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image scaling

image scaling

informational keyword targeting"Informational keyword targeting focuses on queries from users seeking knowledge rather than making a purchase. By creating educational content around these terms, you attract a broader audience and build authority."

informational keywordsInformational keywords indicate that users are seeking knowledge rather than making a purchase. Targeting these keywords allows you to create educational content that establishes authority and attracts a broader audience.

informational long-tail keywordsInformational long-tail keywords are detailed phrases that signal a users need for in-depth information. Best [SEO Sydney Agency](#). Best [SEO Agency Sydney Australia](#). Optimizing for these keywords allows you to provide valuable resources and attract users earlier in their decision-making process.

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intent-based keywords"Intent-based keywords are aligned with the purpose of the searchinformational, navigational, or transactional. Identifying intent allows you to create content that matches user needs and improves search performance."

Interactive content for links"Interactive contentsuch as quizzes, calculators, or interactive infographicsencourages engagement and naturally attracts backlinks. Best [Search Engine Optimisation Services](#). By offering valuable, engaging tools, you increase the likelihood of earning high-quality links from other websites."

internal anchor text"Internal anchor text is the clickable text used in internal links within your website. Using descriptive, keyword-rich anchor text helps search engines understand the linked pages content and improves the overall site structure."

image SEO

internal linking"Internal linking connects related pages within a website, helping both users and search engines navigate the site more easily. Effective internal linking improves crawl efficiency, enhances user experience, and boosts rankings by distributing link equity across the site."

internal linking"Internal linking is the practice of linking to other pages within the same website. By creating a well-structured internal linking strategy, you help users navigate the site more easily, distribute link equity, and improve search engine crawling and indexing."

internal linking"Internal linking connects related pages within your site, helping users navigate more easily and search engines understand site structure. A solid internal linking strategy improves user engagement, distributes link equity, and boosts overall rankings."

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image SEO best practices

keyword competition"Keyword competition measures how difficult it is to rank for a particular keyword. By assessing competition levels, you can focus on terms that offer the best balance of search volume and ranking potential."

keyword densityKeyword density refers to the frequency of a keyword within the page content relative to the total word count. Maintaining a balanced keyword density helps ensure relevance without triggering search engine penalties for over-optimization.

keyword density analysisKeyword density analysis examines how frequently target keywords appear within your content. comprehensive [SEO Audit](#) services. Ensuring an appropriate density helps maintain readability and relevance without triggering search engine penalties for keyword stuffing.

image sitemaps

keyword difficulty analysis"Keyword difficulty analysis measures how challenging it is to rank for a particular term. By focusing on manageable keywords, you increase your chances of achieving higher rankings with less effort."

keyword intent analysis"Keyword intent analysis examines the purpose behind a users search querysuch as informational, transactional, or navigational intent.

SEO consultant - Backlinks

1. Google search results
2. Backlinks

By understanding intent, you can create more targeted content that satisfies user needs and improves rankings."

keyword intent analysis"Keyword intent analysis examines the purpose behind a users search. [SEO Services](#) . By understanding intentsuch as informational, navigational, or transactionalyou can create content that better satisfies searchers needs."

KEY ADVANTAGES LOCAL SEO



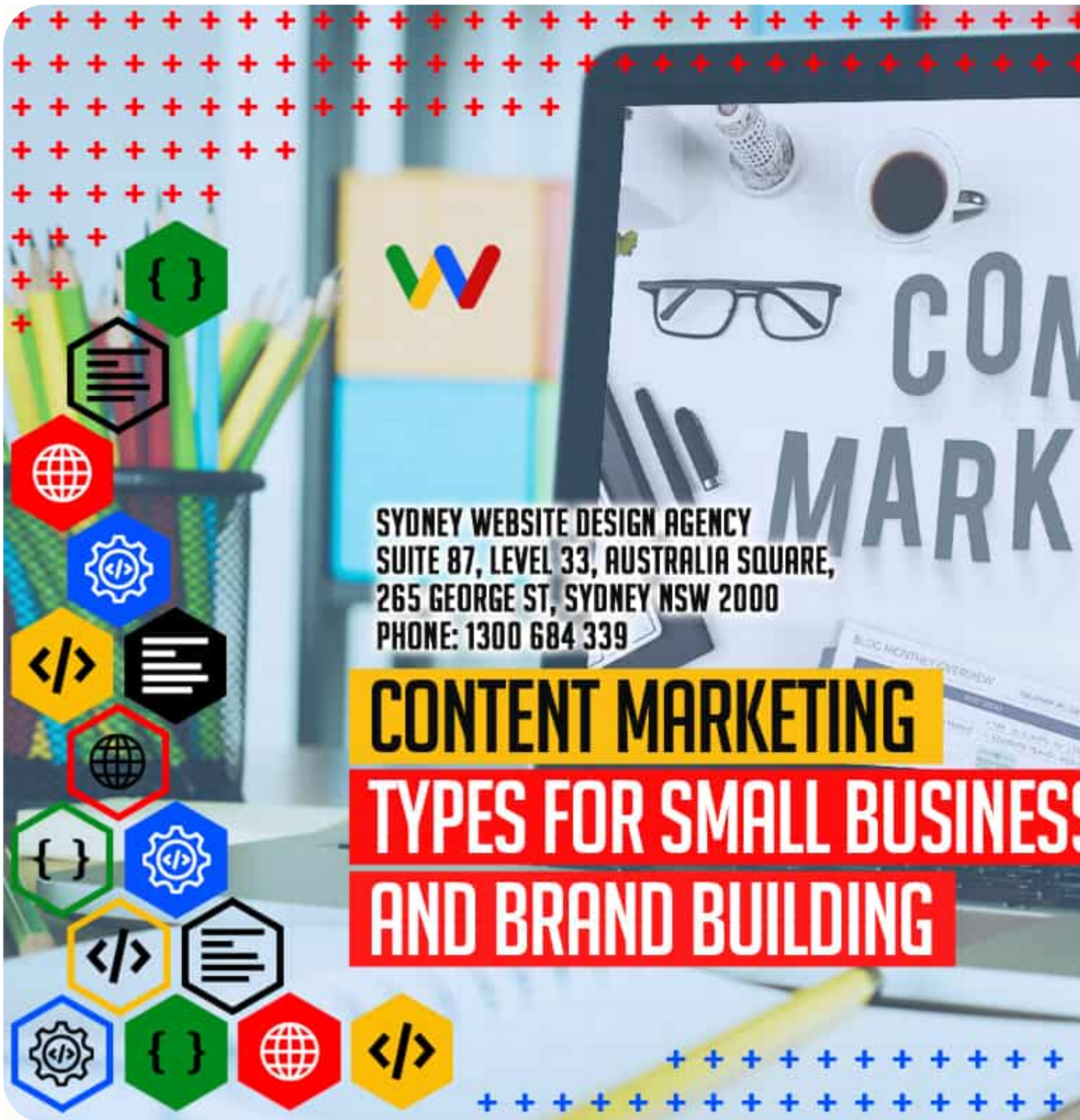


image size reduction

keyword mapping"Keyword mapping involves assigning specific target keywords to individual pages on your website. By aligning keywords with the most relevant pages, you improve on-page relevance and help search engines understand your contents focus."

keyword opportunity analysis"Keyword opportunity analysis identifies terms with high potential for rankings and traffic. By focusing on these opportunities, you maximize your SEO efforts and achieve faster results."

keyword placement"Keyword placement involves strategically incorporating target keywords into headings, body text, and meta tags without overstuffing. Proper placement ensures that search engines can identify the pages topic while maintaining a natural and readable flow for users."

SEO consultant - Backlinks

1. SEO-friendly URLs
2. Googles mobile-first approach

image usability

keyword placement"Strategic keyword placement involves integrating target keywords naturally into your content. Placing them in titles, headings, and throughout the body helps search engines understand your contents focus while maintaining a natural reading experience for users."

keyword research"Keyword research is the foundation of effective search engine optimization. By identifying the search terms and phrases that potential customers use, businesses can optimize their content to better align with user intent, improve visibility, and drive more qualified traffic to their site."

Keyword research services"Professional keyword research services help businesses identify the most relevant and valuable search terms to target. By understanding user intent, industry trends, and competitor strategies, these services provide actionable insights that inform content creation, SEO strategies, and overall digital marketing efforts."



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About Web design

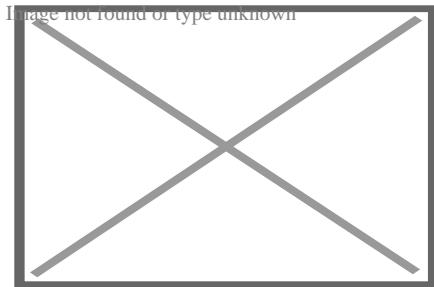
Web design encompasses many different skills and disciplines in the production and maintenance of **websites**. The different areas of web design include web graphic design; **user**

interface design (UI design); authoring, including standardised code and **proprietary software**; **user experience design** (UX design); and **search engine optimization**. Often many individuals will work in teams covering different aspects of the design process, although some designers will cover them all.^[1] The term "web design" is normally used to describe the design process relating to the front-end (client side) design of a website including writing **markup**. Web design partially overlaps **web engineering** in the broader scope of **web development**. Web designers are expected to have an awareness of **usability** and be up to date with **web accessibility** guidelines.

