WEB EVOLUTION

THE EVOLUTION OF THE INTERNET

ARPANET (1969-1990)

THE BEGINNINGS OF CONNECTIVITY

ARPANET, created by the U.S. Department of Defense, was the first step toward what we now know as the Internet. Its main goal was to develop a network capable of connecting users on different computers to facilitate communication and data exchange.

First links and expansion

The first ARPANET connection was established on November 21, 1969, between UCLA and the Stanford Research Institute. Shortly after, the network expanded to the University of Utah and UCSB, marking the beginning of an interconnected network enabling communication among multiple users.

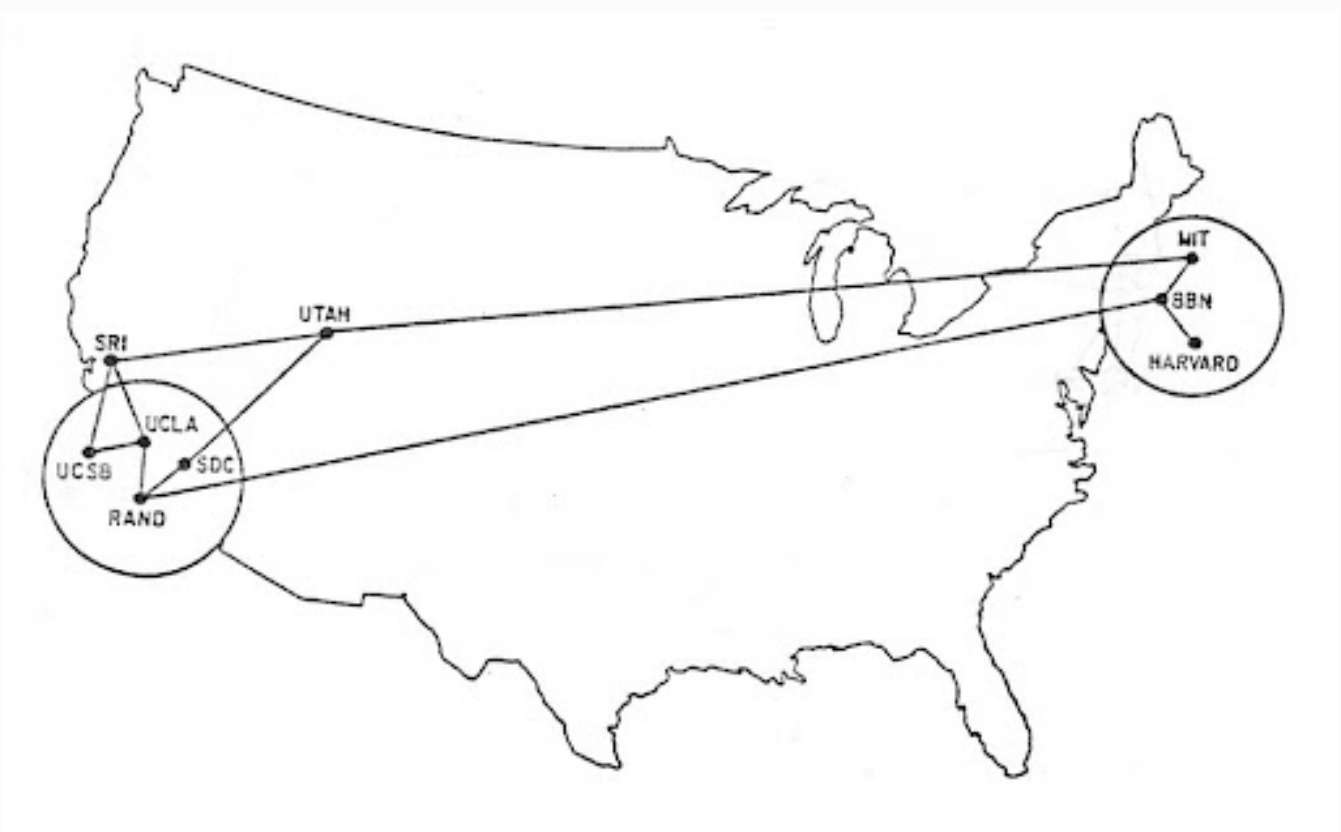
Rapid growth

By 1971, ARPANET connected 24 computers from various universities and research centers. This number grew quickly to 213 by 1981 and to 500 by 1983, demonstrating exponential growth that laid the foundation for the expansion of the modern Internet.

