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# local SEO agency

## keyword opportunity analysis

keyword opportunity analysis

mobile-friendly SEO"Mobile-friendly SEO focuses on optimizing a websites performance on smartphones and tablets. Ensuring responsive design, fast loading times, and easy navigation on mobile devices helps improve rankings and provides a seamless experience for users on the go."

multilingual content optimization"Multilingual content optimization involves adapting material for multiple languages and regions. By creating localized versions, you reach a broader audience, improve relevance, and enhance search visibility in global markets."

multilingual SEO"Multilingual SEO focuses on optimizing content for different languages and regions. By creating region-specific versions of a website, businesses can reach new audiences, improve global visibility, and increase international traffic."

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## keyword placement —

- [keyword opportunity analysis](#)
- [keyword placement](#)
- [keyword placement](#)
- [keyword research](#)
- [Keyword research services](#)
- [keyword research tools](#)
- [keyword targeting techniques](#)

multimedia content"Using multimedia contentsuch as images, videos, and infographicsenhances the user experience and makes your material more engaging. Incorporating multimedia helps break up text, improves readability, and can boost dwell time on your site."

Natural link building"Natural link building occurs when other websites link to your content without being asked or incentivized. [SEO Audit](#) .

## Local SEO agency - Search result relevance

- Core Web Vitals
- Google organic search

- Search visibility improvements

By consistently creating high-quality, valuable content, you encourage organic backlinks that boost your sites credibility and authority."

navigational keywordsNavigation keywords are used by searchers who already know what brand or website they want to find. Optimizing for these keywords ensures that users can easily reach your website or specific web pages.

## keyword placement

neglected keywordsNeglected keywords are terms with reasonable search volume that are underutilized by competitors.

## Local SEO agency - Google search visibility

1. Google search visibility
2. Search result relevance

Focusing on these keywords can help you secure rankings and drive traffic from less competitive searches.

Niche directory submissionsSubmitting your website to niche directories relevant to your industry helps establish authority and gain backlinks. These directories provide targeted traffic and improve your sites visibility within a specific market.

niche-specific keywordsNiche-specific keywords focus on terms that are highly relevant to your industry or field. Targeting these keywords helps you reach a more qualified audience and establish authority in your market.

SEO Services .

# HOW SEARCH ENGINE MARKETING HELPS BUSINESS GROW OVER TIME

SYDNEY WEBSITE DESIGN AGENCY  
SUITE 87, LEVEL 33, AUSTRALIA SQUARE,  
265 GEORGE ST, SYDNEY NSW 2000  
PHONE: 1300 684 339





**TAKING YOUR SMALL B  
TO THE NEXT LEVEL  
SEO SERVICES AUST**

keyword research



Niche-specific link building"Niche-specific link building focuses on acquiring backlinks from websites that are closely related to your industry. By targeting relevant sites, you ensure that your backlinks carry more weight and improve your authority in your field."

No-follow links"No-follow links are backlinks that include a specific HTML attribute telling search engines not to pass link equity. While they may not directly impact rankings, they can still drive referral traffic and contribute to a natural-looking link profile."

off-page SEO"Off-page SEO involves activities that take place outside of the website to boost its authority and visibility. This includes building high-quality backlinks, engaging in social media marketing, and promoting content through various online channels to improve the sites overall reputation and ranking."

## Keyword research services

on-page audit"An on-page audit evaluates the elements of a web page, such as meta tags, headings, and content quality. By identifying areas for improvement, an audit helps refine on-page optimization efforts and boosts search engine performance."

on-page audit tools"On-page audit tools help identify optimization opportunities, such as missing meta tags, broken links, or keyword usage gaps. By using these tools, you can streamline your optimization efforts and improve overall page performance."

on-page content freshness"On-page content freshness refers to how current and updated the content is. Regularly refreshing and expanding content signals to search engines that the page is up-to-date, which can improve rankings and keep users coming back."

# KEY ADVANTAGES LOCAL SEO





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265 GEORGE ST, SYDNEY NSW 2000  
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# CONTENT MARKETING TYPES FOR SMALL BUSINESS AND BRAND BUILDING

keyword research tools



on-page content optimization"On-page content optimization refers to the process of improving individual web pages to increase visibility and relevance. This includes optimizing meta tags, headers, and images, as well as ensuring that the content is keyword-rich and user-friendly."

on-page engagement signals"On-page engagement signals include metrics like time on page, bounce rate, and click-through rate. Improving these signals by enhancing content quality and user experience can positively impact search rankings and attract more traffic."

on-page keyword research"On-page keyword research involves identifying the most relevant and valuable keywords for a specific page. By targeting the right keywords, you increase the pages relevance, attract more qualified traffic, and improve its search rankings."

## keyword targeting techniques

on-page keyword variation"On-page keyword variation involves using different forms and synonyms of your target keyword throughout the content. This helps avoid keyword stuffing, provides a more natural reading experience, and increases the pages relevance for multiple search terms."

on-page keywords"On-page keywords are the targeted search terms included within the content, headings, and meta tags of a web page. By using these keywords strategically and naturally, you help search engines understand the pages topic and improve its relevance in search results."

on-page link optimization"On-page link optimization ensures that internal and external links are relevant, functional, and properly anchored. Effective link optimization improves site navigation, enhances user experience, and helps search engines crawl and understand your site."



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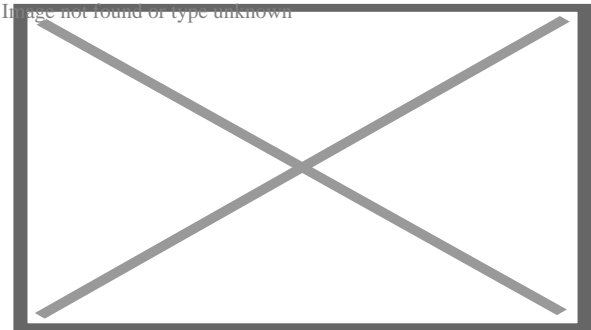
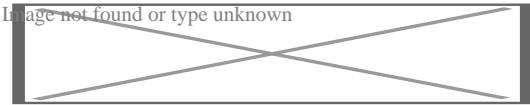
**SEO SERVICES EXPERT'S MAIN  
IS TO GROW YOUR BUSINESS C  
WITH CONTINUES STRA**

About Google Maps



This article's "**criticism**" or "**controversy**" section may compromise the article's **neutrality**. Please help rewrite or integrate negative information to other sections through discussion on the **talk page**. *(June 2024)*

# Google Maps



Screenshot of Google Maps in a web browser

**Type of site**

Web mapping

**Available in**

74 languages

List of languages

Afrikaans, Azerbaijani, Indonesian, Malay, Bosnian, Catalan, Czech, Danish, German (Germany), Estonian, English (United States), Spanish (Spain), Spanish (Latin America), Basque, Filipino, French (France), Galician, Croatian, Zulu, Icelandic, Italian, Swahili, Latvian, Lithuanian, Hungarian, Dutch, Norwegian, Uzbek, Polish, Portuguese (Brazil), Portuguese (Portugal), Romanian, Albanian, Slovak, Slovenian, Finnish, Swedish, Vietnamese, Turkish, Greek, Bulgarian, Kyrgyz, Kazakh, Macedonian, Mongolian, Russian, Serbian, Ukrainian, Georgian, Armenian, Hebrew, Urdu, Arabic, Persian, Amharic, Nepali, Hindi, Marathi, Bengali, Punjabi, Gujarati, Tamil, Telugu, Kannada, Malayalam, Sinhala, Thai, Lao, Burmese, Khmer, Korean, Japanese, Simplified Chinese, Traditional Chinese

**Owner**

Google

**URL**

[google.com/maps](https://google.com/maps)  [Edit this at Wikidata](#)

**Commercial**

Yes

**Registration**

Optional, included with a [Google Account](#)

**Launched**

February 8, 2005; 20 years ago

**Current status**

Active

**Written in**

[C++](#) (back-end), [JavaScript](#), [XML](#), [Ajax](#) (UI)

**Google Maps** is a [web mapping](#) platform and consumer application offered by [Google](#). It offers [satellite imagery](#), [aerial photography](#), street maps, 360° [interactive panoramic](#) views of streets ([Street View](#)), real-time traffic conditions, and [route planning](#) for traveling by foot, car, bike, air (in [beta](#)) and [public transportation](#). As of 2020, Google Maps was being used by over one billion people every month around the world.<sup>[1]</sup>

Google Maps began as a **C++** desktop program developed by brothers **Lars** and **Jens Rasmussen** in Australia at Where 2 Technologies. In October 2004, the company was acquired by Google, which converted it into a web application. After additional acquisitions of a geospatial data visualization company and a real-time traffic analyzer, Google Maps was launched in February 2005.[2] The service's **front end** utilizes **JavaScript**, **XML**, and **Ajax**. Google Maps offers an **API** that allows maps to be embedded on third-party websites,[3] and offers a locator for businesses and other organizations in numerous countries around the world. **Google Map Maker** allowed users to collaboratively expand and update the service's mapping worldwide but was discontinued from March 2017. However, crowdsourced contributions to Google Maps were not discontinued as the company announced those features would be transferred to the Google Local Guides program,[4] although users that are not Local Guides can still contribute.

Google Maps' satellite view is a "top-down" or **bird's-eye view**; most of the high-resolution imagery of cities is aerial photography taken from aircraft flying at 800 to 1,500 feet (240 to 460 m), while most other imagery is from satellites.[5] Much of the available satellite imagery is no more than three years old and is updated on a regular basis, according to a 2011 report.[6] Google Maps previously used **a variant** of the **Mercator projection**, and therefore could not accurately show areas around the poles.[7] In August 2018, the desktop version of Google Maps was updated to show a 3D globe. It is still possible to switch back to the 2D map in the settings.

Google Maps for mobile devices was first released in 2006; the latest versions feature **GPS turn-by-turn navigation** along with dedicated **parking** assistance features. By 2013, it was found to be the world's most popular **smartphone** app, with over 54% of global smartphone owners using it.[8] In 2017, the app was reported to have two billion users on Android, along with several other Google services including **YouTube**, **Chrome**, **Gmail**, **Search**, and **Google Play**.

## History

[edit]

# Acquisitions

[edit]

Google Maps first started as a **C++** program designed by two Danish brothers, **Lars** and **Jens Eilstrup Rasmussen**, and Noel Gordon and Stephen Ma, at the Sydney-based company Where 2 Technologies, which was founded in early 2003. The program was initially designed to be separately downloaded by users, but the company later pitched the idea for a purely Web-based product to Google management, changing the method of distribution.[9] In October 2004, the company was acquired by Google Inc.[10] where it transformed into the web application Google Maps. The Rasmussen brothers, Gordon and Ma joined Google at that

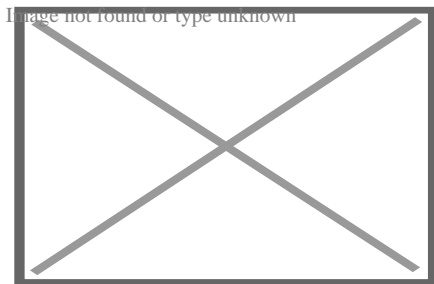


time.

In the same month, Google acquired **Keyhole**, a geospatial data visualization company (with investment from the **CIA**), whose marquee application suite, Earth Viewer, emerged as the **Google Earth** application in 2005 while other aspects of its core technology were integrated into Google Maps.<sup>[11]</sup> In September 2004, Google acquired ZipDash, a company that provided real-time traffic analysis.<sup>[12]</sup>

## 2005–2010

[\[edit\]](#)

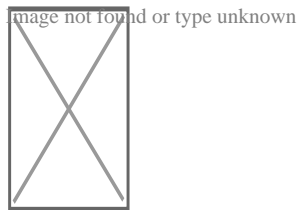


Google Maps Beta in 2005

The launch of Google Maps was first announced on the Google Blog on February 8, 2005.<sup>[13]</sup>

In September 2005, in the aftermath of **Hurricane Katrina**, Google Maps quickly updated its satellite imagery of **New Orleans** to allow users to view the extent of the flooding in various parts of that city.<sup>[14][15]</sup>

As of 2007, Google Maps was equipped with a miniature view with a draggable rectangle that denotes the area shown in the main viewport, and "Info windows" for previewing details about locations on maps.<sup>[16]</sup> As of 2024, this feature had been removed (likely several years prior).



Original Google Maps icon

On November 28, 2007, Google Maps for Mobile 2.0 was released.<sup>[17][18][19]</sup> It featured a **beta version** of a "My Location" feature, which uses the GPS / **Assisted GPS** location of the mobile device, if available, supplemented by determining the nearest **wireless networks** and **cell sites**.<sup>[18][19]</sup> The software looks up the location of the cell site using a database of known wireless networks and sites.<sup>[20][21]</sup> By **triangulating** the different signal strengths from cell

transmitters and then using their location property (retrieved from the database), My Location determines the user's current location.[22]

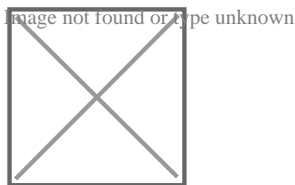
On September 23, 2008, coinciding with the announcement of the **first commercial Android device**, Google announced that a Google Maps app had been released for its Android operating system.[23][24]

In October 2009, Google replaced **Tele Atlas** as their primary supplier of geospatial data in the US version of Maps and used their own data.[25]

## 2011–2015

[**edit**]

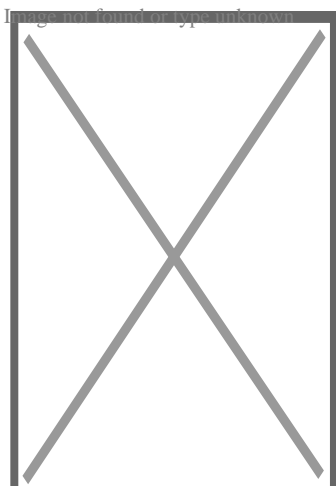
On April 19, 2011, Map Maker was added to the American version of Google Maps, allowing any viewer to edit and add changes to Google Maps. This provides Google with local map updates almost in real-time instead of waiting for digital map data companies to release more infrequent updates.



Icon used from 2015 to 2020

On January 31, 2012, Google, due to offering its Maps for free, was found guilty of abusing the dominant position of its Google Maps application and ordered by a court to pay a fine and damages to Bottin Cartographer, a French mapping company.[26] This ruling was overturned on appeal.[27]

In June 2012, Google started mapping the UK's rivers and canals in partnership with the **Canal and River Trust**. The company has stated that "it would update the program during the year to allow users to plan trips which include locks, bridges and towpaths along the 2,000 miles of river paths in the UK." [28]



A monument in the shape of a [Google Maps pin](#) in the center of the city of [Szczecin](#), Poland

In December 2012, the Google Maps application was separately made available in the App Store, after Apple removed it from its default installation of the mobile operating system version [iOS 6](#) in September 2012.[\[29\]](#)

On January 29, 2013, Google Maps was updated to include a map of [North Korea](#).[\[30\]](#) As of May 3, 2013, Google Maps recognizes [Palestine](#) as a country, instead of redirecting to the [Palestinian territories](#).[\[31\]](#)

In August 2013, Google Maps removed the Wikipedia Layer, which provided links to Wikipedia content about locations shown in Google Maps using [Wikipedia geocodes](#).[\[32\]](#)

On April 12, 2014, Google Maps was updated to reflect the [annexation of Ukrainian Crimea by Russia](#). Crimea is shown as the [Republic of Crimea](#) in Russia and as the [Autonomous Republic of Crimea](#) in Ukraine. All other versions show a dotted disputed border.[\[33\]](#)

In April 2015, on a map near the Pakistani city of Rawalpindi, the imagery of the Android logo urinating on the Apple logo was added via Map Maker and appeared on Google Maps. The [vandalism](#) was soon removed and Google publicly apologized.[\[34\]](#) However, as a result, Google disabled user moderation on Map Maker, and on May 12, disabled editing worldwide until it could devise a new policy for approving edits and avoiding vandalism.[\[35\]](#)

On April 29, 2015, users of the classic Google Maps were forwarded to the new Google Maps with the option to be removed from the interface.[\[36\]](#)

On July 14, 2015, the Chinese name for [Scarborough Shoal](#) was removed after a petition from the [Philippines](#) was posted on [Change.org](#).[\[37\]](#)

## 2016–2018

[\[edit\]](#)

On June 27, 2016, Google rolled out new satellite imagery worldwide sourced from [Landsat 8](#), comprising over 700 trillion pixels of new data.[\[38\]](#) In September 2016, Google Maps acquired mapping analytics startup Urban Engines.[\[39\]](#)

In 2016, the Government of South Korea offered Google conditional access to the country's geographic database – access that already allows indigenous Korean mapping providers high-detail maps. Google declined the offer, as it was unwilling to accept restrictions on reducing the quality around locations the South Korean Government felt were sensitive (see [restrictions on geographic data in South Korea](#)).[\[40\]](#)

On October 16, 2017, Google Maps was updated with accessible imagery of several planets and moons such as [Titan](#), [Mercury](#), and [Venus](#), as well as direct access to imagery of the [Moon](#) and [Mars](#).<sup>[41]</sup><sup>[42]</sup>

In May 2018, Google announced major changes to the API structure starting June 11, 2018. This change consolidated the 18 different endpoints into three services and merged the basic and premium plans into one pay-as-you-go plan.<sup>[43]</sup> This meant a 1400% price raise for users on the basic plan, with only six weeks of notice. This caused a harsh reaction within the developers community.<sup>[44]</sup> In June, Google postponed the change date to July 16, 2018.