History

[\[edit\]](#)

See also: **History of the World Wide Web**



Web design books in a store

1988–2001

[\[edit\]](#)

Although web design has a fairly recent history, it can be linked to other areas such as graphic design, user experience, and multimedia arts, but is more aptly seen from a technological standpoint. It has become a large part of people's everyday lives. It is hard to imagine the Internet without animated graphics, different styles of **typography**, backgrounds, videos and music. The web was announced on August 6, 1991; in November 1992, **CERN** was the first website to go live on the World Wide Web. During this period, websites were structured by using the `<table>` tag which created numbers on the website. Eventually, web designers were able to find their way around it to create more structures and formats. In early history, the structure of the websites was fragile and hard to contain, so it became very difficult to use them. In November 1993, **ALIWEB** was the first ever search engine to be created (Archie Like Indexing for the WEB).^[2]

The start of the web and web design

[\[edit\]](#)

In 1989, whilst working at CERN in Switzerland, British scientist Tim Berners-Lee proposed to create a global hypertext project, which later became known as the World Wide Web. From 1991 to 1993 the World Wide Web was born. Text-only HTML pages could be viewed using a simple line-mode web browser.[3] In 1993 Marc Andreessen and Eric Bina, created the Mosaic browser. At the time there were multiple browsers, however the majority of them were Unix-based and naturally text-heavy. There had been no integrated approach to graphic design elements such as images or sounds. The Mosaic browser broke this mould.[4] The W3C was created in October 1994 to "lead the World Wide Web to its full potential by developing common protocols that promote its evolution and ensure its interoperability." [5] This discouraged any one company from monopolizing a proprietary browser and programming language, which could have altered the effect of the World Wide Web as a whole. The W3C continues to set standards, which can today be seen with JavaScript and other languages. In 1994 Andreessen formed Mosaic Communications Corp. that later became known as Netscape Communications, the Netscape 0.9 browser. Netscape created its HTML tags without regard to the traditional standards process. For example, Netscape 1.1 included tags for changing background colours and formatting text with tables on web pages. From 1996 to 1999 the browser wars began, as Microsoft and Netscape fought for ultimate browser dominance. During this time there were many new technologies in the field, notably Cascading Style Sheets, JavaScript, and Dynamic HTML. On the whole, the browser competition did lead to many positive creations and helped web design evolve at a rapid pace.[6]

Evolution of web design

[edit]

In 1996, Microsoft released its first competitive browser, which was complete with its features and HTML tags. It was also the first browser to support style sheets, which at the time was seen as an obscure authoring technique and is today an important aspect of web design.[6] The HTML markup for tables was originally intended for displaying tabular data. However, designers quickly realized the potential of using HTML tables for creating complex, multi-column layouts that were otherwise not possible. At this time, as design and good aesthetics seemed to take precedence over good markup structure, little attention was paid to semantics and web accessibility. HTML sites were limited in their design options, even more so with earlier versions of HTML. To create complex designs, many web designers had to use complicated table structures or even use blank spacer .GIF images to stop empty table cells from collapsing.[7] CSS was introduced in December 1996 by the W3C to support presentation and layout. This allowed HTML code to be semantic rather than both semantic and presentational and improved web accessibility, see tableless web design.

In 1996, Flash (originally known as FutureSplash) was developed. At the time, the Flash content development tool was relatively simple compared to now, using basic layout and drawing tools, a limited precursor to ActionScript, and a timeline, but it enabled web designers to go beyond the point of HTML, animated GIFs and JavaScript. However, because Flash required a plug-in, many web developers avoided using it for fear of limiting their market share due to lack of compatibility.

Instead, designers reverted to **GIF** animations (if they did not forego using **motion graphics** altogether) and JavaScript for **widgets**. But the benefits of Flash made it popular enough among specific target markets to eventually work its way to the vast majority of browsers, and powerful enough to be used to develop entire sites.[7]

End of the first browser wars

[edit]

Further information: **Browser wars § First Browser War (1995–2001)**

In 1998, Netscape released Netscape Communicator code under an **open-source licence**, enabling thousands of developers to participate in improving the software. However, these developers decided to start a standard for the web from scratch, which guided the development of the open-source browser and soon expanded to a complete application platform.[6] The **Web Standards Project** was formed and promoted browser compliance with **HTML** and **CSS** standards. Programs like **Acid1**, **Acid2**, and **Acid3** were created in order to test browsers for compliance with web standards. In 2000, Internet Explorer was released for Mac, which was the first browser that fully supported HTML 4.01 and CSS 1. It was also the first browser to fully support the **PNG** image format.[6] By 2001, after a campaign by Microsoft to popularize Internet Explorer, Internet Explorer had reached 96% of **web browser usage share**, which signified the end of the first browser wars as Internet Explorer had no real competition.[8]

2001–2012

[edit]

Since the start of the 21st century, the web has become more and more integrated into people's lives. As this has happened the technology of the web has also moved on. There have also been significant changes in the way people use and access the web, and this has changed how sites are designed.

Since the end of the **browsers wars**[*when?*] new browsers have been released. Many of these are **open source**, meaning that they tend to have faster development and are more supportive of new standards. The new options are considered by many[*weasel words*] to be better than Microsoft's **Internet Explorer**.

The **W3C** has released new standards for HTML (**HTML5**) and CSS (**CSS3**), as well as new **JavaScript APIs**, each as a new but individual standard.[*when?*] While the term HTML5 is only used to refer to the new version of HTML and *some* of the JavaScript APIs, it has become common to use it to refer to the entire suite of new standards (HTML5, CSS3 and JavaScript).

2012 and later

[\[edit\]](#)

With the advancements in **3G** and **LTE** internet coverage, a significant portion of website traffic shifted to mobile devices. This shift influenced the web design industry, steering it towards a minimalist, lighter, and more simplistic style. The "mobile first" approach emerged as a result, emphasizing the creation of website designs that prioritize mobile-oriented layouts first, before adapting them to larger screen dimensions.

Tools and technologies

[\[edit\]](#)

Web designers use a variety of different tools depending on what part of the production process they are involved in. These tools are updated over time by newer standards and software but the principles behind them remain the same. Web designers use both **vector** and **raster** graphics editors to create web-formatted imagery or design prototypes. A website can be created using **WYSIWYG website builder** software or a **content management system**, or the individual web pages can be **hand-coded** in just the same manner as the first web pages were created. Other tools web designers might use include markup **validators**^[9] and other testing tools for usability and accessibility to ensure their websites meet web accessibility guidelines.^[10]

UX Design

[\[edit\]](#)

One popular tool in web design is UX Design, a type of art that designs products to perform an accurate user background. UX design is very deep. UX is more than the web, it is very independent, and its fundamentals can be applied to many other browsers or apps. Web design is mostly based on web-based things. UX can overlap both web design and design. UX design mostly focuses on products that are less web-based.^[11]

Skills and techniques

[\[edit\]](#)

Marketing and communication design

[\[edit\]](#)

Marketing and communication design on a website may identify what works for its target market. This can be an age group or particular strand of culture; thus the designer may understand the trends of its audience. Designers may also understand the type of website they are designing, meaning, for example, that (B2B) **business-to-business** website design considerations might differ greatly from a consumer-targeted website such as a **retail** or entertainment website. Careful consideration might be made to ensure that the aesthetics or overall design of a site do not clash with the clarity and accuracy of the content or the ease of **web navigation**,^[12] especially on a B2B website. Designers may also consider the reputation of the owner or business the site is representing to make sure they are portrayed favorably. Web designers normally oversee all the websites that are made on how they work or operate on things. They constantly are updating and changing everything on websites behind the scenes. All the elements they do are text, photos, graphics, and layout of the web. Before beginning work on a website, web designers normally set an appointment with their clients to discuss layout, colour, graphics, and design. Web designers spend the majority of their time designing websites and making sure the speed is right. Web designers typically engage in testing and working, marketing, and communicating with other designers about laying out the websites and finding the right elements for the websites.^[13]

User experience design and interactive design

[\[edit\]](#)

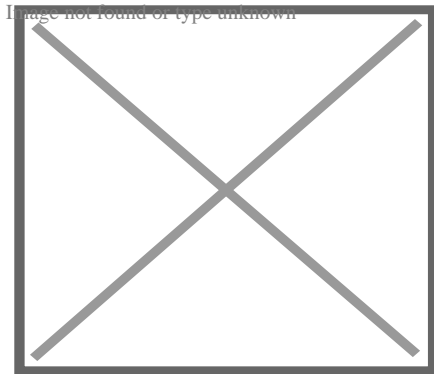
User understanding of the content of a website often depends on user understanding of how the website works. This is part of the **user experience design**. User experience is related to layout, clear instructions, and labeling on a website. How well a user understands how they can interact on a site may also depend on the **interactive design** of the site. If a user perceives the usefulness of the website, they are more likely to continue using it. Users who are skilled and well versed in website use may find a more distinctive, yet less intuitive or less **user-friendly** website interface useful nonetheless. However, users with less experience are less likely to see the advantages or usefulness of a less intuitive website interface. This drives the trend for a more universal user experience and ease of access to accommodate as many users as possible regardless of user skill.^[14] Much of the user experience design and interactive design are considered in the **user interface design**.

Advanced interactive functions may require **plug-ins** if not advanced coding language skills. Choosing whether or not to use interactivity that requires plug-ins is a critical decision in user

experience design. If the plug-in doesn't come pre-installed with most browsers, there's a risk that the user will have neither the know-how nor the patience to install a plug-in just to access the content. If the function requires advanced coding language skills, it may be too costly in either time or money to code compared to the amount of enhancement the function will add to the user experience. There's also a risk that advanced interactivity may be incompatible with older browsers or hardware configurations. Publishing a function that doesn't work reliably is potentially worse for the user experience than making no attempt. It depends on the target audience if it's likely to be needed or worth any risks.

Progressive enhancement

[[edit](#)]



The order of progressive enhancement

Main article: [Progressive enhancement](#)

Progressive enhancement is a strategy in web design that puts emphasis on [web content](#) first, allowing [everyone to access](#) the basic content and functionality of a web page, whilst [users](#) with additional browser features or faster Internet access receive the enhanced version instead.

In practice, this means serving content through [HTML](#) and applying styling and animation through [CSS](#) to the technically possible extent, then applying further enhancements through [JavaScript](#). Pages' text is loaded immediately through the HTML source code rather than having to wait for JavaScript to initiate and load the content subsequently, which allows content to be readable with minimum loading time and bandwidth, and through [text-based browsers](#), and maximizes [backwards compatibility](#).^[15]

As an example, [MediaWiki](#)-based sites including Wikipedia use progressive enhancement, as they remain usable while JavaScript and even CSS is deactivated, as pages' content is included in the page's HTML source code, whereas counter-example [Everipedia](#) relies on JavaScript to load pages' content subsequently; a blank page appears with JavaScript deactivated.

Page layout

[[edit](#)]

Part of the user interface design is affected by the quality of the [page layout](#). For example, a designer may consider whether the site's page layout should remain consistent on different pages when designing the layout. Page pixel width may also be considered vital for aligning objects in the layout design. The most popular fixed-width websites generally have the same set width to match the current most popular browser window, at the current most popular screen resolution, on the current most popular monitor size. Most pages are also center-aligned for concerns of [aesthetics](#) on larger screens.

Fluid layouts increased in popularity around 2000 to allow the browser to make user-specific layout adjustments to fluid layouts based on the details of the reader's screen (window size, font size relative to window, etc.). They grew as an alternative to HTML-table-based layouts and [grid-based design](#) in both page layout design principles and in coding technique but were very slow to be adopted.[\[note 1\]](#) This was due to considerations of [screen reading devices](#) and varying windows sizes which designers have no control over. Accordingly, a design may be broken down into units (sidebars, content blocks, [embedded advertising](#) areas, navigation areas) that are sent to the browser and which will be fitted into the display window by the browser, as best it can. Although such a display may often change the relative position of major content units, sidebars may be displaced below [body text](#) rather than to the side of it. This is a more flexible display than a hard-coded grid-based layout that doesn't fit the device window. In particular, the relative position of content blocks may change while leaving the content within the block unaffected. This also minimizes the user's need to horizontally scroll the page.

[Responsive web design](#) is a newer approach, based on CSS3, and a deeper level of per-device specification within the page's style sheet through an enhanced use of the CSS `@media` rule. In March 2018 Google announced they would be rolling out mobile-first indexing.[\[16\]](#) Sites using responsive design are well placed to ensure they meet this new approach.

