Consumer-Oriented Electronic Commerce
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Consumer-Oriented E-Commerce

Consumer applications such as on-line stores and electronic shopping malls are burgeoning but access is still cumbersome and basic issues need to be resolved. Customers can browse (net-surf) at their PCs, traveling through electronic shops viewing products, reading descriptions, and sometimes trying samples.

For instance, if customers are interested in buying CD-ROMs with racy pictures, they can download sample pictures before purchasing. However, these early systems are not consumer friendly or well integrated.

Consumers should be able to execute a transaction by clicking on the BUY button to authorize payment, and the on-line store's bank account would then automatically receive it from the customer's preferred payment mode (credit, debit or check). Security of online payments remains a major barrier to this feature. Customers could pay by credit card, by transmitting the necessary data via modem, but intercepting messages on the Internet is easy for a smart hacker, so sending a credit card number in an unscrambled message is inviting trouble.

The following business issues must be addressed before consumer-oriented e-commerce can become widespread, including:

1. Establishment of standard business processes for buying and selling products and services in electronic markets.
2. Development of widespread and easy-to-use implementations of mercantile protocols for order-taking, online payment, and service delivery similar to those found in retail/credit card based transactions.
3. Development of transport and privacy methods that will allow parties that have no reason to trust one another to carry on secure commercial exchanges.

CONSUMER-ORIENTED APPLICATIONS

The wide range of applications for the consumer marketplace can be broadly classified into entertainment, financial service, information, essential services, and education and training as shown in table below.

Consumer-Oriented Services	
Consumer Life-Style Needs	*Complementary Multimedia Services*
Entertainment	Movies on demand, video cataloging, interactive. ads, multiuser games, on-line discussions
Financial services and information	Home banking, financial services, financial news
Essential services	Home shopping, electronic catalogs, telemedicine, remote diagnostics
Education & training	interactive education, multiuser games, video conferencing, on-line databases

The rule that states how consumer-oriented electronic commerce has emerged is based on the feasibility of one of the following methods of information transfer,

1) Physical Transfer of Information
2) Digital Transfer of Information

The factors that will decide which method is used are,

1. *Cost* - The costs of both the transmission methods are compared and a method with less cost is selected for transmitting information.
2. *Speed* - The next is determining the feasibility. It is to compare the speeds of both the methods and a method with more speed a chosen.

The four types of applications that illustrate the operational rule of evolution in very different areas:

1. Personal finance and home banking management
2. Home shopping
3. Home entertainment
4. Micro transactions of Information

1. Personal Finance and Home Banking Management

The technology for paying bills, whether by computer or telephone, is infinitely more sophisticated than anything on the market a few years ago.

Experts have been predicting the demise of paper checks for a number of years, paper checks still outnumber electronic checks nearly 30 to 1. The newest technologies-direct deposit of payroll, on-line bill payment and telephone transfer do not yet have wide acceptance, even though they promise to cut the amount of time spent balancing check books. Only 4 percent of bills are paid by phone, and it is estimated that only 1 percent of consumers use computers for home banking, even though more than 25 percent of America households have PCs.

The range of options has expanded to include PCs, interactive television, and even personal digital assistants (PDAs). It would be myopic indeed to predict that choices will stop with these.

Home banking services are often categorized as :

i) **Basic Services** - Basic services are- related to personal finance; checking and savings account statement reporting, round-the-clock banking with Automated Teller Machines (ATM), funds transfer, bill payment, account reconciliation (balancing check books), and status of payments of "stop payment requests."

ii) **Intermediate Services** - Intermediate services include a growing array of home financial management services, which include household budgeting, updating stock portfolio values, and tax return preparation.

iii) **Advanced Services-***Advanced* services include stock and mutual fund brokerage or trading services, currency trading, and credit or debit card management.

Basic Services

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Initially the thinking in banking environment was that the high-balance customers would do business with bank tellers and ATMs would be used by the less wealthy. Customers soon discovered, however, that ATMs were more convenient than live tellers because they were open late and often didn't have a long queue. In addition, with transaction volume growing steadily, banks discovered that ATMs resulted in real cost savings. According to a ATM survey conducted by the American Banker, customer use of ATMs has been rising significantly with a gradual decrease in bank operating costs.

