

GOOGLE'S CHROME ANTITRUST PARADOX

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ABSTRACT

This article delves into Google's dominance of the browser market, highlighting how Google's Chrome browser is playing a critical role in asserting Google's dominance in other markets. While Google perpetuates the perception that Google Chrome is a neutral platform built on open-source technologies, we argue that Chrome is instrumental in Google's strategy to reinforce its dominance in online advertising, publishing, and the browser market itself. Our examination of Google's strategic acquisitions, anti-competitive practices, and the implementation of so-called "privacy controls," shows that Chrome is far from a neutral gateway to the web. Rather, it serves as a key tool for Google to maintain and extend its market power, often to the detriment of competition and innovation.

We examine how Chrome not only bolsters Google's position in advertising and publishing through practices such as coercion, self-preferencing, it also helps leverage its advertising clout to engage in a "pay-to-play" paradigm, which serves as a cornerstone in Google's larger strategy of market control. We also discuss potential regulatory interventions and remedies, drawing on historical antitrust precedents. We propose a triad of solutions motivated from our analysis of Google's abuse of Chrome: behavioral remedies targeting specific anti-competitive practices, structural remedies involving an internal separation of Google's divisions, and divestment of Chrome from Google.

Despite Chrome's dominance and its critical role in Google's ecosystem, it has escaped antitrust scrutiny—a gap our article aims to bridge. Addressing this gap is instrumental to solve current market imbalances and future challenges brought on by increasingly hegemonizing technology firms, ensuring a competitive digital environment that nurtures innovation and safeguards consumer interests.

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1 INTRODUCTION

Google is one of the largest companies on the planet. Alphabet, its parent company, has a market capitalization of nearly \$1.7 trillion.¹ In 2022, it generated more than 282 billion dollars in revenue, 80% of which came from Google’s online advertising services.²

Key to Google’s dominance in the market for online advertising has been a series of strategic acquisitions. This series of strategic acquisitions have expanded Google’s portfolio of advertising services, and—most crucially—consolidated its dominant position across the advertising stack: *buy-side* (known as demand-side platform or DSP), *sell-side* (known as supply-side platform or SSP), and the ad exchange that connects the buy-side with the sell-side. In 2003, Google acquired Applied Semantics,³ later rebranded as AdSense, which is now Google’s SSP. In 2005, Google acquired Urchin Software,⁴ later rebranded as Google Analytics, which is now Google’s analytics service. This was followed by the acquisition of DoubleClick in 2007,⁵ which is now Google’s ad exchange (AdX) service. The trend continued with the acquisition of AdMob in 2009,⁶ extending Google’s presence in mobile advertising. In 2010, Google acquired Invite Media, which was subsequently integrated into Google’s ad exchange to offer open/exchange bidding⁷ as well as its DSP service called

¹ Market Capitalization of Alphabet (Google) (GOOG), <https://companiesmarketcap.com/alphabet-google/marketcap/> (“As of February 2024 Alphabet (Google) has a market cap of \$1.76 trillion.”)

² Alphabet Inc., *United States Securities and Exchange Commission, File Number: 001-37580* (For the fiscal year ended on December 31, 2022), <https://www.sec.gov/Archives/edgar/data/1652044/000165204423000016/goog-20221231.htm> (“How we make money: We have built world-class advertising technologies for advertisers, agencies, and publishers to power their digital marketing businesses. Our advertising solutions help millions of companies grow their businesses through our wide range of products across devices and formats, and we aim to ensure positive user experiences by serving the right ads at the right time and by building deep partnerships with brands and agencies. 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 (“Google Network properties”). We continue to invest in both performance and brand advertising and seek to improve the measurability of advertising, so advertisers understand the effectiveness of their campaigns.”)

³ Dawn Kawamoto, *Google buys Applied Semantics* (April 24, 2003), <https://www.zdnet.com/article/google-buys-applied-semantics/> (“The company, through its AdSense product, will deliver text advertisements to Web pages based on keyword relevance to the page. This type of content targeting is an area Google entered last month...”)

⁴ Scott Crosby, *The unlikely origin story of Google Analytics, 1996–2005-ish* (September 2, 2016), <https://urchin.biz/urchin-software-corp-89a1f5292999> (“In April 2005 the company was acquired by Google, and the Urchin product became “Urchin from Google,” then later simply Google Analytics.”)

⁵ Louis Story and Miguel Helft, *Google Buys DoubleClick for \$3.1 Billion* (April 14, 2007), <https://www.nytimes.com/2007/04/14/technology/14DoubleClick.html> (“The sale offers Google access to DoubleClick’s advertisement software and, more importantly, its relationships with Web publishers, advertisers and advertising agencies. ... DoubleClick’s exchange is different from the ad auctions that Google uses on its networks because the exchange is open to any Web publisher or ad network — not just the sites in Google’s network.”)

⁶ Susan Wojcicki, *Investing in a mobile future with AdMob* (November 9, 2009), <https://googleblog.blogspot.com/2009/11/investing-in-mobile-future-with-admob.html> (“...we are looking forward to having them join the Google team and work with us on the future of mobile advertising.”)

⁷ Neal Mohan, *Investing in Exchange Bidding* (June 3, 2010), <https://doubleclick-advertisers.googleblog.com/2010/06/investing-in-exchange-bidding.html> (“...going to continue to invest significantly in improving Invite Media’s technology and products as a separate platform and, in time, make it work seamlessly with our DoubleClick for Advertisers (DFA) ad serving product. DFA enables advertisers and agencies to effectively plan, target, serve and measure display ad campaigns across the web. Integrating Invite

DV360.⁸ In 2011, Google acquired AdMeld,⁹ a SSP which was subsequently integrated into Google's AdX service.¹⁰ Google is now by far the most dominant player in the online advertising landscape—its ad exchange has greater than or equal to 50% market share.¹¹

Google has also conducted a series of strategic acquisitions to become dominant in the online publisher market, whose advertising space is sold exclusively by Google's advertising services. Google acquired Outride in 2001¹² and Kaltix in 2003,¹³ whose personalized search technology was integrated in Google Search.¹⁴ In 2006, Google acquired YouTube,¹⁵ which is now one of the most popular social media sites in the United States^{16,17} despite the general perception that Google does not own a social media service since it shut down Google Plus in

Media's technology will help DFA's clients to easily buy ad space across multiple ad exchanges, as part of managing their broader display ad campaigns.”)

⁸ Karina Montoya, *How Three Mergers Buttressed Google's Ad Tech Monopoly, Per DOJ* (March 9, 2023), <https://techpolicy.press/how-three-mergers-buttressed-googles-ad-tech-monopoly-per-doj/> (“Google merged Invite Media with DV360 and gained access to a much larger network of advertisers.”)

⁹ *The best of Admeld, now in DoubleClick Ad Exchange*, <https://admeld.com> (“Google bought Admeld in 2011 and we've worked diligently to build Admeld's best features into the DoubleClick Ad Exchange. Now that we've completed the integration, AdX provides publishers a unique platform that combines robust, publisher-centric tools with a massive, global pool of demand.”)

¹⁰ AdExchanger, *Google Integrates Admeld Into DoubleClick AdX, Preps 'Unified' Publisher Solution* (March 22, 2012), <https://www.adexchanger.com/ad-exchange-news/google-integrates-admeld-into-doubleclick-adx-preps-unified-publisher-solution/> (“Google Integrates Admeld Into DoubleClick AdX.”)

¹¹ *Justice Department Sues Google for Monopolizing Digital Advertising Technologies* (January 24, 2023), <https://www.justice.gov/opa/pr/justice-department-sues-google-monopolizing-digital-advertising-technologies> (“Google AdExchange, which is greater than or equal to 50% of the ad exchange market share...”)

¹² *Google Acquires Technology Assets of Outride Inc. (Sep 20, 2001)*, <https://googlepress.blogspot.com/2001/09/google-acquires-technology-assets-of.html> (“Google Inc. today announced the company's acquisition of the intellectual property, including patent rights, source code, trademarks, and associated domain names, from Outride Inc., a Redwood City, Calif.-based developer of online information retrieval technologies.”)

¹³ *Google Acquires Kaltix Corp.* (September 30, 2003), <https://googlepress.blogspot.com/2003/09/google-acquires-kaltix-corp.html> (“Google Inc. today announced it acquired Kaltix Corp., a Palo Alto, Calif.-based search technology start-up.”)

¹⁴ Ed Sim, *Personalized Search* (March 31, 2004), https://www.beyondvc.com/2004/03/personalized_se.html (“Fast forward to now and Google is bringing this back into the market, although it is using its latest acquisition, Kaltix, as the basis for its search. This one is based on profiles rather than behavior... It will be interesting to see how personalization and the search wars play out over the next couple of years. I, for one, am a big fan of the original Outride model based on user behavior.”)

¹⁵ *Google buys YouTube for \$1.65 Billion* (October 9, 2006), <https://www.nbcnews.com/id/wbna15196982> (“Internet search leader Google is snapping up YouTube for \$1.65 billion, brushing aside copyright concerns to seize a starring role in the online video revolution.”)

¹⁶ Brooke Auxier and Monica Anderson, *Social Media Use in 2021* (April 7, 2021), <https://www.pewresearch.org/internet/2021/04/07/social-media-use-in-2021/> (“A majority of Americans say they use YouTube and Facebook, while use of Instagram, Snapchat and TikTok is especially common among adults under 30.”)

¹⁷ Emily A. Vogels, Risa Gelles-Watnick and Navid Massarat, *Teens, Social Media and Technology 2022* (August 10, 2022), <https://www.pewresearch.org/internet/2022/08/10/teens-social-media-and-technology-2022/> (“YouTube tops the 2022 teen online landscape among the platforms covered in the Center's new survey, as it is used by 95% of teens.”)

2019.¹⁸ In 2004, Google acquired Where 2,^{19,20} Keyhole,²¹ and ZipDash,²² which formed the basis of Google Maps and Google Earth. Google also acquired Waze,²³ a Google Maps competitor in 2013. In 2004, Google acquired Picasa,²⁴ a photo management and editing platform, which was later subsumed by Google Photos. Google acquired DocVerse²⁵ as a precursor to launching Google Docs in 2010. Like the advertising and analytics acquisitions discussed above, the strategic acquisitions of these publisher services steadily positioned Google as an ever more dominant force in various segments of the publisher market (e.g., search engine, maps service, video streaming). Most notably, Google Search is by far the most popular search engine, with more than 90% market share.²⁶ Gmail is the most popular website in the email category,²⁷ Google Drive is the most popular file sharing service,²⁸ and Google Workspace is the most popular office suite.²⁹ In fact, Google today owns an outsized fraction of the top websites: the top 2 most visited websites in the world, google.com and youtube.com, are both owned by Google.³⁰

While Google's dominance as an advertiser and publisher has come under scrutiny in the

¹⁸ Chris Fox, *Google shuts failed social network Google+* (April 1, 2019), <https://www.bbc.com/news/technology-47771927> (“Google+, the search giant's failed social network, will finally be laid to rest on Tuesday morning.”)

¹⁹ Chris Morris, *10 Notable Google Acquisitions* (Aug 9, 2012), <https://www.cnn.com/id/48569184> (“In 2003, Danish brothers Lars and Jens Rasmussen founded a small mapping technology company, but had grander plans to revolutionize how people got directions. When Google heard those plans—and saw the prototype the Rasmussens and two associates had created—it quickly bought the company. The result was Google Maps, which has gone on to become one of the company's most popular features.”)

²⁰ See. *Where 2 Technologies acquired by Google* (Oct 9, 2004), <https://www.crunchbase.com/acquisition/google-acquires-where2--7f71b983>

²¹ Matt Hines, *Google buys satellite image firm Keyhole* (October 27, 2004), <https://www.cnet.com/tech/services-and-software/google-buys-satellite-image-firm-keyhole/> (“The acquisition of Keyhole underscores Google's efforts to widen its search capabilities beyond basic Web page results, as competition in the search sector heats up.”)

²² *Google Acquires ZipDash* (September 1, 2004), <https://mergr.com/alphabet-acquires-zipdash> (“On September 1, 2004, Google acquired software company ZipDash.”)

²³ Ingrid Lunden, *Google Bought Waze For \$1.1B, Giving A Social Data Boost To Its Mapping Business* (June 11, 2013), <https://techcrunch.com/2013/06/11/its-official-google-buys-waze-giving-a-social-data-boost-to-its-location-and-mapping-business> (“After months of speculation, the fate of Waze, the social-mapping-location-data startup, is finally decided: Google is buying the company, giving the search giant a social boost to its already-strong mapping and mobile businesses.”)

²⁴ Morris, *supra note 19* (“In the days leading up to its IPO, Google bought this [Picasa] online photo manager in an effort to maintain its lead over Yahoo and MSN, which were still viable competitors to its primary search business.”)

²⁵ Michael Arrington, *Google Acquires Docverse To Further Office Arms Race* (March 5, 2010), <https://techcrunch.com/2010/03/05/google-acquires-docverse-to-further-office-arms-race/?guccounter=1> (“With DocVerse Google will have a direct software connection to Microsoft Office, allowing users to collaborate real time on documents.”)

²⁶ *Search Engine Market Share Worldwide* (November 2022–November 2023), <https://gs.statcounter.com/search-engine-market-share>

²⁷ See. *Number of Email Users Worldwide 2024: Demographics & Predictions*, <https://financesonline.com/number-of-email-users/> (“Gmail is the most popular email provider with 1.5 billion active user accounts worldwide.”)

²⁸ See. *File Sharing Software Market Share*. <https://www.datanyze.com/market-share/file-sharing--198>

²⁹ See. *Top 5 Office Suites technologies in 2024*. <https://6sense.com/tech/office-suites> (“Google Workspace with 67.96% market share (1,223,114 customers), Microsoft Office with 20.80% market share (374,460 customers), Google Sheets with 5.75% market share (103,523 customers).”)

³⁰ See. *Top Website Rankings*, <https://www.similarweb.com/top-websites/>

past,^{31,32} there is another market that has garnered much less attention: Google’s dominance in the market for browsers that are used by consumers to access the web on both desktop computers and mobile devices.³³ Google launched the Chrome browser in 2008 by combining WebKit, an open-source web engine³⁴ originally developed by Apple for its Safari browser, with its own V8 JavaScript engine.³⁵ Later in 2013, Chrome started creating its own version of WebKit called Blink, citing that the rest of the WebKit partners were “slowing everybody down”.³⁶ Chrome also benefited from several strategic acquisitions by Google, which included Reqwireless³⁷ and its mobile browser, and GreenBorder,³⁸ which provided state-of-the-art security functionality for Chrome on launch (“sandboxing”). Chrome’s market share has steadily increased since its inception.³⁹ Chrome has now become the most dominant browser, with more than 63% market share on desktop and mobile devices.⁴⁰

Even though Chrome is so central to many of us accessing and browsing the web, what interest does Google have in developing it? Why does Google pour immense resources into

³¹ See. *United States, State of California, Colorado, Connecticut, New Jersey, New York, Rhode Island, Tennessee, and Commonwealth of Virginia v. Google LLC, No. 1:23-cv-00108* (2023), <https://www.justice.gov/opa/press-release/file/1563746/download> (“The United States and Plaintiff States bring this action for violations of the Sherman Act to halt Google’s anticompetitive scheme, unwind Google’s monopolistic grip on the market, and restore competition to digital advertising.”)

³² See. *State of Arkansas, Idaho, Indiana, Mississippi, Missouri, North Dakota, South Dakota, Utah, and the Commonwealth of Kentucky v. Google LLC, No. 4:2020cv00957* (2020), <https://dockets.justia.com/docket/texas/txedce/4:2020cv00957/202878>

³³ While a web browser is used on both mobile phone and desktops, there exists an interesting fundamental difference in how they are used. While on mobile phones, most users prefer to use separate applications to access different services (e.g. social media, content streaming, etc.), on desktop all these activities take place through the web browser. This gives the web browser a much bigger role on desktop as compared to mobile. Hence in this article, we focus on the browser market on desktop and how Google is using its monopoly through Chrome to its advantage across parallel markets.

³⁴ A browser engine is the core of each web browser and is responsible for communicating with websites and visualizing them. This means that, to begin with, Google Chrome was mainly a container for the WebKit browser engine, with a different user interface compared to Safari and a deeper integration of Google’s own services.

³⁵ Most websites on the internet are made up of three parts: HTML, JavaScript, and CSS. HTML contains the layout and the website content. CSS contains the visual elements, such as colors and spacing between the website elements. JavaScript contains interactive computer code that describes how a website is supposed to change in response to user interactions, i.e., changing the layout, design, or content of a website without navigating to a different website.

³⁶ Frederic Lardinois, *Google Forks WebKit And Launches Blink, A New Rendering Engine That Will Soon Power Chrome And Chrome OS* (April 3, 2013), <https://techcrunch.com/2013/04/03/google-forks-webkit-and-launches-blink-its-own-rendering-engine-that-will-soon-power-chrome-and-chromeos/> (“Having to integrate Google’s way of doing things with WebKit and what the rest of the WebKit partners were doing was “slowing everybody down,” Komoroske said)

³⁷ Elinor Mills, *Google buys Canadian wireless-software company* (Jan 9, 2006), <https://www.cnet.com/tech/services-and-software/use-cnet-shopping-to-look-out-the-best-deals/> (“Google has acquired Reqwireless, a small Canadian company that makes Web browser and e-mail software for use on wireless devices...”)

³⁸ Matt Hines, *Google buys into security, acquires GreenBorder* (May 29, 2007), <https://www.infoworld.com/article/2662225/google-buys-into-security--acquires-greenborder.html> (“Google has jumped into the anti-malware market, snatching up browser-based security software maker GreenBorder Technologies for an undisclosed amount of money.”)

³⁹ *Global market share held by leading internet browsers from January 2012 to May 2023*, <https://www.statista.com/statistics/268254/market-share-of-internet-browsers-worldwide-since-2009/>

⁴⁰ *Browser Market Share Worldwide* (November 2022–November 2023), <https://gs.statcounter.com/browser-market-share>

the development of Chrome? After all, Chrome is available for free and does not have an independent revenue stream or business model. Instead, Chrome's publicly stated mission, from the onset, has been increasing adoption of Google's advertising and publisher services.⁴¹ While prior research and regulatory action focused on Google's abuse of its dominance as an advertiser⁴² or publisher,⁴³ far less attention has been given to how Google leverages Chrome's dominance to unfairly advance its services in the advertising and publisher markets.

In this Article, we show that Chrome is the key to Google's dominance as an advertiser and publisher. First, Google leverages its dominance as a publisher to reinforce Chrome's dominance using (a) subtle coercion, such as by employing dark patterns and (b) undermining web standards. Second, Google leverages Chrome's dominance to reinforce Google's dominance as a publisher and advertiser using the same techniques and additionally (c) self-preferencing and (d) "privacy controls." These strategies employed by Google demonstrate that Chrome is not merely a neutral gateway to the web and is instead an instrument for Google to gain and maintain an unfair advantage over its competitors. Finally, Google employs (e) "pay-to-play"—using income generated from its dominating advertising business for strategic acquisitions of more publishing and advertising services and paying competitors to give prominence to Google Search. This results in a vicious cycle of cross-market abuse in one market, be it browser, advertising, or publishing, to cement position in the other market.

Google's dominance of the web (through Google Chrome), publishing (through Google Search, YouTube, Gmail, etc.), and advertising (through Google Ads and Google Analytics) markets raises concerns about fair competition in the digital economy. Google's multifaceted approach—combining strategic acquisitions with tactics that disadvantage its competitors—underlines the complexity of Google's dominance and the need for regulatory scrutiny. Drawing upon historical antitrust actions, we discuss three potential types of remedies: (a) behavioral remedies, (b) structural remedies, and (c) divestment. First, as a relatively mild measure, we discuss the imposition of behavioral remedies on Google. These restrictions would aim to specifically mitigate deceptive practices, such as the use of dark patterns, and prevent the coercive integration of users into Google's broader service ecosystem. Second, we consider an internal restructuring within Google to enforce a clear demarcation between its advertising and browser divisions. Such separation is crucial to prevent the advertising interests of Google from unduly influencing the operation and development of Chrome. However, these measures, while addressing certain aspects of Google's anti-competitive behavior, may not sufficiently tackle its extant market dominance. In this context, the extensive and successful history of antitrust law, particularly its role in disbanding

⁴¹ Ben Goodger, *Welcome to Chromium* (September 2, 2008), https://blog.chromium.org/2008/09/welcome-to-chromium_02.html ("To be clear, improving the web in this way also has some clear benefits for us as a company. With a richer set of APIs, we can build more interesting apps allowing people to do more online. The more people do online, the more they can use our services.")

⁴² Throughout this article, term *advertiser* is used to refer to an entity which facilitates the relationship between publishers and brands by identifying user interests, determining the appropriate brand for the user, and displaying the advertisement for the brand on the publisher's website. Google Ads is an example of an advertiser. Unless otherwise specified, advertiser is also used as an umbrella term for analytics services such as Google Analytics, which determine the quantity and qualities of the users visiting a website.

⁴³ Throughout this article, term *publisher* is used to refer to an application, website, or a service, which a user visits to get access to a specific functionality. Google Search, YouTube, Gmail, and Google Drive are some examples of Google's business products where it acts as a publisher.

monopolies like AT&T/Bell System, becomes highly pertinent. Thus, third, we discuss how Google Chrome might need to be divested from its parent company and restructured essentially as a public utility. The organization of Chrome as an independent organization would ensure that it serves the neutral gateway to the web. This would not only diminish Google's ability to leverage Chrome as a tool for market capture but also foster innovation in online advertising and publisher markets.

2 PAST CHALLENGES TO THE DOMINANCE OF CHROME AND GOOGLE

In its role as a leading player across multiple markets, Google—and Google Chrome browser in particular—has faced numerous challenges over the years. Each of those threatened to restrict Google's control over technology infrastructure and its access to vast amounts of data, both of which are key to Google's business model. This section delves into some of these pivotal challenges and explores how they have influenced Google's business strategies and practices. Specifically, we study self-regulatory initiatives, and the past use of privacy and competition law to rein in on Google's dominance. By examining these instances, we gain insight into the company's adaptability and the evolving landscape of market competition and regulation.

2.1 Self-regulation

Online tracking, which is at the heart of Google's advertising business, and countermeasures against tracking have evolved significantly over the years. In 2007, prominent consumer advocacy groups, such as The Consumer Federation of America and the Consumers Union, petitioned the Federal Trade Commission (FTC) for a regulatory framework to address online advertising's intrusive nature^{44,45}. This initiative sought the creation of a "Do-Not-Track" (DNT) list, which would be conceptually like the "Do-Not-Call" list that significantly reduced telephone advertising in the US. After several years of relatively limited progress, in July 2009, researchers Christopher Soghoian and Sid Stamm proposed the first DNT standard, designed to empower web browser users to opt out of online tracking.⁴⁶ This proposal entailed the transmission of a user's tracking preferences through browser signals (called HTTP headers), thereby passing these preferences to website operators. The website operators and any embedded 3rd parties could then choose to ignore or to honor the user's preferences. With no technical restrictions nor legal requirements for honoring DNT, adoption was low.

At the same time, the FTC urged the advertising industry to develop self-regulatory

⁴⁴ See, *Consumer Rights and Protections in the Behavioral Advertising Sector*, <https://cdt.org/wp-content/uploads/privacy/20071031consumerprotectionsbehavioral.pdf> ("Specifically, we urge the U.S. Federal Trade Commission (FTC) to take proactive steps to adequately protect consumers as online behavioral tracking and targeting become more ubiquitous.")

⁴⁵ Diane Bartz, *Consumer groups urge 'do not track' registry* (April 15, 2008), <https://www.nbcnews.com/id/wbna24138328> ("While companies like Google are trying to put pretty good practices in place, we don't want to rely on the good graces of the companies because they might change their minds.")

⁴⁶ Christopher Soghoian, *slight paranoia* (January 21, 2011), <http://paranoia.dubfire.net/2011/01/history-of-do-not-track-header.html> ("In mid-July 2009, the Future of Privacy Forum organized a meeting and conference call in which I pitched the header concept to a bunch of industry players, public interest groups, and other interested parties. I was perhaps slightly over-dramatic when I told them that the "day of reckoning was coming", for opt out cookies, and that it was time to embrace a header-based mechanism.")

measures for online advertising,⁴⁷ which resulted in the launch of the “AdChoices”⁴⁸ program in 2010.⁴⁹ This industry-led initiative allowed individuals to opt-out from tracking by advertisers through a dedicated website. The initiative, however, never reached widespread trust and adoption, in part because it—somewhat counterintuitively—involved letting the same advertisers set cookies on their web browsers to store those opt-outs.

