

# Online Search And Society: Could Your Best Friend Be Your Worst Enemy?

By Rachel Noonan

Submitted to OCAD University in partial fulfillment of the requirements  
for the degree of Master of Design in Strategic Foresight and Innovation  
Toronto, Ontario, Canada, December, 2017

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**“** *Automated reward systems like YouTube algorithms necessitate exploitation in the same way that capitalism necessitates exploitation, and if you’re someone who bristles at the second half of that equation then maybe this should be what convinces you of its truth.*

*Exploitation is encoded into the systems we are building, making it harder to see, harder to think and explain, harder to counter and defend against.* **”**

JAMES BRIDLE, *MEDIUM*

Principal Advisor: Suzanne Stein

Secondary Advisor: Tessa Sproule

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# Abstract

Online search is becoming the main source individuals use to find information about sports, politics, health, religion, world issues, and other subjects that shape our views on the world and how we live our lives. Of all internet users, 92% use online search and are doing so on desktop and mobile, with an average of 129 searches a month per person.

Search is designed to keep users engaged and serviced with speed and brevity. As search engine usage increases around the world and impact on behaviours becomes more of a concern, we must understand how might the design of search engine algorithms be affecting society's ability to shape the way we see the world. Is commerce compromising community in user experience and design? Are we unknowingly being sent into echo chambers with predictive and personalized search algorithms. Is the fast and wide internet actually narrowing the doors of perception we have been walking through online for the last 30 years?

It is the right time for through exploratory research to better

understand the current and potential future impacts and implications of search on society and citizens. I will employ a literature review, first party participant research and document a chronology of knowledge discovery and capture in context to searching, sharing and storing of information, along with a horizon scanning exercise with a focus on trends research. The first-party human-based research will involve the segmentation of Digital Natives and Digital Immigrants to explore whether there are patterns emerging within distinct age groups. These methods will be deployed and findings will be analyzed to ascertain what the issues might be and whether people understand the complexities, powers, and abilities of search engines.

# Acknowledgements

When I had my interviews in consideration for the Masters of Design in Strategic Foresight and Innovation, I was asked, “What kind of questions would you like to ask about the world?” I answered with conviction that I wanted to explore the world of search engines and their impact on society. I didn’t know how or if it would ever happen, but here we are three years later and my MRP is about search in the future!

As we moved toward the end of the program, I was lucky enough to have a professor and amazing human being agree to advise me. She would have some life challenges through the process as would I, with us both coming out the other side committed to completing the project. Her name is Suzanne Stein and I would like to acknowledge her unwavering and inspirational contributions. She was a source of support throughout the process, from the most granular of elements to the larger philosophical questions as I navigated this research and subject matter. Without her, I would not have the privilege of an MDes designation and the perspective on the world and approach to research that I do today.

I would like to thank Cheryl Hsu, Kaitlyn Whelan, Hayley Lapalme, and all the other amazing crew in my cohort who were there when I broke my face, there when it mattered the most, and helped me get better so I could get back into living not just a fulfilling life, but one with purpose.

Thank you!



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Figure 1: Feedback Loop. Rachel Noonan

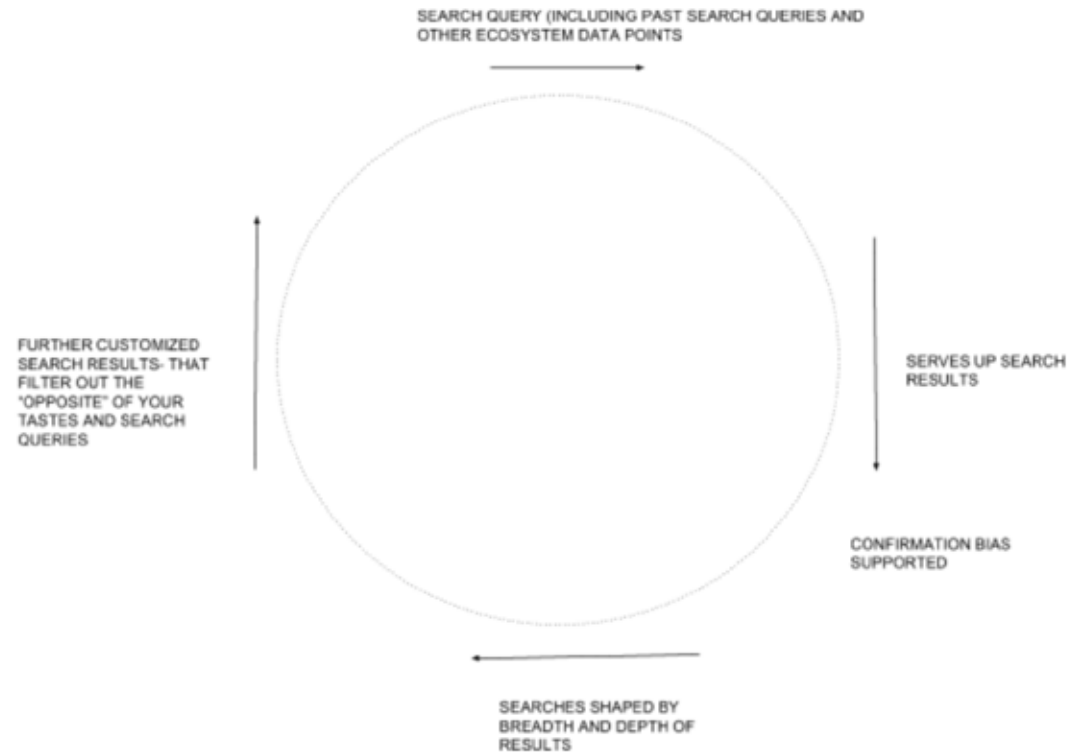


Figure 2, Source: Eli Pariser, LSE Public Lecture

# Meet Scott's Google Search

GENDER: **Male**

RACE: **Caucasian**

LOCATION: **New York**


Google Egypt

About 350,000,000 results (0.24 seconds)

**Crisis in Egypt**  
Voices in Egypt have been muted but will not be silenced. Listen. [humanrightsfirst.org/Egypt](http://humanrightsfirst.org/Egypt)

**Egypt - Wikipedia, the free encyclopedia**  
Egypt officially the Arab Republic of Egypt, is a country mainly in North Africa, with the Sinai Peninsula forming a land bridge in Southwest Asia. ... Hosni Mubarak - Ancient Egypt - Female genital cutting - History of modern Egypt [en.wikipedia.org/wiki/Egypt](http://en.wikipedia.org/wiki/Egypt) - Cached - Similar

**Egypt News - The Protests of 2011 - The New York Times**  
World news about Egypt and the protests of 2011. Breaking news and archival information about its people, politics and economy from The New York Times. [topics.nytimes.com> World / Countries and Territories](http://topics.nytimes.com> World / Countries and Territories) - Cached - Similar

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**News for Egypt**

**Why Lara Logan Was Eager to Return to Egypt**  
1 hour ago  
By Charlotte Triggs AP Lara Logan had already had one troubling experience in Egypt before last Friday's "brutal and sustained" sexual assault, ... [People Magazine](http://People Magazine) - 1558 related articles - Shared by 20+

**In Egypt, renewed hope for gender equality**  
USA Today - 24874 related articles - Shared by 5+


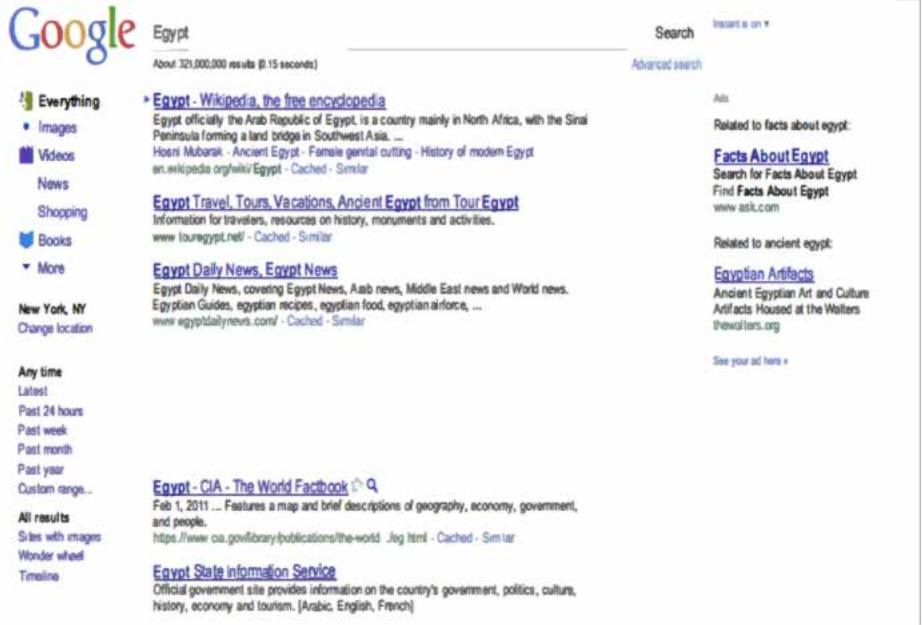
**Realtime updates for Egypt (D9C)**

# Meet Daniel's Google Search

GENDER: **Male**

RACE: **Caucasian**

LOCATION: **New York**

Google Egypt

About 329,000,000 results (0.15 seconds)

**Everything**

- Images
- Videos
- News
- Shopping
- Books
- More

**New York, NY**  
Change location

**Any time**  
Latest  
Past 24 hours  
Past week  
Past month  
Past year  
Custom range...

**All results**  
Sites with images  
Wonder wheel  
Timeline  
Social

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**Egypt - CIA - The World Factbook**  
Feb 1, 2011 ... Features a map and brief descriptions of geography, economy, government, and people. <https://www.cia.gov/library/publications/the-world-factbook> .Jag.html - Cached - Similar

**Egypt State Information Service**  
Official government site provides information on the country's government, politics, culture, history, economy and tourism. [Arabic, English, French]

Figure 2, Source: Eli Pariser, LSE Public Lecture

**Egypt** ✕

About 350,000,000 results (0.24 seconds)

▶ [Crisis in Egypt](#)  
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[Favot Daily News](#) [Favot News](#)

**Egypt**

About 321,000,000 results (0.15 seconds)

▶ [Egypt - Wikipedia, the free encyclopedia](#)  
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 Hosni Mubarak - Ancient Egypt - Female genital cutting - History of modern Egypt  
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<https://www.cia.gov/library/publications/the-world.../eg.html> - Cached - Similar

[Egypt State Information Service](#)  
 Official government site provides information on the country's government, politics, culture, history, economy and tourism. [Arabic, English, French]

Figure 3: Number of daily searches by search engine. Source: Smart Insights.com.

Breaking this down using the above Market Share chart and the data from [Internet live stats](#), below you'll find the number of daily searches per Search Engine.

Search Engine	Searches per day
Google	4,464,000,000
Bing	873,964,000
Baidu	583,520,803
Yahoo	536,101,505
Other (AOL, Ask etc)	128,427,264

Figure 4: Annual Global revenue of Google from 2002 to 2016 (Statistica)

Google: global annual revenue 2002-2016  
**Annual revenue of Google from 2002 to 2016 (in billion U.S. dollars)**

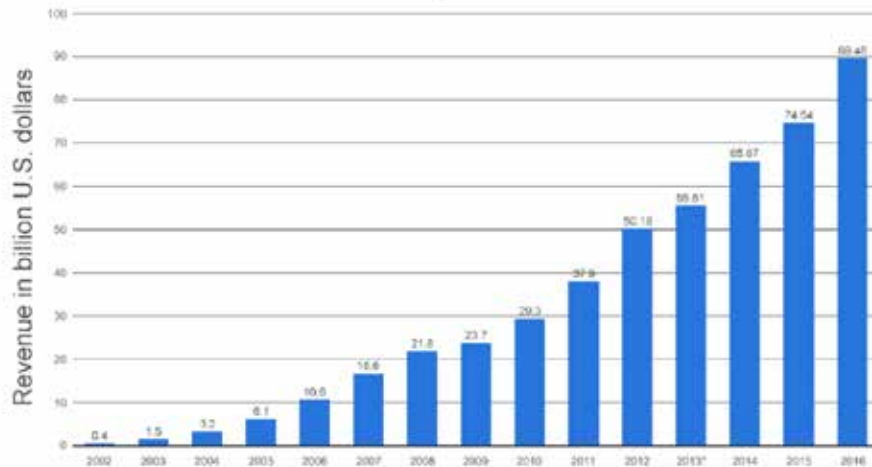


Figure 5: Number of daily searches by search engine

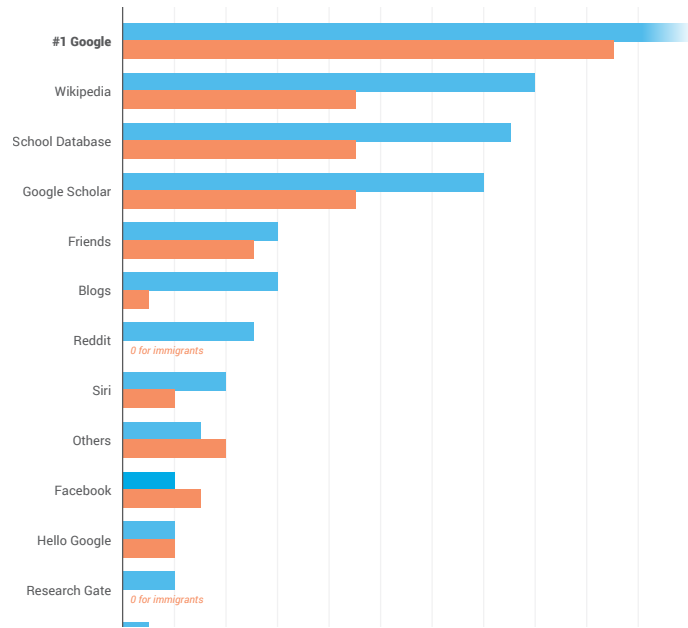


Figure 6: Google search engine algorithm

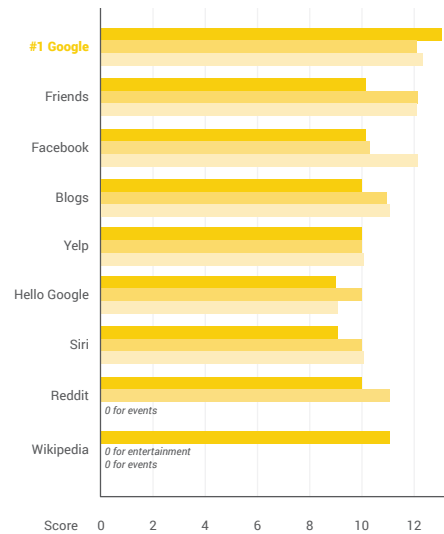


Figure 7: Search Engine Influence

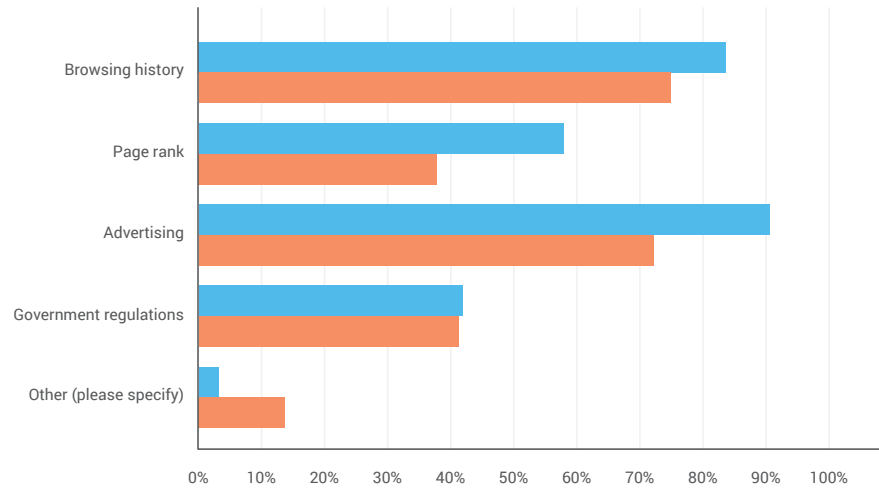


Figure 8: User Trust in Search Engine

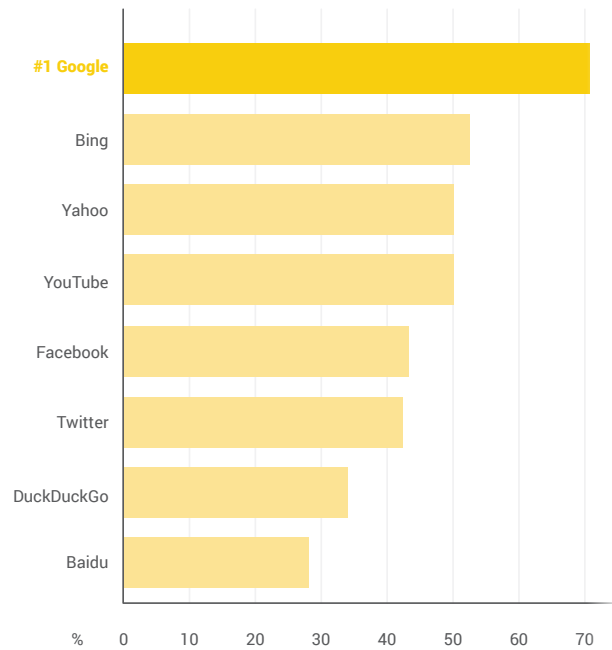




Figure 9: Last Time in a Public Library Chart

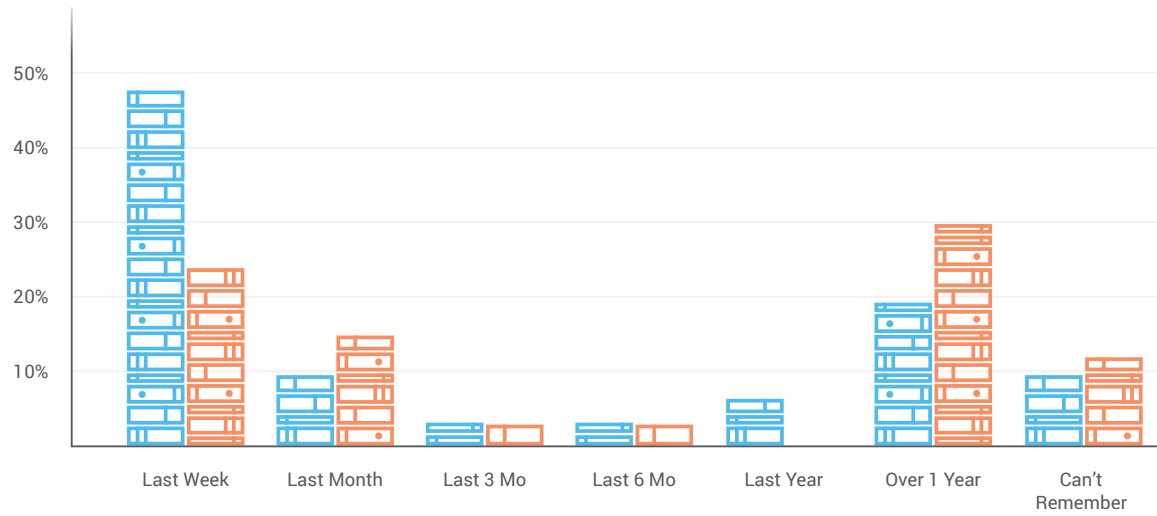


Figure 10: Information Sources

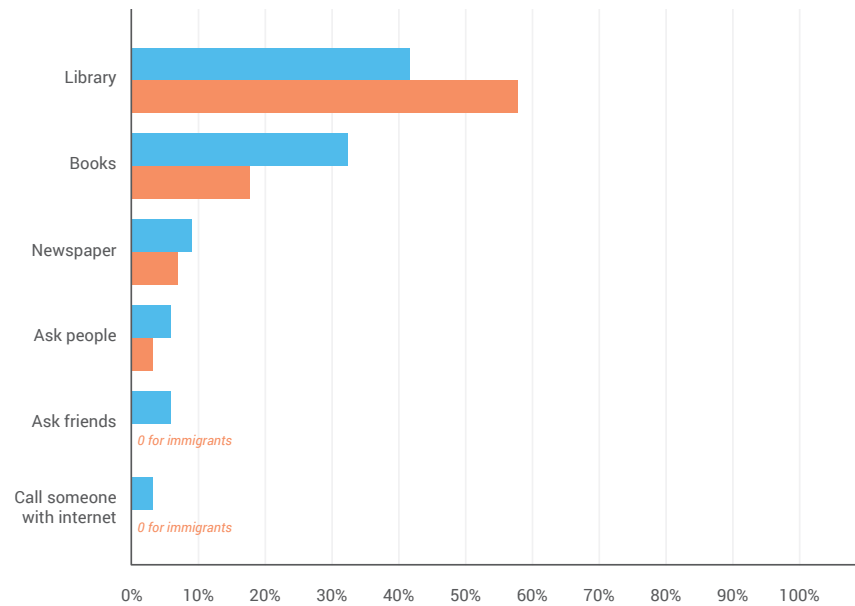
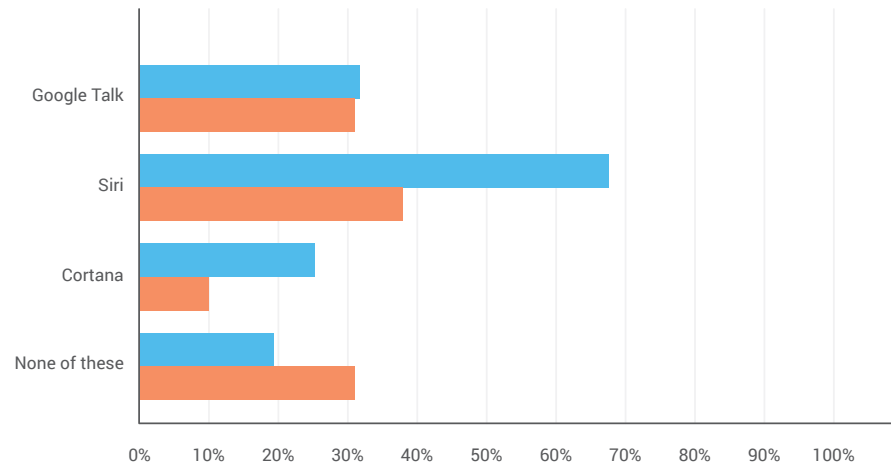


Figure 11: Services Used



## Chapter 1: Introduction

*NOTE: Throughout this paper, I will refer to search engines as search, which can be accessed via web-enabled devices, either by typing into a web browser, or using voice-automated search functions on certain devices.*

*'Search' also applies to other products and services such as Facebook and Twitter. I will make mention of these other platforms, but the main focus of this paper is search engines and the algorithms that drive the user experience.*

---

Marshall McLuhan declared that the adoption of platforms such as radio and television (and now cell phones, the internet, and artificial intelligence) are causing the electrical retribalization of the west. These technological innovations of communication have had an irreversible impact on all aspects of people's lives: how they entertain each other, how they motivate political action, and how they create more false idols, realities, and ideals.

A 1982 study was conducted by the Institute for the Future, "peering into the future of an electronic world," focused on the emerging videotex industry formed by the marriage of two older technologies: communications and computing. It estimated that 40% of American households will have two-way videotex service by the end of the century. By comparison, it took television 16 years to penetrate 90% of households from the time commercial service began in 1946. In addition to

their penetration predictions, The Institute for the Future also warned that the new technology would raise difficult issues of privacy and control that will have to be addressed soon to "maximize its benefits and minimize its threats to society."

As the meteoric rise of "two-way videotex services" has evolved, computers, laptops, smartphones, and smart devices have penetrated our lives. It is now 2017, 35 years later, and we have leapfrogged the estimations by the Institute of the Future, with 77% of U.S. citizens owning a smartphone and over 88% of all homes using broadband internet with multiple desktop computers, laptops and tablets. (PEW, 2016).

In only 27 years, the internet has become a virtual home for close to half the world's population. According to Internet Live Statistics (Internet Live Stats-a, Internet Live Stats-b, 2015), the internet has more than 3,000,000,000 users and there

are more than 900,000 active sites (Chiru, 2016). Marshall McLuhan's declaration of the electrical retribalization of the west couldn't be more relevant today as we have moved from morse code to telephones and televisions, and now we speak to devices like the Amazon Echo, a voice-enabled assistants that seem as if they are human.

These innovations paved the way to one of the most disruptive and pervasive communication technologies ever in the history of humankind: search engines.

Search engines are programs that search documents for specific keywords and return a list of the documents where the keywords were found. A search engine is a general class of programs; however, the term is often used to specifically describe systems such as Google, Bing, and Yahoo! Search, which enable users to search for information on the World Wide Web. Search results are determined by an algorithm that uses multiple data points that are applied to the query, and results are returned based on all the collective points. There is a ranking system to those points, with certain points given priority over others. Although most search engine company algorithms are proprietary, it is widely understood that quality of content, commercial goals, and personalization are three of the driving forces built into the architecture of the algorithms

of many of the search engines used today. The study of algorithmic sciences is a fascinating one, but for the purposes of this paper, all we need to know is that currently search engine companies with significant market share are not required to disclose the architecture of their algorithms; in fact, they keep them confidential. When search engine companies do discuss their algorithms (for example, when announcing updates and improvements), they speak in general terms.