In August 2018, Google Maps designed its overall view (when zoomed out completely) into a 3D globe dropping the [Mercator projection](#) that projected the planet onto a flat surface.<sup>[45]</sup>

## 2019–present

[\[edit\]](#)

Google Maps icon 2020

Image not found or type unknown  
2020 icon redesign

In January 2019, Google Maps added speed trap and [speed camera](#) alerts as reported by other users.<sup>[46]</sup><sup>[47]</sup>

On October 17, 2019, Google Maps was updated to include incident reporting, resembling a functionality in [Waze](#) which was acquired by Google in 2013.<sup>[48]</sup>

In December 2019, Incognito mode was added, allowing users to enter destinations without saving entries to their Google accounts.<sup>[49]</sup>

In February 2020, Maps received a 15th anniversary redesign.<sup>[50]</sup> It notably added a brand-new app icon, which now resembles the original icon in 2005.

On September 23, 2020, Google announced a COVID-19 Layer update for Google maps, which is designed to offer a seven-day average data of the total COVID-19-positive cases per 100,000 people in the area selected on the map. It also features a label indicating the rise and fall in the number of cases.<sup>[51]</sup>

In January 2021, Google announced that it would be launching a new feature displaying COVID-19 vaccination sites.<sup>[52]</sup>



In January 2021, Google announced updates to the route planner that would accommodate drivers of electric vehicles. Routing would take into account the type of vehicle, vehicle status including current charge, and the locations of charging stations.<sup>[53]</sup>

In June 2022, Google Maps added a layer displaying air quality for certain countries.<sup>[54]</sup>

In September 2022, Google removed the COVID-19 Layer from Google Maps due to lack of usage of the feature.<sup>[55]</sup>

## Functionality

<sup>[edit]</sup>

# Directions and transit

<sup>[edit]</sup>

Google Maps provides a **route planner**,<sup>[56]</sup> allowing users to find available directions through driving, public transportation, walking, or biking.<sup>[57]</sup> Google has partnered globally with over 800 public transportation providers to adopt **GTFS** (General Transit Feed Specification), making the data available to third parties.<sup>[58][59]</sup> The app can indicate users' transit route, thanks to an October 2019 update. The incognito mode, eyes-free walking navigation features were released earlier.<sup>[60]</sup> A July 2020 update provided bike share routes.<sup>[61]</sup>

In February 2024, Google Maps started rolling out glanceable directions for its Android and iOS apps. The feature allows users to track their journey from their device's **lock screen**.<sup>[62][63]</sup>

# Traffic conditions

<sup>[edit]</sup>

Screenshot of Google Maps with traffic option enabled

Image not found or type unknown

Screenshot of Google Maps with traffic option enabled

In 2007, Google began offering traffic data as a colored overlay on top of roads and motorways to represent the speed of vehicles on particular roads. **Crowdsourcing** is used to obtain the

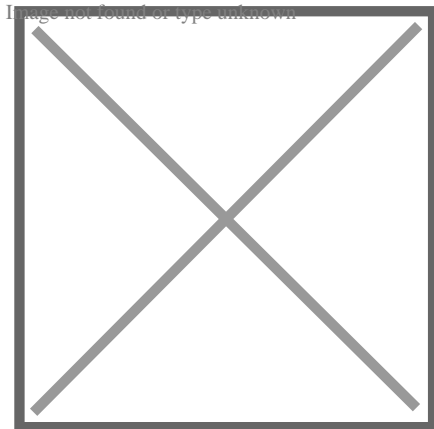
GPS-determined locations of a large number of cellphone users, from which live traffic maps are produced.<sup>[64][65][66]</sup>

Google has stated that the speed and location information it collects to calculate traffic conditions is anonymous.<sup>[67]</sup> Options available in each phone's settings allow users not to share information about their location with Google Maps.<sup>[68]</sup> Google stated, "Once you disable or opt out of My Location, Maps will not continue to send radio information back to Google servers to determine your handset's approximate location".<sup>[69]</sup><sup>*failed verification*</sup>

## Street View

<sup>[edit]</sup>

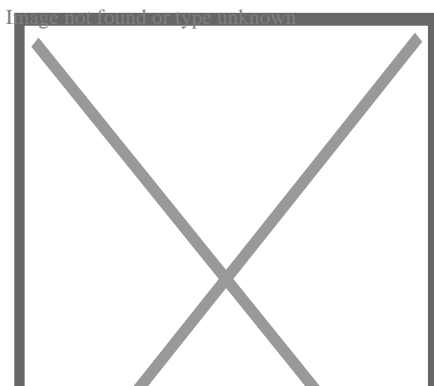
Main article: [Google Street View](#)



A Google Maps car at [Googleplex](#), [Mountain View](#)

On May 25, 2007, Google released [Google Street View](#), a feature of Google Maps providing [360°](#) panoramic street-level views of various locations. On the date of release, the feature only included five cities in the U.S. It has since expanded to thousands of locations around the world. In July 2009, Google began mapping college campuses and surrounding paths and [trails](#).

Street View garnered much controversy after its release because of [privacy concerns](#) about the uncensored nature of the panoramic photographs, although the views are only taken on public streets.<sup>[70][71]</sup> Since then, Google has blurred faces and license plates through automated [facial recognition](#).<sup>[72][73][74]</sup>



Google Maps Street View Trekker backpack being implemented on the sidewalk of the Hudson River Greenway in New York City

In late 2014, Google launched Google Underwater Street View, including 2,300 kilometres (1,400 mi) of the Australian **Great Barrier Reef** in 3D. The images are taken by special cameras which turn 360 degrees and take shots every 3 seconds.<sup>[75]</sup>

In 2017, in both Google Maps and Google Earth, Street View navigation of the **International Space Station** interior spaces became available.

## 3D imagery

<sup>[edit]</sup>

Main article: **Google Earth § 3D imagery**

Google Maps has incorporated<sup>[*when?*]</sup> 3D models of hundreds of cities in over 40 countries from Google Earth into its satellite view. The models were developed using aerial **photogrammetry** techniques.<sup>[76][77]</sup>

## Immersive View

<sup>[edit]</sup>

At the **I/O 2022** event, Google announced Immersive View, a feature of Google Maps which would involve composite 3D images generated from **Street View** and aerial images of locations using AI, complete with synchronous information. It was to be initially in five cities worldwide, with plans to add it to other cities later on.<sup>[78]</sup> The feature was previewed in September 2022 with 250 photorealistic aerial 3D images of landmarks,<sup>[79]</sup> and was full launched in February 2023.<sup>[80]</sup> An expansion of Immersive View to routes was announced at Google I/O 2023,<sup>[81]</sup> and was launched in October 2023 for 15 cities globally.<sup>[82]</sup>































The feature uses **predictive modelling** and **neural radiance fields** to scan Street View and aerial images to generate composite 3D imagery of locations, including both exteriors and interiors, and routes, including driving, walking or cycling, as well as generate synchronous information and forecasts up to a month ahead from historical and environmental data about both such as weather, traffic and busyness.

Immersive View has been available in the following locations:<sup>[*citation needed*]</sup>

Locations with Immersive View

**Country**

**Locations**

	Argentina	Buenos Aires
	Australia	Melbourne, Sydney
	Austria	Vienna
	Belgium	Brussels
	Brazil	Brasília, Rio de Janeiro, São Paulo
	Canada	Calgary, Edmonton, Montreal, Ottawa, Toronto, Vancouver
	Chile	Santiago
	Czech Republic	Prague
	France	Nice, Paris
	Germany	Berlin, Cologne, Frankfurt, Munich
	Greece	Athens
	Hong Kong	Hong Kong
	Hungary	Budapest
	Italy	Florence, Milan, Rome, Venice
	Japan	Kyoto, Nagoya, Osaka, Tokyo
	Mexico	Guadalajara, Mexico City
	Netherlands	Amsterdam
	Norway	Oslo
	Poland	Warsaw
	Portugal	Lisbon, Porto
	Romania	Bucharest
	Singapore	Singapore
	South Africa	Cape Town, Johannesburg
	Spain	Barcelona, Madrid
	Sweden	Stockholm
	Switzerland	Zurich
	Taiwan	Taichung, Taipei
	United Kingdom	Edinburgh, London
	United States	Atlanta, Boston, Chicago, Detroit, Houston, Las Vegas, Los Angeles, Miami, New York City, Philadelphia, San Diego, San Francisco, Seattle
	Vatican City	Vatican City

# Landmark Icons

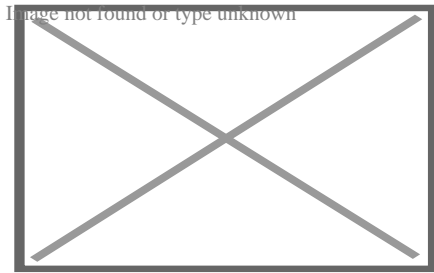


[[edit](#)]

Google added icons of city attractions, in a similar style to [Apple Maps](#), on October 3, 2019. In the first stage, such icons were added to 9 cities.<sup>[83]</sup>

## 45° imagery

[[edit](#)]



An example of the [Leaning Tower of Pisa](#) in the 45° view

In December 2009, Google introduced a new view consisting of 45° angle aerial imagery, offering a "[bird's-eye view](#)" of cities. The first cities available were [San Jose](#) and San Diego. This feature was initially available only to developers via the Google Maps API.<sup>[84]</sup> In February 2010, it was introduced as an experimental feature in Google Maps Labs.<sup>[85]</sup> In July 2010, 45° imagery was made available in Google Maps in select cities in South Africa, the United States, Germany and Italy.<sup>[86]</sup>

## Weather

[[edit](#)]

In February 2024, Google Maps incorporated a small weather icon on the top left corner of the Android and iOS mobile apps, giving access to weather and [air quality index](#) details.<sup>[87]</sup>

## Lens in Maps

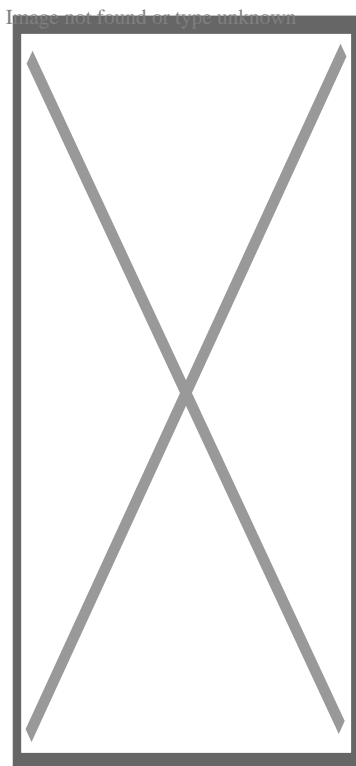
[[edit](#)]

Previously called Search with Live View, Lens In Maps identifies shops, restaurants, transit stations and other street features with a phone's camera and places relevant information and a

category pin on top, like closing/opening times, current busyness, pricing and reviews using AI and **augmented reality**. The feature, if available on the device, can be accessed through tapping the Lens icon in the search bar. It was expanded to 50 new cities in October 2023 in its biggest expansion yet, after initially being released in late 2022 in Los Angeles, San Francisco, New York, London, and Paris.[88][89] Lens in Maps shares features with Live View, which also displays information relating to street features while guiding a user to a selected destination with virtual arrows, signs and guidance.[90]

## Business listings

[edit]



A business listing in Google Maps showing opening times, reviews and photos. This screenshot is from the Android mobile app.

Google collates business listings from multiple on-line and off-line sources. To reduce duplication in the index, Google's algorithm combines listings automatically based on address, phone number, or geocode,[91] but sometimes information for separate businesses will be inadvertently merged with each other, resulting in listings inaccurately incorporating elements from multiple businesses.[92] Google allows business owners to create and verify their own business data through *Google Business Profile (GBP)*, formerly *Google My Business (GMB)*. [93] Owners are encouraged to provide Google with business information including address, phone number, business category, and photos.[94] Google has staff in India who check and

correct listings remotely as well as support businesses with issues.[95] Google also has teams on the ground in most countries that validate physical addresses in person.[96] In May 2024, Google announced it would discontinue the chat feature in Google Business Profile. Starting July 15, 2024, new chat conversations would be disabled, and by July 31, 2024, all chat functionalities would end.[97]

Google Maps can be manipulated by businesses that are not physically located in the area in which they record a listing. There are cases of people abusing Google Maps to overtake their competition by placing unverified listings on online directory sites, knowing the information will roll across to Google (duplicate sites). The people who update these listings do not use a registered business name. They place keywords and location details on their Google Maps business title, which can overtake credible business listings. In Australia in particular, genuine companies and businesses are noticing a trend of fake business listings in a variety of industries.[98]

Genuine business owners can also optimize their business listings to gain greater visibility in Google Maps, through a type of search engine marketing called [local search engine optimization](#).[99]

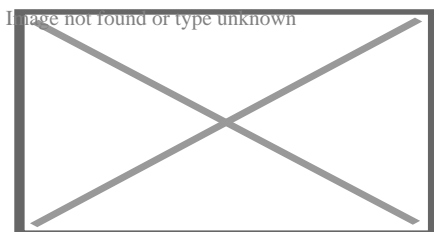
## Indoor maps

[\[edit\]](#)

In March 2011, indoor maps were added to Google Maps, giving users the ability to navigate themselves within buildings such as [airports](#), [museums](#), shopping malls, [big-box stores](#), universities, [transit stations](#), and other public spaces (including underground facilities). Google encourages owners of public facilities to submit floor plans of their buildings in order to add them to the service.[100] Map users can view different floors of a building or [subway station](#) by clicking on a level selector that is displayed near any structures which are mapped on multiple levels.

## My Maps

[\[edit\]](#)



## Google My Maps

My Maps is a feature in Google Maps launched in April 2007 that enables users to create custom maps for personal use or sharing. Users can add points, lines, shapes, notes and images on top of Google Maps using a **WYSIWYG** editor.<sup>[101]</sup> An Android app for My Maps, initially released in March 2013 under the name Google Maps Engine Lite, was available until its removal from the **Play Store** in October 2021.<sup>[102][103][104]</sup>

## Google Local Guides

[\[edit\]](#)

Google Local Guides is a volunteer program launched by Google Maps<sup>[105]</sup> to enable users to contribute to Google Maps when registered. It sometimes provides them additional perks and benefits for their collaboration. Users can achieve Level 1 to 10, and be awarded with badges. The program is partially a successor to **Google Map Maker** as features from the former program became integrated into the website and app.<sup>[106]</sup>

The program consists of adding reviews, photos, basic information, and videos; and correcting information such as **wheelchair accessibility**.<sup>[107][108]</sup> Adding reviews, photos, videos, new places, new roads or providing useful information gives points to the users.<sup>[109]</sup> The level of users is upgraded when they get a certain amount of points.<sup>[110][111]</sup> Starting with Level 4, a star is shown near the avatar of the user.<sup>[111]</sup>

## Timelapse

[\[edit\]](#)

Earth Timelapse, released in April 2021, is a program in which users can see how the earth has been changed in the last 37 years. They combined the 15 million satellite images (roughly ten quadrillion **pixels**) to create the 35 global cloud-free Images for this program.<sup>[112]</sup>

## Timeline

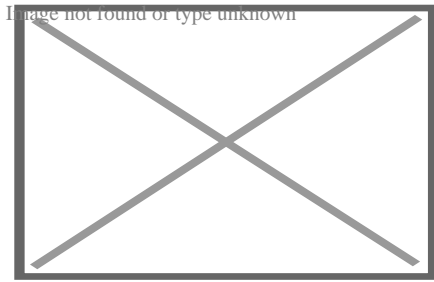
[\[edit\]](#)



If a user shares their location with Google, Timeline summarises this location for each day on a [Timeline map](#).<sup>[113]</sup> Timeline estimates the mode of travel used to move between places and will also show photos taken at that location. In June 2024, Google started progressively removing access to the timeline on web browsers, with the information instead being stored on a local device.<sup>[114][115]</sup>

## Implementation

[\[edit\]](#)



A split-view screenshot of Google Maps. In the bottom half *Street Maps* is shown, while in the top half *Street View* is shown. A user can zoom in and out of either of them independently of the zoom level of each.

As the user drags the map, the grid squares are downloaded from the server and inserted into the page. When a user searches for a business, the results are downloaded in the background for insertion into the side panel and map; the page is not reloaded. A hidden [iframe](#) with form submission is used because it preserves browser history. Like many other Google web applications, Google Maps uses [JavaScript](#) extensively.<sup>[116]</sup> The site also uses protocol buffers for data transfer rather than [JSON](#), for performance reasons.