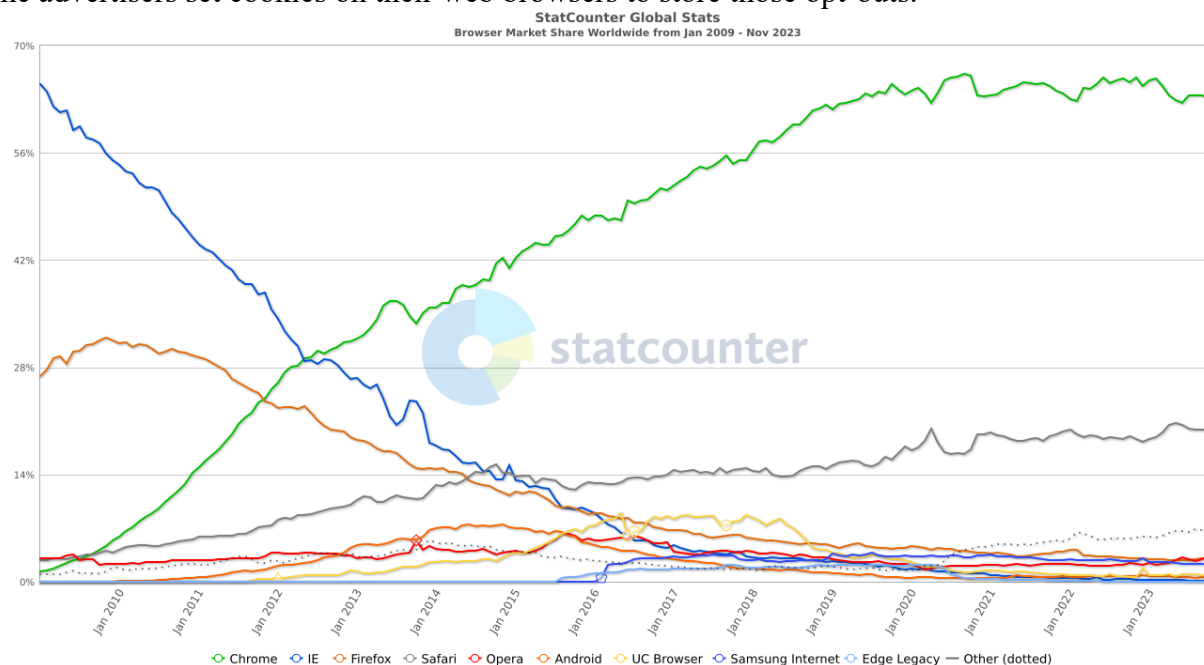


Figure 1 Browser market share over time.⁵⁰ After Google Chrome was released in December 2008, it managed to overtake the incumbents in less than five years.

Recognizing the potential of DNT to enhance online privacy, the FTC, in December 2010, endorsed its adoption⁵¹—with some success. By the end of 2012, all major web browsers had implemented DNT functionality. This also included Google Chrome, even though it was the last adapter in November 2012. It also had a much smaller market share at the time but was already the most used web browser: Chrome reached a market share of about 31% by the end of 2012, while Microsoft’s Internet Explorer had dropped to 27% and

⁴⁷ *Self-regulatory Program for Online Behavioral Advertising Factsheet* (June, 2015), https://www.iab.com/wp-content/uploads/2015/06/OBA_OneSheet_Final.pdf

⁴⁸ See, *YourAdChoices Gives You Control* (<https://youradchoices.com>)

⁴⁹ See, *Digital Advertising Alliance (DAA) Announces 'Your AdChoices' Consumer Education Campaign* (January 20, 2012), <https://www.prnewswire.com/news-releases/digital-advertising-alliance-daa-announces-your-adchoices-consumer-education-campaign-137749828.html> (“The DAA Self-Regulatory Program for Online Behavioral Advertising was launched in 2010 by the Digital Advertising Alliance (DAA), a consortium of the nation’s largest media and marketing associations including the American Association of Advertising Agencies (4A’s), the Association of National Advertisers (ANA), the American Advertising Federation (AAF), the Direct Marketing Association (DMA), the Interactive Advertising Bureau (IAB) and the Network Advertising Initiative (NAI).”)

⁵⁰ See, *Browser Market Share Worldwide* (January 2009–November 2023), <https://gs.statcounter.com/browser-market-share#monthly-200901-202311>

⁵¹ *FTC Testifies on Do Not Track Legislation* (December 2, 2010), <https://www.ftc.gov/news-events/news/press-releases/2010/12/ftc-testifies-do-not-track-legislation> (“...the agency supports giving consumers a “Do Not Track” option because the practice is largely invisible to consumers, and they should have a simple, easy way to control it.)

Mozilla's Firefox to 19%.⁵²

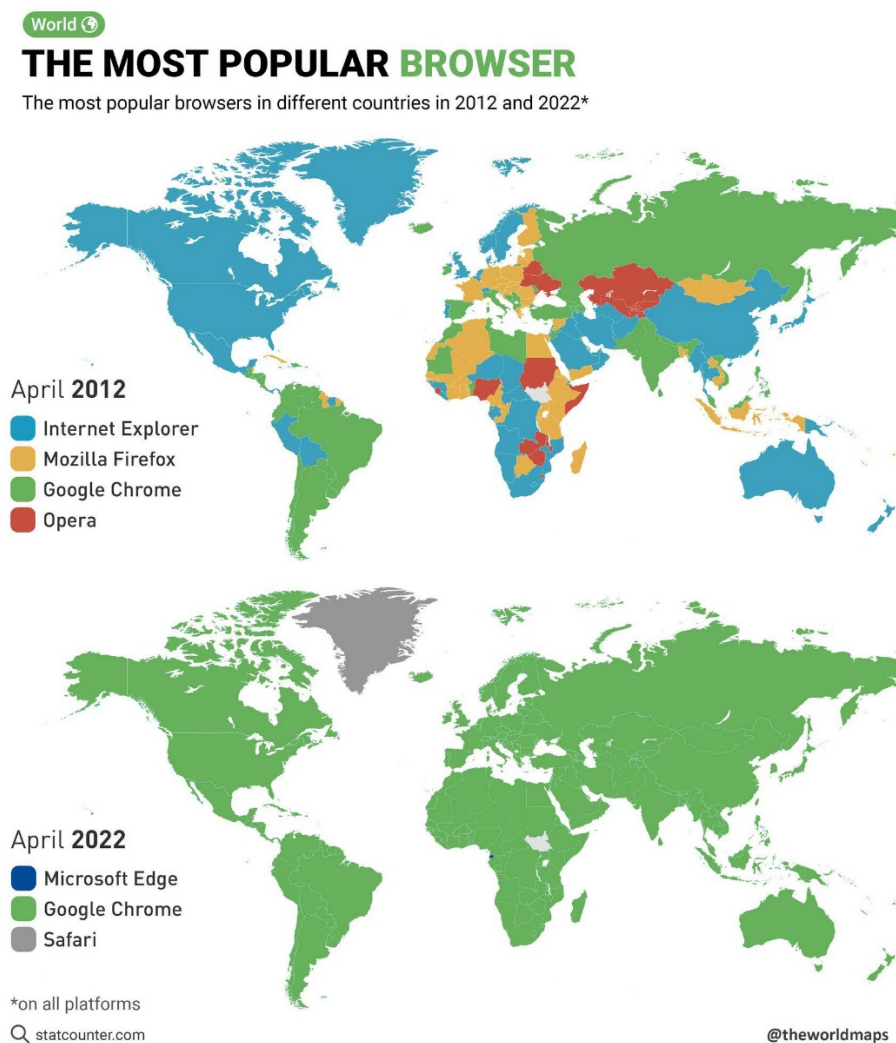


Figure 2 Difference in most popular browser in different countries in 2012 and 2022.

Interestingly, like many other advertising companies, Google did not honor DNT on its own 1st party websites⁵³ nor on its 3rd party services (e.g., Google Analytics⁵⁴), reflecting a significant gap in the adoption of privacy measures by major online websites.⁵⁵ While there was initially cautious support for the DNT standard in the advertising industry, this vanished

⁵² *Supra* note 50

⁵³ Turn "Do Not Track" on or off,

<https://support.google.com/chrome/answer/2790761?hl=en&co=GENIE.Platform%3DDesktop> ("Most websites and web services, *including Google's*, don't change their behavior when they receive a Do Not Track request. Chrome doesn't provide details of which websites and web services respect Do Not Track requests and how websites interpret them.", emphasis added)

⁵⁴ Kevin Dees, *Adding Google Analytics To Your Website While Respecting "Do Not Track"* (April 13, 2020), <https://kevdees.com/adding-google-analytics-to-your-website-while-respecting-do-not-track/> ("You see, Google Analytics does not automatically handle "privacy" for you.")

⁵⁵ Kashmir Hill, *'Do Not Track,' the Privacy Tool Used by Millions of People, Doesn't Do Anything* (October 15, 2018), <https://gizmodo.com/do-not-track-the-privacy-tool-used-by-millions-of-peop-1828868324> ("From the department of irony, Google's Chrome browser offers users the ability to turn off tracking, but Google itself doesn't honor the request, a fact Google added to its support page some time in the last year.")

after Microsoft announced in November 2012 that its Internet Explorer—still widely used at the time—would enable the DNT signal by default.⁵⁶ It was only three years later, in May 2015, that Microsoft switched back to an opt-out rather than opt-in model for DNT.⁵⁷ However, the damage had been done and the DNT initiative ultimately faltered, culminating in the dissolution of the relevant web standards working group in January 2019.⁵⁸ Following this, Apple removed DNT support from Safari in February 2019,⁵⁹ signaling a retreat from the once-promising DNT initiative.

While the DNT initiative on its own did not prove to be useful, industry giants Mozilla and Apple have since pioneered sophisticated countermeasures against online tracking. Apple's Safari browser introduced Intelligent Tracking Prevention in September 2017,⁶⁰ a feature meant to curb cross-site tracking. Mozilla followed suit with Firefox's Enhanced Tracking Protection in June 2019.⁶¹ As part of these initiatives, Safari and Firefox started blocking third-party cookies in 2020⁶² and 2022⁶³ respectively. These actions signify a major shift in the browser industry towards actively supporting user privacy—rather than putting trust in legal action or industry standards. Additionally, independent efforts in the form of browser extensions (e.g., Adblock Plus,⁶⁴ uBlock Origin,⁶⁵ and Disconnect.me⁶⁶) contribute to this landscape, blocking tracking scripts and offering users further control over their online privacy.

Google's approach to online tracking and user privacy markedly contrasts with the

⁵⁶ *Internet Explorer 10 released for Windows 7* (November 13, 2012), <https://www.pcmag.com/archive/internet-explorer-10-released-for-windows-7-304943> (“On the security front, IE10 includes the “do not track” technology, so advertisers cannot secretly monitor your activity in order to serve up targeted ads. Those who want it, however, can disable “do not track.””)

⁵⁷ Gregg Keizer, *Microsoft rolls back commitment to Do Not Track* (April 3, 2015), <https://www.csoonline.com/article/551084/microsoft-rolls-back-commitment-to-do-not-track.html> (“Microsoft today rolled back its commitment to the nearly-dead “Do Not Track” (DNT) standard, saying that it would no longer automatically switch on the signal in its browsers.”)

⁵⁸ *Tracking Protection Working Group* (This working group is currently closed. It closed on 17 January 2019), <https://www.w3.org/2011/tracking-protection/>

⁵⁹ *See. Safari 12.1 Release Notes* (March 25, 2019), https://developer.apple.com/documentation/safari-release-notes/safari-12_1-release-notes (“Removed support for the expired Do Not Track standard to prevent potential use as a fingerprinting variable.”)

⁶⁰ John Wilander, *Intelligent Tracking Prevention* (June 5, 2017), <https://webkit.org/blog/7675/intelligent-tracking-prevention/> (“Intelligent Tracking Prevention is a new WebKit feature that reduces cross-site tracking by further limiting cookies and other website data.”)

⁶¹ Dave Camp, *Firefox Now Available with Enhanced Tracking Protection by Default Plus Updates to Facebook Container, Firefox Monitor and Lockwise* (June 4, 2019), <https://blog.mozilla.org/en/products/firefox/firefox-now-available-with-enhanced-tracking-protection-by-default/> (“Firefox will be rolling out this feature, Enhanced Tracking Protection, to all new users on by default, to make it harder for over a thousand companies to track their every move.”)

⁶² John Wilander, *Full Third-Party Cookie Blocking and More* (March 24, 2020), <https://webkit.org/blog/10218/full-third-party-cookie-blocking-and-more/> (“Cookies for cross-site resources are now blocked by default across the board. This is a significant improvement for privacy since it removes any sense of exceptions or “a little bit of cross-site tracking is allowed.”)

⁶³ *Firefox rolls out Total Cookie Protection by default to more users worldwide* (April 11, 2023), <https://blog.mozilla.org/en/products/firefox/firefox-rolls-out-total-cookie-protection-by-default-to-all-users-worldwide/> (“Any time a website, or third-party content embedded in a website, deposits a cookie in your browser, that cookie is confined to the cookie jar assigned to only that website.”)

⁶⁴ *See.* <https://adblockplus.org>

⁶⁵ *See.* <https://ublockorigin.com>

⁶⁶ *See.* <https://disconnect.me>

actions of other major browser vendors, such as Mozilla and Apple. While the other browser vendors were attempting to curtail tracking through third-party cookies, Google was sued several times⁶⁷ over collecting user data without consent and misrepresenting the use of cookies. In 2012, Google settled with FTC for \$22.5 million, the largest civil penalty ever at that time, on charges that it misrepresented users of Safari on use of tracking cookies to serve them targeted ads⁶⁸. This divergence became particularly evident in May 2019 when, in response to the industry's shift towards enhanced privacy measures, Google announced—contrary to all other major browser vendors—its intention not to phase out third-party cookies.⁶⁹ Instead, they proposed to refine the classification of cookies to better balance privacy concerns with the needs of web publishers and advertisers. Google's hesitancy to restrict online tracking, while possibly maintaining the status quo favorable to advertisers, raised significant concerns regarding the adequacy of user privacy protection in the digital space. In August 2019, Google announced the Privacy Sandbox initiative, which included Federated Learning of Cohorts (FLoC) as a new method for privacy-preserving online advertising. Despite this progressive step, Google simultaneously expressed reservations about the complete elimination of cookies, advocating instead for a more sophisticated classification. Their argument hinged on the financial repercussions for publishers, predicting a substantial average decline in revenue by 52% if third-party cookies were phased out⁷⁰. Indeed, Google's FLoC was widely criticized as potentially hampering privacy protections even further online, rather than delivering on its promises of increasing privacy protections^{71,72}. It took another 6 months for Google's policy to further shift: by January

⁶⁷ See. *Lloyd vs Google LLC, UKSC 50* (10 November 2021), <https://www.supremecourt.uk/cases/docs/uksc-2019-0213-judgment.pdf> (“Mr Richard Lloyd - with financial backing from Therium Litigation Funding IC, a commercial litigation funder - has issued a claim against Google LLC, alleging breach of its duties as a data controller under section 4(4) of the Data Protection Act 1998 (“the DPA 1998”). The claim alleges that, for several months in late 2011 and early 2012, Google secretly tracked the internet activity of millions of Apple iPhone users and used the data collected in this way for commercial purposes without the users’ knowledge or consent.”)

⁶⁸ See. *Google Will Pay \$22.5 Million to Settle FTC Charges it Misrepresented Privacy Assurances to Users of Apple's Safari Internet Browser* (August 9, 2012), <https://www.ftc.gov/news-events/news/press-releases/2012/08/google-will-pay-225-million-settle-ftc-charges-it-misrepresented-privacy-assurances-users-apples> (“Google Inc. has agreed to pay a record \$22.5 million civil penalty to settle Federal Trade Commission charges that it misrepresented to users of Apple Inc.’s Safari Internet browser that it would not place tracking “cookies” or serve targeted ads to those users, violating an earlier privacy settlement between the company and the FTC.”)

⁶⁹ Ben Galbraith and Justin Schuh, *Improving privacy and security on the web* (May 7, 2019), <https://blog.chromium.org/2019/05/improving-privacy-and-security-on-web.html> (“Because of this, blunt solutions that block all cookies can significantly degrade the simple web experience that you know today, while heuristic-based approaches—where the browser guesses at a cookie's purpose—make the web unpredictable for developers.”)

⁷⁰ Justin Schuh, *Building a more private web* (August 22, 2019), <https://blog.google/products/chrome/building-a-more-private-web/> (So today, we are announcing a new initiative to develop a set of open standards to fundamentally enhance privacy on the web...large scale blocking of cookies undermine people’s privacy by encouraging opaque techniques such as fingerprinting...Recent studies have shown that when advertising is made less relevant by removing cookies, funding for publishers falls by 52% on average.”)

⁷¹ Bennet Cyphers, *Google's FLoC is a Terrible Idea* (March 3, 2021), <https://www.eff.org/deeplinks/2021/03/googles-floc-terrible-idea> (“The technology [FLoC] will avoid the privacy risks of third-party cookies, but it will create new ones in the process. It may also exacerbate many of the worst non-privacy problems with behavioral ads, including discrimination and predatory targeting.”)

⁷² Alex Berke and Dan Calacci, *Privacy Limitations of Interest-based Advertising on The Web: A Post-mortem Empirical Analysis of Google's FLoC* (November 7, 2022),

2020⁷³, Google finally announced its intention to phase out third-party cookies in Chrome by 2022.

The history of DNT and its failure underscores the complexities of regulating online privacy, the challenges of effective industry self-regulation, and the need for alternative measures such as legal action combined with effective industry action. It also reveals Google's challenges in protecting the privacy of internet users in Google Chrome and its other services. Given that most of its revenue derives from personalized advertising online, the company has had to take a more cautious approach towards rolling out measures that would limit flows of user data. This constitutes a fundamental conflict of interest where Chrome as a browser cannot go against the business interests of its parent company Google. This conflict-of-interest results in a less private browser for users of Google Chrome.

2.2 Regulatory action

2.2.1 Privacy and data protection law

As discussed in the previous section, we appear to have reached the limits of self-regulatory mechanisms regarding taming privacy issues online. FTC, in a set of guidelines released in 2009, urged self-regulation for online behavioral advertising⁷⁴, with the hope that as online advertising and tracking becomes more commonplace, companies with significant stake in the industry would behavior in a responsible manner and adopt a strong self-regulatory framework. However, FTC later realized it was a mistake to leave a topic as sensitive as user's privacy and security to entities whose financial interests were tied to selling and monetization of data⁷⁵. This realization by FTC is also shared by other policymakers and legislators around the world which have increasingly shifted their attention to the enactment of novel laws and regulation aimed at curbing excesses of data collection practices online. These actions have direct consequences for large tech companies, such as Google, whose primary business model is tightly coupled to relatively unrestricted access to data.

In this domain, the arguably most impactful legal change was the adoption of the EU General Data Protection Regulation (GDPR) by the European Union (EU) in April 2016—

<https://dl.acm.org/doi/10.1145/3548606.3560626> (“We show how FLoC cohort ID sequences observed over time can provide this unique identifier to trackers, even with third-party cookies disabled. We estimate the number of users in our dataset that could be uniquely identified by FLoC IDs is more than 50% after 3 weeks and more than 95% after 4 weeks.”)

⁷³ Justin Schuh, *Building a more private web: A path towards making third party cookies obsolete* (January 14, 2020), <https://blog.chromium.org/2020/01/building-more-private-web-path-towards.html> (“...we plan to phase out support for third-party cookies in Chrome. Our intention is to do this within two years.”)

⁷⁴ See. *FTC Staff Report: Self-Regulatory Principles For Online Behavioral Advertising* (February 2009), <https://www.ftc.gov/sites/default/files/documents/reports/federal-trade-commission-staff-report-self-regulatory-principles-online-behavioral-advertising/p085400behavadreport.pdf> (“Some companies and industry groups have begun to develop new privacy policies and self-regulatory approaches, but more needs to be done to educate consumers about online behavioral advertising and provide effective protections for consumers’ privacy.”)

⁷⁵ See. *Surveillance in the Shadows – Third-Party Data Aggregation and the Threat to our Liberties* (September 21, 2023), https://www.ftc.gov/system/files/ftc_gov/pdf/cdia-sam-levine-9-21-2023.pdf (“But I believe it was a serious mistake to favor self-regulation over establishing baseline but binding protections for the American public. And although the Commission later came to endorse privacy legislation,⁵ that took a decade – by which time powerful interests were already lined up against laws that could limit their ability to monetize data.”)

and its subsequent coming into force in May 2018⁷⁶. The GDPR, with its stringent data protection standards, has led to notable consequences due to lack of basis for excessive data collection. This has also affected Google. For example, the French data protection authority, CNIL, has in total imposed fines of 200 million Euros on Google over GDPR violations related to a lack of transparency in its advertising practices and insufficient legal basis for data processing⁷⁷⁷⁸. The CNIL fined Google another 150 million Euros around Google's consent practices regarding tracking cookies under the 2009 EU ePrivacy Directive, another European data protection law separate from the GDPR⁷⁹. This law requires consent to most forms of tracking⁸⁰. Google has also been fined 10 million Euros by AEPD (Spanish data protection authority)⁸¹, and 5 million Euros by Datainspektionen (Swedish data protection authority)⁸² on similar grounds pertaining to lack of legal basis for data processing and fulfilment of consumer rights enshrined in GDPR.

Rather than privacy, the GDPR—like its 1995 predecessor⁸³—puts its primary focus on rights and control residents of European Economic Area on their own data. Data protection, in the EU, is a fundamental right protected under the EU Charter⁸⁴ and exists next to the right to privacy⁸⁵. Both rights have somewhat independent legal histories⁸⁶, with the right to privacy having arisen in the EU from the right to protection of the home—which ultimately

⁷⁶ *The History of the General Data Protection Regulation (1995 to 2018)*, https://edps.europa.eu/data-protection/data-protection/legislation/history-general-data-protection-regulation_en (“In 2016, the EU adopted the General Data Protection Regulation (GDPR), one of its greatest achievements in recent years. It replaces the 1995 Data Protection Directive which was adopted at a time when the internet was in its infancy.”)

⁷⁷ *The CNIL's restricted committee imposes a financial penalty of 50 Million euros against GOOGLE LLC* (January 21, 2019), https://edpb.europa.eu/news/national-news/2019/cnils-restricted-committee-imposes-financial-penalty-50-million-euros_en (“The company GOOGLE states that it obtains the user's consent to process data for ads personalization purposes. However, the restricted committee considers that the consent is not validly... The CNIL restricted committee publicly imposes a financial penalty of 50 Million euros against GOOGLE.”)

⁷⁸ See. *Délibération SAN-2021-024 du 31 décembre 2021* (December 31, 2021), <https://www.legifrance.gouv.fr/cnil/id/CNILTEXT000044840532>

⁷⁹ *Cookies: the CNIL fines GOOGLE a total of 150 million euros and FACEBOOK 60 million euros for non-compliance with French legislation* (January 6, 2022), <https://www.cnil.fr/en/cookies-cnil-fines-google-total-150-million-euros-and-facebook-60-million-euros-non-compliance> (“...the websites facebook.com, google.fr and youtube.com offer a button allowing the user to immediately accept cookies. However, they do not provide an equivalent solution (button or other) enabling the Internet user to easily refuse the deposit of these cookies.”)

⁸⁰ Konrad Kollnig et al. *A Fait Accompli? An Empirical Study into the Absence of Consent to Third-Party Tracking in Android Apps* (August 9, 2021), <https://www.usenix.org/system/files/soups2021-kollnig.pdf> (“EU and UK data protection law, however, requires consent, both 1) to access and store information on users' devices and 2) to legitimate the processing of personal data as part of third-party tracking...”)