In 2017, if you aren't using Google, DuckDuckGo, Bing, or Baidu to find information, it will be assumed you are either a baby or you are over the age of 102, without the required dexterity to swipe and type.

Beginning with an innocent and practical mission "To organize the world's information and make it universally accessible," Google and many other search engine companies such as Yahoo! and AltaVista were rudimentary in their technology and goals, working to weave the web of data together so users could save time and connect faster with their information. Strong user growth and commercial interest saw the introduction of AdWords for Google search, its proprietary advertising system based partly on cookies and partly on keywords determined by advertisers (Geddes, 2012). Google uses these characteristics to place advertising copy on pages where it

thinks the ads might be relevant. Advertisers pay when users divert their browsing to click on the advertising copy. Partner websites receive a portion of the generated income (Google, n.d).

As the algorithms have evolved to help us find the best pharmacy or date spot, so has the technology evolved to help us get better results. From autocomplete in 2005 to knowledge graphs in 2011, search has gotten smarter and we have become more dependent on search to access the world around us. In December 2009, Google began customizing its search results for all users, and we entered a new era of personalization (Pariser, 2012). Google now tracks search history, phone numbers, devices you use, your patterns of search, how often you use voice automation, and other information via cookies and pixel tags to customize and personalize your experience with Google. In its privacy policy Google states, “Our automated systems analyze your content (including emails) to provide you personally relevant product features, such as customized search results, tailored advertising, and spam and malware detection.” Baidu says, “We may provide your information to our third party partners for marketing or promotional purposes,” yet they also say, “We will never sell your information.” Privacy and information sharing concerns have never been as relevant as they are today, yet people use

search every day, knowing to a degree that these companies are tracking their every online move and using that data to sell, inform, and engage them. From our Facebook feeds to our Google searches, the more we search and post, the more our “customized experiences” are formed.

Search is now the core service embedded in the experience running on all the devices we use to move us through life with over 1.5 billion searches a day taking place on Google alone (Statista, 2017).

Online search is becoming the main source people go to for information about sports, politics, health, religion, world issues, and other subjects that shape our views on the world and how we live our lives. Of smartphone owners, 68% use their phone at least occasionally to follow breaking news, with 33% saying that they do this frequently (Smith, 2015).

How might the design of search engine algorithms be affecting society’s ability to shape the way we see the world? How much is the design of search redefining our lives? Consumer behaviors are being shaped by websites, search engines, and mobile applications that deliver the world to their doorstep. Retailers such as Amazon, research companies such as Ask Wonder, food delivery services such as Fresh City Farms or

Uber Eats remove the need to explore options, and prioritize immediacy and convenience over choice and more thoughtful recommendations.

We now have fewer library patrons and more smartphone users, and encyclopedias have been replaced with Wikipedia. Physical use of academic library collections and services has been declining since 1995 (Martell, 2008). Of a group surveyed between the ages 18-65, 36% had been at a library within a week of taking the survey, 12.5% within a month and 25% within a year. The same survey found that they use Google search 35% more often than an academic database to conduct online school research (PEW, 2012).

The fact that search has and will continue to have an impact on society and culture is undeniable. It has shaped our habits, our buying patterns, and how we interact with each other. To gain perspective on the potential societal and individual implications, I endeavoured to compare the present with the past by exploring whether society ever had access to this volume of information and the accessibility of the access points and integrity and oversight of the information. The product of this analysis is a timeline of knowledge. I wanted to show generational indicators of the behavioral effects of search on people. I also wanted to balance the research with a micro

and macro approach, looking both at people and the contextual landscape that influences search. For the macro approach that works to create perspective in the now and the potential futures, I undertook a horizon scan with my desk research and literature review and completed a STEEP-V trends research collection and analysis. These research methods, along with potential interventions based on the findings, should help inform how search and society can continue to evolve together, leveraging the global power of connectivity with societal goals that foster strong discourse, cognitive dissonance, and measured transparency that allows companies to maintain a competitive edge—but not at the risk of a healthy and open society.



## Chapter 2: The Wonderful World Of Search

Here in chapter 2 we explore the prevailing themes in the literature review, looking at the commercial, political, and social drivers that encompass contemporary search and also inform the additional research methods along with predictions of what a future with search at the forefront of knowledge access could look like.

Among the many facts gathered through this research, it is clear there are some prevailing innovations and elements of design that without which, many of the contemporary world events appearing in the headlines such as “fake news” stories influencing elections would never have occurred or would have been delivered to the world in a different way. After gathering petabytes of data and turning that data into revenue via services such as AdWords where businesses can buy

ads that will appear in the search results when certain search terms are entered by a user, Google sought to increase the accuracy of search results and originally introduced Personalized Search. Currently, 88% of Google’s revenue comes from advertising. On March 29, 2004, personalized search was launched as a beta test of a Google Labs project (Hines). On April 20, 2005, it was made available as a non-beta service, but still separate from ordinary Google Search. Beginning on December 4, 2009, Personalized Search was applied to all users of Google Search, including those not logged into a Google Account.

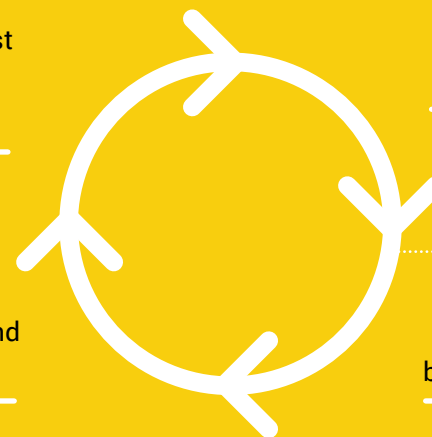
One of the prevailing themes in the growth and evolution of search engines is what is now referred to as predictive and personalized search.

### Feedback Loop Of Customized Search

Predictive and personalized search key traits. Adapted from Eli Pariser who calls it a “filter bubble”.

Search query, including past search queries and other ecosystem data points

Further customized search results that filter out the “opposite” of your tastes and search queries



Serves up search results

*Confirmation bias supported here*

Searches shaped by breadth and depth of results



What started out as a very intelligent and sophisticated way to gather, index, and share the world's information has evolved into something more; a technology designed to anticipate and predict solutions to every query that benefits both the company and the user.

The vast and compelling amount of data Google and other search engine companies capture created an opportunity for them to design the experience of search to move from an open, vast and neutral results page to a personalized search to keep the user happy with information that an algorithm predicts will fulfill their needs. This new and pervasive customized search has caused the unintended magnification of humans' propensity to gravitate toward confirmation bias. A 2016 study that analyzed 376 million Facebook users' interactions with over 900 news outlets found that people tend to seek information that aligns with their views. (Schmidta, Zolloa, Vicarioa, Bessib, Scalaa, Caldarella, Stanleyd, Quattrociocchia, 2016). This human drive to stay in the safe zone led to what Eli Pariser calls the Filter Bubble (2011), a feedback loop that perpetuates behaviour. The user is either unaware, apathetic, or is fully aware and indifferent. The algorithm driving this behaviour is neither moral nor human. It uses the 200-plus data points to provide the user with the content that will best suit their needs based on the "magic" mix of data points to ensure they are left feeling satisfied. The feedback loop has

influenced how users get their information and how advertisers target their ads.

Ordering of search results does influence people, says Martin Moore, director of the Centre for the Study of Media, Communication and Power at King's College, London. He has written at length on the impact of big tech companies on our civic and political spheres. "There's large-scale, statistically significant research into the impact of search results on political views; and in the way in which you see the results and the types of results you see on the page necessarily has an impact on your perspective." Fake news, he says, has simply "revealed a much bigger problem. These companies are so powerful and so committed to disruption. They thought they were disrupting politics but in a positive way. They hadn't thought about the downsides. These tools offer remarkable empowerment, but there's a dark side to it. It enables people to do very cynical, damaging things." (Cadwalladr, 2016).

Reports have confirmed that people have been able to "game" the algorithms of internet giants and create a new reality where Hitler is a good guy, Jews are evil and... Donald Trump becomes president. In each case, the results are taken from websites that many people would not usually turn to for trustworthy information.

Frank Pasquale, professor of law at the University of Maryland, and one of the leading academic figures calling for tech companies to be more open and transparent, came across a similar instance in 2006:

“ *If you typed ‘Jew’ in Google, the first result was jewwatch.org. It was ‘look out for these awful Jews who are ruining your life.’ And the Anti-Defamation League went after them and so they put an asterisk next to it which said: ‘These search results may be disturbing but this is an automated process.’ What is clear with the results is that despite the fact they have vastly researched this problem, it has gotten vastly worse.* ”

(CADWALLADR, C. 2016)

If someone is curious or is exploring morality in a search, it will shape their current search and other future searches based on sentiment, the nature of their search, plus other factors that are not disclosed because Google keeps the details of its algorithm confidential.

Search personalization adds a potentially unintended bias to user’s search queries. If a user has a particular set of interests or internet history and uses the web to research a controversial issue, the user’s search results will reflect that. The user may not be shown both sides of the issue and may miss potentially important information if the user’s interests lean to one side or another. A study done on search personalization and its effects on search results in Google News resulted in different orders of news stories being generated by different users, even though each user entered the same search query. According to Bates (2011), “only 12% of the searchers had the same three stories in the same order. This to me is prima facie evidence that there is filtering going on.” If search personalization was not active, in theory all the results should have displayed the same stories in identical order.

# Each person searched the word "Egypt"



## Scott's profile & search results

Gender: Male

Race: Caucasian

Location: New York



Egypt

About 350,000,000 results (0.24 seconds)

### [Crisis in Egypt](#)

Ad

Voices in **Egypt** have been muted but will not be silenced. Listen.  
[humanrightsfirst.org/Egypt](http://humanrightsfirst.org/Egypt)

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## Daniel's profile & search results

Gender: Male

Race: Caucasian

Location: New York



Egypt

About 321,000,000 results (0.15 seconds)

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### [Egypt - CIA - The World Factbook](#)

Feb 1, 2011 ... Features a map and brief descriptions of geography, economy, government, and people.  
<https://www.cia.gov/library/publications/the-world.../eg.html> - Cached - Similar

### [Egypt State Informaion Service](#)

Official government site provides information on the country's government, politics, culture, history, economy and tourism. [Arabic, English, French]  
[www.sis.gov.eg/](http://www.sis.gov.eg/)

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The personalization feature of the search algorithm has many positive implications such as meeting the micro-targeted regional needs of a user searching for information about food, shopping, travel research, local service, people, and personal services such as spas and health care professionals. Personalized search is also a great feature if you want to gather information about a particular side of a subject. The bias that is built into the query process could be leveraged if someone wants to understand a polarized view about a subject, if the person were aware of the bias. Unpacking consumer and commercial product information needs from other broader topics such as politics, sexuality, immigration, world history and others is important when understanding when and where the bias can shift a person's perspective or understanding about a subject. For example, when a user is looking for information about their sexuality or perhaps the political landscape in their hometown, confirmation bias is built into those results as well as previous search terms that have been built into the algorithm as a correlation. This keeps the user in their constructed world. The system uses words, search history, page ranks, information matching and context to construct the best response for the users. There are no ethical parameters built into the algorithm, unless it's explicitly defined by the subject matter of the search query. It is intentionally partial and subjective based on the person searching. This issue is especially concerning in regard to student research.

As we increasingly use search for learning and education, its curatorial backbone works counter-intuitively with the true definition of learning.

Siva Vaidhyanathan writes in *The Googlization of Everything*:

**“ Learning is by definition an encounter with what you don't know, what you haven't thought of, what you couldn't conceive, and what you never understood or entertained as possible. ”**

(SARIN, 2012)

If search continues to deliver search results based on the history of a person's search and other data points, what happens to evolving outlooks, new discoveries, and unplanned revelations by way of sharing the worlds we each live in? From economics to social good to understanding people who are different than you, search engines are a portal to the past, present and future. The research shows that the younger the searcher, the less likely they are to go past the first page of search results or cross-reference the information with other sources (Noonan, 2017).

## Adwords (Ad Serving Networks)

In 2012, PEW research asked all internet users if they were OKAY with targeted advertising:

**68%**  
**NOT**  
**OKAY**

*I'm NOT OKAY with targeted advertising because I don't like having my online behavior tracked and analyzed.*

**28%**  
**OKAY**

*I'm OKAY with targeted advertising because it means I see advertisements and get information about things I'm really interested in.*

(PURCELL, K. BRENNER, J. AND RAINIE, L.)

Almost 70% of the population 2012 said they don't want their online behaviour tracked and analyzed because:

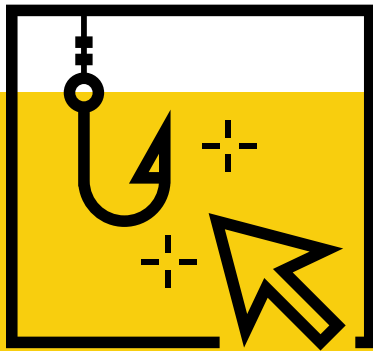
- They fear businesses will sell or misuse their data
- They fear hackers will gain access to their personal data
- They fear advertisements will be served to them with unqualified information

Search advertising accounted for half of all internet ad spending in the U.S. in 2015, which topped \$27.5 billion in the first half of 2015, according to the Interactive Advertising Bureau.

That includes search ad spending on Bing and Yahoo!, but Google maintains a nearly 64% share of desktop search and almost 90% of mobile search in the U.S. In 2015, 88% of Google's total revenue came from advertising, amounting to 19.1 billion USD globally, up 17% from 2014. In 2016, 88% of Google's total revenue came from advertising. The cross-pollination of customized search along with contextual advertising and digital ad networks that are trading now not just in display ads but in rich content are further blurring the lines between content advertising, native content, independent sources of information, and opportunistic content creators trying to manipulate the system. Google has made many upgrades to its algorithms to deflect these players such as the upgrade called Penguin 2.0 in 2013 that was targeted at combating web spam and Black hat Web spam and native advertising and advertorials (Cutts, 2013), in 2016, the first phase of Penguin 4.0, which launched approximately September 23, was the rollout of the new, "gentler" Penguin algorithm, which devalues bad links instead of penalizing sites. Even with the updates and fixes, stories and advertising on web and mobile bubble to the top of the feeds underscore how users find it hard to distinguish an ad from an organic search result.

Early in the fall of 2016, when Donald Trump started saying he feared the election would be rigged, recent Davidson College graduate Cameron Harris decided to post a story to support Trump's theory. Relying purely on his imagination, Harris made up a story about a man named Randall Prince stumbling across a shocking discovery. The headline read: "Breaking: 'Tens of thousands' of fraudulent Clinton votes found in Ohio warehouse."

That's what you call clickbait—and a lie.

**CLICKBAIT:**

Something (such as a headline) designed to make readers want to click on a hyperlink especially when the link leads to content of dubious value or interest.

Harris, featured in *The Charlotte Observer*, said he was acting on a theory:

“ Given the severe distrust of the media among Trump supporters, anything that parroted Trump's talking points, people would click. ... People were predisposed to believe Hillary Clinton could not win except by cheating. ”

Harris' theory held up. He posted the fake story on September 30, 2016. Within a few days, the clicks earned him about \$22,000 through Google ads on his website over the course of the election. Eventually, the story was shared some 6 million times. The story was completely false—no warehouse, no Randall Prince, no fraudulent votes. As Winston Churchill said, though, a lie gets halfway around the world before the truth has a chance to get its pants on—in this case, 6 million times over. Cameron Harris admitted he needed to pay for college and knew the system could be manipulated and that people would click (Shane, 2016).

## The Business Bias

In addition to the components of design that have been driving and shaping behaviours, the integrity of the search companies has been called into question. In some cases, search companies have been prosecuted and guilty verdicts have been rendered in regard to how they are depicted.

The ultimate goal of success of any business is to exchange a product or service that provides value to a customer for currency or something else of value. That exchange should be transparent and both parties should be aware of what is being exchanged. As search has grown to become such an important source for people to access personal and commercial information, search has become one of the biggest sources of online advertising in the world. Google, Safari, Windows 10, Baidu, Yandex, and Yahoo! all use cookies as a main data collection tool to target ads to users and shape their search results. Services such as DuckDuckGo, Firefox, and Start-Page have identified that millions of users do not want to be tracked. Although search engines like Google Chrome give you private browsing using the incognito mode on your regular browser, Private Search Engines are search engines that do not store your queries or track your steps on the internet (Fekete, n.d).

### Here's what a search engine does in regular browsing mode

- Records what websites you visit to help you find the same URLs again and recall previously visited sites
- Manages (creates, stores, opens) cookies to personalize your browsing experience, lets you stay logged in, helps you with auto-completed forms
- Lets installed extensions modify and record what shows when and how
- Allows search engines to record your search history
- Allows ad engines to record your browsing details and to store information on which ads you click on
- Allows social engines to record which sites you visit while staying logged on at their site
- Allows your internet service provider to track pages you visit
- Allows anyone with proper (or illegal) access to your hard drive or cloud storage to find and do whatever with your files

(BECCA, C. 2017)

**Private browsing tracks the following when turned on from a traditional browser that offers a “private mode.”**

- Private browsing discards browsing history while in incognito mode, so your movement will not be recorded in your browser history
- Your cookies, although created, will be deleted as soon as you close a private window, so those cookies are useful only while the original window/tab is still open
- Some extensions/plugins will be disabled if their developer decided on that on your behalf
- Private browser windows have access to previously stored data such as saved passwords and browsing history from non-private browsing sessions. The data is still accessible in private mode

(BECCA, C. 2017)

**Private Browser feature highlights**

**Start page:** It offers browsing through a proxy server to help protect you from a website tracking your IP address or location. You can add it to your browser, on Chrome or Firefox, and even change its color theme.

**DuckDuckGo:** DuckDuckGo distinguishes itself from other search engines by not profiling its users and by deliberately showing all users the same search results for a given search term. The company does not collect or share any personal user information.

Along with the control Google has in relation to all the data it gathers through tracking and how the data gets applied to search results, there is now opportunity for Google or any search engine to leverage that data to favour cross-organizational growth or for purposes that could serve the long-term growth and sustainability of many or all of the companies it owns. During the 2016 election, Trump accused Google of suppressing search results, asserting that the search results showed an inherent bias toward Hillary Clinton. This was rigorously researched by multiple sources and it was determined that, in fact, Clinton was not singled out with suppressed search words.



In a statement, a Google spokesperson says the filter “operates according to the same rules, no matter who the person is.”

“The autocomplete algorithm is designed to avoid completing a search for a person’s name with terms that are offensive or disparaging,” the statement says. “We made this change a while ago following feedback that autocomplete too often predicted offensive, hurtful or inappropriate queries about people.”

The statement refutes the idea that Google manipulated autocomplete in favor of Hillary Clinton. Most people who are accused of crimes but were not convicted will not show up in suggestions (Lee, 2016).

Accusations that have been made, confirmed, and prosecuted can turn up in searches; this highlights the level of complexity of search engines and the influence they can have in society. Search engines such as Baidu fall under Chinese privacy regulations and it is widely known that Baidu routinely removes world trends and controversial topics from being searchable by its users. In May 2011, activists sued Baidu in the United States for violating the U.S. Constitution by the censorship it conducts in accord with the demand of the Chinese govern-

ment. A U.S. judge ruled that the Chinese search engine Baidu has the right to block pro-democracy works from its query results, dismissing a lawsuit that sought to punish the company for internet censorship (Zhang et al v. Baidu.Com Inc. et al).

Baidu has millions of users and yet can, in plain view, remove a side of an argument, a fact, or an opinion with no governmental or judicial ramifications. Google has not been able to circumvent the courts in Europe, where laws pertaining to privacy and consumer advocacy are more stringent and focused on ensuring consumers have choice and that competitive markets remain open.

The European Union’s antitrust chief Margrethe Vestager served Google with a record \$2.7 billion fine in June of 2017, saying Google illegally steered users toward its comparison shopping site and warning that other parts of Google’s business were being evaluated. This case took seven years to investigate. “Google has abused its market dominance in its search engine by promoting its own shopping comparison service in its search results and demoting its competitors,” E.U. competition chief Margrethe Vestager said (Birnbaum,-Fung, 2017).

Adwords, customized search, and business bias are just a few of the main drivers to search engines' threat to our balanced and open access to knowledge. The active pursuit of knowledge as a vocation is being disrupted, discovery of communities is shifting, and learning about different perspectives and world issues in physical settings and through real-life moments is being reduced to a Google search and a Facebook feed which are fast becoming primary sources of news for many people. All this movement is driven by search engines that are growing in use, providing more value to consumers, and more revenue to shareholders. Most search engines are driven by revenue, optimization, user retention, and screen time. The pursuit of user persuasion is the driving force of the experience by way of both the front-end and back-end design of search—not the goal of ensuring the information searched and found is corroborated by an authoritative source or that the information is well-balanced. There are many reasons for this approach to the experience design. First, commercial goals dominate the search architecture. Second, search engine companies say all information is treated equally. This means that when we search for medical information or fashion designers, the same 200-plus algorithm points are used to filter the search and return the results. The algorithm does not distinguish between the need for an ethical filter or weighted results based on the query. The algorithm responds

with calculated relevance to the user and to the parent company which is in the service of growth and profit, not ethics and morals. The companies want more searches about more topics by more people so they can serve more ads and make more money.

Breaking this down using the above Market Share chart and the data from Internet live stats, below you'll find the daily searches per Search Engine.

<b>Search Engine</b>	<b>Searches per day</b>
Google	4,464,000,000
Bing	873,964,000
Baidu	583,520,803
Yahoo	536,101,505
Other (AOL, Ask etc)	128,427,264

FIGURE 3. SOURCE: SMART INSIGHTS.COM (NEED TO CONFIRM YEAR) (ADAPTED)

Google: global annual revenue 2002-2016

### Annual revenue of Google from 2002 to 2016 (in billion U.S. dollars)

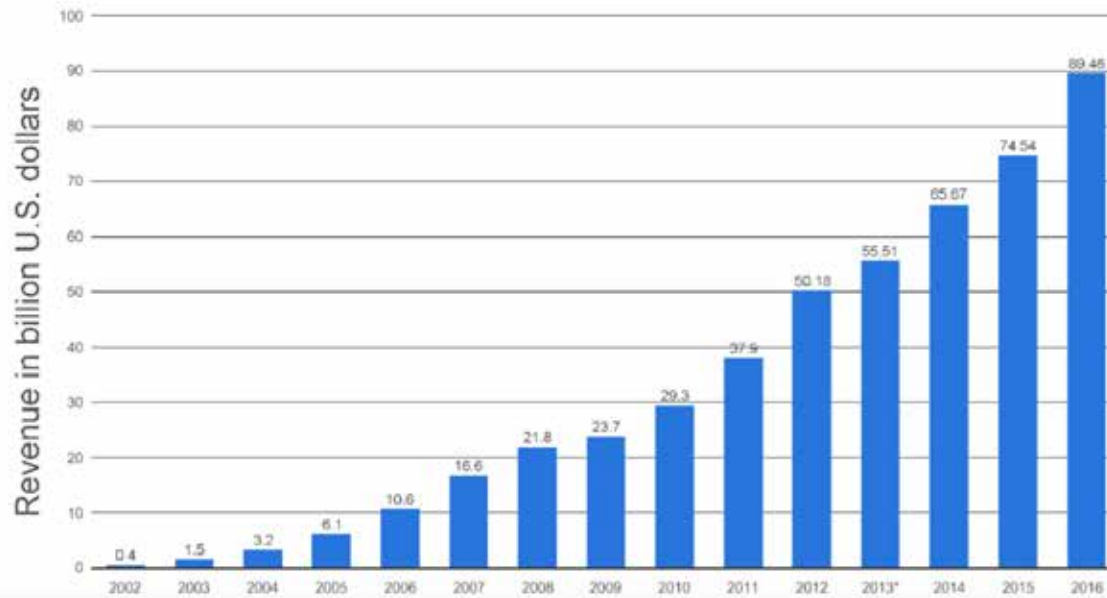


FIGURE 4. SOURCE: STATISTICA

This growth in search queries translates into growth in ad revenue, which rose from 40 billion in 2002 to 89.5 billion in 2016.

The design of certain search engine algorithms have the power to shape political perspectives, the way we discover our cities and communities, and how we understand others. This impact is vast and far reaching, and for the paradigm-shifting innovations that companies like Yahoo! and Google have created, this does not nullify the need to understand how people want to search, how governing bodies should provide effective ethical oversight, and how we can balance commerce and community.

To put the power of the morality-free algorithm into context, in 2016, search engine users using search terms related to the Holocaust or ethnic minorities found a disturbing trend: top results would lead to hate-filled sites.