The ATM network, figure below can be thought of as analogous to the Internet, 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.

Today, the ATM interface is an integral part of a bank's communications and market strategy. Bankers, applying traditional, time-honoured management models, originally saw only automation in the ATM network, however. They did not see that such automation would change the entire process of retail banking itself.
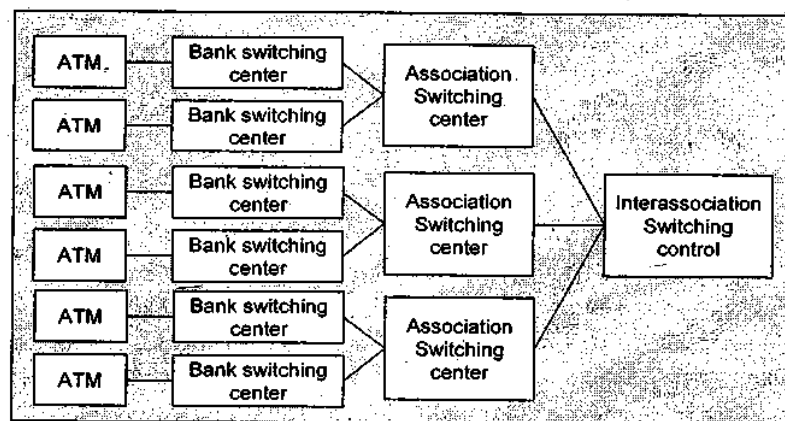

Fig. : Structure of ATM network.

3

Increased ATM usage and the consequent decrease in teller transactions do not necessarily mean the demise of branches. There will always be customers who will prefer a live teller to a machine, but it will be bank officers with their sophisticated software who will, work with increased efficiency, meet new customers, handle their queries, and make the customers know about their new services and the ease in using them.

Intermediate Services

For the sophisticated customers, home banking offers the facility of paying bills, transferring funds, and opening new accounts from home. As the equipment becomes less and less expensive and as banks offer a broader array of services, home banking could develop inter a comprehensive package that could even include such non-bank activities as insurance, entertainment, travel, and business news.

Experts predict that as home banking matures it will include a mixture of delivery mechanisms from phones, computers, to even televisions. The PC based products allow the customer to maintain account data in a local data-base on their hard drive and to perform import/export between the banking application and others on the PC such as accounting and check register. Some of the more robust products offer specialized services for businesses, such as direct payroll deposit and cash concentration. At the high end of this category are the more sophisticated cash management packages offered to the bank's -large corporate customers.

Whether for a large or small business, the underlying principles remain the same. The use of Quick & Dirty Personal Money Management (QDPMMJ program for keeping track of your finances, allows you to pay the bills (electronically and by check), reconcile your checking accounts, reconcile your credit card accounts, move money between investment accounts, and so forth. The program can pass data to/from any bank that can provide data in "standard" formats.

Another approach to home finance is being followed by Intuit, the makers of the "Quicken" personal financial management program who have an agreement with VISA to provide monthly financial statements on disk to individuals. The program will even have a modern that, on request, calls computers and dumps statements directly onto the machines.

Figure 7.2 Check-clearing process
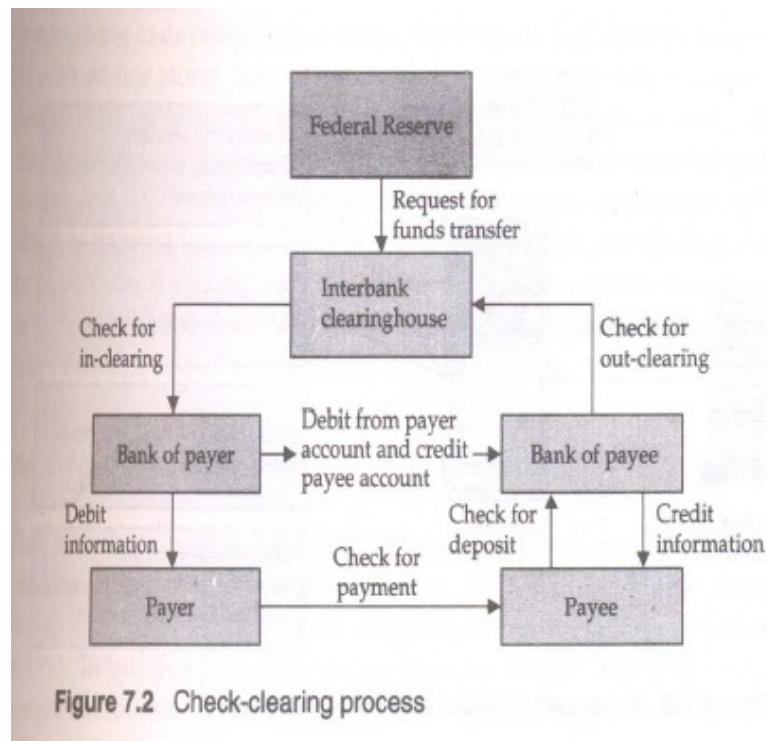
Advanced Services