⁸¹ See. *RESOLUCIÓN DE PROCEDIMIENTO SANCIONADOR* (May 18, 2022), <https://www.aepd.es/documento/ps-00140-2020.pdf>

⁸² See. *Tillsyn enligt EU:s dataskyddsförordning 2016/679 – Googles hantering av begäranden om borttagande från dess söktjänster* (March 10, 2020), <https://www.imy.se/globalassets/dokument/beslut/2020-03-11-beslut-google.pdf>

⁸³ See. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31995L0046>

⁸⁴ See. *Article 8 (“Protection of personal data”)*, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:12012P/TXT>

⁸⁵ See. *Article 7 (“Respect of private and family life”)*, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:12012P/TXT>

⁸⁶ A good account is provided by Orla Lynskey in her 2015 book on the subject. See. Dr. Orla Lynskey, *The Foundations of EU Data Protection Law* (2015), <https://global.oup.com/academic/product/the-foundations-of-eu-data-protection-law-9780198718239?cc=nl&lang=en&>

dates to Warren and Brandeis' seminal 1890 paper *The Right to Privacy*⁸⁷. Meanwhile, the right to data protection emerged initially to protect individuals against the overreach of state actors, following Europe's experiences with the Nazi regime in the Second World War. Thus, the right to data protection was first formulated by the German Supreme Court that, in response to a complaint regarding the 1983 German Census, ruled that German citizens have a right to informational self-determination that arises directly from the right to human dignity (Article 1 of the German Constitution⁸⁸) in the age of the data centric society⁸⁹.

While the full impact of EU data protection legislation—and the GDPR in particular—is challenging to quantify⁹⁰, its implementation has substantially elevated the importance of data privacy globally, prompting similar legal initiatives in Brazil⁹¹, China⁹², and several U.S. states including California⁹³. The California Consumer Privacy Act (CCPA)⁹⁴ from 2018 has had profound implications for companies like Google, which are headquartered and operate extensively in California. The CCPA's introduction marks a significant step in data privacy regulation, particularly impacting businesses with vast data collection and processing practices, and even though the US—unlike other countries—does not have an explicitly protected right to privacy in its constitution⁹⁵.

An important development arising from the CCPA is the creation of the Global Privacy Control (GPC)⁹⁶, which can be seen as an advancement over the earlier Do-Not-Track (DNT) initiative. While DNT represented an industry-led effort at self-regulation in response to growing data privacy concerns, it ultimately fell short, primarily due to its lack of enforceability, regulatory backing, and clarity over whether it would be implemented as opt-

⁸⁷ Samuel D. Warren II and Louis Brandeis, *The Right to Privacy* (1890), Harvard Law Review, *Volume 4*

⁸⁸ See. *Article 1*, German Basic Law (“Human dignity shall be inviolable. To respect and protect it shall be the duty of all state authority.”)

⁸⁹With decreasing storage costs, in the 1980s, database systems were increasingly adopted, by both private and state actors. This spurred the first wave of data protection and privacy laws at the time of Europe and beyond. See. *Leitsätze zum Urteil des Ersten Senats vom 15. Dezember 1983 (Guiding principles on the judgment of the First Senate of December 15, 1983)*, https://www.bundesverfassungsgericht.de/SharedDocs/Entscheidungen/DE/1983/12/rs19831215_1bvr020983.html

⁹⁰ There has been a wealth of economic studies on the matter, which, however, can only ever focus on short-term economic effects and do not usually factor in fundamental rights considerations as externalities in their models. See. Jian Jia, Ginger Zhe Jin and Liad Wagman, *The Short-Run Effects of GDPR on Technology Venture Investment* (November 2018), <https://www.nber.org/papers/w25248>

⁹¹ See. *General Personal Data Protection Act (LGPD)*, <https://lgpd-brazil.info>

⁹² See. *Personal Information Protection Law (PIPL)*, <https://pro.bloomberglaw.com/brief/china-personal-information-protection-law-pipl-faqs/>

⁹³ See. *California Consumer Privacy Act (CCPA)*, <https://oag.ca.gov/privacy/ccpa>

⁹⁴ See. *AB-375 Privacy: personal information: businesses.* (2017-2018), https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB375 (“This bill would enact the California Consumer Privacy Act of 2018. Beginning January 1, 2020, the bill would grant a consumer a right to request a business to disclose the categories and specific pieces of personal information that it collects about the consumer, the categories of sources from which that information is collected, the business purposes for collecting or selling the information, and the categories of 3rd parties with which the information is shared.”)

⁹⁵ See. *Griswold v. Connecticut*, 381 U.S. 479

⁹⁶ See. *Global Privacy Control (GPC)* (December 4, 2023), <https://privacycg.github.io/gpc-spec/> (“This document defines a signal, transmitted over HTTP and through the DOM, that conveys a person's request to websites and services to not sell or share their personal information with third parties. This standard is intended to work with existing and upcoming legal frameworks that render such requests enforceable.”)

in or opt-out in web browsers^{97,98}. In contrast, GPC builds upon the legal foundations laid by the CCPA⁹⁹, offering a more robust framework. Under CCPA, each business which collects personal data by users should “allow consumers to submit requests to opt-out of sale/sharing through an opt-out preference signal”, allowing users to communicate their preference not to be tracked across the internet through a universal and legally recognized signal. This mechanism is designed to be more effective than DNT, leveraging the legally binding nature of CCPA’s privacy protections to ensure user choices are respected and implemented. It remains, however, an opt-out signal—and not opt-in—and may thus not provide the vast majority with real protections, given the known stickiness of defaults in behavioral economics¹⁰⁰.

As of this writing, the Global Privacy Controls (GPC) initiative has garnered support from several prominent browsers and extensions, including Firefox¹⁰¹, Brave¹⁰², DuckDuckGo¹⁰³, and Disconnect¹⁰⁴. However, the most widely used web browser, Google Chrome, has not so far implemented the functionality for Chrome users to emit GPC signal¹⁰⁵. Although CCPA regulations mandate the businesses to respect GPC, there is no compulsion for browsers to implement it yet, which allows Chrome to resist implementing it while GPC is fast becoming a standard on other browsers. Moreover, Chrome team has voiced relatively univocal opposition to the GPC standard as becoming an official standard

⁹⁷ Konrad Kollnig, *Do-Not-Track is dead. Long live Do-Not-Track!* (May 31, 2020), <https://hcc.cs.ox.ac.uk/news/2020/05/31/do-not-track.html> (“The weakest point of DNT is its reliance on the tracking industry. Implementation in all major browsers is not enough. Websites using tracking must also respect the user’s DNT setting.”)

⁹⁸ See. *Standardizing Global Privacy Control (GPC)* (April 6, 2020), <https://github.com/privacypg/proposals/issues/10/> (“Previously, the Tracking Protection Working Group developed the Tracking Preference Expression (DNT). There are certainly lots of learnings that can be taken from that effort for the question here. Though, a big difference is that recipients of a DNT signal are not required to comply with it.”)

⁹⁹ *Supra note 96*, (“Under the CCPA, the GPC signal will be intended to communicate a Do Not Sell request from a global privacy control, as per [CCPA-REGULATIONS] §999.315 for that browser or device, or, if known, the consumer.”)

¹⁰⁰ See. *United States v. Google LLC, No. 1:23-cv-00108* (2023), <https://www.justice.gov/atr/case/us-and-plaintiff-states-v-google-llc-2023> (“the same discussion can also lie at the heart of this lawsuit, in which Google paid billions of dollars to be set as the standard search engine in most major web browsers.”).

¹⁰¹ See. *Implementing Global Privacy Control* (October 28, 2021), <https://blog.mozilla.org/netpolicy/2021/10/28/implementing-global-privacy-control/> (“UPDATE, December 2021: Global Privacy Control is now available in the general release version of Firefox (Firefox 95).”)

¹⁰² Peter Snyder, *Global Privacy Control, a new Privacy Standard Proposal* (October 7, 2020), <https://brave.com/web-standards-at-brave/4-global-privacy-control/> (“We are also excited to announce our implementation of the GPC proposal, available today in the Nightly channel of our Desktop browser and in our Android browser beta release.”)

¹⁰³ See. *Global Privacy Controls (GPC) in DuckDuckGo*, <https://duckduckgo.com/duckduckgo-help-pages/privacy/gpc/> (“In order to provide additional protection for situations where the websites otherwise sell or share your data with other companies that may profit or benefit from it (such as selling data to advertisers or data brokers after your visit), we decided to help pioneer the Global Privacy Control (GPC) standard.”)

¹⁰⁴ See. *Introducing Global Privacy Controls* (October 7, 2020), <https://blog.disconnect.me/introducing-global-privacy-control/> (“In order to provide additional protection for situations where the websites otherwise sell or share your data with other companies that may profit or benefit from it (such as selling data to advertisers or data brokers after your visit), we decided to help pioneer the Global Privacy Control (GPC) standard.”)

¹⁰⁵ Jaron Rubenstein. *Is your stie ready for new regulations going into effect this month?* (January 20, 2023), <https://www.rubensteintech.com/innovate/client-alert-ca-202301-CPRA-and-Global-Privacy-Controls-GPC.html#:~:text=In%20order%20for%20GPC%20signals,the%20Dbox%20in%20the%20future> (“...it’s important to note that Google Chrome (which accounts for ~65% of the total browser market share), does not yet support the GPC signal by default.”)

supported by the World Wide Web Consortium¹⁰⁶. This hesitation is reminiscent of Google's previous stance on the phase-out of 3rd cookies and on the Do-Not-Track (DNT) initiative, where its lack of support was a crucial factor in DNT's limited efficacy.

Google's reluctance to embrace GPC without regulatory compulsion raises concerns about the initiative's future success. Given Google's substantial influence in the browser market, its support for GPC is pivotal. Without Google's participation, GPC may struggle to achieve widespread impact, potentially facing a similar fate as DNT. This scenario underscores a larger issue: the challenge of aligning Google's business interests with increasing calls for stronger privacy protections. Unless compelled explicitly by further regulation, there could remain limited incentives for Google to prioritize user privacy in its current data practices.

2.2.2 Antitrust and competition law

2.2.2.1 Academic literature

Given that current data protection and privacy laws have yet had limited effects and that the US lacks a federal privacy law, many scholars have instead suggested reinvigorating long-established law on the books, namely antitrust law (also called competition law in Europe).

Fiona M. Scott Morton and lawyer David C. Dinielli, in their 2020 report "Roadmap for a Digital Advertising Monopolization Case Against Google",¹⁰⁷ focus on the traditional price effects paradigm of antitrust law. They assert that Google has established extensive control over the AdTech stack, enabling the company to capture a substantial portion of advertising budgets, with estimates nearing 50%. According to their analysis, Google's dominance is a result of various anti-competitive practices designed to stifle rival participation in AdTech. These tactics include impeding interoperability, leveraging its search engine dominance to coerce advertisers into using Google's display products, and granting exclusive access to YouTube ad inventory solely through Google's tools. Scott Morton and Dinielli's analysis concludes that Google's practices have resulted in wide-ranging detrimental effects on the digital market. Advertisers grapple with inflated costs, publishers face declining revenues, competitors are marginalized, and consumers suffer from increased prices for goods and services, stifled innovation, lower-quality content, and eroded privacy. Their viewpoint offers a practical lens for examining Google's influence in the digital advertising sector. This approach circumvents the need to overhaul longstanding antitrust legal principles that have traditionally emphasized price effects, opting instead to apply these established frameworks to understand and address the nuances of Google's digital dominance. In proposing solutions, Scott Morton, and Dinielli advocate for a range of remedies to mitigate the market impact of

¹⁰⁶ The World Wide Web Consortium is one of the main standardization organizations for technical standards followed by the web browsers. The minutes of many meetings are public. *See*. *2023-08-24 Privacy CG Meeting*, <https://github.com/privacycg/meetings/blob/9bfd2fcdfe76ac9393ba8a046513bde6118c329f/2023/telcons/08-24-minutes.md>

¹⁰⁷ Fiona M. Scott Morton and David C. Dinielli, *Roadmap for a Digital Advertising Monopolization Case Against Google* (May, 2020), <https://omidyar.com/wp-content/uploads/2020/09/Roadmap-for-a-Case-Against-Google.pdf> ("The end result is that, in the digital advertising market, virtually all roads lead through Google. Google now performs every function that connects advertisers to publishers. Using the insurmountable data advantage, it derives from its search engine and other properties as well as contract and design choices, Google has made it nearly impossible for publishers and advertisers to do business with each other except through Google.")

Google's operations. These remedies include enforcing divestitures to dismantle parts of Google's business that contribute to its monopolistic hold, imposing restrictions on contract forms to prevent exclusionary practices, mandating data and information sharing to level the playing field and enforcing interoperability standards to facilitate competition.

Reuben Binns and Elettra Bietti provide a critical analysis of the mergers and acquisitions (M&A) landscape within the AdTech and online tracking industry. Their research contributed novel quantitative evidence and brought to light the increasing market concentration. Among other aspects, the study showed that this was underscored by Google's acquisitions of platforms like DoubleClick, YouTube, Firebase, and AdMob¹⁰⁸. This trend of consolidation, as Binns et al. revealed in related work, had by 2018 already reached a level potentially warranting scrutiny by EU competition authorities¹⁰⁹. Binns and Bietti note that many of these significant transactions have escaped in-depth examination by both EU and US competition regulators. Traditionally, these authorities did not extensively consider privacy concerns and data concentration in their assessments, often focusing instead on traditional market dynamics. The authors advocate for a more comprehensive approach to competition law in digital markets, one that transcends the conventional consumer welfare standard primarily based on price effects¹¹⁰¹¹¹. The insights from Binns and Bietti's work are particularly pertinent in the context of ongoing investigations and legal actions against tech giants like Google. Their research calls for a recalibration of competition law frameworks to better address the multifaceted challenges and implications of digital market dominance.

Binns and Bietti's work fall within the Neo-Brandeisian school of thought, which emerged in the 2010s and was significantly influenced by the works of legal scholars like Lina Khan and Tim Wu¹¹². Khan's seminal paper, "Amazon's Antitrust Paradox",¹¹³ challenges the traditional antitrust framework focused mainly on consumer welfare through pricing. She argues for a broader, more holistic approach to antitrust laws, one that accounts

¹⁰⁸ Reuben Binns and Elettra Bietti, *Dissolving privacy, one merger at a time: Competition, data and third party tracking* (April, 2020), <https://www.sciencedirect.com/science/article/abs/pii/S0267364919303802> ("In the years since the acquisition, the Alphabet companies (including Google and DoubleClick) have expanded the reach of their third party tracking capability to encompass the majority of all websites and apps on the Android platform.")

¹⁰⁹ Reuben Binns, Jun Zaho, Max Van Kleek, and Nigel Shadbolt, *Measuring Third-party Tracker Power across Web and Mobile* (August 7, 2018), <https://dl.acm.org/doi/10.1145/3176246> ("Third-party networks collect vast amounts of data about users via websites and mobile applications. Consolidations among tracker companies can significantly increase their individual tracking capabilities, prompting scrutiny by competition regulators.")

¹¹⁰ *Id.* ("By overtly omitting privacy considerations, the Commission in fact has failed to fulfill its mandate to protect consumer welfare (which, as argued above, must be understood as encompassing more than just price and quality of search), while also protecting and celebrating potentially harmful data reliant business models in the advertising ecosystem.")

¹¹¹ U.S. Department of Justice and Federal Trade Commission. *Merger Guidelines* (December 18, 2023), https://www.ftc.gov/system/files/ftc_gov/pdf/2023_merger_guidelines_final_12.18.2023.pdf. The new merger guidelines released by DoJ and FTC attempt to broaden the scope of investigations that agencies do when a new merger is improved. Now the agencies are expected to go far and beyond price effects to also look into competition, innovation, and effect of merger on other platforms.

¹¹² Tim Wu, *The Curse of Bigness: Antitrust in the New Gilded Age* (2018), <https://scholarship.law.columbia.edu/books/63/>

¹¹³ Lina M. Khan, *Amazon's Antitrust Paradox* (January, 2017), <https://www.yalelawjournal.org/note/amazons-antitrust-paradox> ("The current framework in antitrust fails to register certain forms of anticompetitive harm and therefore is unequipped to promote real competition—a shortcoming that is illuminated and amplified in the context of online platforms and data-driven markets.")

for the unique challenges posed by digital market behemoths like Amazon and Google. Khan emphasizes the need to consider factors such as market dominance, the role of data in reinforcing market power, and the implications for competition and innovation. This perspective is particularly relevant in the context of Google, a company whose extensive market reach and data practices raise similar concerns to those Khan identifies in Amazon. Her advocacy for a broader interpretation of antitrust laws, to include aspects like data privacy and market concentration, aligns with the growing scrutiny of Google's dominance in various digital markets and its broader implications for consumer welfare in the digital era. Following her work, in 2021, Khan was elected head of the FTC, which—besides the Department of Justice (DoJ)—enforces antitrust law in the United States.

2.2.2.2 Regulators and courts

This academic work arguably contributed to competition regulators around the world acting against market power. In a notable development against Google in July 2019, the UK's Competition and Markets Authority (CMA) launched a market study into online platforms and digital advertising¹¹⁴. This investigation primarily focused on Google and Facebook and aimed to investigate concerns regarding potential market power abuses. Concluded in 2020, the study scrutinized Google's January 2020 initiative to phase out third-party cookies¹¹⁵. Among its findings, the CMA report emphasized the substantial immediate impact on publisher revenues, with a potential reduction of up to 70%¹¹⁶.

In January 2021, prompted by its earlier findings, the CMA initiated a formal investigation into Google's planned phase-out of third-party cookies¹¹⁷. This move by the CMA underscored the regulatory concerns surrounding Google's market influence and its privacy practices. In a quick turn of events, Google announced in June 2021 a postponement of the third-party cookie phase-out to 2023¹¹⁸, a decision reflective of the mounting regulatory and industry pressures. Further evolving its approach, Google replaced the Federated Learning of Cohorts (FLoC) with the Topics API¹¹⁹ in January 2022¹²⁰.

¹¹⁴ See. *Online platforms and digital advertising market study* (July 3, 2019), <https://www.gov.uk/cma-cases/online-platforms-and-digital-advertising-market-study>

¹¹⁵ See. *Online platforms and digital advertising* (July 1, 2020), https://assets.publishing.service.gov.uk/media/5fa557668fa8f5788db46efc/Final_report_Digital_ALT_TEXT.pdf

¹¹⁶ See. *Appendix F: the role of data in digital advertising*, https://assets.publishing.service.gov.uk/media/5fe495438fa8f56af97b1e6c/Appendix_F_-_role_of_data_in_digital_advertising_v.4_WEB.pdf

¹¹⁷ See. *Investigation into Google's 'Privacy Sandbox' browser changes* (January 8, 2021), <https://www.gov.uk/cma-cases/investigation-into-googles-privacy-sandbox-browser-changes#case-timetable>

¹¹⁸ Vinay Goel, *An updated timeline for Privacy Sandbox milestones* (June 24, 2021), <https://blog.google/products/chrome/updated-timeline-privacy-sandbox-milestones/> (“Subject to our engagement with the United Kingdom’s Competition and Markets Authority (CMA) and in line with the commitments we have offered, Chrome could then phase out third-party cookies over a three month period, starting in mid-2023 and ending in late 2023.”)

¹¹⁹ API is short for Application Programming Interface and refers to a set of pre-defined and shared instructions to interact between different pieces of software. As such, APIs are akin to glue that pieces the software products from different developers together and allows them to interact. In the case of the Topics API, this API enables website developers to access a set of user-specific topics stored within the Chrome browser and thereby learn about characteristics of the Chrome/website user in a more privacy-preserving manner.

¹²⁰ Vinay Goel, *Get to know the new Topics API for Privacy Sandbox* (January 25, 2022), <https://blog.google/products/chrome/get-know-new-topics-api-privacy-sandbox/> (“... we’re announcing Topics, a new Privacy Sandbox proposal for interest-based advertising. Topics was informed by our learning and widespread community feedback from our earlier FLoC trials, and replaces our FLoC proposal.”)

Subsequently, in February 2022, the CMA accepted a set of commitments from Google concerning the third-party cookie phase-out¹²¹. These commitments were designed to address key concerns, including supporting publishers' revenue generation, and enhancing user transparency and control over data. To ensure compliance, the CMA appointed a monitoring trustee in March 2022¹²². However, in a further adjustment to its timeline, Google announced in July 2022 an additional delay in the cookie phase-out, extending it to 2024¹²³.

In the United States, Google is currently subject to several investigations and legal battles that put to test both traditional and Neo-Brandeisian legal theories. In October 2020, the Department of Justice (DoJ) initiated legal action against Google¹²⁴, alleging the company unlawfully maintains monopolies in search and search advertising through anti-competitive and exclusionary practices. These practices, as stated by the DoJ, include exclusivity agreements that stifle competition. Further, in December 2020, a coalition of states led by Texas filed a lawsuit against Google, accusing it of operating a digital advertising monopoly and engaging in anti-competitive behavior¹²⁵. These two cases have since been merged, now focusing on Google's use of contractual agreements to perpetuate its market dominance and notably its strategies to make Google the default search engine on mobile devices. This narrowed emphasis mirrors the approach taken in the 2022 Google Android ruling by the Court of Justice of the European Union, which confirmed prior investigations by the European Commission (EC) and imposed a €4.125 billion fine on Google¹²⁶.

Beyond these cases, Google faces a spectrum of additional legal challenges. In January 2023, the Department of Justice escalated its actions against the tech giant with a groundbreaking lawsuit seeking the breakup of Google's advertising business¹²⁷. This move

¹²¹ See. *COMPETITION AND MARKETS AUTHORITY Case 50972 - Privacy Sandbox Google Commitments Offer* (February 4, 2022), https://assets.publishing.service.gov.uk/media/62052c6a8fa8f510a204374a/100222_Appendix_1A_Google_s_nal_commitments.pdf

¹²² See. *CMA Appoints Monitoring Trustee to supervise commitments in relation to Google's 'Privacy Sandbox' browser changes* (February 11, 2022), https://assets.publishing.service.gov.uk/media/6239a8468fa8f540f5c3c068/220323_-_CMA_Appointment_of_Monitoring_Trustee.pdf ("The CMA has today (23 March 2022) approved under paragraph 32(b) of the commitments the appointment by Google of ING Bank N.V. as Monitoring Trustee to monitor compliance with the abovementioned provisions of the commitments.")

¹²³ Anthony Chavez, *Expanding testing for the Privacy Sandbox for the Web* (July 27, 2022), <https://blog.google/products/chrome/update-testing-privacy-sandbox-web/> ("..we now intend to begin phasing out third-party cookies in Chrome in the second half of 2024.")

¹²⁴ See. *Justice Department Sues Monopolist Google For Violating Antitrust Laws* (October 20, 2022), <https://www.justice.gov/opa/pr/justice-department-sues-monopolist-google-violating-antitrust-laws> ("Department of Justice — along with eleven state Attorneys General — filed a civil antitrust lawsuit in the U.S. District Court for the District of Columbia to stop Google from unlawfully maintaining monopolies through anticompetitive and exclusionary practices in the search and search advertising markets and to remedy the competitive harms.")

¹²⁵ *Supra note 32*

¹²⁶ See. *Court of Justice of the European Union Press Release No 147/22* (September 14, 2022), <https://curia.europa.eu/jcms/upload/docs/application/pdf/2022-09/cp220147en.pdf> ("The General Court largely confirms the Commission's decision that Google imposed unlawful restrictions on manufacturers of Android mobile devices and mobile network operators in order to consolidate the dominant position of its search engine...In order better to reflect the gravity and duration of the infringement, the General Court considers it appropriate however to impose a fine of €4.125 billion on Google...")

¹²⁷ *Supra note 31*

marks a significant step in antitrust enforcement, suggesting a more aggressive regulatory stance. In July 2023, Gannett, the media conglomerate owning USA Today and various other outlets, launched a lawsuit against Google for monopolization of advertising technology markets and deceptive commercial practices¹²⁸. Their lawsuit revolves around the fact that while the digital advertising business has grown to \$200 billion and more and more people are reading news online, publishers are unable to reap the benefits due to Google's monopolistic practices. Gannett alleges that Google controls both how publishers sell their ad slots, to whom they sell it to, and dictating the price at which they sell the ad slots. This results in a revenue model which increasingly affects publisher revenues and is forcing Gannett to close more than 170 publications across US¹²⁹. Moreover, Google is subject to a variety of lawsuits targeting its privacy practices¹³⁰¹³¹¹³²¹³³. These cases reflect increasing concerns over data protection and privacy in the digital age, and they underscore the broader societal and legal scrutiny regarding how tech companies, particularly those with significant market power like Google, handle user data.

