

Alphabet

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Alphabet Inc. (Formerly Google)

	Total Returns			Annualized Returns		
	Alphabet	S&P 500	Nasdaq	Alphabet	S&P 500	Nasdaq
2-Year	282%	24%	21%	96%	11%	10%
3-Year	398%	40%	41%	71%	12%	12%
5-Year	342%	1%	13%	35%	0%	2%
Lifetime	6,089%	668%	1,058%	22%	10%	13%

Notes:

1. Return data from FactSet.
2. Total returns include dividends reinvested, if any.
3. The start date for the return data above is 8/19/2004, which was the day of Alphabet's (formerly Google) IPO.
4. Lifetime end date is as of 3/31/2025.

Alphabet Private Market Valuation vs Market Cap as of 3/31/2025

	Valuation (\$ Million)	MoM	IRR
June 1999 (Series A)	\$125	15,077x	45%
March 2025	\$1,884,570	-	-

Notes:

1. In 1998, prior to the founding of Google, Andy Bechtolsheim, the co-founder of Sun Microsystems, wrote a \$100,000 check to Google's founders. Around the same time, Stanford professor David Cheriton invested \$200,000.¹ No details of the investments have been disclosed.²
2. In 1998, Larry Page and Sergey Brin approached Yahoo for an investment or acquisition, offering to sell PageRank, the core algorithm behind Google Search, for \$1 million.³ Yahoo rejected the offer.
3. In early 1999, Larry Page and Sergey Brin attempted to sell Google to Excite, a web portal at the time (later acquired by Ask Jeeves in 2004), for between \$250,000 and \$500,000, along with a 1% stake in Excite.⁴ However, Excite's CEO at the time, George Bell, declined the offer. Further details of the offer are not publicly available.
4. In June 1999, Google announced that it had received a \$25 million round of equity funding led by Sequoia Capital and Kleiner Perkins Caufield & Byers.⁵ The details of the share exchange were not disclosed in the announcement. TechCrunch, an American online media magazine focusing on technology companies, reported that Sequoia Capital received 10% of Google's equity in 1999 for \$12.5 million.⁶ In Google's 2004 IPO prospectus, it was revealed that Sequoia held a 9.9% stake in the company.⁷
5. MoM and IRR indicate the gross stock price returns assuming gross dividends reinvested as of March 2025.
6. The valuation in March 2025 is the market cap of Alphabet on the last trading day of March 2025, provided by FactSet.
7. Details of other rounds of venture funding were not found.

¹ Frugal after Google. The Stanford Daily. <https://stanforddaily.com/2010/04/16/frugal-after-google/>

² Google History - Corporate Information.

<https://web.archive.org/web/20110401002313/https://www.google.com/corporate/history.html>

³ Yahoo Rejected Two PhD Students' \$1 Million Offer for Their Site.

<https://economictimes.indiatimes.com/news/international/global-trends/yahoo-rejected-two-phd-students-1-million-offer-for-their-site-heres-why-they-are-still-thankful-for-it/articleshow/115486083.cms?from=mdr>

⁴ Why I Passed on Buying Google. CNBC. <https://www.cnbc.com/2015/03/02/dotcom-bubble-ceo-why-i-passed-on-buying-google.html>; Yahoo Rejected Two PhD Students' \$1 Million Offer for Their Site.

<https://economictimes.indiatimes.com/news/international/global-trends/yahoo-rejected-two-phd-students-1-million-offer-for-their-site-heres-why-they-are-still-thankful-for-it/articleshow/115486083.cms?from=mdr>

⁵ Google Receives \$25 Million in Equity Funding. <https://googlepress.blogspot.com/1999/06/google-receives-25-million-in-equity.html>;

⁶ Sequoia Could Take \$480 Million from Google YouTube Deal. <https://techcrunch.com/2006/10/09/sequoia-could-take-480-million-from-googleyoutube-deal/>

⁷ Google Prospectus 2004.

Mental Model Summary Derived from Alphabet

1. **Google has maintained an overwhelmingly dominant position in online search, driven by its ability to index more web pages and to make users experience more efficient by delivering relevant results in a split second with low online ad penetration. Google has held nearly 90% market share of online search since 2009 (56% at the end of 2003, a year time prior to its IPO)^{8, 9} with loyal and sticky users with high engagement,¹⁰ who spend about three times more time on Google than on its closest competitors. At the time of its IPO, internet ad spending in the U.S. accounted for just 4% of total ad expenditures,¹¹ a very low penetration with significant potential for growth.**

Google Search gained popularity shortly after its founding due to its technical superiority, ultimately leading to dominant market share. From 2000 to 2003, Yahoo used Google as its default search engine provider,¹² reflecting Google's advanced technology and user-focused algorithms. When Google was founded in 1998, internet users broadly would enter a few keywords and receive a long list of thousands of results, many of which were irrelevant.¹³ In addition, the process was so slow that when users typed in their queries, they did something else while they waited and came back for the results.¹⁴ **Brin and Page's proprietary product solved this frustration by bringing order to this randomness and delivering results in a split second by the time they launched Google in 1998.** Over time, Google continued to refine and expand its algorithms and patented several of them.

At the time of its IPO in 2004, Google had already indexed over 4 billion web pages out of an estimated 10 billion and made nearly every website globally searchable through its search engine.¹⁵ Google's mission has consistently centered on developing products that allow people to find, create, and organize information easily, with the potential to enhance lives worldwide. **A court document from U.S. v. Google in 2024 suggested that Google has indexed approximately 400 billion documents.** However, the company neither confirmed nor denied this estimate,¹⁶ but states on its website that "when you search, Google looks through hundreds of billions of webpages and other digital content organized in our Search index to find helpful information - more information than all of the libraries of the world."¹⁷ **In contrast, Bing is estimated to have indexed 8 to 14 billion pages as of 2024,¹⁸ 2% to 3.5% of Google's volume.**

A 2005 Nielsen study showed that Google users are more loyal than those of rival search engines. In the U.K., about 29% of Google users also searched via MSN, while 22% also used Yahoo.¹⁹ By comparison, 70% of MSN Search users and 67% of Yahoo Search users also searched using Google. Similarly, in the U.S., 58% of Google users also used Yahoo, MSN, or both, while about 70% of Yahoo and MSN users also used one of the other search engines mentioned. **The study, conducted in February of 2005, also found that Google users in the U.K. performed an average of 9.1 searches and spent over 26 minutes on the site. By comparison, Yahoo users conducted 4.2 searches and spent 9 minutes, while MSN Search users averaged 3.1 searches and 4 minutes on the platform.**

⁸ Yahoo and MSN Prove Competition for Google. Search Engine Journal. <https://www.searchenginejournal.com/yahoo-and-msn-prove-competition-for-google/297/>

⁹ Measuring search engine market share consistently can be challenging. StatCounter, an online traffic volume tracker, indicates that Google has maintained a market share of over 90% since 2009, the earliest year for which the site provides data, followed by Yahoo and Bing's low- to mid-single-digit market share. <https://gs.statcounter.com/search-engine-market-share#yearly-2009-2024>

¹⁰ A 2005 Nielsen study in the U.K. showed that Google users performed an average of 9.1 searches and spent over 26 minutes on the site, followed by Yahoo users' 4.2 searches and 9 minutes. Google Users More Loyal Than Rival Sites'. <https://www.marketingweek.com/google-users-more-loyal-than-rival-sites/>

¹¹ IAB Internet Advertising Revenue Report 2003. PricewaterhouseCoopers. Interactive Advertising Bureau. https://www.iab.com/wp-content/uploads/2015/05/resources_adrevenue_pdf_IAB_PwC_2003.pdf

¹² Yahoo! Selects Google as its Default Search Engine Provider. <https://googlepress.blogspot.com/2000/06/yahoo-selects-google-as-its-default.html>

¹³ All Eyes on Google. Forbes. <https://www.forbes.com/forbes/2003/0526/100.html>

¹⁴ Larry Page & Sergey Brin - Billionaire Documentary- Google, YouTube, Alphabet, Innovation. <https://www.youtube.com/watch?v=8J7TRSLf55U>

¹⁵ Google Prospectus 2004.

¹⁶ Google's Index Size Revealed 400 Billion Docs. <https://zyppey.com/seo/google-index-size/>; U.S. v. Google 10/18/2023

¹⁷ Organizing Information – How Google Search Works. <https://www.google.com/search/howsearchworks/how-search-works/organizing-information/>

¹⁸ Google vs Microsoft Bing. <https://www.searchenginejournal.com/google-vs-microsoft-bing/400855/>

¹⁹ Google Users More Loyal Than Rival Sites'. <https://www.marketingweek.com/google-users-more-loyal-than-rival-sites/>

These findings indicate that Google users not only searched more frequently but also spent more time on the platform, increasing their likelihood of exposure to targeted ads.

Google's dominating market position in online search creates a powerful, positive feedback loop. **As more people used Google, the company was able to gather more data, enabling it to continuously refine and improve its algorithms. In turn, these better algorithms generated higher-quality search results, attracting even more users. This created a powerful feedback loop — more users led to better results, which attracted even more users.** An MIT scholar observed, “[Google’s] quality of algorithm likely played a role early on, but now it’s mostly network effects – dominance breeds dominance.” Similarly, a Stanford scholar stated, **“Google’s search engine has been far better from the outset—this alone can explain why it dominated. It is simply a better search engine.”**²⁰ In 2025, building on its advancements in AI, Google has integrated powerful new features into Search. Unlike in the past, when users were limited to short queries, the updated Search can now handle complex, natural-language questions and provide direct answers. New capabilities include Deep Search, real-time visual interaction through Search Live, and agentic actions that can complete tasks like booking tickets. Google’s AI shopping tools also let users virtually try on clothes, track price changes, and receive personalized product recommendations.

Prior to Google’s IPO in 2004, research by PricewaterhouseCoopers (PwC) reported that total U.S. internet advertising revenue grew from \$1.9 billion in 1998 to \$7.3 billion in 2003.²¹ **This accounted for 4% of total U.S. advertising revenue in 2003, reflecting a CAGR of 31%.**²² In comparison, the market shares of traditional channels were as follows: direct mail at 24%, newspapers at 22%, TV and cable TV combined at 30%, and radio at 9%. In 2003, Google occupied an estimated 14% of the internet ad segment, while Yahoo held a slightly smaller market share of about 13.7%, with market-services revenues of \$1.2 billion, primarily from advertising with the assumption that 83% of Yahoo’s revenue came from the U.S., consistent with its overall geographic revenue distribution.²³ In addition, Microsoft was estimated to hold over 8% of the market share,²⁴ while AskJeeves accounted for approximately 1%.^{25, 26} **In 2021, eMarketer estimated that Google held nearly 29% of the U.S. digital advertising market, including ads in various formats on computers, mobile devices, and other internet-connected devices. Google was followed by Meta with nearly 24% market share and Amazon with 12%.**²⁷ **A notable fact is that, by 2024, only about 20% of Google search queries are monetized, meaning that 80% of the search queries are not associated with ads,**²⁸ contributing to nearly 70% of Google’s advertising revenue,²⁹ suggesting that, potentially, there are still plenty of opportunities for Google to grow its advertising revenues in the future.

2. **Google’s products and services primarily cater to two groups – users (consumers and enterprises) and advertisers. For users, Google delivers highly relevant search results (with accuracy rates of 80% to 95%,**

²⁰ Does Google Have Too Much Market Power. Chicago Booth Review. <https://www.chicagobooth.edu/review/does-google-have-too-much-market-power>

²¹ IAB Internet Advertising Revenue Report 2003. PricewaterhouseCoopers. Interactive Advertising Bureau. https://www.iab.com/wp-content/uploads/2015/05/resources_adrevenue_pdf_IAB_PwC_2003.pdf

²² IAB Internet Advertising Revenue Report 2003. PricewaterhouseCoopers. Interactive Advertising Bureau. https://www.iab.com/wp-content/uploads/2015/05/resources_adrevenue_pdf_IAB_PwC_2003.pdf

²³ Yahoo Annual Report 2003.

²⁴ Microsoft did not disclose its exact advertising revenue for 2003 or its corresponding regional breakdown. The company’s total revenue in 2003 was \$32.2 billion, with \$22.1 billion generated from U.S. operations. Additionally, MSN generated \$1.95 billion in revenue, driven by an 11% increase—or \$112 million—in MSN Subscriptions. This suggests that paid search and advertising revenue totaled approximately \$930 million. Assuming it followed the same regional distribution as the company’s overall sales, around \$640 million of this advertising revenue was generated in the U.S., or over 8% of the \$7.6 billion U.S. internet advertising market. Microsoft Annual Report 2003.

²⁵ In 2003, AskJeeves generated \$107 million in revenue, with 96% coming from advertising and 65% of that from the U.S. This implies that approximately \$67 million of its advertising revenue was generated in the U.S., representing about a 1% share of the \$7.6 billion U.S. internet advertising market that year. AskJeeves Annual Report 2003.

²⁶ Due to limited data on internet advertising revenue, we were unable to estimate the market share of other competitors to Google during this period. For instance, although Time Warner generated nearly \$6.2 billion in advertising revenue in 2003, the breakdown between AOL, its internet portal, and its cable TV segment was not disclosed. AOL Time Warner Annual Report 2003.

²⁷ Google, Facebook, and Amazon to Account for 64% of US Digital Ad Spending This Year. <https://www.emarketer.com/content/google-facebook-amazon-account-over-70-of-us-digital-ad-spending>

²⁸ Interview with Former Director, Global Go-to-Market Strategy, Ads at Google. 7/22/2024.

²⁹ Interview with Former Head, Go-To-Market, Media Service at Google. 7/12/2024.

depending on types of queries, higher than competitors³⁰) and offers free services such as Gmail and Google Maps to strengthen its ecosystem. For advertisers, Google's advertising products are designed to help businesses and organizations deliver targeted, relevant advertisements to users exactly when they are searching for information. Google's chief economist in 2009 found that, on average, advertisers generate \$2 to \$2.3 in revenue for every \$1 spent on Google Ads.³¹

Despite accepting advertiser fees, Google promises that its search results are objective, with advertising clearly separated from organic search results, even in Froogle (Google Shopping)³². Some competitors such as Overture (later acquired by Yahoo in 2003) took a different approach, charging advertisers for prominent ad placement based on keywords,³³ as well as charging a fee for being included in users' search results.

Google's simple, intuitive website, featuring fewer than 30 words and only a few tabs, potentially contributed significantly to its widespread adoption by minimizing the effort required for users to learn and use it such that users can easily type keywords into the search bar and retrieve results within seconds. Unlike rivals such as Yahoo and AOL, Larry Page and Sergey Brin refused to clutter Google's homepage with ads, believing that a clean design would build user trust.³⁴

Google's advertising products are designed to help businesses and organizations deliver targeted, relevant advertisements to users exactly when they are searching for information. Leveraging its position as the world's most popular search engine, **Google enables advertisers to reach target customers with great accuracy, showing ads to users as they search for related content. Google's advertising services are also pay-for-performance to advertisers, charging them only when users click on their ads rather than on an impression basis, maximizing the effectiveness of ads.**

Through its AdWords program, businesses can promote products and services with targeted ads. In addition, third-party websites (i.e., Google Network members) participating in Google's AdSense program display these ads, generating revenue for both Google and the hosting sites. **AdWords is automated and self-serve, enabling advertisers to set up campaigns within 15 minutes with little or no assistance from Google.**³⁵

A wholesaler of industrial tape in Florida endorsed Google's ability to deliver effective ads and stated "We spend about \$2,000 to \$2,500 a month on search-based advertising on Google and Yahoo. But we get 20 times more a month on sales (implying only 5% of revenue) ... The search-engine ads work great for us because they're cheap and we can track how many people are coming to our site... You can't do that with print ads which are so much more expensive."³⁶

Google's advertising services are primarily on a cost-per-click model that is auction-based. In early 2002, Google shifted AdWords to a cost-per-click (CPC) model exclusively, where advertisers paid only when users clicked on their ads. Then, in 2004, Google adopted a single-pricing structure for all advertisers based on the CPC model.³⁷ AdWords operates as an auction-based platform, where advertisers bid on specific keywords, an idea originally from a young Google product manager in his early 20s.³⁸ When users search for these keywords, relevant ads appear alongside search results.

Google's auction-based model benefits advertisers by delivering cost-effective ad placement. Advertisers pay only the minimum amount required to maintain their ad position, often saving money. For example, if three companies bid on the same keyword, with Company A bidding \$1.00 per click, Company B \$0.60, and Company C \$0.50, Company A would secure the top position but only pay \$0.61 per click. Company B would

³⁰ Navigational queries: Google 95.27% vs. Bing 76.57%; Informational queries: Google 82% vs. Bing 79.3%. Evaluating The Retrieval Effectiveness of Web Search Engines Using A Representative Query Sample. Dirk Lewandowski. Hamburg University of Applied Sciences. <https://arxiv.org/abs/1405.2210>; <https://asistdl.onlinelibrary.wiley.com/doi/10.1002/asi.23304>

³¹ Varian, Hal R. 2009. "Online Ad Auctions." American Economic Review 99 (2): 430–34.; Google Economic Impact. <https://economicimpact.google/methodology/>

³² Google Prospectus 2004.

³³ Google Prospectus 2004.

³⁴ Larry Page & Sergey Brin - Billionaire Documentary- Google, YouTube, Alphabet, Innovation.

<https://www.youtube.com/watch?v=8J7TRSLf55U>

³⁵ Google Prospectus 2004.

³⁶ Retailers Googly-Eyed Over Google. CNN. https://money.cnn.com/2004/04/29/technology/search_advertising/

³⁷ Google Prospectus 2004.

³⁸ CHM Revolutionaries: An Evening with Google's Executive Chairman Eric Schmidt.

<https://www.youtube.com/watch?v=NfalakTPsnE>

take the second position at \$0.51, and Company C the third position at \$0.05, the minimum bid at the time of Google's IPO. At its IPO, bids started at \$0.05 per click but could go to higher range depending on different products.³⁹ This program helps advertisers save money by minimizing the cost per click and reduces the need for constant monitoring and adjusting of their bids.⁴⁰ In late 2003, Google's average cost-per-click (CPC) was estimated to be \$0.30, compared to Overture, which was later acquired by Yahoo, \$0.40 during this period.⁴¹

David Becker, an AdWords project manager, stated that "advertisers love the system because they only pay when someone actually clicks on their ads. **For many advertisers, it's the most efficient form of marketing they ever have.**"⁴²

In addition to AdWords, Google introduced AdSense in 2002, a product allowing third-party websites (i.e., Google Network members) to display targeted ads from AdWords advertisers (revenue from Google Network accounted for 44% of Google's advertising revenue at the time of IPO vs. 56% from AdWords). Websites can easily join AdSense for free by adding a simple string of HTML code, and Google automatically generates relevant ads based on each site's content. When a click occurs on an ad displayed by a Google Network member, Google retains a small portion of the advertiser's fee, while the majority is paid to the network member. This arrangement provided a substantial benefit to third-party websites, as Google paid out over 80% of advertising revenue from AdSense to these websites at the time of its IPO.⁴³ By contrast, the gross margin from ads displayed on Google's own websites was estimated at around 85%.⁴⁴ This difference highlights how Google's own websites are far more profitable than third-party ad placements.

Google has consistently maintained high, stable profit margins since its IPO. Its gross margin has generally ranged between 55% and 65%, while operating margins have stayed near 25% to 30%. As a company primarily offering online services such as search, email, and software to users, alongside advertising services to businesses, Google has been able to scale its revenue. This scalability largely stems from its infrastructure; as long as Google has sufficient data center capacity and computing power, it can support additional users and customers without incurring substantial new expenses.

One likely reason that the company has not shown significant margin expansion (gross margin 56.7% to 56.6% and operating margin 23.4% to 27.4% from 2003 to 2023) is its investment in newer business ventures beyond advertising. These include Google Cloud and "Other Bets" such as autonomous driving and healthcare, many of which are either low-profit or currently unprofitable. In 2023, Google Services⁴⁵ generated total revenue of \$272 billion with an operating margin of approximately 35%. By comparison, Google Cloud⁴⁶ contributed \$33 billion in revenue with a modest 5% operating margin (from losses prior to 2022), while Other Bets⁴⁷ generated \$1.5 billion in revenue but incurred an operating loss exceeding \$4 billion.

3. **Google is a best-in-class search engine with a loyal user base (Pew Research's 2012 survey showed 83% of search users used Google the most often, followed by Yahoo's 6%⁴⁸) with dominant market share (~90% as of 2009⁴⁹) and yet, despite this, Google continues to invest heavily in research and development, both as a percentage of sales and in absolute value versus competitors.**

³⁹ All Eyes on Google. Forbes. <https://www.forbes.com/forbes/2003/0526/100.html>

⁴⁰ Google Prospectus 2004.

⁴¹ Case Study: Google Inc. (9-910-036). Harvard Business School.

⁴² Larry Page & Sergey Brin - Billionaire Documentary- Google, YouTube, Alphabet, Innovation. <https://www.youtube.com/watch?v=8J7TRSLf55U>

⁴³ Google Prospectus 2004; Google Annual Report 2004.

⁴⁴ Google Prospectus 2004.

⁴⁵ Google Services generates revenues primarily by delivering both performance and brand advertising that appears on Google Search & other properties, YouTube, and Google Network partners' properties. Alphabet Annual Report 2023.

⁴⁶ Google Cloud generates revenues primarily from consumption-based fees and subscriptions for infrastructure, platform, collaboration tools and other cloud services. Alphabet Annual Report 2023.

⁴⁷ Alphabet's investment in the portfolio of Other Bets includes businesses that are at various stages of development, ranging from those in the R&D phase to those that are in the beginning stages of commercialization. Revenues from Other Bets are generated primarily from the sale of healthcare-related services and internet services. Alphabet Annual Report 2023.

⁴⁸ Main Findings. Pew Research Center. <https://www.pewresearch.org/internet/2012/03/09/main-findings-11/>

⁴⁹ Measuring search engine market share consistently can be challenging. StatCounter, an online traffic volume tracker, indicates that Google has maintained a market share of over 90% since 2009, the earliest year for which the site provides data, followed by Yahoo and Bing's low- to mid-single-digit market share. <https://gs.statcounter.com/search-engine-market-share#yearly-2009-2024>

According to a 2004 report by Search Engine Journal, about 56.7% of internet users consistently use the same search engine or directory when searching for information, and another 30.5% have a few specific search engines they use regularly.⁵⁰ Less than 13% of users said they use a different search engine each time, indicating that the majority are loyal to their preferred platforms. **More specifically, Google had the highest user loyalty rate at 65.8%, compared to Yahoo's 55%, MSN's 54%, and AOL's less than 50%.** A later survey by Pew Research in 2012 found that 83% of search users preferred Google and used it the most often, while Yahoo was a distant second at just 6%.⁵¹

A 2004 survey by the Pew Internet & American Life Project ranked Google highest in user satisfaction, with 47% of respondents naming it their top choice for a search engine, followed by Yahoo at 26%.⁵² **The study also indicates strong loyalty among Google users, with 56% of them conducting their searches on Google, compared to 43% for Yahoo users and 26% for MSN users on their respective platforms.**

A 2005 Nielsen study, conducted in February of 2005, found that Google users in U.K. performed an average of 9.1 searches and spent over 26 minutes on the site. By comparison, Yahoo users conducted 4.2 searches and spent 9 minutes, while MSN Search users averaged 3.1 searches and 4 minutes on the platform, indicating higher engagement.⁵³

Google's high-quality search results, which attract users over the long term, are credited to its superior algorithms. In contrast, Yahoo, one of Google's main competitors in search, saw its R&D expenses grow from \$218 million in 2003 to \$1 billion in 2016 before its acquisition by Verizon, reflecting a 13% CAGR.⁵⁴ In comparison, Google's R&D spending increased from \$230 million in 2003 to nearly \$14 billion in 2016, a significantly higher 37% CAGR. Microsoft, another major competitor in search, grew its R&D investment from \$4.7 billion in 2003 to \$27 billion in 2023, representing a 9% CAGR.⁵⁵

- 4. Google has cultivated a company culture that seeks to promote long-term innovation and experimentation through embracing high-risk, high-reward projects and a relatively flat organizational structure. Examples include the following. Google encourages employees to develop side projects, some of which eventually became Google's most iconic products (such as Chrome, Gmail, AdSense). Google has also been willing to take risks in strategic acquisitions. Some of Google's most successful businesses were from acquisitions such as YouTube (with an estimated 20 million monthly users in 2006 vs. over 2 billion monthly users in 2022) and Android (without a finished product when acquired in 2008 vs. over 3 billion active users and 70% market share of mobile operating systems).**

Throughout its development, Google has introduced a variety of products, many of which are free, through both organic development and acquisitions. Some of these ventures have been short-lived, while others have become widely popular. The pursuit of new ventures has been embedded in Google's culture since the beginning.

Google has often embraced high-risk, high-reward projects, whether related to its current business or entirely new opportunities, even if such ventures could take years to realize profits. The company considers pursuing such projects as key to its long-term success. In their IPO letter, the founders stated that Google would fund projects with even a 10% chance of earning a billion dollars return over the long term.⁵⁶ **Google encourages risk-taking and innovation, embraces failure as part of the process, and rewards effort rather than just results. Sundar Pichai, Google's current CEO, pointed out that companies overly focused on outcomes tend to favor safer bets over time.**⁵⁷ **Google, by contrast, strives to preserve its culture of technological innovation and product development.**

⁵⁰ Internet Users Loyal to Their Search Engines. <https://www.searchenginejournal.com/internet-users-loyal-to-their-search-engines/453/>

⁵¹ Main Findings. Pew Research Center. <https://www.pewresearch.org/internet/2012/03/09/main-findings-11/>

⁵² Data Memo on Search Engines. Pew Research Center. <https://www.pewresearch.org/internet/2004/08/12/data-memo-on-search-engines/>

⁵³ Google Users More Loyal Than Rival Sites'. <https://www.marketingweek.com/google-users-more-loyal-than-rival-sites/>

⁵⁴ Company annual reports.

⁵⁵ It is important to note that Microsoft's search engine business, approximated by its advertising revenue, has consistently accounted for only a low- to mid-single-digit percentage of the company's overall revenue. The majority of Microsoft's revenue has come from other segments, including software, operating systems, and cloud services. Company annual reports. Microsoft Annual Report 2004, ended June 30, 2004; Google Annual Report 2003, ended December 31, 2003; Microsoft Annual Report 2024, ended June 30, 2024; Google Annual Report 2023, ended December 31, 2023.

⁵⁶ Founders' IPO Letter – "An Owner's Manual" for Google's Shareholders.

⁵⁷ Sundar Pichai, CEO of Google and Alphabet. <https://www.youtube.com/watch?v=j9qGmO8Yy-Y>

To encourage creativity and efficiency and minimize bureaucracy, Google organizes work into small teams, typically consisting of three to five members, which facilitates rapid decision-making and the sharing of ideas. The company actively limits middle management, as it believes that larger teams can slow productivity and decision-making. Decisions at Google are often consensus-oriented.⁵⁸

Eric Schmidt, Google's CEO from 2001 to 2011, recalled a story during his first year at the company that highlighted Google's innovative culture and flat organizational structure. Larry Page, dissatisfied with Google's ads at the time, decided to change.⁵⁹ He typed in queries that he thought were representative, printed the search results pages, and displayed them in the break room on a Friday afternoon. Instead of calling formal meetings with vice presidents or directors of engineering, he asked everyone to critique the ads and suggest how to fix them. By Monday, a group of engineers, none of whom were part of the ads team, had developed improved algorithms to address the issues. They had taken on the challenge simply because they found the questions interesting. This moment underscored the value of Google's flat organizational structure, which fostered efficiency and innovation by minimizing middle layers.

The company also encourages employees to spend 20% of their time working on projects they believe will most benefit Google.⁶⁰ This policy empowers employees to be creative and innovative, with a view to driving the company's long-term success. For example, both AdSense for content and Google News were prototyped during employees' 20% time. Although many risky projects may not work out, Google values the lessons learned and the potential for certain ventures to succeed.

Some of Google's most iconic products, besides Google Search, are developed as a side project, reflecting the company's innovative culture. Google Chrome, the most popular internet browser with over 60% market share in 2023, exemplifies this spirit. Initially conceived as a small project led by Sundar Pichai, who would later become Google's CEO, Chrome was developed in secrecy. At the time, Eric Schmidt, Google's CEO, believed the web browser market was too competitive, so Pichai chose not to disclose the project to anyone until his team had a working prototype. Once the project was complete, Pichai presented Chrome to the company, sparking excitement and support. This story highlights Google's adventurous spirit, where the willingness to embrace uncertainty often leads to groundbreaking innovations driven by small, dedicated teams.⁶¹

Although Google does not publicly disclose its general acquisition criteria or details about past acquisitions, some of its notable acquisitions such as YouTube and Android, demonstrate its willingness to take risks when opportunities have the potential to become billion-dollar businesses. For example, in 2006, Google acquired YouTube for \$1.65 billion in stock,⁶² less than two years after YouTube's founding, making it Google's largest acquisition at the time. While Google did not disclose YouTube's financial details, market analysts later (in 2007) estimated that YouTube generated approximately \$15 million in revenue for the entire year of 2006.⁶³ At the time of its acquisition, YouTube had already established itself as one of the fastest-growing websites globally, delivering more than 100 million video views daily with around 65,000 new uploads each day.⁶⁴ Although neither Google nor YouTube disclosed its monthly active users, Nielsen estimated that YouTube had nearly 20 million unique monthly users.⁶⁵ Its user base had expanded significantly, from 2.8 million users in August 2005 to 72.1 million by the time of the acquisition.⁶⁶ Without disclosing further details, in 2022, Google stated that **YouTube had over 2 billion monthly users.**⁶⁷ **This growth implies a CAGR of at least 33% from 20 million monthly users in 2006.**⁶⁸ In 2023, YouTube generated \$31.5 billion in advertising revenue, accounting for 10% of Alphabet's total revenue and 13% of its overall advertising revenue.⁶⁹ Between 2006, the year when Google acquired YouTube, and 2023, YouTube's revenue grew at an estimated CAGR of 57%, outpacing Alphabet's (Google's parent company) overall revenue CAGR of 22% during the same period.

⁵⁸ Case Study: Keeping Google "Googley". Harvard Business School.

⁵⁹ CHM Revolutionaries: An Evening with Google's Executive Chairman Eric Schmidt.

<https://www.youtube.com/watch?v=NfalakTPsnE>

⁶⁰ Google Prospectus 2004.

⁶¹ Sundar Pichai, CEO of Google and Alphabet. <https://www.youtube.com/watch?v=j9qGmO8Yy-Y>

⁶² Google To Acquire YouTube for \$1.65 Billion in Stock.

<https://www.sec.gov/Archives/edgar/data/1288776/000119312506206884/dex991.htm>

⁶³ YouTube 2006 Sales Pegged at \$15 Million. <https://www.marketwatch.com/story/youtube-2006-sales-pegged-at-15-million>

⁶⁴ YouTube Serves Up 100 Million Videos A Day. <https://www.nbcnews.com/id/wbna13890520>

⁶⁵ YouTube Serves Up 100 Million Videos A Day. <https://www.nbcnews.com/id/wbna13890520>

⁶⁶ Google Buys YouTube for \$1.65 Billion. <https://www.nbcnews.com/id/wbna15196982>

⁶⁷ Alphabet Q1 2022 Earnings Call. 4/26/2022.

⁶⁸ YouTube Serves Up 100 Million Videos A Day. <https://www.nbcnews.com/id/wbna13890520>

⁶⁹ Alphabet Annual Report 2023.

In 2005, Google acquired Android Inc.,⁷⁰ a 22-month-old startup focused on developing a software operating system for cell phones without disclosing the purchase price. Three years after the acquisition, in October 2008, Google launched the first version of the Android operating system, which debuted on the T-Mobile G1 (also known as the HTC Dream) in the U.S.⁷¹ At that time, the world's mobile phone operating system market was dominated by Symbian, which held a 49.8% market share, followed by BlackBerry's RIM at 15.9%. Apple's iPhone, which had launched in 2007 with its own operating system, accounted for nearly 13% of the market, while Microsoft's Windows Mobile held an 11% share.⁷² Android's open, developer-friendly ecosystem and the free of charge facilitated rapid adoption by manufacturers and developers, helping to expand the Android ecosystem.⁷³ Although many developers work across multiple platforms, a 2016 report by Evans Data Group estimated that 5.9 million developers worldwide primarily targeted Android, while 2.8 million primarily targeted iOS.⁷⁴ While Google does not disclose Android's financial performance, it has undoubtedly become a key part of its business. By 2023, Android has grown to become the world's largest mobile operating system, commanding over 70% of the market,⁷⁵ with most of the remaining share held by Apple's iOS. **With more than 3 billion monthly active users worldwide,⁷⁶ Android-powered devices, along with other mobile devices, now account for about 50% of searches on Google.com, made from mobile devices such as smartphones and tablets.⁷⁷**

In 2024, Sergey Brin made it official for the first time since his retirement (started in 2019) that he was back at Google, working on AI “pretty much every day.”⁷⁸ Acknowledging Google's earlier hesitation, he stated it was time to take risks and move faster, even if that meant mistakes and embarrassments. Currently, Google places Gemini, a family of AI models created by the company, at the center of its ecosystem, from search to creative tools.⁷⁹ At Google I/O (developer conference) 2025, the company announced its AI advancements. **The new Search AI Mode introduces features such as Deep Search, Search Live (real-time visual interaction), and agentic actions that can perform tasks such as booking tickets. Enhanced AI shopping tools now include virtual try-on, intelligent price tracking, and personalized product suggestions.** The company also announced smart glasses (Android XR glasses) with visual understanding and real-world interaction capabilities, developed in collaboration with Samsung, Warby Parker, and Gentle Monster.

Gemini 2.5 according to Google, is now the world's leading model for learning with Gemini 2.5 Pro outperforming competitors on every category of learning science principles. In Google's report, it states that Gemini is preferred by experts in 73.2% of head-to-head match-ups overall.

5. Google has remained founder-controlled since its IPO, with a long-term focus enabled by controlling shares.

At the time of its IPO, Google was primarily led by three key figures: the two founders, Larry Page and Sergey Brin, along with the CEO, Eric Schmidt. The three leaders operated collaboratively, with Page and Brin serving as Presidents. To ensure timely decision-making, they met daily to update each other on the business and to collectively focus on the most important and immediate issues.⁸⁰

Google's dual-voting structure was designed to ensure that Google's leadership, especially the founders, retained significant control over the company's destination as its shares changed hands. Google's management team believes that such a structure preserves what they think is important about Google. For example, the company does not want

⁷⁰ Google Buys Android for Its Mobile Arsenal. Bloomberg Businessweek.

https://web.archive.org/web/20110205190729/http://www.businessweek.com/technology/content/aug2005/tc20050817_0949_tc024.htm

⁷¹ The History of Android. <https://web.archive.org/web/20150310151326/http://arstechnica.com/gadgets/2014/06/building-android-a-40000-word-history-of-googles-mobile-os/6/>

⁷² Apple Jumps to Third Place in Smartphone Market as Nokia Declines. The Guardian.

<https://www.theguardian.com/technology/blog/2008/dec/04/gartner-smartphones>

⁷³ Google Inc. Presents at BofA Merrill Lynch 2012 Global Technology Conference. 5/8/2012.

⁷⁴ Mobile Developer Population Reaches 12M Worldwide. <https://evansdata.com/press/viewRelease.php?pressID=244>

⁷⁵ Mobile Operating System Market Share Worldwide. StatCounter GlobalStats. <https://gs.statcounter.com/os-market-share/mobile/worldwide#yearly-2009-2024>

⁷⁶ Alphabet Q1 2024 Earnings Call. 4/25/2024.

⁷⁷ Interview with Former Google AdWords Workflow and Revenue Lead at Google. 11/30/2021.

⁷⁸ Sergey Brin Is Back. Is Google Working on a 'God' AI Model. <https://www.entrepreneur.com/business-news/sergey-brin-is-back-is-google-working-on-a-god-ai-model/479739>

⁷⁹ Google I/O 2025 – 100 Things Google Announced. <https://blog.google/technology/ai/google-io-2025-all-our-announcements/>

⁸⁰ Founders' IPO Letter – “An Owner's Manual” for Google's Shareholders.

to have a short-term revenue or profit opportunity that makes them do something that they feel compromises the company's integrity.⁸¹

After the IPO, Page, Brin, and Schmidt would collectively hold 37.6% of the voting power, while the executive management team and directors as a whole would control 61.4%.⁸² As of 2023, the two founders, Larry Page and Sergey Brin, collectively owned approximately 51.5% of the voting power of Alphabet, Google's parent company.⁸³

6. **At the time of Google's IPO in 2004, its valuation multiple of 130x P/E seemed optically high.** However, that does not consider the company's trailing growth, over 200% 1-year CAGR and 300% 3-year CAGR in revenue. Google had only become profitable in 2001, but its net income was growing rapidly at the time of its IPO, with a 1-year CAGR of over 100% and a 2-year CAGR of 300% (adjusted to exclude the effects of stock-based compensation from FY2000 to FY2003). The expanding operating margin, which grew from negative levels before FY2001 to 23% in FY2003, would drive net margin expansion. **Within five years, that seemingly high IPO multiple shrank to 4x P/E, driven by an over 50% revenue CAGR and a 90% net income CAGR over the period, with its net margin expanding significantly, from 8% to 28%.**

Google provided no financial guidance, and the internet sector was in its early stage, with few peer companies for comparison. If an investor in 2004 believed that Google could outpace its peers in online advertising, an industry projected to grow at a mid-to-high-teens percentage to low twenties in the next few years,⁸⁴ with its dominant position in online search, Google could have achieved a 27% CAGR. Under this assumption, the company might have reached 17x P/E by the end of year five.

⁸¹ Google Prospectus 2004.

⁸² Google Prospectus 2004.

⁸³ Google Annual Report 2023.

⁸⁴ US Internet Ad Market Set To Grow By 28% In 2005. <https://uk.themedialeaders.com/us-internet-ad-market-set-to-grow-by-28-in-2004-21-in-2005/>; Advertising Spending Online Offline Spending Forecasts Report July 2003. eMarketer. <https://www.bus.umich.edu/KresgePublic/Journals/EmarketerReports/2003/Advertising%20Spending%20Online%20Offline%20Spending%20Forecasts%20Report%20July%202003.pdf>

Figure 1: Valuation Metrics

Metric	Amount (\$ Million)	Multiple / Ratio Analysis
Market Cap	\$ 24,971	Fully diluted basis
Enterprise Value	\$ 24,422	10.8x EV/Sales; 20.7x EV/Gross Profit
Cash	\$ 549	2.2% of Market Cap
LTD, STD, & Current Portion of LTD	\$ 0	\$549M of Net Cash
-		-0.98x Net Debt/EBITDA
Working Capital (inc. Cash)	\$ 630	2.5% of Mkt Cap
Net Working Capital (ex. Cash and STD)	\$ 81	0.3% of Mkt Cap
Total Equity Value	\$ 1,017	24.6x Price/Book Value
Tangible Book Value	\$ 913	27.3x Price/Tangible BV
Gross Profit	\$ 1,182	52.3% Gross Profit Margin
SG&A	\$ 368	16.3% SG&A/Revenue
R&D	\$ 334	14.8% R&D/Revenue
EBITDA	\$ 557	43.8x EV/EBITDA
Capex	\$ 299	94.5x EV/(EBITDA-CAPEX)
Net Income	\$ 191	130.9x Fully Diluted P/E; 63.4x adjusted P/E ⁸⁵
Levered FCF	\$ 290	86.0x Price/Levered FCF
Unlevered FCF	\$ 288	84.9x EV/Unlevered FCF
Owner's Earnings	\$ (41)	-602.4x Price/OE
-	-	-589.2x EV/OE
ROIC	36.0%	-
ROTCE	119.3%	-
1-Yr. Sales CAGR	233.5%	From FY2002 to FY2003
1-Yr. CAGR of Net Income	6.0%	
1-Yr. CAGR of Adjusted Net Income	124.0%	See notes below
1-Yr. FCF CAGR	85.2%	
2-Yr. Sales CAGR	311.8%	From FY2001 to FY2003
2-Yr. Net Income CAGR	288.9%	
2-Yr. CAGR of Adjusted Net Income	311.6%	See notes below
2-Yr. FCF CAGR	248.2%	
3-Yr. Sales CAGR	324.9%	From FY2000 to FY2003
3-Yr. CAGR of Net Income	N/A	Net loss in FY2000
3-Yr. FCF CAGR	N/A	FY2000 cash flow statement not available

Notes:

1. Market capitalization at the time of IPO is calculated as the issuing price times total common stock to be outstanding after the offering and shares of common stock issuable upon the exercise of options and warrants disclosed in the IPO prospectus. Google's common stocks were issued at a price of \$85 per share.⁸⁶ The company expected the total number of Class A and Class B (equal shares with different voting power) common stock to be outstanding 271,219,643 shares. The company's shares could be potentially diluted with options and warrants to a total of 293,777,445 shares.
2. EV = market cap on 8/19/2004 + STD (as of 6/30/2004) + LTD (as of 6/30/2004) – Cash (as of 6/30/2004). The company had no debt at the time of IPO. The company's cash includes cash equivalents and short-term investment, which consists of municipal securities and U.S. government notes.
3. COGS, SG&A, and R&D expenses include stock-based compensations as disclosed in Google's prospectus.
4. Sales and profit data are last-twelve-month as of 6/30/2004.
5. Sales and Net Income CAGR is calculated from FY2000 to FY2003.
6. Levered FCF is calculated as CFO-CAPX. Unlevered FCF is calculated as Levered FCF + Net Interest Expense.
7. Owner's earnings are calculated as Net Income + Depreciation and Amortization – CAPX – Change in Net Working Capital. The change in Net Working Capital is approximated from the cash flow statement due to the limited disclosure on the interim period balance sheet.

⁸⁵ Adjusted for stock-based compensation.

⁸⁶ Google IPO priced at \$85 a share. CNN. <https://money.cnn.com/2004/08/18/technology/googleipo/>

8. ROIC is calculated EBIT*(1-Effective Tax Rate) divided by Total Asset – Cash – Non-interest-Bearing Current Liabilities. Capital lease is not considered an interest-bearing liability.
9. Components of ROTCE are EBIT=\$479; Current Asset (ex. Cash)=\$882-\$549=\$333; Current Liabilities (ex. STD)=\$252-\$0=\$252; NFA=\$321.
10. Adjusted net income removed the effects of stock-based compensation from FY2000 to FY2003. Stock-based compensation increased \$207.8 million to \$229.4 million (or 15.6% of revenues) in 2003 from \$21.6 million (or 4.9% of revenues) in 2002. The increase was primarily driven by the larger differences between the exercise prices and the reassessed values of the underlying common stock on the dates of the grant and, to a lesser extent, an increase in the level of stock option grants in 2003. We removed the stock-based compensation of \$2.5 million, \$12.38 million, \$21.64 million, and \$229.36 million from 2000 to 2003, respectively, and assumed a 35% statutory tax rate applied to these expenses since we do not know the effective tax rates applied to such expenses in those years.

Company Overview

Google, now known as Alphabet, is the world's largest search engine and a global software and technology provider, with 90% share of the worldwide search engine market from 2009.⁸⁷ Beyond its dominance in search, the company also operates the world's most widely used mobile operating system and offers a broad range of products and services for both consumer and commercial use such as cloud technology, hardware, and autonomous driving.

The company was founded in 1998 by Larry Page and Sergey Brin while they were graduate students (both later dropped out to start Google) at Stanford University, working from their dorm rooms. Initially, it was called Backrub, a search engine that ranked web pages by analyzing their links to determine importance. Page and Brin stated in an interview that they did not start out to create a search engine, their focus was purely on their research.⁸⁸ The name "Google" was a playful reference to the mathematical term "googol," which represents the number 1 followed by 100 zeros (1 googol = 1.0×10^{100}). This reflected Larry and Sergey's mission: "to organize the world's information and make it universally accessible and useful." They later named Google's headquarters, located in Mountain View, California, the "Googleplex."

The emergence of Backrub, later known as Google, addressed a major problem users faced when searching for content online. At the time when Google was founded (1998), internet users would enter a few keywords and receive a long list of thousands of results, many of which were irrelevant.⁸⁹ In addition, the process was very slow that users typed in their queries, did something else while they waited, and came back for the results.⁹⁰ **Brin and Page's proprietary product solved this frustration of the slow process by bringing order to such randomness and delivering results in a split second.** It ranked a site's relevancy based on how many other websites linked to it, a unique approach that no one else had done⁹¹ and became the foundation of Google's PageRank algorithm (named after Larry Page, not web pages).⁹² This method was later enhanced with additional algorithms that factored in other variables, such as giving news websites higher rankings than personal blogs. Over time, Google continued to refine and expand these algorithms and patented several of them.

By 2000, Google had already started gaining popularity, with over 50 million searches every day,⁹³ partly due to its technological superiority. During this time, the internet industry was experiencing the dot-com bubble crash, a collapse that paradoxically benefited Google. As other technology firms failed, Google took advantage of cheap office space, barely used Herman Miller Aeron chairs and servers, and hired many unemployed talented programmers.⁹⁴ **By mid-2001, Google became profitable, employed several hundred people, and was experiencing 20% monthly traffic growth.** As the company grew, the founders recognized the need for experienced leadership and began searching for a seasoned Chief Executive to help guide the company's business growth because they realized that their youth could be a handicap when it came to managing people. In August 2001, Eric Schmidt, the former Chief Technology Officer of Sun Microsystems and former CEO of Novell, joined Google as CEO. Page mentioned in a 2000 interview, "Age is a real issue and a handicap in the sense of managing people... more so than it should be."⁹⁵ Schmidt clarified that his role was to

⁸⁷ Search Engine Market Share Worldwide. Statcounter Global Stats. <https://gs.statcounter.com/search-engine-market-share#yearly-2009-2024>

⁸⁸ Larry Page and Sergey Brin interview on Starting Google (2000). <https://www.youtube.com/watch?v=tldZ3lhsXEE>

⁸⁹ All Eyes on Google. Forbes. <https://www.forbes.com/forbes/2003/0526/100.html>

⁹⁰ Larry Page & Sergey Brin - Billionaire Documentary- Google, YouTube, Alphabet, Innovation. <https://www.youtube.com/watch?v=8J7TRSLf55U>

⁹¹ Larry Page and Sergey Brin interview on Starting Google (2000). <https://www.youtube.com/watch?v=tldZ3lhsXEE>

⁹² Case Study: Google Inc. MH0029. McGraw Hill Education.

⁹³ Larry Page and Sergey Brin interview on Starting Google (2000). <https://www.youtube.com/watch?v=tldZ3lhsXEE>

⁹⁴ All Eyes on Google. Forbes. <https://www.forbes.com/forbes/2003/0526/100.html>

⁹⁵ Larry Page and Sergey Brin interview on Starting Google (2000). <https://www.youtube.com/watch?v=tldZ3lhsXEE>

bring order and focus to the business model, not to replace the founders, allowing them to continue focusing on technology and product development.⁹⁶

In August 2004, six years after its founding, Google went IPO on the Nasdaq. By the time of its IPO, Google had already become the world's largest online index of websites, providing its search services free to anyone with an internet connection.⁹⁷ Google claimed to serve its users by creating products that enabled people to more efficiently find, create, and organize information, potentially improving their lives.⁹⁸ As the internet grew in popularity, search engines became vital for people seeking information on a wide range of topics, from medical conditions and purchase decisions to technical issues and reconnecting with long-lost friends.

Figure 2-1: Google Website 1998⁹⁹

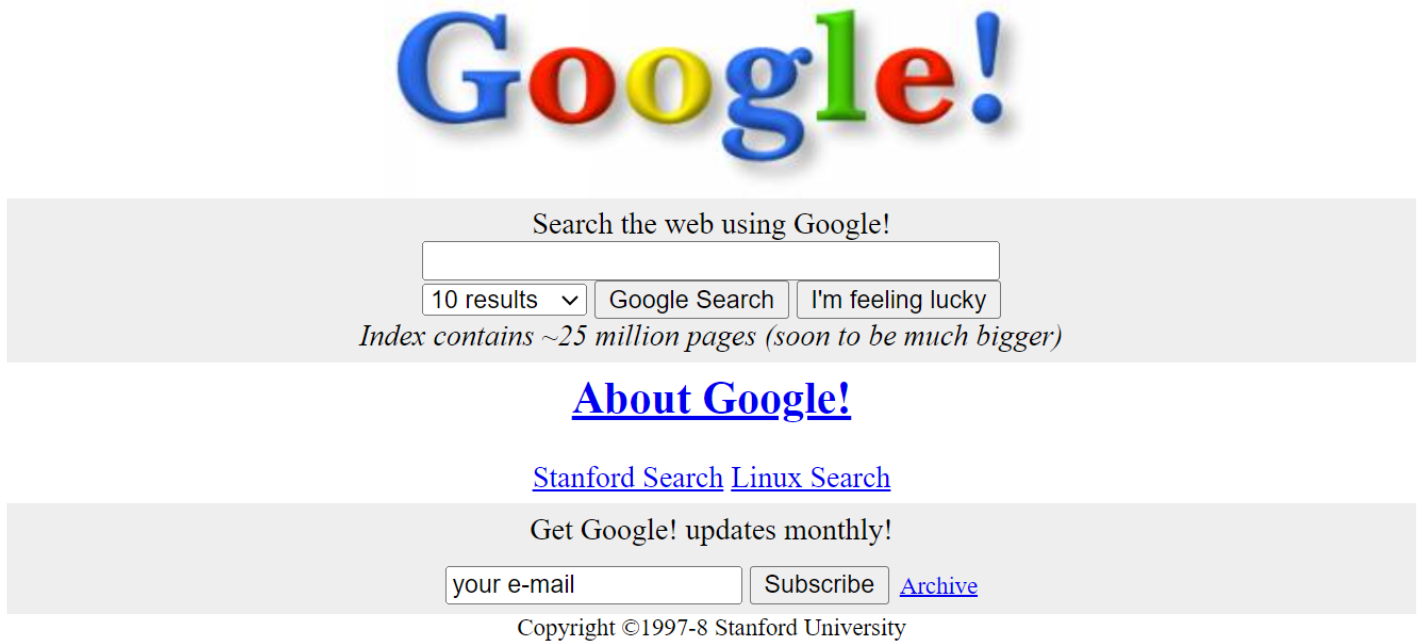
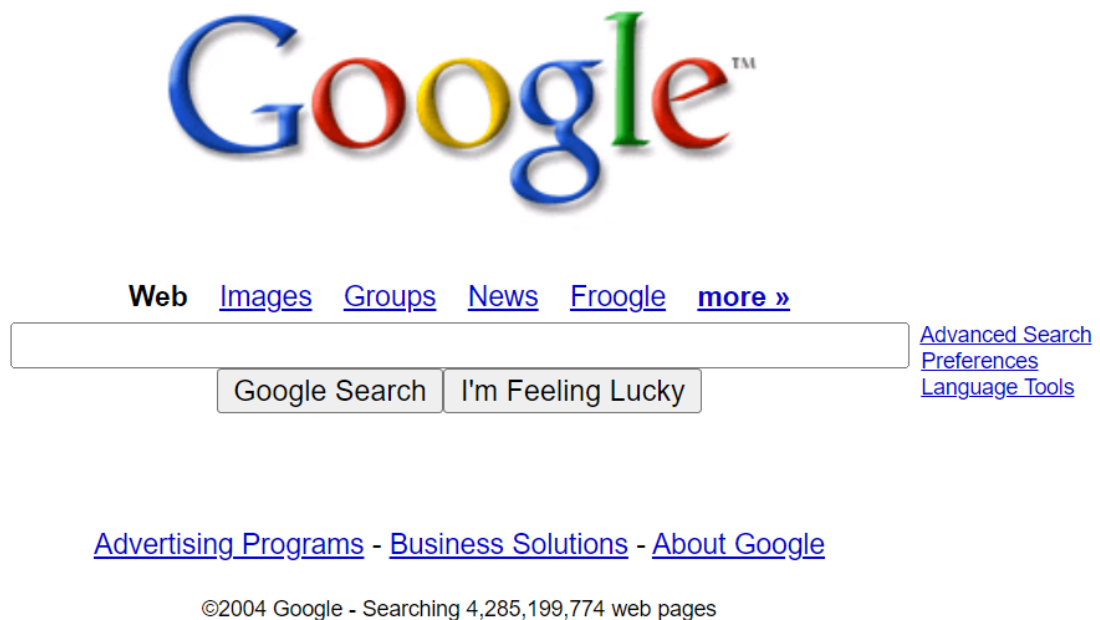


Figure 2-2: Google Website 2004¹⁰⁰



⁹⁶ All Eyes on Google. Forbes. <https://www.forbes.com/forbes/2003/0526/100.html>

⁹⁷ Google Prospectus 2004.

⁹⁸ Google Prospectus 2004.

⁹⁹ Google Website 1998. <https://web.archive.org/web/19981111183552/http://google.stanford.edu/>

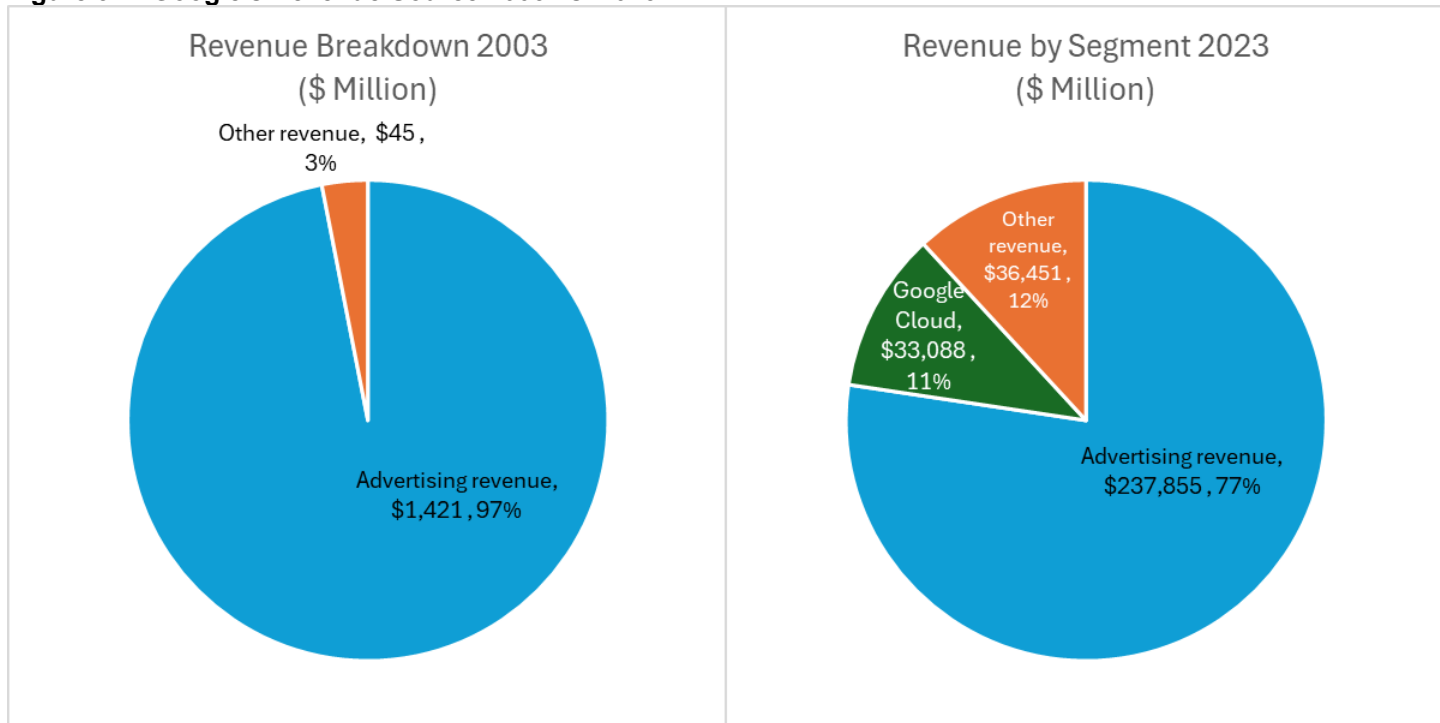
¹⁰⁰ Google Website 2004. <https://web.archive.org/web/20040805012113/http://www.google.com/>

Communication was also evolving rapidly with the internet becoming a popular tool for connecting with others. At the time of Google's IPO, its email service, Gmail, offered each user a gigabyte of free storage,¹⁰¹ along with email search capabilities and relevant advertising based on users' emails. Google also offered, and still offers, a variety of other free search services to users, including Froogle (later Google Shopping), Google Images, and Google News.

The majority of Google's revenue then and now has come from delivering relevant, search-based advertisements, both on its own websites and on third-party sites that formed the Google Network. As Figures 3-1 and 3-2 show, just before Google's IPO, nearly 97% of its revenue was generated from advertising, with 71% of that coming from the U.S. By 2023, although advertising still contributed 77% of Google's revenue, only 47% came from the U.S., reflecting the company's expanding global reach and increasing diversified business portfolio.

Google has often embraced high-risk, high-reward projects, whether related to its current business or entirely new opportunities, even if such ventures could take years to realize profits. The company considers pursuing such projects as key to its long-term success. In their IPO letter, the founders stated that Google would fund projects with even a 10% chance of earning a billion dollars return over the long term.¹⁰²

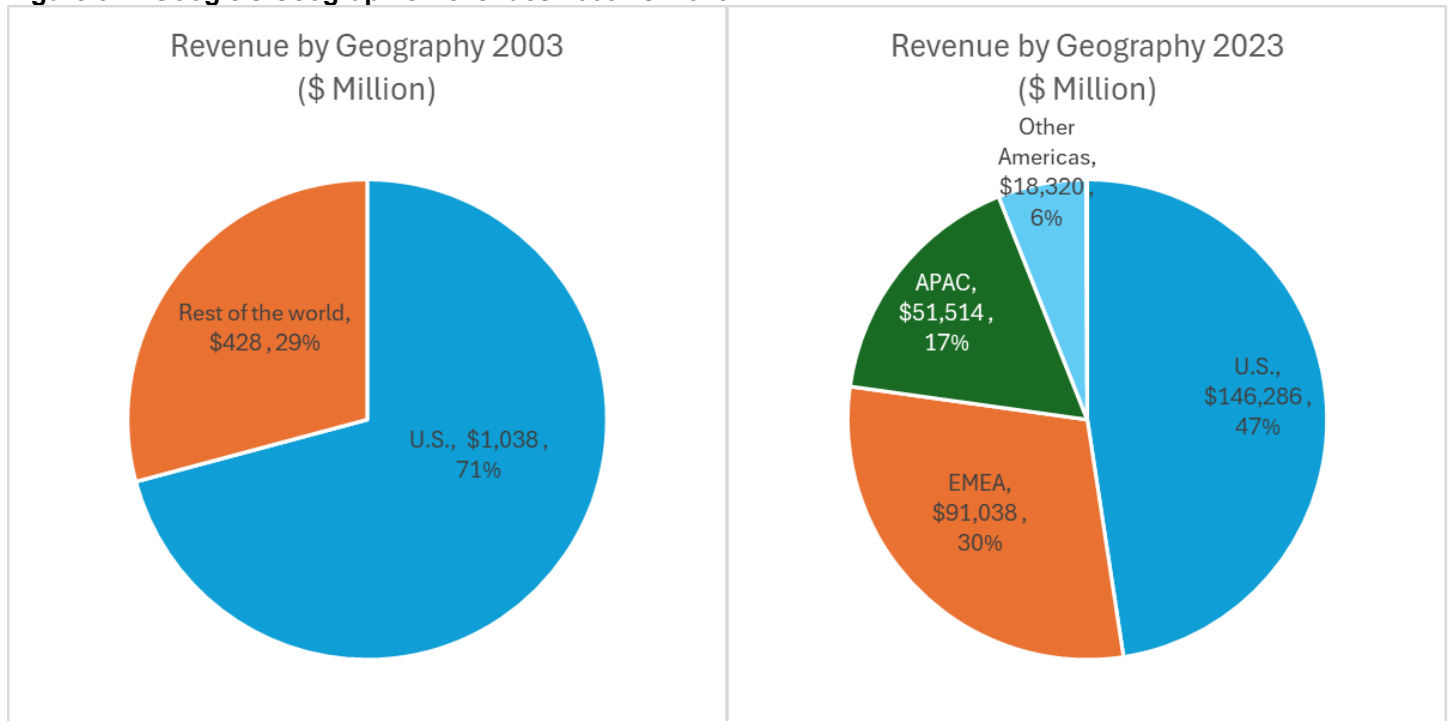
Figure 3-1: Google's Revenue Source 2003 vs. 2023



¹⁰¹ Google Prospectus 2004.

¹⁰² Founders' IPO Letter – "An Owner's Manual" for Google's Shareholders.

Figure 3-2: Google's Geographic Revenues 2003 vs. 2023



Since its IPO, Google's revenue has grown from less than \$1.5 billion in 2003 to \$307 billion by 2023, a CAGR of 31% over two decades, primarily driven by its advertising revenue.

Figure 4: Alphabet Revenue 1999 – 2023

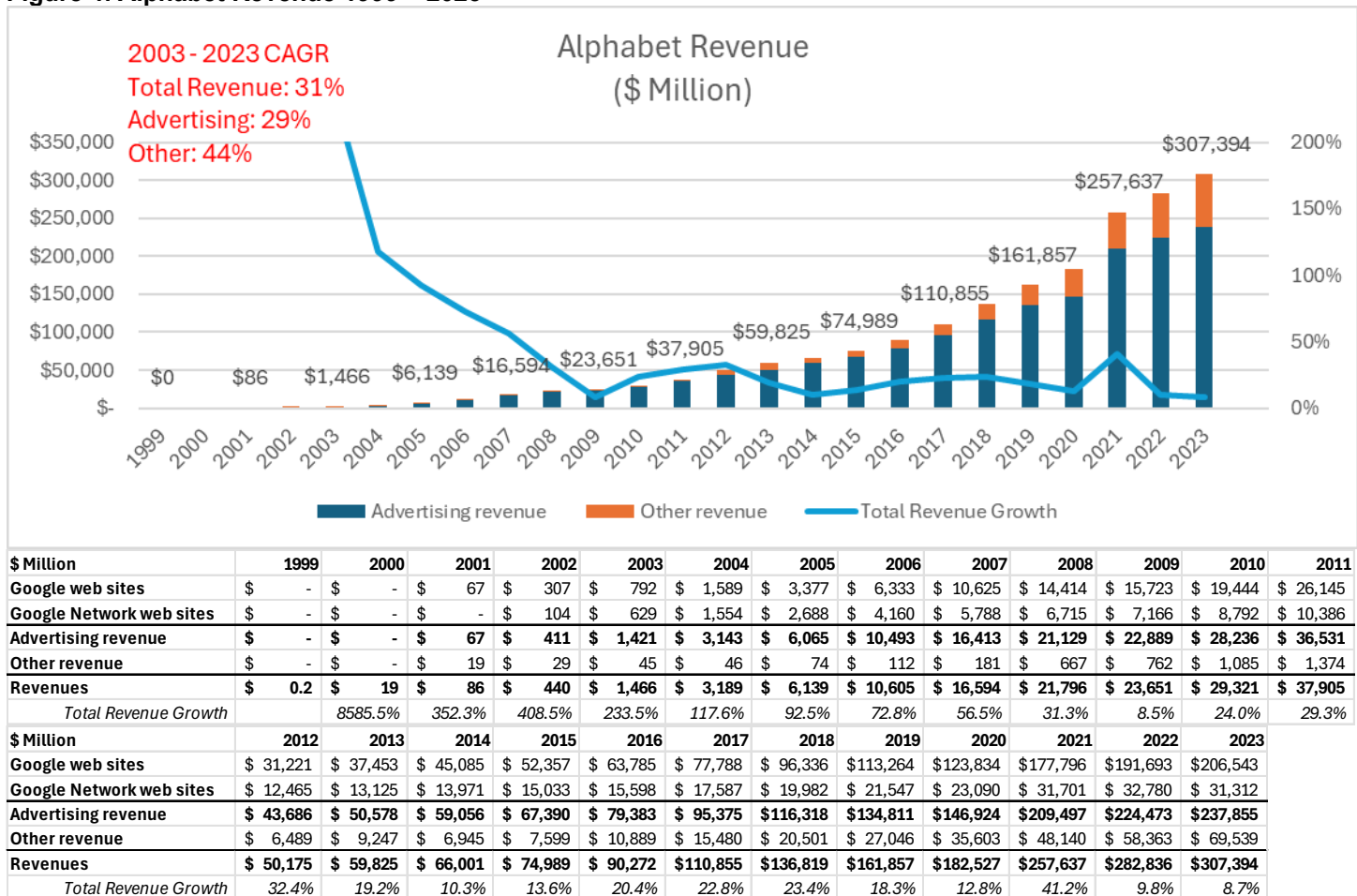


Figure 5-1: Income Statements 2001 – 2023

\$ Million	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Advertising revenue	\$ 67	\$ 411	\$ 1,421	\$ 3,143	\$ 6,065	\$ 10,493	\$ 16,413	\$ 21,129	\$ 22,889	\$ 28,236	\$ 36,531	\$ 43,686	
Other revenue	\$ 19	\$ 29	\$ 45	\$ 46	\$ 74	\$ 112	\$ 181	\$ 667	\$ 762	\$ 1,085	\$ 1,374	\$ 6,489	
Total revenue	\$ 86	\$ 440	\$ 1,466	\$ 3,189	\$ 6,139	\$ 10,605	\$ 16,594	\$ 21,796	\$ 23,651	\$ 29,321	\$ 37,905	\$ 50,175	
YoY Growth	352.3%	408.5%	233.5%	117.6%	92.5%	72.8%	56.5%	31.3%	8.5%	24.0%	29.3%	32.4%	
Gross profit	\$ 71	\$ 307	\$ 832	\$ 1,720	\$ 3,561	\$ 6,380	\$ 9,945	\$ 13,174	\$ 14,806	\$ 18,904	\$ 24,717	\$ 29,541	
Gross Margin	82.5%	69.8%	56.7%	53.9%	58.0%	60.2%	59.9%	60.4%	62.6%	64.5%	65.2%	58.9%	
YoY Growth	454.6%	330.3%	170.9%	106.9%	107.0%	79.1%	55.9%	32.5%	12.4%	27.7%	30.8%	19.5%	
Research and development	\$ 21	\$ 40	\$ 230	\$ 395	\$ 600	\$ 1,229	\$ 2,120	\$ 2,793	\$ 2,843	\$ 3,762	\$ 5,162	\$ 6,793	
R&D expenses as % of Sales	24.2%	9.2%	15.7%	12.4%	9.8%	11.6%	12.8%	12.8%	12.0%	12.8%	13.6%	13.5%	
Sales and marketing	\$ 22	\$ 49	\$ 165	\$ 296	\$ 468	\$ 850	\$ 1,461	\$ 1,946	\$ 1,984	\$ 2,799	\$ 4,589	\$ 6,143	
Sales and marketing expenses as % of Sales	25.2%	11.1%	11.3%	9.3%	7.6%	8.0%	8.8%	8.9%	8.4%	9.5%	12.1%	12.2%	
General and administration	\$ 18	\$ 31	\$ 95	\$ 188	\$ 387	\$ 752	\$ 1,279	\$ 1,803	\$ 1,667	\$ 1,962	\$ 2,724	\$ 3,845	
G&A expenses as % of Sales	20.5%	7.1%	6.4%	5.9%	6.3%	7.1%	7.7%	8.3%	7.0%	6.7%	7.2%	7.7%	
Other expenses	\$ -	\$ -	\$ -	\$ 201	\$ 90	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 500	\$ -
EBIT	\$ 11	\$ 186	\$ 342	\$ 640	\$ 2,017	\$ 3,550	\$ 5,084	\$ 6,632	\$ 8,312	\$ 10,381	\$ 11,742	\$ 12,760	
EBIT Margin	12.7%	42.4%	23.4%	20.1%	32.9%	33.5%	30.6%	30.4%	35.1%	35.4%	31.0%	25.4%	
YoY Growth	N/A	1600.7%	83.7%	86.9%	215.1%	76.0%	43.2%	30.4%	25.3%	24.9%	13.1%	8.7%	
EBT	\$ 10	\$ 185	\$ 347	\$ 650	\$ 2,142	\$ 4,011	\$ 5,674	\$ 5,854	\$ 8,381	\$ 10,796	\$ 12,326	\$ 13,386	
EBT Margin	11.6%	42.1%	23.6%	20.4%	34.9%	37.8%	34.2%	26.9%	35.4%	36.8%	32.5%	26.7%	
YoY Growth	N/A	1736.7%	87.5%	87.6%	229.4%	87.3%	41.5%	3.2%	43.2%	28.8%	14.2%	8.6%	
Tax	\$ 3	\$ 85	\$ 241	\$ 251	\$ 676	\$ 934	\$ 1,470	\$ 1,627	\$ 1,861	\$ 2,291	\$ 2,589	\$ 2,598	
Effective Tax Rate	30.6%	46.1%	69.5%	38.6%	31.6%	23.3%	25.9%	27.8%	22.2%	21.2%	21.0%	19.4%	
Net income	\$ 7	\$ 100	\$ 106	\$ 399	\$ 1,465	\$ 3,077	\$ 4,204	\$ 4,227	\$ 6,520	\$ 8,505	\$ 9,737	\$ 10,788	
Net income as percentage of Sales	8.1%	22.7%	7.2%	12.5%	23.9%	29.0%	25.3%	19.4%	27.6%	29.0%	25.7%	21.5%	
YoY Growth		1326.7%	6.0%	277.8%	267.1%	110.0%	36.6%	0.6%	54.3%	30.4%	14.5%	10.8%	
Net income from continuing operation	\$ 7	\$ 100	\$ 106	\$ 399	\$ 1,465	\$ 3,077	\$ 4,204	\$ 4,227	\$ 6,520	\$ 8,505	\$ 9,737	\$ 10,737	
Net Margin	8.1%	22.7%	7.2%	12.5%	23.9%	29.0%	25.3%	19.4%	27.6%	29.0%	25.7%	21.4%	
YoY Growth		1326.7%	6.0%	277.8%	267.1%	110.0%	36.6%	0.6%	54.3%	30.4%	14.5%	10.3%	
Forward Split Adjusted P/E				58.2x	16.9x	8.6x	6.4x	6.4x	4.2x	3.2x	2.9x	2.6x	
Split Adjusted IPO Price				\$ 85.00									
\$ Million	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023		
Advertising revenue	\$ 50,578	\$ 59,056	\$ 67,390	\$ 79,383	\$ 95,375	\$ 116,318	\$ 134,811	\$ 168,635	\$ 237,529	\$ 253,528	\$ 237,855		
Other revenue	\$ 9,247	\$ 6,945	\$ 7,599	\$ 10,889	\$ 15,480	\$ 20,501	\$ 27,046	\$ 13,892	\$ 20,108	\$ 29,308	\$ 69,539		
Total revenue	\$ 59,825	\$ 66,001	\$ 74,989	\$ 90,272	\$ 110,855	\$ 136,819	\$ 161,857	\$ 182,527	\$ 257,637	\$ 282,836	\$ 307,394		
YoY Growth	19.2%	10.3%	13.6%	20.4%	22.8%	23.4%	18.3%	12.8%	41.2%	9.8%	8.7%		
Gross profit	\$ 33,967	\$ 40,310	\$ 46,825	\$ 55,134	\$ 65,272	\$ 77,270	\$ 89,961	\$ 97,795	\$ 146,698	\$ 156,633	\$ 174,062		
Gross Margin	56.8%	61.1%	62.4%	61.1%	58.9%	56.5%	55.6%	53.6%	56.9%	55.4%	56.6%		
YoY Growth	15.0%	18.7%	16.2%	17.7%	18.4%	18.4%	16.4%	8.7%	50.0%	6.8%	11.1%		
Research and development	\$ 7,952	\$ 9,832	\$ 12,282	\$ 13,948	\$ 16,625	\$ 21,419	\$ 26,018	\$ 27,573	\$ 31,562	\$ 39,500	\$ 45,427		
R&D expenses as % of Sales	13.3%	14.9%	16.4%	15.5%	15.0%	15.7%	16.1%	15.1%	12.3%	14.0%	14.8%		
Sales and marketing	\$ 7,253	\$ 8,131	\$ 9,047	\$ 10,485	\$ 12,893	\$ 16,333	\$ 18,464	\$ 17,946	\$ 22,912	\$ 26,567	\$ 27,917		
Sales and marketing expenses as % of Sales	12.1%	12.3%	12.1%	11.6%	11.6%	11.9%	11.4%	9.8%	8.9%	9.4%	9.1%		
General and administration	\$ 4,796	\$ 5,851	\$ 6,136	\$ 6,985	\$ 6,872	\$ 8,126	\$ 9,551	\$ 11,052	\$ 13,510	\$ 15,724	\$ 16,425		
G&A expenses as % of Sales	8.0%	8.9%	8.2%	7.7%	6.2%	5.9%	5.9%	6.1%	5.2%	5.6%	5.3%		
Other expenses	\$ -	\$ -	\$ -	\$ -	\$ 2,736	\$ 5,071	\$ 1,697	\$ -	\$ -	\$ -	\$ -		
EBIT	\$ 13,966	\$ 16,496	\$ 19,360	\$ 23,716	\$ 26,146	\$ 26,321	\$ 34,231	\$ 41,224	\$ 78,714	\$ 74,842	\$ 84,293		
EBIT Margin	23.3%	25.0%	25.8%	26.3%	23.6%	19.2%	21.1%	22.6%	30.6%	26.5%	27.4%		
YoY Growth	9.5%	18.1%	17.4%	22.5%	10.2%	0.7%	30.1%	20.4%	90.9%	-4.9%	12.6%		
EBT	\$ 14,496	\$ 17,259	\$ 19,651	\$ 24,150	\$ 27,193	\$ 34,913	\$ 39,625	\$ 48,082	\$ 90,734	\$ 71,328	\$ 85,717		
EBT Margin	24.2%	26.1%	26.2%	26.8%	24.5%	25.5%	24.5%	26.3%	35.2%	25.2%	27.9%		
YoY Growth	8.3%	19.1%	13.9%	22.9%	12.6%	28.4%	13.5%	21.3%	88.7%	-21.4%	20.2%		
Tax	\$ 2,282	\$ 3,331	\$ 3,303	\$ 4,672	\$ 14,531	\$ 4,177	\$ 5,282	\$ 7,813	\$ 14,701	\$ 11,356	\$ 11,922		
Effective Tax Rate	15.7%	19.3%	16.8%	19.3%	53.4%	12.0%	13.3%	16.2%	16.2%	15.9%	13.9%		
Net income	\$ 12,214	\$ 13,928	\$ 16,348	\$ 19,478	\$ 12,662	\$ 30,736	\$ 34,343	\$ 40,269	\$ 76,033	\$ 59,972	\$ 73,795		
Net income as percentage of Sales	20.4%	21.1%	21.8%	21.6%	11.4%	22.5%	21.2%	22.1%	29.5%	21.2%	24.0%		
YoY Growth	13.2%	14.0%	17.4%	19.1%	-35.0%	142.7%	11.7%	17.3%	88.8%	-21.1%	23.0%		
Net income from continuing operation	\$ 12,920	\$ 14,444	\$ 15,826	\$ 19,478	\$ 12,662	\$ 30,736	\$ 34,343	\$ 40,269	\$ 76,033	\$ 59,972	\$ 73,795		
Net Margin	21.6%	21.9%	21.1%	21.6%	11.4%	22.5%	21.2%	22.1%	29.5%	21.2%	24.0%		
YoY Growth	20.3%	11.8%	9.6%	23.1%	-35.0%	142.7%	11.7%	17.3%	88.8%	-21.1%	23.0%		
Forward Split Adjusted P/E	2.2x	2.0x	1.9x	1.5x	2.4x	1.0x	0.9x	0.7x	0.4x	0.5x	0.4x		

Note:

1. Google has had two stock-splits since IPO. In 2014, there was a 2-for-1 stock-split in the form of a stock dividend. In 2022, there was a 20-for-1 stock split in the form of a one-time special dividend.

