Webpages:

- Web page is a document available on World Wide Web (WWW).
- 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 hyperlinks.
- These hyperlinks are the link to other web pages.
- There is unique Uniform Resource Locator (URL) is associated with each web page.

Websites:

- Collection of linked web pages on a web server is known as website.
- A website is a collection of web pages and related content that is identified by a common domain name and published on at least one web server.
- The URL of these pages shares a common prefix which is the address of the home page of the website.
- Notable examples are wi.kipedia.org, google.com, and amazon.com. All publicly accessible websites collectively constitute the World Wide Web.
- A web address is composed of 4 parts:
    - Ex: https://www.google.com
        - **HTTP (Hyper Text 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)** is a collection of millions of files stored on the thousands of computers called web servers.
        - **Google** is the web server and site maintainer.
        - **.com** tells that it is a commercial site.

[edu(educational), gov(government), net(network), org(organization), in(India), ca(Canada), uk(United Kingdom), us(United States of America), au(Australia).

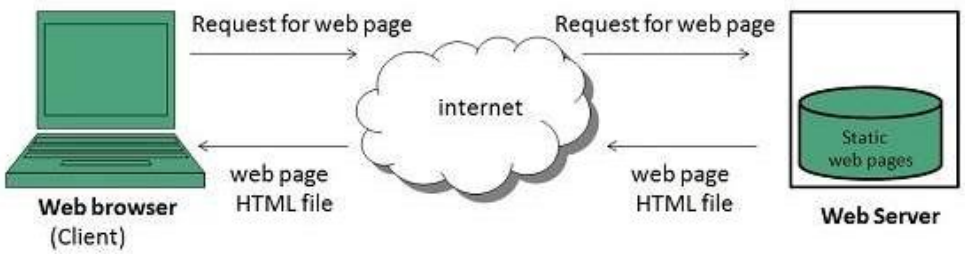
Purpose of websites:

- Selling products and services.
- Posting and finding information on the web.
- Gaining knowledge.
- Communicating with each other.
- Having fun, etc.

Types of Webpages:

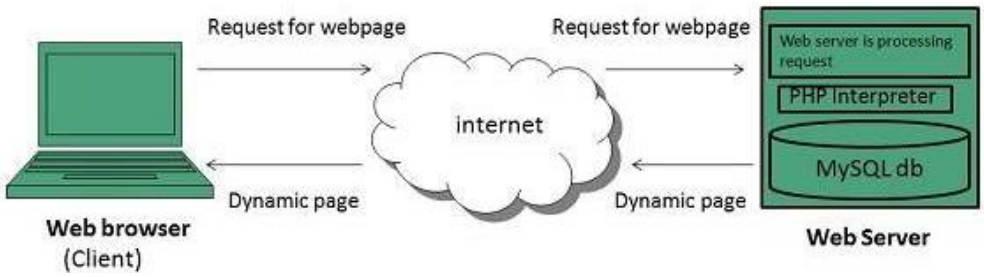
1. Static Webpage:

- 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/view 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.
- Ex: Wikipedia, w3schools, etc.



2. Dynamic Webpage:

- 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 2 types of dynamic webpages.



- **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 webpage to respond to client-side events.
- **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, JSPallow a web page to respond to submission events.

Types of Websites:

1. **Static Websites:**

- In Static Websites, Web pages are returned by the server which are prebuilt source code files built using simple languages such as HTML, CSS, or JavaScript.
- There is no processing of content on the server (according to the user) in Static Websites.
- Web pages are returned by the server with no change therefore, static Websites are fast. There is no interaction with databases.
- Also, they are less costly as the host does not need to support server-side processing with different languages.

2. **Dynamic Websites:**

- In Dynamic Websites, Web pages are returned by the server which are processed during runtime means they are not prebuilt web pages but they are built during runtime according to the user's demand with the help of server-side scripting languages such as PHP, Node.js, ASP.NET and many more supported by the server.
- So, they are slower than static websites but updates and interaction with databases are possible.

Purposes of different types of websites:

- **Purpose of Information Websites:**
  - The most basic site is informational. The informational website acts as a user's guide on the web.
  - 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.
  - To help users to find the necessary information on a specific topic.
- **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.
  - Main purpose is to attract visitors using bright and funny images, animation effects, and interactive services.
  - A perfect place for advertising.
- **Purpose of E-Commerce Websites:**
  - The purpose of e-commerce websites are 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 customer's product at their home.

➢ **Purpose of Service-Based Business Websites:**

- 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 Websites:**

- The purpose of social media websites are 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 allows them to get feedback on their products and services and allows them to learn more about what their customers really need and want.

