CHAPTER-1 INTRODUCTION to WWW

Topic:1 Concept of WWW.

- **WWW** is stands for World Wide Web.
- The **World Wide Web (WWW)** is a global information medium which users can read and write via computer connected to the internet.
- The Web, or World Wide Web, is basically a system of Internet servers that support specially formatted documents. The documents are formatted in a markup language called HTML (Hypertext Markup Language) that supports links to other documents, as well as graphics, audio, and video files.
- In short, **World Wide Web (WWW)** is collection of text pages, digital photographs, music files, videos, and animations you can access over the Internet.
- Web pages are primarily text documents formatted and annotated with Hypertext Markup Language (HTML). In addition to formatted text, web pages may contain images, video, and software components that are rendered in the user's web browser as coherent pages of multimedia content.
- The terms Internet and World Wide Web are often used without much distinction. However, the two are not the same.
- The Internet is a global system of interconnected computer networks. In contrast, the World Wide Web is one of the services transferred over these networks. It is a collection of text documents and other resources, linked by hyperlinks and URLs, usually accessed by web browsers, from web servers.
- There are several applications called **Web browsers** that make it easy to access the World Wide Web; For example: Firefox, Microsoft's Internet Explorer, Chrome Etc.
- Users access the World-Wide Web facilities via a client called a browser, which provides transparent access to the WWW servers. User can access WWW via two way such us:

History of WWW:

- Tim Berners-Lee, in 1980 was investigating how computer could store information with random links. In 1989, while working at European Particle Physics Laboratory, he proposed to idea of global hypertext space in which any network-accessible information could be referred to by single **"universal Document Identifier".** After that in 1990, this idea expanded with further program and knows as **World Wide Web.**

Topic:2 Internet and WWW

- The Internet, linking your computer to other computers around the world, is a way of transporting content. The Web is software that lets you use that content…or contribute your own. The Web, running on the mostly invisible Internet, is what you see and click on in your computer's browser.

What is The Internet?

- The Internet is a massive network of networks, a networking infrastructure. It connects millions of computers together globally, forming a network in which any computer can communicate with any other computer as long as they are both connected to the Internet. Information that travels over the Internet does so via a variety of languages known as

protocols. So we can says that Internet is network of computer which connect to together and any computer communicate with any other computer.

What is The Web (World Wide Web)?

- The World Wide Web, or simply Web, is a way of accessing information over the medium of the Internet. It is an information-sharing model that is built on top of the Internet.
- The Web uses the HTTP protocol, only one of the languages spoken over the Internet, to transmit data. The Web also utilizes browsers, such as Internet Explorer or Firefox, to access Web documents called Web pages that are linked to each other via hyperlinks. Web documents also contain graphics, sounds, text and video.

Different between Internet and WWW

- **The Web** is a Portion of The Internet. The Web is just one of the ways that information can be disseminated over the Internet. **The Internet**, not the Web, is also used for email, which relies on SMTP, Usenet news groups, instant messaging and FTP. So the Web is just a portion of the Internet.

S.No.	INTERNET	WWW
1	Internet is a global network of networks.	WWW stands for World wide Web.
2	Internet is a means of connecting a computer to any other computer anywhere in the world.	World Wide Web which is a collection of information which is accessed via the Internet.
3	Internet is infrastructure.	WWW is service on top of that infrastructure.
4	Internet can be viewed as a big book-store.	Web can be viewed as collection of books on that store.

5	At some advanced level, to understand we can think of the Internet as hardware.	At some advanced level, to understand we can think of the WWW as software.
6	Internet is primarily hardware-based.	WWW is more software-oriented as compared to the Internet.
7	It is originated sometimes in late 1960s.	English scientist Tim Berners-Lee invented the World Wide Web in 1989.
8	Internet is superset of WWW.	WWW is a subset of the Internet.
9	The first version of the Internet was known as ARPANET.	In the beginning WWW was known as NSFNET.
10	Internet uses IP address.	WWW uses HTTP(Hypertext Transfer Protocol).

Topic:3 HTTP Protocol: Request and Response.