Figure 5-2: Balance Sheet 2002 – 2023

\$ Million	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Cash and cash equivalents	\$ 58	\$ 149	\$ 427	\$ 3,877	\$ 3,545	\$ 6,082	\$ 8,657	\$ 10,198	\$ 13,630	\$ 9,983	\$ 14,778
Shot-term investments	\$ 89	\$ 186	\$ 1,705	\$ 4,157	\$ 7,699	\$ 8,137	\$ 7,189	\$ 14,287	\$ 21,345	\$ 34,643	\$ 33,310
Accounts receivable	\$ 62	\$ 155	\$ 312	\$ 688	\$ 1,322	\$ 2,163	\$ 2,642	\$ 3,178	\$ 4,252	\$ 5,427	\$ 7,885
Income taxes receivable	\$ -	\$ -	\$ 71	\$ -	\$ -	\$ 145	\$ -	\$ 23	\$ -	\$ -	\$ -
Inventories	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 35	\$ 505
Receivable under reverse repurchase agreements	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 750	\$ 745	\$ 700
Deferred income taxes	\$ 13	\$ 22	\$ 19	\$ 49	\$ 30	\$ 69	\$ 286	\$ 644	\$ 259	\$ 215	\$ 1,144
Other current assets	\$ 11	\$ 49	\$ 159	\$ 230	\$ 444	\$ 694	\$ 1,404	\$ 836	\$ 1,326	\$ 1,710	\$ 2,132
Total current assets	\$ 232	\$ 560	\$ 2,693	\$ 9,001	\$ 13,040	\$ 17,289	\$ 20,178	\$ 29,167	\$ 41,562	\$ 52,758	\$ 60,454
Non-marketable equity securities				\$ 14	\$ 1,032	\$ 1,060	\$ 85	\$ 129	\$ 523	\$ 790	\$ 1,469
Deferred income taxes, non-current	\$ -	\$ -	\$ 12	\$ -	\$ -	\$ 33	\$ -	\$ 263	\$ 265	\$ -	\$ -
Property and equipment	\$ 54	\$ 188	\$ 379	\$ 962	\$ 2,395	\$ 4,039	\$ 5,234	\$ 4,845	\$ 7,759	\$ 9,603	\$ 11,854
Operating lease assets	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Intangible assets	\$ 0	\$ 18	\$ 71	\$ 83	\$ 347	\$ 447	\$ 997	\$ 775	\$ 1,044	\$ 1,578	\$ 7,473
Goodwill	\$ -	\$ 87	\$ 123	\$ 195	\$ 1,545	\$ 2,299	\$ 4,840	\$ 4,903	\$ 6,256	\$ 7,346	\$ 10,537
Other non-current assets	\$ 1	\$ 17	\$ 35	\$ 17	\$ 114	\$ 169	\$ 434	\$ 416	\$ 442	\$ 499	\$ 2,011
Total assets	\$ 287	\$ 871	\$ 3,313	\$ 10,272	\$ 18,473	\$ 25,336	\$ 31,768	\$ 40,497	\$ 57,851	\$ 72,574	\$ 93,798
Accounts payable	\$ 9	\$ 46	\$ 33	\$ 116	\$ 211	\$ 282	\$ 178	\$ 216	\$ 483	\$ 588	\$ 2,012
Short-term debt	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,826	\$ 3,225	\$ 4,222
Accrued compensation and benefits	\$ 15	\$ 34	\$ 83	\$ 199	\$ 352	\$ 588	\$ 812	\$ 982	\$ 1,410	\$ 1,818	\$ 2,239
Accrued revenue share	\$ 13	\$ 89	\$ 123	\$ 216	\$ 370	\$ 522	\$ 533	\$ 694	\$ 885	\$ 1,168	\$ 1,471
Deferred revenue	\$ 11	\$ 15	\$ 37	\$ 73	\$ 105	\$ 178	\$ 218	\$ 285	\$ 394	\$ 547	\$ 895
Income taxes payable	\$ 26	\$ 21	\$ -	\$ 28	\$ 0	\$ -	\$ 82	\$ -	\$ 37	\$ 197	\$ 240
Accrued expenses and other current liabilities	\$ 15	\$ 31	\$ 66	\$ 114	\$ 266	\$ 465	\$ 480	\$ 570	\$ 961	\$ 1,370	\$ 3,258
Total current liabilities	\$ 89	\$ 235	\$ 340	\$ 745	\$ 1,305	\$ 2,036	\$ 2,302	\$ 2,747	\$ 9,996	\$ 8,913	\$ 14,337
Long-term debt	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,986	\$ 2,988
Deferred revenue, long-term	\$ 2	\$ 5	\$ 7	\$ 10	\$ 20	\$ 30	\$ 30	\$ 42	\$ 35	\$ 44	\$ 100
Income taxes payable, non-current	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 478	\$ 890	\$ 1,392	\$ 1,200	\$ 1,693	\$ 2,046
Deferred income taxes, non-current	\$ 1	\$ 19	\$ -	\$ 35	\$ 40	\$ -	\$ 13	\$ -	\$ -	\$ 287	\$ 1,872
Operating lease liabilities	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other long-term liabilities	\$ 21	\$ 24	\$ 36	\$ 62	\$ 68	\$ 102	\$ 294	\$ 311	\$ 379	\$ 506	\$ 740
Total liabilities	\$ 113	\$ 283	\$ 384	\$ 853	\$ 1,434	\$ 2,646	\$ 3,529	\$ 4,493	\$ 11,610	\$ 14,429	\$ 22,083
Total stockholders' equity	\$ 174	\$ 589	\$ 2,929	\$ 9,419	\$ 17,040	\$ 22,690	\$ 28,239	\$ 36,004	\$ 46,241	\$ 58,145	\$ 71,715
Total liabilities and stockholders' equity	\$ 287	\$ 871	\$ 3,313	\$ 10,272	\$ 18,473	\$ 25,336	\$ 31,768	\$ 40,497	\$ 57,851	\$ 72,574	\$ 93,798
\$ Million	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Cash and cash equivalents	\$ 18,898	\$ 18,347	\$ 16,549	\$ 12,918	\$ 10,715	\$ 16,701	\$ 18,498	\$ 26,465	\$ 20,945	\$ 21,879	\$ 24,048
Shot-term investments	\$ 39,819	\$ 46,048	\$ 56,517	\$ 73,415	\$ 91,156	\$ 92,439	\$ 101,177	\$ 110,229	\$ 118,704	\$ 91,883	\$ 86,868
Accounts receivable	\$ 8,882	\$ 9,383	\$ 11,556	\$ 14,137	\$ 18,336	\$ 20,838	\$ 25,326	\$ 30,930	\$ 39,304	\$ 40,258	\$ 47,964
Income taxes receivable	\$ 408	\$ 1,298	\$ 1,903	\$ 95	\$ 369	\$ 355	\$ 2,166	\$ 454	\$ 966	\$ -	\$ -
Inventories	\$ 426	\$ -	\$ 491	\$ 268	\$ 749	\$ 1,107	\$ 999	\$ 728	\$ 1,170	\$ 2,670	\$ -
Receivable under reverse repurchase agreements	\$ 100	\$ 875	\$ 450	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Deferred income taxes	\$ 1,526	\$ 1,322	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other current assets	\$ 2,827	\$ 3,412	\$ 2,648	\$ 4,575	\$ 2,983	\$ 4,236	\$ 4,412	\$ 5,490	\$ 7,054	\$ 8,105	\$ 12,650
Total current assets	\$ 72,886	\$ 80,685	\$ 90,114	\$ 105,408	\$ 124,308	\$ 135,676	\$ 152,578	\$ 174,296	\$ 188,143	\$ 164,795	\$ 171,530
Non-marketable equity securities	\$ 1,976	\$ 3,079	\$ 5,183	\$ 5,878	\$ 7,813	\$ 13,859	\$ 13,078	\$ 20,703	\$ 29,549	\$ 30,492	\$ 31,008
Deferred income taxes, non-current	\$ -	\$ -	\$ 251	\$ 383	\$ 680	\$ 737	\$ 721	\$ 1,084	\$ 1,284	\$ 5,261	\$ 12,169
Property and equipment	\$ 16,524	\$ 23,883	\$ 29,016	\$ 34,234	\$ 42,383	\$ 59,719	\$ 73,646	\$ 84,749	\$ 97,599	\$ 112,668	\$ 134,345
Operating lease assets	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 10,941	\$ 12,211	\$ 12,959	\$ 14,381	\$ 14,091
Intangible assets	\$ 6,066	\$ 4,607	\$ 3,847	\$ 3,307	\$ 2,692	\$ 2,220	\$ 1,979	\$ 1,445	\$ 1,417	\$ 2,084	\$ -
Goodwill	\$ 11,492	\$ 15,599	\$ 15,869	\$ 16,468	\$ 16,747	\$ 17,888	\$ 20,624	\$ 21,175	\$ 22,956	\$ 28,960	\$ 29,198
Other non-current assets	\$ 1,976	\$ 3,280	\$ 3,181	\$ 1,819	\$ 2,672	\$ 2,693	\$ 2,342	\$ 3,953	\$ 5,361	\$ 6,623	\$ 10,051
Total assets	\$ 110,920	\$ 131,133	\$ 147,461	\$ 167,497	\$ 197,295	\$ 232,792	\$ 275,909	\$ 319,616	\$ 359,268	\$ 365,264	\$ 402,392
Accounts payable	\$ 2,453	\$ 1,715	\$ 1,931	\$ 2,041	\$ 3,137	\$ 4,378	\$ 5,561	\$ 5,589	\$ 6,037	\$ 5,128	\$ 7,493
Short-term debt	\$ 4,383	\$ 4,787	\$ 5,653	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Accrued compensation and benefits	\$ 2,502	\$ 3,069	\$ 3,539	\$ 3,976	\$ 4,581	\$ 6,839	\$ 8,495	\$ 11,086	\$ 13,889	\$ 14,028	\$ 15,140
Accrued revenue share	\$ 1,729	\$ 1,952	\$ 2,329	\$ 2,942	\$ 3,975	\$ 4,592	\$ 5,916	\$ 7,500	\$ 8,996	\$ 8,370	\$ 8,876
Deferred revenue	\$ 1,062	\$ 752	\$ 788	\$ 1,099	\$ 1,432	\$ 1,784	\$ 1,908	\$ 2,543	\$ 3,288	\$ 3,908	\$ 4,137
Income taxes payable	\$ 24	\$ 96	\$ 302	\$ 554	\$ 881	\$ 69	\$ 274	\$ 1,485	\$ 808	\$ -	\$ -
Accrued expenses and other current liabilities	\$ 3,755	\$ 4,434	\$ 4,768	\$ 6,144	\$ 10,177	\$ 16,958	\$ 23,067	\$ 28,631	\$ 31,236	\$ 37,866	\$ 46,168
Total current liabilities	\$ 15,908	\$ 16,805	\$ 19,310	\$ 16,756	\$ 24,183	\$ 34,620	\$ 45,221	\$ 56,834	\$ 64,254	\$ 69,300	\$ 81,814
Long-term debt	\$ 2,236	\$ 3,228	\$ 1,995	\$ 3,935	\$ 3,969	\$ 4,012	\$ 4,554	\$ 13,932	\$ 14,817	\$ 14,701	\$ 13,253
Deferred revenue, long-term	\$ 139	\$ 104	\$ 151	\$ 202	\$ 340	\$ 396	\$ 358	\$ 481	\$ 535	\$ 599	\$ 911
Income taxes payable, non-current	\$ 2,638	\$ 3,407	\$ 3,663	\$ 4,677	\$ 12,812	\$ 11,327	\$ 9,885	\$ 8,849	\$ 9,176	\$ 9,258	\$ 8,474
Deferred income taxes, non-current	\$ 1,947	\$ 1,971	\$ 189	\$ 226	\$ 430	\$ 1,264	\$ 1,701	\$ 3,561	\$ 5,257	\$ 514	\$ 485
Operating lease liabilities	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 10,214	\$ 11,146	\$ 11,389	\$ 12,501	\$ 12,460
Other long-term liabilities	\$ 743	\$ 1,118	\$ 1,822	\$ 2,665	\$ 3,059	\$ 3,545	\$ 2,534	\$ 2,269	\$ 2,205	\$ 2,247	\$ 1,616
Total liabilities	\$ 23,611	\$ 26,633	\$ 27,130	\$ 28,461	\$ 44,793	\$ 55,164	\$ 74,467	\$ 97,072	\$ 107,633	\$ 109,120	\$ 119,013
Total stockholders' equity	\$ 87,309	\$ 104,500	\$ 120,331	\$ 139,036	\$ 152,502	\$ 177,628	\$ 201,442	\$ 222,544	\$ 251,635	\$ 256,144	\$ 283,379
Total liabilities and stockholders' equity	\$ 110,920	\$ 131,133	\$ 147,461	\$ 167,497	\$ 197,295	\$ 232,792	\$ 275,909	\$ 319,616	\$ 359,268	\$ 365,264	\$ 402,392

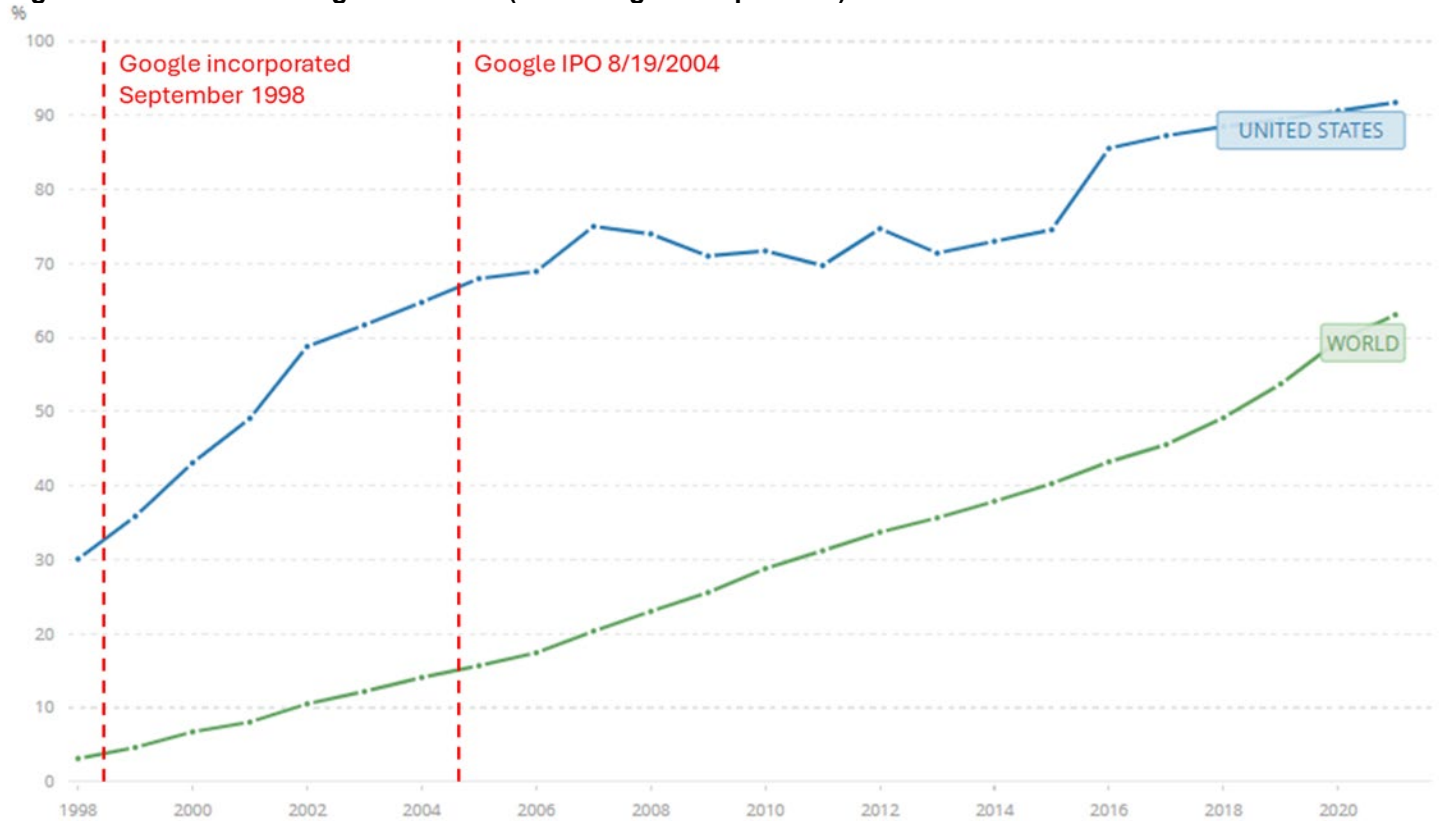
Figure 5-3: Cash Flow Statement 2002 – 2023

\$ Million	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Net income	\$ 100	\$ 106	\$ 399	\$ 1,465	\$ 3,077	\$ 4,204	\$ 4,227	\$ 6,520	\$ 8,505	\$ 9,737	\$ 10,737
Depreciation and amortization of property and equipment	\$ 18	\$ 44	\$ 129	\$ 257	\$ 494	\$ 808	\$ 1,212	\$ 1,240	\$ 1,067	\$ 1,396	\$ 1,988
Amortization of intangible and warrants	\$ 11	\$ 11	\$ 20	\$ 37	\$ 78	\$ 160	\$ 288	\$ 284	\$ 329	\$ 455	\$ 974
Stock-based compensation	\$ 22	\$ 229	\$ 279	\$ 201	\$ 458	\$ 869	\$ 1,120	\$ 1,164	\$ 1,376	\$ 1,974	\$ 2,692
Tax benefits from exercise of warrants and other	\$ -	\$ -	\$ 192	\$ 434	\$ (582)	\$ (379)	\$ (159)	\$ (90)	\$ (94)	\$ (86)	\$ (188)
Deferred income taxes						\$ (164)	\$ (225)	\$ (268)	\$ 9	\$ 343	\$ (266)
Other	\$ -	\$ 12	\$ 212	\$ 22	\$ 12	\$ (40)	\$ 1,063	\$ (20)	\$ (12)	\$ 116	\$ (216)
Changes in assets and liabilities, net of effects of acquisitions:											
Accounts receivable	\$ (44)	\$ (90)	\$ (157)	\$ (372)	\$ (624)	\$ (837)	\$ (334)	\$ (504)	\$ (1,129)	\$ (1,156)	\$ (787)
Income taxes, net	\$ 12	\$ (6)	\$ (125)	\$ 87	\$ 398	\$ 745	\$ 626	\$ 217	\$ 102	\$ 731	\$ 1,492
Inventories	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (30)	\$ 301
Prepaid revenue share, expenses and other assets	\$ (6)	\$ (59)	\$ (100)	\$ (52)	\$ (290)	\$ (299)	\$ (147)	\$ 262	\$ (414)	\$ (232)	\$ (833)
Accounts payable	\$ 6	\$ 37	\$ (14)	\$ 81	\$ 95	\$ 70	\$ (212)	\$ 34	\$ 272	\$ 101	\$ (499)
Accrued expenses and other liabilities	\$ 15	\$ 31	\$ 86	\$ 167	\$ 292	\$ 419	\$ 339	\$ 243	\$ 745	\$ 795	\$ 762
Accrued revenue share	\$ 13	\$ 75	\$ 34	\$ 93	\$ 139	\$ 150	\$ 14	\$ 158	\$ 214	\$ 259	\$ 299
Deferred revenue	\$ 9	\$ 7	\$ 22	\$ 40	\$ 31	\$ 70	\$ 41	\$ 76	\$ 111	\$ 162	\$ 163
Net cash provided by operating activities	\$ 155	\$ 395	\$ 977	\$ 2,459	\$ 3,580	\$ 5,775	\$ 7,853	\$ 9,316	\$ 11,081	\$ 14,565	\$ 16,619
Purchases of property and equipment	\$ (37)	\$ (177)	\$ (319)	\$ (838)	\$ (1,903)	\$ (2,403)	\$ (2,358)	\$ (810)	\$ (4,018)	\$ (3,438)	\$ (3,273)
Purchase of short-term investments	\$ (93)	\$ (317)	\$ (4,135)	\$ (12,676)	\$ (26,682)	\$ (15,997)	\$ (15,356)	\$ (29,139)	\$ (43,985)	\$ (61,672)	\$ (33,410)
Maturities and sales of short-term investments	\$ 20	\$ 219	\$ 2,611	\$ 10,257	\$ 23,107	\$ 15,659	\$ 15,763	\$ 22,103	\$ 37,099	\$ 48,746	\$ 35,180
Investment in non-marketable securities, net	\$ -	\$ -	\$ -	\$ -	\$ (1,019)	\$ (35)	\$ (47)	\$ (65)	\$ (320)	\$ (428)	\$ (696)
Acquisitions, net of cash acquired and purchases of intangible and other assets	\$ 0	\$ (40)	\$ (59)	\$ (101)	\$ (402)	\$ (907)	\$ (3,320)	\$ (108)	\$ (1,067)	\$ (1,900)	\$ (10,568)
Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (750)	\$ 5	\$ 45
Net cash used in investing activities	\$ (110)	\$ (314)	\$ (1,901)	\$ (3,358)	\$ (6,899)	\$ (3,682)	\$ (5,319)	\$ (8,019)	\$ (13,041)	\$ (18,687)	\$ (12,722)
Net payments related to stock-based award activities	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Repurchases of capital stock	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Proceeds from exercise of stock options, net	\$ 2	\$ 15	\$ 12	\$ 85	\$ 321	\$ 24	\$ (72)	\$ 143	\$ 294	\$ (5)	\$ (287)
Excess tax benefits from stock-based award activity	\$ -	\$ -	\$ -	\$ -	\$ 582	\$ 379	\$ 159	\$ 90	\$ 94	\$ 86	\$ 188
Proceeds from issuance of debt	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,246	\$ 10,905	\$ 16,109
Repayment of short-term debt	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (1,783)	\$ (10,179)	\$ (14,781)
Net proceeds from initial public offering	\$ -	\$ -	\$ 1,161	\$ 4,287	\$ 2,064	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ (8)	\$ (7)	\$ 22	\$ (1)	\$ -	\$ -	\$ -	\$ -	\$ (801)	\$ -	\$ -
Net cash provided by (used in) financing activities	\$ (5)	\$ 8	\$ 1,195	\$ 4,371	\$ 2,966	\$ 403	\$ 88	\$ 233	\$ 3,050	\$ 807	\$ 1,229
Effect of exchange rate changes on cash and cash equivalents	\$ -	\$ 2	\$ 8	\$ (22)	\$ 20	\$ 40	\$ (46)	\$ 11	\$ (19)	\$ 22	\$ 3
Net increase (decrease) in cash and cash equivalents	\$ 40	\$ 91	\$ 278	\$ 3,450	\$ (333)	\$ 2,537	\$ 2,575	\$ 1,541	\$ 1,071	\$ (3,293)	\$ 5,129
\$ Million	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Net income	\$ 12,920	\$ 14,444	\$ 16,348	\$ 19,478	\$ 12,662	\$ 30,736	\$ 34,343	\$ 40,269	\$ 76,033	\$ 59,972	\$ 73,795
Depreciation and amortization of property and equipment	\$ 2,781	\$ 3,523	\$ 4,132	\$ 5,267	\$ 6,103	\$ 8,164	\$ 10,856	\$ 12,905	\$ 11,555	\$ 15,287	\$ 11,946
Amortization of intangible and warrants	\$ 1,158	\$ 1,456	\$ 931	\$ 877	\$ 812	\$ 871	\$ 925	\$ 792	\$ 886	\$ 641	\$ -
Stock-based compensation	\$ 3,343	\$ 4,279	\$ 5,203	\$ 6,703	\$ 7,679	\$ 9,353	\$ 10,794	\$ 12,991	\$ 15,376	\$ 19,362	\$ 22,460
Tax benefits from exercise of warrants and other	\$ (481)	\$ (648)	\$ (548)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Deferred income taxes	\$ (437)	\$ (104)	\$ (179)	\$ (38)	\$ 258	\$ 778	\$ 173	\$ 1,390	\$ 1,808	\$ (8,081)	\$ (7,763)
Other	\$ (594)	\$ (938)	\$ 546	\$ 449	\$ 331	\$ (6,839)	\$ (3,390)	\$ (5,050)	\$ (12,483)	\$ 6,549	\$ 5,153
Changes in assets and liabilities, net of effects of acquisitions:											
Accounts receivable	\$ (1,307)	\$ (1,641)	\$ (2,094)	\$ (2,578)	\$ (3,768)	\$ (2,169)	\$ (4,340)	\$ (6,524)	\$ (9,095)	\$ (2,317)	\$ (7,833)
Income taxes, net	\$ 401	\$ 283	\$ (179)	\$ 3,125	\$ 8,211	\$ (2,251)	\$ (3,128)	\$ 1,209	\$ (625)	\$ 584	\$ 523
Inventories	\$ (234)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Prepaid revenue share, expenses and other assets	\$ (696)	\$ 459	\$ (318)	\$ 312	\$ (2,164)	\$ (1,207)	\$ (621)	\$ (1,330)	\$ (1,846)	\$ (5,046)	\$ (2,143)
Accounts payable	\$ 605	\$ 436	\$ 203	\$ 110	\$ 731	\$ 1,067	\$ 428	\$ 694	\$ 283	\$ 707	\$ 664
Accrued expenses and other liabilities	\$ 713	\$ 757	\$ 1,597	\$ 1,515	\$ 4,891	\$ 8,614	\$ 7,170	\$ 5,504	\$ 7,304	\$ 3,915	\$ 3,937
Accrued revenue share	\$ 254	\$ 245	\$ 339	\$ 593	\$ 955	\$ 483	\$ 1,273	\$ 1,639	\$ 1,682	\$ (445)	\$ 482
Deferred revenue	\$ 233	\$ (175)	\$ 43	\$ 223	\$ 390	\$ 371	\$ 37	\$ 635	\$ 774	\$ 367	\$ 525
Net cash provided by operating activities	\$ 18,659	\$ 22,376	\$ 26,024	\$ 36,036	\$ 37,091	\$ 47,971	\$ 54,520	\$ 65,124	\$ 91,652	\$ 91,495	\$ 101,746
Purchases of property and equipment	\$ (7,358)	\$ (10,959)	\$ (9,915)	\$ (9,972)	\$ (13,085)	\$ (25,041)	\$ (23,548)	\$ (22,281)	\$ (24,640)	\$ (31,485)	\$ (32,251)
Purchase of short-term investments	\$ (45,444)	\$ (56,310)	\$ (74,368)	\$ (84,509)	\$ (92,195)	\$ (50,158)	\$ (100,315)	\$ (136,576)	\$ (135,196)	\$ (78,874)	\$ (77,858)
Maturities and sales of short-term investments	\$ 38,314	\$ 51,315	\$ 62,905	\$ 66,895	\$ 73,959	\$ 48,507	\$ 97,825	\$ 132,906	\$ 128,294	\$ 97,822	\$ 86,672
Investment in non-marketable securities, net	\$ (569)	\$ (1,227)	\$ (2,172)	\$ (615)	\$ (1,212)	\$ (321)	\$ (1,527)	\$ (6,152)	\$ (1,904)	\$ (2,381)	\$ (2,080)
Acquisitions, net of cash acquired and purchases of intangible and other assets	\$ (1,448)	\$ (4,888)	\$ (236)	\$ (986)	\$ (287)	\$ (1,491)	\$ (2,515)	\$ (738)	\$ (2,618)	\$ (6,969)	\$ (495)
Other	\$ 3,125	\$ (389)	\$ 425	\$ 450	\$ 1,419	\$ -	\$ 589	\$ 68	\$ 541	\$ 1,589	\$ (1,051)
Net cash used in investing activities	\$ (13,380)	\$ (22,458)	\$ (23,361)	\$ (28,737)	\$ (31,401)	\$ (28,504)	\$ (29,491)	\$ (32,773)	\$ (35,523)	\$ (20,298)	\$ (27,063)
Net payments related to stock-based award activities	\$ -	\$ -	\$ -	\$ (3,304)	\$ (4,166)	\$ (4,993)	\$ (4,765)	\$ (5,720)	\$ (10,162)	\$ (9,300)	\$ (9,837)
Repurchases of capital stock	\$ -	\$ -	\$ -	\$ (3,693)	\$ (4,846)	\$ (9,075)	\$ (18,396)	\$ (31,149)	\$ (50,274)	\$ (59,296)	\$ (61,504)
Proceeds from exercise of stock options, net	\$ (781)	\$ (2,069)	\$ (1,612)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Excess tax benefits from stock-based award activity	\$ 481	\$ 648	\$ 548	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Proceeds from issuance of debt	\$ 10,768	\$ 11,625	\$ 13,705	\$ 8,729	\$ 4,291	\$ 6,766	\$ 317	\$ 11,761	\$ 20,199	\$ 52,872	\$ 10,790
Repayment of short-term debt	\$ (11,325)	\$ (11,643)	\$ (13,728)	\$ (10,064)	\$ (4,377)	\$ (6,827)	\$ (585)	\$ (2,100)	\$ (21,435)	\$ (54,068)	\$ (11,550)
Net proceeds from initial public offering	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ -	\$ -	\$ (2,590)	\$ -	\$ 800	\$ 950	\$ 220	\$ 2,800	\$ 310	\$ 35	\$ 8
Net cash provided by (used in) financing activities	\$ (857)	\$ (1,439)	\$ (3,677)	\$ (8,332)	\$ (8,298)	\$ (13,179)	\$ (23,209)	\$ (24,408)	\$ (61,362)	\$ (69,757)	\$ (72,093)
Effect of exchange rate changes on cash and cash equivalents	\$ (3)	\$ (433)	\$ (434)	\$ (170)	\$ 405	\$ (302)	\$ (23)	\$ 24	\$ (287)	\$ (506)	\$ (421)
Net increase (decrease) in cash and cash equivalents	\$ 4,419	\$ (1,954)	\$ (1,448)	\$ (1,203)	\$ (2,203)	\$ 5,986	\$ 1,797	\$ 7,967	\$ (5,520)	\$ 934	\$ 2,169

A. Large Total Addressable Market, Expanding Global Internet Users, and Satisfied Users

When Google was founded in 1998, the internet penetration among population was relatively low, both in the United States and globally. In 1998, only about 30% of the U.S. population and 3% of the world's population had access to the internet,¹⁰³ as shown in Figure 6. **By 2003, just before Google's IPO, internet usage had risen significantly, with 62% of the U.S. population and 12% of the global population online.** This rapid growth in internet adoption acted as a tailwind for many internet-based businesses, including Google, by providing a growing user base and increasing demand for online services such as search, email, web browsing, and advertising. Since 2020, over 90% of the U.S. population and more than 60% of the world's population now have access to the internet.

Figure 6: Individuals Using the Internet (Percentage of Population) 1998 - 2021¹⁰⁴



In 2003, a survey by OneStat, cited by eMarketer, revealed that Google was the dominant search engine on the internet, with a market share of 56.1% among the top search engines,^{105, 106} as illustrated in Figure 7. While this market share does not directly reflect the company's ability to monetize its services at that time, it indicates that Google had gained popularity among users and stood in a strong position in delivering relevant search results to users through its superior indexing capabilities. This dominance in search has been fundamental to Google's business model and underscores the potential to monetize its growing volume of search queries through search-based advertising, a topic which we will explore in the following sections.

¹⁰³ Individuals Using the Internet. World Bank. <https://data.worldbank.org/indicator/IT.NET.USER.ZS?end=2021&locations=US-1W&start=1998>

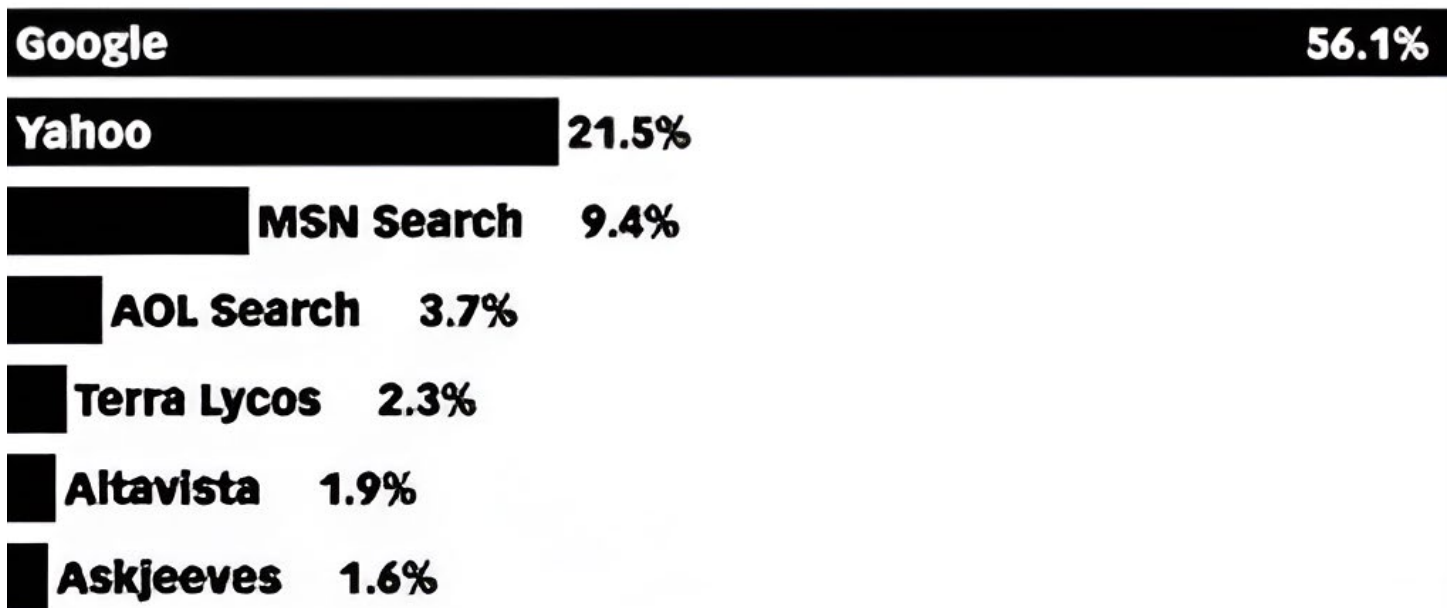
¹⁰⁴ Individuals Using the Internet. World Bank. <https://data.worldbank.org/indicator/IT.NET.USER.ZS?end=2021&locations=US-1W&start=1998>

¹⁰⁵ Yahoo and MSN Prove Competition for Google. Search Engine Journal. <https://www.searchenginejournal.com/yahoo-and-msn-prove-competition-for-google/297/>

¹⁰⁶ Measuring search engine market share consistently can be challenging. StatCounter, an online traffic volume tracker, indicates that Google has maintained a market share of over 90% since 2009, the earliest year for which the site provides data, followed by Yahoo and Bing's low- to mid-single-digit market share. <https://gs.statcounter.com/search-engine-market-share#yearly-2009-2024>

Figure 7: Market Share of Search Engines 2003¹⁰⁷

Market Share of the Top Search Engines on the Worldwide Web, 2003



Source: OneStat.com, November 2003

054379 ©2003 eMarketer, Inc.

www.eMarketer.com

Notes:

1. The OneStat research was based on a sample of two million visitors divided into 20,000 visitors of 100 countries each day 2003.¹⁰⁸
2. The following table describes Google's competitors at the time of IPO.

	Market Share	Search Engine	Paid Inclusion ¹⁰⁹	Ad Pricing Model	Cost per click / Cost per impression	Ad Revenue (\$ Million)	Revenue Growth YoY
Google	56.1%	Google	No	Click	Average \$0.30/click; minimum \$0.01. ¹¹⁰	\$1,421 ¹¹¹	246%
Yahoo	21.5%	Acquired Overture/Inktomi	Yes ¹¹²	Impression + Click	Average \$0.40/click; minimum \$0.05 (Overture) ¹¹³	\$1,200 ¹¹⁴	84%

¹⁰⁷ Yahoo and MSN Prove Competition for Google. Search Engine Journal. <https://www.searchenginejournal.com/yahoo-and-msn-prove-competition-for-google/297/>

¹⁰⁸ Search Engine Marketing - Why It Benefits Us All. Business Information Review 2003; 20; 195 DOI: 10.1177/0266382103204005

¹⁰⁹ The Evolution Of Paid Inclusion.

<https://web.archive.org/web/20110625153143/http://searchenginewatch.com/article/2067575/The-Evolution-Of-Paid-Inclusion>

¹¹⁰ Case Study: Google Inc. (9-910-036). Harvard Business School.

¹¹¹ Google's advertising revenue in 2003.

¹¹² Yahoo Annual Report 2003.

¹¹³ Case Study: Google Inc. (9-910-036). Harvard Business School.

¹¹⁴ Yahoo Annual Report 2003.

MSN Search	9.4%	Outsourced AltaVista/Yahoo (Inktomi, Overture)	-	Shared revenue from partner.		\$1,200 ¹¹⁵	43%
AOL Search	3.7%	Outsourced Google ¹¹⁶	-	Shared revenue from partner.		\$787 ¹¹⁷	-40%
Terra Lycos	2.3%	Outsourced Google ¹¹⁸	-	Shared revenue from partner.		\$170	-49%
AltaVista	1.9%	AltaVista. Acquired by Overture in early 2003. ¹¹⁹	Yes	Impression ¹²⁰		N/A, acquired by Yahoo in 2003.	N/A
Ask Jeeves	1.6%	Ask	Yes ¹²¹	Impression + Click, and shared revenue from Google. ¹²²		\$100 ¹²³	73%

- Google's ad revenue includes ads displayed on Google Network members' sites such as Ask Jeeves, AOL, etc.
- Due to limited disclosure, Yahoo's ad revenue includes sale of rich media advertisements, sponsorship and text-link advertisements, paid inclusion, algorithmic searches and transactions revenue.¹²⁴
- The ad revenue of Microsoft, which runs MSN, includes both search-based advertising and display advertising on its MSN website. The company's fiscal year ended June 30, 2004.
- AOL merged with Time Warner in 2000. Its ad revenue includes both search-based advertising and display advertising on its AOL website.
- Terra Lycos reported advertising and e-commerce revenue of €143 million in 2003, approximately \$170 million, that includes both advertising and e-commerce businesses from multiple platforms under the parent company in addition to Lycos search.¹²⁵
- Of Ask Jeeves' \$100 million ad revenue, \$77 million from paid placement, and \$23 million from branded advertising.¹²⁶ In addition to ad revenue, the company also generated over \$2 million from paid inclusion and \$4 million from licensing.

A 2004 survey by the Pew Internet & American Life Project ranked Google highest in user satisfaction, with 47% of respondents naming it their top choice for a search engine, followed by Yahoo at 26%.¹²⁷ **The study also indicates strong loyalty among Google users, with 56% of them conducting their searches on Google, compared to 43% for Yahoo users and 26% for MSN users on their respective platforms.**

¹¹⁵ Microsoft Annual Report 2004, ended 6/30/2004.

¹¹⁶ AOL Shifts Key Contract To Google. The New York Times.

<https://web.archive.org/web/20101118052116/https://www.nytimes.com/2002/05/02/business/technology-aol-shifts-key-contract-to-google.html>; AOL Time Warner Annual Report 2003.

¹¹⁷ AOL Time Warner Annual Report 2003.

¹¹⁸ Lycos Drops Overture Amid Dispute. <https://www.marketwatch.com/story/terra-lycos-drops-yahoos-overture-amid-dispute>; Terra Lycos 6-K 2003.

¹¹⁹ Overture Services to Buy AltaVista for \$140 Million. The New York Times.

<https://web.archive.org/web/20111104094839/https://www.nytimes.com/2003/02/19/business/technology-overture-services-to-buy-altavista-for-140-million.html>

¹²⁰ How AltaVista Works. <https://www.searchenginewatch.com/2002/02/19/how-altavista-works/>

¹²¹ Ask Jeeves Annual Report 2003.

¹²² Ask Jeeves Annual Report 2003.

¹²³ Ask Jeeves Annual Report 2003.

¹²⁴ Yahoo Annual Report 2003.

¹²⁵ Terra Lycos 6-K 2003.

¹²⁶ Ask Jeeves Annual Report 2003.

¹²⁷ Data Memo on Search Engines. Pew Research Center. <https://www.pewresearch.org/internet/2004/08/12/data-memo-on-search-engines/>

Another survey conducted by comScore, cited by CNN, showed that in February 2004, just six months before Google's IPO, Google accounted for nearly 35% of all web searches in the U.S., making it the largest search engine.¹²⁸ Yahoo followed with 30% of the searches. Globally, Google held an even larger lead, with 43% of worldwide searches compared to Yahoo's 31%. This data underscored Google's growing dominance in the search engine market both in the U.S. and internationally, solidifying its position as a key player in the search landscape.

Users tend to be loyal to their preferred search engines. **According to a 2004 report by Search Engine Journal, about 56.7% of internet users consistently use the same search engine or directory when searching for information, and another 30.5% have a few specific search engines they use regularly.**¹²⁹ Less than 13% of users said they use a different search engine each time, indicating that the majority are loyal to their preferred platforms. **More specifically, Google had the highest user loyalty rate at 65.8%, compared to Yahoo's 55%, MSN's 54%, and AOL's less than 50%.** A later survey by Pew Research in 2012 found that 83% of search users preferred Google and used it the most often, while Yahoo was a distant second at just 6%.¹³⁰

By 2008, Google held over 60% of the market share in the internet search industry.¹³¹ The company attributed its success to continuous innovation, with its scientists constantly improving both the relevance of search results for users and the efficiency of its advertising system for advertisers and publishers. In 2012, Google reportedly adjusted its search engine 667 times,¹³² and by 2017, it made 2,453 modifications in that year alone.¹³³

By the end of 2012, Google continued to lead in the internet search market, with nearly 115 billion monthly searches, accounting for 65% of total searches.¹³⁴ No other search engine at the time held more than 10% of the market. Surveys indicate that by 2023, Google has accumulated over 90% of the worldwide search engine market share,¹³⁵ followed by Bing's nearly 3%.

At the time of its IPO, a survey by comScore Media Metrix revealed that, as of June 2004, users spent significantly more aggregate time on Google than on any other search engine, nearly double the time spent on Yahoo or AOL Search, and three times more than on MSN Search.¹³⁶ This metric underscored Google's popularity and its ability to attract and retain a large, engaged user base.

¹²⁸ Google Files for Its Long Awaited IPO - Apr. 30, 2004. CNN. <https://money.cnn.com/2004/04/29/technology/google/>

¹²⁹ Internet Users Loyal to Their Search Engines. <https://www.searchenginejournal.com/internet-users-loyal-to-their-search-engines/453/>

¹³⁰ Main Findings. Pew Research Center. <https://www.pewresearch.org/internet/2012/03/09/main-findings-11/>

¹³¹ Google, The New Master of Network Effects. The New York Times. <https://www.nytimes.com/2008/07/07/technology/07iht-07google.14282611.html>

¹³² Case Study: Google Inc. MH0029. McGraw Hill Education.

¹³³ Google Tests Changes To Its Search Algorithm. CNBC. <https://www.cnbc.com/2018/09/17/google-tests-changes-to-its-search-algorithm-how-search-works.html>

¹³⁴ Google Still World's Most Popular Search Engine By Far. Search Engine Land. <https://searchengineland.com/google-worlds-most-popular-search-engine-148089>

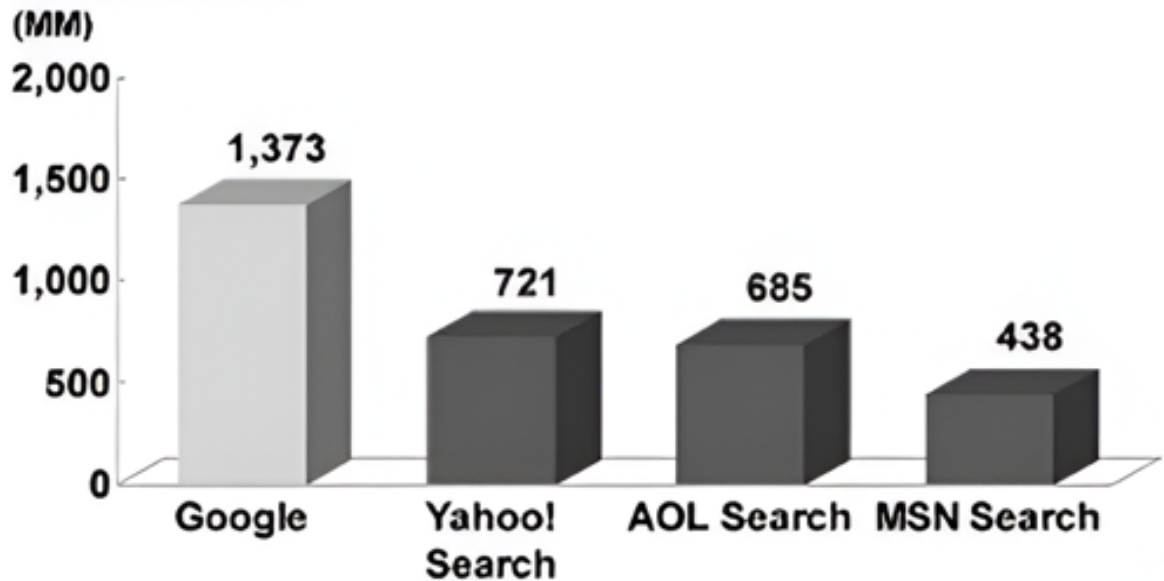
¹³⁵ Search Engine Market Share Worldwide. StatCounter GlobalStats. <https://gs.statcounter.com/search-engine-market-share>

¹³⁶ Comscore Media Metrix cited in Google Prospectus 2004.

Figure 8: Monthly Total Audience Minutes¹³⁷

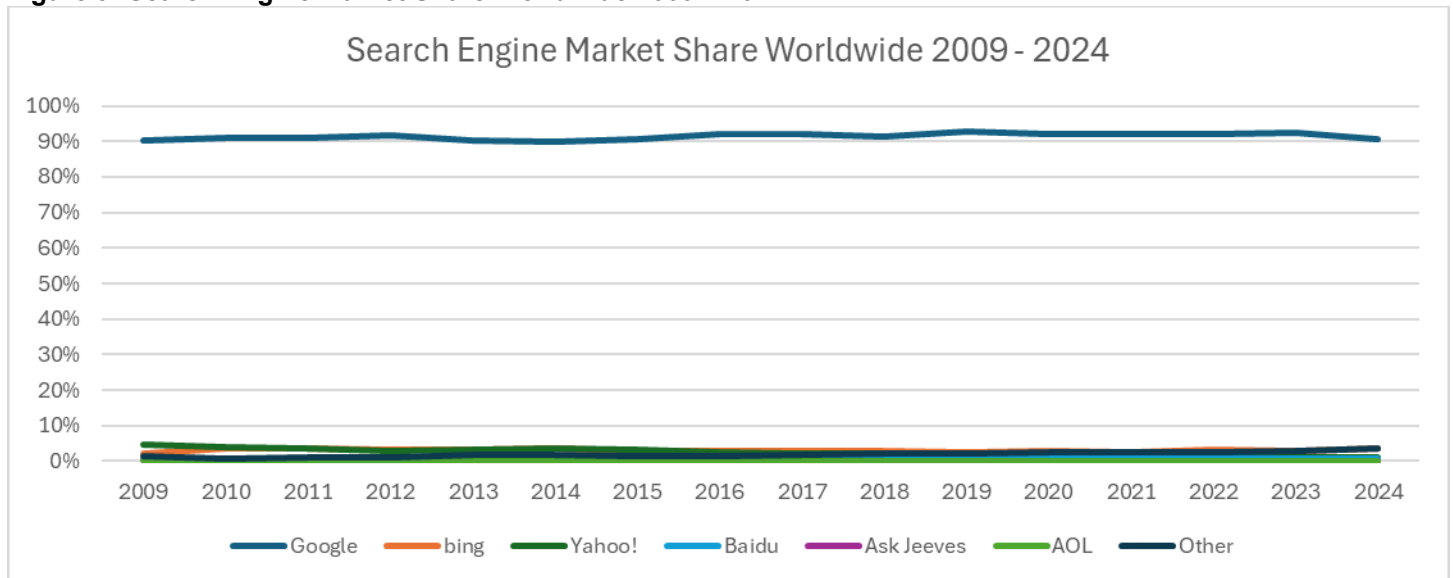
Leading Internet Search Destinations

Total Audience Minutes per Month



Consistent data on search engine market share tracked by the same research companies using consistent methodologies over time is limited. According to StatCounter, a web analytics service that tracks millions of websites globally,¹³⁸ Google has maintained a 90% share of the worldwide search engine market from 2009, the earliest year for which data is available, through 2024.¹³⁹ During this period, Google has been consistently followed by Bing, with a market share of 2% in 2009 and less than 4% in 2024, and Yahoo, whose share declined from under 5% in 2009 to nearly 1% in 2024.

Figure 9: Search Engine Market Share Worldwide 2009 – 2024¹⁴⁰



¹³⁷ Comscore Media Metrix cited in Google Prospectus 2004.

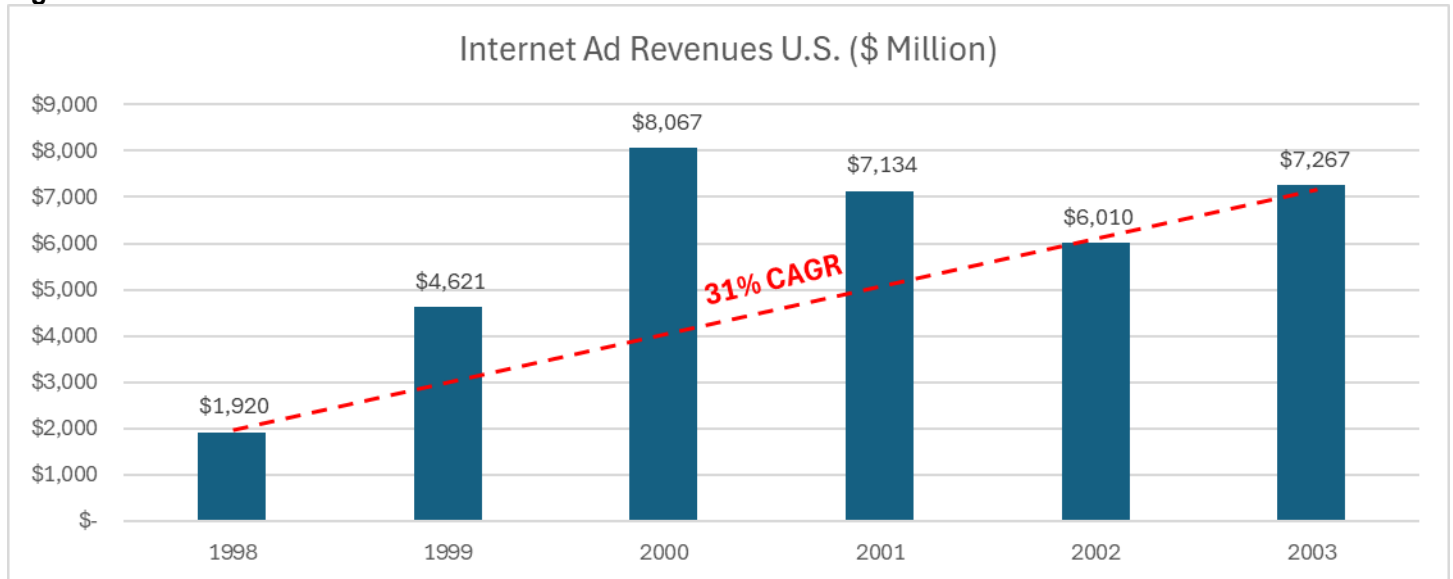
¹³⁸ StatCounter's data is based on pageviews from its network of member sites referred from different search engines. FAQ - Statcounter Global Stats. <https://gs.statcounter.com/faq#methodology>

¹³⁹ Search Engine Market Share Worldwide. Statcounter Global Stats. <https://gs.statcounter.com/search-engine-market-share#yearly-2009-2024>

¹⁴⁰ Search Engine Market Share Worldwide. Statcounter Global Stats. <https://gs.statcounter.com/search-engine-market-share#yearly-2009-2024>

Research by PricewaterhouseCoopers (PwC) reported that total U.S. internet advertising revenue grew from \$1.9 billion in 1998 to \$7.3 billion in 2003, as shown in Figure 10-1. **This accounted for 4% of total U.S. advertising revenue in 2003, reflecting a CAGR of 31%.**¹⁴¹ In comparison, the market shares of traditional channels were as follows: direct mail at 24%, newspapers at 22%, TV and cable TV combined at 30%, and radio at 9%. In 2003, Google occupied an estimated 14% of the internet ad segment, while Yahoo held a slightly smaller market share of about 13.7%, with market-services revenues of \$1.2 billion, primarily from advertising with the assumption that 83% of Yahoo’s revenue came from the U.S., consistent with its overall geographic revenue distribution.¹⁴² In addition, Microsoft was estimated to hold over 8% of the market share,¹⁴³ while AskJeeves accounted for approximately 1%.¹⁴⁴ Due to limited data on internet advertising revenue, we were unable to estimate the market share of other competitors to Google during this period. For instance, although Time Warner generated nearly \$6.2 billion in advertising revenue in 2003,¹⁴⁵ the breakdown between AOL, its internet portal, and its cable TV segment was not disclosed. **In 2021, eMarketer estimated that Google held nearly 29% of the U.S. digital advertising market, including ads in various formats on computers, mobile devices, and other internet-connected devices. Google was followed by Meta with nearly 24% market share and Amazon with 12%.**¹⁴⁶

Figure 10-1: Internet Ad Revenues U.S. 1998 – 2003¹⁴⁷



¹⁴¹ IAB Internet Advertising Revenue Report 2003. PricewaterhouseCoopers. Interactive Advertising Bureau.

https://www.iab.com/wp-content/uploads/2015/05/resources_adrevenue_pdf_IAB_PwC_2003.pdf

¹⁴² Yahoo Annual Report 2003.

¹⁴³ Microsoft did not disclose its exact advertising revenue for 2003 or its corresponding regional breakdown. The company’s total revenue in 2003 was \$32.2 billion, with \$22.1 billion generated from U.S. operations. Additionally, MSN generated \$1.95 billion in revenue, driven by an 11% increase—or \$112 million—in MSN Subscriptions. This suggests that paid search and advertising revenue totaled approximately \$930 million. Assuming it followed the same regional distribution as the company’s overall sales, around \$640 million of this advertising revenue was generated in the U.S., or over 8% of the \$7.6 billion U.S. internet advertising market. Microsoft Annual Report 2003.

¹⁴⁴ In 2003, AskJeeves generated \$107 million in revenue, with 96% coming from advertising and 65% of that from the U.S. This implies that approximately \$67 million of its advertising revenue was generated in the U.S., representing about a 1% share of the \$7.6 billion U.S. internet advertising market that year. AskJeeves Annual Report 2003.

¹⁴⁵ AOL Time Warner Annual Report 2003.

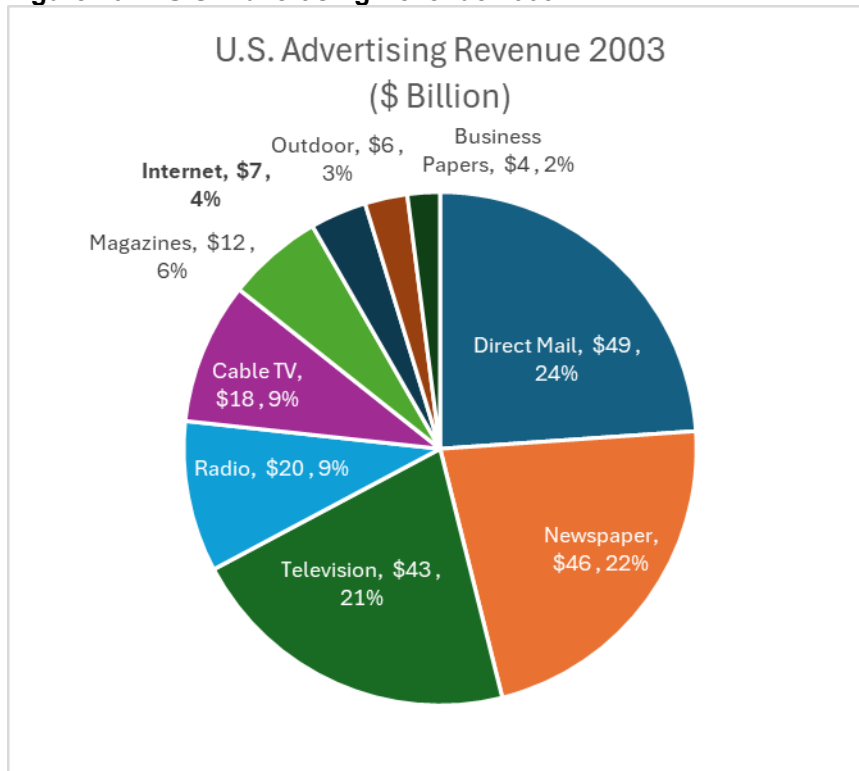
¹⁴⁶ Google, Facebook, and Amazon to Account for 64% of US Digital Ad Spending This Year.

<https://www.emarketer.com/content/google-facebook-amazon-account-over-70-of-us-digital-ad-spending>

¹⁴⁷ IAB Internet Advertising Revenue Report 2003. PricewaterhouseCoopers. Interactive Advertising Bureau.

https://www.iab.com/wp-content/uploads/2015/05/resources_adrevenue_pdf_IAB_PwC_2003.pdf

Figure 10-2: U.S. Advertising Revenue 2003¹⁴⁸



In 2004, The Wall Street Journal cited data from a New York research firm that tracked ad spending across various media platforms, such as network TV and the internet. The data revealed that total U.S. advertising spending increased by 6.1% to \$128.3 billion in 2003.¹⁴⁹ Network TV ad spending grew by 1.8% (to \$20.4 billion, or 16% of total ad spending¹⁵⁰), while local newspaper ad spending grew by 13.4%, comprising 18% of total spending and making it the largest media category. **Meanwhile, internet ad spending grew by 15.7%, reaching \$6.5 billion, or merely 5% of total U.S. ad spending in 2003.** During that year, Google generated \$1.47 billion in total revenue, with nearly 97% coming from advertising.¹⁵¹ Of that amount, \$1.04 billion came from the U.S., giving Google an estimated 16% share of the U.S. internet advertising market. However, when comparing Google's advertising revenue to the broader advertising market, the company's sales accounted for less than 1% of total U.S. ad spending, indicating both its significant presence in online advertising and its potential for growth within the overall advertising market.

At Google's IPO, the company did not provide specific guidance on industry trends or its business prospects and declined to offer any forecasts. However, several third-party research firms, including market surveyors and industry analysts, projected that the overall internet advertising segment could potentially grow at a median CAGR of 17% through 2005.¹⁵² These projections varied significantly, likely due to differences in subject opinions, methodologies, and survey scopes, reflecting the uncertainty in the rapidly evolving digital landscape. This variation also highlighted the high uncertainty following the dot-com bubble burst and the early stage of online advertising.

In July 2004, just a few weeks before Google's IPO, Jupiter Media, a market research firm, estimated that U.S. online advertising would double by 2009,¹⁵³ implying a CAGR of 15%. Similarly, an eMarketer report from October

¹⁴⁸ IAB Internet Advertising Revenue Report 2003. PricewaterhouseCoopers. Interactive Advertising Bureau.

https://www.iab.com/wp-content/uploads/2015/05/resources_adrevenue_pdf_IAB_PwC_2003.pdf

¹⁴⁹ U.S. Ad Spending Rose 6.1% in 2003. WSJ. 3/9/2004. <https://www.wsj.com/articles/SB107878737212349684>; U.S. Ad Spending Up 6.1% In 2003. NBC. <https://www.nbcnews.com/id/wbna4480480>

¹⁵⁰ U.S. Ad Spending Up 6.1% In 2003. NBC. <https://www.nbcnews.com/id/wbna4480480>

¹⁵¹ Google Prospectus 2004.

¹⁵² Advertising Spending Online Offline Spending Forecasts Report July 2003. eMarketer.

<https://www.bus.umich.edu/KresgePublic/Journals/EmarketerReports/2003/Advertising%20Spending%20Online%20Offline%20Spending%20Forecasts%20Report%20July%202003.pdf>

¹⁵³ US Online Advertising Set To Double By 2009. <https://uk.themedialleader.com/us-online-advertising-set-to-double-by-2009/>

2004, two months after Google's IPO, projected that U.S. online advertising spending would grow by nearly 29% in 2004 and another 21% in 2005.¹⁵⁴

These projections from various sources contributed to a general consensus that the overall online advertising market was poised for a CAGR in the mid-to-high-teens to low twenties.

Figure 11: Comparative Estimates from July 2002: US Online Advertising Spending 2002-2005¹⁵⁵

\$ Billion	2002	2003	2004	2005	3-Yr CAGR
Adams Media Research, May 2001	\$9.0	\$10.6	\$12.4	\$14.1	16%
eMarketer*, July 2002	\$7.9	\$8.8	\$10.6	\$12.7	17%
Forrester Research, October 2001	\$6.3	-	-	\$30.7	70%
GartnerG2, December 2001	\$11.4	\$14.7	\$17.2	\$18.8	18%
J.P. Morgan, September 2002	\$6.4	\$6.9	\$7.7	\$8.3	9%
Kagan World Media, December 2001	\$7.0	\$7.9	\$8.9	\$10.1	13%
Myers Group, July 2002	\$4.5	\$5.1	\$6.5	\$7.5	19%
Veronis Suhler, July 2002	\$7.6	\$7.9	\$8.4	\$8.9	5%
Average					21%
Median					17%

¹⁵⁴ US Internet Ad Market Set To Grow By 28% In 2005. <https://uk.themedialeader.com/us-internet-ad-market-set-to-grow-by-28-in-2004-21-in-2005/>

¹⁵⁵ Advertising Spending Online Offline Spending Forecasts Report July 2003. eMarketer. <https://www.bus.umich.edu/KresgePublic/Journals/E marketerReports/2003/Advertising%20Spending%20Online%20Offline%20Spending%20Forecasts%20Report%20July%202003.pdf>

B. Business Model, Value Proposition

*Don't be evil. We believe strongly that in the long term, we will be better served – as shareholders and in all other ways – by a company that does good things for the world even if we forgo some short-term gains. This is an important aspect of our culture and is broadly shared within the company. Google users trust our systems to help them with important decisions: medical, financial and many others. Our search results are the best we know how to produce. They are unbiased and objective, and we do not accept payment for them or for inclusion or more frequent updating. We also display advertising, which we work hard to make relevant, and we label it clearly. This is similar to a well-run newspaper, where the advertisements are clear, and the articles are not influenced by the advertisers' payments. We believe it is important for everyone to have access to the best information and research, not only to the information people pay for you to see.*¹⁵⁶

– Larry Page and Sergey Brin, 2004

Google has established itself as a leading global technology company, dedicated to enhancing how people connect with information. Through services such as web search and online advertising, Google has become one of the most recognized brands worldwide, solidifying its place as a top internet destination.¹⁵⁷ The company maintains the world's largest online index of websites and content, offering free access to this information to anyone with an internet connection.

At the time of its IPO, Google had already indexed over 4 billion web pages out of an estimated 10 billion and made nearly every website globally searchable through its search engine.¹⁵⁸ Google's mission has consistently centered on developing products that allow people to find, create, and organize information easily, with the potential to enhance lives worldwide. A court document from U.S. v. Google in 2024 suggested that Google indexed approximately 400 billion documents. However, the company neither confirmed nor denied this estimate,¹⁵⁹ but states on its website that “when you search, Google looks through hundreds of billions of webpages and other digital content organized in our Search index to find helpful information - more information than all of the libraries of the world.”¹⁶⁰ In contrast, Bing is estimated to have indexed 8 to 14 billion pages as of 2024.¹⁶¹

Google generates revenue primarily by offering relevant, cost-effective online advertising. Through its AdWords program, businesses can promote products and services with targeted ads. In addition, third-party websites (i.e., Google Network members) participating in Google's AdSense program display these ads, as Figure 12-3 shows, generating revenue for both Google and the hosting sites. Advertisers in the AdWords program pay Google each time a user clicks on their ads, which are displayed on either Google's own websites or those of Google Network members. When a click occurs on an ad displayed by a Google Network member, Google retains a small portion of the advertiser's fee, while the majority is paid to the network member. This arrangement provided a substantial benefit to third-party websites, as Google paid out over 80% of advertising revenue from AdSense to these websites at the time of its IPO.¹⁶²

¹⁵⁶ Founders' IPO Letter – “An Owner's Manual” for Google's Shareholders.

¹⁵⁷ Google Prospectus 2004.

¹⁵⁸ Google Prospectus 2004.

¹⁵⁹ Google's Index Size Revealed 400 Billion Docs. <https://zyppy.com/seo/google-index-size/>; U.S. v. Google 10/18/2023

¹⁶⁰ Organizing Information – How Google Search Works. <https://www.google.com/search/howsearchworks/how-search-works/organizing-information/>

¹⁶¹ Google vs Microsoft Bing. <https://www.searchenginejournal.com/google-vs-microsoft-bing/400855/>

¹⁶² Google Prospectus 2004; Google Annual Report 2004.

Figure 12-1: Google AdWords Example 2005¹⁶³

The screenshot shows a Google search results page for the query "ford escape". At the top, there is a navigation bar with links for "Web", "Images", "Groups", "News", "Froogle", "Local", "Desktop", and "more". The search bar contains "ford escape" and a "Search" button. Below the search bar, the page is divided into two main columns: "Web" on the left and "Sponsored Links" on the right.

Web Results:

- Ford Escape Homepage** (Sponsored Link): www.FordVehicles.com Visit the Official Escape Homepage Plus Features, Options, MSRP
- Ford Escape Prices** (Sponsored Link): www.CarPriceSecrets.com Get the Dealer's Bottom Line Price! No obligation quotes - Easy & Free.
- Ford Escape Prices** (Sponsored Link): www.FordDirect.com Free & Fast Price Quotes on New Fords - Official Ford Website!

22 results stored on your computer - Hide - About

MarketingShift Marketing - **Escape** Pollution In A **Ford Escape** Hybrid - 9:03am
Ford Escape Hybrid On - 3 reasons for the project: **Ford Escape** - Apr 19

Refine your search for ford escape

Location	Make	Model
<input type="text" value="US city or zip"/>	<input type="text" value="ford"/>	<input type="text" value="escape"/>

Remember this location

Ford Vehicles: 2006 Ford Escape - See pricing details, SUV options ...
Ford Vehicles offers information on the **Ford Escape**. Information includes SUV comparisons, SUV options, colors, 360 views, photo gallery, models, trims, ...
www.fordvehicles.com/suvs/escape/ - 11k - [Cached](#) - [Similar pages](#) - [Remove result](#)

Ford Vehicles: Escape Hybrid
ENTER SITE
www.fordvehicles.com/escapehybrid/ - 7k - [Cached](#) - [Similar pages](#) - [Remove result](#)
[[More results from www.fordvehicles.com](#)]

2006 Ford Escape Hybrid Prices, Pictures, Reviews on Yahoo! Autos
Find out 2006 **Ford Escape** Hybrid cars information on Yahoo! autos. Get free new **Ford Escape** Hybrid car prices, new **Ford Escape** Hybrid pictures, specs, ...
autos.yahoo.com/newcars/ford_escapehybrid_2006/4358/model_overview.html - 82k - [Cached](#) - [Similar pages](#) - [Remove result](#)

CarDirect.com - Ford Escape Reviews

Sponsored Links:

- Ford escape** (Sponsored Link): Find a Used **Ford** by Zip Code Search local dealers--Autoguide.com www.AutoGuide.com Orlando-Daytona Beach, FL
- Ford Escape Prices** (Sponsored Link): Get Free, fast price quotes on new **Ford Escapes** now! No obligation. www.NewCars.com
- 2006 Ford Escape** (Sponsored Link): Compare multiple quotes on a new **Ford Escape** from local dealers. www.PriceQuotes.com
- Ford Escape at Carmax** (Sponsored Link): Actual Prices & Photos of Over 20,000 New & Used Vehicles Online www.carmax.com
- Ford Escape Overstock** (Sponsored Link): Database of Overstocked Dealers. They Slash Prices to Clear Lot. CarQuote.AutoDiscountGroup.com
- 2006 Escape Review** (Sponsored Link): Read Our Comprehensive Review On **Ford Escape** at edmunds.com www.Ford.edmunds.com
- Ford Escape** (Sponsored Link): Fast and Free **Ford Escape** Quotes. [Get the Best Price Guarantee](#)

¹⁶³ The Evolution of Google AdWords. <https://www.advia.com.au/adwords/the-evolution-of-google-adwords>

Figure 12-2: Google AdWords Example 2024¹⁶⁴

The image shows a Google search results page for "ford escape". At the top, the Google logo is on the left, and the search bar contains "ford escape" with a search icon on the right. Below the search bar are navigation tabs for "All", "Images", "Shopping", "Videos", "News", "Forums", "Web", and "More", along with a "Tools" dropdown.

The main content area is divided into two columns. The left column contains sponsored ads from Ford. The first ad is titled "2025 Ford Escape® SUV" and includes a small image of a red SUV. Below the title is a description: "Build & Price Your Model Today — 6 models & 4 available engines including Hybrid & Plug-In Hybrid = Endless potential. Leave The Everyday Grind Behind With The 2025 Ford Escape® SUV. Visit Us To Learn More." Below this are four links: "Build & Price", "Find A Local Dealer", "Compare Vehicles", and "Interactive Shopping Tool", each with a short description. The second ad is titled "2025 Ford Escape® SUV | Pricing, Photos, Specs & More" and includes a description: "The versatile 2025 Ford Escape® offers six models and four powerful engine options, including hybrid & plug-in hybrid choices. Explore its bold design, ...". Below this are two more links: "2024 Ford Escape® SUV" and "2025 Escape® Platinum".

