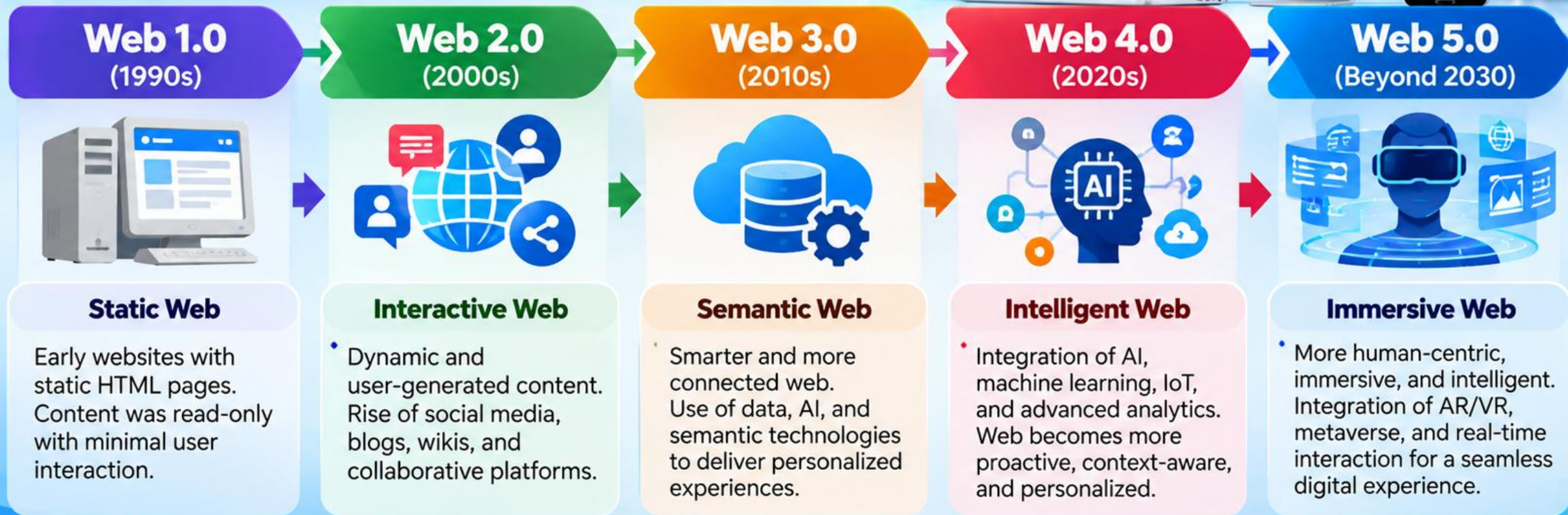


# Web Programming



# Major Phases in Web Development History



# What is Internet and Web programming?



## The Internet

The Internet is a global network of interconnected computers and servers that allows people to communicate, share information, and access resources from anywhere in the world.



## Web Programming

Web programming involves creating dynamic websites that are interactive and user-friendly. This includes the use of databases, server-side scripting, and client-side scripting to create applications that can process data, display content, and interact with users.



# What is Internet, Intranet and Extranet?



## Internet

The **Internet** is a global network of interconnected computers and servers around the world. It allows people to communicate, share information, and access resources from anywhere.



### Commonly used for:

- ✓ Browsing websites
- ✓ Sending emails
- ✓ Online communication (social media, video calls)
- ✓ Accessing online services (cloud, e-commerce, etc.)



## Intranet

An **Intranet** is a private network within an organization. It uses the same technologies as the Internet (such as TCP/IP and web browsers) but is only accessible to authorized users inside the organization.



### Commonly used for:

- ✓ Internal communication
- ✓ Employee portals
- ✓ Accessing internal systems and files
- ✓ Sharing resources within the organization



## Extranet

An **Extranet** is a network that provides controlled access to an organization's internal resources for external users, such as partners, suppliers, or customers. It is more limited than an intranet and requires authentication.