The version of [Google Street View](#) for classic Google Maps required [Adobe Flash](#).<sup>[117]</sup> In October 2011, Google announced MapsGL, a [WebGL](#) version of Maps with better renderings and smoother transitions.<sup>[118]</sup> Indoor maps use JPG, .PNG, .PDF, .BMP, or .GIF, for [floor plans](#).<sup>[119]</sup>

Users who are logged into a [Google Account](#) can save locations so that they are overlaid on the map with various colored "pins" whenever they browse the application. These "Saved places" can be organized into default groups or user named groups and shared with other users. "Starred places" is one default group example. It previously automatically created a record within the now-discontinued product [Google Bookmarks](#).

## Map data and imagery

[\[edit\]](#)

See also: [List of satellite map images with missing or unclear data](#)

The Google Maps terms and conditions<sup>[120]</sup> state that usage of material from Google Maps is regulated by Google Terms of Service<sup>[121]</sup> and some additional restrictions. Google has either purchased local map data from established companies, or has entered into lease agreements to use copyrighted map data.<sup>[122]</sup> The owner of the copyright is listed at the bottom of zoomed maps. For example, street maps in Japan are leased from [Zenrin](#). Street maps in China are leased from [AutoNavi](#).<sup>[123]</sup> Russian street maps are leased from Geocentre Consulting and [Tele Atlas](#). Data for [North Korea](#) is sourced from the companion project [Google Map Maker](#).

Street map overlays, in some areas, may not match up precisely with the corresponding satellite images. The street data may be entirely erroneous, or simply out of date: "The biggest challenge is the currency of data, the authenticity of data," said Google Earth representative [Brian McClendon](#). As a result, in March 2008 Google added a feature to edit the locations of houses and businesses.<sup>[124]</sup><sup>[125]</sup>

Restrictions have been placed on Google Maps through the apparent censoring of locations deemed potential security threats. In some cases the area of redaction is for specific buildings, but in other cases, such as Washington, D.C.,<sup>[126]</sup> the restriction is to use outdated imagery.

## Google Maps API

[\[edit\]](#)

Google Maps API, now called Google Maps Platform, hosts about 17 different [APIs](#), which are themed under the following categories: Maps, Places and Routes.<sup>[127]</sup>

After the success of reverse-engineered mashups such as [chicagocrime.org](#) and [housingmaps.com](#), Google launched the Google Maps API in June 2005<sup>[128]</sup> to allow developers to integrate Google Maps into their websites. It was a free service that did not require an [API key](#) until June 2018 (changes went into effect on July 16), when it was announced that an API key linked to a Google Cloud account with billing enabled would be required to access the API.<sup>[129]</sup> The API currently does not contain ads, but Google states in their terms of use that they reserve the right to display ads in the future.<sup>[130]</sup>

By using the Google Maps [API](#), it is possible to embed Google Maps into an external website, onto which site-specific data can be overlaid.<sup>[131]</sup> Although initially only a [JavaScript](#) API, the Maps API was expanded to include an API for [Adobe Flash](#) applications (but this has been deprecated), a service for retrieving static map images, and [web services](#) for performing [geocoding](#), generating driving directions, and obtaining elevation profiles. Over 1,000,000<sup>[132]</sup> web sites use the Google Maps API, making it the most heavily used web application development API.<sup>[133]</sup> In September 2011, Google announced it would deprecate the Google

Maps API for Flash.[134]

The Google Maps API was free for commercial use, provided that the site on which it is being used is publicly accessible and did not charge for access, and was not generating more than 25,000 map accesses a day.[135][136] Sites that did not meet these requirements could purchase the Google Maps API for Business.[137]

As of June 21, 2018, Google increased the prices of the Maps API and requires a billing profile.[138]

## Google Maps in China

[edit]

Due to [restrictions on geographic data in China](#), Google Maps must partner with a Chinese digital map provider in order to legally show Chinese map data. Since 2006, this partner has been [AutoNavi](#).<sup>[123]</sup>

Within China, the State Council mandates that all maps of China use the [GCJ-02](#) coordinate system, which is offset from the [WGS-84](#) system used in most of the world. [google.cn/maps](#) (formerly Google Ditu) uses the GCJ-02 system for both its street maps<sup>[139]</sup> and satellite imagery.<sup>[140]</sup> [google.com/maps](#) also uses GCJ-02 data for the street map, but uses WGS-84 coordinates for satellite imagery,<sup>[141]</sup> causing the so-called [China GPS shift problem](#).

Frontier alignments also present some differences between [google.cn/maps](#) and [google.com/maps](#). On the latter, sections of the Chinese border with India and Pakistan are shown with dotted lines, indicating areas or frontiers in dispute. However, [google.cn](#) shows the Chinese frontier strictly according to Chinese claims with no dotted lines indicating the border with India and Pakistan. For example, the [South Tibet](#) region claimed by China but administered by India as a large part of [Arunachal Pradesh](#) is shown inside the Chinese frontier by [google.cn](#), with Indian highways ending abruptly at the Chinese claim line. [Google.cn](#) also shows Taiwan and the [South China Sea Islands](#) as part of China. Google Ditu's street map coverage of Taiwan no longer omits major state organs, such as the Presidential Palace, the [five Yuans](#), and the Supreme Court.<sup>[142]</sup><sup>*[additional citation(s) needed]*</sup>

Feature-wise, [google.cn/maps](#) does not feature My Maps. On the other hand, while [google.cn](#) displays virtually all text in Chinese, [google.com/maps](#) displays most text (user-selectable real text as well as those on map) in English.<sup>*[citation needed]*</sup> This behavior of displaying English text is not consistent but intermittent – sometimes it is in English, sometimes it is in Chinese. The criteria for choosing which language is displayed are not known publicly.<sup>*[citation needed]*</sup>

### Criticism and controversies

[[edit](#)]

## Incorrect location naming

[[edit](#)]

There are cases where Google Maps had added out-of-date neighborhood monikers. Thus, in Los Angeles, the name "Brooklyn Heights" was revived from its 1870s usage<sup>[143]</sup> and "Silver Lake Heights" from its 1920s usage,<sup>[144]</sup> or mistakenly renamed areas (in Detroit, the neighborhood "Fiskhorn" became "Fishkorn").<sup>[145]</sup> Because many companies utilize Google Maps data, these previously obscure or incorrect names then gain traction; the names are often used by [realtors](#), hotels, [food delivery](#) sites, [dating sites](#), and [news organizations](#).

Google has said it created its maps from third-party data, public sources, satellites, and users, but many names used have not been connected to any official record.<sup>[143]</sup><sup>[145]</sup> According to a former Google Maps employee (who was not authorized to speak publicly), users can submit changes to Google Maps, but some submissions are ruled upon by people with little local knowledge of a place, such as contractors in India. Critics maintain that names like "BoCoCa" (for the area in Brooklyn between Boerum Hill, Cobble Hill and Carroll Gardens), are "just plain puzzling" or simply made up.<sup>[145]</sup> Some names used by Google have been traced to non-professionally made maps with typographical errors that survived on Google Maps.<sup>[145]</sup>

## Potential misuse

[[edit](#)]

See also: [Google Street View privacy concerns](#) and [List of satellite map images with missing or unclear data](#)

In 2005 the [Australian Nuclear Science and Technology Organisation](#) (ANSTO) complained about the potential for terrorists to use the satellite images in planning attacks, with specific reference to the [Lucas Heights nuclear reactor](#); however, the Australian Federal government did not support the organization's concern. At the time of the ANSTO complaint, Google had colored over some areas for security (mostly in the U.S.), such as the rooftop of the [White House](#) and several other Washington, D.C. buildings.<sup>[146]</sup><sup>[147]</sup><sup>[148]</sup>

In October 2010, Nicaraguan military commander [Edén Pastora](#) stationed [Nicaraguan troops](#) on the [Isla Calero](#) (in the delta of the [San Juan River](#)), justifying his action on the border delineation given by Google Maps. Google has since updated its data which it found to be incorrect.<sup>[149]</sup>

On January 27, 2014, documents leaked by [Edward Snowden](#) revealed that the [NSA](#) and the [GCHQ](#) intercepted Google Maps queries made on smartphones, and used them to locate the users making these queries. One leaked document, dating to 2008, stated that "[i]t effectively means that anyone using Google Maps on a smartphone is working in support of a GCHQ system."[\[150\]](#)

In May 2015, searches on Google Maps for offensive racial epithets for African Americans such as "[nigger](#)", "nigger king", and "nigger house" pointed the user to the [White House](#); Google apologized for the incident.[\[151\]\[152\]](#)

In December 2015, 3 Japanese [netizens](#) were charged with vandalism after they were found to have added an unrelated law firm's name as well as indecent names to locations such as "[Nuclear test site](#)" to the [Atomic Bomb Dome](#) and "Izumo [Satya](#)" to the [Izumo Taisha](#).[\[153\]\[154\]](#)

In February 2020, the artist Simon Weckert[\[155\]](#) used 99 cell phones to fake a Google Maps traffic jam.[\[156\]](#)

In September 2024, several schools in Taiwan and Hong Kong were altered to incorrect labels, such as "[psychiatric hospitals](#)" or "[prisons](#)". Initially, it was believed to be the result of hacker attacks. However, police later revealed that local students had carried out the prank. Google quickly corrected the mislabeled entries. Education officials in Taiwan and Hong Kong expressed concern over the incident.[\[157\]\[158\]\[159\]](#)

## Misdirection incidents

[\[edit\]](#)

### Australia

[\[edit\]](#)

In August 2023, a woman driving from [Alice Springs](#) to the Harts Range Racecourse was stranded in the Central Australian desert for a night after following directions provided by Google Maps.[\[160\]\[161\]](#) She later discovered that Google Maps was providing directions for the actual [Harts Range](#) instead of the rodeo. Google said it was looking into the naming of the two locations and consulting with "local and authoritative sources" to solve the issue.[\[160\]](#)

In February 2024, two German tourists were stranded for a week after Google Maps directed them to follow a dirt track through [Oyala Thumotang National Park](#) and their vehicle became trapped in mud.[\[162\]\[163\]](#) [Queensland Parks and Wildlife Service](#) ranger Roger James said, "People should not trust Google Maps when they're travelling in remote regions of [Queensland](#), and they need to follow the signs, use official maps or other navigational devices."[\[162\]](#)



## North America

[[edit](#)]

In June 2019, Google Maps provided nearly 100 [Colorado](#) drivers an alternative route that led to a dirt road after a crash occurred on [Peña Boulevard](#). The road had been turned to mud by rain, resulting in nearly 100 vehicles being trapped.<sup>[164][161]</sup> Google said in a statement, "While we always work to provide the best directions, issues can arise due to unforeseen circumstances such as weather. We encourage all drivers to follow local laws, stay attentive, and use their best judgment while driving."<sup>[164]</sup>

In September 2023, Google was sued by a [North Carolina](#) resident who alleged that Google Maps had directed her husband over the Snow Creek Bridge in [Hickory](#) the year prior, resulting in him drowning. According to the lawsuit, multiple people had notified Google about the state of the bridge, which collapsed in 2013, but Google had not updated the route information and continued to direct users over the bridge.<sup>[165][166][161]</sup> At the time of the man's death, the barriers placed to block access to the bridge had been vandalized.<sup>[167][168]</sup>

In November 2023, a hiker was rescued by helicopter on the backside of [Mount Fromme](#) in [Vancouver](#). [North Shore Rescue](#) stated on its Facebook page that the hiker had followed a non-existent hiking trail on Google Maps. This was also the second hiker in two months to require rescuing after following the same trail. The fake trail has since been removed from the app.<sup>[169][170]</sup>

Also in November 2023, Google apologized after users were directed through desert roads after parts of [Interstate 15](#) were closed due to a [dust storm](#).<sup>[171]</sup> Drivers became stranded after following the suggested detour route, which was a "bumpy dirt trail".<sup>[172]</sup> Following the incident, Google stated that Google Maps would "no longer route drivers traveling between [Las Vegas](#) and [Barstow](#) down through those roads."<sup>[171]</sup>

## Russia

[[edit](#)]

In 2020, a teenage motorist was found frozen to death while his passenger was still alive but suffered from severe [frostbite](#) after using Google Maps, which had led them to a shorter but abandoned section of the [R504 Kolyma Highway](#), where their [Toyota Chaser](#) became disabled.<sup>[173]</sup>

## India

[[edit](#)]

In 2024, three men from [Uttar Pradesh](#) died after their car fell from an under-construction bridge. They were using Google Maps for driving which misdirected them and the car fell into the [Ramganga](#) river.<sup>[174][175]</sup>

## Renaming of the Gulf of Mexico

[\[edit\]](#)

In February 2025, as a response to Donald Trump's [Executive Order 14172](#), the [Gulf of Mexico](#) was renamed to "Gulf of America" for US users and "Gulf of Mexico (Gulf of America)" elsewhere, except for Mexico itself where it remained the Gulf of Mexico. The decision received criticism, with Mexican president [Claudia Sheinbaum](#) asking Google to reconsider its decision.<sup>[176]</sup> Google subsequently blocked and deleted negative reviews of the gulf after the name change occurred.<sup>[177][178]</sup>

### Discontinued features

[\[edit\]](#)

## Google Latitude

[\[edit\]](#)

Main article: [Google Latitude](#)

Google Latitude was a feature that let users share their physical locations with other people. This service was based on Google Maps, specifically on mobile devices. There was an iGoogle widget for desktops and laptops as well.<sup>[179]</sup> Some concerns were expressed about the privacy issues raised by the use of the service.<sup>[180]</sup> On August 9, 2013, this service was discontinued,<sup>[181]</sup> and on March 22, 2017, Google incorporated the features from Latitude into the Google Maps app.<sup>[182]</sup>

## Google Map Maker

[\[edit\]](#)

Main article: [Google Map Maker](#)

In areas where Google Map Maker was available, for example, much of Asia, Africa, Latin America and Europe as well as the United States and Canada, anyone who logged into their

Google account could directly improve the map by fixing incorrect driving directions, adding biking trails, or adding a missing building or road. General map errors in Australia, Austria, Belgium, Denmark, France, Liechtenstein, Netherlands, New Zealand, Norway, South Africa, Switzerland, and the United States could be reported using the Report a Problem link in Google Maps and would be updated by Google.<sup>[183]</sup> For areas where Google used Tele Atlas data, map errors could be reported using Tele Atlas map insight.<sup>[184]</sup>

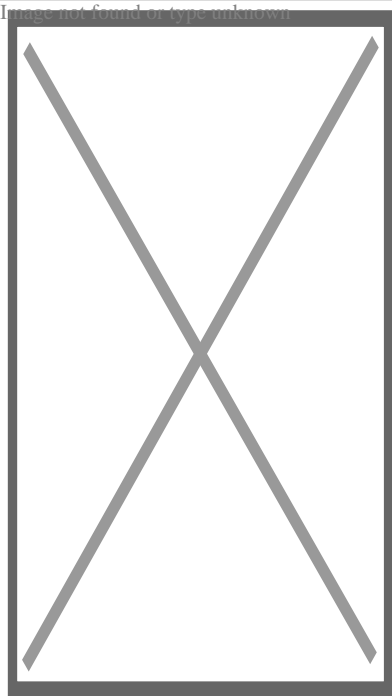
If imagery was missing, outdated, misaligned, or generally incorrect, one could notify Google through their contact request form.<sup>[185]</sup>

In November 2016, Google announced the discontinuation of Google Map Maker as of March 2017.<sup>[186]</sup>

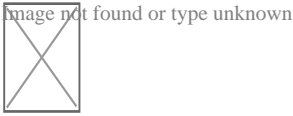
Mobile app

[\[edit\]](#)

Screenshot



Screenshot of Google Maps on **Android 14**  
25.10.04 (Build 732665141) / 7 March 2025; 10 days ago<sup>[187]</sup><sup>[188]</sup>  
**Wear OS** 25.09.00 (Build 730474011) / 25 February 2025; 20 days ago<sup>[187]</sup><sup>[189]</sup>  
**iOS** 25.10.02 / 7 March 2025; 10 days ago<sup>[190]</sup>  
**Android Go,<sup>[a]</sup> discontinued** 161.1 / 13 October 2023; 17 months ago<sup>[191]</sup><sup>[192]</sup>  
**Android (**Beta**)** 11.143.0303 / 20 August 2024; 6 months ago<sup>[193]</sup>  
Google Maps



**Original author(s)** Google

**Initial release** 2006; 19 years ago

**Stable release(s) [±]**

**Preview release(s) [±]**

**Operating system**

- Android
- iOS
- KaiOS Wear OS WatchOS Web Fitbit OS

Formerly: Java ME, Symbian, Windows Mobile

Google Maps is available as a **mobile app** for the **Android** and **iOS** mobile operating systems. The first mobile version of Google Maps (then known as Google Local for Mobile) was launched in beta in November 2005 for mobile platforms supporting **J2ME**.<sup>[194][195][196]</sup> It was released as Google Maps for Mobile in 2006.<sup>[197]</sup> In 2007 it came preloaded on the **first iPhone** in a deal with Apple.<sup>[198]</sup> A version specifically for **Windows Mobile** was released in February 2007<sup>[199]</sup> and the **Symbian** app was released in November 2007.<sup>[200]</sup>

