

Q.2a. What is a Hypertext according to Nelson?

(2)

Answer:

Hypertext is text which contains links to other texts. The term was coined by Ted Nelson around 1965. Hypertext systems are particularly useful for organizing and browsing through large databases that consist of disparate types of information.

b. What are the advantages of e-Commerce?

(6)

Answer:

Advantages of E-commerce

Some of the key strengths of using the Internet for businesses include the following:

1. **24 × 7 operation.** Round-the-clock operation is an expensive proposition in the 'brick-and-mortar' world, while it is natural in the 'click-and-conquer' world.
2. **Global reach.** The net being inherently global, reaching global customers is relatively easy on the net compared to the world of bricks.
3. **Cost of acquiring, serving and retaining customers.** It is relatively cheaper to acquire new customers over the net; thanks to 24 × 7 operation and its global reach. Through innovative tools of 'push' technology, it is also possible to retain customers' loyalty with minimal investments.
4. **An extended enterprise is easy to build.** In today's world every enterprise is part of the 'connected economy'; as such, you need to extend your enterprise all the way to your suppliers and business partners like distributors, retailers and ultimately your end-customers. The Internet provides an effective (often less expensive) way to extend your enterprise beyond the narrow confines of your own organization. Tools like enterprise resource planning (ERP), supply chain management (SCM) and customer relationship management (CRM), can easily be deployed over the Internet, permitting amazing efficiency in time needed to market, customer loyalty, on-time delivery and eventually profitability.

5. **Disintermediation.** Using the Internet, one can directly approach the customers and suppliers, cutting down on the number of levels and in the process, cutting down the costs.
6. **Improved customer service to your clients.** It results in higher satisfaction and more sales.
7. **Power to provide the 'best of both the worlds'.** It benefits the traditional business side-by-side with the Internet tools.
8. **A technology-based customer interface.** In a brick-and-mortar business, customers conduct transactions either face-to-face or over the phone with store clerks, account managers, or other individuals. In contrast, the customer interface in the electronic environment is a 'screen-to-face' interaction. This includes PC-based monitors, ATM machines, PDAs, or other electronic devices such as the DoCopMo iMode in Japan and the Nokia 7100 in Europe. Operationally, these types of interfaces place an enormous responsibility on the organization to capture and represent the customer experience because there is often no opportunity for direct human intervention during the encounter. If the interface is designed correctly, the customer will have no need for a simultaneous or follow-up phone conversation. Thus, the 'screen-to-customer' interface has the potential to both increase sales and decrease costs. In fact, a number of innovators are entering the e-commerce markets with solutions that reintroduce humans into the process, such as the service representatives available on demand for Web users at www.liveperson.com. When the interface does not work, not only is the revenue lost but the organization also incurs the technology costs. Thus, a poorly designed customer interface has both negative revenue and cost implications.
9. **The customer controls the interaction.** At most websites, the customer is in control during screen-to-face interaction, in that the Web largely employs a 'self service' model for managing commerce or community-based interaction. The customer controls the search process, the time spent on various sites, the degree of price/product comparison, the people with whom he or she comes in contact, and the decision to buy. In a face-to-face interchange, the control can rest with either the buyer/seller or the community member. At a minimum, the seller attempts to influence the buying process by directing the potential buyer to different products or locations in the store, overcoming price objections and reacting in real time to competitive offering. The virtual store can attempt to shape the customer experience with uniquely targeted promotions, reconfiguration of storefronts to reflect past search behaviour, recommendations based on previous behaviour of other similar users, and access to proprietary information. However, the seller has much less power in the online environment due to the control and information flows that the online world puts in customer's hands.
10. **Knowledge of customer behaviour.** While the customer controls the interaction, the firm has unprecedented access to observe and track individual consumer behaviour. Companies, through a third-party measurement firm such as Vividence and Accrue,

can track a host of behaviours on websites visited, length of stays on a site, page views on a site, contents of wish lists and shopping carts, purchases, dollar amounts of purchases, repeat purchases behaviour, conversion rates of visitors who have completed transactions and other metrics. This level of customer behaviour tracking, in contrast with tracking consumer attitudes, knowledge or behavioural intentions, is not possible in the brick-and-mortar world. Armed with this information, companies can provide one-to-one customization of their offerings. In addition, companies can dynamically publish their storefronts on the Web to configure offerings to individual customers. In a tactical embellishment, electronic retailers can welcome a user back by name. In more strategic terms, an online business can actually position offers and merchandise in ways that uniquely appeal to specific customers.

11. Network economics. In information intensive industries, a key competitive battleground centres on the emergence of industry-standard products, services, components, and or architecture. Network effects, as described by Metcalfe's law, can best be expressed as the situation where the value of a product or service rises as a function of the number of other users who are using the product. A classic example is the fax machine of other people who adopt the technology. A key characteristic of network's economic is positive feedback, that is, as the installed base grows, more and more users are likely to adopt the technology because of the installed base. Many commercial wares in the digital economy revolve around setting a standard, growing the installed base and attempting to 'lock-in' customers to the standard because of rising switching costs. This applies to both hardware (e.g. cable modems versus DSL lines) and software (e.g. MP3 versus streaming audio). A key result of network effects and positive feedback is 'increasing return' economies as compared to the traditional decreasing-returns model often associated with the brick-and-mortar world. It also means that the traditional realities of marketing such as the importance of word-of-mouth (WOM) among potential customers, become greatly magnified in this new environment. It is this turbocharged WOM phenomenon that makes viral marketing a reality for consumer-oriented e-commerce business such as ICQ in instant messaging system.

c. Briefly explain about following E-business transaction models with an example:

(i) B2G

(ii) B2C

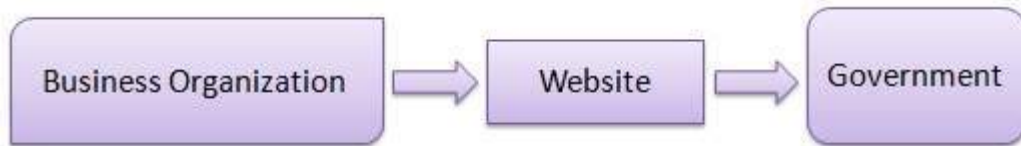
(iii) C2B

(8)

Answer:

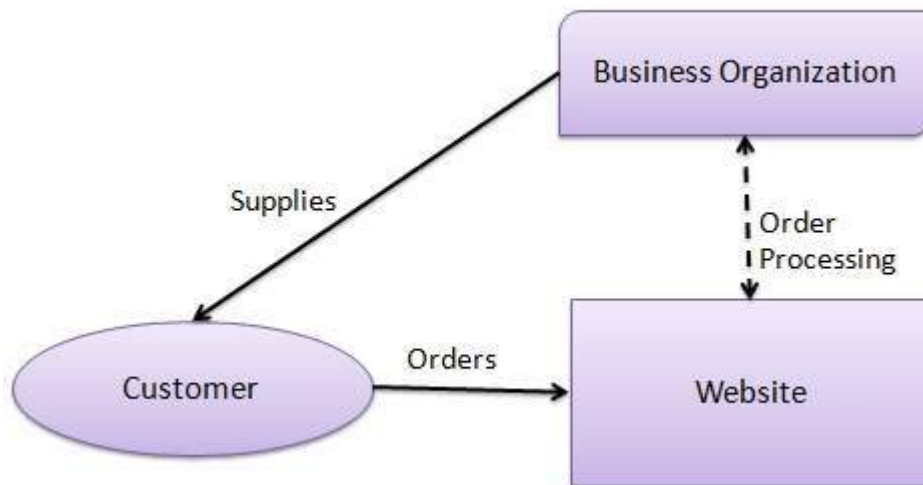
Business - to - Government (B2G)

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



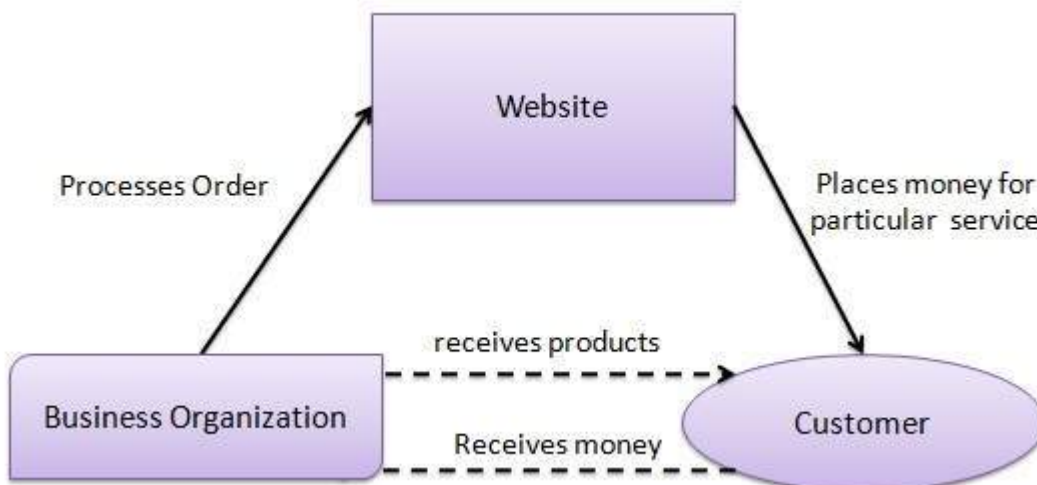
Business - to - Consumer(B2C)

Website following B2C business model sells its product directly to a customer. A customer can view products shown on the website of business organization. The customer can choose a product and order the same. Website will send a notification to the business organization via email and organization will dispatch the product/goods to the customer.