In the European Union, Google's advertising business is under intense scrutiny, mirroring similar concerns as in the United States. Beyond Google Android, the EC expressed its preliminary view on the necessity of dismantling Google's online advertising operations¹³⁴. This radical proposal stems from the Commission's assessment of Google's conflict of interest and its overwhelming market power, which, in their view, stifles free competition within the advertising sector. The EC's critique centers on Google's dual role: it operates not only as a seller of digital advertising space, exemplified by platforms like YouTube, but also as an intermediary between advertisers and advertising space. Google's dominance in the European market is particularly pronounced in two areas: firstly, publisher ad servers, where its "Google Ad Manager" service holds a significant position, and secondly, in the realm of programmatic ad buying tools for the open web, facilitated by "Google Ads" and "Google Display & Video 360." The Commission contends that Google's practices, which include favoring its own ad exchange in Google Ads and Google Display & Video 360¹³⁵, constitute anti-competitive conduct, reinforcing the need for a potential breakup to restore market balance.

2.2.3 Platform law

As a third pillar to challenging the dominance of digital platforms, there is an increasing

¹²⁸ See. *Gannett Files Federal Lawsuit Against Google* (June 20, 2023), <https://gannett.com/pr/gannett-files-federal-lawsuit-against-google/> ("Google has monopolized market trading to their advantage and at the expense of publishers, readers and everyone else.")

¹²⁹ See. *Gannett Co., Inc. vs Google LLC and Alphabet Inc., No. 1:23-cv-05177* (June 20, 2023), <https://www.gannett.com/wp-content/uploads/2023/06/2023-06-20-01-Gannett-v.-Google-Complaint.pdf> ("Gannett brings this antitrust action for compensation and for injunctive relief to restore competition in the monopolized markets and safeguard news content for readers.")

¹³⁰ See. *Paloma Gaos v. Google, Inc., No. 5:10-cv-4809 EJD* (Mar. 29, 2012)

¹³¹ See. *Napoleon Patacsil v. Google, Inc., No. 3:18-cv-05062* (August 17, 2018)

¹³² See. *Rodrigues v. Google LLC, No. 20-cv-04688-RS* (January 3, 2024)

¹³³ See. *Chasom Brown et al. v. Google LLC, No. 4:20-cv-3664-YGR* (August 7, 2023)

¹³⁴ See. *Antitrust: Commission sends Statement of Objections to Google over abusive practices in online advertising technology* (June 14, 2023), https://ec.europa.eu/commissio_n/presscorner/detail/en/ip_23_3207 ("The Commission's preliminary view is therefore that only the mandatory divestment by Google of part of its services would address its competition concerns.")

¹³⁵ *Id* ("Favouring its ad exchange AdX in the way its ad buying tools Google Ads and DV360 place bids on ad exchanges. For example, Google Ads was avoiding competing ad exchanges and mainly placing bids on AdX, thus making it the most attractive ad exchange.")

body of laws that targets the dominance of online platforms directly. This is rooted in the observations that previous laws, such as data protection and competition law, have not been sufficiently agile to keep up with fast technological change¹³⁶. This matters because online platforms have become primary spheres for day-to-day life and should thus have similar protections for civil liberties as the offline sphere—but currently they are not. This has been highlighted, for example, by the genocide of the Rohingya Muslims that was spurred by the design of Facebook¹³⁷ or the addictive design of Instagram that hampers teens’ mental health¹³⁸.

In developing platform laws, the European Union has arguably been at the forefront. Some of its earliest legislative platform laws was the 2019 Business-to-Platform (B2P) regulation that aims to protect businesses using online platforms such as Amazon to sell their products¹³⁹. These rules were complemented by revised copyright rules that, for the first time, explicitly set out obligations for online platforms—such as YouTube—to implement measures to reduce the dissemination of illegal content¹⁴⁰.

In late 2022, the EU adopted two further platform laws: the Digital Services Act (DSA)¹⁴¹ and the Digital Markets Act (DMA)¹⁴². Both laws include a set of specific obligations for gatekeepers and online platforms. While the DMA tries to complement existing EU competition law, the DSA mainly aims at strengthening existing EU consumer protection laws. To this end, the DMA has several obligations to mitigate an abuse of market dominance, e.g. through interoperability and transparency requirements. Meanwhile, the DSA tries to make the moderation of content on online platforms and search engines more transparent and accountable and tackle the spread of hate speech and disinformation. Those online platforms and search engines that have 45 million monthly active users in the EU (about 10% of the population) are classified as Very Large Online Platforms (VLOPs) or

¹³⁶ Ursula von der Leyen, *A Union that strives for more. My agenda for Europe* (April, 2020), https://commission.europa.eu/system/files/2020-04/political-guidelines-next-commission_en_0.pdf (“...upgrade our liability and safety rules for digital platforms, services and products, and complete our Digital Single Market.”)

¹³⁷ Chad De Guzman, *Meta’s Facebook Algorithms ‘Proactively’ Promoted Violence Against the Rohingya, New Amnesty International Report Asserts* (September 28, 2022), <https://time.com/6217730/myanmar-meta-rohingya-facebook/> (“...Amnesty claims that Facebook’s algorithms “proactively amplified” anti-Rohingya content. It also alleges that Meta ignored civilians’ and activists’ pleas to curb hate-mongering on the social media platform while profiting from increased engagement.”)

¹³⁸ Nicole Westman, *Facebook’s whistleblower report confirms what researchers have known for years* (October 6, 2021), <https://www.theverge.com/2021/10/6/22712927/facebook-instagram-teen-mental-health-research> (“But for researchers who study social media, the internal study that sparked the controversy was mostly confirmation of what they already knew — that Instagram makes teen girls feel worse about their bodies, and that they blame the platform for anxiety, depression, and suicidal thoughts.”)

¹³⁹ See. *Regulation (EU) 2019/1150 of the European Parliament and of the Council of 20 June 2019 on promoting fairness and transparency for business users of online intermediation services* (20 June 2019), <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32019R1150>

¹⁴⁰ See. *Article 17, Official Journal of the European Union* (May 17, 2019), <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:2019:130:TOC>

¹⁴¹ See. *Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market for Digital Services and amending Directive 2000/31/EC (Digital Services Act)* (October 19, 2022), <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32022R2065>

¹⁴² See. *Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act)* (September 14, 2022), <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022R1925>

Search Engines (VLOSEs) and face stringent obligations¹⁴³. The DMA has a similar classification for gatekeepers, albeit with additional conditions¹⁴⁴. At the time of writing, Google Search, Google Play, Google Maps, and Google Shopping were classified as VLOPs or VLSE under the DMA¹⁴⁵. Meanwhile, Google Search, Google Maps, Google Play, Google Shopping, Google Ads, Google Chrome, and Android were classified as gatekeepers in their respective markets under the DMA¹⁴⁶.

Under both laws, substantial fines may be imposed for infringements. The DMA can levy fines up to 10% of a firm's global turnover¹⁴⁷. In cases of repeated infringements, fines can increase to as much as 20%. Meanwhile, the DSA can lead to fines of up to 6% of global turnover¹⁴⁸.

Platform regulation has also been considered in other countries. For example, the South Korean parliament, in 2021, passed a law that limits Apple and Google's ability to charge commission on transactions on the mobile app stores. Yet, so far, this law seems to have had limited effect and the responsible regulator threatened to impose fines on them¹⁴⁹. In the US, too, the debate around platform regulation is on top of the agenda. At the core of the debate are two important acts, Digital Services Oversight and Safety Act (DSOSA) and Communications Decency Act (CDA). While DSOSA aims to establish a Bureau of Digital Services Oversight and Safety at FTC to hold online companies accountable for their policies, internal processes, and safety features¹⁵⁰. On the other hand, discussion around CDA is centered around whether Section 230(c) of the Communications Decency Act (CDA)—which currently exempts online platforms from liability regarding shared content—should be revised¹⁵¹. The CDA was motivated by two conflicting court rulings, which disagreed over whether content intermediaries would face liability for the content that they distributed^{152,153}.

¹⁴³ *Supra* note 141. See Article 33

¹⁴⁴ *Supra* note 142. See Article 3

¹⁴⁵ See. *Digital Services Act: Commission designates first set of Very Large Online Platforms and Search Engines* (April 25, 2023), https://ec.europa.eu/commission/presscorner/detail/en/IP_23_2413

¹⁴⁶ See. *Digital Markets Act: Commission designates six gatekeepers* (September 6, 2023), https://ec.europa.eu/commission/presscorner/detail/en/ip_23_4328

¹⁴⁷ *Supra* note 142. See Article 30

¹⁴⁸ *Supra* note 141. See Article 42

¹⁴⁹ Kate Park, *Google, Apple face fines in South Korea for breaching in-app billing rules* (October 6, 2023), <https://techcrunch.com/2023/10/06/google-apple-face-fines-in-south-korea-for-breaching-in-app-billing-rules/> (“South Korea’s telecommunication regulator, the Korea Communications Commission (KCC), said Friday that it plans to levy fines on Google and Apple, which could total up to \$50.5 million, for violating the country’s in-app payment law.”)

¹⁵⁰ See. *Trahan Unveils Comprehensive Online Transparency Legislation* (February 22, 2022), <https://trahan.house.gov/news/documentsingle.aspx?DocumentID=2389> (“...unveiled the Digital Services Oversight and Safety Act (DSOSA), comprehensive transparency legislation to establish a Bureau of Digital Services Oversight and Safety at the Federal Trade Commission that would have the authority and resources necessary to hold powerful online companies accountable for the promises they make to users, parents, advertisers, and enforcers.”)

¹⁵¹ See. *47 U.S. Code § 230 - Protection for private blocking and screening of offensive material*, <https://www.law.cornell.edu/uscode/text/47/230>

¹⁵² See. *Stratton Oakmont, Inc. v. Prodigy Servs. Co., No. 1995 WL 323710* (N.Y. Sup. Ct. May 24, 1995), <https://casetext.com/case/stratton-oakmont-inc-v-prodigy-servs>

¹⁵³ See. *Cubby, Inc. v. CompuServe Inc., 776 F. Supp. 135* (S.D.N.Y. October 29, 1991), <https://law.justia.com/cases/federal/district-courts/FSupp/776/135/2340509/>

The CDA was challenged in the courts, but Section 230(c) has been upheld¹⁵⁴. Recently, a district court in Oakland, California, ruled against application of this immunity based on first amendment and Section 230(c)¹⁵⁵¹⁵⁶, which opens up possibility of further lawsuits against social media companies on the basis of content shared on these platforms.

3 GOOGLE'S CYCLICAL USE OF DOMINANCE

This section explores how Google uses its leading position across various markets to try to get an unfair advantage over its competitors, resulting in a vicious cycle where dominance in one market helps Google dominate the others as well. Specifically, we will explore how Chrome's leading position is used as a bridge between different markets to perpetuate Google's dominance. We will look at this flow of advantage in three different directions: from Google as a publisher to Chrome, from Chrome to Google as an advertiser/publisher, and from Google as an advertiser to Google as a publisher.

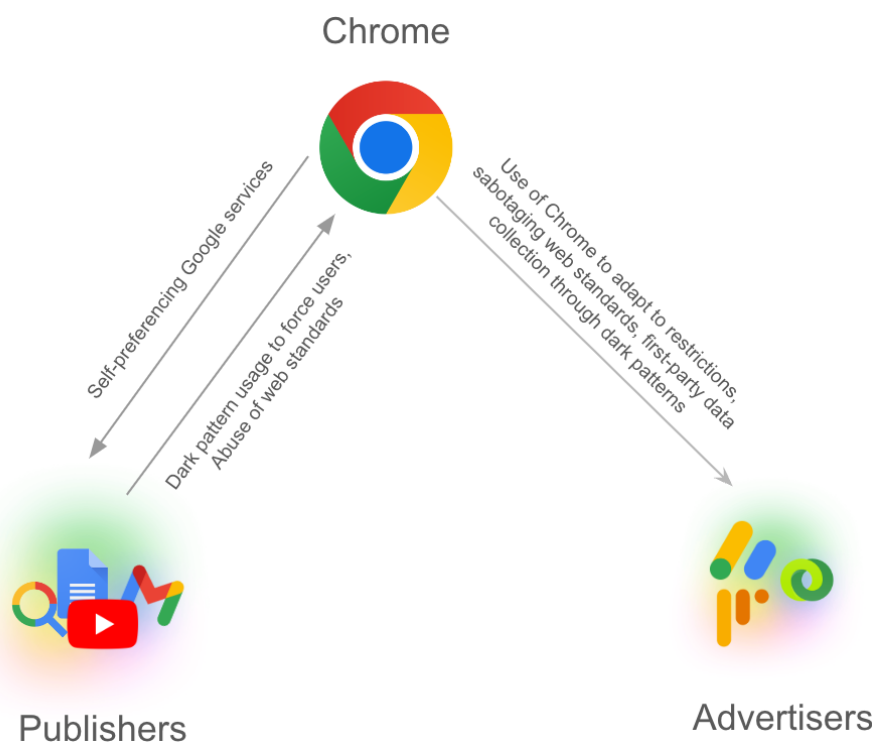


Figure 3 Google's dominance of browser, publisher, and advertising markets. Google abuses its position as a web browser market leader to augment its publishing and advertising business, while its publisher business works to increase Chrome's market share.

¹⁵⁴ See. *Reno v. American Civil Liberties Union*, 521 U.S. 844 (June 26, 1997), <https://supreme.justia.com/cases/federal/us/521/844/>

¹⁵⁵ See. *ORDER GRANTING IN PART AND DENYING IN PART DEFENDANTS' MOTIONS TO DISMISS* (4:22-md-03047-YGR) (November 14, 2023), <https://www.cand.uscourts.gov/wp-content/uploads/2023/11/YGR-Order-Granting-in-Part-and-Denying-in-Part-Defendants-Motions-to-Dismiss.pdf> ("By way of summary, the Court finds that the parties' "all or nothing" approach to the motions to dismiss does not sufficiently address the complexity of the issues facing this litigation.")

¹⁵⁶ Jonathan Stempel and Nate Raymond. *Social media companies must face youth addiction lawsuits, US judge rules* (November 14, 2023), <https://www.reuters.com/legal/judge-says-social-media-companies-must-face-lawsuits-over-harm-children-2023-11-14/> ("In her 52-page ruling, opens new tab, Rogers rejected arguments that the companies were immune from being sued under the U.S. Constitution's First Amendment and a provision of the federal Communications Decency Act.")

3.1 What are publishers and advertisers?

Throughout this section, we distinguish between Google as an advertiser and Google as a publisher. To understand Google's overreach across different markets, it is important to understand the difference between these two terms. We define a publisher as a first-party website or application which is visited by a user to gain access to a particular service or functionality. For example, when a user visits Google Search or Google Maps, Google is acting as a publisher and providing the user with a search and navigation functionality respectively.

On the other hand, an advertiser, in partnership with a publisher, shows the visiting users' advertisements to attract the user towards other publishers or services which closely relate to either user's interests or user's recent activities. For example, while visiting BBC's website, a user might see advertisements to purchase sports shoes. While the advertisement shows a sport shoe company, it is shown to a user through a third-party advertising company such as Google Ads, which performs the technical labor involved in identifying user, their interests/activities and delivering the actual advertisement on the BBC website.

In this section, we show that Google is not only a dominant force as both a publisher and advertiser, but it uses its dominance in browser market share to further solidify its position and gain unfair advantage over its competitors and vice versa; resulting in a vicious cycle of Google's dominance across multiple markets.

First, we show how Google uses its publisher market share to coerce users into switching to Chrome.

3.2 Flow of dominance from publisher to browser market

Google is a dominant publisher in several different key areas, these include, but are not limited to, search, navigation, video streaming, and email. Google makes use of this dominant position to push users towards using its Chrome browser, solidifying its position as a browser market leader. It achieves this through use of dark patterns and abuse of web standards.

3.2.1.1 Dark pattern usage by Google to force users to switch to Chrome.

To push users towards Chrome, Google employs user interface strategies—often termed “dark patterns” or “deceptive patterns”^{157,158}—to encourage a switch to Google Chrome.

Google's employment of coercive user interface tactics (dark patterns) to nudge users towards Chrome is evident through persistent prompts across its services. Users of non-Chrome browsers are frequently met with pop-ups recommending Chrome installation when they visit Google services like Search and Docs. These prompts, designed to be unavoidable

¹⁵⁷ See. *What are deceptive patterns*, <https://www.deceptive.design> (“Deceptive patterns (also known as “dark patterns”) are tricks used in websites and apps that make you do things that you didn't mean to, like buying or signing up for something.”)

¹⁵⁸ Eric Ravenscraft, *How to Spot—and Avoid—Dark Patterns on the Web* (July 29, 2020), <https://www.wired.com/story/how-to-spot-avoid-dark-patterns/> (“The term “dark patterns” was first coined by UX specialist Harry Brignull to describe the ways in which software can subtly trick users into doing things they didn't mean to do, or discouraging behavior that's bad for the company.”)

and recurring, even permeate into the user experience of Google services accessed through competitors' browsers, such as Microsoft Edge, where users might find suggestions to switch to Chrome within their email notifications. Figure 6 shows an example of how an email from Google looks when you view it from another browser.

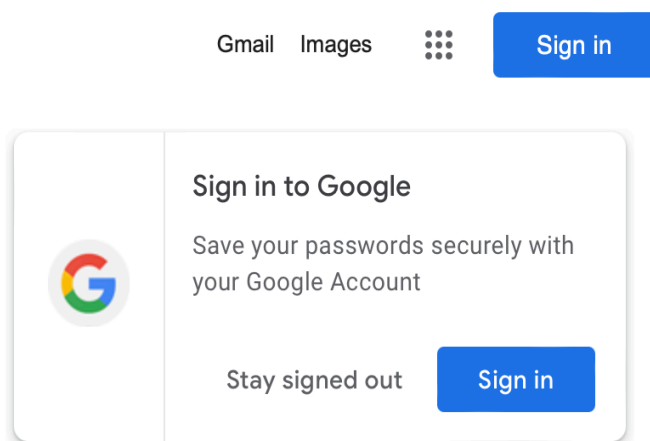


Figure 4 Visiting Google Search on any browser results in a suggestion to sign in to Google.

While Microsoft engages in similar practices by promoting Edge within its Bing search engine, Edge holds a modest market share of 5%¹⁵⁹, which does not confer the same level of market dominance.

The persistent push from both Google and Microsoft to direct users to their respective services (See Figures Figure 5Figure 6Figure 7Figure 8) underscores the substantial economic value derived from user data and the promotion of proprietary digital services. With the release of Chrome 69 in 2018, users found themselves automatically signed into the

browser when accessing Google services like YouTube and Gmail¹⁶⁰, a design choice that was somewhat mitigated in Chrome 70 by offering an opt-out¹⁶¹. Yet, the default setting persists, and most users tend to stick with defaults¹⁶², resulting in Google obtaining larger amount of data from users who use Chrome to visit their services vs other browsers.

Furthermore, Chrome's synchronization feature, which allows seamless access to browsing history, open tabs, passwords, and more across devices, tends to lock users into the Chrome ecosystem on all their devices. This synchronized sign-in mechanism across multiple devices enables Google to track user activities more effectively and tailor advertisements, thus boosting ad revenue potential. Therefore, from an advertising and data perspective, a Chrome user inherently offers more value to Google than a user of any other browser, irrespective of the latter's default search engine.

¹⁵⁹ See. *Global Desktop Browser Market Share*, <https://kinsta.com/browser-market-share/>

¹⁶⁰ Mathew Green, *Why I'm done with Chrome* (September 23, 2018), <https://blog.cryptographyengineering.com/2018/09/23/why-im-leaving-chrome/> ("From now on, every time you log into a Google property (for example, Gmail), Chrome will automatically sign the browser into your Google account for you. It'll do this without asking, or even explicitly notifying you.")

¹⁶¹ Zach Koch, *Product updates based on your feedback* (September 26, 2018), <https://blog.google/products/chrome/product-updates-based-your-feedback/> ("We've heard—and appreciate—your feedback. We're going to make a few updates in the next release of Chrome (Version 70, released mid-October) to better communicate our changes and offer more control over the experience.")

¹⁶² Geoffrey A. Fowler, *Google spent \$26 billion to hide this phone setting from you* (November 8, 2023), <https://www.washingtonpost.com/technology/2023/11/08/google-search-default-iphone-samsung/> ("We're getting an inside view of how Google exploits this behavioral science, sometimes called the "power of defaults." The idea is that defaults can nudge people's choices one way or another, because most people are too distracted or confused to change them.")

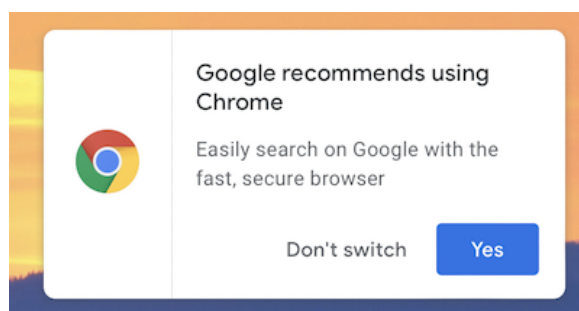


Figure 5 Pop-up on Google service, suggesting user to switch to Chrome.

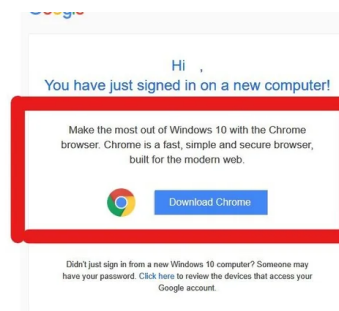


Figure 6 Email after logging in to Google in Microsoft Edge browser.

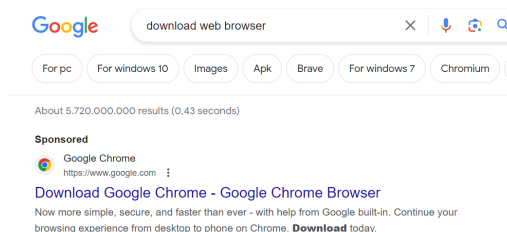


Figure 7 Google Ad on Google Search promoting Google Chrome, with no visual distinction from other search results.

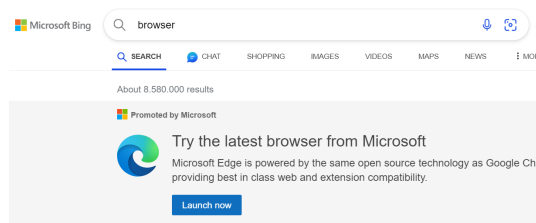


Figure 8 Microsoft promoting Edge in Bing. In contrast to Google Search, the ad does not have the format of usual ads on Bing,

Further, Google leverages its advertising dominance to promote its Chrome browser directly through its search engine. When users search for “web browser” on Google Search, they are often met with a top-placed Google Ad advocating for Chrome. This scenario illustrates a circular flow of funds within Google’s corporate structure: the company effectively pays itself to ensure Chrome’s ad outbids competitors on its own search platform. As these internal transactions occur within Google’s subsidiaries, the company possesses the capacity to consistently outspend other advertisers, forfeiting only the potential ad revenue from the next highest bid.

This strategy raises significant competitive concerns, particularly since Google is the default search engine on other major browsers like Safari and Firefox. Users on these platforms encounter the same Google-centric ads when searching for web browsers, subtly nudging them towards Google’s browser. Such practices underscore the intricate ways in which Google can use its integrated business model to maintain and extend its market influence, potentially at the expense of fair competition and consumer choice.

3.2.1.2 Abuse of web standards.

Google’s strategy to force users to switch to Chrome extends to promoting proprietary standards that are not widely adopted by other browsers or the tech community. A pertinent

case is Google's acquisition and development of Widevine DRM¹⁶³, a digital rights management solution for premium media content¹⁶⁴. Widevine's compatibility issues have recurrently resulted in subpar user experiences across various media platforms. A notable instance occurred in 2017 when Spotify updated its web player to incorporate Widevine DRM. This update led to Safari users encountering messages suggesting they switch browsers or download the Spotify mobile app¹⁶⁵¹⁶⁶¹⁶⁷, illustrating how Google's control over key technologies can indirectly compel users to migrate to its products, such as Chrome, to avoid disruptions in service. This practice not only highlights Google's influence over web standards but also raises questions about its impact on user choice and market competition.

