WEB TECHNOLOGY

Chapter 1: WEB ESSENTIALS

Lecture Five

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Quick Lookback of Previous Class:

- World Wide Web:
- Web Server & Web Client
- How Do Web Servers and Web Clients Work Together?
- Domain Names, DNS, and URLs
- Working of DNS
- Web Pages
- Websites
  - Static Website
  - Dynamic Website

Need an additional info about the Web:

- Please visit:
  - *http://info.cern.ch/* - **What is it?**

- Get onto the following site to get knowledge saved from your social media time:
- ***https://home.cern/science/computing/birth-web/short-history-web***

Web 1.0

- Basically, this first version of the Web consisted of a few people creating web pages and content and web pages for a large group of readers, allowing them to access facts, information, and content from the sources.
- it was designed to help people better find information. This web version dealt was dedicated to users searching for data.
- This web version is sometimes called “the read-only Web” because it lacks the necessary forms, visuals, controls, and interactivity we enjoy on today’s Internet.
- People use the term “Web 1.0” to describe the earliest form of the Internet.
- Users saw the first example of a worldwide network that hinted at future digital communication and information-sharing potential.

- Here are a few characteristics found in Web 1.0:
  - *It's made up of static pages connected to a system*
  - *It has HTML 3.2 elements like frames and tables*
  - *HTML forms get sent through e-mail*
  - *The content comes from the server's filesystem, not a relational database management system*
  - *It features GIF buttons and graphics*
  - *Take a real-world dictionary, digitize everything in it, and make it accessible to people online to look at (but not be able to react to it). -→ That's Web 1.0.*

Web 2.0

- If Web 1.0 was made up of a small number of people generating content for a larger audience, then Web 2.0 is many people creating even more content for a growing audience. Web 1.0 focused on reading;
- Web 2.0 focused on participating and contributing.
- This Internet form emphasizes User-Generated Content (UGC), ease of use, interactivity, and improved compatibility with other systems and devices.
- Web 2.0 is all about the end user's experience. Consequently, this Web form was responsible for creating communities, collaborations, dialogue, and social media.
- As a result, Web 2.0 is considered the primary form of web interaction for most of today's users.

- Web 2.0 is known as “the participative social Web.” Web 2.0 is a better, more enhanced version of its predecessor, incorporating web browser technologies such as JavaScript frameworks.
- Here’s a breakdown of typical Web 2.0 characteristics:
  - *It offers free information sorting, allowing users to retrieve and classify data collectively*
  - *It contains dynamic content that responds to the user’s input*
  - *It employs Developed Application Programming Interfaces (API)*

- *It encourages self-usage and allows forms of interaction like:*
  - *Podcasting*
  - *Social media*
  - *Tagging*
  - *Blogging*
  - *Commenting*
  - *Curating with RSS*
  - *Social networking*
  - *Web content voting*

- *It’s used by society at large and not limited to specific communities.*
- *Mobile Internet access and the rise of social networks have contributed to a dramatic upturn in Web 2.0’s growth. This explosion is also fueled by the rampant popularity of mobile devices such as Android-powered devices and iPhones.*
- *In addition, Web 2.0's growth made it possible for apps such as TikTok, Twitter, and YouTube to expand and dominate the online landscape.*

Web 3.0

- When trying to figure out the definitive web 3.0 meaning, we need to look into the future. Although there are elements of Web 3.0 currently available today, it still has a way to go before it reaches full realization.
- Web 3.0, which is also referred to as Web3, is built on a foundation consisting of the core ideas of decentralization, openness, and more excellent user utility.
- Web 1.0 is the "read-only Web," Web 2.0 is the "participative social Web," and Web 3.0 is the "read, write, execute Web."

- This Web interaction and utilization stage moves users away from centralized platforms like Facebook, Google, or Twitter and towards decentralized, nearly anonymous platforms.
- World Wide Web inventor Tim Berners-Lee initially called Web 3.0 the Semantic Web and envisioned an intelligent, autonomous, and open Internet that used Artificial Intelligence and Machine Learning to act as a "global brain" and process content conceptually and contextually.
- This idealized version didn’t quite pan out due to technological limitations, like how expensive and complicated it is to convert human language into something readily understood by computers.

- Here’s a list of typical Web 3.0 characteristics:
  - *It's a semantic web, where the web technology evolves into a tool that lets users create, share, and connect content via search and analysis. It is based on comprehension of words instead of numbers and keywords.*
  - *It incorporates Artificial Intelligence and Machine Learning. If these concepts are combined with Natural Language Processing (NLP), the result is a computer that uses Web 3.0 to become smarter and more responsive to user needs.*
  - *It presents the connectivity of multiple devices and applications through the Internet of Things (IoT). Semantic metadata makes this process possible, allowing all available information to be effectively leveraged. In addition, people can connect to the Internet anytime, anywhere, without needing a computer or smart device.*

- *It offers users the freedom to interact publicly or privately without having an intermediary expose them to risks, therefore offering people "trustless" data.*
- *It uses 3-D graphics. In fact, we already see this in computer games, virtual tours, and e-commerce.*
- *It facilitates participation without needing authorization from a governing body. It's permissionless.*

- It can be used for:
  - Metaverses: A 3D-rendered, boundless, virtual world
  - Blockchain games: They allow users to have actual ownership of in-game resources, following the principles of NFTs
  - Privacy and digital infrastructure: This use includes zero-knowledge proofs and more secure personal information
  - Decentralized finance. This use includes payment Blockchains, peer-to-peer digital financial transactions, smart contracts, and cryptocurrency
  - Decentralized autonomous organizations. Community members own online communities

Web 1.0	Web 2.0	Web 3.0
Typically read-only	Strongly read-write	Read-write-interact
Owned content	Shared content	Consolidated content
Visual/interactive Web	Programmable Web	Linked data Web
Home pages	Wikis and blogs	Waves and live streams
Web page	Web service endpoint	Data space
HTML/HTTP/URL/Portals	XML/RSS	RDF/RDFS/OWL

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Web 1.0	Web 2.0	Web 3.0
File/web servers, search engines, e-mail, P2P file sharing, content and enterprise portals	Instant messaging, Ajax and JavaScript frameworks, Adobe Flex	Personal intelligent data assistants, ontologies, knowledge bases, semantic search functions
Directories	Tagging the user	User behavior
Focus on the company	Focus on the community	Focus on the individual
Read-only Web	Social Web	The Semantic Web
Banner advertising	Interactive advertising	Behavioral advertising
File/web servers, search engines, e-mail, P2P file sharing, content and enterprise portals	Instant messaging, Ajax and JavaScript frameworks, Adobe Flex	Personal intelligent data assistants, ontologies, knowledge bases, semantic search functions