Google has shown reluctance to change its algorithms in the past, preferring to prioritize whatever pages generated the most online sharing and discussion.

But instead of providing objective results, Google's algorithms were being manipulated to amplify misinformation and hate speech, as reported by The Guardian's Carole Cadwalladr:

“After the 2016 U.S. election, scrutiny of Google's practices led to reports that one of the auto-fill suggestions to complete the search query “are Jews” included “are Jews evil?” Also, the top search for “did the Holocaust happen” linked to a page by Stormfront, an infamous white supremacist group, and searches related to various ethnic minorities would often bring up other sites espousing racist views. These revelations, among others, led Google to rethink some aspects of their algorithm.”

“Judging which pages on the web best answer a query is a challenging problem and we don't always get it right,” a Google spokesperson told Fortune. “We recently made improvements to our algorithm that will help surface more high quality, credible content on the web. We'll continue to change our algorithms over time in order to tackle these challenges.” (Cadwalladr, 2016).

In order to correct this problem and stem the flood of misinformation getting to users of its popular search engine, Google has changed its search algorithms to prioritize high-quality information, bumping down sites associated with racial hate speech, and to remove anti-Semitic auto-fill queries.

While the Fortune article indicated that the algorithm had kicked in to replace the Stormfront result with a link to the United States Holocaust Museum, when the reporter, Weston Williams, searched, he still found the white supremacist group in the number one spot, indicating that the changes may not be universal yet (Williams, 2016).

There is a need to ensure innovation is not compromised and that our global portals to information have a more engaged, informed, and empathetic society at the frontend of their design. How is the subjectivity of topics of interest counter-balanced with objectivity to reach a point of balanced discourse—which is vital to the health of society?

## Chapter 3: Methodology

Here in Chapter 3, we review the chosen approach to the research based on the goals of gathering information, perspective and data that would provide a holistic view of the subject of online search and the direction it is moving in. The aim of the research was to provide an applied perspective to a subject that is influencing people's behaviours, access to knowledge, and understanding of each other. The goal is to show how search can affect our lives. Due to the nature of the subject matter being in a constant state of change, I chose to use a combination of first-party data, trends research, and foresighting technique to imagine different futures shaped by search engines.

In addition to desk research (literature review: academic papers, books, magazine and newspaper articles, videos, lectures, presentations by industry experts and academic faculty), four research methods were used, one of which involved participants.

The research methods are described below:

1. **Knowledge Timeline**
2. **Participant Surveys**
3. **STEEP-V Trend Analysis And Horizon Scanning**
4. **Literature Review**

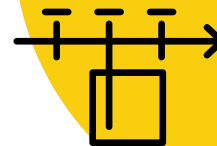
**Literature Review**  
Context



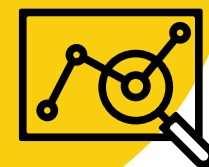
**Survey**  
Human behaviour



**Timeline**  
Historical evolution



**Trends**  
What's happening

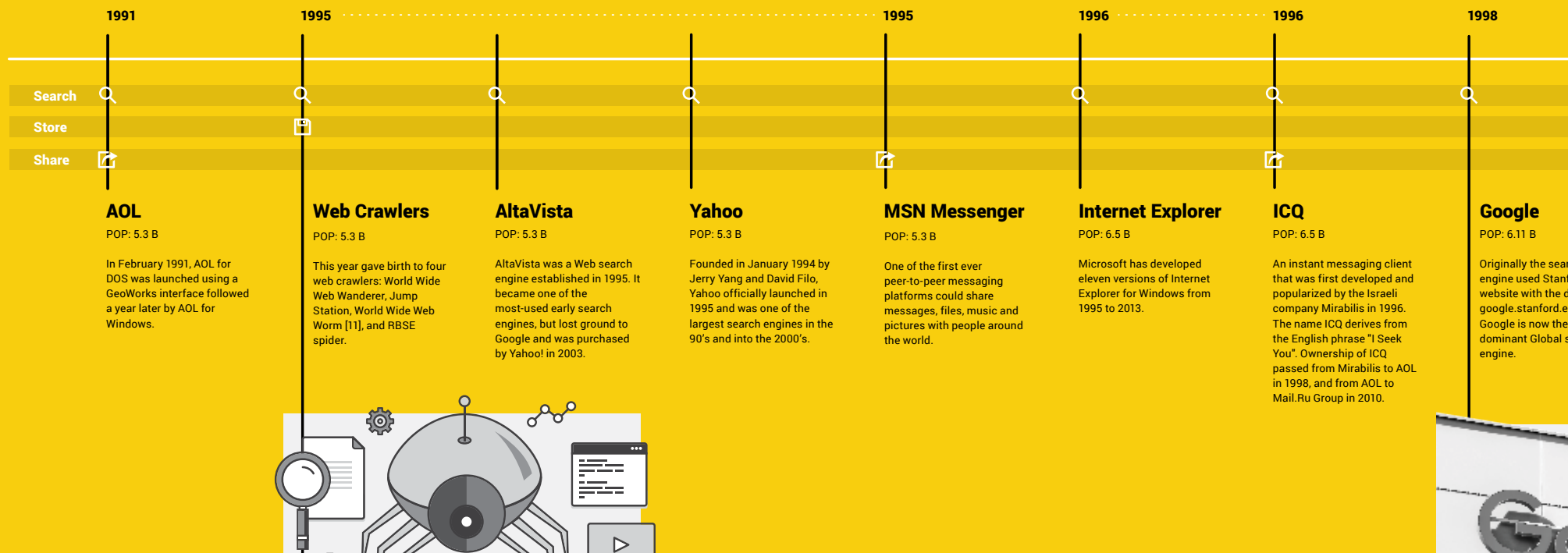


## 1. Knowledge Timeline

This research method and output was selected to put search engines in context with other resources and tools people have used to access knowledge since the methods were first documented and or discovered. There was a desire to understand access points, volume of access available to the general public, and to consider whether there was an argument to be made about techno determinism in context with how knowledge tools have evolved over centuries. For those unfamiliar with techno determinism, it is a reductionist theory

that assumes that a society's technology determines the development of its social structure and cultural values. The term is believed to have originated from Thorstein Veblen, an American sociologist and economist. The decision was made to begin the timeline based on the year of the first known discovery of cave drawings. One of the biggest challenges of the research was that multiple sources that offered conflicting years of discovery or launch. To ensure accuracy, where the body of research did not indicate one specific year, I provided a range.

PORTION OF TIMELINE



## 2. Participant Survey: Human Based Research; Research Panel

A survey was designed and deployed for two different relevant groups to get perspectives from “Digital Immigrants” (Premsky and Marc, 2001) and “Digital Natives”.

The goal of the survey was to learn how much people know about how search engines work, their level of trust pertaining to search engines, which devices they use, and how they gather information when not using search engines or Facebook. I also wanted to understand more about how people use search engines to search for news, entertainment, local information, academic research, and more. I chose to use a market research partner to secure my respondents. After evaluating options based on budget, ease of product use, and the incentives the services offered, I selected Survey Monkey market research service.

Survey Monkey incentivises respondents by offering a donation to a charity; respondents choose from a list of charities serving a variety of causes. For every survey our U.S. panelists took, we donated \$0.50 to their chosen charity.

### **The specific goals of the survey were to:**

1. Secure a baseline of comparison between digital immigrants and digital natives as it relates to search and their engagement online.
2. Use the data to inform the foresight scenarios.
3. Understand what search tools people are using for different kinds of information.
4. Understand people’s level of trust in search engine results
5. Understand people’s level of knowledge pertaining to how search engines work.
6. Draw a comparison between digital natives (ages 18-33) and digital immigrants (ages 33 plus) to see if there were clear differences in understanding, adoption, and trust of search engines and their results.
7. Draw a comparison between the results of the men and women to see if there were any variations, patterns or trends in the results that provided insight about how people use, understand, and trust search engines.

The survey was broken into two separate survey groups: Digital Immigrants (ages 33+) and Digital Natives (ages 18-33). The survey was then divided into 50% male and 50% female to ensure equal representation of both men and women, and also to see if there were any obvious variations in the knowledge, usage, and trust men and women have concerning search engines.

During the research design of the survey, it was imperative to include a question that would determine whether respondents were answering questions honestly. There have been cases where online research respondents were actually bots and not real humans or did not meet the qualifying criteria for the survey.

One question asked when people started using search engines, with multiple time periods: (1990 - 1995); (1995 - 2000); (2005 - 2010); (2010 - 2015); (After 2015). Search engines were first introduced commercially between 1991-1993 by AOL (first a DOS version in 1991-2, then a version for Windows in 1993). One of the time periods offered in the survey was pre-1990 as a trap question to determine whether the survey participants were responding honestly. ARPANET

was launched in 1969 to a very small group of high-ranking security and information technology professionals working for the U.S. government. This survey targeted commercial audiences under the age of most people who would have launched or interacted with ARPANET. The framing of the survey was also in relation to consumer-facing search engines. Four respondents answered pre-1990; they were removed from the data collection.

Survey Monkey was alerted to the respondents whose answer to the screening question disqualified them, and the survey was deployed again to replace those respondents with new ones. Upon completion of the redeployment, it was discovered that one more issue had to be addressed. A manual review of each respondent showed that eight had not identified their age, but their answers had been submitted as part of the completed group. This called into question all the results of those 8 respondents. Two new surveys were deployed to the target "Digital Immigrant and "Digital Native" groups with an even split between men and women for both surveys.



## Survey Subject Criteria:

### Who are digital immigrants?

#### Characteristics

Digital Immigrants were born in a world without the internet. They lived through the birth and death of laser discs, portable CD players, car phones, floppy discs, and mini discs. They have seen the convergence of news, entertainment, politics, and world issues come together from multiple platforms to one access point with multiple tools of access. They remember reference libraries, studying from books, and handwritten bibliographies.

#### Key traits

- They still buy the weekend newspaper
- Their social media feeds are filled with their family and two to three old friends from school
- They would rather read a physical book, but have a Kobo or Kindle
- They still use email as their primary mode of digital communication

#### Qualifications

*They must meet at least three of the following identifiers to qualify to take the survey:*

- They used a phone book in the past to find contact details for businesses and people they knew
- They at one point subscribed to Reader's Digest or a newspaper
- They lived in a home without a computer
- They remember typing class in high school
- They used the "computer lab" in College or University

#### Ages of immigrant respondents surveyed:

**52%**

30-44 years old

**48%**

45-59 years old

**“** A person born or brought up before the widespread use of digital technology. **”**

(PENSKY AND MARC 2001).

**Survey Subject Criteria:****Who are digital natives?****Characteristics**

#Onlineforlife could be a good way to describe the average digital native. They were born into an internet-rich life.

**Key traits**

- They are highly socially connected via digital platforms and heavy users of social media
- They communicate with their social group through Facebook, Snapchat, and Whatsapp
- They stream most of their music and movies

**Qualifications**

*They must meet at least three of the following identifiers to qualify to take the survey:*

- They owned a cell phone in high school
- They have at least two active social media accounts
- They had a laptop in high school

**Ages of native respondents surveyed:****74%**

18-29 years old

**26%**

30-44 years old

**“** *A person born or brought up during the age of digital technology and therefore familiar with computers and the Internet from an early age.* **”**

(PENSKY)

### 3. STEEP-V Trend Analysis

STEER-V is a great tool to get a macro look at a topic such as search engines. Due to the far-reaching and pervasive nature of the technology, it has impacted society, culture and our access to a seemingly bottomless digital pit of knowledge. I would be confident in referring to search as the largest single source access point to the largest data depository of knowledge ever.

The STEEPV process evolved from ideas developed by Johnson Research Associates (JRA) in the early 1960s. These ideas were developed into the field anomaly relaxation (FAR) method in a collaborative arrangement between Stanford Research Institute, as it then was, and JRA, the outcome being published in 1971. This work was extended by Holroyd & Loveridge in 1975 into STEEPV. So much for history, but what does STEEPV mean, what is the process and when has it been used?

STEER-V is an acronym for the six themes for thinking about the future:

**Social, Technology, Economics, Ecology, Politics, Values**

The second E (ecology) is often misinterpreted as “the environment.” Ecology is a far wider concept: the relationship between an organism and its environment. In this instance the organism is the human being and the environment is the world, both natural and human, in which human beings live. Consequently, the second E spans from the ecology of ideas to the relationship between human beings and the physical and biological system within which they live. While not its original purpose, the acronym has been used as a guide to brainstorming sessions. There is nothing wrong in this but it should not be confused with the STEEPV process which is more thoughtful and thorough. The acronym has also been used to give structure to the learning processes that are essential to technology, environmental impact assessment, foresight, and scenario planning. Here again the STEEPV acronym acts as a guide to thinking and learning that informs the investigative processes of TA and EIA, and that underpins foresight and scenario planning.

It is imperative to understand the trends that are directly and indirectly influencing the search engine industry in order to shape a projected image of the future. It is also necessary to frame these trends in relation to their stages of scaling from an industry and audience perspective.

I have established a four-stage evolution for the trends in the search landscape. Each stage is based on the evolution of a trend transitioning from theory to proof of concept to testing to market introduction to adoption to mass adoption of the target market. Not all trends transition through each stage, but this is a fairly defined flow through with most trends go through.

## Stage of trend evolution

### **Emerging: Approx 10% adoption, impact, or awareness by or to consumers**

Nascent. Not yet adopted by industry or consumers. Most consumers who are aware of the trends are connected to the industry in question or are early adopters. In proof of concept stage. Could be in market, but with small level of consumer awareness. Emerging trends are being covered mostly by academic or industry sources. No way of doing a direct prognosis of potential societal, cultural, or economic impact.

The potential impact areas of the trends range from social to cultural to economic. To provide a consistent factor that defines one trend from another, I used consumer awareness and impact at a high level as the factors.

The definition of consumer awareness directly correlates to the level of which the mass media has covered the trend of the level of interest consumers have shown via voting, protests or online activities.

The definition of impact for one trend will be different than another. The impact could be economic, environmental, political or geographic. Many trends highlighted will have been adopted in North America, but won't have been adopted in other countries such as China, Canada, or India; where adoption numbers would vary greatly. Some trends will have a wide level of impact, but will be lower in consumer awareness due to the intentions of the companies driving those trends.

### **Tipping Point: Approx 30% adoption, impact, or awareness by or to consumers**

Low consumer awareness, but this trend is having a direct effect on 30% plus of the population. Tipping point trends, larger publications and media outlets are reporting on and discussing the trends. Low ability to provide a prognosis of potential societal, cultural, or economic impact.

**Mature: Approx. 40-60% adoption, impact, or awareness by or to consumers**

Major market integration. Mass consumer adoption. Media coverage from national and international consumer organizations along with more robust academic coverage. There is either discussion about the need for government intervention or they are already involved.

There is enough data to provide a prognosis of potential societal, cultural, or economic impact.

**Very Mature: Approx. 60% plus adoption, impact, or awareness by or to consumers**

Commonly known to the average consumer. If someone were asked if they recognize the name of the trend, it would be familiar to them. Consumer and industry media have covered the trend extensively, academics have covered the trend extensively and government regulations might be in place. There is a clear prognosis of potential societal, cultural, or economic impact.

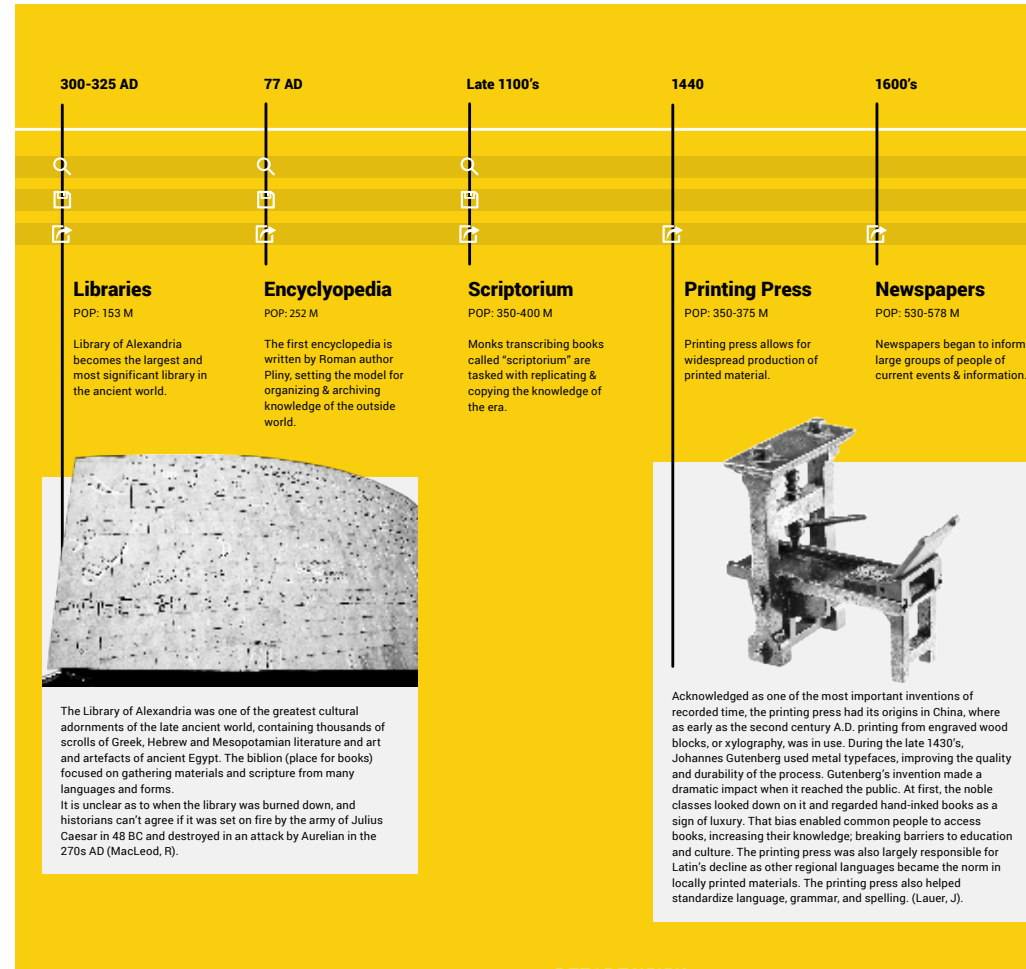
Trends were developed by over two years of research scanning academic reports, papers and presentations, looking at government policies and positions about the internet and related subjects, and speaking with industry experts anonymously. The research also included synthesizing trends and patterns in the literature review and participant research, as well as reviewing industry and consumer media coverage about online search and related subject matter. STEEP-V was the main framework for synthesizing the trends research.



## Chapter 4: Knowledge Timeline With Details

Since the beginning of recorded time, people have been trying to communicate and share with each other. There has been no other time in recorded history when people have had such ready access to information. Other pivotal moments in history featured an increase of information resources. The establishment of the Library of Alexandria circa 300 A.D. and the invention of the Gutenberg printing press in the 15th century were milestones in the realm of information storage and distribution, but it's hard to determine how many people had access to those resources. Academic pursuits were often reserved only for the wealthy, aristocratic members of society. Although there were thousands of books and scrolls sitting in libraries, access to a library was and often reserved for only the upper class.

After decades of an open internet, the search engine is controlled by an algorithm that is commercially motivated (Google has over 80% of the market) (Statica). Although billions of people can access the internet, the information filter (the search engine) now resembles Roman era library doors. Search results are neither democratic nor overseen by a moral or ethical standards body. Results are driven and filtered by



PORTION OF TIMELINE



the commercial goals of the search organization along with an algorithm that creates a Filter Bubble, where results are tailored to users and their likes, rather providing a broad and deep search result that is weighted and balanced.

The seemingly open and free access point that billions of people use to get information is actually a somewhat closed platform because of the algorithm that defines its behaviour. As we move forward, are we regressing and taking one of the most disruptive and connective technologies and forward-fitting it to suit the capitalistic framework we have been using as a beacon of success for over a century now?

Throughout history, groundbreaking tools and technology have changed how people get information (printing press, radio/television, web, social, etc.). Search appears to have been a great equalizer. The open internet and the networked search engine could get users all the information they needed, quickly and easily. But is that really the case? From the launch of the first consumer search engine in 1995 until the present day, with the evolution of how we search, store and share information, are we as open and neutral as we have ever been? For centuries, library sciences have been battling with similar bias from authors, publishers, and distributors altering

facts, omitting periods of history and rewriting stories in favor of contemporary value systems. As communication technology expanded, people around the world began to learn about perspectives different than their own. People began to see world issues through new lenses. New systems were established to ensure the accountability and ethical integrity of information sources. From the ombudsman of the journalism sector to advertising ethics bureaus around the world, media companies work within a world of unbiased governance to keep the audience's moral and ethical interests aligned with the companies commercial growth.

The timeline of knowledge shows that the evolution of knowledge searching, sharing, and storing has been rapid—especially in the last century. Access to knowledge has become decentralized, offering more access to search engines than libraries and more ways for peers to share and corroborate information. The main information sources we are using, such as search engines, have no borders, few to no regulations, and have global market penetration that very few brands and sectors have ever been able to achieve. In that opening of the aperture, the hidden side has the aperture closing rapidly, offering up less results with more customized specificity, filtering out options that could be viable and insightful based on

the search query. While we have more monitors in our homes and hands that are giving us access to the knowledge of the world, what we see is a fraction of what is available. This fraction of a fraction that we see is determined not by the user's discretion or their sense of curiosity. The results are determined by providing results that have the best possible chance of the user being happy with the results. Bias has been in knowledge capture before; from scriptorium to encyclopedia, those who write history can turn folklore into fact. In 2017, this is more prevalent and pervasive before, creating an invisible bottleneck the eye can't see, but the mind consumes. We are so far ahead and yet so far behind in the way we are providing the world access to enriching their understanding of people, agriculture, politics, sports and other topics that shape us every day. Is it true that more people do have access to the ability to access knowledge now, but through who's filter and by what commercial lens?



## Chapter 5: Horizon Scanning With STEEP-V Trend Analysis

In this chapter we explore the predominant and driving trends impacting search engines today. STEEP+V provides a holistic view of the trends impacting the subject area via social, technological, environmental, economic, political external factors. Are we progressing faster than we thought with policy reform? Are consumers engaged in shaping how search makes their lives better? How fake is fake news? We explore the trends here to better understand the landscape and the positive or negative trends that are shaping how we search, share and store the world's knowledge.

# SOCIAL

## Description

### Attention Spans Need Not Apply TREND DRIVER

The on-going trend of people who search never searching past the first page of search results.

 Mature

 Negative Trend

## Implications

Confirmed from 3rd party and 1st party data, this trend speaks to our impatience as a society to thoroughly review information being provided and highlights the importance of SEO marketing and the impact on products and services being marketed through search engines. If this consumer behaviour doesn't help evolve the way results are presented and search engine marketing which drives billions of dollars in profit continues to grow, we could see for-profit commercially driven search engines driving profit over balanced search results. Without policy ensuring the weighted balance of the algorithm between societal, moral and commercial needs, there might be a growing need for more government supported search engines and more money and time invested in media policy reform.

## Signals

1. The YOY increase in companies investing in SEO to ensure top of page ranking, Over half (52%) of small businesses in the US invested in search engine optimization (SEO) in 2016, and 74% expect to do so in 2017, according to new research from Clutch, a leading B2B research and reviews firm. In addition, 66% of small businesses say they plan to invest in pay-per-click (PPC) digital advertising, such as Google search ads, by the end of 2017. (Kemper, 2016).
2. 90% of people searching never leave the first page. 50% of all clicks go to the top search results.

## Stakeholders

- Citizens
- Corporations
- Ethicists
- Policy makers
- Programmers
- Regulatory bodies
- Search companies

Keywords 🔍

Internet public interest, socioeconomic search patterns, search effects and consumer behavior, online superstructures, social network engagement

# SOCIAL

## Description

### Micro Search Engines / Curated Search Engines

Rather than a broad based general search engine with links wide, curated search engines are often seeded through links specified by curators of custom search engines.

 Emerging

 Positive Trend

## Implications

From search engines such as Wolfram Alpha to Pinterest (which isn't technically a search engine, but does function like a micro search destination), there is an opportunity for search to get slower and smarter. Algorithms can become specialized and shaped by the content isn't meant to curate. This would have positive implications to academia, citizen search and the overall quality of the content we seek out online everyday.

## Signals

1. Sites like Yelp, Research Gate, business.com, Ask Wonder (one part paid custom search/one part research partner), and others continue to grow in user base and relevance in very specific search needs.
2. The birth of Attract (an Italian search engine exploring more curated results). Attract was sued by Google, which ended in a countersuit, which Attract won, but their site never worked again (Bue, 2016).
3. Search browsers such as CAKE launched in October 2017 that is available exclusively on mobile. CAKE is focused on streamlining searches by taking users directly to results and letting them swipe through pre-loaded pages (Well, 2017).