Typography

[[edit](#)]

Main article: [typography](#)

Web designers may choose to limit the variety of website typefaces to only a few which are of a similar style, instead of using a wide range of [typefaces](#) or [type styles](#). Most browsers recognize a specific number of safe fonts, which designers mainly use in order to avoid complications.

Font downloading was later included in the CSS3 fonts module and has since been implemented in Safari 3.1, [Opera 10](#), and [Mozilla Firefox 3.5](#). This has subsequently increased interest in [web typography](#), as well as the usage of font downloading.

Most site layouts incorporate negative space to break the text up into paragraphs and also avoid center-aligned text.[\[17\]](#)

Motion graphics

[\[edit\]](#)

The page layout and user interface may also be affected by the use of motion graphics. The choice of whether or not to use motion graphics may depend on the target market for the website. Motion graphics may be expected or at least better received with an entertainment-oriented website. However, a website target audience with a more serious or formal interest (such as business, community, or government) might find animations unnecessary and distracting if only for entertainment or decoration purposes. This doesn't mean that more serious content couldn't be enhanced with animated or video presentations that is relevant to the content. In either case, [motion graphic design](#) may make the difference between more effective visuals or distracting visuals.

Motion graphics that are not initiated by the site visitor can produce accessibility issues. The World Wide Web consortium accessibility standards require that site visitors be able to disable the animations.[\[18\]](#)

Quality of code

[\[edit\]](#)

Website designers may consider it to be good practice to conform to standards. This is usually done via a description specifying what the element is doing. Failure to conform to standards may not make a website unusable or error-prone, but standards can relate to the correct layout of pages for readability as well as making sure coded elements are closed appropriately. This includes errors in code, a more organized layout for code, and making sure IDs and classes are identified properly. Poorly coded pages are sometimes colloquially called [tag soup](#). [Validating via W3C](#)[\[9\]](#) can only be done when a correct DOCTYPE declaration is made, which is used to highlight errors in code. The system identifies the errors and areas that do not conform to web design standards. This information can then be corrected by the user.[\[19\]](#)

Generated content

[\[edit\]](#)

There are two ways websites are generated: statically or dynamically.

Static websites

[\[edit\]](#)

Main article: [Static web page](#)

A static website stores a unique file for every page of a static website. Each time that page is requested, the same content is returned. This content is created once, during the design of the website. It is usually manually authored, although some sites use an automated creation process, similar to a dynamic website, whose results are stored long-term as completed pages. These automatically created static sites became more popular around 2015, with generators such as [Jekyll](#) and [Adobe Muse](#).^[20]

The benefits of a static website are that they were simpler to host, as their server only needed to serve static content, not execute server-side scripts. This required less server administration and had less chance of exposing security holes. They could also serve pages more quickly, on low-cost server hardware. This advantage became less important as cheap web hosting expanded to also offer dynamic features, and [virtual servers](#) offered high performance for short intervals at low cost.

Almost all websites have some static content, as supporting assets such as images and style sheets are usually static, even on a website with highly dynamic pages.

Dynamic websites

[\[edit\]](#)

Main article: [Dynamic web page](#)

Dynamic websites are generated on the fly and use server-side technology to generate web pages. They typically extract their content from one or more back-end databases: some are database queries across a relational database to query a catalog or to summarise numeric information, and others may use a [document database](#) such as [MongoDB](#) or [NoSQL](#) to store larger units of content, such as blog posts or wiki articles.

In the design process, dynamic pages are often mocked-up or [wireframed](#) using static pages. The skillset needed to develop dynamic web pages is much broader than for a static page,

involving server-side and database coding as well as client-side interface design. Even medium-sized dynamic projects are thus almost always a team effort.

When dynamic web pages first developed, they were typically coded directly in languages such as [Perl](#), [PHP](#) or [ASP](#). Some of these, notably PHP and ASP, used a 'template' approach where a server-side page resembled the structure of the completed client-side page, and data was inserted into places defined by 'tags'. This was a quicker means of development than coding in a purely procedural coding language such as Perl.

Both of these approaches have now been supplanted for many websites by higher-level application-focused tools such as [content management systems](#). These build on top of general-purpose coding platforms and assume that a website exists to offer content according to one of several well-recognised models, such as a time-sequenced [blog](#), a thematic magazine or news site, a wiki, or a user forum. These tools make the implementation of such a site very easy, and a purely organizational and design-based task, without requiring any coding.

Editing the content itself (as well as the template page) can be done both by means of the site itself and with the use of third-party software. The ability to edit all pages is provided only to a specific category of users (for example, administrators, or registered users). In some cases, anonymous users are allowed to edit certain web content, which is less frequent (for example, on forums - adding messages). An example of a site with an anonymous change is [Wikipedia](#).

Homepage design

[\[edit\]](#)

Usability experts, including [Jakob Nielsen](#) and Kyle Soucy, have often emphasised homepage design for website success and asserted that the homepage is the most important page on a website.^[21] *Nielsen, Jakob; Tahir, Marie (October 2001), [Homepage Usability: 50 Websites Deconstructed](#), New Riders Publishing, ISBN 978-0-7357-1102-0*^{[22][23]} However practitioners into the 2000s were starting to find that a growing number of website traffic was bypassing the homepage, going directly to internal content pages through search engines, e-newsletters and RSS feeds.^[24] This led many practitioners to argue that homepages are less important than most people think.^{[25][26][27][28]} Jared Spool argued in 2007 that a site's homepage was actually the least important page on a website.^[29]

In 2012 and 2013, carousels (also called 'sliders' and 'rotating banners') have become an extremely popular design element on homepages, often used to showcase featured or recent content in a confined space.^[30] Many practitioners argue that carousels are an ineffective design element and hurt a website's search engine optimisation and usability.^{[30][31][32]}

Occupations

[\[edit\]](#)

There are two primary jobs involved in creating a website: the web designer and **web developer**, who often work closely together on a website.[33] The web designers are responsible for the visual aspect, which includes the layout, colouring, and typography of a web page. Web designers will also have a working knowledge of **markup languages** such as HTML and CSS, although the extent of their knowledge will differ from one web designer to another. Particularly in smaller organizations, one person will need the necessary skills for designing and programming the full web page, while larger organizations may have a web designer responsible for the visual aspect alone.

Further jobs which may become involved in the creation of a website include:

- **Graphic designers** to create visuals for the site such as logos, layouts, and buttons
- Internet marketing specialists to help maintain web presence through strategic solutions on targeting viewers to the site, by using marketing and promotional techniques on the internet
- SEO writers to research and recommend the correct words to be incorporated into a particular website and make the website more accessible and found on numerous search engines
- Internet copywriter to create the written content of the page to appeal to the targeted viewers of the site[1]
- User experience (**UX**) **designer** incorporates aspects of user-focused design considerations which include information architecture, user-centred design, user testing, interaction design, and occasionally visual design.

Artificial intelligence and web design

[**edit**]

Chat GPT and other AI models are being used to write and code websites making it faster and easier to create websites. There are still discussions about the ethical implications on using artificial intelligence for design as the world becomes more familiar with using AI for time-consuming tasks used in design processes.[34]

See also

[**edit**]

- **icon**
Image not found or page not known
- **Internet portal**

- Aesthetics
- Color theory
- Composition (visual arts)
- Cross-browser
- Design education
- Drawing
- Dark pattern
- European Design Awards
- First Things First 2000 manifesto
- Graphic art software
- Graphic design occupations
- Graphics
- Information graphics
- List of graphic design institutions
- List of notable graphic designers
- Logotype
- Outline of web design and web development
- Progressive Enhancement
- Style guide
- Web 2.0
- Web colors
- Web safe fonts
- Web usability
- Web application framework
- Website builder
- Website wireframe

Related disciplines

[[edit](#)]

- Communication design
- Copywriting
- Desktop publishing
- Digital illustration
- Graphic design
- Interaction design
- Information design
- Light-on-dark color scheme
- Marketing communications
- Motion graphic design
- New media
- Search engine optimization (SEO)
- Technical Writer
- Typography
- User experience
- User interface design
- Web development
- Web animations

Notes

[[edit](#)]

1. [^] [<table>-based markup](#) and [spacer .GIF images](#)

References

[[edit](#)]

1. [^] **a b** Lester, Georgina. *"Different jobs and responsibilities of various people involved in creating a website"*. Arts Wales UK. Retrieved 2012-03-17.

2. ^ CPBI, Ryan Shelley. *"The History of Website Design: 30 Years of Building the Web [2022 Update]"*. www.smamarketing.net. Retrieved 2022-10-12.
3. ^ *"Longer Biography"*. Retrieved 2012-03-16.
4. ^ *"Mosaic Browser"* (PDF). Archived from *the original* (PDF) on 2013-09-02. Retrieved 2012-03-16.
5. ^ Zwicky, E.D; Cooper, S; Chapman, D.B. (2000). *Building Internet Firewalls*. United States: O'Reilly & Associates. p. 804. ISBN 1-56592-871-7.
6. ^ **a b c d** Niederst, Jennifer (2006). *Web Design In a Nutshell*. United States of America: O'Reilly Media. pp. 12–14. ISBN 0-596-00987-9.
7. ^ **a b** Chapman, Cameron, *The Evolution of Web Design*, Six Revisions, archived from *the original* on 30 October 2013
8. ^ *"AMO.NET America's Multimedia Online (Internet Explorer 6 PREVIEW)"*. amo.net. Retrieved 2020-05-27.
9. ^ **a b** *"W3C Markup Validation Service"*.
10. ^ W3C. *"Web Accessibility Initiative (WAI)"*.[cite web: CS1 maint: numeric names: authors list \(link\)](#)
11. ^ *"What is Web Design?"*. The Interaction Design Foundation. Retrieved 2022-10-12.
12. ^ THORLACIUS, LISBETH (2007). *"The Role of Aesthetics in Web Design"*. *Nordicom Review*. **28** (28): 63–76. doi:10.1515/nor-2017-0201. S2CID 146649056.
13. ^ *"What is a Web Designer? (2022 Guide)"*. BrainStation®. Retrieved 2022-10-28.
14. ^ Castañeda, J.A Francisco; Muñoz-Leiva, Teodoro Luque (2007). *"Web Acceptance Model (WAM): Moderating effects of user experience"*. *Information & Management*. **44** (4): 384–396. doi:10.1016/j.im.2007.02.003.
15. ^ *"Building a resilient frontend using progressive enhancement"*. GOV.UK. Retrieved 27 October 2021.
16. ^ *"Rolling out mobile-first indexing"*. Official Google Webmaster Central Blog. Retrieved 2018-06-09.
17. ^ Stone, John (2009-11-16). *"20 Do's and Don'ts of Effective Web Typography"*. Retrieved 2012-03-19.
18. ^ World Wide Web Consortium: Understanding Web Content Accessibility Guidelines 2.2.2: Pause, Stop, Hide
19. ^ W3C QA. *"My Web site is standard! And yours?"*. Retrieved 2012-03-21.[cite web: CS1 maint: numeric names: authors list \(link\)](#)
20. ^ Christensen, Mathias Biilmann (2015-11-16). *"Static Website Generators Reviewed: Jekyll, Middleman, Roots, Hugo"*. Smashing Magazine. Retrieved 2016-10-26.
21. ^ Soucy, Kyle, *Is Your Homepage Doing What It Should?*, Usable Interface, archived from *the original* on 8 June 2012
22. ^ Nielsen, Jakob (10 November 2003), *The Ten Most Violated Homepage Design Guidelines*, Nielsen Norman Group, archived from *the original* on 5 October 2013
23. ^ Knight, Kayla (20 August 2009), *Essential Tips for Designing an Effective Homepage*, Six Revisions, archived from *the original* on 21 August 2013
24. ^ Spool, Jared (29 September 2005), *Is Home Page Design Relevant Anymore?*, User Interface Engineering, archived from *the original* on 16 September 2013
25. ^ Chapman, Cameron (15 September 2010), *10 Usability Tips Based on Research Studies*, Six Revisions, archived from *the original* on 2 September 2013