- HTTP stands for Hypertext Transfer Protocol.
- HTTP is based on the client-server architecture model and a stateless request/response protocol that operates by exchanging messages across a reliable TCP/IP connection.
- An HTTP "client" is a program (Web browser) that establishes a connection to a server for the purpose of sending one or more HTTP request messages. An HTTP "server" is a program (generally a web server like Apache Web Server) that accepts connections in order to serve HTTP requests by sending HTTP response messages.
- Errors on the Internet can be quite frustrating — especially if you do not know the difference between a 404 error and a 502 error. These error messages, also called HTTP status codes are response codes given by Web servers and help identify the cause of the problem.
- For example, "404 File Not Found" is a common HTTP status code. It means the Web server cannot find the file you requested. The file -- the webpage or other document you try to load in your Web browser has either been moved or deleted, or you entered the wrong URL or document name.
- HTTP is a stateless protocol means the HTTP Server doesn't maintain the contextual information about the clients communicating with it and hence we need to maintain sessionsin case we need that feature for our Web-applications
- HTTP header fields provide required information about the request or response, or about the object sent in the message body. There are four types of HTTP message headers:
  - **General-header:**

  These header fields have general applicability for both request and response messages.
  - **Request-header:**

  These header fields have applicability only for request messages.
  - **Response-header:**

  These header fields have applicability only for response messages.
  - **Entity-header:**

  These header fields define Meta information about the entity-body.

- As mentioned, whenever you enter a URL in the address box of the browser, the browser translates the URL into a request message according to the specified protocol; and sends the request message to the server.
- For example, the browser translated the **URL http://www.test101.com/doc/index.html** into the following request message:

```
GET /docs/index.html HTTP/1.1
Host: www.test101.com
Accept: image/gif, image/jpeg, */*
Accept-Language: en-us
Accept-Encoding: gzip, deflate
User-Agent: Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1)
```

Here,Step by step communication between client and server mention into followingfigure.

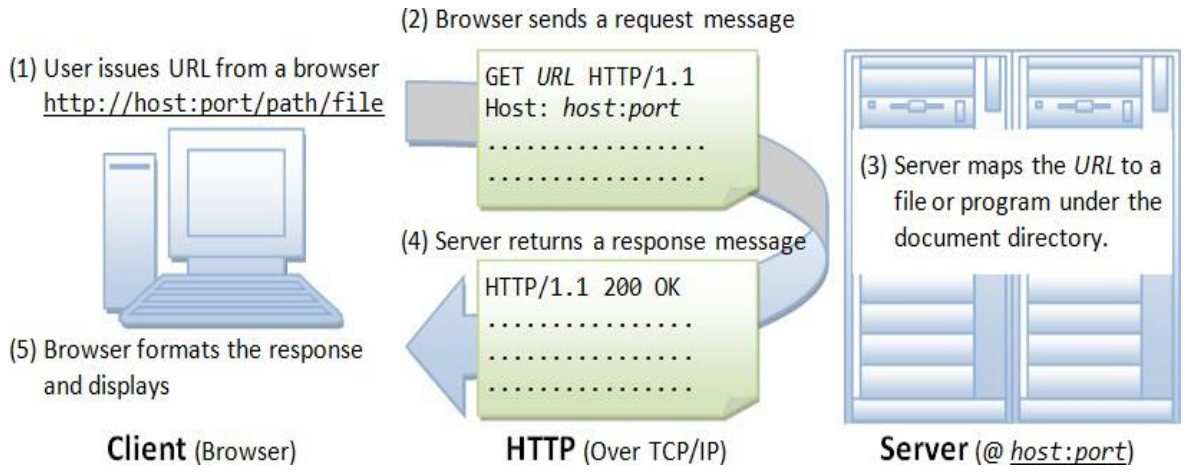


Fig 1: Communication between HTTP Client and HTTP Server

Topic:4 Web Browser and Web Server.

- Web server and web browser are the terms which are commonly used for website. The basic purpose of both is to develop a platform for internet web directory. So that any users can anytime access any kind of website. Major difference between them is on their function and how they perform their functions. Check for the detail of both topics before understanding the differences between them.

Web Browser

- Web browser is a client, program, software or tool through which we sent HTTP request to web server. The main purpose of web browser is to locate the content on the World Wide Webband display in the shape of web page, image, audio or video form.

- We can also call it a client server because it contacts the web server for desired information. If the requested data is available in the web server data, then it will send back the requested information again via web browser.
- Microsoft Internet Explorer, Mozilla Firefox, Safari, Opera and Google Chrome are examples of web browser and they are more advanced than earlier web browser because they are capable to understand the HTML, JavaScript, AJAX, etc. Now days, web browser for mobiles are also available, which are called micro browser.