➢ **Purpose of Personal Websites:**

- Personal websites are created to promote the person, to find new customers, sponsors, employers or partners.

➢ **Purpose of Educational Websites:**

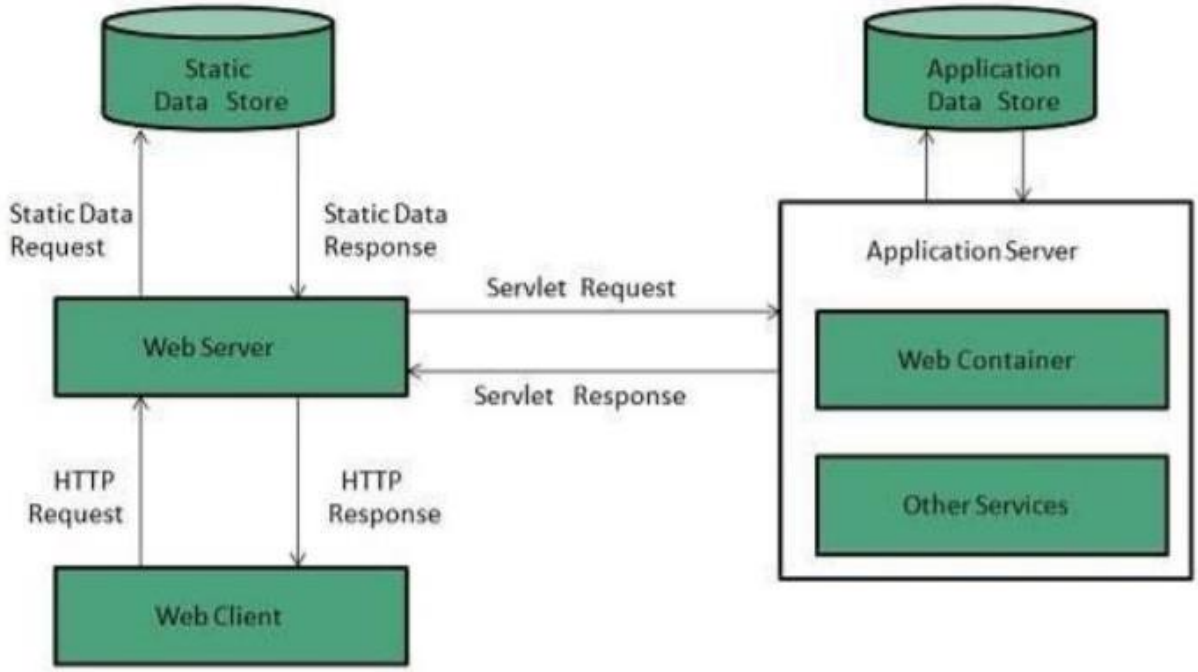
- Providing wide and high-quality access to existing educational products.
- Stimulating the process of creating innovative educational products.
- Contributing to the promotion of model forms of organization of the educational process.

- Providing educational and methodical support of the educational process.

- **Purpose of Portfolio Websites:**
  - Getting orders and to attract new customers.
  - Selling your works (if you offer ready-made goods).
  - Gaining a reputation in the industry.
  - Making useful connections.

Working of Interactive Websites:

- Web server is a computer where the web content is stored.
- Basically, web server is used to host the websites but there exists other web servers also such as gaming, storage, FTP, email etc.
- Website is a collection of webpages while web server is a 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.
- 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.



Software & Tools for Static Websites:

- **HTML:**
  - HTML is the standard markup language for creating Web pages.
  - How HTML differs from procedural language?
    - ❖ HTML describes the structure of Web pages using hypertext markup, whereas procedural languages are used to create compiled files such as EXE files.
    - ❖ Procedural languages need compiler to run whereas HTML doesn't.
    - ❖ HTML elements are represented by tags.
    - ❖ What is a tag?
      - HTML tags label pieces of content such as "heading", "paragraph", "table", and so on.
      - Browsers do not display the HTML tags, but use them to render the content of the page.