Consumer - to - Business (C2B)

In this model, a consumer approaches website showing multiple business organizations for a particular service. Consumer places an estimate of amount he/she wants to spend for a particular service. For example, comparison of interest rates of personal loan/ car loan provided by various banks via website. Business organization who fulfills the consumer's requirement within specified budget approaches the customer and provides its services.



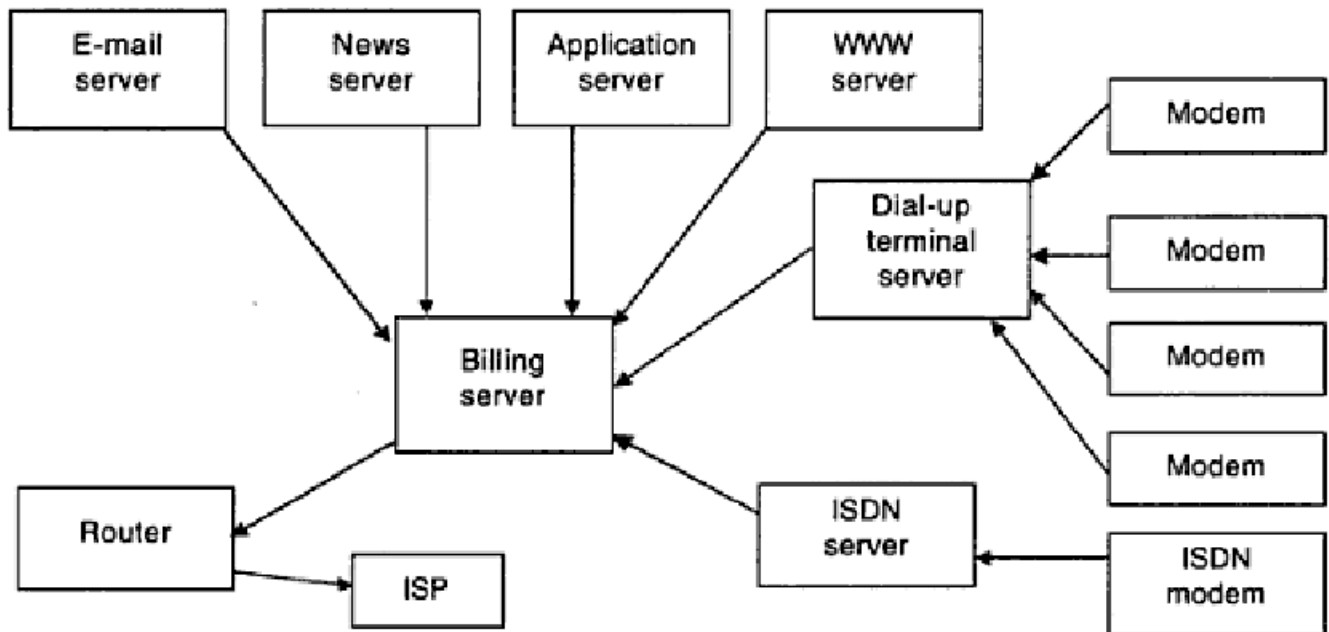
Q.3 a. What is the role of ISP? List out any four ISPs which are having All-India license (4)

Answer:

1	A	Bharat Sanchar Nigam Ltd.	All India	2262349
2	B	Mahanagar Telephone Nigam Ltd.	Mumbai & Delhi	1207476
3	A	Sify Ltd.	All India	855690
4	A	Videsh Sanchar Nigam Ltd.	All India	509411
5	A	Reliance Communications Infrastructure Ltd.	All India	309951
6	A	Data Infosys	All India	245560
7	A	Bharti Televentures Ltd.(Bharti Infotel)	All India	192996
8	A	Iqara Telecom India Pvt. Ltd. (BG Broadband)	All India	104281
9	A	Shyam Internet Service Pvt. Ltd.	All India	50028
10	A	Hathway Cable & Data Pvt Ltd.	All India	49929
11	A	HCL Infinet Ltd.	All India	42818
12	B	ICENET.NET Ltd.	Gujrat	27720
13	A	Tata Teleservices (Maharashtra) Ltd. (Hughes Telecom)	All India	23955
14	B	Asianet Sattelite Communications Ltd.	Kerala	23147
15	B	HFCL Infotel Ltd.	Punjab	18409
16	B	Fascel Ltd.	Gujarat	18001
17	B	WWW Communications Ltd.	Delhi	14680
18	A	Hughes Escorts Communications Ltd.	All India	11192
19	B	Broadband Pacenet (I) Pvt. Ltd.	Mumbai	10229
20	B	West Bengal Electronics Industry Development Corporation Ltd.	Calcutta	9437
21	B	Seven Star Dot Com Pvt. Ltd.	Khar(w), Jogeshwari (w)	9013
22	B	S. S. Net Com Pvt Ltd.	North East	7748

b. Draw the architecture of Public Access Providers. (4)

Answer:



c. What is the Difference between HTML and XML?

(4)

Answer:

XML and XHTML have an infinite number of possible elements, whereas HTML has a very strict set of predefined elements.

An HTML document can be XML, but an XML document can't be HTML unless it uses the named HTML elements and served as XHTML.

XML (and to some degree XHTML) have to be well-formed and valid before they can be interpreted, HTML can be still be interpreted even if it is malformed and invalid. XML attributes have to be quoted and can't be value-less. HTML doesn't care how attributes are written, unless it's XHTML, in which case it assumes XML attribute rules. HTML can be parsed as text/html and application/xhtml+xml, over and above what XML can be parse as: application/xml

.XML and XHTML have to have a closing element for each open element. HTML doesn't care whether a singleton element is closed or not.

XML elements are mostly meaningless and its parsers won't act on those elements, whereas the elements of an HTML document convey meaning or browser-instruction by their use.

HTML has been in use a lot longer than XML

d. Which search engine is best in the world? Explain how a search engine works?

(4)

Answer: search engine is a large collection of logical programs that help to get the data from thousands of TBs of data. Google is preferred by everyone hence it is

probably the best one at present. Internet search engines are special sites on the Web that are designed to help people find information stored on other sites. There are differences in the ways various search engines work, but they all perform three basic tasks:

- They search the Internet -- or select pieces of the Internet -- based on important words.
- They keep an index of the words they find, and where they find them.
- They allow users to look for words or combinations of words found in that index.

Early search engines held an index of a few hundred thousand pages and documents, and received maybe one or two thousand inquiries each day. Today, a top search engine will index hundreds of millions of pages, and respond to tens of millions of queries per day. In this article, we'll tell you how these major tasks are performed, and how Internet search engines put the pieces together in order to let you find the information you need on the Web.

Q.4 a. What is the major difference between a search engine and software agent? (2)

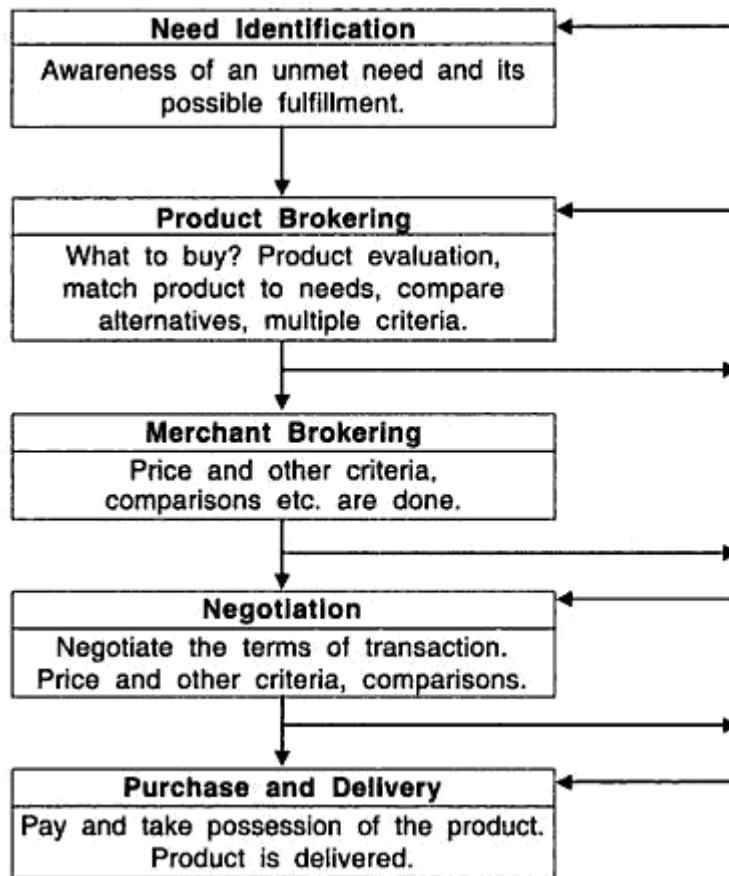
Answer:

Search engine is a bunch of programs which identify the content and search the items. Software agent is an intelligent program which will be able to search intelligently it will identify the customer previous searches and his interests such that it will always identify the intended results of customer.

b. How intelligent agent will help a customer for buying a product online? (6)

Explain with a flow chart.

Answer:



c. Explain Affiliate Marketing and Viral Marketing strategies.