Web Server

- **Web server** is a computer system, which provides the web pages via HTTP (Hypertext Transfer Protocol). IP address and a domain name is essential for every web server.
- Whenever, you insert a URL or web address into your web browser, this sends request to the web address where domain name of your URL is already saved. Then this server collects the all information of your web page and sends to browser, which you see in form of web page on your browser.
- Lot of web server software is available in the market in shape of NCSA, Apache, Microsoft and Netscape. Storing, processing and delivering web pages to clients are its main function. All the communication between client (web browser) and server takes place via HTTP.
- Here, we can easily understand concept of web browser and web server by following figure.

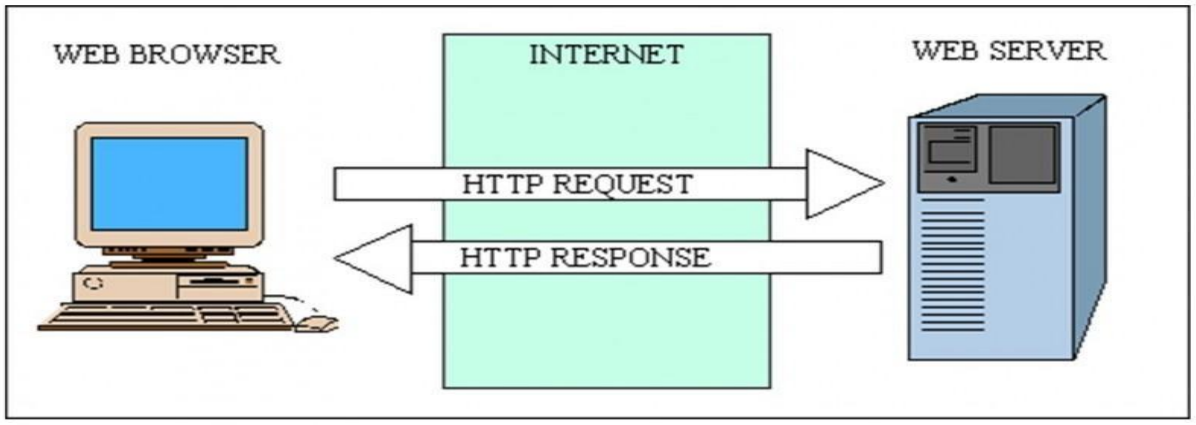


Fig 2: Communication between web Browser and Web Server

Web Browser	Web Server
Web Browser is an Application program that displays a World wide web document. It usually uses the internet service to access the document.	Web server is a program or the computer that provide services to other programs called client.
The Web browser requests the server for the web documents and services.	The Web server accepts, approve and respond to the request made by the web browser for a web document or services.

The Web browser requests the server for the web documents and services.	The Web server accepts, approve and respond to the request made by the web browser for a web document or services.
The web browser act as an interface between the server and the client and displays a web document to the client.	The web server is a software or a system which maintain the web applications, generate response and accept clients data.
The web browser sends an HTTP request and gets an HTTP response.	The web server gets HTTP requests and send HTTP responses.

Topic:5 Feature of Web 2.0.

- Web 2.0 is term that was introduced in 2004 and refers to the second generation of the World Wide Web.The term "2.0" comes from the software industry, where new versions of software programs are labeled with an incremental version number.
- Some examples of features considered to be part of Web 2.0 are listed below:
  - **Blogs :**

    It also known as Web logs, these allow users to post thoughts and updates about their life on the Web.
  - **Wikis:**

    Wikis - sites like Wikipedia and others enable users from around the world to add and update online content.
  - **Social Networking:**

Sites like Facebook and MySpace allow users to build and customize their own profile sand communicate with friends.

- **Web Application:**

Web application is a broad range of new applications make it possible for users to run programs directly in a Web browser.as Web logs, these allow users to post thoughts and updates about their life on the Web.

- **User Participation:**

In traditional web the contents are solely provider by the web site owner or company, but in web 2.0 the users participate in content sourcing. This is also known as Crowd sourcing.
Examples: Wikipedia & You Tube.

- **Long Tail:**

The traditional web was like a retail business the product is sold directly to user and the revenue generated. But in web 2.0 the niche product is not sold directly but offered as a service on demand basis and income is generated as monthly fee and pay per consumption.

- **Rich User Experience :**

Traditional web are built with HTML and CSS CGI and had been offered as a static page. On the other hand Web 2.0 uses AjaxAsynchronous JavaScript + XML) presenting dynamic, rich user experience to users.
Example: Google Provided Google Maps and Google Suggest.