## Stakeholders

- Algorithm developers
- Corporations
- ISPs
- Search companies

Keywords 

Internet public interest, socioeconomic search patterns, search effects and consumer behavior, online superstructures, social network engagement

# SOCIAL


## Description

### The Genius Syndrome

“The act of humans deferring to a search engine to prove that they are correct when engaging in conversations with people. Historically, we would have either known a fact, a piece of information or a opinion and shared that information without the need or ability to corroborate.

We can now confirm information in a mere minute by asking Siri, Alexa or going on Baidu to confirm the information.

 Mature

 Negative Trend

## Implications

This trend has many potential positive and negative implications. With the east access to information, will people be less inclined to pause and absorb seemingly unnecessary information? Will they rely on search for all the facts and figures they don't want to retain? Empirical evidence questions this theory, with very smart people going back to Roman times sharing the same fear about thoughts from the mind being transferred to books. In addition to the brain drain concern, there is a growing assumption that the majority of the information found online is factual. With the rise of “fake news” sites and other sources positioned as credible sites, how does one distinguish the BBQ from Gawker?

## Signals

1. Trend has been referenced in pop culture TV shows in context to trivia and knowledge challenges among characters, where Google plays the access point, rather than the characters memory.

## Stakeholders

- Citizens
- Corporations
- Ethicists
- Programmers
- Search companies

Keywords 🔍

Internet public interest, socioeconomic search patterns, search effects and consumer behavior, online superstructures, social network engagement

# SOCIAL

## Description

### Slow Search

The movement to focus more on the quality and dynamic nature of the search to yield smarter more relevant results as oppose to speed being the driving force behind securing results.

 Emerging

 Positive Trend

## Implications

There is an opportunity here to engage the public and apply the same mental model of the slow food movement. In preserving our cultural heritage the slow movement and the slow food movement in particular also preserves our physical environment by supporting and promoting sustainable systems of agriculture such as organic and biodynamic, and the use of traditional seeds and agricultural practices. This connection between the food we eat and the land we live on could be used to create a connection with our search and the thoughtful and unbiased search results we should all be getting. Relaxing time constraints creates interesting opportunities to change “search” as we know it. Especially useful for complex information needs that extend over time, richer understanding and presentation of information. Slow search can allow us to think about solutions that support differential computation (e.g., CiteSight) and combine human and algorithmic components (e.g., TailAnswers, VizWiz).

## Signals

1. The drive for consumers and advocacy agencies to better understand the function and intelligence of the algorithms that are powering our search (Access Now, n.d).
2. Academics and information literacy experts identifying the problem and beginning the process of recommending solutions (Teevan, 2013).

## Stakeholders

- Citizens
- Corporations
- Ethicists
- Programmers
- Search companies

Keywords 🔍

Internet public interest, socioeconomic search patterns, search effects and consumer behavior, online superstructures, social network engagement



# TECHNOLOGICAL

## Description


### The Filter Bubble

#### TREND DRIVER

A filter bubble is the intellectual isolation that can occur when websites make use of algorithms to selectively assume the information a user would want to see, and then give information to the user according to this assumption. Websites make these assumptions based on the information related to the user, such as former click behavior, browsing history, search history and location. For that reason, the websites are more likely to present only information that will abide by the user's past activity. A filter bubble, therefore, can cause users to get significantly less contact with contradicting viewpoints, causing the user to become intellectually isolated.

Personalized search results from Google and personalized news stream from Facebook are two perfect examples of this phenomenon.

 Mature

 Negative Trend

## Implications

Individuals' tendency toward confirmation bias has long been established in the offline world (see Klayman 1995; Nickerson 1998; Schulz-Hardt et al. 2000). This tendency is inherent in us all and now a main factor in the search results of billions of people. If we don't see immediate exploration of how to evolve this component of design, we will see the world become more divided, more segmented and less inclined to suspend disbelief in some of the most important subjects in contemporary society, such as gender equity, race relations, class systems and capitalism. Among the many trends that are affecting search, the filter bubble is among the top contenders for long term negative implications.

## Signals

1. News outlets and social networks adopting the predictive and personalized search algorithms around the world
2. Studies confirming search results dramatically impact people's opinions on whether to elect someone into political office
3. Technology solution companies such as SAP creating filter bubbles for products and services ranging from media products to educational institutions
4. Results of two major studies show that search engines may exacerbate confirmation bias by generating results that consist only of confirming evidence for search contexts where disconfirming evidence is identified using different terms or phrases. This induces individuals to make biased decisions.
5. The strategy of extremist groups to use YouTube and search as a way to promote and proliferate their propaganda and content.

## Stakeholders

- Citizens
- Ethicists
- Policy makers
- Programmers
- Regulatory bodies
- Search companies

Keywords 🔍

Info: Electronic information, resource searching, online information services, information privatization, information economy, information biases heterogenous network, information prioritization, information filtering  
 Search: Intelligent algorithm, algorithmic accountability, predictive search, native search, contextual keywords, search technology, network intelligence, web search engines, internet searching, google ideology, bobble, search engine, retrieval systems, capitalism in search, seo, metatags, metalinks, search incognito, algorithmic personalization, classification algorithms, algorithms, automatic classification, personal assistants  
 AI: Environment scanning, artificial intelligence, digital assistants, voice command, human computer interaction, software industry, computer software, content transmission to cognitive immersion

# TECHNOLOGICAL

## Description

### The Future Is Now

Using patterns, predictive analytics and machine learning to predict the future with far more certainty than we have ever been able to before.

 Emerging

 Positive Trend

## Implications

There is a very real threat this trend could have in practice depending on who leveraged it. From politics to a pre-crime unit, films have theorized about how predictive or “future telling” can be applied, both ethically and unethically. Removing the technology and level of sophistication from the trend, humans have been living patterns for thousands of years within feedback loops, both positive and negative. If this trends becomes prevalent and widely used, the impacts could negatively affects people's ability to imagine themselves not repeating a pattern and relegating themselves to a life of manifest destiny; keeping them within their socioeconomic levels, their education levels, their physical settings, etc. If it against many odds that people persevere and break through and beyond molds. If we endeavour to predict who we act, what we eat, who we love and why we live; we might limit our ability to dream and create beyond the confines of the predictions masqueraded as fact.

## Signals

1. Companies such as SAP, Cisco, IBM and others launching machine learning products around the world.
2. Companies like social lender take your social media profile and they use that data to determine whether you are a good candidate for a loan. (Social Lender, 2017)

## Stakeholders

- Citizens
- Ethicists
- ISPs
- Policy makers
- Programmers
- Search companies
- Software developers

Keywords 🔍

Info: Electronic information, resource searching, online information services, information privatization, information economy, information biases heterogenous network, information prioritization, information filtering  
 Search: Intelligent algorithm, algorithmic accountability, predictive search, native search, contextual keywords, search technology, network intelligence, web search engines, internet searching, google ideology, bobble, search engine, retrieval systems, capitalism in search, seo, metatags, metalinks, search incognito, algorithmic personalization, classification algorithms, algorithms, automatic classification, personal assistants  
 AI: Environment scanning, artificial intelligence, digital assistants, voice command, human computer interaction, software industry, computer software, content transmission to cognitive immersion

# TECHNOLOGICAL

## Description

### Talk Is Cheap... Or Is It?

The rise of voice based search products.

 Emerging

 Positive Trend

## Implications

As I walk the streets of downtown Toronto, large ads are peppered throughout the downtown core promoting "Google Home". Simple questions to help you with your day make voice enabled search tools like Google home, Siri, Amazon Echo very attractive. It is easy and natural, like speaking with a friend. The implications for this trend are almost too vast to comprehend. Voice has been used by many for years in different closed platform settings. Disabled people and those with physical challenges as well as the blind have used voice automated services for dictation, home automation and other functions. As the feature of voice has been paired with open sources, networked tools such as IFTTH, Nest, apps, home lighting and other home features; we are starting to see the impact of connected devices, search and voice. It would be prudent for investors to double down on this area and for consumers to wait for the second or third generations of products being launched that offer these connected services. Search services need to be aggressive and differentiate themselves in unique ways that truly add value to a consumer from a micro or macro perspective.

## Signals

1. Amy, Echo, Jibo, Hound, Window's Cortana, Apple's Siri, Google home. Google Home now launched Google Home mini to compliment their larger unit. Revenue in the Control and Connectivity segment amounts to US\$6,816m in 2017 (Statista, 2017).
2. At CES 2017, full sessions were dedicated to programmers working exclusively on voice enabled tools.
3. Artists are exploring the converging relationship between humans and voice automated search by tracking years of searches to highlight how we are engaging with the toos. An NFB digi doc "'OK Google'" by Brett Gaylor draws upon five years' worth of recordings of Gaylor's son, Rowan, interacting with Google's voice-activated digital assistant. The film observes the growth of both the child and his AI buddy side by side as fun animation develops the amusing recordings.

## Stakeholders

- Citizens
- ISPs
- Policy makers
- Programmers
- Search companies
- Software developers
- Venture capitalists

Keywords 🔍

Info: Electronic information, resource searching, online information services, information privatization, information economy, information biases heterogenous network, information prioritization, information filtering  
 Search: Intelligent algorithm, algorithmic accountability, predictive search, native search, contextual keywords, search technology, network intelligence, web search engines, internet searching, google ideology, bobble, search engine, retrieval systems, capitalism in search, seo, metatags, metalinks, search incognito, algorithmic personalization, classification algorithms, algorithms, automatic classification, personal assistants  
 AI: Environment scanning, artificial intelligence, digital assistants, voice command, human computer interaction, software industry, computer software, content transmission to cognitive immersion

# TECHNOLOGICAL

## Description

### Decentralized Learning

The transition from academic research sources, libraries and encyclopedias to YouTube, Google and open source and free sources as key sources of knowledge. With the birth of search, libraries are losing their relevance and the art of preservation is in a state of flux. Where do we go when we want to engage with a subject, explore and artifact or corroborate a story? Our local library or Google?

 Mature

 Positive Trend

## Implications

Connection and experience in the physical and digital spaces will be paramount. Micro search engines, specialized sections in libraries and collaborations with different complementary businesses and brands will help create context and value for audiences. This presents a great opportunity for learning institutions to create barrier free educational opportunities that are elevated beyond just access to information.

## Signals

1. Libraries are collaborating more with outside non-academic partners; diversifying their programming. (Sarjeant-Jenkins, R., & Walker, K. 2011)
2. Students using Google Scholar more than accessing their school library sources.
3. KHAN Academy that was launched in 2008 as a free educational online module based resource has delivered more than one billion lessons and students have completed more than eight billion exercise problems. Khan Academy has more than 57 million registered users (many more use our site without registering). (Khan Academy, 2017)

## Stakeholders

- Citizens
- Content creators
- Educators
- ISPs
- Software developers

Keywords 🔍

Info: Electronic information, resource searching, online information services, information privatization, information economy, information biases heterogenous network, information prioritization, information filtering  
 Search: Intelligent algorithm, algorithmic accountability, predictive search, native search, contextual keywords, search technology, network intelligence, web search engines, internet searching, google ideology, bobble, search engine, retrieval systems, capitalism in search, seo, metatags, metalinks, search incognito, algorithmic personalization, classification algorithms, algorithms, automatic classification, personal assistants  
 AI: Environment scanning, artificial intelligence, digital assistants, voice command, human computer interaction, software industry, computer software, content transmission to cognitive immersion

# ENVIRONMENTAL


## Description

### Conditional Connections

#### TREND DRIVER

The current pattern of extreme weather that is causing hurricanes, major storms and other community damaging weather that is killing power lines, internet and cellular connections between people around the world.

 Tipping Point

 Negative Trend

## Implications

Search is becoming more and more of a source of pertinent information such as locations of hospitals, pharmacies along with everything from local politics to tracking weather patterns. Yellowpages and 411 are long gone and have been replaced with desktop and mobile search. Understanding this growing dependency and how to be prepared for a situation where a neighbourhood, city or perhaps even a country could be without the ability to search for information is as essential as ensuring we have light and heat. This could drive the home solar battery business forward more, with economies of scale enabling more family homes to purchase power; creating less dependence.

## Signals

1. Hurricane Irma in Miami and the Caribbean
2. Hurricane Maria in Puerto Rico
3. Hurricane Harvey in Texas

## Stakeholders

- Citizens
- Ethicists
- Programmers
- Policy makers
- Search companies
- Regulatory bodies

Keywords 




# ENVIRONMENTAL

## Description

### In Solar We Trust

As alternative energy collecting technology scales and becomes more affordable, consumers will have more access to harnessing their own power through tools such as solar panels. This energy could be used to power personal home and office power grids.

 Tipping Point

 Positive Trend

## Implications

This trend has the ability to impact small and large businesses, and any person who is dependent on power. As we become more self sustaining with gathering and storing our own power and looking to government to help support and subsidize initiatives that will help continue to bring costs down and access to more people, we will be able to diversity our dependencies. The trend could be very beneficial for very remote parts of the world where infrastructure investments aren't as substantial as major cities.

## Signals

1. The consumer adoption of products like the Telsa Powerwall that backup power during utility outages, natural disasters or to reduce the strain on existing power sources.
2. After years of price barriers for industry and consumers alike, solar and electric power sources are scaling along, research now indicates that even in the worst-case scenario, whereby solar panels perform at their lowest efficiency levels, the industry is set to break even in 2017 in terms of energy use and in 2018 for emissions. (Nature Commun. 7, 13728 (2016))
3. Growth of more solar focused investment funds such as Solar Bonds
4. The growth of employment in the renewable energy industry worldwide. By the end of 2014 there were 7.7 million jobs in the renewable energy industry worldwide, up 18 per cent over the year before. (IRENA, 2015)

## Stakeholders

- Citizens
- Ethicists
- Programmers
- Policy makers
- Search companies
- Regulatory bodies

Keywords 

# ECONOMIC

**Description**

**Implications**

**Signals**

**Stakeholders**

## Every Step You Take

### TREND DRIVER

The invasive and pervasive act of data collection and advertising companies who track your data across any touchpoint where you are connected and opted in. This happens primarily through location based authentication, with multiple data points being cross references to create a consumer path advertisers can use to sell things to people with.

Organizations such as the Location Based Marketing Association have launched campaigns that harmonize data from search, user behaviour, buying trends and other data they gather when people are connected.


The meteoric growth of data driven advertising companies mining the internet for data to connect with audiences to sell fulsome data sets to brands, products and services.

1. All location technologies - beacon, NFC, GPS, and wifi - are set to grow by double digits, with 63% of marketers planning to invest in wifi, 57% of marketers planning to invest in GPS, 46% NFC and 41% in beacons. (Location Based Marketing Association, 2016).

2. In a survey of "500 marketing decision makers," 25% of marketing budgets are spent on location-based marketing and over 50% of brands are using location data to target customers. This represents billions of dollars. Location is an increasingly critical element of digital marketing for brands and enterprises. (Location Based Marketing Association, 2016).

Citizens  
Corporations  
Ethicists  
Policy makers  
Regulatory bodies  
Search companies

 Mature

 Positive & Negative Trend

Keywords 

Marketing: Seo optimization, user data, consumer behavior, marketing, search and adwords, internet policy  
Libraries: Digitization, digital preservation, book scanning, digital storage,digital information


# ECONOMIC

## Description

### From A Nudge To Manipulation

When advertisers adjust pricing and recommendations based on your income level. From travel to concert tickets, based on data collected, advertisers shape what you see and pricing variations based on your history and any data markers they can use to customize the deals.

 Mature

 Negative Trend

## Implications

This trend is similar to the filter bubble, with a focus on economic and behavioral factors. This trend could be perceived as one of the most ethically precarious ones, with very low to no visibility to customers and no firm regulations to date. The ripple effect of this trend is far reaching and is contradictory to an open market where all buyers are treated fairly. The act of adjusting prices has happened in marketplaces for centuries, but not in such a pervasive fashion.

## Signals

1. It was the same Swingline stapler, on the same Staples.com website. But for Kim Wamble, the price was \$15.79, while the price on Trude Frizzell's screen, just a few miles away, was \$14.29. Exerpt from a Wall Street Journal article. (Valentine, J, 2012)

## Stakeholders

Citizens  
Corporations  
Ethicists  
Policy makers  
Regulatory bodies  
Search companies

Keywords 

Marketing: Seo optimization, user data, consumer behavior, marketing, search and adwords, internet policy  
Libraries: Digitization, digital preservation, book scanning, digital storage,digital information



# ECONOMIC


## Description

### An Attempt At Balance

Google Ad Grants are advertising credits that enable non-profit organizations the ability to apply for and use Google Adwords to their campaigns. Non-profit advertisers ads are entirely text-based (no videos or images). Ads appear only on Google search results pages, in positions below the ads of paying advertisers. All campaigns must be keyword-targeted. Maximum cost-per-click (CPC) will be \$2.00 USD. They can receive \$10,000 USD (up to \$40,000 USD for Grantspro participants) of in-kind AdWords advertising each month. Keyword-based advertising are ads that are linked to specific words or phrases specified by the advertiser (in this case, you), so when a search term matches the specific word or phrase, the ad will appear.

Pay-per-click is an advertising model where you pay the publisher (in this case, Google) when a visitor clicks on your ad.

 Tipping Point

 Positive Trend

## Implications

Although there has been quantifiable impact through the support search companies are providing non-profits, there are set limits on bidding and certain restrictions that limit their ability to leverage the grants. It would be advantageous for search providers to explore set discounts for non-profits and charities to go beyond the grant and aggressively compete with for-profits for specific search terms and words. It would be great if there was designated individuals in government that can help create more awareness about the services offered and the benefits of using search in their organizational goals.

## Signals

1. Science Buddies was one of the earliest adopters of the Google Ad Grants program, having joined the year the program launched in 2003, and later became a Grantspro recipient. In 2004, 171,000 unique visits to Science Buddies came via Ad Grants; by 2005, this number had increased to 773,000 unique visits. By 2006, Google Ad Grants had doubled the traffic to the website. According to President and Founder Kenneth Hess, "Ad Grants really put us on the map!" In the past 12 months alone, approximately 1,500 teachers have registered to download resources to help manage student science projects, and approximately 100,000 students have registered to use the Topic Selection Wizard, which helps them find a science project suited to their interests. (Google, n.d).

2. Ad Grants was able to quickly help the organization, "When large numbers of refugees arrived in Frankfurt at the end of 2015 needing rapid help, we started a corresponding fundraising campaign via Google," recounted Franz. "So we were present with the right message at the right time on the right channel, and very quickly generated extensive resources." Compared to 2010, Caritas was able to increase its online donations by 646% in 2015 and better publicize its charitable work. In addition to Google Ad Grants, the organization is planning to leverage other Google tools in the future, to draw even more attention to problems and to increase people's generosity (Google. n.d).

## Stakeholders

Citizens  
 Ethicists  
 Policy makers  
 Regulatory bodies  
 Search companies

Keywords 


# ECONOMIC

## Description

### Playing The Long Game

The trend of companies using more long tail search terms that will help them appear more in search in context to their offering, competing with more short tail terms that are usually harder to “own”. Terms and words are suppose to be contextual to your product or service to be used, so SEO/SEM companies are getting very creative with their recommendations for key long tail terms that are broad enough, but won’t cause flags with the system.

 Tipping Point

 Positive & Negative Trend

## Implications

There is a challenge here for both organic search results and AdWords and other programmatic search based services. Launched in 2013, The Canadian Marketing Association (CMA) has “AdChoices”, the Canadian Self-Regulatory Program for Online Behavioural Advertising which is suppose to bring more transparency and consumer choice to online advertising. The program has been crafted by the Digital Advertising Alliance of Canada (DAAC), a partnership between CMA and seven other Canadian leading marketing and advertising associations. When programs such as AdChoices or the New Privacy Forum based out of Washington are established, to succeed in working to help maintain ethical business balance, having them be self-regulated creates an inherent bias with compromised motivation to govern over their colleagues and peers.

## Signals

1. Google making updates to their algorithms to combat companies manipulating their search terms beyond their true business offering. (Google. n.d).

## Stakeholders

Corporations  
Ethicists  
Regulatory bodies  
Search companies

Keywords 

# POLITICAL


## Description

### No One Should Be Accounting For Your Taste Or Access

#### TREND DRIVER

The uncertain future of net neutrality. Net neutrality is the idea that internet service providers (ISPs) treat everyone’s data equally – whether that’s an email from your mother, a bank transfer or a streamed episode of *The Handmaid’s Tale*. It means that ISPs don’t get to choose which data is sent more quickly, and which sites get blocked or throttled (for example, slowing the delivery of a TV show because it is streamed by a video company that competes with a subsidiary of the ISP) and who has to pay extra. For this reason, some have described net neutrality as the “first amendment of the internet”.

 Very Mature

 Negative Trend

## Implications

If net neutrality is no longer one of the main equalizers of the internet, search will start to lose their power in the ability to serve up search results based on their algorithm if they are forced to rank results based on CP’s that are paying ISP’s for priority speeds. This is not a definitive result of the loss of net neutrality, but it is a probability.

## Signals

1. The unified opposition of eliminating or loosening the rules of net neutrality by companies like Facebook, Amazon and others. Corporate interest, public office officials positioning net neutrality as a barrier to innovation and open market competition. (BBC, 2017).
2. In 2014, TV personality, John Oliver from *Last Week Tonight* asked his audience to oppose the removal of net neutrality regulations. His audience went online and crashed the Federal Communication Commission website and over 47,000 public complaints were filed and the video was shared over 800,000 times. (Holpuch, 2014).
3. In 2017, TV personality, John Oliver from *Last Week Tonight* asked his audience to again, oppose the roll back net neutrality rules for what the Federal Communication Commission Chair Ajit Pai calls a change to voluntary adherence to net neutrality. (Roberts. 2017).

## Stakeholders

- Citizens
- Corporations
- Ethicists
- Policy makers
- Regulatory bodies
- Search companies

Keywords 

Search effects and politics, internet governance, internet regulations, search censorship, digital barriers, search policy  
 Relevant cases: China, Google-Hilary issue


# POLITICAL

## Description

### Buying The Vote

Services such as Google AdWords give businesses the ability to bid on search words and terms based on an auction style structure. This trend has been a search engine product offering for over a decade and the majority of search engines profits come from bidding revenue. In recent years, deeper understanding has become more commonplace about the process of bidding on search words and strategies to secure words and terms has become a priority for many businesses. These strategies have moved beyond consumer goods and are now being used extensively by political strategists, extremist groups and organizations looking to bias results by manipulating search results.

 Emerging

 Positive & Negative Trend

## Implications

This trend is one of the most pertinent trends and requires attention from multiple stakeholders. Search companies do endeavour to keep organizations from manipulating results, but there is work to be done in the automated system to extend the same rigour to flagging companies who are buying sentiment words against certain products, services, etc. Companies could be using audience profiles to target them based on their desired outcomes. This is perfectly fine if the results the company is looking to serve up are ethical and truthful. The main focus of ensuring this search advertising feature isn't subverted is to focus on qualifying the companies paying for the search words and terms.

## Signals

1. In recent experiments we were able to shift people's viewpoints about fracking (safe or dangerous?), homosexuality (in the genes or a matter of choice?), and artificial intelligence (beneficial or a threat to humanity?) by between 25 and 36 per cent after a single online search.   
 ""The Search Engine Manipulation Effect (SEME) and Its Unparalleled Power To Influence How We Think""- Robert Epstein of American Institute for Behavioral Research and Technology
2. House of Cards was one of the first to popularize the ""data strategy"" of shaping elections by impacting online search results.
3. Google has launched ""The Civic Information API"", which allows developers to build applications that let citizens and voters know about their political representation and voting locations. (Google, n.d).

## Stakeholders

- Citizens
- Ethicists
- Policy makers
- Programmers
- Regulatory bodies
- Search companies

Keywords 

Search effects and politics, internet governance, internet regulations, search censorship, digital barriers, search policy  
 Relevant cases: China, Google-Hilary issue




# POLITICAL

## Description

### Fake News Awakening

Some call it “fake news”, others call it “propaganda”. It is the trend of false news stories being placed across social and online posing as legitimate news. Fake news is conceived, written, published and disseminated for the purpose of swaying public opinion, in many cases towards the far political right. Fake news may take the form of videos posted on social media. In most cases, the purpose is purely the generation of advertising revenue.

 Mature

 Negative Trend

## Implications

The ability for citizens to distinguish between legitimate and credible news sources and news that has no credible facts or have been substantiated by credible sources or are completely fabricated is essential to ensure society perception and understanding isn't skewed by political agenda's or commercial drivers without being aware of the context. “Entertainment news” and “Tabloid news” have been part of our media landscape for over a century, but there was a clear distinction between tabloid sources and news sources such as BBC, CBC or Al Jazeera; all of which follow more structured codes of conduct and in most operating structures have oversight from an ombudsman, who works on behalf people's right to fair and factual stories. As the right balance of governance is determined in regards to the internet and new news sources such as Facebook, Twitter and other sources that have no regulated responsibility to ensure their information is credible and transparent, we must be vigilant in ensuring from both a consumer and government level, this trend is at the forefront of the conversation with policy makers, corporations and all other relevant stakeholders. Fake news married with predictive search along with contextual advertising can result in further division between people's perspectives on the world they live in and the way we will shape policy, culture and a connected society. There is a great opportunity for legitimate publishers to align with some of the top fact checkers such as Snopes, Politifact, ABC News, and FactCheck.org to put set regulations in place and a global designation as a credible news source.