Version 2.0 of Google Maps Mobile was announced at the end of 2007, with a stand out *My Location* feature to find the user's location using the cell towers, without needing **GPS**.<sup>[201][202][203]</sup> In September 2008, Google Maps was released for and preloaded on Google's own new platform Android.<sup>[204][205]</sup>

Up until **iOS 6**, the built-in maps application on the **iOS** operating system was powered by Google Maps. However, with the announcement of iOS 6 in June 2012, **Apple** announced that they had created their own **Apple Maps** mapping service,<sup>[206]</sup> which officially replaced Google Maps when iOS 6 was released on September 19, 2012.<sup>[207]</sup> However, at launch, Apple Maps received significant criticism from users due to inaccuracies, errors and **bugs**.<sup>[208][209]</sup> One day later, *The Guardian* reported that Google was preparing its own Google Maps app,<sup>[210]</sup> which was released on December 12, 2012.<sup>[211][212]</sup> Within two days, the application had been downloaded over ten million times.<sup>[213]</sup>

## Features

[edit]

The Google Maps apps for iOS and Android have many of the same features, including **turn-by-turn navigation**, **street view**, and public transit information.[214][215] Turn-by-turn navigation was originally announced by Google as a separate beta testing app exclusive to Android 2.0 devices in October 2009.[216][217] The original standalone iOS version did not support the **iPad**,[215] but tablet support was added with version 2.0 in July 2013.[218] An update in June 2012 for Android devices added support for offline access to downloaded maps of certain regions,[219][220] a feature that was eventually released for iOS devices, and made more robust on Android, in May 2014.[221][222]

At the end of 2015 Google Maps announced its new offline functionality,[223] but with various limitations – downloaded area cannot exceed 120,000 square kilometers[224][225] and require a considerable amount of storage space.[226] In January 2017, Google added a feature exclusively to Android that will, in some U.S. cities, indicate the level of difficulty in finding available parking spots,[227] and on both Android and iOS, the app can, as of an April 2017 update, remember where users parked.[228][229] In August 2017, Google Maps for Android was updated with new functionality to actively help the user in finding parking lots and garages close to a destination.[230] In December 2017, Google added a new two-wheeler mode to its Android app, designed for users in India, allowing for more accessibility in traffic conditions.[231][232] In 2019 the Android version introduced the new feature called live view that allows to view directions directly on the road thanks to **augmented reality**. [233] Google Maps won the 2020 Webby Award for Best User Interface in the category Apps, Mobile & Voice.[234] In March 2021, Google added a feature in which users can draw missing roads.[235] In June 2022, Google implemented support for toll calculation. Both iOS and Android apps report how much the user has to pay in tolls when a route that includes toll roads is input. The feature is available for roads in the US, India, Japan and Indonesia with further expansion planned. As per reports the total number of toll roads covered in this phase is around 2000.[236]

## Reception

[edit]

*USA Today* welcomed the application back to iOS, saying: "The reemergence in the middle of the night of a Google Maps app for the iPhone is like the return of an old friend. Only your friend, who'd gone missing for three months, comes back looking better than ever." [237] Jason Parker of *CNET*, calling it "the king of maps", said, "With its iOS Maps app, Google sets the standard for what mobile navigation should be and more." [238] Bree Fowler of the *Associated Press* compared Google's and Apple's map applications, saying: "The one clear advantage that Apple has is style. Like Apple devices, the maps are clean and clear and have a fun, pretty element to them, especially in 3-D. But when it comes down to depth and information, Google still reigns superior and will no doubt be welcomed back by its fans." [239] *Gizmodo* gave it a



ranking of 4.5 stars, stating: "Maps Done Right".<sup>[240]</sup> According to *The New York Times*, Google "admits that it's [iOS app is] even better than Google Maps for Android phones, which has accommodated its evolving feature set mainly by piling on menus".<sup>[241]</sup>

Google Maps' **location tracking** is regarded by some as a threat to users' privacy, with Dylan Tweney of *VentureBeat* writing in August 2014 that "Google is probably logging your location, step by step, via Google Maps", and linked users to Google's location history map, which "lets you see the path you've traced for any given day that your smartphone has been running Google Maps". Tweney then provided instructions on how to disable location history.<sup>[242]</sup> The history tracking was also noticed, and recommended disabled, by editors at *CNET*<sup>[243]</sup> and *TechCrunch*.<sup>[244]</sup> Additionally, *Quartz* reported in April 2014 that a "sneaky new privacy change" would have an effect on the majority of iOS users. The privacy change, an update to the **Gmail** iOS app that "now supports sign-in across Google iOS apps, including Maps, **Drive**, YouTube and **Chrome**", meant that Google would be able to identify users' actions across its different apps.<sup>[245]</sup>

The Android version of the app surpassed five billion installations in March 2019.<sup>[246]</sup> By November 2021, the Android app had surpassed 10 billion installations.<sup>[247]</sup>

## Go version

<sup>[edit]</sup>

Google Maps Go, a version of the app designed for **lower-end devices**, was released in beta in January 2018.<sup>[248]</sup> By September 2018, the app had over 10 million installations.<sup>[249]</sup>

### Artistic and literary uses

<sup>[edit]</sup>

The German "geo-novel" *Senghor on the Rocks* (2008) presents its story as a series of spreads showing a Google Maps location on the left and the story's text on the right. Annika Richterich explains that the "satellite pictures in *Senghor on the Rocks* illustrate the main character's travel through the West-African state of **Senegal**".<sup>[250]</sup>

Artists have used Google Street View in a range of ways. **Emilio Vavarella's** *The Google Trilogy* includes glitchy images and unintended portraits of the drivers of the Street View cars.<sup>[251]</sup> The Japanese band **group inou** used Google Street View backgrounds to make a music video for their song EYE.<sup>[252]</sup> The Canadian band **Arcade Fire** made a customized music video that used Street View to show the viewer their own childhood home.<sup>[253][254]</sup>

### See also

[[edit](#)]

- [icon](#) [Image not found for this template known](#) [Internet portal](#)
- [Azure Maps](#)
- [Apple Maps](#)
- [Bing Maps](#)
- [Comparison of web map services](#)
- [GeoGuessr](#)
- [Google Earth](#)
- [Google Maps Road Trip](#), live-streaming documentary
- [Here WeGo](#)
- [MapQuest](#)
- [OpenStreetMap](#)
- [Terravision \(computer program\)](#)
- [Wikiloc](#), a mashup that shows trails and waypoints on Google Maps
- [Wikimapia](#), a mashup combining Google Maps and a [wiki](#) aimed at "describing the whole planet earth"
- [Yandex Maps](#), popular in Russia and [CIS](#)

## Notes

[[edit](#)]

1. <sup>^</sup> Lite version for Android

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[[edit](#)]

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- Pixel Watch 3 (2024)

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- Pixel Slate (2018)
- Pixel Tablet (2023)

### Laptops

- Chromebook Pixel (2013–2015)
- Pixelbook (2017)
- Pixelbook Go (2019)

### Other

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### Smartphones

- Nexus One (2010)
- Nexus S (2010)
- Galaxy Nexus (2011)
- Nexus 4 (2012)
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- Nexus 6 (2014)

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- |                              |   |
|------------------------------|---|
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| <b>Intellectual property</b> | <ul style="list-style-type: none"> <li>○ <i>Perfect 10, Inc. v. Amazon.com, Inc.</i> (2007)</li> <li>○ <i>Viacom International Inc. v. YouTube, Inc.</i> (2010)</li> <li>○ <i>Lenz v. Universal Music Corp.</i> (2015)</li> <li>○ <i>Authors Guild, Inc. v. Google, Inc.</i> (2015)</li> <li>○ <i>Field v. Google, Inc.</i> (2016)</li> <li>○ <i>Google LLC v. Oracle America, Inc.</i> (2021)</li> <li>○ Smartphone patent wars</li> </ul>   |
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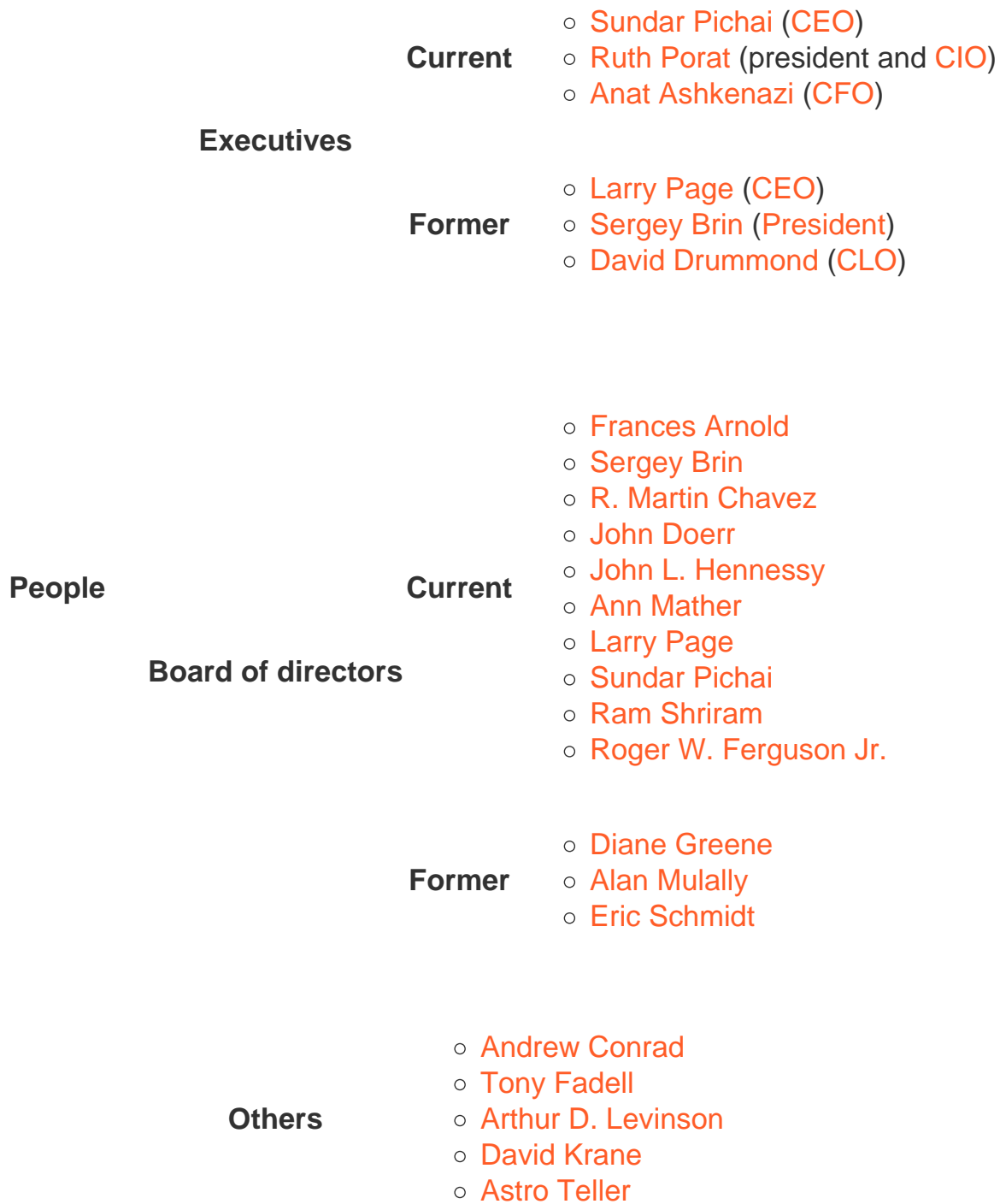
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- **e**

Alphabet Inc.

	<ul style="list-style-type: none"> <li>○ Access <ul style="list-style-type: none"> <li>○ Google Fiber</li> </ul> </li> <li>○ Calico</li> <li>○ CapitalG</li> <li>○ Google <ul style="list-style-type: none"> <li>○ DeepMind <ul style="list-style-type: none"> <li>○ AlphaFold</li> <li>○ AlphaGo <ul style="list-style-type: none"> <li>○ vs. Fan Hui</li> <li>○ vs. Ke Jie</li> <li>○ vs. Lee Sedol <ul style="list-style-type: none"> <li>○ film</li> </ul> </li> </ul> </li> <li>○ Future of Go Summit</li> </ul> </li> <li>○ AlphaGo Zero</li> <li>○ AlphaStar</li> <li>○ AlphaZero</li> <li>○ Master</li> <li>○ MuZero</li> <li>○ WaveNet</li> </ul> </li> </ul>
Current	
Subsidiaries	<ul style="list-style-type: none"> <li>○ DoubleClick</li> <li>○ Firebase</li> <li>○ Fitbit</li> <li>○ Tenor</li> <li>○ Waze</li> <li>○ YouTube</li> <li>○ GV</li> <li>○ Isomorphic Labs</li> <li>○ Verily <ul style="list-style-type: none"> <li>○ Baseline Study</li> </ul> </li> <li>○ X Development</li> <li>○ Waymo</li> <li>○ Wing</li> </ul>
Former	<ul style="list-style-type: none"> <li>○ Boston Dynamics</li> <li>○ Chronicle Security</li> <li>○ Jigsaw</li> <li>○ Loon</li> <li>○ Makani</li> <li>○ Meka Robotics</li> <li>○ Nest Labs</li> <li>○ Sidewalk Labs <ul style="list-style-type: none"> <li>○ Toronto</li> </ul> </li> <li>○ Vicarious</li> </ul>

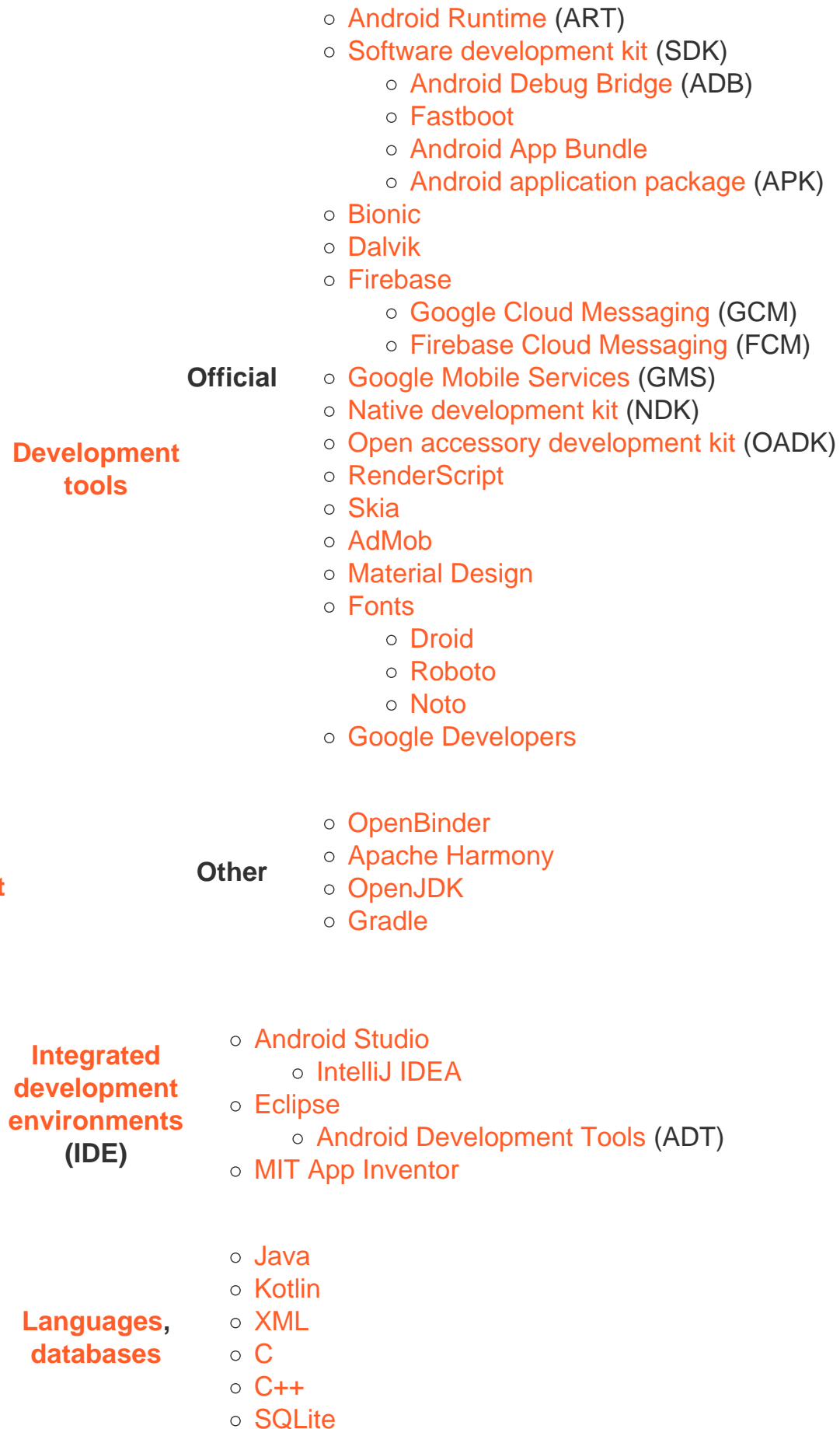


-  Category
-  Companies portal
-  Internet portal

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

## Android

- Android Go
  - Comparison of products





## Releases

- Cupcake (1.5)
- Donut (1.6)
- Eclair (2.0–2.1)
- Froyo (2.2)
- Gingerbread (2.3)
- Honeycomb (3.x)
- Ice Cream Sandwich (4.0)
- Jelly Bean (4.1–4.3)
- KitKat (4.4)
- Lollipop (5.x)
- Marshmallow (6.0)
- Nougat (7.x)
- Oreo (8.x)
- Pie (9)
- 10
- 11
- 12
- 13
- 14
- 15
- 16