Key technologies

ARPANET introduced essential communication technologies and protocols that would become fundamental to the later development of the Internet, most notably the Transmission Control Protocol (TCP) and the Internet Protocol (IP). These protocols enabled reliable data transmission and proper addressing across the network, becoming the backbone of today's Internet architecture.

The creation and expansion of ARPANET were crucial in the evolution of global connectivity, establishing the technological and conceptual foundation for future generations of the Internet.



WEB 1.0 (1990–2004)

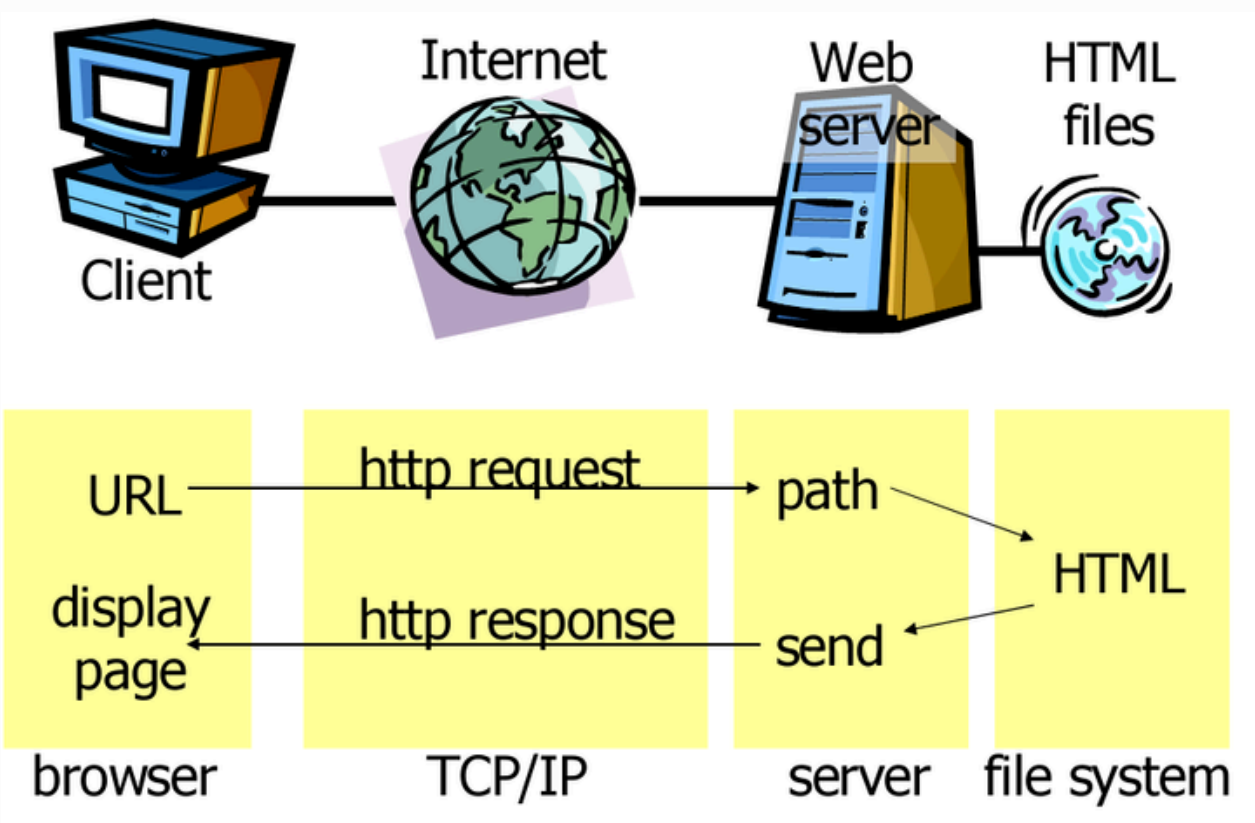
THE STATIC WEB

In 1990, Tim Berners-Lee developed HTML, URL, and HTTP, technologies that laid the foundation for the web. These innovations enabled the creation and linking of documents, providing the necessary structure for online navigation. In 1994, Berners-Lee founded the World Wide Web Consortium (W3C), which established open standards to ensure interoperability and orderly growth of the web.

Static pages
Web 1.0 was characterized by static information and a lack of interaction between users and servers. Web pages were static documents that couldn't be modified by users—only the site administrator could update and maintain the content.

Content consumption
Users during this era were mainly passive content consumers, similar to reading a digital magazine or newspaper. There was no possibility for interaction or feedback.