## Signals

1. Some search engines have incorporated machine learning “fact checkers” that generally do not affect the ranking order of search results, but attempt to provide additional information on the trustworthiness of the content. For example, if two or more third-party fact-checking algorithms dispute content, this will be flagged to the user (J, Condlife). These computational fact-checking algorithms may use sources such as Wikipedia and/or Freebase, using the complexity of linkages among concepts in these knowledge graphs to estimate “truth scores” (Giovanni, C). Some commentators, however, have raised the issue of who checks the fact checkers.
2. 23% of people surveyed say they have shared a made-up news story – either knowingly or not (PEW) and 64% are experiencing a great deal of confusion trying to distinguish between real and fake news. Man brings gun to pizza restaurant based on fake news reports that they are hiding a child sex ring.
3. Actual fake news sites are being created in partnership with legitimate news sources. Fake news websites have even been created by mainstream businesses. For example, 20th Century Fox received significant criticism for working with a fake news publisher to create multiple websites with names like the Houston Leader, which imitated the look of mainstream websites and published articles about celebrities and controversial topics of interest that were widely shared through public media, but had as their primary purpose the promotion of a new film by promotional hashtags (Gentzkow, M & Allcott, H).

## Stakeholders

- Citizens
- Fact checking services
- Publishers
- Regulators

Keywords 

Search effects and politics, internet governance, internet regulations, search censorship, digital barriers, search policy  
 Relevant cases: China, Google-Hilary issue


# POLITICAL

## Description

### Blind Faith

“Organizations like the electronic frontiers foundation protecting internet services from prosecution in favor of protecting section 230 of the U.S code of Congress: Section 230 is the two-decade old statute passed by Congress to promote online free speech and innovation by immunizing (with certain exceptions) Internet intermediaries from liability for illegal content created or posted by their users. Section 230 immunity holds as long as the companies did not themselves create the illegal content, while editing user-generated content is permitted by Section 230 as long as the editing does not make the content illegal.

 Very Mature

 Positive & Negative Trend

## Implications

In the face of watershed moments such as the introduction of the The Stop Online Piracy Act (SOPA), the controversial United States bill introduced by U.S. Representative Lamar S. Smith, which would have expanded the ability of U.S. law enforcement to combat online copyright infringement and online trafficking in counterfeit goods, the power of citizens and organizations such as the EFF are actualized. The challenge lies in the rigidity of the position to protect all internet intermediaries from liability. Due to the ambiguity of the role of the intermediary and the focused effort of the “responsible” party to hire their identity, there must be further exploration as to what governing officials can ask of the intermediaries in extreme situations. This will become more important as voice automated search starts to record and store voice search queries along with typed search queries.

## Signals

1. A blistering bipartisan report was released from the U.S. Senate’s Subcommittee on Investigations found that “Backpage has knowingly concealed evidence of criminality by systematically editing” advertisements to disguise the fact that they involve prostitution and child sex trafficking. Backpage was an intermediary and had been protected by the EFF.
2. Search engines like Baidu fall under Chinese privacy regulations and it is widely known that they routinely remove world trends and topics from being searchable by Baidu users. In May 2011, activists sued Baidu in the United States for violating the U.S. constitution by the censorship it conducts in accord with the demand of the Chinese government. A U.S. judge has ruled that the Chinese search engine Baidu has the right to block pro-democracy works from its query results, dismissing a lawsuit that sought to punish the company for Internet censorship (Zhang et al v. Baidu.Com Inc. et al).

## Stakeholders

- Citizens
- Corporations
- Ethicists
- Policy makers
- Regulatory bodies
- Search companies

Keywords 

Search effects and politics, internet governance, internet regulations, search censorship, digital barriers, search policy  
 Relevant cases: China, Google-Hilary issue

# VALUES

**Description**

**Implications**

**Signals**

**Stakeholders**

## Chicken And The Egg

**TREND DRIVER**


The tension between an information content provider, an interactive computer service and a publisher that has developed due to the lack or regulation, accountability and oversight pertaining to information being posted that breaks laws, endangers people and has no factual filter. As social networks become publishers of multiple kinds of content, some now original content; the transition from information highway to curated, algorithm driven network has regulators, policy makers and consumers looking for more oversight and accountability for the content that is being posted by anyone and everyone with no third party liability or accountability.

If code 230 within the CDA does not get amended to make one or both the ISP or/and computer internet service provider accountable for the content posted on the service providers sites, companies creating spaces for drug trafficking, human trafficking and other dangerous and illegal activities will continue to flourish. As service providers like Craigslist and Backpage have been pressured to remove their adult services sections, companies like Silk Road are pulled down, the case studies and supporting materials to warrant review of code 230 strengthen.

1. Craigslist removed their personal ad amidst all the controversy about BackPage, who was being accused of enabling sex trafficking to happen via private tools and payment systems on Backpage.

- Citizens
- Corporations
- Ethicists
- ISPs
- Policy makers
- Search companies

 Mature

 Negative Trend

Keywords 

Search engine corporate social responsibility, google integrity, google ethics, search discrimination, social construction technology, search result media biases, search result media sources, mathwashing

Examples (unbiased search result news sources):

Balance: seeks to diversify the result sets provided by news aggregators (such as google news)

Newscube: web service which automatically provides readers with multiple viewpoints on a given news item



# VALUES

## Description

## Implications


## Signals

## Stakeholders

### Conscious Cognitive Dissonance

The development of products and services that address the current bias that is build into a personalized and/or predictive search engine algorithm.

 Tipping Point

 Positive Trend

There is an opportunity here to offer a higher level tier search engine or search product that lets the user curate their algorithm, allowing them to build in sources that will challenge their current understanding and perception of different topics and issues. This could be a great opportunity for policy advisors to help shape that offering, making hard recommendations to companies to not give up their main offering, but offer tiers based on the users desired experience.


1. Industry leaders in the media space are leaving their jobs to create products that offer not just balanced content offerings, but divergent; consciously working to ensure people are reading or listening to multiple perspectives to facts, knowledge and stories.
2. The growth of services like DuckDuckGo and Brave, search engines that doesn't track people with cookies who has had consistent year over year growth for the last five years. (Hoffman, C. 2012)

Citizens  
Corporations  
Ethicists  
ISPs  
Policy makers  
Programmers  
Search companies

### Dark Search

The process of going "anonymous" online so one can search without detection.

 Mature

 Positive & Negative Trend

Political groups around the world along with millions of people use the Tor network to search for everything from cooking receipes to nuclear weapons. Many of those who use networks such as Tor do not want the state or corporations to have the ability to analyse their search traffic, to threaten their personal freedom and privacy, get information about their confidential business activities and relationships via search, cookies, pixels and any other tracking mechanism individual governments or organizations might be using.

1. The scale of Tor network which is driven with the goals of preventing people from learning browng location or/and habits.Tor is for web browsers, instant messaging clients, and more.
2. The popularization of shows such as VICE's Cyberwars and Mr.Robot.
3. Organizations like the Electronic Frontiers Foundation and the Internet Defense league are aligned with many large and influential organizations who support the right to online privacy. From Mozilla to Reddit to Open Media, there is a strong support base for fighting legislation that reduces that freedom, and is seen with situations like SOPA and currently with Net Neutrality.

Citizens  
Internet freedom organizations  
ISPs  
Online security companies  
Police  
Programmers  
Search companies

Keywords 

Search engine corporate social responsibility, google integrity, google ethics, search discrimination, social construction technology, search result media biases, search result media sources, mathwashing  
Examples (unbiased search result news sources):  
Balance: seeks to diversify the result sets provided by news aggregators (such as google news)  
Newscube: web service which automatically provides readers with multiple viewpoints on a given news item



# VALUES

Description

## Hand Over The Algorithm

The act of the network handing over control to the user to define how much privacy they want to give up.



Emerging



Positive Trend

Implications

This trend is one of the most nascent and one that could help reshape how we approach privacy controls across many tech based businesses. Silicon Valley “knows” that anonymity isn’t profitable. This has driven Internet monoliths such as Google and Facebook to turn the Internet into a cog that turns us into a real-time surveillance state and George Orwell into an historian and prognosticator instead of an acclaimed fiction writer. The challenge here is the motivation to alter the user experience from an opt out system to an opt in system. Although advance messaging is implemented across multiple services, that is merely the acceptance of the data collection, rather than opting into what is collected. There is an opportunity here to test some different tiers of services based on price and access to test assumptions and theories as to what citizens are truly willing to pay for and how easily they will give away their person data in the name of convenience and cost.

Signals

1. Initiatives such as the The Global Online Freedom, which in 2013 set out to “prevent United States businesses from cooperating with repressive governments in transforming the Internet into a tool of censorship and surveillance, to fulfill the responsibility of the United States Government to promote freedom of expression on the Internet, to restore public confidence in the integrity of United States businesses, and for other purposes”. Acknowledging the exposure internet companies have to oppressive regimes and other companies, namely Google and other search engines, they propose empowering citizens to control their own access.
2. Products such as MeWe launching in the face of the Edward Snowden leak of confidential NSA files such as PRISM which confirmed that the U.S government was tracking a major portion of its population.

Stakeholders

- Citizens
- Ethicists
- ISPs
- Policy makers
- Programmers
- Search companies

Keywords 🔍

Search engine corporate social responsibility, google integrity, google ethics, search discrimination, social construction technology, search result media biases, search result media sources, mathwashing  
 Examples (unbiased search result news sources):  
 Balance: seeks to diversify the result sets provided by news aggregators (such as google news)  
 Newscube: web service which automatically provides readers with multiple viewpoints on a given news item

The varying and diverse trends that are directly and indirectly impacting the search engine landscape are both inspiring and canaries in the coal mine. Although we have seen technological innovation similar to this before along with the evolution of journalism and consumer privacy, which all weave together to create the foundation of the new normal; the speed at which the search space has evolved has made it a challenge for policy makers and consumers to get a grasp on policy reform and consumer advocacy. It is clear from the trends, there are nascent trends that are working to take search to a deeper and more thoughtful place. There are more mature trends that are working to offer specialized search offerings; helping to dilenate information so consumers can unpack a search for wool socks from a search to find an eye doctor.

There is a major dependency on corporations to self-regulate, which as we have seen from the fake news issues over the last two years to the repeal of net neutrality in 2017, corporate self-regulation may not always be in favor of the consumer (Roberts). There has been a consistent drive from organizations like the Electronic Frontiers Foundation (EFF) to defend civil liberties in the digital world. Founded in 1990, EFF cham-

pions user privacy, free expression, and innovation through impact litigation, policy analysis, grassroots activism, and technology development. They work to ensure that rights and freedoms are enhanced and protected as use of technology grows. In that process, they have fought regulation; mostly in the name of free speech. Their work is important, but different pictures often need to be painted with different brushes. As the internet has evolved, the need for policy reform has as well, which the government and advocacy groups such as the EFF need to help; being as self-critical as they are critical of the organizations they litigate against.

From services to combat companies and individuals manipulating search results to influence voters such as “The Civic Information API” which Google launched that allows developers to build applications that let citizens and voters know about their political representation and voting locations to search engines that have incorporated machine learning “fact checkers” that generally do not affect the ranking order of search results, but attempt to provide additional information on the trustworthiness of the content, there is a concerted effort to help combat some of the most challenging issues

in search today; much without any government oversight or policies in place (J, Condlife). The trends show great strides in combating many of the concerning trends with new and innovative tools both consumer facing and on the back-end.

The most far reaching trend, the filter bubble, is affection billions of people every day by serving up results of confirmation bias. This trend needs to be addressed with great concern for fair and balanced news, resources and knowledge being provided to people that gives them a true representation of the world their live in and the worlds around them.

Every trend has a unique marker, but ultimately, they all connect to the user or commercial gain. It is those two motivators that have given us Google Translate or DuckDuckGo's no tracking policy. What we need to determine is whether one motivator is out weighing the other. As the world and nature needs balance, so does the world of commercial enterprise. Further research to help inform and shape how search continues to provide superior services to consumers while maintaining the rights of those users as long as non-commercially invasive transparency would be very beneficial to society and commercial growth in the search space.





## Chapter 6: Survey Results

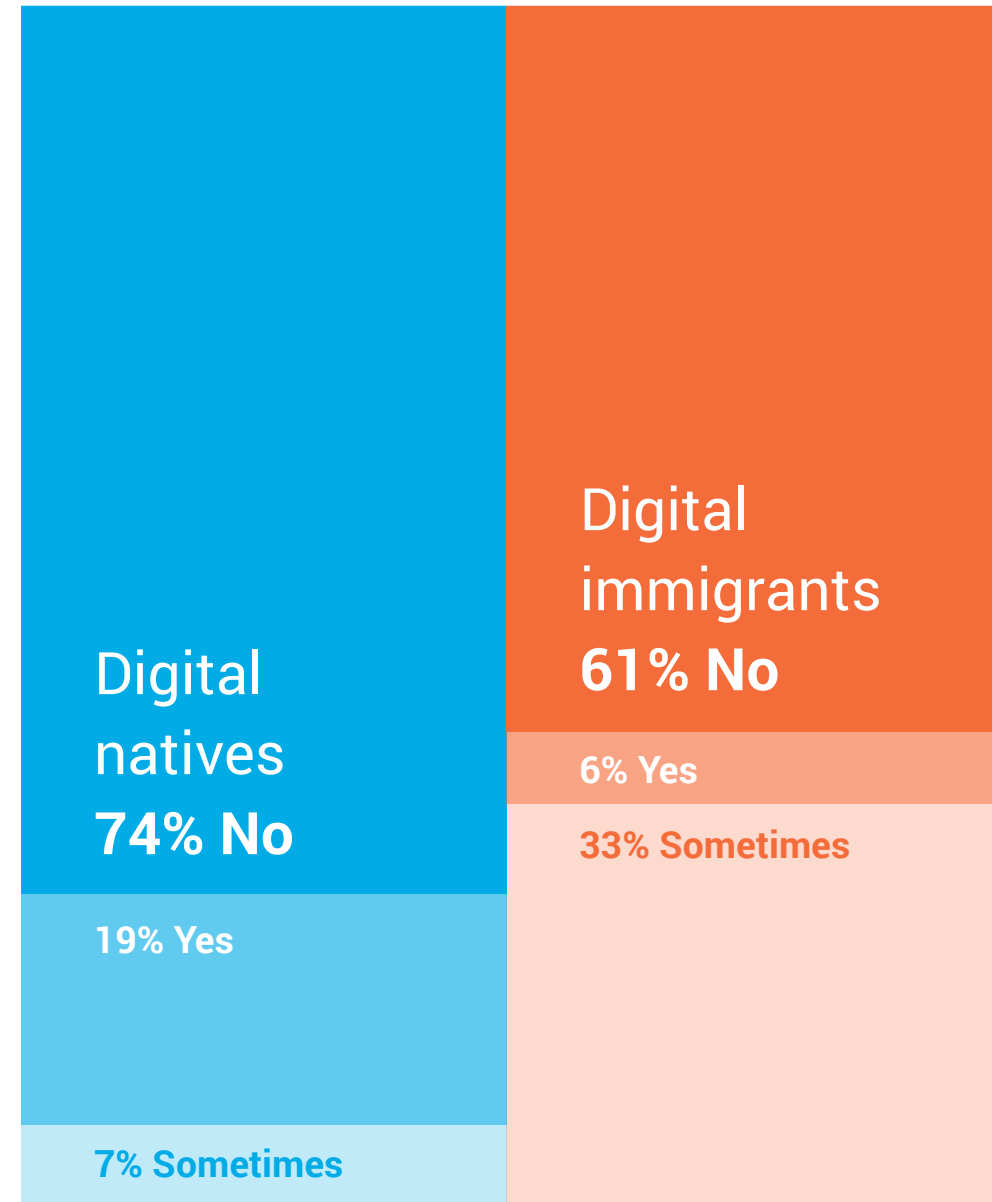
To ensure the research is synthesized to create a holistic picture of the current context in which we are using search engines and the impact search engine algorithms might be having on society, it was imperative to pair the previously examined research methods of capturing the history of knowledge storage, sharing, and searching along with the examination of STEEP-V trends with first-party research that provides the first-person account of people's understanding of search. This was done by designing a survey that was deployed to understand the base knowledge survey participants had in relation to search engines and their functions. The survey was also designed to better understand how different distinct groups gather knowledge in 2017. The survey was designed for and deployed to two separate groups: Digital Natives and Digital Immigrants. For this study, we have defined millennials as anyone born between the years of 1984 and 1999. This aligns with the Digital Native and Digital Immigrant age designation. Because technology and search engines are moving at such a rapid speed, which is clear by the number of product innovations and new services being launched as seen on the knowledge timeline, it was essential to understand what

patterns and trends might emerge by comparing the Digital Natives and Digital Immigrants survey results. Is one group more educated or apathetic? Is there a higher level of usage among one group over the other?

## Apathy Or Engagement

It is clear from the participant survey results that millennials online activity is increasing year-over-year. They are also becoming more apathetic as they engage in more search-driven products and services with a far less focused critical lens. Key learnings show that Digital Natives search through fewer search engine result pages than Digital Immigrants. There is a moderate difference between the groups comparing their search results with other sources; with 74.19% of Digital Immigrants versus 60.61% of Digital Natives comparing their results with other search engines. Digital Natives are 6.17% more likely to trust a search engine based on brand recognition. Across both groups there is a low awareness and understanding of how the technology generates search results and tracks behaviour. There was a higher level of understanding among Digital Natives as to what a search engine cookie was, although the responses were fragmented and high level, aside from a few participants who were fully educated on the function of a search engine cookie.

## Do you compare results from different search engines?



Survey results when asked:

## What is search engine cookie?

Digital  
natives  
42% No

58% Yes

Digital  
immigrants  
51% No

49% Yes

### Search Engine Cookie (Generic)

A cookie is a small amount of data generated by a website and saved by your web browser. Its purpose is to remember information about you, similar to a preference file created by a software application. While cookies serve many functions, their most common purpose is to store login information for a specific site. Some sites will save both your username and password in a cookie, while others will only save your username. Whenever you check a box that says, "Remember me on this computer," the website will generate a login cookie once you successfully log in. Each time you revisit the website, you may only need to enter your password or you might not need to log in at all. (Gomer, R., Rodrigues, E., Milic-Frayling, N., & Schraefel, M. 2013)



Survey results when asked:

## What is page rank?

### PageRank (Google)

PageRank is an algorithm used by Google Search to rank websites in their search engine results. PageRank was named after Larry Page, one of the founders of Google. PageRank is a way of measuring the importance of website pages. PageRank or PR(A) can be calculated using a simple iterative algorithm, and corresponds to the principal eigenvector of the normalized link matrix of the web. These ranked maps allow rapid calculation of a web page's "PageRank", an objective measure of its citation importance that corresponds well with people's subjective idea of importance. Because of this correspondence, PageRank is an excellent way to prioritize the results of web keyword searches. For most popular subjects, a simple text matching search that is restricted to web page titles performs admirably when PageRank prioritizes the results. For the type of full text searches in the main Google system, PageRank also helps a great deal. (Brin, S. Page, L, 1998)

Digital  
natives  
74% No

26% Yes

Digital  
immigrants  
66% No

34% Yes

Survey results when asked:

## What is edge rank?

### EdgeRank (Facebook)

EdgeRank, the algorithmic editorial voice of Facebook, determines what is shown on users' Top News by drawing on different factors relating to the Edges. At least three different components are key to determining the rank of an Edge:

(1) Affinity. This pertains to the nature of the relationship between the viewing user and the item's creator. Here the amount and nature of the interaction between two users is measured. Sending a friend a private message or checking out his or her profile on a frequent basis heightens the users' affinity score to that particular friend.

(2) Weight. Each Edge is given a specific 'weight' depending on how popular or important Facebook considers it to be. Therefore, not every Edge gets weighted the same. Some types of interactions are considered more important than others. Arguably, a Comment has more importance than a Like.

(3) Time decay. Probably the most intuitive component relates to the recency or freshness of the Edge. Older Edges are thus considered less important than new ones. (Bucher, T. 2012)

Digital  
natives  
90% No

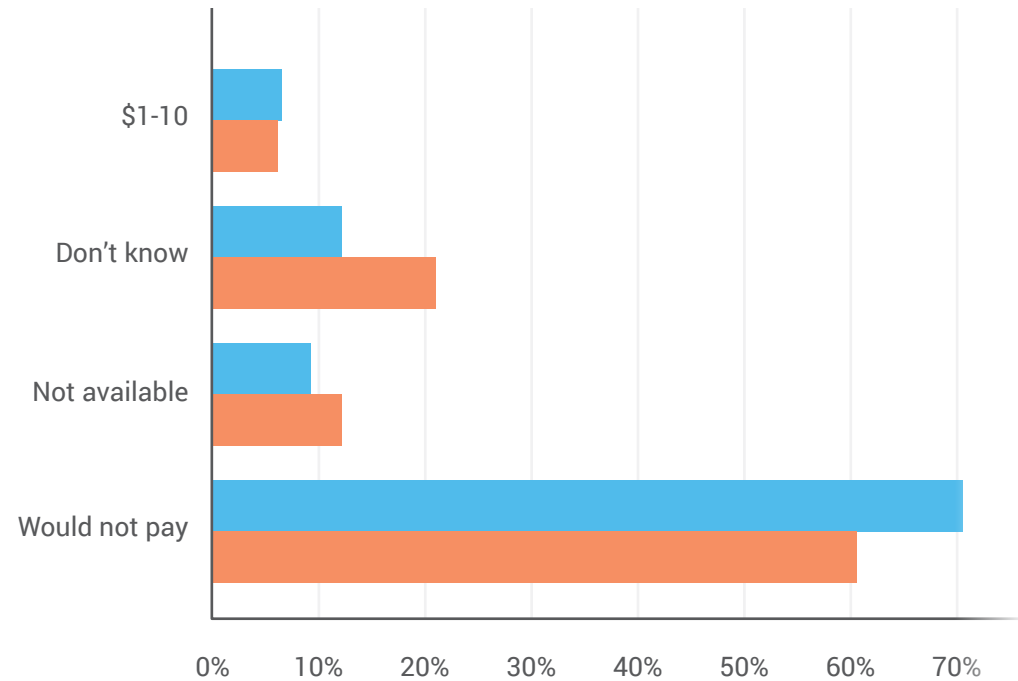
10% Yes

Digital  
immigrants  
88% No

12% Yes

## Search As A Paid Service

Desire overall from both Digital Natives and Digital Immigrants to customize their search experience was low. When asked “What kind of features would you want for search engines and how much would you pay?”, most respondents said they would not pay for search and had very few recommendations for new or different features and services. 60.1% of Digital Immigrants wouldn’t pay and 20% didn’t know what kind of features they wanted or what they wanted to pay. 70.9% of Digital Natives wouldn’t pay and 12.9% didn’t know what kind of features they wanted or what they wanted to pay. A clear apathy that comes through in the results, with very few respondents thinking beyond using a free search engine. Users seem to accept that they are exchanging data for the free use of the search engine.



