

Module 3 - Building Blocks of Web Development

Web Servers

- A **web server** is software (or a physical machine) that delivers web pages to users' browsers when they request them.
- When you type a website URL, the request goes to a server, and the server sends back the website files (HTML, CSS, JS).

Examples:

- Apache, Nginx, Microsoft IIS
- Cloud servers like AWS, Google Cloud

Why important in web development?

- Hosts and runs your website.
- Handles traffic, requests, and responses.
- Ensures your website is available 24/7.

Frameworks & Libraries

Frameworks and libraries are **pre-written code** that make development faster and easier.

- **Frameworks** = provide a structure and rules to build applications.
 - Example (Frontend): Angular, React (although React is technically a library).
 - Example (Backend): Django (Python), Laravel (PHP), Express.js (Node.js).
- **Libraries** = collections of reusable functions/tools.
 - Example: jQuery (makes JavaScript easier), Bootstrap (CSS design components).

Why important?

- Save time (don't need to write everything from scratch).
- Provide tested, secure, and efficient solutions.
- Standardize coding practices.

Responsive Design

Responsive design means a website **adapts automatically** to different devices and screen sizes (desktop, tablet, mobile).

How it's done:

- CSS Media Queries (@media)
- Flexible grids and layouts
- Mobile-first design

Why important?

- Users visit websites from phones, laptops, and even TVs.
- Improves **user experience (UX)**.
- Essential for **SEO ranking** (Google favors mobile-friendly sites).



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Example:

A news website should look great whether viewed on a 27-inch desktop monitor or a 6-inch phone screen.

User Experience (UX)

• What it means:

UX is about how people feel when they interact with a website. It focuses on making websites easy, enjoyable, and useful.

• Key elements in Web Development:

- **Navigation:** Menus and links should be simple and logical.
- **Loading speed:** Faster sites = happier users.
- **Accessibility:** Design for everyone, including users with disabilities.
- **Consistency:** Colors, fonts, and layouts should match.

• Example:

An online store with clear product categories, a quick checkout process, and mobile-friendly design → **Good UX**.

Search Engine Optimization (SEO)

• What it means:

SEO is the process of making a website rank higher in search engines (like Google) so more people can find it.

• Key elements in Web Development:

- **Keywords:** Use relevant words in page titles, headings, and content.
- **Mobile-friendly design:** Google ranks responsive sites higher.
- **Page speed:** Faster websites improve SEO ranking.
- **Clean code & metadata:** HTML tags (like <title> and <meta>) help search engines understand the site.

• Example:

If you create a travel blog about “Best places in India,” using keywords like “*Top travel destinations in India*” helps it appear higher in search results.

Security

Web security ensures websites and apps are safe from hackers and data leaks.

Common Security Practices:

- HTTPS (SSL certificates) for secure data transfer
- Authentication (logins with passwords, OTPs, or biometrics)
- Regular updates to fix vulnerabilities

Why important?

- Protects sensitive user data (passwords, payment info).
- Builds trust with customers.
- Avoids legal and financial risks.



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Example:

An e-commerce website must secure customer payment details using encryption and secure servers.

In summary:

- **Web Servers** = Deliver your site.
- **Frameworks & Libraries** = Speed up development.
- **Responsive Design** = Make it user-friendly across devices.
- **Security** = Keep it safe for users and businesses

Assignment

Q1: Simple: Which of the following is a **web server**?

- a) Apache
- b) CSS
- c) React
- d) Bootstrap

Q2: Simple: Which technology is used to make a website **responsive** across devices?

- a) SQL
- b) CSS Media Queries
- c) Python
- d) PHP

Q3: Hard: In web development, **UX (User Experience)** mainly focuses on:

- a) Server performance
- b) How users feel while using the website
- c) Installing security certificates
- d) Writing backend code

Q4: Hard: Which of the following helps a website rank higher in **search engines**?

- a) Metadata and keywords
- b) Using only JavaScript
- c) Ignoring responsive design
- d) Adding large uncompressed images



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