### Commonly used for:

- ✓ Collaboration with business partners
- ✓ Sharing information with suppliers
- ✓ Providing limited access to customers
- ✓ Secure access to specific organization resources

# What is WWW?



## World Wide Web (WWW)

The World Wide Web (WWW) is a system of interlinked documents, websites, and other resources that are accessed over the Internet using web browsers. It allows users to view and interact with information through web pages that are connected by hyperlinks.

## Key Features of WWW



A collection of interlinked web pages.



Accessed using a web browser.



Uses links (hyperlinks) to connect pages.



Contains various types of content (text, images, videos, etc.).



# The Rise of the Web



**1989 – 1991**

Tim Berners-Lee invented the World Wide Web at CERN, creating core technologies that still form the web's foundation today:



**HTTP**

(HyperText Transfer Protocol)

The protocol used to transfer data on the web.



**HTML**

(HyperText Markup Language)

The language for creating web pages.



**URI/URL**

(Uniform Resource Identifier/Locator)

The system for locating and addressing web pages.



**1990**

Berners-Lee developed the first web browser (WorldWideWeb, later Nexus) and the first web server.

The early web was primarily static and text-based, used mostly for academic and research information sharing.



**Tim Berners-Lee**

Inventor of the World Wide Web  
at CERN (1989-1991)



# What is the Difference Between Internet and WWW?



## Internet

The **Internet** is a global network of interconnected computers and servers. It allows people to communicate, share information, and access various services such as email, file sharing, online games, and the World Wide Web.



Email



Messaging



File Sharing



Online Games



Other Services



## World Wide Web (WWW)

The **World Wide Web (WWW)** is a system of interlinked web pages and other resources that are accessed over the Internet using web browsers. It is just one of the many services that run on the Internet.



Web Pages



News



Online Shopping



Videos



Social Media

## Key Differences

|                                                                                                       | Internet                                                      | World Wide Web (WWW)                                           |
|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------|
|  <b>Definition</b> | A global network of interconnected computers and servers.     | A system of interlinked web pages and resources.               |
|  <b>Scope</b>      | Broad network infrastructure.                                 | A service that runs on the Internet.                           |
|  <b>Purpose</b>    | Enables communication, data sharing, and access to services.  | Provides access to web pages and online content.               |
|  <b>Examples</b>   | Email, file sharing, online games, VoIP, streaming, WWW, etc. | Websites, web pages, blogs, online shopping, online news, etc. |
|  <b>Analogy</b>    | The highway (the network infrastructure).                     | The cars you use on the highway (one service among many).      |

# What is HTTP and HTTPS?



## HTTP

(HyperText Transfer Protocol)

HTTP is the standard protocol used to transfer data on the web. It allows your browser to communicate with web servers, but the data is sent in plain text **without encryption**.



No encryption

Security

Encrypted (SSL/TLS)



Data can be read by others

Data Privacy

Data is protected and secure



More vulnerable to attacks

Risk of Interception

More secure and trusted



No certificate required

SSL/TLS Certificate

Requires a valid SSL/TLS certificate



Standard speed

Performance

Slightly slower (due to encryption)



Used for non-sensitive websites

Common Use

Used for websites with sensitive data (e.g., login, payment)



## HTTPS

(HyperText Transfer Protocol Secure)

HTTPS is the secure version of HTTP. It uses **encryption (SSL/TLS)** to protect the data exchanged between your browser and the web server, keeping it **private and safe** from attackers.



**In short:** HTTP transfers data **without encryption**, while HTTPS encrypts the data to make web browsing safer and more secure.

# Parts of URL

A URL (Uniform Resource Locator) is the address used to locate a resource on the Internet, such as a website or a specific web page.

 **https://** **www.** **example.com** **:8080** **/folder/page.html** **?search=web** **#section1** 



## Protocol

**https**

Specifies how data is transferred between your browser and the server.

**Examples:**  
http, https



## Subdomain

**www**

A subdomain (usually www) that points to the main website.

**Examples:**  
www, mail, shop, etc.



## Domain Name

**example.com**

The name of the website. It identifies the organization or owner.

**Examples:**  
google.com, example.com



## Port

**:8080**

An optional port number used to access a specific service on the server.

**Examples:**  
:80 (HTTP), :443 (HTTPS), :8080, etc.



## Path

**/folder/page.html**

The path to a specific folder and file on the server.