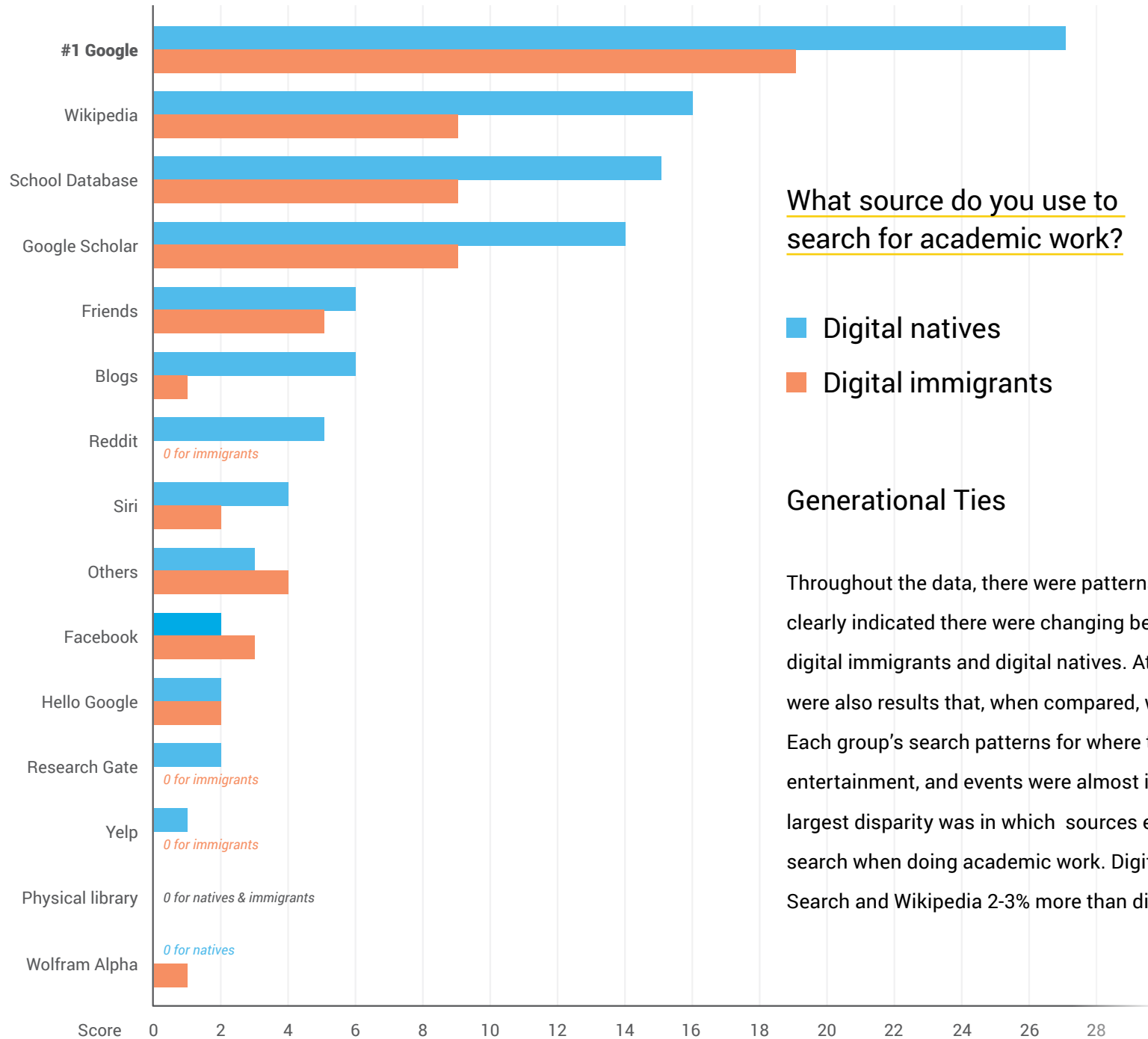
### What kind of features would you want for search engines and how much would you pay?

#### ■ Digital natives

- Accurate data/results
- Anonymity
- Privacy controls
- No advertising

#### ■ Digital immigrants

- Anonymity
- Fast searches
- Trustworthy info



What source do you use to search for academic work?

■ Digital natives  
 ■ Digital immigrants

**Generational Ties**

Throughout the data, there were patterns that emerged that clearly indicated there were changing behaviours between the digital immigrants and digital natives. At the same time, there were also results that, when compared, were almost identical. Each group’s search patterns for where they search for news, entertainment, and events were almost identical, while the largest disparity was in which sources each group uses to search when doing academic work. Digital natives use Google Search and Wikipedia 2-3% more than digital immigrants do.

All users share similar search behaviours when looking up:

- News
- Entertainment
- Events

Participants were asked to rank sources in order to generate a score.

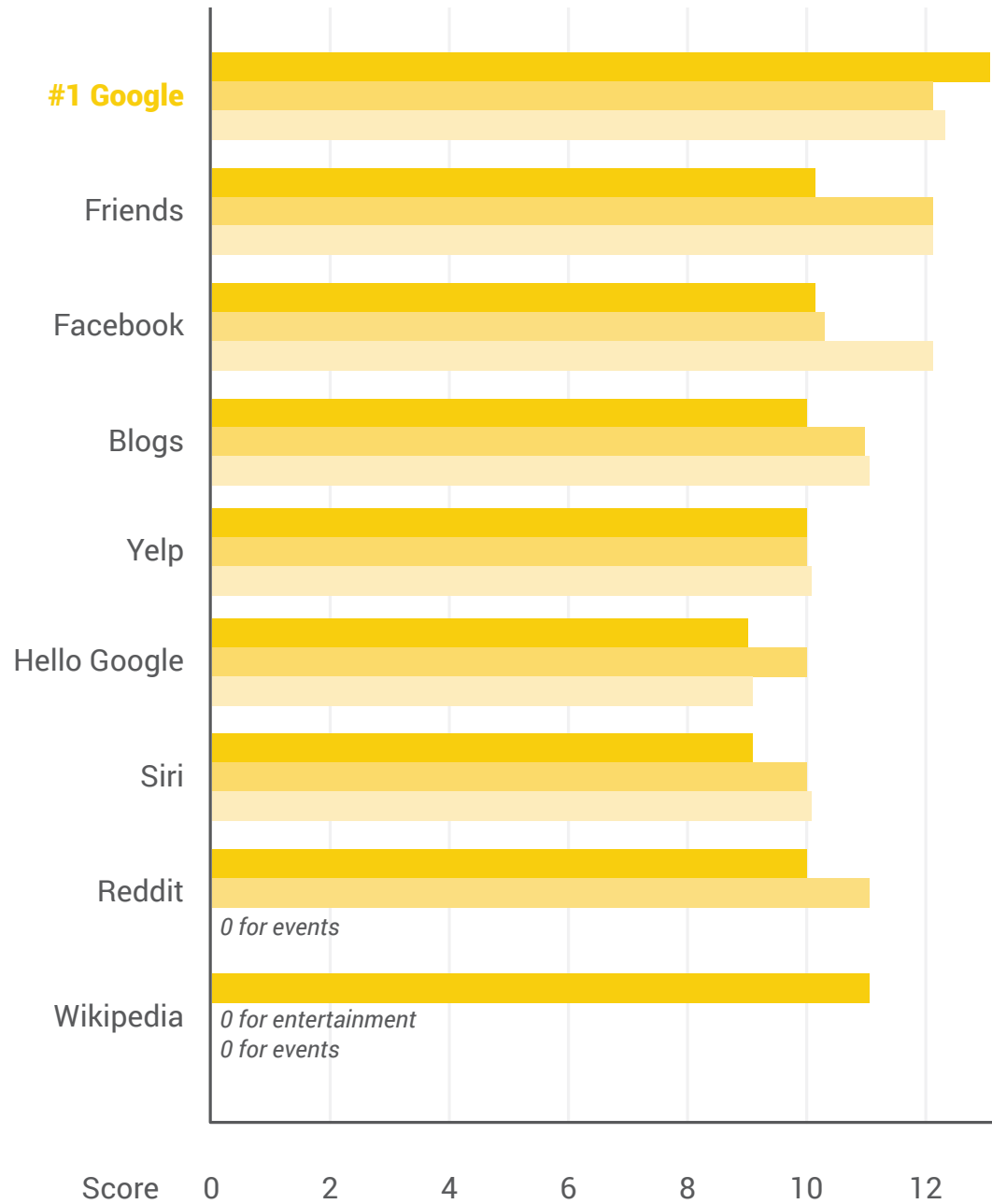
Questions from survey:

What source do you use to search for news?

What source do you use to search for entertainment?

What source do you use to search for events?

Physical library, school database, Wolfram Alpha, and Research Gate all scored 0. Google Scholar has been omitted in this comparison.



## Influence

From a governmental oversight understanding Digital Immigrants score 10% higher than Digital Natives in thinking government regulators influence search. Both groups clearly feel their browsing history influences their search results, both placing that at an 80% likelihood. Digital Natives feel very strongly that advertising has an impact on how search results are influenced, sitting approximately 20% over where Digital Immigrants placed the likelihood, at 90%. This is an interesting and concerning statistic, because Digital Natives use Google Search for academic research more than they use Google Scholar, Wikipedia, or school databases. They appear to fully engage with the understanding that their search results are biased by advertising.

Although there is an understanding of what influences search results, there is no indication in the survey results to indicate there is a desire to use products or services to help them generate more unbiased results. Of the different search engines on the market today, there are very few that don't collect or share your personal information. DuckDuckGo is a search engine with the most market penetration among search engines that do not track your personal data. Launched in 2008, DuckDuckGo focuses on providing smart

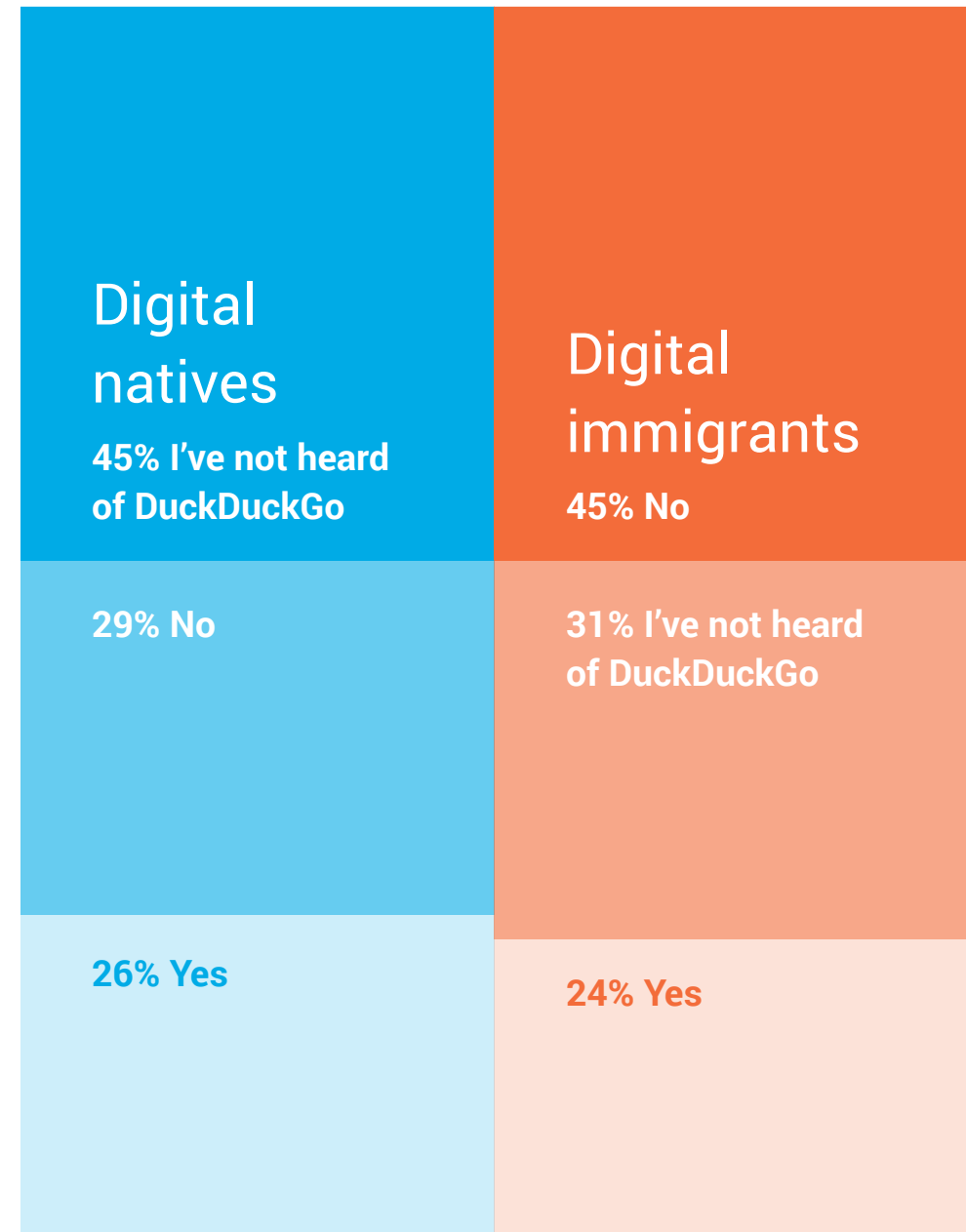
search results without tracking users. The company relies on free and open-source projects along with private funding for sustainability and growth. Part of the company strategy is to support communities focused on open source software and services, donating money to such groups as nginx, FreeBSD, Tor, Clamwin, Tahoe-LAFS and OpenSSH. For more timely info (and more reader-recognizable groups), check DuckDuckGo's 2017 contributions:

<https://duckduckgo.com/about>. After DuckDuckGo hit more than 5 million searches on February 26, 2014, Apple included the search engine in Safari with the launch of iOS 8 and OS X Yosemite; Mozilla added DuckDuckGo as an add-in option to Firefox and Firefox OS. In February 2017, DuckDuckGo reached 15,106,357 searches. Even with these major milestones and consistent growth, 74.28% of Digital Natives either have never heard of DuckDuckGo or they don't understand the difference between this and other search engines. Those numbers are similar for Digital Immigrants: 79.41% either never heard of DuckDuckGo or don't understand its differentiating factors from other search engines.

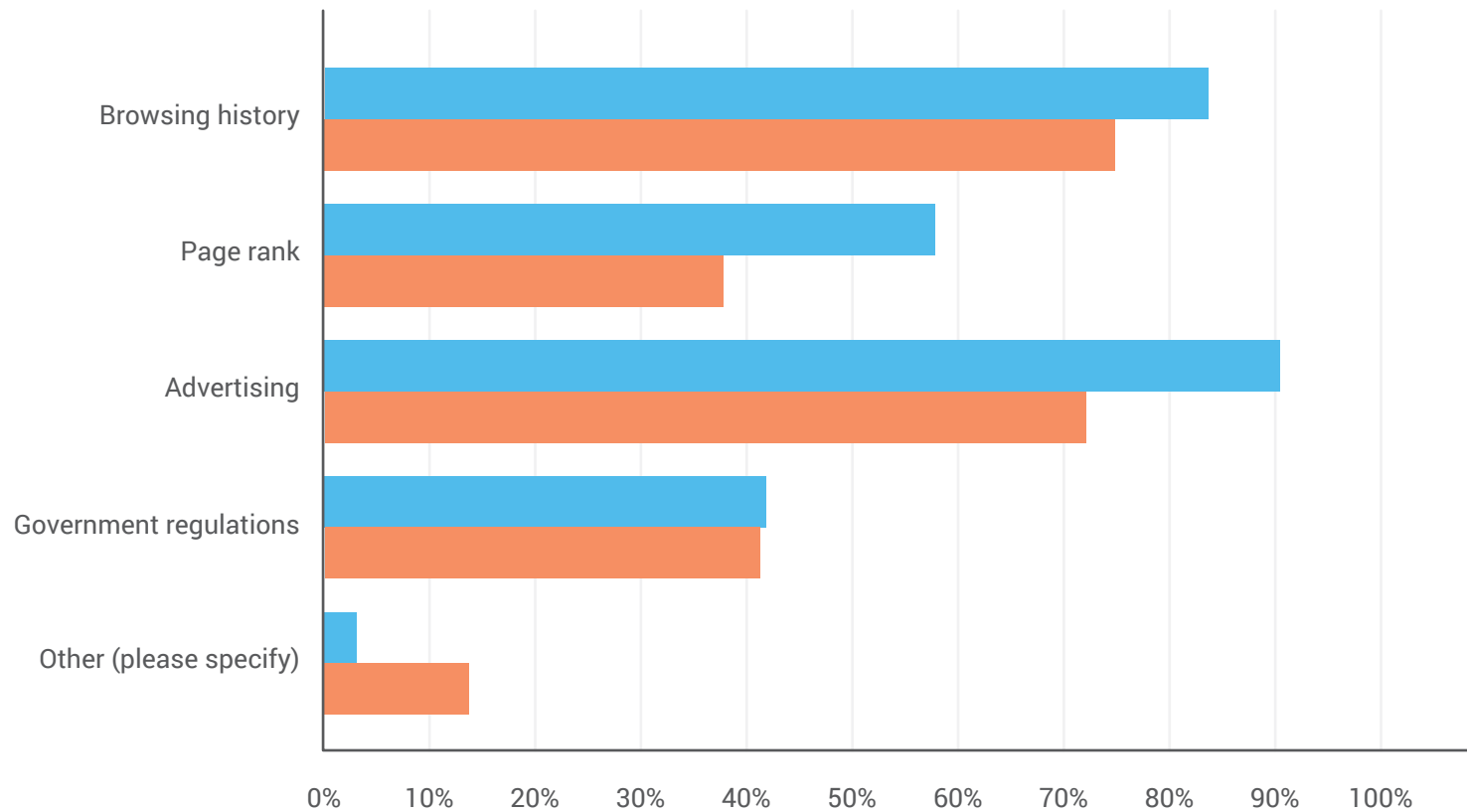
In addition to DuckDuckGo, there are other browsers on the market that aim to provide transparency and community focus.

Web browsers such as Firefox has been available since 2004. In their first year, Firefox was downloaded over 100 million times (Mozilla, 2005). The most recent addition to the privacy-focused web browsers is Brave. Launched in 2016, Brave is a free and open-source web browser launched by the Brendan Eich, co-founder of the Mozilla Project and creator of JavaScript. Brave blocks intrusive ads and online trackers to provide a faster and safer web experience. Unlike traditional browsers, Brave has a built-in ad-blocker which reduces page loading time, improves performance, and guards from ads infected with malware. On the desktop, Brave provides a 40% to 60% speed increase compared to other ad-enabled browsers, and a 2x to 4x speed increase on mobile devices. Mobile users see a direct reduction in both battery and data plan consumption. Brave also protects users with leading privacy and security features such as HTTPS Everywhere (encrypted data traffic), fingerprinting shields, phishing protection, malware filtering, and script blocking (Brave, 2016).

### Do you know the difference between DuckDuckGo and other search engines?



# Do you think search engine results are influenced by the following?



■ Digital natives

■ Digital immigrants

### Examples when respondents specified "Other":

*"Companies paying fees for higher placement"*

*"Not sure"*

*"The #1 factor: name of document."*

*"Fucking stupid, right? But true!"*



## Trust

Both Digital Natives and Digital Immigrants are highly trusting of search engines, with Google being the service most trusted service by both groups. Chinese search engine Baidu holds the lowest ranking. DuckDuckGo ranks second last, most likely because people are not familiar with it. One respondent who was an expert user indicated they use StartPage, another privacy-focused search engine that predates DuckDuckGo; it was founded in 1998. Originally named Ixquick, the company renamed the search engine StartPage and launched it in the United States in 2009. Ixquick was originally built with a comprehensive user data storage model. But the company never wanted to extend its services beyond search, so in June 2006, the company purged its databases and retroactively deleted all IP addresses and other stored search data. Ixquick began deleting all new IP addresses within 48 hours. In January 2009, StartPage stopped recording IP addresses at all. StartPage has optimized its search processes to guarantee privacy and ensure the search engine never collects personal data on users. StartPage also ensures that user search data is not collected by other parties. StartPage is the only leading search engine to offer Secure Socket Layer (SSL) or HTTPS encryption to prevent Internet Service Providers (ISPs) or

unscrupulous WiFi providers and hackers from eavesdropping on users. In recognition of this unique feature, StartPage's parent company, Ixquick, received the first European Privacy Award from EU Privacy Commissioner, Peter Hustinx, in July 2008. Since its inception in 1998, Ixquick has grown steadily, primarily as a result of word-of-mouth referrals.

The complacent and apathetic nature of the relationship most respondents have with search engines is disconcerting and must be taken seriously by stakeholders such as policy makers, ethicists, behavioral economists, designers, and programmers. By the design of each element of the search experience, the power to shape our expectations of the search experience is used to educate or placate users. From government oversight to educating users about the true architecture of search results, the lawmakers and those governing have a responsibility in the monetization and governance of publicly accessible media sources to ensure users are not being unknowingly manipulated. By nature, humans will take the path of least resistance. We become comfortable with products and services that imbue trust through marketing, market penetration, and convenience.

In conclusion, the survey results provided perspective as to the predominant and underlying issues that could impact societies relationship with search. The growing apathy of millennials is not surprising, with billions of people of all ages giving up their identities, personal data and most private secrets in exchange for the convenience of following a friend on Facebook or searching for the best ceviche restaurant in Santa Monica. Where the apathy is concerning is in people's right to transparency and understanding of where their data is going and what is being done with it. A trove of consumer data can be used for corruption and illegal activities in the same way a blueprint for a bank vault can be. Our data is as valuable as that blueprint, but the fragility of that data doesn't seem to resonate with consumers; even when you have a situation such as the Equifax breach, where 143 million American consumers whose sensitive personal information was exposed in a data breach, one of the nation's three major credit reporting agencies (Gressin,S). This apathy increases the younger the person is, as privacy is often not considered a major concern in their lives.

Moving beyond apathy, the convenience factor people love so much with online and mobile search does not translate into

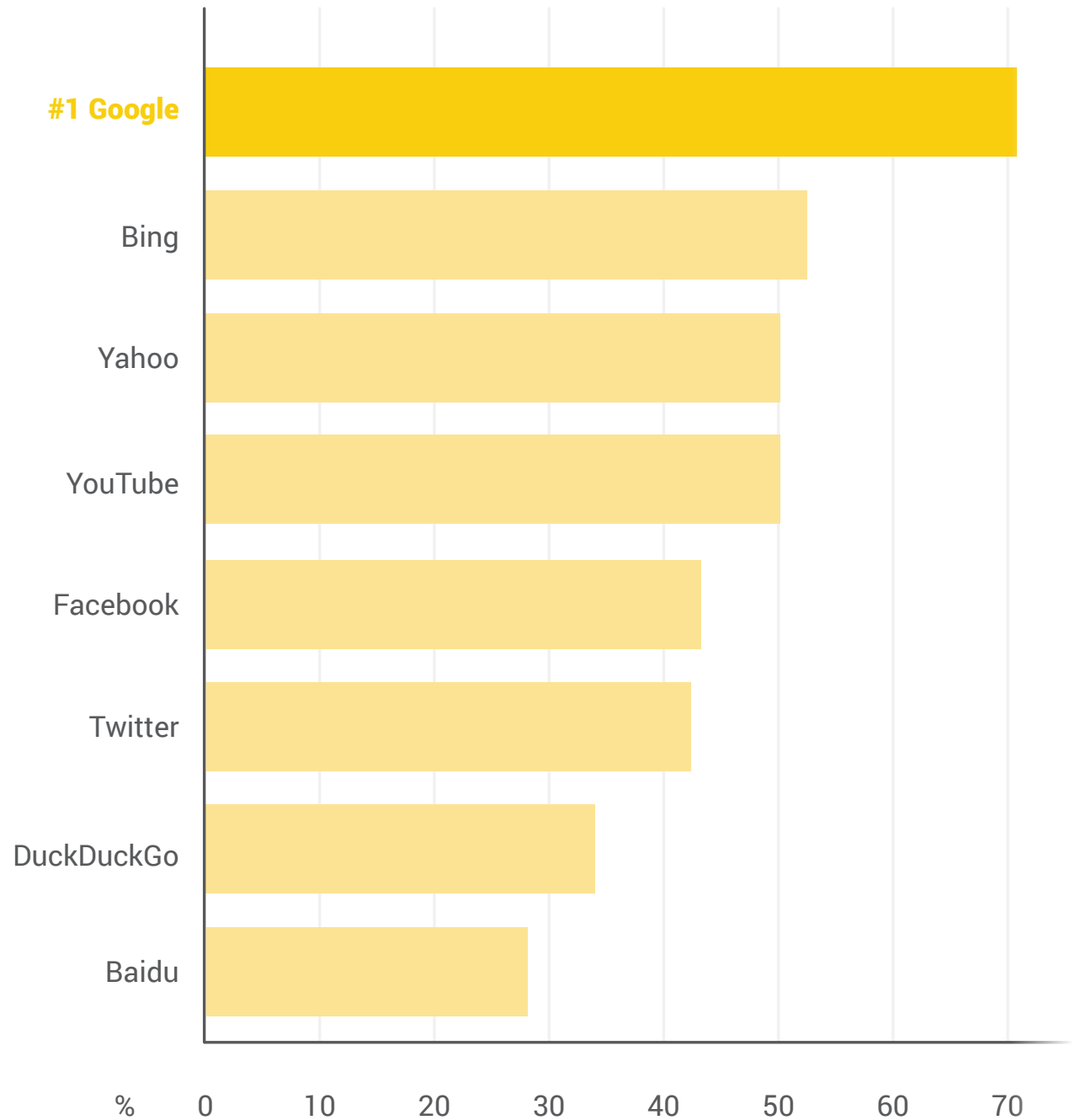
a motivation to pay for their services. There was almost no desire to pay for search services or create customized search experiences based on person need. When the product or service does offer their own personalized experience, it's not surprising this response was so resounding. That being said, as the great Henry Ford used to say "If I had asked people what they wanted, they would have said faster horses." Although this result was clear, due to the nascent stage we are at in the development of search, the evolution of paid based search services could be driven by the market or government as well as consumers.

The secret sauce if you will, of search is influenced by many factors, most of which are commercial. It is clear based on the respondents feedback that they are aware results are shaped by advertisers and share of searches by other users. They referenced advertising, other people's search results and keywords as influential factors in what their search result looks like. They weren't concerned with the full breadth and depth of the magic sauce and feedback clearly indicated convenience is a strong motivator for passively using search engines without understanding the full innerworkings.

Google search is **trusted** more than Facebook, Twitter, Baidu and DuckDuckGo\* by all users.



\*DuckDuckGo is the only search surveyed that doesn't track you.