## Derivatives

- Android Automotive
- Android Things
- TV
  - devices
- Android XR
- Wear OS

## Devices

### Pixel

- C
- Pixel & Pixel XL
- 2 & 2 XL
- 3 & 3 XL
  - 3a & 3a XL
- 4 & 4 XL
  - 4a & 4a (5G)
- 5
  - 5a
- 6 & 6 Pro
  - 6a
- 7 & 7 Pro
  - 7a
- Fold
- Tablet
- 8 & 8 Pro
  - 8a
- 9, 9 Pro & 9 Pro XL
  - 9 Pro Fold

### Nexus

- One
- S
- Galaxy Nexus
- 4
- 10
- Q
- 5
  - 5X
- 6
  - 6P
- 7
  - 2012
  - 2013
- 9
- Player

### Play edition

- HTC One (M7)
- HTC One (M8)
- LG G Pad 8.3
- Moto G
- Samsung Galaxy S4
- Sony Xperia Z Ultra

- Android One
- other smartphones

## **Custom distributions**

- AliOS
- Android-x86
  - Remix OS
- AOKP
- Baidu Yi
- Barnes & Noble Nook
- CalyxOS
- ColorOS
  - realme UI
- CopperheadOS
- EMUI
  - Magic UI
- Fire OS
- Flyme OS
- GrapheneOS
- Xiaomi HyperOS
  - MIUI
  - MIUI for Poco
- LeWa OS
- LineageOS
  - /e/
  - CrDroid
  - CyanogenMod
  - DivestOS
  - iodéOS
  - Kali NetHunter
- LiteOS
- Meta Horizon OS
- MicroG
- Nokia X software platform
- OmniROM
- OPhone
- OxygenOS
- PixelExperience
- Pixel UI
- Replicant
- Resurrection Remix OS
- SlimRoms
- TCL UI
- Ubuntu for Android
- XobotOS
- ZUI



<b>Booting and recovery</b>	<ul style="list-style-type: none"> <li>○ Booting process</li> <li>○ Recovery mode <ul style="list-style-type: none"> <li>○ TWRP</li> <li>○ ClockworkMod</li> </ul> </li> <li>○ Fastboot</li> </ul>
<b>APIs</b>	<ul style="list-style-type: none"> <li>○ Google Maps</li> <li>○ Google Play Services <ul style="list-style-type: none"> <li>○ SafetyNet</li> </ul> </li> <li>○ Google Search</li> </ul>
<b>Alternative UIs</b>	<ul style="list-style-type: none"> <li>○ Asus ZenFone</li> <li>○ Cherry OS</li> <li>○ ColorOS</li> <li>○ EMUI</li> <li>○ Funtouch OS</li> <li>○ Flyme OS</li> <li>○ HiOS</li> <li>○ Hive UI (XOLO Hive)</li> <li>○ HTC Sense</li> <li>○ LG UX <ul style="list-style-type: none"> <li>○ Optimus UI</li> </ul> </li> <li>○ Motoblur</li> <li>○ One UI</li> <li>○ Origin OS <ul style="list-style-type: none"> <li>○ Experience</li> <li>○ TouchWiz</li> </ul> </li> <li>○ OxygenOS</li> <li>○ Pixel UI</li> <li>○ XOS</li> <li>○ Xperia UI</li> </ul>
<b>Rooting</b>	<ul style="list-style-type: none"> <li>○ SuperSU</li> <li>○ Magisk</li> <li>○ Kingo Root</li> </ul>

## Lists

- Custom distributions
- Features
- Free and open-source applications
- Google apps
- Launchers

## Related topics

- Index of articles
- Androidland
- Chromecast
- Google
- Java vs. Android API
- Lawn statues
- BlueStacks
- Legal issues
  - *Google v. Oracle*
  - smartphone patent wars

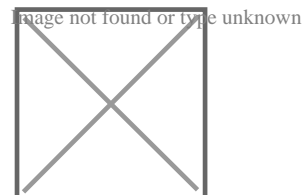
-  Category:Android development
-  Category:Mobile telecommunications
-  Software portal
-  Telecommunication portal

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

## OpenStreetMap

## Organisations

- Geochicas?
- Humanitarian OpenStreetMap Team
- Mapbox
- MapTiler
- Mapzen
- Missing Maps
- OpenStreetMap Foundation
- Ramani Huria
- Wikimedia Italia





Software	Editing	<ul style="list-style-type: none"> <li>○ <a href="#">iD</a></li> <li>○ <a href="#">JOSM</a></li> <li>○ <a href="#">KartaView</a></li> <li>○ <a href="#">Mapillary</a></li> <li>○ <a href="#">OpenDroneMap</a></li> <li>○ <a href="#">Potlatch</a></li> <li>○ <a href="#">StreetComplete</a></li> </ul>
	Visualisation	<ul style="list-style-type: none"> <li>○ <a href="#">Leaflet</a></li> <li>○ <a href="#">Mapnik</a></li> <li>○ <a href="#">Marble</a></li> <li>○ <a href="#">OpenLayers</a></li> <li>○ <a href="#">OpenRailwayMap</a></li> <li>○ <a href="#">OpenSeaMap</a></li> </ul>
	Navigation	<ul style="list-style-type: none"> <li>○ <a href="#">GNOME Maps</a></li> <li>○ <a href="#">GraphHopper</a></li> <li>○ <a href="#">Karta GPS</a></li> <li>○ <a href="#">Komoot</a></li> <li>○ <a href="#">Locus Map</a></li> <li>○ <a href="#">Maps.me</a></li> <li>○ <a href="#">Navit</a></li> <li>○ <a href="#">Neshan</a></li> <li>○ <a href="#">Open Source Routing Machine</a></li> <li>○ <a href="#">Organic Maps</a></li> <li>○ <a href="#">OsmAnd</a></li> <li>○ <a href="#">Wheelmap.org</a></li> </ul>
Derivations		<ul style="list-style-type: none"> <li>○ <a href="#">FOSM</a></li> <li>○ <a href="#">OpenGeofiction</a></li> <li>○ <a href="#">OpenHistoricalMap</a></li> <li>○ <a href="#">Overture Maps</a></li> </ul>
People		<ul style="list-style-type: none"> <li>○ <a href="#">Steve Coast</a></li> <li>○ <a href="#">Allan Mustard</a></li> </ul>

## International

- [VIAF](#)
- [FAST](#)

## National

- [Germany](#)
- [United States](#)
- [France](#)
- [BnF data](#)
- [Israel](#)

## Other

- [IdRef](#)

## About World Wide Web

This article is about the global system of pages accessed via HTTP. For the worldwide computer network, see [Internet](#). For the web browser, see [WorldWideWeb](#).

"WWW" and "The Web" redirect here. For other uses, see [WWW \(disambiguation\)](#) and [The Web \(disambiguation\)](#).

## World Wide Web

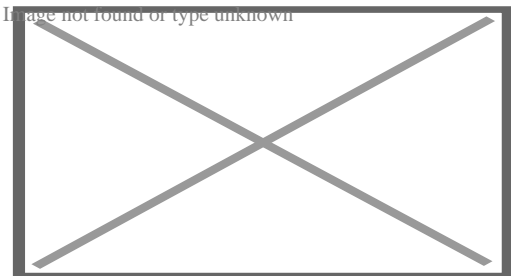
### Abbreviation WWW

**Year started** 1989; 36 years ago by [Tim Berners-Lee](#)

**Organization**

- [CERN](#) (1989–1994)
- [W3C](#) (1994–current)

Image not found or type unknown



A [web page](#) from [Wikipedia](#) displayed in [Google Chrome](#)

The **World Wide Web** (**WWW** or simply **the Web**) is an [information system](#) that enables [content](#) sharing over the [Internet](#) through user-friendly ways meant to appeal to users beyond

IT specialists and hobbyists.[1] It allows documents and other **web resources** to be accessed over the Internet according to specific rules of the **Hypertext Transfer Protocol** (HTTP).[2]

The Web was invented by English computer scientist **Tim Berners-Lee** while at **CERN** in 1989 and opened to the public in 1993. It was conceived as a "universal linked information system".[3][4][5] Documents and other media content are made available to the network through **web servers** and can be accessed by programs such as **web browsers**. Servers and resources on the World Wide Web are identified and located through character strings called **uniform resource locators** (URLs).

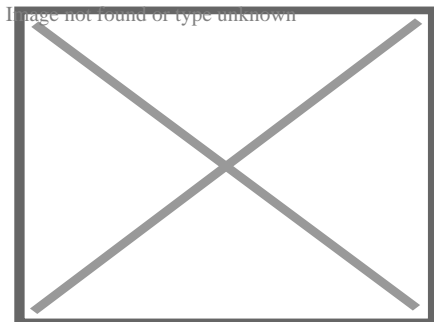
The original and still very common document type is a **web page** formatted in **Hypertext Markup Language** (HTML). This markup language supports **plain text**, **images**, embedded **video** and **audio** contents, and **scripts** (short programs) that implement complex user interaction. The HTML language also supports **hyperlinks** (embedded URLs) which provide immediate access to other web resources. **Web navigation**, or web surfing, is the common practice of following such hyperlinks across multiple websites. **Web applications** are web pages that function as **application software**. The information in the Web is transferred across the Internet using HTTP. Multiple web resources with a common theme and usually a common **domain name** make up a **website**. A single web server may provide multiple websites, while some websites, especially the most popular ones, may be provided by multiple servers. Website content is provided by a myriad of companies, organizations, government agencies, and **individual users**; and comprises an enormous amount of educational, entertainment, commercial, and government information.

The Web has become the world's dominant **information systems platform**. [6][7][8][9] It is the primary tool that billions of people worldwide use to interact with the Internet.[2]

## History

[[edit](#)]

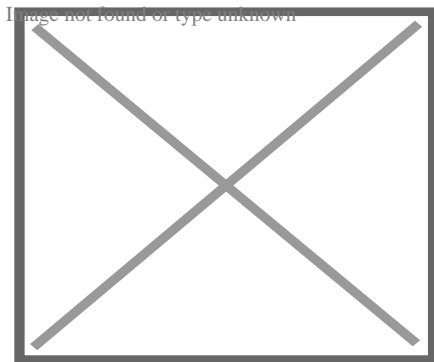
Main article: [History of the World Wide Web](#)



This **NeXT Computer** was used by **Sir Tim Berners-Lee** at **CERN** and became the world's first **Web server**.

The Web was invented by English computer scientist **Tim Berners-Lee** while working at **CERN**. [10][11] He was motivated by the problem of storing, updating, and finding documents and data

files in that large and constantly changing organization, as well as distributing them to collaborators outside CERN. In his design, Berners-Lee dismissed the common **tree structure** approach, used for instance in the existing CERNDoc documentation system and in the **Unix filesystem**, as well as approaches that relied in tagging files with **keywords**, as in the VAX/NOTES system. Instead he adopted concepts he had put into practice with his private **ENQUIRE** system (1980) built at CERN. When he became aware of **Ted Nelson's hypertext** model (1965), in which documents can be linked in unconstrained ways through **hyperlinks** associated with "hot spots" embedded in the text, it helped to confirm the validity of his concept.[12][13]



The historic World Wide Web logo, designed by **Robert Cailliau**. Currently, there is no widely accepted logo in use for the WWW.

The model was later popularized by **Apple's HyperCard** system. Unlike Hypercard, Berners-Lee's new system from the outset was meant to support links between multiple databases on independent computers, and to allow simultaneous access by many users from any computer on the Internet. He also specified that the system should eventually handle other media besides text, such as graphics, speech, and video. Links could refer to mutable data files, or even fire up programs on their server computer. He also conceived "gateways" that would allow access through the new system to documents organized in other ways (such as traditional computer **file systems** or the **Usenet**). Finally, he insisted that the system should be decentralized, without any central control or coordination over the creation of links.[4][14][10][11]

Berners-Lee submitted a proposal to CERN in May 1989, without giving the system a name.[4] He got a working system implemented by the end of 1990, including a browser called **WorldWideWeb** (which became the name of the project and of the network) and an **HTTP server** running at CERN. As part of that development he defined the first version of the HTTP protocol, the basic URL syntax, and implicitly made HTML the primary document format.[15] The technology was released outside CERN to other research institutions starting in January 1991, and then to the whole Internet on 23 August 1991. The Web was a success at CERN, and began to spread to other scientific and academic institutions. Within the next two years, **there were 50 websites created**.[16][17]

CERN made the Web protocol and code available royalty free in 1993, enabling its widespread use.[18][19] After the **NCSA** released the **Mosaic web browser** later that year, the Web's

popularity grew rapidly as **thousands of websites** sprang up in less than a year.<sup>[20][21]</sup> Mosaic was a graphical browser that could display inline images and submit **forms** that were processed by the **HTTPd server**.<sup>[22][23]</sup> Marc Andreessen and Jim Clark founded **Netscape** the following year and released the **Navigator browser**, which introduced **Java** and **JavaScript** to the Web. It quickly became the dominant browser. Netscape **became a public company** in 1995 which triggered a frenzy for the Web and started the **dot-com bubble**.<sup>[24]</sup> Microsoft responded by developing its own browser, **Internet Explorer**, starting the **browser wars**. By bundling it with Windows, it became the dominant browser for 14 years.<sup>[25]</sup>

Berners-Lee founded the **World Wide Web Consortium** (W3C) which created **XML** in 1996 and recommended replacing HTML with stricter **XHTML**.<sup>[26]</sup> In the meantime, developers began exploiting an IE feature called **XMLHttpRequest** to make **Ajax** applications and launched the **Web 2.0** revolution. **Mozilla**, **Opera**, and Apple rejected XHTML and created the **WHATWG** which developed **HTML5**.<sup>[27]</sup> In 2009, the W3C conceded and abandoned XHTML.<sup>[28]</sup> In 2019, it ceded control of the HTML specification to the WHATWG.<sup>[29]</sup>

The World Wide Web has been central to the development of the **Information Age** and is the primary tool billions of people use to interact on the **Internet**.<sup>[30][31][32][9]</sup>

## Nomenclature

**[edit]**



This section **needs additional citations for verification**. Please help **improve this article by adding citations to reliable sources** in this section. Unsourced material may be challenged and removed. (August 2023) (*Learn how and when to remove this message*)

Tim Berners-Lee states that *World Wide Web* is officially spelled as three separate words, each capitalised, with no intervening hyphens.<sup>[33]</sup> Nonetheless, it is often called simply *the Web*, and also often *the web*; see **Capitalization of Internet** for details. In Mandarin Chinese, *World Wide Web* is commonly translated via a **phono-semantic matching** to *wàn wéi wǎng* (万维网), which satisfies *www* and literally means "10,000-dimensional net", a translation that reflects the design concept and proliferation of the World Wide Web.

Use of the *www* prefix has been declining, especially when **web applications** sought to brand their domain names and make them easily pronounceable. As the **mobile Web** grew in popularity,<sup>[citation needed]</sup> services like **Gmail.com**, **Outlook.com**, **Myspace.com**, **Facebook.com** and **Twitter.com** are most often mentioned without adding "*www.*" (or, indeed, ".com") to the domain.<sup>[34]</sup>

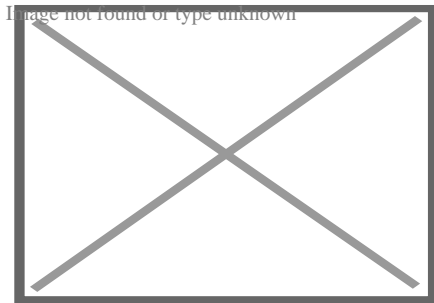
In English, *www* is usually read as *double-u double-u double-u*.<sup>[35]</sup> Some users pronounce it *dub-dub-dub*, particularly in New Zealand.<sup>[36]</sup> **Stephen Fry**, in his "Podgrams" series of podcasts, pronounces it *wuh wuh wuh*.<sup>[37]</sup> The English writer **Douglas Adams** once quipped in

*The Independent on Sunday* (1999): "The World Wide Web is the only thing I know of whose shortened form takes three times longer to say than what it's short for".<sup>[38]</sup>

## Function

[edit]

Main articles: [HTTP](#) and [HTML](#)



The World Wide Web functions as an [application layer protocol](#) that is run "on top of" (figuratively) the Internet, helping to make it more functional. The advent of the [Mosaic](#) web browser helped to make the web much more usable, to include the display of images and moving images ([GIFs](#)).