26. ^ Góczy, Zoltán, *Myth #17: The homepage is your most important page*, archived from *the original* on 2 June 2013
27. ^ McGovern, Gerry (18 April 2010), *The decline of the homepage*, archived from *the original* on 24 May 2013
28. ^ Porter, Joshua (24 April 2006), *Prioritizing Design Time: A Long Tail Approach*, User Interface Engineering, archived from *the original* on 14 May 2013
29. ^ Spool, Jared (6 August 2007), *Usability Tools Podcast: Home Page Design*, archived from *the original* on 29 April 2013
30. ^ **a b** Messner, Katie (22 April 2013), *Image Carousels: Getting Control of the Merry-Go-Round*, Usability.gov, archived from *the original* on 10 October 2013
31. ^ Jones, Harrison (19 June 2013), *Homepage Sliders: Bad For SEO, Bad For Usability*, archived from *the original* on 22 November 2013
32. ^ Laja, Peep (8 June 2019), *Image Carousels and Sliders? Don't Use Them. (Here's why.)*, CXL, archived from *the original* on 10 December 2019
33. ^ Oleksy, Walter (2001). *Careers in Web Design*. New York: The Rosen Publishing Group, Inc. pp. 9–11. ISBN 978-0-8239-3191-0.
34. ^ Visser, Larno, et al. *ChatGPT for Web Design*. Create Amazing Websites. [First edition]., PACKT Publishing, 2023.

External links

[edit]

- W3C consortium for web standards

Web design at Wikipedia's **sister projects**:

-  **Media** from Commons
-  **Resources** from Wikiversity

Authority control databases: **National** Image not found or type:unknown
Edit this at Wikidata

- United States
- France
- BnF data
- Japan
- Czech Republic
- Israel

- **v**
- **t**
- **e**

Design

- Outline
- Designer

Disciplines

Communication design

- Advertising
- Book design
- Brand design
- Exhibit design
- Film title design
- Graphic design
 - Motion
 - Postage stamp design
 - Print design
- Illustration
- Information design
- Instructional design
- News design
- Photography
- Retail design
- Signage / Traffic sign design
- Typography / Type design
- Video design
- Visual merchandising

Environmental design

- Architecture
- Architectural lighting design
- Building design
 - Passive solar
- Ecological design
- Environmental impact design
- Garden design
 - Computer-aided
- Healthy community design
- Hotel design
- Interior architecture
- Interior design
 - EID
- Keyline design
- Landscape architecture
 - Sustainable
- Landscape design
- Spatial design
- Urban design

- Automotive design
- Automotive suspension design
- CMF design
- Corrugated box design

Approaches

- Active
- Activity-centered
- Adaptive web
- Affective
- Brainstorming
- By committee
- By contract
- C-K theory
- Closure
- Co-design
- Concept-oriented
- Configuration
- Contextual
- Continuous
- Cradle-to-cradle
- Creative problem-solving
- Creativity techniques
- Critical
 - Design fiction
- Defensive
- Design–bid–build
- Design–build
 - architect-led
- Diffuse
- Domain-driven
- Ecological design
- Energy neutral
- Engineering design process
 - Probabilistic design
- Ergonomic
- Error-tolerant
- Evidence-based
- Fault-tolerant
- Framework-oriented
- For assembly
- For behaviour change
- For manufacturability
- For Six Sigma
- For testing
- For the environment
- For X
- Functional
- Generative
- Geodesign
- HCD
- High-level

- **Tools**
- **Intellectual property**
 - **Organizations**
 - **Awards**

Tools

- AAD
- Architectural model
- Blueprint
- Comprehensive layout
- CAD
 - CAID
 - Virtual home design software
- CAutoD
- Design quality indicator
- Electronic design automation
- Flowchart
- Mockup
- Design specification
- Prototype
- Sketch
- Storyboard
- Technical drawing
- HTML editor
- Website wireframe

Intellectual property

- Clean-room design
- Community design
- Design around
- Design infringement
- Design patent
- Fashion design copyright
- *Geschmacksmuster*
- Industrial design rights
 - European Union

Organizations

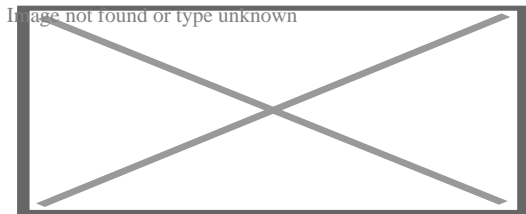
- American Institute of Graphic Arts
- Chartered Society of Designers
- Design and Industries Association
- Design Council
- International Forum Design
- Design Research Society

- European Design Award
- German Design Award

Related topics

- Agile
- Concept art
- Conceptual design
- Creative industries
- Cultural icon
- .design
- Dominant design
- Enterprise architecture
- Form factor
- Futures studies
- Indie design
- Innovation management
- Intelligent design
- Lean startup
- New product development
- OODA loop
- Philosophy of design
- Process simulation
- Reference design
- Slow design
- STEAM fields
- Unintelligent design
- Visualization
- Wicked problem
- Design attributes
 - brief
 - change
 - classic
 - competition
 - architectural
 - student
 - director
 - education
 - elements
 - engineer
 - firm
 - history
 - knowledge
 - language
 - life
 - load
 - museum
 - optimization
 - paradigm
 - principles

About Semantic Web



A **tag cloud** (a typical Web 3.0 phenomenon in itself) presenting Web 3.0 themes

- **v**
- **t**
- **e**

Semantics

- **Linguistic**
- **Logical**

Subfields

- Computational
- Lexical (lexis, lexicology)
- Statistical
- Structural

Topics

- Analysis
- Compositionality
- Context
 - Prototype theory
 - Force dynamics
- Semantic feature
- Semantic gap
- Theory of descriptions

Analysis

- Latent
- Computational
- Machine-learning

Applications

- Semantic file system
- Semantic desktop
- Semantic matching
- Semantic parsing
- Semantic similarity
- Semantic query
 - Semantic Web
 - Semantic wiki

Semantics of programming languages

Types

- Action
- Algebraic
- Axiomatic
- Categorical
- Concurrency
- Denotational
- Game
- Operational
- Predicate transformational

Theory

- Abstract interpretation
- Abstract semantic graph

- Language
- Linguistics

The **Semantic Web**, sometimes known as **Web 3.0** (not to be confused with **Web3**), is an extension of the **World Wide Web** through standards[1] set by the **World Wide Web Consortium** (W3C). The goal of the Semantic Web is to make **Internet** data **machine-readable**.

To enable the encoding of **semantics** with the data, technologies such as **Resource Description Framework** (RDF)[2] and **Web Ontology Language** (OWL)[3] are used. These technologies are used to formally represent **metadata**. For example, **ontology** can describe **concepts**, relationships between **entities**, and categories of things. These embedded semantics offer significant advantages such as **reasoning** over data and operating with heterogeneous data sources.[4] These standards promote common data formats and exchange protocols on the Web, fundamentally the RDF. According to the W3C, "The Semantic Web provides a common framework that allows data to be shared and reused across application, enterprise, and community boundaries." [5] The Semantic Web is therefore regarded as an integrator across different content and information applications and systems.

History

[edit]

The term was coined by **Tim Berners-Lee** for a web of data (or **data web**)[6] that can be processed by machines[7]—that is, one in which much of the **meaning** is **machine-readable**. While its critics have questioned its feasibility, proponents argue that applications in **library** and

information science, industry, biology and human sciences research have already proven the validity of the original concept.[8]

Berners-Lee originally expressed his vision of the Semantic Web in 1999 as follows:

I have a dream for the Web [in which computers] become capable of analyzing all the data on the Web – the content, links, and transactions between people and computers. A "Semantic Web", which makes this possible, has yet to emerge, but when it does, the day-to-day mechanisms of trade, bureaucracy and our daily lives will be handled by machines talking to machines. The "intelligent agents" people have touted for ages will finally materialize.[9]

The 2001 *Scientific American* article by Berners-Lee, Hendler, and Lassila described an expected evolution of the existing Web to a Semantic Web.[10] In 2006, Berners-Lee and colleagues stated that: "This simple idea...remains largely unrealized".[11] In 2013, more than four million Web domains (out of roughly 250 million total) contained Semantic Web markup.[12]

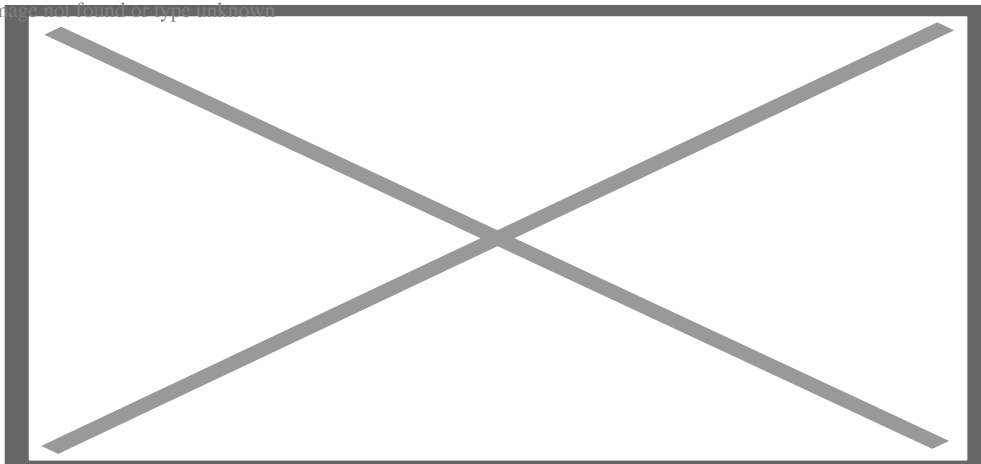
Example

[edit]