The right column features a large product listing for the "2025 Ford Escape SUV". It includes a grid of images showing the SUV from various angles and colors (red, white, grey). Below the images is a "More images" button. The title "2025 Ford Escape" is followed by "SUV". Below this are three columns of fuel economy ratings: "4/5 Kelley Blue Book", "7.8/10 Edmunds", and "7.5/10 Car and Driver". Further down, technical specifications are listed: "MSRP: From \$28,150", "MPG: Up to 42 city / 36 highway", "Engine: 1.5 L 3-cylinder, 2.0 L 4-cylinder, 2.5 L 4-cylinder", "Horsepower: 163 to 250 hp", and "Transmission: 8-speed automatic, Continuous variable transmission".

¹⁶⁴ Ford Escape – Google Search.

https://www.google.com/search?q=ford+escape&sca_esv=1e35dc1f4110e681&gl=us&hl=en&pws=0&source=hp&ei=j2qhZ5frLpC80PEPybLb4Q0&iflsig=ACKRmUkAAAAAZ6F4nwG-M8ISGPo3L0lIfhY1L9NasS_F&ved=0ahUKEwjX70ci7KiLAXUQHjQIHUnZNtwQ4dUDCBA&uact=5&oq=ford+escape&gs_lp=Egdnd3Mtd2l6lgtmb3JkIGVzY2FwZTIIEAAYgAQYsQMYCBAAGIAEGLEDmGgQABiABBixAziLEAAYgAQYsQMYgWeyCxAAGIAEGLEDGIMBMgUQABiABDIFEAAYgAQYsCBAAGIAEGLEDmGgUQABiABDILEAAYgAQYsQMYgWFI0BNQpQZYwBJwAXgAkAEAmAFWoAGdBaoBAjExuAEDyAEA-AEBmAlMoALEBAGCCsICEBAAGIAEGEMYtAIYigUY6gLCAGsQABiABBIRahiKBcICERAUgIAEGLEDGNEGDGIMBGMcBwgIOEC4YgAQYsQMYQMYxwHCAhQQLhiABBixAxiRaxiDARjHARiKBcICEBAAGIAEGLEDGEMYgWeyYigXCAG0QABiABBixAxDGloFwgIKAAAYgAQYQxiKBcICChAuGIAEGEMYigXCAhAQLhiABBixAxDGNQCGIoFwglIEC4YgAQY0QMYxwHCAHEQABiABBIRahixAxiDARIKBcICERAUgIAEGJECGNEDGMcBGloFwglIEC4YgAQYsQMY0QMYQxiDARjHARjJAXiKBcICCAAGIAEGJIDGloFwglIEC4YgAQYKQIYxwEYigUYjgUYrwhCAhAQLhiABBixAxDGLOUEGloFwglIEC4YgAQYsQMYQxiDARIKBZgDBfEFvW0YqXPQkACSBwixMqAH4GI&client=gws-wiz#cobssid=s

Figure 12-3: Google AdSense Example¹⁶⁵

The screenshot shows a website layout with several Google AdSense advertisements. At the top, there is a banner ad for 'GREECE RELAX ON THE BEACHES' by Jet2holidays with a 'BOOK NOW' button. Below the site's navigation bar, the main article title is 'Marvel Comic-Con 2019: The 5 Biggest Phase 4 Bombshells, Including Everything We Know About Valkyrie'. Three blue arrows originate from the text 'Google AdSense ads' and point to three distinct ads: 1) A banner ad for Greece beaches, 2) A text-based ad for '£75 ad credit for you' by Google Ads, and 3) A video ad for 'Advertisement' featuring a man's face.

Despite most Google products and services to users being free, the company remains focused on its mission: “to organize the world’s information and make it universally accessible and useful.”¹⁶⁶ Google believes that prioritizing user needs is the best approach to achieving this mission and ultimately generating profit. To this the goal, Google has committed to three core principles:

1. Providing the most relevant and useful search results possible, independent of financial incentives, meaning it does not accept payment for inclusion or ranking in search results.
2. Delivering the most relevant and useful advertising, and clearly indicating to users the ads in search results, ensuring that ads do not disrupt the user experience.
3. Continuously improving user experience, its search technology, and other key areas of information organization.

Google’s products and services primarily cater to two groups – users (consumers and enterprises) and advertisers. While advertising remains the company’s main revenue source, Google has also expanded its offerings over time to include products such as smartphones, smart home devices, and cloud services. However, advertising has remained to be the majority of its revenue.

User-Focused Products and Services

Google provides a variety of free, search-related services for users, such as Google Web Search, Google Image Search, Google News, Google Toolbar, Froogle (later renamed Google Shopping), and YouTube, which it acquired in 2006. YouTube has since become one of the world’s most popular video-sharing platforms, which we will delve into in a later section.

The core value Google provides is delivering relevant, reliable, and useful information from billions of indexed websites using its proprietary algorithms. **By the time of its IPO, Google had indexed over 4 billion web pages, employing patented technologies such as PageRank and advanced text-matching techniques to ensure accurate search**

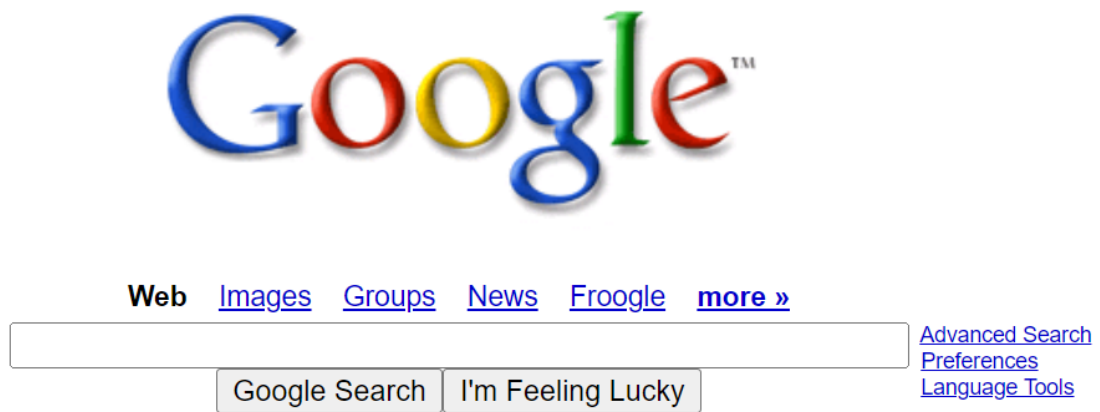
¹⁶⁵ 21 Best AdSense Alternatives to Consider for Your Site.

¹⁶⁶ Google Prospectus 2004.

results.¹⁶⁷ Users could also personalize their searches based on other factors such as interests and geographic location. Despite accepting advertiser fees, Google promises that its search results are objective, with advertising clearly separated from organic search results, even in Froogle (Google Shopping)¹⁶⁸. Some competitors such as Overture (later acquired by Yahoo in 2003) took a different approach, charging advertisers for prominent ad placement based on keywords,¹⁶⁹ as well as charging a fee for being included in users' search results.

By the time of its IPO, Google's services were available in 95 countries and supported over 90 languages. Due to the global nature of the internet, users can technically access Google's services from anywhere in the world with an internet connection. **Its simple, intuitive website, featuring fewer than 30 words and only a few tabs, as Figure 13-1 shows, potentially contributed significantly to its widespread adoption by minimizing the effort required for users to learn and use it such that users can easily type keywords into the search bar and retrieve results within seconds.** Google has maintained its simple web design throughout its entire course of development. This intuitive interface makes it straightforward for users to access information on a wide range of topics, including news, products, and other useful information deemed to be important to them, with just a few words typed and a simple click. **Unlike rivals such as Yahoo and AOL, Larry Page and Sergey Brin refused to clutter Google's homepage with ads, believing that a clean design would build user trust.**¹⁷⁰

Figure 13-1: Google Website 2004¹⁷¹



[Advertising Programs](#) - [Business Solutions](#) - [About Google](#)

©2004 Google - Searching 4,285,199,774 web pages

¹⁶⁷ Google Prospectus 2004.

¹⁶⁸ Google Prospectus 2004.

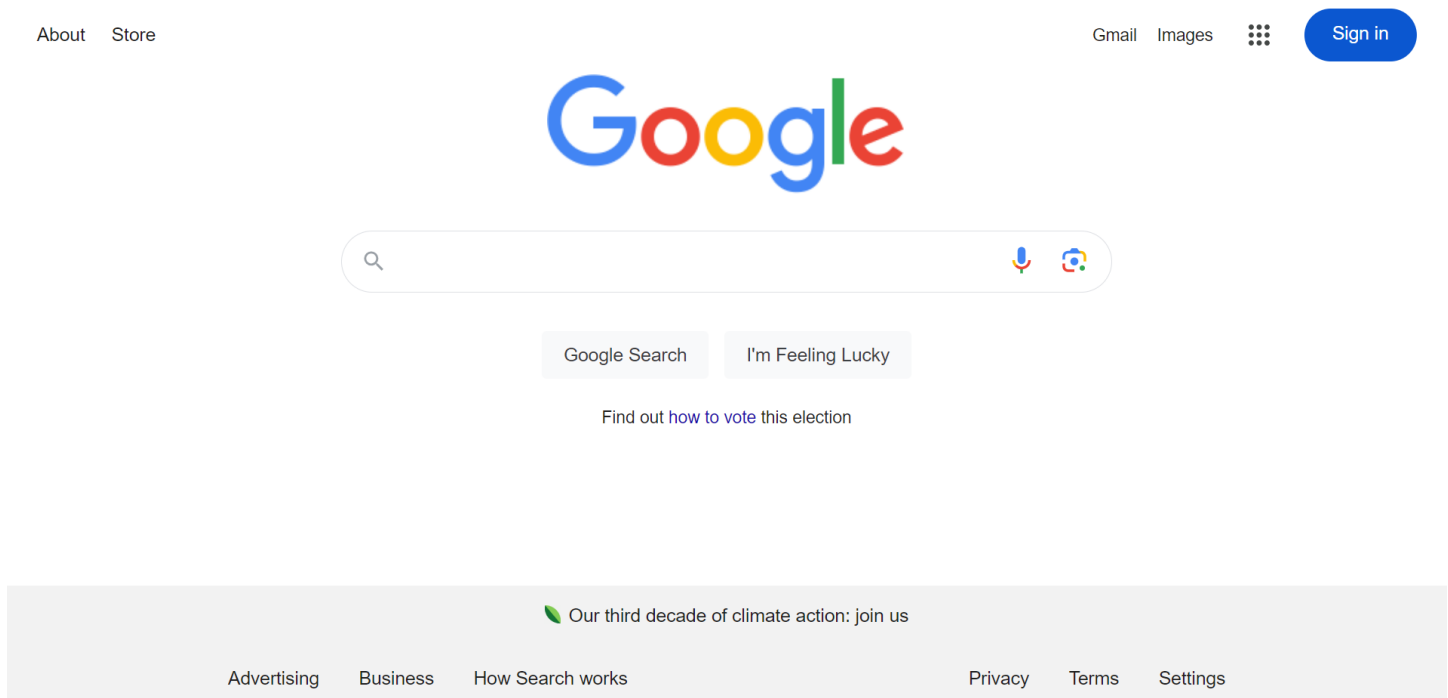
¹⁶⁹ Google Prospectus 2004.

¹⁷⁰ Larry Page & Sergey Brin - Billionaire Documentary- Google, YouTube, Alphabet, Innovation.

<https://www.youtube.com/watch?v=8J7TRSLf55U>

¹⁷¹ Google Website 2004. <https://web.archive.org/web/20040805012113/http://www.google.com/>

Figure 13-2: Google Website 2024¹⁷²



Before going public, Google had already gained popularity not only among individual users but also in workplaces. For instance, a hotel manager in California shared that she searched for all her guests before their arrival to better serve them – “If we find out they like to jog early in the day, we make sure they get a room with morning sun.”¹⁷³ Danny Meyer, a New York restaurateur and founder of Shake Shack, praised Google in his book *Setting the Table*, highlighting how the search engine helped him understand his guests better, even inspiring new recipe ideas.¹⁷⁴ For example, during a late-night dinner at Eleven Madison Park with prominent media figures, Meyer’s team used Google to quickly find information about “eggs daffodil”, a dish mentioned by one of the guests. The search inspired the chef to create an improvised version with Zucchini blossoms and cheese, impressing the influential guests and enhancing their dining experience.

Google’s rapid adoption exceeded the founders’ expectations.¹⁷⁵ According to a Forbes report, Sergey Brin admitted he was surprised by its success, noting that people love Google because it consistently provides reliable answers. Larry Page similarly observed that Google had become “like a person to [users], helping them and providing intelligence any time of the day.” By consistently delivering better results, Google cultivated user loyalty.

A 2005 Nielsen study showed that Google users are more loyal than those of rival search engines. In the U.K., about 29% of Google users also searched via MSN, while 22% also used Yahoo.¹⁷⁶ By comparison, 70% of MSN Search users and 67% of Yahoo Search users also searched using Google. Similarly, in the U.S., 58% of Google users also used Yahoo, MSN, or both, while about 70% of Yahoo and MSN users also used one of other search engines mentioned. **The study, conducted in February of 2005, also found that Google users in U.K. performed an average of 9.1 searches and spent over 26 minutes on the site. By comparison, Yahoo users conducted 4.2 searches and spent 9 minutes, while MSN Search users averaged 3.1 searches and 4 minutes on the platform.** These findings indicate that Google users not only searched more frequently but also spent more time on the platform, increasing their likelihood of exposure to targeted ads. Google’s user loyalty is also indirectly reflected in its global market share in search engine, consistently maintaining an over 90% from 2009 to 2024.¹⁷⁷

Network effects, especially during the early years when Google was founded, have played a crucial role in Google’s growth and popularity. When Google was first launched, the founders shared it with only a few people – friends,

¹⁷² <https://www.google.com/> retrieved on 10/9/2024.

¹⁷³ All Eyes on Google. Forbes. <https://www.forbes.com/forbes/2003/0526/100.html>

¹⁷⁴ Turning Over the Rocks. Setting The Table. Danny Meyer.

¹⁷⁵ All Eyes on Google. Forbes. <https://www.forbes.com/forbes/2003/0526/100.html>

¹⁷⁶ Google Users More Loyal Than Rival Sites’. <https://www.marketingweek.com/google-users-more-loyal-than-rival-sites/>

¹⁷⁷ Search Engine Market Share Worldwide. StatCounter GlobalStats. <https://gs.statcounter.com/search-engine-market-share#yearly-2009-2024>

professors, and some attendees at a conference. However, as people began to use Google, they found it effective and recommended it to others.¹⁷⁸ This word-of-mouth spread rapidly, leading to a growing user base. **As more people used Google, the company was able to gather more data, enabling it to continuously refine and improve its algorithms. In turn, these better algorithms generated higher-quality search results, attracting even more users. This created a powerful feedback loop – more users led to better results, which attracted even more users.**

Scholars around the world agree that while Google's high-quality algorithm initially attracted users, network effects have been pivotal in sustaining its dominance.¹⁷⁹ **An MIT scholar observed, “[Google’s] quality of algorithm likely played a role early on, but now it’s mostly network effects – dominance breeds dominance.” Similarly, a Stanford scholar stated, “Google’s search engine has been far better from the outset – this alone can explain why it dominated. It is simply a better search engine.”**

As Google’s popularity spread, “Google” became synonymous with “search.” One of the earliest known uses of the term in this sense may date back to 1998, when Larry Page, in an update about Google's new features, ended his message with, “Have fun and keep googling!”¹⁸⁰ In 2003, Wordspy.com, a website that tracks newly coined terms, recorded the term “google” in the context of searching for information.¹⁸¹ By 2006, “Google” was officially recognized as a verb and added to the Merriam-Webster Collegiate Dictionary with the definition: “to use the Google search engine to obtain information ... on the World Wide Web.”¹⁸² For example, “Let me google that.”

In addition to network effects, psychological influences also play a significant role in broadening Google's popularity as a search engine. Researchers have found that people tend to use the internet as an external memory bank, a phenomenon known as the “Google Effect.” With the rise of the internet, search engines such as Google and other online databases have increasingly become external memory sources that individuals can access at any time. A 2011 study conducted by Columbia University demonstrated that participants faced with difficult questions were more likely to think of computers and the internet as tools for retrieving information.¹⁸³ “It seems that when we are faced with a gap in our knowledge, we are primed to turn to the computer to rectify the situation,” the study noted. This conditioning suggests that people have become accustomed to turning to search engines when they encounter knowledge gaps. The study also implies that as people increasingly rely on online sources for information, the use of search engines will likely continue to grow, as they offer immediate access to knowledge and allow individuals to offload memory storage onto these external systems. The study observed, “Although the concept of knowledge in general seems to prime thoughts of computers, even when answers are known, not knowing the answer to general-knowledge questions primes the need to search for the answer, and subsequently, computer interference is particularly acute.”

A 2024 study published on Frontiers further highlights this tendency, revealing that individuals are more likely to rely on the internet for information rather than committing it to memory. This reliance on the internet increases the likelihood that participants will use search engines again when encountering similar problems.¹⁸⁴ Specifically, the study found that individuals who previously searched online for information tend to repeat this behavior because of the ease and immediacy of access, often recalling the source such as the website or domain rather than the information itself. The study reported, “after training on Internet search questions (even for a short period of time), participants had a greater impulse to use the search engine again when presented with a query.” Moreover, it found that “people who have searched the Internet for a solution to a problem, for example, will remember the website where they found the solution more vividly when they encounter the problem again, even if they have forgotten the precise essence of the problem for which they were searching.” **This indicates that “when people search for information on the Internet while working on the Internet, they are more likely to use the Internet rather than their brain the next time they encounter that issue...people’s perceptions of findability roughly predict the amount of time it will take them to find the information they need on the Internet, which increases their reliance on it laterally.”**

¹⁷⁸ Google Founders Larry Page And Sergey Brin. 10/14/2003. FreshAir With Terry Gross & Tonya Mosley. NPR.

<https://freshairarchive.org/segments/google-founders-larry-page-and-sergey-brin>

¹⁷⁹ Does Google Have Too Much Market Power. Chicago Booth Review. <https://www.chicagobooth.edu/review/does-google-have-too-much-market-power>

¹⁸⁰ google-friends message #3. <https://web.archive.org/web/19991009052012/http://www.egroups.com/group/google-friends/3.html>

¹⁸¹ Google Says Use of Its Name As a Verb Is ‘Inappropriate’. WSJ. <https://www.wsj.com/articles/SB1046301835604826743>

¹⁸² Google Goes From Web to Webster’s. Los Angeles Times.

<https://web.archive.org/web/20240421125243/https://www.latimes.com/archives/la-xpm-2006-jul-07-fi-google7-story.html>

¹⁸³ Google Effects on Memory - Cognitive Consequences of Having Information at Our Fingertips. Betsy Sparrow, et al. Science.

¹⁸⁴ Google Effects on Memory A Meta-Analytical Review of The Media Effects of Intensive Internet Search Behavior. Chen Gong, Yang Yang.

Furthermore, the study also found that North American participants exhibited a higher tendency toward frequent internet searches than individuals from other regions, possibly due to the greater availability of broadband connections and higher local GDP, factors that likely increase both the frequency and ease of internet access in North America.¹⁸⁵ **This finding aligns with our previous observation that greater quality internet accessibility may have contributed to the wide adoption of Google.**

At the core of Google's search engine is PageRank, as well as other proprietary algorithms, initially developed by founders Larry Page and Sergey Brin while at Stanford University,¹⁸⁶ which owns the patent since 1998.¹⁸⁷ **Google held a perpetual license to the patent, with exclusivity expiring in 2011.**¹⁸⁸ PageRank assesses a webpage's importance based on its link structure, and Google held exclusive rights to this patented technology until 2011. PageRank, along with advanced text-matching techniques, analyzes not only keyword frequency but also their proximity and relevance on linked pages, allowing Google to present the most relevant results among millions of possible webpages.¹⁸⁹ Google's algorithms also analyze the content of a web page by the use of fonts and page layout.¹⁹⁰ This sophisticated approach helps Google display the most relevant search results to users from millions of web pages. **Google's algorithms use over 200 unique signals to determine search result relevance, including factors like word frequency, word location on a page, and synonyms.** This allows Google to quickly sift through millions of potential results and display the most relevant ones at the top of the page.

Beyond its search engine, Google products such as Gmail, Google Drive, and Chrome have been crucial in acquiring and retaining users. **Although most Google products and services are free to users, they create a high switching cost, effectively binding users to its ecosystem.** For example, Gmail, launched in 2004, offered 1 gigabyte of storage space for free, which was said to be 200 times larger than primary competitors when it was launched,¹⁹¹ with targeted ads displayed to users based on email content. Once users commit to Gmail, switching becomes impractical, encouraging continued use of Google's services. The longer users communicate through Gmail, the more likely they are to continue using other Google services due to the difficulty of switching to another provider after storing years of emails and files. By 2012, Gmail had reached over 425 million active users globally,¹⁹² growing to 900 million by 2015. By 2019, Gmail had amassed over 1.5 billion active users worldwide, making it the largest email provider.¹⁹³ This vast user base is also appealing to advertisers, who are attracted to Gmail's ability to serve targeted ads based on the content of users' emails. This not only enhances Google's advertising revenue but also strengthens its overall ecosystem by keeping users and customers engaged with its services.

Another notable example is Chrome, a free web browser launched by Google in 2008. Not only does it help Google to acquire and retain users, but it also potentially fends off competitors in search engines, namely Microsoft, which we will discuss in a later section.

Initially conceived as a small project led by Sundar Pichai, who would later become Google's CEO, Chrome was developed in secrecy. At the time, Eric Schmidt, Google's CEO, believed the web browser market was too competitive, so Pichai chose not to disclose the project to anyone until his team had a working prototype. Once the project was complete, Pichai presented Chrome to the company, sparking excitement and support. This story highlights Google's adventurous spirit, where the willingness to embrace uncertainty often leads to groundbreaking innovations driven by small, dedicated teams.¹⁹⁴

Similar to Google.com, Chrome has a simple design to minimize the learning curve for users, as Figure 14 shows. To make the transition easier, Chrome allows users to import their browsing data from previous browsers, such as Microsoft's Internet Explorer (later Edge), which was pre-installed with Microsoft's Windows operating system with over 65% market

¹⁸⁵ Google Effects on Memory A Meta-Analytical Review of The Media Effects of Intensive Internet Search Behavior. Chen Gong, Yang Yang.

¹⁸⁶ Google Prospectus 2004.

¹⁸⁷ Google Prospectus 2004.

¹⁸⁸ Google Prospectus 2004.

¹⁸⁹ Facts about Google and Competition. Google.

<https://web.archive.org/web/20130702063520/https://www.google.com/competition/howgooglesearchworks.html>

¹⁹⁰ Case Study: The Google IPO. Darden Business Publishing, University of Virginia.

¹⁹¹ Google Prospectus 2004.

¹⁹² Chrome & Apps @ Google I/O: Your Web, Everywhere. <https://blog.google/products/chrome/chrome-apps-google-io-your-web/>

¹⁹³ Gmail Dominates Consumer Email with 1.5 Billion Users. CNBC. <https://www.cnbc.com/2019/10/26/gmail-dominates-consumer-email-with-1point5-billion-users.html>

¹⁹⁴ Sundar Pichai, CEO of Google and Alphabet. <https://www.youtube.com/watch?v=j9qGmO8Yy-Y>

share at the time when Chrome was launched, followed by Mozilla Firefox's over 20%.¹⁹⁵ In 2009, the year of its debut, Chrome was estimated to have a 3% share of the global browser market.¹⁹⁶

Unlike some other browsers, which may require users to visit a search engine website separately, Chrome integrates an omnibox, allowing users to both type web addresses and perform searches from the same bar,¹⁹⁷ which, by default, using Google as its search engine. Google keeps updating and innovating Chrome with the user experience continues to improve. Just one year after its launch, in 2009, *Computerworld*, a magazine owned by International Data Group, reviewed web browsers and found that Google's Chrome was the fastest in performance of the top five browsers on Windows, beating every competitor.¹⁹⁸ **Some of the tests showed that Chrome was more than nine times faster than Microsoft's Internet Explorer, five times faster than Opera 10, two-and-a-half times faster than Firefox, and 30% faster than Apple's Safari.** The newly released version of Chrome in 2009 was 150% faster than the original version launched in 2008. This simplicity of design and seamless user experience on Chrome encourage more frequent use of Google's search services, which is default on Chrome, saving users time and letting them enjoy surfing the internet. Chrome quickly gained widespread adoption among users worldwide.

When users sign into Chrome, they are automatically signed into other Google services such as Gmail and YouTube whenever they visit those sites. This also allows for synchronization of bookmarks, passwords, and other browser settings. While this automatic sign-in makes for a smoother experience, it also enables Google to build more detailed user profiles by linking browsing activity to users' Google Accounts.

In a 2019 presentation to the Justice Department's Antitrust Division, Google described Chrome's launch as a defensive move to protect access to its products.¹⁹⁹ However, internally, Google often viewed Chrome as a key element of its growth strategy. Most notably, Chrome gave Google control over key entry points to its core markets – online search and advertising. By setting Google Search as the default search engine, Chrome further entrenched Google's dominance in search engines. In addition, the browser provided another valuable source of user data, which Google leveraged to enhance its targeted advertising efforts.

By 2012, Chrome had accumulated over 310 million active users globally,²⁰⁰ and surpassed Microsoft's Internet Explorer to become the world's most popular internet browser, as Figure 15 shows. By 2023, Chrome's user base had surpassed 3 billion,²⁰¹ with its global market share growing from 3% in 2009 to over 60% in 2023, followed by Safari's 18%, and Firefox's less than 3%.²⁰² Chrome's user-friendly features and integration with Google's ecosystem have played a crucial role in driving its widespread adoption and maintaining Google's dominance in the browser, and, in turn, the search engine markets.

¹⁹⁵ Google Targets Microsoft's Turf. WSJ. <https://www.wsj.com/articles/SB124702911173210237>

¹⁹⁶ Browser Market Share Worldwide. StatCounter GlobalStats. <https://gs.statcounter.com/browser-market-share#yearly-2009-2024>

¹⁹⁷ Giving Google Chrome A Spin. <https://techcrunch.com/2008/09/02/giving-google-chrome-a-spin-this-thing-moves-fast/>

¹⁹⁸ Chrome Buries Windows Rivals in Browser Drag Race.

https://web.archive.org/web/20091002004128/http://www.computerworld.com/s/article/9138331/Chrome_buries_Windows_rivals_in_browser_drag_race

¹⁹⁹ Investigation of Competition in Digital Markets. Subcommittee on Antitrust, Commercial And Administrative Law of The Committee on The Judiciary. U.S. House of Representatives.

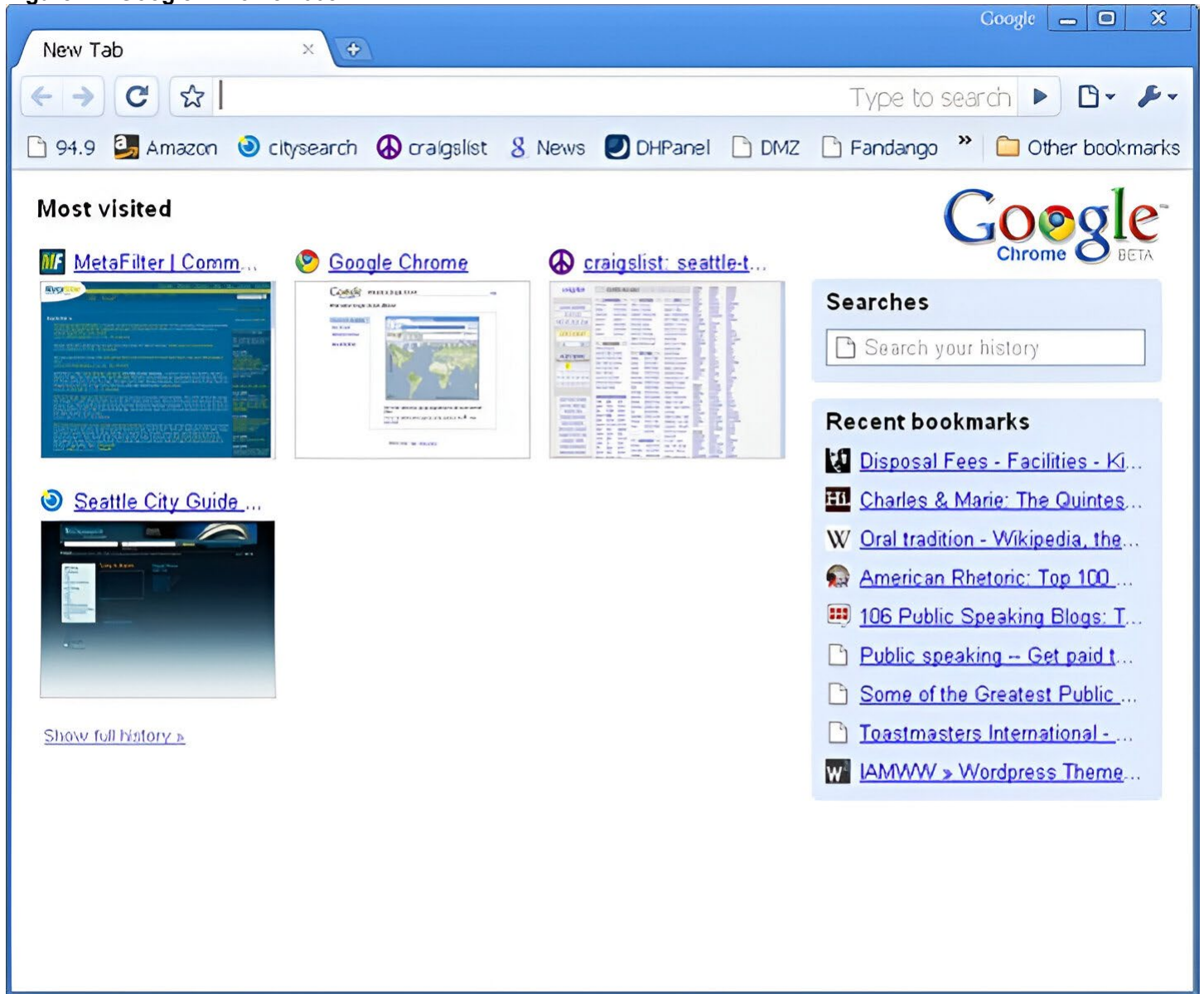
²⁰⁰ Chrome & Apps @ Google I/O: Your Web, Everywhere. <https://blog.google/products/chrome/chrome-apps-google-io-your-web/>

²⁰¹ Google Issues First 2023 Zero Day Warning To 3 Billion Chrome Users. Forbes.

<https://www.forbes.com/sites/gordonkelly/2023/04/18/google-chrome-browser-zero-day-vulnerability-critical-chrome-update/>

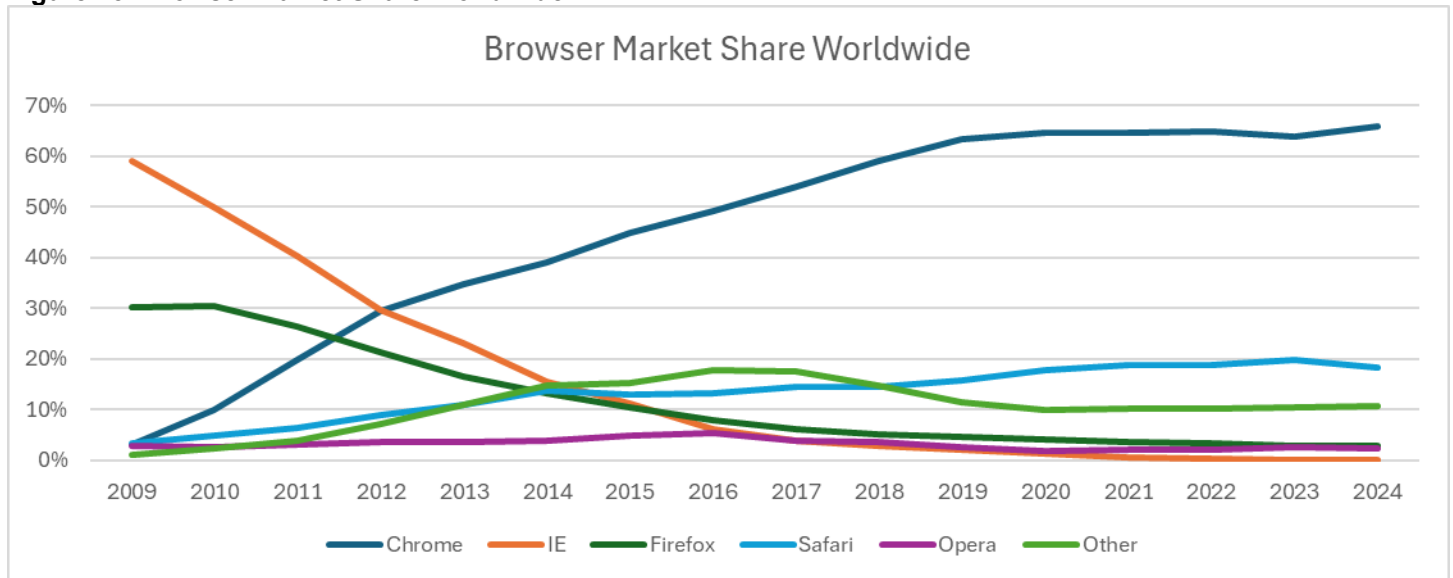
²⁰² Browser Market Share Worldwide. StatCounter GlobalStats. <https://gs.statcounter.com/browser-market-share#yearly-2009-2024>

Figure 14: Google Chrome 2008²⁰³



²⁰³ Google's Web Browser (Chrome): Early Review. <https://scottberkun.com/2008/googles-web-browser-chrome-early-review/>
Worldly Partners

Figure 15: Browser Market Share Worldwide²⁰⁴



Another significant feature Google has leveraged to expand its internet presence is its Single Sign-On (SSO) capability. This feature allows users to access all of Google’s services with a single account, and it also enables them to log into third-party websites or applications on computers or mobile devices using the same Google credentials, further embedding users within Google’s ecosystem. While the exact launch date of Google’s SSO is unclear, it may be linked to Google’s support of OpenID 2.0 announced in 2008,²⁰⁵ an open standard that enables users to log into various websites using a single identity provider. By eliminating the need to create and remember separate usernames and passwords for each site, Google’s SSO offers a highly convenient solution for users.

Developers often prefer integrating Google’s SSO into their products as it simplifies the sign-up process, reducing the time users spend entering personal information and remembering multiple passwords. This integration also gives developers access to basic user information shared by Google, enabling more precise ad targeting in the future. **Moreover, Google benefits from insights into user activity on third-party websites, which it uses to refine algorithms and enhance its overall services. For instance, when a user logs into The New York Times with their Google account, the website immediately gains access to basic user information, such as names and email addresses, as shown in Figures 16-1 and 16-2. This access enables the Times to track user activity, which Google can then combine with its own data to serve more relevant ads on the platform.**²⁰⁶

While the exact number of websites and applications worldwide utilizing Google’s SSO feature is not publicly disclosed, it has already been adopted many commonly used platforms such as The New York Times, The Wall Street Journal, Twitter, Uber, and LinkedIn, as well as many smaller and local websites and applications. This single sign-on service is free for users, but developers pay on a tiered basis depending on their traffic.²⁰⁷ For example, for fewer than 50,000 monthly active users, the service is free. For more than 50,000 but fewer than 99,000 monthly users, Google charges \$0.0055 per active user. For those exceeding 10 million monthly active users, the cost drops to \$0.0025 per user. Although Google does not disclose detailed metrics about this service, it has become a widely adopted tool for improving user experience and engagement by collecting user data from websites and applications that use Google’s services.

²⁰⁴ Browser Market Share Worldwide. StatCounter GlobalStats. <https://gs.statcounter.com/browser-market-share#monthly-200901-202408>

²⁰⁵ Microsoft and Google announce OpenID support. <https://openid.net/microsoft-and-google-announce-openid-support/>

²⁰⁶ The New York Times Company Privacy Policy. The New York Times. <https://help.nytimes.com/hc/en-us/articles/10940941449492-The-New-York-Times-Company-Privacy-Policy>

²⁰⁷ Identity Platform pricing. Google Cloud. <https://cloud.google.com/identity-platform/pricing#identity-platform-pricing>

Figure 16-1: Google Single Sign-On (SSO)

The New York Times

Log in or create an account

Email Address


Continue

or

By continuing, you agree to the [Terms of Sale](#), [Terms of Service](#), and [Privacy Policy](#).

 **Continue with Google**

 **Continue with Facebook**

 **Continue with Apple**

[**Continue with work or school single sign-on >**](#)

Figure 16-2: Google Single Sign-On (SSO)

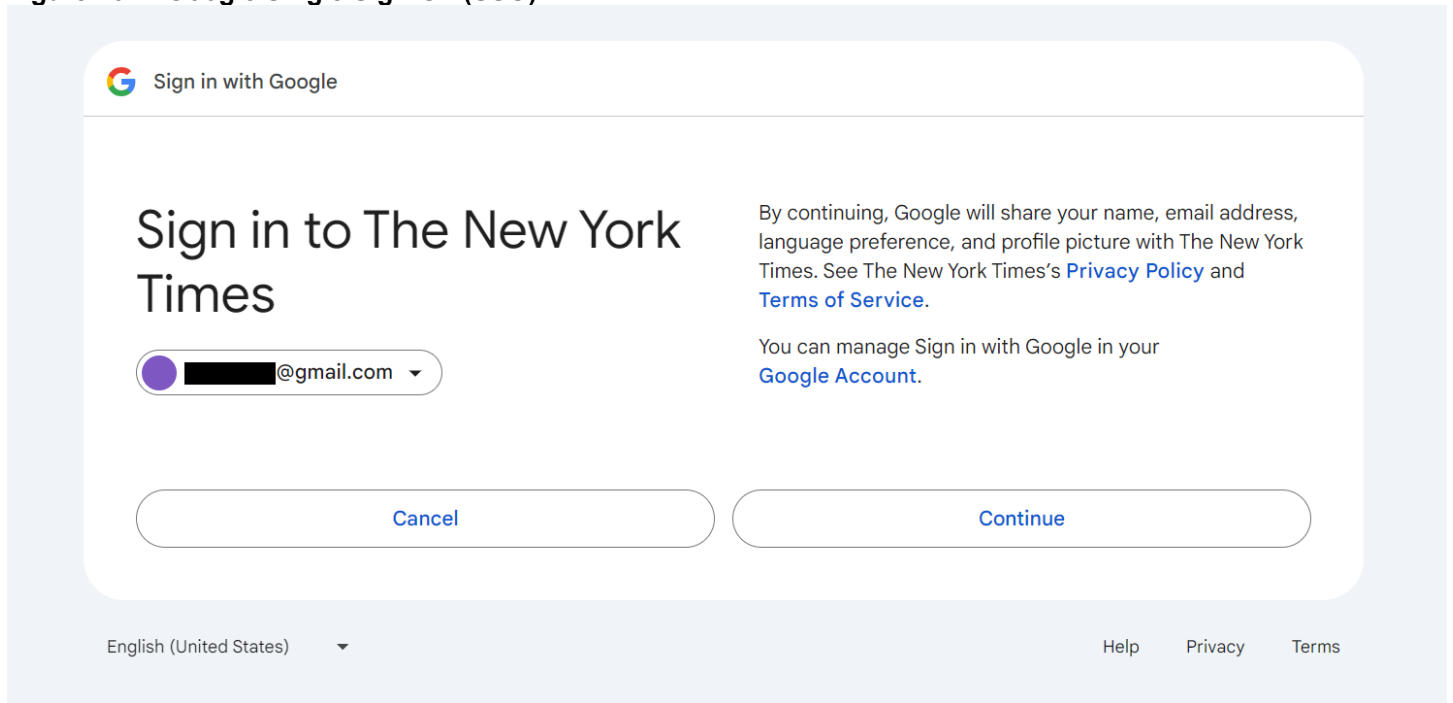
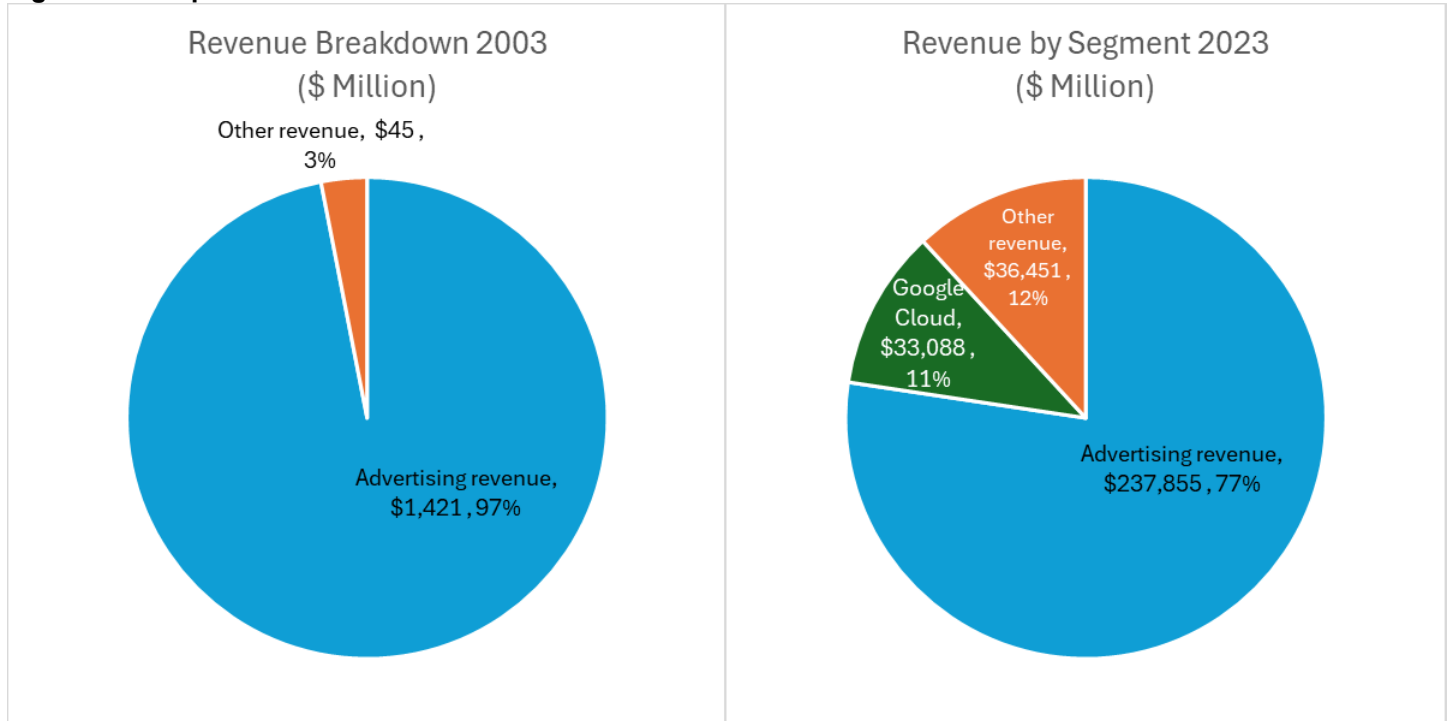


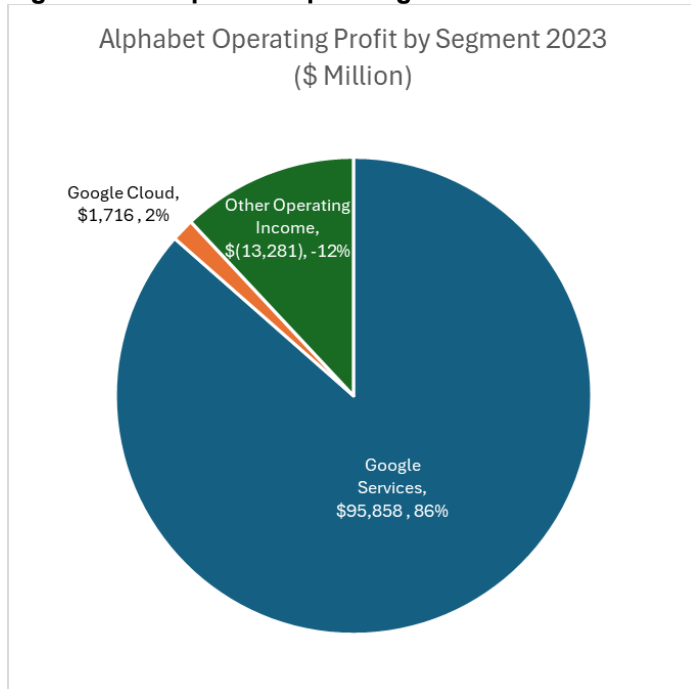
Figure 17-1: Alphabet Revenue Breakdown 2003 vs. 2023



Notes:

1. Google's advertising revenues consist of sales from Google Search and other Google properties, such as Gmail, Google Maps, and Google Play, as well as YouTube and the Google Network.²⁰⁸
2. Other revenues include sales from Google subscriptions, platforms, and devices, as well as other bets, such as healthcare-related services.
3. The total revenue of Google Services, including Google advertising, subscriptions, platforms, and devices, are \$272.5 billion in 2023.

Figure 17-2: Alphabet Operating Profit Breakdown 2023



²⁰⁸ Alphabet Annual Report 2023.

Notes:

1. Google did not disclose its segment profit in 2003, but the company's overall operating margin that year was approximately 23%. This should reasonably reflect the operating margin of Google's advertising (Google Service) segment, given that it accounted for 97% of the company's total sales at the time.
2. The operating margin of Google Services was approximately 35% in 2023.

Google's advertising products are designed to help businesses and organizations deliver targeted, relevant advertisements to users exactly when they are searching for information. Leveraging its position as the world's most popular search engine, **Google enables advertisers to reach target customers with great accuracy, showing ads to users as they search for related content. Google's advertising services are also pay-for-performance to advertisers, charging them only when users click on their ads rather than on an impression basis, maximizing the effectiveness of ads.**

Before 2000, Google's business model primarily involved licensing its search engine services to other websites, such as Yahoo.²⁰⁹ In early 2000, however, Google introduced its first advertising program through a direct sales force, allowing advertisers to place text-based ads on Google's websites, targeted to user search queries. Initially, advertisers paid based on impressions, or the number of times their ads were displayed on search results pages.²¹⁰ Later in 2000, Google launched Google AdWords as an online self-service, impression-based platform, enabling advertisers to place targeted ads on Google's websites. The pricing of the model was not disclosed.

In early 2002, Google shifted AdWords (later became Google Ads) to a cost-per-click (CPC) model exclusively, where advertisers paid only when users clicked on their ads. **Then, in 2004, Google adopted a single-pricing structure for all advertisers based on the CPC model.**²¹¹ **AdWords operates as an auction-based platform, where advertisers bid on specific keywords, an idea originally from a young Google product manager in his early 20s.**²¹² When users search for these keywords, relevant ads appear alongside search results. In 2005, Google reintroduced a cost-per-impression model that allowed advertisers to pay based on the number of times ads appeared on Google Network members' sites,²¹³ although this revenue remained a minor part of Google's overall revenue base.²¹⁴

AdWords is automated and self-serve, enabling advertisers to set up campaigns within 15 minutes with little or no assistance from Google.²¹⁵ The platform allows advertisers to control their budgets, monitor campaign performance, and adjust strategies in real-time. This ease of use has made AdWords popular among advertisers. Ten months after its launch, AdWords attracted over 100,000 advertisers, with many testing keywords to maximize marketing results. Sheryl Sandberg, who joined Google in 2001 to lead the AdWords program (later becoming Facebook's Chief Operating Officer), noted that some companies (i.e., advertisers) were purchasing thousands of keywords to test how they could best market their products. She also expected that Google had the potential to monetize globally, given AdWords' popularity in the U.S., where most bidders were located while half of Google's searches coming from overseas users.²¹⁶

In addition to AdWords, Google introduced AdSense in 2002, a product allowing third-party websites (i.e., Google Network members) to display targeted ads from AdWords advertisers. Websites can easily join AdSense for free by adding a simple string of HTML code, and Google automatically generates relevant ads based on each site's content. Google shares a significant portion of revenue, around 80% at the time of its IPO, with participating sites, as Figure 18 shows. Signing up for AdSense is free and not contractual, allowing websites to terminate their participation at any time.²¹⁷ Google also actively seeks out larger, high-traffic sites through direct sales efforts to join its network. In 2011, Google disclosed in its annual report that, under its standard agreements, it pays 51% and 68% of the fees collected from advertisers to Google Network members in AdSense for search and AdSense for content, respectively.²¹⁸

²⁰⁹ Google Prospectus 2004.

²¹⁰ Google Prospectus 2004.

²¹¹ Google Prospectus 2004.

²¹² CHM Revolutionaries: An Evening with Google's Executive Chairman Eric Schmidt.

<https://www.youtube.com/watch?v=NfalakTPsnE>

²¹³ Google Annual Report 2005.

²¹⁴ Google Annual Report 2015 – 2017

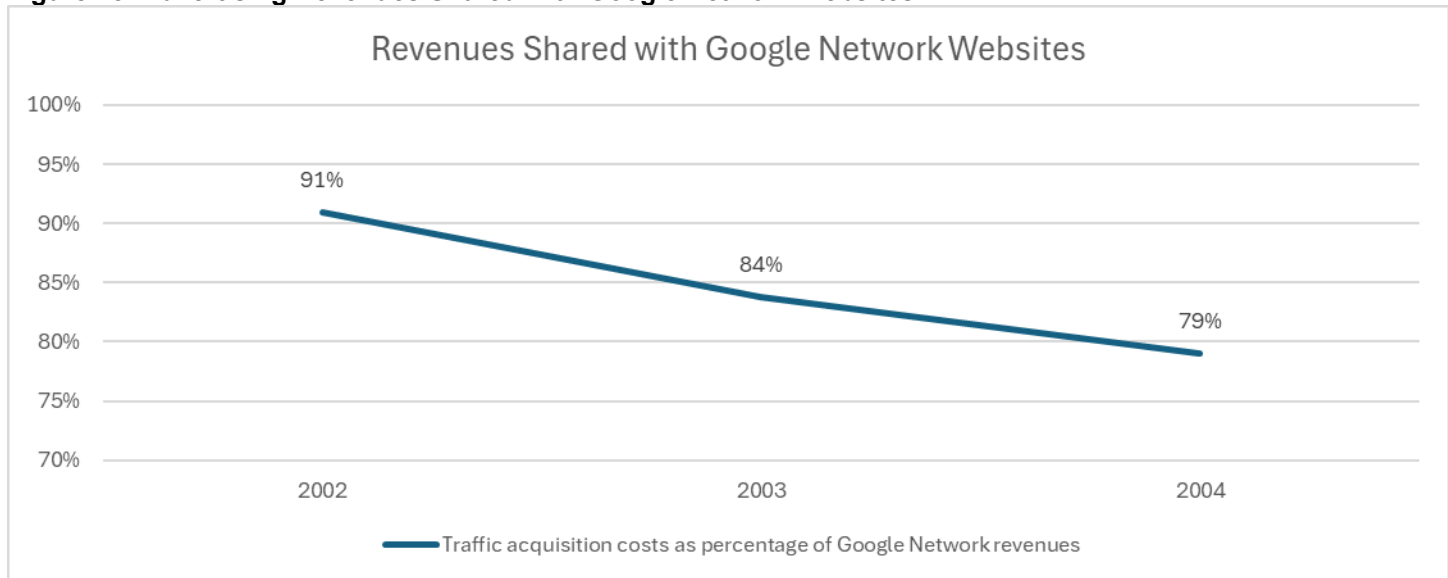
²¹⁵ Google Prospectus 2004.

²¹⁶ All Eyes on Google. Forbes. <https://www.forbes.com/forbes/2003/0526/100.html>

²¹⁷ Google Prospectus 2004.

²¹⁸ Google Annual Report 2005.

Figure 18: Advertising Revenues Shared with Google Network Websites



Notes:

1. The advertising revenues shared by Google with its network members are estimated by the traffic acquisition costs (TACs) as a percentage of advertising revenue from the Google Network. TACs consist of payments made to Google Network members. These payments are primarily based on revenue share arrangements under which Google pays its Google Network members most of the fees it receives from its advertisers.²¹⁹
2. At the time of IPO, Google's last-twelve-month TACs were estimated to be \$908 million, representing 82% of the revenue from Google Network. Since 2005, TACs have no longer been a good indicator of how much Google pays to Google Network websites because now TACs include not only payments to Google Network members but also other expenses such as payment to partners who direct search queries to Google's websites.²²⁰

Google's auction-based model benefits advertisers by delivering cost-effective ad placement. Advertisers pay only the minimum amount required to maintain their ad position, often saving money. For example, if three companies bid on the same keyword, with Company A bidding \$1.00 per click, Company B \$0.60, and Company C \$0.50, Company A would secure the top position but only pay \$0.61 per click. Company B would take the second position at \$0.51, and Company C the third position at \$0.05, the minimum bid at the time of Google's IPO. At its IPO, bids started at \$0.05 per click but can go to higher range depending on different products.²²¹ This program helps advertisers save money by minimizing the cost per click and reduces the need for constant monitoring and adjusting of their bids.²²² In late 2003, Google's average cost-per-click (CPC) was estimated to be \$0.30, compared to Overture, which was later acquired by Yahoo, \$0.40.²²³

Google also provides advertisers with extensive support, including analytics, content operation, and troubleshooting. Advertisers can reach out anytime and receive feedback and insights from support teams such as on how much budget they should allocate, whether they should spend more on YouTube or Search, and how the campaigns perform.²²⁴ In addition, advertisers also receive insights on information such as what their competitors are doing and not doing; and who they have lost the auction to and competed with, not in specific names and bidding price but in an index compared with a group of competitors.

Google's self-serve system also provides insights to clients on what they should do based on their budget and targeting parameters such as key words and geographic locations.²²⁵ It can tell them whether they are underinvesting in certain areas or how competitors are performing in the same settings. Clients also have the ability to completely stop a campaign or change direction at any point in just a few clicks. Furthermore, unlike some ad services from competitors, Google,

²¹⁹ Google Prospectus 2004.

²²⁰ Google Annual Report 2005.

²²¹ All Eyes on Google. Forbes. <https://www.forbes.com/forbes/2003/0526/100.html>

²²² Google Prospectus 2004.

²²³ Case Study: Google Inc. (9-910-036). Harvard Business School.

²²⁴ Interview with Former Senior Account Executive, Search Ads 360, Large Customer Sales – Travel/Finance at Google. 6/5/2024

²²⁵ Interview with Former Senior Account Executive, Search Ads 360, Large Customer Sales – Travel/Finance at Google. 6/5/2024

including YouTube, allows advertisers to track the entire activities of users after their ads are clicked, such as where they go afterwards, what they do, how much time they spend on the sites before they leave, etc.

Google prioritizes ad quality within its system. Ads with low response rates are moved to lower positions, encouraging advertisers to improve ad relevancy. If fewer than 0.5% of viewers click on an ad, Google may request revisions to improve relevance.²²⁶ This not only encourages advertisers to refine their wording to best associate with their ads but also helps maximize advertising revenue by placing ads with the most effective bids on top. By comparison, traditional banner ads had click-through rates of only 0.3%, making Google's approach much more effective. **We believe that this system, in which advertisers are incentivized to optimize their ads while Google serves the most relevant ads based on just a few keywords, is a key factor in Google's success in the advertising industry.**

By targeting specific keywords, businesses can ensure their ads appear when users are searching for related content, making the ads both relevant and accessible. Since AdWords uses a cost-per-click model, advertisers only pay when a user actually clicks, offering a measurable return on investment,²²⁷ allowing businesses to control their budgets, set daily spending limits, and optimize their campaigns based on user engagement. Advertisers can further refine their targeting based on geographic location, language, and even local neighborhoods, making their campaigns precise and cost-effective.

David Becker, an AdWords project manager, stated that “advertisers love the system because they only pay when someone actually clicks on their ads. **For many advertisers, it's the most efficient form of marketing they ever have.**”²²⁸

²²⁶ All Eyes on Google. Forbes. <https://www.forbes.com/forbes/2003/0526/100.html>

²²⁷ Google Prospectus 2004.

²²⁸ Larry Page & Sergey Brin - Billionaire Documentary- Google, YouTube, Alphabet, Innovation. <https://www.youtube.com/watch?v=8J7TRSLf55U>

Figure 19: Google AdWords Example 2005²²⁹

The screenshot displays a Google search interface for the query "ford escape". At the top, navigation links for "Web", "Images", "Groups", "News", "Froogle", "Local", "Desktop", and "more" are visible. The search bar contains "ford escape" and a "Search" button. Below the search bar, the results are categorized under "Web".

Sponsored Links:

- Ford Escape Homepage** (www.FordVehicles.com) - Visit the Official Escape Homepage Plus Features, Options, MSRP
- Ford Escape Prices** (www.CarPriceSecrets.com) - Get the Dealer's Bottom Line Price! No obligation quotes - Easy & Free.
- Ford Escape Prices** (www.FordDirect.com) - Free & Fast Price Quotes on New Fords - Official Ford Website!

Organic Search Results:

- 22 results stored on your computer - Hide - About
- MarketingShift - Marketing - Escape Pollution In A Ford Escape Hybrid - 9:03am
- Ford Escape Hybrid On... - 3 reasons for the project: Ford Escape - Apr 19

Refine your search for ford escape:

Location: [US city or zip] | Make: [ford] | Model: [escape] | Search vehicles

Remember this location

Ford Vehicles: 2006 Ford Escape - See pricing details, SUV options ...
 Ford Vehicles offers information on the Ford Escape. Information includes SUV comparisons, SUV options, colors, 360 views, photo gallery, models, trims, ...
www.fordvehicles.com/suvs/escape/ - 11k - Cached - Similar pages - Remove result

Ford Vehicles: Escape Hybrid
 ENTER SITE
www.fordvehicles.com/escapehybrid/ - 7k - Cached - Similar pages - Remove result
 [More results from www.fordvehicles.com]

2006 Ford Escape Hybrid Prices, Pictures, Reviews on Yahoo! Autos
 Find out 2006 Ford Escape Hybrid cars information on Yahoo! autos. Get free new Ford Escape Hybrid car prices, new Ford Escape Hybrid pictures, specs, ...
autos.yahoo.com/newcars/ford_escapehybrid_2006/4358/model_overview.html - 82k - Cached - Similar pages - Remove result

Sponsored Links (Right Column):

- Ford escape** - Find a Used Ford by Zip Code Search local dealers--Autoguide.com www.AutoGuide.com Orlando-Daytona Beach, FL
- Ford Escape Prices** - Get Free, fast price quotes on new Ford Escapes now! No obligation. www.NewCars.com
- 2006 Ford Escape** - Compare multiple quotes on a new Ford Escape from local dealers. www.PriceQuotes.com
- Ford Escape at Carmax** - Actual Prices & Photos of Over 20,000 New & Used Vehicles Online www.carmax.com
- Ford Escape Overstock** - Database of Overstocked Dealers. They Slash Prices to Clear Lot. CarQuote.AutoDiscountGroup.com
- 2006 Escape Review** - Read Our Comprehensive Review On Ford Escape at edmunds.com www.Ford.edmunds.com
- Ford Escape** - Fast and Free Ford Escape Quotes.

The Google Network, comprising third-party sites, extends advertisers' reach beyond Google's own platforms. By 2013, Google ads were displayed on over 2 million websites globally,²³⁰ reaching 90% of global internet users and 94% of U.S. users, 65% of whom engaged with ads daily. This wide reach increases businesses' chances of reaching new audiences likely to engage with their products or services.

For third-party websites, regardless of their sizes, joining Google Network and participating in Google's AdSense program offer them opportunities to monetize their content without having to invest additional resources to develop their own advertising infrastructure. Google handles the ad delivery process, providing access to a broad base of advertisers, and shares the majority of the revenue generated from ad clicks with the participating websites. Once a website joins the Google Network, ads are automatically displayed on its pages, creating an immediate revenue stream without additional costs, while the owners of website retains the control of where they would like to display the ad from Google.²³¹ Compared with traditional banner advertising, ads displayed through AdSense had up to 5 times the average click-through rate.²³²

By 2004, Google had already amassed over 100,000 advertisers worldwide, including AOL, Amazon, the New York Times, Yahoo, Ask Jeeves, etc.²³³ During the same time, Overture, was estimated to have 88,000 advertisers when it was acquired by Yahoo.²³⁴

²²⁹ The Evolution of Google AdWords. <https://www.advia.com.au/adwords/the-evolution-of-google-adwords>

²³⁰ Google Display Network. Think With Google. https://www.thinkwithgoogle.com/_qs/documents/5265/think2Fdocs2Fgoogle-display-network_products.pdf

²³¹ Google Prospectus 2004.

²³² Case Study: The Google IPO. Darden Business Publishing, University of Virginia.

²³³ Case Study: The Google IPO. Darden Business Publishing, University of Virginia.

²³⁴ Yahoo Agrees to Acquire Overture For \$1.63 Billion. WSJ. <https://www.wsj.com/articles/SB105818965623153600>

Google, along with some other online advertising platforms, has advantages over traditional media channels such as TV and print media. We will discuss these advantages in the section below but believe it is not just because of its cost-per-click model but also due to its ability to precisely target audiences and track their behaviors. Eric Schmidt, Google's CEO at the time of IPO, stated that "the internet will transform advertising because of its trackability, not its beauty."²³⁵

Advertisers on Google pay anywhere from a few cents to as much as \$100 for keywords related to their businesses, such as "tape," "nails," and others. **Importantly, they only pay Google when users actually click on the ads that appear in search results. In addition, advertisers can bid more if they want to secure better positions for ad placement among other advertisers.**²³⁶ A wholesaler of industrial tape in Florida endorsed Google's ability to deliver effective ads and stated that, "We spend about \$2,000 to \$2,500 a month on search-based advertising on Google and Yahoo. But we get 20 times more a month on sales (implying only 5% of revenue) ... The search-engine ads work great for us because they're cheap and we can track how many people are coming to our site... You can't do that with print ads which are so much more expensive."²³⁷ Although the exact cost difference between advertising on Google and using traditional print media was not specified, it is clear that Google ads are more effective for many advertisers – advertising on Google ensures that everyone who clicks on the links has seen the ad, and advertisers can easily track their data, something much harder to do with print and other forms of media. Although Google does not publicly disclose the overall return on ad spending for its advertisers, its chief economist in 2009 found that, on average, advertisers generate \$2 to \$2.3 in revenue for every \$1 spent on Google Ads.²³⁸

A former employee familiar with AdWords at Google mentioned that typical mid-size retailers might spend anywhere from 5% to 10% of their revenue annually on Google ads and Search ads.²³⁹

While Google is a cost-effective advertising platform for small businesses, it also works well for larger companies. A New York-based jewelry retailer shared that the company allocates about 80% of its advertising budget, roughly six figures monthly, to Google ads, as well as other some other websites. The owner spoke highly of Google, saying, "We tested all kinds of advertising when the company was founded five years ago. Nothing worked except Google paid ads."²⁴⁰ The owner also noted that many large retailers, like J.C. Penney and Walmart, had become Google advertisers as well.

In contrast, TV commercials usually require advertisers to pay a large lump sum for a set time slot, such as 30 seconds, between TV shows, hoping viewers will engage with their advertisements. However, this approach offers limited insight into its effectiveness, as advertisers have no way of determining how many people watching actually stay tuned and respond to the ads. For example, the 2004 Super Bowl, one of the most-watched TV events in the U.S., charged a \$2.3 million for a 30-second commercial.²⁴¹ With 89.8 million viewers estimated to have watched the game, this works out to roughly \$0.026 per viewer, assuming every single viewer stayed and paid attention to the ads. However, this assumption might be far from realistic. Moreover, this steep cost restricted such advertising opportunities to only the largest companies.

Beyond the high price tag, advertisers face two important limitations with TV commercials: they cannot measure how many viewers actually watched the ads, nor can they target viewers based on specific demographic characteristics such as interests and locations, leaving them unable to determine the effectiveness of their investment and whether they should continue in the future. Furthermore, TV commercials lack the interactivity and permanence that Google ads offer. If viewers miss crucial details such as phone numbers or web addresses, they have no way to revisit the ads, even if they develop an interest in the products.

In addition, the production process for a 30-second TV commercial can be costly and time-consuming, requiring photoshoots, editing, and post-production to create an ad that captures viewers' attention in such a short span, all of which add to the overall expense on top of the \$2.3 million commercial fee. In contrast, online advertising allows advertisers to simply post links that direct potential customers to product pages for viewers to view the details of the advertised products and services, making it a far more cost-effective option. Consequently, the actual cost per effective

²³⁵ Eric Schmidt, chairman and CEO, Google; Jupiter/IAB Ad Forum, October 2002. Advertising Spending Online Offline Spending Forecasts Report July 2003. eMarketer.

²³⁶ Retailers Googly-Eyed Over Google. CNN. https://money.cnn.com/2004/04/29/technology/search_advertising/

²³⁷ Retailers Googly-Eyed Over Google. CNN. https://money.cnn.com/2004/04/29/technology/search_advertising/

²³⁸ Varian, Hal R. 2009. "Online Ad Auctions." American Economic Review 99 (2): 430–34.; Google Economic Impact. <https://economicimpact.google/methodology/>

²³⁹ Interview with Former Google AdWords Workflow and Revenue Lead at Google. 11/30/2021.

²⁴⁰ Retailers Googly-Eyed Over Google. CNN. https://money.cnn.com/2004/04/29/technology/search_advertising/

²⁴¹ Super Bowl Historical Advertising Cost and Viewers. Nielsen <https://www.nielsen.com/news-center/2021/super-bowl-lv-draws-nearly-92-million-tv-viewers/>

view for TV commercials can be much higher than the basic \$0.026 average mentioned earlier. Advertisers must be prepared to set aside the full \$2.3 million upfront for just 30 seconds of exposure during a single event, such as the Super Bowl. This sharply contrasts with the flexibility and targeted reach that online advertising platforms like Google offers, where the investment is far more efficient and flexible to a brand's specific needs, regardless of the business size.

Advertising with Google, on the other hand, is fundamentally different and more efficient. At a minimum cost of just \$0.05 per click, depending on bidding competition, advertisers can display their ads indefinitely as long as users stay on the webpages, allowing users to spend as much time as they want exploring the advertised products or services. Moreover, Google enables advertisers to precisely target audiences by ensuring their ads are directly aligned with the keywords users search for, eliminating the need for a massive upfront investment. They can also monitor users' engagement on a real time basis and make adjustment accordingly such as to the key words related to their advertisements, users' geographic locations, etc. As a senior e-marketing manager from AstraZeneca pointed out in 2003, "it's also much less costly doing marketing online versus TV and/or print. Not only for our brands, but for the smaller brands that have to be frugal."²⁴²

Beyond cost-effective services, Google treats advertisers well, fostering strategic conversations and encouraging spending. According to a former Advertising Research Lead at Facebook, which does digital advertising through its social media platform, Google offers many perks to their clients to make them happy to have more strategic conversations and spend more on Google and churn less.²⁴³ For example, large advertising clients of Google might have someone from Google with over 15 to 20 years of experience in media as their account representative to help them prepare for board meeting, look at consumer insight trends, and review their performance to make sure they are working toward achieving best-in-class performance. In addition, Google might also invite their clients to exciting events from time to time, inviting them to Disney, giving them free gifts, etc.

Since its IPO, Google's advertising revenue has grown from \$1.4 billion in 2003 to \$237.8 billion in 2023, a 29% CAGR, including the revenue from both Google and Google Network. The share of advertising revenue as a percentage of Google's overall revenue has decreased from 97% to 77% over the same period. This shift reflects Google's strategic expansion into new areas, such as YouTube subscriptions, Google Play Store, cloud services, Pixel phones, and Generative AI, all of which have diversified its revenue streams beyond advertising.

A notable fact is that, by 2024, only about 20% of Google search queries are monetized, meaning that 80% of the search queries are not associated with ads,²⁴⁴ contributing to nearly 70% of Google's advertising revenue.²⁴⁵ This suggests that, potentially, there are still plenty of opportunities for Google to grow its advertising revenues in the future. However, with its development of generative artificial intelligence (GenAI), which is partly to defend search queries from going to other AI models such as ChatGPT, Google might face decreased users' clicks on search results because users can get their answers directly in the top section of search pages and thus less likely to click on an ad, potentially hurting the advertising revenue. It would be difficult to have ads in search results generated by the AI because they might look unnatural to users, as well as raising concerns that Google's GenAI is being influenced by paying advertisers, against Google's founding principle of being objective. However, the short-term impact of GenAI on Google's revenue is uncertain at this stage. Google's priority is to ensure a good user experience in search by integrating AI and retaining its users. In addition to improving search, Google also rolled out paid subscription for its generative AI model, Gemini, in the first quarter of 2024, at \$19.99 a month, including a more power AI model than the free version.²⁴⁶

Although Larry Page indicated in a 2000 interview that "artificial intelligence will be the ultimate version of Google" that understands everything on the web and exactly what users want, and delivers the right things,²⁴⁷ at this point, Google has not yet fully figured out the long-term strategy, particularly in monetization, of its GenAI. According to an AI expert from Adobe, who is also an AI search consultant, Google has been proceeding cautiously with consumer-facing AI features, trying to avoid cannibalizing its search queries, which its advertising business still relies on. While it is undoubtedly technically capable of developing AI products better than competitors, Google, along with the broader industry, has not yet

²⁴² Advertising Spending Online Offline Spending Forecasts Report July 2003. eMarketer.

<https://www.bus.umich.edu/KresgePublic/Journals/EmarketerReports/2003/Advertising%20Spending%20Online%20Offline%20Spending%20Forecasts%20Report%20July%202003.pdf>

²⁴³ Interview with Former Advertising Research Lead at Facebook. 11/13/2020.

²⁴⁴ Interview with Former Director, Global Go-to-Market Strategy, Ads at Google. 7/22/2024.

²⁴⁵ Interview with Former Head, Go-To-Market, Media Service at Google. 7/12/2024.

²⁴⁶ Google Rebrands Bard Chatbot as Gemini, Rolls Out Paid Subscription. Reuters. <https://www.reuters.com/technology/google-rebrands-bard-chatbot-gemini-rolls-out-paid-subscription-2024-02-08/>

²⁴⁷ Larry Page and Sergey Brin interview on Starting Google (2000). <https://www.youtube.com/watch?v=tldZ3lhsXEE>

figured out ways to effectively incorporate advertising into AI-driven search.²⁴⁸ At present, the ultimate monetization model for GenAI across the industry remains unclear. In addition to offering free versions of their AI tools, Google and other leading companies have introduced subscription tiers, typically ranging from around \$20 to over \$200 per month. These tiers vary based on users' needs for advanced features and the computing power required.

The Return of Google's Founder and the 2025 I/O Conference

In December 2019, Google co-founders Larry Page and Sergey Brin announced they were stepping down from their executive roles at Alphabet, the parent company of Google. Though they remained on Alphabet's board, their intention was to simplify the company's leadership structure.²⁴⁹ With Sundar Pichai already serving as CEO of Google, the founders saw no need to maintain overlapping leadership. From then on, Pichai assumed the dual role of CEO for both Google and Alphabet, overseeing Google's operations and managing the broader portfolio of Alphabet's investments.

During their semi-retirement, Page and Brin largely stayed out of day-to-day operations, checking in only occasionally, mostly to review progress on Alphabet's ambitious "moonshot" projects under the "Other Bets" division. They were not particularly involved with Google's core search engine business.²⁵⁰

That changed in late 2022, when the launch of OpenAI's ChatGPT took the tech world, including Google, by surprise. Industry participants viewed ChatGPT as a disruptor capable of reshaping how people interact with information online.²⁵¹ Unlike traditional search, which delivers a list of links, ChatGPT could generate direct answers, ideas, and suggestions, from business strategies to holiday gift lists.

Although Google had already invested heavily in AI and built its own chatbot called LaMDA (Language Model for Dialogue Applications), it was hesitant to release it publicly. **The concern was that a conversational AI might disrupt its core search business and would not easily support the advertising model that Google has heavily relied on.**²⁵² In addition, Google, as a massive and highly visible company, was more cautious about releasing a new technology that could produce inaccurate or biased information, issues that are commonly seen on generative AI chatbots.

However, just weeks after ChatGPT's release, Pichai sounded the alarm internally. In January 2023, he invited Page and Brin back to consult on Google's AI strategy, declaring a "code red."²⁵³ The company quickly shifted its priorities, accelerating the development and release of AI technologies. Google lined up a suite of AI tools, from code generation and image creation to developer platforms for building custom AI solutions. These efforts were aimed not just to defend its search business, but to open new revenue streams through Google Cloud and enterprise services.

By September 2024, **Sergey Brin made it official for the first time since his retirement that he was back at Google, working on AI "pretty much every day."**²⁵⁴ **Acknowledging Google's earlier hesitation, he stated it was time to take risks and move faster, even if that meant mistakes and embarrassments.** He referenced the flawed launch of Google's Gemini image generator as an example, which produced inaccurate images.