(8)

Answer:

Affiliate marketing is a type of [performance-based marketing](#) in which a business rewards one or more [affiliates](#) for each visitor or customer brought by the affiliate's own marketing efforts. The industry has four core players: the [merchant](#) (also known as 'retailer' or 'brand'), the [network](#) (that contains offers for the affiliate to choose from and also takes care of the payments), the publisher (also known as 'the affiliate'), and the customer. The market has grown in complexity, resulting in the emergence of a secondary tier of players, including affiliate management agencies, super-affiliates and specialized third party [vendors](#).

Affiliate marketing overlaps with other [Internet marketing](#) methods to some degree, because affiliates often use regular [advertising](#) methods. Those methods include [organic search engine optimization](#) (SEO), paid [search engine marketing](#) (PPC - Pay Per Click), [e-mail marketing](#), [content marketing](#) and in some sense [display advertising](#). On the other hand, affiliates sometimes use less orthodox techniques, such as publishing reviews of products or services offered by a partner

Viral marketing:

Viral marketing depends on a high pass-along rate from person to person. If a large percentage of recipients forward something to a large number of friends, the overall growth snowballs very quickly. If the pass-along numbers get too low, the overall growth quickly fizzles.

At the height of B2C it seemed as if every startup had a viral component to its strategy, or at least claimed to have one. However, relatively few marketing viruses achieve success on a scale similar to Hotmail, widely cited as the first example of viral marketing.

Q.5 a. Explain, how websites are hacked? (4)

Answer:

Distributed systems based on the client/server model have become common. In recent months, we can see an increase in the development and the use of distributed sniffers, scanners, and denial-of-service tools. Attacks using these tools can involve a large number of sites simultaneously and focus to attack one or more victim hosts or networks.

In a typical distributed attack system, the 'intruder' controls a small number of 'masters', which in turn control a large number of 'daemons'. These daemons can be used to launch packet flooding or other attacks against the 'victims' targeted by the intruder.

In the incidents that have occurred so far, daemons were installed on several hundred sites, typically through the exploitation of well-known vulnerabilities that lead to root privileges on the compromised machines. Though some implementations of the daemon program do not require root privileges to launch attacks, in practice most of the daemons are concealed by the installation of 'root kits' designed to hide evidence of intrusion. There are indications that the processes for discovering vulnerable sites, compromising them,

stalling daemons, and concealing the intrusion are largely automated, with each step being informed in 'batch' mode against many machines in one session. Daemons have been discovered on a variety of operating systems with varying levels of security and system management.

Once installed and operated, the daemon announces its presence to several (usually three or four) predefined masters and waits for further commands. The master program records that the daemon is ready to receive commands in an internal list, which can be retrieved by the intruder. Masters can cause daemons in the list to launch attacks, shut down gracefully, or even announce themselves to a new master server. Intruders have used cryptographic techniques to conceal the information recorded by the master and daemons.

At the command from an intruder, the master can issue attack requests to the daemons in its list. These requests contain information about the requested attack such as the address of the victim, the duration, and other parameters. The master programs frequently operate as ordinary user programs on compromised hosts, where their activity can easily be hidden.

b. What are the components of a Firewall? (4)

Answer:

The primary components (or aspects) of a firewall are:

1. Network policy
2. Advanced authentication mechanisms
3. Packet filtering
4. Application gateways.

The following sections describe each of these components in detail.

Network Policy

There are two levels of network policy that directly influence the design, installation and use of a firewall system. The higher-level policy is an issue-specific network access policy that defines those services which will be allowed or explicitly denied from the restricted network, how these services will be used, and the conditions for exceptions to this policy. The lower-level policy describes how the firewall will actually go about restricting the access and filtering the services that were defined in the higher level policy. The following sections describe these policies in brief.

Service access policy. The service access policy should focus on Internet-specific use issues as defined above, and perhaps all outside network access (i.e., dial-in policy, and SLIP and PPP connections) as well. This policy should be an extension of an overall organizational policy regarding the protection of information resources in the organization. For a firewall to be successful, the service access policy must be realistic and sound, and should be drafted before implementing a firewall. A realistic policy is one that provides a balance between protecting the network from known risks, while still providing users access to network resources. If a firewall system denies or restricts services, it usually requires the strength of the service access policy to prevent the firewall's access controls from being modified on an ad hoc basis. Only a management-backed sound policy can provide this.

A firewall can implement a number of service access policies. However, a typical policy may be to allow no access to a site from the Internet, but allow access from the site to the Internet. Another typical policy would be to allow some access from the Internet, but perhaps only to selected systems such as information servers and e-mail servers. Firewalls often implement service access policies that allow some user access from the Internet to selected internal hosts, but this access would be granted only if necessary and only if it could be combined with advanced authentication.

Firewall design policy. The firewall design policy is specific to the firewall. It defines the rules used to implement the service access policy. One cannot design this policy in a vacuum isolated from understanding issues such as firewall capabilities and limitations, and threats and vulnerabilities associated with TCP/IP. Firewalls generally implement one of the following two basic design policies:

1. Permit any service unless it is expressly denied
2. Deny any service unless it is expressly permitted.

A firewall that implements the first policy allows all services to pass into the site by default, with the exception of those services that the service access policy has identified as disallowed. A firewall that implements the second policy denies all services by default, but passes those services that have been identified as allowed. This second policy follows the classic access model used in all areas of information security.

The first policy is less desirable, since it offers more avenues for getting around the firewall, i.e. users could access new services currently not denied by the policy (or even addressed by the policy) or run denied services at non-standard TCP/UDP ports that are not denied by the policy. Certain services such as X Windows, FTP, Archie, and RPC cannot be filtered easily and are better accommodated by a firewall that implements the first policy. The second policy is stronger and safer, but is more difficult to implement and may impact users in that certain services such as those just mentioned may have to be blocked or restricted.

The relationship between the high-level service access policy and its lower level counterpart is reflected in the discussion above. This relationship exists because the implementation of the service access policy is heavily dependent upon the capabilities and limitations of the firewall system, as well as upon the inherent security problems associated with the wanted Internet services. For example, wanted services defined in the service access policy may have to be denied if the inherent security problems in these services cannot be effectively controlled by the lower level policy and if the security of the network takes precedence over other factors. On the other hand, an organization that is heavily dependent on these services to meet its mission may have to accept higher risk and allow access to these services. This relationship between the service access policy and its lower-level counterpart allows for an iterative process in defining both, thus producing the realistic and sound policy initially described.

The service access policy is the most significant component of the four described here. The other three components are used to implement and enforce the policy. (And as noted above, the service access policy should be a reflection of a strong overall organization security policy.) The effectiveness of the firewall system in protecting the network depends on the type of firewall implementation used, the use of proper firewall procedures, and the service access policy.

Advanced Authentication

Security lapses on the identity of Internet users have occurred in part due to the weaknesses associated with traditional passwords. For years, users have been advised to choose passwords that would be difficult to guess, or not to reveal their passwords. However, even if users follow this advice (and many do not), the fact that intruders can and do monitor the Internet for passwords that are transmitted in the clear has rendered traditional passwords obsolete.

Advanced authentication measures such as smartcards, authentication tokens, biometrics, and software-based mechanisms are designed to counter the weaknesses of traditional passwords. While the authentication techniques vary, they are indeed similar in one aspect. The passwords generated by advanced authentication devices cannot be reused by an attacker who has monitored a connection. Given the inherent problems with passwords on the Internet, an

Internet-accessible firewall that does not use or does not contain the hooks to use advanced authentication makes little sense.

Some of the more popular advanced authentication devices in use today are called one-time password systems. A smartcard or authentication token, for example, generates a response that the host system can use in place of a traditional password. The token or card works in conjunction with software or hardware on the host, and therefore, the generated response is unique for every login. The result is a one-time password which, if monitored, cannot be reused by an intruder to gain access to an account.

Since firewalls can centralize and control site access, the firewall is the logical place for the advanced authentication software or hardware to be located. Although advanced authentication measures could be used at each host, it is more practical and manageable to centralize the measures at the firewall. Figure 5.3 illustrates that a site without a firewall using advanced authentication permits unauthenticated application traffic, such as Telnet or FTP, directly to site systems. If the hosts do not use advanced authentication, then intruders could attempt to crack passwords or could monitor the network for login sessions that would include the passwords. The figure also shows a site with a firewall using advanced authentication, such that Telnet or FTP sessions originating from the Internet to site systems must pass the advanced authentication before being permitted to the site systems. The site systems may still require static passwords before permitting access. However, these passwords would be protected against exploitation, even if the passwords are monitored, as long as the advanced authentication measures and other firewall components prevent intruders from penetrating or bypassing the firewall.