**Example:**  
/folder/page.html



## Query Parameters

**?search=web**

Optional parameters used to send additional information to the server.

**Example:**  
?search=web &page=2



## Fragment

**#section1**

Points to a specific section within the page.

**Example:**  
#section1, #top

# What is Website and Webpage?



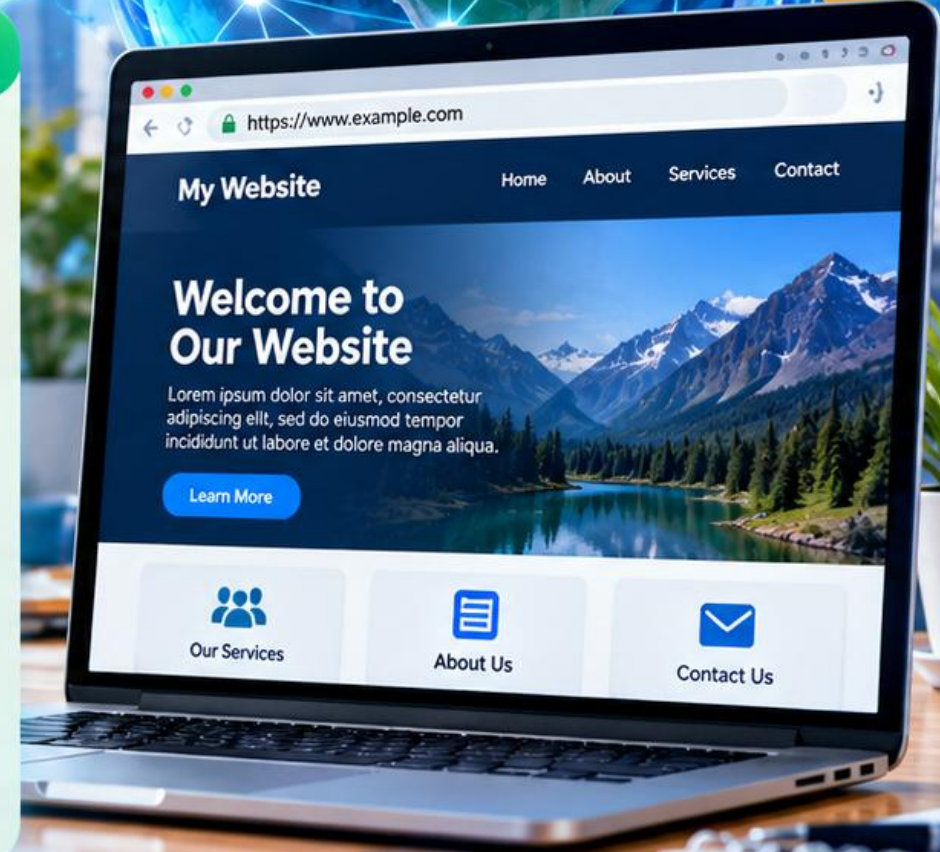
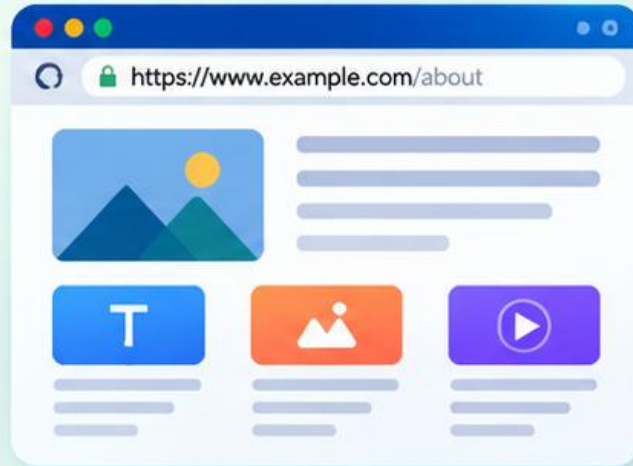
## Website

website is a collection of related web pages, images, and other files that are stored on a web server and accessible through a domain name on the Internet.