²⁴⁸ Interview with Data Science Manager AI/ML Applications at Adobe. 12/17/2024.

²⁴⁹ A Letter from Larry and Sergey. <https://blog.google/alphabet/letter-from-larry-and-sergey/>

²⁵⁰ Google Calls In Larry Page and Sergey Brin to Tackle ChatGPT and A.I. Chatbots. The New York Times.

<https://web.archive.org/web/20250306224121/https://www.nytimes.com/2023/01/20/technology/google-chatgpt-artificial-intelligence.html>

²⁵¹ The New Chatbots Could Change the World. Can You Trust Them. The New York Times.

<https://web.archive.org/web/20250306120112/https://www.nytimes.com/2022/12/10/technology/ai-chat-bot-chatgpt.html>

²⁵² ChatGPT and Other Chat Bots Are a 'Code Red' for Google Search. The New York Times.

<https://web.archive.org/web/20250307131343/https://www.nytimes.com/2022/12/21/technology/ai-chatgpt-google-search.html>

²⁵³ Google Calls In Larry Page and Sergey Brin to Tackle ChatGPT and A.I. Chatbots. The New York Times.

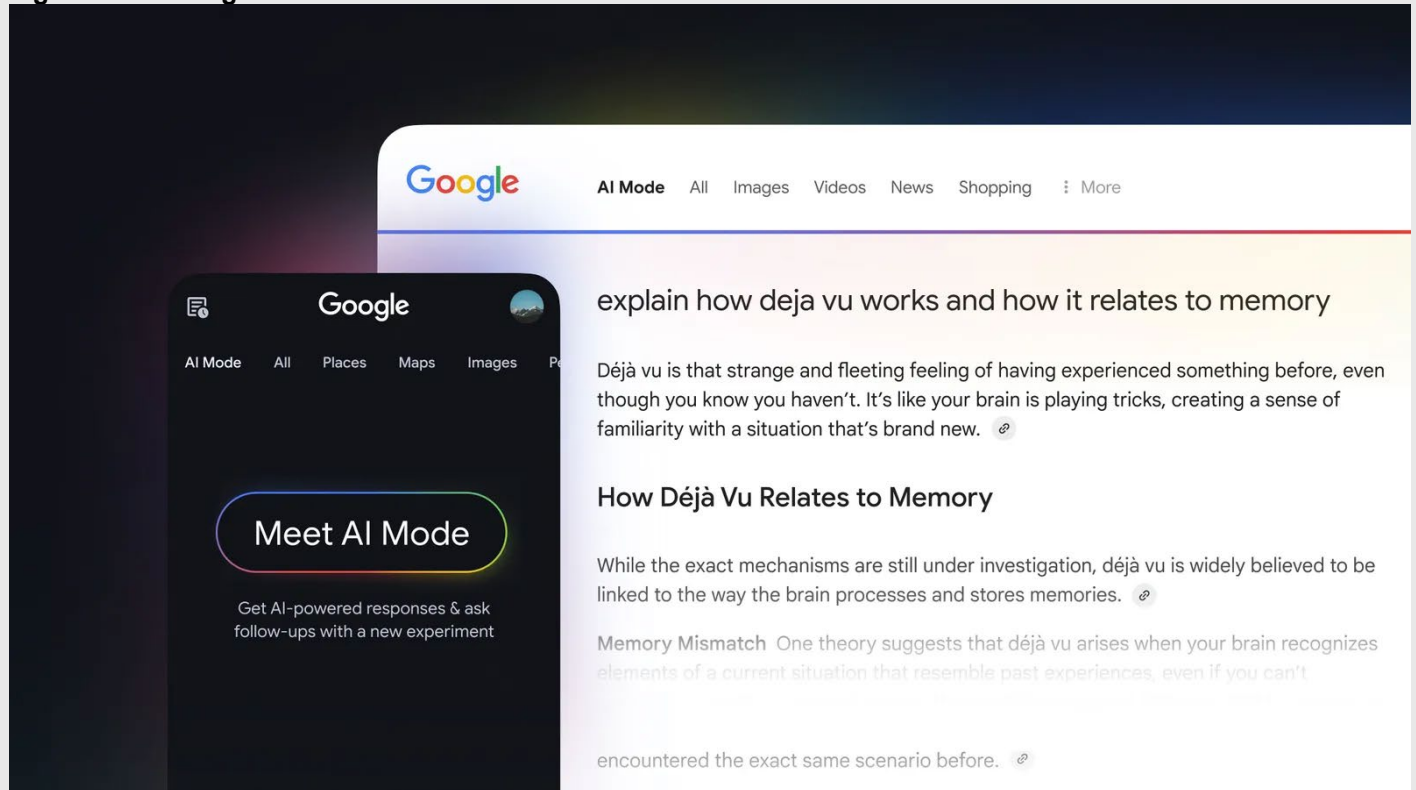
<https://web.archive.org/web/20250306224121/https://www.nytimes.com/2023/01/20/technology/google-chatgpt-artificial-intelligence.html>

²⁵⁴ Sergey Brin Is Back. Is Google Working on a 'God' AI Model. <https://www.entrepreneur.com/business-news/sergey-brin-is-back-is-google-working-on-a-god-ai-model/479739>

In May 2025, Sergey Brin appeared on Google I/O developer conference, restating he is back at Google “pretty much every day now,” developing AI products and helping train the Gemini models.²⁵⁵ Brin declared that Google fully intend that “Gemini will be the very first AGI (artificial general intelligence²⁵⁶).”²⁵⁷

At its I/O in May 2025, Google announced its AI advancements, placing Gemini at the center of Google’s ecosystem, from search to creative tools, and stating that it would make them gradually available to users.²⁵⁸ **The new Search AI Mode introduces features such as Deep Search, Search Live (real-time visual interaction), and agentic actions that can perform tasks such as booking tickets. Enhanced AI shopping tools now include virtual try-on, intelligent price tracking, and personalized product suggestions.**

Figure 20-1: Google AI Mode²⁵⁹



Note:

1. The screenshot above shows how Google Search, in AI mode, can directly answer users’ questions, regardless of their length or complexity. The new features are available on both the desktop and mobile versions.

²⁵⁵ Sergey Brin Explains His Google Return and AI Focus at I/O Conference. Business Insider. <https://www.businessinsider.com/google-cofounder-sergey-brin-ai-io-conference>

²⁵⁶ Current AI works within fixed limits and performs specific tasks, like recognizing images or generating text. AGI (Artificial General Intelligence) is a theoretical goal to create AI that can learn, adapt, and solve new problems across different areas, like a human, without being pre-programmed for each task.

²⁵⁷ Sergey Brin Returns to Google, Calls on Retired Computer Scientists to Join the AI Revolution. Business Today. <https://www.businesstoday.in/technology/news/story/sergey-brin-returns-to-google-calls-on-retired-computer-scientists-to-join-the-ai-revolution-477452-2025-05-23>

²⁵⁸ Google I/O 2025 – 100 Things Google Announced. <https://blog.google/technology/ai/google-io-2025-all-our-announcements/>

²⁵⁹ Expanding AI Overviews and Introducing AI Mode. <https://blog.google/products/search/ai-mode-search/>

Figure 20-2: Google Deep Search in AI Mode²⁶⁰

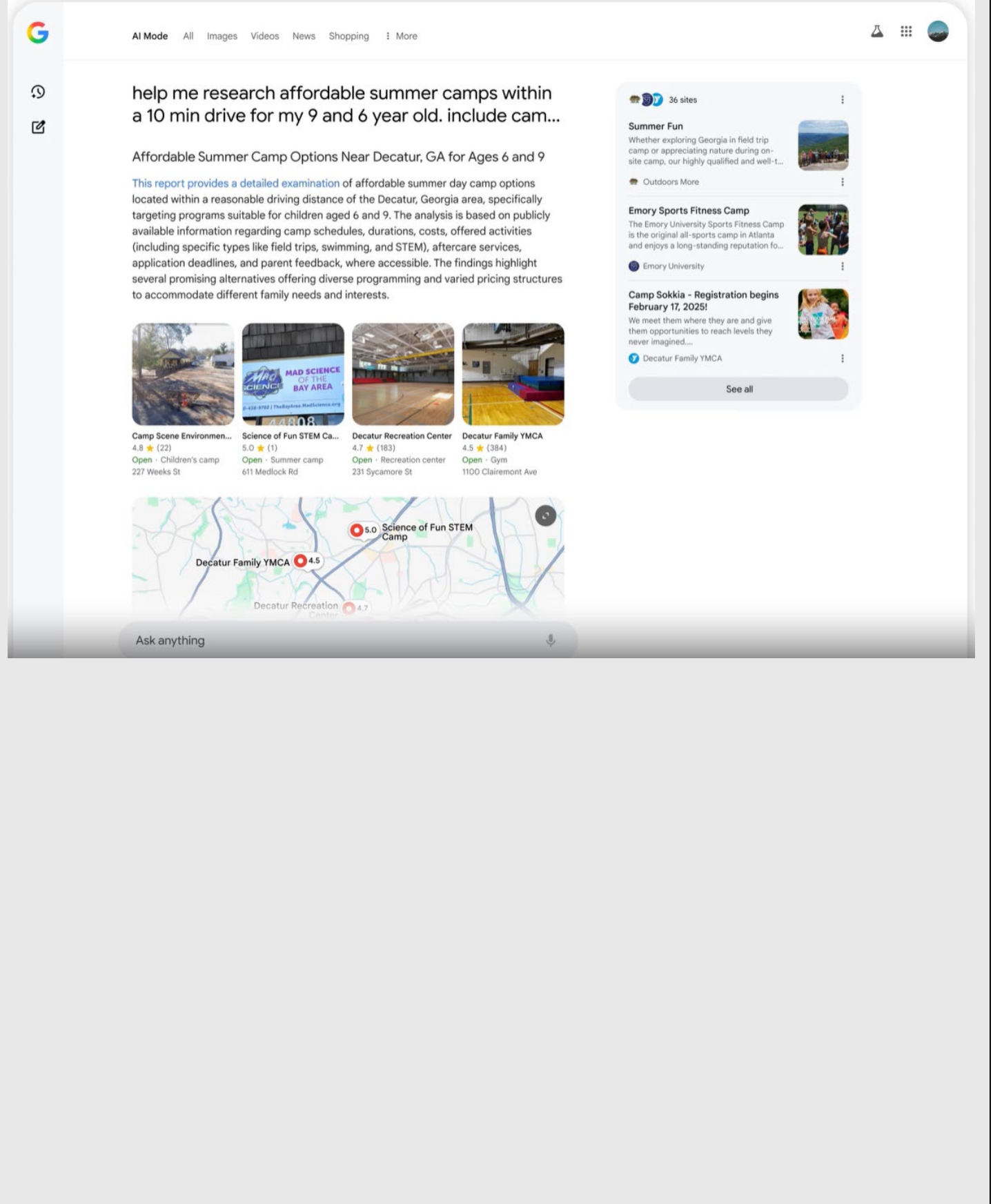
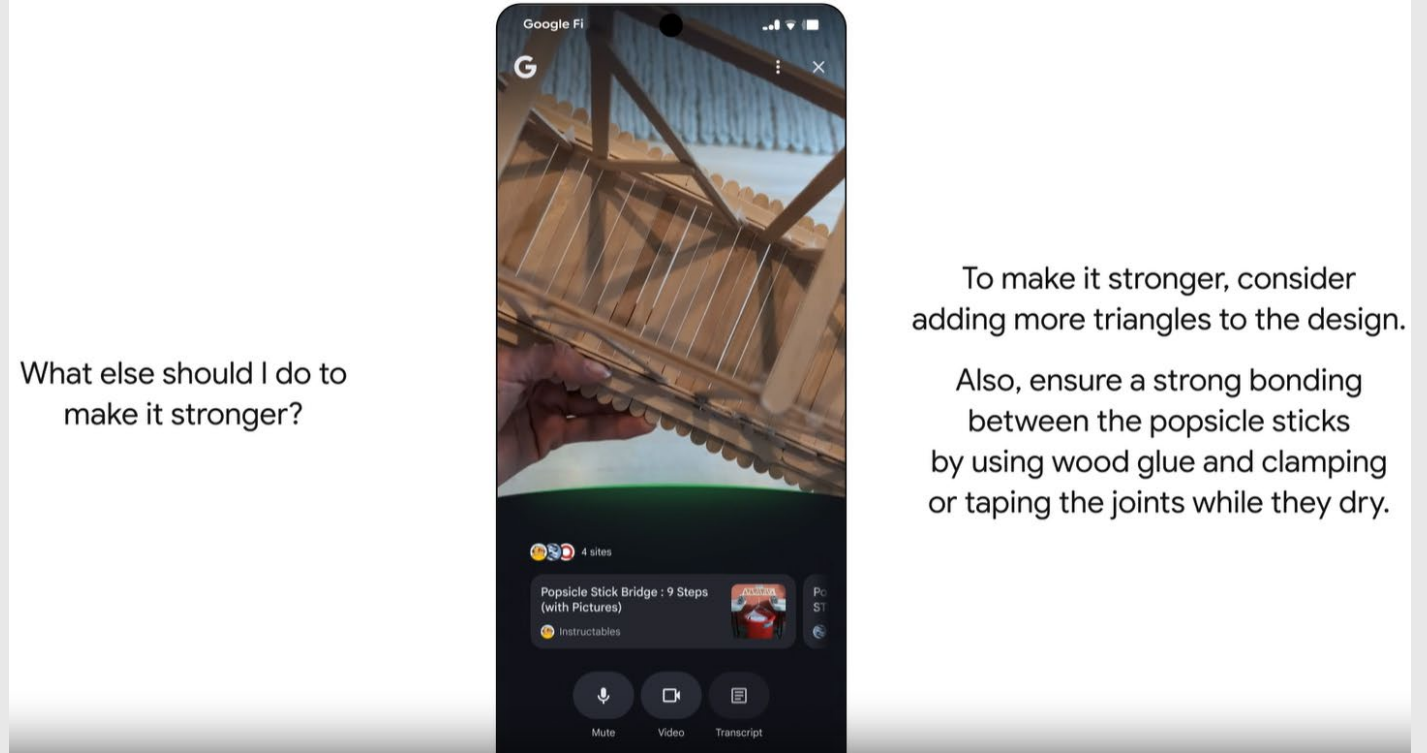
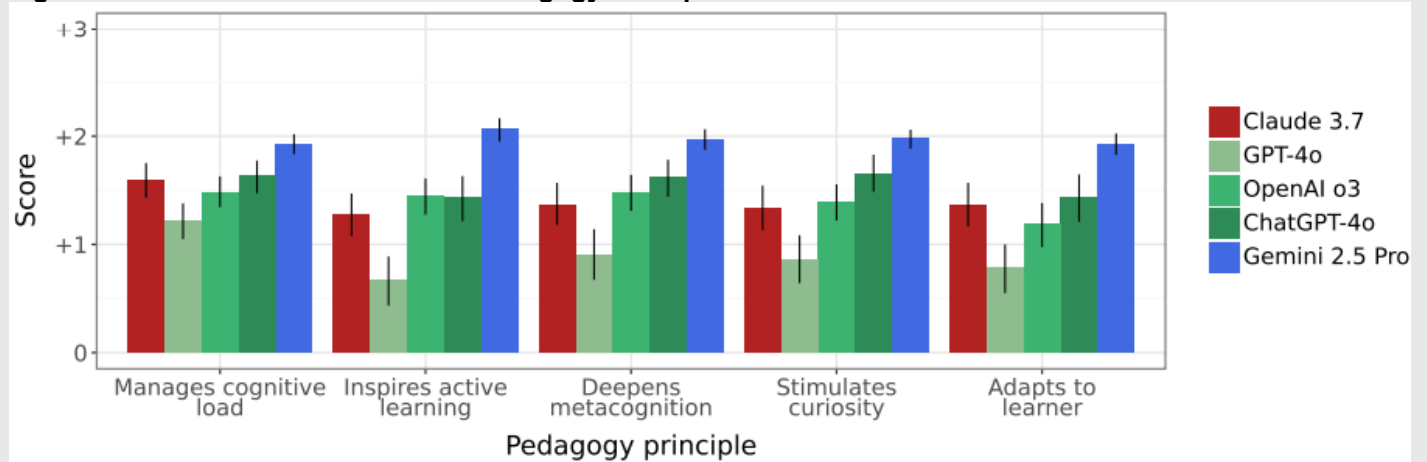


Figure 20-3: Google Search Live²⁶¹



Gemini 2.5 according to Google, is now the world’s leading model for learning with Gemini 2.5 Pro outperforming competitors on every category of learning science principles. In Google’s report, it states that Gemini is preferred by experts in 73.2% of head-to-head match-ups overall. Specifically, it beat Claude 3.7 Sonnet (71.3%), GPT-4o (81.8%), OpenAI o3 (74.2%), and ChatGPT-4o (61.0%). It scored highest on all pedagogical principles, including managing cognitive load (82.1% on a scale of -3 to +3) and inspiring active learning (84.4%). In targeted evaluations, it showed the lowest grade-level deviation (0.99) in text simplification, top-tier accuracy in short-answer grading (84.1%), and led in mistake identification (87.4%).²⁶²

Figure 21: Gemini Pro 2.5 Scores on Pedagogy Principle²⁶³



Gemini powers AI Overviews, which now serve 1.5 billion users monthly across 200+ countries. The Pro version, Gemini 2.5 Pro, leads the industry in reasoning and learning science benchmarks, while Gemini 2.5 Flash offers high-speed and efficient performance.

²⁶¹ Search Live AI Mode. https://storage.googleapis.com/gweb-uniblog-publish-prod/original_videos/Search_Live_-_AI_Mode_2.mp4

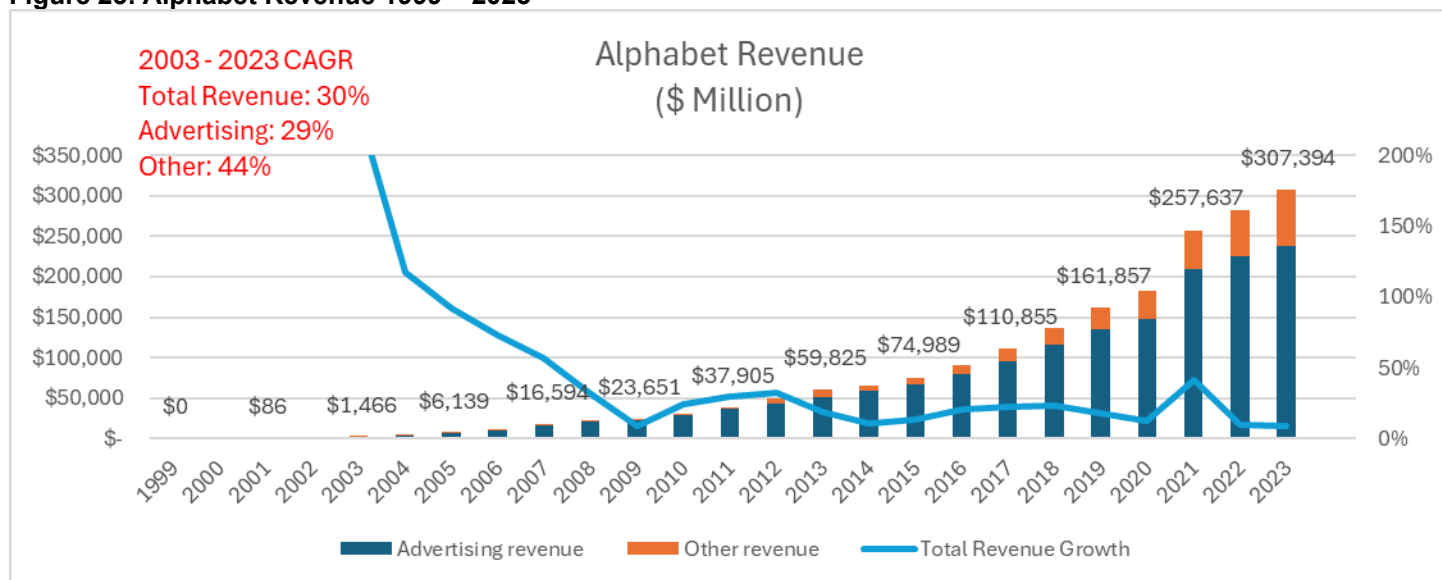
²⁶² Evaluating Gemini in an Arena for Learning. LearnLM Team. 5/19/2025

²⁶³ Evaluating Gemini in an Arena for Learning. LearnLM Team. 5/19/2025

(Journeys to developers test critical user journeys using Gemini by describing test steps in natural language) to simplify app and AI development.

In addition, Google launched new plans to users: AI Ultra (\$249.99/month) gives full access to the best models and tools, while AI Pro (\$19.99/month) offers a powerful but affordable alternative. College students in select countries get a free Gemini upgrade for a year. **Google has also seen a significant adoption of its AI, now processing over 480 trillion tokens per month, up from 9.7 trillion last year, evidence that Gemini has become Google's flagship product and strategic focus.**

Figure 23: Alphabet Revenue 1999 – 2023



\$ Million	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Google web sites	\$ -	\$ -	\$ 67	\$ 307	\$ 792	\$ 1,589	\$ 3,377	\$ 6,333	\$ 10,625	\$ 14,414	\$ 15,723	\$ 19,444	\$ 26,145
Google Network web sites	\$ -	\$ -	\$ -	\$ 104	\$ 629	\$ 1,554	\$ 2,688	\$ 4,160	\$ 5,788	\$ 6,715	\$ 7,166	\$ 8,792	\$ 10,386
Advertising revenue	\$ -	\$ -	\$ 67	\$ 411	\$ 1,421	\$ 3,143	\$ 6,065	\$ 10,493	\$ 16,413	\$ 21,129	\$ 22,889	\$ 28,236	\$ 36,531
Other revenue	\$ -	\$ -	\$ 19	\$ 29	\$ 45	\$ 46	\$ 74	\$ 112	\$ 181	\$ 667	\$ 762	\$ 1,085	\$ 1,374
Revenues	\$ 0.2	\$ 19	\$ 86	\$ 440	\$ 1,466	\$ 3,189	\$ 6,139	\$ 10,605	\$ 16,594	\$ 21,796	\$ 23,651	\$ 29,321	\$ 37,905
Total Revenue Growth		8585.5%	352.3%	408.5%	233.5%	117.6%	92.5%	72.8%	56.5%	31.3%	8.5%	24.0%	29.3%

\$ Million	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Google web sites	\$ 31,221	\$ 37,453	\$ 45,085	\$ 52,357	\$ 63,785	\$ 77,788	\$ 96,336	\$ 113,264	\$ 123,834	\$ 177,796	\$ 191,693	\$ 206,543	
Google Network web sites	\$ 12,465	\$ 13,125	\$ 13,971	\$ 15,033	\$ 15,598	\$ 17,587	\$ 19,982	\$ 21,547	\$ 23,090	\$ 31,701	\$ 32,780	\$ 31,312	
Advertising revenue	\$ 43,686	\$ 50,578	\$ 59,056	\$ 67,390	\$ 79,383	\$ 95,375	\$ 116,318	\$ 134,811	\$ 146,924	\$ 209,497	\$ 224,473	\$ 237,855	
Other revenue	\$ 6,489	\$ 9,247	\$ 6,945	\$ 7,599	\$ 10,889	\$ 15,480	\$ 20,501	\$ 27,046	\$ 35,603	\$ 48,140	\$ 58,363	\$ 69,539	
Revenues	\$ 50,175	\$ 59,825	\$ 66,001	\$ 74,989	\$ 90,272	\$ 110,855	\$ 136,819	\$ 161,857	\$ 182,527	\$ 257,637	\$ 282,836	\$ 307,394	
Total Revenue Growth		32.4%	19.2%	10.3%	13.6%	20.4%	22.8%	23.4%	18.3%	12.8%	41.2%	9.8%	8.7%

Google has consistently maintained high, stable profit margins since its IPO. Its gross margin has generally ranged between 55% and 65%, while operating margins have stayed near 25% to 30%. As a company primarily offering online services such as search, email, and software to users, alongside advertising services to businesses, Google has been able to scale its revenue. This scalability largely stems from its infrastructure; as long as Google has sufficient data center capacity and computing power, it can support additional users and customers without incurring substantial new expenses. One likely reason that the company has not shown significant margin expansion is its investment in newer business ventures beyond advertising. These include Google Cloud and “Other Bets” such as autonomous driving and healthcare, many of which are either low-profit or currently unprofitable. In 2023, Google Services²⁶⁵ generated total revenue of \$272 billion with an operating margin of approximately 35%. By comparison, Google Cloud²⁶⁶ contributed \$33 billion in revenue with a modest 5% operating margin (from losses prior to 2022), while Other Bets²⁶⁷ generated \$1.5 billion in revenue but

²⁶⁵ Google Services generates revenues primarily by delivering both performance and brand advertising that appears on Google Search & other properties, YouTube, and Google Network partners' properties. Alphabet Annual Report 2023.

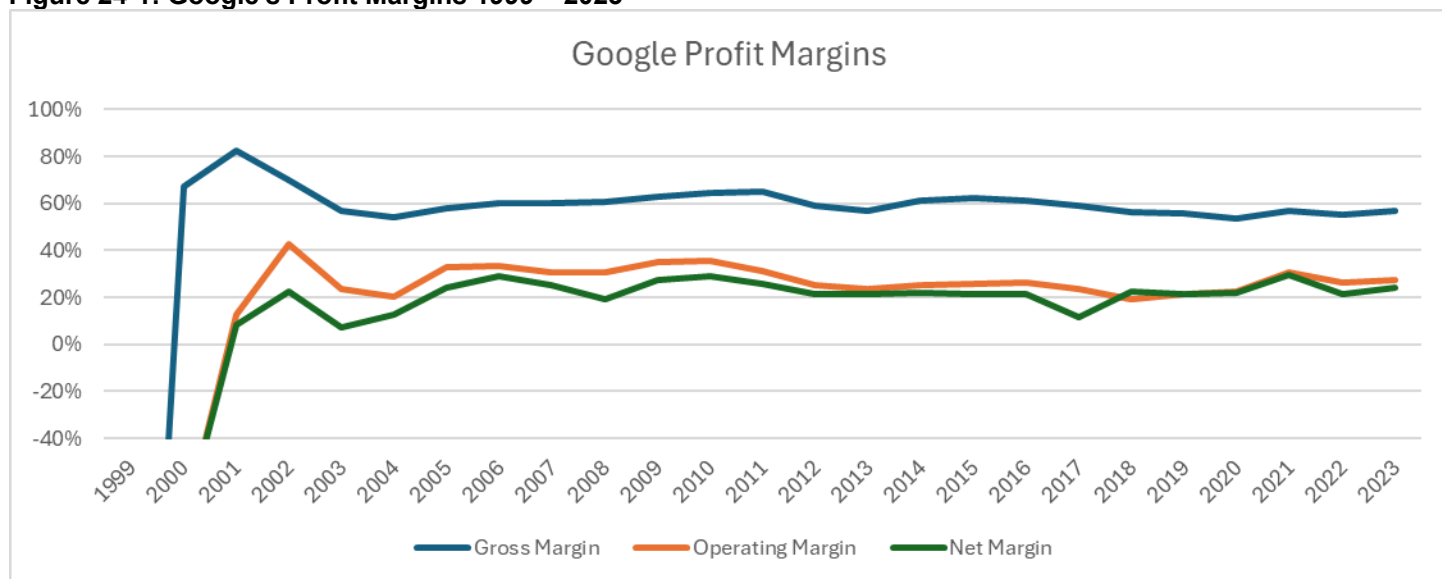
²⁶⁶ Google Cloud generates revenues primarily from consumption-based fees and subscriptions for infrastructure, platform, collaboration tools and other cloud services. Alphabet Annual Report 2023.

²⁶⁷ Alphabet's investment in the portfolio of Other Bets includes businesses that are at various stages of development, ranging from those in the R&D phase to those that are in the beginning stages of commercialization. Revenues from Other Bets are generated primarily from the sale of healthcare-related services and internet services. Alphabet Annual Report 2023.

incurred an operating loss exceeding \$4 billion. In addition, at the corporate level, the company faced billions in losses from workforce reductions, office space optimization, and other restructuring efforts.²⁶⁸

At the time of its IPO, a notable portion of Google's cost of revenue came from revenue-sharing with Google Network members who displayed advertisements on their websites through Google's AdSense program. In 2003, Google shared nearly 80% of the revenue earned from ads on these third-party sites, which lowered its overall gross margin to below 60%. By contrast, the gross margin from ads displayed on Google's own websites was estimated at around 85%, as Figure 25 shows, a level comparable to peers in online advertising such as Facebook. This difference highlights how Google's own websites are far more profitable than third-party ad placements.

Figure 24-1: Google's Profit Margins 1999 – 2023



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Gross Margin	-312.7%	67.3%	82.5%	69.8%	56.7%	53.9%	58.0%	60.2%	59.9%	60.4%	62.6%	64.5%	65.2%
Operating Margin	-2961.8%	-77.1%	12.7%	42.4%	23.4%	20.1%	32.9%	33.5%	30.6%	30.4%	35.1%	35.4%	31.0%
Net Margin	-2761.8%	-76.9%	8.1%	22.7%	7.2%	12.5%	23.9%	29.0%	25.3%	19.4%	27.6%	29.0%	25.7%

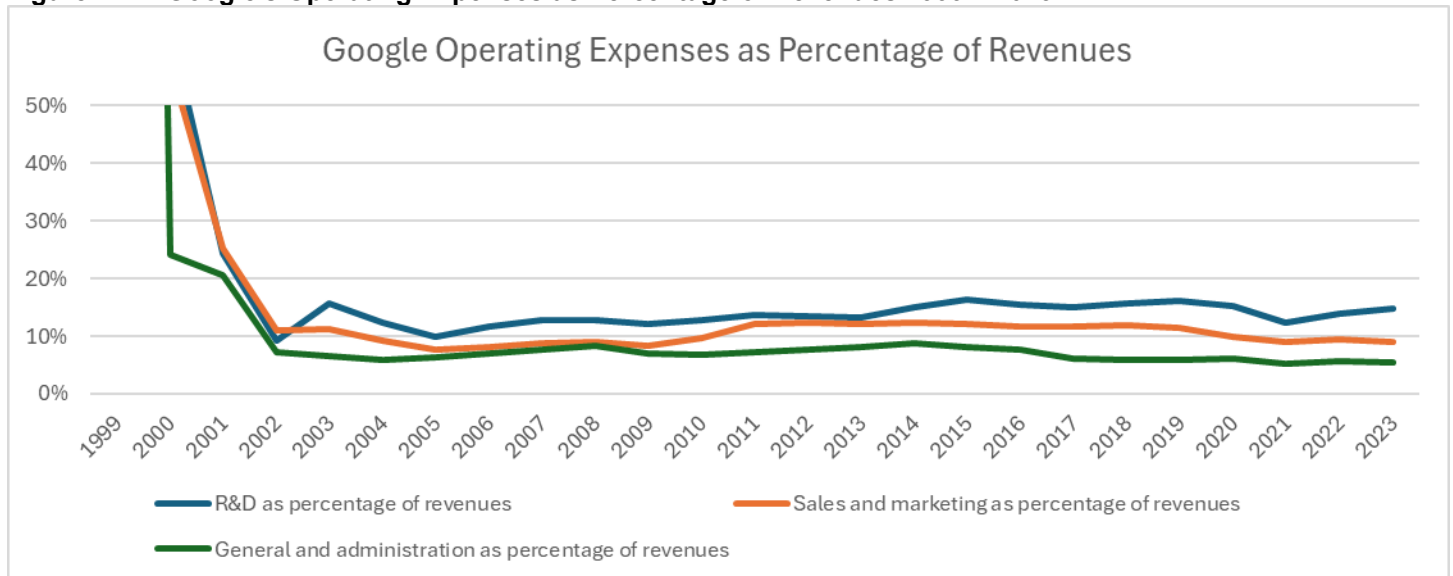
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Gross Margin	58.9%	56.8%	61.1%	62.4%	61.1%	58.9%	56.5%	55.6%	53.6%	56.9%	55.4%	56.6%
Operating Margin	25.4%	23.3%	25.0%	25.8%	26.3%	23.6%	19.2%	21.1%	22.6%	30.6%	26.5%	27.4%
Net Margin	21.4%	21.6%	21.9%	21.1%	21.6%	11.4%	22.5%	21.2%	22.1%	29.5%	21.2%	24.0%

Notes:

1. In 1999, Google generated only \$0.2 million revenue and negative gross, operating, and net profits.
2. In 2000, Google generated \$19 million revenue with \$13 million gross profit and negative operating profit.

²⁶⁸ Alphabet Annual Report 2023.

Figure 24-2: Google's Operating Expenses as Percentage of Revenues 1999 – 2023



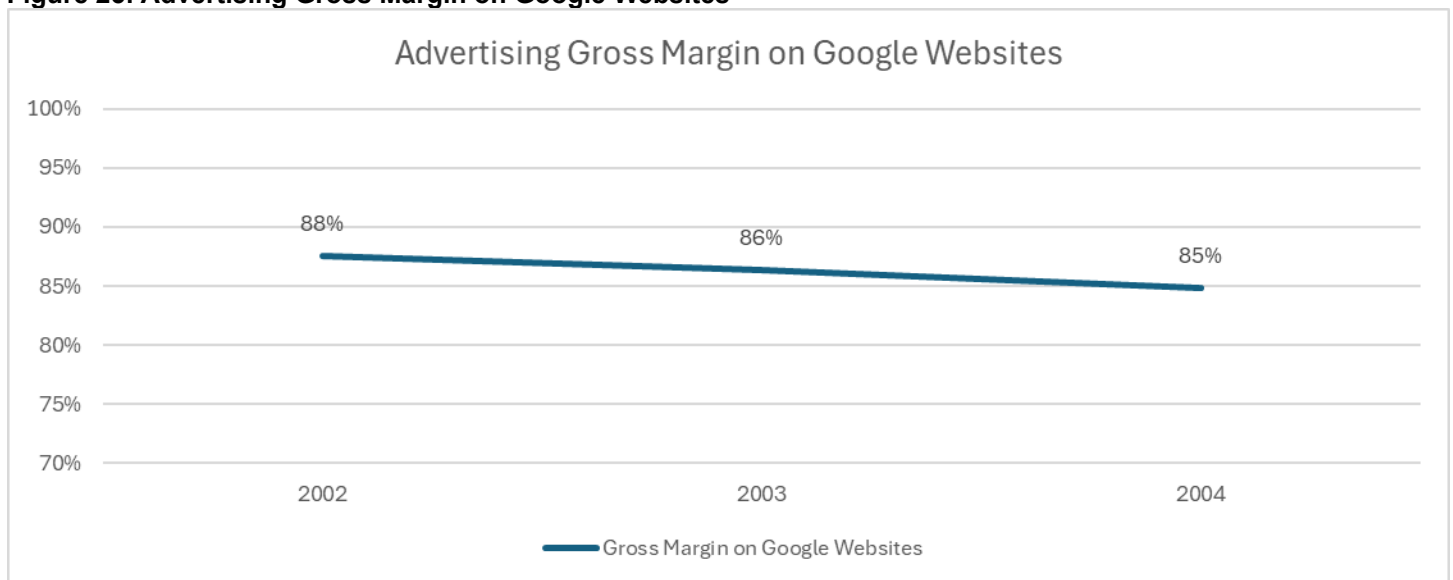
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
R&D as percentage of revenues	1331.8%	63.3%	24.2%	9.2%	15.7%	12.4%	9.8%	11.6%	12.8%	12.8%	12.0%	12.8%	13.6%
Sales and marketing as percentage of revenues	762.3%	57.0%	25.2%	11.1%	11.3%	9.3%	7.6%	8.0%	8.8%	8.9%	8.4%	9.5%	12.1%
General and administration as percentage of revenues	555.0%	24.1%	20.5%	7.1%	6.4%	5.9%	6.3%	7.1%	7.7%	8.3%	7.0%	6.7%	7.2%

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
R&D as percentage of revenues	13.5%	13.3%	14.9%	16.4%	15.5%	15.0%	15.7%	16.1%	15.1%	12.3%	14.0%	14.8%
Sales and marketing as percentage of revenues	12.2%	12.1%	12.3%	12.1%	11.6%	11.6%	11.9%	11.4%	9.8%	8.9%	9.4%	9.1%
General and administration as percentage of revenues	7.7%	8.0%	8.9%	8.2%	7.7%	6.2%	5.9%	5.9%	6.1%	5.2%	5.6%	5.3%

Note:

1. Operating expenses include stock-based compensation.

Figure 25: Advertising Gross Margin on Google Websites



Notes:

1. The gross margins above were estimated by excluding traffic acquisition costs (TAC) and considering only advertising revenue generated from Google's own websites.²⁶⁹ The gross margin also incorporates expenses related to data centers that support advertisements displayed on both Google's websites and those of Google Network members.
2. Since 2005, TACs have no longer been a good indicator of how much Google pays to Google Network websites because now TACs include not only payments to Google Network members but also other expenses such as payment to partners who direct search queries to Google's websites.²⁷⁰

²⁶⁹ Google Prospectus 2004.

²⁷⁰ Google Annual Report 2005.

It is noteworthy that around the time of Google's IPO, as Figure 26-1 shows, the company's stock-based compensation expenses as a percentage of revenue stood at 14.3%, 4.9%, and 15.6% for the years 2001, 2002, and 2003, respectively. These expenses were largely aimed at attracting and retaining top talent. During the same period, Google's reported operating margins were 12.7%, 42.4%, and 23.4%. However, if we exclude the impact of stock-based compensation, the adjusted operating margins are estimated to have been 26%, 47%, and 39% for those years, as Figure 26-2 shows.

Figure 26-1: Stock-Based Compensation 2001 – 2023

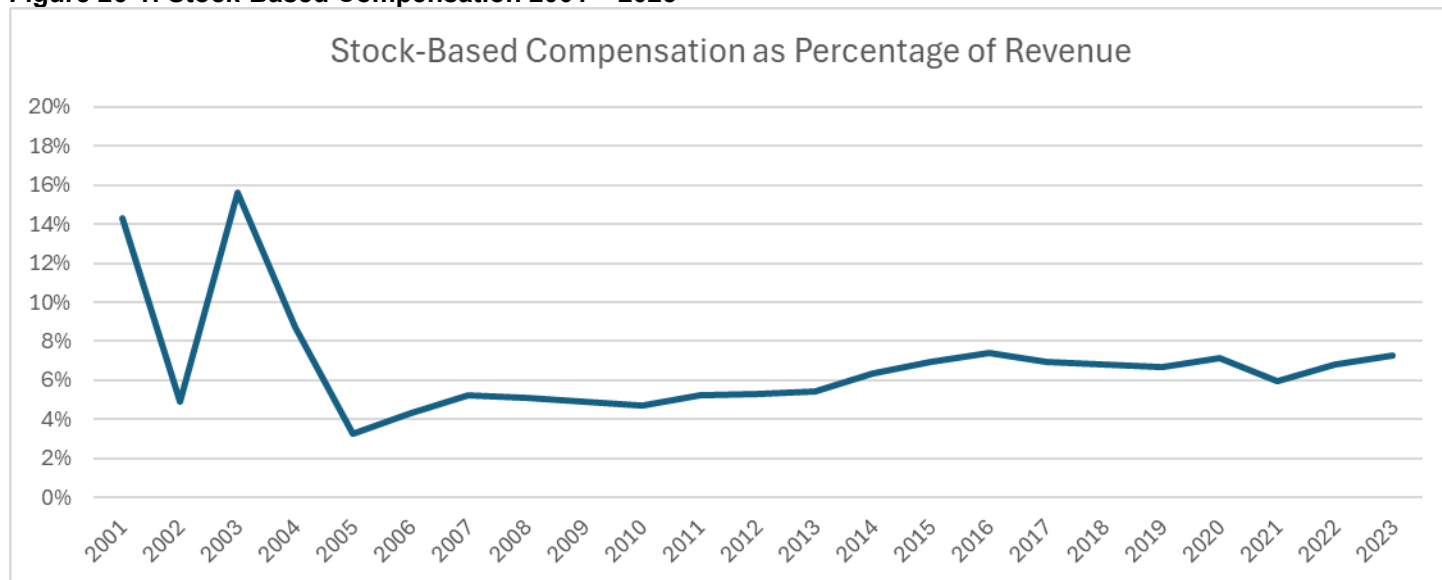
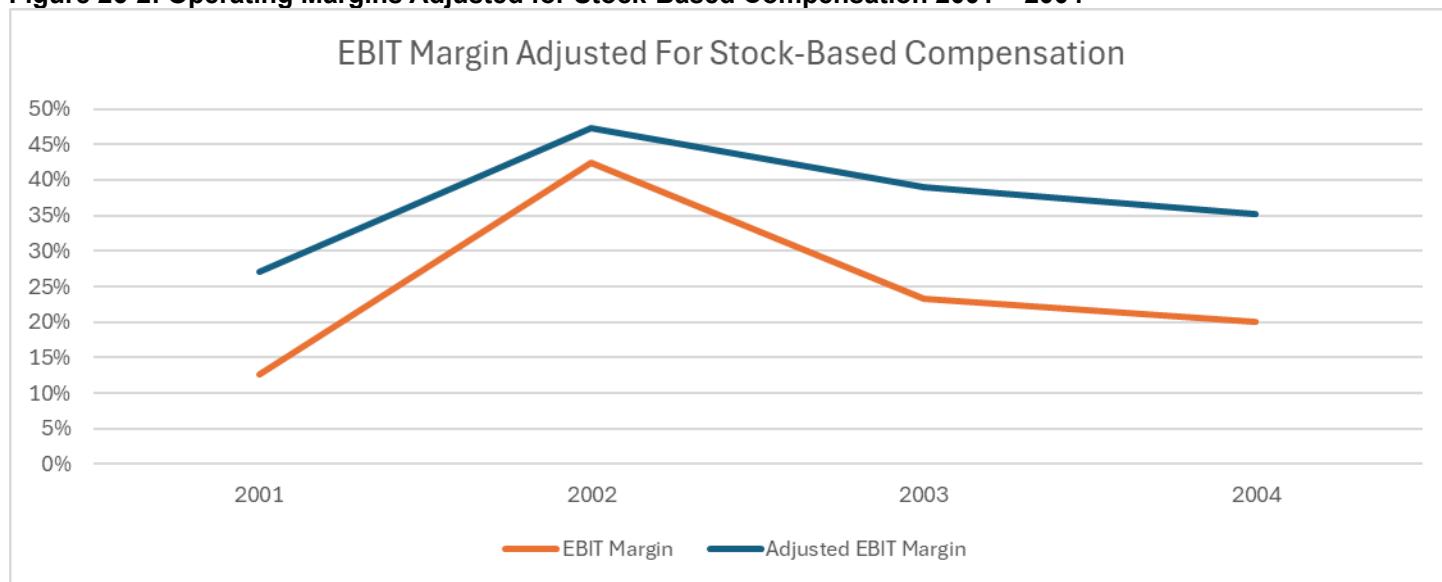


Figure 26-2: Operating Margins Adjusted for Stock-Based Compensation 2001 – 2004



Notes:

1. From 2001 to 2004, Google's stock-based compensation expenses were \$12.38 million, \$21.64 million, \$229.36 million, and \$278.75 million, respectively. As a percentage of revenue, these figures represented 14.3%, 4.9%, 15.6%, and 8.7%. The adjusted EBIT margins were calculated under the assumption that these expenses had not occurred.
2. Google's operating margin saw a substantial increase in 2002, primarily because the company was scaling up its revenue following the launch of the AdWords program in 2001 and the shift to an exclusively cost-per-click model in the first quarter of 2002.²⁷¹
3. Starting in 2003, Google's EBIT margin declined from nearly 45% in 2002 to just over 35% on an adjusted basis. This drop was largely due to the introduction of the AdSense program in 2002, which involved sharing a significant portion of advertising revenue with third-party websites displaying Google ads, causing the company's gross margin declined

²⁷¹ Google Prospectus 2004.

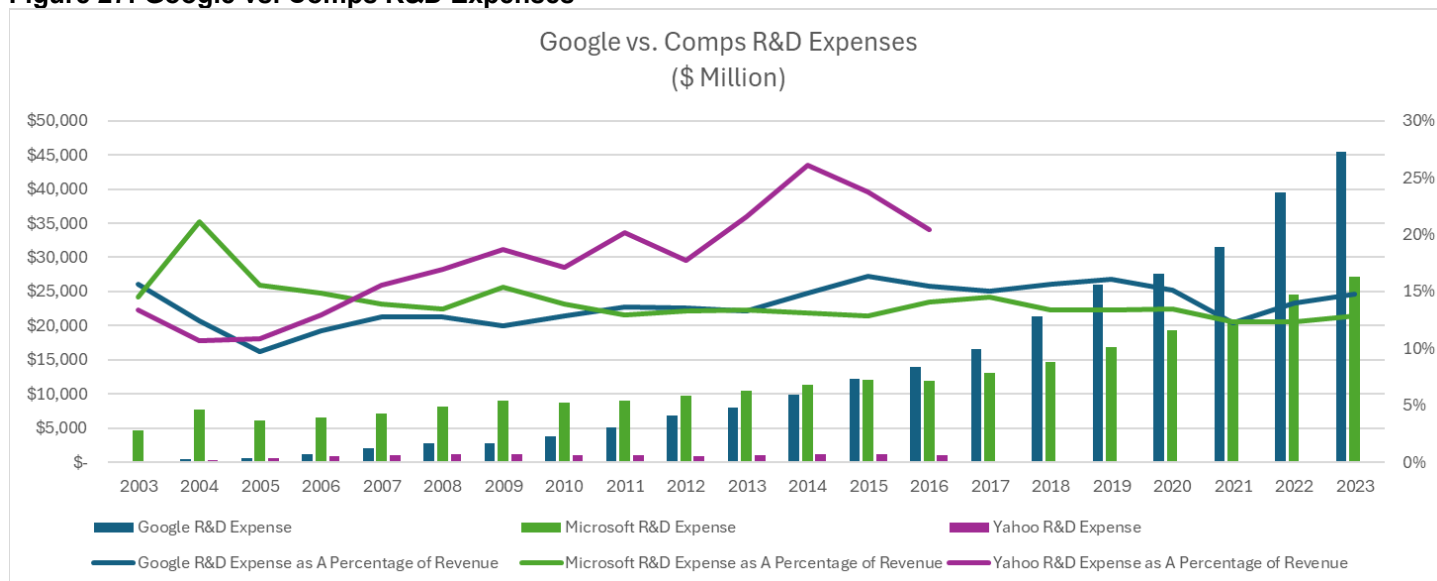
from nearly 70% in 2002 to 57% in 2003 and 54% in 2004. In 2002, only 25% of Google's advertising revenue came from Google Network websites, but this share increased to 44% in 2003 and 49% in 2004.²⁷²

Since its IPO in 2004, Google has consistently invested around 10% to 15% of its revenue in R&D most years, growing from \$230 million in 2003 to over \$45 billion in 2023, a CAGR of approximately 30%, closely matching its sales CAGR over the same period.²⁷³

Yahoo, one of Google's main competitors in search, saw its R&D expenses grow from \$218 million in 2003 to \$1 billion in 2016 before its acquisition by Verizon, reflecting a 13% CAGR.²⁷⁴ In comparison, Google's R&D spending increased from \$230 million in 2003 to nearly \$14 billion in 2016, a significantly higher 37% CAGR.

Microsoft, another major competitor in search, grew its R&D investment from \$4.7 billion in 2003 to \$27 billion in 2023, representing a 9% CAGR.²⁷⁵ However, it is important to note that Microsoft's search engine business, approximated by its advertising revenue, has consistently accounted for only a low- to mid-single-digit percentage of the company's overall revenue. The majority of Microsoft's revenue has come from other segments, including software, operating systems, and cloud services.²⁷⁶

Figure 27: Google vs. Comps R&D Expenses²⁷⁷



²⁷² Google Prospectus 2004.

²⁷³ Google Prospectus 2004; Company annual reports.

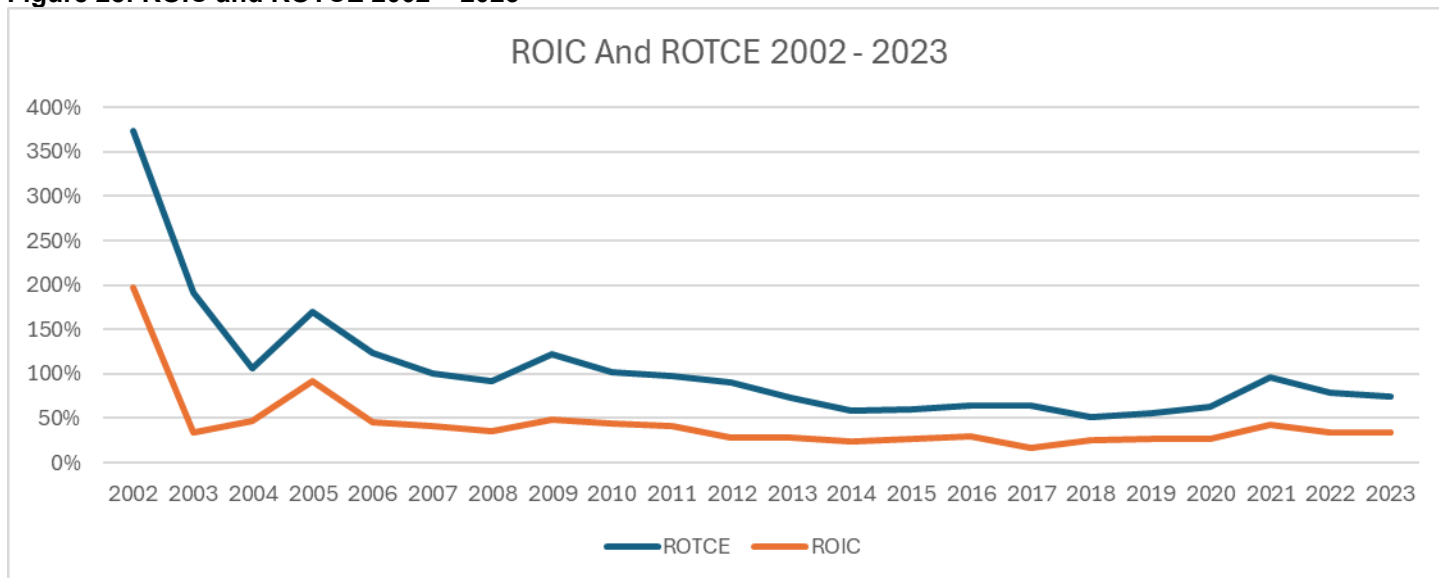
²⁷⁴ Company annual reports.

²⁷⁵ Company annual reports.

²⁷⁶ Microsoft Annual Report 2004, ended June 30, 2004; Google Annual Report 2003, ended December 31, 2003; Microsoft Annual Report 2024, ended June 30, 2024; Google Annual Report 2023, ended December 31, 2023.

²⁷⁷ Google Prospectus 2004; Company annual reports.

Figure 28: ROIC and ROTCE 2002 – 2023



Notes:

1. Balance sheet data prior to 2002 are not available.
2. $ROTCE = EBIT / (((Current\ Asset - Cash\ and\ Cash\ Equivalents) - (Current\ Liabilities - Short-Term\ Debt)) + PP\&E)$
3. $ROIC = EBIT * (1 - Effective\ Tax\ Rate) / (Total\ Asset - Cash\ and\ Cash\ Equivalent - Non-Interest-Bearing\ Current\ Liabilities)$

Throughout its development, Google has introduced a variety of products, many of which are free, through both organic development and acquisitions. Some of these ventures have been short-lived, while others have become widely popular. The pursuit of new ventures has been embedded in Google’s culture since the beginning. In their IPO letter, the founders stated that they:

“will not shy away from high-risk, high-reward projects because of short-term earnings pressure...recognize the pursuit of such projects as the key to [their] long-term success...[they] will continue to seek them out... [they] will accept projects further outside our current businesses, especially when the initial investment is small relative to the level of investment in their current businesses.”²⁷⁸

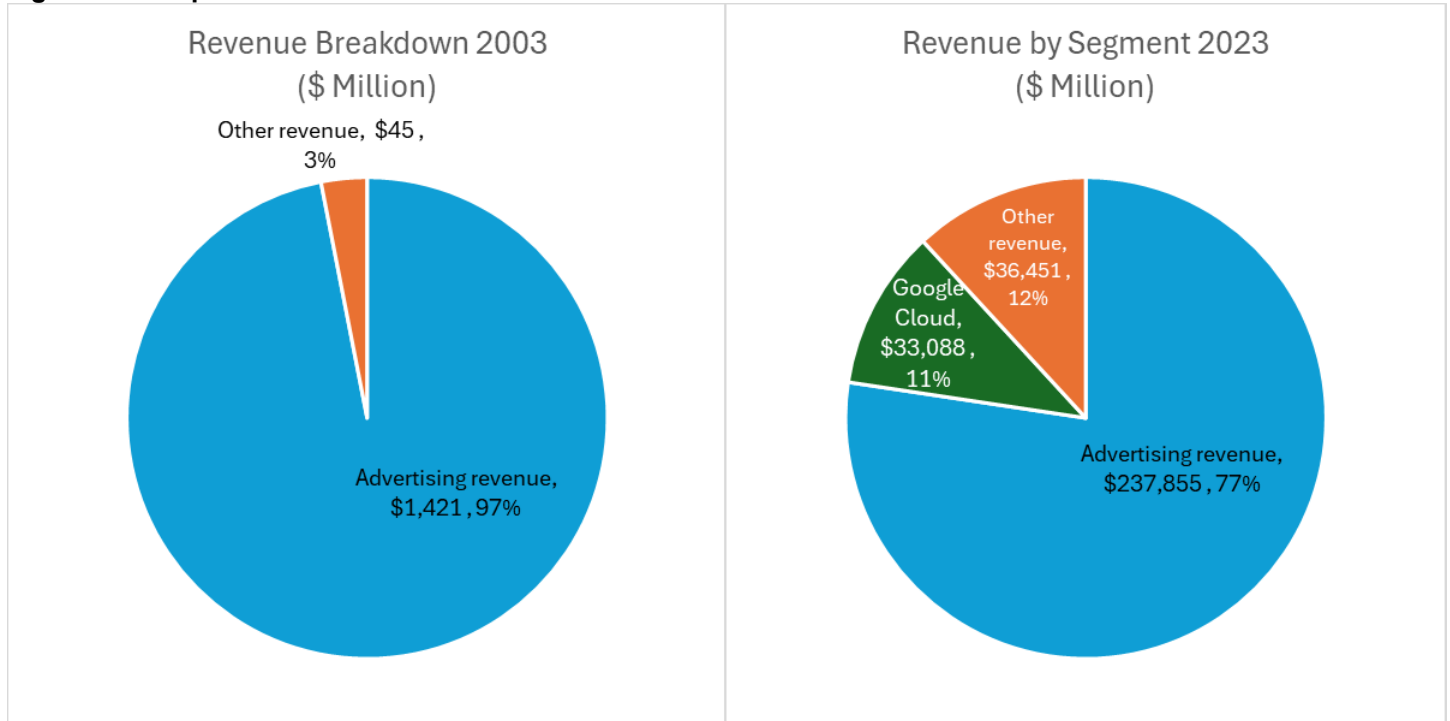
The company also encourages employees to spend 20% of their time working on projects they believe will most benefit Google.²⁷⁹ This policy empowers employees to be creative and innovative, with a view to driving the company’s long-term success. For example, both AdSense for content and Google News were prototyped during employees’ 20% time. Although many risky projects may not work out, Google values the lessons learned and the potential for certain ventures to succeed.

Most of Google’s products serve to either expand its search services or attract and retain users, thereby increasing the size of its user data. Google can then leverage its large user base, and the data collected to enhance advertising revenue through improved algorithms and new platforms, while also building diversified revenue streams, including hardware sales and subscriptions.

²⁷⁸ Founders’ IPO Letter – “An Owner’s Manual” for Google’s Shareholders.

²⁷⁹ Google Prospectus 2004.

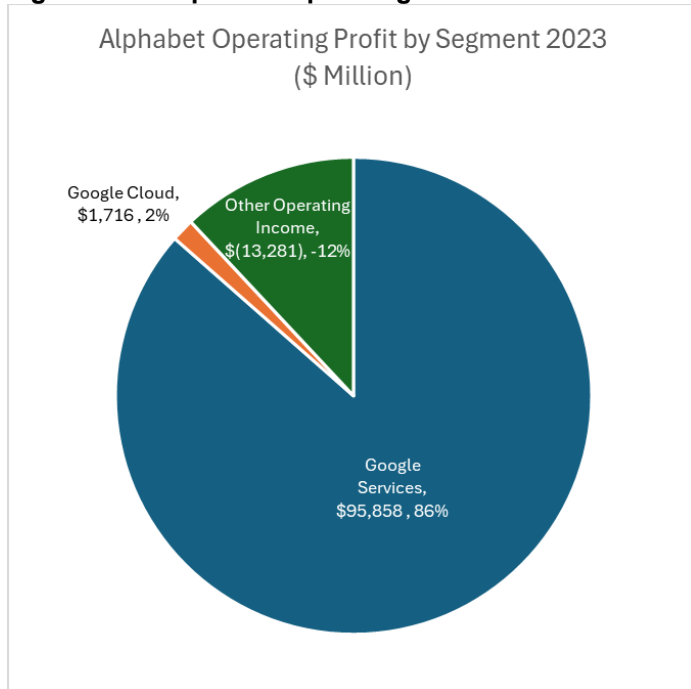
Figure 29-1: Alphabet Revenue Breakdown 2003 vs. 2023



Notes:

1. Google's advertising revenues consist of sales from Google Search and other Google properties, such as Gmail, Google Maps, and Google Play, as well as YouTube and the Google Network.²⁸⁰
2. Other revenues include sales from Google subscriptions, platforms, and devices, as well as other bets, such as healthcare-related services.
3. The total revenue of Google Services, including Google advertising, subscriptions, platforms, and devices, are \$272.5 billion in 2023.

Figure 29-2: Alphabet Operating Profit Breakdown 2023



²⁸⁰ Alphabet Annual Report 2023.

Notes:

1. Google did not disclose its segment profit in 2003, but the company's overall operating margin that year was approximately 23%. This should reasonably reflect the operating margin of Google's advertising (Google Service) segment, given that it accounted for 97% of the company's total sales at the time.
2. The operating margin of Google Services was approximately 35% in 2023.

YouTube was founded in California by Steve Chen, Chad Hurley, and Jawed Karim in February 2005 as an online platform for sharing and watching original videos worldwide. It enabled users to easily upload and share video clips not only on its own website but also across the broader internet through websites, blogs, and email. **In October 2006, less than two years after its founding, Google acquired YouTube for \$1.65 billion in stock,²⁸¹ marking it as Google's largest acquisition at the time.** While Google did not disclose YouTube's financial details, market analysts later (in 2007) estimated that YouTube generated approximately \$15 million in revenue for the entire year of 2006.²⁸²

At the time of acquisition, YouTube had already established itself as one of the fastest-growing websites globally, delivering more than 100 million video views daily with around 65,000 new uploads each day.²⁸³ Its user base had also expanded significantly, from 2.8 million users in August 2005 to 72.1 million by the time of the acquisition.²⁸⁴ Although neither Google nor YouTube disclosed its monthly active users, Nielsen estimated that YouTube had nearly 20 million unique monthly users.²⁸⁵

Google co-founder Sergey Brin described the acquisition as a way to enhance Google's search capabilities, envisioning video search as an extension of the overall search experience.²⁸⁶ He also emphasized video as a powerful advertising medium. YouTube co-founder Steve Chen emphasized that YouTube's strength lies in providing an engaging video-watching experience, with users easily discovering new content. With Google's expertise in search, YouTube could better index its vast video library and deliver the most relevant content to users. As usual, Google did not disclose YouTube's financial details or provide revenue guidance.

YouTube's evolution continued alongside the rapid growth of smartphones. Coinciding with the launch of the first iPhone, YouTube introduced its mobile site in mid-2007, allowing users to watch selected videos on mobile devices.²⁸⁷ It was also pre-installed on iPhones. In 2010, YouTube relaunched its mobile site using HTML5 technology compatible with mobile browsers on both iPhone and Android devices, providing a smoother interface and faster load times.²⁸⁸ Although YouTube did not disclose the exact improvement in load times when switching from its original Flash-based mobile version,²⁸⁹ a 2015 blog post by YouTube stated that videos load 15% to 80% faster with HTML5 compared to Flash.²⁹⁰

After the acquisition, YouTube introduced several new features to improve user experience, including the ability to post comments while videos were playing, in-page playback for uninterrupted viewing, and higher definition video options. A significant milestone came in 2007 when YouTube launched in-video ads, delivering advertisements based on factors like video genre, viewer demographics, and location.²⁹¹ Major brands such as Fox, The Simpsons Movie, and BMW were among early advertisers. In the same year, Google expanded YouTube's reach by allowing websites within its ad network

²⁸¹ Google To Acquire YouTube for \$1.65 Billion in Stock.

<https://www.sec.gov/Archives/edgar/data/1288776/000119312506206884/dex991.htm>

²⁸² YouTube 2006 Sales Pegged at \$15 Million. <https://www.marketwatch.com/story/youtube-2006-sales-pegged-at-15-million>

²⁸³ YouTube Serves Up 100 Million Videos A Day. <https://www.nbcnews.com/id/wbna13890520>

²⁸⁴ Google Buys YouTube for \$1.65 Billion. <https://www.nbcnews.com/id/wbna15196982>

²⁸⁵ YouTube Serves Up 100 Million Videos A Day. <https://www.nbcnews.com/id/wbna13890520>

²⁸⁶ Google Special/M&A Call. 10/9/2006.

²⁸⁷ Google Q3 2007 Earnings Call. 10/18/2007.

²⁸⁸ YouTube Mobile Goes HTML5, Video Quality Beats Native Apps Hands Down. <https://techcrunch.com/2010/07/07/youtube-iphone-mobile-html5/>

²⁸⁹ HTML5 Version of YouTube Launches for Mobiles.

<https://web.archive.org/web/20140311014527/https://www.theguardian.com/technology/pda/2010/aug/24/html5-youtube-mobile>

²⁹⁰ YouTube Now Defaults to HTML5. https://web.archive.org/web/20150206035020/http://youtube-eng.blogspot.com/2015/01/youtube-now-defaults-to-html5_27.html; Whitepaper – Moving to HTML5 Video. Google.

²⁹¹ First Ads Appear on YouTube Clips. <https://www.theguardian.com/media/2007/aug/22/advertising.digitalmedia>

to embed relevant YouTube videos,²⁹² such as hiking videos on hiking-focused blogs. YouTube ads are generally sold on an impression basis.²⁹³

In 2007, YouTube also launched its partnership program, allowing popular content creators to monetize their videos.²⁹⁴ Through this program, creators could select videos to monetize, with Google placing ads alongside their content and sharing revenue with them. Although Google did not disclose the revenue split due to varying advertiser demand for different video types, reports in 2022 indicated that creators typically receive 55% of ad revenue, with YouTube retaining the remainder.²⁹⁵ However, YouTube usually requires creators to reach a minimum of 1,000 views on their videos before they are eligible to share in revenue from the company.²⁹⁶ This revenue-sharing model has enabled many creators to make a full-time living on the platform.

In 2010, YouTube launched TrueView, a new ad format that allows users to skip ads after five seconds if they are not interested.²⁹⁷ Advertisers are only charged when viewers watch at least 30 seconds of the ad, view the entire ad if it's under 30 seconds, or interact with it, whichever comes first.²⁹⁸ This approach ensures that ads effectively reach genuinely engaged viewers. As of 2023, nearly 85% of YouTube's ad revenue comes from these skippable TrueView ads.²⁹⁹

As content creators build substantial followings on YouTube, they gain influence, fostering interactive communities where viewers can engage through comments and other forms of communication. This dynamic has created a powerful network effect – as more users join and upload videos, YouTube's value increases for all participants through the growing interactions among them.³⁰⁰ The expanding user base attracts more businesses eager to advertise, recognizing the potential to reach a large audience and drive sales. This increased advertising opportunity, in turn, motivates content creators to produce and share more videos to gain views, subscribers, partnerships, and sponsorships, thereby increasing revenue. This positive feedback loop continually draws more users to the platform, enhancing YouTube's reach, engagement, and overall value for advertisers, creators, and viewers alike.

YouTube offers volume discounts to large account advertisers, depending on their financial commitment. For example, Google, including YouTube, typically provides around a 20% discount on a \$100 million commitment, 10%-12% for a \$50 million commitment, and less than 5% for a \$30 million range.³⁰¹ Discounts can also take the form of free impressions on YouTube, though not on Google Search, as it operates on a cost-per-click basis. In addition, Google provides Strategic Value Add (SVA) services to advertising clients, offering them access to content creators for collaboration on brand launches, creative support from its BrandLab team, and insights from its data science team to enhance ad performance. Although valuing such services is difficult, their impact can be significant, with benefits worth millions to different advertisers.

YouTube's user base grew rapidly, reaching 1 billion monthly users by 2013,³⁰² 1.5 billion by 2017,³⁰³ and surpassing 2 billion by 2019.³⁰⁴ Although Google does not disclose the exact number of monthly users of YouTube, in 2022, it stated that YouTube had over 2 billion monthly users.³⁰⁵ This growth implies a CAGR of at

²⁹² Google to Put YouTube Videos on Its Ad Network. <https://www.nytimes.com/2007/10/09/technology/09google.html>

²⁹³ About YouTube Ads And View Metrics. <https://support.google.com/youtube/answer/2375431>

²⁹⁴ YouTube Elevates Most Popular Users to Partners. <https://blog.youtube/news-and-events/youtube-elevates-most-popular-users-to/>

²⁹⁵ YouTube Stars Cash In Video Rights for Millions of Dollars. <https://www.wsj.com/articles/youtube-stars-cash-in-video-rights-for-millions-of-dollars-11670883441>

²⁹⁶ Former Head of Global Sales Enablement at Google. 12/28/2023.

²⁹⁷ YouTube Officially Launches Ads You Can Skip. <https://techcrunch.com/2010/12/01/youtube-officially-launches-ads-you-can-skip/>

²⁹⁸ Skippable In-Stream Ads - Google Ads Help. <https://support.google.com/google-ads/answer/6055025?hl=en>

²⁹⁹ Interview with Former Head of Global Sales Enablement at Google. 12/28/2023.

³⁰⁰ YouTube An Example of a Successful Product with Network Effects. Cornell University.

<https://blogs.cornell.edu/info2040/2019/11/21/youtube-a-perfect-example-of-a-product-with-network-effects/>

³⁰¹ Interview with Former Executive at Google. 9/23/2024.

³⁰² YouTube Reaches 1 Billion Users Milestone. CNBC. <https://www.cnbc.com/amp/2013/03/21/youtube-reaches-1-billion-users-milestone.html>

³⁰³ YouTube Claims 1.5 billion Monthly Users. CNBC. <https://www.cnbc.com/2017/06/22/youtube-claims-1-point-5-billion-monthly-users.html>

³⁰⁴ YouTube Crosses 2 billion Viewers A Month. <https://www.cnet.com/tech/services-and-software/youtube-crosses-2-billion-viewers-a-month/>

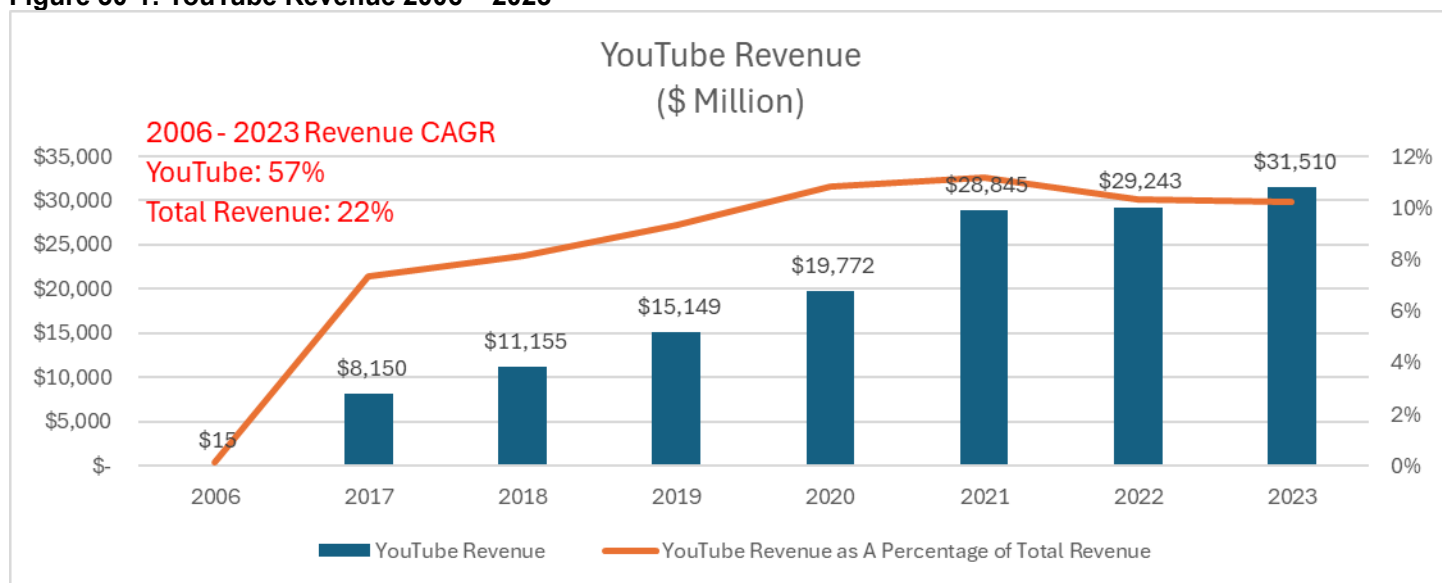
³⁰⁵ Alphabet Q1 2022 Earnings Call. 4/26/2022.

least 33% from 20 million monthly users in 2006.³⁰⁶ As of the second quarter of 2024, YouTube was the world's second-most visited website, with 31 billion monthly visits, accounting for 7% of total internet traffic. It trailed only Google.com, which had 82 billion monthly visits, or 18% of total traffic, and was ahead of Facebook.com, which saw 15 billion visits.³⁰⁷ Over 70% of YouTube views are from mobile devices.³⁰⁸

Financially, YouTube has become an important revenue driver for Alphabet, Google's parent company. In 2023, YouTube generated \$31.5 billion in advertising revenue, accounting for 10% of Alphabet's total revenue and 13% of its overall advertising revenue.³⁰⁹ Between 2006, the year when Google acquired YouTube, and 2023, YouTube's revenue grew at an estimated CAGR of 57%, outpacing Alphabet's overall revenue CAGR of 22% during the same period. YouTube's share of Alphabet's overall revenue has risen from 0.1% in 2006 to over 10% after 2020. During this period, YouTube's monthly users were estimated to have grown from 20 million in 2006³¹⁰ to over 2 billion in 2022,³¹¹ reflecting a CAGR of over 33%.

Although YouTube started to offer subscription services since 2014,³¹² the revenue generated from these has been relatively small compared to the company's overall sales. As of fiscal year 2023, Google's revenue from subscriptions (including YouTube), platforms, and devices, combined totaled \$34.7 billion,³¹³ accounting for 11% of the company's overall revenue.

Figure 30-1: YouTube Revenue 2006 – 2023



Notes:

1. YouTube's revenue for 2006 was estimated by market analysts in 2007.³¹⁴ Alphabet began disclosing YouTube's advertising revenue in 2019.
2. YouTube's advertising revenue for 2017 and 2018 was disclosed in Alphabet's 2019 annual report. YouTube's revenue prior to 2017 was not disclosed by Alphabet.

³⁰⁶ YouTube Serves Up 100 Million Videos A Day. <https://www.nbcnews.com/id/wbna13890520>

³⁰⁷ The Most Visited Websites in 2024. <https://www.visualcapitalist.com/ranked-the-most-visited-websites-in-2024/>

³⁰⁸ Former Head of Global Sales Enablement at Google. 12/28/2023.

³⁰⁹ Alphabet Annual Report 2023.

³¹⁰ YouTube Serves Up 100 Million Videos A Day. <https://www.nbcnews.com/id/wbna13890520>

³¹¹ Alphabet Q1 2022 Earnings Call. 4/26/2022.

³¹² YouTube Starts Paid Subscription Service. CNBC. <https://www.cnbc.com/2013/05/09/youtube-starts-paid-subscription-service.html>

³¹³ Alphabet Annual Report 2023.