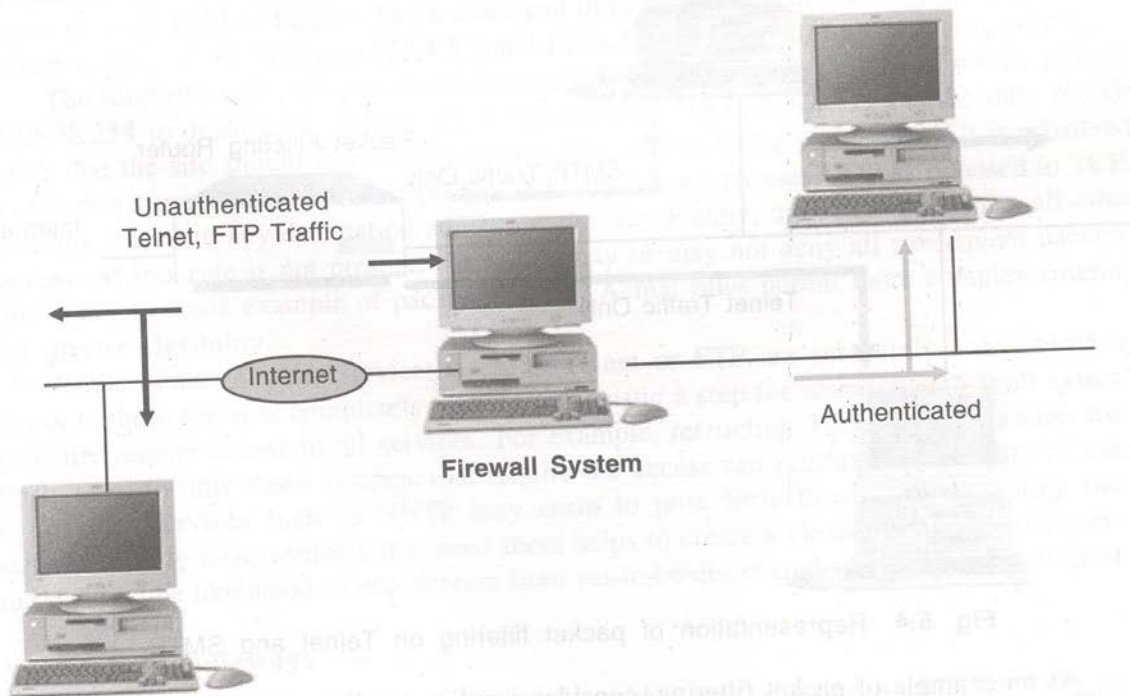


Fig. 5.3 Advanced authentication on a firewall to pre-authenticate Telnet, FTP traffic.

Packet Filtering

IP packet filtering is done, usually, using a packet filtering router designed for filtering packets, as they pass between the router's interfaces. A packet filtering router usually can filter IP packets based on some or all of the following fields:

1. Source IP address
2. Destination IP address
3. TCP/UDP source port
4. TCP/UDP destination port.

Not all packet filtering routers currently filter the source TCP/UDP port, though vendors have now started incorporating this capability. Some routers examine the router's network interfaces in which a packet arrives, and then use this as an additional filtering criterion. Some UNIX hosts provide packet filtering capability, although most do not.

Filtering can be used in a variety of ways to block connections from or to specific hosts or networks, and to block connections to specific ports. A site might wish to block connections from certain addresses, such as from hosts or sites that it considers to be hostile or untrustworthy. Alternatively, a site may wish to block connections from all addresses external to the site (with certain exceptions, such as SMTP for receiving e-mail) (see Figure 5.4).

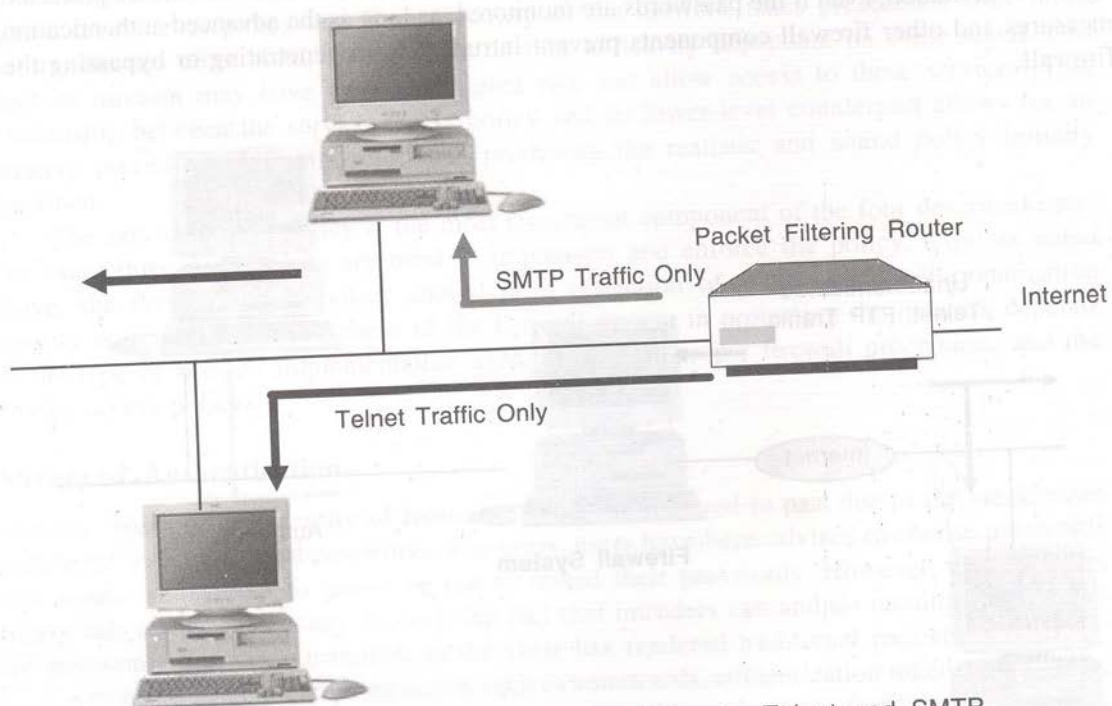


Fig. 5.4 Representation of packet filtering on Telnet and SMTP.

As an example of packet filtering, consider a policy to allow only certain connections to a network of address 123.4.*.*. Telnet connections will be allowed to only one host, 123.4.5.6, which may be the site's Telnet application gateway, and SMTP connections will

be allowed to two hosts, 123.4.5.7 and 123.4.5.8, which may be the site's two electronic mail gateways. NNTP (Network News Transfer Protocol) is allowed only from the site's NNTP feed system, 129.6.48.254, and only to the site's NNTP server, 123.4.5.9, and NTP (Network Time Protocol) is allowed to all hosts. All other services and packets are to be blocked. An example of the rule-set is in Table 5.4.

TABLE 5.4
PACKET FILTERING TABLE

Type	Source address	Destination address	Source port	Destination port	Action
TCP	*	123.4.5.6	>1023	23	permit
TCP	*	123.4.5.6	>1023	25	permit
TCP	*	123.4.5.6	>1023	2	permit
TCP	129.6.58.254	123.4.5.6	>1023	119	permit
UDP	*	123.4.*.*	>1023	123	permit
*	*	*	*	*	deny

The first rule allows TCP packets from any source address and port greater than 1023 on the Internet to the destination address of 123.4.5.6 and port of 23 at the site. Port 23 is the port associated with the Telnet server, and all Telnet clients should have unprivileged source ports of 1024 or higher. The second and third rules work in a similar fashion, except packets to destination addresses 123.4.5.7 and 123.4.5.8, and port 25 for SMTP, are permitted.

The fourth rule permits packets to the site's NNTP server, but only from source address 129.6.48.254 to destination address 123.4.5.9 and port 119 (129.6.48.254 is the only NNTP server that the site should receive news from, thus access to the site for NNTP is restricted to only that system). The fifth rule permits NTP traffic, which uses UDP as opposed to TCP, from any source to any destination address at the site. Finally, the sixth rule denies all other packets—if this rule is not present, the router may or may not deny all subsequent packets. This is a very basic example of packet filtering. Actual rules permit more complex filtering and greater flexibility.

While some of these services such as Telnet or FTP are inherently risky, blocking access to these services completely may be too drastic a step for many sites. Not all systems generally require access to all services. For example, restricting Telnet or FTP access from the Internet to only those systems that require the access can improve the security of users at no cost. Services such as NNTP may seem to pose little threat, but restricting these services to only those systems that need them helps to create a cleaner network environment and reduces the likelihood of exploitation from yet-to-be-discovered vulnerabilities and threats.

Application Gateways

To counter some of the weaknesses associated with packet filtering routers, firewalls need to use software applications to forward and filter connections for services such as Telnet and

FTP. Such an application is referred to as a proxy service, while the host running the proxy service is referred to as an application gateway. Application gateways and packet filtering routers can be combined to provide higher levels of security and flexibility than if either were used alone.

- c. Briefly explain about smart card cash payment system and micropayment system. (8)**

Answer:

We will first look at the smart card-based cash payment system. In the early 1990s, a payment system for low value amounts using smart cards was first introduced in Europe.

Most of these methods are known as *stored value cards* or *electronic purse system*. Units of prepayment or currency value are electronically stored on an IC chip imbedded in the cards. When purchases are made, the payment is effected through these units of electronic value.

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 chip, at its current state of development, can store significantly greater amounts of data estimated to be 80 times more than a 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 programmes. The idea has taken longer to catch on in the United States, since a highly reliable and fairly inexpensive telecommunications system has favoured the use of credit and debit cards.

Smart cards are basically of two types: relationship-based smart credit cards and electronic purses. Electronic purses, which replace money, are also known as debit cards and electronic money.

The benefits of smart cards will rely on the ubiquity of devices called *smart card reader*: that can communicate with the chip in a smart card. In addition to reading from and writing to smart cards, these devices can also support a variety of key management methods. Some smart-card readers combine elements of a personal computer, a point-of-sale terminal, and a phone to allow consumers to quickly conduct financial transactions without leaving their homes.