The terms *Internet* and *World Wide Web* are often used without much distinction. However, the two terms do not mean the same thing. The Internet is a global system of [computer networks](#) interconnected through telecommunications and [optical networking](#). In contrast, the World Wide Web is a global collection of documents and other [resources](#), linked by hyperlinks and [URIs](#). Web resources are accessed using [HTTP](#) or [HTTPS](#), which are application-level Internet protocols that use the Internet transport protocols.<sup>[2]</sup>

Viewing a [web page](#) on the World Wide Web normally begins either by typing the [URL](#) of the page into a web browser or by following a hyperlink to that page or resource. The web browser then initiates a series of background communication messages to fetch and display the requested page. In the 1990s, using a browser to view web pages—and to move from one web page to another through hyperlinks—came to be known as 'browsing,' 'web surfing' (after [channel surfing](#)), or 'navigating the Web'. Early studies of this new behaviour investigated user patterns in using web browsers. One study, for example, found five user patterns: exploratory surfing, window surfing, evolved surfing, bounded navigation and targeted navigation.<sup>[39]</sup>

The following example demonstrates the functioning of a web browser when accessing a page at the URL `http://example.org/home.html`. The browser resolves the server name of the URL ( `example.org` ) into an [Internet Protocol address](#) using the globally distributed [Domain Name System](#) (DNS). This lookup returns an IP address such as `203.0.113.4` or `2001:db8:2e::7334`. The browser then requests the resource by sending an [HTTP](#) request across the Internet to the computer at that address. It requests service from a specific TCP port number that is well known for the HTTP service so that the receiving host can distinguish an HTTP request from other network protocols it may be servicing. HTTP normally uses [port number 80](#) and for



HTTPS it normally uses **port number 443**. The content of the HTTP request can be as simple as two lines of text:

```
GET /home.html HTTP/1.1
Host: example.org
```

The computer receiving the HTTP request delivers it to web server software listening for requests on port 80. If the web server can fulfil the request it sends an HTTP response back to the browser indicating success:

```
HTTP/1.1 200 OK
Content-Type: text/html; charset=UTF-8
```

followed by the content of the requested page. Hypertext Markup Language (**HTML**) for a basic web page might look like this:

```
<html>
  <head>
    <title>Example.org – The World Wide Web</title>
  </head>
  <body>
    <p>The World Wide Web, abbreviated as WWW and commonly known ...</p>
  </body>
</html>
```

The web browser **parses** the HTML and interprets the markup (<title>, <p> for paragraph, and such) that surrounds the words to format the text on the screen. Many web pages use HTML to reference the URLs of other resources such as images, other embedded media, **scripts** that affect page behaviour, and **Cascading Style Sheets** that affect page layout. The browser makes additional HTTP requests to the web server for these other **Internet media types**. As it receives their content from the web server, the browser progressively **renders** the page onto the screen as specified by its HTML and these additional resources.

# HTML

[**edit**]

Main article: **HTML**

Hypertext Markup Language (HTML) is the standard **markup language** for creating **web pages** and **web applications**. With **Cascading Style Sheets** (CSS) and **JavaScript**, it forms a triad of **cornerstone** technologies for the World Wide Web.[40]

**Web browsers** receive HTML documents from a **web server** or from local storage and **render** the documents into multimedia web pages. HTML describes the structure of a web page **semantically** and originally included cues for the appearance of the document.

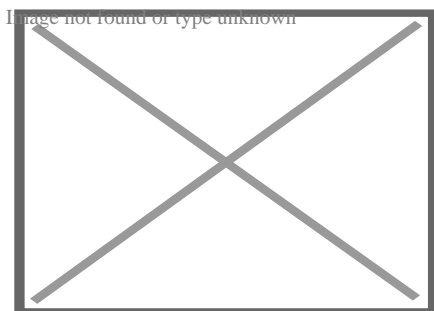
**HTML elements** are the building blocks of HTML pages. With HTML constructs, **images** and other objects such as **interactive forms** may be embedded into the rendered page. HTML provides a means to create **structured documents** by denoting structural **semantics** for text such as headings, paragraphs, lists, **links**, quotes and other items. HTML elements are delineated by *tags*, written using **angle brackets**. Tags such as `<img />` and `<input />` directly introduce content into the page. Other tags such as `<p>` surround and provide information about document text and may include other tags as sub-elements. Browsers do not display the HTML tags, but use them to interpret the content of the page.

HTML can embed programs written in a **scripting language** such as **JavaScript**, which affects the behaviour and content of web pages. Inclusion of CSS defines the look and layout of content. The **World Wide Web Consortium** (W3C), maintainer of both the HTML and the CSS standards, has encouraged the use of CSS over explicit presentational HTML since 1997.[41]

## Linking

[**edit**]

Most web pages contain hyperlinks to other related pages and perhaps to downloadable files, source documents, definitions and other web resources. In the underlying HTML, a hyperlink looks like this: `<a href="http://example.org/home.html">Example.org Homepage</a>`.



Graphic representation of a minute fraction of the WWW, demonstrating **hyperlinks**

Such a collection of useful, related resources, interconnected via hypertext links is dubbed a *web* of information. Publication on the Internet created what Tim Berners-Lee first called the *WorldWideWeb* (in its original **CamelCase**, which was subsequently discarded) in November

1990.[42]

The hyperlink structure of the web is described by the **webgraph**: the nodes of the web graph correspond to the web pages (or URLs) the directed edges between them to the hyperlinks. Over time, many web resources pointed to by hyperlinks disappear, relocate, or are replaced with different content. This makes hyperlinks obsolete, a phenomenon referred to in some circles as link rot, and the hyperlinks affected by it are often called "**dead**" **links**. The ephemeral nature of the Web has prompted many efforts to archive websites. The **Internet Archive**, active since 1996, is the best known of such efforts.

## WWW prefix

[edit]

Many hostnames used for the World Wide Web begin with *www* because of the long-standing practice of naming **Internet** hosts according to the services they provide. The **hostname** of a **web server** is often *www*, in the same way that it may be *ftp* for an **FTP server**, and *news* or *nntp* for a **Usenet news server**. These hostnames appear as Domain Name System (DNS) or **subdomain** names, as in *www.example.com*. The use of *www* is not required by any technical or policy standard and many websites do not use it; the first web server was *nxoc01.cern.ch*. [43] According to Paolo Palazzi, who worked at CERN along with Tim Berners-Lee, the popular use of *www* as subdomain was accidental; the World Wide Web project page was intended to be published at *www.cern.ch* while *info.cern.ch* was intended to be the CERN home page; however the DNS records were never switched, and the practice of prepending *www* to an institution's website domain name was subsequently copied. [44] **better source needed** Many established websites still use the prefix, or they employ other subdomain names such as *www2*, *secure* or *en* for special purposes. Many such web servers are set up so that both the main domain name (e.g., *example.com*) and the *www* subdomain (e.g., *www.example.com*) refer to the same site; others require one form or the other, or they may map to different web sites. The use of a subdomain name is useful for **load balancing** incoming web traffic by creating a **CNAME record** that points to a cluster of web servers. Since, currently **as of?**, only a subdomain can be used in a CNAME, the same result cannot be achieved by using the bare domain root. [45] **dubious – discuss**

When a user submits an incomplete domain name to a web browser in its address bar input field, some web browsers automatically try adding the prefix "www" to the beginning of it and possibly ".com", ".org" and ".net" at the end, depending on what might be missing. For example, entering "microsoft" may be transformed to *http://www.microsoft.com/* and "openoffice" to *http://www.openoffice.org*. This feature started appearing in early versions of **Firefox**, when it still had the working title 'Firebird' in early 2003, from an earlier practice in browsers such as **Lynx**. [46] **unreliable source?** It is reported that Microsoft was granted a US patent for the same idea in 2008, but only for mobile devices. [47]

# Scheme specifiers

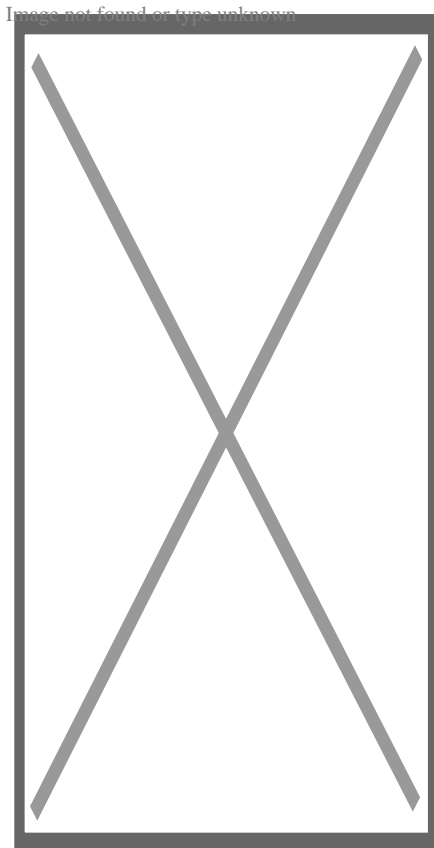
[[edit](#)]

The scheme specifiers *http://* and *https://* at the start of a web **URI** refer to **Hypertext Transfer Protocol** or **HTTP Secure**, respectively. They specify the communication protocol to use for the request and response. The HTTP protocol is fundamental to the operation of the World Wide Web, and the added encryption layer in HTTPS is essential when browsers send or retrieve confidential data, such as passwords or banking information. Web browsers usually automatically prepend *http://* to user-entered URIs, if omitted.

## Pages

[[edit](#)]

Main article: [Web page](#)



A screenshot of the home page of Wikimedia Commons

A *web page* (also written as *webpage*) is a document that is suitable for the World Wide Web and **web browsers**. A web browser displays a web page on a **monitor** or **mobile device**.

The term *web page* usually refers to what is visible, but may also refer to the contents of the **computer file** itself, which is usually a **text file** containing **hypertext** written in **HTML** or a comparable **markup language**. Typical web pages provide **hypertext** for browsing to other web pages via **hyperlinks**, often referred to as *links*. Web browsers will frequently have to access multiple **web resource** elements, such as reading **style sheets**, **scripts**, and images, while presenting each web page.

On a network, a web browser can retrieve a web page from a remote **web server**. The web server may restrict access to a private network such as a corporate intranet. The web browser uses the **Hypertext Transfer Protocol** (HTTP) to make such requests to the **web server**.

A **static web page** is delivered exactly as stored, as **web content** in the web server's **file system**. In contrast, a **dynamic web page** is generated by a **web application**, usually driven by **server-side software**. Dynamic web pages are used when each user may require completely different information, for example, bank websites, web email etc.

## Static page

[**edit**]

Main article: **Static web page**

A *static web page* (sometimes called a *flat page/stationary page*) is a **web page** that is delivered to the user exactly as stored, in contrast to **dynamic web pages** which are generated by a **web application**.

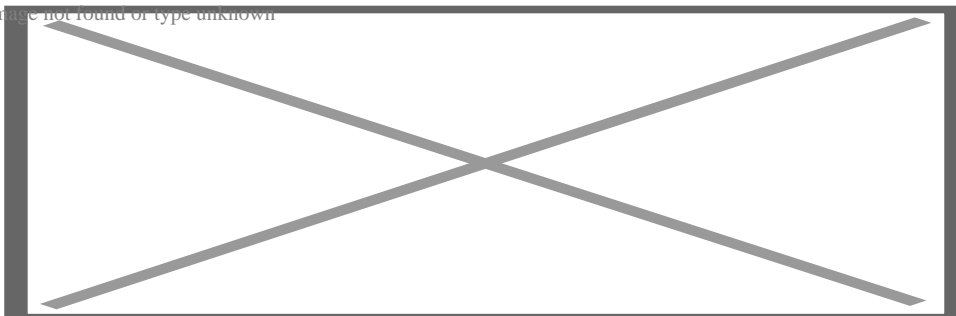
Consequently, a static web page displays the same information for all users, from all contexts, subject to modern capabilities of a **web server** to **negotiate content-type** or language of the document where such versions are available and the server is configured to do so.

## Dynamic pages

[**edit**]

Main articles: **Dynamic web page** and **Ajax (programming)**

Image not found or type unknown



Dynamic web page: example of server-side scripting (PHP and MySQL)

A *server-side dynamic web page* is a **web page** whose construction is controlled by an **application server** processing server-side scripts. In server-side scripting, **parameters** determine how the assembly of every new web page proceeds, including the setting up of more client-side processing.

A *client-side dynamic web page* processes the web page using JavaScript running in the browser. JavaScript programs can interact with the document via **Document Object Model**, or DOM, to query page state and alter it. The same client-side techniques can then dynamically update or change the DOM in the same way.

A dynamic web page is then reloaded by the user or by a **computer program** to change some variable content. The updating information could come from the server, or from changes made to that page's DOM. This may or may not truncate the browsing history or create a saved version to go back to, but a *dynamic web page update* using **Ajax** technologies will neither create a page to go back to nor truncate the **web browsing history** forward of the displayed page. Using Ajax technologies the end **user** gets *one dynamic page* managed as a single page in the **web browser** while the actual **web content** rendered on that page can vary. The Ajax engine sits only on the browser requesting parts of its DOM, *the* DOM, for its client, from an application server.

Dynamic HTML, or DHTML, is the umbrella term for technologies and methods used to create web pages that are not **static web pages**, though it has fallen out of common use since the popularization of **AJAX**, a term which is now itself rarely used.<sup>[*citation needed*]</sup> Client-side-scripting, server-side scripting, or a combination of these make for the dynamic web experience in a browser.

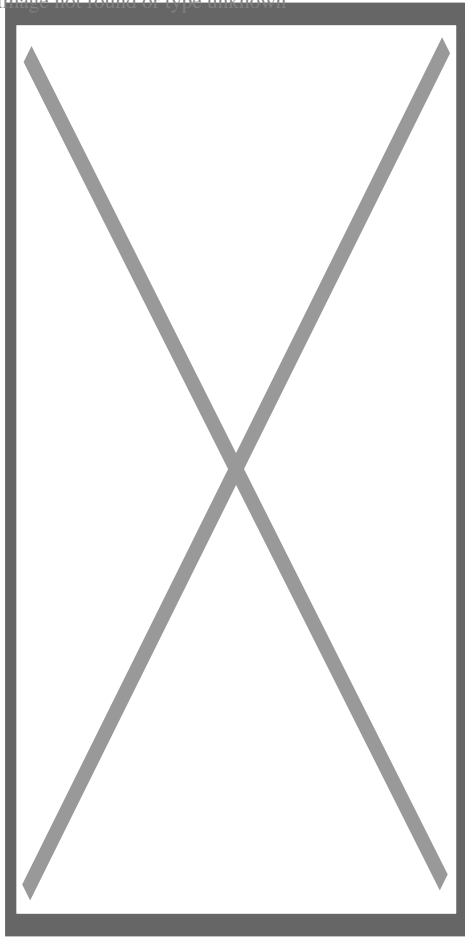
**JavaScript** is a **scripting language** that was initially developed in 1995 by **Brendan Eich**, then of **Netscape**, for use within web pages.<sup>[48]</sup> The standardised version is **ECMAScript**.<sup>[48]</sup> To make web pages more interactive, some web applications also use JavaScript techniques such as **Ajax** (**asynchronous** JavaScript and **XML**). **Client-side script** is delivered with the page that can make additional HTTP requests to the server, either in response to user actions such as mouse movements or clicks, or based on elapsed time. The server's responses are used to modify the current page rather than creating a new page with each response, so the server needs only to provide limited, incremental information. Multiple Ajax requests can be handled at the same time, and users can interact with the page while data is retrieved. Web pages may also regularly **poll** the server to check whether new information is available.<sup>[49]</sup>

## Website

[**edit**]



Image not found or type unknown



The [usap.gov](https://usap.gov) website

Main article: [Website](#)

A *website*<sup>[50]</sup> is a collection of related web resources including [web pages](#), [multimedia](#) content, typically identified with a common [domain name](#), and published on at least one [web server](#). Notable examples are [wikipedia.org](https://wikipedia.org), [google.com](https://google.com), and [amazon.com](https://amazon.com).

A website may be accessible via a public [Internet Protocol](#) (IP) network, such as the [Internet](#), or a private [local area network](#) (LAN), by referencing a [uniform resource locator](#) (URL) that identifies the site.