³¹⁴ YouTube 2006 Sales Pegged at \$15 Million. <https://www.marketwatch.com/story/youtube-2006-sales-pegged-at-15-million>

Figure 30-2: YouTube Monthly Users 2006 – 2022³¹⁵

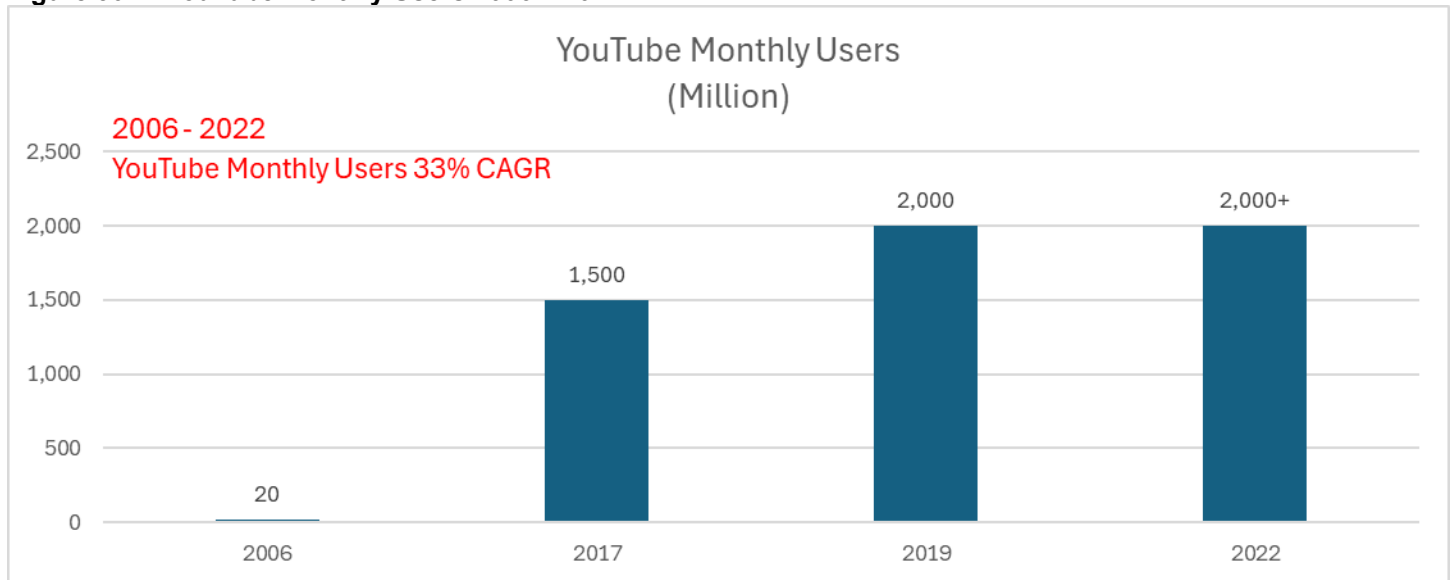
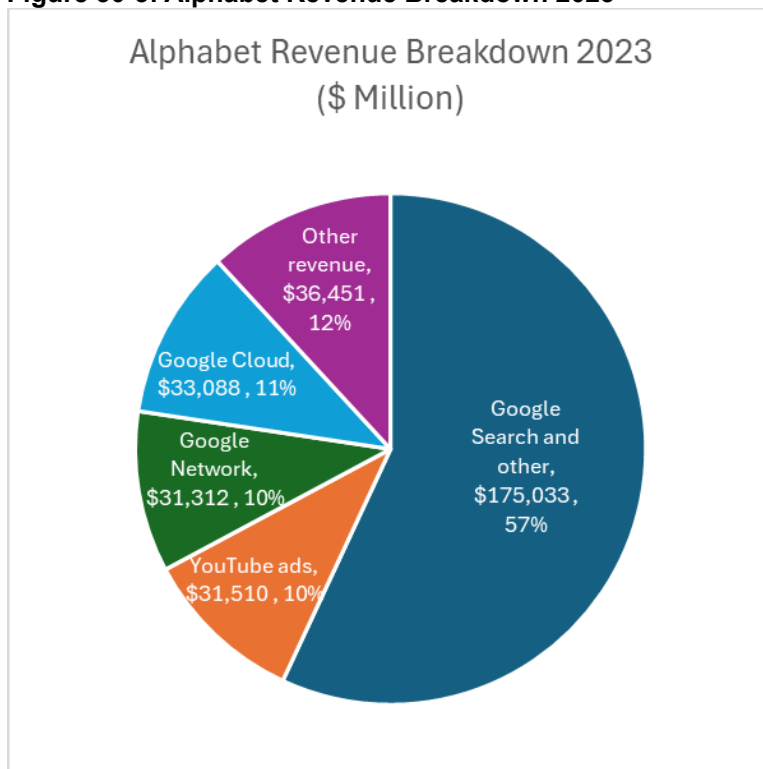


Figure 30-3: Alphabet Revenue Breakdown 2023

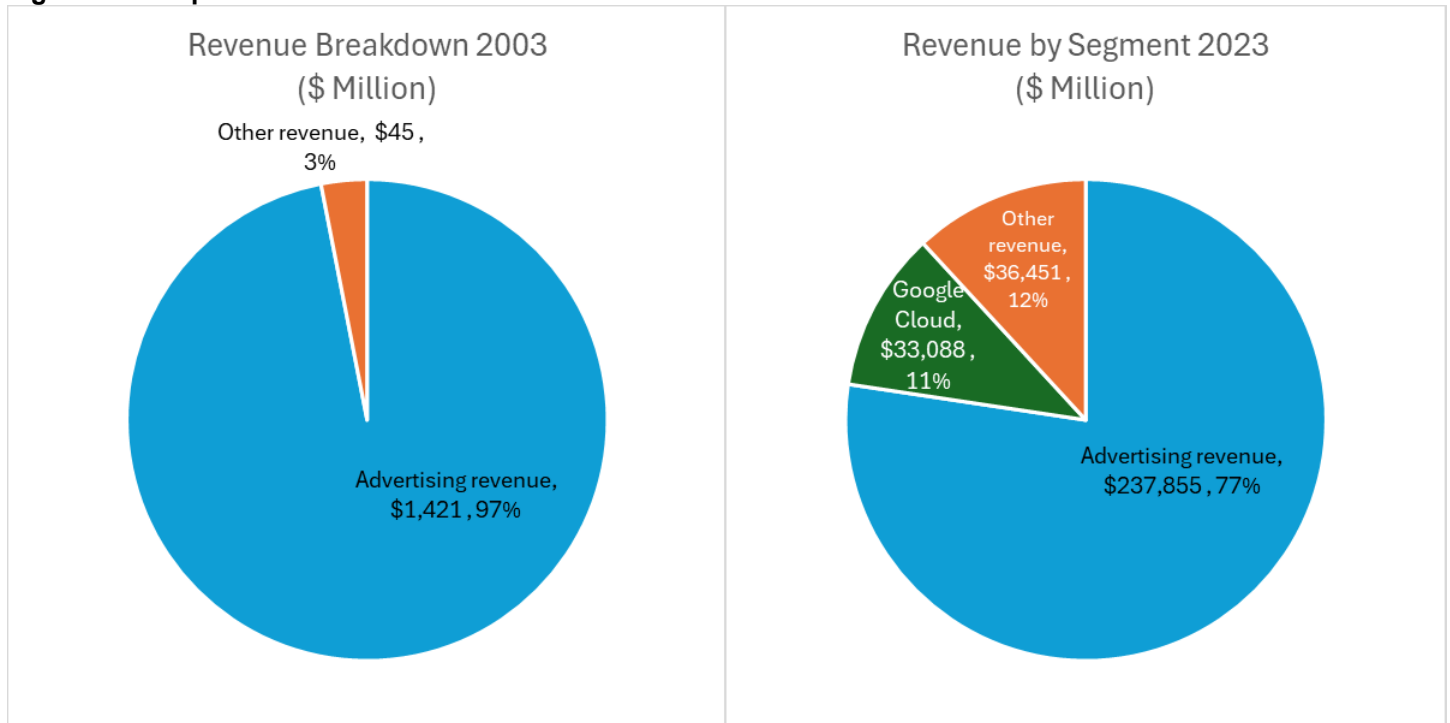


Note:

1. Alphabet's advertising revenue consists of Google Search and other, Google Network, and YouTube ads, totaling nearly 77% of Alphabet's revenue in 2023.

³¹⁵ YouTube Serves Up 100 Million Videos A Day. <https://www.nbcnews.com/id/wbna13890520>; YouTube Reaches 1 Billion Users Milestone. CNBC. <https://www.cnbc.com/amp/2013/03/21/youtube-reaches-1-billion-users-milestone.html>; YouTube Claims 1.5 billion Monthly Users. CNBC. <https://www.cnbc.com/2017/06/22/youtube-claims-1-point-5-billion-monthly-users.html>; YouTube Crosses 2 billion Viewers A Month. <https://www.cnet.com/tech/services-and-software/youtube-crosses-2-billion-viewers-a-month/>; Alphabet Q1 2022 Earnings Call. 4/26/2022.

Figure 31-1: Alphabet Revenue Breakdown 2003 vs. 2023

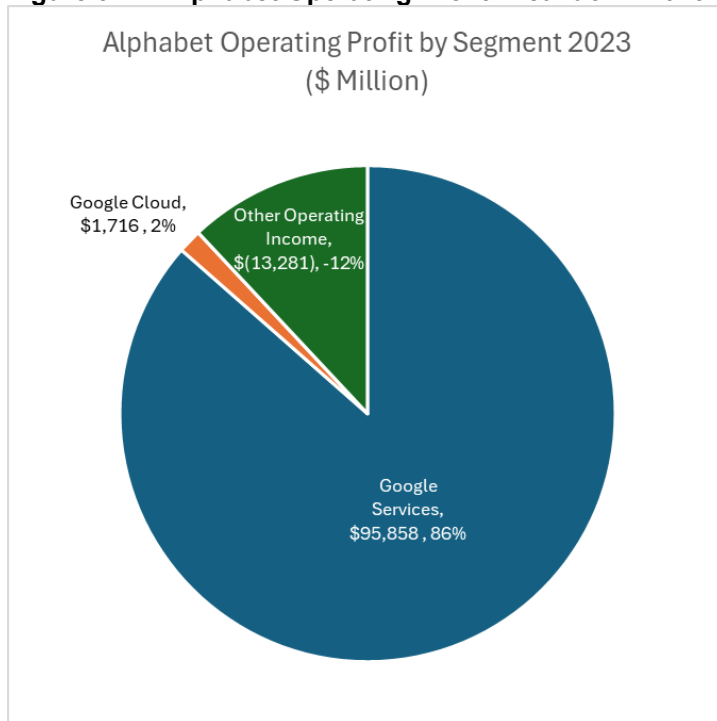


Notes:

1. Google's advertising revenues consist of sales from Google Search and other Google properties, such as Gmail, Google Maps, and Google Play, as well as YouTube and the Google Network.³¹⁶
2. Other revenues include sales from Google subscriptions, platforms, and devices, as well as other bets, such as healthcare-related services.
3. The total revenue of Google Services, including Google advertising, subscriptions, platforms, and devices, are \$272.5 billion in 2023.

³¹⁶ Alphabet Annual Report 2023.

Figure 31-2: Alphabet Operating Profit Breakdown 2023



Notes:

1. Google did not disclose its segment profit in 2003, but the company's overall operating margin that year was approximately 23%. This should reasonably reflect the operating margin of Google's advertising (Google Service) segment, given that it accounted for 97% of the company's total sales at the time.
2. The operating margin of Google Services was approximately 35% in 2023.
3. The operating margin of Google Cloud was approximately 5% in 2023.
4. The company had operating losses in non-core business in 2023.

In 2004, Google acquired Where 2 Technologies, a Sydney-based startup founded in 2003, and renamed it as Google Maps. The acquisition price and other financial details were not disclosed. Initially, Google Maps allowed users to navigate maps with street names and satellite photos.³¹⁷ Google launched the product in 2005, shortly after the acquisition. The lead engineer for the Google Maps project, also the founder of Where 2 Technologies, noted that Google was willing to release unfinished products to its user base, who in turn provided valuable feedback.³¹⁸ Upon launch, Maps received 5,000 user e-mails daily. In November 2007, Google launched Google Maps for mobile, making it free and widely accessible.³¹⁹ By 2013, when Google Maps had reached over one billion monthly users – many of which searched for local businesses such as restaurants, car dealerships, and dentists, and see corresponding business information such as photos, reviews, phone numbers, and navigation links – Google introduced ads on Google Maps.³²⁰ Users searching on Google Maps can now see ads marked with a small but clear “Ad” label that provides business information of advertisers. Once a user performs a search, relevant ads appear at the bottom of the screen, allowing users to easily view more information, call the business, or get directions.

In 2023, Google Maps holds an estimated 70% market share, followed by its closest competitor, Apple Maps, with 10%.³²¹ A 2020 report from the U.S. House of Representatives on competition in digital markets noted that Google Maps,

³¹⁷ Google Ups Ante in Mapping Rivalry. <https://www.cnet.com/tech/services-and-software/google-ups-ante-in-mapping-rivalry/>

³¹⁸ Google Mapper Take Browsers to The Limit. <https://www.cnet.com/tech/tech-industry/google-mapper-take-browsers-to-the-limit/>

³¹⁹ Google Announces Launch of Google Maps for Mobile With "My Location" Technology. https://googlepress.blogspot.com/2007/11/google-announces-launch-of-google-maps_28.html

³²⁰ Attract New Customers with Local Ads on The Google Maps App. <https://adwords.googleblog.com/2013/08/attract-new-customers-with-local-ads-on.html>

³²¹ Big Tech Giants Are Working to Change the Mapping Industry. <https://www.thestreet.com/technology/big-tech-working-to-change-mapping-industry>

together with Waze, captured over 80% of the market for turn-by-turn navigation services. The report also estimated that the Google Maps API³²² accounts for over 90% of the business-to-business market.³²³

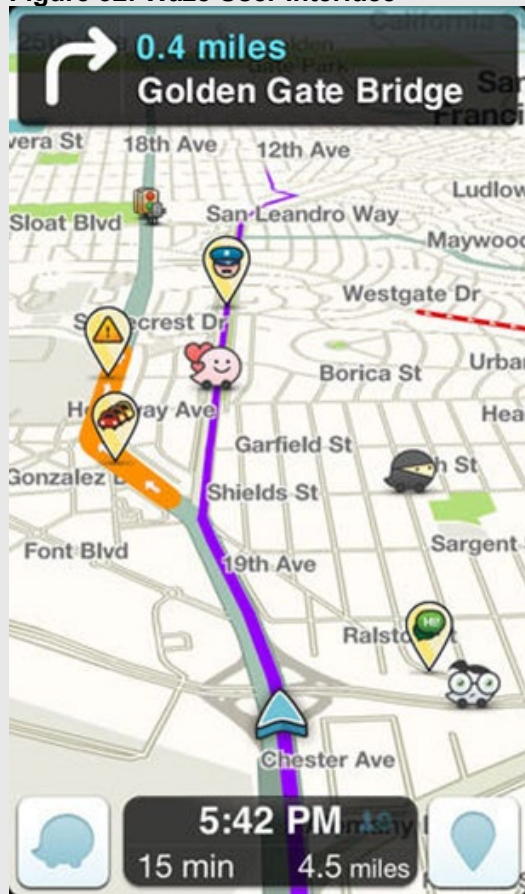
Google does not publicly disclose the specific revenue generated by individual Google apps, such as Google Maps.

Waze

It is worth noting that in 2013, Google acquired Waze, an Israeli company founded in 2006 that provides a free mobile map application offering turn-by-turn navigation and real-time traffic updates powered by user-submitted incident reports and route information, potentially creating a network effect from its interactive feature. Despite the acquisition, Waze has remained an independent entity.³²⁴ The acquisition was completed for total cash consideration of \$969 million.³²⁵ Financial details of Waze's performance were not disclosed at the time of acquisition.

Waze's approach to mapping has heavily relied on user-generated data, with drivers using the app to share real-time information. Volunteer editors then enhance the maps by correcting street names, adding businesses, and making other updates.³²⁶

Figure 32: Waze User Interface³²⁷



³²² APIs are mechanisms that enable two software components to communicate with each other. They essentially allow an app to retrieve data and perform activities from other apps.

³²³ Investigation of Competition in Digital Markets. Subcommittee on Antitrust, Commercial And Administrative Law of The Committee on The Judiciary. U.S. House of Representatives.

³²⁴ Google is Bringing Together its Waze and Maps Teams as It Pushes to Reduce Overlap.

<https://www.theverge.com/2022/12/8/23499734/google-maps-waze-development-teams-combined-productivity>

³²⁵ Google Annual Report 2013.

³²⁶ Investigation of Competition in Digital Markets. Subcommittee on Antitrust, Commercial And Administrative Law of The Committee on The Judiciary. U.S. House of Representatives.

³²⁷ New Waze for Android. <https://www.electronicweekly.com/blogs/eyes-on-android/android-business/new-waze-for-android-2013-06/>

In an internal presentation, Google outlined several key reasons for acquiring Waze.³²⁸ These included tapping into a “highly engaged community” of map contributors and expertise to help grow and nurture communities, a challenge Google had faced. The acquisition also offered a scalable way to maintain an up-to-date map with real-time incident data. Google viewed Waze as a “sandbox” to test new map and navigation features, without disrupting its much larger Google Maps.

However, Google identified several weaknesses in Waze’s performance, such as lower accuracy in smaller cities and limited map search features.³²⁹ Google also found Waze’s map tiles lacking in detail, with some data missing and the rendering too simplistic. Financially, Google saw Waze’s future projections as uncertain, noting that despite the app’s \$1 billion purchase price, Waze’s revenue in 2012 was less than \$1 million. By the end of 2012, it had just begun monetizing its platform by packaging user data for advertisers, enabling them to purchase ads based on users’ proximity and intent.³³⁰

At the time of the acquisition, Waze was estimated to have 50 million users worldwide,³³¹ compared to Google Maps’ user base of over 1 billion.³³² However, Waze had experienced rapid growth, increasing from 10 million users at the start of 2012 to 34 million by the end of the same year, more than 3x its user base within a year. It was expected to reach 70 million users by the end of 2013, effectively doubling again.³³³ Although Waze’s user base was small compared to Google Maps, it had attracted interest from major tech companies such as Facebook, Microsoft, and Apple. Earlier in 2013, Facebook had reportedly offered around \$1 billion for Waze, while Microsoft and Apple each submitted bids of approximately \$400 million.³³⁴ Google’s acquisition potentially prevented Waze from falling into the hands of competitors.

A market participant stated:

“The acquisition would effectively lead to the elimination of Waze as a market disrupting force that would otherwise be capable of challenging the model adopted by Google’s dominant Google Maps. In essence, Google’s acquisition of Waze is defensive - seeking to remove a disruptive force from the market.”³³⁵

By early 2021, Waze had reached 140 million monthly active users,³³⁶ reflecting a CAGR of 17% since 2013.

In 2022, Google announced that it would merge the Waze team with its Geo team to reduce overlapping work and enhance collaboration between the two teams.³³⁷

Since September 2023, Waze has stopped selling ads and begun transitioning Waze Ads to Google Ads.³³⁸ As of this writing, the new Waze Ads platform has not yet gone live.

³²⁸ Investigation of Competition in Digital Markets. Subcommittee on Antitrust, Commercial And Administrative Law of The Committee on The Judiciary. U.S. House of Representatives.

³²⁹ Investigation of Competition in Digital Markets. Subcommittee on Antitrust, Commercial And Administrative Law of The Committee on The Judiciary. U.S. House of Representatives.

³³⁰ Q&A With Waze CEO Noam Bardin. Forbes. 6/14/2013. <https://www.forbes.com/sites/parmyolson/2013/06/13/qa-with-waze-ceo-noam-bardin/>

³³¹ Google's Effort to Skirt Regulation May Invite More Scrutiny. The New York Times. 6/18/2013.

<https://archive.nytimes.com/dealbook.nytimes.com/2013/06/18/googles-effort-to-skirt-regulation-may-invite-more-scrutiny/>

³³² Attract New Customers with Local Ads on The Google Maps App. <https://adwords.googleblog.com/2013/08/attract-new-customers-with-local-ads-on.html>

³³³ Waze Built Up 34 Million Users in 2012, Expects 2x That in 2013. https://www.phonearena.com/news/Waze-built-up-34-million-users-in-2012-expects-2x-that-in-2013_id38475

³³⁴ Google's Effort to Skirt Regulation May Invite More Scrutiny. The New York Times. 6/18/2013.

<https://archive.nytimes.com/dealbook.nytimes.com/2013/06/18/googles-effort-to-skirt-regulation-may-invite-more-scrutiny/>

³³⁵ Investigation of Competition in Digital Markets. Subcommittee on Antitrust, Commercial And Administrative Law of The Committee on The Judiciary. U.S. House of Representatives.

³³⁶ The Insider Story of Waze. <https://www.nfx.com/post/the-insider-story-of-waze>

³³⁷ Google is Bringing Together its Waze and Maps Teams as It Pushes to Reduce Overlap.

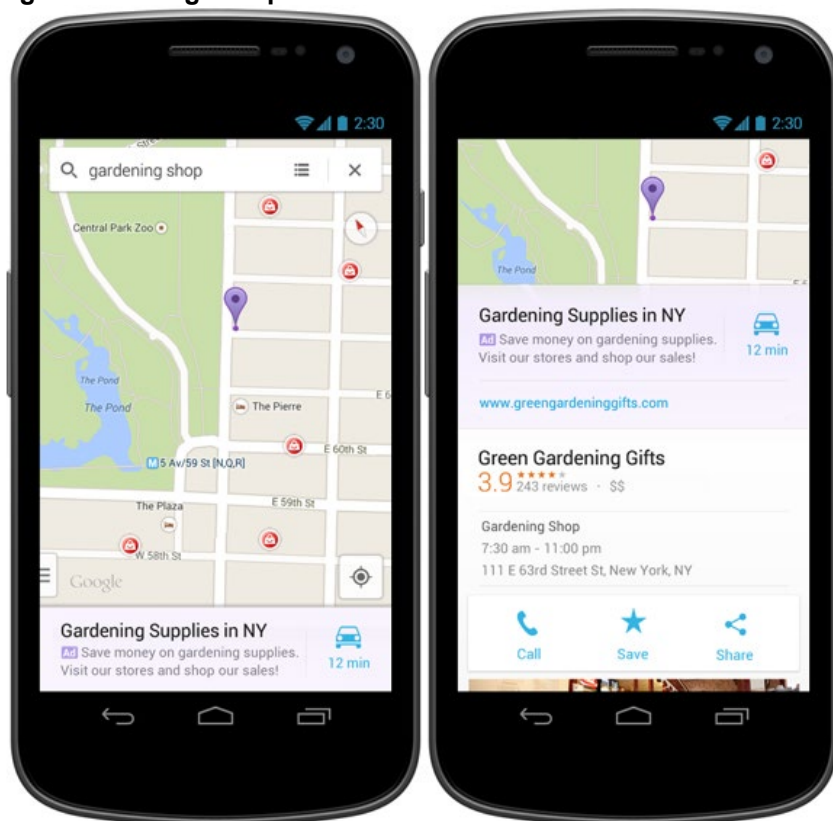
<https://www.theverge.com/2022/12/8/23499734/google-maps-waze-development-teams-combined-productivity>

³³⁸ Waze Ads. <https://www.waze.com/ads/>

As we will discuss in a later section, since the debut of the first Android device, Google's mobile operating system, which later became the world's most popular system around mid-2010s,³³⁹ has served as a key distribution channel of Google apps for the company. Google pre-installs its core apps, such as Search, Gmail, and Google Maps, on Android devices that users purchase.³⁴⁰ Additionally, users can access all of Google's products with a single Google account, eliminating the hassle of remembering different login credentials for each app. As of 2022, there are an estimated 3 to 4 billion Android devices worldwide.³⁴¹ For operating systems that do not come pre-loaded with Google's apps, such as Apple's iOS, users can download these apps for free.

In addition, from the users' perspective, both individual and business, Google Maps offers higher quality than its competitors. A survey shows that more than 65% of map app users prefer Google Maps over other alternatives.³⁴² In 2019, Uber stated that it relied on Google Maps for "the mapping function that is critical to the functionality"³⁴³ of its platform, adding that they did not "believe that an alternative mapping solution exists that can provide the global functionality that [they] require to offer [their] platform in all of the markets in which [they] operate." Another business user of Google Maps remarked that there are no viable alternatives, stating, "the data advantages that Google incorporates into its tools will only grow with time, making it impossible for a new player to ever achieve the scale, user base, or database necessary to compete."

Figure 33: Google Maps Ads 2013³⁴⁴



³³⁹ Mobile Operating System Market Share Worldwide. StatCounter GlobalStats. <https://gs.statcounter.com/os-market-share/mobile/worldwide#yearly-2009-2024>

³⁴⁰ Android Phone Is A Good iPhone Alternative. NBC News. <https://www.nbcnews.com/id/wbna27198184>

³⁴¹ Living in A Multi-Device World with Android. <https://blog.google/products/android/io22-multideviceworld/>; 4 Billion Android Users Who Downloaded Apps Flagged by Microsoft Need to Take Some Actions to Stay Safe. https://www.phonearena.com/news/4-billion-Android-users-who-downloaded-apps-flagged-by-Microsoft-need-to-take-some-actions-to-stay-safe_id157966

³⁴² Big Tech Giants Are Working to Change the Mapping Industry. <https://www.thestreet.com/technology/big-tech-working-to-change-mapping-industry>

³⁴³ Investigation of Competition in Digital Markets. Subcommittee on Antitrust, Commercial And Administrative Law of The Committee on The Judiciary. U.S. House of Representatives.

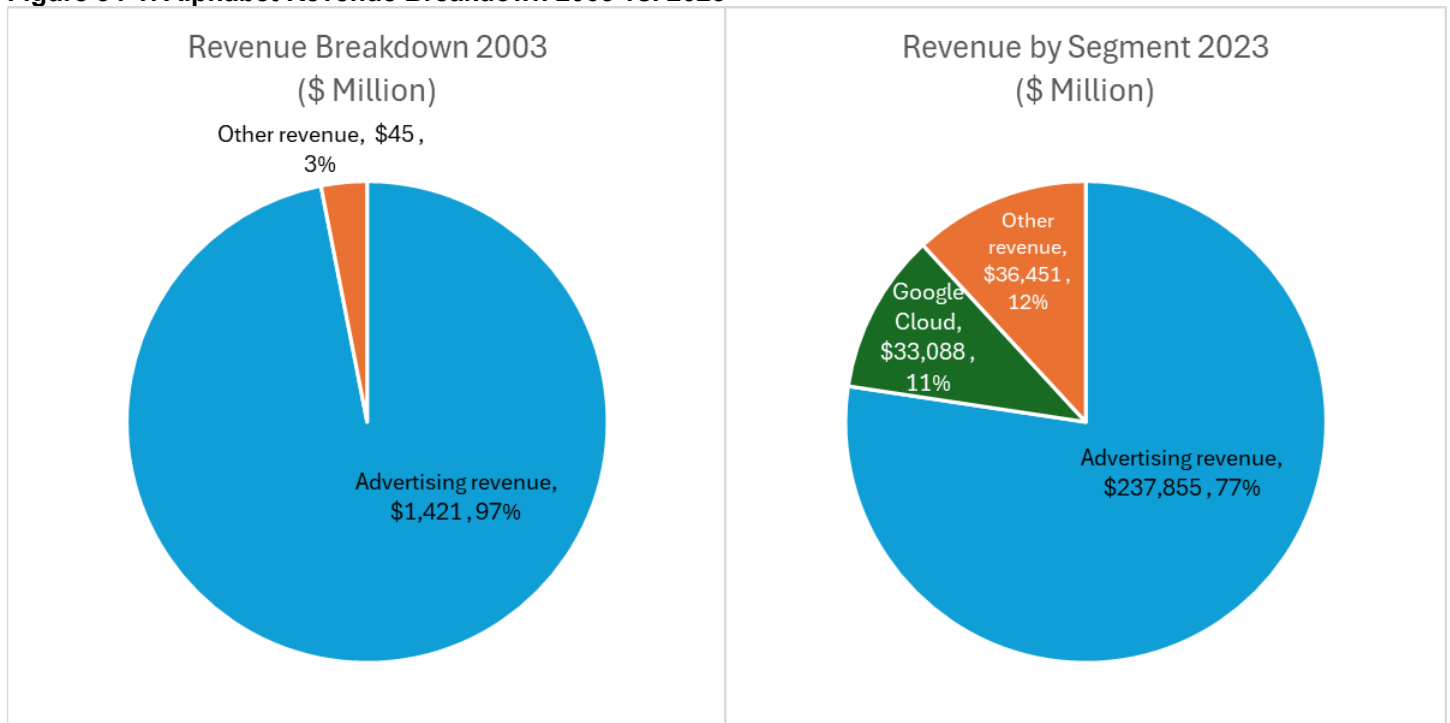
³⁴⁴ Attract New Customers with Local Ads on The Google Maps App. <https://adwords.googleblog.com/2013/08/attract-new-customers-with-local-ads-on.html>

In a 2021 interview, a former Head of Product for Google Map Ads described Google Maps as “the browser for the offline world.”³⁴⁵ He noted that certain types of businesses such as hotels and restaurants will always operate offline. Google Maps aims to increase visibility for these businesses, much like how it promotes top slots on its search results pages for advertisers. Through Google Maps, businesses can raise their prominence, display logos, and potentially appear in alternative route options. For instance, users might see ads for nearby businesses and even take detours if the ads catch their attention, thus increasing visibility for some brands.

This approach to increasing user engagement and broadening business reach aligns with Google’s broader strategy of enhancing user experience while creating value for advertisers. By maintaining a stable cost structure and encouraging innovation, Google has continued to evolve, introducing products and services that expand its reach and support its profitability. This model has allowed Google to solidify its position as a leading provider of digital services and advertising solutions.

Android

Figure 34-1: Alphabet Revenue Breakdown 2003 vs. 2023



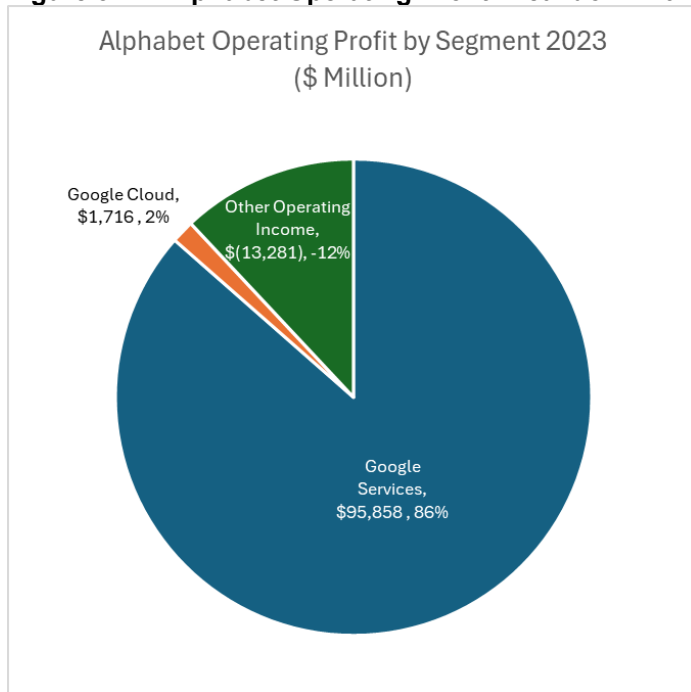
Notes:

1. Google’s advertising revenues consist of sales from Google Search and other Google properties, such as Gmail, Google Maps, and Google Play, as well as YouTube and the Google Network.³⁴⁶
2. Other revenues include sales from Google subscriptions, platforms, and devices, as well as other bets, such as healthcare-related services.
3. The total revenue of Google Services, including Google advertising, subscriptions, platforms, and devices, are \$272.5 billion in 2023.

³⁴⁵ Interview with Former Head of Product, Google Maps Ads of Google. 2/10/2021.

³⁴⁶ Alphabet Annual Report 2023.

Figure 34-2: Alphabet Operating Profit Breakdown 2023



Notes:

1. Google did not disclose its segment profit in 2003, but the company's overall operating margin that year was approximately 23%. This should reasonably reflect the operating margin of Google's advertising (Google Service) segment, given that it accounted for 97% of the company's total sales at the time.
2. The operating margin of Google Services was approximately 35% in 2023.
3. The operating margin of Google Cloud was approximately 5% in 2023.

In 2005, Google acquired Android Inc.,³⁴⁷ a 22-month-old startup focused on developing a software operating system for cellphones, without disclosing the purchase price. This acquisition brought talent to Google, most notably co-founder Andy Rubin, who later became known as the "father of Android." At the time, Google was secretive about the acquisition, only stating that it was interested in Android's talented engineers and great technology.

Before acquiring Android, Google had already begun extending its reach into mobile platforms. By the time of its IPO, Google Wireless (later known as Google Mobile) was already accessible through various mobile phone services worldwide, allowing users to search both the "mobile web," which consisted of 5 million pages tailored for wireless devices, and Google's vast index of over 4 billion web pages.³⁴⁸

Three years after the acquisition, in October 2008, Google launched the first version of the Android operating system, which debuted on the T-Mobile G1 (also known as the HTC Dream) in the U.S.³⁴⁹ At that time, the world's mobile phone operating system market was dominated by Symbian, which held a 49.8% market share, followed by BlackBerry's RIM at 15.9%. Apple's iPhone, which had launched in 2007 with its own operating system, accounted for nearly 13% of the market, while Microsoft's Windows Mobile held an 11% share.³⁵⁰

Android distinguished itself apart as a free, open-source mobile operating system that not only empowered developers to create applications for mobile devices but also enabled manufacturers to freely customize it to better suit their products based on different specification regardless of factors such as brands, processors, and screen sizes. It later attracted major manufacturers, including Samsung, HTC, and Xiaomi, who adopted Android and integrated Google's applications and services into their devices. The G1 debut included a suite of integrated Google apps that pre-installed on Android such as

³⁴⁷ Google Buys Android for Its Mobile Arsenal. Bloomberg Businessweek. https://web.archive.org/web/20110205190729/http://www.businessweek.com/technology/content/aug2005/tc20050817_0949_tc024.htm

³⁴⁸ Google Prospectus 2004.

³⁴⁹ The History of Android. <https://web.archive.org/web/20150310151326/http://arstechnica.com/gadgets/2014/06/building-android-a-40000-word-history-of-googles-mobile-os/6/>

³⁵⁰ Apple Jumps to Third Place in Smartphone Market as Nokia Declines. The Guardian. <https://www.theguardian.com/technology/blog/2008/dec/04/gartner-smartphones>

Google Search, Gmail, Google Maps, Google Calendar, and YouTube.³⁵¹ In addition, Android also came with the Android Market, which was later rebranded as the Google Play Store, offering users access to apps and games. While Apple's App Store, launched four months earlier, enforced strict design and technical guidelines subject to Apple's review, Android offered developers far more freedom to create innovative functionalities, even including the ability to replace stock apps. This flexibility likely contributed to Android's broader adoption, attracting manufacturers and developers alike.³⁵² Such freedom potentially widened Android's adoption among manufacturers, significantly broadening Android's ecosystem and making it more appealing as a versatile platform for mobile devices. Initially, all apps on the Android Market were free to download, while Apple's App Store charged for some applications. **This open, developer-friendly ecosystem and the free of charge facilitated rapid adoption by manufacturers and developers, helping to expand the Android ecosystem.**³⁵³ Although many developers work across multiple platforms, a 2016 report by Evans Data Group estimated that 5.9 million developers worldwide primarily targeted Android, while 2.8 million primarily targeted iOS.³⁵⁴

In terms of user experience, the T-Mobile G1 was competitive for its time, especially as 3G networks were emerging. Even on a 2G network, the web browsing experience on the G1 was impressive by the standards of the era, although some noted it was not as smooth as the iPhone experience. Nonetheless, it was vastly superior to other smartphones available.³⁵⁵

Figure 35-1: T-Mobile G1 vs. iPhone 3G³⁵⁶



³⁵¹ Android Phone Is A Good iPhone Alternative. NBC News. <https://www.nbcnews.com/id/wbna27198184>

³⁵² Android Phone Is A Good iPhone Alternative. NBC News. <https://www.nbcnews.com/id/wbna27198184>

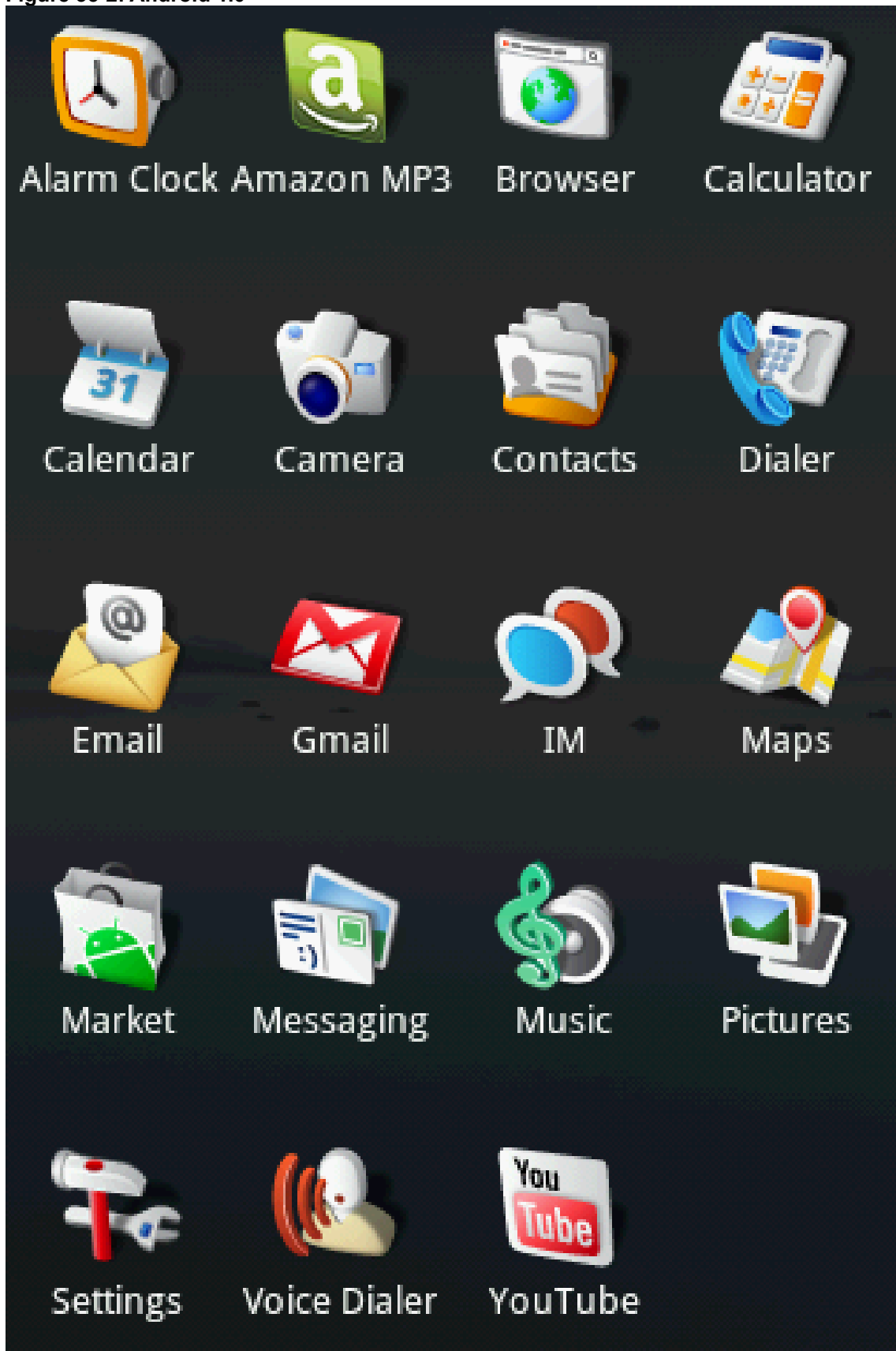
³⁵³ Google Inc. Presents at BofA Merrill Lynch 2012 Global Technology Conference. 5/8/2012.

³⁵⁴ Mobile Developer Population Reaches 12M Worldwide. <https://evansdata.com/press/viewRelease.php?pressID=244>

³⁵⁵ Android Phone Is A Good iPhone Alternative. NBC News. <https://www.nbcnews.com/id/wbna27198184>

³⁵⁶ Images from <https://web.archive.org/web/20150310151326/http://arstechnica.com/gadgets/2014/06/building-android-a-40000-word-history-of-googles-mobile-os/6/>; <https://www.techradar.com/reviews/phones/mobile-phones/apple-iphone-3g-421417/review>

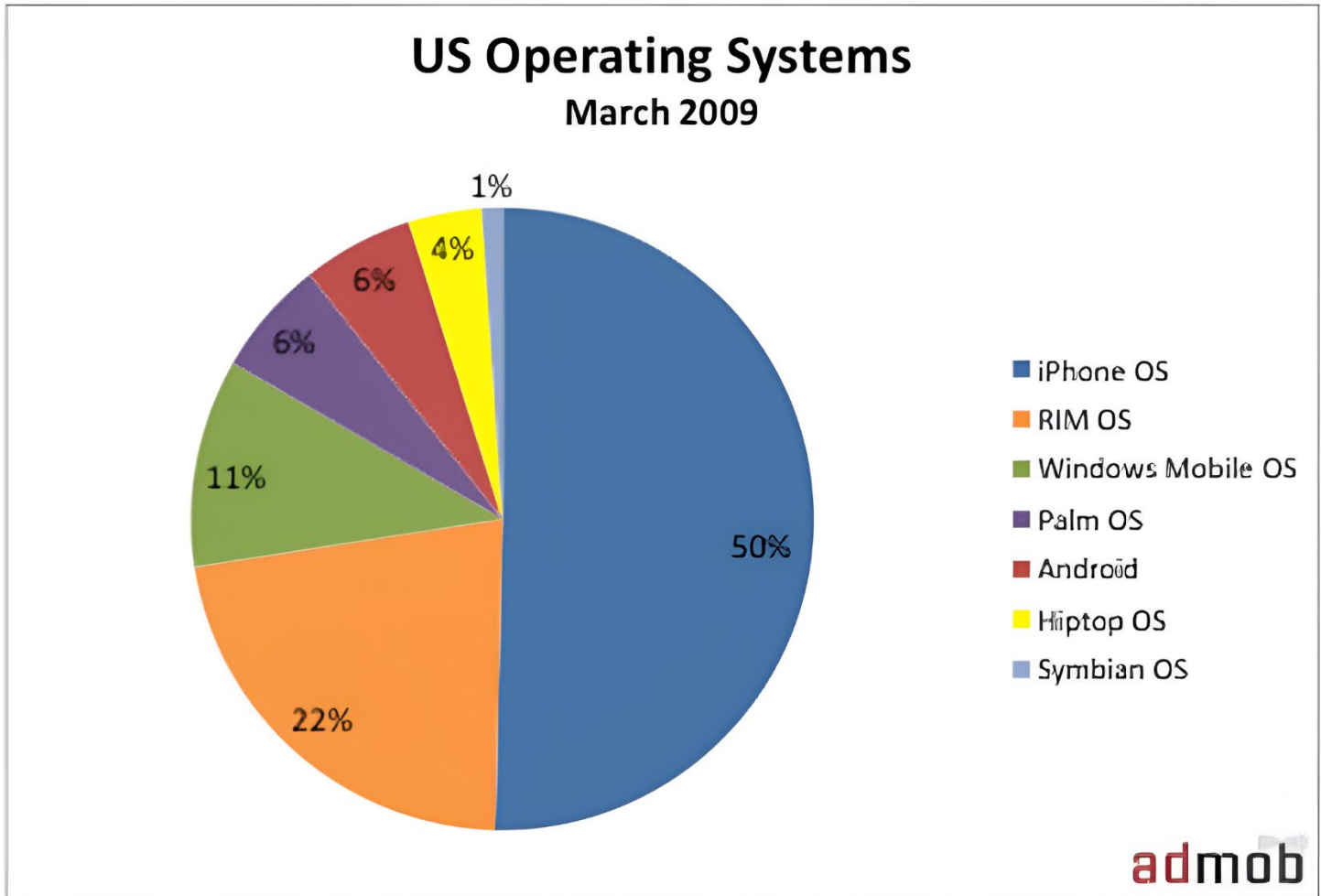
Figure 35-2: Android 1.0³⁵⁷



³⁵⁷ The History of Android. <https://web.archive.org/web/20150310151326/http://arstechnica.com/gadgets/2014/06/building-android-a-40000-word-history-of-googles-mobile-os/6/>

Six months after launching the G1, in April 2009, T-Mobile reported sales exceeding 1 million units in the U.S., accounting for approximately two-thirds of all 3G phones on its network.³⁵⁸ Although the G1 did not reach the same level of public attention as the iPhone, whose 3G model sold over 1 million units in its first weekend, it marked a significant milestone for both Google and T-Mobile. This was particularly significant given the popularity of the iPhone 3G, which was exclusively available through AT&T at the time.³⁵⁹ By March 2009, surveys showed 50% of mobile phones in the U.S. used iPhone OS, followed by BlackBerry at 22%, Windows Mobile at 11%, and Android with a 6% market share.

Figure 36: U.S. Mobile Operating Systems, March 2009³⁶⁰



As mentioned earlier, the Android system is free and open source, allowing developers and manufacturers to customize apps and the operating system for various mobile device models. Moreover, Android devices offer users greater customization than their main competitor, iOS, and come in a wide range of models from different manufacturers. This means consumers have access to a broader selection of phones or tablets across multiple price points, unlike Apple's iPhone or iPad, which typically launch with only a few sub-models.

On average, smartphones running Android are sold at significantly lower price points than iPhones. For example, in 2013, the average selling price (ASP) of an iPhone was around \$650 compared to less than \$300 for Android devices;³⁶¹ by 2023, the ASP for an Android phone was around \$250, while the average iPhone cost nearly \$950.³⁶²

³⁵⁸ T-Mobile Has Sold 1 Million G1 Android Phones. CNET. <https://www.cnet.com/tech/mobile/t-mobile-has-sold-1-million-g1-android-phones/>

³⁵⁹ Android Phone Is A Good iPhone Alternative. NBC News. <https://www.nbcnews.com/id/wbna27198184>

³⁶⁰ T-Mobile Has Sold 1 Million G1 Android Phones. CNET. <https://www.cnet.com/tech/mobile/t-mobile-has-sold-1-million-g1-android-phones/>

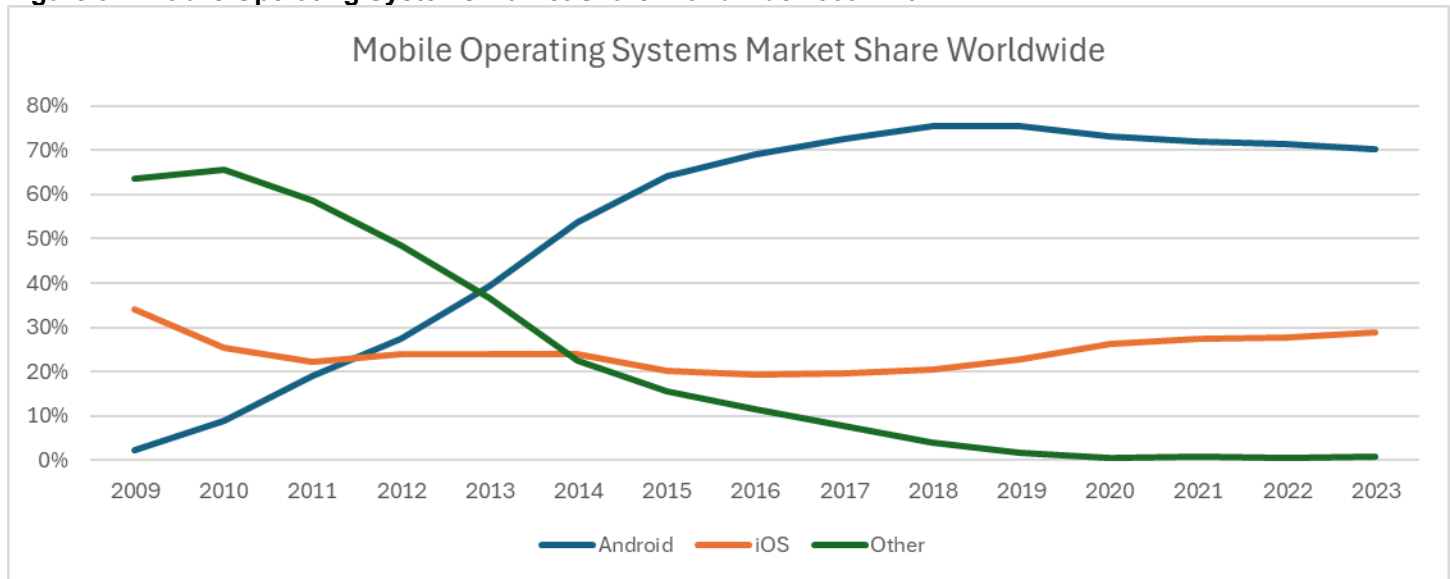
³⁶¹ Why Qualcomm Incorporated's Royalty Is in No Real Danger. <https://www.fool.com/investing/general/2014/07/08/why-qualcomm-incorporateds-royalty-is-in-no-real-d.aspx>

³⁶² Apple Hits "All-Time High" Smartphone Market Share. <https://arstechnica.com/gadgets/2024/01/apple-hits-all-time-high-smartphone-market-share-takes-1-spot-for-2023/>

Customers also benefit from a much wider selection of Android phones. In 2023, four of the world’s top five smartphone manufacturers by volume used Android, collectively capturing 50% of the market share, compared to Apple’s 19%.³⁶³ Samsung, the world’s largest smartphone manufacturer by unit sales, delivering 20% of the world’s smartphones, offers dozens of Galaxy models ranging from less than \$200 to around \$2,000.³⁶⁴ Similarly, Xiaomi provides over a dozen smartphone models priced from under \$300 to just under \$3,000.³⁶⁵ In contrast, Apple offers only a handful of iPhone models at any given time, with prices ranging from over \$400 to around \$1,600.³⁶⁶

By 2023, Android has grown to become the world’s largest mobile operating system, commanding over 70% of the market, as Figure 37 shows, with most of the remaining share held by Apple’s iOS. With more than 3 billion monthly active users worldwide,³⁶⁷ Android-powered devices, along with other mobile devices, now account for about 50% of searches on Google.com, made from mobile devices such as smartphones and tablets.³⁶⁸

Figure 37: Mobile Operating Systems Market Share Worldwide 2009 – 2024³⁶⁹



Android, like Google Chrome, plays a key role in expanding Google’s global user base while strengthening its ecosystem by keeping users engaged within its services. Android devices are pre-installed with Google’s suite of apps such as Search and Chrome, enabling Google to continuously collect user data, which it feeds into its algorithms to personalize search results and ads. According to Google’s privacy policy, data is collected through apps, browsers, and devices as users interact with Google services, regardless of whether they are logged into a Google account.³⁷⁰ If not logged in, Google associates data with unique identifiers for the device or browser. This enables Google to maintain user preferences during browsing sessions and serve personalized ads or search results based on their activities. However, if users are logged into their accounts, the data is directly linked to their profiles and shared across all their devices.

A former Google Search product manager highlighted two critical factors for a successful search engine – search quality and distribution.³⁷¹ Search quality improves with more data, and distribution refers to effectively delivering the search engine to users. The ownership of platforms such as Chrome and Android strengthens Google’s distribution, providing a steady stream of data that enhances search quality and reinforces Google’s competitive edge over competitors like Microsoft’s Bing. While Google generates revenue through the Play Store on Android devices, insignificant relative to the

³⁶³ Smartphone Market Recovers In 2024 After Two Years Of Decline. <https://www.counterpointresearch.com/insight/post-insight-research-notes-blogs-smartphone-market-recovers-in-2024-after-two-years-of-decline>

³⁶⁴ Galaxy Cell Phones. <https://www.samsung.com/us/mobile/phones/all-phones/>

³⁶⁵ All Products – Xiaomi Store. <https://www.mi.com/shop/search?keyword=xiaomimix%E7%B3%BB%E5%88%97>

³⁶⁶ Buy iPhone – Apple. <https://www.apple.com/shop/buy-iphone>

³⁶⁷ Alphabet Q1 2024 Earnings Call. 4/25/2024.

³⁶⁸ Interview with Former Google AdWords Workflow and Revenue Lead at Google. 11/30/2021.

³⁶⁹ Mobile Operating System Market Share Worldwide. StatCounter GlobalStats. <https://gs.statcounter.com/os-market-share/mobile/worldwide#yearly-2009-2024>

³⁷⁰ Google Privacy Policy. <https://policies.google.com/privacy>

³⁷¹ Interview with Former Group Product Manager, Search at Google. 2/29/2024.

company's overall revenue, the primary purpose of Android is to distribute Search and Chrome. These services are default on Android devices, making it nearly impossible to use Android without accessing Google's built-in services such as Google Search.³⁷²

For average users, avoiding Google's tracking is nearly impossible. Google gathers data from any interaction with its services, such as search terms, videos watched, interactions with ads, and content preferences. Even if users do not directly interact with Google services, their data may still be tracked through third-party apps that use Google services.³⁷³ This data is then processed by Google's algorithms to personalize ads and other features, tailoring them to user preferences.

An IT consultant and web developer was shocked by the extent of information Google had collected about him.³⁷⁴ He discovered that Google tracked his location in the background, calculated travel times between places, and had records on his hobbies, interests, estimated weight, income, apps used, and even deleted files.³⁷⁵ His data file from Google was reportedly nine times larger than that from Facebook.³⁷⁶ This anecdote illustrates the vast scale of data collection, given that billions of users worldwide rely on Google's services.

Although Google offers Android as a free, open-source operating system to manufacturers, it introduced licensing fees in 2018 for devices that include Google Mobile Services, such as the Google Play Store, in specific regions.³⁷⁷ This change responded to the European Commission's antitrust ruling, which found Google leveraged Android's market power by requiring manufacturers to bundle Google Chrome and Google Search with other apps in its suite. Following the ruling, Android remains free and open source, but manufacturers must pay licensing fees to include the full suite of Google apps on devices sold within the European Economic Area (EEA).³⁷⁸ Some media reports estimated that manufacturers could face charges as high as \$40 per device for new models released after the decision.³⁷⁹

The integration of the Play Store on Android operating system has provided Google with a substantial revenue stream. In 2010, Google introduced paid apps on Android Market worldwide,³⁸⁰ taking a 30% cut from developers for app sales, in-app ads, and purchases.³⁸¹ The fee structure has evolved since 2018,³⁸² and as of 2024, Google charges developers 15% on their first \$1 million in annual revenue, with the rate increasing to 30% for earnings beyond that threshold. For subscription-based products, Google charges a flat 15% regardless of a developer's total earnings.³⁸³ Apple's fee structure is similar to Google's, with slight variations. It charges developers a 30% fee for apps and in-app purchases.³⁸⁴ For subscriptions, the fee is 30% in the first year, dropping to 15% in subsequent years. Developers who make less than \$1 million annually qualify for a reduced fee of 15%.

³⁷² Interview with Former Group Product Manager, Search at Google. 2/29/2024.

³⁷³ Google Privacy Policy. <https://policies.google.com/privacy>

³⁷⁴ Worried About What Facebook Knows About You - Check out Google. NBC. <https://www.nbcnews.com/tech/social-media/worried-about-what-facebook-knows-about-you-check-out-google-n860781>

³⁷⁵ Worried About What Facebook Knows About You - Check out Google. NBC. <https://www.nbcnews.com/tech/social-media/worried-about-what-facebook-knows-about-you-check-out-google-n860781>

³⁷⁶ Google Sells The Future, Powered By Your Personal Data. NBC. <https://www.nbcnews.com/tech/tech-news/google-sells-future-powered-your-personal-data-n870501>

³⁷⁷ Google App Suite Costs As Much As \$40 Per phone Under New EU Android Deal.

<https://www.theverge.com/2018/10/19/17999366/google-eu-android-licensing-terms>

³⁷⁸ Complying With The EC's Android Decision. Google. <https://blog.google/around-the-globe/google-europe/complying-ecs-android-decision/>

³⁷⁹ Google App Suite Costs As Much As \$40 Per phone Under New EU Android Deal.

<https://www.theverge.com/2018/10/19/17999366/google-eu-android-licensing-terms>

³⁸⁰ Big News: Google Starts Rolling Out Paid Android Apps Support In More Countries. <https://techcrunch.com/2010/09/27/android-market-international/>

³⁸¹ Android Is Google's Next Giant Revenue Stream. CNN.

https://money.cnn.com/2010/10/07/technology/google_android/index.htm

³⁸² Google Will Reduce Play Store Cut to 15 Percent for A Developer's First \$1M in Annual Revenue.

<https://www.theverge.com/2021/3/16/22333777/google-play-store-fee-reduction-developers-1-million-dollars>

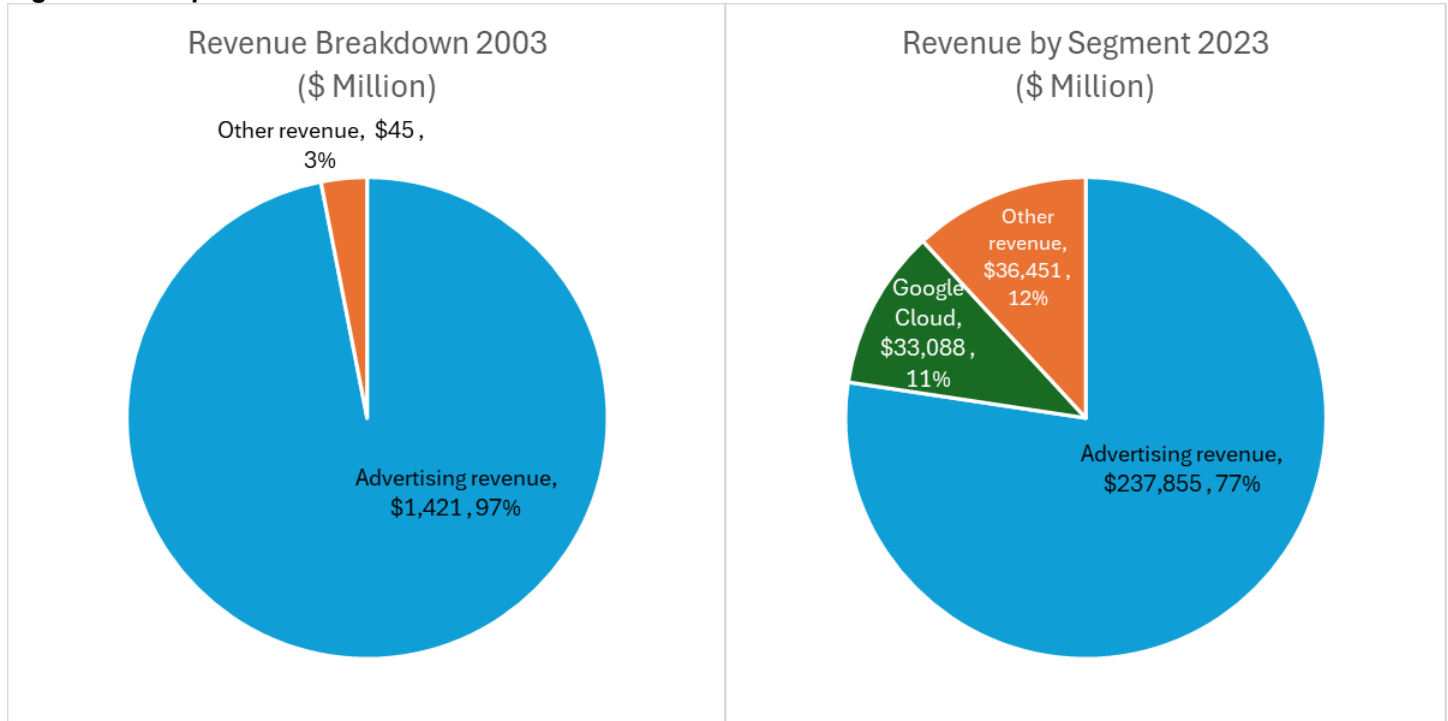
³⁸³ Service Fees. Play Console Help. <https://support.google.com/googleplay/android-developer/answer/112622?sjid=16087689109494940127-NA>

³⁸⁴ Every Apple App Store Fee, Explained. <https://appleinsider.com/articles/23/01/08/the-cost-of-doing-business-apples-app-store-fees-explained>

While Google does not publicly disclose its app store revenue, a 2019 court filing revealed that Google’s mobile app store generated \$11.2 billion that year, representing nearly 7% of the company’s total revenue. This included earnings from app sales, in-app purchases, and ads, with a gross margin of 76% and an operating margin of 63%.³⁸⁵ Most importantly, the over 3 billion Android users worldwide create significant user data, which Google continually uses to refine its algorithms, enhance ad targeting, and maintain its competitive edge in the evolving mobile market.

Google Cloud

Figure 38-1: Alphabet Revenue Breakdown 2003 vs. 2023



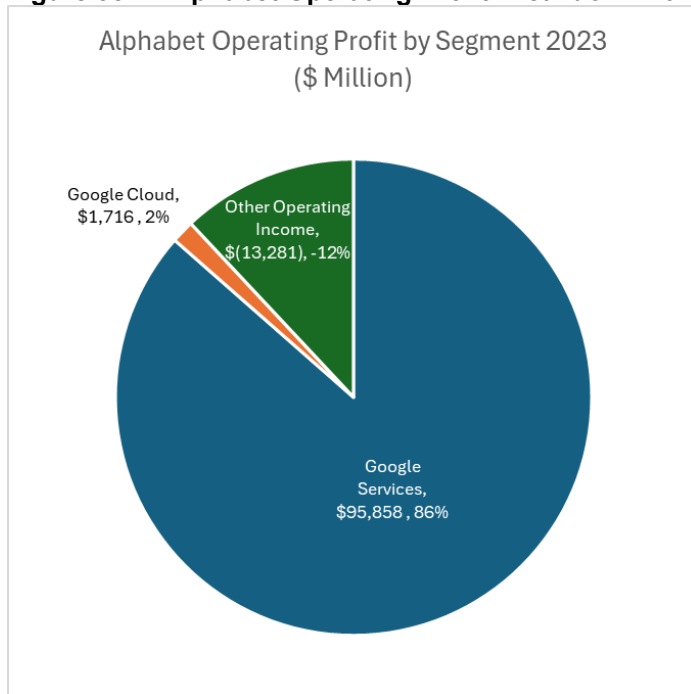
Notes:

1. Google’s advertising revenues consist of sales from Google Search and other Google properties, such as Gmail, Google Maps, and Google Play, as well as YouTube and the Google Network.³⁸⁶
2. Other revenues include sales from Google subscriptions, platforms, and devices, as well as other bets, such as healthcare-related services.
3. The total revenue of Google Services, including Google advertising, subscriptions, platforms, and devices, are \$272.5 billion in 2023.

³⁸⁵ Google Play App Store Revenue Hit \$11.2 Billion in 2019. CNBC. <https://www.cnbc.com/technology/google-play-app-store-revenue-hit-112-billion-in-2019-lawsuit-says-10536121.htm>

³⁸⁶ Alphabet Annual Report 2023.

Figure 38-2: Alphabet Operating Profit Breakdown 2023



Notes:

1. Google did not disclose its segment profit in 2003, but the company's overall operating margin that year was approximately 23%. This should reasonably reflect the operating margin of Google's advertising (Google Service) segment, given that it accounted for 97% of the company's total sales at the time.
2. The operating margin of Google Services was approximately 35% in 2023.
3. The operating margin of Google Cloud was approximately 5% in 2023.

As of 2023, Google Cloud is one of Alphabet's major segments, primarily consisting of Google Cloud Platform (GCP) services such as infrastructure and data analytics solutions. These services are targeted toward developers in businesses, organizations, and individuals seeking to build, deploy, and scale applications, websites, and other digital services using Google's infrastructure without needing to setup their own.

Google Cloud's journey began in 2008 with the launch of Google App Engine, a developer tool designed to simplify the development process by allowing users to run web applications on Google's infrastructure. This tool provided developers access to the same infrastructure that powers services such as Gmail and Google Calendar, ensuring reliability even under heavy loads or large data volumes.³⁸⁷ Google stated that the goal of Google App Engine was to let developers focus on writing code and improving their applications while Google managed the underlying infrastructure.

The initial beta release of Google App Engine was free for the first 10,000 developers, who were allocated resources including 500MB of storage, 200M CPU megacycles per day, and 10GB of daily bandwidth, sufficient to support roughly five million monthly page views. Developers had the option to purchase additional resources as needed.³⁸⁸ In 2010, Google expanded its cloud offerings by launching Google Storage for Developers. Initially available as a limited-access beta, this service allocated developers up to 100GB of data storage and 300GB of monthly bandwidth for free. Google's scalable, reliable data centers across the U.S. allowed developers to leverage its extensive infrastructure without the need to build their own.³⁸⁹

Google's cloud services continued to evolve, and in 2013, it released Google Compute Engine to the general public.³⁹⁰ Compute Engine provided virtual machines (VMs) for developers, complementing the platform-as-a-service (PaaS) model offered by Google App Engine. This infrastructure-as-a-service (IaaS) solution allowed businesses to rent a portion of

³⁸⁷ Introducing Google App Engine. <https://cloudplatform.googleblog.com/2008/04/introducing-google-app-engine-our-new.html>

³⁸⁸ Introducing Google App Engine. <https://cloudplatform.googleblog.com/2008/04/introducing-google-app-engine-our-new.html>

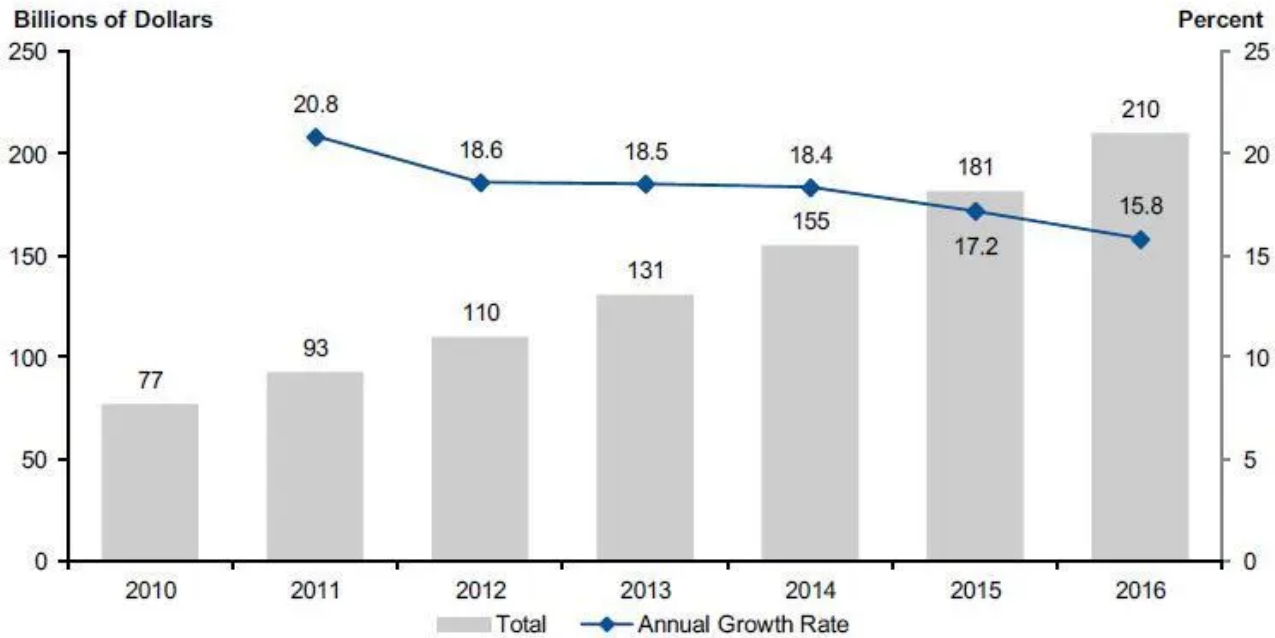
³⁸⁹ Google Storage for Developers. <https://googlecode.blogspot.com/2010/05/google-storage-for-developers-preview.html>

³⁹⁰ Google Compute Engine Is Now Generally Available with Expanded OS Support. <https://cloudplatform.googleblog.com/2013/12/google-compute-engine-is-now-generally-available.html>

Google's vast network infrastructure rather than investing in their own data centers,³⁹¹ offering developers greater flexibility and support for various programming languages beyond App Engine's initial focus on Python and Java.³⁹²

A 2013 Gartner report projected rapid growth for public cloud services, as Figure 39-1 and 39-2 show, from \$77 billion in 2010 to \$210 billion by 2016, representing an 18% CAGR,³⁹³ with IaaS experiencing the fastest growth, from \$3 billion to \$24 billion, a 41% CAGR. By then, the IaaS market accounted for more than 10% of the overall public cloud market, presenting a substantial opportunity for Google Cloud, though it was still relatively new to the space.