In the simplest form, the card reader features a two-line with a 16-character display that can show both the prompt and the response entered by the user. Efficiency is further enhanced by colour-coded function keys, which can be programmed to perform the most frequently used operations in a single key stroke. It can communicate via an RS-232 serial interface with the full range of transaction automation systems, including PCs and Electronic Cash Registers (ECRs).

Card readers in the form of screen phones are becoming more prominent. Proponents of screen phone applications have long stated that consumers, familiarity with phones gives screen phones an entry that computers cannot match. Some screen-based phones feature a four-line screen, a magnetic stripe card reader, and a phone keypad that folds away to reveal a keyboard for use in complex transactions. The phone prompts the users for transactions, using menus patterned on those found on automated teller machines.

Smart card readers can be customized for specific environments. The operating environment allows programmers to use the C programming language to create and modify applications without compromising the device's security functions. The development system for most card readers even comes with pre-coded modules for accelerated application development. To promote smart card usage, the Smart Card Forum—a group of about 130 businesses and government agencies—is drawing up common specifications to promote the use of multiple application smart cards useable for every kind of payments.

Micropayment Systems

VISA Cash of Visa International

Visa International, the world's largest credit card company, introduced their own stored value card (VISA Cash) in 1995 under license from and incorporation of the technology developed by Danmont in Denmark.

In the system of VISA Cash, the transaction is made on an existing financial network of Visa, where large value payments are also transacted. The level of security is quite high. However, as all transaction data go through the data centres of Visa International, anonymity could be jeopardized. The transactions handled here are different from transactions by credit card. The user's identification and authentication are not required at the time of payment. Each bank does clearing of units of prepayment and deposit; thus the person concerned cannot be identified. In this manner, it provides anonymity. The operational cost is relatively high, since all transactions pass through the network for settlement at banks.

Mondex of Mondex International

We will now explore the system of Mondex which has been developed by National Westminster Bank (hereafter, NatWest Bank), a major commercial bank in Britain.

In December 1993, NatWest Bank announced an electronic low value payment system called Mondex. Mondex can be classified as a cash substitution system using smart cards, which in a sense is the same as VISA Cash, but the concept is notably different. In the Mondex system, there is one issuing body—the originator of electronic value in the currency of the country. This originator basically serves as an issuing bank in the Mondex system and issues to the Mondex member banks, the equivalent amount of electronic Mondex Value in exchange for prime negotiable instruments or cash. Consumers as cardholders load Mondex value on their card from a bank ATM, or a Mondex telephone. It can then be used as cash for shopping. Using a wallet, which resembles a pocket calculator, customers can also exchange electronic value between individuals. Therefore, once the electronic value has been drawn from a bank, only the person involved in the transaction knows the history of the monetary movement. No one else can trace it. In addition, using a private or a public telephone connected to the Mondex system, the electronic value can be withdrawn, deposited, or sent to a person at a remote location over the telephone network. By adding reader/writer functions to a personal computer, it will also be possible to send money over the Internet.

Q.6 a. What is a Digital Signature? Explain how it works.

(8)

Answer:

A digital signature (not to be confused with a [digital certificate](#)) is a mathematical technique used to validate the authenticity and integrity of a message, software or digital document. Digital signatures are based on public key cryptography, also known as [asymmetric cryptography](#). Using a [public key algorithm](#) such as [RSA](#), one can generate two keys that are mathematically linked: one private and one public. To create a digital signature, signing software (such as an email program) creates a one-way hash of the electronic data to be signed. The [private key](#) is then used to encrypt the hash. The encrypted hash -- along with other information, such as the [hashing](#) algorithm -- is the digital signature. The reason for encrypting the hash

instead of the entire message or document is that a hash function can convert an arbitrary input into a fixed length value, which is usually much shorter. This saves time since hashing is much faster than signing. The value of the hash is unique to the hashed data. Any change in the data, even changing or deleting a single character, results in a different value. This attribute enables others to validate the integrity of the data by using the signer's public key to decrypt the hash. If the decrypted hash matches a second computed hash of the same data, it proves that the data hasn't changed since it was signed. If the two hashes don't match, the data has either been tampered with in some way (integrity) or the signature was created with a private key that doesn't correspond to the public key presented by the signer ([authentication](#)).

A digital signature can be used with any kind of message -- whether it is encrypted or not -- simply so the receiver can be sure of the sender's identity and that the message arrived intact. Digital signatures make it difficult for the signer to deny having signed something (non-repudiation) -- assuming their private key has not been compromised -- as the digital signature is unique to both the document and the signer, and it binds them together. A digital certificate, an electronic document that contains the digital signature of the certificate-issuing authority, binds together a public key with an identity and can be used to verify a public key belongs to a particular person or entity.

b. What is E-CRM Toolkit?

(2)

Answer:

The eCRM or electronic customer relationship management encompasses all the CRM functions with the use of the net environment i.e., intranet, extranet and internet. Electronic [CRM](#) concerns all forms of managing relationships with customers making use of [information technology](#) (IT). eCRM is enterprises using IT to integrate internal organization resources and external "marketing" strategies to understand and fulfill their customers needs. Comparing with traditional [CRM](#), the integrated information for eCRM intra organizational collaboration can be more efficient to communicate with customers

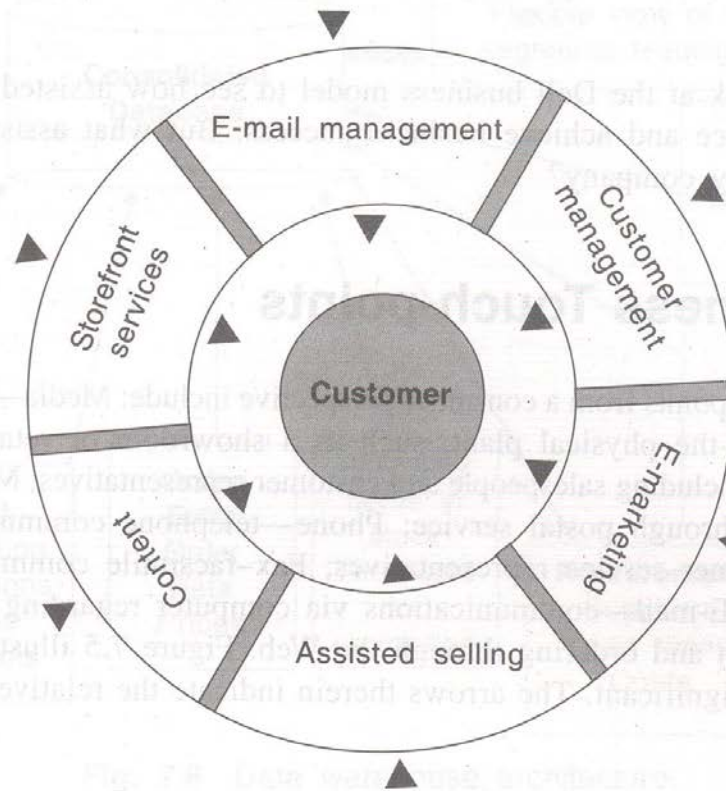


Fig. 7.4 E-CRM toolkit.

c. Explain e-supply chain architecture and its advantages.

(6)

Answer:

The focus of contemporary organizations, based on the concept of supply chain management, was created as a response to ongoing business requirements related to the business process improvement, flexibility, agility and supply chain collaboration. Looking for additional sources for cost reduction and process improvement, organizations are beginning to introduce modern management tools in their chains of suppliers and customers. During the last decade, computational techniques and methods of management for internal functions in business have systematically been applied, such as Enterprise Resource Planning – ERP, Total Quality Management – TQM and Business Process Reengineering – BPR, to optimize operations of organizations and activate high agility, lean manufacturing and distributed functions with the highest quality and service. Cost reduction and process optimization in supply chains, which used to be predominant inside organizations in the past, focus on applying the same paradigms of management and technology, but outside internal supply chains. The goal of management is to eliminate all forms of dissipation created by some entities in the supply chain, such as logistics, inventory, purchase, product development, finance and others. Internet enables organizations to observe the supply chain as a source of competitive advantage. With the emergence of e-business, these tactical advantages rapidly increase, so additional strategic capabilities enabling the entire supply chain create the radically new regions of the market value, which was practically impossible in the past. E-business technologies enable even small organizations to connect their supply chains with each other and be able to implement competitive business models that, previously, only large organizations had (Arsovski et al., 2012).

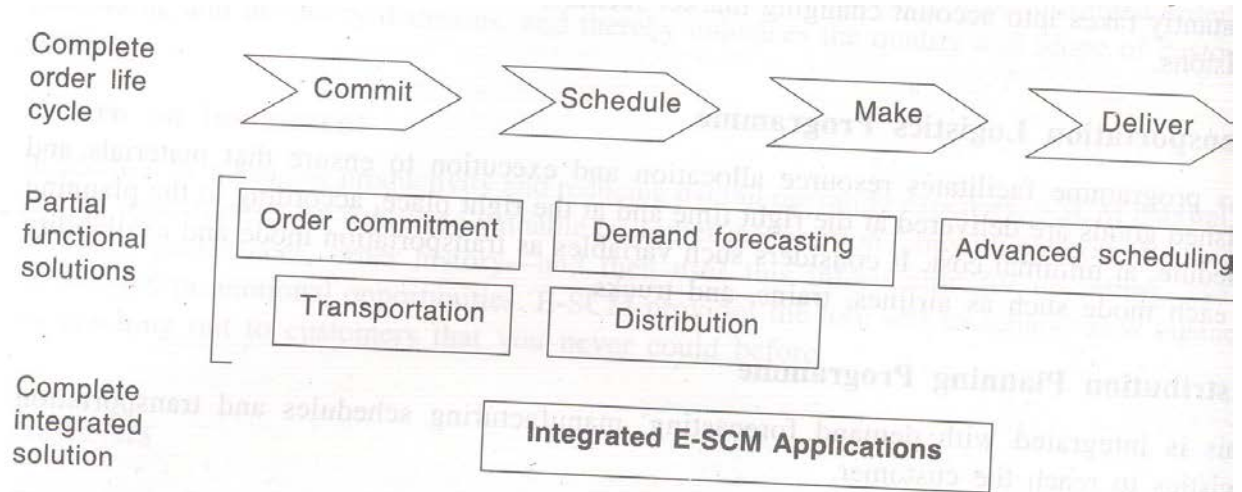


Fig. 8.8 E-supply chain architecture.