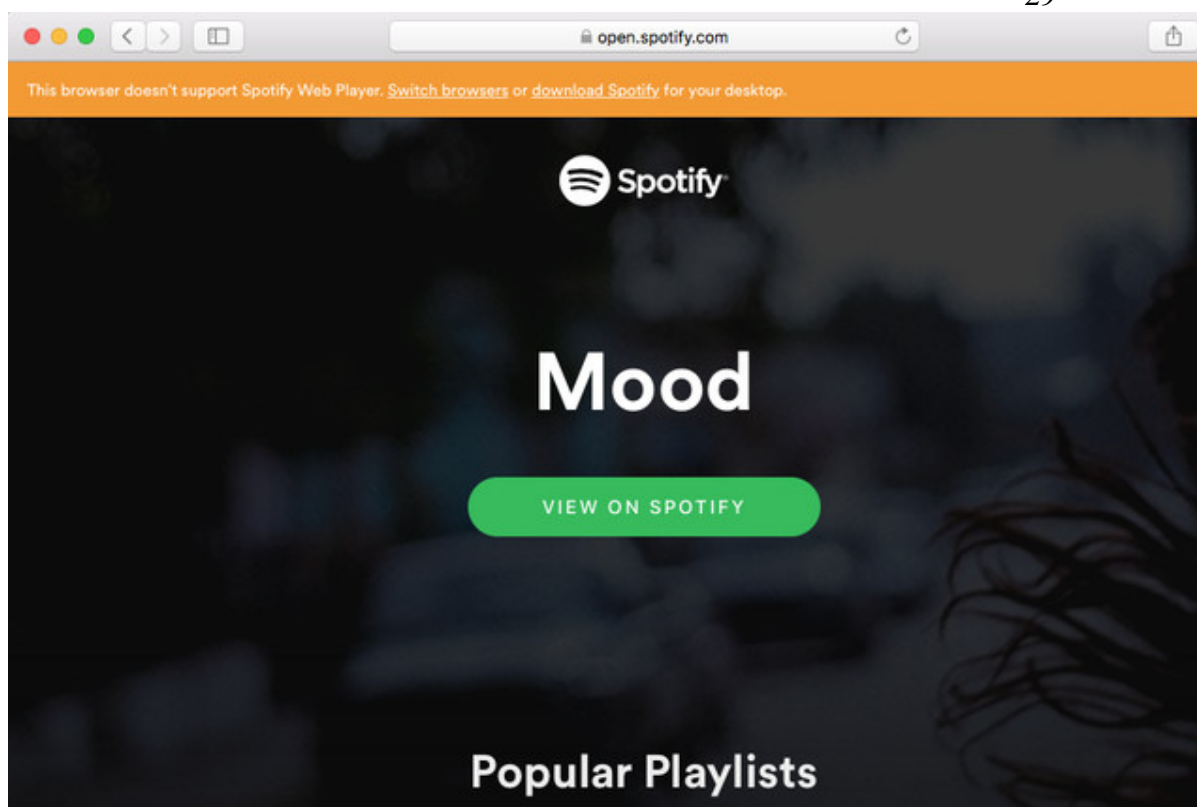
¹⁶³ See. *Widevine Technologies acquired by Google* (December 3, 2010), <https://www.crunchbase.com/acquisition/google-acquires-widevine--1d323873> ("Acquired Organization: Widevine, Acquiring Organization: Google, Price: \$160M")

¹⁶⁴ See. *Digital Rights Management (Overview)*, <https://developers.google.com/widevine/drm/overview> ("Widevine DRM is Google's content protection system for premium media. It is used by major partners around the world such as Google Play, YouTube, Netflix, Disney+, Amazon Prime Video, HBO Max, Hulu, Peacock, Discovery+, Paramount+ and many more.")

¹⁶⁵ See. *Safari No Longer Supported??!*, <https://community.spotify.com/t5/Other-Podcasts-Partners-etc/Safari-No-Longer-Supported/td-p/1975103> ("Apparently it has something to do with the Google Widevine content decryption module, which Apple doesn't support because it's not very secure. I tried enabling the Widevine plugin and got the attached message. Looks like Apple is having a pissing contest with Google, Spotify, and anyone else who uses Widevine. In the meantime, we users are caught in the crossfire.")

¹⁶⁶ See. *Spotify Web Player no longer supports Safari as they move to use Widevine CDM in Web Player. Music DRM in your browser??!*, <https://linustechtips.com/topic/833410-spotify-web-player-no-longer-supports-safari-as-they-move-to-use-widevine-cdm-in-web-player-music-drm-in-your-browser/> ("Spotify recently moved their recently updated Web Player to use Widevine CDM, a controversial mechanism aimed at combating piracy. Widevine CDM has been supported in Edge, Firefox, Chrome, and Opera for a while. Apple hasn't implemented Widevine into Safari as of this yet and thus Safari users will be unable to play back content in Spotify Web Player.")

¹⁶⁷ Andrew Liptak, *Spotify's Web Player no longer works on Safari* (September 10, 2017), <https://www.theverge.com/2017/9/10/16283494/spotify-web-player-safari-browser-support-apple> ("The company's system requirements page now states that it only supports Chrome, Firefox, Edge, and Opera.")



Over time, Google’s use of non-standard APIs has led to several instances where certain services or websites were optimized exclusively for Chrome. Services such as Google Meet¹⁶⁸, Google Earth¹⁶⁹, and YouTube TV¹⁷⁰ were initially accessible only through Chrome, or certain features were exclusively available on this browser. This preferential treatment is not confined to Google’s own services; other companies like Airbnb¹⁷¹¹⁷² have also been observed recommending users to switch to Chrome for an optimized experience. Chrome’s dominant share in the browser market explains why such companies prefer to develop only for one browser. This approach effectively discriminates against other browsers, underscoring a broader concern about Google’s influence in shaping user choices and reinforcing its own market position at the potential expense of fair competition and browser diversity.

¹⁶⁸ Rajesh Pandey, *Google Meet’s new picture-in-picture mode for Chrome is almost an app of its own* (June 9, 2023), <https://www.androidpolice.com/google-meets-new-pip-mode-chrome-almost-an-app/> (“Google is taking advantage of the new Document Picture-in-Picture API, which first debuted with Chrome 111, to deliver enhanced picture-in-picture capabilities in Google Meet. Sadly, this also means you must use Chrome to enjoy the improvements, as the API is not available on other browsers.”)

¹⁶⁹ Rich McCormick, *Redesigned Google Earth brings guided tours and 3D view to Chrome browsers and Android devices* (April 18, 2017), <https://www.theverge.com/2017/4/18/15337646/google-earth-redesign-update-guided-tours> (“The revamped Google Earth — which the company says was two years in the making — is now available in Chrome or on Android, and will be coming to iOS and other browsers in the future.”)

¹⁷⁰ Chaim Gartenberg, *YouTube TV now works in Firefox* (April 5, 2018), <https://www.theverge.com/2018/4/5/17203192/youtube-tv-google-firefox-browser-support-chrome-update-streaming> (“Google is expanding YouTube TV to support Firefox, as spotted by YourTechExplained, marking the first browser to work with Google’s over-the-top streaming service that isn’t Chrome (which you’ll recall is also owned by Google.)”)

¹⁷¹ See. <https://twitter.com/AirbnbHelp/status/752829250198245376>

¹⁷² See. <https://twitter.com/AirbnbHelp/status/752829250198245376>



Hi Rustram. We'd always recommend that you use Google Chrome to browse the site: we've optimised things for this browser. Thanks.



We are sorry about this. Safari is not a good browser to use with our website. Google Chrome work better with our website or you can download the app.

The issue of websites favoring Chrome to the exclusion of other browsers has become pervasive enough to prompt Mozilla to create Webcompat.com¹⁷³. This platform is dedicated to users reporting websites that lack cross-browser compatibility. Predominantly, the complaints lodged on this site pertain to websites functioning exclusively with Chrome. Prominent examples include Microsoft Teams¹⁷⁴ and Snapchat¹⁷⁵, where users are prompted to switch to Chrome to access certain features like video calling. Over time, Webcompat.com has amassed numerous reports of websites that are solely operational with Chrome^{176,177,178}, highlighting a growing trend that raises significant concerns about browser diversity and the principles of an open and competitive web.

¹⁷³ See. <https://webcompat.com/about> (“Webcompat.com is developed by volunteers and supported by Mozilla. This site is an open invitation for all web users, developers, and browser vendors to get involved in the web compatibility effort. Our goal is to make it easy to report and view compatibility problems for any part of the web.”)

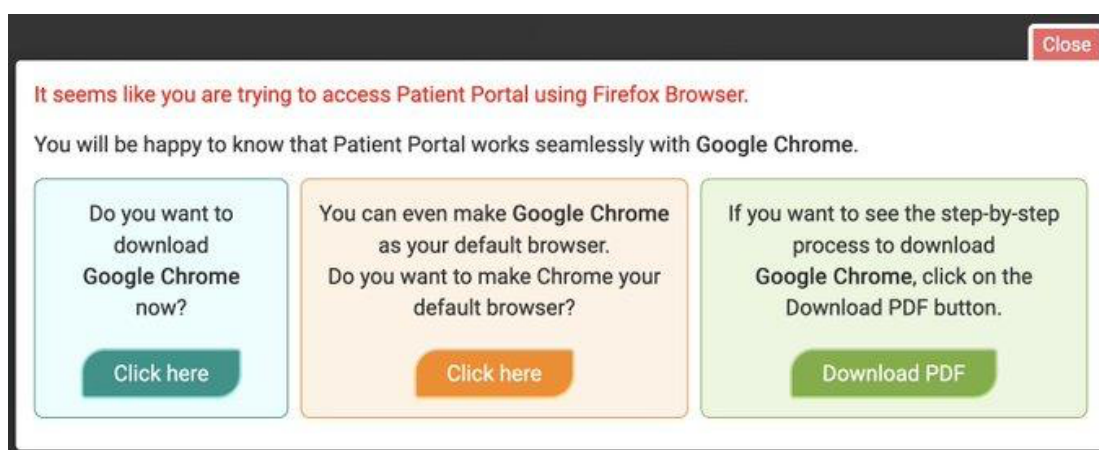
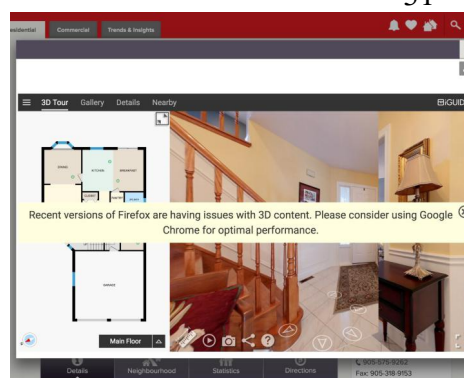
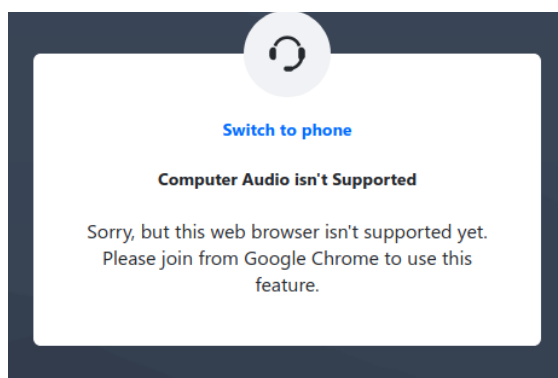
¹⁷⁴ See. teams.microsoft.com - *Video calls only enabled for Chrome & Edge* (January 29, 2019), <https://webcompat.com/issues/25070> (“Video calls on MS Teams only work in Chrome, Edge or the Desktop App (aka an Electron wrapper)”)

¹⁷⁵ See. web.snapchat.com - *Browser unsupported* (July 19, 2022), <https://webcompat.com/issues/107613> (“Snapchat for web says only chrome and edge are supported...this is so rude!”)

¹⁷⁶ See. www.realtor.ca - *Site says issues with 3D content in Firefox, recommends Chrome* (September 18, 2018), <https://webcompat.com/issues/18922> (Site says issues with 3D content in Firefox, recommends Chrome)

¹⁷⁷ See. [GoToMeeting](https://www.gotomeeting.com) - *Firefox browser is unsupported* (January 13, 2021), <https://webcompat.com/issues/65496> (Site says this web browser isn't supported yet. Please join from Google Chrome...)

¹⁷⁸ See. [\[subdomain\].insynchcs.com](https://www.insynchcs.com) - *"please use Chrome" banner shown* (May 19, 2022), <https://webcompat.com/issues/104596> (The site shows a "please use Chrome" banner. This can be dismissed, but it's very intrusive.)



The recurrent issues of browser incompatibility stem largely from Chrome's reliance on non-standard APIs, the subsequent use of those APIs by Google owned services, and the influence on web developers to prioritize Chrome due to its substantial market share. This prioritization often results in subpar or non-functional experiences for users of other browsers, presenting them with a stark choice: either contend with these limitations or switch to Chrome for a smoother experience¹⁷⁹. Most users, opting to avoid the inconvenience, choose the latter. This trend further entrenches Chrome's dominance in the web browser market, highlighting how Google uses its dominant position in the publisher market to force users to switch to Chrome.

3.3 Flow of dominance from browser to advertiser/publisher market

In this section, we discuss how Google uses Chrome to dominate both advertiser and publisher markets.

3.3.1 From browser to advertiser market

Before discussing how Google uses Chrome to dominate its advertising business, it is important to understand the distinction between third- and first-party data collection, and how it affects online advertisers.

¹⁷⁹ Tom Warren, *Chrome is turning into the new Internet Explorer 6* (January 4, 2018), <https://www.theverge.com/2018/1/4/16805216/google-chrome-only-sites-internet-explorer-6-web-standards> (“Either way, Chrome now has the type of dominance that Internet Explorer once did, and we’re starting to see Google’s own apps diverge from supporting web standards much in the same way Microsoft did a decade and a half ago.”)

3.3.1.1 Difference between a first-party and a third-party data collector

An online website typically utilizes two distinct types of resources: first-party and third-party. These resources can encompass elements like JavaScript code, images, and videos, and are differentiated by their source domain¹⁸⁰. For instance, on a website such as nytimes.com, resources that originate from the same domain (nytimes.com) are considered first-party. In contrast, resources from a different domain, like doubleclick.net (advertising company acquired by Google), are deemed third-party. The classification as first-party or third-party has significant implications for the privileges granted to these resources within a webpage. One key privilege is the capability to store information, often in the form of cookies, in a user's web browser. Cookies set directly by the domain the user is visiting are termed first-party cookies, whereas those set by external, third-party domains are referred to as third-party cookies¹⁸¹.

Third-party cookies play a crucial role for advertisers because they allow a user to be recognized across all websites where the third-party is active. Taking the previous example of doubleclick.net, imagine it places a cookie with a unique user identifier on nytimes.com. The same identifier can then be picked up by doubleclick.net when the same user visits another website, like washingtonpost.com, if it also uses resources from doubleclick.net. This identifier would then enable third-party websites to follow and record a person's online behavior across various websites, including which sites they visit, the actions they take on those sites, and the amount of time they spend on each site. Consequently, this information is used by advertisers to determine the interests of a user and display relevant advertisements.

Concerns about privacy and the tracking capabilities of third-party cookies have prompted major browsers to act; Safari began imposing restrictions in 2017¹⁸² and fully blocked them by 2020¹⁸³, while Firefox initiated limitations in 2018¹⁸⁴ and followed with a complete block in 2022¹⁸⁵. In response, some advertisers and tracking companies have started

¹⁸⁰ See. *What are 3rd Party Scripts?*, <https://supreme.justia.com/cases/federal/us/521/844/> (“Third-party scripts are often JavaScript code used to add additional functionality or features to a website or application, such as tracking analytics, displaying ads, or providing social media integration. It is also used to leverage code that has been developed and tested by others rather than having to write it from scratch.”)

¹⁸¹ See. *Client-side Storage* (September, 2001), <https://www.w3.org/2001/tag/2010/09/ClientSideStorage.html> (“The most important use of cookies however, and the most controversial, is to use cookies for tracking where you go and what you do there. These are typically used by advertising sites, but you do not visit any of the advertising websites, so how can they get their cookies into your local storage? If you look at the cookies stored on your machine you will probably find cookies from DoubleClick, a site that tracks what ads you look at. This happens because a search engine you used has a relationship with DoubleClick and allows it to set cookies in your local storage. These are called third-party cookies.”)

¹⁸² Wilander. *Supra note 60* (“Intelligent Tracking Prevention is a new WebKit feature that reduces cross-site tracking by further limiting cookies and other website data.”)

¹⁸³ Wilander. *Supra note 62* (“Cookies for cross-site resources are now blocked by default across the board. This is a significant improvement for privacy since it removes any sense of exceptions or “a little bit of cross-site tracking is allowed.”)

¹⁸⁴ Nick Nguyen, *Latest Firefox Rolls out Enhanced Tracking Protection* (October 23, 2018), <https://blog.mozilla.org/en/products/firefox/latest-firefox-rolls-out-enhanced-tracking-protection/> (“With today's Firefox release, users will have the option to block cookies and storage access from third-party trackers. This is designed to effectively block the most common form of cross-site tracking.”)

¹⁸⁵ *Supra note 63* (“Any time a website, or third-party content embedded in a website, deposits a cookie in your browser, that cookie is confined to the cookie jar assigned to only that website.”)

to pivot towards first-party cookies. Unlike third-party cookies¹⁸⁶, creating a first-party cookie as a third-party requires cooperation with the site owner and the execution of privileged JavaScript in a first-party context. This approach necessitates a high degree of trust from the website owner towards the third party¹⁸⁷, incurs higher costs, and demands a time investment from both parties. These barriers make it challenging for many advertisers to transition to first-party cookies. Later in this section, we will discuss how Google capitalizes on this complex situation to their advantage.

Google is one of the biggest advertiser and analytics service provider¹⁸⁸. This section finds that Google's command over the browser market, particularly with Chrome, has enabled it to implement policies, establish controls, and set standards that disproportionately advantage its own advertising and analytics services, while not affording the same benefits to its competitors and limiting their market access over time.

3.3.1.2 Google's third-party services

Google administers two main third-party services: Google Ads and Google Analytics. Google Ads enables website publishers to display advertisements on their sites¹⁸⁹. By integrating a provided code snippet into their website, publishers grant Google the ability to gather user data and display targeted ads based on user behavior and interests. This integration allows Google to act as a first-party, which comes with privileges such as reading and writing first-party data such as cookies. This data may encompass pages visited and links clicked by the user, with each user being assigned a distinct identifier, allowing Google Ads to aggregate this information at the individual level¹⁹⁰. Similarly, Google Analytics is embedded into websites using a code snippet from

Google¹⁹¹, which leverages user data to offer comprehensive insights into the volume and nature of traffic a website receives¹⁹². Recent data suggests that Google Ads is utilized by

¹⁸⁶ Setting a third-party cookie can be as easy as embedding an image on a website. This is why tracking scripts are sometimes referred to as “pixels”, even though they are usually more complex than just images these days and include sophisticated fingerprinting techniques. For information on the Meta/Facebook pixel, see <https://www.facebook.com/business/tools/meta-pixel>

¹⁸⁷ Granting the third-party extensive access to first-party storage and other sensitive data presents security and privacy risks. Running in a privileged first-party context, third-party scripts could, for example, easily exfiltrate confidential information on the given website. For example, an adversary third-party script could potentially make a copy of the other first-party cookies and thereby log in to a website as the current user. *See* Marius Musch et. al, *ScriptProtect: Mitigating Unsafe Third-Party JavaScript* (July 2, 2019), <https://dl.acm.org/doi/abs/10.1145/3321705.3329841> (“The downside of inclusion of cross-origin JavaScript resources in Web applications is that such external code runs in the same context and with the same privileges as the first-party code. Thus, all potential security problems in the code directly affect the including site.”)

¹⁸⁸ Tim Wambach and Katharina Bräunlich, *The Evolution of Third-Party Web Tracking* (February 18, 2017), https://link.springer.com/chapter/10.1007/978-3-319-54433-5_8 (“...73% of all analyzed websites are covered by the top three of the most included third party trackers from 2015: according to Table 4 these are google-analytics.com, doubleclick.net, and facebook.net.”)

¹⁸⁹ *See* <https://support.google.com/google-ads/answer/6349091?hl=en>

¹⁹⁰ *See* <https://support.google.com/google-ads/answer/9199250?hl=en> (“These segments that use User ID are eligible for targeting across Google properties, including Search, Shopping, and YouTube.”)

¹⁹¹ *See* <https://support.google.com/analytics/answer/9304153?hl=en#zippy=%2Cweb%2Cadd-the-tag-to-a-website-builder-or-cms-hosted-website-eg-hubspot-shopify-etc%2Cadd-the-google-tag-directly-to-your-web-pages> (“On the screen, you’ll see the JavaScript snippet for your account's Google tag...”)

¹⁹² *See* <https://support.google.com/analytics/answer/12159447?hl=en> (“Every time a user visits a webpage, the tracking code will collect pseudonymous information about how that user interacted with the page.”)

about 50% of all websites¹⁹³, and Google Analytics by about 55%¹⁹⁴.

Table 1 Companies' presence with first-/third-party cookies. Sorted by first-party cookie prevalence.

Organization	Percentage of sites with first-party cookies	Percentage of sites with third-party cookies
Google LLC	80.74	73.78
Facebook, Inc.	26.23	5.09
Microsoft Corporation	15.78	22.83
Amazon Technologies, Inc.	8.64	10.26
Hotjar Ltd	8.26	0.04
Yandex LLC	6.63	8.32
OneTrust LLC	6.11	0.11
Criteo SA	5.88	11.06
Twitter, Inc.	5.05	10.63
Quantcast Corporation	3.95	9.82
ByteDance Ltd.	3.93	4.30
HubSpot, Inc.	3.70	3.58
Adobe Inc.	3.28	16.89
Oracle Corporation	3.10	13.39
Pinterest, Inc.	3.00	3.13
Baidu, Inc.	2.41	2.60
Salesforce.com, Inc.	2.08	7.13
ID5 Technology Ltd	2.07	6.72
Lotame Solutions, Inc.	2.01	8.47
Taboola, Inc.	1.82	7.13

3.3.1.3 Use of Chrome to adapt to privacy restrictions.

Historically, publishers have incorporated Google's services into their websites as third-party scripts, enabling the setting of third-party cookies to store user identifiers across various domains. Concerns over privacy implications of allowing anyone to set these third-party

¹⁹³ See. *Usage statistics and market share of Google Ads for websites*, <https://w3techs.com/technologies/details/ad-google> ("Google Ads is used by 99.0% of all the websites whose advertising network we know. This is 50.3% of all websites.")

¹⁹⁴ See. *Usage statistics and market share of Google Analytics for websites*, <https://w3techs.com/technologies/details/ta-googleanalytics> ("Google Analytics is used by 84.7% of all the websites whose traffic analysis tool we know. This is 54.6% of all websites.")

cookies, and subsequently track user activity across different sites, has resulted in widespread criticism of third-party cookies. Due to these valid concerns, Firefox and Safari recently blocked third-party cookies.

As described earlier in section 2.1, Chrome was initially hesitant to enact the same privacy protections as its peer browsers. After initially dragging feet on third-party cookies, Google Chrome revealed its intention to phase out third-party cookies as well¹⁹⁵¹⁹⁶, introducing the Privacy Sandbox initiative in early 2020. There are indications that Google had been advocating for the adoption of first-party cookies within its analytics and advertising tools as early as 2018¹⁹⁷¹⁹⁸. While first-party cookies cannot directly be used to identify users in a similar fashion to third-party cookies, Google's documentation provides evidence that their first-party cookies, in combination with other information channels such as URL parameters, can be used for cross-domain measurement of a user's activity¹⁹⁹. This shift and use of first-party cookies by Google signals that the hesitation by Chrome was in part due to Google's reliance on third-party cookies and the subsequent shift in rhetoric could be due to Google's successful shift to first-party cookies.

This shift towards first-party cookies is also visible in some other places in Chrome. In Chrome version 112, Google updated the cookie settings page to remove the option to block all cookie. The option allowed users to block both first- and third-party cookies. However, in the new settings page for cookies, only third-party cookies can be blocked. The removal of the explicit option to block all cookies can be interpreted as a strategic move by Google to discourage users from opting for a more restrictive cookie policy that would impede the functionality of first-party cookies. First-party cookies are integral to Google's business model, as they enable the company to collect vast amounts of user data directly from its services, including the Chrome browser. This data is invaluable for refining Google's targeted advertising algorithms, which represent the core of its revenue stream.

¹⁹⁵ Frederic Lardinois, *Google wants to phase out support for third-party cookies in Chrome within two years* (January 14, 2020), <https://techcrunch.com/2020/01/14/google-wants-to-phase-out-support-for-third-party-cookies-in-chrome-within-two-years/> (“Google today announced its plans to phase out support for third-party cookies in Chrome within the next two years.”)

¹⁹⁶ Schuh. *Supra note 73* (“... we plan to phase out support for third-party cookies in Chrome.”)

¹⁹⁷ *See*. 2:52. https://www.youtube.com/watch?v=8qvyP_7-PnA (“... in the near future, first-party cookies will be the way to go in the industry.”)

