

Unit 2 : Web Oriented User Interactive Applications

2.1 What is Website ?

Web site is a collection of Web pages that belonging to a particular person or organization. The URL of these pages shares a common prefix which is the address of the home page of the site.

A web address is typically composed of four parts:

For example, the address <http://www.google.ca> is made up of the following areas:

- HTTP: (Hypertext Transfer Protocol) is the basic underlying application-level protocol used to facilitate the transmission of data to and from a web server.
- www: (World Wide Web or simply Web)
WWW is a collection of millions of files stored on the thousands of computers, called Web server, all over the world. WWW provides a network of interactive documents and the software to access them. It is based on the documents called pages which combine text, pictures, forms, sound, animation and hypertext links called hyperlinks.
- google
The Web server and site maintainer.
- ca
This tells us it is a site in Canada.

Endings of web pages tell us a bit about the page. Some common endings to web addresses are:

- com (commercial)
- edu (educational institution)
- gov (government)
- net (network)
- org (organization)
- You might also see addresses that add a country code as the last part of the address such as:
 - In (India)
 - ca (Canada)

- uk (United Kingdom)
- fr (France)
- us (United States of America)
- au (Australia)

Web Page

Web page is a document available on World Wide Web. Web Pages are stored on web server and can be viewed using a web browser.

A web page can contain huge information including text, graphics, audio, video and hyper links. These hyperlinks are the link to other web pages.

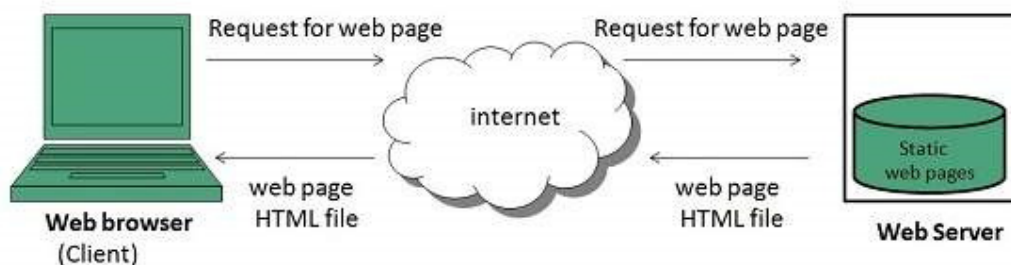
Collection of linked web pages on a web server is known as website. There is unique Uniform Resource Locator (URL) is associated with each web page.

Types of Web Pages

Static Web page

Static web pages are also known as flat or stationary web page. They are loaded on the client's browser as exactly they are stored on the web server. Such web pages contain only static information. User can only read the information but can't do any modification or interact with the information.

Static web pages are created using only HTML. Static web pages are only used when the information is no more required to be modified.



Example: you visit a portfolio website where every time you visit you see the same content and images unless the Admin/developer makes any changes. This can be accomplished just with simple markup language like HTML.

Dynamic Web page

Dynamic web page shows different information at different point of time. It is possible to change a portion of a web page without loading the entire web page. It has been made possible using Ajax technology.

There are two types of Dynamic Web pages :

CLIENT-SIDE DYNAMIC WEB PAGE: This is created by using client side scripting.

- **CLIENT-SIDE SCRIPTING :**

Web pages that change in response to an action within that web page, such as a mouse or a keyboard action use client-side scripting.

Client-side scripts generate client-side content. Client-side content is content that's generated on the user's computer rather than the server. In these cases, the user's web browser would download the web page content from the server, process the code that's embedded in the web page, and then display the updated content to the user.