Q.7 a. Briefly explain the steps in planning the e-Commerce project. (8)

Answer:

Planning the E-commerce Project

✓ A successful business plan for an e-commerce initiative should include the following activities.

1. Identifying the initiative's specific objectives
2. Linking objectives to business strategies
3. Managing the implementation of business strategies
4. Overseeing the continuing operations of the initiative, once it is launched.

In setting the objectives for an e-commerce initiative, managers should consider the strategic role of the project, its intended scope, and the resources available for executing it.

Identifying Objectives

Businesses undertake e-commerce initiatives for a wide variety of reasons. Common objectives that a business might hope to accomplish through e-commerce could include increasing sales in existing markets, opening new markets, serving existing customers better, identifying new vendors, coordinating more efficiently with existing vendors, or recruiting employees more effectively.

Resource decisions for e-commerce initiatives should consider the expected benefits and expected costs of meeting the objectives. These decisions should also consider the risks inherent in the e-commerce initiative and compare them to the risks of inaction—a failure to act could concede a strategic advantage to competitors.

Linking Objectives to Business Strategies

Businesses can use downstream strategies, which are tactics that improve the value that the business provides to its customers. Alternatively, businesses can pursue upstream strategies that focus on reducing costs or generating value by working with suppliers or inbound logistics.

You have already learnt about the different things that companies do on the Web. Although the Web is a tremendously attractive sales channel for many firms, companies can use e-commerce in a variety of ways to do much more than selling: they can use the Web to improve their business strategies and their competitive positions. As described in earlier chapters of this book, e-commerce opportunities can inspire businesses to undertake activities such as:

- Building brands
- Enhancing existing marketing programs
- Selling products and services
- Selling advertising
- Improving after-sale service and support
- Purchasing products and services
- Managing supply chains
- Operating auctions
- Creating virtual communities and web portals.

Although the success of each of these activities is measurable to some degree, many companies have undertaken these activities on the Web without setting specific, measurable goals. In the mid 1990s—the early days of e-commerce—businesses that had good ideas could start a business activity on the Web and not face competition. Successes and failures were measured in broad strokes. A company would either become the *amazon.com* or the *eBay* of its industry, or it would disappear, either slipping into bankruptcy or be acquired by another company.

As e-commerce is now beginning to mature, more companies are taking a closer look at the benefits and costs of their e-commerce projects. Measuring both benefits and costs is

becoming more important. A good business plan will set specific objectives for benefits to be achieved and costs to be incurred. In many cases, a company will create a pilot website to test an e-commerce idea, and then release a production version of the site when it works well. These companies must specify clear goals for the pilot test, so that they know when the site is ready to scale up.

Measuring Benefit Objectives

Many companies create websites to build their brands or enhance existing marketing programs. These companies can set goals in terms of increased brand awareness, as measured by market research surveys and opinion polls. Companies that sell goods or services on their sites can measure sales volume in units or dollars. A complication that occurs in measuring either brand awareness or sales is that the increases can be caused by other things that the company is doing at the same time or by a general improvement in the economy. A good marketing staff or outside consulting firm can help a company sort out the specific causes and effects of marketing and sales programs. Firms may need these groups to help set and evaluate these kinds of goals for e-commerce initiatives.

Companies that want to use their websites to improve customer service or after-sale support might set goals of increased customer satisfaction or reduced costs of providing customer service or support. For example, Philips Lighting wanted to use the Web to provide an ordering system for its smaller customers, that did not use EDI. The primary goal for this initiative was to reduce the cost of processing smaller orders. Philips had identified that over half the cost of processing smaller orders was towards handling inventory availability and order status requests. Customers who placed small orders often called or sent faxes asking for this information. In 1999, Philips built a pilot website and invited a number of its smaller customers to try it. The company found that customer service phone calls from the test group of customers dropped by 80 per cent. Based on that measurable increase in efficiency, Philips decided to invest in additional hardware and personnel to staff a version of the website that could handle virtually all its smaller customers. The reduction in the cost of handling small orders justified the additional investment.

Companies can handle a variety of similar measures to assess the benefits of other electronic commerce initiatives. Supply chain managers can measure supply cost reductions, quality improvements, or faster deliveries of ordered goods. Auction sites can set goals for the number of auctions, the number of bidders and sellers, the dollar volume of items sold, the number of items sold, or the number of registered participants. The ability to track such numbers is usually built into auction site software. Virtual communities and Web portals measure the number of visitors and try to measure the quality of their visitors' experiences. Some sites use online surveys to gather these data. However, most settle for approximations provided by measuring the length of time that each visitor remains on the site and the frequency of his visits. A summary of benefits and measurements that companies can make to assess the value of those benefits is found in Table 9.2.

TABLE 9.2
MEASURING THE BENEFITS OF E-COMMERCE INITIATIVES

<i>E-commerce initiatives</i>	<i>Common measurements of benefits provided</i>
Build brands	Surveys or opinion polls that measure brand awareness.
Enhance existing marketing programs	Change in per unit sales volume.
Improve customer service	Customer satisfaction surveys, the number of customer complaints.
Reduce cost of after-sale support	Quantity and type (telephone, fax, e-mail) of support activities.
Improve supply chain operation	Cost, quality, and on-time delivery of materials or services purchased.
Hold auctions	Quantity of auctions, bidders, sellers, items sold, registered participants; dollar volume of items sold.
Provide portals and virtual communities	Number of visitors, number of return visits per visitor, and duration of an average visit.

No matter how a company measures the benefits provided by its website, it usually tries to convert the raw activity measurements to dollars. Having the benefits measured in dollars lets the company compare benefits to costs and compare the net benefit (benefits minus costs) of a particular initiative to the net benefits provided by other projects. Although each activity provides some value to the company, it is often difficult to measure that value in dollars. Usually, even the best attempts to convert benefits to dollars yield only rough approximations.

Measuring Cost Objectives

At the first glance, the task of identifying and estimating costs may seem much easier than the task of setting benefits objectives. However, many managers have found that information technology project costs can be as difficult to estimate and control as the benefits of those projects. Since Web development uses relatively new hardware and software technologies, managers have little experience on which they can make estimates. Most changes in the cost of hardware are on the decline, but the increasing sophistication of software provides an ever-increasing demand for newer, cheaper hardware. This often yields a net increase in overall hardware costs. Even though e-commerce initiatives tend to be completed within a shorter time frame than many other information technology projects, the rapid changes in web technology can destroy a manager's best-laid plans very quickly.

In addition to hardware and software costs, the project budget must include the costs of hiring, training, and paying the personnel who will design the website, write or customize the software, create the content, and operate and maintain the site. As more companies build

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e-commerce sites, people who have the skills necessary to do the work are demanding increasingly higher compensation.

The initial cost of building an electronic commerce site is not the whole story, unfortunately. Since Web technology continues to evolve at a rapid pace, most businesses will want to take advantage of what that technology offers, to remain competitive. Most experts agree that the annual cost to maintain and improve a site once it is up and running, whether it is a small site or a large site, will be between 50 per cent to 100 per cent of its initial cost.

As an increasing number of traditional businesses create Web versions of their physical stores, the cost to build an online business that is a true differentiator—a site that stands out and offers something new to customers—will continue to increase. Much of the cost in such a website is for elements that make a major difference in how well the site works, but are not readily apparent to a site visitor. For example, Kmart's Web business site *BlueLight.com*, costed more than \$140 million to create. The site's home page is certainly well-designed and highly functional, but the typical visitor would never guess how much this company spent to build its site. Much of the site's cost was incurred in building connections to Kmart's vast inventory and logistics databases.