The goal of many financial services firms 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. Barriers to this goal lie not only on the customer's side but in the fact that the systems lie in place of many financial services firms and are not interoperable. Even within most companies offering a range of financial products, each line of business typically has separate accounting and customer record systems.

There is a growing demand in the banking and brokerage community to develop systems that support advanced services. Figure below illustrates the range of services that may well be offered by banks in the future. These services range from on-line shopping to real-time financial information from anywhere in the world. Some of these services are already being offered and others are planned for the future. Although some of these services may appear simple enough, they require extraordinary integration of computer systems at the branch, central office, and partners levels.
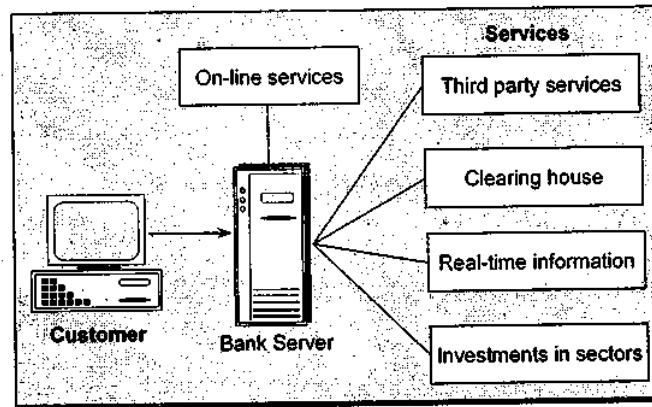
Fig. : Advanced services in home banking.

In short, home banking allows consumers to avoid long lines and given them the flexibility of doing their banking at any time. For bankers, it's an opportunity to avoid building more bank branches and cut office expenses. It is estimated that processing an electronic transaction costs six times less than the cost of processing a check.

On the customer side, factors are working both for and against home banking. Growing familiarity with technology to access bank accounts and to handle financial affairs is boosting interest.

Home banking services can be expensive to implement and operate, yet consumer are rarely willing to pay much more than hundreds per month. The companies offering these services have to provide incentives such as low fees to customers to use the service. Banks must also look beyond consumers for home banking. Many regard small businesses as the next target for these services. While the issues surrounding home banking appear to be growing in complexity, with several opportunities and challenges for bankers.

2. Home Shopping

Home shopping, is already in wide use and has generated substantial revenues for many companies racing to develop on-line malls. These malls will enable a "customer" to enter on-line stores, look at products, see a reflection in a digital mirror, and purchase with overnight delivery against credit card billing.

The two main forms of home shopping are :

1. Television-Based Shopping
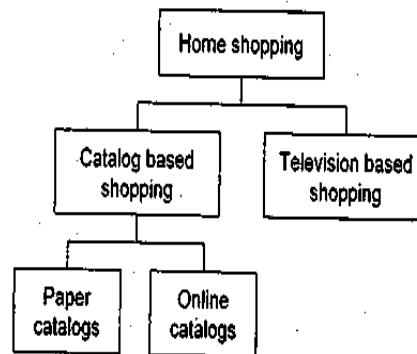2. Catalog-Based Home Shopping

Fig.: Types of Home Shopping

Television-Based Shopping

The home shopping concept gained the amazing popularity of television-based shopping Launched in 1977 by the Home Shopping Network (HSN).