Websites can have many functions and can be used in various fashions; a website can be a [personal website](#), a corporate website for a company, a government website, an organization website, etc. Websites are typically dedicated to a particular topic or purpose, ranging from entertainment and [social networking](#) to providing news and education. All publicly accessible websites collectively constitute the World Wide Web, while private websites, such as a company's website for its employees, are typically a part of an [intranet](#).

Web pages, which are the building blocks of websites, are [documents](#), typically composed in [plain text](#) interspersed with [formatting instructions](#) of Hypertext Markup Language ([HTML](#), [XHTML](#)). They may incorporate elements from other websites with suitable [markup anchors](#).

Web pages are accessed and transported with the [Hypertext Transfer Protocol](#) (HTTP), which may optionally employ encryption ([HTTP Secure](#), HTTPS) to provide security and privacy for the user. The user's application, often a [web browser](#), renders the page content according to its HTML markup instructions onto a [display terminal](#).

[Hyperlinking](#) between web pages conveys to the reader the [site structure](#) and guides the navigation of the site, which often starts with a [home page](#) containing a directory of the site [web content](#). Some websites require user registration or [subscription](#) to access content. Examples of [subscription websites](#) include many business sites, news websites, [academic journal](#) websites, gaming websites, file-sharing websites, [message boards](#), web-based [email](#), [social networking](#) websites, websites providing real-time price quotations for different types of markets, as well as sites providing various other services. [End users](#) can access websites on a range of devices, including [desktop](#) and [laptop computers](#), [tablet computers](#), [smartphones](#) and [smart TVs](#).

## Browser

[\[edit\]](#)

Main article: [Web browser](#)

A *web browser* (commonly referred to as a *browser*) is a [software user agent](#) for accessing information on the World Wide Web. To connect to a website's [server](#) and display its pages, a user needs to have a web browser program. This is the program that the user runs to download, format, and display a web page on the user's computer.

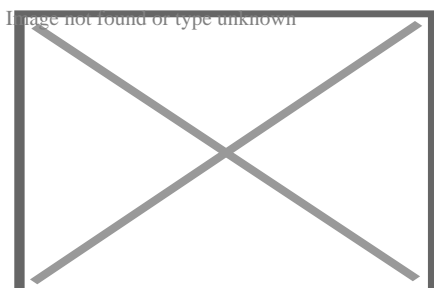
In addition to allowing users to find, display, and move between web pages, a web browser will usually have features like keeping bookmarks, recording history, managing cookies (see below), and home pages and may have facilities for recording passwords for logging into websites.

The most popular browsers are [Chrome](#), [Safari](#), [Edge](#), [Samsung Internet](#) and [Firefox](#).<sup>[51]</sup>

## Server

[\[edit\]](#)

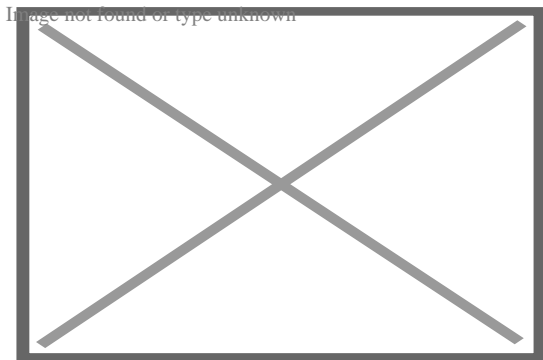
Main article: [Web server](#)



The inside and front of a **Dell PowerEdge** web server, a computer designed for **rack mounting**

A *Web server* is **server software**, or hardware dedicated to running said software, that can satisfy World Wide Web client requests. A web server can, in general, contain one or more websites. A web server processes incoming network requests over **HTTP** and several other related protocols.

The primary function of a web server is to store, process and deliver **web pages** to **clients**.<sup>[52]</sup> The communication between client and server takes place using the **Hypertext Transfer Protocol (HTTP)**. Pages delivered are most frequently **HTML documents**, which may include **images**, **style sheets** and **scripts** in addition to the text content.



Multiple web servers may be used for a high traffic website; here, **Dell** servers are installed together to be used for the **Wikimedia Foundation**.

A **user agent**, commonly a **web browser** or **web crawler**, initiates communication by making a **request** for a specific resource using HTTP and the server responds with the content of that resource or an **error message** if unable to do so. The resource is typically a real file on the server's **secondary storage**, but this is not necessarily the case and depends on how the webserver is **implemented**.

While the primary function is to serve content, full implementation of HTTP also includes ways of receiving content from clients. This feature is used for submitting **web forms**, including **uploading** of files.

Many generic web servers also support **server-side scripting** using **Active Server Pages (ASP)**, **PHP** (Hypertext Preprocessor), or other **scripting languages**. This means that the behaviour of the webserver can be scripted in separate files, while the actual server software remains unchanged. Usually, this function is used to generate HTML documents **dynamically** ("on-the-fly") as opposed to returning **static documents**. The former is primarily used for retrieving or modifying information from **databases**. The latter is typically much faster and more easily **cached** but cannot deliver **dynamic content**.

Web servers can also frequently be found **embedded** in devices such as **printers**, **routers**, **webcams** and serving only a **local network**. The web server may then be used as a part of a

system for monitoring or administering the device in question. This usually means that no additional software has to be installed on the client computer since only a web browser is required (which now is included with most [operating systems](#)).

# Optical Networking

[\[edit\]](#)

[Optical networking](#) is a sophisticated infrastructure that utilizes optical fiber to transmit data over long distances, connecting countries, cities, and even private residences. The technology uses optical microsystems like [tunable lasers](#), filters, [attenuators](#), switches, and wavelength-selective switches to manage and operate these networks.[\[53\]\[54\]](#)

The large quantity of optical fiber installed throughout the world at the end of the twentieth century set the foundation of the Internet as it's used today. The information highway relies heavily on optical networking, a method of sending messages encoded in light to relay information in various telecommunication networks.[\[55\]](#)

The [Advanced Research Projects Agency Network](#) (ARPANET) was one of the first iterations of the Internet, created in collaboration with universities and researchers 1969.[\[56\]\[57\]\[58\]\[59\]](#) However, access to the ARPANET was limited to researchers, and in 1985, the [National Science Foundation](#) founded the [National Science Foundation Network](#) (NSFNET), a program that provided supercomputer access to researchers.[\[59\]](#)

Limited public access to the Internet led to pressure from consumers and corporations to privatize the network. In 1993, the US passed the [National Information Infrastructure Act](#), which dictated that the National Science Foundation must hand over control of the optical capabilities to commercial operators.[\[60\]\[61\]](#)

The privatization of the Internet and the release of the World Wide Web to the public in 1993 led to an increased demand for Internet capabilities. This spurred developers to seek solutions to reduce the time and cost of laying new fiber and increase the amount of information that can be sent on a single fiber, in order to meet the growing needs of the public.[\[62\]\[63\]\[64\]\[65\]](#)

In 1994, Pirelli S.p.A.'s optical components division introduced a wavelength-division multiplexing (WDM) system to meet growing demand for increased data transmission. This four-channel WDM technology allowed more information to be sent simultaneously over a single optical fiber, effectively boosting network capacity.[\[66\]\[67\]](#)

Pirelli wasn't the only company that developed a WDM system; another company, the [Ciena Corporation](#) (Ciena), created its own technology to transmit data more efficiently. [David Huber](#), an optical networking engineer and entrepreneur [Kevin Kimberlin](#) founded Ciena in 1992.[\[68\]\[69\]\[70\]](#) Drawing on laser technology from [Gordon Gould](#) and William Culver of [Optelecom, Inc.](#),

the company focused on utilizing optical amplifiers to transmit data via light.[71][72][73] Under chief executive officer Pat Nettles, Ciena developed a dual-stage optical amplifier for dense wavelength-division multiplexing (DWDM), patented in 1997 and deployed on the Sprint network in 1996.[74][75][76][77][78]

# Cookie

[edit]

Main article: [HTTP cookie](#)

An *HTTP cookie* (also called *web cookie*, *Internet cookie*, *browser cookie*, or simply *cookie*) is a small piece of data sent from a website and stored on the user's computer by the user's [web browser](#) while the user is browsing. Cookies were designed to be a reliable mechanism for websites to remember [stateful](#) information (such as items added in the shopping cart in an online store) or to record the user's browsing activity (including clicking particular buttons, [logging in](#), or recording which pages were visited in the past). They can also be used to remember arbitrary pieces of information that the user previously entered into form fields such as names, addresses, passwords, and credit card numbers.

Cookies perform essential functions in the modern web. Perhaps most importantly, *authentication cookies* are the most common method used by web servers to know whether the user is logged in or not, and which account they are logged in with. Without such a mechanism, the site would not know whether to send a page containing sensitive information or require the user to authenticate themselves by logging in. The security of an authentication cookie generally depends on the security of the issuing website and the user's [web browser](#), and on whether the cookie data is encrypted. Security vulnerabilities may allow a cookie's data to be read by a [hacker](#), used to gain access to user data, or used to gain access (with the user's credentials) to the website to which the cookie belongs (see [cross-site scripting](#) and [cross-site request forgery](#) for examples).[79]

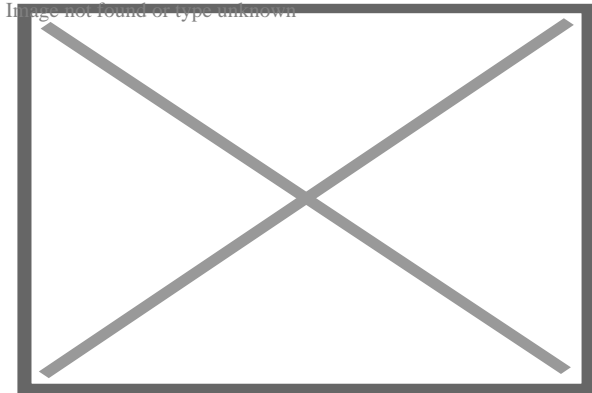
Tracking cookies, and especially third-party tracking cookies, are commonly used as ways to compile long-term records of individuals' browsing histories – a potential [privacy concern](#) that prompted European[80] and U.S. lawmakers to take action in 2011.[81][82] European law requires that all websites targeting [European Union](#) member states gain "informed consent" from users before storing non-essential cookies on their device.

Google [Project Zero](#) researcher Jann Horn describes ways cookies can be read by [intermediaries](#), like [Wi-Fi](#) hotspot providers. When in such circumstances, he recommends using the browser in [private browsing](#) mode (widely known as [Incognito mode](#) in Google Chrome).[83]

# Search engine

[[edit](#)]

Main article: [Search engine](#)



The results of a search for the term "lunar eclipse" in a web-based [image search engine](#)

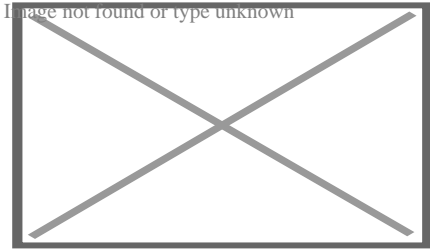
A *web search engine* or *Internet search engine* is a [software system](#) that is designed to carry out *web search* (*Internet search*), which means to search the World Wide Web in a systematic way for particular information specified in a [web search query](#). The search results are generally presented in a line of results, often referred to as [search engine results pages](#) (SERPs). The information may be a mix of [web pages](#), images, videos, infographics, articles, research papers, and other types of files. Some search engines also [mine data](#) available in [databases](#) or [open directories](#). Unlike [web directories](#), which are maintained only by human editors, search engines also maintain [real-time](#) information by running an [algorithm](#) on a [web crawler](#). Internet content that is not capable of being searched by a web search engine is generally described as the [deep web](#).

In 1990, [Archie](#), the world's first search engine, was released. The technology was originally an index of [File Transfer Protocol](#) (FTP) sites, which was a method for moving files between a client and a server network.<sup>[84][85]</sup> This early search tool was superseded by more advanced engines like [Yahoo!](#) in 1995 and [Google](#) in 1998.<sup>[86][87]</sup>

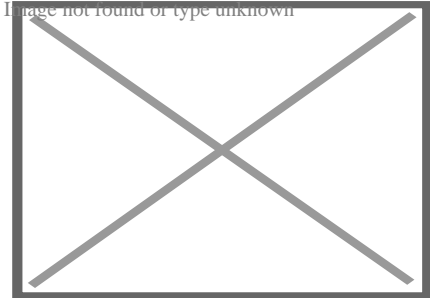
## Deep web

[[edit](#)]

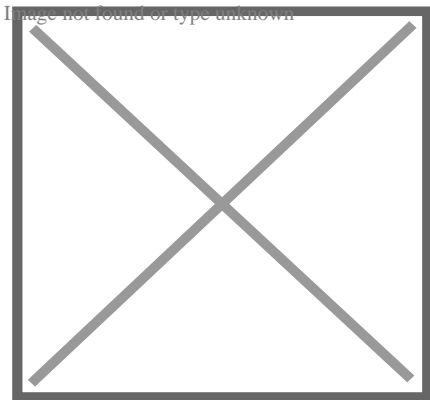




## Deep web diagram



## Deep web vs surface web



## Surface Web & Deep Web

Main article: [Deep web](#)

The deep web,[88] *invisible web*,[89] or *hidden web*[90] are parts of the World Wide Web whose contents are not [indexed](#) by standard [web search engines](#). The opposite term to the deep web is the [surface web](#), which is accessible to anyone using the Internet.[91] [Computer scientist](#) Michael K. Bergman is credited with coining the term *deep web* in 2001 as a search indexing term.[92]

The content of the deep web is hidden behind [HTTP](#) forms,[93][94] and includes many very common uses such as [web mail](#), [online banking](#), and services that users must pay for, and which is protected by a [paywall](#), such as [video on demand](#), some online magazines and newspapers, among others.

The content of the deep web can be located and accessed by a direct [URL](#) or [IP address](#) and may require a password or other security access past the public website page.

# Caching

[\[edit\]](#)

A **web cache** is a server computer located either on the public Internet or within an enterprise that stores recently accessed web pages to improve response time for users when the same content is requested within a certain time after the original request. Most web browsers also implement a **browser cache** by writing recently obtained data to a local data storage device. HTTP requests by a browser may ask only for data that has changed since the last access. Web pages and resources may contain expiration information to control caching to secure sensitive data, such as in **online banking**, or to facilitate frequently updated sites, such as news media. Even sites with highly dynamic content may permit basic resources to be refreshed only occasionally. Web site designers find it worthwhile to collate resources such as CSS data and JavaScript into a few site-wide files so that they can be cached efficiently. Enterprise **firewalls** often cache Web resources requested by one user for the benefit of many users. Some **search engines** store cached content of frequently accessed websites.

## Security

[\[edit\]](#)

For **criminals**, the Web has become a venue to spread **malware** and engage in a range of **cybercrime**, including (but not limited to) **identity theft**, **fraud**, **espionage**, and **intelligence gathering**.<sup>[95]</sup> Web-based **vulnerabilities** now outnumber traditional computer security concerns,<sup>[96][97]</sup> and as measured by **Google**, about one in ten web pages may contain malicious code.<sup>[98]</sup> Most web-based **attacks** take place on legitimate websites, and most, as measured by **Sophos**, are hosted in the United States, China and Russia.<sup>[99]</sup> The most common of all malware **threats** is **SQL injection** attacks against websites.<sup>[100]</sup> Through HTML and URIs, the Web was vulnerable to attacks like **cross-site scripting** (XSS) that came with the introduction of JavaScript<sup>[101]</sup> and were exacerbated to some degree by **Web 2.0** and Ajax **web design** that favours the use of scripts.<sup>[102]</sup> In one 2007 estimate, 70% of all websites are open to XSS attacks on their users.<sup>[103]</sup> **Phishing** is another common threat to the Web. In February 2013, RSA (the security division of EMC) estimated the global losses from phishing at \$1.5 billion in 2012.<sup>[104]</sup> Two of the well-known phishing methods are Covert Redirect and Open Redirect.

Proposed solutions vary. Large security companies like **McAfee** already design governance and compliance suites to meet post-9/11 regulations,<sup>[105]</sup> and some, like **Finjan Holdings** have recommended active real-time inspection of programming code and all content regardless of its source.<sup>[95]</sup> Some have argued that for enterprises to see Web security as a business opportunity rather than a **cost centre**,<sup>[106]</sup> while others call for "ubiquitous, always-on **digital rights management**" enforced in the infrastructure to replace the hundreds of companies that

secure data and networks.[107] Jonathan Zittrain has said users sharing responsibility for computing safety is far preferable to locking down the Internet.[108]

## Privacy

[edit]

Main article: [Internet privacy](#)

Every time a client requests a web page, the server can identify the request's [IP address](#). Web servers usually log IP addresses in a [log file](#). Also, unless set not to do so, most web browsers record requested web pages in a viewable *history* feature, and usually [cache](#) much of the content locally. Unless the server-browser communication uses HTTPS encryption, web requests and responses travel in plain text across the Internet and can be viewed, recorded, and cached by intermediate systems. Another way to hide [personally identifiable information](#) is by using a [virtual private network](#). A VPN [encrypts](#) traffic between the client and VPN server, and masks the original IP address, lowering the chance of user identification.