Lastly, tying the apathy, convenience and influence together, survey respondents showed a very high level of trust for brands they knew, most specifically Google. Less than 3% of the respondents knew about search engines like DuckDuckGo, which are based on trust and have build a product based on trust and no tracking policies. Brand familiarity and convenience are the main drivers for the participants search engine selection; with many using what was installed on their computer when they purchased it. It is clear there is an opportunity for a search engine company to really galvanize the space and set their brand apart. It is very interesting to note that nobody surveyed mentioned Mozilla or Firefox; two companies that have pioneered the search engine space and are global advocates for trust, transparency, and industry collaboration. It appears that perhaps the search companies who are investing in ethical search and transparent business practices need to open the aperture of their scope and explore how they can make an impact on more people in more places who don't yet know the options available to them as consumers in a search forward world.

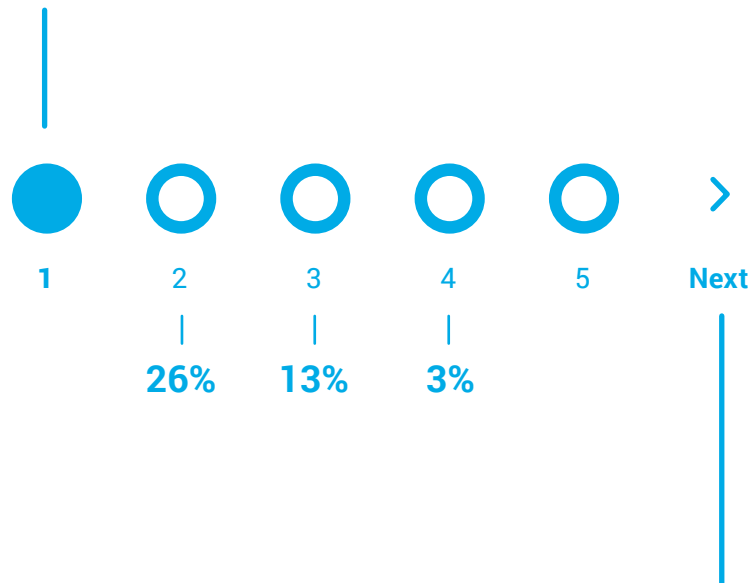
How many pages of search results do users go to before clicking through?



## Digital natives

45%

Do not go past **page 1** on Google search.

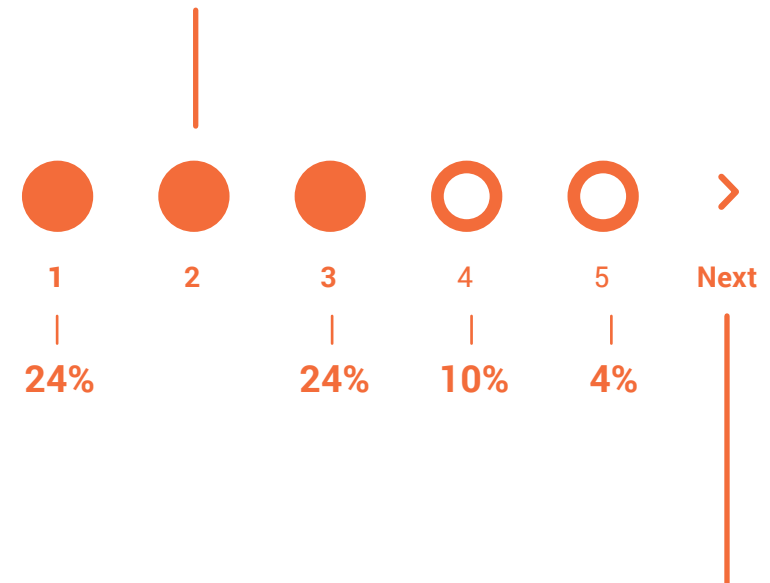


13% Are *deep searchers* and go more than 5 pages

## Digital immigrants

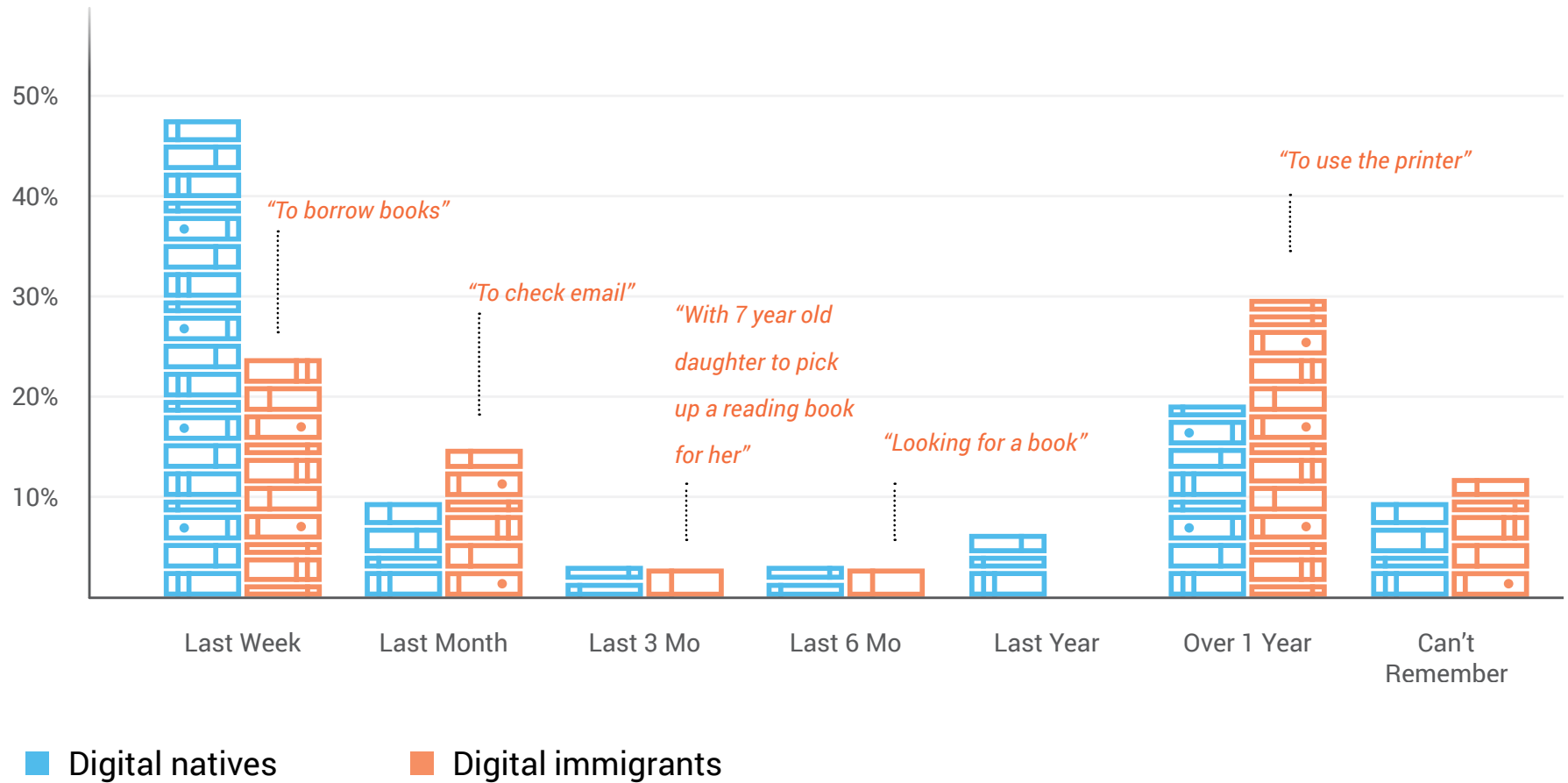
28%

Do not go past **page 2** on Google search.

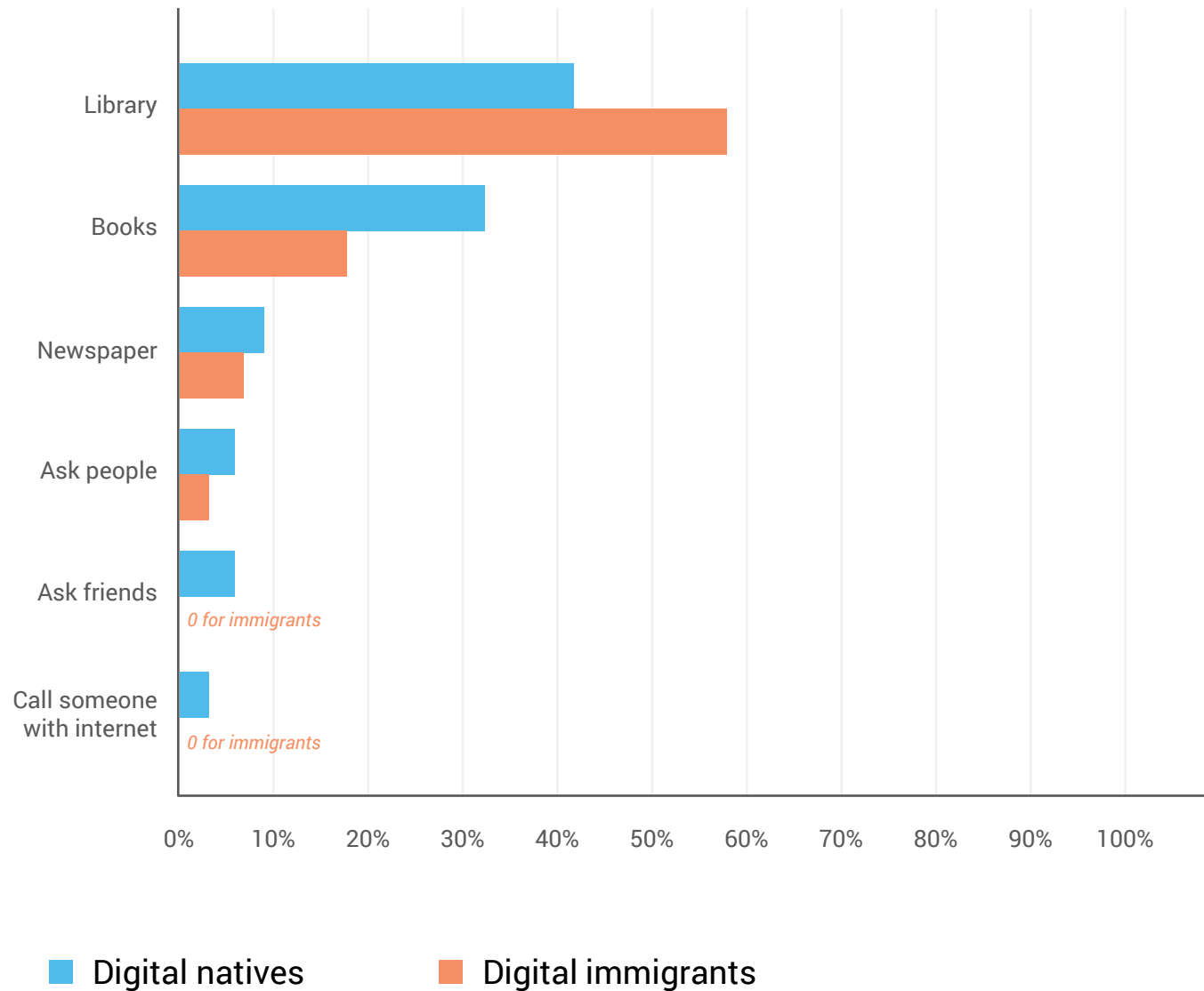


10% Are *deep searchers* and go more than 5 pages

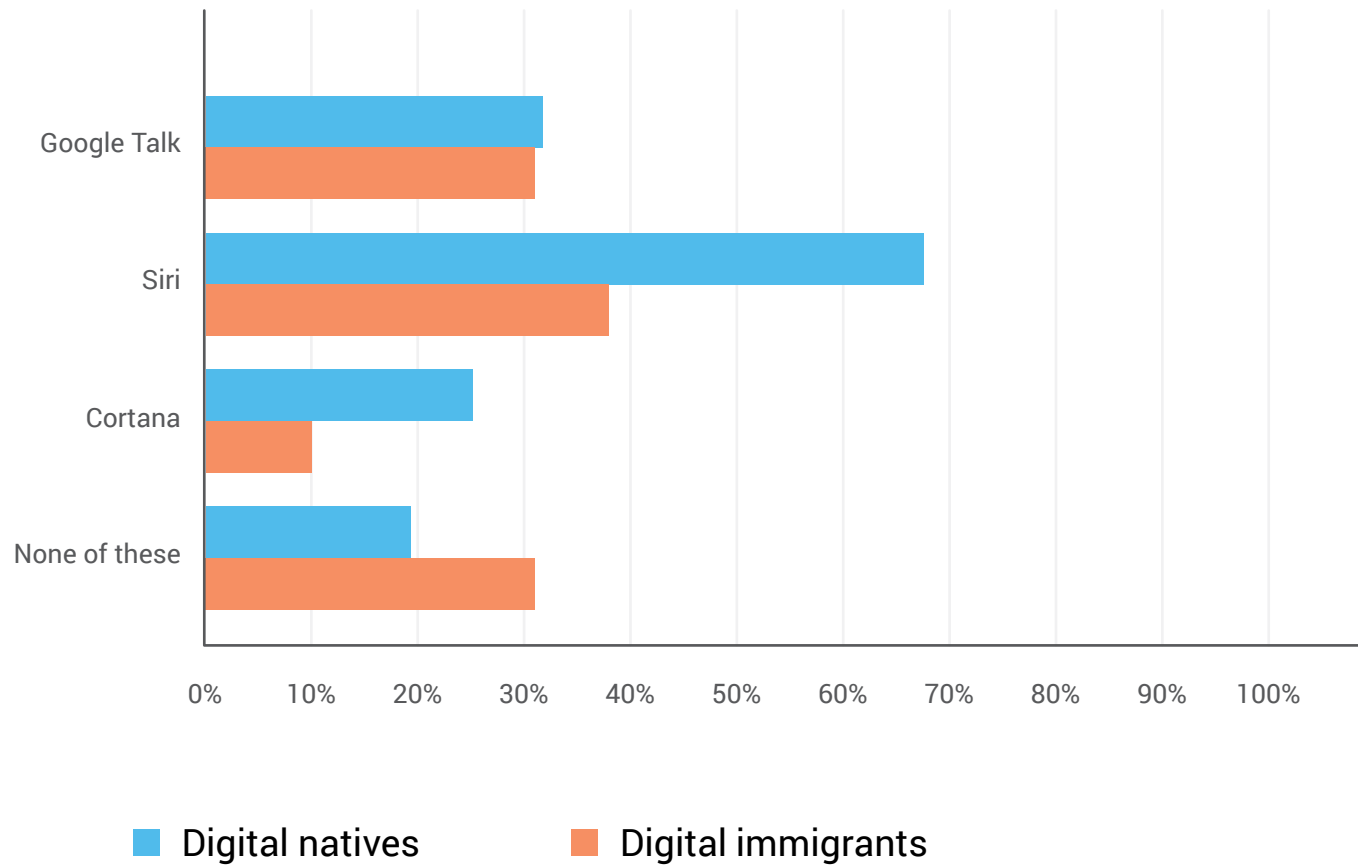
# When was the last time you visited an physical library and for what?



# How would you find information if you didn't have access to the internet?



Select which of these services you have used (select as many):





Survey results when asked:

Have you heard of **net neutrality**, if so what is it?

Digital natives  
68%  
Does not understand

32% Understands

Digital immigrants  
76%  
Does not understand

24% Understands

## Chapter 7: So What

Throughout the paper, the goals were to understand the larger trends at play in search engines and surrounding spaces, how humans are navigating the world of search and specifically, what the differences are between digital immigrants and digital natives, if any. It was also a major focus to explore how access to knowledge has evolved and what impact has that had on society. The research shows that we are at a crossroads. Libraries are evolving and endeavouring to maintain relevance by digitizing their collections, offering more digital media services and focusing on physical in library experiences. Anyone in Los Angeles can now stream the whole Criterion Collection of films (Wick, J. 2017)

Those surveyed are still visiting libraries, with over 50% of digital immigrants having visited a library within the last week. That being said, only 22% of digital natives surveyed had been to a library within the last week. There is a pattern emerging across the STEEP-V trends, participant surveys and the aggregated data in market. Less people under the age of 33 are visiting libraries, search engine usage is increasing year-over-year, and the use of voice automated search products like Google Home, Siri and Amazon Echo are on the rise. (Statista, 2017).

The search market is driven primarily by advertising with Google taking in 88% of its revenue from advertising in 2016. (Google 2017 Annual Report). We have reviewed the Search Engine Manipulation Effect. The researchers argue that SEME is “a serious threat to the democratic system of government” because it is a form of social influence that cannot be seen by the naked eye. Furthermore, no regulations are in place to prevent Google from tweaking its algorithm to exert influence on the 2016 Presidential elections. (Epstein, R). When tests were deployed to groups in the United States and India, using a specially designed search engine called Kadoodle, found that voters tended to increase their preference for candidates favored higher in the search results, especially if they were unfamiliar with the names on the ballot.

This research gives further insight into how we decide what to trust online and how search could be shaping our personal behaviours and how society accesses knowledge, makes important personal, social and political decisions based on how information is presented to us. As I was concluding my research, a new search engine called CAKE launched. It gives you the ability to segment between news, images, videos, shopping. It is mobile only and uses Google search for the

query. They have designed a new mobile first user experience that gives the user one search result based on their query. When you search, it does not initially offer a variety of options, but one option that is loaded immediately. This new product was born of a demand and a desire to make search even more automatic and convenient; removing any need for the user to parse through pages. This product is a reflection of the highlighted trends such as “Attention Spans Need Not apply”, “Curated Search Engines” and “The Genius Syndrome”. If this is an indication of how search will continue to evolve, the time for deeper research and exploration of potential interventions.

This paper looks back to 35,00 BC until present day to best understand the ego of the user in relation to the potential reality of tech-determinism. Throughout this process of going back centuries along with conducting extensive first party research, the research challenges were very specific. The number of conflicting credible sources for dating pivotal times in history presented a challenge. There are many reputable and credible sources that contradict each other. To ensure I did not bias the research with one source, where there was a range of dates or challenged timelines, I provided an estimation of the time frames, ensuing this paper remained as unbiased as possible. Participant data integrity was another major challenge. Using a self-managed platform, Survey Monkey,

proved to be challenging in securing credible participants. Out of a total of 418 survey participants engaged, I was able to use 60 in total. Upon manual review of the participants, many were not completing the survey, were providing false information or did not identify their age; which was the main differentiating factor between the Digital Immigrants and Digital Natives. Although it was a challenge and added time to the overall research process, the data that was secured was very insightful and indicates there is deeper research to be done with participants in relation to this subject. The third main research challenge was speaking to experts. This search engine industry relies heavily on proprietary software, algorithms and user experience. My attempts to speak with anyone from Google were unsuccessful. Emails to the public relations department went unanswered, so I relied on interviews provided to media outlets, press releases, and YouTube videos where many of Google’s top engineers presented their new technology advancements and answered developers questions. Even with the challenges listed above, the research concluded with a substantial picture painted of the depth of search engine impact we are seeing on everything from politics to the way we take our vacations. This impact is pervasive, with no firm conclusion as to whether the impacts are leaning in a negative or positive direction.

Now that we have more perspective and understanding about the technology that is shaping our lives and helping to define the future of global networked communication, how can we harness the irrefutable power of search engines and continue to connect people around the world with the networked web of data in a way that honors the legacy of people such as Tim Berners Lee, Ted Nelson, and others who invented the foundation of our digital knowledge infrastructure? How can we embed transparency while giving search companies the competitive edge they require to offer more sophisticated and intelligent searches?

In recent experiments, Robert Epstein and his team of The American Institute for Behavioral Research and Technology were able to shift people's viewpoints about fracking (safe or dangerous?), homosexuality (in the genes or a matter of choice?), and artificial intelligence (beneficial or a threat to humanity?) by between 25 and 36 percent after a single online search (Epstein, 2015).

Actual fake news sites are being created in partnership with legitimate news sources. Fake news websites have even been created by mainstream businesses. For example, 20th Century Fox received significant criticism for working with a fake news publisher to create multiple websites with names like

the Houston Leader, which imitated the look of mainstream websites and published articles about celebrities and controversial topics of interest that were widely shared through public media, but had as their primary purpose the promotion of a new film by promotional hashtags (Gentzko, & Allcott, 2017).

It is clear as the decades of regulation-free and moderately regulated innovations such as search engines, web crawlers, and personalized algorithms have created amazing and sophisticated products and services that have improved the lives of citizens around the world. People around the world are more connected than ever before, and the pervasive nature of those innovations could have more impact than all the libraries in the world. More access and impact could result in more influencer and behavioral impact. The subversive nature of many of the trends we have examined here such as the filter bubble, companies strategically buying search terms and words to manipulate search results, and advertisers consciously profiling users based on tracked data are all strong motivators to explore reform in a way that manages innovation with the free and open market that is founded primarily on market growth, not societal ethics.

It is not merely a choice point for stakeholders such as policy makers, technology ethicists, information literacy professionals and developers to decide how they will proceed into the future of search governance, design, and advocacy. The choices those key influencers make will shape people's lives, their perceptions of the world they live in, and how the discovery of information is designed, regulated, and managed. Within the last year, and even as most recently as August 2016, new search engines such as CAKE have been launched that are exclusively mobile and provide one result with a search query (Wells, 2017).

Based on the research, search on desktop will slowly move over to mobile. Projections by Statista estimate over 221 million people will be using mobile search by 2020 (Statista, 2017). Products like CAKE launching as mobile search, along with the growth projection indicate that search will continue to become more ubiquitous and the impacts of search will affect more people. In 2015, ZenithOptimedia and GlobalWebIndex conducted a survey using GWI's panel of 200,000 internet users and found that within three years, 16-24 year-olds across 34 of the world's largest advertising markets will spend more time accessing the internet via mobile than via all other devices combined, regardless of their location. Some

countries, such as Mexico and Saudi Arabia, have already reached this tipping point (Zenith Media, 2015).

As desktop search transitions to mobile and voice based search, the delivery space and communications structure will change. This will make it more imperative than ever to ensure the foundations pertaining to consumer rights, ethical business practices, and societal influence get due consideration. Human beings are curious, lazy, optimistic, and very trusting. Designing for all of those in both the front-end user experience and the back-end that shapes the matrix of decisions that influence the algorithm and search process is essential. I have identified key interventions that could be practical and ethical ways to navigate a probable future where search continues to grow as our primary source of access to information that shapes our identity, our community, and how we interact with the stories that shape our lives.

## Interventions

The following interventions have been developed with the goal of designing impartial and unbiased options for search and knowledge discovery; which includes transparency, customization based on consumer desires and options that offer long term sustainable solutions.

These interventions are not unlike the way we deal with information storage, sharing and searching in contemporary society. From traditional libraries to research institutions to academic knowledge sources along with government managed data, the need to manage the ethics of how we validate and provide portals of knowledge to citizens has long since been a priority. What I am suggesting below are inspired by ombudsman services, encyclopedias, and public libraries. Organizations such as UNESCO and the United Nations are also channeled in the interventions below; taking a nod from their diplomatic and global approaches to world issues that have the ability to impact citizens, communities and nations and how they perceive the world around them. These are high level ideas that could be further explored or be used in partnership with other ideas that could support the continued evolution of search engines value to society.

The ultimate goal of the interventions is to ensure the speed at which technology innovates isn't stifled, but citizens are aware of the exchange being made between user and provider. I have not defined stakeholders for each intervention at this point, as they are not formed enough to provide context and appropriate recommendations. Furthermore, as with design thinking methodologies which would could be applied when exploring these options; the most impactful stakeholders might not be obvious until deeper research is conducted. I do not want to inadvertently bias the solution or the approach to actioning it. The stakeholders that are currently entrenched in the evolving world of search engines that might be important stakeholders, advocates or opposition in regards to the below mentioned interventions are as follows:

Citizens | Programmers

Government Policy makers

Search Companies | Hardware Developers

Corporations Ethicists | Regulatory Bodies

Internet Service Providers | Algorithm Developers

Search Engine Optimization Companies

**A LA CARTE OFFERING:****Offer paid search with customizable algorithms**

There is an opportunity to sell not the algorithm but the discovery journey. Engage consumers in the act of curating their search experience. Allow them to custom tailor the search criteria and explore options for tiered search criteria based on set prototypes of audience members based on behavioral science segmentation.

This intervention could help users feel more in control of their search while ensuring they get a reliable search results.

**PRIORITIZE OVERSIGHT:****Formalize and elect a governing body that provides oversight for all search engine services and focus on supporting market balance**

An ombudsman represents the interests of the public by investigating and addressing issues surrounding search engine practices. An ombudsman could be an independent person or a group appointed or elected to the position. The ombudsman would be more active in advocacy and policy implementation, working with global organizations such as UNESCO and the United Nations to develop global reform and oversight of search engines.