## Webpage

webpage is a single page or document within a website. It can contain text, images, videos, links, and other content, and it has its own unique URL.



# What is Web Browser?

A **web browser** is a software application that allows users to access, view, and interact with websites and web content on the Internet.

## Main Functions



Retrieves web pages from the Internet using HTTP/HTTPS.



Displays text, images, videos, and other content.



Allows users to navigate between pages using links.



Provides tools such as bookmarks, history, downloads, and settings.

## Popular Web Browsers



Google Chrome



Mozilla Firefox



Microsoft Edge



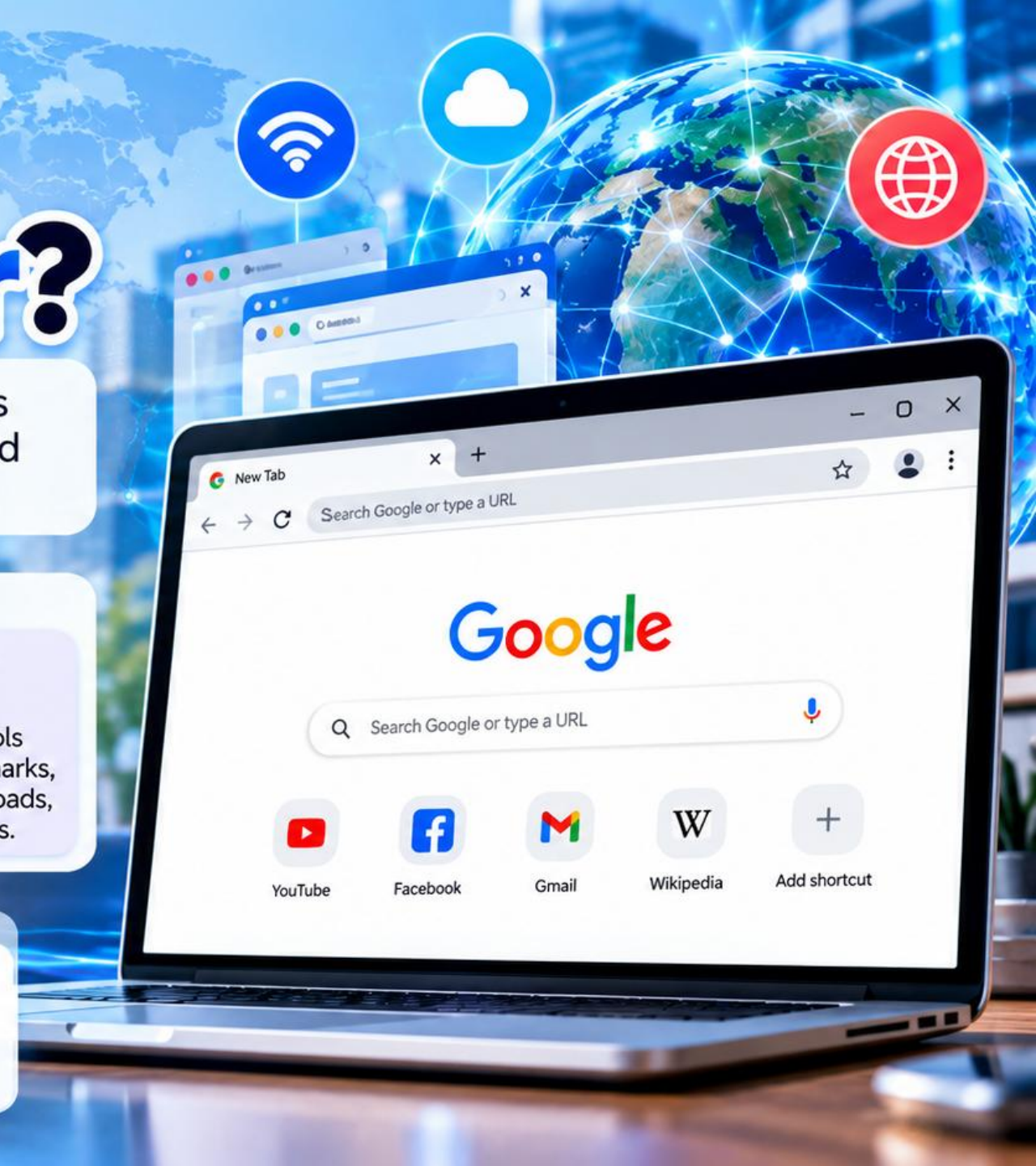
Safari



Opera



Brave



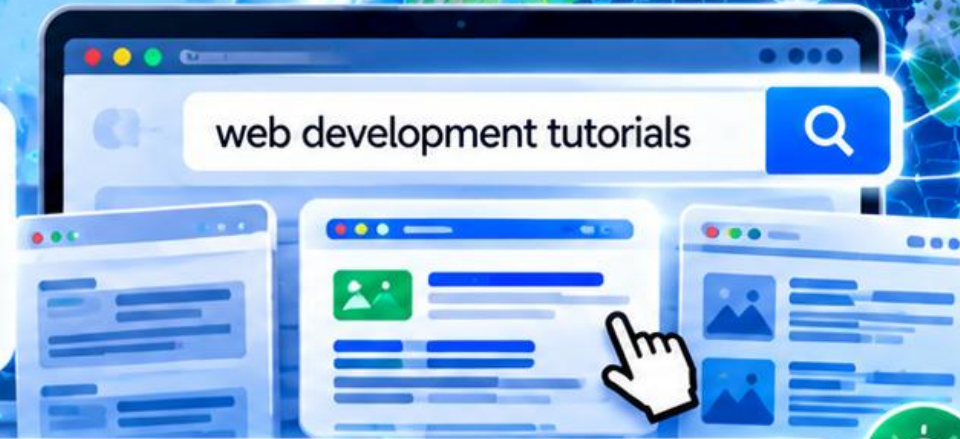
# What is Search Engine

## in Web Development?



### Definition

A search engine is a web-based tool that helps users **find information on the Internet**. It searches, indexes, and displays relevant web pages based on the keywords or queries entered by the user.



### How a Search Engine Works?

#### 1 Crawling

Bots (web crawlers) scan and discover new and updated web pages.



#### 2 Indexing

The discovered pages are analyzed and stored in a huge database (index).



#### 3 Processing

When you enter a query, the search engine analyzes the keywords and looks for the most relevant pages.