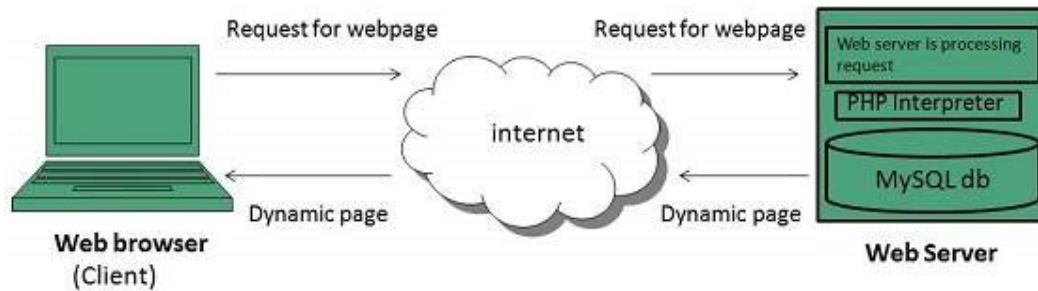
Scripting languages such as JavaScript and Flash allow a web page to respond to client-side events.

SERVER-SIDE DYNAMIC WEB PAGE : This is created by using server side scripting.

- **SERVER SIDE SCRIPTING :**

Web pages that change when a web page is loaded or visited use server-side scripting. Server-side content is content that's generated when a web page is loaded. For example, login pages, forums, submission forms, and shopping carts, all use server-side scripting since those web pages change according to what is submitted to it.

Scripting languages such as PHP, ASP, ASP.NET, JSP allow a web page to respond to submission events.



2.2 Purpose of Website:

Different kinds of websites have different purposes depending on who the intended audience is. Some websites are geared towards selling products and other websites are geared towards providing practical information, while others are merely for entertainment.

Website is considered primarily a means of communication, “first to inform and second to promote”.

For Example:-

Purpose of Information Website:-

The most basic site is informational. This is a site that tells a potential customer or visitor what your business is, where it’s located, its hours, how to contact you and may be a bit more. These sites are fast and easy to construct and usually only involve a page or two. All sites have some basic information on them.

Purpose of Entertainment Website:-

These websites showcase entertaining information for visitors. Online magazines, gossip oriented websites, celebrity news, sports coverage, movies, the arts, humorous websites, etc. These websites are designed to be easy to navigate and frequently updated in order to keep users coming back for more information.

Purpose of E-Commerce Website :-

The purpose of e-commerce websites is to sell products to users. If you have departmental store in your local area market, you can sell your product to your local customers who used to visit your store physically. But, how can you reach your product to those, who don’t have enough time to come into Your store. E-commerce web design will help you in this regard. You can sell to the remote customer by offering your website to them. Your customer will visit your shopping site, chose their products and place order to your website. You just need to have a representative team to supply customers Product at their home.

Purpose of Service-Based Business Website:-

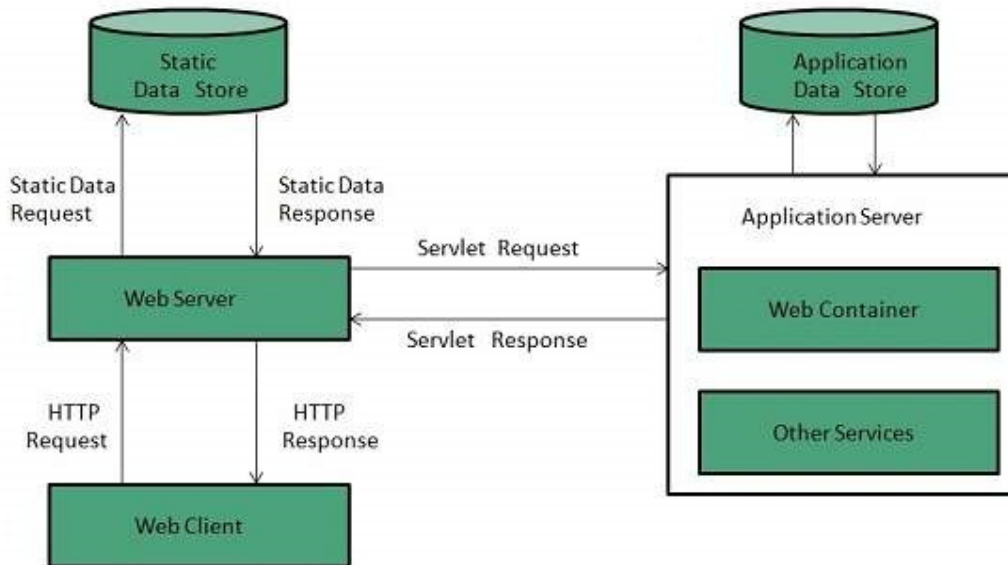
The purpose of a service-based business website is to convince website visitors that they should become customers of the service company.

