

## **UNIT I: Introduction to Web Technology**

- 1.1 Internet and WWW.
- 1.2 HTTP Protocol: Request and Response.
- 1.3 Web browser and Web servers.
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## 1.1 Internet and WWW.

### Internet

The internet is a globally connected network system facilitating worldwide communication and access to data resources through a huge collection of personal, public, business, academic and government networks.

It's governed by agencies just like **Internet Assigned Numbers Authority (IANA)** that establish universal protocols.

### WWW

World Wide Web (WWW), byname Web, is leading information retrieval service of web (the worldwide computer network).

Online gives users access to a huge array of documents that are connected to every other by means of hypertext

**Hypertext allows the user to pick a word or phrase from text and thereby access other documents that contain additional information concerning that word or phrase.**

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	At some advanced level, to understand we can think of the

	Internet as hardware.	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.

## 1.2 HTTP Protocol: Request and Response.

HTTP stands for Hypertext Transfer Protocol.

It is a protocol used to access the data on the World Wide Web (www).

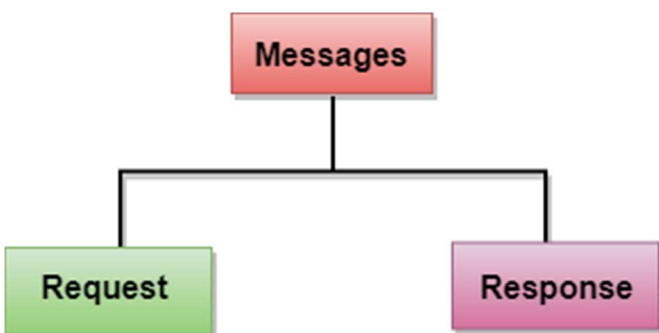
The HTTP protocol can be used to transfer the data in the form of plain text, hypertext, audio, video, and so on.

This protocol is known as Hypertext Transfer Protocol because of its efficiency that allows us to use in a hypertext environment where there are rapid jumps from one document to another document.

HTTP is similar to the FTP as it also transfers the files from one host to another host.

HTTP is used to carry the data in the form of MIME-like format.

HTTP messages are of two types:



### Request:

The request message is sent by the client that consists of a request line, headers, and sometimes a body.

### Response:

The response message is sent by the server to the client that consists of a status line, headers, and sometimes a body.



### 1.3 Web browser and Web servers.

#### Web browser

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

A web server is a program or the computer that provide services to other programs called client.

Sr. No.	Parameters	Web Browser	Web Server
1.	<b>Function</b>	The Web browser requests the server for the web documents and services.	The Web server accepts, approves, and responds to the request made by the web browser for a web document or service.
2.	<b>Responsibility</b>	A web browser is a program that uses websites to search the internet for information.	The web server is responsible for connecting websites and web browsers.
3.	<b>HTTP request and response</b>	The web browser sends an HTTP request and gets an HTTP response.	The web server gets HTTP requests and sends HTTP responses.
4.	<b>Storing data</b>	Web browser stores the cookies for different websites.	Web servers provide an area to store and organize the pages of the website.
5.	<b>Installation</b>	The web browser is installed on the client's computer.	The web server can be a remote machine placed on the other side of your network or even on the other end of the globe

<b>Sr. No.</b>	<b>Parameters</b>	<b>Web Browser</b>	<b>Web Server</b>
10.	<b>Examples</b>	Examples of Web browsers are Mozilla Firefox, Google Chrome, and Internet Explorer.	An example of a Web Server is Apache Server.

### **1.4 Features of Web 2.0.**

“Web 2.0 is the business revolution in the computer industry caused by the move to the internet as a platform, and any attempt to understand the rules for success on that new platform”.

#### **Features**

Available at any time, any place.

Variety of media.

Ease of usage.

Learners can actively be involved in knowledge building.

Can create dynamic learning communities.

Everybody is the author and the editor, every edit that has been made can be tracked.

User-friendly.

Updates in the wiki are immediate and it offers more sources for researchers. It provides real-time discussion.

**In a market the newer version is available i.e web3.0**

## **1.5 Concepts of effective web design.**

**“Design is not just what it looks like and feels like. Design is how it works.”**

### **1. Have a Purpose and Plan**

A user needs a reason to visit an application and that’s why your website should clearly explain or convey the services or products you are offering to the users.

### **2. Simplicity**

Make your website simple and try to display one detail at a time for getting the individual attention of each part.

### **3. Readability**

Users should not face difficulty in reading the text on your website so you need to pay attention to the contrast between your text and its background.

### **4. Responsiveness**

People use mobile devices for most of their browsing and 50% of web traffic comes from mobile devices.

These all are the reasons that your application should be viewable on different devices.

### **5. Simple Navigation**

The navigation menu should be on the top and sticky on your website so if a user scrolls down the webpage they can still find and access the menu on your website.

### **6. Color Palette**

The color of your website should match the brand of your website. Choosing the right color to represent your brand is very important.

### **7. Pick Up The Right Images**

A picture says a lot about a website and choosing the right image for your website can get a lot of visitors.