Browsers and search engines
Tools like Netscape (1994–2008) and Altavista (1995–2013) emerged to facilitate web navigation. Netscape became one of the first widely adopted web browsers, and Altavista enabled efficient information search.
Web 1.0 was fundamental in creating a global information platform, establishing the foundation for future generations of the web.



WEB 2.0 (2004–2017)

THE INTERACTIVE WEB

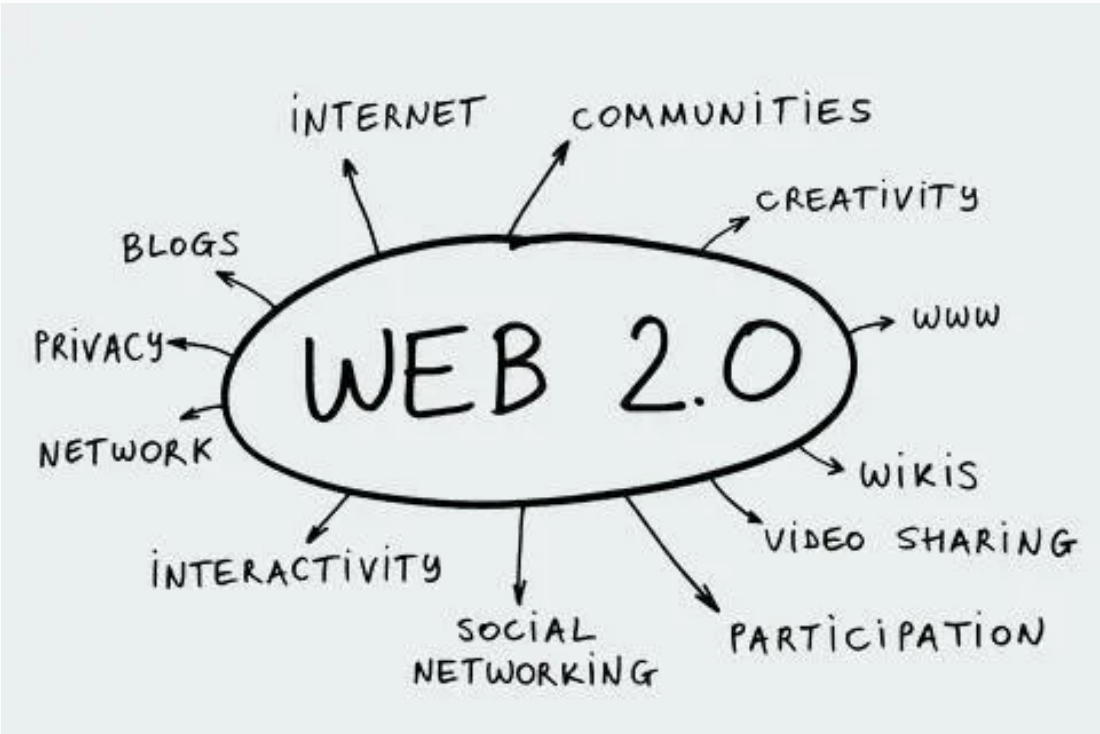
Web 2.0 introduced a more dynamic and participatory internet, where users could not only consume content but also generate it.

Interactivity and web applications
With technologies like AJAX, users could interact with faster, more dynamic web applications. Content could be updated without reloading the entire page.

Social platforms
Facebook, Twitter, YouTube, and Instagram became key platforms, encouraging online interaction and content sharing. The IPO of Google and the creation of Facebook in 2004 accelerated Web 2.0 adoption.

Content centralization
Despite greater user participation, content was still centralized within tech corporations, raising concerns about data privacy and control.

Social impact
Web 2.0 democratized content creation, enabled new business models, and facilitated social and political movements through online organization and expression.