- 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 closing part. (Ex: <HTML> … </HTML>)
- Closing tags has the same text as the opening tag, but has an additional forward-slash (/)

➢ **CSS:**
- CSS stands for Cascading Style Sheets.
- CSS is used to style and layout web pages — for example, to alter the font, color, size, and spacing of your content, split it into multiple columns, or add animations and other decorative features.
- CSS can be applied in 3 ways:
  - ❖ **Inline CSS** (by using "style" attribute in the HTML element itself)
  - ❖ **Internal CSS** (by using <style> … </style> tag in header tag)
  - ❖ **External CSS** (by using external CSS file)
- Advantages of CSS:
  - ❖ Pages loads faster
  - ❖ Easy maintenance
  - ❖ Saves a lot of time
  - ❖ Provides more attributes

➢ **JavaScript:**
- It is a dynamic computer programming language.
- It is lightweight and most commonly used as a part of web pages, whose implementation allows client-side scripting to interact with the user and make dynamic pages.
- It is an interpreted language and has object oriented capabilities.

- The <script> … </script> tags are used to define JavaScript in the webpage.
- Uses of JavaScript are:
  - ❖ Image manipulation
  - ❖ Form validation
  - ❖ Dynamic changes in content

➢ **Servlet:**

- Servlet = JAVA + HTML + CSS + JavaScript.
- It is use to create web applications.
- Servlet is an API that provides many interfaces and classes including documentations.
- Servlet is a class that extends the capabilities of the servers to respond to the incoming requests.
- It is a web component that is deployed on the server to create dynamic web page.
- Read the explicit data from the client (HTML forms)
- Read the implicit HTTP request data from the client (cookies, media files)
- Process the data and generate the result (communication with the database, invoking a web service, or computing the response directly)
- Send the explicit data to the clients (text, excel, images, gifs, etc.)
- Send implicit HTTP response to the client (setting cookies, catching parameters, etc)

➢ **JSP: (JAVA + HTML + CSS + JavaScript)**

- It helps developers to insert java code in HTML pages by using special JSP tags (<% java source code %>)
- It is type of Java servlet that is designed to fulfill the role of a user interface for a Java web application.

- JSP tags can be used for a variety of purposes, such as retrieving information from a database or registering user preferences, passing control between pages, sharing information between pages and requests, etc.
- Advantages of JSP over:
  - **ASP (Active Server Pages) –** dynamic part is written in JAVA not VB/Ms specific language. It is portable to other operating system.
  - **Pure Servlets –** convenient to write regular HTML than plenty of 'println' statements.
  - **JavaScript –** JavaScript can generate dynamic HTML pages but can hardly interact with the web server to perform complex tasks (database accessing, image processing, etc.)
  - **Static HTML –** regular HTML cannot contain dynamic information.

- **ASP.NET: (VB.NET + HTML + CSS + JavaScript)**
  - It is a web application framework developed and marketed by Microsoft to allow programmers to build dynamic websites.
  - It allows you to use a full featured programming language such as C# or VB.NET to build web application easily.
  - It works on top of the HTTP protocol and uses HTTP commands and policies to set a browser-to-server bilateral communication and co-operation.
  - It is used to create interactive, data-driven web applications over the internet.
  - It has a large number of controls such as text-box, buttons, labels, etc.
- **PHP: (PHP + HTML + CSS + JavaScript)**
  - PHP stands for Hypertext Preprocessor.
  - It is a server-side HTML embedded scripting language.

