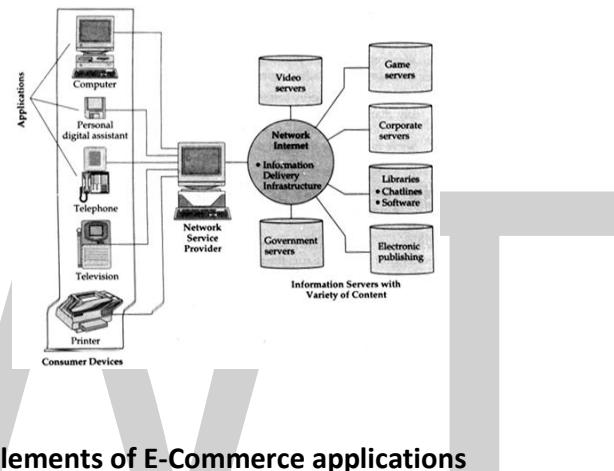
Public policy issues deal with:

- The cost of accessing information.
- Regulation to protect consumers from fraud.
- To protect their right to privacy.
- Policing of global information traffic to detect information pirating.

Technical standards are crucial to:

- Ensure seamless and harmonious integration across the transportation network
- Access of information on any type of device the consumer chooses.
- Laser disc, PCs, portable hand-held devices or television + set-top boxes and on all types of operating systems.

1.3 Anatomy of E-Commerce Applications



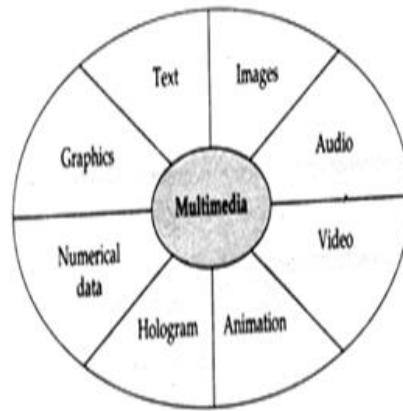
Elements of E-Commerce applications are:

- 1. Multimedia Content for E-Commerce Applications**
- 2. Multimedia Storage Servers & E-Commerce Applications**
 - Client-Server Architecture in Electronic Commerce
 - Internal Processes of Multimedia Servers
 - Video Servers & E-Commerce
- 3. Information Delivery/Transport & E-Commerce Applications**
- 4. Consumer Access Devices**

Multimedia Content for E-Commerce Applications

Multimedia content can be considered both fuel and traffic for electronic commerce applications.

Technical definition of multimedia is the use of digital data in more than one format such as the combination of text, audio, video, images, graphics, numerical data, holograms and animations in a computer file.



Possible components of multimedia

The goal of multimedia is to increase the utility of all information through the processing and distribution of new forms such as images, audio and video. Multimedia is associated with hardware components in different networks.

The accessing of multimedia content depends on the hardware capabilities of the customer. The success of e-commerce applications also depends on the variety and innovativeness of multimedia content and packaging.

Table: Traditional division of content by industry

Industry	Content produced
Entertainment producers	Cartoons, game, movies, videos, music.
Broadcast television productions	Game shows, documentaries, entertainment programs.
Print publishing	Books, reference collections, directories, catalogs.
Computer software	Software programs: animation, games, productivity enhancing tools.

Multimedia Storage Servers & E-Commerce Applications:

E-Commerce requires robust servers to store and distribute large amounts of digital content to consumers. These Multimedia storage servers are large information warehouses capable of handling various contents, ranging from books, newspapers, advertisement catalogs, movies, games, & X-ray images.

These servers, derive their name because,

- They serve information upon request
- Must handle large-scale distribution
- Guarantee security & complete reliability.

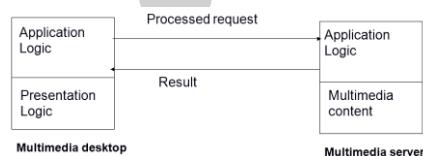
1. Client-Server Architecture in Electronic Commerce

All e-commerce applications follow the client-server model. Clients are devices plus software that request information from servers.

Client server architecture:

- Links PCs to storage server, where most of the computing is done on the client
- Allows client to interact with the server through a request-reply sequence known as message passing

The server manages application tasks, storage & security & provides scalability-ability to add more clients and client devices.



Distribution of processing in multimedia client-server world

2. Internal Processes of Multimedia Servers

The internal processes involved in the storage, retrieval & management of multimedia and objects are integral to e-commerce applications.

A multimedia server is a hardware & software combination that converts raw data into usable information & then dishes out this information where and when users need it.

It captures, processes, manages, & delivers text, images, audio & video.

Most multimedia servers provide a core set of functions,

- To display, create and manipulate multimedia documents
- To transmit and receive multimedia documents over computer networks
- 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)
- Deliver information streams to consumers at affordable costs.

Technical challenges:

- Data differ radically - no longer dealing with only table-formatted alphanumeric data
- Computing platforms pose bottlenecks when trying to deliver large pieces of complex data

3. Video Servers & E-Commerce

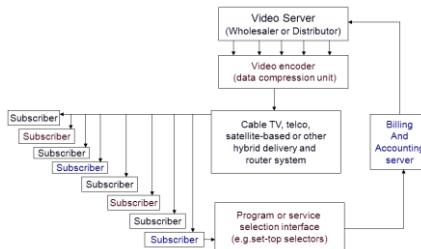
The electronic commerce applications related to digital video will include

1. Telecommunicating and video conferencing
2. Geographical information systems that require storage & navigation over maps
3. Corporate multimedia servers
4. Post-production studios
5. Shopping kiosks.

Consumer applications will include:

- Video-on-demand.
- Range of interactive services such as shopping, video navigation (e.g. Interactive TV guides) and directories.

Video servers is an important link between the content providers (entertainment / media) & transport providers (wireless / cable operators). It is designed to deliver information to hundreds of consumers simultaneously via public telecommunications and cable networks.



Block diagram of a generic video on-demand system

Information Delivery/Transport & E-Commerce Applications

Transport providers are principally telecommunications, cable, & wireless industries.

Telecom based applications:

- Include long-distance and local telephone service providers.
- Using ADSL (Asymmetric Digital Subscriber line) its possible to squeeze a video signal through a telephone wire.

Problems

- Cannot handle live transmissions
- Picture it produces is not as clear as that provided by a well-tuned cable hook-up.

Cable-based applications:

These providers depend on coaxial cable as transport roads and will help determine which broadband applications and services the viewing public prefers.

The strategy is to develop a “network neutral” content that uses digital compression and is adaptable to alternative delivery systems such as wireless and satellites.

Computer network-based applications:

- Commercial on-line service providers
- Dial-up linkages of lower bandwidth when compared to telecom and cable highways.

Wireless

- Radio based - Cellular, satellite
- Light based - Infra-red

Consumer Access Devices

Information Consumers	Access Devices
Computers with audio & video	Mobile computing
Telephonic devices	Videophone
Consumer electronics	Television + set-top box
Personal digital assistants (PDAs)	Game systems Pen-based computing, voice-driven computing



1.4 E-commerce Consumer Applications

The wide range of applications for the consumer marketplace can be broadly classified into:

- **Financial services and information:** Home banking, financial services, financial news
- **Entertainment:** Movies on demand, Video cataloging, interactive ads, multi-user games, on-line discussions
- **Educational and training:** Interactive education, video conferencing, on-line databases
- **Essential services:** Home shopping, electronic catalogs, telemedicine, remote diagnostics

Consumer Applications and Social Interaction:

Lessons from history indicate that the most successful technologies are those that make their mark socially. In 1945, in U.S., no one had TV. By 1960, about 86percent of households did. Now, contrast with Telephone. Bell invented the telephone in 1876 and by 1940, 40% of U.S. households and by 1980, about 95-98 percent of households connected.

Penetration was slower for Telephone than for TV because of the effort needed to set up the wiring infrastructure. The most successful marketplaces are expected to be those that cater to consumer's loneliness, boredom, education and career.

What do Consumers really want?

- They want quality and cost of service.
- If a new system requires more steps to do essentially the same things, consumers may resist it.
- Some people want to be converted from passive to interactive television watchers, but most of the public prefers to lay back and just watch television and let someone else do the work of figuring out the sequence of television programming.

What are Consumers willing to spend?

According to the video on-demand, consumers get the cable bill at basic charge which they will buy. If it is doubled, they will not buy and the service provider economics will be increased, then network operators might look for advertisers to fill the gap.

Delivering products to Consumers

Packing and distribution must be considered.

Eg. Blockbuster video collects the information and shows the typical consumer.

- Spends \$12 a month on home video expenditures.
- Go to video store to select video on limited budget and has time to kill.
- Only periodically expends a large sum of money.

Consumer Research and E-Commerce

Consumer opinion about interactive television is:

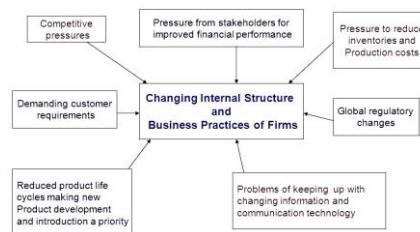
- 46% be willing to pay.
- 39% want video phone calls.
- 63% would pay for movies on-demand.
- 57% would pay for Television shows on-demand.
- 78% said their worry about it is that they will pay for something that they previously received free of charge.
- 64% are think it make it harder for viewers to protect privacy.
- 41% are tell that it is too confusing to use.

1.5 E-Commerce Organization Applications

ELECTRONIC COMMERCE ORGANIZATION APPLICATIONS

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. Organizations establishing private electronic connections to customers, suppliers, distributors, industry groups and even competitors. The I-superhighway will expand this trend so that it allow business to exchange information.



Pressures influencing businesses

E-Commerce and the retail Industry

1. Conditions are changing in the “new economy” with respect to the retail industry
2. Consumers are demanding lower prices, better quality, a large selection of in-season goods.
3. Retailers are filling their order by
 - Slashing back-office costs
 - Reducing profit margins
 - Reducing cycle times
 - Buying more wisely
 - Making huge investments in technology.
4. Retailers are in the immediate line of fire and were first to bear the brunt of cost cutting.

Marketing and E-Commerce

1. E-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 & potential customer.
 - **Event marketing**-setting up a virtual booth where interested people come and visit.
2. Interactive marketing is accomplished in electronic markets via interactive multimedia catalogs that give the same look & feel as a shopping channel.
3. Users find moving images more appealing than still images and listening more appealing than reading text on screen.

Inventory Management and Organizational Applications

1. Companies are facing stiff global competition.
2. Adaptation would include moving to computerized, “paperless” operations to reduce costs and facilitate the adoption of new business processes.
3. One often targeted business process is inventory management, solutions for these processes go by different names

- Manufacturing industry also known as just-in-time inventory systems,
- Retail industry as quick response programs,
- Transportation industry as consignment tracking systems

Just-in-Time (JIT) Manufacturing

JIT is based on 2 principles:

- Elimination of waste (time, materials, labour & equipment) in the production cycle
- Empowering workers

Management practices associated with JIT systems are:

- Focused factory
- Reduced set-up times
- Group technology
- Total productive maintenance
- Multifunction employees
- Uniform workloads
- JIT purchasing
- Total quality control .etc



JIT purchasing is considered as an integral part of JIT system. It optimizes supplier and customer relations. In a production plant the needed materials are to be supplied just in time, no earlier or later than is demanded for processing.

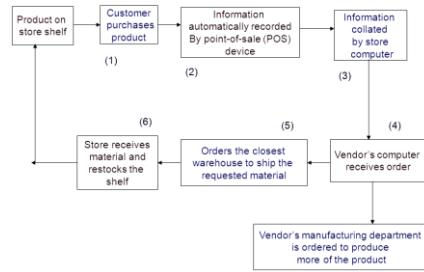
Production cost will decrease as the required level of stock is reduced. Materials from the supplier will be ordered only if the production plant can sell its product. Market risks are passed through the supplier chain.

Quality control of production is considerably enhanced. All stages of production are closely monitored.

Quick Response Retailing (QR)

- It is a version of JIT purchasing tailored for retailing
- To reduce the risk of being out of stock, retailers are implementing QR systems

- It 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 consisting of retailer, vendor, & consumer chain, & as consumers make purchases the vendor orders new deliveries from the retailer through its computer network.



The Quick response chains

Supply Chain Management

QR and JIT address only part of the overall picture, it's not feasible if a company depends on an 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 the manufacturer and finished products to the consumer

It includes following functions:

1. Supplier management:

The goal is to reduce the number of suppliers and get them to partners in business in a win/win relationship.

Benefits

- Reduced purchase order (PO) processing costs
- Increased number of processes by fewer employees
- Reduced order 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 be sent instantly. Documents can be tracked to ensure they were received, thus improving auditing capabilities.

3. Distribution management:

The goal is to move documents (accurate data) related to shipping (bills of loading, purchase orders, advanced ship notices and manifest claims).

4. Channel management:

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

5. Payment management:

The goal is to link company and the suppliers and distributors, so that payments can be sent and received electronically.

6. Financial management:

The goal is to enable global companies to manage their money in various foreign exchange accounts.

7. 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 because of the following:

- Global sourcing of products and services to reduce costs
- Short product life cycles
- Increasingly flexible manufacturing systems resulting in customizable products.

Work group Collaboration Applications:

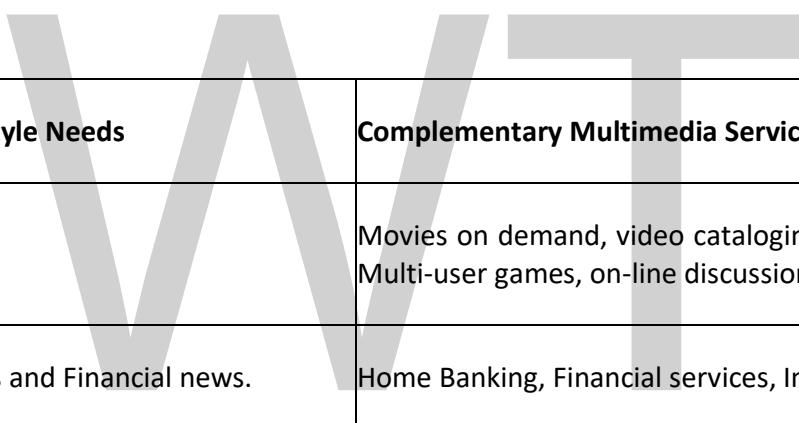
1. A inter-network that enables easy and inexpensive connection of various organizational segments.
2. It is to improve communications and information sharing and to gather and analyze competitive data in real-time.
3. Videoconferencing, document sharing and multimedia e-mail, are expected to reduce travel and encourage telecommuting

4. Improves the distribution channel for documents and records to suppliers, collaborators and distributors.

1.6 Consumer Oriented Electronic commerce

The wide range of applications envisioned for the consumer marketplace can be broadly classified into:

- (i) Entertainment**
- (ii) Financial Services and Information**
- (iii) Essential Services**
- (iv) Education and Training**



Consumer Life-Style Needs	Complementary Multimedia Services
Entertainment	Movies on demand, video cataloging, interactive Ads, Multi-user games, on-line discussions.
Financial Services and Financial news.	Home Banking, Financial services, Information,
Essential Services and remote diagnostics.	Home Shopping, Electronic Catalogs, telemedicine,
Education and Training conferencing, on-line databases.	Interactive education, multiuser games, video

1. Personal Finance and Home Banking Management

- (i) Basic Services
- (ii) Intermediate Services
- (iii) Advanced services

2. Home Shopping

(i) Television-Based Shopping

(ii) Catalog-Based Shopping

3. Home Entertainment

(i) Size of the Home Entertainment Market

(ii) Impact of the Home Entertainment on Traditional Industries

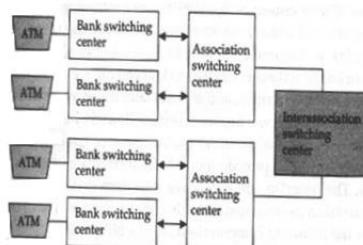
4. Micro transactions of Information

Personal Finance and Home Banking Management:

The newest technologies are direct deposit of payroll, on-line bill payment and telephone transfers. The technology for paying bills, whether by computer or telephone, is infinitely more sophisticated than anything on the market a few years ago. In 1980s were the days of "stone age" technology because of technology choices for accessing services were limited. For home banking, greater demands on consumers and expanding need for information, its services are often categorized as basic, intermediate and advanced.

