

# Web 3.0

**Web 3.0** is a term used to describe the future of the [World Wide Web](#). Following the introduction of the phrase "[Web 2.0](#)" as a description of the recent evolution of the Web, many technologists, journalists, and industry leaders[[who?](#)] have used the term "Web 3.0" to hypothesize about a future wave of Internet innovation.

Views on the next stage of the World Wide Web's evolution vary greatly. Some believe that emerging technologies such as the [Semantic Web](#) will transform the way the Web is used, and lead to new possibilities in [artificial intelligence](#).[\[citation needed\]](#) Other visionaries[[who?](#)] suggest that increases in Internet connection speeds, modular [web applications](#), or advances in [computer graphics](#) will play the key role in the evolution of the World Wide Web.[\[citation needed\]](#)

## Views of industry leaders

In May 2006, [Tim Berners-Lee](#), inventor of the World Wide Web stated[\[1\]](#):

People keep asking what Web 3.0 is., I think maybe when you've got an overlay of [scalable vector graphics](#) - everything rippling and folding and looking misty - on Web 2.0 and access to a semantic Web integrated across a huge space of data, you'll have access to an unbelievable data resource.

—[Tim Berners-Lee](#), <http://www.iht.com/articles/2006/05/23/business/web.php> A 'more revolutionary' World Wide Web]

At the [Seoul Digital Forum](#) in May 2007, [Eric Schmidt](#), CEO of Google, was asked to define Web 2.0 and Web 3.0.[\[2\]](#) He responded:

Web 2.0 is a marketing term, and I think you've just invented Web 3.0.

But if I were to guess what Web 3.0 is, I would tell you that it's a different way of building applications... My prediction would be that Web 3.0 will ultimately be seen as applications which are pieced together. There are a number of characteristics: the applications are relatively small, the data is in the cloud, the applications can run on any device, PC or mobile phone, the applications are very fast and they're very customizable. Furthermore, the applications are distributed virally: literally by social networks, by email. You won't go to the store and purchase them... That's a very different application model than we've ever seen in computing.

—[Eric Schmidt](#)

At the Technet Summit in [November 2006](#), [Jerry Yang](#), founder and Chief of [Yahoo](#), stated:[\[3\]](#)

Web 2.0 is well documented and talked about. The power of the Net reached a critical mass, with capabilities that can be done on a network level. We are also seeing richer devices over last four years and richer ways of interacting with the network, not only in hardware like game consoles and mobile devices, but also in the software layer. You don't have to be a computer scientist to create a program. We are seeing that manifest in Web 2.0 and 3.0 will be a great extension of that, a true communal medium...the distinction between professional, semi-professional and consumers will get blurred, creating a network effect of business and applications.

—[Jerry Yang](#)

At the same Technet Summit, [Reed Hastings](#), founder and CEO of [Netflix](#), stated a simpler formula

for defining the phases of the Web:

Web 1.0 was dial-up, 50K average bandwidth, Web 2.0 is an average 1 megabit of bandwidth and Web 3.0 will be 10 megabits of bandwidth all the time, which will be the full video Web, and that will feel like Web 3.0.

—[Reed Hastings](#)

## Web 3.0 debates

There is considerable debate as to what the term Web 3.0 means, and what a suitable definition might be.

### Transforming the Web into a database

The first step towards a "Web 3.0" is the emergence of "The Data Web" as structured data records are published to the Web in reusable and remotely queryable formats, such as [XML](#), [RDF](#), [Website Parse Template](#) and [microformats](#). The recent growth of [SPARQL](#) technology provides a standardized query language and API for searching across distributed RDF databases on the Web. The Data Web enables a new level of data integration and application interoperability, making data as openly accessible and linkable as Web pages. The Data Web is the first step on the path towards the full Semantic Web. In the Data Web phase, the focus is principally on making structured data available using RDF. The full Semantic Web stage will widen the scope such that both structured data and even what is traditionally thought of as unstructured or semi-structured content (such as Web pages, documents, etc.) will be widely available in RDF and OWL semantic formats. [4] [Website parse templates](#) will be used by Web 3.0 [crawlers](#) to get more precise information about [web sites'](#) structured [content](#).