## 1.6 Web design issues including Browser.

Web design faces several challenges related to **browsers, bandwidth, cache,** and **display resolution.**

### 1. Browser Compatibility:

**Challenge:** Different web browsers (Chrome, Firefox, Safari, Edge, etc.) interpret code slightly differently. A design that looks great in one browser might appear broken or different in another.

**Addressing the Challenge:** Designers can use standardized coding practices (following HTML, CSS, and JavaScript standards) and test their designs across various browsers. They may use tools that help identify and fix compatibility issues to ensure consistency across platforms.

### 2. Bandwidth and Loading Speed:

**Challenge:** Users with slower internet connections might experience slow-loading websites, especially if the site contains large images or videos.

**Addressing the Challenge:** Designers can optimize website performance by compressing images, minifying code (removing unnecessary spaces and characters), and using efficient coding techniques.

### 3. Cache and Refresh Issues:

**Challenge:** Cached versions of websites may lead to users seeing outdated content even after updates have been made. Sometimes, a hard refresh is needed to load the latest version.

**Addressing the Challenge:** Designers can use cache control headers to specify how long browsers should cache resources

### 4. Display Resolution and Responsiveness:

**Challenge:** Websites should look good and function well across various devices and screen sizes, from large desktop monitors to small mobile screens.

**Addressing the Challenge:** Designers can adopt responsive web design principles, using flexible layouts and CSS media queries. These techniques allow the website to adapt its layout and content based on the user's device, ensuring a consistent user experience across different screen sizes.



## **1.7 Look and Feel of the Website.**

The look and feel of your website should give the visitor a clear indication of what your company is about, and what they can expect in terms of **culture, service quality.**

### **1. Text and Color**

Text and color are simple elements that can say a lot about your company.

If all the text on your website is in black and white and an elegant script font is used, a visitor will feel that the website, and the connected company, are very fancy and upmarket.

### **2. Interactive Elements**

Finding ways to make your website more interactive is a good way to make your visitors feel engaged, and want to spend more time on the website.

### **3. Create Value**

In order to create value for your website visitor, you need to make sure that the information they are searching for is easily accessible, and not too long while still being meaty enough to get all the information they are looking for.

### **4. Flow**

In continuation of creating value for the visitors on your website, the value that you create for your visitors (in the information or desired products etc.) should be laid out in a manner that allows them to easily navigate to and discover.

### **5. Page Load Speed**

Optimizing the page load speed so that users across all devices experience text and media that loads efficiently, is vitally important for leaving a good impression of your website to its visitors.

### **6. Links To External Sites**

This is most commonly seen when ads are present on a website, or even if links to affiliate and partner sites are implemented. While the importance of ads and external links on your website do have their purpose

## 1.8 Page Layout and linking.

The page layout of a website refers to the arrangement of different elements within a webpage.

It involves structuring content, images, text, navigation menus, and other elements to create an organized and visually appealing presentation for website visitors.

Good page layout aims to guide users smoothly through the content, making it easy for them to navigate and find information.

Key elements of page layout include:

**Header:** Contains the logo, website navigation, and sometimes contact information or search bars.

**Content Area:** Where the main information is displayed, such as text, images, videos, etc.

**Sidebar:** Often used for additional information, links, or navigation options.

**Footer:** Contains supplementary information like copyright notices, sitemaps, contact details, etc.

### **Linking:**

Linking on a website refers to connecting different webpages or resources together using hyperlinks. These hyperlinks allow users to navigate between pages within the same website or to external websites.

There are two main types of linking:

**Internal Links:** These links connect different pages within the same website. For example, a homepage linking to specific product pages, or a blog post linking to related articles on the same site. Internal linking helps with navigation and can improve user experience and SEO (Search Engine Optimization).

**External Links:** These links point to pages or resources outside the current website domain. They can direct users to other websites, references, or sources of information.

Both page layout and linking are critical aspects of website design and user experience. A well-structured layout coupled with effective linking enhances usability, accessibility, and the overall quality of interaction for website visitors.

### 1.9 User centric design.

User-centered design (UCD) is an iterative design process in which designers focus on the users and their needs in each phase of the design process.

Design teams involve users throughout the design process via a variety of research and design techniques, to create highly usable and accessible products for them.