Figure 39-1: Public Cloud Services Market 2010 – 2016³⁹⁴
 Public Cloud Services Market and Annual Growth Rate, 2010-2016



Source: Gartner (February 2013)

Note:

1. The above data from 2013 to 2016 was projected by Gartner in its 2013 report.

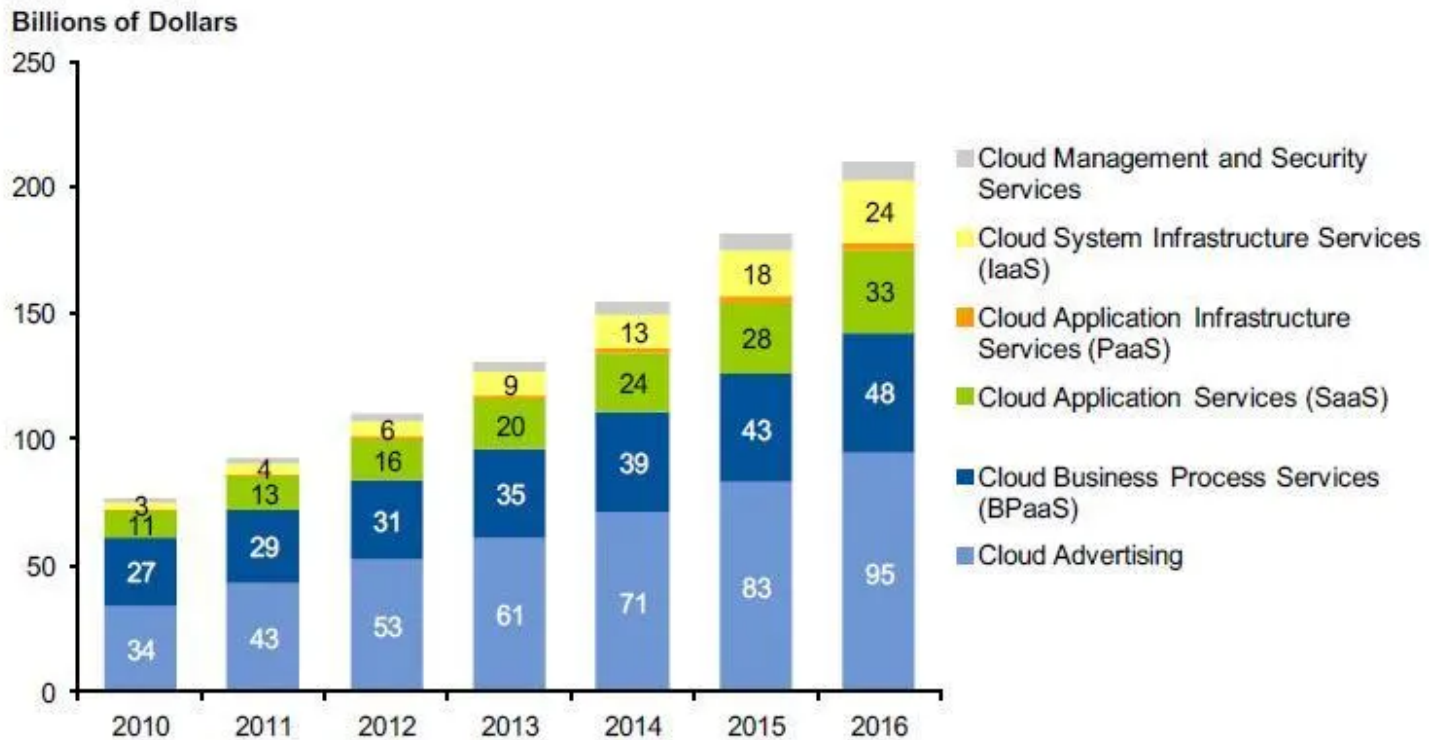
³⁹¹ Amazon Sees Sunshine in a Cloudy Play. WSJ. <https://www.wsj.com/articles/SB10001424052702304579404579236352606941672>

³⁹² Google Compute Engine vs App Engine. <https://tutorialsdojo.com/google-compute-engine-vs-app-engine/>; Compute Engine Documentation. <https://cloud.google.com/compute/docs/faq>

³⁹³ Gartner Predicts Infrastructure Services Will Accelerate Cloud Computing Growth. <https://www.forbes.com/sites/louiscolombus/2013/02/19/gartner-predicts-infrastructure-services-will-accelerate-cloud-computing-growth/>

³⁹⁴ Gartner Predicts Infrastructure Services Will Accelerate Cloud Computing Growth. <https://www.forbes.com/sites/louiscolombus/2013/02/19/gartner-predicts-infrastructure-services-will-accelerate-cloud-computing-growth/>

Figure 39-2: Public Cloud Service Market by Segment 2010 2016³⁹⁵
 Public Cloud Services Market by Segment, 2010-2016



Source: Gartner (February 2013)

While Google Cloud has seen remarkable growth, Alphabet does not disclose a detailed revenue breakdown within the segment. However, a 2023 Gartner report indicated that the worldwide IaaS market had grown by 16.2% year-over-year to reach \$140 billion, with Google's IaaS revenue growing at 26%, the fastest among top providers.³⁹⁶ Gartner emphasized that cloud technologies remain a major business disruptor and that growth is expected to continue exponentially, especially with the rise of generative AI, which consumes considerable IaaS resources. **Despite Google Cloud's growth, its 8.2% share in the nearly \$140 billion IaaS market still trails Amazon and Microsoft, which hold 39.0% and 23% market shares, respectively, as Figure 40 shows. Google's late entry and the high switching costs for existing users partly explain its smaller market share compared to Amazon and Microsoft, which launched services earlier.**

For example, Amazon introduced Amazon S3 (Simple Storage Service) and EC2 (Elastic Compute Cloud) in 2006,³⁹⁷ and Microsoft launched Azure in 2008.³⁹⁸ By the time Google Compute Engine became generally available in 2013, Amazon had already captured 37% of the \$9 billion IaaS market, while Microsoft held nearly 11% and Google less than 10%.³⁹⁹

³⁹⁵ Gartner Predicts Infrastructure Services Will Accelerate Cloud Computing Growth. <https://www.forbes.com/sites/louiscolombus/2013/02/19/gartner-predicts-infrastructure-services-will-accelerate-cloud-computing-growth/>

³⁹⁶ Gartner Says Worldwide IaaS Public Cloud Services Revenue Grew 16.2% in 2023. <https://www.gartner.com/en/newsroom/press-releases/2024-07-22-gartner-says-worldwide-iaas-public-cloud-services-revenue-grew-16-point-2-percent-in-2023>

³⁹⁷ Amazon-Web-Services-Launches. <https://press.aboutamazon.com/2006/3/amazon-web-services-launches>; Amazon EC2 Beta. https://aws.amazon.com/blogs/aws/amazon_ec2_beta/

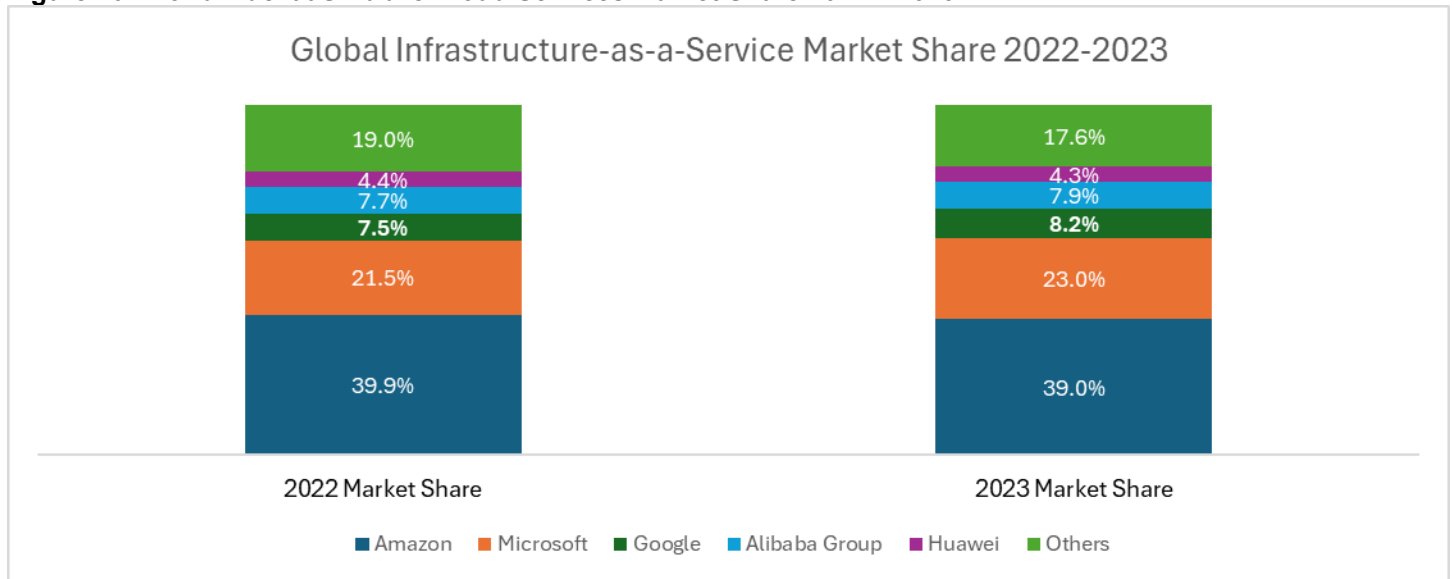
³⁹⁸ Ray Ozzie Announces Windows Azure. https://archive.nytimes.com/www.nytimes.com/external/readwriteweb/2008/10/27/27readwriteweb-windows_azure.html

³⁹⁹ Amazon Web Services Market Share. Business Insider. <https://web.archive.org/web/20140617110922/https://www.businessinsider.com/amazon-web-services-market-share-2014-6>

In 2014, Amazon held a 28% share of the global cloud infrastructure market, including IaaS, PaaS, and hybrid solutions. Microsoft followed with 10%, IBM with 7%, Google with 5%, and Salesforce with 4%.⁴⁰⁰ Another report shows that Amazon's computational capacity at that time was estimated to be more than five times that of its next 14 IaaS competitors combined.⁴⁰¹

Different cloud providers use unique technologies and interfaces, making migration between platforms challenging. Migration may require significant technical adjustments due to differences in supported programming languages and platform-specific tools. Since engineers often specialize in a single platform, migration can necessitate retraining or hiring specialists,⁴⁰² adding to the complexity and cost. For companies with substantial data needs, migration can span several years. Dropbox, for instance, took over two years (from 2015 to 2017) to migrate 500 petabytes of data from Amazon Web Services (AWS) to its own infrastructure,⁴⁰³ demonstrating the scale and difficulty of large migrations. Once developers commit to a cloud provider, changing becomes impractical unless absolutely necessary.

Figure 40: Worldwide IaaS Public Cloud Services Market Share 2022 – 2023⁴⁰⁴



Price competition is another factor in the cloud landscape. A 2015 RBC report⁴⁰⁵ showed that, in the institution's own use cases, Google Cloud's average monthly cost per gigabyte of RAM was about 24% higher than AWS in 2013. However, Google narrowed this gap by reducing prices over time. By the end of 2014, Google Cloud was still 28% more expensive than AWS but slightly cheaper than Microsoft Azure by about 6%. Nevertheless, price alone does not determine platform choice; developers also consider factors such as storage space, GPU, CPU options, data center locations, and other infrastructure features.

Despite its initial challenges, Google Cloud has become a key revenue driver for Alphabet. In 2023, Google Cloud generated \$33.1 billion, accounting for nearly 11% of Alphabet's total revenue. From 2017 to 2023, during which the data is available, Google Cloud revenue grew at a 42% CAGR, significantly outpacing the 19% CAGR of Alphabet's overall revenue. Consequently, Google Cloud's share of Alphabet's total revenue increased from 3.7% in 2017 to nearly 11% in 2023. However, the cloud segment did not become profitable until fiscal year 2023, achieving only a 5% operating margin.

⁴⁰⁰ AWS Market Share Reaches Five-Year High Despite Microsoft Growth Surge. <https://www.srgresearch.com/articles/aws-market-share-reaches-five-year-high-despite-microsoft-growth-surge>

⁴⁰¹ Amazon's AWS Market Share And Revenues. Business Insider.

<https://web.archive.org/web/20131123043855/https://www.businessinsider.com/amazons-aws-market-share-and-revenues-2013-8>

⁴⁰² The Economics of Cloud. Toulouse School of Economics.

⁴⁰³ Dropbox Saved Almost \$75 Million over Two Years by Building Its Own Tech Infrastructure.

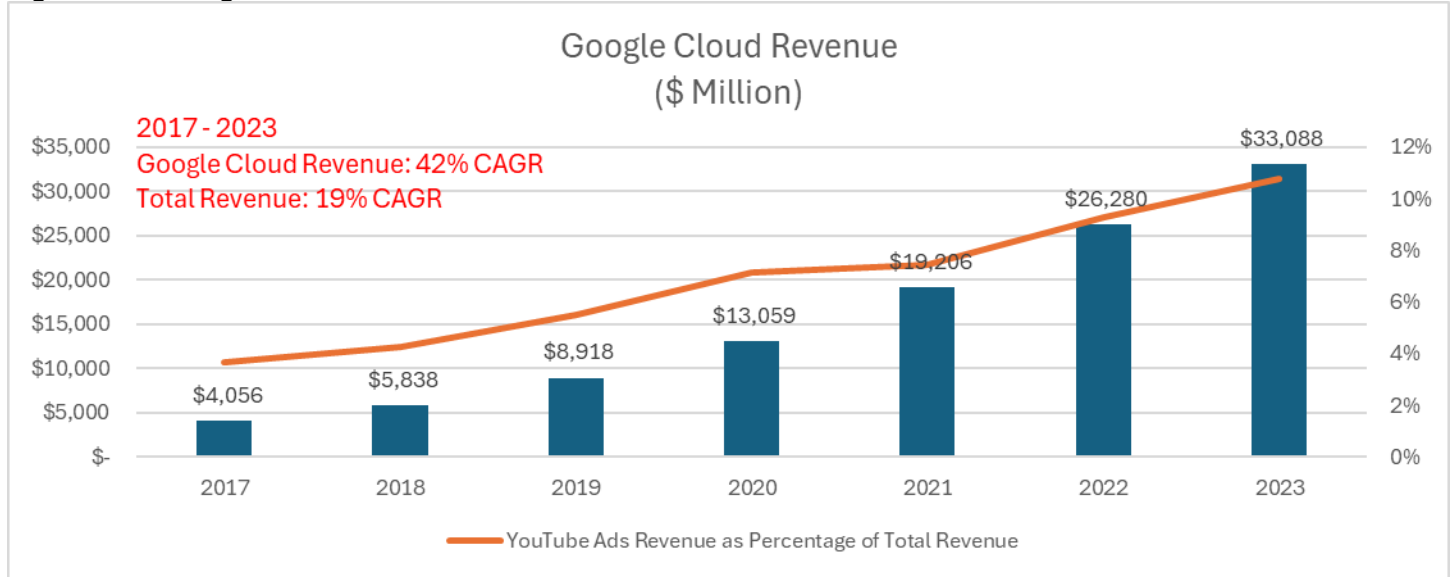
<https://www.geekwire.com/2018/dropbox-saved-almost-75-million-two-years-building-tech-infrastructure/>; Dropbox Slips 500PB into Its Magic Pocket. https://www.theregister.com/2016/03/14/dropbox_moves_data_from_aws/

⁴⁰⁴ Gartner Says Worldwide IaaS Public Cloud Services Revenue Grew 16.2% in 2023. <https://www.gartner.com/en/newsroom/press-releases/2024-07-22-gartner-says-worldwide-iaas-public-cloud-services-revenue-grew-16-point-2-percent-in-2023>

⁴⁰⁵ Cloud Computing Price War in One Chart. Business Insider. <https://www.businessinsider.com/cloud-computing-price-war-in-one-chart-2015-1>

compared to the 35% operating margin of Google Services, which includes products and services such as advertising, Android, Chrome, and Maps.⁴⁰⁶

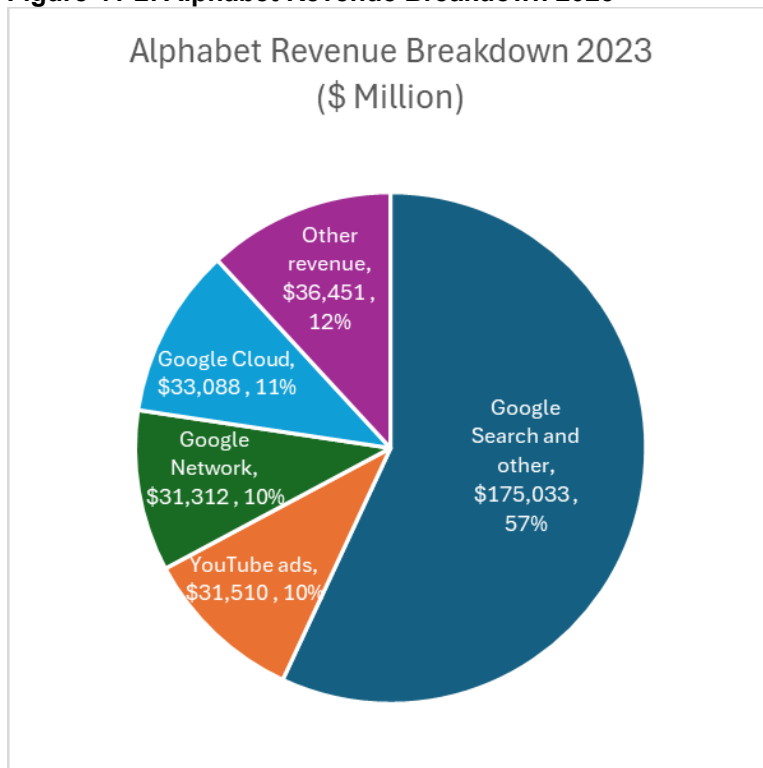
Figure 41-1: Google Cloud Revenue 2017 - 2023



Note:

1. Google Cloud revenues consist of Google Cloud Platform services such as infrastructure and data and analytics; G Suite productivity tools including apps such as Gmail, Docs, Drive, and Calendar; and other enterprise cloud services.

Figure 41-2: Alphabet Revenue Breakdown 2023



Note:

1. Alphabet's advertising revenue consists of Google Search and other, Google Network, and YouTube ads, totaling nearly 77% of Alphabet's revenue in 2023.

⁴⁰⁶ Alphabet Annual Report 2023.

C. Management Team

At the time of its IPO, Google was primarily led by three key figures: the two founders, Larry Page and Sergey Brin, along with the CEO, Eric Schmidt. The three leaders operated collaboratively, with Page and Brin serving as Presidents. To ensure timely decision-making, they met daily to update each other on the business and to collectively focus on the most important and immediate issues.⁴⁰⁷ While decisions were often made by one of the three, the others would be briefed later. Larry Page believed this approach worked because they had tremendous trust and respect for each other, and they generally shared similar views. Because of their long-standing working relationship, they could often predict any differences of opinion. All three leaders also had deep technical expertise.

To protect the company from external takeovers or influence after going public, Google implemented a dual-class voting structure, which was rare in the early 2000s. Larry Page believed that this structure would allow the management team to maintain a long-term, innovative approach.⁴⁰⁸ The Class A common stock offered to the public had one vote per share, while the Class B shares, held by many of the original shareholders, carried 10 votes per share. In 2012, Google also introduced Class C shares, which have no voting rights.

Google's management team believes that such a structure preserves what they think is important about Google. For example, the company does not want to have a short-term revenue or profit opportunity that makes them do something that they feel compromise the company's integrity.⁴⁰⁹ The dual-voting structure was designed to ensure that Google's leadership, especially the founders, retained significant control over the company's destination as its shares changed hands. **After the IPO, Page, Brin, and Schmidt would collectively hold 37.6% of the voting power, while the executive management team and directors as a whole would control 61.4%, as Figure 42 shows. As of 2023, the two founders, Larry Page and Sergey Brin, collectively owned approximately 51.5% of the voting power of Alphabet, Google's parent company.**⁴¹⁰

Figure 42: Management Ownership Structure at IPO⁴¹¹

	Principal Position	Shares Beneficially Owned Prior to Offering			Shares Beneficially Owned After Offering		
		Class A Common Stock	Class B % Common Stock	% Voting Power	Class A Common Stock	Class B % Common Stock	% Voting Power
Eric Schmidt	Chairman of the Executive Committee, CEO and Director	-	14,758,600	6.1%	-	14,389,635	6.1%
Sergey Brin	President of Technology, Founder	-	38,489,048	15.9%	-	38,007,935	15.8%
Larry Page	President of Products, Founder	-	38,593,200	16.0%	-	38,110,785	15.8%
Omid Kordestani	Senior Vice President of Worldwide Sales and Field Operations	-	4,810,520	2.0%	-	4,569,994	1.9%
Wayne Rosing	Vice President of Engineering	-	1,468,000	<1%	-	1,397,751	<1%
George Reyes	Vice President and CFO	-	851,750	<1%	-	809,163	<1%
Jonathan J. Rosenberg	Vice President of Product Management	-	850,500	<1%	-	807,975	<1%
All executive officers and directors as a group (15 persons)		157,000	151,281,553	62.0%	157,000	149,236,902	62.3%

Note:

1. Applicable percentage ownership is based on 12,359,204 shares of Class A common stock and 241,956,117 shares of Class B common stock outstanding on June 30, 2004, assuming the conversion of all outstanding shares of preferred stock into Class B common stock. In Google's IPO document, the company also assumed that 33,603,386 shares of Class A common stock and 237,616,257 shares of Class B common stock would be outstanding upon completion of the offering.⁴¹²

Google's IPO took an unconventional approach in how the shares were priced. Instead of relying on underwriters to set the price, the company adopted an auction-based approach, similar to how it prices ads. Bidders (investors) would submit bids to the underwriters, specifying how many shares they wanted to purchase and at what price. The final offering price was set at the highest price at which all the available shares, including shares subject to the underwriters' over-allotment option, could be sold to potential investors, based on the bids in the master order book.

After the IPO, the shares owned by the two founders were expected to be worth over \$3.2 billion each, while Eric Schmidt's shares were valued at over \$1.2 billion.

As of 2024, both founders, Larry Page and Sergey Brin, continue to serve as directors on Alphabet's board.⁴¹³

⁴⁰⁷ Founders' IPO Letter – "An Owner's Manual" for Google's Shareholders.

⁴⁰⁸ Founders' IPO Letter – "An Owner's Manual" for Google's Shareholders.

⁴⁰⁹ Google Prospectus 2004.

⁴¹⁰ Google Annual Report 2023.

⁴¹¹ Google Prospectus 2004.

⁴¹² Google Prospectus 2004.

⁴¹³ Board & Governance - Alphabet Investor Relations. <https://abc.xyz/investor/board-and-governance/>

D. Employees, Workplace, Culture

Google's success is deeply rooted in its philosophy that its talents, known as "Googlers," are the core assets of the company. By focusing on attracting and nurturing top talent, both in technology and business, Google has established a culture that is designed to inspire creativity, innovation, and a strong sense of belonging. The company rewards and supports its workforce, offering a range of benefits and fostering an environment that encourages both personal and professional growth.

Google seeks candidates with "Googley" qualities – traits such as initiative, flexibility, a collaborative spirit, and "evidence of being well-rounded."⁴¹⁴ Laszlo Bock, a former Head of People Operations, describes "Googlyness" as "attributes like enjoying fun...intellectual humility...consciousness (we want owners, not employees), comfort with ambiguity (we don't know how our business will evolve, and navigating Google internally requires dealing with a lot of ambiguity), and evidence that you've taken some courageous or interesting paths in your life".⁴¹⁵

To encourage creativity and efficiency and minimize bureaucracy, Google organizes work into small teams, typically consisting of three to five members, which facilitates rapid decision-making and the sharing of ideas.

The company actively limits middle management, as it believes that larger teams can slow productivity and decision-making. Decisions at Google are often consensus oriented.⁴¹⁶ This flat structure preserves an entrepreneurial spirit, even as Google has grown into one of the world's largest companies.⁴¹⁷ One of Google's best-known policies is its "20% time" initiative, which allows employees to dedicate 20% of their work hours to projects they believe will benefit the company. This freedom has led to the creation of some of Google's most successful products, including AdSense for content and Google News,⁴¹⁸ showcasing the belief that innovations can be realized when employees are empowered to pursue their passions. This freedom nurtures a culture of creativity and experimentation, allowing Google to stay at the forefront of technological advancements.

Eric Schmidt, Google's CEO from 2001 to 2011, recalled a story during his first year at the company that highlighted Google's innovative culture and a flat organizational structure. Larry Page, dissatisfied with Google's ads at the time, decided to change.⁴¹⁹ He typed in queries that he thought were representative, printed the search results pages, and displayed them in the break room on a Friday afternoon. Instead of calling formal meetings with vice presidents or directors of engineering, he asked everyone to critique the ads and suggest how to fix them. By Monday, a group of engineers, none of whom were part of the ads team, had developed improved algorithms to address the issues. They had taken on the challenge simply because they found the questions interesting. This moment underscored the value of Google's flat organizational structure, which fostered efficiency and innovation by minimizing middle layers. Google later reorganized and flattened its structure. Schmidt emphasized that one of its executives even had 121 direct reports.

All Googlers participate in 360-degree programs once or twice a year, where they receive feedback from managers, peers, and direct reports. This comprehensive evaluation provides a well-rounded view of each employee's contributions, supporting Google's philosophy that collective input can lead to more accurate assessments.⁴²⁰

Google's work environment is often described as energetic and fun, sometimes compared to the excitement of the dot-com boom era in the late 1990s, with an informal, playful atmosphere. Offices are adorned with bright, colorful decor such as party-colored lava lamps, giant plastic balls resembling Google's logo, and bins of free candy and soda.⁴²¹ This lighthearted approach extends to meals as well, with Googlers enjoying complimentary food throughout the day, from breakfast to lunch, and dinner for those working late. Google's on-site restaurants serve gourmet cuisine from around the world, with options ranging from French to Chinese dishes.⁴²² Between meals, snack stations offer beverages, espresso machines, and treats. The company believes that providing such amenities fosters creativity and a sense of community, where people can connect, exchange ideas, and become inspired.⁴²³ Balancing these indulgences, employees have access to on-site gyms, swimming pools, spas, and basketball courts, among other amenities. Google also provides

⁴¹⁴ Case Study: Keeping Google "Googley". Harvard Business School.

⁴¹⁵ Case Study: Culture at Google. Harvard Business School.

⁴¹⁶ Case Study: Keeping Google "Googley". Harvard Business School.

⁴¹⁷ Case Study: Google Inc. (9-910-036). Harvard Business School.

⁴¹⁸ Founders' IPO Letter – "An Owner's Manual" for Google's Shareholders.

⁴¹⁹ CHM Revolutionaries: An Evening with Google's Executive Chairman Eric Schmidt.

<https://www.youtube.com/watch?v=NfalakTPsnE>

⁴²⁰ Case Study: Keeping Google "Googley". Harvard Business School.

⁴²¹ All Eyes on Google. Forbes. 5/26/2003. <https://www.forbes.com/forbes/2003/0526/100.html>

⁴²² Google Benefits or Google's Benefits? Journal of Business & Technology Law. University of Maryland.

⁴²³ The David Rubenstein Show: Sundar Pichai. <https://www.youtube.com/watch?v=pW6yJOqFiVQ>

laundromats, hair salons, massages, and language classes on-site. Employees report that these benefits not only save them time and money but also help foster deeper relationships with colleagues,⁴²⁴ contributing to a sense of community, which encourages creativity and collaboration in the workplace.⁴²⁵

Google's commitment to its employees' well-being extends to other areas of their lives as well. For instance, the company offers a shuttle service equipped with Wi-Fi, enabling employees to work or relax during their commute. This service means Googlers can live anywhere in San Francisco without the need for a car.⁴²⁶ Moreover, employees are welcome to bring their pets to work, which not only adds to the fun, friendly atmosphere but also encourages spontaneous interactions and helps build connections across different teams.

Google is equally committed to supporting employees with families. New parents, both mothers and fathers, receive paid leave, and during this time, their bonuses continue, and stock options vest.⁴²⁷ Upon returning to work, parents have access to free on-site daycare, with a nominal fee introduced later.⁴²⁸ **Google's death benefits, which are rare in the corporate world, provide significant support to families of deceased U.S. employees – the surviving spouse or partner receives 50% of the employee's annual salary for 10 years, with no minimum tenure required to qualify, and any children receive monthly payments until they turn 19, or 23 if enrolled full-time in school.**⁴²⁹

As a high-paying employer, Google offers competitive salaries, with WIRED reporting in 2019 that the median annual salary at Google was \$246,804, nearly four times the median U.S. household income. This figure was also higher than other major tech companies such as Facebook's \$228,651, Twitter's \$172,703, and Nvidia's \$155,035.⁴³⁰ With its extensive benefits, dynamic work environment, and generous compensation, Google has consistently ranked as one of the best companies to work for, earning the top spot in the U.S. by Fortune in 2007 and remaining among the top employers in subsequent years.⁴³¹

The perks at Google foster loyalty and encourage long-term commitment. According to management experts from the Wharton School, Google aims to “attract the best knowledge-workers it can in the intensely competitive environment for high achievers; help them work long hours by feeding them gourmet meals on-site and handling other time-consuming personal chores; show that they are valued; and have them remain Googlers, as employees are known, for many years.” These perks allow employees to focus on their work, knowing Google is taking care of many day-to-day needs.⁴³² The more chores and errands that Google can take care of his employees, the more employees can concentrate on their work.

Some former employees' opinions concurred with Wharton's perspective, stating that while these perks are generous, they also have a strategic purpose in keeping employees at the office for longer hours. For example, Google's free dinner perk does not start until 6:00 or 6:30 p.m., incentivizing employees to stay late.⁴³³ The shuttle services run from 6 a.m. to 10 p.m., with Wi-Fi access, effectively extending the workday by enabling employees to remain connected during their

⁴²⁴ Google Employees' Favorite Perks. Business Insiders. 7/1/2014. <https://www.businessinsider.com/google-employees-favorite-perks-2014-7#the-free-gourmet-food-and-snacks-are-never-ending-1>

⁴²⁵ Sundar Pichai, CEO of Google and Alphabet. <https://www.youtube.com/watch?v=j9qGmO8Yy-Y>

⁴²⁶ Google Employees' Favorite Perks. Business Insiders. 7/1/2014. <https://www.businessinsider.com/google-employees-favorite-perks-2014-7#the-free-gourmet-food-and-snacks-are-never-ending-1>

⁴²⁷ Google Employees' Favorite Perks. Business Insiders. 7/1/2014. <https://www.businessinsider.com/google-employees-favorite-perks-2014-7#the-free-gourmet-food-and-snacks-are-never-ending-1>

⁴²⁸ Here's What Happens To Google Employees When They Die. Forbes. 8/12/2012.

<https://www.forbes.com/sites/meghancasserly/2012/08/08/heres-what-happens-to-google-employees-when-they-die/>

⁴²⁹ Here's What Happens To Google Employees When They Die. Forbes. 8/12/2012.

<https://www.forbes.com/sites/meghancasserly/2012/08/08/heres-what-happens-to-google-employees-when-they-die/>

⁴³⁰ Case Study: Culture at Google. Harvard Business School; What Tech Companies Pay Employees in 2019. Wired.

[https://web.archive.org/web/20200809053923/https://www.wired.com/story/what-tech-companies-pay-employees-](https://web.archive.org/web/20200809053923/https://www.wired.com/story/what-tech-companies-pay-employees-2019/?utm_source=facebook&utm_social-)

[2019/?utm_source=facebook&utm_social-](https://web.archive.org/web/20200809053923/https://www.wired.com/story/what-tech-companies-pay-employees-2019/?utm_source=facebook&utm_social-)

[type=owned&utm_campaign=wired&utm_brand=wired&utm_medium=social&mbid=social_fb](https://web.archive.org/web/20200809053923/https://www.wired.com/story/what-tech-companies-pay-employees-2019/?utm_source=facebook&utm_social-type=owned&utm_campaign=wired&utm_brand=wired&utm_medium=social&mbid=social_fb)

⁴³¹ 100 Best Companies to Work For 2007. https://money.cnn.com/magazines/fortune/bestcompanies/2007/full_list/

⁴³² Perk Place: The Benefits Offered by Google and Others May Be Grand, but They're All Business.

<https://knowledge.wharton.upenn.edu/podcast/knowledge-at-wharton-podcast/perk-place-the-benefits-offered-by-google-and-others-may-be-grand-but-theyre-all-business/>

⁴³³ Google Perks Like Free Dinner Keeps You at Work Longer. Fortune. 3/29/2022.

commute. This perspective was further supported by a 2023 internal memo revealing that Googlers often work more than the standard eight-hour day.⁴³⁴

Many employees view their time at Google as a career highlight. Being surrounded by brilliant minds, interacting with tech leaders, celebrities, and thought leaders,⁴³⁵ fosters a dynamic environment that is both challenging and energizing. An employee stated that "I've worked at several other .coms and have never been more challenged and energized professionally from my colleagues than at Google. People are generally happy to work there, they come from diverse backgrounds, and almost always have an interesting story to share."⁴³⁶

When Sundar Pichai, who later became Google's CEO, joined the company in 2004, he was struck by its optimistic working environment.⁴³⁷ He observed that when someone shared an idea, even casually in the hallway, others would expand on it, offering suggestions to improve and refine it, unlike in many other companies where people would say why they would not work. This fostered a culture of innovation, continuous improvement, and collaborative problem-solving. Pichai also notes that as companies grow, they often become more conservative in their decision-making, focusing on rewarding outcomes rather than the efforts behind them. However, Google takes a different approach. **It encourages risk-taking and innovation, embraces failure as part of the process, and rewards effort rather than just results. Pichai pointed out that companies overly focused on outcomes tend to favor safer bets over time. Google, by contrast, strives to preserve its culture of technological innovation and product development.**

Ultimately, Google's approach to employee engagement, creativity, and support has been a key driver of its sustained success. By prioritizing its workforce, maintaining a sense of fun and innovation, and providing exceptional benefits, Google has built a culture that not only attracts top talent but also keeps them motivated and engaged.

⁴³⁴ Google Employees Typically Work Longer Than Eight Hours A Day. CNBC. 11/9/2023. <https://www.cnbc.com/2023/11/09/google-employees-typically-work-longer-than-eight-hours-a-day.html>

⁴³⁵ Google Employees' Favorite Perks. Business Insiders. 7/1/2014. <https://www.businessinsider.com/google-employees-favorite-perks-2014-7#the-free-gourmet-food-and-snacks-are-never-ending-1>

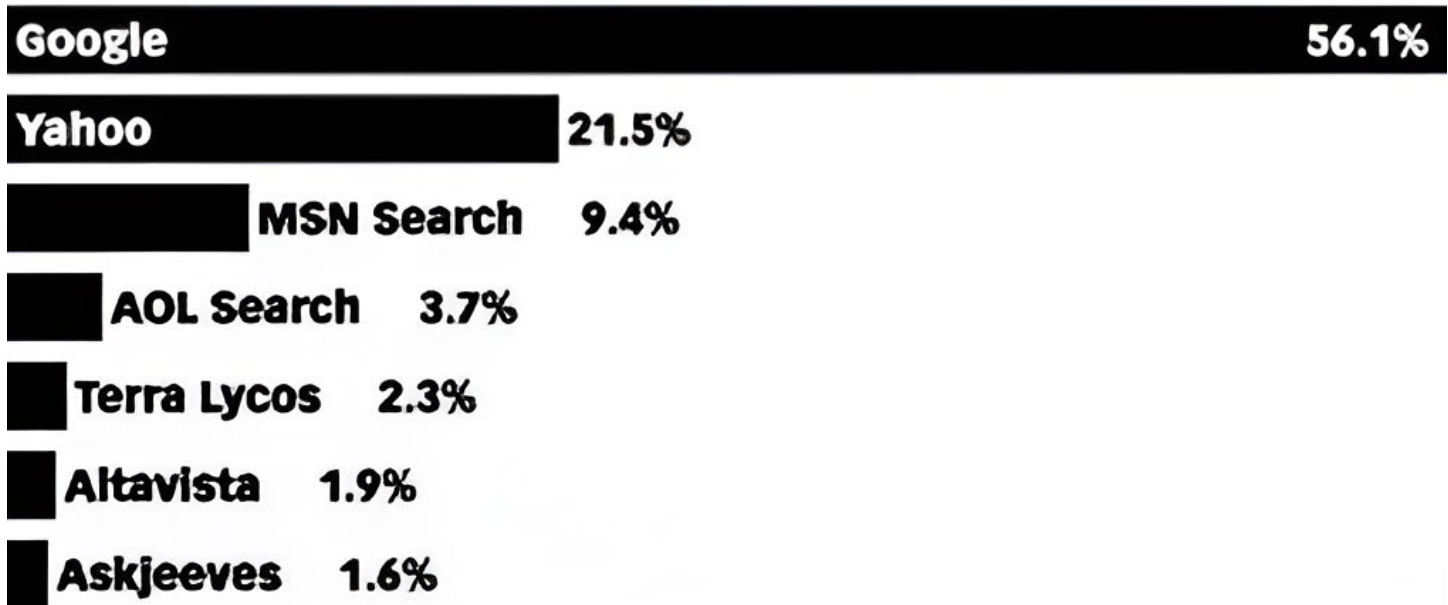
⁴³⁶ Google Employees' Favorite Perks. Business Insiders. 7/1/2014. <https://www.businessinsider.com/google-employees-favorite-perks-2014-7#the-free-gourmet-food-and-snacks-are-never-ending-1>

⁴³⁷ Sundar Pichai, CEO of Google and Alphabet. <https://www.youtube.com/watch?v=j9qGmO8Yy-Y>

E. Competition

Figure 43-1: Market Share of Search Engines 2003⁴³⁸

Market Share of the Top Search Engines on the Worldwide Web, 2003



Source: OneStat.com, November 2003

054379 ©2003 eMarketer, Inc.

www.eMarketer.com

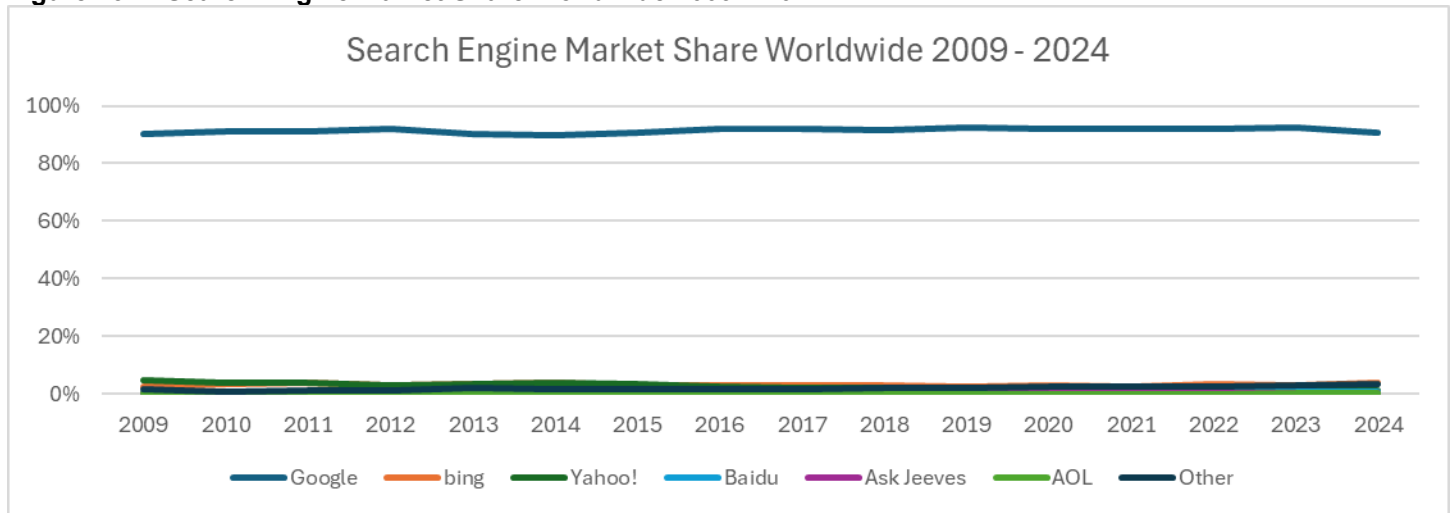
Notes:

1. The OneStat research was based on a sample of two million visitors divided into 20,000 visitors of 100 countries each day in 2003.⁴³⁹

⁴³⁸ Yahoo and MSN Prove Competition for Google. Search Engine Journal. <https://www.searchenginejournal.com/yahoo-and-msn-prove-competition-for-google/297/>

⁴³⁹ Search Engine Marketing - Why It Benefits Us All. Business Information Review 2003; 20; 195 DOI: 10.1177/0266382103204005

Figure 43-2: Search Engine Market Share Worldwide 2009 – 2024⁴⁴⁰



Note:

1. The data above does not include referrals from AI-powered platforms like Perplexity and ChatGPT. A 2025 survey found that Google continues to dominate the search engine market, maintaining an average market share of over 90%, followed by Bing's over 3%.⁴⁴¹ **Meanwhile, ChatGPT and Perplexity together account for less than 1%, though their market share reflects an upward trend, with ChatGPT gaining 0.09% and Perplexity 0.02% share in search traffic during 2024. Industry experts predicted that ChatGPT could reach a 1% market share in 2025.**⁴⁴²

In the early 2000s, the search engine industry was intensely competitive, consisting of established web portals and pure-play search engine websites. Recognized names included web portals such as Yahoo, Microsoft's MSN, and AOL, and search-focused players like Ask Jeeves, Overture, and AltaVista. Notably, Yahoo, one of the larger players in this space, acquired both Overture and AltaVista in 2003. However, no other search engines managed to come close to Google's market position during this period. Interestingly, many of Google's competitors, such as Yahoo, Ask Jeeves, and AOL, even ended up licensing Google's search engine algorithms or ad-serving technologies to enhance their offerings. This reliance on Google underscored the company's unique edge in the market, as smaller, search-focused players struggled and were often absorbed by larger entities.

We believe one of the primary factors that led to Google's success and the failure of many competitors shared in common in the search engine market, as we already discussed in the previous sections, was its algorithms from the onset that have the ability to deliver highly accurate, relevant, and unbiased search results, combined with sophisticated advertising solutions tailored to users' search behaviors, quickly making it the world's number one search engine despite being not the first one. Beyond Google's own technical excellence, the competitive landscape of the broader search engine industry was also shaped by a series of pivotal decisions and trends made by competitors, which we would discuss in the below section.

Before Google's IPO, co-founder Sergey Brin reflected on why so many early competitors failed. He noted that "toward the end of the 1990s, most of the portals started as search engines. **Yahoo was the exception, but Excite, Infoseek, HotBot, and Lycos began as search engines. They diversified and didn't take searching as seriously as they should have.**"⁴⁴³ These companies, aiming to become comprehensive web portals, treated search as one feature among many, diluting its importance. **Brin observed, "They assumed they would be 100 times as successful with 100 services. But they learned that not all services are created equal. Finding information is much more important to most people than horoscopes, stock quotes, or a whole range of other things – which all have merit, but searching is substantially more important."** This recognition helped set Google apart – from its inception, Google centered around search as a vital service, making it the foundation of its dominance. Most of its user-facing products such

⁴⁴⁰ Search Engine Market Share Worldwide. Statcounter Global Stats. <https://gs.statcounter.com/search-engine-market-share#yearly-2009-2024>

⁴⁴¹ Google Market Share Slips, AI Referrals & Regional Search Engines Rise. <https://www.searchenginejournal.com/google-market-share-slips-ai-referrals-regional-search-engines-rise/539373/>; ChatGPT's Search Surge. <https://searchengineland.com/chatgpt-search-market-share-1-percent-449378>; Top Search Engines. <https://seranking.com/blog/top-search-engines/>

⁴⁴² ChatGPT's Search Surge. <https://searchengineland.com/chatgpt-search-market-share-1-percent-449378>

⁴⁴³ Playboy Interview: Google Guys. Google Prospectus 2004.

as Chrome, Google Maps, and Android, are intended to solidify its dominance in search and to fend off potential competition.

Another defining characteristic of Google's approach was its focus on delivering not just search results, but the right search results. Prior to Google, search engines often returned thousands of results for a query, but little effort was put into ensuring that the most relevant results appeared at the top. As Brin explained, "Before Google, I don't think people put much effort into the ordering of results. You might get a couple thousand results for a query. We saw that a thousand results weren't necessarily as useful as 10 good ones."⁴⁴⁴

A 2010 study published in the South African Journal of Science compared the relevance of search results among major search engines at the time. Google ranked as the most accurate, with an average accuracy rate of 70% based on sample tests, followed by Yahoo at 60% and Bing/MSN at 50%.⁴⁴⁵ Similarly, a 2014 study published in the Journal of the Association for Information Science and Technology reinforced Google's superiority in accuracy and relevance. For navigational queries, Google provided the correct answer 95% of the time, compared to Bing's 76%. For informational queries, Google achieved 82% accuracy, while Bing reached 79%.⁴⁴⁶

Google's breakthrough was its ability to rank websites based on relevance and usefulness, employing an innovative approach that filtered out the noise and prioritized quality over quantity.⁴⁴⁷ This transformed the search experience, making Google synonymous with finding the most useful information quickly.

Google's long-term success is also attributed to its dedication to user experience, particularly its commitment to unbiased and relevant search results. Unlike many competitors, Google clearly separated advertising from organic search results, ensuring that financial incentives did not compromise the integrity of its search service. Brin emphasized this distinction, stating, "One thing that's important to us is the distinction between advertising and pure search results. We make it clear when something is paid for. Our advertising is off to the side and in a couple of slots across the top. Ads are clearly marked. There's a clear, large wall between the objective search results and the ads, which have commercial influence. Other search engines don't necessarily distinguish. Beyond ads, with other search engines, payment affects the results. We think that's a slippery slope. At Google, the search results cannot be bought or paid for."⁴⁴⁸

We believe that this clear and consistent separation between advertising and organic search results not only earned users' trust but also potentially solidified Google's reputation as the most reliable search engine and help users find easily the most relevant information to their search. It was this objectivity, combined with technological superiority and a focus on the core mission of search, that enabled Google to rise above the competition and secure its place as the definitive leader in the search engine industry.

Although not a direct competitor in search engines, a former advertising research lead at Facebook, noted that Google probably focuses the most on improving user experience among peer companies, as well as on experimentation and market research, even more so than Facebook. Google is willing to let its experimentation programs run for two or three years because it believes that it takes a long time for consumer behavior to change.⁴⁴⁹ This long-term approach potentially reflects Google's commitment to deeply understanding user preferences and gradually evolving its services based on data-driven insights.

⁴⁴⁴ Playboy Interview: Google Guys. Google Prospectus 2004.

⁴⁴⁵ Edosomwan J, Edosomwan TO. Comparative analysis of some search engines. S Afr J Sci. 2010;106(11/12), Art. #169, 4 pages. DOI: 10.4102/sajs.v106i11/12.169

⁴⁴⁶ Evaluating The Retrieval Effectiveness of Web Search Engines Using A Representative Query Sample. Dirk Lewandowski. Hamburg University of Applied Sciences. <https://arxiv.org/abs/1405.2210>; <https://asistdl.onlinelibrary.wiley.com/doi/10.1002/asi.23304>

⁴⁴⁷ Playboy Interview: Google Guys. Google Prospectus 2004.

⁴⁴⁸ Playboy Interview: Google Guys. Google Prospectus 2004.

⁴⁴⁹ Interview with Former Advertising Research Lead at Facebook. 11/13/2020.

Yahoo

Founded in 1994 by Stanford engineering students Jerry Yang and David Filo, Yahoo began as a project to organize their favorite websites into categories.⁴⁵⁰ Originally named “Jerry and David’s Guide to the World Wide Web,” it was soon rebranded as “Yahoo!” – an acronym for “Yet Another Hierarchical Officious Oracle.” However, the founders preferred the general definition of “yahoo” as “rude, unsophisticated, uncouth.” Growing rapidly through word of mouth, Yahoo became a popular resource within the internet community beyond Stanford. By the fall of 1994, the site was attracting over a million hits daily and roughly 100,000 unique visitors.

In March 1995, Yahoo incorporated in California and attracted Silicon Valley venture capitalists, securing a nearly \$2 million investment from Sequoia Capital, known for backing companies like Apple and Oracle.⁴⁵¹ Later that year, Yahoo received additional funding from Reuters Ltd. and Softbank. Yahoo’s April 1996 IPO launched with a valuation of \$334 million, despite the company not yet being profitable.⁴⁵²

By 2004, when Google went public, Yahoo had grown from a search service into the world’s most popular directory.⁴⁵³ In fiscal year 2003, Yahoo’s offerings, similar to Google’s, were largely free for users, generating revenue primarily through marketing and listing services, with additional income from paid premium services. Yahoo’s services fell into four primary categories:

1. Search and Marketplace, included Yahoo’s search services and a bunch of Yahoo websites such as Yahoo Local, Maps, Autos, Shopping, Travel.
2. Information and Content offered both free and paid content. E.g., Sports, Games, Music, Finance, Movies, News.
3. Communications and Consumer Services provided services to consumers or businesses. E.g., Mail, Messenger, Photos, premium internet services co-branded with telecom companies like SBC Communication.
4. Affiliate Services. E.g., advertising, paid-inclusion, and algorithmic search services.

Given its extensive services, Yahoo competed with a variety of companies across media, recruitment, entertainment, and more. The most easily identifiable competitors were Google in search and AOL and Microsoft’s MSN in portal services.

Before Google’s IPO, in 2003, Yahoo’s revenue reached \$1.63 billion, eight years after its launch, with 74% coming from marketing services such as advertising and paid search inclusion. Comparatively, Google’s \$1.47 billion in revenue during the same period was almost entirely from advertising, without any paid inclusion. Yahoo’s advertising revenue was largely recognized on an impression basis for graphical and rich media ads such as banner advertisements,⁴⁵⁴ while Google operated primarily on a click-based revenue model.

⁴⁵⁰ The History of Yahoo. Yahoo Media Relations.

<https://web.archive.org/web/20130402073246/http://docs.yahoo.com/info/misc/history.html>

⁴⁵¹ The History of Yahoo. Yahoo Media Relations.

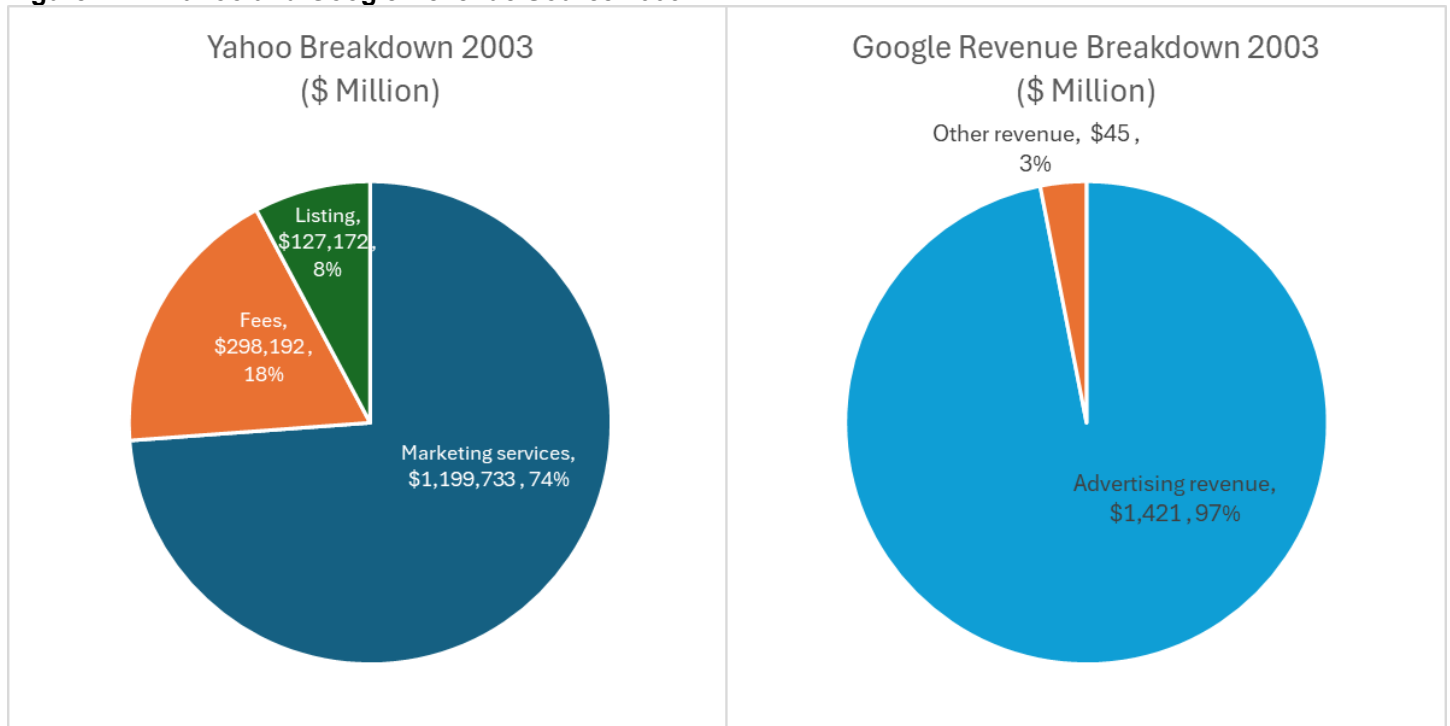
<https://web.archive.org/web/20130402073246/http://docs.yahoo.com/info/misc/history.html>

⁴⁵² Yahoo! Offering Is Set for Today. <https://www.nytimes.com/1996/04/12/business/yahoo-offering-is-set-for-today.html>

⁴⁵³ Yahoo! Selects Google as its Default Search Engine Provider. <https://googlepress.blogspot.com/2000/06/yahoo-selects-google-as-its-default.html>

⁴⁵⁴ Yahoo Annual Report 2003.

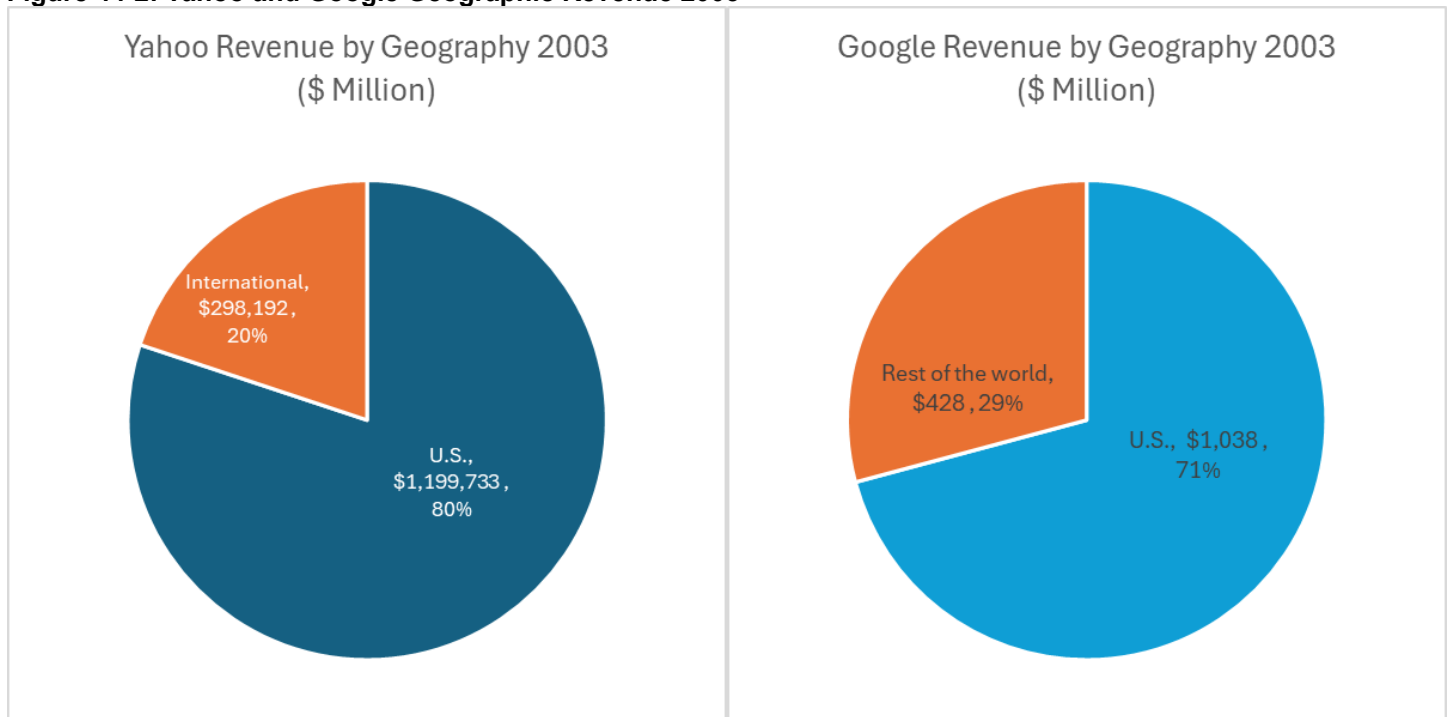
Figure 44-1: Yahoo and Google Revenue Source 2003



Notes:

1. Marketing services revenue is primarily generated from the sale of rich media advertisements (banner and other media advertisements), sponsorship and text-link advertisements, (including pay-for-performance search advertisements), paid inclusion, algorithmic searches and transactions revenue.
2. Fees revenue consists of revenues generated from a variety of consumer and business fee-based services, including SBC Yahoo! DSL and SBC Yahoo! Dial, Yahoo! Personals, Small Business Services, Yahoo! Mail and Yahoo! Enterprise Solutions.
3. Listings revenue consists of revenues generated from a variety of consumer and business listings-based services, including access to the HotJobs database and classifieds, such as Yahoo! Autos, Yahoo! Real Estate and other search services. HotJobs career offerings are handled by a designated sales team.

Figure 44-2: Yahoo and Google Geographic Revenue 2003



Interestingly, Yahoo and Google were not only competitors but also partners in search before 2003. **From 2000 to 2003, Yahoo used Google as its default search engine provider,⁴⁵⁵ reflecting Google's advanced technology and user-focused algorithms.** In the announcement, Google emphasized a series of rewards and recognitions that it received from users such as The Webby Awards' prestigious Best Technical Achievement award, as well as its People's Voice Award. Google was also selected as "Best Search Engine on the Internet" by Yahoo! Internet Life; named as one of the "Top Ten Best Cybertech of 1999" by TIME magazine; earned the "Technical Excellence Award" from PC Magazine; and was chosen "Best Search Engine" by The Net. In addition, Google was also named the No. 1 search engine in a search and portal site tracking study conducted by NPD, a leading independent research company. Google led all search engines with 97 percent of its users indicating that they would recommend Google to a friend. The agreement between Yahoo and Google not only brought to Google Yahoo's 180 million worldwide users who generated over 900 million daily page views on average, but also, most importantly, enabled Google to fine tune its search engine based on the vast increase in traffic,⁴⁵⁶ creating a positive loop to reinforce Google's algorithm.

During this period, AOL also powered its web search through Google, further reinforcing the loop. Such partnerships not only help Google to improve its algorithms, but also potentially send users to Google. A former executive at Inktomi stated that "They'll learn over time that Google takes your users; it does not help you build your property."⁴⁵⁷

However, the gear shifted in 2003 by Yahoo acquiring Inktomi for \$235 million⁴⁵⁸ and Overture for \$1.63 billion,⁴⁵⁹ marking the beginning of direct competition with Google in both search and search-related advertising. Through its acquisition of Overture, Yahoo inherited a pending lawsuit filed against Google in 2002 over alleged patent infringement related to advertising technology. Before Google's 2004 IPO, it settled the dispute, offering Yahoo 2.7 million shares, valued between \$291 million and \$365 million based on Google's estimated offering price.⁴⁶⁰

By the time of Google's IPO, a survey indicated that Google dominated the search market with a 56.1% global share, while Yahoo held 21.5%, as Figure 45 shows.

⁴⁵⁵ Yahoo! Selects Google as its Default Search Engine Provider. <https://googlepress.blogspot.com/2000/06/yahoo-selects-google-as-its-default.html>

⁴⁵⁶ Case Study: Google Inc. MH0029. McGraw Hill Education.

⁴⁵⁷ Case Study: Google Inc. MH0029. McGraw Hill Education.

⁴⁵⁸ Yahoo! to Acquire Inktomi. <https://altaba.gcs-web.com/news-releases/news-release-details/yahoo-acquire-inktomi>

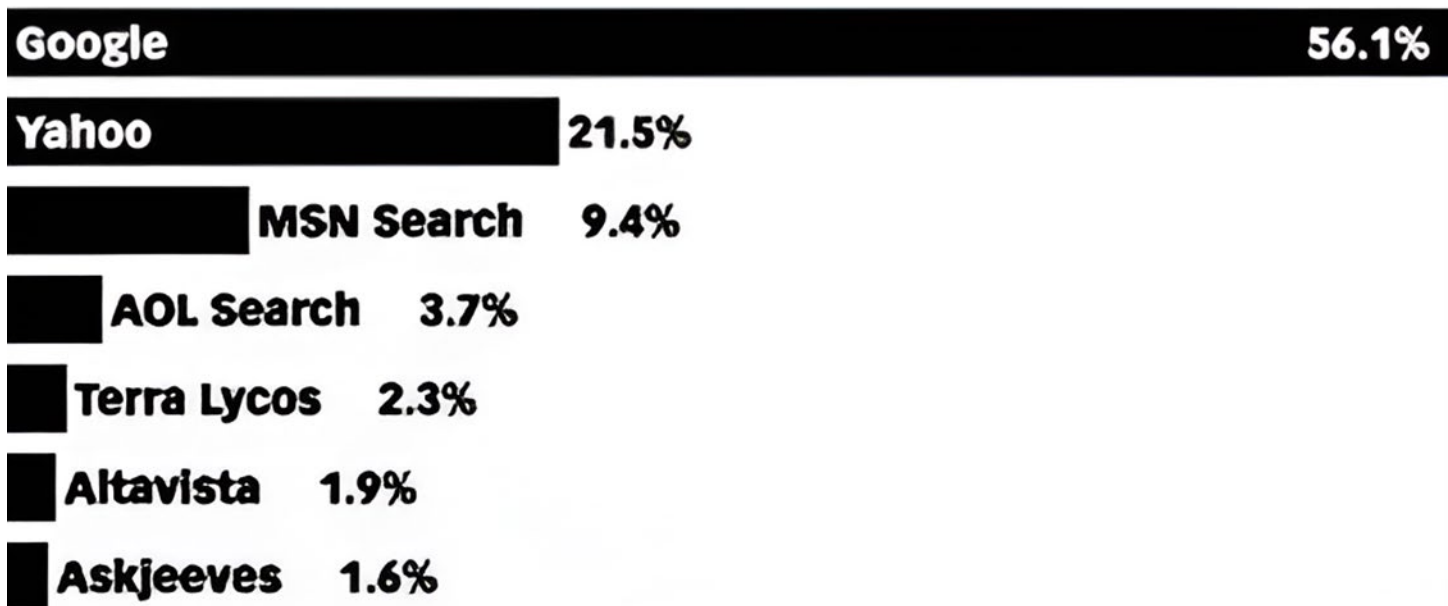
⁴⁵⁹ Yahoo! To Acquire Overture. <https://altaba.gcs-web.com/static-files/02d71a46-30cb-4c27-9080-881a3211e494>

⁴⁶⁰ Google and Yahoo Settle Dispute Over Search Patent. The New York Times.

<https://www.nytimes.com/2004/08/10/business/technology-google-and-yahoo-settle-dispute-over-search-patent.html>

Figure 45: Market Share of Search Engines 2003⁴⁶¹

Market Share of the Top Search Engines on the Worldwide Web, 2003



Source: OneStat.com, November 2003

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www.eMarketer.com

Note:

1. The OneStat research was based on a sample of two million visitors divided into 20,000 visitors of 100 countries each day in 2003.⁴⁶²

Over the comparable period between 2000 and 2016, Yahoo's total revenue grew from \$1.1 billion to \$5.2 billion, a 10% CAGR, while Google's revenue surged from \$19 million to over \$90 billion, a 70% CAGR, as Figure 46-1 shows. In 2016, Yahoo sold its core business to Verizon for \$4.8 billion, a significant decline from its peak valuation of about \$125 billion during the dot-com bubble.⁴⁶³

⁴⁶¹ Yahoo and MSN Prove Competition for Google. Search Engine Journal. <https://www.searchenginejournal.com/yahoo-and-msn-prove-competition-for-google/297/>

⁴⁶² Search Engine Marketing - Why It Benefits Us All. Business Information Review 2003; 20; 195 DOI: 10.1177/0266382103204005

⁴⁶³ This Chart of Yahoo's Market Cap Is Just The Most Outrageous Thing. Business Insider. <https://www.businessinsider.com/yahoo-market-cap-over-time-2016-7>

Figure 46-1: Yahoo vs. Google Revenues

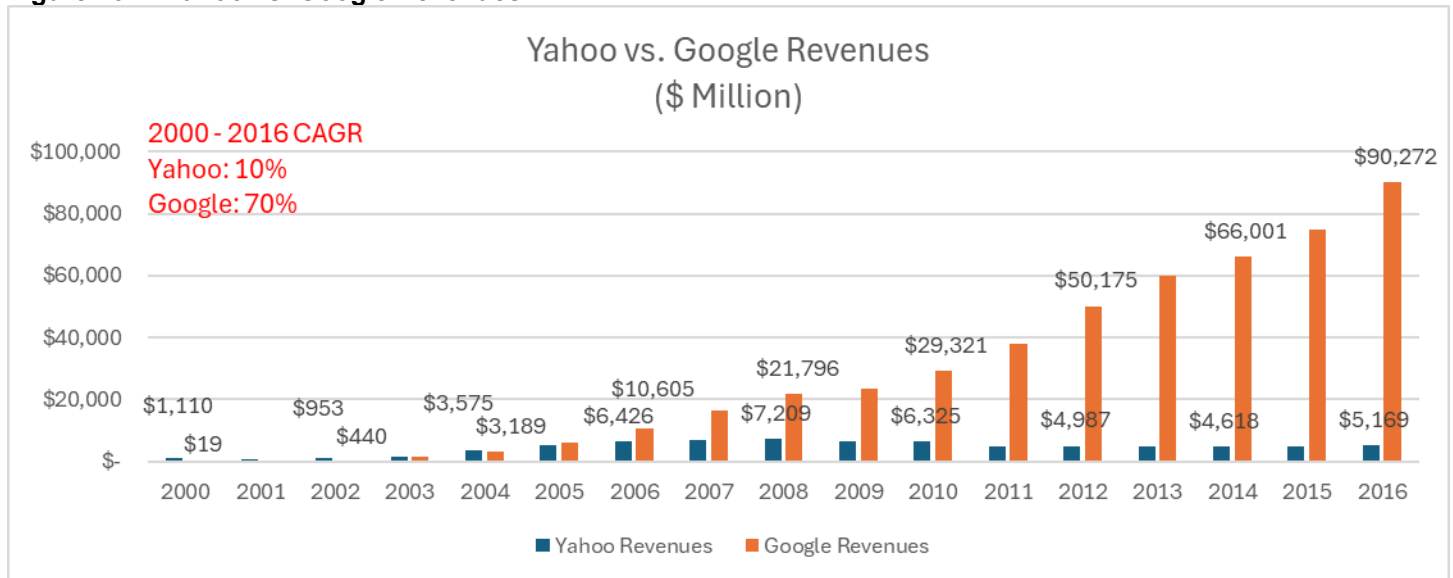
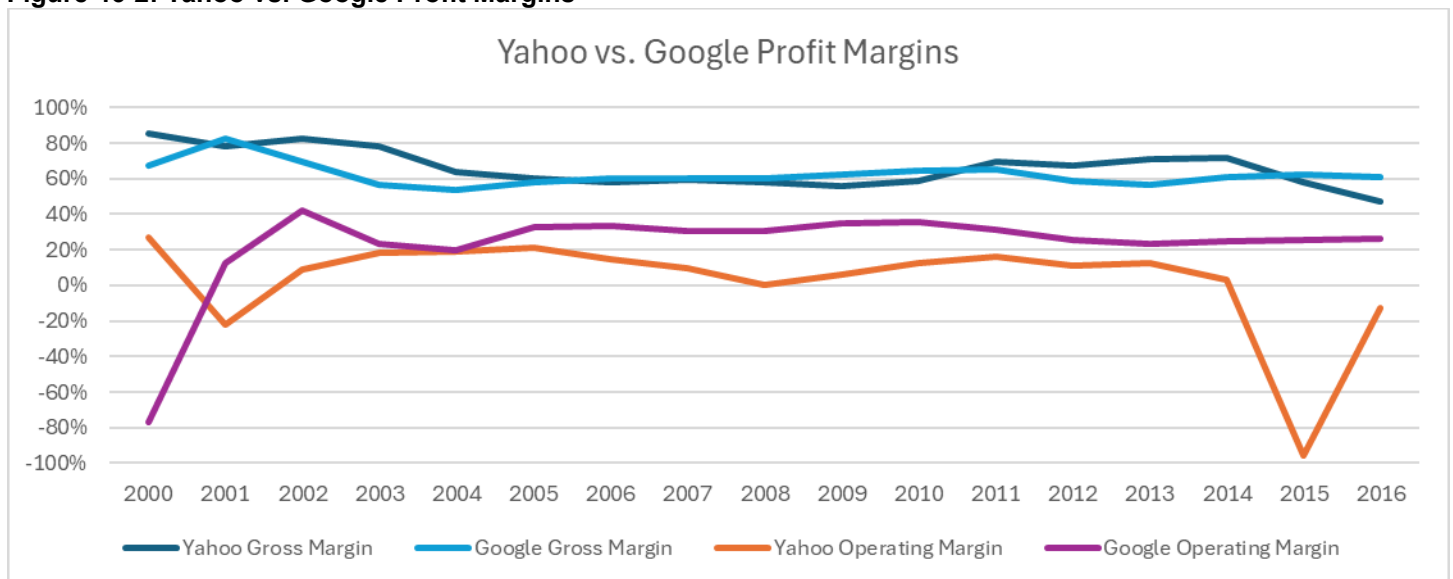


Figure 46-2: Yahoo vs. Google Profit Margins



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Yahoo Gross Margin	85.7%	78.1%	82.9%	78.0%	63.7%	60.1%	58.4%	59.3%	58.1%	55.5%	58.5%	69.9%	67.5%	71.2%	71.9%	58.2%	47.4%
Yahoo Operating Margin	26.8%	-22.1%	9.3%	18.2%	19.3%	21.1%	14.6%	10.0%	0.2%	6.0%	12.2%	16.1%	11.4%	12.6%	3.1%	-95.6%	-12.5%
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Google Gross Margin	67.3%	82.5%	69.8%	56.7%	53.9%	58.0%	60.2%	59.9%	60.4%	62.6%	64.5%	65.2%	58.9%	56.8%	61.1%	62.4%	61.1%
Google Operating Margin	-77.1%	12.7%	42.4%	23.4%	20.1%	32.9%	33.5%	30.6%	30.4%	35.1%	35.4%	31.0%	25.4%	23.3%	25.0%	25.8%	26.3%

Several factors contributed to Yahoo’s decline and Google’s continuous rise. Initially focused on directories, Yahoo evolved into a broad portal, offering diverse services and becoming a popular site in the late 1990s. In contrast, Google, despite an early rejection from Yahoo when its founders sought a \$1 million buyout,⁴⁶⁴ focused intensely on search and search-related advertising, emphasizing innovation and user experience. While Yahoo attempted to be everything to everyone, Google concentrated on refining its core search service, developing superior algorithms that delivered more relevant results and providing users simple solutions by delivering the most relevant and unbiased search results just within a few clicks. Figure 47-1, 47-2, 47-3, and 47-4 clearly demonstrate the difference in the two companies’ position and user experience.

⁴⁶⁴ Why Did Yahoo Falter While Google Flourished. <https://medium.com/@rgdaksh03122005/why-did-yahoo-falter-while-google-flourished-b14d214ce4b5>

Figure 47-1: Yahoo Website 1996⁴⁶⁵



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⁴⁶⁵ Yahoo 1996. <https://web.archive.org/web/19961020022754/http://www9.yahoo.com/>

Figure 47-2: Yahoo Website 2004⁴⁶⁶



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⁴⁶⁶ Yahoo! 2004. <https://web.archive.org/web/20020801071342/http://www.yahoo.com/>

Figure 47-3: Google Website 1998⁴⁶⁷

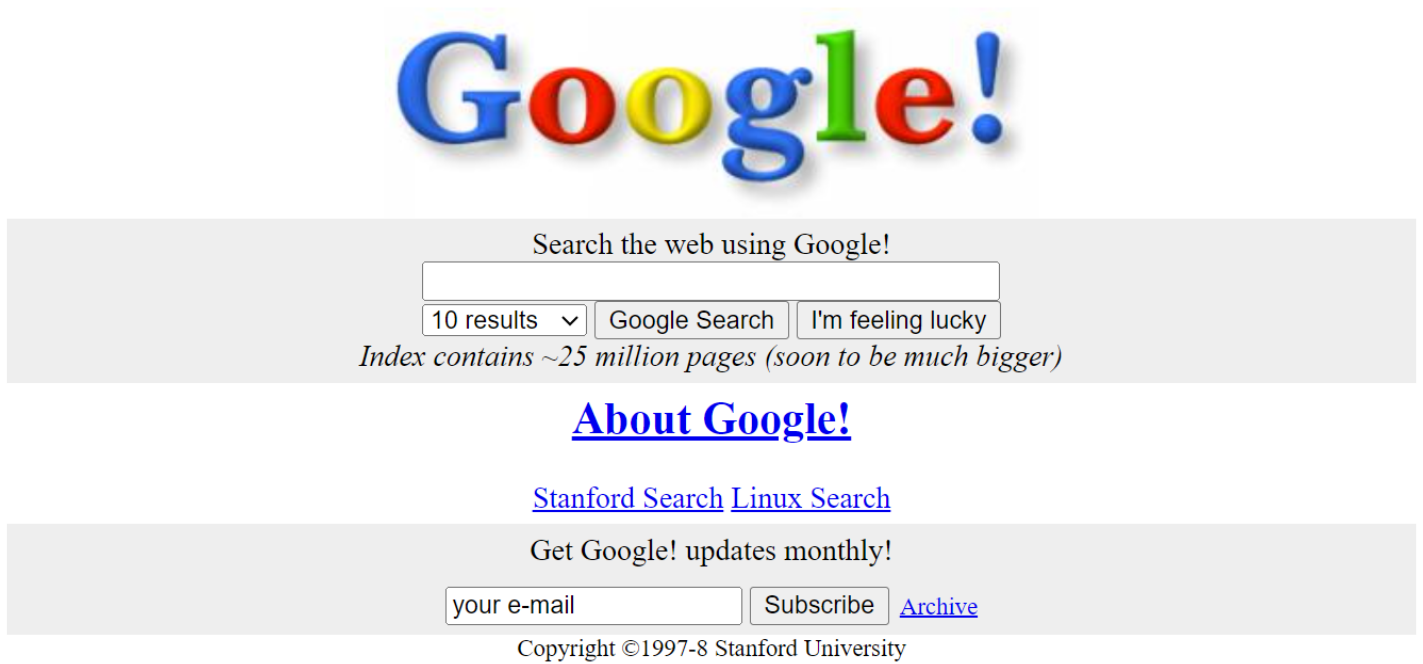
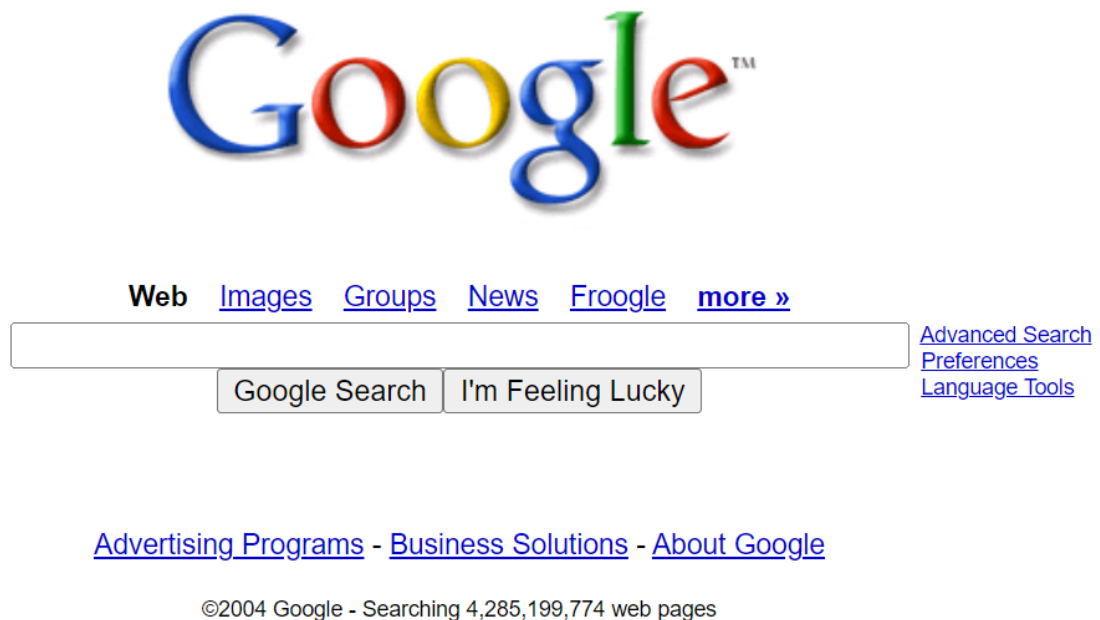


Figure 47-4: Google Website 2004⁴⁶⁸



Another major issue was Yahoo's lack of stable leadership, which potentially hindered the execution of strategies based on a long-term vision. **By the time Verizon acquired Yahoo in 2016, it had been through eight CEOs since its 1996 IPO, including five between 2007 and 2012.** This high turnover of leadership resulted in inconsistent strategies, missed opportunities, and an unclear vision for the company's future. Yahoo's early success of being a directory relying on categorization of websites for users to find the relevant information on their own, but as the internet grew, with millions of websites, this approach potentially became overwhelming to users and eventually led Yahoo's core business to

⁴⁶⁷ Google Website 1998. <https://web.archive.org/web/19981111183552/http://google.stanford.edu/>

⁴⁶⁸ Google Website 2004. <https://web.archive.org/web/20040805012113/http://www.google.com/>

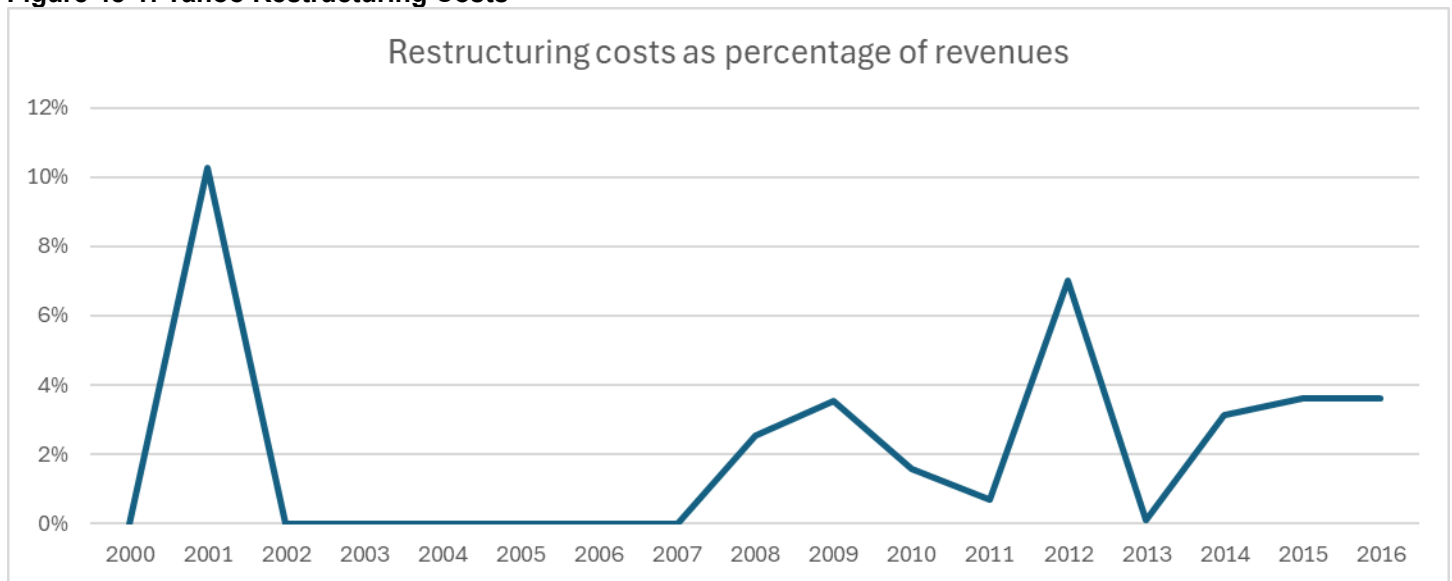
collapse.⁴⁶⁹ In the end of 2014, Yahoo shut down its Yahoo Directory.⁴⁷⁰ Meanwhile, Google's algorithmic method crawling over the internet proved far more efficient in delivering relevant results to users.