(i) Basic services

- These are related to personal finance
- The evolution of ATM machines from live tellers and now to home banking
- The ATM network has with banks and their associations being the routers and the ATM machines being the heterogeneous computers on the network.
- This interoperable network of ATMs has created an interface between customer and bank that changed the competitive dynamics of the industry. It is shown in the below figure.
- Increased ATM usage and decrease in teller transactions
- The future of home banking lies with PC's Engineering



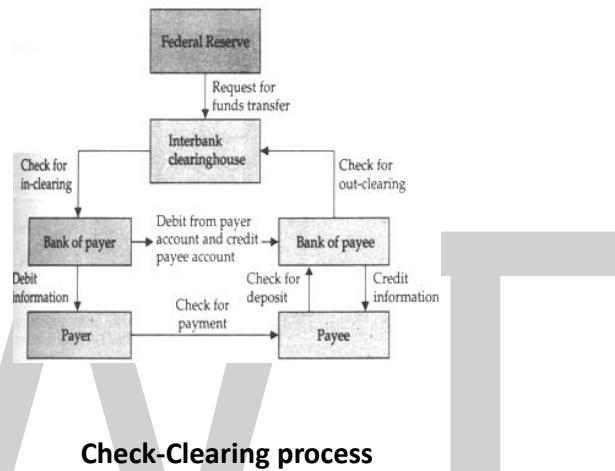
* MERGEFORMAT* MERGEFORMAT

Structure of ATM Network

(ii) Intermediate Services

The problem with home banking in 1980 is, it is expensive service that requires a PC, a modem and special software. As the equipment becomes less expensive and as bank offers broader services, home banking develops into a comprehensive package that could even include an insurance entertainment.

Consider the computerized on-line bill-payment system. It never forgets to record a payment and keeps track of user account number, name, amount and the date and we used to instruct with payment instructions.

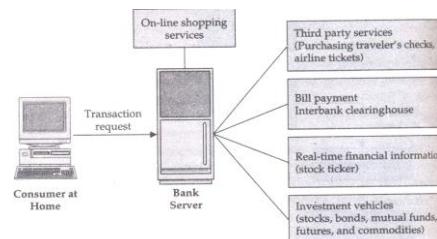


(iii) Advanced Services

The goal of advanced series is to offer their on-line customers a complete portfolio of life, home and auto insurance along with mutual funds, pension plans, home financing and other financial products. The below figure explains the range of services that may well be offered by banks in future. The services range from on-line shopping to real-time financial information from anywhere in the world. In short, home banking allows consumers to avoid long lines and gives flexibility.

2. Home Shopping:

It is already in wide use. This enables a customer to do online shopping



Advanced services and home banking

(i) Television-Based Shopping:

It is launched in 1977 by the Home Shopping Network (HSN). It provides a variety of goods ranging from collectibles, clothing, small electronics, house wares, jewelry and computers. When HSN started in Florida in 1977, it mainly sold factory overruns and discontinued items. It works as: the customer uses her remote control to shop at different channels with the touch of a button. At this time, cable shopping channels are not truly interactive.

(ii) Catalog-Based Shopping

- In this the customer identifies the various catalogs that fit certain parameters such as safety, price and quality.
- The on-line catalog business consists of brochures, CD-ROM catalogs and on-line interactive catalogs.
- Currently, we are using the electronic brochures.

2. Home Entertainment:

- It is another application for e-commerce
- Customer can watch movie, play games, on-screen catalogs, such as TV guide.
- In Home entertainment area, customer is the control over programming

Advanced Services

Size of the home Entertainment Market:

- Entertainment services play a major role in e-commerce.
- This prediction is underscored by the changing trends in consumer behavior.

Impact of Home entertainment on traditional industries:

- This will have devastating effects on theater business
- Economic issues might allow theaters to maintain an important role in the movie industry
- Today average cable bill is approximately \$30 a month industry estimates of consumer expenditures.

	1980 (\$4.7 bin)	1990 (\$31.0 bin)	1993 (\$37.8 bin)
--	-------------------------	--------------------------	--------------------------

Theaters	49.0%	\$2.3	14.5%	\$4.5	13.2%	\$5.0
Basic cable	35.0%	\$1.6	34.5%	\$10.7	36.9%	\$13.9
Premium cable	16.0%	\$0.8	16.5%	\$5.1	14.0%	\$5.3
Home video	-	-	33.8%	\$10.5	34.8%	\$13.2
Pay per view	-	-	0.7%	\$0.2	1.1%	\$0.4

Micro transactions of information:

One change in traditional business forced by the on-line information business is the creation of a new transaction category called small-fee transactions for micro services. The customer by giving some information away for free and provide information bundles that cover the transaction overhead.

The growth of small-money transfers could foster a boom in other complementary information services. The complexity is also increased in micro services when an activity named, re-verification is entered. It means checking on the validity of the transaction after it has been approved.

Desirable Characteristics of an Electronic marketplace

- **Critical mass of Buyers and sellers:** To get critical mass, use electronic mechanisms
- **Opportunity for independent evaluations and for customer dialogue and discussion:** Users not only buy and sell products, they compare notes on who has the best products and whose prices are outrageous
- **Negotiation and bargaining:** Buyers and sellers need to able to haggle over conditions of mutual satisfaction, money, terms & conditions, delivery dates & evaluation criteria
- **New products and services:** Electronic marketplace is only support full information about new services
- **Seamless interface:** The trading is having pieces work together so that information can flow seamlessly
- **Resource for disgruntled buyers:** It provide for resolving disagreements by returning the product.

1.7 Mercantile Process models

Mercantile processes define interaction models between consumers and merchants for on-line commerce

Mercantile Models from the Consumer's Perspective

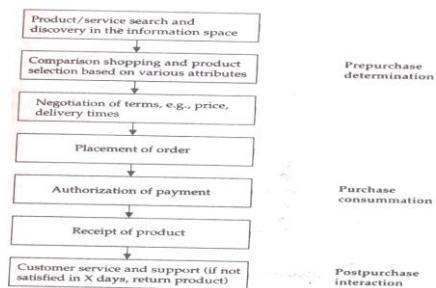
(i) Pre purchase preparation: The pre purchase preparation phase include search and discovery for a set of products to meet customer requirements.

- The consumer information search process.
- The Organizational search process.
- Consumer search experiences.
- Information brokers & brokerages.

(ii) Purchase consummation: The purchase consummation phase includes mercantile protocols.

- Mercantile process using digital cash.
- Mercantile transaction using credit cards.
- Costs of electronic purchasing.

(iii) Post purchase interaction: The post purchase interaction phase includes customer service & support.



Steps taken by a customer in product/service purchasing

(i) Pre purchase Preparation

The purchase is done by the buyers, so consumers can be categorized into 3 types

- **Impulsive buyers**, who purchase products quickly

- **Patient buyers**, purchase products after making some comparisons
- **Analytical buyers**, who do substantial research before making decision to purchase products.

Marketing researches have several types of purchasing:

- Specifically planned purchases
- Generally planned purchases
- Reminder purchase
- Entirely unplanned purchases

The consumer information search process

Information search is defined as the degree of care, perception & effort directed toward obtaining data or information related to the decision problem.

The Organizational search process

Organizational search can be viewed as a process through which an organization adapts to such changes in its external environment as new suppliers, products, & services.

Consumer Search Experiences

The distinction between carrying out a shopping activity “to achieve a goal” (utilitarian) as opposed to doing it because “u love it”.

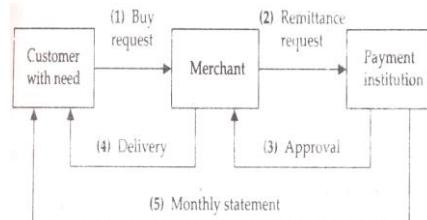
Information Brokers and Brokerages

To facilitate better consumer and organizational search, intermediaries called information brokers or brokerages. Information brokerages are needed for 3 reasons: Comparison shopping, reduced search costs and integration.

(ii) Purchase Consummation

- Buyer contacts vendor to purchase
- Vendor states price
- Buyer and Vendor may or may not engage in negotiation
- If satisfied, buyer asks the payment to the vendor
- Vendor contacts billing service
- Billing service decrypts authorization and checks buyers account balance

- Billing service gives to the vendor to deliver product
- Vendor delivers the goods to buyer
- On receiving the goods, the buyer signs and delivers receipt
- At the end of the billing cycle, buyer receives a list of transactions



Simplified online-mercantile model

Mercantile process using Digital Cash

- Buyer obtains e-cash from issuing bank
- Buyer contacts seller to purchase product
- Seller states price
- Buyer sends e-cash to seller
- Seller contacts his bank or billing service to verify the validity of the cash
- Bank gives okay signal
- Seller delivers the product to buyer
- Seller then tells bank to mark the e-cash as “used” currency

Mercantile Transactions Using Credit Cards

Two major components compromise credit card transactions in this process: electronic authorization and settlement.

In retail transaction, a third-party processor (TPP) captures information at the point of sale, transmits the information to the credit card issuer for authorization, communicates a response to the merchant and electronically stores the information for settlement and reporting.

The benefits of electronic processing include the reduction in credit losses, lower merchant transaction costs, & faster consumer checkout & merchant-to-bank settlement

A step-by-step account of retail transaction follows:

Step1: A customer presents a credit card for payment at a retail location.

Step2: The point-of-sale software directs the transaction information to the local network.

Step3: System verifies the source of the transaction and routes it.

Step4: In this, transaction count and financial totals are confirmed between the terminal and the network.

Step5: In this, the system gathers all completed batches and processes the data in preparation for settlement.

A merchant client takes one of two forms:

- Merchants are charged a flat fee per transaction for authorization and data capture services.
- The other form of billing allows merchants to pay a "bundled" price for authorization, data capture, & settlement

Cost of Electronic Purchasing:

Cash seems to be preferable to electronic payments, such as on-line debit, credit and electronic check authorization. Consumers appear to spend more when using cards than when spending cash

(iii)Post purchase Interaction

Returns and claims are an important part of the purchasing process. Other complex customer service challenges arise in customized retailing are:

Inventory issues: To serve the customer properly, a company should inform a customer right away and if the item is in stock, a company must be able to assign that piece to customer

Database access and compatibility issues: Customers should get all kind of services by easy means like calling a number 800 etc.,

Customer service issues: To clear the doubts of customer about product.

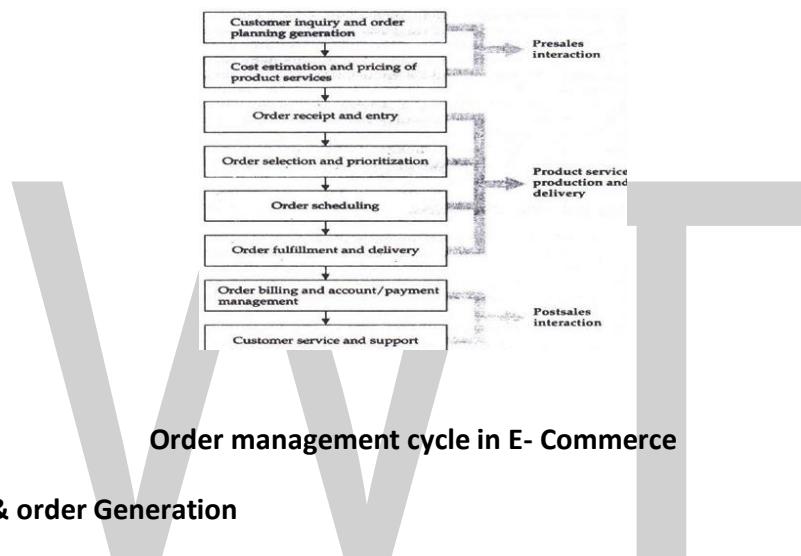
Mercantile Models from the Merchant's Perspective

For better understanding, it is necessary to examine the order management cycle (OMC). The OMC includes eight distinct activities. The actual details of OMC vary from industry to industry and also for individual products and services.

OMC has generic steps:

(i) Order planning & Order generation.

- (ii) Cost estimation & pricing.
- (iii) Order receipt & entry.
- (iv) Order selection & prioritization.
- (v) Order Scheduling
- (vi) Order fulfillment & delivery.
- (vii) Order billing & account/payment management.
- (viii) Post sales service.



Order planning & order Generation

- Order planning leads to order generation.
- Orders are generated in a number of ways in the e-commerce environment.
- The sales force broadcasts ads (direct marketing), sends personalized e-mail to customers (cold calls), or creates a WWW page

Cost Estimation & pricing

Pricing is the bridge between customer needs & company capabilities. Pricing at the individual order level depends on understanding the value to the customer that is generated by each order, evaluating the cost of filling each order; & instituting a system that enables the company to price each order based on its value & cost

Order Receipt & Entry

After an acceptable price Quote, the customer enters the order receipt & entry phase of OMC. This was under the purview of departments variously titled customer service, order entry, the inside sales desk, or customer liaison.

Order Selection & Prioritization

Customer service representatives are also often responsible for choosing which orders to accept and which to decline. Not, all customers' orders are created equal; some are better for the business.

Order Scheduling

In this phase, the prioritized orders get slotted into an actual production or operational sequence. This task is difficult because the different functional departments- sales, marketing, customer service, operations, or production- may have conflicting goals, compensation systems, & organizational imperatives.

Production people seek to minimize equipment changeovers while marketing & customer service reps argue for special service for special customers.

Order Fulfillment & Delivery

- In this actual provision of the product or service is made.
- It involves multiple functions and locations.

Order Billing & Account/Payment Management

After the order has been fulfilled & delivered, billing is given by finance staff. The billing function is designed to serve the needs and interests of the company, not the customer.

Post sales Service

This phase plays an increasingly important role in all elements of a company's profit equation: customer, price, & cost. It can include elements such as physical installation of a product, repair & maintenance, customer training, equipment upgrading & disposal.

ELECTRONIC PAYMENT SYSTEMS AND INTER ORGANIZATIONAL COMMERCE

Electronic payment systems - Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems. Inter Organizational Commerce - EDI, EDI Implementation, Value added networks.

2.1 Electronic payment systems

Electronic payment systems are proliferating in banking, retail, health care, on-line markets and even government in fact, anywhere money needs to change hands. Organizations are motivated by the need to deliver products and services more cost effectively and to provide a higher quality of service to customers.

The emerging electronic payment technology labeled electronic funds transfer (EFT). EFT is defined as "any transfer of funds initiated through an electronic terminal, telephonic instrument, or computer or magnetic tape so as to order, instruct, or authorize a financial institution".