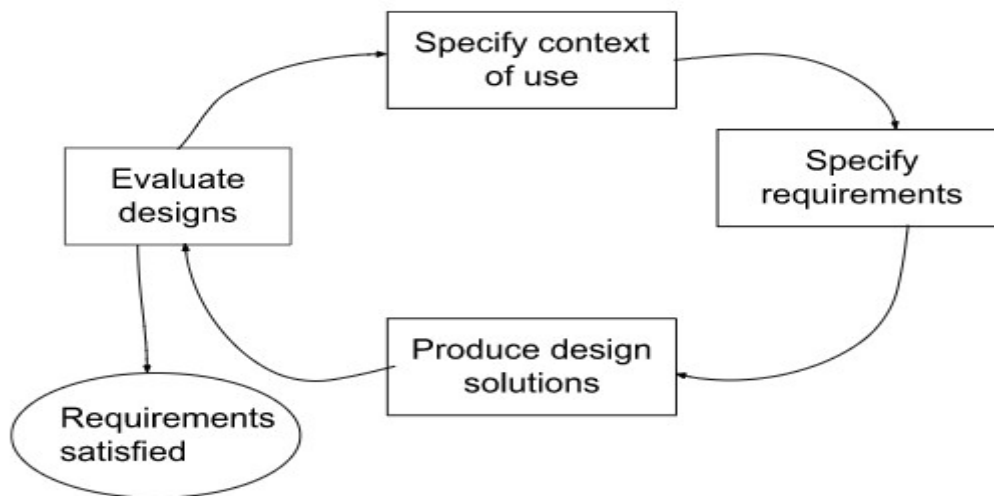
The Essential Elements of User-Centered Design:

**Visibility:** Users should be able to see from the beginning what they can do with the product, what it is about, and how they can use it.

**Accessibility:** Users should be able to find information easily and quickly. They should be offered various ways to find information for example calls action buttons, search options, menu, etc.

**Legibility:** Text should be easy to read. As simple as that.

**Language:** Short sentences are preferred here. The easier the phrase and the words, the better.



**Specify the context of use:** Identify the people who will use the product, what they will use it for, and under what conditions they will use it.

**Specify requirements:** Identify any business requirements or user goals that must be met for the product to be successful.

**Create design solutions:** This part of the process may be done in stages, building from a rough concept to a complete design.

**Evaluate designs:** Evaluation – ideally through usability testing with actual users – is as integral as quality testing is to good software development.

## 1.10 Sitemap.

Sitemap is actually a file which contains the list of all the webpages which are present in your website and are visible to and accessible by the search engines as well as the users of the webpage.

It is helpful to the users for navigating through the website easily and to the search engines for indexing the website.

### Types of sitemap

There are basically two types of sitemaps namely **HTML** and **XML** sitemaps.

#### HTML Sitemaps:

These sitemaps are generally useful for the visitor of the website. It helps them to navigate through various webpages present in the website.

HTML sitemap is also a sort of webpage where the whole structure of the website is given.

#### XML sitemaps:

XML sitemaps are only used by the search engines to crawl through the webpages of the website.

This is not visible to the user of the website as it is an xml file which is placed in the root directory while uploading the website.

These xml files not only contain the list of the webpages but also information about the webpages like when the webpage was modified

```
<?xml version="1.0" encoding="UTF-8"?>
<urlset
  xmlns="http://www.sitemaps.org/schemas/sitemap/0.9"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.sitemaps.org/schemas/sitemap/0.9
    http://www.sitemaps.org/schemas/sitemap/0.9/sitemap.xsd">
<url>
  <loc>https://cocsit.org.in/index.php/</loc>
  <lastmod>2024-01-25T10:48:46+00:00</lastmod>
  <priority>1.00</priority>
</url>
</urlset>
```

## **1.11 Planning and publishing website.**

### **Planning elements**

#### **Content**

Content refers to the information made available through your website.

Reviews and interviews

Videos, graphics interchange formats (GIFs) and animation.

#### **Assets**

Assets refer to the design elements that are unique to your brand.

Logo, Colors, Fonts, Photos, Customer testimonials.

#### **Features**

Features refer to the tools that allow users to navigate your website safely.

Navigation tools

Menu

Sitemap

### **Publishing website**

#### **Pick your domain name**

The domain name is the URL string that someone will enter to visit your website.

When you are picking a new domain name, you want to pick a name that is representative of what your website offers and is relatively easy to remember.

If your domain name has already been taken, you may want to consider changing the top-level domain.

#### **Choose a web hosting provider**

A web hosting provider is a service that will make sure your website works when someone visits it.

As your website becomes more popular, you will need to increase your bandwidth. This will require investing in a stronger hosting provider.

## **1.12 Designing effective navigation.**

It is way that helps users or visitors to find content that they want to see. It is simply a way of navigating pages, content and information on website using internet.

### **Structure of Navigation**

Structure of website navigation is very important as it have a greater impact on sales, user experience and Search Engine Optimization (SEO) rankings. It not only includes sketching pages but also include greater level of abstraction. It is not at all easy to design and organize website.

### **Importance of website Navigation**

Website navigation is way by which one can easily increase audience or number of visitors on website.

If website navigation is not good and effective, there is not point of having a creative website because users won't be able to navigate easily around it to find information they want.

#### **Increase duration of visit:**

Website navigation helps people to find information they want to see very easily and effectively. Good website navigation provides clear and simple navigation bars and links that encourages visitors or peoples to explore more and more.

#### **Increased chance of sales:**

Website navigation generally helps in showing visitors what website is actually about without any wastage of time.

#### **Improved user experience:**

Navigation is very important for website because without navigation, websites won't look good, and appear unorganized.

#### **Good Design:**

Good navigation make website look more attractive, effective and good. Navigation has a greater impact on how website is viewed by users or visitors and how longer they will stay on website.

**The End**