Acquisitions further complicated Yahoo's trajectory. For instance, in 1999, Yahoo acquired Broadcast.com for \$5.7 billion to pivot toward digital media.⁴⁷¹ **In 2002, it offered \$3 billion for acquiring Google, which was declined as Google thought it was worth at least \$5 billion.**⁴⁷² **Even earlier, in 1998, Google's founders had offered to sell to Yahoo for \$1 million, an offer Yahoo passed on.** Yahoo ended up acquiring Inktomi and Overture in 2003, but by then, Google had already established a strong foothold in search engines. Yahoo's failed attempts to buy Facebook in 2006 and its decision not to sell to Microsoft for \$45 billion in 2008 further illustrate its missed opportunities.

Despite making what would later be recognized as one of the best investments by an American company in China with its 40% stake in Alibaba in 2005, Yahoo's mismanagement persisted.⁴⁷³ When Jerry Yang, one of the co-founders, took over as CEO in 2007, he rejected Microsoft's \$45 billion acquisition offer, which was a 60% premium, leading to investor backlash and his eventual stepdown as company's CEO in 2009.

When Marissa Mayer took over as CEO in 2012, she led Yahoo into an aggressive acquisition practice, trying to mimic what she saw during her long career at Google, purchasing over 50 startups for more than \$2 billion.⁴⁷⁴ However, Yahoo struggled to integrate these acquisitions effectively, as it lacked Google's hugely profitable digital advertising as an ample cushion. It also lacked the time and management style necessary to foster creativity and new services. Consequently, frequent layoffs, write-downs, and restructuring became regular occurrences, and most of Yahoo's acquisitions did not pay off, as Figure 48-1 and 48-2 show. Although the restructuring costs as percentage of revenue were insignificant, ranging anywhere from 0% to 4% of the company's annual sales from 2007 to 2012,⁴⁷⁵ it potentially indicates the company's internal misalignment and chaotic strategic vision. The often layoffs also indicate low morale among employees.

Figure 48-1: Yahoo Restructuring Costs



Notes:

1. In 2001, Yahoo incurred over \$57 million in restructuring costs, primarily related to terminating leases on excess facilities and reducing its workforce by approximately 650 employees across various functions and geographic regions.⁴⁷⁶ This reduction represented nearly 20% of the company's total workforce that year.

⁴⁶⁹ How Yahoo Destroyed Its Value. UCLA. <https://newsroom.ucla.edu/stories/ucla-faculty-voice:-how-yahoo-destroyed-its-value>

⁴⁷⁰ Internet Icon Dies As Yahoo Directory Goes Dark. CNN. <https://money.cnn.com/2014/12/29/technology/yahoo-directory/>

⁴⁷¹ How Yahoo Destroyed Its Value. UCLA. <https://newsroom.ucla.edu/stories/ucla-faculty-voice:-how-yahoo-destroyed-its-value>

⁴⁷² Yahoo CEO Laments Not Buying Google. CNET. <https://www.cnet.com/culture/yahoo-ceo-laments-not-buying-google/>; The Story Of The Masterminds Behind Google. <https://www.youtube.com/watch?v=7Kn-KxCQjI8>

⁴⁷³ How Yahoo Destroyed Its Value. UCLA. <https://newsroom.ucla.edu/stories/ucla-faculty-voice:-how-yahoo-destroyed-its-value>

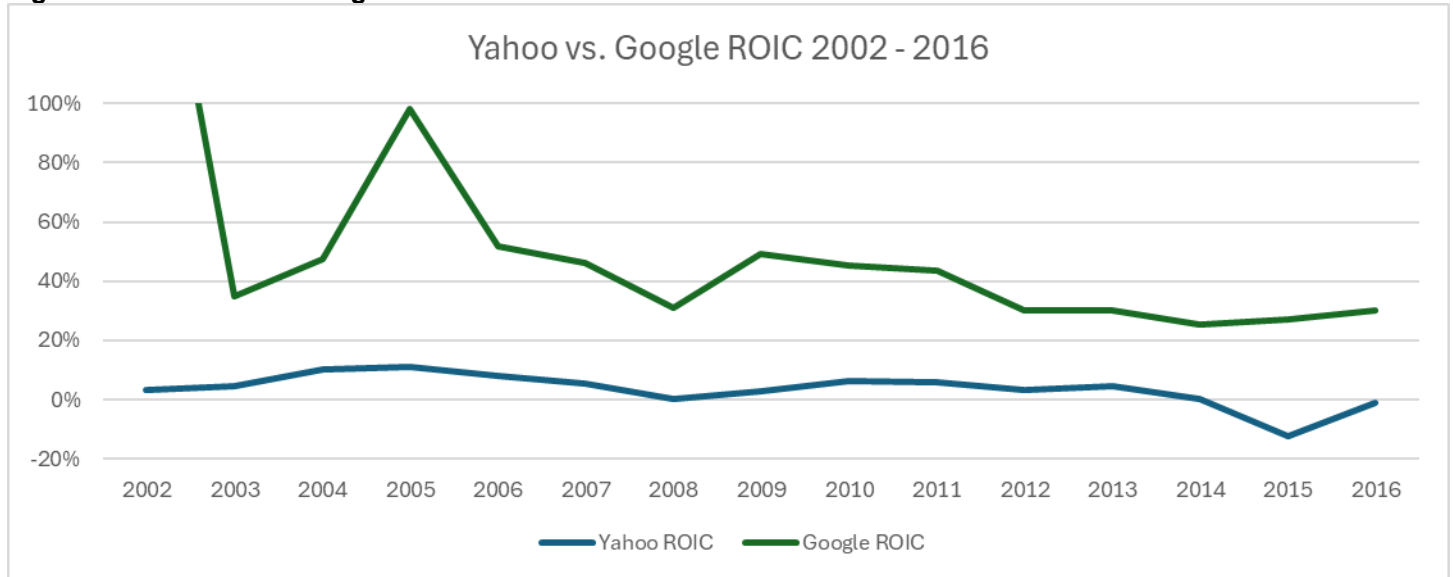
⁴⁷⁴ How Yahoo Destroyed Its Value. UCLA. <https://newsroom.ucla.edu/stories/ucla-faculty-voice:-how-yahoo-destroyed-its-value>

⁴⁷⁵ Yahoo Annual Report 2008.

⁴⁷⁶ Yahoo Annual Report 2001.

- Since 2008, Yahoo has implemented several cost-reduction initiatives, including global workforce reductions and the optimization of real estate facilities, such as terminating leases on excess properties.⁴⁷⁷

Figure 48-2: Yahoo vs. Google ROIC 2002 – 2016



Note:

- Yahoo's operating income peaked in 2005 and steadily declined over the following decade, eventually leading to unprofitability by 2015.

Yahoo's overwhelming web services confused users, lacking a unified identity as Google became synonymous with "search" and Microsoft with "Windows."⁴⁷⁸ A former Yahoo vice president noted, "It was all over the map... Some people said mail. Some people said news. Some people said search."⁴⁷⁹ This disorganization extended to Yahoo's engineers, who found it challenging to secure investment or alignment on new products. As one former senior product manager stated, "It became very difficult to get both investment and alignment... If you built a new product and the home page didn't want to feature it, you were hosed."⁴⁸⁰ By contrast, Google maintained a streamlined, user-centric approach, continuously refining its core products.

A business owner who sold its startup to Yahoo observed, "They didn't take programming seriously enough... Microsoft, Google, and Facebook have all had hacker-centric cultures. But Yahoo treated programming as a commodity."⁴⁸¹ His statement potentially implies that while Yahoo expanded its services extensively, it failed to focus on any of them and make them a core product or deliver a unique user experience. Instead of focusing and excelling in a few areas, Yahoo attempted to incorporate everything, ultimately diluting its brand and failing to refine any single service to reach its potential.

The lack of a core product and delivery of a unique user experience is also exemplified by how Yahoo operated its search engine. Prior to 1998, Yahoo provided users search results of their Internet directory listings using AltaVista.⁴⁸² In 1998, Yahoo entered into an agreement with Inktomi to provide text-based search results to complement its directory and navigational guide. Yahoo stated that it would "depend substantially upon ongoing maintenance and technical support from Inktomi to ensure accurate and rapid presentation of such search results to its customers."⁴⁸³ In 2000, Yahoo began

⁴⁷⁷ Yahoo Annual Report 2008 – 2016.

⁴⁷⁸ The Identity Crisis That Led To Yahoo's Demise. Reuters. <https://www.reuters.com/article/business/the-identity-crisis-that-led-to-yahoos-demise-idUSKCN1060DN/>

⁴⁷⁹ The Identity Crisis That Led To Yahoo's Demise. Reuters. <https://www.reuters.com/article/business/the-identity-crisis-that-led-to-yahoos-demise-idUSKCN1060DN/>

⁴⁸⁰ The Identity Crisis That Led To Yahoos Demise. Reuters. <https://www.reuters.com/article/business/the-identity-crisis-that-led-to-yahoos-demise-idUSKCN1060DN/>

⁴⁸¹ The Identity Crisis That Led To Yahoo's Demise. Reuters. <https://www.reuters.com/article/business/the-identity-crisis-that-led-to-yahoos-demise-idUSKCN1060DN/>

⁴⁸² Yahoo Annual Report 1996 – 1997

⁴⁸³ Yahoo Annual Report 1998

to partner with Google and integrated its search technology into its directory search function to display search results⁴⁸⁴ In 2003, Yahoo acquired Inktomi and Overture, integrating their technology to power the search functionality of its directory. However, in 2009, Yahoo entered into an agreement with Microsoft, making Microsoft the exclusive provider of its algorithmic and paid search services, while Yahoo took on the role of managing premium search advertisers for both companies.⁴⁸⁵

Yahoo's sprawling ambitions without developing its core competency, unstable leadership, lack of clear vision, and inability to prioritize user experience doomed it to decline, while Google's relentless focus on search and innovation propelled it to become the dominant force and rose with the internet era.

Figure 49-1: Yahoo Income Statement

\$ Million	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Net revenues	\$ 1,110	\$ 717	\$ 953	\$ 1,625	\$ 3,575	\$ 5,258	\$ 6,426	\$ 6,969	\$ 7,209	\$ 6,460	\$ 6,325	\$ 4,984	\$ 4,987	\$ 4,680	\$ 4,618	\$ 4,968	\$ 5,169
Cost of revenues	\$ 158	\$ 157	\$ 163	\$ 358	\$ 1,299	\$ 2,096	\$ 2,676	\$ 2,839	\$ 3,023	\$ 2,872	\$ 2,628	\$ 1,503	\$ 1,621	\$ 1,349	\$ 1,298	\$ 2,078	\$ 2,719
Gross profit	\$ 952	\$ 560	\$ 790	\$ 1,267	\$ 2,276	\$ 3,161	\$ 3,750	\$ 4,131	\$ 4,185	\$ 3,589	\$ 3,697	\$ 3,482	\$ 3,366	\$ 3,331	\$ 3,320	\$ 2,891	\$ 2,450
Sales and marketing	\$ 420	\$ 387	\$ 431	\$ 536	\$ 788	\$ 1,034	\$ 1,322	\$ 1,610	\$ 1,563	\$ 1,245	\$ 1,264	\$ 1,122	\$ 1,102	\$ 1,131	\$ 1,234	\$ 1,081	\$ 882
Product development	\$ 117	\$ 126	\$ 143	\$ 218	\$ 381	\$ 570	\$ 833	\$ 1,084	\$ 1,222	\$ 1,210	\$ 1,082	\$ 1,005	\$ 886	\$ 1,008	\$ 1,207	\$ 1,178	\$ 1,055
General and administrative	\$ 75	\$ 79	\$ 106	\$ 163	\$ 273	\$ 341	\$ 529	\$ 633	\$ 705	\$ 580	\$ 488	\$ 496	\$ 540	\$ 570	\$ 575	\$ 688	\$ 651
Amortization of intangibles	\$ 20	\$ 64	\$ 21	\$ 54	\$ 146	\$ 109	\$ 125	\$ 107	\$ 88	\$ 39	\$ 32	\$ 34	\$ 36	\$ 45	\$ 67	\$ 79	\$ 58
Restructuring costs	\$ -	\$ 57	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 107	\$ 127	\$ 58	\$ 24	\$ 236	\$ 4	\$ 103	\$ 104	\$ 89
Other costs	\$ 23	\$ 5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 488	\$ -	\$ -	\$ -	\$ -	\$ (16)	\$ (9)	\$ 4,510	\$ 361
Operating income	\$ 298	\$ (158)	\$ 88	\$ 296	\$ 689	\$ 1,108	\$ 941	\$ 695	\$ 13	\$ 387	\$ 773	\$ 800	\$ 566	\$ 590	\$ 143	\$ (4,748)	\$ (645)
Other income (losses)	\$ (34)	\$ 77	\$ 92	\$ 95	\$ 591	\$ 1,564	\$ 269	\$ 305	\$ 680	\$ 438	\$ 694	\$ 504	\$ 5,324	\$ 940	\$ 11,427	\$ 308	\$ 309
Income before tax	\$ 264	\$ (81)	\$ 180	\$ 391	\$ 1,280	\$ 2,672	\$ 1,210	\$ 1,000	\$ 693	\$ 825	\$ 1,466	\$ 1,304	\$ 5,891	\$ 1,530	\$ 11,570	\$ (4,441)	\$ (336)
Tax	\$ 188	\$ 11	\$ 71	\$ 147	\$ 438	\$ 768	\$ 458	\$ 337	\$ 263	\$ 219	\$ 222	\$ 242	\$ 1,940	\$ 153	\$ 4,038	\$ (90)	\$ (126)
Cumulative effect of accounting change	\$ -	\$ -	\$ (64)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net income	\$ 76	\$ (92)	\$ 44	\$ 244	\$ 842	\$ 1,904	\$ 752	\$ 663	\$ 430	\$ 605	\$ 1,245	\$ 1,063	\$ 3,951	\$ 1,377	\$ 7,532	\$ (4,351)	\$ (209)
Minority interest	\$ 5	\$ 1	\$ 2	\$ 6	\$ 2	\$ 8	\$ 1	\$ 3	\$ 6	\$ 7	\$ 13	\$ 14	\$ 5	\$ 10	\$ 10	\$ 8	\$ 5
Net income to shareholders	\$ 71	\$ (93)	\$ 43	\$ 238	\$ 840	\$ 1,896	\$ 751	\$ 660	\$ 424	\$ 598	\$ 1,232	\$ 1,049	\$ 3,945	\$ 1,366	\$ 7,522	\$ (4,359)	\$ (214)

Figure 49-2: Yahoo Balance Sheet

\$ Million	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Cash and cash equivalents	\$ 1,150	\$ 926	\$ 774	\$ 1,310	\$ 3,512	\$ 2,561	\$ 2,601	\$ 2,001	\$ 3,452	\$ 3,291	\$ 2,884	\$ 2,056	\$ 4,184	\$ 3,408	\$ 7,995	\$ 5,857	\$ 6,820
Accounts receivable	\$ 91	\$ 69	\$ 114	\$ 282	\$ 480	\$ 722	\$ 931	\$ 1,056	\$ 1,060	\$ 1,003	\$ 1,029	\$ 1,037	\$ 1,008	\$ 980	\$ 1,033	\$ 1,048	\$ 1,084
Prepaid expenses and other current assets	\$ 50	\$ 56	\$ 82	\$ 130	\$ 99	\$ 167	\$ 218	\$ 181	\$ 233	\$ 300	\$ 433	\$ 359	\$ 460	\$ 638	\$ 671	\$ 603	\$ 221
Current assets	\$ 1,291	\$ 1,052	\$ 970	\$ 1,722	\$ 4,090	\$ 3,450	\$ 3,750	\$ 3,238	\$ 4,745	\$ 4,595	\$ 4,346	\$ 3,453	\$ 5,653	\$ 5,026	\$ 9,699	\$ 7,507	\$ 8,126
Long-term investment in marketable securities	\$ 626	\$ 839	\$ 763	\$ 1,262	\$ 1,043	\$ 1,439	\$ 936	\$ 362	\$ 70	\$ 1,227	\$ 745	\$ 474	\$ 1,838	\$ 1,590	\$ 2,231	\$ 976	\$ 1,090
Property and equipment	\$ 110	\$ 132	\$ 371	\$ 450	\$ 532	\$ 698	\$ 1,101	\$ 1,332	\$ 1,536	\$ 1,427	\$ 1,653	\$ 1,731	\$ 1,686	\$ 1,489	\$ 1,488	\$ 1,547	\$ 1,210
Goodwill	\$ -	\$ 193	\$ 415	\$ 1,806	\$ 2,551	\$ 2,896	\$ 2,969	\$ 4,002	\$ 3,441	\$ 3,640	\$ 3,682	\$ 3,901	\$ 3,827	\$ 4,680	\$ 5,164	\$ 808	\$ 416
Other intangible assets	\$ -	\$ 19	\$ 96	\$ 446	\$ 481	\$ 535	\$ 406	\$ 611	\$ 486	\$ 356	\$ 256	\$ 255	\$ 154	\$ 418	\$ 471	\$ 347	\$ 162
Other assets	\$ 243	\$ 145	\$ 174	\$ 248	\$ 482	\$ 1,816	\$ 2,352	\$ 2,685	\$ 3,411	\$ 3,691	\$ 4,247	\$ 4,970	\$ 3,946	\$ 3,604	\$ 42,908	\$ 34,018	\$ 37,080
Total Assets	\$ 2,270	\$ 2,379	\$ 2,790	\$ 5,932	\$ 9,178	\$ 10,832	\$ 11,514	\$ 12,230	\$ 13,690	\$ 14,936	\$ 14,928	\$ 14,783	\$ 17,103	\$ 16,805	\$ 61,960	\$ 45,204	\$ 48,083
Short term debt	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 750	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Accounts payable	\$ 26	\$ 13	\$ 19	\$ 32	\$ 48	\$ 70	\$ 109	\$ 176	\$ 152	\$ 137	\$ 162	\$ 167	\$ 185	\$ 138	\$ 238	\$ 209	\$ 172
Accrued expenses and other	\$ 168	\$ 236	\$ 258	\$ 484	\$ 853	\$ 828	\$ 1,047	\$ 1,006	\$ 1,140	\$ 1,170	\$ 1,209	\$ 846	\$ 808	\$ 908	\$ 671	\$ 935	\$ 1,007
Deferred revenue	\$ 117	\$ 109	\$ 136	\$ 192	\$ 279	\$ 306	\$ 318	\$ 368	\$ 413	\$ 411	\$ 255	\$ 195	\$ 297	\$ 294	\$ 337	\$ 134	\$ 109
Other current liabilities	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,282	\$ -	\$ -
Current liabilities	\$ 311	\$ 359	\$ 412	\$ 708	\$ 1,181	\$ 1,204	\$ 1,474	\$ 2,300	\$ 1,705	\$ 1,718	\$ 1,626	\$ 1,207	\$ 1,290	\$ 1,340	\$ 4,529	\$ 1,277	\$ 1,287
Long term debt	\$ -	\$ -	\$ -	\$ 750	\$ 750	\$ 750	\$ 750	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Convertible notes	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,111	\$ 1,233	\$ 1,300
Long term deferred revenue	\$ -	\$ -	\$ -	\$ -	\$ 66	\$ 68	\$ 65	\$ 95	\$ 218	\$ 123	\$ 56	\$ 44	\$ 408	\$ 259	\$ 21	\$ 28	\$ 40
Other liabilities	\$ 32	\$ 24	\$ 85	\$ 73	\$ 36	\$ 244	\$ 56	\$ 289	\$ 497	\$ 577	\$ 649	\$ 950	\$ 800	\$ 965	\$ 17,455	\$ 13,586	\$ 14,372
Redeemable convertible preferred stock	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total liabilities	\$ 343	\$ 382	\$ 496	\$ 1,531	\$ 2,032	\$ 2,265	\$ 2,345	\$ 2,685	\$ 2,421	\$ 2,417	\$ 2,332	\$ 2,201	\$ 2,498	\$ 3,674	\$ 23,175	\$ 16,125	\$ 16,999
Shareholders' equity	\$ 1,897	\$ 1,967	\$ 2,262	\$ 4,363	\$ 7,101	\$ 8,566	\$ 9,161	\$ 9,533	\$ 11,251	\$ 12,493	\$ 12,558	\$ 12,541	\$ 14,560	\$ 13,075	\$ 38,742	\$ 29,044	\$ 31,049
Minority interest	\$ 29	\$ 30	\$ 32	\$ 37	\$ 44	\$ -	\$ 8	\$ 12	\$ 18	\$ 25	\$ 38	\$ 40	\$ 45	\$ 56	\$ 44	\$ 36	\$ 35
Total liabilities and shareholders' equity	\$ 2,270	\$ 2,379	\$ 2,790	\$ 5,932	\$ 9,178	\$ 10,832	\$ 11,514	\$ 12,230	\$ 13,690	\$ 14,936	\$ 14,928	\$ 14,783	\$ 17,103	\$ 16,805	\$ 61,960	\$ 45,204	\$ 48,083

⁴⁸⁴ Yahoo Annual Report 2000

⁴⁸⁵ Yahoo Annual Report 2009

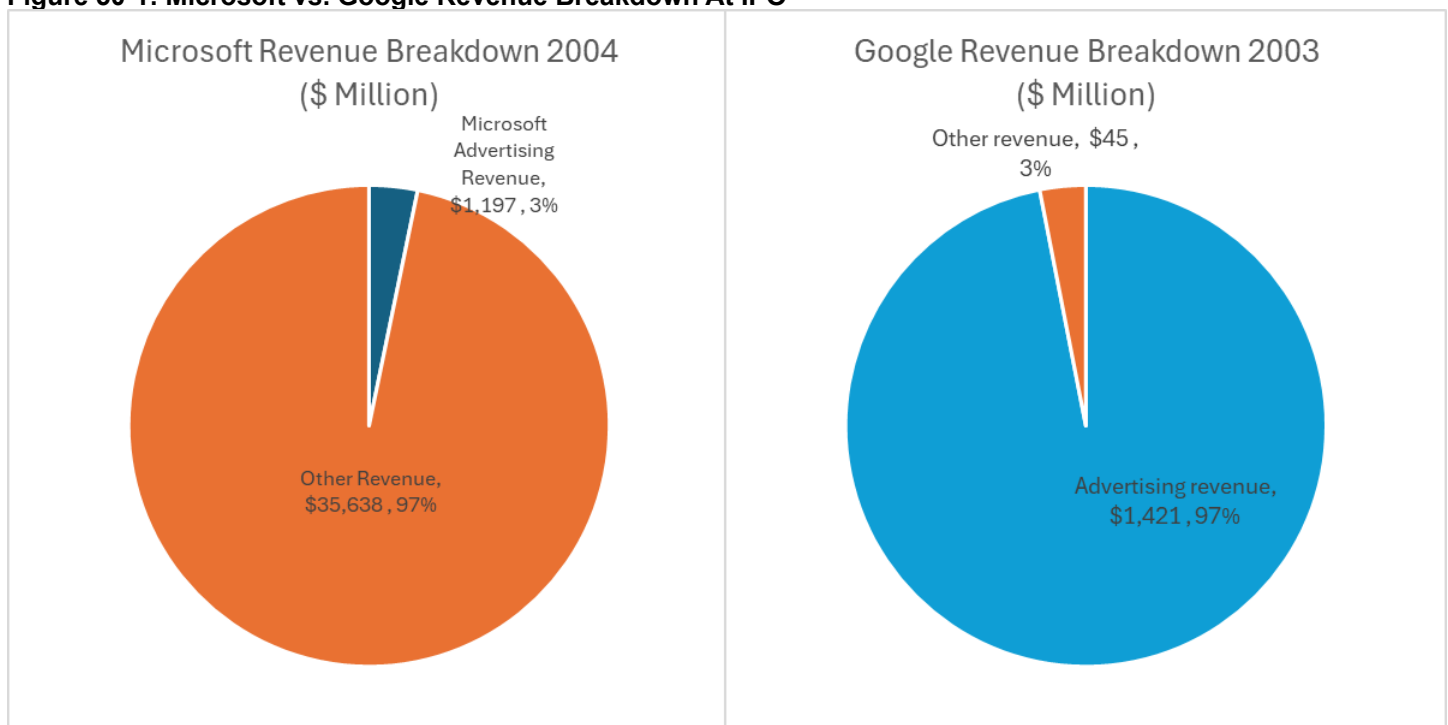
Microsoft (MSN Search, Windows Live, Microsoft Bing)

Microsoft's MSN Search, launched in the late 1990s, served as a built-in search function for its web portal msn.com, similar in concept to Yahoo. This marked Microsoft's initial attempt in the search engine space, which evolved in 2006 to become Windows Live Search,⁴⁸⁶ eventually rebranding as Bing in 2009.⁴⁸⁷ By the time Google went public, it dominated the search engine market with a 56% share, while Microsoft's MSN Search held only 9.4%.⁴⁸⁸ Over the following years, Microsoft's market share remained relatively stagnant. A 2009 comScore survey revealed that Google had grown its share to 64%, with Yahoo at 20% and Microsoft trailing at 8%, continuing to decline.⁴⁸⁹

In terms of revenue, as Figure 50-1 shows, at the time of Google's IPO, it generated over \$1.4 billion in advertising revenue, which accounted for 97% of its total revenue. In contrast, Microsoft generated nearly \$1.2 billion in advertising revenue, representing only 3% of its overall revenue. Advertising has remained a small part of Microsoft's business. As of 2023, Google amassed nearly \$238 billion in advertising revenue, making up 77% of its total revenue, whereas Microsoft's advertising revenue from search and news reached only \$12 billion, representing just 6% of its overall revenue.

As Figure 50-3 illustrates, from Google's IPO to 2023, Google's advertising revenue grew from \$1.4 billion to nearly \$238 billion, achieving a 35% CAGR. During the same period, Microsoft's advertising revenue grew from \$837 million to over \$12 billion, with a 14% CAGR.

Figure 50-1: Microsoft vs. Google Revenue Breakdown At IPO⁴⁹⁰



Note:

1. Microsoft's fiscal year ended on June 30, 2004, prior to Google's IPO.

⁴⁸⁶ What's New with Windows Live Search. <https://blogs.bing.com/search/March-2006/What%E2%80%99s-new-with-Windows-Live-Search/>; Live.com Leaving Beta, Replacing MSN Search. <https://techcrunch.com/2006/09/11/livecom-to-leave-beta-replace-msn-search/>

⁴⁸⁷ Microsoft Unveils Bing Search Engine. CNN. https://money.cnn.com/2009/05/28/technology/microsoft_bing/index.htm?iid=EL

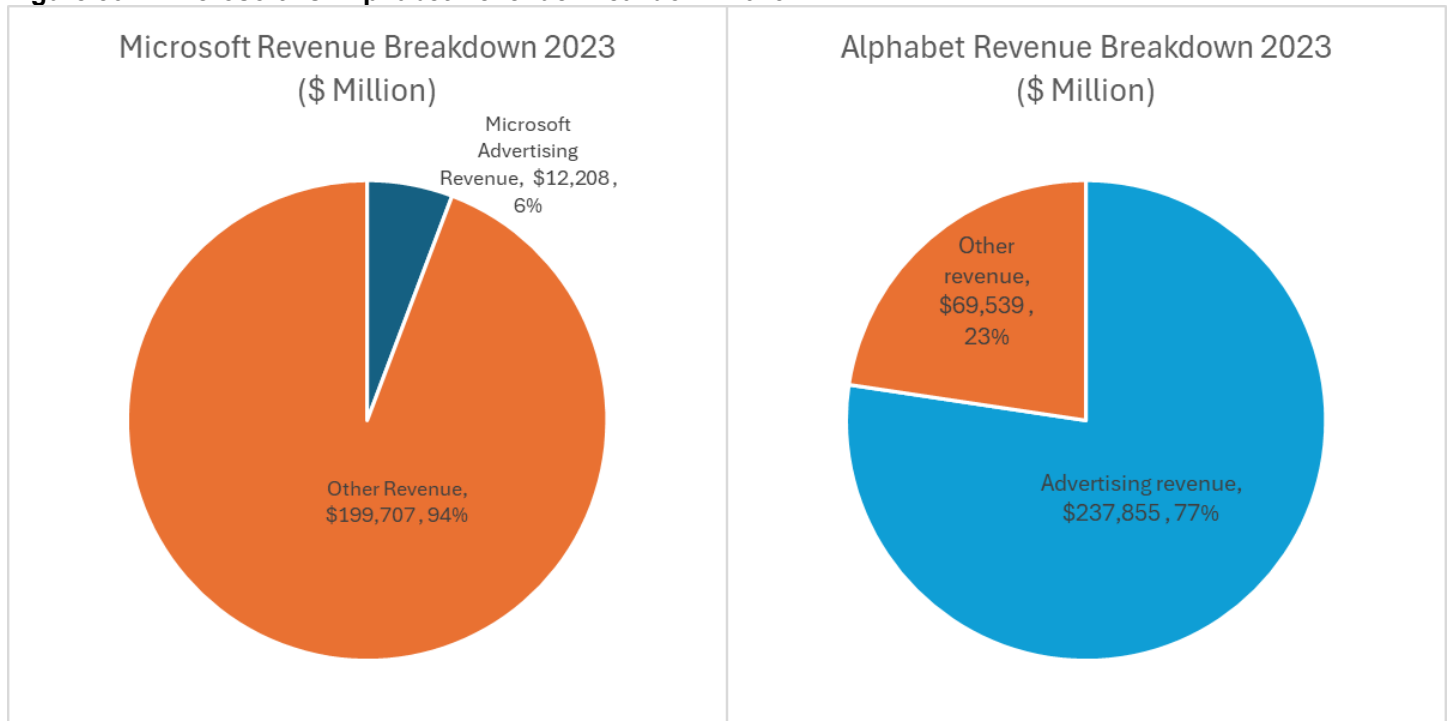
⁴⁸⁸ Yahoo and MSN Prove Competition for Google. Search Engine Journal. <https://www.searchenginejournal.com/yahoo-and-msn-prove-competition-for-google/297/>

⁴⁸⁹ Search Wars WolframAlpha Joins The Battle. CNN.

https://money.cnn.com/2009/05/27/technology/search_engines/index.htm?postversion=2009052717

⁴⁹⁰ Microsoft Annual Report 2004, ended June 30, 2004; Google Annual Report 2003, ended December 31, 2003.

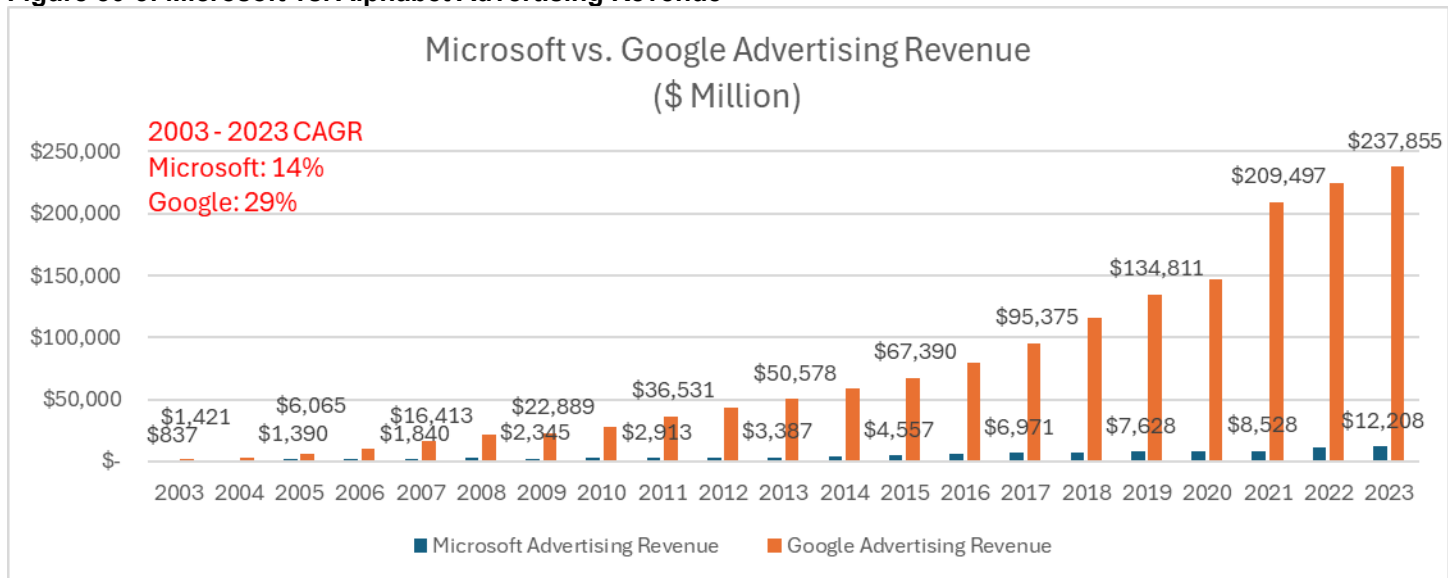
Figure 50-2: Microsoft vs. Alphabet Revenue Breakdown 2023⁴⁹¹



Note:

1. Microsoft's fiscal year ended on June 30, 2023. Alphabet's fiscal year ended on December 31, 2023.

Figure 50-3: Microsoft vs. Alphabet Advertising Revenue



Note:

1. Microsoft reclassified its business segments in certain years, meaning that the reported revenue may not be solely search-related but could also include a broader range of advertising revenue generated by Microsoft.

By the end of 2023, according to a StatCounter survey, Google dominated the search engine market with over 92% market share globally, while Microsoft's Bing held just 3%.⁴⁹² Although different methodologies across surveys may lead to variations in market share estimates, Google has been no doubt the dominant player in the search engine space. Microsoft's efforts in the search market, though not a complete failure, are hardly a success compared to Google.

⁴⁹¹ Microsoft Annual Report 2024, ended June 30, 2024; Google Annual Report 2023, ended December 31, 2023.

⁴⁹² Search Engine Market Share Worldwide. StatCounter GlobalStats. <https://gs.statcounter.com/search-engine-market-share#yearly-2009-2024>

Several factors could explain Microsoft's inability to keep up with Google. Microsoft developed its own search technology relatively late, and its search products, such as MSN Search and later Bing, have not performed as well as Google. Although Google was not the world's first search engine (and technically launched slightly after Microsoft), it quickly established a strong foothold due to its superior algorithm, PageRank, which delivered more relevant and useful information to users than competitors.⁴⁹³ Google's simple design and commitment to delivering objective search results, not affected by advertisers' influence, further helped it build trust with users. As more people used Google, it gained a network effect that accelerated its market share growth and solidified its market position.

By contrast, Microsoft lagged in developing its own search algorithm. Despite its strong presence in software and operating systems, Microsoft did not launch its own search engine technology until 2005. Prior to that, the company relied on partnerships with other search engines, such as Overture,⁴⁹⁴ Inktomi,⁴⁹⁵ Looksmart,⁴⁹⁶ and AltaVista,⁴⁹⁷ during different time periods. Although Microsoft launched its new MSN Search in 2005, based entirely on its own web-crawler technology started in 2003,⁴⁹⁸ it was already far behind Google. Microsoft celebrated reaching the milestone of indexing 5 billion web pages at the time of the launch,⁴⁹⁹ but Google had already surpassed 4 billion pages a year earlier when it filed for its IPO,⁵⁰⁰ and had exceeded 8 billion web pages just a few weeks before Microsoft launched MSN Search.⁵⁰¹

Bill Gates acknowledged at the 2004 World Economic Forum that Microsoft had made a critical mistake by overlooking the search market, admitting that Google "kicked our butts."⁵⁰² Even with over 5 billion pages indexed, the search results that MSN generated were not as good as those of Google.⁵⁰³ The vast difference in indexed data as well as algorithms gave Google an advantage – it could continually improve its algorithms by analyzing user activities, creating a feedback loop where better search results attracted more users, which in turn fed Google's system more data for further refinements. Even with Microsoft developing its own web crawler, one of its project leaders stated that it was the most challenging technical problem he had encountered in his 16 years at the company,⁵⁰⁴ underscoring the complexity, superiority, and innovation behind Google's technology.

A product manager with experience at both Google Search and Bing notes that search quality and user engagement reinforce each other. Both Google and Bing use user interactions on search results pages to continually improve the relevance and quality of their results.⁵⁰⁵ This enhanced relevance leads to greater distribution, which in turn brings in more user interactions, further refining search quality. As of 2024, Google processes over 8 billion searches daily, while Bing handles close to, but fewer than, 1 billion.

In 2005, to compete with Google, Microsoft launched a year-long campaign to lure AOL away. Despite AOL's market share already declining, it remained the largest internet service provider in the U.S., with over 110 million monthly users. In response, Google countered by offering AOL \$300 million in advertising credits and acquiring 5% of AOL's equity for \$1 billion.⁵⁰⁶

⁴⁹³ The Coming Search Wars. The New York Times.

<https://web.archive.org/web/20240927064934/https://www.nytimes.com/2004/02/01/business/the-coming-search-wars.html>

⁴⁹⁴ Overture Annual Report 1999 – 2002

⁴⁹⁵ Microsoft Joins With Inktomi to Provide Comprehensive Search Capabilities for Microsoft Online Properties.

<https://news.microsoft.com/1997/10/20/microsoft-joins-with-inktomi-to-provide-comprehensive-search-capabilities-for-microsoft-online-properties/>

⁴⁹⁶ MSN Makes Search Offering More Robust With Looksmart's Comprehensive Category and Site Listings.

<https://news.microsoft.com/1999/02/09/msn-makes-search-offering-more-robust-with-looksmarts-comprehensive-category-and-site-listings/>

⁴⁹⁷ Microsoft Returns To Inktomi For Search Services. <https://www.cnet.com/tech/services-and-software/microsoft-returns-to-inktomi-for-search-services/>

⁴⁹⁸ How to Build a Better Search Engine: MSN Launches New Internet Search Service. <https://news.microsoft.com/2005/02/01/how-to-build-a-better-search-engine-msn-launches-new-internet-search-service/>

⁴⁹⁹ Microsoft Learns to Crawl. The Seattle Times. <https://www.seattletimes.com/business/microsoft-learns-to-crawl/>

⁵⁰⁰ Google Prospectus 2004.

⁵⁰¹ Google.com 4/21/2005. <https://web.archive.org/web/20050421074400/http://www.google.com/>

⁵⁰² The Coming Search Wars. The New York Times.

<https://web.archive.org/web/20240927064934/https://www.nytimes.com/2004/02/01/business/the-coming-search-wars.html>

⁵⁰³ Microsoft Learns to Crawl. The Seattle Times. <https://www.seattletimes.com/business/microsoft-learns-to-crawl/>

⁵⁰⁴ Microsoft Learns to Crawl. The Seattle Times. <https://www.seattletimes.com/business/microsoft-learns-to-crawl/>

⁵⁰⁵ Interview with Former Group Product Manager, Search at Google. 10/29/2024.

⁵⁰⁶ Google Annual Report 2006; Case Study: Google Inc. MH0029. McGraw Hill Education.

Furthermore, the decline in Microsoft Internet Explorer's market share in favor of Google's Chrome browser further strengthened Google's dominance in the search market. As discussed previously, Chrome won the competition among browsers due to its focus on simplicity, speed, and seamless integration with Google's ecosystem. Its minimalist design minimized the learning curve, while features like the omnibox streamlined browsing and searching in one place, enhancing user convenience. Chrome's performance was a significant differentiator, with benchmark tests in 2009 showing it to be substantially faster than competitors such as Internet Explorer, Firefox, and Safari.⁵⁰⁷ Continuous updates and improvements further boosted its speed and user experience, encouraging widespread adoption.

In addition, Chrome's integration with Google services, such as automatic sign-ins to Gmail and YouTube with a single Google account, created an ecosystem that kept users within Google's products. By setting Google Search as the default engine, Chrome not only drove search traffic but also allowed Google to collect valuable user data, enhancing its advertising capabilities and user experience. This combination of superior performance, user-friendly features, and deep integration with Google's core services helped Chrome rapidly gain market share and maintain its dominance in the browser market.

Chrome's rise not only increased Google's presence among users but also reinforced its ecosystem. Since its launch in 2008, the market share of Google's Chrome has continued to expand and reached over 60% worldwide as of 2023, while that of Microsoft's Internet Explorer continued to decline from over 60% to low single digit. In 2022, Microsoft officially retired Internet Explorer and ceased supports.⁵⁰⁸ Microsoft Edge, the successor of Internet Explorer, occupies little market share.

A former Google Search product manager highlighted that Microsoft's struggle in the search market was also partly due to Google's successful execution of Android. With Google Search as the default search engine on Android and other integrated services such as Maps and Chrome, Android became a significant distribution channel for Google. By contrast, Microsoft primarily focused on web (desktop) users and did not fully capitalize on mobile distribution.⁵⁰⁹ This strategic difference, particularly on mobile devices, has been a crucial factor in Google's sustained dominance in the search market.

Moreover, search has always been a core focus for Google, which relies heavily on it for the majority of its revenue. By contrast, search has only been a minor part of Microsoft's overall business, contributing very little to its revenue. While both companies invest 10% to 20% of their revenue in research and development, Google has been steadily increasing its investment in search technology and innovation as a percentage of overall revenue. Meanwhile, Microsoft's investment has remained more moderate, showing a slight downward trend, as Figure 51 shows.

⁵⁰⁷ Chrome Buries Windows Rivals in Browser Drag Race.

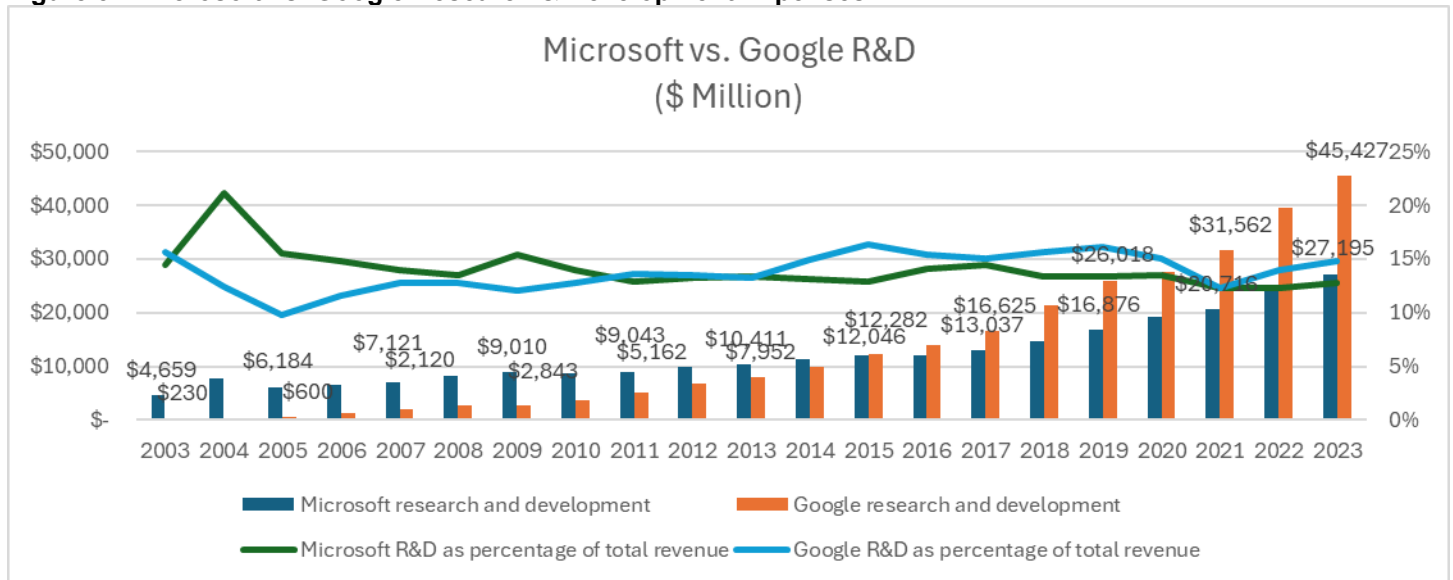
https://web.archive.org/web/20091002004128/http://www.computerworld.com/s/article/9138331/Chrome_buries_Windows_rivals_in_browser_drag_race

⁵⁰⁸ Internet Explorer 11 Has Retired And Is Officially Out of Support.

<https://blogs.windows.com/windowsexperience/2022/06/15/internet-explorer-11-has-retired-and-is-officially-out-of-support-what-you-need-to-know/>

⁵⁰⁹ Interview with Former Group Product Manager, Search at Google. 2/29/2024.

Figure 51: Microsoft vs. Google Research & Development Expenses



Other Competitors

In recent years, the competitive landscape of the search engine market, and the underlying search-related online advertising segment, has gradually shifted. New competitors have emerged, particularly outside traditional search engines, including platforms for short-form video and e-commerce. These platforms leverage extensive user data, enhanced by artificial intelligence, to offer advertising services that are similar to Google's offering. In addition, some generative AI models have begun exploring ad integration within their responses. For example, Perplexity, an AI startup backed by Jeff Bezos, introduced ads into its AI-generated answers beginning in November 2024.⁵¹⁰

Current Situation of AI Search vs. Google

At the current stage, it is difficult to project how much challenge AI search engines will ultimately impose on traditional search engines such as Google and Bing, as they are still at an early stage and have not yet been fully and successfully commercialized. A 2025 survey shows that as of 2024, Google continues to dominate the search engine market, maintaining an average market share of over 90%, followed by Bing's over 3%.⁵¹¹ **Meanwhile, ChatGPT and Perplexity together account for less than 1%, though their market share reflects an upward trend, with ChatGPT gaining 0.09% and Perplexity 0.02% share in search traffic during 2024. Industry experts predicted that ChatGPT could reach a 1% market share in 2025.**⁵¹²

Adding to the shifting dynamics, Apple's senior vice president of Services, Eddy Cue, testified during Google's antitrust trial with the U.S. Department of Justice in May 2025 that Apple is "actively looking at" alternative AI-powered search options for Safari, the default internet browser on Apple's mobile devices. Companies under consideration include Perplexity, OpenAI, and Anthropic. However, Cue noted that current offerings "are just not good enough" to replace Google yet.⁵¹³ Apple reportedly receives around \$20 billion annually from Google to keep Google Search as the default search engine on Safari. Cue revealed that Safari searches fell for the first time in 22 years in April, a drop he attributed to growing adoption of generative AI tools such as ChatGPT and Perplexity.⁵¹⁴ This decline in search volume poses a concern to Apple as fewer searches also mean less revenue for Apple.

Despite still commanding a dominant 90% market share, followed by Bing's over 3%,⁵¹⁵ Google's lead has slipped slightly from its 93% peak in late 2022, around the time ChatGPT and other generative AI tools began to gain traction. In response to this growing competition, Google made a series of announcements at its 2025 I/O developer conference, just a few days after Apple's statements. Chief among them was the rollout of "AI Mode" for Google Search in the U.S., an AI-enhanced experience that allows users to ask complex, multi-layered questions, even using images captured by their phone cameras. Google framed this as a move toward a more "personal and proactive" search experience,⁵¹⁶ essentially embedding generative AI directly into its core product. To compete with premium AI offerings like ChatGPT Pro, Google also launched a new \$249.99-per-month AI subscription tier, positioned against OpenAI's \$200-per-month plan. These initiatives are part of a larger strategy to infuse AI throughout Google's ecosystem, including upgrades to its Gemini AI models and the launch of "AI Overviews," which present concise summaries above traditional search results.

However, even with these innovations, Google's advertising-based search business could face long-term uncertainty. Some analysts project that Google's market share in search could fall below 50% within the next five years due to

⁵¹⁰ Why We're Experimenting with Advertising. <https://www.perplexity.ai/hub/blog/why-we-re-experimenting-with-advertising>; Google's Dominant Search Business Is Under Attack From TikTok to AI. WSJ. <https://www.wsj.com/tech/online-ad-market-google-tiktok-9599d7e8?mod=mhp>

⁵¹¹ This result is based on traffic data from 2024 from a sample of 13,700 websites. Google Market Share Slips, AI Referrals & Regional Search Engines Rise. <https://www.searchenginejournal.com/google-market-share-slips-ai-referrals-regional-search-engines-rise/539373/>; ChatGPT's Search Surge. <https://searchengineland.com/chatgpt-search-market-share-1-percent-449378>; Top Search Engines. <https://seranking.com/blog/top-search-engines/>

⁵¹² ChatGPT's Search Surge. <https://searchengineland.com/chatgpt-search-market-share-1-percent-449378>

⁵¹³ Apple is Looking at Adding Perplexity and other AI Search Engines to Safari. <https://www.theverge.com/news/662656/apple-ai-search-alternatives-eddy-cue-testimony>

⁵¹⁴ Google Stock Tumbles After Apple Warns AI Services Attracting Search Users. <https://www.wsj.com/tech/ai/ais-threat-to-google-just-got-real-8280b4ee>

⁵¹⁵ Google Market Share Slips, AI Referrals & Regional Search Engines Rise. <https://www.searchenginejournal.com/google-market-share-slips-ai-referrals-regional-search-engines-rise/539373/>; ChatGPT's Search Surge. <https://searchengineland.com/chatgpt-search-market-share-1-percent-449378>; Top Search Engines. <https://seranking.com/blog/top-search-engines/>

⁵¹⁶ Google I/O Conference AI Upgrades, Subscriptions and Smart Glasses. <https://www.reuters.com/business/google-unveil-ai-upgrades-io-conference-amid-search-challenges-2025-05-20/>

shifting user behavior.⁵¹⁷ Still, Robin Stein from Google's search team argued that enabling users to tackle more complex queries could create new opportunities for "hyper-relevant, useful advertising." CEO Sundar Pichai echoed this sentiment, emphasizing that generative AI enhances, rather than replaces, traditional search. "The kind of use cases we're serving in search is dramatically expanding," Pichai said. "We've been able to deliver the best models at the most effective price point."

As of May 2025, Google's Gemini AI assistant surpassed 400 million monthly active users.⁵¹⁸ In comparison, ChatGPT had around 600 million monthly active users (according to Google's March 2025 estimate),⁵¹⁹ while Meta AI reported nearly 500 million monthly active users as of September 2024, per Mark Zuckerberg.⁵²⁰ Despite launching its generative AI to the public a few months later in 2023 than its competitors such as OpenAI's ChatGPT and Perplexity, it now holds the top spot for AI-related patents in the U.S., including generative AI and other AI applications. Following Google in the patent rankings are Nvidia, Microsoft, and IBM, while OpenAI is absent from the top list.⁵²¹

Today, while these generative AI models such as ChatGPT and Perplexity evolve rapidly and sometimes show surprising results, particularly in delivering direct answers and summarizing information, they still struggle to match Google's speed, accuracy, and versatility.⁵²² The key challenge for AI tools is not just providing information but replicating the broad functionality that Google offers, from quick navigational queries to real-time data such sports scores and weather updates.

Importantly, users would still find it easier and more readily available to use Google for searching than newly emerging AI search engines as Google remains the default search engine on Chrome, the world's most popular web browser, with over 60% market share and 3 billion monthly users.⁵²³ It also powers search on Android, the world's leading mobile operating system, which holds over 70% market share and 3 billion monthly users of Android.⁵²⁴ This deep integration allows Google to seamlessly direct users to their search results within just a few clicks, whereas AI tools such as ChatGPT and Perplexity require users to visit their websites or download apps before entering their queries and being directed to the search results.

Although Google continues to dominate the online search market, AI-powered search engines no doubt are rapidly gaining traction. **For example, both ChatGPT and Perplexity were launched around 2022, yet by 2024, Perplexity was already handling over 100 million queries per week, equivalent to 14 million searches per day.**⁵²⁵ For comparison, two years after Google's founding in 2000, it was already processing over 50 million searches per day.⁵²⁶ While OpenAI, the developer of ChatGPT, does not disclose comparable metrics, it reported that as of 2024, ChatGPT users sent 1 billion messages daily, with 300 million weekly active users,⁵²⁷ a number that grew to 400 million by February 2025.⁵²⁸ Meanwhile, Google remains the undisputed leader, processing over 5 trillion searches per year, or

⁵¹⁷ Google I/O Conference AI Upgrades, Subscriptions and Smart Glasses. <https://www.reuters.com/business/google-unveil-ai-upgrades-io-conference-amid-search-challenges-2025-05-20/>

⁵¹⁸ Google I/O Conference AI Upgrades, Subscriptions and Smart Glasses. <https://www.reuters.com/business/google-unveil-ai-upgrades-io-conference-amid-search-challenges-2025-05-20/>

⁵¹⁹ Google's Gemini AI App Has 400M Monthly Active Users. TechCrunch. <https://techcrunch.com/2025/05/20/googles-gemini-ai-app-has-400m-monthly-active-users/>

⁵²⁰ Mark Zuckerberg Says Meta AI Has Nearly 500 Million Users. <https://techcrunch.com/2024/09/25/mark-zuckerberg-says-meta-ai-has-nearly-500-million-users/>

⁵²¹ Google Dominates AI Patent Applications. <https://www.axios.com/2025/05/15/ai-patents-google-agents>

⁵²² Perplexity, Copilot, You.com – Putting the AI Search Engines to The Test. <https://www.theverge.com/24111326/ai-search-perplexity-copilot-you-google-review>

⁵²³ Google Issues First 2023 Zero Day Warning To 3 Billion Chrome Users. Forbes.

<https://www.forbes.com/sites/gordonkelly/2023/04/18/google-chrome-browser-zero-day-vulnerability-critical-chrome-update/>; Browser Market Share Worldwide. StatCounter GlobalStats. <https://gs.statcounter.com/browser-market-share#yearly-2009-2024>.

⁵²⁴ Mobile Operating System Market Share Worldwide. StatCounter GlobalStats. <https://gs.statcounter.com/os-market-share/mobile/worldwide#yearly-2009-2024>; Alphabet Q1 2024 Earnings Call. 4/25/2024.

⁵²⁵ Perplexity Says It Serves 100 Million Queries Per Week. <https://www.pymnts.com/artificial-intelligence-2/2024/perplexity-says-ai-search-engine-serves-100-million-queries-per-week/>

⁵²⁶ Larry Page and Sergey Brin interview on Starting Google (2000). <https://www.youtube.com/watch?v=tldZ3lhsXEE>; Google Now Sees More Than 5 trillion Searches Per Year. <https://searchengineland.com/google-5-trillion-searches-per-year-452928>

⁵²⁷ ChatGPT Now Has Over 300 Million Weekly Users. <https://www.theverge.com/2024/12/4/24313097/chatgpt-300-million-weekly-users>

⁵²⁸ OpenAI's Weekly Active Users Surpass 400 Million. <https://www.reuters.com/technology/artificial-intelligence/openais-weekly-active-users-surpass-400-million-2025-02-20/>

approximately 14 billion searches per day.⁵²⁹ However, the rapid adoption of AI-driven platforms such as Perplexity and ChatGPT suggests that this landscape could evolve on a monthly basis, driven by advancements in AI technology. **Gartner predicted in early 2024 that search engine volume could drop 25% by 2026 caused by AI Chatbots and other virtual agents.**⁵³⁰ As a result, stakeholders such as business owners and investors should closely monitor these shifts to stay ahead of potential market disruptions that might threaten the market position of traditional search engines such as Google.

Search queries generally fall into three categories: navigational, informational, and exploratory. AI tools tend to perform poorly with navigational queries, where users simply want to reach specific websites quickly.

In contrast, Google handles navigational queries with unmatched efficiency, typically displaying the desired website as the top result on the page. In contrast, AI search engines like Perplexity not only show the destination websites but also include additional information that may be less relevant to the user's intent, such as background details. **For example, when someone searches for "closest gas station near me," Google presents a clean layout with a ranked list of nearby gas stations, displayed on a map. Users can simply click on a location to start navigation via Google Maps. However, Perplexity might instead generate a summary explaining how to find nearby gas stations using tools like Google Maps, rather than directly listing gas stations based on proximity.** Moreover, the information generated by AI models tends to vary with each query, reducing consistency. Some AI models also require specific instructions to display search results directly.

⁵²⁹ Google Now Sees More Than 5 trillion Searches Per Year. <https://searchengineland.com/google-5-trillion-searches-per-year-452928>

⁵³⁰ Gartner Predicts Search Engine Volume Will Drop 25% by 2026, Due to AI Chatbots and Other Virtual Agents. <https://www.gartner.com/en/newsroom/press-releases/2024-02-19-gartner-predicts-search-engine-volume-will-drop-25-percent-by-2026-due-to-ai-chatbots-and-other-virtual-agents>

Figure 52: Perplexity AI Search Example⁵³¹

The screenshot shows the Perplexity AI search interface. At the top, the search query is "closest gas station near me". Below the search bar, there are four source cards: "gasbuddy" (GasBuddy - Find The Nearest Gas Stations & Cheapest Prices), "petro-canada" (Find a Petro-Canada Gas Station Near Me), "esso" (Find a gas station in the Cornwall Ontario | Esso.ca), and "+5 sources". Below the sources, there is an "Answer" section with the following text:

To find the closest gas station near you, you can use several tools and websites:

1. **GasBuddy:** This platform allows you to search for gas stations by city or zip code. It provides information on gas prices and station locations across various regions, including Canada and the U.S. ¹.
2. **Petro-Canada Locator:** If you are in Canada, you can use Petro-Canada's location finder to search for nearby stations. It offers filters for services like diesel, propane, and car washes ².
3. **Shell Station Locator:** Shell provides a station locator tool that helps you find the nearest Shell stations, including those offering petrol, diesel, and other services ⁶.
4. **Google Maps:** Simply type "gas stations near me" into Google Maps to get a list of nearby options along with directions.

At the bottom left of the interface, there is a "Sign Up" button.

AI provides valuable context in informational searches but often falls short of Google's real-time accuracy and speed, especially for dynamic data such as stock prices and game results. However, AI excels at handling "buried information" queries, where straightforward answers are hidden within dense content such as summarizing tech tutorials or extracting quick facts. If someone asks an AI-powered search engine something like "What is the Mayo Clinic?", they will usually get a direct answer along with a detailed summary, depending on how the question is phrased. In contrast, Google is more likely to show a list of relevant links such as homepages, blog posts, and news articles, based on its algorithm, and users still have to click through to find the answer themselves.

Exploratory queries, which involve learning about complex topics, showcase AI's strengths. Here, tools such as Copilot and Perplexity synthesize diverse information effectively, often providing more engaging and informative answers than Google. Despite this, at the current stage, AI's slower response times, occasional factual inconsistencies, and weaker real-time data integration limit its ability to fully replace traditional search engines.

⁵³¹ Closest Gas Station Near Me – Perplexity. <https://www.perplexity.ai/search/closest-gas-station-near-me-MRkppVzwThm2Hy0OkNtMzQ>

Figure 53-1: Google Search Example⁵³²


The screenshot shows a Google search for "how to cook mac and cheese". The search bar is at the top with the Google logo on the left and search icons on the right. Below the search bar are navigation tabs: All, Videos, Images, Forums, Shopping, Web, News, and More. The "All" tab is selected. The main content area is titled "Recipes" and displays three recipe cards. Each card includes a thumbnail image, a title, the source, a rating, a cooking time, and a list of ingredients. Below the recipe cards is a "Show more" button. Underneath is a "People also ask" section with four questions and expandable arrows. At the bottom, there is a featured recipe from "The Kitchn" titled "Homemade Mac and Cheese Recipe (Our BEST Recipe!)" with a rating and a small thumbnail image.


Google


how to cook mac and cheese

All Videos Images Forums Shopping Web News More Tools

Recipes :

 **Homemade Mac and Cheese**
The Kitchn
4.0 ★★★★★ (10)
40 mins
Elbow macaroni, cheddar cheese, all purpose flour, whole

 **Mac and Cheese:**
Tastes Better From Scratch
5.0 ★★★★★ (4.1K)
30 mins
Elbow macaroni, cheddar cheese, butter, all purpose flour,

 **Simple Macaroni and Cheese**
Allrecipes
4.6 ★★★★★ (1.1K)
25 mins
Elbow macaroni, cheddar cheese, all purpose flour, black

Show more ▾

People also ask :


How to make mac and cheese step by step? ▾

How long should you cook mac and cheese in the oven for? ▾

How to cook macaroni step by step? ▾

Is it better to cook mac and cheese in milk or water? ▾


Feedback

 **The Kitchn**
<https://www.thekitchn.com> > ... > Pasta & Noodles ;

Homemade Mac and Cheese Recipe (Our BEST Recipe!)

Bake homemade mac and cheese in the oven for just 10 minutes or until the cheese on top melts and the edges begin to bubble. If you have prepped the mac and ...

4.0 ★★★★★ (10) · 40 mins



⁵³² Google Search Example.

Figure 53-2: Copilot Search Example⁵³³

Copilot uses AI. Check for mistakes. By interacting with Copilot, you agree to the [Terms of Use](#) and confirm you've reviewed the [Privacy Statement](#).

Today

how to cook mac and cheese?

Absolutely, I can help you cook a classic mac and cheese! Here's a simple and delicious recipe:

Ingredients

- 2 cups elbow macaroni
- 2 cups shredded cheddar cheese
- 1/2 cup grated Parmesan cheese
- 3 cups milk
- 1/4 cup butter
- 2 1/2 tablespoons all-purpose flour
- 1/2 teaspoon salt
- 1/2 teaspoon black pepper
- Optional: a pinch of paprika, bread crumbs for topping

Instructions

1. **Cook the Pasta:** Bring a large pot of salted water to a boil. Add the macaroni and cook according to package directions until al dente. Drain and set aside.
2. **Make the Cheese Sauce:**

⁵³³ Copilot Search Example. <https://copilot.microsoft.com/chats/xqK8buFGvEbTfHvbUnikX>

Figure 53-3: Perplexity Search Example⁵³⁴

The screenshot shows the Perplexity AI search interface. At the top, the search query is "how to cook mac and cheese?". The interface is divided into several sections:

- Sources:** Three search results are displayed as cards. The first is "Homemade Mac and Cheese (Easy and..." from "budgetbytes". The second is "Easy Homemade Mac and Cheese - ..." from "joyfoodsunshine". The third is "Easy Homemade Mac and Cheese - Tastes..." from "tastesbetterfromscr...". A "Show all" button is visible to the right.
- Perplexity:** A section with the Perplexity logo and the text "Here's how to cook mac and cheese from scratch:".
- Ingredients:** A bulleted list of ingredients:
 - 8 oz macaroni
 - 3 Tbsp butter
 - 3 Tbsp all-purpose flour
 - 2 cups whole milk
 - 8 oz sharp cheddar cheese, shredded
 - Salt and seasonings to taste
- Cooking Steps:** A numbered list of steps:
 - 1. Cook the Pasta**
 - Boil macaroni in salted water for 7-8 minutes until tender
 - Drain the pasta in a colander 1 2
 - 2. Prepare the Cheese Sauce**
 - Melt butter in a medium pot over medium heat

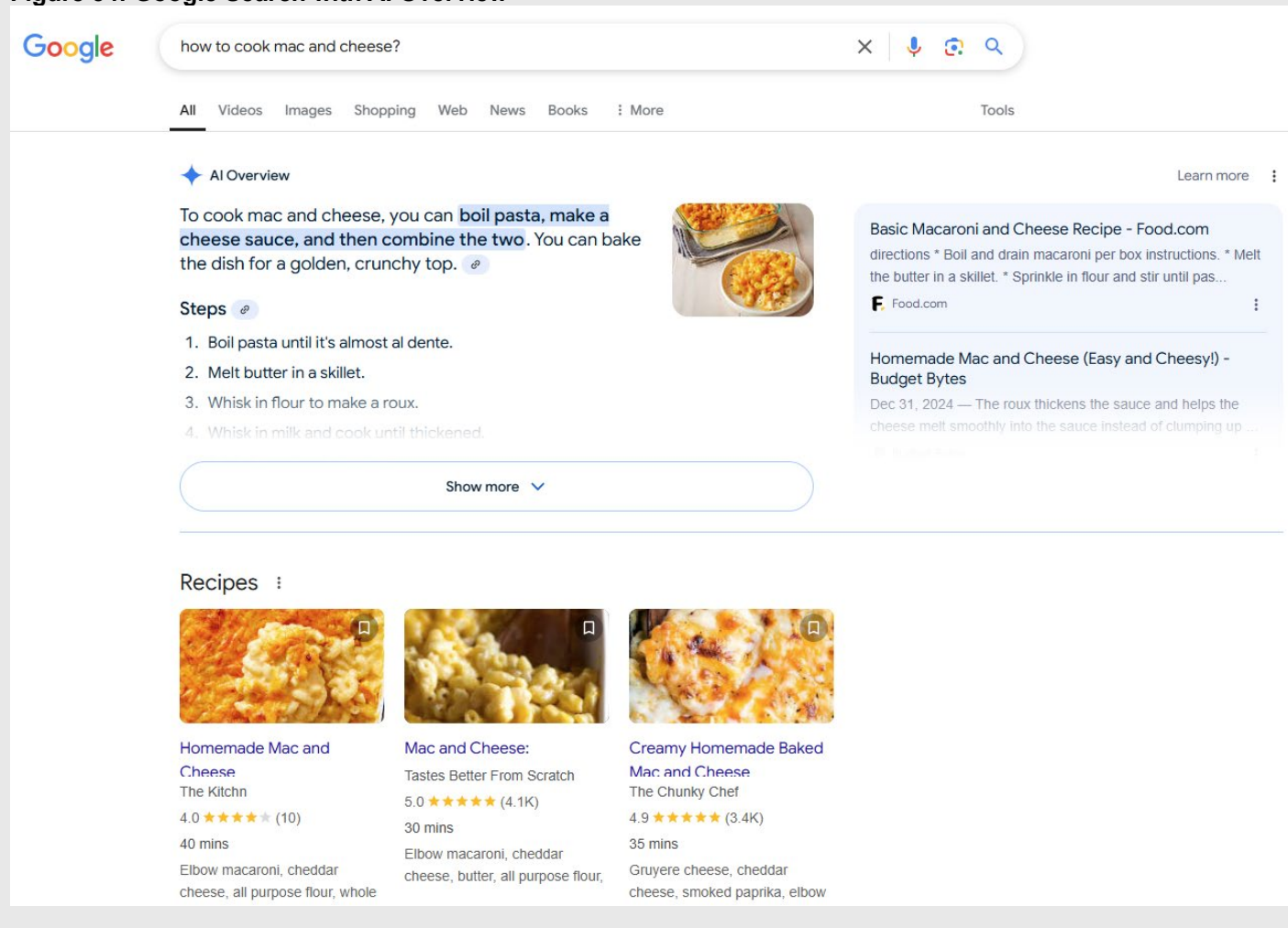
On the right side of the interface, there is a large image of a bowl of mac and cheese. Below the image are three interactive buttons: "Search Images", "Search Videos", and "Generate Image", each with a plus sign to its right. A "Watch" button is also visible in the bottom right corner of the image area.

⁵³⁴ Perplexity Search Example. https://www.perplexity.ai/search/how-to-cook-mac-and-cheese-CBOtQRRVRuWKW8BDk_7K0Q

Amid growing competition from AI-powered search platforms, since 2023, Google Search has gradually expanded its capabilities with the integration of generative AI, powered by Gemini model developed in-house.⁵³⁵ This model enhances multi-step reasoning, planning, and multimodal understanding, working with Google’s robust search systems to handle more complex tasks, including research, planning, and brainstorming.

A key feature of this enhancement is AI Overviews, designed to provide quick, concise answers alongside links for deeper exploration. Google stated that AI Overviews have proven to increase user engagement and satisfaction while driving more traffic to a diverse range of websites. In addition, Google Search’s new planning capabilities can assist users with tasks such as meal and trip planning, offering customizable plans that can be easily adjusted and exported to tools like Google Docs or Gmail. For complex queries, Gemini’s multi-step reasoning allows users to ask detailed, nuanced questions in a single search. Future enhancements will include AI-organized results pages for idea exploration and advanced video search functionalities, enabling users to get AI-generated assistance by simply uploading videos of real-world issues.

Figure 54: Google Search with AI Overview⁵³⁶



In 2019, The Wall Street Journal reported that advertisers had begun shifting some of their search ad spending from Google’s parent company, Alphabet, to Amazon,⁵³⁷ as many consumers started their product searches directly on Amazon’s e-commerce platform. The report cited data from WPP PLC, the world’s largest ad buyer, which spent around \$300 million on Amazon search ads in the previous year. Notably, 75% of that amount, an estimated \$150 to \$200 million,

⁵³⁵ New Generative AI Experiences in Search. <https://blog.google/products/search/generative-ai-google-search-may-2024/>

⁵³⁶ Google Search Example.