Designing Electronic Payment systems

Basic Requirements

Designing an electronic payment system should have the requirements assessed:

1. Technological Requirements

When designing an electronic payment system, the system's ability of the effectiveness and the security of each transaction and the degree of compatibility with the online shop must be taken into consideration.

A payment system requires the greatest level of security in electronic commerce transactions. It must have confidentiality, authenticity, integrity and non-repudiation of transactions.

2. Economic Requirements

These deal with the cost of transaction which refers to the amount paid by the client. Economic assessments include also atomic exchange which means that the consumer will pay money or something equivalent in value.

An electronic payment system must also be accessible in all countries of the world, to all ages (user range) or currency in equal value and must not be restricted to the company that created the value.

Economic needs also deal with financial risks, because consumers and merchants are very concerned about the degree of security involved in online transactions.

Return On Investment(ROI) is a economic parameter and a performance measure used to evaluate the efficiency of an investment.

3. Social Requirements

Payment system must prevent companies or financial institutions from tracing user information and must be simple and user-friendly. As social needs, electronic payment methods should also be accessible anywhere.

4. Legal Requirements

Electronic payment system must abide by governmental regulations and the law and guaranty all necessary proofs (digital signature, contracts,...) to protect users performing domestic/international transactions.

Components that make e-payment system

1. Database Integration

An integration database is a database which acts as the data store for multiple applications and thus integrates data across these applications (in contrast to an Application Database). An integration database needs a schema that takes all its client applications into account.

Each record should be kept in separate database. Each database must be linked together to access from anywhere.

2. Brokers

- The role of electronic brokers facilitate financial transactions electronically.
- The information superhighway directly connects millions of people, each both a consumer of information and a potential provider. If their exchanges are to be efficient, yet protected on matters of privacy, sophisticated mediators are required. Electronic brokers play this important role by organizing markets that promote the efficient production and consumption of information.
- Electronic brokers will be required to permit even reasonably efficient levels and patterns of exchanges.
- Their ability to handle complex, albeit mechanical, transactions, to process millions of bits of information per second and to act in a demonstrably even-handed fashion will be critical as this information market develops.

- Electronic brokers can also run pricing systems, charging and crediting slight amounts to individual accounts as bits careen along the superhighway.

3. Standards

The e-payment standards enable payment users to link with various networks and other payment systems. Standards for interoperability which enable users to buy and receive information regardless of which bank is managing their money.

4. Pricing

Payment card networks, such as Visa, require merchants' banks to pay substantial "interchange" fees to cardholders' banks, on a per transaction basis. Consumers make two distinct decisions (membership and usage) whereas merchants make only one (membership).

5. Privacy

- Protecting the privacy of evaluators and their information is another important policy concern of e-payment system.
- Contemporary standards of fairness require that many documents, ranging from letters to the editor to personnel evaluations, be signed and that one's accuser be identified in court.
- Signed evaluations are less likely to be unfair and, over time, people can identify trustworthy evaluators.

In a model of electronic payment gateway, there are five interfaces.

1. Customer Interface
2. Server(e-payment Gateway) Interface
3. Client Bank Interface
4. Merchant Bank Interface
5. Merchant Interface

Online Customer will connect to e-payment gateway through Internet. Gateway will connect to the bank and check whether its bank accounts is enough to buy the required product. Online customer can also visit Merchant's website through gateway.

Protocol Design and Verification

Success of electronic payment system is based on the design principals and its correctness.

Rules, formats and procedures that have been agreed upon between participating parties are collectively called a protocol.

The protocol can contain agreements on the methods used for:

- Initiation and termination of data exchanges.
- Synchronization of senders and receivers.
- Detection and correction of transmission errors.
- Formatting and encoding of data.

A protocol specification consists of five distinct parts. To be complete, each specification should include explicitly:

1. The service to be provided by the protocol.
2. The assumptions about the environment in which the protocol is executed.
3. The vocabulary of messages used to implement the protocol.
4. The encoding (format) of each message in the vocabulary.
5. The procedure rules guarding the consistency of message exchanges.

Types of Electronic Payment Systems

EFT can be segmented into three broad categories:

1. Banking and financial payments

- Large-scale or wholesale payments (e.g., bank-to-bank transfer)
- Small-scale or retail payments (e.g., automated teller machines)
- Home banking (e.g., bill payment)

2. Retailing payments

- Credit Cards (e.g., VISA or MasterCard)
- Private label credit/debit cards (e.g., J.C. Penney Card)
- Charge Cards (e.g., American Express)

3. On-line electronic commerce payments

- (i) Token-based payment systems
- Electronic cash (e.g., DigiCash)

- Electronic checks (e.g., NetCheque)
- Smart cards or debit cards (e.g., Mondex Electronic Currency Card))

(ii) Credit card-based payments systems

- Encrypted Credit Cards (e.g., World Wide Web form-based encryption)
- Third-party authorization numbers (e.g., First Virtual)

Advantages:

It is clear that the electronic payment systems have a range of pros in comparison to traditional banking services:

1. Time savings:

Money transfer between virtual accounts usually takes a few minutes, while a wire transfer or a postal one may take several days. Also, we will not waste our time waiting in lines at a bank or post office.

2. Expenses control:

Even if someone is eager to bring his disbursements under control, it is necessary to be patient enough to write down all the petty expenses which often takes a large part of the total amount of disbursements.

The virtual account contains the history of all the transactions indicating the store and the amount we spent. And we can check it anytime we want. This advantage of electronic payment system is pretty important in this case.

3. Reduced risk of loss and theft:

We cannot forget the virtual wallet somewhere and it cannot be taken away by robbers. Although in cyberspace, there are many scammers to make our e-currency account secure.

4. Low commissions:

If we pay for internet service provider or a mobile account replenishment through the UPT (unattended payment terminal), we will encounter high fees. As for the electronic payment system, a fee of this kind of operations consists of 1% of the total amount and this is a considerable advantage.

5. User-friendly:

Usually every service is designed to reach the widest possible audience, so it has the intuitively understandable user interface. In addition, there is always the opportunity to submit a question to a

support team, which often works 24/7. Anyway, we can always get an answer using the forums on the subject.

5. Convenience:

All the transfers can be performed at any time, anywhere. It is enough to have an access to the Internet.

Disadvantages:

1. Restrictions:

Each payment system has its limits regarding the maximum amount in the account, the number of transactions per day and the amount of output.

2. The risk of being hacked:

If we follow the security rules, the threat is minimal. It can be compared to the risk of something like a robbery. The worse situation when the system of processing company has been broken because it leads to the leak of personal data on cards and its owners. Even if the electronic payment system does not launch plastic cards, it can be involved in scandals regarding the identity theft.

3. The problem of transferring money between different payment systems:

Usually, the majority of electronic payment systems do not cooperate with each other. In this case, we have to use the services of e-currency exchange and it can be time-consuming if still do not have a trusted service for this purpose.

4. The lack of anonymity:

The information about all the transactions, including the amount, time and recipient are stored in the database of the payment system. And it means the intelligence agency has an access to this information. We should decide whether it is bad or good.

5. The necessity of Internet access:

If internet connection fails, we cannot get to our online account. In general, the advantages of electronic payment system outweigh its disadvantages and they have bigger opportunities comparing with ones of traditional wire transfers.

2.2 Digital Token-Based Electronic Payment Systems

Electronic tokens are three types:

1. Cash or Real-time

Transactions are settled with exchange of electronic currency.

Example: On-line currency exchange is electronic cash (e-cash).

2. Debit or Prepaid

Users pay in advance for the privilege of getting information.

Example: Prepaid payment mechanisms are stored in smart cards and electronic purses that store electronic money.

3. Credit or Postpaid

The server authenticates the customers and verifies with the bank that funds are adequate before purchase.

Example: Postpaid mechanisms are credit/debit cards and electronic checks.

Properties of Electronic Cash:

There are many ways that exist for implementing an e-cash system, all must incorporate a few common features.

Specifically, e-cash must have the following four properties:

1. Monetary value
2. Interoperability
3. Retrievability
4. Security

Electronic Cash in Action

Electronic Cash is based on cryptographic systems called “digital signatures”. This method involves a pair of numeric keys: one for locking (encoding) and the other for unlocking (decoding).

Purchasing E-cash from Currency Servers

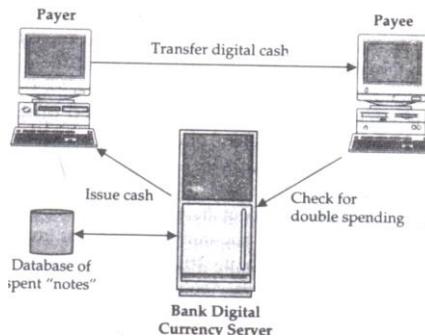
The purchase of e-cash from an on-line currency server (or bank) involves two steps:

- Establishment of an account and
- Maintaining enough money in the account to bank the purchase.

Some customers might prefer to purchase e-cash with paper currency, either to maintain anonymity or because they don't have a bank account.

Using the Digital Currency

Once the tokens are purchased, the e-cash software on the customer's PC stores digital money undersigned by a bank. The users can spend the digital money at any shop accepting e-cash, without opening an account there or transmitting credit card numbers. As soon as the customer wants to make a payment, the software collects the necessary amount from the stored tokens.



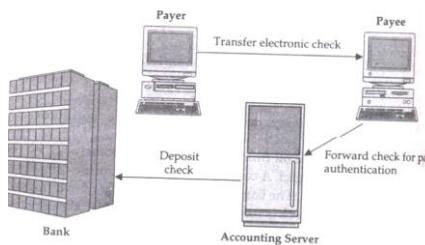
Deduction of double spending in e commerce

Electronic Checks

It is another form of electronic tokens. In the given model shown in the below figure, buyers must register with third-party account server before they are able to write electronic checks. The account server acts as a billing service.

The advantages are:

1. They work in the same way as traditional checks.
2. These are suited for clearing micro payments.
3. They create float and availability of float is also important for commerce.
4. Financial risk is assumed by the accounting server and may result in easier acceptance.



Payment transaction sequence in an electronic check system

2.2.1 Smart Cards based Electronic Payment Systems

Smart cards have been in existence since the early 1980s and hold promise for secure transactions using existing infrastructure. Smart cards are credit and debit cards and other card products enhanced with microprocessors capable of holding more information than the traditional magnetic stripe.

The smart card technology is widely used in countries such as France, Germany, Japan and Singapore to pay for public phone calls, transportation and shopper loyalty programs.

Smart cards are basically two types:

1. Relationship-Based Smart Credit Cards

2. Electronic Purses, which replace money, are also known as debit cards and electronic money.

Relationship-Based Smart Credit Cards

It is an enhancement of existing cards services or the addition of new services that a financial institution delivers to its customers via a chip-based card or other device. These services include access to multiple financial accounts, value-added marketing programs, or other information card holders may want to store on their card.

It includes access to multiple accounts such as debit, credit, cash access, bill payment and multiple access options at multiple locations.

Electronic Purses

There is a need for a financial instrument to replace cash. To meet this need, banks, credit card companies and even government institutions are racing to introduce "electronic purses", a wallet-sized smart cards embedded with programmable microchips that store sums of money for people to use instead of cash for everything.

The electronic purse works in the following manner:

1. After purse is loaded with money at an ATM, it can be used to pay for candy in a vending machine with a card reader.
2. It verifies card is authentic and if it has enough money, the value is deducted from balance on the card and added to an e-cash and the remaining balance is displayed by the vending machine.

2.2.2 Credit Card-Based Electronic Payment Systems

Payment cards are all types of plastic cards that consumers use to make purchases:

Credit cards: Such as a Visa or a MasterCard, has a preset spending limit based on the user's credit limit.

Debit cards: Removes the amount of the charge from the card holder's account and transfers it to the seller's bank.

Charge cards: Such as one from American Express, carries no preset spending limit.

Advantages:

- Payment cards provide fraud protection.
- They have worldwide acceptance.
- They are good for online transactions.

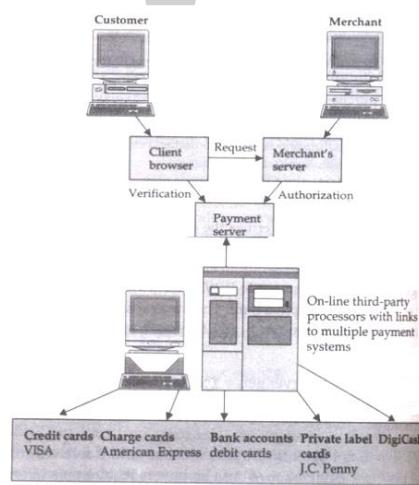
Disadvantages:

Payment card service companies charge merchants per-transaction fees and monthly processing fees.

Payment Acceptance and Processing

Open loop (such as VISA) and closed loop (such as American Express) systems will accept and process payment cards. A merchant bank or acquiring bank is a bank that does business with merchants who want to accept payment cards.

Software packaged with our electronic commerce software can handle payment card processing automatically. Electronic cash is a general term that describes the attempts of several companies to create value storage and exchange system that operates online in much the same way that government-issued currency operates in the physical world.



Online payment process using third party processor

Concerns about electronic payment methods include:

1. Privacy
2. Security
3. Independence
4. Portability
5. Convenience

Electronic Cash Issues

1. Primary advantage is with purchase of items less than £5
 - Credit card transaction fees make small purchases unprofitable
 - Facilitates Micro-payments – e.g., for items costing less than £1
 - Must be anonymous, just like regular currency
2. Safeguards must be in place to prevent counterfeiting
3. Must be independent and freely transferable regardless of nationality or storage mechanism.

Electronic Cash Storage

There are two methods

1. On-line

- Individual does not have possession personally of electronic cash.
- Trusted third party, e.g. e-banking, bank holds customers' cash accounts.

Off-line

- Customer holds cash on smart card or electronic wallet.
- Fraud and double spending require tamper-proof encryption.

2.2.3 Risks in Electronic Payment systems

Tax Evasion

Businesses are required by law to provide records of their financial transactions to the government, so that their tax compliance can be verified. Electronic payment can frustrate the efforts of tax collection. Unless a business discloses the various electronic payments it has made or received over the tax period, the government may not know the truth, which could cause tax evasion.

Fraud

Electronic payment systems are prone to fraud. The payment is done usually after keying in a password and sometimes answering security questions. There is no way of verifying the true identity of the maker of the transaction. As long as the password and security questions are correct, the system assumes are the right person. If this information falls into the possession of fraudsters, then they can defraud us of our money.

Impulse Buying

Electronic payment systems encourage impulse buying, especially online. We need to make a decision to purchase an item we find on sale online, even though we had not planned to buy it, just because it will cost us just a click to buy it through our credit card. Impulse buying leads to disorganized budgets and is one of the disadvantages of electronic payment systems.

Payment Conflict

Payment conflicts often arise because the payments are not done manually but by an automated system that can cause errors. This is especially common when payment is done on a regular basis to many recipients. If we do not check our pay slip at the end of every pay period, for instance, then we might end up with a conflict due to these technical glitches, or anomalies.

2.3 Inter Organizational Commerce

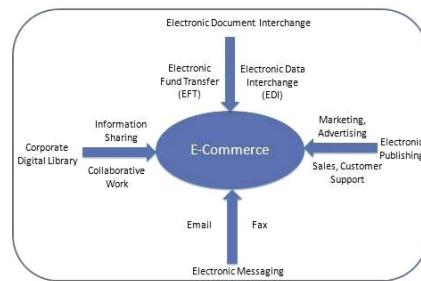
- Electronic communication between the firm and its environment.
- Includes all forms of communication depicted in the EC model, but restricted to communication between a firm and its environment.
- One-to-one, one-to-many and many-to many communications.