#### 4 Ranking

It uses complex algorithms to rank the most relevant and useful results.



#### 5 Results

The search engine displays a list of relevant web pages, images, videos, and other content.



### Why is it Important in Web Development?

- ✓ Helps users find your website.
- ✓ Increases website visibility.
- ✓ Drives organic traffic.
- ✓ Supports SEO (Search Engine Optimization).
- ✓ Improves user experience.
- ✓ Helps developers create search-friendly websites.



### Popular Search Engines

**Google**  
(Most Popular)

**Bing**  
(Microsoft)

**YAHOO!**  
Yahoo!

  
**DuckDuckGo**  
(Privacy Focused)

**Baidu** 百度

**Yandex**  
(Popular in Russia)

  
**Ecosia**  
(Environment Focused)

# What is Web Server?



## Definition

A **web server** is a computer or software that stores, processes, and delivers web pages to users over the Internet using protocols such as HTTP or HTTPS.

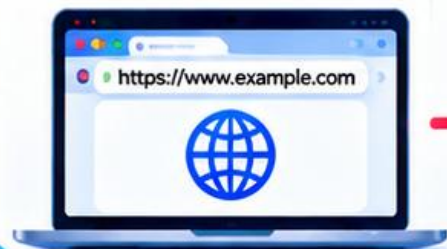


## How a Web Server Works?

1

### User Request

You enter a website address (URL) in your browser.



2

### Internet

The request is sent over the Internet using HTTP or HTTPS.



3

### Web Server

The web server receives the request, processes it, and finds the requested files or runs server-side code.



4

### Sends Response

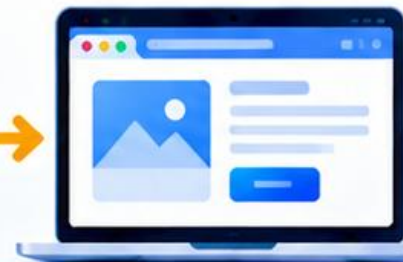
The web server sends the web page (HTML, CSS, JavaScript, images, etc.) back to your browser.