- Web 2.0 technologies provide a level user interaction that was not available before. Websites have become much more dynamic and interconnected, producing "online communities" and making it even easier to share information on the Web. Because most Web 2.0 features are offered as free services, sites like Wikipedia and Facebook have grown at amazingly fast rates.

Topic:6 Dynamic ip

A dynamic IP address is an IP address that an ISP lets you use temporarily. If a dynamic address is not in use, it can be automatically assigned to a different device. Dynamic IP addresses are assigned using either DHCP or PPPoE.

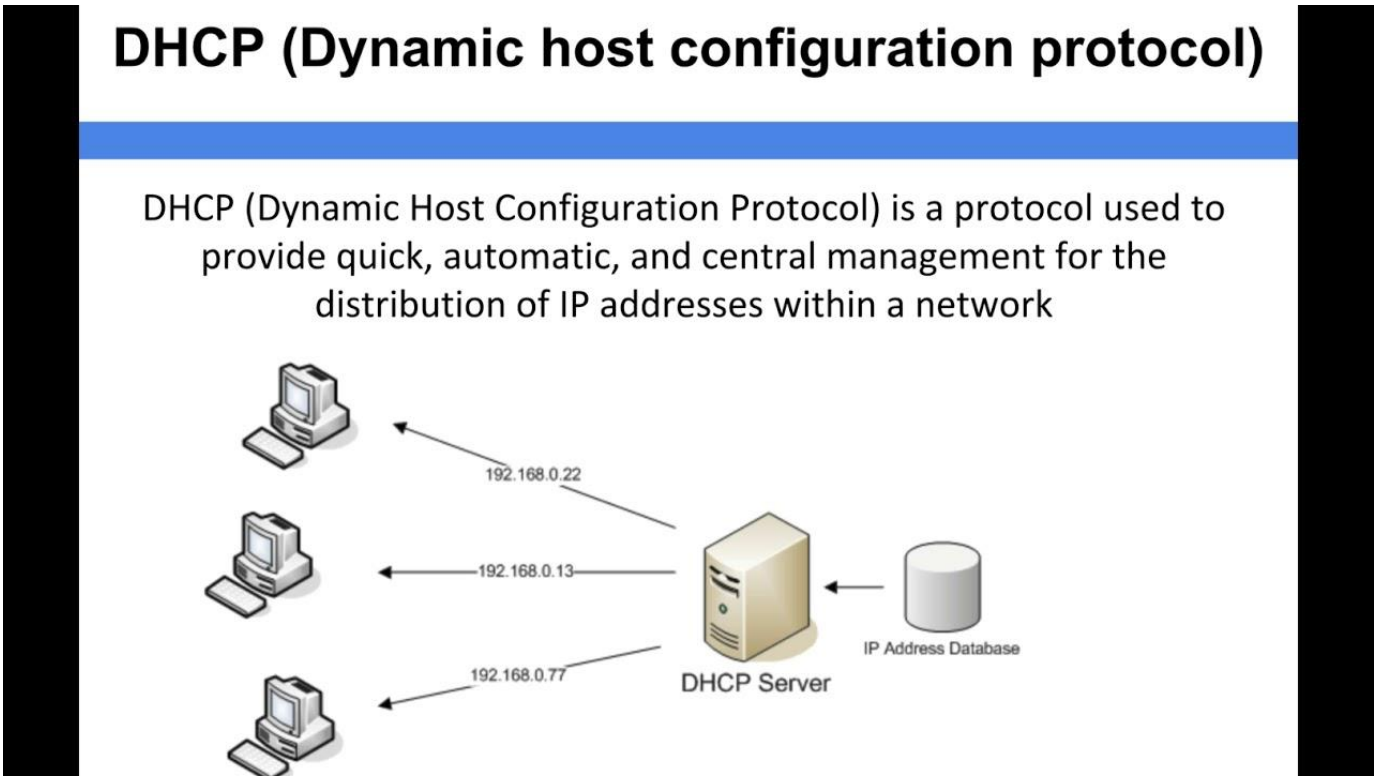
About DHCP

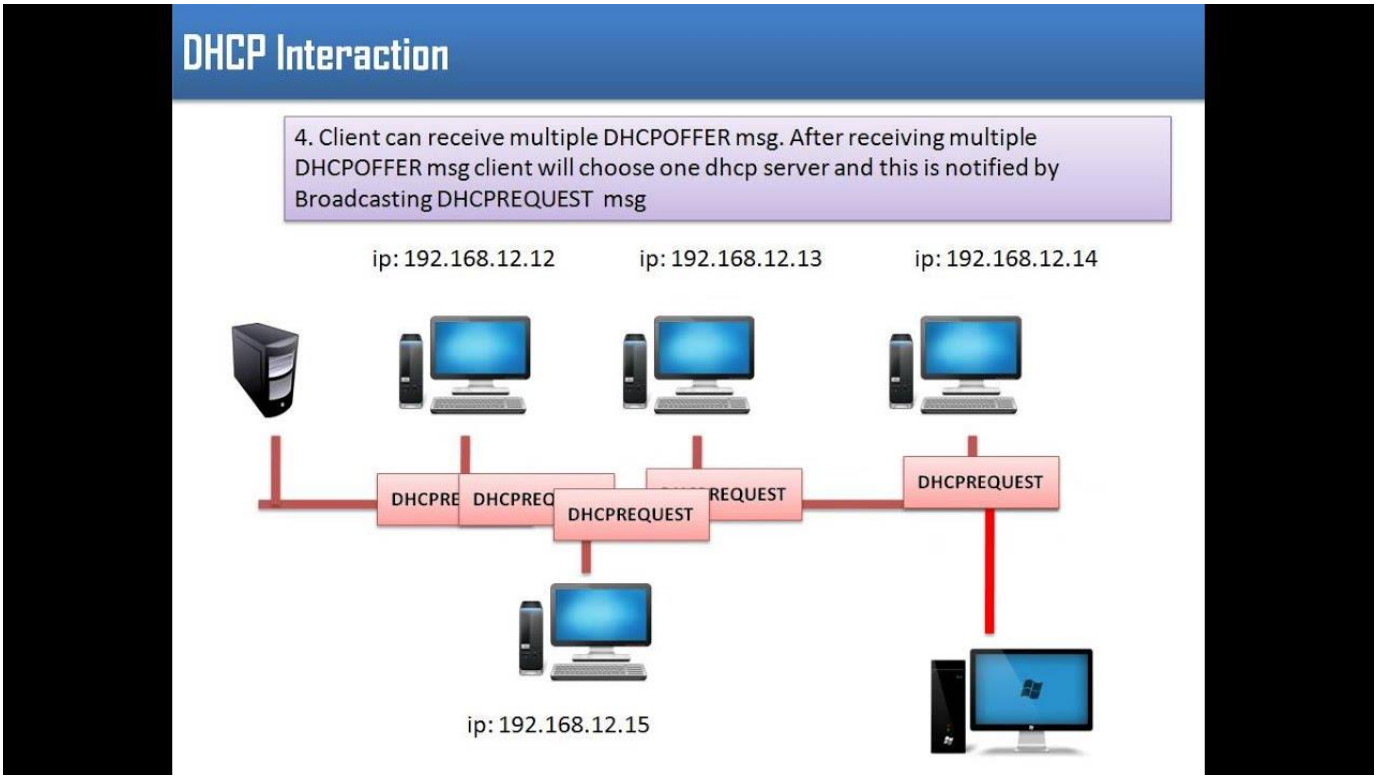
Dynamic Host Configuration Protocol (DHCP) is an Internet protocol that computers on a network use to get IP addresses and other information such as the default gateway. When you connect to the Internet, a computer configured as a DHCP server at the ISP automatically assigns you an IP address. It could be the same IP address you had before, or it could be a new one. When you close an Internet connection that uses a dynamic IP address, the ISP can assign that IP address to a different customer.

You can configure your Firebox as a DHCP server for networks behind the device. You assign a range of addresses for the DHCP server to use.

About PPPoE

Some ISPs assign IP addresses through Point-to-Point Protocol over Ethernet (PPPoE). PPPoE adds some of the features of Ethernet and PPP to a standard dial-up connection. This network protocol allows the ISP to use the billing, authentication, and security systems of their dial-up infrastructure with DSL modem and cable modem products.





Topic:7 concepts of effective web design

- A well-designed website can help build trust and guide visitors to take action.
- Several factors such as consistency, colours, typography, imagery, simplicity, and functionality contribute to good website design.

1. WEBSITE PURPOSE

- Having a simple clear intention on all pages will help the user interact with what you have to offer. What is the purpose of your website?
- Is it an entertainment website like sports coverage or are you selling a product to the user?

2. SIMPLICITY

- Simplicity is the best way to go when considering the user experience and the usability of your website.