In the following example, the text "Paul Schuster was born in Dresden" on a website will be annotated, connecting a person with their place of birth. The following HTML fragment shows how a small graph is being described, in RDFa-syntax using a schema.org vocabulary and a Wikidata ID:

```
<div vocab="https://schema.org/" typeof="Person">
  <span property="name">Paul Schuster</span> was born in
  <span property="birthPlace" typeof="Place" href="https://www.wikidata.org/entity/Q1731">
    <span property="name">Dresden</span>.
  </span>
</div>
```

Image not found or type unknown

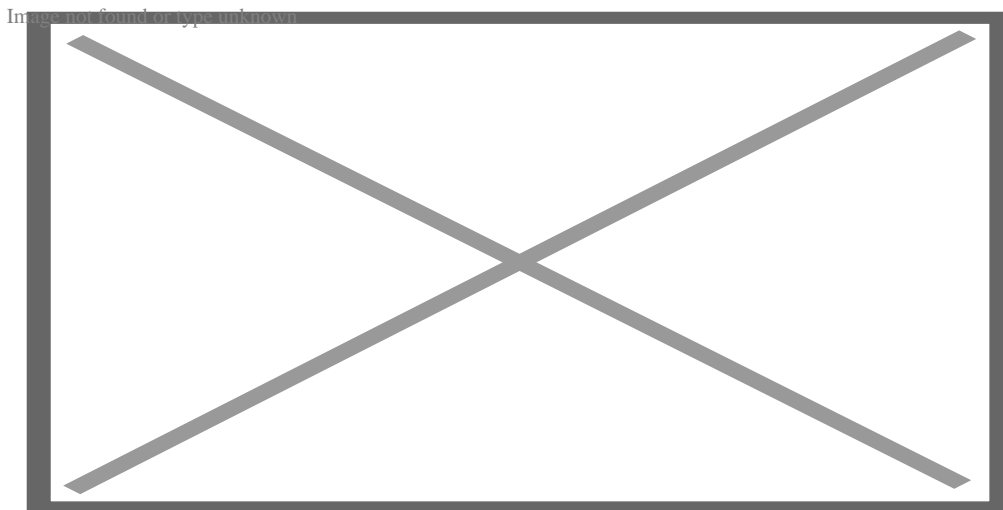


Graph resulting from the RDFa example

The example defines the following five **triples** (shown in **Turtle** syntax). Each triple represents one edge in the resulting graph: the first element of the triple (the *subject*) is the name of the node where the edge starts, the second element (the *predicate*) the type of the edge, and the last and third element (the *object*) either the name of the node where the edge ends or a literal value (e.g. a text, a number, etc.).

```
_:a <https://www.w3.org/1999/02/22-rdf-syntax-ns#type> <https://schema.org/Person> .
_:a <https://schema.org/name> "Paul Schuster" .
_:a <https://schema.org/birthPlace> <https://www.wikidata.org/entity/Q1731> .
<https://www.wikidata.org/entity/Q1731> <https://schema.org/itemtype> <https://schema.org/Place> .
<https://www.wikidata.org/entity/Q1731> <https://schema.org/name> "Dresden" .
```

The triples result in the graph shown in **the given figure**.



Graph resulting from the RDFa example, enriched with further data from the Web

One of the advantages of using **Uniform Resource Identifiers (URIs)** is that they can be dereferenced using the **HTTP** protocol. According to the so-called **Linked Open Data** principles, such a dereferenced URI should result in a document that offers further data about the given URI. In this example, all URIs, both for edges and nodes (e.g. <http://schema.org/Person>, <http://schema.org/birthPlace>, <http://www.wikidata.org/entity/Q1731>) can be dereferenced and will result in further RDF graphs, describing the URI, e.g. that Dresden is a city in Germany, or that a person, in the sense of that URI, can be fictional.

The second graph shows the previous example, but now enriched with a few of the triples from the documents that result from dereferencing <https://schema.org/Person> (green edge) and <https://www.wikidata.org/entity/Q1731> (blue edges).

Additionally to the edges given in the involved documents explicitly, edges can be automatically inferred: the triple

`_:a <https://www.w3.org/1999/02/22-rdf-syntax-ns#type> <http://schema.org/Person> .`

from the original RDFa fragment and the triple

`<https://schema.org/Person> <http://www.w3.org/2002/07/owl#equivalentClass> <http://xmlns.com/foa`

from the document at <https://schema.org/Person> (green edge in the figure) allow to infer the following triple, given **OWL** semantics (red dashed line in the second Figure):

`_:a <https://www.w3.org/1999/02/22-rdf-syntax-ns#type> <http://xmlns.com/foaf/0.1/Person> .`

Background

[[edit](#)]

Further information: [Semantic network § History](#)

The concept of the **semantic network** model was formed in the early 1960s by researchers such as the **cognitive scientist** [Allan M. Collins](#), **linguist** [Ross Quillian](#) and **psychologist** [Elizabeth F. Loftus](#) as a form to represent semantically structured knowledge. When applied in the context of the modern internet, it extends the network of **hyperlinked** human-readable **web pages** by inserting machine-readable metadata about pages and how they are related to each other. This enables **automated agents** to access the Web more intelligently and perform more tasks on behalf of users. The term "Semantic Web" was coined by [Tim Berners-Lee](#),^[7] the inventor of the World Wide Web and director of the World Wide Web Consortium ("**W3C**"), which oversees the development of proposed Semantic Web standards. He defines the Semantic Web as "a web of data that can be processed directly and indirectly by machines".

Many of the technologies proposed by the W3C already existed before they were positioned under the W3C umbrella. These are used in various contexts, particularly those dealing with information that encompasses a limited and defined domain, and where sharing data is a common necessity, such as scientific research or data exchange among businesses. In addition, other technologies with similar goals have emerged, such as **microformats**.

Limitations of HTML

[edit]

Many files on a typical computer can be loosely divided into either human-readable documents, or machine-readable data. Examples of human-readable document files are mail messages, reports, and brochures. Examples of machine-readable data files are calendars, address books, playlists, and spreadsheets, which are presented to a user using an application program that lets the files be viewed, searched, and combined.

Currently, the World Wide Web is based mainly on documents written in **Hypertext Markup Language** (HTML), a markup convention that is used for coding a body of text interspersed with multimedia objects such as images and interactive forms. Metadata tags provide a method by which computers can categorize the content of web pages. In the examples below, the field names "keywords", "description" and "author" are assigned values such as "computing", and "cheap widgets for sale" and "John Doe".

```
<meta name="keywords" content="computing, computer studies, computer" />
<meta name="description" content="Cheap widgets for sale" />
<meta name="author" content="John Doe" />
```

Because of this metadata tagging and categorization, other computer systems that want to access and share this data can easily identify the relevant values.

With HTML and a tool to render it (perhaps **web browser** software, perhaps another **user agent**), one can create and present a page that lists items for sale. The HTML of this catalog page can make simple, document-level assertions such as "this document's title is 'Widget Superstore'", but there is no capability within the HTML itself to assert unambiguously that, for example, item number X586172 is an Acme Gizmo with a retail price of €199, or that it is a consumer product. Rather, HTML can only say that the span of text "X586172" is something that should be positioned near "Acme Gizmo" and "€199", etc. There is no way to say "this is a catalog" or even to establish that "Acme Gizmo" is a kind of title or that "€199" is a price. There is also no way to express that these pieces of information are bound together in describing a discrete item, distinct from other items perhaps listed on the page.

Semantic HTML refers to the traditional HTML practice of markup following intention, rather than specifying layout details directly. For example, the use of `` denoting "emphasis" rather than `<i>`, which specifies **italics**. Layout details are left up to the browser, in combination with **Cascading Style Sheets**. But this practice falls short of specifying the semantics of objects such as items for sale or prices.

Microformats extend HTML syntax to create **machine-readable** semantic markup about objects including people, organizations, events and products.^[13] Similar initiatives include **RDFa**, **Microdata** and **Schema.org**.

Semantic Web solutions

[[edit](#)]

The Semantic Web takes the solution further. It involves publishing in languages specifically designed for data: [Resource Description Framework](#) (RDF), [Web Ontology Language](#) (OWL), and Extensible Markup Language ([XML](#)). HTML describes documents and the links between them. RDF, OWL, and XML, by contrast, can describe arbitrary things such as people, meetings, or airplane parts.

These technologies are combined in order to provide descriptions that supplement or replace the content of Web documents. Thus, content may manifest itself as descriptive data stored in Web-accessible [databases](#),^[14] or as markup within documents (particularly, in Extensible HTML ([XHTML](#)) interspersed with XML, or, more often, purely in XML, with layout or rendering cues stored separately). The machine-readable descriptions enable content managers to add meaning to the content, i.e., to describe the structure of the knowledge we have about that content. In this way, a machine can process knowledge itself, instead of text, using processes similar to human [deductive reasoning](#) and [inference](#), thereby obtaining more meaningful results and helping computers to perform automated information gathering and research.

An example of a tag that would be used in a non-semantic web page:

```
<item>blog</item>
```

Encoding similar information in a semantic web page might look like this:

```
<item rdf:about="https://example.org/semantic-web/">Semantic Web</item>
```

Tim Berners-Lee calls the resulting network of [Linked Data](#) the [Giant Global Graph](#), in contrast to the HTML-based World Wide Web. Berners-Lee posits that if the past was document sharing, the future is [data sharing](#). His answer to the question of "how" provides three points of instruction. One, a URL should point to the data. Two, anyone accessing the URL should get data back. Three, relationships in the data should point to additional URLs with data.

Tags and identifiers

[[edit](#)]

Tags, including hierarchical categories and tags that are collaboratively added and maintained (e.g. with **folksonomies**) can be considered part of, of potential use to or a step towards the semantic Web vision.[15][16][17]

Unique **identifiers**, including hierarchical categories and collaboratively added ones, analysis tools and **metadata**, including tags, can be used to create forms of semantic webs – webs that are to a certain degree semantic.[18] In particular, such has been used for structuring scientific research i.a. by research topics and **scientific fields** by the projects **OpenAlex**,[19][20][21] **Wikidata** and **Scholia** which are under development and provide **APIs**, Web-pages, feeds and graphs for various **semantic queries**.

Web 3.0

[[edit](#)]

Tim Berners-Lee has described the Semantic Web as a component of Web 3.0.[22]

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, 2006*

"Semantic Web" is sometimes used as a synonym for "Web 3.0",[23] though the definition of each term varies.