¹⁹⁸ *See*. *Allow & block ads. Ad serving settings*, <https://web.archive.org/web/20201027223352/https://support.google.com/adsense/answer/3234887?hl=en> (“Choose whether or not you want to allow first-party cookies from Google on your site... Allowing first-party cookies from Google may increase your revenue because it enables features like frequency capping on ads and allows ads with a frequency cap to serve on your site.”)

¹⁹⁹ *See*. [GA4] *Set up cross-domain measurement*, <https://support.google.com/analytics/answer/10071811?hl=en> (“With cross-domain measurement, the cookies retain the same IDs as they are passed from one domain to another via a URL parameter (`_gl`) when the user navigates between domains through a link or a form. As a result, Analytics identifies just one user and one session.”)

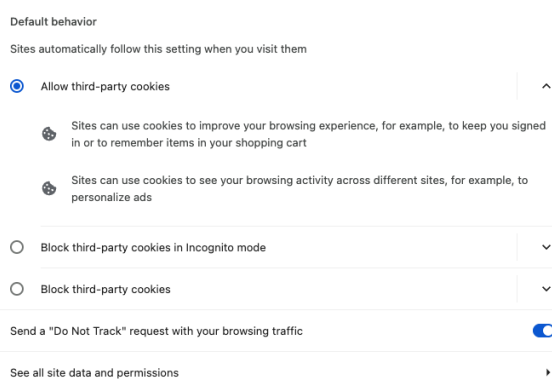


Figure 9 New cookie settings in Google Chrome, with the option to block all cookies missing.

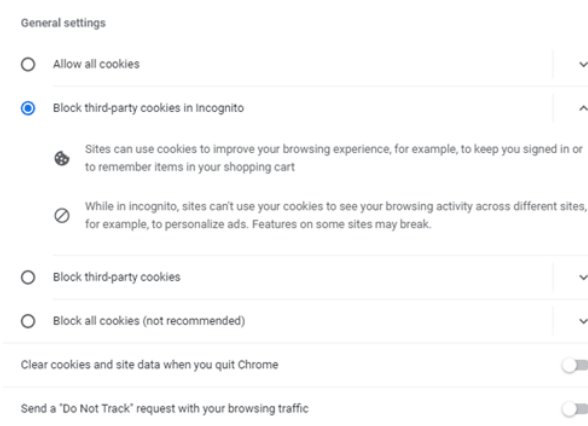


Figure 10 Older cookie settings in Google, which allowed users to block all cookies, including first-party cookies.

Another interesting aspect of Google’s transition to first-party cookies is the speed of transition. As we mentioned earlier, transitioning to first-party cookies requires a third-party to establish a level of trust with the website publisher, due to the potential risks such as identity theft or other malicious activities if the third-party has access to the first-party context. Leveraging its substantial market share and established relationships with publishers, there is evidence to suggest that Google has moved relatively swiftly to adopt first-party cookies across a vast array of websites. Recent research analyzing the use of first-party cookies across a sample of 20,000 websites from the top 100,000 most-visited sites revealed that Google has implemented first-party cookies on approximately 70% of these websites²⁰⁰. Notably, Google owns six out of the top ten domains that were identified as setting first-party cookies in this sample.

Table 1 shows the deployment of first-party cookies by various organizations. Google is prominently reliant on first-party cookies, significantly outpacing its competitors. For instance, Facebook, which has the second-largest footprint in terms of first-party cookie use, still only achieves less than a third of Google’s extensive reach and presence. Other competitors, including Criteo, Adobe, Yandex, and Oracle, predominantly utilize third-party cookies. These competitors face the biggest threat in the case of complete third-party cookie blockage. On the other hand, any restrictions on third-party cookies by Google Chrome or other web browsers is now unlikely to substantially affect Google’s capacity for user tracking. It shows that Google was able to use its dominance in browser market to a) effectively sidestep any considerable impact on its advertising business by delaying third-party cookie blockage, and b) is now in prime position to leverage its browser market share against its advertising competitors.

As explored in Section 2.2.2.2, the CMA came to the same conclusion after scrutiny of Google’s proposed elimination of third-party cookies and its planned introduction of the

²⁰⁰ Shaoor Munir et. al, *CookieGraph: Understanding and Detecting First-Party Tracking Cookies* (November 21, 2023), <https://dl.acm.org/doi/10.1145/3576915.3616586> (“Two major advertising entities (Google and Facebook) set first-party ATS cookies on approximately a third of all sites in our dataset. CookieGraph detects `_gid` and `_ga` cookies by Google Analytics as ATS on 62.63% and 53.27% of the sites.”)

Privacy Sandbox. The CMA’s findings suggest that these changes, as they stand, would significantly harm Google’s competitors who rely on third-party cookies—at least in the short-run as Google’s competitors adapt their strategies²⁰¹. Furthermore, Google’s suggested alternatives to third-party cookies were deemed insufficient for rival advertisers and analytics services. The CMA highlighted that the transition period was not adequate for competitors to adapt without incurring substantial revenue losses, indicating up to a 70 percent decline in revenue following the restriction of third-party cookies. Notably, Google has postponed the phasing out of third-party cookies compared to its peers like Firefox and Safari.

A notable development in Google’s suite of mitigation measures is the Topics API²⁰², which categorizes a user’s interests into general themes or “Topics.” Google’s internal assessments indicate that implementing the Topics API would only result in a revenue decrease of 1–3% for its entities that previously relied on third-party cookies. Currently, under a mandate from the CMA, Google Chrome is collaborating with other advertising and analytics entities to assess the Topics API’s efficacy²⁰³. Evaluations by Audience X and Criteo, companies dependent on third-party cookies, hold that the API is, so far, an inadequate substitute. Audience X’s²⁰⁴ analysis suggests that the Topics API lacks the specificity of third-party cookies, underscoring the increased value of first-party data for website operators and advertisers, so much so that “website owners and advertisers will need to put a premium on acquiring and managing first-party data.” Criteo’s trial²⁰⁵ with approximately one million users revealed that their interest-based audiences are “five times more relevant than those generated by this first iteration of the Topics API”. However, Criteo also noted that the Topics API’s effectiveness could be enhanced when supplemented with additional inputs like first-party data and contextual cues. This point is pivotal as we subsequently demonstrate Google’s extensive collection of first-party data, which potentially amplifies the effectiveness of third-party cookie alternatives, such as the Topics API, for Google rather than for its competitors.

Some of the negative effects that are being reported right now by the advertising industry, may only be short-lived and will be mitigated over time as firms adapt. In the meantime,

²⁰¹ *Supra note 117* (“On 7 January 2021, the CMA launched an investigation under Chapter II of the Competition Act 1998 into suspected breaches of competition law by Google. The investigation concerns Google’s proposals to remove third-party cookies (TPCs) on Chrome and replace TPCs functionality with a range of ‘Privacy Sandbox’ tools, while transferring key functionality to Chrome.”)

²⁰² *See. Topics API developer guide*, <https://developer.android.com/design-for-safety/privacy-sandbox/guides/topics> (“The Topics API infers coarse-grained interest signals on-device based on a user’s app usage. These signals, called topics, are shared with advertisers to support interest-based advertising without tracking individual users across apps.”)

²⁰³ *See. Chrome-facilitated testing*, <https://developers.google.com/privacy-sandbox/setup/web/chrome-facilitated-testing> (“To prepare for third-party cookie deprecation, we will be providing Chrome-facilitated testing modes that allow sites to preview how site behavior and functionality works without third-party cookies.”)

²⁰⁴ *See. The Impact of the Google Topics API* (July 7, 2022), <https://audiencex.com/insights/google-topics-api/> (“Since Google API reflects only broad user behavior from site visits, it will be less granular than what advertisers are used to or like.”)

²⁰⁵ Elias Selman, Topics API: Criteo’s First Look at Google’s Interest-Based Advertising Solution (November 10, 2022), <https://medium.com/criteo-engineering/is-googles-topics-api-a-viable-replacement-for-interest-based-advertising-297076192bd> (“Overall, we observe that Criteo’s interest-based audiences are five times more relevant than those generated by this first iteration of the Topics API... We are also aware that the signals the Topics API provides could have further utility if combined with other signals such as first-party data and contextual information, and this will be a matter for our future experimentation.”)

however, Google might be able to snap up even more market share than it already has since it would have, at least for a while, some of the most attractive advertising offerings²⁰⁶.

3.3.1.4 Role of first-party data collection in Google's dominance of advertising market

The assessments conducted by Criteo and Audience X suggest that the Topics API cannot independently replace third-party cookies. Instead, a combination of different techniques is necessary. First-party data is one of the most promising options, which we discuss in the following.

Although trackers are beginning to use first-party cookies in anticipation of third-party cookie restrictions, these cookies have inherent limitations for tracking purposes. Unlike third-party cookies, which can be accessed by their creator across various websites visited by a user, first-party cookies are confined to the domain where they were set. This restriction significantly limits the ability of trackers and advertisers to monitor and gather comprehensive user data across multiple websites. To circumvent the constraints of third-party cookie alternatives, trackers are increasingly focusing on aggregating more extensive collection of first-party data. This data often comprises personally identifiable information, such as email addresses and phone numbers²⁰⁷, which facilitates the recognition of users across various websites. For instance, if a tracker operates on two separate websites and a user enters the same email address on both, the tracker can then correlate the user's activities between these sites.

3.3.1.4.1 First-party data collection through new tools

Google has been intensifying its efforts to gather first-party data, complementing its

²⁰⁶ This is reminiscent of the public clash between Apple and Facebook over Apple's planned roll-out of an opt-in (rather than opt-out) to user tracking with iOS 14 from late 2020. While an opt-in to user tracking is already required by many privacy laws such as those in the EU (as outlined in Section 2), these have long been ignored by the industry. For example, it was found that more than 70% of Android apps used to send data to tracking companies once apps were opened the first time, but less than 3.5% implemented the opt-in mechanisms that are legally required under EU law. Tracking, if not for a good reason and communicated in a transparent manner, remains highly unpopular with end-users, most of which feel like neither private companies nor the government sufficiently give them control over their data. Putting users in control over tracking would also limit the industry's ability to create profiles about users and monetize those through advertising. Hence, Facebook ended up running a public campaign against Apple in leading newspapers. In those ads (some of which were titled "Apple vs. the free internet"), Facebook claimed that it stood up to small businesses and helped them reach potential customers through targeted advertising, which Apple sought to undermine through the announced changes. Regardless, Apple went ahead with those changes and many advertising companies, including Facebook, posted significant losses in revenues. Indeed, it was reported that many advertisers ended up shifting their budgets from iOS to Android, which did not face similar restrictions, and to Apple's own advertising systems. Despite those concerns, revenues of Facebook and others seem to have recovered, since they have been increasing sharply again recently. What remains are investigations by various competition and data protection authorities against Apple's measures, a major fine against the company by the French data protection authority over Apple's own user tracking practices, and a notably increased share of iOS advertising for Apple whose market share has tripled since. This underlines the risk of market capture by large tech companies that persists, even if the underlying anti-competitive mechanisms is addressed over time. Google's phase out of third-party cookies could bring similar risks.

²⁰⁷ See. *How Google uses Customer Match data*, <https://support.google.com/google-ads/answer/6334160?hl=en#:~:text=Google%20doesn%27t%20receive%20actual,is%20not%20unencrypted%20by%20Google> ("Google doesn't receive actual email addresses. Google's system transforms the contact information we have for Google accounts, like email addresses and phone numbers, into hashed codes using the secure hashing algorithm SHA256, a one-way hashing mechanism that is not unencrypted by Google.")

reliance on first-party cookies and other substitutes like the Topics API. A prime example is Google Tag Manager, which enables publishers to manage first-party data for purposes such as analytics and advertising conversion tracking²⁰⁸. This tool works synergistically with Google Analytics to capture various user activities on websites and mobile apps²⁰⁹. This translates to Google obtaining a large amount of first-party data from publishers. A recent study²¹⁰ revealed that googletagmanager.com ranks as the third most queried domain, trailing only behind google-analytics.com and doubleclick.net, showing the sheer number of publishers sharing first-party data with Google. Moreover, the research indicated a significant volume of user-specific identifiers being transmitted to Google Tag Manager. These identifiers further enrich Google's ability to identify and measure user behavior in absence of third-party cookies.

To make first-party data collection easier, Google is making it significantly easier for publishers to share first-party data. A significant development in this direction was the incorporation of Seller Defined Audiences (SDA)²¹¹ into Google Ad Manager²¹² in 2022. This feature simplifies the process for publishers to offer first-party data to potential buyers. SDA enables the structuring of user data collected by publishers into a widely recognized format, facilitating seamless transactions with programmatic buyers throughout the advertising sector. By standardizing this format, publishers can transfer data to Google more efficiently without incurring the additional overhead associated with proprietary data formats.

Furthermore, Google launched the Publisher Advertiser Identity Reconciliation (PAIR) service towards the end of 2022²¹³. Whereas SDA facilitates the structured sharing of user data, PAIR enables the merging of first-party data between distinct publishers and advertisers. This collaboration yields access to more nuanced user profiles, encompassing preferences, dislikes, demographics, and more. Despite being promoted as an inclusive platform open to various industry players, PAIR is perceived by some as a Google-centric

²⁰⁸ See. *New ways to support your measurement with first-party data* (April 15, 2021), <https://support.google.com/google-ads/answer/10591309?hl=en> (“Consistent with how existing first-party cookies work, the new cookie will be unique and limited to users on your site only. Starting in May 2021, this first-party cookie will enable more accurate attribution of conversions, including instances where a user might engage with more than one of your ads before converting.”)

²⁰⁹ See. *Send data to server-side Tag Manager*, <https://developers.google.com/tag-platform/tag-manager/server-side/send-data?option=gtag> (“...set up the Google Analytics 4 client in your server container to parse the additional parameters and create event data out of them.”)

²¹⁰ Munir, *supra note 200*, Table 5.

²¹¹ See. *Seller Defined Audiences*, <https://iabtechlab.com/sda> (Seller Defined Audiences (SDA) is an addressability specification incubated within Project Rearc. It allows publishers, DMPs and data providers to scale first-party data responsibly and reliably without data leakage or reliance on deprecated IDs and/or new, untested technologies.)

²¹² Peentoo Patel, *New ways for publishers to manage first-party data* (September 13, 2022), <https://blog.google/products/admanager/new-ways-for-publishers-to-manage-first-party-data/> (“As a first step, we are integrating the IAB Tech Lab’s Seller Defined Audiences into this solution. Publishers can use the IAB’s Audience Taxonomy and Content Taxonomy to share signals with Google Ads and Display & Video 360 as part of our beta testing.”)

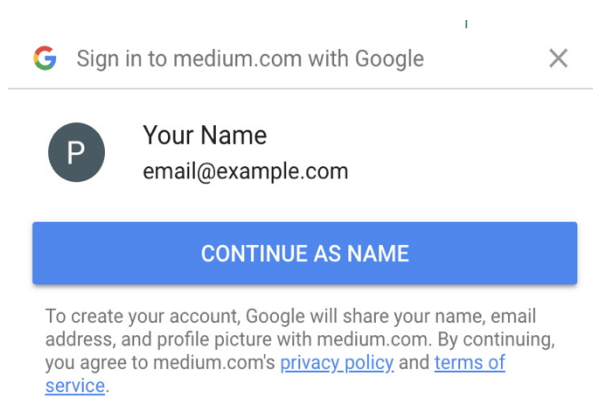
²¹³ Dan Taylor, *Engage your first-party audience in Display & Video 360* (October 11, 2022), <https://blog.google/products/marketingplatform/360/engage-your-first-party-audience-in-display-video-360/> (“Publisher Advertiser Identity Reconciliation, or PAIR, is a new solution that gives publishers and advertisers the option to securely and privately reconcile their first-party data for audiences who have visited both an advertiser’s and a publisher’s site.”)

solution, primarily benefiting its ecosystem²¹⁴.

These developments show Google’s push towards both collection of first-party data and its continued use in its existing services. As described in previous sections, this first-party data is critical in making sure that Google’s own businesses do not get impacted by the imminent third-party cookie blockage. This gives Google an unfair advantage over other competitors which do not have access to such a vast amount of first-party data.

3.3.1.4.2 Dark pattern usage by Google to encourage collection of first-party data.

Google also employs dark patterns to prompt users into sharing more first-party data, enhancing its data collection strategies.



One common example of such practices is Google’s integration of its single sign-on (SSO) service across various websites. Users visiting sites that offer Google login options with a popup featuring their Google account details, encouraging them to authenticate with Google’s credentials. This login method permits Google to monitor user interactions on these third-party websites and logs the user into other Google services in the background, thereby

broadening its first-party data acquisition scope. One example of the additional data collection is through Google Ads’ “DSID” cookie, which is deployed when a user logs in via Google. This cookie assigns a unique ID to the user, allowing for the aggregation of their advertisement preferences²¹⁵. In response to this egregious use of popups to coerce users into logging in, DuckDuckGo has developed an application and browser extension aimed at obstructing Google’s ability to track users through these means²¹⁶.

Google has also been restructuring its services from distinct subdomains to centralized paths under its main domain, such as transitioning from maps.google.com to google.com/maps²¹⁷. This strategic move permits Google to apply the same data collection permissions across multiple services. For instance, once a user consents to location sharing on google.com/maps, this permission extends seamlessly to other services like

²¹⁴ Trey Titone, *What is Google PAIR? A new first-party data solution* (October 17, 2022), <https://adtechexplained.com/google-pair-a-not-so-universal-identity-solution/> (“First, the most obvious difference is that PAIR is only a solution for Google’s DSP, Display & Video 360 (DV360). While other solutions are DSP-agnostic, PAIR is a solution by Google for Google.”)

²¹⁵ See. *How Google uses cookies*, <https://policies.google.com/technologies/cookies?hl=en-US> (“DSID’ cookie is used to identify a signed-in user on non-Google sites and to remember whether the user has agreed to ad personalization. It lasts for 2 weeks.”)

²¹⁶ Hisan Kidwai, *DuckDuckGo now auto-blocks Google Sign-in Pop-Ups on all sites* (December 26, 2022), <https://www.androidheadlines.com/2022/12/duckduckgo-google-sign-in-auto-block-pop-ups.html> (“...even if you sign into sites not owned by Google, they can still track your behavior and collect your data on those sites.”)

²¹⁷ Garrit Franke, *Smart Move, Google* (November 23, 2022), <https://garrit.xyz/posts/2022-11-24-smart-move-google> (This implies that the permissions I give to Google Maps now apply to all of Google’s services hosted under this domain.)

google.com/flights. Such a unified permission model simplifies Google’s data collection process across its various platforms.

These deceptive patterns used by Google has also resulted in legal troubles for the tech giant. A case in Arizona²¹⁸ revealed the company’s data collection practices to be very opaque. Google had to pay \$85 million for tracking users’ location data, where internal communications exposed criticisms by employees over the complexity of Google’s privacy settings. One employee noted that the user interface seemed “designed to make things possible, yet difficult enough that people won’t figure it out.” Additionally, in a separate California lawsuit²¹⁹, Google agreed to a \$93 million settlement over allegations of unauthorized data collection. The court indicated that Google had been deceiving users, employing coercive methods to gather data without providing a clear and accessible opt-out option^{220,221}.

These new tools and dark patterns employed by Google are designed to allow the collection and utilization of substantial volumes of first-party data. As discussed in the prior section, the integration of first-party data with Google’s proposed Topics API and other emerging standards significantly strengthens its competitive position. This advantage is set to become even more pronounced once Chrome phases out third-party cookies, thereby potentially constraining the data collection capabilities of its rivals. This strategic access to first-party data is reflected in Google’s internal assessment of the Topics API, which reported only a slight revenue impact of 1–3%. In contrast, competitors like Criteo have observed performance disparities as high as fivefold²²², according to some preliminary studies conducted within the industry. This highlights the stark disparity between Google and its competitors when it comes to effects of changes enacted in Chrome. Considering these changes are enacted on behest of Google’s interests, it reveals a critical pattern of Google using its market share in Chrome to perpetuate its own advertising solutions and monopolize the market.

3.3.1.5 Sabotaging web standards to maintain market dominance.

Google has also endeavored to solidify its advertising market dominance by shaping web standards in ways that predominantly advantage its own advertising services, consequently skewing the competitive landscape to its benefit.

²¹⁸ See. *Attorney General Mark Brnovich Achieves Historic \$85 Million Settlement with Google* (October 4, 2022), <https://www.azag.gov/press-release/attorney-general-mark-brnovich-achieves-historic-85-million-settlement-google> (“an investigation of Google after a 2018 Associated Press article revealed that the company was misleading and deceiving consumers about the collection and use of their personal location data...”)

²¹⁹ Ernestas Naprys, *Google to pay \$93M over alleged location privacy deceptions* (November 15, 2023), <https://cybernews.com/news/google-settles-93m-location-privacy-deceptions/> (“Google was deceiving users by collecting, storing, and using their location data for consumer profiling and advertising purposes without informed consent...”)

²²⁰ See. *State of Arizona v. Google LLC, No. 3:23-cv-02431-VC* (August 24, 2023)

²²¹ *Id at 34* (“In my opinion, these “loopholes” that enabled Google to collect and use location data even when the user explicitly disabled location tracking through various combinations of settings is an example of the dark pattern strategies sneaking and forced action.”)

²²² *Supra note 205*

In 2018, Google introduced Manifest v3²²³ to Chrome, citing aims to enhance extension performance, privacy, and security. This initiative, proposed with minimal engagement from other industry participants, has notably restricted the capabilities of adblocking, anti-tracking, and web security extensions such as Adblock Plus, DuckDuckGo, and Norton Safe Web — tools that once significantly impacted Google’s advertising revenues. Manifest v3’s shift from the webRequest API, which permitted extensions to scrutinize and block network requests, to the more restrictive DeclarativeNetRequest API, has been a point of contention. This change also includes limitations on the syntax and quantity of blocking rules that can be imposed by these extensions. Despite considerable pushback from the adblocking community²²⁴, Google implemented Manifest v3 in Chrome v88²²⁵, with plans to phase out the previous version, Manifest v2, in 2023²²⁶. In contrast, browsers like Brave²²⁷ and Firefox²²⁸ have opted to maintain support for Manifest v2, preserving the functionality of these third-party extensions. Independent studies have challenged Google’s justifications for Manifest v3, suggesting that it does not necessarily enhance browser performance and may, in fact, degrade it by permitting more advertising and tracking scripts to load^{229,230}. This instance illustrates how Chrome has caused consumer harm by curbing the efficacy of third-party adblocking, anti-tracking and web security extensions that users rely on to keep them safe on the web. Indeed, the Manifest v3 standard seems to primarily serve Google’s interests in advertising and tracking.

Google’s introduction of the SameParty cookie attribute²³¹, which evolved into the First-

²²³ James Wagner, *Trustworthy Chrome Extensions, by default* (October 1, 2018), <https://blog.chromium.org/2018/10/trustworthy-chrome-extensions-by-default.html> (“In 2019 we will introduce the next extensions manifest version. Manifest v3 will entail additional platform changes that aim to create stronger security, privacy, and performance guarantees.”)

²²⁴ Daly Barnett, *Chrome Users Beware: Manifest V3 is Deceitful and Threatening* (December 9, 2021), <https://www.eff.org/deeplinks/2021/12/chrome-users-beware-manifest-v3-deceitful-and-threatening> (“Like FLoC and Privacy Sandbox before it, Manifest V3 is another example of the inherent conflict of interest that comes from Google controlling both the dominant web browser and one of the largest internet advertising networks.”)

²²⁵ Pete LePage, *New in Chrome 88* (January 19, 2021), <https://developer.chrome.com/blog/new-in-chrome-88/> (“You can now upload extensions using manifest V3 to the Chrome Web Store.”)

²²⁶ David Li, *More details on the transition to Manifest V3* (September 28, 2022), <https://developer.chrome.com/blog/more-mv2-transition> (“In January 2024, following the expiration of the Manifest V2 enterprise policy, the Chrome Web Store will remove all remaining Manifest V2 items from the store.”)

²²⁷ See. *Brave confirms it will support Manifest V2 extensions like uBlock Origin even after Chrome drops them* (September 29, 2022), <https://www.ghacks.net/2022/09/29/brave-browser-manifest-v2-extensions-after-v3-update/> (“Brave has done the same to reassure its users that it too will support ad blocking after the dreaded update, and Manifest V2 extensions like uBlock Origin.”)