TV shopping has evolved over the years to provide a wide variety of goods ranging from clothing, small electronics, house wares, jewellery, and computers. When HSN started in Florida in 1977, it mainly sold factory overruns and discontinued items. The other major home shopping network, operate more like traditional retailers and offer many of the same services.

Like other merchants, the TV shopping networks try to hook consumers by offering exclusive lines of merchandise. If you yearn for some celebrity's shoes or jewellery, you'll have to buy them from HSN. Aside from their appeal to some viewers, exclusive lines and private labels are popular with television retailers because viewers can't comparison-shop.

A customer uses her remote control to visit several different channels with the touch of a button. To target customers, channels are often specialized with a wide variety of styles. Cable shopping channels are not truly interactive because they use phone lines to take orders. But soon they will be interactive, offering new ways by which the customers feel comfortable.

Catalog-Based Shopping

The necessary information needed for objective decision making, such as third-party ratings, could be located on a *Consumer Reports Commercial Archival Service,* which our consumer has never accessed before. The customer would like to retrieve copies of these reports to read on to their computer. The archive service informs the customer that there will be a charge for the consumer report. Our fictional consumer cannot buy on credit because she doesn't have an account with this service and the service doesn't accept credit cards for charges under a fixed amount. So the customer places his smart card containing electronic cash provided as part of a bank service into the smart-card reader. She transfers the worth of these electronic tokens to the archival service. The service validates the tokens as authentic and sends the reports to the

consumer. Upon receipt of the requested reports, the consumer in turn completes the transaction by transferring ownership for the amount in tokens to the service.

Traditional paper-based shopping catalogs have to be replaced, at least in part, by on-line catalogs.

The on-line catalog business consists of brochures, CD-ROM catalogs, and on-line interactive catalogs. Currently, most on-line catalogs are some form of electronic brochures. Also known as soft-ads or inter-ads, electronic brochures are a multimedia replacement for direct mail paper, and diskette brochures used in the business-to-business marketing arena. Basically, they consist of a highly interactive program using still images, graphics, animation, sound, text, and data. Motion picture video becomes seldom in usage due-to storage and performance limitations.

An extension of the electronic brochure concept is a multi product comprehensive on-line catalog system typically put in kiosks. These interactive kiosks let shoppers browse through video presentations of products and go one step further-into the future of interactive advertising. These catalogs are very similar to electronic brochures and have no added benefit except for more storage capacity (they often use CD-ROM for storage).

One of the most active areas of on-line shopping is distributed component catalogs. Electronic access to component information is essential during the design and manufacturing processes for almost all products. Component information often includes schematic symbols,- logical circuit diagrams, timing circuit diagrams, and thermal simulation models for manufacturing, electrical/mechanical parameters, part footprint, costing, reliability models, and ordering and delivery information.

Distributed component catalogs seek to address three aspects of electronic component commerce: the component information itself, transfer of the information from vendor to user, and information integration into the customer's CAD/CAM (computer-aided design and manufacturing). The goal is to eliminate the current paper path for component information and avoid investing resources into correcting the deficiencies of paper-based information transfer. Achieving this goal is expected to help organizations focus their resources directly on producing higher quality products in less time and at lower cost.

3. Home Entertainment

Another application area of e-commerce is that of home entertainment. When a customer wishes to watch a movie. He browses through an on-line movie archive guide containing thousands of movies, music videos, award-winning documentaries, episodes, and sporting events after selecting an artistic movie and the language from a distributor who operates a server. He sends a request to the movie distributor with the cost of the movie in the form of electronic tokens. The distributor informs him that he accepts only credit cards, not tokens as they are hard to change into other currency. The customer then sends her credit card number with expiration date using an encrypted message (e.g., privacy-enhanced mail message). The distributor validates the credit card and

transfers the movie to the customers TV set-top with the necessary safeguards that prevent any copying or reproduction of the movie.

Movie on-demand represented in this scenario is very similar in technology and characteristics to interactive games. In the entire home entertainment area, the key element is the notion of customer control over programming. Entertainment on-demand is expected to give each viewer total control over what, when, and where to watch. Table below illustrates what will be required in terms of television-based technology for this telemart to become a reality.