2.3.1 Electronic Data Interchange

E-Commerce or Electronics Commerce is a methodology of modern business, which addresses the need of business organizations, vendors and customers to reduce cost and improve the quality of goods and services while increasing the speed of delivery.

E-commerce refers to the paperless exchange of business information using the following ways:

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



Interposes communication of business information in standardized electronic form. Prior to EDI, business was dependent on postal and phone systems that restricted communication to few hours of the workday that overlap between time zones.

EDI plays major role in:

- Reduction in transaction costs.

- Foster closer relationships between trading partners.

EDI & Electronic Commerce

Electronic commerce includes EDI & much more. EDI forges boundary less relationships by improving interchange of information between trading partners, suppliers, & customers

Benefits of EDI

- Cost & time savings, Speed, Accuracy, Security, System Integration, Just-In-Time Support.
- Reduced paper-based systems, i.e. record maintenance, space, paper, postage costs
- Improved problem resolution & customer service
- Expanded customer/supplier base or suppliers with no EDI program lose business

2.3.2 EDI Implementation

EDI layered architecture

- 1. Semantic (or application) layer**
- 2. Standards translation layer**
- 3. Packing (or transport) layer**
- 4. Physical network infrastructure layer**



EDI SEMANTIC LAYER	APPLICATION LEVEL SERVICES	
	EDIFACT BUSINESS FORM STANDARDS	
EDI STANDARD LAYER	ANSI X12 BUSINESS FORM STANDARDS	
	EMAIL	X.435 MIME
EDI TRANSPORT LAYER	POINT TO POINT	FTP TELNET
	WWW	HTTP
PHYSICAL LAYER	DIAL UP LINES, INTERNET, IWAY	

EDI layered architecture

Application Layer:

The first layer of EDI defines the business applications that are used by EDI. This layer of EDI translates business application into request for quotes, purchase orders, acknowledgment and invoices. For every company, this layer is specific and also for the software that company uses.

The application layer also called as the semantic layer. The Semantic layer describes the business application that is driving EDI. For a procurement application, this translates into request for quotes, price purchase orders, acknowledgments and invoice.

This layer is specific to a company and the software it uses i.e., the user interface and content visible on the screen are tailored or customized to local environment. By the semantic layer of EDI, the companies form are changed into more specific format and then it may be send to various partners of the company which have a several software applications to handle all forms aspects.

To achieve all the above activities the company must follow the EDI standard. Examples of EDI standards are X12, ANSI, EDIFACT etc. If the sender and receivers of company want to exchange some files, then requires a compatible standards of Electronic Data Interchange.

The Sender who want to send a data use a software application with EDI and exchange data in EDI format so that at the receivers end, the receiver can read it. The EDI standards are very important in exchange of data because at sending end, a sender manipulate data by EDI as in receiving end, data is manipulated by EDI.

Standards translation:

Specifies business form structure so that information can be exchanged.

Two competing standards are:

- American National Standards Institute (ANSI) X12
- EDIFACT developed by UN/ECE, Working Party for the Facilitation of International Trade Procedures

EDI transport layer

- How the business form is sent, e.g. post, UPS, fax
- Increasingly, e-mail is the carrier
- Differentiating EDI from e-mail
- Emphasis on automation
- EDI has certain legal status

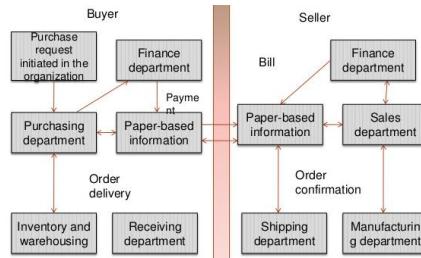
Physical network infrastructure layer

Dial-up lines, Internet, value-added network, etc.

EDI in Action

The below figure shows the information flow when paper documents are shuffled between organizations via the mail room. When the buyer sends a purchase order, then relevant data is extracted & recorded on a hard copy.

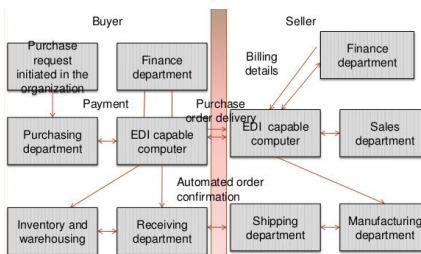
This hard copy is forwarded to several steps, at last manually entered into system by the data entry operators. This process is somewhat overhead in labor costs & time delays.



Information Flow without EDI

Information flow with EDI are as follows:

- Buyer sends purchase order to seller computer
- Seller sends purchase order confirmation to buyer
- Seller sends booking request to transport company
- Transport company sends booking confirmation to seller
- Seller sends advance ship notice to buyer
- Transport company sends status to seller
- Buyer sends Receipt advice to seller
- Seller sends invoice to buyer
- Buyer sends payment to seller EDI as a fast, inexpensive & safe method



Information Flow with EDI

EDI Applications in Business

Four different scenarios in industries that use EDI extensively are:

1. International or cross-border trade
2. Electronic funds transfer
3. Health care EDI for insurance claims processing
4. Manufacturing & retail procurement

1. International or cross-border trade

EDI has always been very closely linked with international trade.

Trade efficiency, which allows faster, simpler, broader & less costly transactions

Role of EDI in international trade

- EDI facilitates the smooth flow of information and it reduces paper work.

EDI benefits for international trade are:

- Reduced transaction expenditures
- Quicker movement of imported & exported goods
- Improved customer service through “track & trace” programs
- Faster customs clearance & reduced opportunities for corruption, a huge problem in trade

2. Interbank Electronic Funds Transfer (EFT)

EFTS is credit transfers between banks where funds flow directly from the payer's bank to the payee's bank.

The two biggest funds transfer services in the United States are the Federal Reserve's system, Fed wire, & the Clearing House Interbank Payments System (CHIPS) of the New York clearing house.

Automated Clearinghouse (ACH) Transfers

ACH transfers are used to process high volumes of relatively small-dollar payments for settlement in one or two business days.

It provides services, pre-authorized debits, such as repetitive bill payments; & consumer-initiated payments.

3. Health care EDI for insurance EDI

- Providing good & affordable health care is a universal problem
- EDI is becoming a permanent fixture in both insurance & health care industries as medical provider, patients and payers
- Electronic claim processing is quick & reduces the administrative costs of health care.
- Using EDI software, service providers prepare the forms & submit claims via communication lines to the value-added network service provider
- The company then edits, sorts & distributes forms to the payer. If necessary, the insurance company can electronically route transactions to a third-party for price evaluation
- Claims submission also receives reports regarding claim status & request for additional information.

4. Manufacturing & retail procurement using EDI

- These are heavy users of EDI.
- In manufacturing, EDI is used to support just-in-time.
- In retailing, EDI is used to support quick response

Just-In-Time & EDI

- Companies using JIT & EDI calculates how many parts are needed each day based on the production schedule & electronically transmit orders.
- Delivery has to be responsive, or it will cost too much in money & time.
- Getting data to suppliers quickly
- A major benefit of JIT & EDI is a streamlined cash flow.

Quick Response & EDI

- For the customer, QR means better service & availability of a wider range of products
- For the retailer & supplier, QR may mean survival in a competitive marketplace
- Much focus of QR is in reduction of lead times using event-driven EDI.
- In QR, EDI documents include purchase orders, shipping notices, invoices, inventory position, catalogs, & order status

EDI: Legal, Security, & Privacy Issues

Legal Status of EDI Messages

To understand the legal framework, let's take a look on three modes of communication types:

Instantaneous: If the parties are face to face or use an instantaneous communication medium such as the telephone.

Delayed (USPS): The “mailbox rule” provides that an acceptance communicated via USPS mail is effectively dispatched.

Delayed (non-USPS): Acceptances transmitted via telegram, mailgram, & electronic messages, are communicated & operable upon receipt.

Digital Signatures & EDI

- Digital signatures might be time-stamped or digitally notarized to establish dates & times.
- If digital signatures are to replace handwritten signatures, they must have the same legal status as handwritten signatures.
- It provides a means for a third party to verify that notarized object is authentic.

EDI & Electronic Commerce

New types of EDI are:

1. Traditional EDI

2. Open EDI

Traditional EDI

It replaces the paper forms with almost strict one-to-one mappings between parts of a paper form to fields of electronic forms called transaction sets.

It covers two basic business areas:

Trade data Interchange (TDI) encompasses transactions such as purchase orders, invoice & acknowledgments.

Electronic Funds Transfer (EFT) is the automatic transfer of funds among banks & other organizations

It is divided into 2 camps: old EDI & new EDI. Old EDI is a term created by those working on the next generation of EDI standards in order to differentiate between the present & the future.

Old EDI

In this automating the exchange of information pertinent to business activity is achieved. It is referred as the current EDI-standardization process where it allows every company to choose its own, unique, proprietary version

New EDI

It is refocusing of the standardization process. In this, the structure of the interchanges is determined by the programmer who writes a program. It removes long standardization process.

Open EDI

It is a business procedure that enables e-commerce to occur between organizations where the interaction is of short duration. It is a process of doing EDI without the upfront trading partner agreement that is currently signed by the trading partners. The goal is to sustain adhoc business or short-term trading relationships using simpler legal codes. It is a law of contract within the context of e-commerce where transactions are not repeated over long period of time.

Structure of EDI transactions

- Transaction set is equivalent to a business document, such as a purchase order
- Data Segments are logical groups of data elements that together convey information
- Data elements are individual fields, such as purchase order no.

Comparison of EDIFACT & X.12 Standards

- These are comprised of strings of data elements called segments.
- A transaction set is a set of segments ordered as specified by the standard.
- ANSI standards require each element to have a very specific name, such as order date or invoice date.
- EDIFACT segments, allow for multi use elements, such as date.
- EDIFACT has fewer data elements & segments & only one beginning segment (header), but it has more composites.
- It is an ever-evolving platform

EDI Software Implementation

EDI software has 4 layers:

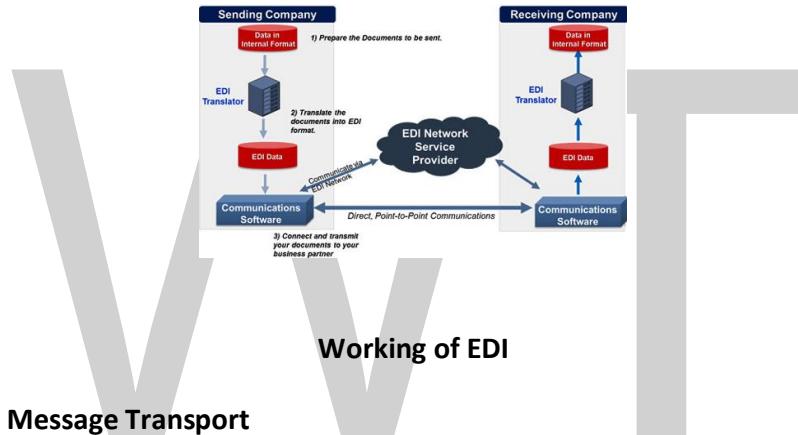
1. Business application

2. Internal format conversion
3. EDI Translator
4. EDI envelope for document messaging

These 4 layers package the information & send it over the value-added network to the target business, which then reverses the process to obtain the original information.

EDI Business Application Layer

- It creates a document, an invoice.
- Sends to EDI translator, reformats the invoice into an EDI standard.
- If these are on the same type of computer, the data move faster.



EDI Envelope for Message Transport

The X.400 & X.435 Envelopes

- The X.400 standard was meant to be the universal answer to e-mail inter-connectivity
- It promises much & to date, delivers little.
- The work on X.400 began in 1980
- It is the open standard for mail interchange
- The standard exists in 3 versions: 1984, 1988, & 1992.

EDI Software Implementation

The X.435 inserts a special field in an X.400 envelope to identify an EDI message. It includes data encryption; integrity; notification of message delivery & non-delivery; & non-repudiation of delivery. It is a secure, reliable way to send EDI & accompanying files within the same message.

Purchase orders, invoices, drawings, e-mail- all could be sent with end-to-end acknowledgment of message receipt.

2.4 Value-Added Networks (VANs)

Value-added network or VAN involves the use of a common carrier's phone lines to allow business-to-business network communication. The network is "value-added" because it has various services and enhancements that improve the way business applications communicate with each other.

The use of a VAN provides communication channels among supply chain and trading partners by allowing the transmission of data and its translation between formats. The automated communications achieved through a VAN can help a business and its trading partners engage in more effective e-commerce transactions through the encryption, retransmission and support of messages, but from a small business's cost perspective, the implementation of a VAN can also be expensive and a resource-intensive endeavor.

An EDI VAN (Value Added Network) offers a B2B (business to business) network of electronic communications, a network which includes an array of 'value added' services, as well as facilitated communication protocols that otherwise would not be available when going through the Internet or regular phone lines.

Using a EDI VAN allows for seamless and automated communication channels between trading partners, while offering multiple formats for EDI translation. This, in turn, results in a proficient and effective supply chain management. Most importantly, EDI VANs (Value Added Networks) are not industry-centric, they work across all industries, in which case scalability is fundamental.

Some of the key advantages and benefits to using an EDI VAN (Value Added Network) as the preferred mode of electronic business communication.

Data Integrity: EDI VANs typically audit both incoming, as well as outgoing data, to detect errors. There are checks and balances in place and in some cases, EDI VANs (Value Added Networks) may provide corrections and adjustments services to enable successful transmissions and receipt of data.

Improved B2B (business to business) exchanges: VANs (Value Added Networks) allow for the use of multiple protocols to send data and for each trading partner to employ the data format best suited for their organization.

Speedy business communication: The exchange of documents through a VAN (Value Added Network) is significantly faster than other means of data transfer as data is exchanged directly from one business software to another. Manual processing is typically eliminated which therefore significantly reduces the risks associated with errors and consequent time delays.

Secure and reliable communication channels: VANs (Value Added Networks) are highly secure and meet government and HIPAA security standards.

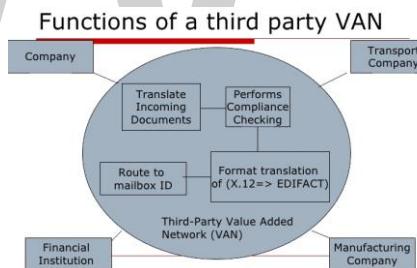
Unrestricted accessibility: With a 24/7 accessibility of the VAN (Value Added Network), the exchange of data is secure to anywhere in the world, with no time constraints or disruption to our daily business operations.

Simpler EDI compliance: EDI testing and compliance are required by most retailers, to be met and complied with by their supply chain vendor community. Furthermore, retailers often require to do so through the use of an EDI VAN (Value Added Network), their preferred EDI method of communication. Consequently, going through a VAN (Value Added Network) will facilitate and simplify, to some degree, the EDI.

Visibility tools: A handful of VAN (Value Added Network) providers, such as EDI Gateway Inc, offer a monitoring web tool and corresponding reports to allow us to track the data we exchange and with our trading partners and its delivery status. Such ‘value add’, multi-user visibility tools have unrestricted and unlimited accessibility from anywhere, at anytime.

A VAN is a communication network that typically exchanges EDI messages among trading partners. It provides services, including holding messages in “electronic mailboxes”, interfacing with other VANs.

