

## Alternative Business Model: DuckDuckGo

Summary by Ariel Hsieh

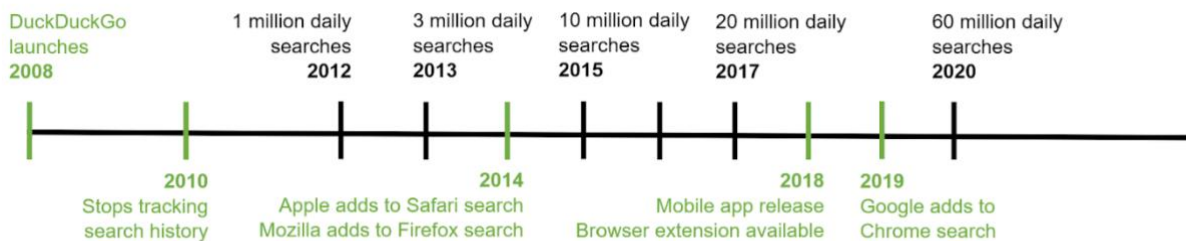


DuckDuckGo is a search engine that prioritizes user privacy. It does not store user data and is free to use as a browser extension or mobile app. DuckDuckGo currently processes over 60 million search queries a day. In comparison, Google processes over 3.5 billion search queries a day. As of June 2020, DuckDuckGo had a share of approximately 1.5% in the market for search engines. This summary describes how DuckDuckGo works, its business model, competitors, and implications for innovation and competition policy.

### How DuckDuckGo Works

DuckDuckGo started as a project by entrepreneur Gabriel Weinberg to improve his Google search results.<sup>1</sup> In 2008, Weinberg launched the DuckDuckGo search engine. By 2012, DuckDuckGo reached 1 million searches a day and by 2020, 60 million searches. The recent popularity of DuckDuckGo may reflect a growing number of people who are concerned about the use of their personal data.<sup>2</sup>

Figure 1: DuckDuckGo timeline<sup>3</sup>



Like other search engines, DuckDuckGo allows users to enter a search term and displays a list of results from its database based on that term. Results are compiled from over 400 sources that are indexed or filed into a database. These sources include DuckDuckBot, a web crawler that browses and indexes sites on the World Wide Web; sites for “Instant Answers” such as Wikipedia; and partners such as Microsoft Advertising and Apple Maps.<sup>4</sup>

DuckDuckGo’s differentiating feature is that it does not store user data. While the search engine may “know” information about a user’s location from her IP address (a unique code sent from her browser which discloses general geographic location), it promises not to save or collect this information. Other data DuckDuckGo does not store are user agents (codes for device operating systems and browser versions), cookies, and search histories. This means that users are anonymous when they search, identifying information is not factored into search algorithms, and users who enter the same search query on DuckDuckGo see the same results.

Figure 2: Google search for “donut hole”

The screenshot shows a Google search for "donut hole". The search bar contains "donut hole" and the results show "About 19,900,000 results (0.54 seconds)".

The top result is from [www.medicareinteractive.org](http://www.medicareinteractive.org) titled "The Part D donut hole - Medicare Interactive". The snippet reads: "The Medicare Part D donut hole or coverage gap is the phase of Part D coverage after your initial coverage period. You enter the donut hole when your total drug costs—including what you and your plan have paid for your drugs—reaches a certain limit. In 2020, that limit is \$4,020."

Below this result is a "People also ask" section with the following questions:

- What does Donut Hole mean?
- Is donut hole going away in 2020?
- Can you avoid the donut hole?
- What is the donut hole amount for 2020?

The second result is from [www.healthcare.gov](http://www.healthcare.gov) titled "Donut Hole, Medicare Prescription Drug - HealthCare.gov ...". The snippet reads: "Most plans with Medicare prescription drug coverage (Part D) have a coverage gap (called a 'donut hole'). This means that after you and your drug plan have spent a certain amount of money for covered drugs, you have to pay all costs out-of-pocket for your prescriptions up to a yearly limit."

A yellow box highlights a snippet from [Wikipedia](https://www.wikipedia.org) titled "Medicare Part D coverage gap". The text reads: "The Medicare Part D coverage gap is a period of consumer payment for prescription medication costs which lies between the initial coverage limit and the catastrophic-coverage threshold, when the consumer is a member of a Medicare Part D prescription-drug program administered by the United States federal government." Below the text is a "Feedback" link.

Figure 3: DuckDuckGo search for “donut hole”

The screenshot shows a DuckDuckGo search for "donut hole". The search bar contains "donut hole" and the results show "Privacy, simplified" and "Settings".