⁵³⁷ Amazon’s Rise in Ad Searches Dents Google’s Dominance. WSJ. https://www.wsj.com/articles/amazons-rise-in-ad-searches-dents-googles-dominance-11554414575?mod=article_inline

was redirected from Google search ad budgets. WPP’s global spend on Google search ads totaled over \$3 billion,⁵³⁸ meaning around 5% of that budget was shifted to Amazon. Although this shift was relatively small, it could indicate a potential change in consumer behavior. According to Jumpshot, a research firm that collects data from 100 million devices, by 2019, about 54% of people searching for products started their search directly on Amazon, up from 46% in 2015.⁵³⁹

Amazon, like Google, uses an auction-based system for advertisers to bid on keywords so their products can appear when consumers search for related items. However, making direct comparisons between Amazon and Google ad prices for the same product is challenging due to limited data. Some advertisers have noted that Amazon has become more expensive for advertisers due to the influx of brands. For example, the cost-per-click for “laundry detergent liquid” rose 127% between September 2018 and March 2019, reaching \$17.51.⁵⁴⁰

According to data cited by Forbes in 2022, the cost-per-click (CPC) for Amazon sponsored products averaged \$0.75, compared to \$2.32 for Google Search ads and \$1.35 for Facebook ads, as illustrated in Figure 55-1.

Figure 55-1: Average Cost-Per-Click on Social and Online Platforms 2021⁵⁴¹

WORLDWIDE COST PER CLICK AVERAGES ON SOCIAL AND ONLINE PLATFORMS – USD, 2021.



Sources: Sellics, Top Draw, WordStream, Pacvue.

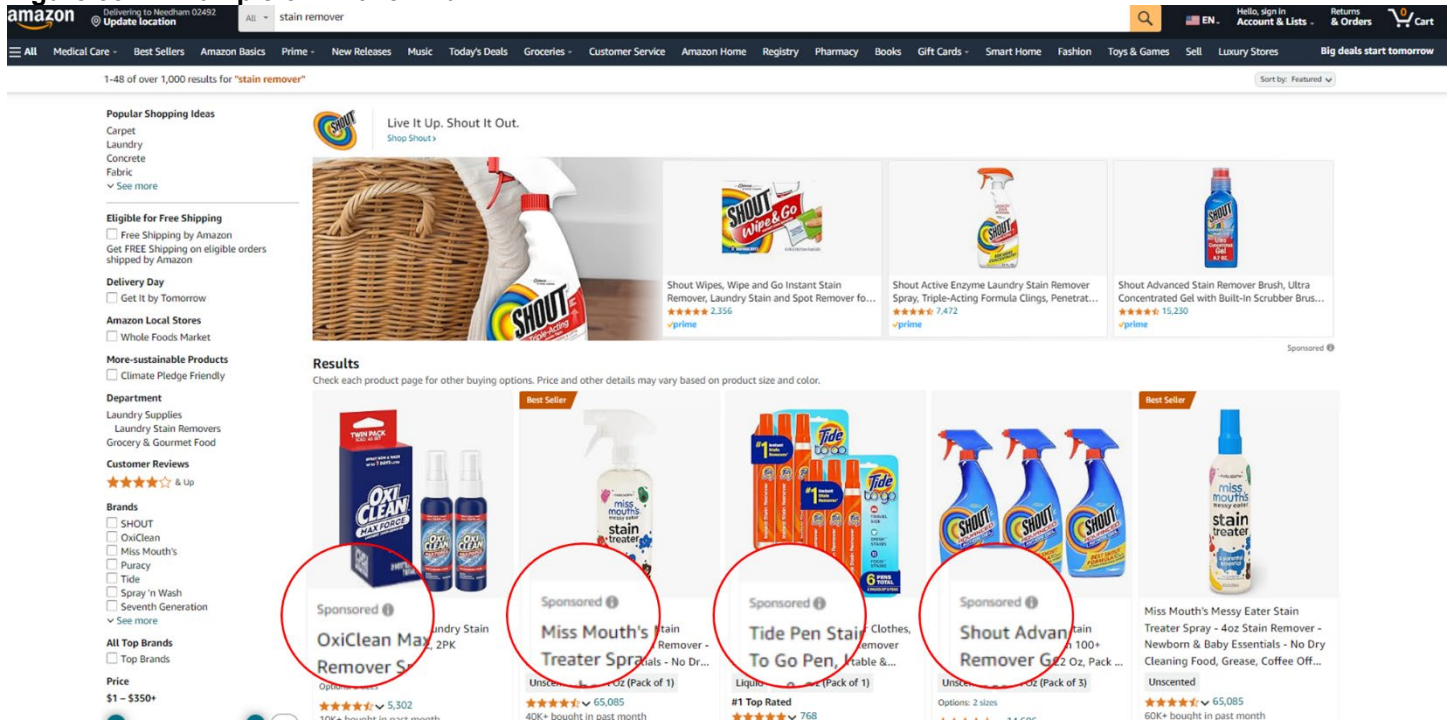
⁵³⁸ Amazon’s Rise in Ad Searches Dents Google’s Dominance. WSJ. https://www.wsj.com/articles/amazons-rise-in-ad-searches-dents-googles-dominance-11554414575?mod=article_inline

⁵³⁹ Amazon’s Rise in Ad Searches Dents Google’s Dominance. WSJ. https://www.wsj.com/articles/amazons-rise-in-ad-searches-dents-googles-dominance-11554414575?mod=article_inline

⁵⁴⁰ Amazon’s Rise in Ad Searches Dents Google’s Dominance. WSJ. https://www.wsj.com/articles/amazons-rise-in-ad-searches-dents-googles-dominance-11554414575?mod=article_inline

⁵⁴¹ Amazon Advertising Is 44% Cheaper Than Facebook Or Google. Forbes. <https://www.forbes.com/sites/kirimasters/2022/05/06/amazon-advertising-is-44-cheaper-than-facebook-or-google-but-thats-not-the-only-only-thing-brands-should-care-about/>

Figure 55-2: Example of Amazon Ad⁵⁴²



Despite Amazon's increasing competition, Google still holds a significant advantage. Amazon's search ads are confined to products sold on its platform, while Google offers broader advertising opportunities, appealing to industries outside of e-commerce, such as financial services, insurance, and automobiles.⁵⁴³ This differentiation enables Google to maintain its edge, even as competition from Amazon and other platforms grows.

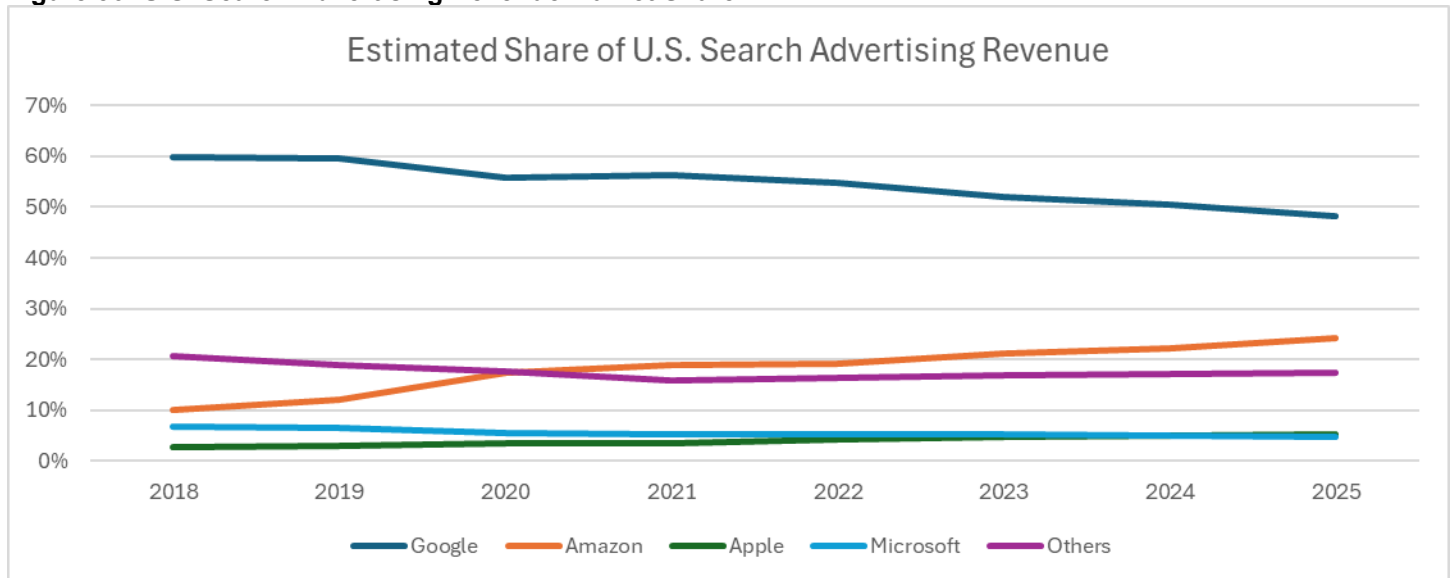
A 2024 estimation by eMarketer indicated Google's market share in U.S. search advertising revenue declined from 59% in 2018 to 52% in 2023, and it is expected to continue falling to 48% by 2025. In contrast, Amazon's share of search ad revenue increased from 10% in 2018 to 21% in 2023, with projections indicating further growth to 24% by 2025.⁵⁴⁴ In response to these shifts, Google began rolling out ads within its AI-generated summaries of search results in mid-October 2024. Initially, these ads are only showing up on mobile searches in the U.S. Other search engines, such as Microsoft's Bing, have also introduced ads into AI-generated search result answers, following a similar trend in response to the evolving competitive landscape.

⁵⁴² Stain Remover on Amazon.com

⁵⁴³ Amazon's Rise in Ad Searches Dents Google's Dominance. WSJ. https://www.wsj.com/articles/amazons-rise-in-ad-searches-dents-googles-dominance-11554414575?mod=article_inline

⁵⁴⁴ Google's Dominant Search Business Is Under Attack From TikTok to AI. WSJ. <https://www.wsj.com/tech/online-ad-market-google-tiktok-9599d7e8?mod=mhp>

Figure 56: U.S. Search Advertising Revenue Market Share⁵⁴⁵

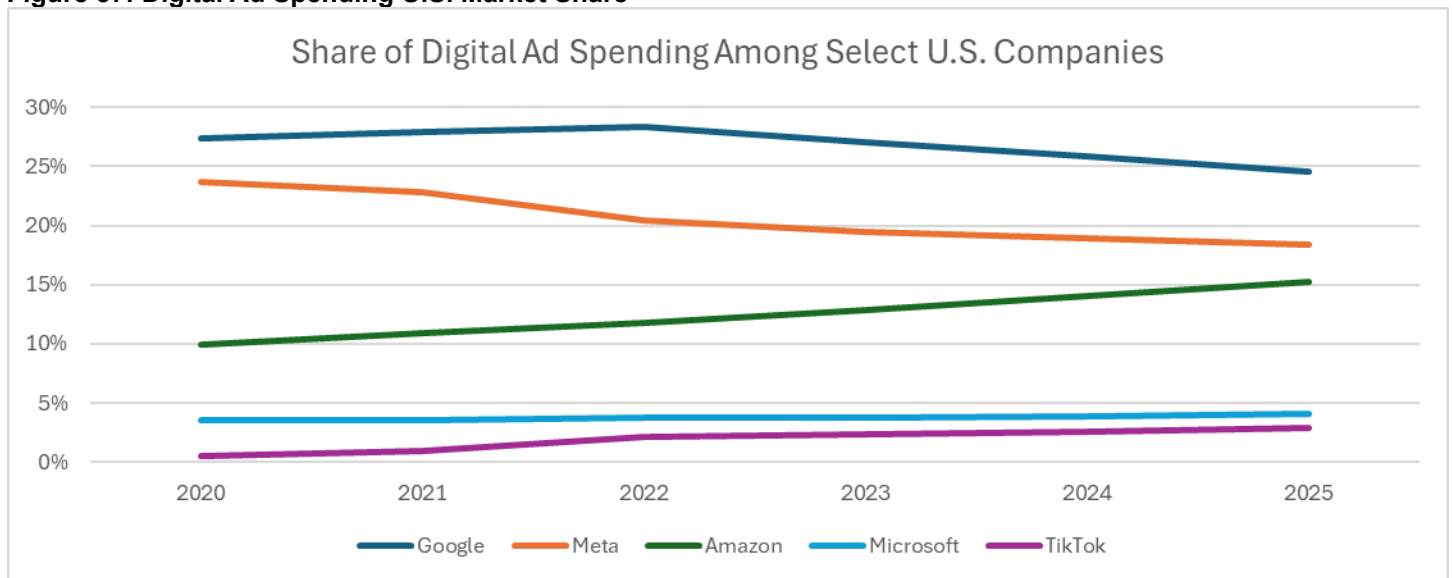


Notes:

1. The data for 2025 is a projection.
2. The above market data only includes search advertising, not the overall online advertising revenue.

According to a 2023 report by eMarketer, Google’s market share of total digital ad spending among select U.S. companies was projected to decrease from 27% in 2020 to 25% by 2025.⁵⁴⁶ During the same period, Amazon's share was expected to grow from 10% to nearly 15%. This shift highlights intensifying competition in the digital ad space as Amazon expands its influence and captures more of the market.

Figure 57: Digital Ad Spending U.S. Market Share⁵⁴⁷



Notes:

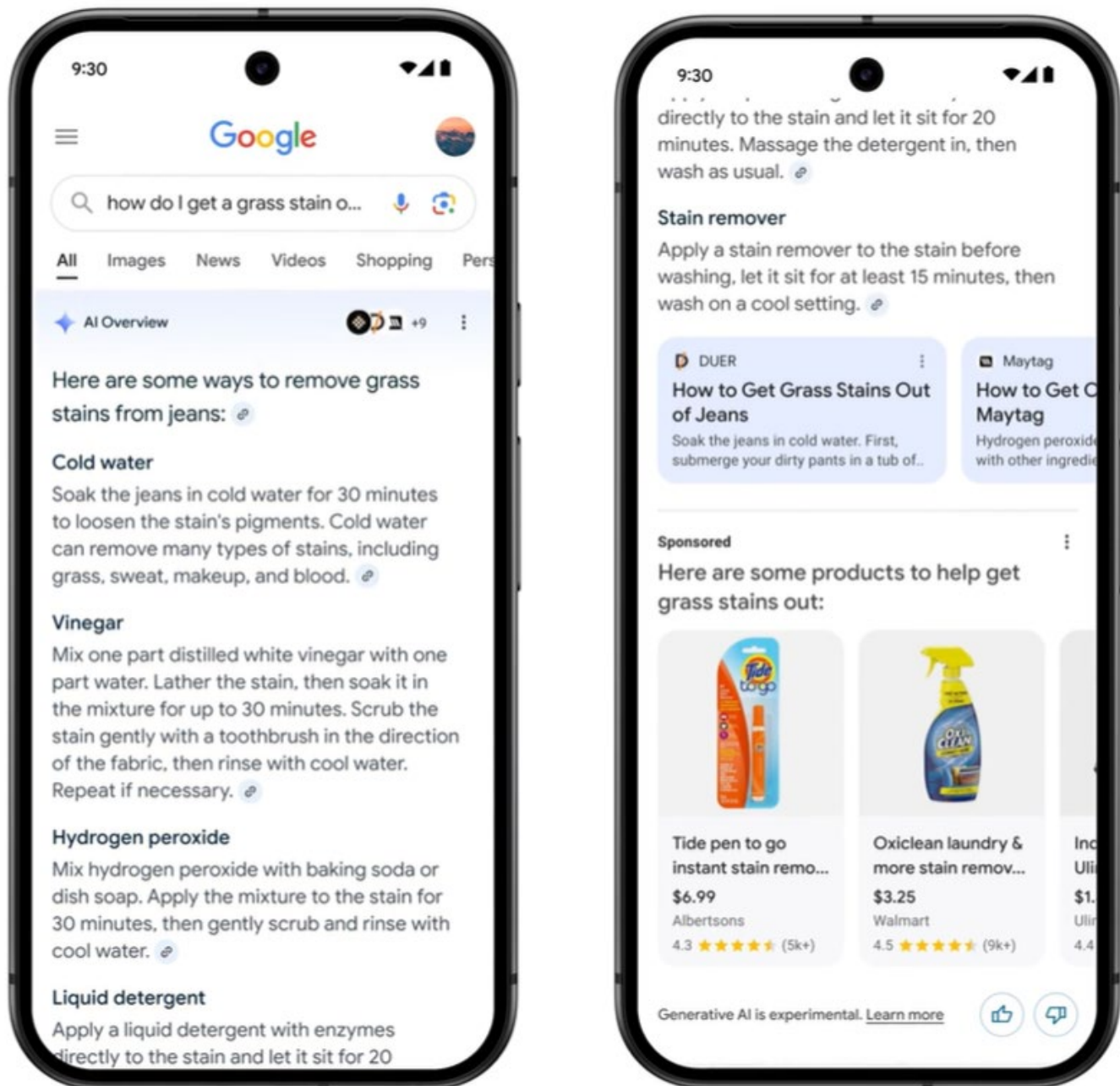
1. The report is as of March 2023.
2. Google’s advertising revenue does not include that of YouTube.
3. The data above includes advertising that appears on desktop and laptop computers as well as mobile phones, tablets, and other internet-connected devices, and includes all the various formats of advertising on those platforms.

⁵⁴⁵ Google’s Dominant Search Business Is Under Attack From TikTok to AI. WSJ. <https://www.wsj.com/tech/online-ad-market-google-tiktok-9599d7e8?mod=mhp>

⁵⁴⁶ U.S. Ad Spending 2023. eMarketer.

⁵⁴⁷ U.S. Ad Spending 2023. eMarketer.

Figure 58: Example of Google's AI Overview of Search Results and Ads⁵⁴⁸



TikTok, a short-form video app and one of the most popular platforms globally, especially among younger adults, has over 170 million users in the U.S. and more than one billion worldwide.⁵⁴⁹ The company reported a global daily search volume exceeding three billion, with 23% of users searching for something within 30 seconds of opening the app. In comparison, Google handles trillions search queries annually.⁵⁵⁰ As of October 2024, TikTok allows brands to display ads near search results but does not yet enable targeting based on specific keywords in user searches.

⁵⁴⁸ Google Lens and AI Overviews – New Ways For Marketers To Reach Customers. <https://blog.google/products/ads-commerce/google-lens-ai-overviews-ads-marketers/>

⁵⁴⁹ TikTok CEO Shou Chew's Opening Statement - Senate Judiciary Committee Hearing on Online Child Sexual Exploitation Crisis. <https://newsroom.tiktok.com/en-us/opening-statement-senate-judiciary-committee-hearing>; Google's Dominant Search Business Is Under Attack From TikTok to AI. WSJ. <https://www.wsj.com/tech/online-ad-market-google-tiktok-9599d7e8?mod=mhp>

⁵⁵⁰ Google's Dominant Search Business Is Under Attack From TikTok to AI. WSJ. <https://www.wsj.com/tech/online-ad-market-google-tiktok-9599d7e8?mod=mhp>

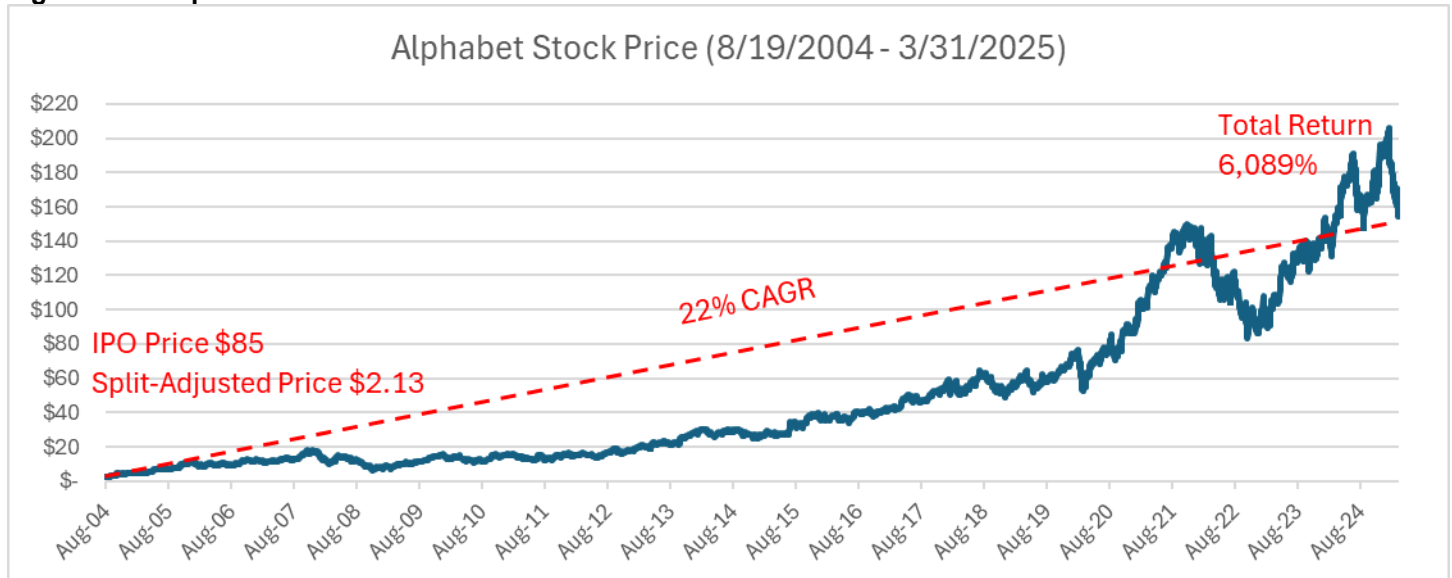
Despite TikTok's growing influence, its advertising revenue in the U.S. remains relatively small, accounting for just 3.4% of the digital ad market, compared to Google's dominant 25%.⁵⁵¹ Some advertisers have noted that "We are seeing performance on return on ad spending that sometimes rivals what we are seeing on Google," highlighting TikTok's potential as an emerging advertising platform. However, many advertisers are still hesitant to shift budgets away from Google, partly due to TikTok's lower search volume of 3 billion daily searches. In contrast, while Google does not disclose exact daily search figures, it has stated that it processes trillions of queries annually. A 2019 report by The Wall Street Journal estimated that Google handles 3.8 million searches per minute, translating to over 5 billion of daily search volume.⁵⁵² While the overall advertising performance on TikTok may not yet match Google's, its rapid growth and user engagement make it a potential threat in the digital ad space.

⁵⁵¹ Google's Dominant Search Business Is Under Attack From TikTok to AI. WSJ. <https://www.wsj.com/tech/online-ad-market-google-tiktok-9599d7e8?mod=mhp>; U.S. Ad Spending 2023. eMarketer.

⁵⁵² How Google Interferes With Its Search Algorithms and Changes Your Results. WSJ. <https://www.wsj.com/articles/how-google-interferes-with-its-search-algorithms-and-changes-your-results-11573823753>

Is The Stock Cheap?

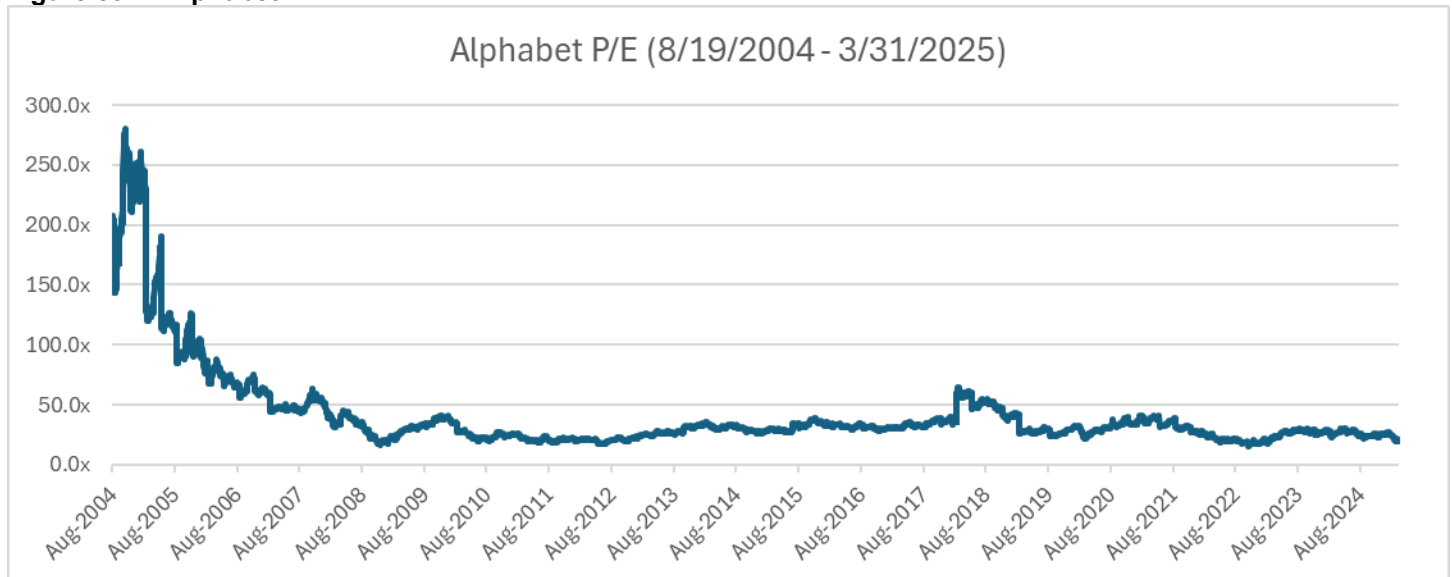
Figure 59-1: Alphabet Stock Return



Notes:

1. Price and return data from FactSet.
2. Total returns include dividends reinvested, if any.

Figure 59-2: Alphabet P/E



Note:

1. P/E ratios are from FactSet.

At the time of IPO, Google's management team did not provide any guidance and stated that it would not provide such information.

"We will make business decisions with the long-term welfare of our company and shareholders in mind and not based on accounting considerations. Although we may discuss long-term trends in our business, we do not plan to give earnings guidance in the traditional sense. We are not able to predict our business within a narrow range for each quarter. We recognize that our duty is to advance our shareholders' interests, and we believe that artificially creating short-term target numbers serves our shareholders poorly. We would prefer not to be asked to make such predictions, and if asked we will respectfully

decline. A management team distracted by a series of short-term targets is as pointless as a dieter stepping on a scale every half hour.”⁵⁵³

At the time of its IPO in 2004, Google’s trailing-twelve-month P/E ratio of 130x seemed optically high. While the company had achieved revenue growth over 100% 1-year CAGR and more than 300% 3-year CAGR, it had only turned profitable in 2001. Adjusted net income that excluded the effect from stock-based compensations grew at a 1-year CAGR of over 100%. Google provided no financial guidance, and the internet sector was in its early stage, with few peer companies for comparison. These factors made it difficult for investors to forecast the company’s future performance. **However, if, hypothetically, an investor in 2004 believed that Google could outpace its peers in online advertising, an industry projected to grow at a mid-to-high teens percentage to low twenties in the next few years,⁵⁵⁴ with its dominant position in online search, Google could have achieved a 27% CAGR. Under this assumption, the company might have reached 17x P/E by the end of year five. In reality, Google far exceeded expectations, achieving nearly 70% CAGR while expanding its net margin from 8% to 28%, ultimately delivering a P/E of just 4x.**

Figure 60-1: Scenario in 5 Years

	IPO (Aug. 2004)	Year 5	5-Year CAGR
Total Revenue	\$ 2,258	\$7,460	27%
Gross Profit	\$ 1,182	\$3,954	27%
<i>Gross Margin</i>	52%	53%	
SG&A Expenses	\$ 368	\$750	15%
<i>SG&A Expense as Percentage of Revenue</i>	16%	10%	
R&D Expenses	\$ 334	\$970	24%
<i>R&D Expense as Percentage of Revenue</i>	15%	13%	
Operating Income	\$ 479	\$2,234	36%
<i>Operating Margin</i>	21%	30%	
<i>Incremental Operating Margin</i>		34%	
Earnings Before Tax	\$ 482	\$2,234	36%
Tax	\$ 291	\$782	
<i>Tax Rate</i>	60%	35%	
Net Income	\$ 191	\$1,452	50%
<i>Net Margin</i>	8%	19%	
P/E	130.9x	17.2x	

Notes:

1. Net income at the time of the IPO included share-based compensation expenses. After adjusting for these expenses, the net income was estimated to be \$392 million, implying a last-twelve-month P/E ratio of 64x.
2. **Since Google did not provide any guidance on its financials at the time of IPO on any timeframe, we assume a 27% CAGR in revenue over the next five years. This estimate is on the higher-end of the projected market growth range of mid-to-high-teens to low-twenties annual growth rate in online advertising spending in the U.S. at the time of Google’s IPO.**⁵⁵⁵ In addition, from 1998 to 2003, internet ad spending in the U.S. grew at a

⁵⁵³ Founders’ IPO Letter – “An Owner’s Manual” for Google’s Shareholders. <https://abc.xyz/investor/founders-letters/ipo-letter/>

⁵⁵⁴ US Internet Ad Market Set To Grow By 28% In 2005. <https://uk.themedialeader.com/us-internet-ad-market-set-to-grow-by-28-in-2004-21-in-2005/>; Advertising Spending Online Offline Spending Forecasts Report July 2003. eMarketer. <https://www.bus.umich.edu/KresgePublic/Journals/EmarketerReports/2003/Advertising%20Spending%20Online%20Offline%20Spending%20Forecasts%20Report%20July%202003.pdf>

⁵⁵⁵ US Internet Ad Market Set To Grow By 28% In 2005. <https://uk.themedialeader.com/us-internet-ad-market-set-to-grow-by-28-in-2004-21-in-2005/>; Advertising Spending Online Offline Spending Forecasts Report July 2003. eMarketer. <https://www.bus.umich.edu/KresgePublic/Journals/EmarketerReports/2003/Advertising%20Spending%20Online%20Offline%20Spending%20Forecasts%20Report%20July%202003.pdf>

31% CAGR, while still representing only 4% of total advertising expenditures⁵⁵⁶, indicating significant growth potential. As the industry leader in online search, Google was well-positioned to outpace its competitors.

3. We estimated the gross margin of advertising revenue from Google websites at 85%, and from Google Network members around 20%. Assuming in the next five years advertising revenue from each of the two sources 50%, the company's gross margin would be estimated at 53%. In 2002, only 25% of Google's advertising revenue came from Google Network websites, but this share increased to 44% in 2003 and 49% in 2004.⁵⁵⁷
4. The above scenario also assumes that R&D expense as a percentage of revenue declines to 13% as the company scales up, similar to that of Yahoo in 2003.
5. We assumed that SG&A expenses as a percentage of revenue would decline to 10%, given that, as long as the company's infrastructure, such as data centers and bandwidth, could support growth, there would be less need to expand personnel, including engineers and back-office staff. Moreover, we assumed a tax rate at the statutory level of 35%.

⁵⁵⁶ IAB Internet Advertising Revenue Report 2003. PricewaterhouseCoopers. Interactive Advertising Bureau.
https://www.iab.com/wp-content/uploads/2015/05/resources_adrevenue_pdf_IAB_PwC_2003.pdf

⁵⁵⁷ Google Prospectus 2004.

Figure 60-2: Sensitivity Analysis in Year 5

		Revenue Growth										
		1.0x	1.3x	1.6x	2.0x	2.5x	3.1x	3.7x	4.5x	5.4x	6.4x	7.6x
		0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Gross Margin	51%	60.9x	47.7x	37.8x	30.3x	24.5x	19.9x	16.4x	13.6x	11.3x	9.5x	8.0x
	52%	58.8x	46.0x	36.5x	29.2x	23.6x	19.3x	15.8x	13.1x	10.9x	9.2x	7.7x
	53%	56.8x	44.5x	35.3x	28.2x	22.8x	18.6x	15.3x	12.7x	10.6x	8.9x	7.5x
	54%	55.0x	43.1x	34.1x	27.3x	22.1x	18.0x	14.8x	12.3x	10.2x	8.6x	7.2x
	55%	53.3x	41.7x	33.1x	26.5x	21.4x	17.4x	14.3x	11.9x	9.9x	8.3x	7.0x
	56%	51.6x	40.5x	32.1x	25.7x	20.8x	16.9x	13.9x	11.5x	9.6x	8.1x	6.8x
	57%	50.1x	39.3x	31.1x	24.9x	20.1x	16.4x	13.5x	11.2x	9.3x	7.8x	6.6x
	58%	48.7x	38.1x	30.2x	24.2x	19.6x	16.0x	13.1x	10.9x	9.1x	7.6x	6.4x
	59%	47.3x	37.1x	29.4x	23.5x	19.0x	15.5x	12.7x	10.6x	8.8x	7.4x	6.2x
	60%	46.0x	36.1x	28.6x	22.9x	18.5x	15.1x	12.4x	10.3x	8.6x	7.2x	6.1x
	61%	44.8x	35.1x	27.8x	22.3x	18.0x	14.7x	12.1x	10.0x	8.3x	7.0x	5.9x
	62%	43.7x	34.2x	27.1x	21.7x	17.6x	14.3x	11.8x	9.7x	8.1x	6.8x	5.8x
	63%	42.6x	33.4x	26.4x	21.2x	17.1x	14.0x	11.5x	9.5x	7.9x	6.6x	5.6x
	64%	41.5x	32.6x	25.8x	20.7x	16.7x	13.6x	11.2x	9.3x	7.7x	6.5x	5.5x
	65%	40.6x	31.8x	25.2x	20.2x	16.3x	13.3x	10.9x	9.0x	7.5x	6.3x	5.3x
	66%	39.6x	31.0x	24.6x	19.7x	15.9x	13.0x	10.7x	8.8x	7.4x	6.2x	5.2x
	67%	38.7x	30.3x	24.0x	19.2x	15.6x	12.7x	10.4x	8.6x	7.2x	6.0x	5.1x
	68%	37.9x	29.7x	23.5x	18.8x	15.2x	12.4x	10.2x	8.4x	7.0x	5.9x	5.0x
	69%	37.0x	29.0x	23.0x	18.4x	14.9x	12.1x	10.0x	8.3x	6.9x	5.8x	4.9x
	70%	36.2x	28.4x	22.5x	18.0x	14.6x	11.9x	9.8x	8.1x	6.7x	5.7x	4.8x
71%	35.5x	27.8x	22.0x	17.6x	14.3x	11.6x	9.6x	7.9x	6.6x	5.5x	4.7x	
72%	34.8x	27.2x	21.6x	17.3x	14.0x	11.4x	9.4x	7.8x	6.5x	5.4x	4.6x	
73%	34.1x	26.7x	21.2x	16.9x	13.7x	11.2x	9.2x	7.6x	6.3x	5.3x	4.5x	
74%	33.4x	26.2x	20.7x	16.6x	13.4x	10.9x	9.0x	7.4x	6.2x	5.2x	4.4x	
75%	32.8x	25.7x	20.3x	16.3x	13.2x	10.7x	8.8x	7.3x	6.1x	5.1x	4.3x	
76%	32.1x	25.2x	20.0x	16.0x	12.9x	10.5x	8.7x	7.2x	6.0x	5.0x	4.2x	
77%	31.5x	24.7x	19.6x	15.7x	12.7x	10.3x	8.5x	7.0x	5.9x	4.9x	4.2x	
78%	31.0x	24.3x	19.2x	15.4x	12.4x	10.1x	8.3x	6.9x	5.8x	4.8x	4.1x	
79%	30.4x	23.8x	18.9x	15.1x	12.2x	10.0x	8.2x	6.8x	5.7x	4.7x	4.0x	
80%	29.9x	23.4x	18.6x	14.9x	12.0x	9.8x	8.0x	6.7x	5.6x	4.7x	3.9x	

Note:
 1. The above sensitivity analysis assumes that SG&A expenses as percentage of revenues at Year 5 stay unchanged and R&D expenses at 13%, while the effective tax rate approaches the statutory tax rate of 35%.

Figure 60-3: Actual Results in 5 Years

		IPO (Aug. 2004)	2009	5-Year CAGR
Total Revenue		\$ 2,258	\$ 23,651	53%
Gross Profit		\$ 1,182	\$ 14,806	58%
	<i>Gross Margin</i>	52%	63%	
SG&A Expenses		\$ 368	\$ 3,651	52%
	<i>SG&A Expense as Percentage of Revenue</i>	16%	15%	
R&D Expenses		\$ 334	\$ 2,843	48%
	<i>R&D Expense as Percentage of Revenue</i>	15%	12%	
Operating Income		\$ 479	\$ 8,312	68%
	<i>Operating Margin</i>	21%	35%	
	<i>Incremental Operating Margin</i>		37%	
Earnings Before Tax		\$ 482	\$ 8,381	68%
Tax		\$ 291	\$ 1,861	
	<i>Tax Rate</i>	60%	22%	
Net Income		\$ 191	\$ 6,520	90%
	<i>Net Margin</i>	8%	28%	
P/E		130.9x	4.2x	

Notes:

1. Net income at the time of the IPO included share-based compensation expenses. After adjusting for these expenses, the net income was estimated to be \$392 million, implying a last-twelve-month P/E ratio of 64x.
2. The CAGR above was based on a 5.5-year time span because Google's last-twelve-month financial results at the time of IPO was as of 6/30/2004 while the fiscal year of 2009 ended on 12/31/2009.
3. The expansion of Google's gross margin in 2009 compared to its IPO period was primarily driven by the growth in advertising revenue from Google websites, which carry a higher margin relative to revenue from Google Network websites. Between 2003 and 2009, revenue generated from Google websites was \$792 million, \$1.6 billion, \$3.4 billion, \$6.3 billion, \$10.6 billion, \$14.4 billion, and \$15.7 billion, respectively, accounting for 54%, 50%, 55%, 60%, 64%, 66%, and 66% of the company's total sales during those years.

Figure 61: Income Statements 2001 – 2023

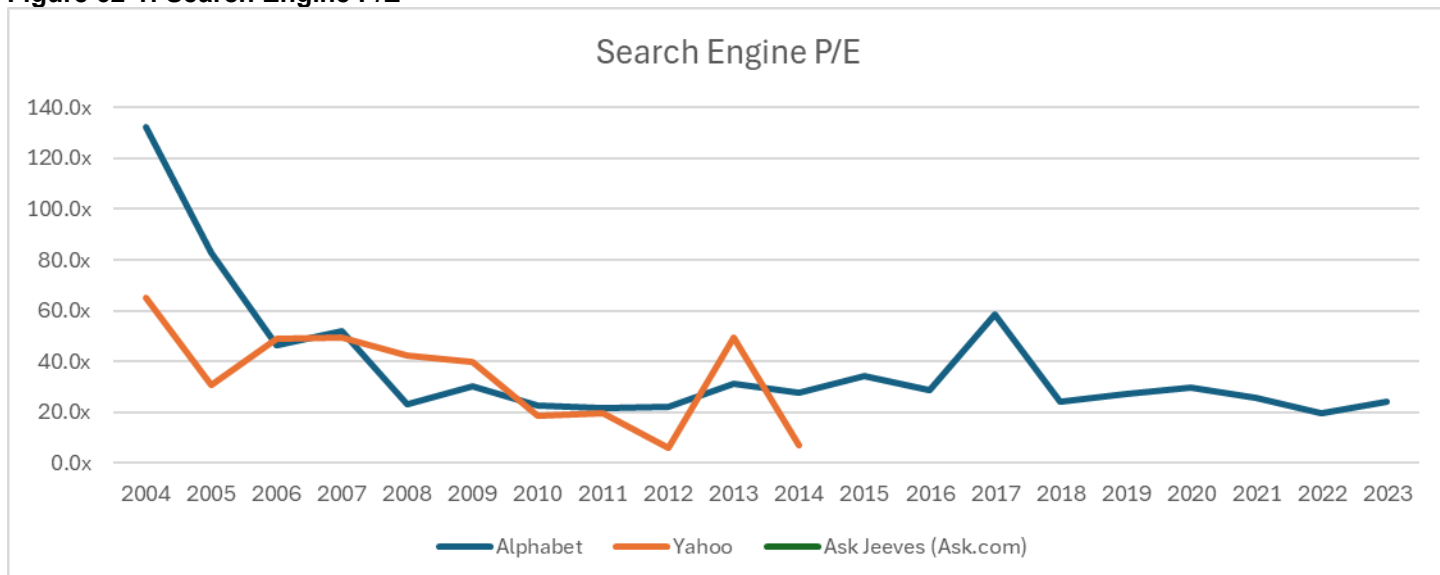
\$ Million	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Advertising revenue	\$ 67	\$ 411	\$ 1,421	\$ 3,143	\$ 6,065	\$ 10,493	\$ 16,413	\$ 21,129	\$ 22,889	\$ 28,236	\$ 36,531	\$ 43,686
Other revenue	\$ 19	\$ 29	\$ 45	\$ 46	\$ 74	\$ 112	\$ 181	\$ 667	\$ 762	\$ 1,085	\$ 1,374	\$ 6,489
Total revenue	\$ 86	\$ 440	\$ 1,466	\$ 3,189	\$ 6,139	\$ 10,605	\$ 16,594	\$ 21,796	\$ 23,651	\$ 29,321	\$ 37,905	\$ 50,175
YoY Growth	352.3%	408.5%	233.5%	117.6%	92.5%	72.8%	56.5%	31.3%	8.5%	24.0%	29.3%	32.4%
Gross profit	\$ 71	\$ 307	\$ 832	\$ 1,720	\$ 3,561	\$ 6,380	\$ 9,945	\$ 13,174	\$ 14,806	\$ 18,904	\$ 24,717	\$ 29,541
Gross Margin	82.5%	69.8%	56.7%	53.9%	58.0%	60.2%	59.9%	60.4%	62.6%	64.5%	65.2%	58.9%
YoY Growth	454.6%	330.3%	170.9%	106.9%	107.0%	79.1%	55.9%	32.5%	12.4%	27.7%	30.8%	19.5%
Research and development	\$ 21	\$ 40	\$ 230	\$ 395	\$ 600	\$ 1,229	\$ 2,120	\$ 2,793	\$ 2,843	\$ 3,762	\$ 5,162	\$ 6,793
R&D expenses as % of Sales	24.2%	9.2%	15.7%	12.4%	9.8%	11.6%	12.8%	12.8%	12.0%	12.8%	13.6%	13.5%
Sales and marketing	\$ 22	\$ 49	\$ 165	\$ 296	\$ 468	\$ 850	\$ 1,461	\$ 1,946	\$ 1,984	\$ 2,799	\$ 4,589	\$ 6,143
Sales and marketing expenses as % of Sales	25.2%	11.1%	11.3%	9.3%	7.6%	8.0%	8.8%	8.9%	8.4%	9.5%	12.1%	12.2%
General and administration	\$ 18	\$ 31	\$ 95	\$ 188	\$ 387	\$ 752	\$ 1,279	\$ 1,803	\$ 1,667	\$ 1,962	\$ 2,724	\$ 3,845
G&A expenses as % of Sales	20.5%	7.1%	6.4%	5.9%	6.3%	7.1%	7.7%	8.3%	7.0%	6.7%	7.2%	7.7%
Other expenses	\$ -	\$ -	\$ -	\$ 201	\$ 90	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 500	\$ -
EBIT	\$ 11	\$ 186	\$ 342	\$ 640	\$ 2,017	\$ 3,550	\$ 5,084	\$ 6,632	\$ 8,312	\$ 10,381	\$ 11,742	\$ 12,760
EBIT Margin	12.7%	42.4%	23.4%	20.1%	32.9%	33.5%	30.6%	30.4%	35.1%	35.4%	31.0%	25.4%
YoY Growth	N/A	1600.7%	83.7%	86.9%	215.1%	76.0%	43.2%	30.4%	25.3%	24.9%	13.1%	8.7%
EBT	\$ 10	\$ 185	\$ 347	\$ 650	\$ 2,142	\$ 4,011	\$ 5,674	\$ 5,854	\$ 8,381	\$ 10,796	\$ 12,326	\$ 13,386
EBT Margin	11.6%	42.1%	23.6%	20.4%	34.9%	37.8%	34.2%	26.9%	35.4%	36.8%	32.5%	26.7%
YoY Growth	N/A	1736.7%	87.5%	87.6%	229.4%	87.3%	41.5%	3.2%	43.2%	28.8%	14.2%	8.6%
Tax	\$ 3	\$ 85	\$ 241	\$ 251	\$ 676	\$ 934	\$ 1,470	\$ 1,627	\$ 1,861	\$ 2,291	\$ 2,589	\$ 2,598
Effective Tax Rate	30.6%	46.1%	69.5%	38.6%	31.6%	23.3%	25.9%	27.8%	22.2%	21.2%	21.0%	19.4%
Net income	\$ 7	\$ 100	\$ 106	\$ 399	\$ 1,465	\$ 3,077	\$ 4,204	\$ 4,227	\$ 6,520	\$ 8,505	\$ 9,737	\$ 10,788
Net income as percentage of Sales	8.1%	22.7%	7.2%	12.5%	23.9%	29.0%	25.3%	19.4%	27.6%	29.0%	25.7%	21.5%
YoY Growth		1326.7%	6.0%	277.8%	267.1%	110.0%	36.6%	0.6%	54.3%	30.4%	14.5%	10.8%
Net income from continuing operation	\$ 7	\$ 100	\$ 106	\$ 399	\$ 1,465	\$ 3,077	\$ 4,204	\$ 4,227	\$ 6,520	\$ 8,505	\$ 9,737	\$ 10,737
Net Margin	8.1%	22.7%	7.2%	12.5%	23.9%	29.0%	25.3%	19.4%	27.6%	29.0%	25.7%	21.4%
YoY Growth		1326.7%	6.0%	277.8%	267.1%	110.0%	36.6%	0.6%	54.3%	30.4%	14.5%	10.3%
Forward Split Adjusted P/E				58.2x	16.9x	8.6x	6.4x	6.4x	4.2x	3.2x	2.9x	2.6x
Split Adjusted IPO Price				\$ 85.00								
\$ Million	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Advertising revenue	\$ 50,578	\$ 59,056	\$ 67,390	\$ 79,383	\$ 95,375	\$ 116,318	\$ 134,811	\$ 168,635	\$ 237,529	\$ 253,528	\$ 237,855	
Other revenue	\$ 9,247	\$ 6,945	\$ 7,599	\$ 10,889	\$ 15,480	\$ 20,501	\$ 27,046	\$ 13,892	\$ 20,108	\$ 29,308	\$ 69,539	
Total revenue	\$ 59,825	\$ 66,001	\$ 74,989	\$ 90,272	\$ 110,855	\$ 136,819	\$ 161,857	\$ 182,527	\$ 257,637	\$ 282,836	\$ 307,394	
YoY Growth	19.2%	10.3%	13.6%	20.4%	22.8%	23.4%	18.3%	12.8%	41.2%	9.8%	8.7%	
Gross profit	\$ 33,967	\$ 40,310	\$ 46,825	\$ 55,134	\$ 65,272	\$ 77,270	\$ 89,961	\$ 97,795	\$ 146,698	\$ 156,633	\$ 174,062	
Gross Margin	56.8%	61.1%	62.4%	61.1%	58.9%	56.5%	55.6%	53.6%	56.9%	55.4%	56.6%	
YoY Growth	15.0%	18.7%	16.2%	17.7%	18.4%	18.4%	16.4%	8.7%	50.0%	6.8%	11.1%	
Research and development	\$ 7,952	\$ 9,832	\$ 12,282	\$ 13,948	\$ 16,625	\$ 21,419	\$ 26,018	\$ 27,573	\$ 31,562	\$ 39,500	\$ 45,427	
R&D expenses as % of Sales	13.3%	14.9%	16.4%	15.5%	15.0%	15.7%	16.1%	15.1%	12.3%	14.0%	14.8%	
Sales and marketing	\$ 7,253	\$ 8,131	\$ 9,047	\$ 10,485	\$ 12,893	\$ 16,333	\$ 18,464	\$ 17,946	\$ 22,912	\$ 26,567	\$ 27,917	
Sales and marketing expenses as % of Sales	12.1%	12.3%	12.1%	11.6%	11.6%	11.9%	11.4%	9.8%	8.9%	9.4%	9.1%	
General and administration	\$ 4,796	\$ 5,851	\$ 6,136	\$ 6,985	\$ 6,872	\$ 8,126	\$ 9,551	\$ 11,052	\$ 13,510	\$ 15,724	\$ 16,425	
G&A expenses as % of Sales	8.0%	8.9%	8.2%	7.7%	6.2%	5.9%	5.9%	6.1%	5.2%	5.6%	5.3%	
Other expenses	\$ -	\$ -	\$ -	\$ -	\$ 2,736	\$ 5,071	\$ 1,697	\$ -	\$ -	\$ -	\$ -	
EBIT	\$ 13,966	\$ 16,496	\$ 19,360	\$ 23,716	\$ 26,146	\$ 26,321	\$ 34,231	\$ 41,224	\$ 78,714	\$ 74,842	\$ 84,293	
EBIT Margin	23.3%	25.0%	25.8%	26.3%	23.6%	19.2%	21.1%	22.6%	30.6%	26.5%	27.4%	
YoY Growth	9.5%	18.1%	17.4%	22.5%	10.2%	0.7%	30.1%	20.4%	90.9%	-4.9%	12.6%	
EBT	\$ 14,496	\$ 17,259	\$ 19,651	\$ 24,150	\$ 27,193	\$ 34,913	\$ 39,625	\$ 48,082	\$ 90,734	\$ 71,328	\$ 85,717	
EBT Margin	24.2%	26.1%	26.2%	26.8%	24.5%	25.5%	24.5%	26.3%	35.2%	25.2%	27.9%	
YoY Growth	8.3%	19.1%	13.9%	22.9%	12.6%	28.4%	13.5%	21.3%	88.7%	-21.4%	20.2%	
Tax	\$ 2,282	\$ 3,331	\$ 3,303	\$ 4,672	\$ 14,531	\$ 4,177	\$ 5,282	\$ 7,813	\$ 14,701	\$ 11,356	\$ 11,922	
Effective Tax Rate	15.7%	19.3%	16.8%	19.3%	53.4%	12.0%	13.3%	16.2%	16.2%	15.9%	13.9%	
Net income	\$ 12,214	\$ 13,928	\$ 16,348	\$ 19,478	\$ 12,662	\$ 30,736	\$ 34,343	\$ 40,269	\$ 76,033	\$ 59,972	\$ 73,795	
Net income as percentage of Sales	20.4%	21.1%	21.8%	21.6%	11.4%	22.5%	21.2%	22.1%	29.5%	21.2%	24.0%	
YoY Growth	13.2%	14.0%	17.4%	19.1%	-35.0%	142.7%	11.7%	17.3%	88.8%	-21.1%	23.0%	
Net income from continuing operation	\$ 12,920	\$ 14,444	\$ 15,826	\$ 19,478	\$ 12,662	\$ 30,736	\$ 34,343	\$ 40,269	\$ 76,033	\$ 59,972	\$ 73,795	
Net Margin	21.6%	21.9%	21.1%	21.6%	11.4%	22.5%	21.2%	22.1%	29.5%	21.2%	24.0%	
YoY Growth	20.3%	11.8%	9.6%	23.1%	-35.0%	142.7%	11.7%	17.3%	88.8%	-21.1%	23.0%	
Forward Split Adjusted P/E	2.2x	2.0x	1.9x	1.5x	2.4x	1.0x	0.9x	0.7x	0.4x	0.5x	0.4x	

Notes:

1. Google has had two stock-splits since IPO. In 2014, there was a 2-for-1 stock-split in the form of a stock dividend. In 2022, there was a 20-for-1 stock split in the form of a one-time special dividend.
2. P/E ratios above are as of the end of each fiscal year.

At the time of Google's IPO, it had already established its dominant position in search engine space. Many of its directly comparable companies in the search engine space have been either private or acquired by larger companies. As a result, common valuation metrics such as P/E and EV/EBITDA might not be useful for comparison. Since 2004, Google's median P/E ratio has been 28x, and its EV/EBITDA has been 18x. However, both metrics have been trending downward over the long term as the company has grown larger and more mature.

Figure 62-1: Search Engine P/E

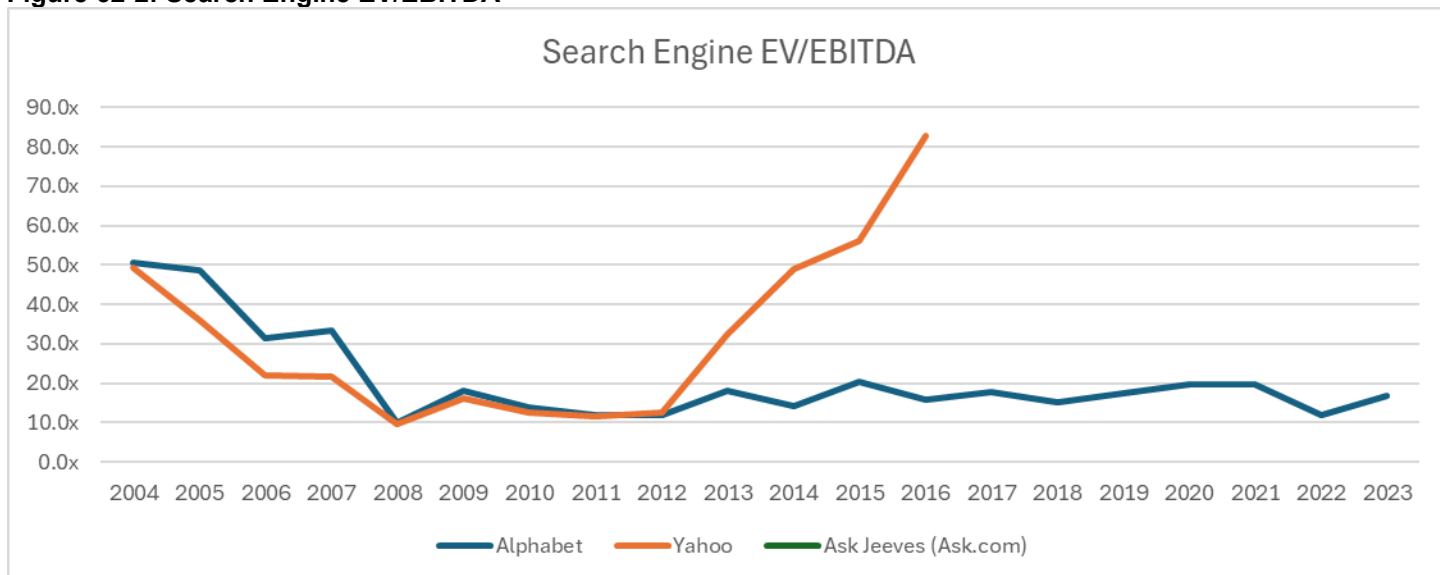


P/E	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Median	
Alphabet	132.2x	82.7x	46.3x	52.0x	23.1x	30.4x	22.6x	21.7x	21.9x	31.2x	27.7x	34.1x	28.4x	58.5x	23.9x	27.2x	29.9x	25.8x	19.4x	24.1x	28.1x	
Yahoo	65.0x	30.6x	49.1x	49.5x	42.1x	40.0x	18.5x	19.7x	6.1x	49.3x	6.8x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40.0x	
Ask Jeeves (Ask.com)	33.4x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	33.4x

Notes:

1. Data are sourced from FactSet.
2. "N/A" indicates either the value is negative, or the company was not public at the time.

Figure 62-2: Search Engine EV/EBITDA

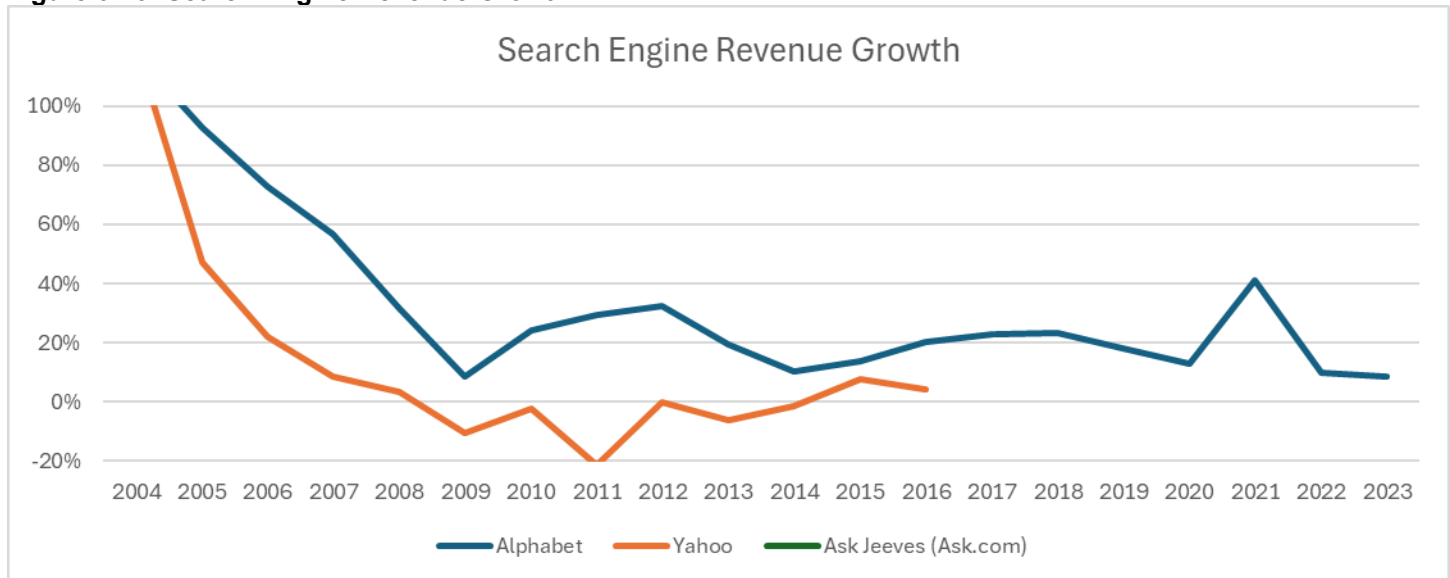


EV/EBITDA	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Median	
Alphabet	50.7x	48.6x	31.5x	33.4x	10.0x	18.1x	13.8x	12.1x	11.9x	18.0x	14.2x	20.3x	15.9x	17.6x	15.3x	17.3x	19.6x	19.9x	11.8x	16.9x	17.5x	
Yahoo	49.4x	35.9x	22.2x	21.8x	9.7x	16.3x	12.5x	11.7x	12.4x	32.2x	48.9x	56.2x	82.9x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	22.2x	
Ask Jeeves (Ask.com)	18.7x	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	18.7x

Notes:

1. Data are sourced from FactSet.
2. "N/A" indicates either the value is negative, or the company was not public at the time.

Figure 62-3: Search Engine Revenue Growth

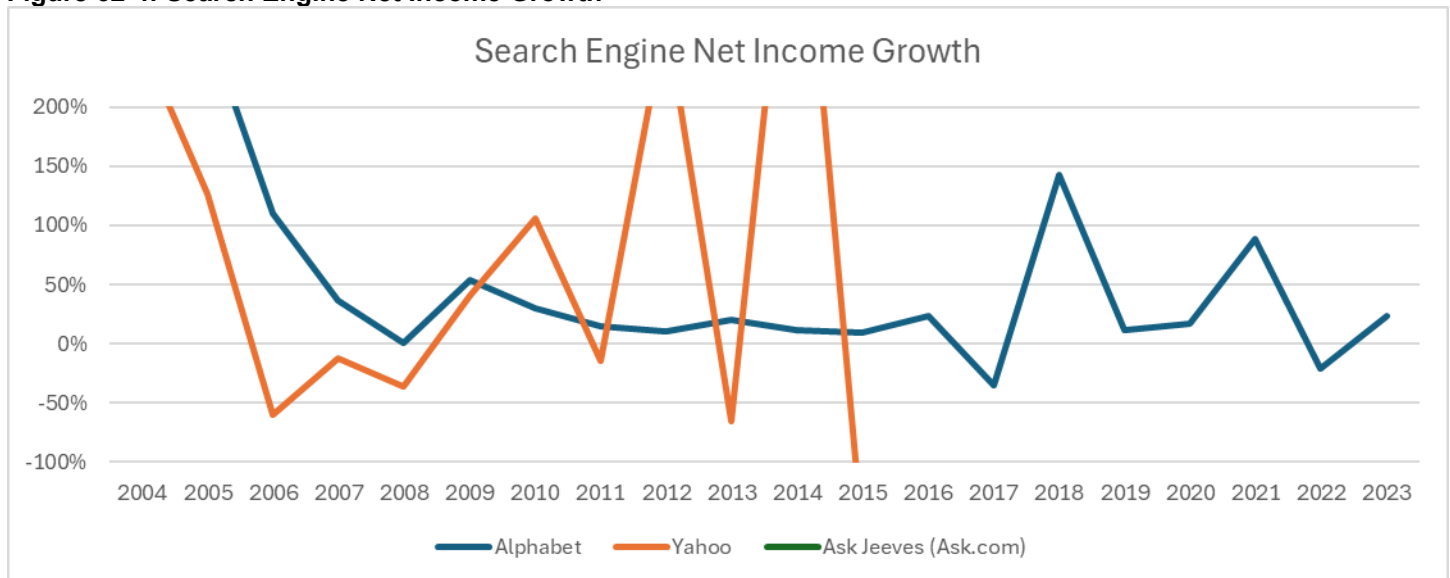


Revenue Growth	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Median	
Alphabet	117.6%	92.5%	72.8%	56.5%	31.3%	8.5%	24.0%	29.3%	32.4%	19.2%	10.3%	13.6%	20.4%	22.8%	23.4%	18.3%	12.8%	41.2%	9.8%	8.7%	23.1%	
Yahoo	120.0%	47.1%	22.2%	8.5%	3.4%	-10.4%	-2.1%	-21.2%	0.0%	-6.1%	-1.3%	7.6%	4.0%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.4%
Ask Jeeves (Ask.com)	143.6%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	143.6%

Notes:

1. Data are sourced from FactSet.
2. Part of the chart above is cut off due to extreme values.
3. "N/A" indicates either the value is negative, or the company was not public at the time.

Figure 62-4: Search Engine Net Income Growth

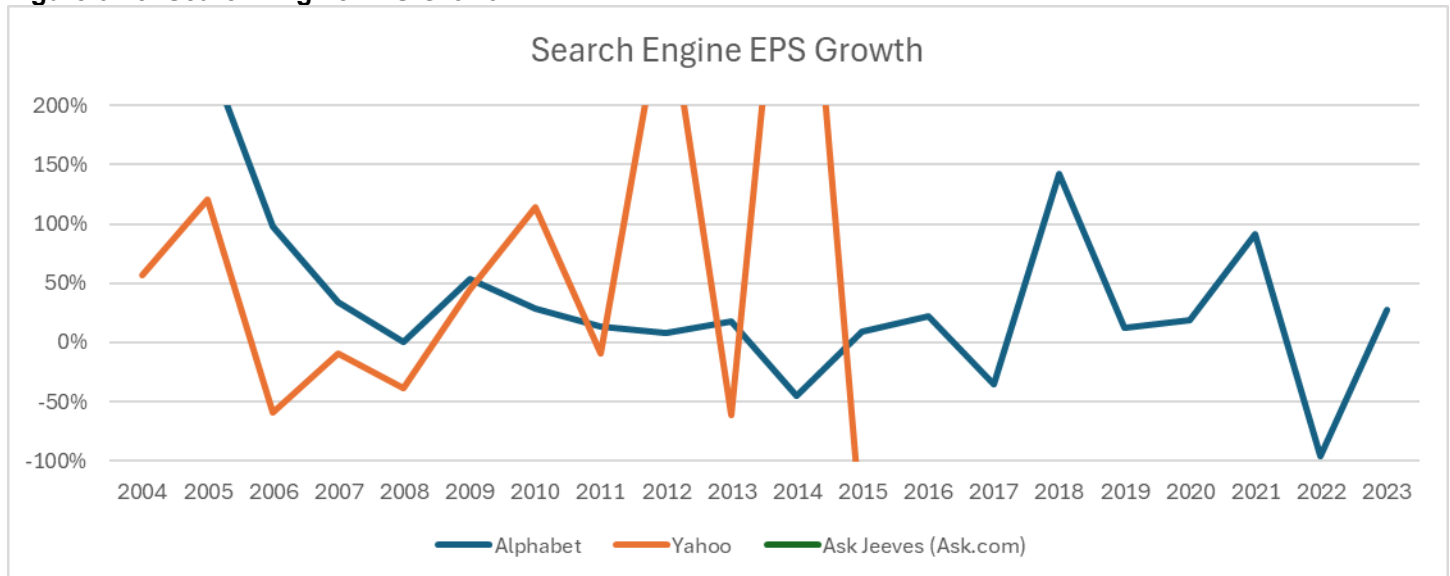


Net Income Growth	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Median	
Alphabet	277.8%	267.1%	110.0%	36.6%	0.6%	54.3%	30.4%	14.5%	10.3%	20.3%	11.8%	9.6%	23.1%	-35.0%	142.7%	11.7%	17.3%	88.8%	-21.1%	23.0%	21.7%	
Yahoo	252.9%	125.9%	-60.4%	-12.2%	-35.7%	40.9%	106.0%	-14.8%	276.2%	-65.4%	450.5%	-158.0%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14.4%
Ask Jeeves (Ask.com)	111.6%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	111.6%

Notes:

1. Data are sourced from FactSet.
2. Part of the chart above is cut off due to extreme values.
3. "N/A" indicates either the value is negative, or the company was not public at the time.

Figure 62-5: Search Engine EPS Growth

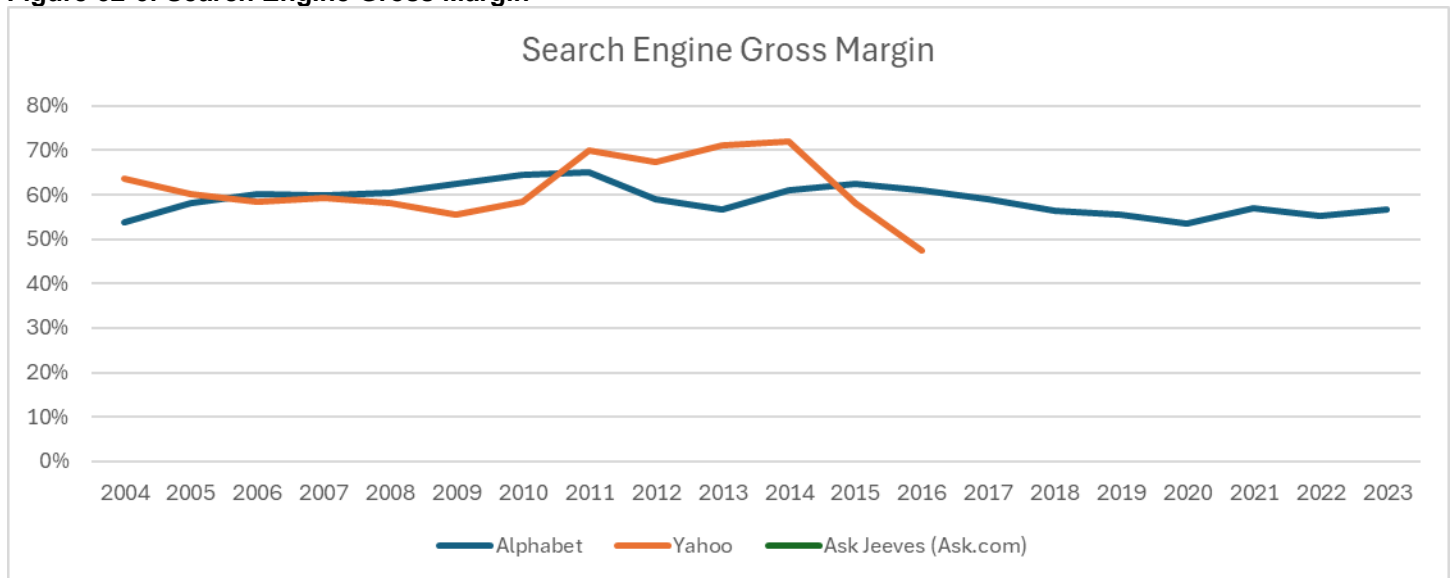


EPS Growth	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Median	
Alphabet	256.1%	243.8%	98.0%	33.7%	0.2%	53.3%	28.9%	13.1%	8.6%	18.0%	-44.9%	8.7%	21.9%	-35.4%	142.8%	12.5%	19.2%	91.4%	-95.9%	27.2%	20.6%	
Yahoo	56.8%	120.7%	-59.4%	-9.6%	-38.3%	44.8%	114.3%	-8.9%	300.0%	-61.6%	491.3%	-162.3%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	18.0%
Ask Jeeves (Ask.com)	77.8%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	77.8%

Notes:

1. Data are sourced from FactSet.
2. Part of the chart above is cut off due to extreme values.
3. "N/A" indicates either the value is negative, or the company was not public at the time.

Figure 62-6: Search Engine Gross Margin

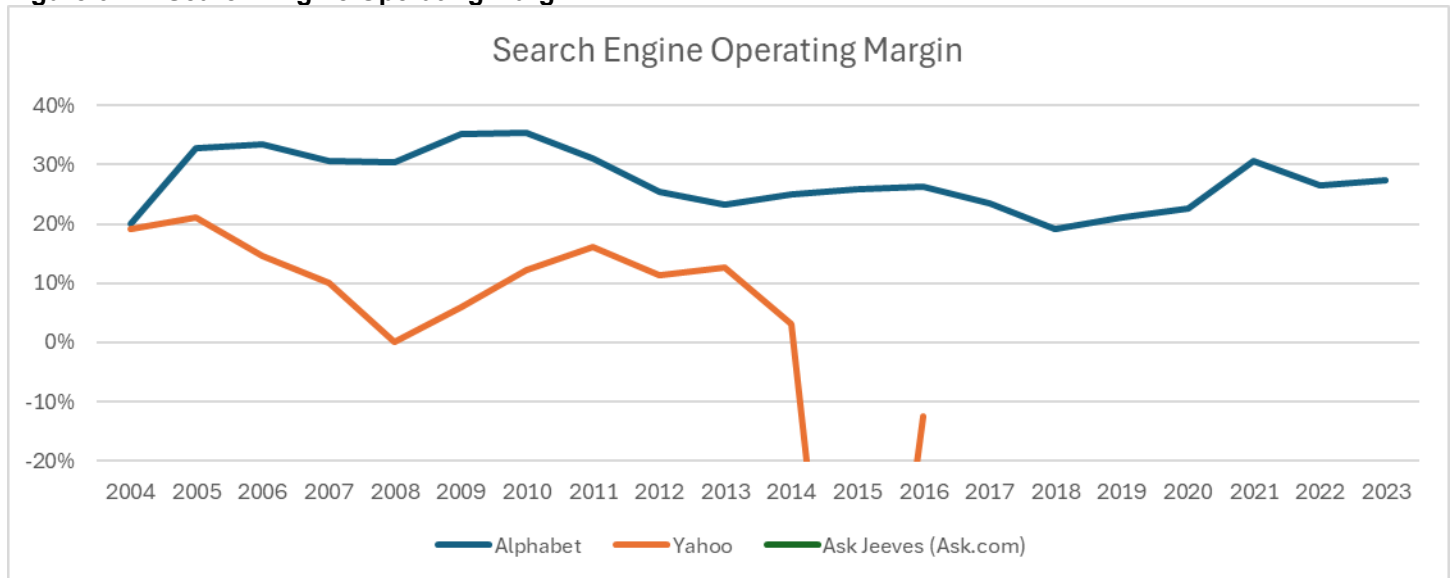


Gross Margin	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Median	
Alphabet	53.9%	58.0%	60.2%	59.9%	60.4%	62.6%	64.5%	65.2%	58.9%	56.8%	61.1%	62.4%	61.1%	58.9%	56.5%	55.6%	53.6%	56.9%	55.4%	56.6%	58.9%	
Yahoo	63.7%	60.1%	58.4%	59.3%	58.1%	55.5%	58.5%	69.9%	67.5%	71.2%	71.9%	58.2%	47.4%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	59.3%
Ask Jeeves (Ask.com)	67.5%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	67.5%

Notes:

1. Data are sourced from FactSet.
2. Part of the chart above is cut off due to extreme values.
3. "N/A" indicates either the value is negative, or the company was not public at the time.

Figure 62-7: Search Engine Operating Margin



Operating Margin	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Median	
Alphabet	20.1%	32.9%	33.5%	30.6%	30.4%	35.1%	35.4%	31.0%	25.4%	23.3%	25.0%	25.8%	26.3%	23.6%	19.2%	21.1%	22.6%	30.6%	26.5%	27.4%	26.4%	
Yahoo	19.3%	21.1%	14.6%	10.0%	0.2%	6.0%	12.2%	16.1%	11.4%	12.6%	3.1%	-95.6%	-12.5%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11.4%	
Ask Jeeves (Ask.com)	21.4%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	21.4%

Notes:

1. Data are sourced from FactSet.
2. Part of the chart above is cut off due to extreme values.
3. "N/A" indicates either the value is negative, or the company was not public at the time.

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