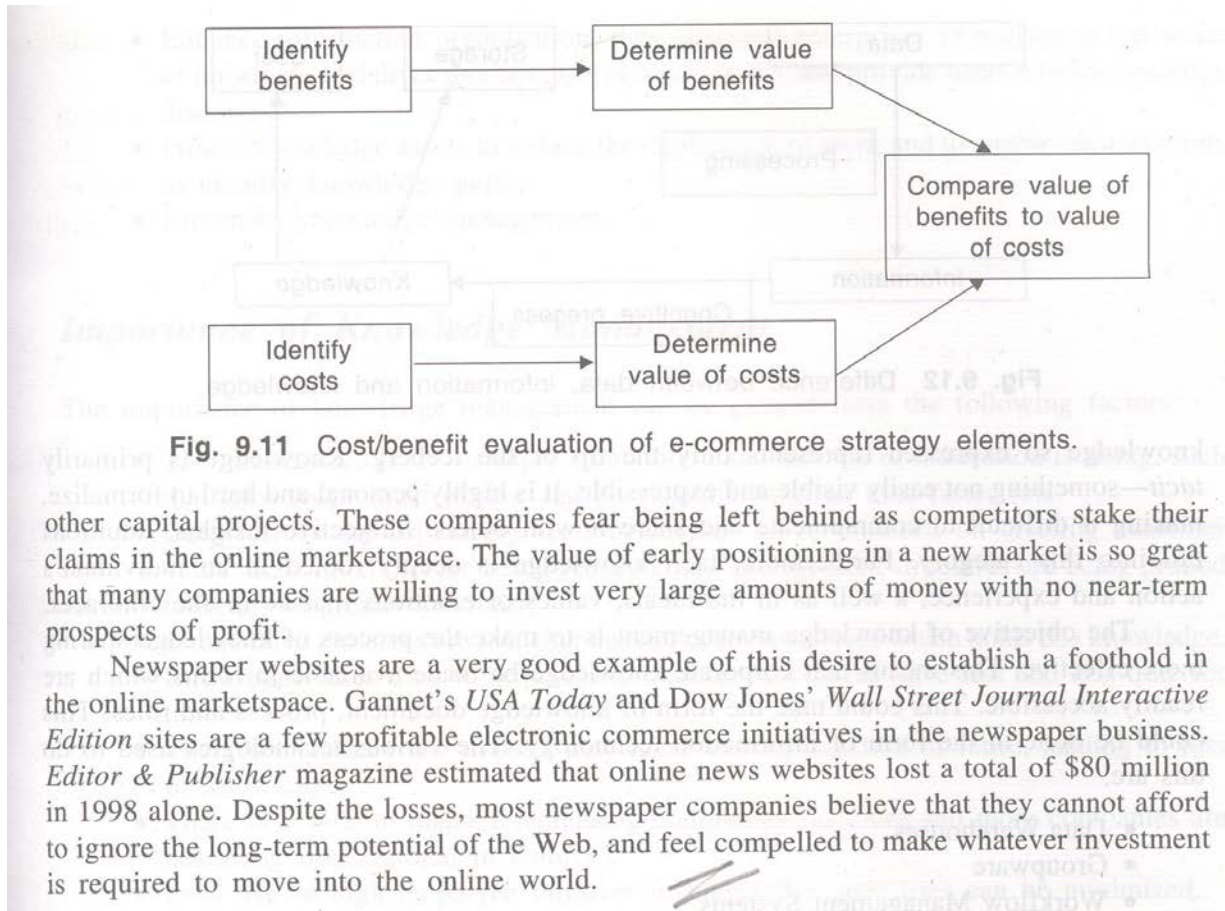
Comparing Benefits to Costs

Most companies have procedures that call for an evaluation of any major expenditure of funds. These major investments in equipment, personnel, and other assets are called capital projects or capital investments. The techniques that companies use to evaluate proposed capital projects range from very simple calculations to complex computer simulation models. However, no matter how complex the technique is, it always reduces to a comparison of benefits and costs. If the benefits exceed the cost of a project by a comfortable margin, the company invests in the project.

A key factor in creating a business plan for e-commerce initiatives is the process of identifying potential benefits (including intangibles such as employee satisfaction and company reputation), identifying the costs required to generate those benefits, and evaluating whether the benefits exceed the costs. Companies should evaluate each element of their e-commerce strategies using this cost/benefit approach. A simplified representation of the cost/benefit approach appears in Figure 9.11.

You might have learned techniques for capital project evaluation, such as the payback method or the net present value method, in your accounting or finance courses. These evaluation approaches provide a quantitative expression of a comfortable benefit-to-cost margin for a specific company. They can also mathematically adjust for the reduced value of benefits that the investment will return in future years (benefits received in future years are worth less than those received in the current year). Managers often use the term Return on Investment (ROI) to describe any capital investment evaluation technique, even though ROI is the name of only one of these techniques.

Although most companies evaluate the anticipated value of e-commerce initiatives in some way before approving them, many companies see these projects as absolutely necessary investments. Thus, they might not subject them to the same close examination as they do to

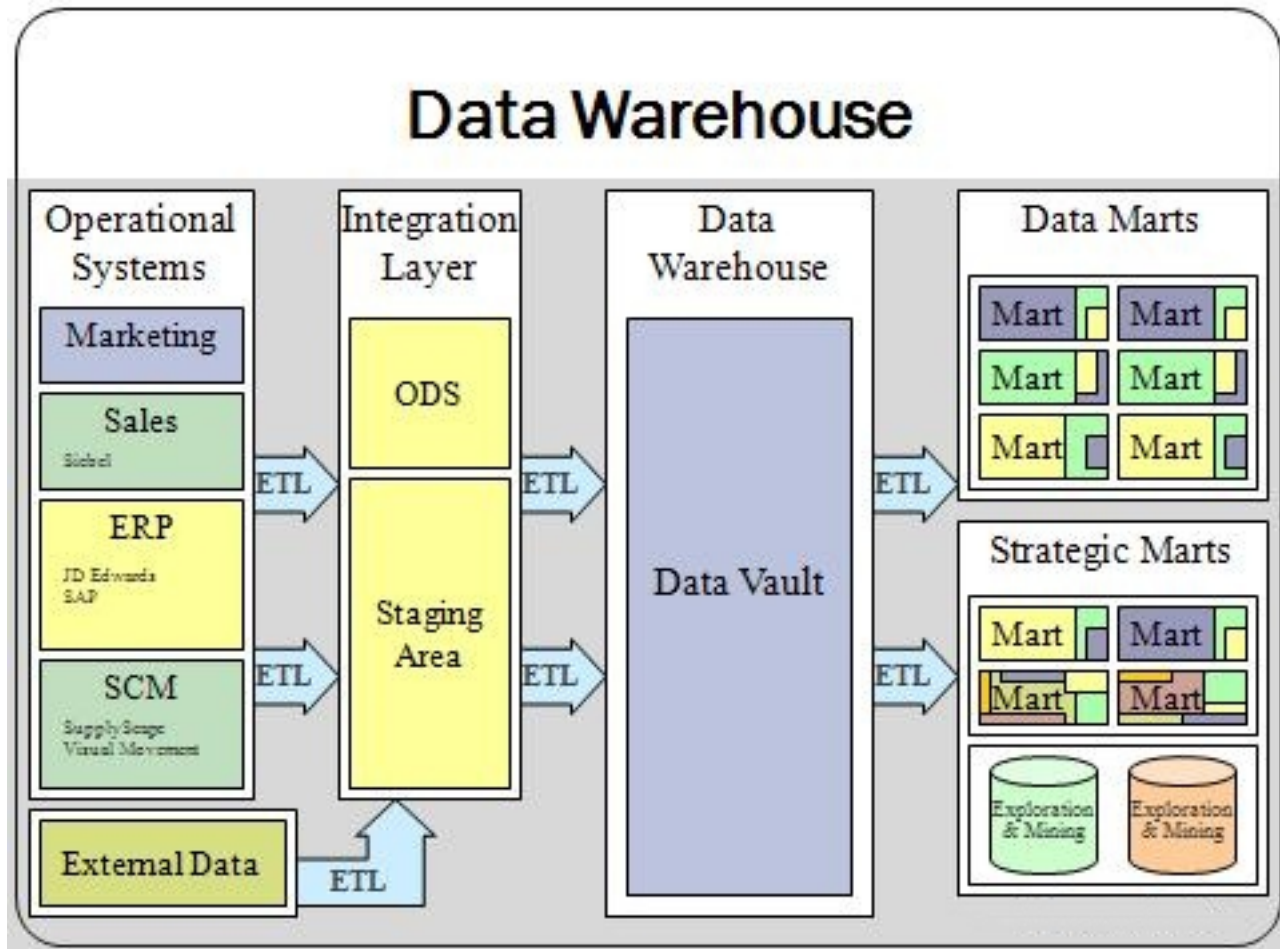


b. What is a Dataware House? Explain its functions and architecture. How it is related to e-Commerce? (8)

Answer:

In computing, a data warehouse (DW or DWH), also known as an enterprise data warehouse (EDW), is a system used for reporting and data analysis. DWs are central repositories of integrated data from one or more disparate sources. They store current and historical data and are used for creating analytical reports for knowledge workers throughout the enterprise. Examples of reports could range from annual and quarterly comparisons and trends to detailed daily sales

analyses.



Data Warehousing is the procedure of designing, and maintaining a Data Warehouse system.

Data Warehousing is a method for gathering and controlling data from different sources making the data easily available for querying and analysis.

A Data Warehouse is a compilation of information/data prearranged so that it can effortlessly used for querying and data analysis.

Data warehousing is not intended for up to date data usage.

Data warehouses usually contain huge amounts of data, divided in logical units called dependent data marts.

Data Warehousing has 2 main functions. The first function is to integrate the information/data coming from different data sources. The second function is to separate the data in the live data sources from the data in the actual data warehouse, which is used for reporting and data analysis.

Q.8 a. What is mobile commerce?