Beyond Web 3.0

[[edit](#)]

The next generation of the Web is often termed Web 4.0, but its definition is not clear. According to some sources, it is a Web that involves **artificial intelligence**,[24] the **internet of things**, **pervasive computing**, **ubiquitous computing** and the **Web of Things** among other concepts.[25] According to the European Union, Web 4.0 is "the expected fourth generation of the World Wide Web. Using advanced artificial and ambient intelligence, the internet of things, trusted blockchain transactions, virtual worlds and XR capabilities, digital and real objects and environments are fully integrated and communicate with each other, enabling truly intuitive, immersive experiences, seamlessly blending the physical and digital worlds".[26]

Challenges

[[edit](#)]

Some of the challenges for the Semantic Web include vastness, vagueness, uncertainty, inconsistency, and deceit. **Automated reasoning systems** will have to deal with all of these issues in order to deliver on the promise of the Semantic Web.

- Vastness: The World Wide Web contains many billions of pages. The **SNOMED CT medical terminology ontology** alone contains 370,000 **class** names, and existing technology has not yet been able to eliminate all semantically duplicated terms. Any automated reasoning system will have to deal with truly huge inputs.
- Vagueness: These are imprecise concepts like "young" or "tall". This arises from the vagueness of user queries, of concepts represented by content providers, of matching query terms to provider terms and of trying to combine different **knowledge bases** with overlapping but subtly different concepts. **Fuzzy logic** is the most common technique for dealing with vagueness.
- Uncertainty: These are precise concepts with uncertain values. For example, a patient might present a set of symptoms that correspond to a number of different distinct diagnoses each with a different probability. **Probabilistic** reasoning techniques are generally employed to address uncertainty.
- Inconsistency: These are logical contradictions that will inevitably arise during the development of large ontologies, and when ontologies from separate sources are combined. Deductive reasoning fails catastrophically when faced with inconsistency, because "**anything follows from a contradiction**". **Defeasible reasoning** and **paraconsistent reasoning** are two techniques that can be employed to deal with inconsistency.
- Deceit: This is when the producer of the information is intentionally misleading the consumer of the information. **Cryptography** techniques are currently utilized to alleviate this threat. By providing a means to determine the information's integrity, including that which relates to the identity of the entity that produced or published the information, however **credibility** issues still have to be addressed in cases of potential deceit.

This list of challenges is illustrative rather than exhaustive, and it focuses on the challenges to the "unifying logic" and "proof" layers of the Semantic Web. The World Wide Web Consortium (W3C) Incubator Group for Uncertainty Reasoning for the World Wide Web^[27] (URW3-XG) final report lumps these problems together under the single heading of "uncertainty".^[28] Many of the techniques mentioned here will require extensions to the Web Ontology Language (OWL) for example to annotate conditional probabilities. This is an area of active research.^[29]

Standards

[[edit](#)]

Standardization for Semantic Web in the context of Web 3.0 is under the care of W3C.^[30]

Components

[edit]

The term "Semantic Web" is often used more specifically to refer to the formats and technologies that enable it.[5] The collection, structuring and recovery of linked data are enabled by technologies that provide a **formal description** of concepts, terms, and relationships within a given **knowledge domain**. These technologies are specified as W3C standards and include:

- **Resource Description Framework** (RDF), a general method for describing information
- **RDF Schema** (RDFS)
- **Simple Knowledge Organization System** (SKOS)
- **SPARQL**, an RDF query language
- **Notation3** (N3), designed with human readability in mind
- **N-Triples**, a format for storing and transmitting data
- **Turtle** (Terse RDF Triple Language)
- **Web Ontology Language** (OWL), a family of **knowledge representation languages**
- **Rule Interchange Format** (RIF), a framework of web rule language dialects supporting rule interchange on the Web
- **JavaScript Object Notation for Linked Data** (JSON-LD), a JSON-based method to describe data
- **ActivityPub**, a generic way for client and server to communicate with each other. This is used by the popular decentralized social network **Mastodon**.

The **Semantic Web Stack** illustrates the architecture of the Semantic Web. The functions and relationships of the components can be summarized as follows:[31]

- XML provides an elemental syntax for content structure within documents, yet associates no semantics with the meaning of the content contained within. XML is not at present a necessary component of Semantic Web technologies in most cases, as alternative syntaxes exist, such as **Turtle**. Turtle is a de facto standard, but has not been through a formal standardization process.
- **XML Schema** is a language for providing and restricting the structure and content of elements contained within XML documents.
- RDF is a simple language for expressing **data models**, which refer to objects ("**web resources**") and their relationships. An RDF-based model can be represented in a variety of syntaxes, e.g., **RDF/XML**, N3, Turtle, and RDFa. RDF is a fundamental standard of the Semantic Web.[32][33]
- RDF Schema extends RDF and is a vocabulary for describing properties and classes of RDF-based resources, with semantics for generalized-hierarchies of such properties and classes.
- OWL adds more vocabulary for describing properties and classes: among others, relations between classes (e.g. disjointness), cardinality (e.g. "exactly one"), equality, richer typing of

- properties, characteristics of properties (e.g. symmetry), and enumerated classes.
- SPARQL is a protocol and query language for semantic web data sources.
- RIF is the W3C Rule Interchange Format. It is an XML language for expressing Web rules that computers can execute. RIF provides multiple versions, called dialects. It includes a RIF Basic Logic Dialect (RIF-BLD) and RIF Production Rules Dialect (RIF PRD).

Current state of standardization

[[edit](#)]

Well-established standards:

- [RDF - Resource Description Framework](#)
- [RDFS - Resource Description Framework Schema](#)
- [RIF - Rule Interchange Format](#)
- [SPARQL - 'SPARQL Protocol and RDF Query Language'](#)
- [Unicode](#)
- [URI - Uniform Resource Identifier](#)
- [OWL - Web Ontology Language](#)
- [XML - Extensible Markup Language](#)

Not yet fully realized:

- Unifying Logic and Proof layers
- [SWRL - Semantic Web Rule Language](#)

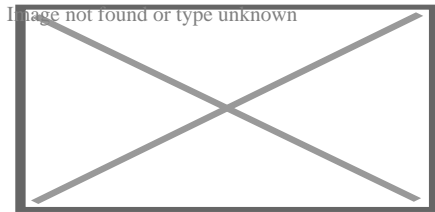
Applications

[[edit](#)]

The intent is to enhance the [usability](#) and usefulness of the Web and its interconnected [resources](#) by creating [semantic web services](#), such as:

- Servers that expose existing data systems using the RDF and SPARQL standards. Many converters to RDF exist from different applications.[\[34\]](#) [Relational databases](#) are an important source. The semantic web server attaches to the existing system without affecting its operation.
- Documents "marked up" with semantic information (an [extension](#) of the HTML <meta> [tags](#) used in today's Web pages to supply information for [Web search engines](#) using [web crawlers](#)). This could be [machine-understandable](#) information about the human-understandable content of the document (such as the creator, title, description, etc.) or it could be purely metadata representing a set of facts (such as resources and services elsewhere on the site). Note that *anything* that can be identified with a *Uniform Resource*

Identifier (URI) can be described, so the semantic web can reason about animals, people, places, ideas, etc. There are four semantic annotation formats that can be used in HTML documents; Microformat, RDFa, Microdata and **JSON-LD**.^[35] Semantic markup is often generated automatically, rather than manually.



Arguments as distinct semantic units with specified relations and version control on **Kialo**

- Common metadata vocabularies (**ontologies**) and maps between vocabularies that allow document creators to know how to mark up their documents so that agents can use the information in the supplied metadata (so that *Author* in the sense of 'the Author of the page' will not be confused with *Author* in the sense of a book that is the subject of a book review).
- Automated agents to perform tasks for users of the semantic web using this data.
- **Semantic translation**. An alternative or complementary approach are improvements to contextual and semantic understanding of texts – these could be aided via Semantic Web methods so that only increasingly small numbers of mistranslations need to be corrected **in manual or semi-automated post-editing**.
- Web-based services (often with agents of their own) to supply information specifically to agents, for example, a **Trust service** that an agent could ask if some online store has a history of poor service or **spamming**.
- Semantic Web ideas are implemented in collaborative structured **argument mapping** sites where their relations are organized semantically, arguments can be mirrored (linked) to multiple places, reused (copied), rated, and **changed** as semantic distinct units. Ideas for such, or a more widely adopted "World Wide Argument Web", go back to at least 2007^[36] and have been implemented to some degree in **Argüman**^[37] and **Kialo**. Further steps towards semantic web services may include enabling "Querying", argument search engines,^[38] and "summarizing the contentious and agreed-upon points of a discussion".^[39]

Such services could be useful to public search engines, or could be used for **knowledge management** within an organization. Business applications include:

- Facilitating the integration of information from mixed sources^[40]
- Dissolving ambiguities in corporate terminology
- Improving **information retrieval** thereby reducing **information overload** and increasing the refinement and precision of the data retrieved^{[41][42][43][44]}
- Identifying relevant information with respect to a given domain^[45]
- Providing decision making support

In a corporation, there is a closed group of users and the management is able to enforce company guidelines like the adoption of specific ontologies and use of **semantic annotation**. Compared to the public Semantic Web there are lesser requirements on **scalability** and the information circulating within a company can be more trusted in general; privacy is less of an issue outside of handling of customer data.

Skeptical reactions

[[edit](#)]

Practical feasibility

[[edit](#)]

Critics question the basic feasibility of a complete or even partial fulfillment of the Semantic Web, pointing out both difficulties in setting it up and a lack of general-purpose usefulness that prevents the required effort from being invested. In a 2003 paper, Marshall and Shipman point out the cognitive overhead inherent in formalizing knowledge, compared to the authoring of traditional web **hypertext**:[\[46\]](#)

While learning the basics of HTML is relatively straightforward, learning a knowledge representation language or tool requires the author to learn about the representation's methods of abstraction and their effect on reasoning. For example, understanding the class-instance relationship, or the superclass-subclass relationship, is more than understanding that one concept is a "type of" another concept. [...] These abstractions are taught to computer scientists generally and knowledge engineers specifically but do not match the similar natural language meaning of being a "type of" something. Effective use of such a formal representation requires the author to become a skilled knowledge engineer in addition to any other skills required by the domain. [...] Once one has learned a formal representation language, it is still often much more effort to express ideas in that representation than in a less formal representation [...]. Indeed, this is a form of programming based on the declaration of semantic data and requires an understanding of how reasoning algorithms will interpret the authored structures.