5

### Web Page Displayed

Your browser receives the files and displays the website to you.



## Examples of Web Servers



Apache  
HTTP Server



NGINX



Microsoft  
IIS



Apache Tomcat



## Key Functions

- ✓ Hosts and stores website files
- ✓ Processes client requests
- ✓ Delivers web pages and resources
- ✓ Supports server-side programming languages (e.g., PHP, Python, Node.js)
- ✓ Handles multiple user requests at the same time



## Common Protocols

HTTP

Hypertext Transfer Protocol  
(used to transfer web pages)

HTTPS

HTTP Secure  
(encrypted and more secure)

# Trivia about the Animal in Mozilla Firefox



## The Animal is a Red Panda

The animal in the Mozilla Firefox logo is a red panda, not a fox. It is a stylized red panda wrapped around a blue globe, representing the browser's global reach.

## Interesting Facts about the Red Panda



### 1. Native to Asia

Red pandas are native to the eastern Himalayas and southwestern China.



### 2. Loves Bamboo

Their main diet is bamboo, but they also eat fruits, berries, and small animals.



### 3. Tree-Dwelling

Red pandas are excellent climbers and spend most of their time in trees.



### 4. Endangered Species

Red pandas are considered endangered due to habitat loss and poaching.

## Why was it chosen for Mozilla Firefox?



The red panda was chosen because it is less common, unique, and memorable. It also represents qualities like curiosity, agility, and exploration — which align with the spirit of the Firefox browser.



# What is Static and Dynamic Website?



## Static Website

A **static website** consists of **fixed web pages** written in HTML, CSS, and sometimes JavaScript. The content is the same for every visitor and only changes when the files are manually edited by a developer.



### Key Characteristics

- ✓ Fixed content (does not change per user)
- ✓ Built with HTML, CSS, and JavaScript
- ✓ Faster and easier to develop
- ✓ Lower cost and simpler hosting
- ✓ Best for simple and small websites

### Examples



Personal Portfolio



Blogs (without login)



Brochure Websites

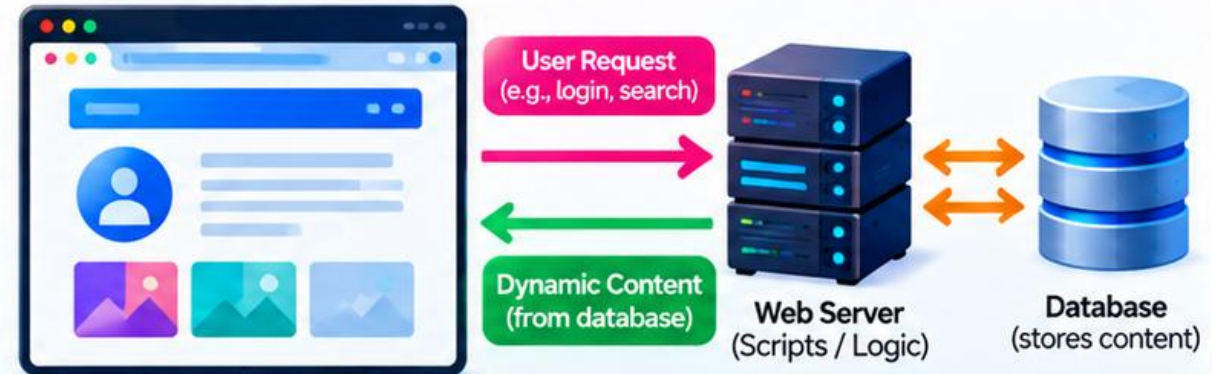


Informational Sites



## Dynamic Website

A **dynamic website** generates content in **real-time** based on user interactions, database data, or other factors. The content can change for each visitor and is usually built with server-side technologies such as PHP, Python, or other frameworks.