²²⁸ Rob Wu, *Manifest v3 update* (May 27, 2021), <https://blog.mozilla.org/addons/2021/05/27/manifest-v3-update/> (“We have not yet set a deprecation date for Manifest v2 but expect it to be supported for at least one year after Manifest v3 becomes stable in the release channel.”)

²²⁹ See. *Chrome extension manifest v3 proposal* (December 13, 2018), <https://github.com/uBlockOrigin/uBlock-issues/issues/338> (“The fact that they are planning to remove a proper blocking webRequest API with no word of an equivalent replacement is a sign of intent, that is, reducing the level of user agency in their user agent (aka Google Chrome)”)

²³⁰ Kevin Borgolte and Nick Feamster, *Understanding the Performance Costs and Benefits of Privacy-focused Browser Extensions* (April 20, 2020), <https://dl.acm.org/doi/10.1145/3366423.3380292> (“Our results highlight that privacy-focused extensions not only improve users’ privacy, but can also increase users’ browsing experience.”)

²³¹ See. *SameParty cookie attribute explainer*, <https://github.com/cfredric/sameparty> (“The SameParty

Party Sets (FPS) standard²³², and later was renamed to “Related Website Sets (RWS)”²³³, was ostensibly aimed at softening the blow of enhanced privacy measures like third-party cookie blocking. This standard would enable a data collecting entity to declare domains under its control as “first parties” to one another, permitting shared cookie access among them. For instance, a cookie set by google.com could be recognized by youtube.com²³⁴, thus enabling cross-domain tracking within Google's ecosystem. Furthermore, RWS proposal sought to extend this collaborative treatment to other browser storage mechanisms, which typically are subject to strict compartmentalization.

This framework was scrutinized by the World Wide Web Consortium's (W3C) Privacy Community Group (PrivacyCG)²³⁵. Despite Google's endorsement, several key browser manufacturers, such as Apple²³⁶ and Brave²³⁷, voiced objections within PrivacyCG, leading to the abandonment of the proposal due to a lack of broad multi-implementer interest²³⁸. The W3C Technical Architecture Group (TAG) also reviewed and arrived at similar conclusions²³⁹.

Nevertheless, Google independently integrated FPS into Chrome with version 115²⁴⁰, circumventing the broader industry consensus. This unilateral move is poised to diminish the effects of Chrome's anticipated third-party cookie restrictions on Google's own operations. Conversely, this provides negligible advantage to Google's competitors, particularly those without an array of domains, further entrenching Google's market dominance.

Google Chrome dispatches a special HTTP header, X-Client-Data, exclusively to

cookie attribute provides web developers a means to annotate cookies that are allowed to be set or sent in same-party, cross-site contexts.”)

²³² See. *Related Website Sets (formerly known as: First-Party Sets)*, <https://github.com/WICG/first-party-sets> (“[Related Website sets] will allow browsers to ensure continued operation of existing functionality that would otherwise be broken by blocking cross-domain cookies (“third-party cookies”)”)

²³³ See. *Related Website Sets - the new name for First-Party Sets in Chrome 117* (31 August, 2023), <https://developers.google.com/privacy-sandbox/blog/related-website-sets> (“In this post, we introduce Related Website Sets (RWS)—our new name for FPS that better reflects its purpose—and provide a refresher on key use cases along with an update on the associated subset domain limit.”)

²³⁴ See. <https://google.com/well-known/related-website-set.json>, Google has added YouTube, along with other sites, to its related sites. Thereby, allowing all first-party cookies and other first-party data to be easily shared across its different websites.

²³⁵ See. *Privacy Community Group*, <https://github.com/privacycg/>

²³⁶ John Wilander, *Apple WebKit's feedback on the First Party Sets proposal* (May 24, 2022), <https://lists.w3.org/Archives/Public/public-privacycg/2022May/0006.html> (“Setting browser policy based on joint domain ownership will very likely go against the user's interest in many cases...”)

²³⁷ Peter Snyder, *First-Party Sets: Tearing Down Privacy Defenses Just as They're Being Built* (May 19, 2022), <https://brave.com/web-standards-at-brave/8-first-party-sets/> (“The privacy harm from [first-party sets] is obvious: it would allow companies to automatically track you across sites, and without proper notification or consent.”)

²³⁸ Theresa O'Connor, *Status of First-Party Sets* (June 2, 2022), <https://lists.w3.org/Archives/Public/public-privacycg/2022Jun/0003.html> (“...chairs of the W3C Privacy Community Group, we have decided to drop First-Party Sets as a Work Item in the group.”)

²³⁹ See. *TAG Review Feedback on First Party Sets* (April 7, 2021), https://github.com/w3ctag/design-reviews/blob/main/reviews/first_party_sets_feedback.md (“...we consider the First Party Sets proposal harmful to the web in its current form.”)

²⁴⁰ See. *Intent to Ship: First-party sets*, https://groups.google.com/a/chromium.org/g/blink-dev/c/7_6JDifE1as?pli=1 (“First-Party Sets (“FPS”) provides a framework for developers to declare relationships among sites, to enable limited cross-site cookie access for specific, user-facing purposes. This is facilitated through the use of the Storage Access API and requestStorageAccessFor API.”)

domains it owns²⁴¹. Google asserts this header is instrumental for testing experimental functionalities, yet it has the potential for user tracking. The header itself carries low entropy, suggesting limited capability for individual user tracking²⁴². However, when this data is combined with an IP address—which accompanies every network request—other HTTP headers, or the first-party data Google accrues (as previously elaborated), it can become a tool for unique user identification²⁴³.

This header emerged around the same time as the industry's move to curtail the granularity of User-Agent strings²⁴⁴, a standard HTTP header, as a measure to bolster privacy²⁴⁵. Google's deployment of the X-Client-Data header thus stands as a strategic pivot: it preserves tracking capabilities for Google's domains amidst privacy advancements that impede similar tracking by other third-parties. As a result, while the utility of the User-Agent diminishes for tracking purposes, Google domains may continue to track users via the novel header.

The instances cited illustrate that Google's market maneuvers extend beyond leveraging its dominant position for competitive advantage. The company appears to be preempting restrictions on current web standards while simultaneously advocating for new standards that may consolidate its dominance, typically at the expense of user privacy and/or equitable market competition. Standard-setting processes typically thrive on multi-stakeholder collaboration; however, Google's actions suggest a deviation from this norm, as it leverages its browser market share to unilaterally craft standards that primarily serve its interests.

3.3.1.6 Implications for consumer welfare

The anticompetitive practices attributed to Google not only cause financial loss to its market rivals but also bear adverse implications for consumer welfare.

The disproportionate impact of tracking limitations enforced by browsers, coupled with the introduction of Google-favored standards, have hampered competitive dynamics within

²⁴¹ Thomas Claburn, *Google: You know we said that Chrome tracker contained no personally identifiable info? Yeah, about that...* (March 11, 2020), https://www.theregister.com/2020/03/11/google_personally_identifiable_info/ (“In February, Arnaud Granal, a software developer who works on a Chromium-based browser called Kiwi, claimed the X-client-data header, which Chrome sends to Google when a Google webpage has been requested, represents a unique identifier that can be used to track people across the web.”)

²⁴² *Id.* (“X-client-data header, which comes in two variations, a low-entropy (13-bit) version that ranges from 0-7999 and a high-entropy version, which is what most Chrome users will send if they have not disabled usage statistic reporting.”)

²⁴³ Claburn, *supra* note 241 (“As a user, in the current state, it's important to understand that no matter if you use a proxy, a VPN, or even Tor (with Google Chrome), Google (including DoubleClick) may be able to identify you using this X-Client-Data. Do you want Google to be able to recognize you even if you are not logged-in to your account or behind a proxy?”)

²⁴⁴ Kyle Bradshaw, *Google is seeking to deprecate Chrome's User Agent string, and that's a win for privacy* (January 14, 2020), <https://9to5google.com/2020/01/14/google-deprecate-chrome-user-agent-string-privacy/> (“Chromium team has submitted a new proposal that includes deprecating the User Agent string starting in Chrome 81.”)

²⁴⁵ See. *RFC 9110 HTTP Semantics*, <https://www.rfc-editor.org/rfc/rfc9110#name-user-agent> (“The "User-Agent" header field contains information about the user agent originating the request, which is often used by servers to help identify the scope of reported interoperability problems, to work around or tailor responses to avoid particular user agent limitations, and for analytics regarding browser or operating system use.”)

the online advertising industry. This has resulted in reduced options and elevated costs for advertisers seeking online visibility. Constrained choice often translates into higher advertising rates, burdening businesses with increased marketing expenses²⁴⁶²⁴⁷²⁴⁸ that may, in turn, inflate consumer prices. Beyond the advertisers, publishers also encounter financial pressures as the lack of competition allows Google to demand a larger share of advertising revenues. This economic strain is self-evident as numerous online news outlets have resorted to implementing paywalls to offset diminished ad revenue²⁴⁹.

Consumers are thus harmed not only in financial terms but from a privacy standpoint as well. While third-party cookies, known for their tracking capabilities, could be managed by privacy-aware users, the increasing shift towards the collection of first-party data presents more drastic challenges. As we have discussed, this data is often harvested and processed outside the purview of a user's browser, escaping easy detection and removal. The nature of the data being accumulated is more personal and, consequently, potentially more intrusive. Furthermore, consumers are afforded minimal oversight or control over this collection and its subsequent use²⁵⁰. The result is a higher "privacy cost" for consumers, stemming directly from the anticompetitive strategies implemented by Google.

3.3.2 From browser to publisher market

Google has a host of first-party services, including Google Search, YouTube, and Gmail. In this section, we show how Google uses its dominance in the browser market to assert, perpetuate and leverage its dominant position within these key markets, especially with the help of Chrome.

3.3.2.1 Self-preferencing Google Search in Chrome

Google Search is the most widely used search engine in the world. Globally, Google Search's market share exceeds 90%. Its closest competitor, Bing, only has a market share of

²⁴⁶ Adi Robertson, *Google quietly raised ad prices to boost search revenue, says executive* (September 19, 2023), <https://www.theverge.com/2023/9/19/23880275/google-search-ads-competition-auction-prices-doj-trial-antitrust> ("Google's dominance lets it raise prices for advertisers with few repercussions — a claim backed up by Google ads executive Jerry Dischler on the stand.")

²⁴⁷ Leah Nysten, *Google Changed Ad Auctions, Raising Prices 15%, Witness Says* (October 6, 2023), <https://www.bloomberg.com/news/articles/2023-10-06/google-changed-ad-auctions-raising-prices-15-witness-says?embedded-checkout=true> ("Alphabet Inc.'s Google changed its advertising auction formula in 2017, raising prices by 15% and likely making the company billions of dollars in additional revenue, according to an economist testifying for the US Justice Department in the antitrust case against the search giant.")

²⁴⁸ Kristen McCormick, *Google Ads Cost Per Lead Has Increased for 91% of Industries YoY* (May 15, 2023), <https://www.wordstream.com/blog/ws/2022/11/10/search-advertising-benchmarks> ("...latest benchmark study showing that cost per lead has increased for 91% of industries year over year...")

²⁴⁹ See. *Justice Department Sues Google for Monopolizing Digital Advertising Technologies* (January 24, 2023), <https://www.justice.gov/opa/pr/justice-department-sues-google-monopolizing-digital-advertising-technologies> ("Website publishers use ad tech tools to generate advertising revenue that supports the creation and maintenance of a vibrant open web, providing the public with unprecedented access to ideas, artistic expression, information, goods, and services... In pursuit of outsized profits, Google has caused great harm to online publishers and advertisers and American consumers.")

²⁵⁰ Florian Eisenmenger, *Shifting to first-party data: Privacy pitfalls around consent and transparency* (March 28, 2023), <https://iapp.org/news/a/shifting-to-first-party-data-privacy-pitfalls-around-consent-and-transparency/> ("Companies are increasingly pursuing first-party data approaches to move away from third parties that collect and process personal data on their behalf. Instead, they rely on personal data collected themselves, in particular to pursue personalized marketing activities. Naturally, this comes with a number of privacy challenges—most importantly, obtaining valid consent that meets transparency requirements.")

about 3%²⁵¹. While Google has diversified its revenue across other business divisions, the financial health of Alphabet, the parent company of Google, continues to hinge on the advertising revenue generated by search. For example, in 2022, advertising revenue generated from Search constituted most of the Alphabet's revenue²⁵². Thus, maintaining the dominant position in search is a key interest of Google.

Google uses its dominant position in Chrome to boost its search business. Google Search has been the default search engine on Chrome since its inception. Relying on the “power of defaults”²⁵³ and exploiting individuals’ known psychological vulnerabilities (i.e., those studied in behavioral economics), Google ensures that its dominant market share among browsers is also translated into search engines. Most users never change default options and Google uses this fact to its advantage on both mobile and desktop. The former behavior was penalized by the European Commission in 2018²⁵⁴, where an antitrust investigation into Google’s behavior on Android found it guilty of unfair practices. Google was fined €4.34 billion and is now required to present users options to choose between different search engines during the initial setup²⁵⁵. Similar antitrust actions in India have resulted in Google loosening control of search engine on Android in other regions of the world²⁵⁶. However, these antitrust actions on mobile did not result in change in Google’s behavior on desktop. Due to self-preferencing their own search engine on a browser which commands a monopolizing share of the market, Google’s actions on desktop deserve the same level of antitrust scrutiny as was afforded too mobile.

3.3.2.2 Implications for consumer welfare

Google’s dominant position in the search engine market, which is further bolstered by its dominance in the browser market, has profound implications for consumer welfare. First, it stifles innovation and competition in the search engine market. This dominance enables Google to amass a vast amount of potentially sensitive consumer data, which further increases the competitive imbalance in the market. Competitors, lacking access to similar levels of consumer data, find it challenging to refine and improve their search algorithms to

²⁵¹ See. *Search Engines Market Share*, <https://www.similarweb.com/engines/>

²⁵² Gennaro Cuofano. *Google Revenue Breakdown* (August 10, 2023), <https://fourweekmba.com/google-revenue-breakdown/> (“Alphabet generated over \$282B from Google search and others, \$32.78 billion from the Network members (AdSense and AdMob), \$29.2 billion from YouTube Ads, \$26.28B from the Cloud, and \$29 billion from other sources (Google Play, Hardware devices, and other services.”)

²⁵³ Fowler. *Supra note 162*

²⁵⁴ See. *Antitrust: Commission fines Google €4.34 billion for illegal practices regarding Android mobile devices to strengthen dominance of Google's search engine* (July 18, 2018), https://ec.europa.eu/commission/presscorner/detail/en/IP_18_4581 (“Our case is about three types of restrictions that Google has imposed on Android device manufacturers and network operators to ensure that traffic on Android devices goes to the Google search engine. In this way, Google has used Android as a vehicle to cement the dominance of its search engine.”)

²⁵⁵ Sam Byford, *Google will give Android users a choice of browser and search engine in Europe* (March 19, 2019), <https://www.theverge.com/2019/3/20/18273888/google-eu-browser-search-choice> (“Google has announced that it will start asking European Android users which browser and search engine they would prefer to use on their devices, following regulatory action against the company for the way it bundles software in its mobile operating system.”)

²⁵⁶ See. *Google Says Will Allow Users In India To Choose Default Search Engine On Android Phones* (January 25, 2023), <https://www.outlookindia.com/business/google-says-will-allow-users-in-india-to-choose-default-search-engine-on-android-phones-news-256829> (“After failing to get a court order to block an antitrust ruling, Google on Wednesday said it will allow users in India to choose default search engine on Android-based smartphones.”)

the same degree, leading to a market where alternative search engines struggle to offer comparable services. This lack of competition, in turn, leads to a poorer consumer experience. Consumers are not only left with fewer choices but are also subject to a search engine ecosystem that evolves more slowly due to reduced competitive pressure. Moreover, Google's data collection practices have raised significant privacy concerns. With few viable alternatives, consumers are often compelled to use a service that continually gathers personal information, potentially infringing on their privacy rights.

Thus, Google's actions using its Chrome browser have resulted in significant ramifications across markets, creating a self-reinforcing cycle where increased usage of Chrome leads to more Google Search users, providing Google with more data, and thus further entrenching its dominance.

3.4 Flow of dominance from advertiser to publisher market

In this section, we look at ways in which Google engages in various anticompetitive behaviors by using the revenue generated by its advertising business to augment its position in the publisher market. As we discussed in previous sections, Google dominates advertisement business through Google Ads and Google Analytics, with both registering a presence of more than 50% of all websites. In 2022, out of 282 billion dollars in revenue generated by Alphabet (Google's parent company), 80% was generated by its advertising business. Most of the Google's publishing business, especially Google Search and YouTube, rely on advertising to generate revenue.

Therefore, Google's advertising business provides it with significant financial leverage, which it then uses to further perpetuate its dominance in other market segments through engaging in pay to play behavior, or outright buying out its competitors. Next, we go over some of the examples of such behavior by Google.

3.4.1 Engaging in pay to play behavior.

Google is frequently found to pay off its competitors to ensure its publisher businesses such as Google Search, YouTube, and others remain dominant in their respective markets.

To preserve its search engine dominance, Google has reportedly paid competitors to guarantee that its search tool is the default choice across major platforms. In a striking demonstration of this market strategy, estimates suggest Google compensated Apple, a competitor in the smartphone, browser, and desktop OS markets, approximately \$20 billion in 2022²⁵⁷ to retain Google Search as the default in Safari on both Apple's desktop and mobile platforms. The payments, escalating annually and surpassing inflation rates²⁵⁸, reflect not only Safari's increasing market share—from about 8% in 2012 to roughly 20% in

²⁵⁷ Paul Kunert, *Google pays Apple \$18B to \$20B a year to keep its search in iPhone* (October 10, 2023), https://www.theregister.com/2023/10/10/google_pays_apple_18_20_claims_bernstein/ (“We estimate that the ISA is worth \$18B-20B in annual payments from Google to Apple, accounting for 14-16 percent of Apple's annual operating profits.”)

²⁵⁸ Jeremy Bowman, *20 Billion Reasons Alphabet's Moat Isn't as Big as It Seems* (February 21, 2023), <https://www.fool.com/investing/2023/02/21/20-billion-reasons-alphabets-moat-isnt-as-big-as-i/> (“In 2022, Alphabet was estimated to pay Apple as much as \$20 billion to be the search engine of choice on Safari. The payment is not publicly disclosed, but it has ramped up significantly over the last decade as court filings in 2014 showed that Alphabet paid Apple just \$1 billion.”)

2023²⁵⁹—but also a strategic effort to deter Apple from entering the search engine market²⁶⁰ or partnering with Google's rivals²⁶¹. Recent disclosures have shed light on a revenue-sharing component within the Google-Apple agreement—a remarkable feature for such deals. This revenue model has practical implications for consumer choice: iPhone users initially had no search engine options during device setup, and until the release of iOS 17 in September 2023²⁶², were restricted from altering the default search engine in private browsing mode.

Firefox, a browser developed by Mozilla, was once a formidable player in the browser market, peaking at a 50% share²⁶³ before 2009 as it emerged from the so-called browser wars. As a successor to NetScape, Firefox is community-developed, open-source, and known for its extensive add-on ecosystem and customization capabilities. However, the introduction of Google Chrome in 2008 precipitated a sharp decline in Firefox's market share as it struggled to keep pace with Google's and Microsoft's offerings. A critical factor in this dynamic is Mozilla's lack of a proprietary search engine and a user-data-driven advertising model for revenue generation. Consequently, Mozilla depends significantly on financial agreements with Google²⁶⁴—approximately \$0.5 billion in 2023²⁶⁵—to maintain Google as the default

²⁵⁹ See, *Browser Market Share Worldwide (December 2022–December 2023)*, <https://gs.statcounter.com/browser-market-share>

²⁶⁰ This is not a theoretical threat since Apple has been developing its own search engine for a while. This search engine comes, however, not with an online interface or ads, but is rather integrated into the “Spotlight” search on macOS and iOS. Whenever individuals make a search through this in-built search functionality of their Apple devices, Apple's own search engine—rather than Google—gets invoked nowadays. As Apple, too, is trying to diversify its revenue and move away from selling hardware to selling service, it might well choose to enter the market for search advertising in Spotlight—like how it already increasingly does in the Apple App Store. Apple does compete against Google in the market for browsers but does not currently generate any direct income from its Safari browser. Again, as Apple moves ever more into services, this might change, given that the browser represents a rich source for data that might be valuable for Apple's own advertising business—like how Google does it already. See, Jon Henshaw, *Apple's search engine is Spotlight and it's looking more like Google*, <https://www.coywolf.news/seo/apples-search-engine-is-spotlight/>

²⁶¹ In the FTC's antitrust proceedings against Google, recent testimonies shed light on the intricate dynamics between major industry players. Microsoft revealed that Apple was effectively dissuaded from acquiring the Bing search engine, attributing this to the lucrative financial arrangement between Google and Apple. Microsoft contended that “Apple is making more money on Bing existing than Bing does,” implying that Google's substantial annual payments serve not only as a revenue stream for Apple but also as a strategic deterrent against Apple's potential entry into the search market, safeguarding Google's most profitable venture. See, Paul Wiseman, *Apple leverages idea of switching to Bing to pry more money out of Google, Microsoft exec says*, <https://apnews.com/article/google-antitrust-microsoft-bing-search-engine-eee462713c9ab59f6f3e886940c11a88> (“Apple was never serious about replacing Google with Microsoft's Bing as the default search engine in Macs and iPhones, but kept the possibility open as a “bargaining chip” to extract bigger payments from Google, a Microsoft executive testified Wednesday in the biggest U.S. antitrust trial in a quarter century.”)

²⁶² Ashley Capoot, *Apple announces iOS 17 release date* (September 13, 2023), <https://www.cnn.com/2023/09/13/apple-announces-ios-17-release-date.html> (“...iOS 17 will be available for users to download for free on Sept. 18”)

²⁶³ Ken Kovash, *Is Firefox Approaching 50% Market Share?* (November 19, 2009), <https://blog.mozilla.org/metrics/2009/11/19/is-firefox-approaching-50-market-share/>

²⁶⁴ Gennaro Cuofano, *How Does Mozilla Make Money? Mozilla Business Model Analysis* (October 4, 2023), <https://fourweekmba.com/how-does-mozilla-make-money> (“The majority of Mozilla Corporation's revenue is from royalties earned through Firefox web browser search partnerships and distribution deals. Precisely about 88% of Mozilla revenues came through royalties received by search engines to be featured on its Mozilla Firefox browser.”)

²⁶⁵ Noam Cohen, *Why Has Google Spent a Half-Billion Dollars on Firefox?* (May 5, 2023), <https://www.bloomberg.com/news/newsletters/2023-05-05/why-google-keeps-paying-mozilla-s-firefox-even-as->

search engine in Firefox, underlining the asymmetry in market power and financial dependency among browser developers. Despite Firefox's market share plummeting by 90% over the past decade, Google's annual payments to Mozilla have remained relatively consistent. This constancy in financial support has raised speculation that Google's rationale extends beyond the mere utility of being the default search engine. Analysts suggest that Google's payments may be partly aimed at preserving the semblance of a competitive browser market²⁶⁶. This arrangement is particularly advantageous for Google, considering Mozilla's non-profit, community-driven nature, which inherently limits its ability to compete with Google on a financial front.

The financial entanglements of Google with key market players extend beyond browser partnerships. In a bid to mitigate the impact of ad filtering on its revenue streams, Google, along with tech giants Microsoft and Amazon, has paid substantial fees to Eyeo GmbH, the company behind Adblock Plus, to have its advertisements whitelisted on various websites, including Google Search²⁶⁷²⁶⁸²⁶⁹. Eyeo's policy stipulates that large advertising entities like Google must remit 30% of ad revenue generated from users with Adblock Plus to bypass the extension's filters. Given Google's dominance in the browser market, it is the most significant contributor to—and beneficiary of—this model. This practice has attracted scrutiny, with calls for the FTC to investigate the implications of such revenue sharing agreements as potentially unfair, deceptive, and anticompetitive²⁷⁰.

Google's strategic expenditures to competitors have effectively positioned Google Search as the default search engine across virtually all consumer platforms. Notably, Firefox (which is pre-installed on popular Linux distributions such as Ubuntu and Linux Mint) defaults to Google Search, as do iOS and MacOS through Safari, and Android via Google Chrome. Furthermore, on personal computers running Microsoft Windows, Google Chrome holds a

[chrome-dominates](#) (“The primary source of this capital is Google, which pays Mozilla to be the default search engine on the Firefox home page. Those payments, which started in 2005, have been increasing—up 50% over the past decade, to more than \$450 million, even as the total number of Firefox users has plummeted. In 2021 these payments accounted for 83% of Mozilla's revenue.”)