Disadvantage is EDI-enabling VANs is that they are slow & high-priced, charging by the number of characters transmitted.



Functions of a Third party VAN

Internet-Based EDI

Several factors make internet useful for EDI:

- Flat-pricing that is not dependent on the amount of information transferred.
- Cheap access with low cost of connection- often a flat monthly fee for leased line Or dial-up access.
- Common mail standards & proven networking & interoperable systems.

- Security public-key encryption techniques are being incorporated in various electronic mail systems.

The image displays two large, light gray, bold letters 'W' and 'T' positioned side-by-side. The letter 'W' is on the left, and the letter 'T' is on the right. Both letters have a thick, slightly rounded font style.

INTRA ORGANIZATIONAL COMMERCE

Intra Organizational Commerce - work Flow, Automation Customization and internal Commerce, Supply chain Management.

3.1 Intra-Organizational Commerce

Internal commerce is the application of electronic commerce to processes or operations. Specifically, we define internal commerce as using methods and pertinent technologies for supporting internal business processes between individuals, departments and collaborating organizations.

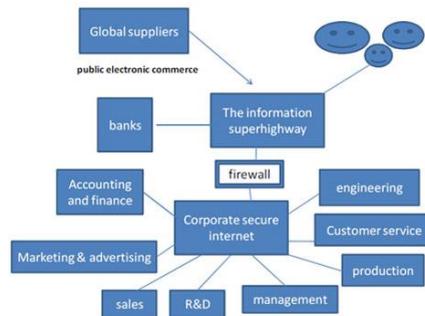
It is of two types:

1. Private commerce
2. Public commerce

In a general sense, the term Information System (IS) refers to a system of people, data records and activities that process the data and information in an organization and it includes the organization's manual and automated processes.

In a narrow sense, the term information system (or computer-based information system) refers to the specific application software that is used to store data records in a computer system and automates some of the information-processing activities of the organization.

These forces makes us rethink about the importance of the networks-computers and communications and their role in the better utilization of corporate information in operational and analytical decision making.



Public electronic commerce

Information architecture (IA) is the art of expressing a model or concept of information used in activities that require explicit details of complex systems.

Among these activities are library systems, content Management Systems, web development, user interactions, data base development, programming, technical writing, enterprise architecture and critical system software design.

Most definitions have common qualities: A structural design of shared environments, methods of organizing and labeling websites, intranets and online communities and ways of bringing the principles of design and architecture to the digital landscape.

Cross-functional Management

Cross-functional management (CFM) manages business processes across the traditional boundaries of the functional areas. CFM relates to coordinating and steering the activities of different units for realizing the superordinate cross-functional goals and policy deployment.

It is concerned with building a better system for achieving such cross-functional goals such as innovation, quality, cost and delivery.

3.2 Workflow Automation

Workflow Automation is a technology solution which automates the tasks, resources and internal operations that form the process known as “workflow”. Workflow is the process, which encompasses many small, definable tasks that link together to achieve the desired result.

Workflow automation utilizes software to link together the elements of workflow (events, tasks, resources) in an attempt to increase the speed, visibility and coordination by which the work gets done.

In last decade, a vision of speeding up or automating routine business tasks has come to be known as “work-flow automation”. This vision has its root in the invention of the assembly line and the application of Taylor's scientific management principles.

Today, a similar trend is emerging in the automation of knowledge-based business processes called work-flow automation. The goal of work-flow automation is to offer more timely, cost-effective and integrated ways to make decisions.

Typically, work-flows are decomposed into steps or tasks, which are task oriented. Work-flows can be simple or complex. Simple work-flows typically involve one or two steps or tasks. Another way of looking at work-flow is to determine the amount of cross-functional activity. In other words, companies must adopt an integrated process view of all the business elements.

Organizational integration is extremely complex and typically involves three steps,

- Improving existing processes by utilizing technology wherever appropriate.
- Integrate across the business function offer identifying the information needs for each process.
- Integrating business functions, application program interface and database across departments and groups.
- Complex work-flows involve several other work-flows, some of which executes simultaneously.

Work-Flow Coordination

The key element of market-driven business is the coordination of tasks and other resources throughout the company to create value for customer. To this end, effective companies have developed horizontal structures around small multi-functional teams that can move more quickly and easily than businesses that use the traditional function-by-function, sequential approach.

Some of the simplest work-flow coordination tools are electronic forms routing applications such as lotus notes. As the number of parties in the work flow increases, good coordination becomes crucial.

Work-flow related technologies

Technology must be the “engine” for driving the initiatives to streamline and transform business interactions. Large organizations are realizing that they have a middle-management offer all the drawn sizing and reorganization of past few years.

Pressures for more comprehensive work-flow systems are building rapidly. Work-flow system are limited to factory like work process.

Middleware is maturing:

By these, users or third-party providers need to learn how to develop work-flow applications within middleware environment.

Organizational memory is becoming practical:

The new tools for memory advancing towards, what can be called the “corporate digital library”.

Advantages

Priorities and timelines are linked across the organization. Tasks and calendars are visible to all users enabling workloads to be shared and efficiently managed visibility.

Managers can quickly see the status of a process but beyond that they can also identify roadblocks, resources constraints and opportunity for process improvement.

Workflow Automation software provides a graphical representation of people, projects and financial processes for workflow design, configuration and self-service.

The graphical workflow interface enables to visually define, control, track and audit approvals, routing, role-based assignments and notifications.

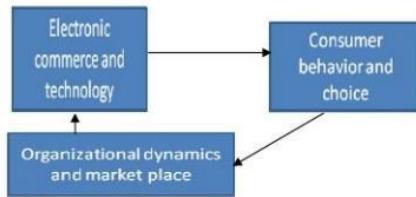
Workflow automation helps to ensure that at the right time, the right person gets the right information about what needs to be done and in what order.

A salesman incurs an expense and fills out an electronic form directly within the system. He takes a photo of his receipt with his iPhone camera and attaches it to the expense form he just completed. When he presses the submit button, it is uploaded and deposited into the ECM repository. The system recognizes the total amount on the expense form and automatically sends it to the appropriate person for approval prior to accounting receiving it.

3.3 Customization and Internal Commerce

Customization

Technology is transforming consumer choices, which in turn transform the dynamics of the marketplace and organizations themselves. Technology embodies adaptability, programmability, flexibility and other qualities so essential for customization.



Mass customization, in marketing, manufacturing and management, is the use of flexible computer-aided manufacturing systems to produce custom output. "Mass Customization" is the new frontier in business competition for both manufacturing and service industries.

Those systems combine the low unit costs of mass production processes with the flexibility of individual customization.

Implementation:

Many implementations of mass customization are operational today, such as software-based product configurations which make it possible to add and/or change functionalities of a core product or to build fully custom enclosures from scratch.

Companies which have succeeded with mass-customization business models tend to supply purely electronic products. However, these are not true "mass customizers" in the original sense, since they do not offer an alternative to mass production of material goods.

Four types of mass customization:

1. **Collaborative customization** - Firms talk to individual customers to determine the precise product offering that best serves the customer's needs.
2. **Adaptive customization** - Firms produce a standardized product, but this product is customizable in the hands of the end-user.
3. **Transparent customization** - Firms provide individual customers with unique products, without explicitly telling them that the products are customized.
4. **Cosmetic customization** - Firms produce a standardized physical product, but market it to different customers in unique ways.

Today technology is so pervasive that it is virtually impossible to make clear distributions among management, design of work and technology in almost all forms of business and industry. Technology has moved into products, the workplace and the market with astonishing speed and thoroughness.

Today, the walls that separated functions in manufacturing and service industries alike are beginning to fall like dominoes. Customization need not be used only in the production of cars,

planes and other traditional products. It can also be used for textiles and clothing. Technology is also enabling new forms of customized production in apparel industry.

Internal Commerce

Internal commerce is the application of electronic commerce to processes or operations. Specifically, we define internal commerce as using methods and pertinent technologies for supporting internal business processes between individuals, departments and collaborating organizations. It is of two types:

1. Private commerce
2. Public commerce

In a general sense, the term Information System (IS) refers to a system of people, data records and activities that process the data and information in an organization and it includes the organization's manual and automated processes.

In a narrow sense, the term information system refers to the specific application software that is used to store data records in a computer system and automates some of the information-processing activities of the organization.

These forces are commanding a rethinking of the importance of the networks-computers and communications and their role in the better utilization of corporate information in operational and analytical decision making.

3.4 Supply Chain Management (SCM)

Supply chain

Supply chain consists of all parties involved, directly or indirectly in fulfilling a customer request.



Supply chain management (SCM)

Supply chain management (SCM) is the management of a network of interconnected business involved in the ultimate provision of product and service packages required by end customers.

Supply Chain Management spans all movement and storage of raw materials, work-in-process inventory and finished goods from point-of-origin to point-of-consumption.

Supply Chain Management can also refer to supply chain management software which is tools or modules used in executing supply chain transactions, managing supplier relationships and controlling associated business processes.

The Management Components of SCM

Supply chain management (SCM) enables enterprises to source the raw materials or components needed to create a product or service and deliver that product or service to customers.

The six components of SCM include:

- **Planning:** Enterprises need to plan and manage all resources required to meet customer demand for their product or service. They also need to design their supply chain and then determine which metrics to use in order to ensure the supply chain is efficient, effective, delivers value to customers and meets enterprise goals.
- **Sourcing:** Companies must choose suppliers to provide the goods and services needed to create their product. After suppliers are under contract, supply chain managers use a variety of processes to monitor and manage supplier relationships. Key processes include ordering, receiving, managing inventory and authorizing supplier payments.
- **Making:** Supply chain managers coordinate the activities required to accept raw materials, manufacture the product, test for quality, package for shipping and schedule for delivery. Most enterprises measure quality, production output and worker productivity to ensure the enterprise creates products that meet quality standards.
- **Delivering:** Often called logistics, this involves coordinating customer orders, scheduling delivery, dispatching loads, invoicing customers and receiving payments. It relies on a fleet of vehicles to ship product to customers. Many organizations outsource large parts of the delivery process to specialist organizations, particularly if the product requires special handling or is to be delivered to a consumer's home.
- **Returning:** The supplier needs a responsive and flexible network to take back defective, excess, or unwanted products. If the produce is defective it needs to be reworked or scrapped. If the product is simply unwanted or excess it needs to be returned to the warehouse for sale.
- **Enabling:** To operate efficiently, the supply chain requires a number of support processes to monitor information throughout the supply chain and assure compliance with all regulations. Enabling processes include finance, HR, IT, facilities, portfolio management, product design, sales and quality assurance.

The literature on business process re-engineering, buyer-supplier relationships and SCM suggests various possible components that must receive managerial attention when managing supply relationships. Lambert and Cooper (2000) identified the following components which are:

- Planning and control -Work structure -Organization structure

- Product flow facility structure -Information flow facility structure - Management methods
- Power and leadership structure -Risk and reward structure -Culture and attitude

Reverse Supply Chain

Reverse logistics is the process of planning, implementing and controlling the efficient, effective inbound flow and storage of secondary goods and related information opposite to the traditional supply chain direction for the purpose of recovering.

Importance of SCM:

SCM plays a vital role in organization activities and an essential element to operational efficiency which can be applied to customer satisfaction and company's success. We can say that it is just like the backbone of an organization which manages the critical issues of the business organization such as rapid growth of multinational corporations, global expansion and environmental concerns which indirectly or dramatically affects the corporate strategy.

Other benefits and importance of supply chain management are: reduces inventory costs provides better medium for information sharing between partners improves customer satisfaction as well as service maintains better trust between partners provides efficient manufacturing strategy improve process integration improves bottom line (by decreasing the use of fixed assets in the supply chain) increase cash flow improves quality and gives higher profit margin.

SCM offers various tools and techniques that help business organization to diagnose the problems and also provide solutions of these disruptions around the business environment. It plays an important role in moving goods more quickly to their destinations.

The most important thing in today's business is managing competition among partners and in order to win this competition SCM helps business organization in a very efficient manner. All the benefits and importance of SCM makes its future so bright and because of emerging trends in organization SCM becomes the most critical business discipline in the world today.

CORPORATE DIGITAL LIBRARY

Document Library, digital Document types, corporate Data Warehouses. Advertising and Marketing - Information based marketing, Advertising on Internet, on-line marketing process, market research.

4.1 Document Library

This section highlights the role that documents play in today's organization and how business can better meet their customers' needs by improving document management support.



These are the following dimensions for internal electronic commerce organization:

User modeling and interaction:

User models are interposing between the user interface and information sources to filter the available information according to the needs of the task and user. It associates with each task or each person is a user agent or set of user agents.

Tasks of user agents are:

- Maintaining the model & current state of the task
- Determination of information for each step of the task
- Appropriate combination of information with user.
- Addressing the issue of displaying information to the user.
- Consideration of wide range of display devices.

- Determining the most appropriate methods for display.

In this user agent tackle two issues:

1. Generation of documents

2. Presentation of documents.

Effective utilization of information

- Organization decision making cannot be supported with a single tool, a set of technology tools are required for effective utilization of information.
- Organization needs online –transactions for design, production, logistics and profitability.

Types of On-line transaction:

Two types of on-line transaction are :

1. On-line transaction processing (OLTP).

2. On-line analytical processing (OLAP).

OLTP involves the detailed, day-to-day procedures such as order entry & order management.

OLAP refers to the activity involved in searching the wealth of data residing throughout an enterprise for trends, opportunities.

Navigating the info sphere

It involves two related activities:

- Information search, discovery and retrieval.
- Presentation of retrieved Information.

Search, Discovery and Retrieval:

This view is changing in three ways.

1. Characterization of accessible information
2. Search concepts from this information.
3. Development of information filter

Presentation or visualization:

- It is used for easy understanding of information.
- Organization must predefine rules for visualization.
- This process will highlight the trouble spots and area of opportunities.

Presentation increases the following tasks of information :

1. Accessing ability of information.
2. Collection of information.
3. Queuing of information.
4. Organizing information.

Digital Library Layer

Many organizations manage their information through corporate library, if it provides the architecture to model, map, integrate information in digital documents it is called digital library. It provides information structures by this organizations & workers access vast amount of data encoded in multimedia formats.

Digital libraries are of two types:

- 1. Electronic document-based digital libraries.**
- 2. Data-base oriented warehouses.**

Document digital library:

The term document is used to denote all non data records i.e. books, reports, e-files, videos and audios. Digital library is simply a distributed network of interlinked information.

Data warehouses:

It is a central repository for combining and storing vast amount of data from different sources. Sources are main frame database, host-server database, text reports....etc.

4.2 Digital Document types

Ad hoc documents: Letters, finance reports, manuals are called ad hoc documents, which are prepared by managers & professionals.

Process-specific documents: invoices and purchase orders which are created, constructed and distributed by support personnel. These are form based.

Knowledge-oriented documents: These are technical documents, catalogs of product information and design documents.

Types of Digital Documents

Four types of digital documents are:

1. Structuring applications around a document interface.
2. Structuring interlinked textual & multimedia documents.
3. Structuring and encoding information using document-encoding standards.
4. Scanning documents for storage and faxing.

Document Imaging

Document imaging emulates microfiche and microfilm. An imaging system passes document through a scanner that renders it digital and then stores the digital data as a bit-mapped image of document. The problem with the imaging approach is that the output contains only images not text.

The following imaging standards are prominently used:

TIFF (tag image file format): format for interchange of bit-mapped images.

ITU-TSS (international telecommunication union-telecommunication standardization sector) Group IV T.6 facsimile: this standard is used for compression and exchange of bit-mapped files.