Compressing and decoding a digital signal	The transition to digital satellite and cable network head broadcasting involves linking the television set to a decoder to reconvert the digital signal into an analog signal.
Decoding a scrambled signal	The broadcasting of a pay channel requires the encryption or scrambling of the signal on emission and the unscrambling on reception.
Loading a program on memory	An increase in the number of individual interactive services is possible only if network overloading is kept to a strict minimum.
Electronic money or card payment	Once separated from the telephone, telemart will need a keyboard linked up to the television set in order to ensure interactivity.

Size of the Home Entertainment Market

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

Although an accurate assessment of the potential size of the e-commerce entertainment market is very difficult, preliminary research by Telco, cable TV, and computer firms indicates that the entertainment market is potentially a multibillion one. These studies indicate that the key to successes may well depend on the ability to tap the large pool of discretionary income within medium-high-income households.

In fact, the statistics suggest that TV and cable usage declines, but that video rental increases with increasing income, which could mean that the market for video on-demand may be greater in higher-income households.

Impact of Home Entertainment on Traditional Industries

The impact of the new reforms of entertainment on the traditional movie industry presents a case study that is likely to be repeated in many other industries.

This scenario could have devastating effects on the theater business, but it appears that the technology many not become available as rapidly as we believe. Currently, only one third of the nation's cable subscribers receive more than fifty three channels; even the most' ambitious cable companies, including. Time Warner and Tele-Communications, are not promising nationwide interactive 500-chahnel cable systems until the first decade of the twenty first century.

To get around this problem, cable companies are actually buying movie production houses. For instance, Tele-Communications (TCI) and Carolco Pictures entered into an agreement whereby TCI would gain the rights to broadcast premiere films (first-runs) over its expansive cable system.

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

4. Micro transactions of Information

To serve the information needs of the consumer, service providers whose product is information delivered over the I-way are creating an entirely new industry. Most sell any form of digital information that can be sent down a network of one sort or another: data, pictures, computer programs and services.

One significant 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 complexity of selling micro services increases further when additional activities like account revivification are factored in. Revivification means checking on the validity of the transaction after it has been approved. For example, individuals can verify the validity of transactions using their monthly checking account and credit card statements. In the electronic world, these statements could be received daily, or within five minutes of the occurrence of a transaction, or at some other interval.

Transactions involving large amounts and/or high risk of fraud require more sophisticated fraud-prevention procedures. The amount of redundant information and real-time revivification for transactions will depend on their risk classes, and the system must be intelligent enough to recognize and investigate anomalies. The systems have to

be fine-tuned to prevent fraud and at the same time impose transaction costs of only 2 or 3 percent (or less) on people dealing with small amounts.

As if the environment is not complex enough, additional possible components for the cost of just doing e-commerce include transport costs; processing costs at endpoints and by agents; if applicable, cost of maintaining and/or setting up/tearing down (TCP) connections to effect transactions; transaction record keeping for auditing and billing; and the costs of running accounting and billing software (to produce statement). Given all this overhead multiple small transactions, instead of one large one, are likely to be more costly to handle.

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.

Mercantile Process models

• Mercantile processes define interaction models between consumers and merchants for online 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

(a) The consumer information search process.
(b) The Organizational search process.
(c) Consumer search experiences.
(d) Information brokers & brokerages.
(ii) Purchase consummation: The purchase consummation phase include mercantile protocols

(a) Mercantile process using digital cash.
(b) Mercantile transaction using credit cards.

(c) Costs of electronic purchasing.

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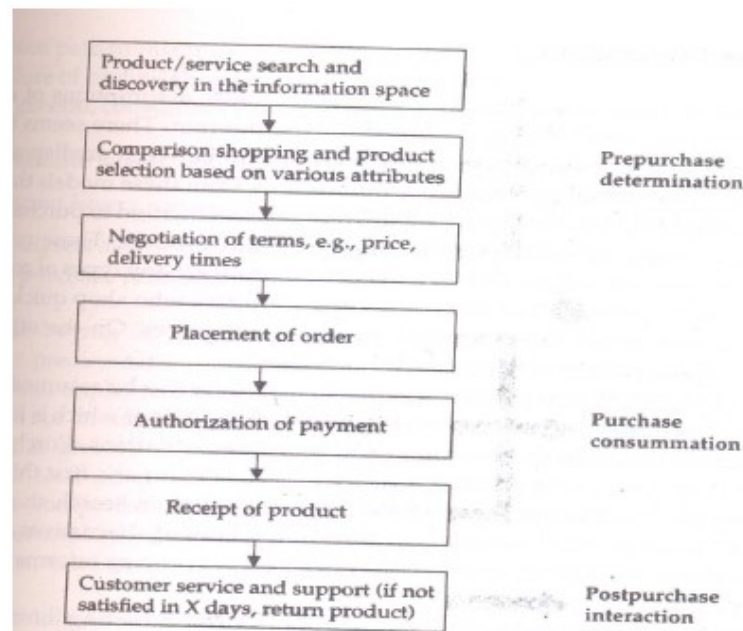