²⁶⁶ Noam Cohen, *Even \$500 Million a Year From Google Isn't Enough to Save Firefox* (May 5, 2023), <https://www.bloomberg.com/news/articles/2023-05-05/google-chrome-dominance-has-mozilla-firefox-searching-for-answers?embedded-checkout=true> (“What a great foil for Google to then sponsor a nonprofit competitor that was never quite as good,” he says. Mozilla, Messina adds, has “served its purpose and function as far as I'm concerned, and then stuck around with the spoils that came out of that success.”)

²⁶⁷ Lara O'Reilly, *Google, Microsoft, and Amazon are paying Adblock Plus huge fees to get their ads unblocked* (February 3, 2015), <https://www.businessinsider.com/google-microsoft-amazon-taboola-pay-adblock-plus-to-stop-blocking-their-ads-2015-2> (“Google, Microsoft, Amazon, and Taboola are paying the owner of Adblock Plus to unblock ads on their websites at a fee of “30% of the additional ad revenues” they would have made were ads unblocked.”)

²⁶⁸ Darrell Etherington, *Google And Others Reportedly Pay Adblock Plus To Show You Ads Anyway* (July 6, 2013), <https://techcrunch.com/2013/07/06/google-and-others-reportedly-pay-adblock-plus-to-show-you-ads-anyway/> (“Adblock Plus essentially acting as a gatekeeper meting out access to that sizeable chunk of consumers.”)

²⁶⁹ Sven Taylor, *Advertisers Are Paying Off Ad Blockers to Show 200 Million Users “Acceptable Ads”* (June 23, 2020), <https://restoreprivacy.com/report-ad-blockers-allowing-acceptable-ads/> (“A handful of ad blocker companies are earning big bucks for not blocking ads from hundreds of advertisers, including big names like LinkedIn, Reddit, Amazon, and even Google.”)

²⁷⁰ *See*, <https://www.wyden.senate.gov/imo/media/doc/011420%20Wyden%20Ad%20Blocking%20Letter%20to%20FTC.pdf> (“Accordingly, I urge the FTC to open an investigation into unfair, deceptive and anti-competitive practices in the ad blocking industry.”)

77% market share²⁷¹. This ubiquity of Google Search, entrenched by Google's financial incentives to its competitors, ensures that alternative search engines face formidable barriers to entry, solidifying Google's search engine monopoly for the foreseeable future.

3.4.2 Google's acquisitions of competitors

Another strategy that Google has been using to stifle competitors is strategic acquisitions of competitors to bolster its own services. This strategy has resulted in Google maintaining a dominant position in several significant key markets. Below we list some of these key acquisitions that have helped Google dominate significant publisher markets:

3.4.2.1 Search engines

- Outride (2001): Specialized in personalized search technology, enhancing Google's ability to tailor search results to individual users, a significant step in developing Google's targeted advertising capabilities²⁷².
- Kaltix (2003): Focused on developing context-sensitive and personalized search, which contributed to the sophistication of Google Search in understanding user queries and preferences²⁷³.
- ITA Software (2010): A provider of flight information, this acquisition played a key role in shaping Google's travel search functionalities²⁷⁴.

As of December 2023, Google Search has a market share of 91.62%, effectively capturing and monopolizing the search engine market²⁷⁵.

3.4.2.2 Social media and content consumption

- YouTube (2006): This acquisition marked Google's significant entry into the video streaming and content creation market, transforming YouTube into one of the world's leading social media platforms. Despite the perception that Google is not a key player in social media following the shutdown of Google Plus in 2019, YouTube's acquisition negates this assumption²⁷⁶.
- Blogger (2003): One of the earliest acquisitions, Blogger helped Google gain a foothold in the content creation and blog hosting service²⁷⁷.
- Songza (2014): Specializing in music curation and streaming, its features were integrated into Google Play Music and later YouTube Music²⁷⁸.

²⁷¹ Sourojit Das, *Understanding Browser Market Share: Which browsers to test on in 2023* (March 14, 2023), <https://www.browsersstack.com/guide/understanding-browser-market-share>

²⁷² See *supra* note 12

²⁷³ See *supra* note 13

²⁷⁴ Amir Efrati And Gina Chon, *Google's Empire Expands to Travel* (July 2, 2010), <https://www.wsj.com/articles/SB10001424052748703571704575341270531117614> ("The Internet search giant said the acquisition will make it easier for customers to comparison shop for flights and airfares and drive more potential customers to the \$80 billion online travel market.")

²⁷⁵ See, *Search Engine Market Share Worldwide*, <https://gs.statcounter.com/search-engine-market-share>

²⁷⁶ See *supra* note 15

²⁷⁷ Neil McIntosh, *Google buys Blogger web service* (February 18, 2003), <https://www.theguardian.com/business/2003/feb/18/digitalmedia.citynews> ("Google, the world's most-used internet search engine, yesterday announced the acquisition of Blogger, a web service which has fuelled the rapid rise of the web journals popularly known as weblogs.")

²⁷⁸ Jordan Crook, *Google Buys Songza* (July 1, 2014), <https://techcrunch.com/2014/07/01/google-buys-songza/> ("According to Google, Songza will remain intact for users and nothing will change about the service for now, though Songza's expertise will be applied to other products like Google Play Music and YouTube.")

YouTube has a market share of 97.58% in online streaming platforms²⁷⁹.

3.4.2.3 Mapping and location services

- Where 2, Keyhole, ZipDash (all in 2004): These companies laid the groundwork for Google Maps and Google Earth, revolutionizing how people navigate and interact with geographic information online.^{280 281 282 283}
- Zagat (2011): A restaurant review and guide company, Zagat's content was integrated into Google Maps and Search, enriching local business information and reviews²⁸⁴.
- Waze (2013): By acquiring Waze, a popular community-based traffic and navigation app, Google not only eliminated a significant competitor but also integrated unique crowd-sourced traffic data into its mapping services²⁸⁵.
- Skybox Imaging (2014): A satellite imaging company, aiding Google Earth and Maps with real-time satellite pictures and data analysis²⁸⁶.

3.4.2.4 Online collaboration and productivity tools

- Writely (2006): The technology behind Writely, an online word processing service, was integral in developing Google Docs²⁸⁷.
- DocVerse (acquired pre-2010): This acquisition was pivotal in creating Google Docs, allowing Google to venture into cloud-based productivity and collaborative working environments, challenging traditional office suite providers²⁸⁸.

Google's office suite controls over 50% of office productivity software market²⁸⁹.

3.4.2.5 Artificial intelligence and machine learning

- DeepMind (2014): A leading AI research company, known for its work in deep learning and artificial neural networks. DeepMind's technology has been

²⁷⁹ See. *Market Share of YouTube*, <https://6sense.com/tech/media-players-and-streaming-platforms/youtube-market-share>

²⁸⁰ Morris, *supra note 19*

²⁸¹ *Supra note 20*

²⁸² Hines, *supra note 21*

²⁸³ *Supra note 22*

²⁸⁴ Casey Johnston, *Google dives deep into content-generation business with Zagat purchase* (September 8, 2011), <https://arstechnica.com/information-technology/2011/09/google-acquires-entertainment-and-dining-review-company-zagat/> ("Google plans to collaborate with Zagat to integrate its content with Google search results and Google Maps—likely, Zagat content will begin appearing on the Places pages of all the locations it has covered.")

²⁸⁵ Lunden, *supra note 23*

²⁸⁶ Thomas Claburn, *Google Buys Skybox Imaging* ("June 11, 2014), <https://www.informationweek.com/machine-learning-ai/google-buys-skybox-imaging> ("Satellite company's technology will improve Google Maps and enhance Google's ability to provide business intelligence to organizations.")

²⁸⁷ Michael Arrington, *Writely Confirms Google Acquisition* (March 9, 2006), <https://techcrunch.com/2006/03/09/writely-confirms-google-acquisition/> ("This signals two things: a confirmation of Google's desire to hit Microsoft hard and attack their largest revenue product, and that they will do this at least partially through acquisition rather than building the office suite entirely in-house.")

²⁸⁸ Arrington, *supra note 25*

²⁸⁹ See. *Market share of major office productivity software worldwide in 2022*, <https://www.statista.com/statistics/983299/worldwide-market-share-of-office-productivity-software/>

instrumental in advancing Google's AI capabilities, particularly in areas like natural language processing and autonomous systems²⁹⁰.

- Dialogflow (2016, formerly known as Api.ai): A tool for building conversational interfaces, enhancing Google's capabilities in AI-driven chatbots and voice services²⁹¹.

3.4.2.6 Cloud computing and data management

- Looker (2020): A big data analytics company, enhancing Google Cloud's data visualization and business intelligence capabilities²⁹².
- Apigee (2016): Specializing in API management, Apigee has bolstered Google Cloud's offerings in helping enterprises in digital transformation and developing API-driven ecosystems²⁹³.
- Firebase (2014): A platform for developing mobile and web applications, Firebase has enhanced Google's offerings in cloud services and application development²⁹⁴.
- Mandiant (2022): A cybersecurity firm known for its expertise in incident response and threat intelligence, reinforcing Google Cloud's security offerings²⁹⁵.

Google cloud has a market share of 10% as of 2023.

3.4.2.7 Photo management and editing

- Picasa (2004): A leader in photo organization and editing software, Picasa's acquisition enabled Google to integrate advanced photo management tools into its suite of services, culminating in the development of Google Photos²⁹⁶.

Google Photos is the most used service in the photography category.

²⁹⁰ Catherine Shu, *Google Acquires Artificial Intelligence Startup DeepMind For More Than \$500M* (January 26, 2014), <https://techcrunch.com/2014/01/26/google-deepmind/> (“Google’s hiring of DeepMind will help it compete against other major tech companies as they all try to gain business advantages by focusing on deep learning.”)

²⁹¹ Greg Kumparak, *Google acquires API.AI, a company helping developers build bots that aren't awful to talk to* (September 19, 2016), <https://techcrunch.com/2016/09/19/google-acquires-api-ai-a-company-helping-developers-build-bots-that-arent-awful-to-talk-to/> (“Google has just disclosed that it has snatched up the team behind API.AI. API.AI provides tools to developers to help them build conversational, Siri-esque bots.”)

²⁹² Ron Miller, *Google closes \$2.6B Looker acquisition* (February 13, 2020), <https://techcrunch.com/2020/02/13/google-closes-2-6b-looker-acquisition/> (“Today, the company announced that deal has officially closed and Looker is part of the Google Cloud Platform.”)

²⁹³ Ron Miller, *Google will acquire Apigee for \$625 million* (September 8, 2016), <https://techcrunch.com/2016/09/08/google-will-acquire-apigee-for-625-million/> (“The company, which helps customers build digital products with open APIs, has an impressive customer list including Walgreens, AT&T, Bechtel, Burberry, First Data and Live Nation.”)

²⁹⁴ Frederic Lardinois, *Google Acquires Firebase To Help Developers Build Better Real-Time Apps* (October 21, 2014), <https://techcrunch.com/2014/10/21/google-acquires-firebase-to-help-developers-build-better-realtime-apps/> (“Google today announced that it has acquired Firebase, a backend service that helps developers build realtime apps for iOS, Android and the web that can store and sync data instantly.”)

²⁹⁵ Sam Shead, *Google to acquire cybersecurity firm Mandiant for \$5.4 billion* (March 8, 2022), <https://www.cnbc.com/2022/03/08/google-plans-to-acquire-mandiant-for-5point4-billion.html> (“Mandiant will join Google’s cloud computing division, which is yet to grow to the same size as Microsoft Azure or Amazon Web Services.”)

²⁹⁶ Morris, *supra* note 24

These acquisitions have helped Google dominate different markets, which shows how the flow of revenues from its advertising businesses is helping Google monopolize and consolidate power across different segments. We next talk about the impact of these actions on consumer welfare.

3.4.3 Implications for consumer welfare

Google's extensive acquisitions and dominance across various digital markets, such as search engines, social media, and cloud computing, have far-reaching implications for consumer welfare. This dominance has led to reduced consumer choice and a potential stifling of innovation. In environments where a single entity like Google holds substantial market share across different platforms, diversity in consumer options tends to diminish. This monopolization can lead to decreased incentives for innovation as competitive pressure to improve and evolve services lessens. Consequently, consumers may face stagnation in the quality and variety of digital services available.

Moreover, Google's extensive data collection practices, integral to its advertising business, pose significant privacy concerns. The company's capacity to collect and analyze vast amounts of user data across its platform challenges consumer privacy. With limited alternatives in essential services such as search engines and email, consumers are often left with little choice but to use platforms that continuously harvest their personal data. This strengthens Google's market position by reinforcing its data monopoly and creates barriers for competitors who lack similar data access.

Additionally, Google's market strategies, like making Google Search the default in Chrome and paying to maintain dominance on other platforms, have raised antitrust concerns. Such practices not only consolidate Google's position in the search market but also create significant barriers to entry for new competitors, thereby undermining competitive market dynamics. This monopolistic stance may impede the emergence of innovative competitors and alternative technologies, affecting consumer choice and the health of the digital market.

A particularly concerning aspect of this scenario is the creation of a vicious cycle where dominance in one market is leveraged to gain control in others. For instance, revenue and data obtained from Google's search business can be used to subsidize and promote other services, further entrenching its market position. This cycle leads to a consolidation of power by Google, stifling competition across multiple sectors. Google dominates each market and becomes a tool to further consolidate its position in other areas, exacerbating the challenges for new entrants and innovators.

While the convenience and integration of Google's services offer benefits, the trade-offs in competition, innovation, and privacy are significant. This situation highlights the need for robust antitrust regulation and consumer protection. Ensuring a balanced digital market, where competition is encouraged, innovation is nurtured, and consumer data and privacy are protected, is crucial. Addressing these issues is essential to maintain a dynamic and fair digital ecosystem that serves the broad interests of consumers.

4 RECOMMENDATIONS

In this section, we use our observations around different anti-competitive practices by Google to recommend remedies that can ensure a fair and competitive online market

landscape.

4.1 Behavioral remedies

In addressing Google Chrome's antitrust challenges, a potential strategy lies in implementing behavioral remedies. Our investigation has revealed a pattern in Google's integration of services across its browser and other platforms to lock individuals into its ecosystem. This lock-in facilitates a more streamlined data collection process, thereby reinforcing Google's advertising dominance.

Central to these concerns is Google's practice of universal login across its services. Current protocols dictate that signing into one Google service inadvertently leads to automatic logins across others. This system blurs the boundaries of user consent, especially since engagement with one service (like YouTube) does not *prima facie* equate to a blanket authorization for sign into other services such as Google Search, Google Docs, or even Google Chrome after v70. To remedy this, one should consider a separation between Google's various services. As a relatively non-invasive remedy, each service should require independent consent for user login coupled with a rigorous enforcement of the existing purpose limitation principle under European and Californian privacy laws, ensuring that interactions with one platform do not result in unintended access to others and that user data is not re-used across different services in an anti-competitive manner. This approach not only upholds the principles of user autonomy and privacy but also restricts Google's ability to leverage its ecosystem to unfairly collect and monetize user data. Moreover, this recommendation underscores the broader implications of informed consent in the digital age. It challenges the prevailing norms of data collection and usage by dominant market players like Google and advocates for a more user-centric approach to service integration. This is not merely a technical adjustment but a fundamental shift towards respecting user choice and privacy in an increasingly interconnected digital landscape, a shift that is essential for restoring competitive balance and fairness in the digital market.

Building on the need for greater user autonomy and privacy, it's crucial to consider regulatory frameworks that define and address corporate dominance in the digital space. A pertinent example is the EU's 2022 DSA²⁹⁷ and DMA²⁹⁸, which set clear criteria for identifying dominant online services and make them subject to stringent obligations. This approach to regulation acknowledges the substantial influence such services can wield over digital markets and user experiences. It serves as a model for imposing accountability and mitigating the risks associated with excessive market power. By establishing dominance criteria, the DSA and DMA aim to ensure that large technology companies do not abuse their market position, while fostering a fairer, more competitive environment. This regulatory measure is a step towards leveling the playing field, compelling dominant players like Google to adhere to higher standards of operation, particularly in aspects of consumer protection, data protection and privacy, and fair competition.

A critical aspect of addressing Google's antitrust practices also involves prohibiting the company from advertising its own services on platforms within its network. An illustrative example of this is Google's promotion of the Chrome browser within its search engine²⁹⁹.

²⁹⁷ *Supra note 140*

²⁹⁸ *Supra note 141*

²⁹⁹ *See section 3.2.1.1*

Since both Chrome and Google Search are under the same corporate umbrella, this internal cross-promotion presents a conflict of interest. Google, in effect, can easily outbid competitors for advertising space, essentially transferring funds within its divisions. This tactic effectively sidelines other browsers, as Google's worst-case scenario is merely the loss of potential additional revenue from these competitors' ads. Similarly, Google's advertising of its array of services on YouTube, where the ad inventory is wholly controlled by Google and inaccessible to any third-party supply-side platform, is another manifestation of this issue. Such practices consolidate Google's market dominance not through superior service or competitive pricing, but through leveraging its existing control over multiple high-traffic platforms. This self-promotion strategy restricts free competition and limits consumer choice. It allows Google to maintain and expand its market dominance in various sectors, from browsers to online video platforms, by using its established platforms as self-reinforcing advertisement channels. To foster a more competitive digital market, regulatory measures should enforce a clear separation between Google's advertising entities and its other service platforms. Such measures would prevent Google from utilizing its dominance in one area (such as search or browser) to unfairly promote its services in another, thereby ensuring a level playing field for all market participants.

Another pivotal recommendation pertains to Google's practice of entering exclusive contracts, exemplified by its agreement with Apple, where Google remains the default search engine in exchange for sharing 36% of the revenue generated from Apple users. Such agreements, while lucrative for the parties involved, contribute to the entrenchment and concentration of market power in the hands of already dominant players. These exclusivity contracts act as barriers to entry for potential competitors in the search engine market. They not only reinforce Google's dominance but also limit consumer choice by pre-emptively deciding the default service for vast user bases. This practice stifles competition and innovation in the market, as emerging players find it increasingly challenging to gain a foothold against such entrenched agreements.

4.2 Structural remedies

Next, we discuss some structural remedies which can be applied if the behavioral remedies are deemed to be lacking.

To address the potential abuse of Chrome's dominant market position, one should consider obliging the Chrome team to operate as a structurally separate entity within Google. This separation is crucial to mitigate conflicts of interests in the operation of both Chrome and other Google other services, which could lead to anti-competitive practices. By separating Chrome, Google's ability to use its browser dominance to unfairly influence other market segments would be significantly curtailed.

Drawing inspiration from historical interventions such as California Public Utilities Act passed in 1912³⁰⁰, which brought natural gas, electric, telephone, and water companies as well as railroads and marine transportation companies under the purview of the California Public Utilities Commission, we recommend developing utility-style regulation for web browsers. This perspective is grounded in the recognition that browsers, much like utilities,

³⁰⁰ See. *Public Utilities Act of California* (1912), https://www.cpuc.ca.gov/-/media/cpuc-website/files/uploadedfiles/cpuc_public_website/content/about_us/history/1912publicutilitiesactofcaliforniatem.p.pdf

are essential conduits to critical services—in this case, the internet. Consequently, imposing utility-style regulation on browsers could ensure a level playing field, like the regulatory frameworks governing electricity or water services. Such regulation would not only maintain Chrome’s functional utility within Google’s broader ecosystem but would also establish safeguards to prevent its use as a tool for market manipulation.

This approach aligns with the broader objective of antitrust law—to foster competitive markets and protect consumer welfare. By redefining browsers as utilities and enforcing structural separation within conglomerates like Google, the market dynamics of the digital age could be recalibrated to ensure fairness and prevent the concentration of power in the hands of a few dominant players.

4.3 Divestment

Should the structural and behavioral remedies prove insufficient in mitigating Google Chrome’s market dominance, a more radical solution may be required: the divestment of Google Chrome (“the hammer”). In this scenario, Chrome would be spun off into an independent entity, free from Google’s influence. This might prompt concerns regarding the financial viability of the newly independent Chrome. The precedent set by Mozilla’s financial dependence on Google highlights potential challenges for Chrome in maintaining its operations without similar support.

To address these financial dependencies, it is essential to couple the divestment with the implementation of the previously discussed behavioral remedies. These measures would ensure that, while Google may retain the ability to financially support Chrome, it would not be able to forge exclusive contracts that could yield an unfair competitive advantage. Additionally, reclassifying browsers as utilities, as previously suggested, could play a crucial role in this context. Under such a classification, Chrome’s agreements and decisions would be subject to heightened scrutiny, particularly to safeguard consumer welfare and prevent exclusionary practices.

In addition to divestment of Chrome, it is also pertinent to re-examine past mergers of Google and analyze if those mergers resulted in less competition in the market. The Google-DoubleClick merger serves as a prime example, where initial regulatory approval overlooked potential long-term anti-competitive effects³⁰¹. By examining the Federal Trade Commission's 2007 approval of the Google-DoubleClick merger, we can see the limitations of forward-looking assessments that failed to foresee the enhanced market power and anti-competitive behavior arising from the combination of Google's dominance in other markets with DoubleClick's advertising technology. Despite some concerns from within FTC³⁰², the

³⁰¹ See. *Federal Trade Commission Closes Google/DoubleClick Investigation* (December 20, 2007), <https://www.ftc.gov/news-events/news/press-releases/2007/12/federal-trade-commission-closes-googledoubleclick-investigation> (“The evidence also showed that it was unlikely that Google could manipulate DoubleClick’s third-party ad serving products in a way that would competitively disadvantage Google’s competitors in the ad intermediation market. Further, the evidence demonstrated that any aggregation of consumer and competitive data resulting from the acquisition is unlikely to harm competition in the ad intermediation market.”)

³⁰² See. *In the matter of Google/DoubleClick F.T.C. File No. 071-0170, Dissenting statement of commissioner Pamela Jones Harbour*, https://www.ftc.gov/sites/default/files/documents/public_statements/statement-matter-google/doubleclick/071220harbour_0.pdf (“I dissent because I make alternate predictions about where this

merger was approved, and FTC claimed to keep a “close watch” on the market and “act quickly” should there be anti-competitive behavior. However, the market situation of today shows the shortcomings of this approach. It is, therefore, pertinent that there should exist a mechanism to revisit such decisions. Thus, it is important to also apply this divestment approach retrospectively on previous mergers as well.

This dual strategy of divestment and regulatory oversight would aim to create a more equitable browser market. It would ensure that Chrome operates independently, both structurally and financially, while remaining subject to regulatory frameworks that prevent anti-competitive contracts and actions detrimental to consumer interests and a competitive market.

5 CONCLUSIONS

In conclusion, Google’s market dominance in the realms of web browsing, publishing, and advertising is a critical barrier to fair competition in the digital age. The company’s strategic acquisitions, coupled with tactics that subtly coerce users and disadvantage competitors, illuminate a complex web of dominance that extends far beyond traditional market boundaries.

The exploration of potential remedies—behavioral, structural, and divestment—is imperative in addressing the multifaceted nature of Google’s market power. Behavioral remedies, while targeting specific anti-competitive practices, may fall short in dismantling the entrenched dominance Google holds. The imposition of structural remedies, calling for an internal reorganization to disentangle Google’s advertising and browser divisions, could serve as a more robust approach to ensuring fair play. However, even this might not be enough to fully address the overarching issue of market dominance.

Drawing parallels with historical regulatory actions, the proposal of recognizing Google Chrome as a public utility through divestment emerges as a potentially transformative solution. This approach would not only curb Google’s ability to exploit Chrome for monopolistic gain but also pave the way for a more equitable digital marketplace. Such a transition would mark a significant shift, transforming Chrome from a tool of market capture into an entity that operates in the public interest, fostering fair competition and innovation.

In the ever-evolving digital landscape, the need for vigilant regulatory oversight and proactive measures is a need of the hour. As Google’s case demonstrates, unchecked dominance in one market can lead to cross-market abuses, distorting competition, and innovation. It is essential for regulatory bodies and policymakers to adapt to these new challenges, ensuring that the digital domain remains a competitive, diverse, and vibrant space. The future of the internet, as a cornerstone of modern society, depends on our ability to maintain its openness and accessibility for all.

market is heading, and the transformative role the combined Google/DoubleClick will play if the proposed acquisition is consummated. If the Commission closes its investigation at this time, without imposing any conditions on the merger, neither the competition nor the privacy interests of consumers will have been adequately addressed.”)