The top result is a map showing "Donut Hole Bakery Cafe" locations in San Francisco, New York, and Washington. Below the map is a list of three cafes:

- 1. Donut Hole Bakery Cafe**  
4.5 stars (975 reviews)  
\$\$ - Donuts, Breakfast & Brunch  
635 Harbor Blvd
- 2. Donut Hole Bakery Cafe**  
4.5 stars (537 reviews)  
\$\$ - Cafes, Breakfast & Brunch, Donuts  
6745 US Hwy 98 W
- 3. Donut Hole**  
4.5 stars (435 reviews)  
\$\$ - Donuts, Breakfast & Brunch, Diners  
12983 Hwy 98 E

Below the list is a "More Places" link and a "Feedback" link.

A yellow box highlights a snippet from [Wikipedia](https://www.wikipedia.org) titled "Donut hole". The text reads: "A doughnut or donut is a type of fried dough confection or dessert food. The doughnut is popular in many countries and is prepared in various forms as a sweet snack that can be homemade or purchased in bakeries, supermarkets, food stalls, and franchised specialty vendors." Below the text is a "Feedback" link.

Below the yellow box is an advertisement for "Entenmann's® Fresh-Baked Goods - Scrumptious Donut Holes" with the URL [entenmanns.com](http://entenmanns.com) and a "Report Ad" link.

Figures 2 and 3 compare a Google search and a DuckDuckGo search for “donut hole.” The yellow boxes highlight an “answer” to the search query. Google refers to this as an “Answer Box” and DuckDuckGo calls it an “Instant Answer.” Though Google and DuckDuckGo deliver different answers, both are valid: a donut hole is a delicious dessert, as well as a moniker for the coverage gap in Medicare Part D. The difference may be attributed to the search algorithm (a set of instructions that decides what results are shown) used by each search engine.

Even though I conducted the Google search while logged out of my Google account, Google may have linked together identifying information such as user agent, IP address, and search history to create a profile and deliver results tailored to the profile. This data could reveal my geographic location, age range, and other demographic information that goes into Google’s algorithm, which decides that I am looking to learn about the Part D coverage gap, not a recipe for a donut hole. The results on the left side of Figure 2 show more links about the coverage gap. The eighth link on the list (not shown) was the first link about donut hole desserts.

In comparison, DuckDuckGo gives an Instant Answer about food. The results on the left side of Figure 3 show map results to bakeries that sell donut holes. The bakeries shown are located all over the United States because, when prompted, I did not allow DuckDuckGo to use my location to refine search results. Below the map, DuckDuckGo displays two advertisements. The third result on the list (not shown) is about the Part D coverage gap. This example is consistent with DuckDuckGo’s claim that it delivers results to anonymous users: the search engine did not know if I was interested in dessert or the coverage gap, so it showed both.

Regarding ads, DuckDuckGo results contain a mix of organic links and sponsored links. Ads are displayed at the top of the results list ads are delivered according to search queries, not users. Users may disable ads through the settings menu.

## **Who Uses DuckDuckGo**

Since DuckDuckGo does not track users, there is little data available about its user base.<sup>5</sup> However, search engine market shares, which measure the percentage of searches conducted on each search engine, provide useful proxies for user demand. These shares suggest that DuckDuckGo is most popular in the United States, but also has a global reach, with users in countries such as Canada, France, and Germany. In 2020, a greater share of DuckDuckGo searches in the United States were conducted on desktops than on mobile devices.

## **Business Model**

DuckDuckGo is a privately owned, for-profit company. Ads are one of three primary sources of revenue. Since DuckDuckGo does not run its own ad network, companies who want to advertise on DuckDuckGo must do so through Microsoft’s ad network, Microsoft Advertising. An ad network is an intermediary between advertisers and publishers; in this case, advertisers are companies and the publisher is DuckDuckGo. Microsoft Advertising allows companies to supply their ads, choose a maximum willingness-to-pay for user

clicks on the ad, and restricts the ad's audience by demographics if the company chooses to do so.<sup>6</sup> Then, Microsoft Advertising provides these ads on DuckDuckGo result lists, keeps tracks of user clicks, and distributes revenue to DuckDuckGo based on advertiser bids.

Along with ad revenue, DuckDuckGo receives a small commission (the exact share is not public) after DuckDuckGo users make purchases from affiliate sites. Currently, Amazon and eBay are affiliates.<sup>7</sup> A third source of revenue is venture capital funding. DuckDuckGo has received two rounds of funding since its founding: 3 million by Union Square Ventures and others in 2011 and 10 million by OMERS Ventures in 2018.<sup>8</sup>

As a search engine, DuckDuckGo is involved in at least two distinct markets.<sup>9</sup> First, the market for online general search connects DuckDuckGo and users. Users may access DuckDuckGo as a free browser extension on Safari, Firefox, and Chrome, as well as a free mobile app on iOS and Android devices. Marketing, UI and UX design, and improving search algorithms are necessary expenditures to attract more users. The market for indexing content, which connects DuckDuckGo and website operators, is contained in the market for general search. DuckDuckGo maintains its own web crawler and contracts with third-party APIs such as Bing Web Search API to generate Instant Answers.