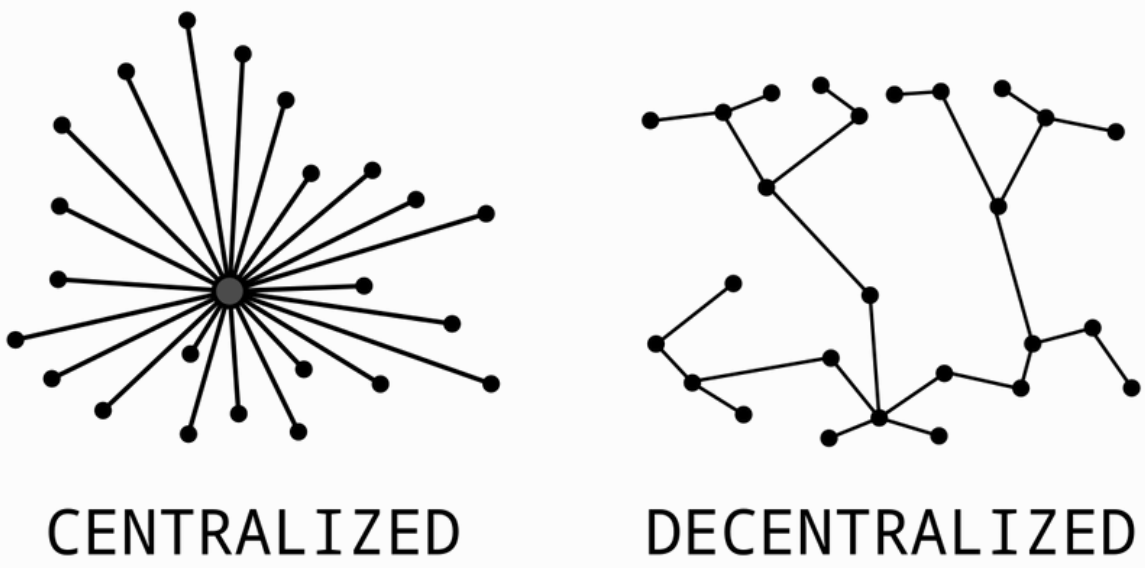
WEB 3.0 (2017-)

THE DECENTRALIZED WEB

Web 3.0 aims to return control over data and content to users using decentralized technologies.

Decentralization and autonomy

Web 3.0 seeks to replace centralized platforms with community-managed networks using blockchain and distributed ledger technologies, ensuring data privacy and eliminating intermediaries.



Token economy

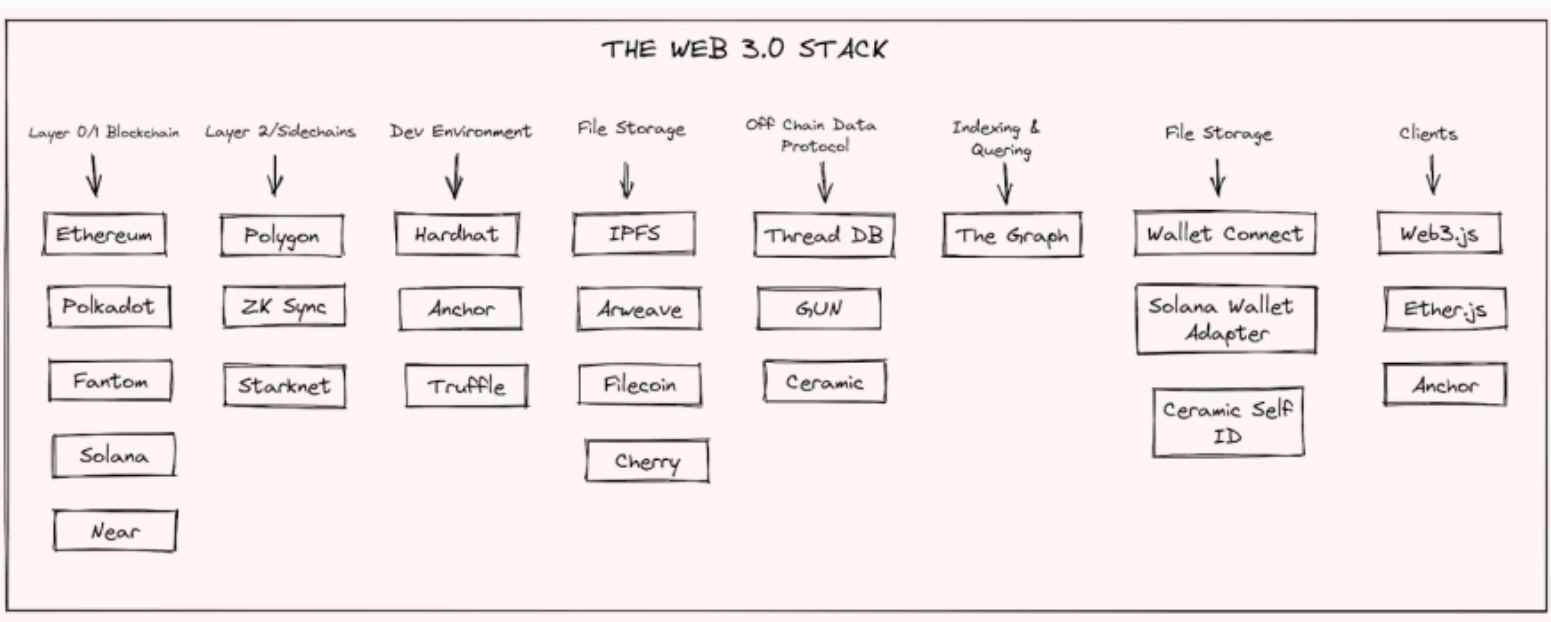
Cryptocurrencies and tokens exemplify the new economic model, where users are rewarded for participation and contributions.