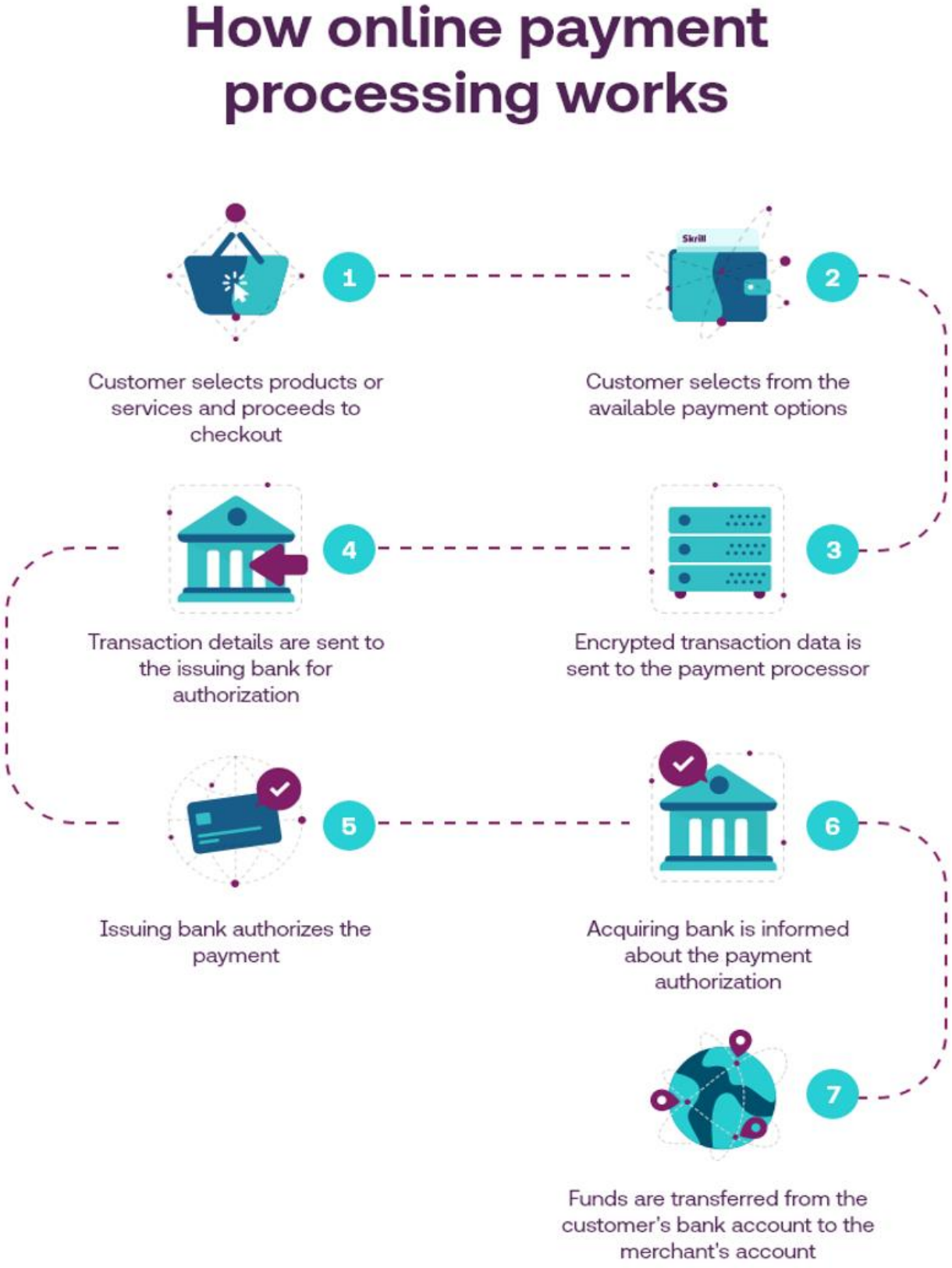
- HTML embedded means you can use PHP statements within an HTML code.
- PHP files are returned to the browser as plain HTML.
- A scripting language is a form of programming language that is usually interpreted rather than compiled.
- In programming languages such as C or C++ you compile the program permanently into an executable file, before you can execute the program.
- A program that is written in scripting language is interpreted one command at a time by the command interpreter
- Characteristics of PHP:
  - PHP scripts are executed on servers.
  - PHP supports many databases (MySQL, Sybase, Oracle, etc.)
  - PHP runs on different platforms (Linux, Windows)
  - PHP is compatible with almost all the web-servers used today. (Apache, IIS, etc.)
  - PHP file can contain plain text, HTML tags, and scripts.
  - PHP files have following extension: '.php' or '.php3'.

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.
- **Online Transaction Processing (OLTP):**
  - OLTP (online transaction processing) is a class of software programs capable of supporting transaction-oriented applications on the Internet.
  - Online transactions covers both computer and mobile transaction.
  - It allows to view recent transactions, print out statements, and 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 Transaction:**
  - User in control
  - Can log on from almost any where
  - Make all payment electronically
  - Transaction speed
  - Saves Time
  - Convenient
  - Flexible
- **Participants involved in Online Transaction:**
  - Cardholder
  - Merchant
  - Issuer
  - Acquire
  - Payment gateway
  - Certificate authority (CA)

- **Steps involved in Online Transaction:**
  - The customer opens an account.
  - The customer receives a certificate.
  - The merchant receives a certificate.
  - The customer places an order.
  - The merchant is verified.
  - The order and payment detail sent to the merchant along with customer digital certificate.
  - The merchant request payment authorization.
  - The payment gateway authorizes the payment.
  - The merchant confirms the order.
  - The merchant provides goods or service as per order.


How online payment processing works
1
Customer selects products or services and proceeds to checkout
2
Customer selects from the available payment options
3
Encrypted transaction data is sent to the payment processor
4
Transaction details are sent to the issuing bank for authorization
5
Issuing bank authorizes the payment
6
Acquiring bank is informed about the payment authorization
7
Funds are transferred from the customer's bank account to the merchant's account

- **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.