According to Marshall and Shipman, the **tacit** and changing nature of much knowledge adds to the **knowledge engineering** problem, and limits the Semantic Web's applicability to specific domains. A further issue that they point out are domain- or organization-specific ways to express knowledge, which must be solved through community agreement rather than only technical means.[\[46\]](#) As it turns out, specialized communities and organizations for intra-company projects have tended to adopt semantic web technologies greater than peripheral and less-specialized communities.[\[47\]](#) The practical constraints toward adoption have appeared less challenging where domain and scope is more limited than that of the general public and the World-Wide Web.[\[47\]](#)

Finally, Marshall and Shipman see pragmatic problems in the idea of ([Knowledge Navigator](#)-style) intelligent agents working in the largely manually curated Semantic Web:[\[46\]](#)

In situations in which user needs are known and distributed information resources are well described, this approach can be highly effective; in situations that are not foreseen and that bring together an unanticipated array of information resources, the Google approach is more robust. Furthermore, the Semantic Web relies on inference chains that are more brittle; a missing element of the chain results in a failure to perform the desired action, while the human can supply missing pieces in a more Google-like approach. [...] cost-benefit tradeoffs can work in favor of specially-created Semantic Web metadata directed at weaving together sensible well-structured domain-specific information resources; close attention to user/customer needs will drive these federations if they are to be successful.

[Cory Doctorow](#)'s critique ("[metacrap](#)")[\[48\]](#) is from the perspective of human behavior and personal preferences. For example, people may include spurious metadata into Web pages in an attempt to mislead Semantic Web engines that naively assume the metadata's veracity. This phenomenon was well known with metatags that fooled the [Altavista](#) ranking algorithm into elevating the ranking of certain Web pages: the Google indexing engine specifically looks for such attempts at manipulation. [Peter Gärdenfors](#) and [Timo Honkela](#) point out that logic-based semantic web technologies cover only a fraction of the relevant phenomena related to semantics.
[\[49\]](#)[\[50\]](#)

Censorship and privacy

[\[edit\]](#)

Enthusiasm about the semantic web could be tempered by concerns regarding [censorship](#) and [privacy](#). For instance, [text-analyzing](#) techniques can now be easily bypassed by using other words, metaphors for instance, or by using images in place of words. An advanced implementation of the semantic web would make it much easier for governments to control the viewing and creation of online information, as this information would be much easier for an automated content-blocking machine to understand. In addition, the issue has also been raised that, with the use of [FOAF](#) files and geolocation [meta-data](#), there would be very little anonymity associated with the authorship of articles on things such as a personal blog. Some of these concerns were addressed in the "Policy Aware Web" project[\[51\]](#) and is an active research and development topic.

Doubling output formats

[edit]

Another criticism of the semantic web is that it would be much more time-consuming to create and publish content because there would need to be two formats for one piece of data: one for human viewing and one for machines. However, many web applications in development are addressing this issue by creating a machine-readable format upon the publishing of data or the request of a machine for such data. The development of microformats has been one reaction to this kind of criticism. Another argument in defense of the feasibility of semantic web is the likely falling price of human intelligence tasks in digital labor markets, such as Amazon's Mechanical Turk.^[*citation needed*]

Specifications such as eRDF and RDFa allow arbitrary RDF data to be embedded in HTML pages. The GRDDL (Gleaning Resource Descriptions from Dialects of Language) mechanism allows existing material (including microformats) to be automatically interpreted as RDF, so publishers only need to use a single format, such as HTML.

Research activities on corporate applications

[edit]

The first research group explicitly focusing on the Corporate Semantic Web was the ACACIA team at INRIA-Sophia-Antipolis, founded in 2002. Results of their work include the RDF(S) based Corese^[52] search engine, and the application of semantic web technology in the realm of distributed artificial intelligence for knowledge management (e.g. ontologies and multi-agent systems for corporate semantic Web) ^[53] and E-learning.^[54]

Since 2008, the Corporate Semantic Web research group, located at the Free University of Berlin, focuses on building blocks: Corporate Semantic Search, Corporate Semantic Collaboration, and Corporate Ontology Engineering.^[55]

Ontology engineering research includes the question of how to involve non-expert users in creating ontologies and semantically annotated content^[56] and for extracting explicit knowledge from the interaction of users within enterprises.

Future of applications

[edit]

Tim O'Reilly, who coined the term Web 2.0, proposed a long-term vision of the Semantic Web as a web of data, where sophisticated applications are navigating and manipulating it.^[57] The data web transforms the World Wide Web from a distributed file system into a distributed database.^[58]

See also

[[edit](#)]

- [AGRIS](#)
- [Business semantics management](#)
- [Computational semantics](#)
- [Calais \(Reuters product\)](#)
- [DBpedia](#)
- [Entity–attribute–value model](#)
- [EU Open Data Portal](#)
- [History of the World Wide Web](#)
- [Hyperdata](#)
- [Internet of things](#)
- [Linked data](#)
- [List of emerging technologies](#)
- [Nextbio](#)
- [Ontology alignment](#)
- [Ontology learning](#)
- [RDF and OWL](#)
- [Semantic computing](#)
- [Semantic Geospatial Web](#)
- [Semantic heterogeneity](#)
- [Semantic integration](#)
- [Semantic matching](#)
- [Semantic MediaWiki](#)
- [Semantic Sensor Web](#)
- [Semantic social network](#)
- [Semantic technology](#)
- [Semantic Web](#)
- [Semantically-Interlinked Online Communities](#)
- [Smart-M3](#)
- [Social Semantic Web](#)
- [Web engineering](#)
- [Web resource](#)
- [Web science](#)

References

[[edit](#)]

1. [^] [Semantic Web at W3C: https://www.w3.org/standards/semanticweb/](https://www.w3.org/standards/semanticweb/)
2. [^] *"World Wide Web Consortium (W3C), "RDF/XML Syntax Specification (Revised)", 25 Feb. 2014".*

3. ^ "World Wide Web Consortium (W3C), "OWL Web Ontology Language Overview", W3C Recommendation, 10 Feb. 2004".
4. ^ Chung, Seung-Hwa (2018). "The MOUSE approach: Mapping Ontologies using UML for System Engineers". *Computer Reviews Journal*: 8–29. ISSN 2581-6640.
5. ^ a b "W3C Semantic Web Activity". World Wide Web Consortium (W3C). November 7, 2011. Retrieved November 26, 2011.
6. ^ "Q&A with Tim Berners-Lee, Special Report". Bloomberg. Retrieved 14 April 2018.
7. ^ a b Berners-Lee, Tim; James Hendler; Ora Lassila (May 17, 2001). "The Semantic Web". *Scientific American*. Retrieved July 2, 2019.
8. ^ Lee Feigenbaum (May 1, 2007). "The Semantic Web in Action". *Scientific American*. Retrieved February 24, 2010.
9. ^ Berners-Lee, Tim; Fischetti, Mark (1999). *Weaving the Web*. HarperSanFrancisco. chapter 12. ISBN 978-0-06-251587-2.
10. ^ Berners-Lee, Tim; Hendler, James; Lassila, Ora (May 17, 2001). "The Semantic Web" (PDF). *Scientific American*. Vol. 284, no. 5. pp. 34–43. JSTOR 26059207. S2CID 56818714 . Archived from the original (PDF) on October 10, 2017. Retrieved March 13, 2008.
11. ^ Nigel Shadbolt; Wendy Hall; Tim Berners-Lee (2006). "The Semantic Web Revisited" (PDF). *IEEE Intelligent Systems*. Archived from the original (PDF) on March 20, 2013. Retrieved April 13, 2007.
12. ^ Ramanathan V. Guha (2013). "Light at the End of the Tunnel". *International Semantic Web Conference 2013 Keynote*. Retrieved March 8, 2015.
13. ^ Allsopp, John (March 2007). *Microformats: Empowering Your Markup for Web 2.0*. *Friends of ED*. p. 368. ISBN 978-1-59059-814-6.
14. ^ Artem Chebotko and Shiyong Lu, "Querying the Semantic Web: An Efficient Approach Using Relational Databases", LAP Lambert Academic Publishing, ISBN 978-3-8383-0264-5 , 2009.
15. ^ "Towards the Semantic Web: Collaborative Tag Suggestions" (PDF).
16. ^ Specia, Lucia; Motta, Enrico (2007). "Integrating Folksonomies with the Semantic Web". *The Semantic Web: Research and Applications. Lecture Notes in Computer Science*. Vol. 4519. Springer. pp. 624–639. doi:10.1007/978-3-540-72667-8_44. ISBN 978-3-540-72666-1.
17. ^ "Bridging the gap between folksonomies and the semantic web: an experience report" (PDF).
18. ^ Nicholson, Josh M.; Mordaunt, Milo; Lopez, Patrice; Uppala, Ashish; Rosati, Domenic; Rodrigues, Neves P.; Grabitz, Peter; Rife, Sean C. (5 November 2021). "scite: A smart citation index that displays the context of citations and classifies their intent using deep learning". *Quantitative Science Studies*. 2 (3): 882–898. doi:10.1162/qss_a_00146.
19. ^ Singh Chawla, Dalmeet (24 January 2022). "Massive open index of scholarly papers launches". *Nature*. doi:10.1038/d41586-022-00138-y. Retrieved 14 February 2022.
20. ^ "OpenAlex: The Promising Alternative to Microsoft Academic Graph". Singapore Management University (SMU). Retrieved 14 February 2022.
21. ^ "OpenAlex Documentation". Retrieved 18 February 2022.
22. ^ Shannon, Victoria (23 May 2006). "A 'more revolutionary' Web". *International Herald Tribune*. Retrieved 26 June 2006.