2.1 Colour

- Pleasing colour combinations increase customer engagement and make the user feel good.

2.2 Imagery

This includes still photography, illustration, video and all forms of graphics.

3. NAVIGATION

- Website navigation is key to retaining visitors.
- If the website navigation is confusing visitors will give up and find what they need elsewhere.
- Keeping navigation simple, intuitive and consistent on every page is key.

4. F-SHAPED PATTERN READING

- The F- based pattern is the most common way visitors scan text on a website.

5. CONTENT

- An effective website has both great design and great content.

6. LOAD TIME

- Waiting for a website to load will lose visitors. Nearly half of web visitors expect a site to load in 2 seconds or less and they will potentially leave a site that isn't loaded within 3 seconds. Optimising image sizes will help load your site faster.

7. MOBILE FRIENDLY

- More people are using their phones or other devices to browse the web. It is important to consider building your website with a responsive layout where your website can adjust to different screens.

Topic:8 Web Design Issues

Browser & Operating Systems

- Web pages are written using different HTML tags and viewed in browser window.
- The different browsers and their versions greatly affect the way a page is rendered, as different browsers sometimes interpret same HTML tag in a different way.
- Different versions of HTML also support different sets of tags.
- The support for different tags also varies across the different browsers and their versions.
- Same browser may work slightly different on different operating system and hardware platform.
- To make a web page portable, test it on different browsers on different operating systems.

Bandwidth and Cache

- Users have different connection speed, i.e. bandwidth, to access the Web sites.
- Connection speed plays an important role in designing web pages, if user has low bandwidth connection and a web page contains too many images, it takes more time to download.
- Generally, users have no patience to wait for longer time than 10-15 seconds and move to other site without looking at contents of your web page.
- Browser provides temporary memory called *cache* to store the graphics.
- When user gives the URL of the web page for the first time, HTML file together with all the graphics files referred in a page is downloaded and displayed.

Display Resolution

- Display resolution is another important factor affecting the Web page design, as we do not have any control on display resolution of the monitors on which user views our pages.
- Display or screen resolution is measured in terms of pixels and common resolutions are 800 X 600 and 1024 X 786.
- We have three choices for Web page design.
    - Design a web page with fixed resolution.
    - Make a flexible design using HTML table to fit into different resolution.
    - If the page is displayed on a monitor with a higher resolution, the page is displayed on left-hand side and some part on the right-hand side remains blank. We can use centered design to display page properly.
    - (Not For Exam) ~~Ideally we should use some frameworks for designing like Bootstrap/Material design.~~

Look & Feel

- Look and feel of the website decides the overall appearance of the website.

- It includes all the design aspects such as
    - Web site theme
    - Web typography
    - Graphics
    - Visual structure
    - Navigation etc…

Page Layout and Linking

- Website contains of individual web pages that are linked together using various navigational links.
- Page layout defines the visual structure of the page and divides the page area into different parts topresent the information of varying importance.
- Page layout allows the designer to distribute the contents on a page such that visitor can view iteasily and find necessary details.

Locating Information

- Webpage is viewed on a computer screen and the screen can be divided into five major areas suchas center, top, right, bottom and left in this particular order.
- The first major area of importance in terms of users viewing pattern is the center, then top, right,bottom and left in this particular order.

Making Design user-Centric

- It is very difficult for any Web designer to predict the exact behavior of the Web site users.
- However, idea of general behavior of common user helps in making design of the Web site user-centric.
- Users either scan the information on the web page to find the section of their interest or read theinformation to get details.

Sitemap

- Many a times Web sites are too complex as there are a large number of sections and each sectioncontains many pages.
- It becomes difficult for visitors to quickly move from one part to other.
- Once the user selects a particular section and pages in that section, user gets confused about wherehe/she is and where to go from there.
- To make it simple, keep your hierarchy of information to few levels or provide the navigation bar oneach page to jump directly to a particular section.

Tips for Effective Navigation.

- Navigation links are either text based, i.e. a word or a phrase is used as a link, or graphical, i.e. aimage, i.e. a icon or a logo is used as a link.
- Navigation links should be clear and meaningful.
- It should be consistent.
- Link should be understandable.
- Organize the links such that contents are grouped logically.
- Provide search link, if necessary, usually on top of the page. Use common links such as ‘about us’ or‘Contact us’.
- Provide the way to return to first page.
- Provide the user with information regarding location
- Horizontal navigation bar can be provided on each page to directly jump to any section