Second, the market for online search advertising connects DuckDuckGo and advertisers. DuckDuckGo syndicates ads through Microsoft Advertising, so marketing is important to convince advertisers to bid for ad slots on DuckDuckGo. In addition to these expenditures, DuckDuckGo maintains one office in Paoli, Pennsylvania and pays salaries for 98 employees (as of July 2020). With an increasing number of privacy-aware web users, DuckDuckGo's business model has been profitable.<sup>10</sup>

## **Competitors**

DuckDuckGo competes in the market for online general search services. This is a global market that includes search on desktop and mobile devices. The rest of this summary will focus on the market for online general search services in the United States because DuckDuckGo has the highest share of users in this country.<sup>11</sup>

Search engine market shares are also useful proxies for dominance. This is because DuckDuckGo is a platform that serves multiple markets with network externalities. Users go to DuckDuckGo when they seek answers for their search queries. The more users that use DuckDuckGo, the more searches are conducted, and DuckDuckGo can deliver better results because data from past searches improve its search algorithms. Similarly, advertisers want to advertise on search engines with large user bases. Based on search engine market shares, the market for general search in the United States is dominated by Google.

Figure 4: Top 5 Search Engines (All Devices) in the United States in June 2020<sup>12</sup>

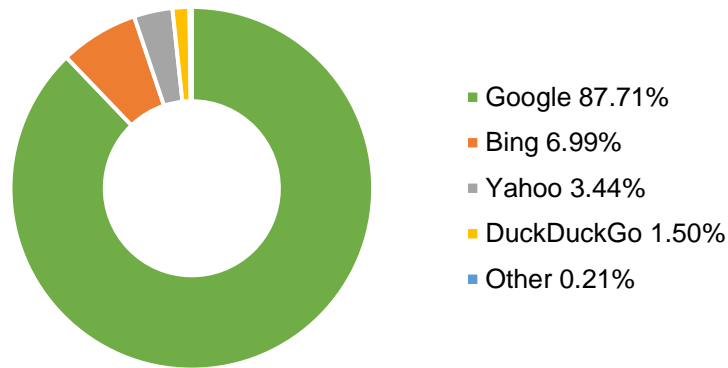
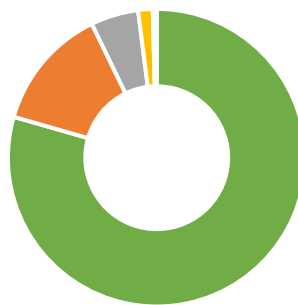


Figure 5: Top Search Engines by Type of Device in the United States in June 2020

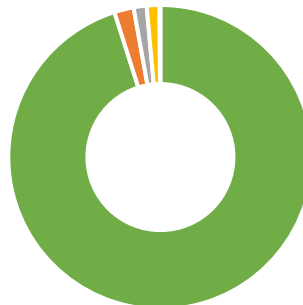
Desktop Searches

- Google 79.25%
- Bing 13.35%
- Yahoo 5.17%
- DuckDuckGo 1.57%
- Other 0.43%



Mobile Searches

- Google 95.06%
- Bing 1.36%
- Yahoo 2.06%
- DuckDuckGo 1.38%
- Other 0.09%



In the global market, DuckDuckGo competes with other privacy-aware search engines that do not collect user data: Startpage.com (formerly ixquick.com) was founded in the Netherlands, Unbubble in Germany, and Qwant in France.

## Implications for Innovation and Competition Policy

A key principle in competition economics is that competition delivers innovation. Google clearly dominates the market for online general search and companies who wish to compete in this market face high barriers to entry. For example, though DuckDuckGo is the default search engine for Brave, a privacy-aware browser, Google is the default search engine for Chrome, Safari, and Firefox, the most used browsers in the world.<sup>13</sup> All these browsers now have extensions and options to change the default search engine, but users may face barriers to installing or switching search engines. One such barrier is the behavioral bias of accepting default options. The “status quo” bias shows that consumers prefer their current states, which could explain why Google is still the dominant search engine despite increasing concern about data and privacy.<sup>14</sup> Allowing users to select their search engine of choice when they first install a browser may lead to more people using their preferred search engine instead of the default.