Purpose of Social Media Website:-

The purpose of social media websites is to make it very easy to share and connect with friends, family, co-workers, acquaintances and even strangers. Social media websites make quick and easy work out of building up a network of connections so as to keep in touch, share daily experiences, photos, interests, preferences, etc. Social networks can be used for both personal and commercial purposes. Businesses use social networks to build direct connections with their customers which allow them to get feedback on their products and services and allow them to learn more about what their customers really need and want.

2.3 Working of Interactive Websites

- Web server is a computer where the web content is stored. Basically, web server is used to host the web sites but there exists other web servers also such as gaming, storage, FTP, email etc.
- Web site is collection of web pages while web server is software that respond to the request for web resources.
- Web server respond to the client request in either of the following two ways:
Sending the file to the client associated with the requested URL.
- Generating response by invoking a script and communicating with database



Key Points

- When client sends request for a web page, the web server search for the requested page if requested page is found then it will send it to client with an HTTP response.
- If the requested web page is not found, web server will the send an HTTP response: Error 404 Not found.
- If client has requested for some other resources then the web server will contact to the application server and data store to construct the HTTP response.

2.4 SOFTWARE AND TOOLS FOR STATIC WEBSITES

STATIC WEBSITES :

HTML

HTML is the standard markup language for creating Web pages.

- HTML stands for Hyper Text Markup Language
- HTML describes the structure of Web pages using markup
- HTML elements are the building blocks of HTML pages
- HTML elements are represented by tags
- Browsers do not display the HTML tags, but use them to render the content of the page

HTML Tags

- HTML tags are the hidden *keywords* within a web page that define how your web browser must format and display the content.
- Most tags must have two parts, an opening and a closing part. For example, <html> is the opening tag and </html> is the closing tag. Note that the closing tag has the same text as the opening tag, but has an additional forward-slash (/) character. I tend to interpret this as the "end" or "close" character.
- Browsers do not display the HTML tags, but use them to render the content of the page

HTML Vs Procedural Language

- HTML is for creating hypertext Web pages. Procedural Language is for creating compiled files such as EXE files.
- Procedural Language needs a compiler to run and Html doesn't .
- In Procedural Language compiler points out the errors if any but in Html, error can be detected only with human eye.
- HTML is a mark-up language and used in web designing while Procedural language is used in programming.

CSS

- CSS stands for Cascading Style Sheets.
- CSS describes how HTML elements are to be displayed on screen, paper, or in other media.
- CSS saves a lot of work. It can control the layout of multiple web pages all at once.

CSS can be added to HTML elements in 3 ways:

- Inline - by using the style attribute in HTML elements
- Internal - by using a <style> element in the <head> section
- External - by using an external CSS file

JAVASCRIPT

JavaScript is a dynamic computer programming language. It is lightweight and most commonly used as a part of web pages, whose implementations allow client-side script to interact with the user and make dynamic pages. It is an interpreted programming language with object-oriented capabilities.