### Key Characteristics

- ✓ Content changes dynamically
- ✓ Uses server-side scripting and a database
- ✓ Interactive and personalized for users
- ✓ More complex to develop and maintain
- ✓ Best for large, data-driven websites

### Examples



Social Media Sites



E-commerce Websites



Video Streaming Sites



Online Systems (e.g., LMS, CRM)

# What is Frontend Vs Backend in Web Development?



## Frontend (Client-Side)

The frontend is the part of a website that **users see and interact with**. It focuses on the design, layout, and user experience.

### Technologies:



HTML



CSS



JavaScript



**Sends Requests**  
(e.g., form data, API calls)

**Sends Responses**  
(e.g., data in JSON or HTML)



## Backend (Server-Side)

The backend is the part of a website that **handles the logic, processes data**, interacts with the database, and manages requests from the frontend.

### Technologies:



PHP



Node.js



Python



Laravel



Spring



Express.js



## How They Work Together



User



Frontend  
(User Interface)

e.g., Login, Get Data, Save Information

Request

Response

e.g., JSON Data, Updated Content



Backend  
(Server Logic)



Database  
(Store and Retrieve Data)

### In short:

- ✓ Frontend = What users see and do.
- ✓ Backend = What happens behind the scenes.

# What is HTML, CSS and JavaScript?

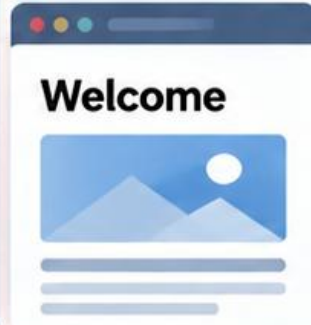


## HTML

(Hypertext Markup Language)

HTML is the standard markup language used to create the **structure and content** of a web page. It defines elements such as headings, paragraphs, images, links, and other content.

```
<!DOCTYPE html>
<html>
  <head>
    <title>My Website</title>
  </head>
  <body>
    <h1>Welcome</h1>
    <p>This is a paragraph.</p>
  </body>
</html>
```



### Key Points

- ✓ Defines the structure of a web page
- ✓ Uses tags (e.g., <h1>, <p>, <img>, <a>)
- ✓ Tells the browser what content to display
- ✓ Provides the basic building blocks of a website



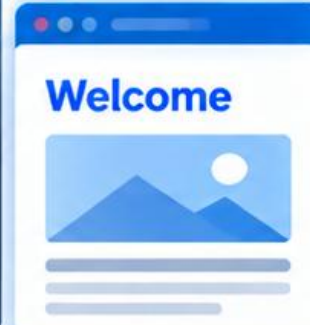
## CSS

(Cascading Style Sheets)

CSS is used to **style and design** the appearance of a web page. It controls the layout, colors, fonts, spacing, and overall visual presentation.

```
h1 {
  color: #007bff;
  font-size: 32px;
  font-family: Arial, sans-serif;
}

p {
  color: #333;
  margin-top: 10px;
}
```



### Key Points

- ✓ Controls the visual design of a web page
- ✓ Changes colors, fonts, layout, and spacing
- ✓ Keeps the website clean and attractive
- ✓ Can be written in an external .css file or inside the HTML file using <style>

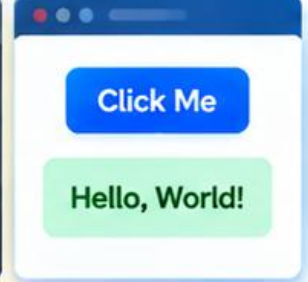
## JS

## JavaScript

(JS)

JavaScript is a programming language used to add **interactivity and dynamic behavior** to a web page. It allows you to create interactive features such as buttons, forms, animations, and real-time updates without reloading the page.

```
document.getElementById("btn").
  addEventListener("click", function() {
    document.getElementById("msg").
      textContent = "Hello, World!";
  });
```



### Key Points

- ✓ Adds interactivity and functionality
- ✓ Can respond to user actions (e.g., clicks, input)
- ✓ Can update content dynamically
- ✓ Often used for animations, form validation, API calls, and more

## How They Work Together?



### HTML

Provides the structure (content)



### CSS

Makes it look good (design)



### JavaScript

Adds interactivity (behavior)