Structured Documents

A structured document provides clear description of document content. Structured documents apply data-base structuring capabilities to individual documents and document collections.

Standard for structured documents are:

SGML (Standard Generalization Markup Language):

It is an ISO standard for interchange & multi formatting description of text document in terms of logical structure.

ODA (Office Document Architecture):

It is an ANSI & ISO standard for interchange of compound office documents. ODA specifies both content & format.

CDA (Compound Document Architecture):

It defines set of rules for content and format .It defines services for compound documents.

RTF (Rich –Text Format):

It is developed by Microsoft for interchanging of desktop documents.

Hyper Text Documents

Hyper text is a way of making document-based information more mobile.

Reasons for mobility of information are:

- Information in enterprises is seldom located on server but is distributed throughout the organization.
- Accessing & retrieving large monolithic document is time consuming.
- Reuse of document for composing new documents is difficult task.
- In this relationships between documents can be represented through hypermedia links i.e. hyperlinks.

Standards of Hypermedia:

HyTime: It adds time based relationships like synchronization, it is extension of SGML.

HTML: Developed by WWW to support distributed hypermedia.

MHEG(multimedia /hypermedia encoding/exporting Group): Standard for presenting objects in multimedia.

Active documents

- Active document represents what is known as document oriented computing.
- It provide an interactive interface between documents.
- Active documents are especially powerful because they combine composition of information with the distributed nature of information.

Example: spreadsheet, word-processing..etc

Issues behind Document Infrastructure

Document infrastructure addressed these questions:

- What is the proper architecture for the corporate digital library?
- What are appropriate model?
- What protocols required?
- What are the best human interfaces?
- How does one represent and manipulate the information processing activities occurred in the digital library?

Document Constituencies:

The emerging document processing & management strategies must address these constituencies. They need system to access distributed repositories & to manipulate them in a number of ways.

Document-oriented processes

Components of Document-oriented processes are:

- Document creation
- Document media conversion(it accept multiple forms of input)
- Document production and distribution
- Document storage and retrieval
- Document-based framework flows:

The following Four activities make up the document-based framework flow:

Document modeling: It defines the structure and processes the document.

Transformation: Creates modules for capturing and validating.

Synthesizing: Create value-added information from the combination of two or more documents.

Business modeling: Defines the structure and processes of the business environment.

4.3 Corporate Data Warehouses

Data Warehousing

The primary concept of data warehousing is that the data stored for business analysis can most effectively accessed by separating it from the data in the operational systems. A data warehouse is

a collection of computer-based information that is critical to successful execution of enterprise initiatives.

A data warehouse is more than an archive for corporate data and more than a new way of accessing corporate data. A data warehouse is a subject-oriented repository designed with enterprise-wide access in mind.

It provides tools to satisfy the information needs of the employees organizational levels-not just for complex data queries, but as general facility for getting quick, accurate and often insightful information. A data warehouse is designed so that its users can recognize the information they want and access that information using simple tools.

One of the principal reasons for developing a data warehouse is to integrate operational data from various sources into a single and consistent architecture that supports analysis and decision-making within the enterprise.

Operational systems create, update and delete production data that feed the data warehouse. A data warehouse is analogous to a physical warehouse. Operational systems create data ‘parts’ that are loaded into the warehouse.

Some of those parts are summarized into information ‘components’ and are stored in the warehouse. Data warehouse users make requests and are delivered information ‘products’ that are created from the components and parts stored in the warehouse. A data warehouse is typically a blending of technologies, including relational and multidimensional databases, client/server architecture, extraction/transformation programs, graphical user interfaces and more.

Data Warehouse:

The term Data Warehouse was coined by Bill Inmon in 1990, which he defined in the following way: “A warehouse is a subject-oriented, integrated, time-variant and non-volatile collection of data in support of management’s decision making process”.

He defined the terms in the sentence as follows:

Subject Oriented:

Data that gives information about a particular subject instead of about a company’s ongoing operations.

Integrated:

Data that is gathered into the data warehouse from a variety of sources and merged into a coherent whole.

Time-variant:

All data in the data warehouse is identified with a particular time period.

Non-volatile:

Data is stable in a data warehouse. More data is added but data is never removed. This enables management to gain a consistent picture of the business. However, a single-subject data warehouse is typically referred to as a data mart, while data warehouses are generally enterprise in scope. Also, data warehouses can be volatile.

Due to the large amount of storage required for a data warehouse, (multi-terabyte data warehouses are not uncommon), only a certain number of periods of history are kept in the warehouse. For instance, if three years of data are decided on and loaded into the warehouse, every month the oldest month will be “rolled off” the database and the newest month added. Ralph Kimball provided a much simpler definition of a data warehouse. A data warehouse is “a copy of transaction data specifically structured for query and analysis”.

This definition provides less insight and depth than Mr. Inmon’s, but is no less accurate. Data warehousing is essentially what we need to do in order to create a data warehouse and what we do with it. It is the process of creating, populating and then querying a data warehouse and can involve a number of discrete technologies such as:

Advantages of data warehouse

Implementing a Data warehouse provides significant benefits many tangible, some intangible.

More cost effective decision making - A Data Warehouse allows reduction of staff and computer resources required to support queries and reports against operational and production databases. This typically offers significant savings. Having a Data Warehouse also eliminates the resource drain on production systems when executing long - running, complex queries and reports.

Better enterprise intelligence - Increased quality and flexibility of enterprise analysis arises from the multi tiered data structures of a Data Warehouse that supports data ranging from detailed transactional level to high level summary information. Guaranteed data accuracy and reliability result from ensuring that a Data Warehouse contains only ‘trusted’ data.

Enhanced customer service - An enterprise can maintain better customer relationships by correlating all customer data via a single Data Warehouse architecture.

Business reengineering - Allowing unlimited analysis of enterprise information often provides insights into enterprise processes that may yield breakthrough ideas for reengineering those processes. Just defining the requirements for Data Warehouse, results in better enterprise goals and measure. Knowing what information is important to an enterprise will provide direction and priority for reengineering efforts.

Information systems reengineering - A Data Warehouse that is based upon enterprise- wide data requirements provides a cost - effective means of establishing both data standardization and operational system interoperability. Data Warehouse development can be an effective first step in reengineering the enterprise’s legacy systems.

Types of Data warehouses:

The term data warehouse is currently being used to describe a number of different facilities each with diverse characteristics.

Physical data warehouse: This is an actual, physical database into which all the corporate data for the data warehouse are gathered, along with schema's (information about data) and the processing logic used to organize, package and pre-process the data for end user access.

Logical data warehouse: This contains all the meta data, business rules and processing logic required scrub, organize, package and pre-process the data. In addition, it contains the information required to find and access the actual data, wherever it actually resides.

Data library: This is a subset of the enterprise wide data warehouse. Typically, it performs the role of departmental, regional or functional data warehouse. As part of the data warehouse process, the organization builds a series of data libraries over time and eventually links them via an enterprise wide logical data warehouse.

Decision support systems (DSSs): These systems are not data warehouses but applications that make use of the data warehouse. They are also called Executive Information Systems (EIS).

Aspects of Data Warehouse Architecture

This list of aspects of architecture that the data warehouse decision maker will have to deal with themselves. There are many other architecture issues that affect the data warehouse, e.g., network topology, but these have to be made with all of an organization's systems in mind (and with people other than the data warehouse team being the main decision makers.)

Data consistency architecture

This is the choice of what data sources, dimensions, business rules, semantics and metrics an organization chooses to put into common usage. It is also the equally important choice of what data sources, dimensions, business rules, semantics and metrics an organization chooses not to put into common usage. This is by far the hardest aspect of architecture to implement and maintain because it involves organizational politics.

However, determining this architecture has more to do with determining the place of the data warehouse in our business than any other architectural decision. In my opinion, the decisions involved in determining this architecture should drive all other architectural decisions.

Reporting data store and staging data store architecture.

The main reasons we store data in a data warehousing systems are so they can be:

- 1) Reported against,
- 2) Cleaned up and (sometimes)

3) Transported

Data modeling architecture

This is the choice of whether we wish to use demoralized, normalized, object oriented, proprietary multidimensional, etc. As we may guess, it makes perfect sense for an organization to use a variety of models.

Tool architecture

This tools are going to use for reporting.

Processing tiers architecture

This is the choice of what physical platforms will do, what pieces of the concurrent processing that takes place, when using a data warehouse. This can range from an architecture as simple as host-based reporting to one as complicated.

Security architecture

If we need to restrict access down to the row or field level, we will probably have to use some other means to accomplish this other than the usual security mechanisms at our organization. Note that while security may not be technically difficult to implement, it can cause political consternation.

In the long run, decisions on data consistency architecture will probably have much more influence on the return of investment in the data warehouse than any other architectural decisions. To get the most return from a data warehouse (or any other system), business practices have to change in conjunction with or as a result of the system implementation. Conscious determination of data consistency architecture is almost always a prerequisite for using a data warehouse to effect business practice change.

4.4 Advertising and Marketing

It is clear that these firms lacked a clear marketing strategy for the electronic marketplace. Very simply, real savings can be gained by using technology to do marketing-related activities that used to require expensive people-directed field operations. For example, marketers are learning that valuable information can be collected from the customer on-line with minimum effort and low cost that otherwise would take months and at least several hundred thousand dollars to gather.

Before delving into the details related to on-line advertising and marketing, it is important to note that there is a tendency in the technology literature to confuse marketing with sales and advertising. The three are certainly complementary, but are separate.

Marketing is a way of managing a business so that each important business decision is made with full knowledge of the impact it will have on the customer. It deals with all the steps between determining customer needs and supplying them at a profit. It entails drawing a management plan that views all marketing components as part of a total system that requires effective strategic planning, organization, leadership and control.

Marketing has two underlying assumptions: (1) All company policies and activities should be aimed at satisfying customer needs and (2) Profitable sales volume is a better company goal than maximum sales volume. Selling is often used as an equivalent term for marketing, although this is not the case.

The sales approach almost always focuses on volume, while the marketing approach focuses on profit. In short, under the sales approach the customer exists for the business, while under the marketing approach the business exists for the customer. Advertising is the process of reaching the customer using a broadcast or direct mail campaign orchestrated to influence purchasing behavior. Advertising plans are conceived within the confines or parameters set by a marketing plan. With the advent of electronic commerce, a new type of interactive advertising is emerging whereby customers can choose the information they wish to access.

Traditionally, mass and direct (one-way) advertising have aimed at broad-casting a message to a large number of customers. Most business continues to operate under the classic broadcast approach—"Come buy this great product we have created or this fantastic service we are offering." Interactive (two-way) advertising, on the other hand, aims at allowing customers to browse, explore, compare, question and even custom design the product configuration.

It has been said that "comparing mass-advertising to interactive advertising is like comparing shotgun buckshot to sniper fire. In the interactive environment time is taken to take aim and really penetrate the customer. Ideally, we want someone to spend 20 minutes drilling down into product information."

In contrast to the traditional approach in which the company "pushes" its product, in an interactive marketing situation the company creates forces that entice customers to "pull" down the information that they are interested in. The goal is to educate and provide utility to the customer rather than to confuse. In short, the new model of advertising aims at "putting the customer first"-a phrase that has mostly been given lip service in the past.

Interactive marketing using such new media technologies as computer-based on-line services or CD-ROMs will not supplant, at least initially, conventional marketing techniques, but will augment them as a new, low-cost means of reaching customers. Below table summarizes the contrasts among the three approaches in marketing: mass, direct and interactive.

Table: Nature of Marketing in Electronic Commerce Environments

	Mass Marketing	Direct Marketing	Interactive Marketing
Distribution Channel	Broadcast and print media (consumer is passive)	Postal service using mailing lists (consumer is passive)	The Internet (consumer is active and is the catalyst for what is shown on screen)
Market Strategy (and sample products)	High volume (food, beer, autos, personal products)	Targeted goods (cards, travel, subscriptions)	Targeted audience (autos, services and all types of product information)
Enabling Technology	Storyboards and desktop publishing	Databases and statistical tools	Information servers, client browsers, bulletin boards and software agents.
Authors of Marketing Material	Ad agencies	Ad agencies and companies.	Companies and consumers.
Expected Out-come from Successful Implementation	Volume sales	Bounded sales, data for analysis.	Data for analysis, customer relationships, new product ideas, volume sales.

4.4.1 Information-Based Marketing

The new age of information-based marketing differ from interactive marketing in four areas:

- Retailers vs manufacturers
- Target and micromarketing
- Small business vs large business
- Regulatory and legal implications of cyberspace marketing.

Retailers' vs Manufacturers:

The role of Retailers and manufacturers are fast reversing in electronic commerce.

Retailer's vs Manufacturers have the following methods:

- Market research and customer prospecting.
- Market presence method
- Product or services building method
- Information-based products pricing and priority method.

Target and Micromarketing:

Electronic commerce, technology has put target and micromarketing within the reach of small business. It gives information to the micro marketers not only about its own business but also about consumer's information.

Consumer target is two-way flow of communication between seller and buyer. Direct mail and telemarketing are two fast growing ways to micro market. Technology is an essential tool in micromarketing.

There are two main types of micromarketing:

- 1. Direct-relationship micromarketing:** is aimed at stimulating sales at retail establishments through direct contacts with consumers.
- 2. Direct-order micromarketing:** is focused on selling products directly to consumers in their homes or businesses.

Small vs large: Thread avoid vs goliath syndrome

The key distinction between small and large business remains access to national and international marketing for advertising purposes. Today, exorbitant advertising cost represents the barrier to reach the customer effectively.

Internet and other networks plays good role in advertising. The major difference between the internet and other I-way advertising media are ownership and membership fees. Due to the empowering effect of internet-facilitated advertising however, the balance of power between large and small companies may change in future.

4.4.2 Advertising on Internet

Advertising on the Internet is almost a necessity for modern businesses, especially those that do business outside of their local community. Consumers use the Internet for more than simply entertainment or information, as they do with radio, television, magazines and newspapers. Consumers use the Internet to assist them in nearly every aspect of life, creating countless opportunities to place relevant, targeted ad messages.

Advantages

The Internet's vast reach can allow advertisers to reach significantly more people than traditional advertising media at a fraction of the cost. Internet advertising is ideal for businesses with a national or international target market and large-scale distribution capabilities.

As a rule, the more people our business serves, the most cost-efficient internet advertising can be. Internet advertising can also be more targeted than some traditional media, ensuring that our messages are seen by the most relevant audiences.

Disadvantages

One disadvantage of advertising on the Internet is that our marketing materials are automatically available for anyone in the world to copy, regardless of the legal ramifications. Logos, images and trademarks can be copied and used for commercial purposes, or even to slander or mock our company.

This is not the case with television and magazine advertising, wherein images must be replicated rather than simply copied electronically. Another disadvantage is the fact that the Internet-advertising gold rush has begun to introduce ad clutter to the Web. Web users are so inundated with banner ads and spam email that they have begun to ignore internet advertising just as much as ads on traditional media.

The notion of advertising and marketing became inevitable after 1991 when the internet was opened for commercial traffic. There are very good reasons for embracing the inevitability of growing commercial advertising on the internet:

- Advertising conveys much needed information
- Advertising generates significant revenue

Key components for making internet advertising effectively are:

- Advertising process

- Core content
- Supporting content
- Market and consumer research
- Repeat customers

4.4.3 On-line marketing process

Two different advertising paradigms are emerging in the on-line world, they are:

- 1. Active or push-based advertising**
- 2. Passive or pull-based advertising**

Active or push-based advertising

Active or push-based advertising is of two types, they are :

The broadcast model:

Broadcasting message provides a means for reaching a great number of people in short period of time. It mimics the traditional model, in which customer id is exposed to the advertisement during TV programming. It basically uses direct mail, spot television, cable television. Text-based broadcast messages also used in advertising in Usenet news groups.