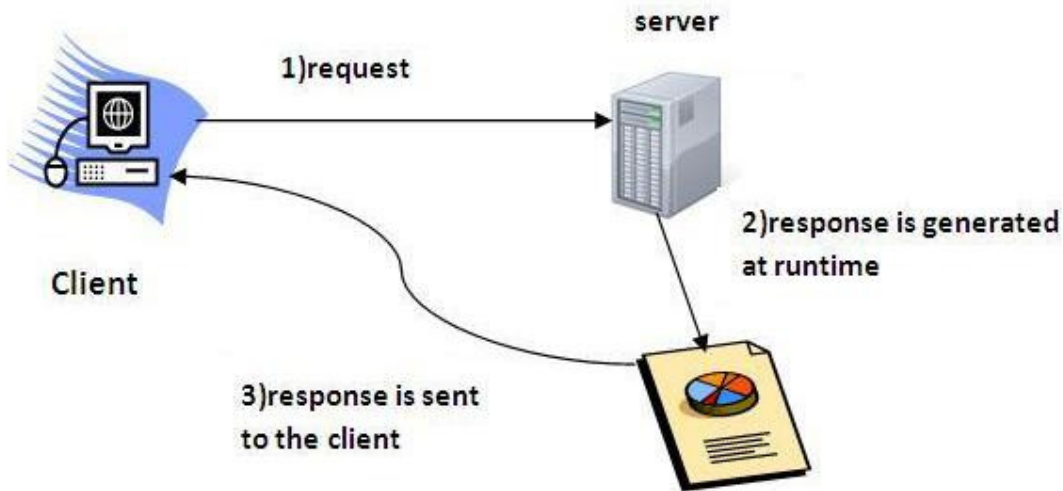
The **<script>** tag is used to define a client-side script (JavaScript).

Common uses for JavaScript are image manipulation, form validation, and dynamic changes of content.

DYNAMIC WEBSITES :-

➤ **SERVLET (JAVA + HTML + CSS + JAVASCRIPT)**

- Servlet is a technology i.e. used to create web application.
- Servlet is an API that provides many interfaces and classes including documentations.
- Servlet is an interface that must be implemented for creating any servlet.
- Servlet is a class that extends the capabilities of the servers and responds to the incoming request. It can respond to any type of requests.
- Servlet is a web component that is deployed on the server to create dynamic web page.



- Read the explicit data sent by the clients (browsers). This includes an HTML form on a Web page .
- Read the implicit HTTP request data sent by the clients (browsers). This includes cookies, media types and compression schemes the browser understands, and so forth.
- Process the data and generate the results. This process may require talking to a database, invoking a Web service, or computing the response directly.
- Send the explicit data (i.e., the document) to the clients (browsers). This document can be sent in a variety of formats, including text (HTML or XML), binary (GIF images), Excel, etc.
- Send the implicit HTTP response to the clients (browsers). This includes telling the browsers or other clients what type of document is being returned (e.g., HTML), setting cookies and caching parameters, and other such tasks.

➤ **JSP (JAVA + HTML + CSS + JAVASCRIPT)**

- Java Server Pages (JSP) is a technology for developing WebPages that supports dynamic content. This helps developers insert java code in HTML pages by making use of special JSP tags, most of which start with `<%` and end with `%>`.
- A Java Server Pages component is a type of Java servlet that is designed to fulfill the role of a user interface for a Java web application. Web developers write JSPs as text files that combine HTML or XHTML code, XML elements, and embedded JSP actions and commands.
- Using JSP, you can collect input from users through Webpage forms, present records from a database or another source, and create WebPages dynamically.

- JSP tags can be used for a variety of purposes, such as retrieving information from a database or registering user preferences, accessing JavaBeans components, passing control between pages, and sharing information between requests, pages etc.

➤ **Advantages of JSP**

Following table lists out the other advantages of using JSP over other technologies –

Vs. Active Server Pages (ASP)

The advantages of JSP are twofold. First, the dynamic part is written in Java, not Visual Basic or other MS specific language, so it is more powerful and easier to use. Second, it is portable to other operating systems and non-Microsoft Web servers.

Vs. Pure Servlets

It is more convenient to write (and to modify!) regular HTML than to have plenty of println statements that generate the HTML.

Vs. JavaScript

JavaScript can generate HTML dynamically on the client but can hardly interact with the web server to perform complex tasks like database access and image processing etc.

Vs. Static HTML

Regular HTML, of course, cannot contain dynamic information.

➤ **ASP.NET (VB.NET +HTML + CSS + JAVASCRIPT)**

ASP.NET is a web application framework developed and marketed by Microsoft to allow programmers to build dynamic web sites. It allows you to use a full featured programming language such as C# or VB.NET to build web applications easily.

ASP.NET works on top of the HTTP protocol, and uses the HTTP commands and policies to set a browser-to-server bilateral communication and cooperation.