(2)

Answer:

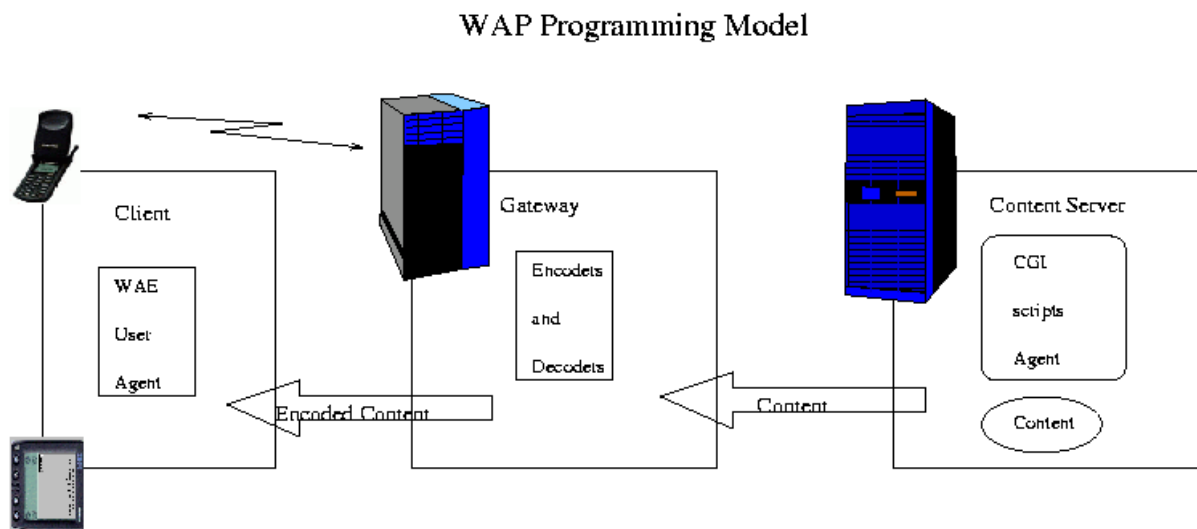
M-commerce (mobile commerce) is the buying and selling of goods and services through wireless handheld devices such as cellular telephone and personal digital assistants (PDAs).

b. Explain the programming model of WAP.

(8)

Answer:

The WAP programming model, as shown in Figure , is similar to the WWW programming model. It borrows heavily from the WWW model and architecture and uses existing tools such as Web servers and XML tools. Optimizations and extensions have been made in order to support the characteristics of the wireless environment. Most of the existing WWW standards have been adopted and have been used as the starting point of the WAP technology.



WAP content and applications are specified in a set of content formats based on the familiar WWW content formats. Content is transported using a set of standard communication protocols based on the WWW communications protocols. A *micro browser* in the wireless terminal coordinates the user interface and is analogous to a standard web browser.

WAP defines a set of standard components that enable communication between mobile terminals and network servers, including:

- Standard naming model - WWW-standard URLs are used to identify WAP content on origin servers. WWW-standards URIs are used to identify local resources in a device, eg call control functions.
- Content typing - All WAP content is given a specific type consistent with WWW typing. This allows WAP user agents to correctly process the content based on its type.
- Standard content formats - WAP content formats are based on WWW technology and include display markup, calendar information, electronic business card objects, images and scripting language. Formats include, WML, WMLScript and WBMP.
- Standard communication protocols - WAP communication protocols enable the communication of browser requests from the mobile terminal to the content server.

The WAP content types and protocols have been optimized for hand-held wireless devices. WAP utilizes proxy technology to connect between the wireless domain and the Internet. The WAP proxy typically is composed of the following functionality:

- Protocol Gateway - The protocol gateway translates requests from the WAP protocol stack (WSP, WTP, WTLS, and WDP), as shown in Figure 3, to the WWW protocol stack (HTTP and TCP/IP).
- Content Encoders and Decoders - The content encoders translate WAP content, WML pages and WMLScript programs, into compact encoded formats to reduce the size of data over the wireless network.

c. Write a short note on second generation of wireless communication. (6)

Answer:

2G (or 2-G) is short for second-generation [wireless telephone technology](#). Second generation 2G cellular telecom networks were commercially launched on the [GSM](#) standard in Finland by [Radiolinja](#) (now part of [Elisa Oyj](#)) in 1991.^[1] Three primary benefits of 2G networks over their predecessors were that phone conversations were digitally encrypted; 2G systems were significantly more efficient on the spectrum allowing for far greater mobile phone penetration levels; and 2G introduced data services for mobile, starting with [SMS](#) text messages. 2G technologies enabled the various mobile phone networks to provide the services such as text messages, picture messages and MMS (multi media messages). All text messages sent over 2G are digitally encrypted, allowing for the transfer of data in such a way that only the intended receiver can receive and read it.

After 2G was launched, the previous mobile telephone systems were retroactively dubbed [1G](#). While radio signals on 1G networks are [analog](#), radio signals on 2G networks are digital. Both systems use digital signaling to connect the radio towers (which listen to the handsets) to the rest of the telephone system.

2G has been superseded by newer technologies such as [2.5G](#), [2.75G](#), [3G](#), and [4G](#); however, 2G networks are still used in many parts of the world

- GSM (TDMA-based), originally from Europe but used in most of the world outside North America. Today accounts for over 80% of all subscribers around the world. Over 60 GSM operators are also using [CDMA2000](#) in the 450 MHz frequency band (CDMA450).^[2]
- [IS-95](#) aka cdmaOne (CDMA-based, commonly referred as simply CDMA in the US), used in the Americas and parts of Asia. Today accounts for about 17% of all subscribers globally. Over a dozen CDMA operators have migrated to GSM including operators in Mexico, India and Australia.
- [PDC](#) also known as JDC (Japanese Digital Cellular) (TDMA-based), used exclusively in Japan

- [iDEN](#) (TDMA-based), proprietary network used by [Nextel](#) in the [United States](#) and [Telus Mobility](#) in [Canada](#)
- [IS-136](#) a.k.a. [D-AMPS](#) (TDMA-based, commonly referred as simply 'TDMA' in the US), was once prevalent in the Americas but most have migrated to GSM.

2G services are frequently referred as [Personal Communications Service](#), or PCS, in the United States.

Q.9 a. What are the strategies for developing a website? (8)

Answer:

Strategic design is the fusion of your organizational goals with every aspect of your design process. You aren't simply designing a user interface that looks good and is usable and accessible. You're designing an interface that will help you accomplish your organization's objectives.

1. ESTABLISH YOUR GOALS

One of the first things you need to do before starting work on a Web design project is to be clear about your client or organization's goals. What are you trying to achieve with the new website or redesign? What is the website's main purpose? Ask your client, your manager or yourself what those are. If they or you don't know yet, then they should be discussed and agreed upon. A clear direction is essential if you want your design to have a purpose.

2. IDENTIFY YOUR AUDIENCE

Who your audience is will play a big role in how your website should look and function. There are many demographics here that can influence your design, ones like age, gender, profession and technical competency. A computer game website for a younger audience needs a different style than that of a serious business journal. Usability should play a bigger role for older and less technically savvy audiences.

3. DETERMINE YOUR BRAND IMAGE

A lot of designers tend to get a little too inspired by the latest trends and then implement them without thinking first about what sort of image they really should be conveying. Glossy buttons, gradients and reflective floors may work for some websites, but they may not be right for your brand.

. GOAL-DRIVEN DESIGN DIRECTION

You've established the purpose of your website, set some goals you want to achieve, identified your audience and determined your brand image. You can now proceed to implement it. So how do you make design decisions sync with your strategy? Let me illustrate this with a likely example.

5. MEASURE RESULTS

Once you've designed and deployed your website, it's time to measure your success. This is just as important as the first two steps because until you test how well your design performs, you won't know whether or not it is effective in fulfilling your goals.

If your goal is to increase the number of sign-ups to your service, measure it and see if your changes are making a positive impact. If you want to increase the number of subscribers to your blog, check your RSS stats. If you want to increase user involvement, see if you get more comments or more forum posts or whatever else is relevant in your context.

b. Explain, what is Cyberstalking? How the Law is Standing up to Cyberstalking? (8)

Answer:

Cyber stalking is the use of the [Internet](#) or other electronic means to [stalk](#) or [harass](#) an individual, a group, or an organization.^[1] It may include [false accusations](#), defamation, slander and [libel](#). It may also include monitoring, [identity theft](#), threats, vandalism, solicitation for sex, or [gathering information](#) that may be used to threaten or harass.

Cyber stalking is often accompanied by real-time or offline stalking.^[2] Both are criminal offenses.^[3] Both are motivated by a desire to control, intimidate or influence a victim.^[4] A stalker may be an online stranger or a person whom the target knows. He may be anonymous and solicit involvement of other people online who do not even know the target.

Cyber stalking is a criminal offense under various state anti-stalking, [slander](#) and [harassment](#) laws. A conviction can result in a restraining order, probation, or criminal penalties against the assailant, including jail.

Legislation on cyber stalking varies from country to country. Cyber stalking and cyber bullying are relatively new phenomena, but that does not mean that crimes committed through the network are not punishable under legislation drafted for that purpose. Although there are often existing laws that prohibit stalking or harassment in a general sense, legislators sometimes believe that such laws are inadequate or do not go far enough, and thus bring forward new legislation to address this perceived shortcoming. In the [United States](#), for example, nearly every state has laws that address cyber stalking, cyber bullying, or both.^[35]

In countries such as the US, in practice, there is little legislative difference between the concepts of "cyber bullying" and "cyber stalking." The primary distinction is one of age; if adults are involved, the act is usually termed *cyber stalking*, while among children it is usually referred to as *cyber bullying*. However, this distinction is one of semantics, and many laws treat *bullying* and *stalking* as much the same issue

Text Book

E-Commerce –An Indian Perspective, P.T.Joseph, S.J., Second Edition , PHI, 2007