In addition, Google is vertically integrated in the market for digital advertising. According to the U.K. Competition and Markets Authority (CMA), Google has captured over 90% of the publisher ad server market with Google Ad Manager and Google DoubleClick for Publishers; 40-60% of the supply-side platform market with Google AdX; and 50-70% of the demand-side platform market with Google Ads.<sup>15</sup> Google’s dominance in digital advertising means that advertisers want to contract with Google to reach as many consumers as possible. Combined with an enormous amount of user data from Google Search and YouTube, Google is a very strong incumbent. Competition authorities in Europe and the United States are currently investigating digital advertising markets. Since one side of the market for general search is digital advertising, findings from these investigations will also inform competition in search markets.

Overall, DuckDuckGo is a profitable business that serves the needs of its user base, but it is far from a threat to Google. DuckDuckGo’s recent partnerships with Apple have sparked discussion about a possible acquisition that could make DuckDuckGo the default search engine on Safari and iOS devices.<sup>16</sup> While this would promote competition in the market for general search, competition authorities may be hesitant to approve the acquisition because Apple itself is already dominant in many markets. Nonetheless, companies like DuckDuckGo will be better able to compete with Google if they join forces with companies in other markets related to search, such as digital advertising and browser systems. Yet, this recommendation suggests that the general search market is so concentrated that smaller firms can only compete by joining forces. Future entrants without resources to make partnerships will face additional barriers to entry if this becomes the status quo.

Finally, privacy preferences are personal choices. If users do not care enough about privacy, they will not switch to DuckDuckGo. However, surveys have shown that consumers do care, to some extent, about their privacy. To encourage engagement in user’s own privacy decisions, companies can act to lower barriers to engagement such as sticky defaults and long privacy policies. At the same time, competition authorities have an important duty to continue investigating, enforcing, and regulating competition in search.

## Endnotes

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<sup>1</sup> Susan Adams, “The Founder of DuckDuckGo Explains Why Challenging Google Isn’t Insane,” *Forbes* (February 16, 2016).

<sup>2</sup> In June 2019, Pew Research surveyed 4,272 American adults on personal data and privacy. In this sample, 79% of respondents indicated they were somewhat or very concerned about how companies use collected data. See the full survey here: <https://www.pewresearch.org/internet/2019/11/15/americans-and-privacy-concerned-confused-and-feeling-lack-of-control-over-their-personal-information/>

<sup>3</sup> Information retrieved from DuckDuckGo’s “About” page.

<sup>4</sup> <https://help.duckduckgo.com/duckduckgo-help-pages/results/sources/>

<sup>5</sup> By default, DuckDuckGo does not display most visited sites. Users may enable this option and presumably, DuckDuckGo does store this information. A 2016 study by SimilarWeb found that the most visited websites for DuckDuckGo users were tech and tech news sites: Whitehatsec.com, Github.com, NYtimes.com, 4chan.org, and YCombinator.com. The same study found that the most visited sites for Bing users were MSN.com, Amazon.com, Reddit.com, Google.com, and Baidu.com.

See the study here: <https://www.similarweb.com/corp/blog/duckduckgo-users/>

<sup>6</sup> <https://about.ads.microsoft.com/en-us/get-started/small-business/what-is-microsoft-advertising>

<sup>7</sup> <https://help.duckduckgo.com/duckduckgo-help-pages/company/advertising-and-affiliates/>

<sup>8</sup> Data from Crunchbase.

<sup>9</sup> Thomas Hoppner, “Defining Markets for Multi-Sided Platforms: The Case of Search Engines,” *38 World Competition* (3) (2015): 349–366.

<sup>10</sup> As a privately owned company, DuckDuckGo is not required to disclose its financial statements. However, at a Bloomberg conference in October 2019, general counsel Megan Gray said that DuckDuckGo is subject to the California Consumer Privacy Act and makes “well above” the required annual revenue of 25 million.

See <https://observer.com/2019/10/duckduckgo-google-competing-search-engine-user-privacy-tracking-ad-revenue/>.

<sup>11</sup> Worldwide, on all devices, 91.75% of searches in June 2020 were conducted on Google, 2.75% on Bing, 1.7% on Yahoo!, 1.02% on Baidu, 0.92% on Yandex, and 0.49% on DuckDuckGo. Data from GlobalStats Statcounter.

<sup>12</sup> Data from GlobalStats Statcounter.

<sup>13</sup> Browser market share worldwide in June 2020: 65.47% Chrome, 16.97% Safari, 4.25% Firefox, 7.01% Other. Data from GlobalStats Statcounter.

<sup>14</sup> For example, see “Status Quo Bias in Decision Making” (1988) by Samuelson and Zeckhauser. Also see “Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias” (1991) by Kahneman, Knetsch, and Thaler.

<sup>15</sup> Access the full report here: <https://assets.publishing.service.gov.uk/media/>

<sup>16</sup> John Koetsier, “Apple Could Cost Google \$15 Billion By Buying DuckDuckGo, Analyst Says,” *Forbes* (June 8, 2020).