Data ownership

Users control their data and digital identities, with secure platforms allowing full autonomy—unlike Web 2.0 where corporations held that power.

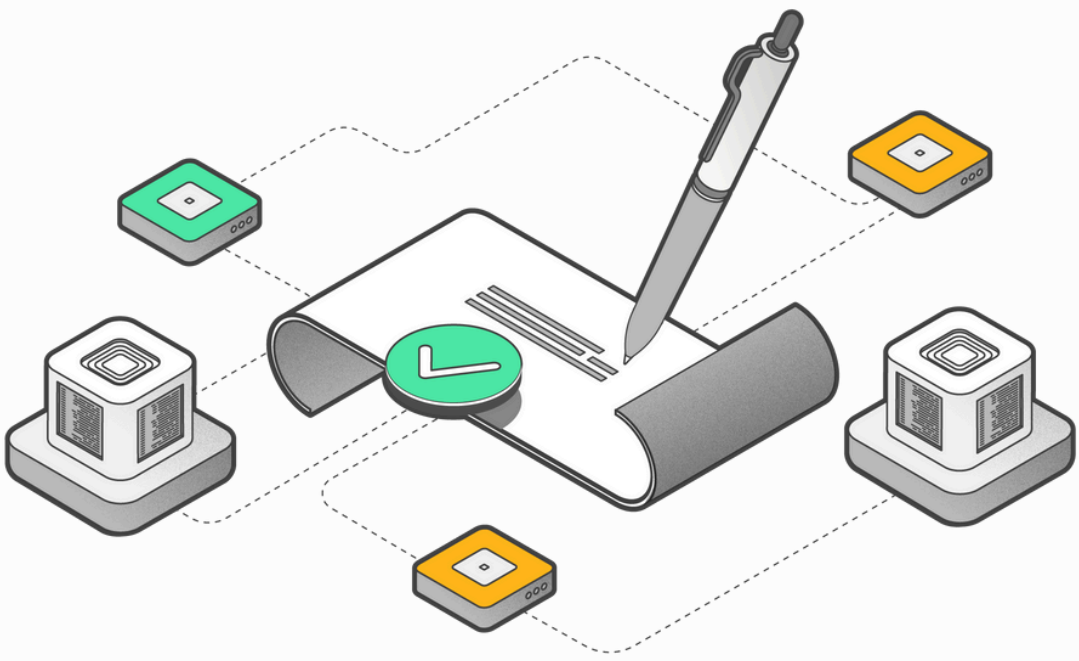
Technological innovations

Web 3.0 integrates AI, machine learning, and the semantic web to enhance intelligent and personalized interactions.



KEY WEB 3.0 TECNHONOLGIES

- **Public DLT/Blockchain:** Transparent, secure, verifiable transactions without intermediaries.
- **Smart Contracts:** Self-executing code enabling automated, secure transactions.
- **IPFS:** A decentralized protocol for file sharing and storage.



FEATURES OF WEB 3.0

- **Data ownership and control**
- **New forms of interaction and token-based economy**
- **Transparency and trust**
- **Decentralized identity**
- **DAOs for collective governance**
- **NFTs and creative ownership**
- **Metaverse and virtual environments**
- **Play-to-Earn games**

LIMITATIONS

- **Content moderation is difficult due to decentralization.**
- **Technical complexity creates adoption barriers.**
- **High costs and limited scalability**
- **User interfaces are often unintuitive.**
- **Regulatory uncertainty**

ETHEREUM

In the following module, we will explore how Ethereum became the leading platform for developing decentralized applications for Web 3.0, thanks to its network, tools, and its own programming language (Solidity).

Content adapted from Ethereum Foundation (n.d.) and Block & Capital (n.d.).