23. ^ ["Web 3.0 Explained, Plus the History of Web 1.0 and 2.0"](#). Investopedia. Retrieved 2022-10-21.
24. ^ <https://www.rsisinternational.org/IJRSI/Issue31/75-78.pdf>
25. ^ Almeida, F. (2017). Concept and dimensions of web 4.0. *International journal of computers and technology*, 16(7).
26. ^ ["The Commission wants the EU to lead on 'Web 4.0' — whatever that is"](#). 11 July 2023.
27. ^ ["W3C Uncertainty Reasoning for the World Wide Web"](#). www.w3.org. Retrieved 2021-05-14.
28. ^ ["Uncertainty Reasoning for the World Wide Web"](#). W3.org. Retrieved 20 December 2018.
29. ^ Lukasiewicz, Thomas; Umberto Straccia (2008). ["Managing uncertainty and vagueness in description logics for the Semantic Web"](#) (PDF). *Web Semantics: Science, Services and Agents on the World Wide Web*. **6** (4): 291–308. doi:10.1016/j.websem.2008.04.001.
30. ^ ["Semantic Web Standards"](#). W3.org. Retrieved 14 April 2018.
31. ^ ["OWL Web Ontology Language Overview"](#). World Wide Web Consortium (W3C). February 10, 2004. Retrieved November 26, 2011.
32. ^ ["Resource Description Framework \(RDF\)"](#). World Wide Web Consortium.
33. ^ Allemang, Dean; Hendler, James; Gandon, Fabien (August 3, 2020). *Semantic Web for the Working Ontologist : Effective Modeling for Linked Data, RDFS, and OWL* (Third ed.). [New York, NY, USA]: ACM Books; 3rd edition. ISBN 978-1450376143.
34. ^ ["ConverterToRdf - W3C Wiki"](#). W3.org. Retrieved 20 December 2018.
35. ^ Sikos, Leslie F. (2015). *Mastering Structured Data on the Semantic Web: From HTML5 Microdata to Linked Open Data*. Apress. p. 23. ISBN 978-1-4842-1049-9.
36. ^ Kiesel, Johannes; Lang, Kevin; Wachsmuth, Henning; Hornecker, Eva; Stein, Benno (14 March 2020). "Investigating Expectations for Voice-based and Conversational Argument Search on the Web". *Proceedings of the 2020 Conference on Human Information Interaction and Retrieval*. ACM. pp. 53–62. doi:10.1145/3343413.3377978. ISBN 9781450368926. S2CID 212676751.
37. ^ Vetere, Guido (30 June 2018). "L'impossibile necessità delle piattaforme sociali decentralizzate". *DigitCult - Scientific Journal on Digital Cultures*. **3** (1): 41–50. doi:10.4399/97888255159096.
38. ^ Bikakis, Antonis; Flouris, Giorgos; Patkos, Theodore; Plexousakis, Dimitris (2023). ["Sketching the vision of the Web of Debates"](#). *Frontiers in Artificial Intelligence*. **6**. doi:10.3389/frai.2023.1124045. ISSN 2624-8212. PMC 10313200. PMID 37396970.
39. ^ Schneider, Jodi; Groza, Tudor; Passant, Alexandre. ["A Review of Argumentation for the Social Semantic Web"](#) (PDF). cite journal: Cite journal requires |journal= (help)
40. ^ Zhang, Chuanrong; Zhao, Tian; Li, Weidong (2015). *Geospatial Semantic Web*. Springer International Publishing : Imprint: Springer. ISBN 978-3-319-17801-1.
41. ^ Omar Alonso and Hugo Zaragoza. 2008. Exploiting semantic annotations in information retrieval: ESAIR '08. SIGIR Forum 42, 1 (June 2008), 55–58. doi:10.1145/1394251.1394262
42. ^ Jaap Kamps, Jussi Karlgren, and Ralf Schenkel. 2011. Report on the third workshop on exploiting semantic annotations in information retrieval (ESAIR). SIGIR Forum 45, 1 (May 2011), 33–41. doi:10.1145/1988852.1988858
43. ^ Jaap Kamps, Jussi Karlgren, Peter Mika, and Vanessa Murdock. 2012. Fifth workshop on exploiting semantic annotations in information retrieval: ESAIR '12). In *Proceedings of the*

- 21st ACM international conference on information and knowledge management (CIKM '12). ACM, New York, NY, USA, 2772–2773. doi:10.1145/2396761.2398761
44. ^ Omar Alonso, Jaap Kamps, and Jussi Karlgren. 2015. Report on the Seventh Workshop on Exploiting Semantic Annotations in Information Retrieval (ESAIR '14). SIGIR Forum 49, 1 (June 2015), 27–34. doi:10.1145/2795403.2795412
 45. ^ Kuriakose, John (September 2009). "Understanding and Adopting Semantic Web Technology". Cutter IT Journal. **22** (9). CUTTER INFORMATION CORP.: 10–18.
 46. ^ a b c Marshall, Catherine C.; Shipman, Frank M. (2003). Which semantic web? (PDF). Proc. ACM Conf. on Hypertext and Hypermedia. pp. 57–66. Archived from the original (PDF) on 2015-09-23. Retrieved 2015-04-17.
 47. ^ a b Ivan Herman (2007). State of the Semantic Web (PDF). Semantic Days 2007. Retrieved July 26, 2007.
 48. ^ Doctorow, Cory. "Metacrap: Putting the torch to seven straw-men of the meta-utopia". www.well.com/. Retrieved 11 September 2023.
 49. ^ Gärdenfors, Peter (2004). How to make the Semantic Web more semantic. IOS Press. pp. 17–34. cite book: |work= ignored (help)
 50. ^ Honkela, Timo; Könönen, Ville; Lindh-Knuutila, Tiina; Paukkeri, Mari-Sanna (2008). "Simulating processes of concept formation and communication". Journal of Economic Methodology. **15** (3): 245–259. doi:10.1080/13501780802321350. S2CID 16994027.
 51. ^ "Policy Aware Web Project". Policyawareweb.org. Retrieved 2013-06-14.
 52. ^ Corby, Olivier; Dieng-Kuntz, Rose; Zucker, Catherine Faron; Gandon, Fabien (2006). "Searching the Semantic Web: Approximate Query Processing based on Ontologies". IEEE Intelligent Systems. **21**: 20–27. doi:10.1109/MIS.2006.16. S2CID 11488848.
 53. ^ Gandon, Fabien (7 November 2002). Distributed Artificial Intelligence And Knowledge Management: Ontologies And Multi-Agent Systems For A Corporate Semantic Web (phdthesis). Université Nice Sophia Antipolis.
 54. ^ Buffa, Michel; Dehors, Sylvain; Faron-Zucker, Catherine; Sander, Peter (2005). "Towards a Corporate Semantic Web Approach in Designing Learning Systems: Review of the Trial Solutions Project" (PDF). International Workshop on Applications of Semantic Web Technologies for E-Learning. Amsterdam, Holland. pp. 73–76.
 55. ^ "Corporate Semantic Web - Home". Corporate-semantic-web.de. Retrieved 14 April 2018.
 56. ^ Hinze, Annika; Heese, Ralf; Luczak-Rösch, Markus; Paschke, Adrian (2012). "Semantic Enrichment by Non-Experts: Usability of Manual Annotation Tools" (PDF). ISWC'12 - Proceedings of the 11th international conference on The Semantic Web. Boston, USA. pp. 165–181.
 57. ^ Mathieson, S. A. (6 April 2006). "Spread the word, and join it up". The Guardian. Retrieved 14 April 2018.
 58. ^ Spivack, Nova (18 September 2007). "The Semantic Web, Collective Intelligence and Hyperdata". novaspivack.typepad.com/nova_spivacks_weblog [This Blog has Moved to NovaSpivack.com]. Retrieved 14 April 2018.

Further reading




[edit]

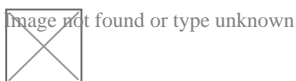
- Liyang Yu (December 14, 2014). *A Developer's Guide to the Semantic Web, 2nd ed.* Springer. ISBN 978-3-662-43796-4.
- Aaron Swartz's *A Programmable Web: An unfinished Work* donated by Morgan & Claypool Publishers after Aaron Swartz's death in January 2013.
- Grigoris Antoniou, Frank van Harmelen (March 31, 2008). *A Semantic Web Primer, 2nd Edition.* The MIT Press. ISBN 978-0-262-01242-3.
- Allemang, Dean; Hendler, James; Gandon, Fabien (August 3, 2020). *Semantic Web for the Working Ontologist : Effective Modeling for Linked Data, RDFS, and OWL (Third ed.).* [New York, NY, USA]: ACM Books; 3rd edition. ISBN 978-1450376143.
- Pascal Hitzler; Markus Krötzsch; Sebastian Rudolph (August 25, 2009). *Foundations of Semantic Web Technologies.* CRCPress. ISBN 978-1-4200-9050-5.
- Thomas B. Passin (March 1, 2004). *Explorer's Guide to the Semantic Web.* Manning Publications. ISBN 978-1-932394-20-7.
- Jeffrey T. Pollock (March 23, 2009). *Semantic Web For Dummies.* For Dummies. ISBN 978-0-470-39679-7.
- Hitzler, Pascal (February 2021). "A Review of the Semantic Web Field". *Communications of the ACM*. **64** (2): 76–83. doi:10.1145/3397512.
- Unni, Deepak (March 2023). "FAIRification of health-related data using semantic web technologies in the Swiss Personalized Health Network". *Scientific Data*. **10** (1): 127. Bibcode:2023NatSD..10..127T. doi:10.1038/s41597-023-02028-y. PMC 10006404. PMID 36899064.

External links

[[edit](#)]

Semantic Web at Wikipedia's [sister projects](#)

-  [Media](#) from Commons
-  [Textbooks](#) from Wikibooks
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Scholia has a *topic* profile for **Semantic Web**.

- [Official website](#)

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Semantic Web

Background

- Databases
- Hypertext
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- Ontologies
- Semantics
- Semantic networks
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Sub-topics

- Dataspaces
- Hyperdata
- Linked data
- Rule-based systems

Applications

- Semantic analytics
- Semantic broker
- Semantic computing
- Semantic mapper
- Semantic matching
- Semantic publishing
- Semantic reasoner
- Semantic search
- Semantic service-oriented architecture
- Semantic wiki
- Solid

Related topics

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- [Digital library](#)
- [Digital humanities](#)
- [Metadata](#)
- [References](#)
- [Topic map](#)
- [Web 2.0](#)
- [Web engineering](#)
- [Web Science Trust](#)

	<p>Syntax and supporting technologies</p>	<ul style="list-style-type: none"> ○ HTTP ○ IRI <ul style="list-style-type: none"> ○ URI ○ RDF <ul style="list-style-type: none"> ○ triples ○ RDF/XML ○ JSON-LD ○ Turtle ○ TriG ○ Notation3 ○ N-Triples ○ TriX (no W3C standard) ○ RRID ○ SPARQL ○ XML ○ Semantic HTML
<p>Standards</p>	<p>Schemas, ontologies and rules</p>	<ul style="list-style-type: none"> ○ Common Logic ○ OWL ○ RDFS ○ Rule Interchange Format ○ Semantic Web Rule Language ○ ALPS ○ SHACL
	<p>Semantic annotation</p>	<ul style="list-style-type: none"> ○ eRDF ○ GRDDL ○ Microdata ○ Microformats ○ RDFa ○ SAWSDL ○ Facebook Platform
	<p>Common vocabularies</p>	<ul style="list-style-type: none"> ○ DOAP ○ Dublin Core ○ FOAF ○ Schema.org ○ SIOC ○ SKOS
	<p>Microformat vocabularies</p>	<ul style="list-style-type: none"> ○ hAtom ○ hCalendar ○ hCard ○ hProduct ○ hRecipe

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Emerging technologies

Fields **Information and communications**

- Ambient intelligence
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 - Machine vision
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- Automation
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- Differential technological development
- Disruptive innovation
- Ephemeralization
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 - Cyberethics
 - Neuroethics
 - Robot ethics
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- Proactionary principle
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 - Technological unemployment
- Technological convergence
- Technological evolution
- Technological paradigm
- Technology forecasting
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 - Moore's law
 - Technological singularity
 - Technology scouting
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-  **List** not found or type unknown

- **v**
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- Computational archaeology
- Computational philosophy
- Computational theory of mind
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- Cybertext
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- Digital history
- Digital library
- Digital Medievalist
- Digital ontology
- Digital physics
- Digital religion
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