The ASP.NET application codes can be written in any of the following languages:

- C#
- Visual Basic.Net
- Jscript
- J#

ASP.NET is used to produce interactive, data-driven web applications over the internet. It consists of a large number of controls such as text boxes, buttons, and labels for assembling, configuring, and manipulating code to create HTML pages.

- PHP (PHP +HTML + CSS + JAVASCRIPT)

PHP stands for PHP: “Hypertext Preprocessor”.

The PHP programming language is a **server-side HTML embedded scripting language**.

The PHP language runs on the server-side. This means that the execution (read starting) of the scripts is done on the server where the web-site is hosted. HTML embedded means that you can use PHP statements (read a piece of PHP code) from within an HTML code. PHP files are returned to the browser as plain HTML.

A scripting language is a form of programming language that is usually interpreted rather than compiled. In programming languages such C or C++ you compile the program (permanently) into an executable file, before you can execute the program. A program that is written in a scripting language is interpreted one command at a time by a command interpreter.

Some other examples of scripting languages are Perl, Python, Java and Ruby.

- The PHP scripts are executed on the server.
- PHP supports many databases (MySQL, Sybase, Oracle and many others.)
- PHP runs on different platforms (UNIX, Linux and Windows.)
- PHP is compatible with almost all web-servers used today (Apache, IIS, etc.)
- A PHP file can contain plain text, HTML tags and scripts
- The PHP files can have one of the following extensions: php, php3.

2.5 Working of Online Transactions

- Online transactions take many forms. In business-to-business (B2B) transactions, businesses conduct transactions with one another.

For example, if Microsoft Corp. purchases office supplies from Office Depot online, both firms are engaged in a B2B transaction. Business-to-consumer transactions (B2C) take place when businesses and consumers conduct business online, such as when individuals buy tickets from Ticketmaster.com.

Person-to-person transactions (P2P) are online interactions between two individuals, like those conducted on online auction site eBay. Although these three types of transactions are the most common, other forms do exist. For example, when individuals submit their taxes electronically, they are completing an online transaction.

- Not all online transactions involve payment, but the majority do
- OLTP (online transaction processing) is a class of software programs capable of supporting transaction-oriented applications on the Internet.
- Online transactions cover both computer and mobile transaction.
- Allow to view recent transactions, print out statements, transfer funds between accounts and to make payment.
- Provide 24 hours access to bank account.

- Also known as online banking or internet banking.

Features of Online Transactions :

- User in control
- Can log on from almost any where
- Make all payment electronically
- Transaction speed
- Saves Time
- Convenient
- Flexible

Participants of Online Transactions :

- Cardholder
- Merchant
- Issuer
- Acquire
- Payment gateway
- Certificate authority (CA)

Steps in online transactions :

1. The customer opens an account.
2. The customer receives a certificate.
3. The merchant receives a certificate.
4. The customer places an order.
5. The merchant is verified.
6. The order and payment detail sent to the merchant along with customer digital certificate.
7. The merchant request payment authorization.
8. The payment gateway authorizes the payment.
9. The merchant confirms the order.
10. The merchant provides goods or service as per order.

So, by using digital certificate payment details are kept secret from merchant.

For Example :

The buyer completes an order via the shopping cart of the merchant's online store.



An online shopping cart is the software that assists buyers in choosing and purchasing products.

The shopping cart submits the order to a payment gateway, which then forwards a request to the buyer's credit card company.



A payment gateway securely transfers encrypted data, authorizing buyers' credit cards and processing the transactions.



The credit card company validates the card and account, clears the card for purchase, then sends an acknowledgment back to the payment gateway that the amount can be transferred.

The payment gateway informs the shopping cart that the transaction was successful so that the buyer and the merchant can proceed accordingly.

The payment gateway initiates the transfer of funds from the buyer's credit card company to the seller's merchant account so that the payment can be deposited and finalized.



A merchant account is a bank account designed to accept electronic payments for your business. When customers purchase your product online, the money they pay for that product is deposited into this account.