**Web System & Technologies**

Static & Dynamic Website:

**Dynamic website** refers to a site that can adapt and change based on user interactions or other factors. Unlike static websites, which display the same content to all users and do not change unless manually updated, dynamic websites can generate content on the fly, often pulling information from databases or external sources in real-time. Here are the key differences between static and dynamic websites:

1. Content Generation:
   * Static Website: Content is fixed and pre-defined, typically coded directly into HTML files. Changes require manual editing of the code.
   * Dynamic Website: Content can be generated dynamically based on user input, database queries, or other external factors. Content is often stored separately from the layout and retrieved as needed.
2. Interactivity:
   * Static Website: Limited interactivity; user interactions are generally restricted to navigating between pages and viewing content.
   * Dynamic Website: Offers greater interactivity, allowing users to input data, search for information, or personalize their experience. Features such as forms, shopping carts, and user accounts are common.
3. Database Integration:
   * Static Website: Typically does not interact with databases or other external data sources.
   * Dynamic Website: Can integrate with databases to store and retrieve information dynamically. This enables features like user authentication, content management systems, and personalized recommendations.

**Web Generation Comparison**

| **Feature** | **Web 1.0** | **Web 2.0** | **Web 3.0** |
| --- | --- | --- | --- |
| Time Period | 1990s - Early 2000s | Mid 2000s - Present | Anticipated Future |
| Content | Static HTML pages with limited interactivity | Dynamic content, user-generated content | Intelligent, context-aware content |
| Technology | Basic HTML, limited multimedia | Rich multimedia, AJAX, APIs | AI, machine learning, blockchain integration |
| Focus | Information dissemination | Collaboration, social networking | Semantic web, decentralized applications |
| Communication | Mostly one-way communication | Two-way communication, commenting, sharing | Multi-way communication, peer-to-peer networks |
| Governance | Centralized control | User-generated content moderation | Distributed governance, smart contracts |
| Security | Basic security measures | User privacy concerns, data security | Blockchain-based security, cryptographic tech |
| Examples | Early websites, online brochures | Social media platforms, blogs | AI-driven assistants, decentralized apps |
| Common Applications | Search engines, online directories | Social networking (e.g., Facebook, LinkedIn) | Decentralized finance (DeFi), smart contracts |

World Wide Web Communication

The World Wide Web is about communication between web **clients** and web **servers**.

**Clients** are often browsers (Chrome, Edge, Safari), but they can be any type of program or device.

**Servers** are most often computers in the cloud.

HTTP Request / Response

Communication between clients and servers is done by **requests** and **responses**:

1. A client (a browser) sends an **HTTP request** to the web
2. A web server receives the request
3. The server runs an application to process the request
4. The server returns an **HTTP response** (output) to the browser
5. The client (the browser) receives the response