The junk mail model:

Disadvantage of the direct mail include relatively high cost per contact. Junk mail is the just poorly targeted direct mail. It is most intrusive of all forms of internet advertising, because it is easily implemented using electronic mail. Junk mail creates unwanted expense as well as an annoyance.

Passive or pull-based advertising

Pull-based advertising provide a feedback loop, company and customers.

On-line pull-based advertising includes the following:

- 1. Billboards**
- 2. Catalogs or yellow pages directories:**
- 3. Endorsements**

Based on the above three we have the fallowing models:

The billboards or WWW model:

Billboard advertising is often used to remind the customer of the advertising messages communicated through other media. The advantage of this model is no customer charges. In this message must be simple, direct.

Catalog and yellow pages directory model:

Traditionally, the most visible directory service of advertising is the yellow pages. Catalog model is the least intrusive model but requires active search on the part of customer. Yellow pages are low in cost in terms of production and placement. Disadvantage of yellow page include lack of timeliness and little creative flexibility.

Customer endorsement model:

In endorsements people tell their experiences with products and services. These are in question and answer format.

4.4.4 Market Research

Market research consists of systematically gathering data about people or companies, a market and then analyzing it to better understand what that group of people needs. The results of market research, which are usually summarized in a report are then used to help business owners make more informed decisions about the company's strategies, operations and potential customer base.

Understanding industry shifts, changing consumer needs and preferences and legislative trends, among other things can shape where a business chooses to focus its efforts and resources. That's the value of market research.

Meaning, if our research told that scientists had recently created a new kind of fabric that helped the wearer lose weight just by putting it on, for example, our retail clothing store might want to adjust its buying plan to test designs using this new fabric.

If we uncovered that shoppers in our area rely heavily on coupons in making a purchase decision, we might decide to test sending our mailing list a promotional coupon. Market research can help businesses run more efficiently and market more effectively.

Market research is extremely important for companies in terms of how they allocate their advertising dollars in sales promotions, how they introduce new products, how they target new markets.

Broadly marketing research is divided into three phases:

- 1. Data collection**
- 2. Data organization**
- 3. Data analysis and sense making**

Data collection:

- Markets mainly relied on source database for understanding consumer behavior.
- Source data base mainly comprise of numeric information.
- Delivery of source database services follows two main patterns.
- Collect data and collate data, making it available by database producers.
- Collect data and collate data, making it available by central hosts like CompuServe, American online..etc.

Data organization:

Everyone is collecting data from electronic commerce, but very few are organizing it effectively for developing a marketing strategy.

The key abilities in their environment are:

- Leverage its established database into customized offerings by audience and markets.
- Leverage its established database in terms of horizontal growth.

Data analysis and sense making:

The ability to link database to analytic tools like econometric programs and forecasting models is called data analysis. Market research is undergoing major changes. The next generation of source database will definitely include multimedia information.

Types of Market Research

While there are a number of market research tools we can use, there are really only two types of market research data:

Primary: Primary data is first-hand information gathered ourselves, or with the help of a market research firm.

Secondary: Secondary data is pre-existing public information, such as the data shared in magazines and newspapers, government or industry reports. We can analyze the data in new ways, but the information is available to a large number of people.

Using primary or secondary data, there are two types of research studies:

Exploratory: Exploratory market research gathers lots of open-ended data from many people to better understand a problem or opportunity. The goal is to gather perceptions and opinions regarding an issue, so our company can decide how to address it. But first we have to understand how our market sees the issue.

Specific: Once we understand the larger market issues, or opportunities, we can use specific questions to gather information that could lead to a new product or service. Market research firms often use specific questions to gather feedback on a new advertising campaign or to refine a planned new product.

Primary Market Research Tools

While primary research is more time-consuming and expensive, sometimes it's the only way to get the information we need. The most common primary research tools are:

Surveys: Asking customers a series of questions to better understand how they feel about a product's features, or about the experience they had during their hotel stay, for example, are two possible uses of a survey. Surveys consist of a list of questions that can be shared with an individual by phone, in person, on a card or paper, or online using a survey software.

Focus groups: Bringing together groups of people with a common characteristic, such as age, hobby, or buying habits, to better understanding their likes and dislikes is a focus group. Focus groups typically consist of 8-12 people with a moderator who poses questions for the group to discuss. They are a useful way of getting feedback on a new product, new features, or new ad-campaign.

Observation: When the researcher gathers information simply by watching how a subject interacts with a product, the technique is observation. This is often used in comparing preferences for several types of products.

In-depth interviews: Another market research technique is the one-on-one interview with an individual, during which probing questions are posed to better understand that person's product preferences.

Sources of Secondary Data

When conducting market research to better understand industry trends and broader shifts, secondary research is often a good place to start. Some of the most useful sources include:

- Industry associations and trade groups – most associations publish annual outlooks.
- Trade journals specific to our industry
- Government reports - such as the Census or annual federal procurement results.
- Industry analysts - these individuals monitor the performance of public companies in our space.
- University faculty members - see what research reports they may have published.
- Websites – while Wikipedia isn't a reliable source, there may be others that leads to reputable sources and reports.

- Competitor websites and materials - to convince potential customers to buy from them, they may share useful statistics and reports.

The purpose of market research is to provide information that will assist in making better decisions, to help our company be more successful.



CONSUMER SEARCH AND RESOURCE DISCOVERY

Consumer Search and Resource Discovery - Information search and Retrieval, Commerce Catalogues, Information Filtering.

5.1 Information search and Retrieval

Search and resource discovery paradigms

Three information search and resource discovery paradigms are in use:

- **Information search and retrieval**
- **Electronic directories & catalogs**
- **Information filtering**

Information search and Retrieval

Search and retrieval begin when a user provides a description of the information to an automated discovery system. Using the knowledge of the environment, the system attempts to locate the information that matches the given description.

An information retrieval method depends on the libraries. The challenge is to develop user in domains such as electronic shopping. Search and retrieval methods refine queries through various computing techniques such as nearest neighbors, then variants of original query.

Information search is sifting through large volumes of information to find some target information. Search and retrieval system are designed for unstructured and semi structural data. The process of searching can be divided into two types:

- **The publisher indexing phase**
- **WAIS (Wide Area Information Service)**

The end-user retrieval phases consist of three steps:

Step1:The user formulates a text based query to search data.

Step2: The server interprets users query, performs the search and returns the user a list of documents.

Step3: The user selects documents from the hit list and browses them, reading and perhaps printing selected portions of retrieved data.

- **The publisher indexing phase:**

It consists of entering documents into the system and creating indexes and pointers to facilitate the subsequent searches. The process of loading a document and updating indexes is normally not a concern to the user. These two phases are highly interdependent.

- **WAIS (Wide Area Information Service):**

It enables users to search the content of the files for any string of text that they supply. WAIS has three elements:

1. Client Server Indexer

It uses an English language query front end a large assortment of databases that contains text-based documents. It allows users search the full text of all the documents on the server.

Users on different platforms can access personal, company and published information from one interface i.e., text, picture, voice or formatted document. Anyone can use this system because it uses natural language questions to find the relevant documents. Then the servers take the user questions and do their best to find relevant documents. Then WAIS returns a list of documents. From those documents, users selects appropriate documents.

Today, the Netscape or NCSA mosaic browser with the forms capability is often used as a front-end to talk to WAIS sever.

2. Search Engines

WAIS is a sophisticated search engine. The purpose of search engine in any indexing system is to find every item that matches a query, no matter where it is located in the file system.

Search engines are now being designed to go beyond simple, broadband searches for which WAIS is so popular. It uses both keywords and information searching to rank the relevance of each document. Other approaches to search data on the web or on other wide area networks are available.

3. Indexing methods

To accomplish accuracy and conserve disk space, two types of indexing methods are used by search engines. They are:

1. File-level indexing

2. Word-level indexing

File-level indexing:

It associates each indexed word with a list of all files in which that word appear atleast once. It does not carry any information about the location of words within the file.

Word-level indexing:

It is more sophisticated and stores the location of each instance of the word. The disadvantage of the word-level indexing is that all the extra information they contain gobbles up a lot of disk space. It is 35 to 100% of the original data. The process of indexing data is simple one, it has large number of indexing packages.

1. These indexing packages are categorized into three types such as:
 1. The client-server approach
 2. The mainframe-based approach
 3. The parallel-processing approach

Search and new data types:

We have the following search technologies for effective search:

Hypertext:

Richly interwoven links among items in displays allow users to move in relatively adhoc sequences from display to display within multimedia.

Sound:

Speech input and output, music and wide variety of acoustic cues include realistic sounds that supplement and replace visual communication.

Video:

Analog or digital video input from multiple media including video tapes, CD-ROM, incorporated broadcast videos turners, cables and satellites.

3D-images:

Virtual reality displays offer a 3D environment in which all portions of the user interface are 3D. Searching using these new types of information poses interesting challenges that need to be addressed soon.

5.2 Commerce Catalogs

Information organizing and browsing is accomplished using directories or catalogs. Organizing refers to how to interrelate information, by placing it in some hierarchy. Maintaining large amount of data is difficult.

A directory performs an essential support function that guides customers in a maze of options by enabling the organizations of the information space.

Directories are of two types:

1. The white pages

2. Yellow pages

The white pages are used to people or institutions and yellow pages are used to consumers and organizations.

Electronic white pages:

Analogues to the telephone white pages, the electronic white pages provide services from a static listing of e-mail addresses to directory assistance. White pages directories, also found within organizations, are integral to work efficiency. The problems facing organizations are similar to the problems facing individuals.

A white pages schema is a data model, specifically a logical schema, for organizing the data contained in entries in a directory service, database or application such as an address book. A white pages schema typically defines, for each real-world object being represented i.e., what attributes of that object are to be represented in the entry for that object.

What relationships of that object to other objects are to be represented?

One of the earliest attempts to standardize a white pages schema for electronic mail use was in X.520 and X.521, part of the X.500, a specification that was derived from the addressing requirements of X.400.

In a white pages directory, each entry typically represents an individual person that makes the use of network resources, such as by receiving email or having an account to log into a system.

In some environments, the schema may also include the representation of organizational divisions, roles, groups and devices. The term is derived from the white pages, the listing of individuals in a telephone directory, typically sorted by the individual's home location (e.g. city) and then by their name.

White pages through X.500:

One of the first goal of the X.500 project has been to create a directory for keeping track of individual electronic mail address on the internet.

X.500 offers the following features:

- **Decentralized maintenance**

Each site running X.500 is responsible only for its local part of the directory.

- **Searching capabilities:**

X.500 provides powerful searching capabilities i.e., in the white pages, we can search solely for users in one country. From there, we can view a list of organizations, then departments, then individual names. This represents the tree structure.

- **Single global name space:**

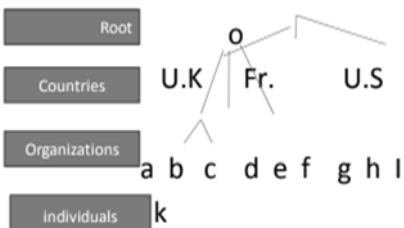
X.500 provides single name space to users.

- **Structured information framework:**

X.500 defines the information framework used in the directory, allowing local extensions.

- **Standards-based directory:**

X.500 can be used to build directory applications that require distributed information.



White Pages Directory Information Tree

Electronic Yellow Pages

The term Yellow Pages refers to a telephone directory of businesses, categorized according to the product or service provided. In 1886 Reuben H. Donnelley created the first official yellow pages directory, inventing an industry. The traditional term Yellow Pages is now also applied to online directories of businesses. To avoid the increasing cost of yellow paper, the yellow background of the pages is currently printed on white paper using ink. Yellow paper is no longer used.

The name and concept of "Yellow Pages" came in 1883, when a printer in Cheyenne, Wyoming working on a regular telephone directory ran out of white paper and used yellow paper instead.

Today, the expression Yellow Pages is used globally, in both English-speaking and non-English speaking countries. In the US, it refers to the category, while in some other countries, it is a registered name and therefore, a proper noun.

Third-party directories can be categorized variously:

- **Basic yellow pages:** These are organized by human-oriented products and services.
- **Business directories:** This takes the extended information about companies, financial-health and news clippings.
- **State business directories:** This type of directory is useful in businesses that operate on a state or geographic basis.
- **Directories by SIC:** Standard Industrial Classification directories are compiled by the government.
- **Manufacturer's directories:** If our goal is to sell our product or service to manufacturers, then this type of directory is used.
- **Big-business directory:** This directory lists companies of 100 or more employees.
- **Metropolitan area business directory:** It develops sales and marketing tools for specific cities.
- **Credit reference directory:** This directory provides credit rating codes for millions of US companies.
- **World Wide Web directory:** This lists various hyperlinks of various servers scattered around the internet.

5.3 Information Filtering

An Information filtering system is a system that removes redundant or unwanted information from an information stream using (semi)automated or computerized methods prior to the presentation to a human user. Its main goal is the management of information overload and increment of the semantic signal-to-noise ratio.

To do this, the user's profile is compared to some reference characteristics. A notable application can be found in the field of email spam filters. Thus, it is not only the information explosion that necessitates some form of filters, but also inadvertently or maliciously introduced pseudo-information.

On the presentation level, information filtering takes the form of user-preferences-based news feeds, etc. Recommender systems are active information filtering systems that attempt to present to the user information items on which the user is interested in.

Information filtering describes a variety of processes involving the delivery of information to people who need it. This technology is needed at the rapid accumulation of information in electronic databases. Information filtering is needed in e-mails, multimedia distributed system and electronic office documents.

Goal of information filtering is selecting of data that is relevant, manageable and understandable.

Filters are of two types:

1. Local filter

2. Remote filter

• **Local filters**

Local filters work on incoming data to a PC such as news feeds.

• **Remote filters**

Remote filters are often software agents that work on behalf of the user and roam around the network from one database to another.

The features of the information filtering are:

- Filtering systems involves large amounts of data (gigabits of text).
- Filtering typically involves streams of incoming data either being broadcast by remote sources or sent directly by other sources like e-mails.
- Filtering has also been used to describe the process of accessing and retrieving information from remote database.
- Filtering is based on descriptions of individual or group information preferences, often called as profiles.
- Filtering system deal primarily with textual information.

Email filtering:

It is the processing of e-mail to organize it according to specified criteria. Most often this refers to the automatic processing of incoming messages, but the term also applies to the intervention of human intelligence in addition to anti-spam techniques and to outgoing emails as well as those being received.

Email filtering software inputs the email. For its output, it might pass the message through unchanged for delivery to the user's mailbox, redirect the message for delivery elsewhere, or even throw the message away. Some mail filters are able to edit messages during processing.

Common uses for mail filters include removal of spam and of computer viruses. A less common use is to inspect outgoing e-mail at some companies to ensure that employees comply with appropriate laws. Users might also employ a mail filter to prioritize messages and to sort them into folders based on subject matter or other criteria.

Mail-filtering agents:

Users of mailing-filtering agents can instruct them to watch for items of interest in e-mail in-boxes, on-line news services, electronic discussion forums and so on. The mail agent will pull the relevant information and put it in the users personalized newspapers at predetermined intervals.

Example: Apple's Search software

Mail filters can be installed by the user, either as separate programs or as part of their e-mail program (e-mail client).