Figure 7.4 Steps taken by customers in product/service purchasing

(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" (hedonic).

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 ask the payment to the vendor
• Vendor contacts billing service
• Billing service decrypts authorization and check 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
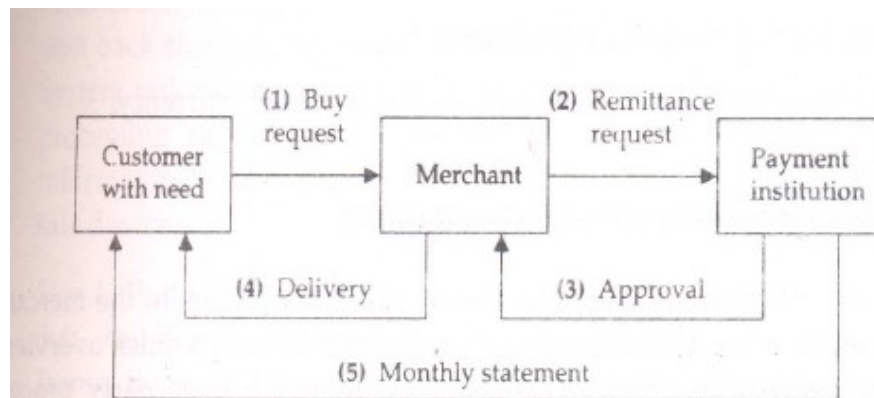• At the end of the billing cycle, buyer receives a list of transactions

Figure 7.5 Simplified on-line 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 then 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 able to assign that piece to customer

Database access and compatibility issues: Customers should get kind of services by easy issues like calling an 800 number
Customer service issues: To clear the doubts of customer about product

Mercantile Models from the Merchant's Perspective

• To 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.
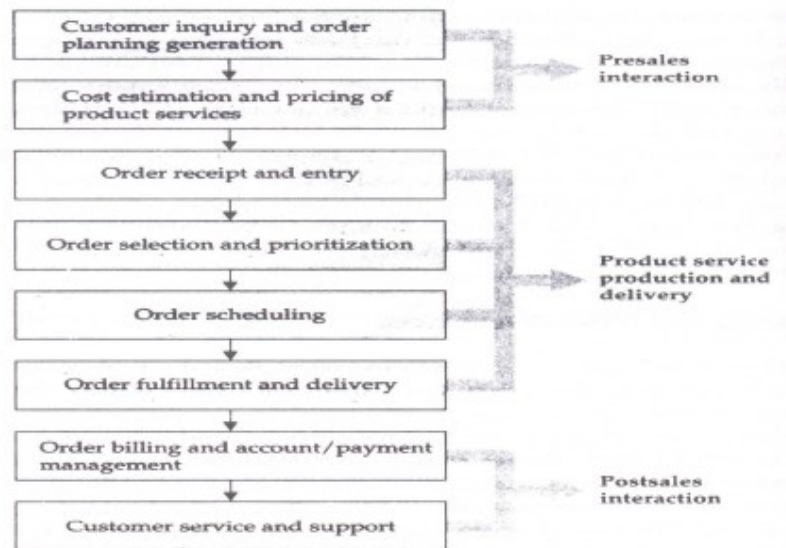(viii) Post sales service.

Figure 7.6 Order management cycle in e-commerce

Order planning & order Generation

• Order planning leads to order generation.

• Orders are generated in a no. 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 such elements as physical installation of a product, repair & maintenance, customer training, equipment upgrading & disposal.