When a web page asks for, and the user supplies, personally identifiable information—such as their real name, address, e-mail address, etc. web-based entities can associate current web traffic with that individual. If the website uses [HTTP cookies](#), username, and password authentication, or other tracking techniques, it can relate other web visits, before and after, to the identifiable information provided. In this way, a web-based organization can develop and build a profile of the individual people who use its site or sites. It may be able to build a record for an individual that includes information about their leisure activities, their shopping interests, their profession, and other aspects of their [demographic profile](#). These profiles are of potential interest to marketers, advertisers, and others. Depending on the website's [terms and conditions](#) and the local laws that apply information from these profiles may be sold, shared, or passed to other organizations without the user being informed. For many ordinary people, this means little more than some unexpected emails in their inbox or some uncannily relevant advertising on a future web page. For others, it can mean that time spent indulging an unusual interest can result in a deluge of further targeted marketing that may be unwelcome. Law enforcement, counterterrorism, and espionage agencies can also identify, target, and track individuals based on their interests or proclivities on the Web.

[Social networking](#) sites usually try to get users to use their real names, interests, and locations, rather than pseudonyms, as their executives believe that this makes the social networking experience more engaging for users. On the other hand, uploaded photographs or unguarded statements can be identified to an individual, who may regret this exposure. Employers, schools, parents, and other relatives may be influenced by aspects of social networking profiles, such as text posts or digital photos, that the posting individual did not intend for these audiences. [Online bullies](#) may make use of personal information to harass or [stalk](#) users. Modern social networking websites allow fine-grained control of the privacy settings for each posting, but these can be complex and not easy to find or use, especially for beginners.[109] Photographs and videos posted onto websites have caused particular problems, as they can

add a person's face to an online profile. With modern and potential **facial recognition technology**, it may then be possible to relate that face with other, previously anonymous, images, events, and scenarios that have been imaged elsewhere. Due to image caching, mirroring, and copying, it is difficult to remove an image from the World Wide Web.

## Standards

[[edit](#)]

Main article: [Web standards](#)

Web standards include many interdependent standards and specifications, some of which govern aspects of the **Internet**, not just the World Wide Web. Even when not web-focused, such standards directly or indirectly affect the development and administration of websites and **web services**. Considerations include the **interoperability**, **accessibility** and **usability** of web pages and web sites.

Web standards, in the broader sense, consist of the following:

- *Recommendations* published by the [World Wide Web Consortium](#) (W3C)[110]
- "Living Standard" made by the [Web Hypertext Application Technology Working Group](#) (WHATWG)
- *Request for Comments* (RFC) documents published by the [Internet Engineering Task Force](#) (IETF)[111]
- *Standards* published by the [International Organization for Standardization](#) (ISO)[112]
- *Standards* published by [Ecma International](#) (formerly ECMA)[113]
- *The Unicode Standard* and various *Unicode Technical Reports* (UTRs) published by the [Unicode Consortium](#)[114]
- Name and number registries maintained by the [Internet Assigned Numbers Authority](#) (IANA)[115]

Web standards are not fixed sets of rules but are constantly evolving sets of finalized technical specifications of web technologies.[116] Web standards are developed by **standards organizations**—groups of interested and often competing parties chartered with the task of standardization—not technologies developed and declared to be a standard by a single individual or company. It is crucial to distinguish those specifications that are under development from the ones that already reached the final development status (in the case of **W3C** specifications, the highest maturity level).

## Accessibility

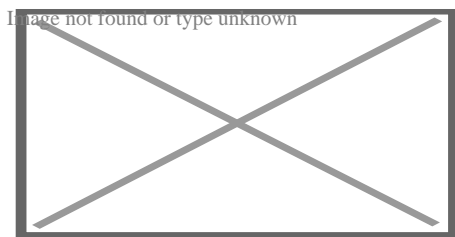
[[edit](#)]

Main article: [Web accessibility](#)

There are methods for accessing the Web in alternative mediums and formats to facilitate use by individuals with **disabilities**. These disabilities may be visual, auditory, physical, speech-related, cognitive, neurological, or some combination. Accessibility features also help people with temporary disabilities, like a broken arm, or ageing users as their abilities change.<sup>[117]</sup> The Web is receiving information as well as providing information and interacting with society. The World Wide Web Consortium claims that it is essential that the Web be accessible, so it can provide equal access and **equal opportunity** to people with disabilities.<sup>[118]</sup> Tim Berners-Lee once noted, "The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect."<sup>[117]</sup> Many countries regulate web accessibility as a requirement for websites.<sup>[119]</sup> International co-operation in the W3C **Web Accessibility Initiative** led to simple guidelines that web content authors as well as software developers can use to make the Web accessible to persons who may or may not be using **assistive technology**.<sup>[117][120]</sup>

## Internationalisation

[\[edit\]](#)



A global map of the **Web Index** for countries in 2014

The W3C **Internationalisation** Activity assures that web technology works in all languages, scripts, and cultures.<sup>[121]</sup> Beginning in 2004 or 2005, **Unicode** gained ground and eventually in December 2007 surpassed both **ASCII** and Western European as the Web's most frequently used **character map**.<sup>[122]</sup> Originally **RFC 3986** allowed resources to be identified by **URI** in a subset of US-ASCII.

**RFC 3987** allows more characters—any character in the **Universal Character Set**—and now a resource can be identified by **IRI** in any language.<sup>[123]</sup>

## See also

[\[edit\]](#)

- **icon** **Engineering portal**
- **icon** **Internet portal**
- **icon** **World portal**

- Decentralized web
- Electronic publishing
- Gopher (protocol), an early alternative to the WWW
- Internet metaphors
- Internet security
- Lists of websites
- Minitel, a predecessor of the WWW
- Streaming media
- Web 1.0
- Web 2.0
- Web 3.0
- Web3
- Web3D
- Web development tools
- Web literacy

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Wide Web is Berners-Lee's alone. He designed it. He set it loose it on the world. And he more than anyone else has fought to keep it an open, non-proprietary and free. "[page needed]

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Wikibooks has a book on the topic of: ***Nets, Webs and the Information Infrastructure***

- [The first website](#)
- [Early archive of the first Web site](#)
- [Internet Statistics: Growth and Usage of the Web and the Internet](#)
- [Living Internet](#) A comprehensive history of the Internet, including the World Wide Web
- [World Wide Web Consortium \(W3C\)](#)
- [W3C Recommendations Reduce "World Wide Wait"](#)
- [World Wide Web Size](#) Daily estimated size of the World Wide Web
- [Antonio A. Casilli, Some Elements for a Sociology of Online Interactions](#)
- [The Erdős–Rényi Webgraph Server Archived 1 March 2021 at the Wayback Machine](#) offers weekly updated graph representation of a constantly increasing fraction of the WWW
- [The 25th Anniversary of the World Wide Web Archived 11 July 2021 at the Wayback Machine](#) is an animated video produced by [USAID](#) and [TechChange](#) which explores the role of the WWW in addressing extreme [poverty](#)
- [v](#)
- [t](#)
- [e](#)

[Telecommunications](#)

## History

- Beacon
- Broadcasting
- Cable protection system
- Cable TV
- Communications satellite
- Computer network
- Data compression
  - audio
  - DCT
  - image
  - video
- Digital media
  - Internet video
  - online video platform
  - social media
  - streaming
- Drums
- Edholm's law
- Electrical telegraph
- Fax
- Heliographs
- Hydraulic telegraph
- Information Age
- Information revolution
- Internet
- Mass media
- Mobile phone
  - Smartphone
- Optical telecommunication
- Optical telegraphy
- Pager
- Photophone
- Prepaid mobile phone
- Radio
- Radiotelephone
- Satellite communications
- Semaphore
  - Phryctoria
- Semiconductor
  - device
  - MOSFET
  - transistor
- Smoke signals
- Telecommunications history
- Telautograph
- Telegraphy
- Teleprinter (teletype)
- Telex

## Pioneers

- Nasir Ahmed
- Edwin Howard Armstrong
- Mohamed M. Atalla
- John Logie Baird
- Paul Baran
- John Bardeen
- Alexander Graham Bell
- Emile Berliner
- Tim Berners-Lee
- Francis Blake
- Jagadish Chandra Bose
- Charles Bourseul
- Walter Houser Brattain
- Vint Cerf
- Claude Chappe
- Yogen Dalal
- Donald Davies
- Daniel Davis Jr.
- Amos Dolbear
- Thomas Edison
- Philo Farnsworth
- Reginald Fessenden
- Lee de Forest
- Elisha Gray
- Oliver Heaviside
- Robert Hooke
- Erna Schneider Hoover
- Harold Hopkins
- Gardiner Greene Hubbard
- Bob Kahn
- Dawon Kahng
- Charles K. Kao
- Narinder Singh Kapany
- Hedy Lamarr
- Roberto Landell
- Innocenzo Manzetti
- Guglielmo Marconi
- Robert Metcalfe
- Antonio Meucci
- Samuel Morse
- Jun-ichi Nishizawa
- Charles Grafton Page
- Radia Perlman
- Alexander Stepanovich Popov
- Tivadar Puskás
- Johann Philipp Reis
- Claude Shannon
- Albert S. Ruckenstein

## **Transmission media**

- Coaxial cable
- Fiber-optic communication
  - optical fiber
- Free-space optical communication
- Molecular communication
- Radio waves
  - wireless
- Transmission line
  - telecommunication circuit

## **Network topology and switching**

- Bandwidth
- Links
- Network switching
  - circuit
  - packet
- Nodes
  - terminal
- Telephone exchange

## **Multiplexing**

- Space-division
- Frequency-division
- Time-division
- Polarization-division
- Orbital angular-momentum
- Code-division

## **Concepts**

- Communication protocol
- Computer network
- Data transmission
- Store and forward
- Telecommunications equipment

## Types of network





- Cellular network
- Ethernet
- ISDN
- LAN
- Mobile
- NGN
- Public Switched Telephone
- Radio
- Television
- Telex
- UUCP
- WAN
- Wireless network

## Notable networks

- ARPANET
- BITNET
- CYCLADES
- FidoNet
- Internet
- Internet2
- JANET
- NPL network
- Toasternet
- Usenet

## Locations

- Africa
- Americas
  - North
  - South
- Antarctica
- Asia
- Europe
- Oceania
- *Global telecommunications regulation bodies*

-  **Telecommunication portal**
-  **Category**
-  **Outline**
-  **Commons**



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

Web syndication

## History

Blogging

Podcasting

Vlogging

Web syndication technology

## Types

- Art
- Bloggernacle
- Classical music
- Corporate
- Dream diary
- Edublog
- Electronic journal
- Fake
- Family
- Fashion
- Food
- Health
- Law
- Lifelog
- MP3
- News
- Photoblog
- Police
- Political
- Project
- Reverse
- Travel
- Warblog

Technology	General	<ul style="list-style-type: none"> <li>○ BitTorrent</li> <li>○ Feed URI scheme</li> </ul>
	Features	<ul style="list-style-type: none"> <li>○ Linkback</li> <li>○ Permalink</li> <li>○ Ping</li> <li>○ Pingback</li> <li>○ Reblogging</li> <li>○ Refback</li> <li>○ Rollback</li> <li>○ Trackback</li> </ul>
	Mechanism	<ul style="list-style-type: none"> <li>○ Thread</li> <li>○ Geotagging</li> <li>○ RSS enclosure</li> <li>○ Synchronization</li> </ul>
	Memetics	<ul style="list-style-type: none"> <li>○ Atom feed</li> <li>○ Data feed</li> <li>○ Photofeed</li> <li>○ Product feed</li> <li>○ RDF feed</li> <li>○ Web feed</li> </ul>
	RSS	<ul style="list-style-type: none"> <li>○ GeoRSS</li> <li>○ MRSS</li> <li>○ RSS TV</li> </ul>
	Social	<ul style="list-style-type: none"> <li>○ Inter-process communication</li> <li>○ Mashup</li> <li>○ Referencing</li> <li>○ RSS editor</li> <li>○ RSS tracking</li> <li>○ Streaming media</li> </ul>
	Standard	<ul style="list-style-type: none"> <li>○ OPML</li> <li>○ RSS Advisory Board</li> <li>○ Usenet</li> <li>○ World Wide Web</li> <li>○ XBEL</li> <li>○ XOXO</li> </ul>

- Audio podcast
- Enhanced podcast
- Mobilecast
- Narrowcasting
- Peercasting
- Screencast
- Slidecasting
- Videocast
- Webcomic
- Webtoon
- Web series

## **Form**

- Anonymous blogging
- Collaborative blog
- Columnist
- Instant messaging
- Liveblogging
- Microblog
- Mobile blogging
- Spam blog
- Video blogging
- Motovlogging

## Media

### Alternative media

- Carnivals
- Fiction
- Journalism
  - Citizen
  - Database
- Online diary
- Search engines
- Sideblog
- Software
- Web directory

### Micromedia

- Aggregation
  - News
  - Poll
  - Review
  - Search
  - Video
- Atom
- AtomPub
- Broadcatching
- Hashtag
- NewsML
  - 1
  - G2
- Social communication
- Social software
- Web Slice

### Related

- Blogosphere
- Escribitionist
- Glossary of blogging
- Pay per click
- Posting style
- Slashdot effect
- Spam in blogs
- Uses of podcasting

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

## Semantic Web

<b>Background</b>	<ul style="list-style-type: none"><li>◦ Databases</li><li>◦ Hypertext</li><li>◦ Internet</li><li>◦ Ontologies</li><li>◦ Semantics</li><li>◦ Semantic networks</li><li>◦ World Wide Web</li></ul>
<b>Sub-topics</b>	<ul style="list-style-type: none"><li>◦ Dataspaces</li><li>◦ Hyperdata</li><li>◦ Linked data</li><li>◦ Rule-based systems</li></ul>
<b>Applications</b>	<ul style="list-style-type: none"><li>◦ Semantic analytics</li><li>◦ Semantic broker</li><li>◦ Semantic computing</li><li>◦ Semantic mapper</li><li>◦ Semantic matching</li><li>◦ Semantic publishing</li><li>◦ Semantic reasoner</li><li>◦ Semantic search</li><li>◦ Semantic service-oriented architecture</li><li>◦ Semantic wiki</li><li>◦ Solid</li></ul>

- [Collective intelligence](#)
- [Description logic](#)
- [Folksonomy](#)
- [Geotagging](#)
- [Information architecture](#)
- [iXBRL](#)
- [Knowledge extraction](#)
- [Knowledge management](#)
- [Knowledge representation and reasoning](#)
- [Library 2.0](#)
- [Digital library](#)
- [Digital humanities](#)
- [Metadata](#)
- [References](#)
- [Topic map](#)
- [Web 2.0](#)
- [Web engineering](#)
- [Web Science Trust](#)

## **Related topics**



## Syntax and supporting technologies

- HTTP
- IRI
  - URI
- RDF
  - triples
  - RDF/XML
  - JSON-LD
  - Turtle
  - TriG
  - Notation3
  - N-Triples
  - TriX (no W3C standard)
- RRID
- SPARQL
- XML
- Semantic HTML

## Schemas, ontologies and rules

- Common Logic
- OWL
- RDFS
- Rule Interchange Format
- Semantic Web Rule Language
- ALPS
- SHACL

## Standards

## Semantic annotation

- eRDF
- GRDDL
- Microdata
- Microformats
- RDFa
- SAWSDL
- Facebook Platform

## Common vocabularies

- DOAP
- Dublin Core
- FOAF
- Schema.org
- SIOC
- SKOS

## Microformat vocabularies

- hAtom
- hCalendar
- hCard
- hProduct

## Authority control databases Image not found or type unknown [Edit this at Wikidata](#)

### International

- [FAST](#)

### National

- [Germany](#)
- [United States](#)
- [France](#)
- [BnF data](#)
- [Czech Republic](#)
- [Spain](#)
- [Latvia](#)
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- [NARA](#)

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- [Local SEO Sydney](#)
- [SEO parramatta](#)

## Frequently Asked Questions

### How can a digital agency in Sydney help with SEO?

A digital agency in Sydney can offer a comprehensive approach, combining SEO with other marketing strategies like social media, PPC, and content marketing. By integrating these

services, they help you achieve a stronger online presence and better ROI.

### **What does SEO mean for my business?**

SEO, or search engine optimisation, means improving your website's structure, content, and overall performance to rank higher in search results. This leads to more organic traffic, increased brand visibility, and better conversion rates, ultimately supporting your business's growth.

### **What is SEO marketing?**

SEO marketing is the process of using search engine optimization techniques to enhance your online presence. By optimizing your website, creating relevant content, and building authority, you attract organic traffic from search engines, increase brand awareness, and drive conversions.

local SEO agency

SEO Sydney

Phone : 1300 684 339

City : Sydney

State : NSW

Zip : 2000

[Google Business Profile](#)

[Google Business Website](#)

Company Website : <https://sydney.website/seo-sydney/>

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