In e-mail programs, users can make personal, "manual" filters that then automatically filter mail according to the chosen criteria. Most e-mail programs now also have an automatic spam filtering function.

Internet service providers can also install mail filters in their mail transfer agents as a service to all of their customers. Corporations often use them to protect their employees and their information technology assets.

News-filtering agents:

These deliver real-time on-line news. Users can indicate topics of interest and the agent will alert them to news stories on those topics as they appear on the newswire. Users can also create personalized news clipping reports by selecting from news services.

Consumers can retrieve their news through the delivery channel of their choice like fax, e-mail, WWW page or lotus notes platform.

MULTIMEDIA

Multimedia- key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing, Desktop video conferencing.

6.1 Multimedia, key multimedia concepts

Multimedia:

The use of digital data in more than one format, such as the combination of text, audio and image data in a computer file. The theory behind multimedia is digitizing traditional media like words, sounds, motion and mixing them together with elements of database.

Multimedia data compression:

Data compression attempts to pack as much information as possible into a given amount of storage. The range of compression is 2:1 to 200:1.

Compression Methods:

- Sector-oriented disk compression (integrated into the operating system, this compression is invisible to end user)
- Backup or archive-oriented compression(Compress file before they are downloaded over telephone lines)
- Graphic & video-oriented compression(Compress graphics & video file before they are downloaded)
- Compression of data being transmitted over low-speed network(tech used in modems, routers)

Data compression in action:

Data compression works by eliminating redundancy. In general, a block of text data containing 1000 bits may have an underlying information content of 100 bits, remaining is the white space. The goal of compression is to make the size of the 1000-bit to 100-bit (size of underlying information). This is also applicable to audio and video files.

Compression Techniques:

Compression techniques can be divided into two major categories:

Lossy:

Lossy compression is a means in which the given set of data will undergo a loss of accuracy or resolution after a cycle of compression and decompression. It is mainly used for voice, audio and video data. The two popular standards for lossy compression technique are: MPEG and JPEG. This usually happens when the data is intended to be transmitted across a medium.

Lossless:

Lossless compression produces compressed output that is same as the input. It is mainly used for text and numerical data.

Multimedia Server:

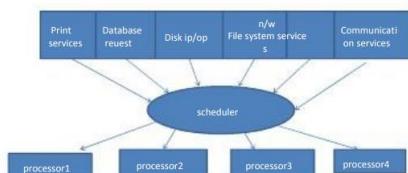
A server is h/w & s/w systems that transforms raw data into usable information and provide to users when needed. E-commerce application will require a server to manage application tasks, storage, security, transaction management and scalability.

Multiprocessing:

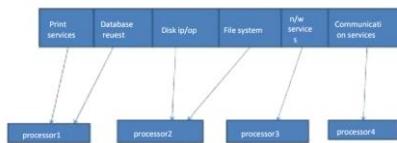
Multiprocessing can be thought of as a process of executing several tasks on multiple processors. This implies that the ability to use more than one CPU for executing programs. The processors can be tightly or loosely coupled.

Symmetric multiprocessing:

Symmetric multiprocessing treats all processors as equal i.e. any processor can do the work of any other processor. It dynamically assigns work to any processor. Here, operating systems turns out to be crucial.



Symmetric multiprocessing



Asymmetric multiprocessing

Multitasking:

Multitasking means that the server's operating systems can run multiple programs and give the illustration that they are running simultaneously by switching control between them.

Two types of multitasking are:

1. Preemptive

2. Non preemptive

Multithreading:

Multithreading is a sophisticated form of multitasking and refer to the ability to support separate paths of execution within a single address space. In this a process broken into independent executable tasks called threads.

Multimedia Storage Technology

Storage technology is becoming a key player in electronic commerce because the storage requirements of modern-day information are enormous.

Storage technology can be divided into two types:

1. Network-based (disk arrays)

2. Desktop-based (CD-ROM)

Disk arrays:

Disk arrays store enormous amounts of information and are becoming an important storage technologies for firewall servers and large servers. Range provided for small arrays is 5-10 gigabytes. Range provided for large arrays is 50-500 gigabytes. Technology behind disk array is RAID (Redundant Array of Inexpensive Disk). RAID offers a high degree of data capacity, availability and redundancy. Current RAIDs use multiple 51/2 -inch disks.

CD-ROM:

CD-ROM is premiere desktop stop storage. It is a read only memory, to read CD-ROM a special drive CD-ROM drive is required. The main advantage is the incredible storage density. That allows a single CD-ROM disc contains 530MB for audio CD.

CD-ROM technology exhibits the following:

High information density: It is with optical encoding, the CD can contain some 600-800 MB of data.

Low unit cost: Unit cost in large quantities is less than two dollars, because CDs are manufactured by well-developed process.

Read only memory: CD-ROM is read only memory so it cannot be written or erased.

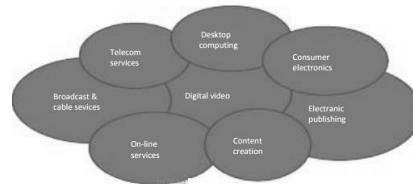
Modest random access performance: Performance of the CDs is better than floppies because of optical encoding methods.

The Process of CD proceeds as follows:

- CD-ROM spiral surface contains shallow depressions called pits. These pits used to scatter light.
- CD-ROM spiral surface contains spaces between indentations called lands. These lands are used to reflect light.
- The laser projects a beam of light, which is focused by the focusing coils.
- The laser beam penetrates a protective layer of plastic & strikes the reflective aluminum layer on the surfaces.
- Light striking a land reflects back to the detector. Light pulses are translated into small electrical voltage to generate 0's & 1's.

6.2 Digital Video and Electronic Commerce

Digital video is binary data that represents a sequence of frames, each representing one image. The frames must be shown at about 30 frames per sec. The frames being ran at a speed of 30 frames per second leaves an impression that it is a video.



Characteristics of Digital Video:

Several Characteristics of digital video differentiate it from traditional analog video.

- It can be manipulated, transmitted and reproduced with no discernible image generation. It allows more flexible routing packet switching technology.
- Development of digital video compression technology has enabled the new applications in consumer electronics, multimedia computers and communications market.
- It poses interesting technical challenges; they are constant rate and continuous time media instead of text, image, audio and video.
- Compression rate are 10 mb /min of video.

Digital video compression/decompression:

Digital video compression takes the advantage of the fact that a substantial amount of redundancies exist in video. The hour-longer video that would require 100 CDs would only require one CD, if video is compressed.

The process of compression & decompression is commonly referred to as just compression, but it involves both the processes. Decompression is inextensible because once compressed a digital video can be stored and decompressed many times. The adaptations of international standards are called codec. Mostly used codec are loss compression one.

Types of Codec's:

Most codec schemes can be categorized into two types:

- 1. Hybrid**
- 2. Software-based.**

Hybrid: Hybrid codec use combination of dedicated processors and software. It requires specialized add-on hardware.

Best examples of hybrid codec are MPEG (Moving Picture Expert Group) JPEG (Joint Photographic Expert Group)

MPEG (Moving Picture Expert Group):

Moving Picture Expert Group is an ISO group; the purpose of this is to generate high quality compression of digital videos.

MPEG I (Moving Picture Expert Group I):

MPEG I defines a bit steam for compressed video and audio optimized to a bandwidth of 1.5 Mbps, it is the data rate of audio CDs & DATs. The standard consists of three parts audio, video and systems. A system allows the synchronization of video & audio. MPEG I implemented in commercial chips. The resolution of the frames in MPEG I is 352X240 pixels at 30 frames per second. The video compression ratio for this is 26:1

MPEG II (Moving Picture Expert Group II):

MPEG II specifies compression signals for broadcast-quality video. It defines a bit steam for high-quality “entertainment-level” digital video. MPEG-2 supports transmission range of about 2-15 Mbps over cable, satellite and other transmission channels. The standard consists of three parts audio, video and systems. A system allows the synchronization of video & audio. MPEG II implemented in commercial chips.

The resolution of the frames in MPEG I is 720X480 pixels at 60 frames per second. A data rate of the MPEG-2 is 4 to 8 Mbps. Future promising of this is rapid evolution of cable TV's news channels.

Two other MPEG standards are:

- MPEG-3(1920X1080 and data rates are 20 to 40)
- MPEG-4(consisting of speech and video synthesis)

JPEG (Joint Photographic Expert Group):

JPEG is a still-image compression algorithm defined by the joint photographic expert group and serves as the foundation for digital video.

JPEG is used in two ways in digital video world:

- As a part of MPEG
- As motion JPEG

This standard has been widely adopted for video sequences. JPEG compression is fast and can capture full-screen, full-rate video. It was designed for compressing either full-color or gray-scale Digital images of real-world scenes.

It is a highly sophisticated technique that uses three steps:

1. The first step, a technique known as DCT (Discrete Cosine Transformation) is applied.
2. Next, a process called quantization manipulates the data and compresses strings of identical pixels by run length encoding method.
3. Finally, the image is compressed using a variant of Huffman encoding.

6.3 Desktop Video Processing

Video on the desktop is a key element in turning a computer into a true multimedia platform. PC has steadily become a highly suitable platform for video. Desktop Video Processing includes upgrade kits, sound cards, video playback accelerator board, video capture hardware and editing software. Microphones, speakers, joystick and other peripherals are also needed.

Desktop video hardware for playback and capture:

Desktop video require a substantial amounts of disk space and considerable CPU horse-power. It also requires specialized hardware to digitize and compress the incoming analog signal from video tapes. The two lines of video playback products become available in the marketplace i.e. video ASIC chips and board level products.

Video playback:

The two lines of video playback products become available in the marketplace i.e., video ASIC chips and board level products.

Broadly speaking, two types of accelerator boards are available:

1. Video
2. Graphics

Video capture and editing:

Video capture board is essential for digitizing incoming video for use in multimedia presentations or video conferencing. Video capture program also include video-editing functions that allows users crop, resize and converts formats and add special effects for both audio and video like fade-in, Embosses, zoom and echo's. Developers are creating next generation editing tools to meet business presenters and video enthusiasts. The best graphical editing tools make complex procedures accessible even to novice users.

Desktop video application software:

Any PC to handle digital video must have a digital-video engine available. Two significant digital video engines are:

1. Apple's QuickTime
2. Microsoft's video for windows

These two are software's only, they don't need any special hardware.

Apple's QuickTime:

QuickTime is a set of software programs from apple that allows the operating system to play motion video sequences on a PC without specialized hardware. QuickTime has its own set of compression/decompression drivers. Apple's QuickTime was the first widely available desktop video technology to treat video as a standard data type.

In this video, data could not be cut, copied and pasted like text in a composition program. Apple's QuickTime movie can have multiple sound tracks and multiple video tracks. Apple's QuickTime engine also supports synchronize.

Microsoft's video for windows:

Microsoft's video for windows is a set of software programs from Microsoft that allows the operating system to play motion video sequences on a PC without specialized hardware. Microsoft video for windows has its own set of compression/decompression drivers. Microsoft chooses a frame-based model, in contrast to QuickTime-based model.

6.4 Desktop video conferencing

Desktop video conferencing is gaining momentum as a communication tool. Face-to-face video conferences are already a common practice, allowing distant colleagues to communicate without the expense and inconvenience of traveling.

Early video conferencing utilized costly equipment to provide room-based conferencing, but now it becoming fast due to desktop video conferencing in this we participate by sitting at our own desks, in our own offices and call up others using their PCs much like telephone.

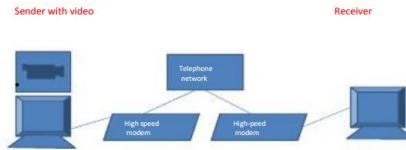
Types of desktop video conferencing:

Desktop video conferencing system in the today's market is divided into three types, they are based on plain old telephone lines:

- 1. POST**
- 2. ISDN**
- 3. Internet**

Using POST for video conferencing:

POST systems are especially attractive for Point-to-Point conferencing because no additional monthly charges are assessed and special arrangements with the telephone company are unnecessary.



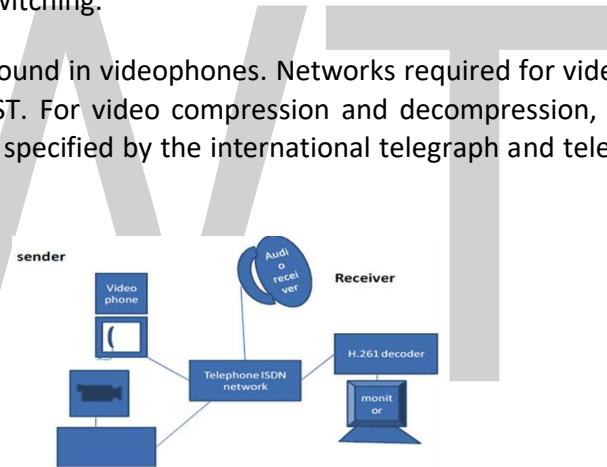
Point-to-Point video conferencing using POTS

The drawback with a POTS solution is a restriction to the top speed of today's modems of 28.8 Kbps. It needs a s/w. Once proper installation of s/w os is done, then the users allows to pipeline video, audio and data down a standard telephone line.

Using ISDN for video conferencing:

ISDN lines mostly offer considerable more bandwidth up to 128 Kbps, but it requires the installation of special hardware. The use of ISDN has been restricted to companies especially in private residence. The following fig explains the basic architecture for television or video conferencing using ISDN network transport switching.

This architecture is commonly found in videophones. Networks required for video conferencing are fiber optic cable or analog POTS. For video compression and decompression, the ISDN networks uses the H.261 technology, it is specified by the international telegraph and telephone consultative committee algorithm.



ISDN video or teleconferencing architecture

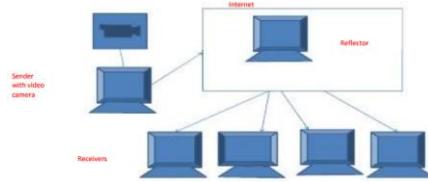
Using the Internet for Video Conferencing:

The two video conferencing programs are available on the internet:

- 1. CU- See Me**
- 2. MBONE**

CU- See Me:

CU- See Me is the first software available for the Macintosh to support real-time multiparty video conferencing on the internet. CU- See Me provides a one-to-one, one-to-many, several-to- several and several-to-many conferencing depending on the user needs with minimal cost.



One-to-many video conferencing

MBONE:

It is a virtual network built on top of the Internet, Invented by Van Jacobson, Steve Dearing and Stephen Caner in 1992. The purpose of MBONE is to minimize the amount of data required for multipoint audio/video-conferencing. MBONE is free; it uses a network of m routers that can support IP Multicast.

It enables access to real-time interactive multimedia on the Internet. MBONE uses a small subset of the class D IP address space (224.0.0.0 - 239.255.255.255) assigned for multicast traffic. It uses 224.2.0.0 for multimedia conferencing.

Characteristics:

- Topology: combination of mesh and star networks.
- IP addresses: 224.2.0.0; routing schemes: DVMRP, MOSPF
- Session registration: IGMP protocol
- Traffic requirement: audio 32-64 kbit/s, video 120 kbit/s

MBONE tools:

- Videoconferencing: vic -t ttl destination-host/port (supports: NV, H.261, CellB, MPEG, MJPEG)
- Audio conferencing: vat -t ttl destination-host/port (supports: LPC, PCMU, DVI4, GSM)
- Whiteboard: wb destination-host/port/ttl
- Session directory: sdr