### A path to artificial intelligence

Web 3.0 has also been used to describe an evolutionary path for the Web that leads to [artificial intelligence](#) that can reason about the Web in a quasi-human fashion. Some skeptics regard this as an unobtainable vision. However, companies such as [IBM](#) and [Google](#) are implementing new technologies that are yielding surprising information such as making predictions of hit songs from mining information on college music Web sites. There is also debate over whether the driving force behind Web 3.0 will be intelligent systems, or whether intelligence will emerge in a more organic fashion, from systems of intelligent people, such as via [collaborative filtering](#) services like [del.icio.us](#), [Flickr](#) and [Digg](#) that extract meaning and order from the existing Web and how people interact with it.[4]

### The realization of the Semantic Web and SOA

Related to the artificial intelligence direction, Web 3.0 could be the realization and extension of the [Semantic web](#) concept. Academic research is being conducted to develop software for reasoning, based on [description logic](#) and [intelligent agents](#). Such applications can perform logical reasoning operations using sets of rules that express logical relationships between concepts and data on the Web.[5]

Sramana Mitra differs on the viewpoint that Semantic Web would be the essence of the next generation of the Internet and proposes a formula to encapsulate Web 3.0. [6]

Web 3.0 has also been linked to a possible convergence of [Service-oriented architecture](#) and the [Semantic web](#). [7]

Web 3.0 is also called the "Internet of Services", i.e. besides the human readable part of the web there will be machine accessible SOA services which can be combined/orchestrated to higher level

of services.[8]

## Evolution towards 3D

Another possible path for Web 3.0 is towards the 3 dimensional vision championed by the [Web3D Consortium](#). This would involve the Web transforming into a series of 3D spaces, taking the concept realised by [Second Life](#) further.[9] This could open up new ways to connect and collaborate using 3D shared spaces.[10]

## Web 3.0 as an "Executable" Web Abstraction Layer

Where Web 1.0 was a "read-only" web, with content being produced by and large by the organizations backing any given site, and Web 2.0 was an extension into the "read-write" web that engaged users in an active role, Web 3.0 could extend this one step further by allowing people to modify the site or resource itself. With the still exponential growth of computer power, it is not inconceivable that the next generation of sites will be equipped with the resources to run user-contributed code on them.[*citation needed*] The "executable web" can morph online applications into [Omni Functional Platforms](#) that deliver a single interface rather than multiple nodes of functionality.[5][11]

## Web 3.0 as it relates to socio-technological values

The inclusion of the concept of a "Web 0.0" as the pre-existing real-world "sensual web" has been proposed. In that context Web 3.0 is the development of a series where integration of technologies for digital networking and processing is digested and non dissociable of the new "real-world". In this definition, Web 3.0 is "the biological, digital analog web where information is made of a plethora of digital values coalesced for sense and linked to the real-world by analog interfaces." [12]

## Proposed expanded definition

[Nova Spivack](#) defines Web 3.0 as the third decade of the Web (HYPERLINK "http://en.wikipedia.org/wiki/2010s" [2010–2020](#)) during which he suggests several major complementary technology trends will reach new levels of maturity simultaneously including:

- **transformation** of the Web from a network of separately siloed applications and content repositories to a more seamless and interoperable whole.
- **ubiquitous connectivity**, broadband adoption, mobile Internet access and mobile devices;
- **[network computing](#)**, software-as-a-service business models, HYPERLINK "http://en.wikipedia.org/wiki/Web\_service" [Web services](#) interoperability, HYPERLINK "http://en.wikipedia.org/wiki/Distributed\_computing" [distributed computing](#), HYPERLINK "http://en.wikipedia.org/wiki/Grid\_computing" [grid computing](#) and HYPERLINK "http://en.wikipedia.org/wiki/Cloud\_computing" [cloud computing](#);
- **open technologies**, open APIs and protocols, open data formats, open-source software platforms and open data (e.g. [Creative Commons](#), [Open Data License](#));
- **open identity**, [OpenID](#), open reputation, roaming portable identity and personal data;
- **the intelligent web**, [Semantic Web](#) technologies such as [RDF](#), [OWL](#), [SWRL](#), [SPARQL](#), [GRDDL](#), semantic application platforms, and statement-based datastores;
- **distributed databases**, the "World Wide Database" (enabled by Semantic Web technologies); and
- **intelligent applications**, natural language processing.[13], machine learning, machine reasoning, autonomous agents.[14]