In the service of citizens' right to fair and balanced access to information, the government could explore how to support organizations such as Mozilla Foundation, Firefox, DuckDuck-Go and Brave. The direct work of these organizations that are bringing us search engines, web browsers, and public interest advocacy support are focused on an open and transparent internet. The goal would not be major subsidies, but support in ensuring consumers are aware of the different service providers in the search space so they can make informed decisions about which services they would like to use and under what terms.

**DIFFERENTIAL SEARCH:****Apply different algorithms to different kinds of information**

Don't treat world news the same way as shopping for socks. The design of how you access information is as important as the information itself. If sentiment, context, and relevance are all factors built into the query process, then bias, opinion, and editorialization are the curatorial drivers of your results. When searching for health facts that could lead to a self-diagnosis and perhaps undue stress and panic, a person has no barometer for the credible and verified information alongside a highly ranked piece of editorial content about health that has no authoritative qualifying features. Why then do we allow our children, friends, and family to search about race relations or health news using the same filter as we would use for searching about sports or shopping. Why then do we not create distinctions between the information and empower the user to distinguish between a credible news source, content marketing, or political propaganda?

This intervention is not new. When we walk into a library or a book store, we are able to visually find content based on its naming identification, the format of the content, and by way of engaging with the people who work there who can verify the credibility of the sources. This approach could bring

increased revenue streams, channeling people through the same search process, but with very different parameters and codes of conduct. Ethical dilemmas in journalism, news, and historical knowledge capture are also not new. History books have been written with periods of time omitted. Journalists have been accused and convicted of reporting false information.



**Select subject matter that could be treated differently:****News**

High level of oversight and governance. Explore how to evolve the Ethics & Compliance teams at search companies to ensure they reflect the transparency needs of the consumer.

**Shopping**

Low-moderate level of oversight. Evaluate and adopt some of the Advertising Standards Bureau principles to ensure products and services promoted via organic and paid search are not misleading consumers.

**Business**

Moderate level of oversight and governance. Explore how the financial regulatory rules can be applied to the search and discovery of business related materials accessed via online search engines.

**Politics**

High level of oversight and governance. Explore how to evolve the Ethics & Compliance teams at search companies to ensure they reflect the transparency needs of the consumer.

**Sports**

Low-moderate level of oversight. Evaluate and adopt some of the Advertising Standards Bureau principles.

**Health And Wellness**

High level of oversight and governance.



## Chapter 8: Conclusion

It is not yet the dystopian world where citizens have been silenced and there are no other options for the discovery of knowledge and information. Companies such as DuckDuckGo, StartPage, and Brave empower people to search with anonymity and privacy. Organizations such as the Electronic Frontier Foundation respect the power of search technologies to radically advance our freedoms, but also understand they can constitute unparalleled invasions of privacy.

It is NOW that more research needs to be undertaken to better substantiate the impacts of search. Further research focused specifically on the current impacts of search algorithms on citizens can help provide deeper insights and direction on how we can continue to harness the imagination of the worlds most creative developers and digital thinkers while ensuring commerce, civil liberties and true consumer choice are all kept in balance. This research could include online social networks that employ the same commercial and personalized algorithmic design as search engines do. (Powers, E. 2017). This research must be designed to include digital native and digital immigrant participant groups who have varying levels of education. This research should be focused on determining the level of understanding of their personal impact on

how information is being delivered to them. If readers don't know they are influencing content, they cannot make critical decisions about what they choose to read" (Jolly 2014). This research should be undertaken with key stakeholders such as academic institutions working alongside government bodies and well known commercial news and consumer goods brands. The intention to bring academic rigour via academic institutions together with the oversight of government bodies and the brand awareness of well known consumer brands into the research is to enable the research to be contextually resonate with different audience types; increasing the potential impact of the research and recommendations. It is clear from the research, academic research papers don't transition over easily to consumer media unless they have a consumer "hook" that is easily consumable by mass media.

The time is NOW that we take the facts we have to help effect positive change in policy and consumer education and awareness around the search engine experience.

It is NOW that we must call for more thoughtful design in the algorithms that are shaping our lives, or education and our connections with each other and the world around us.

As we race to the store to buy the newest Amazon Alexa or download the newest Chrome Browser or turn on the IFTHIS-THENTHAT app, national and international laws have yet to catch up with the evolving need for privacy protection necessary in the face of new digital technologies. Respect for individuals' autonomy, anonymous speech, and the right to free association must be balanced against legitimate concerns of law enforcement. It is a challenge to integrate ethics and morals into organizations that are driven primarily by advertising profits and have a singular financial bottom line. You can't fault a for-profit corporation for trying to make money. Shared value business models are growing. Shared value models defined by Michael Porter, an American academic known for his theories on economics, business strategy, and social causes. Porter now believes "The purpose of the corporation must be redefined as creating shared value, not just profit per se. This will drive the next wave of innovation and productivity growth in the global economy." This business ethos could be a good fit for search engine services developed to solve a problem for the world and are now driven by advertising revenues. Each of those value propositions can be interwoven with intention to explore how search can remain relevant, transparent, conscious and profitable. Too often, lines are drawn in the sand and the desire to regulate gets conflated with lack of innovation and business growth. If Michael Porter,

one of North America's leading voices in business asserts that it is not only an option to create shared value business, but that the purpose of a business is to do so, then the future of search could continue to be driven by growth, innovation alongside embedded principles of a code of ethics and practices that put the human at the front of the design. This could ensure the balance of speed and accuracy and weighted equally with morals and ethics in every query, every search result, every hyperlink and every algorithm that is defining our society and the citizens who shape it. 2018 is the right time for more focused research on the impacts of search engines. The areas of politics, world studies, sexuality, and health and wellness would be great to focus on as those areas affect everyone around the world; rich and poor. If one was to search for information pertaining to those areas and the search contained a commercial or confirmation bias, that could have an unintended impact that could affect how someone votes, how they take care of their health, or how they perceive their sexual identity. These areas of the lives we live impact how we interact with each other, how we allocate our voting dollars and how we connect intimately; all of these areas are the foundation of a progressive, self assured and healthy society. Without open political dialogue, healthy minds and souls and comfort in our own bodies and identities, the world would show clear signs of literal and metaphorical ailments. Further

research to explore whether these ailments are developing is essential. We must further understand how the design of search engine algorithms might be affecting society's ability to shape the way we see the world. It is not just the right time for through exploratory research to better understand the current and potential future impacts and implications of search on society and citizens, it is an imperative time. We are seeing patterns of generational shifts in attitudes and usage, less concern for privacy and oversight. We are seeing more apathy and security breaches impacting millions of people. We are seeing more people with access, but that access comes with terms and conditions. Those terms and conditions are complicated and would send even the most self aware consumer into a tailspin. How do we keep innovation moving, consumers rights prioritized and the world's information at our fingertips, the way Tim-Berners Lee wanted it? Researches, students and citizens; please help shape your world of knowledge sharing, storing and searching for future generations.



## Epilogue

As I was concluding this paper, consumer awareness was increasing at a rapid pace about the subject, new products were being launched and government involvement started to pick up momentum. The US Senate confirmed that they would start to develop a better understanding on the impacts of social media on society.

The mass media coverage of the Clinton/Trump campaign being impacted by Google Search and Facebook was the tipping point for consumers starting to truly understand the impacts of un-governed platforms that have the ability to influence billions of people with a targeted advertisement or a politically infused search engine result. Twitter confirmed they would meet with a Congressional panel probing the 2016 election (Singh, K., 2017).

Facebook admitted in September 2017 that a Russia-based operation spent \$100,000 on thousands of ads on its social media platform promoting 'divisive' messages before and after last year's presidential election.(Singh, K., 2017).

New products started to pop up like CAKE, the mobile first search application, launched, giving the user one search

result for their query. John Oliver asked the citizens of the United States of America to share their voice in the Federal Communications Commission's decision to repeal net neutrality. Over 1 million posts were shared online about Net Neutrality, and their validity was called into question by, due to the proliferation of bots. According to new research from the University of Southern California and Indiana University, up to 15 percent of Twitter accounts are in fact bots rather than people. (Newberg, 2017). The age of the algorithm has helped fuel this next stage of the bot evolution, as such systems are not able to discern real engagement, with real users, from bot interaction. This is how bot messages got on the radar of so many politicians and spokespeople – even US President Donald Trump re-tweeted a bot, thinking it was a genuine supporter. (Hutchinson, A. 2017).

The news media is in transition; consumer's media consumption habits have changed. It's becoming difficult to distinguish between legitimate news and strategically placed native ads. Addiction to social media is now on the agenda for the US Senate and the EU VS Google case was a moment where the unregulated technology companies influencing our every moment were told there are now rules that have to be followed. What do those rules look like to ensure innovation isn't stifled and consumers liberties and needs are built into the design?

If we look at the last 100 years of technological innovation, we have seen the majority of the progress take place in the last 40 years. Those years have seen Moore's Law proven over and over again, techno-determinists validated and challenged and over 5 billion people gain access to Baidu, Yanex , Google Search, DuckDuckGo and others. As those billions of people settle into the new normal of how they learn around the world around them, it is the responsibility of the designers, policy makers, programmers and marketers to consciously design the future they want to see knowing now what the impacts could be of the services they are bringing to towns, villages and cities around the world.

While there are more people than ever in history with access to knowledge, the World Wide Web has gone from a free and open space where communities connect and the world is wired to a space controlled by Internet Service Providers, Content Delivery Networks and Search Engines; most of which are all driven by commercial gains. More people have access to what they perceive as more information, but is that really the case? As the echo chamber gets smaller and algorithms narrow further in on our bias, is that window into the world getting smaller with each new product that takes the "thought" out of discovery and learning, with each personalized search query returned and with each news story served

up that goes unvalidated by credible sources; blurring the lines between entertainment, true knowledge and the pursuit of a more elevated, educated and connected society? It is the responsibility of researchers, advocates and policy makers to push this area of research forward; providing deeper and directional research that will help all stakeholders; commercial and community, to keep the momentum of innovation moving forward while ensuring we are keeping the thread of societies strong fabric tight and strong.

#### **In closing...**

Statement from the 2016 Google annual report

The Internet is one of the world's most powerful equalizers, and we see it as our job to make it available to as many people as possible. At its core, Google has always been an information company. We believe that technology is a democratizing force, empowering people through information. We are helping people get online by tailoring hardware and software experiences that suit the needs of emerging markets, primarily through Android and Chrome. We're also making sure our core Google products are fast and useful, especially for users in areas where speed and connectivity are central concerns. Other Alphabet companies are also pursuing initiatives with similar goals.





## Citations

Rachel Noonan: Search and Society

Major Research Project: Masters of Design in Strategic Foresight and Innovation

(2011, June 6). Share and Discover Knowledge on LinkedIn SlideShare. SEARCH LUMAscape. Retrieved from <http://www.slideshare.net/tkawaja/search-lumascape-8222850>

(2013, March 18). MIT Technology Review. The Rare Disease Search Engine That Outperforms Google - MIT Technology Review. Retrieved from <http://www.technologyreview.com/s/512606/the-rare-disease-search-engine-that-outperforms-google/>

(2013, October 16). Making Friends with Hummingbird: Google Tear Free Algorithm Update. Retrieved from <http://blog.ebyline.com/2013/10/hummingbird-google-tear-free-algorithm-update/>

(2017). Moz | SEO Software, Tools & Resources for Smarter Marketing. Google Algorithm Change History - Moz. Retrieved from <http://moz.com/google-algorithm-change#2000>

Google 2017 Annual Report. (February, 2017). ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934. Retrieved November 12, 2017 from <https://www.last10k.com/sec-filings/googl#fullReport/>

International Renewable Energy Agency. (2015). Renewable Energy and Jobs. Annual Review 2015. Retrieved November 12, 2017 from [http://www.irena.org/DocumentDownloads/Publications/IRENA\\_RE\\_Jobs\\_Annual\\_Review\\_2015.pdf](http://www.irena.org/DocumentDownloads/Publications/IRENA_RE_Jobs_Annual_Review_2015.pdf)

(n.d.). Baidu Privacy Policy. (n.d.). Retrieved December 03, 2017, from <https://www.baiduadvertising.com/privacy-policy>

(n.d.). 94.5 WFLA - Panama City's Talk Radio. Study: Google, Other Search Engines Stumped Hard for Hillary Clinton Throughout 2016 Election | Buck Sexton with America Now | 94.5 WFLA. Retrieved from <http://945wfla.iheart.com/onair/buck-sexton-with-america-now-56597/study-google-other-search-engines-stumped-15870951/>

(n.d.). Google Sites. Impact on Society - The Foundation of Google. Retrieved from <http://sites.google.com/site/jurgensencompositionprojectweb/resources/technology>

(n.d.). IBM - What is big data?. IBM - What is big data?. Retrieved from <http://www-01.ibm.com/software/data/bigdata/what-is-big-data.html>

(n.d.). Web Design New York | Digital Agency Queens | Siteber. The Changing Landscape of Search Engines [infographic]. Retrieved

- from <http://siteber.com/the-changing-landscape-of-search-engines-infographic/>
- (n.d.). Wikipedia, the free encyclopedia. Timeline of algorithms - Wikipedia. Retrieved from [http://en.wikipedia.org/wiki/Timeline\\_of\\_algorithms](http://en.wikipedia.org/wiki/Timeline_of_algorithms)
- (n.d.). Wikipedia, the free encyclopedia. Timeline of computing hardware 2400 BC%ÙÒ1949 - Wikipedia. Retrieved from [http://en.wikipedia.org/wiki/Timeline\\_of\\_computing\\_hardware\\_2400\\_BC%E2%80%931949](http://en.wikipedia.org/wiki/Timeline_of_computing_hardware_2400_BC%E2%80%931949)
- (n.d.). World Wide Web Foundation Founded by Tim Berners-Lee, inventor of the Web, the World Wide Web Foundation empowers people to bring about positive change.. History of the Web %ÙÒ World Wide Web Foundation. Retrieved from <http://webfoundation.org/about/vision/history-of-the-web/>
- Abbott, J. P. (2001). Democracy@ internet. asia? The challenges to the emancipatory potential of the net: Lessons from China and Malaysia. *Third World Quarterly*, 22(1), 99-114.
- Anderson, J., & Rainie, L. (2017, October 19). The Future of Truth and Misinformation Online. Retrieved December 03, 2017, from <http://www.pewinternet.org/2017/10/19/the-future-of-truth-and-misinformation-online/>
- Akdeniz, Y. (2002). Anonymity, democracy, and cyberspace. *Social Research*, 223- 237.
- Akhavan-Majid, R. (2004). Mass media reform in China: Toward a new analytical framework. *Gazette (Leiden, Netherlands)*, 66(6), 553-565.
- Allen, J. P. (2000). *Middle egyptian: An introduction to the language and culture of hieroglyphs*. New York: Cambridge University Press.
- Allen, R. (2017, April 13). Digital marketing strategy advice - Smart Insights Digital Marketing. Search Engine Statistics 2017 - Smart Insights Digital Marketing Advice. Retrieved from <http://www.smartinsights.com/search-engine-marketing/search-engine-statistics/>
- Ananny, M. (2016). Toward an ethics of algorithms: Convening, observation, probability, and timeliness. *Science, Technology & Human Values*, 41(1), 93. doi:10.1177/0162243915606523
- Andrews, R. N. L., Borg, E., Davis, S. N., Domingo, M., & England, J. (2012;2013;). *The SAGE handbook of digital dissertations and theses*: SAGE publications. GB: Sage Publications Ltd.
- Arnold, S. E. (2004). *How Google Has Changed Enterprise Search*.
- Aubert, M., Brumm, A., Ramli, M., Sutikna, T., Saptomo, E. W., Hakim, B., ...Dosseto, A. (2014). Pleistocene cave art from Sulawesi, Indonesia. *Nature*, 514(7521), 223+. Retrieved October 3, 2017, from <http://link.galegroup.com.ocadu.idm.oclc.org/apps/doc/A385406680/AONE?u=toro37158&sid=AONE&xid=e524f24d>

- Balbi, G. (2010). Radio before radio: Araldo Telefonico and the invention of Italian broadcasting. *Technology and Culture*, 51(4), 786-808.
- Barreira, F., João Melo, M., Araújo, R., & Casanova, C. (2016). Through the eyes of science and art: A fourteenth-century winter breviary from alcobaça scriptorium. *Journal of Medieval Iberian Studies*, 8(2), 252-282. doi:10.1080/17546559.2016.1221119
- Bardoel, J. (2002). The Internet, journalism and public communication policies. *Gazette (Leiden, Netherlands)*, 64(5), 501-511.
- Bates, M. E. (n.d.). Is Google Hiding My News? Retrieved December 1, 2017, from <https://www.questia.com/magazine/1G1-272168694/is-google-hiding-my-news>
- Bellis, M. (2017, January 30). ThoughtCo.com is the World's Largest Education Resource. History of the Gramophone - Who Invented the Gramophone?. Retrieved from <http://www.thoughtco.com/emile-berliner-history-of-the-gramophone-1991854>
- Berners-Lee, T., Fischetti, M., & Foreword By-Dertouzos, M. L. (2000). *Weaving the Web: The original design and ultimate destiny of the World Wide Web by its inventor*. Harper Information.
- Bishop, A. P. (2000). Technology literacy in low-income communities. *Journal of Adolescent & Adult Literacy*, 43(5), 47.
- Bond, M. H., & Smith, P. B. (1996). Cross-cultural social and organizational psychology. *Annual review of psychology*, 47(1), 205-235.
- Bosker, B. (2013, January 24). Canadian News Stories, Breaking News, Opinion. SIRI RISING: The Inside Story Of Siri's Origins -- And Why She Could Overshadow The iPhone. Retrieved from [http://www.huffingtonpost.ca/entry/siri-do-engine-apple-iphone\\_n\\_2499165](http://www.huffingtonpost.ca/entry/siri-do-engine-apple-iphone_n_2499165)
- Boyd, D. (2009, November 17). Danah boyd. Streams of Content, Limited Attention: The Flow of Information through Social Media. Retrieved from <http://www.danah.org/papers/talks/Web2Expo.html>
- Brenkert, G. G. (2009). Google, human rights, and moral compromise. *Journal of Business Ethics*, 85(4), 453-478.
- Brin, S. & Page, L. Computer Science Department, Stanford University, Stanford, CA 94305
- Brügger, N. (2013). Historical network analysis of the web. *Social Science Computer Review*, 31(3), 306-321. doi:10.1177/0894439312454267
- Bucher, T. (2012). Want to be on the top? algorithmic power and the threat of invisibility on facebook. *New Media & Society*, 14(7), 1164-1180. doi:10.1177/1461444812440159
- Smith, A. (2015, April 1). U.S. Smartphone Use in 2015. Pew Research. Retrieved April 2, 2016 from <http://www.pewinternet.org/2015/04/01/appendix-a-about-the-december-week-1-and-week-3-omnibus-survey/>
- Browning, J. (1995). Europeans on-line. *Scientific American*, 272, 35-35.

- Cadwalladr, C. (2016, December 04). Google, democracy and the truth about internet search. Retrieved December 03, 2017, from <https://www.theguardian.com/technology/2016/dec/04/google-democracy-truth-internet-search-facebook>
- Caddy, B. (2017, August 14). Google tracks everything you do. Here's how to delete it. Retrieved December 06, 2017, from <http://www.wired.co.uk/article/google-history-search-tracking-data-how-to-delete>
- Carr, N. (2011). *WHAT THE INTERNET IS DOING TO OUR BRAINS*. New York: W.W. Norton & Company. Chander, A. (2010). *Googling Freedom*.
- Chan, Z. C. Y., & Cheuk, W. (2009). An exploratory study on adolescents' experiences of using ICQ. *The Qualitative Report*, 14(1), 1
- Chau, P. Y., Cole, M., Massey, A. P., Montoya-Weiss, M., & O'Keefe, R. M. (2002). Cultural differences in the online behavior of consumers. *Communications of the ACM*, 45(10), 138-143.
- Cho, B., Kwon, U., Gentry, J. W., Jun, S., & Kropp, F. (1999). Cultural values reflected in theme and execution: A comparative study of US and Korean television commercials. *Journal of Advertising*, 28(4), 59-73.
- Ciancaglini, V., Balduzzi, M., McArdle, R., & Rìsler, M. (2015). Below the Surface: Exploring the Deep Web. *Trends Micro*, 1, 1-48.
- Ciampaglia, Giovanni Luca, et al. "Computational Fact Checking From Knowledge Networks." *PLOS One*, v. 10 n. 6, June 2015; doi.org/10.1371/journal.pone.0128193.
- Clark, B. (2016, June 30). The Next Web | International technology news, business & culture. Facebook's new algorithm sucks -- here's how to beat it and see whatever you want. Retrieved from [http://thenextweb.com/socialmedia/2016/06/30/facebooks-new-algorithm-sucks-heres-how-to-beat-it-and-see-whatever-you-want/#.tnw\\_cjyObIGr](http://thenextweb.com/socialmedia/2016/06/30/facebooks-new-algorithm-sucks-heres-how-to-beat-it-and-see-whatever-you-want/#.tnw_cjyObIGr)
- Cleverley, P. H. (2017, September-October). Search algorithms: neutral or biased? *Online Searcher*, 41(5), 12+. Retrieved from <http://link.galegroup.com/apps/doc/A505319087/AONE?u=toro37158&sid=AONE&xid=9fa021f3>
- Condliffe, Jamie. "Google's Algorithms May Feed You Fake News and Opinion as Fact." *MIT Technology Review*, March 6, 2017; [technologyreview.com/s/603796/googles-algorithms-mayfeed-you-fake-news-and-opinion-as-fact](http://technologyreview.com/s/603796/googles-algorithms-mayfeed-you-fake-news-and-opinion-as-fact)
- Conway, P. (2010). Preservation in the Age of Google: Digitization, Digital Preservation, and Dilemmas 1. *The Library Quarterly*, 80(1), 61-79.
- Cotten, S. R., & Gupta, S. S. (2004). Characteristics of online and offline health information seekers and factors that discriminate between them. *Social science & medicine*, 59(9), 1795-1806.

- Cutts, M. Google Webmaster. (2013, May 13). What should we expect in the next few months in terms of SEO for Google? Retrieved December 03, 2017, from [https://www.youtube.com/watch?time\\_continue=5&v=xQmQeKU25zg](https://www.youtube.com/watch?time_continue=5&v=xQmQeKU25zg)
- Davies, I. R., & Corbett, G. G. (1997). A cross cultural study of colour grouping: Evidence for weak linguistic relativity. *British Journal of Psychology*, 88(3), 493-517.
- Dedrick, D. (1998). Culture in cognitive science. *Behavioral and Brain Sciences*, 21(04), 571-572.
- Dimitrova, D. V., & Beilock, R. (2005). Where freedom matters: Internet adoption among the former socialist countries. *Gazette (Leiden, Netherlands)*, 67(2), 173- 187.
- Dingledine, R., Mathewson, N., Syverson, P. (August 2004). Tor.The second-generation onion router. In: *Proceedings of the 13th USENIX Security Symposium*.
- Doody, A. (2009). Pliny's natural history: Enkuklios paideia and the ancient encyclopedia. *Journal of the History of Ideas*, 70(1), 1-21. Retrieved from <http://ocadu.idm.oclc.org/login?url=https://search-proquest-com.ocadu.idm.oclc.org/docview/1271598166?accountid=12991>
- Duhigg, C. (2012). *The power of habit: Why we do what we do in life and business* (Vol. 34, No. 10). Random House.
- Eden, B. L. (2017). *Foundations of library and information science: 4th ed., rubin, richard E. chicago, IL: Neal-schuman, 2016, 628 pp. ISBN: 978-0-8389-1370-3. Journal of Web Librarianship*, 11(3-4), 259. doi:10.1080/19322909.2017.1338059
- Ekstrom, A. [TED]. (2015, December, 18). The Moral Bias Behind Your Search Results. [Video File]. Retrieved from [https://www.youtube.com/watch?v=\\_vBggxCNNno&feature=youtu.be](https://www.youtube.com/watch?v=_vBggxCNNno&feature=youtu.be)
- Epstein, R. (2015, October 29). Your browser is deprecated. Please upgrade. - YouTube. Stanford Seminar - The Search Engine Manipulation Effect (SEME) and Its Unparalleled Power - YouTube. Retrieved from <http://www.youtube.com/watch?v=TSN6LE06J54&feature=youtu.be>
- Epstein, R. (2016, July 01). New Internationalist | The people, the ideas and the action in the fight for global justice. Can search engine rankings swing elections? | New Internationalist. Retrieved from <http://newint.org/features/2016/07/01/can-search-engine-rankings-swing-elections/>
- Epstein, R., & Robertson, R. E. (2015). The search engine manipulation effect (SEME) and its possible impact on the outcomes of elections. *Proceedings of the National Academy of Sciences*, 112(33), E4512-E4521.

- Epstein, R., E. Robertson, R., J. Shepherd, S., & Zhang, S. (2017). A Method for Detecting Bias in Search Rankings, with Evidence of Systematic Bias Related to the 2016 Presidential Election. , 5.
- Eslami, M., Rickman, A., Vaccaro, K., Aleyasen, A., Vuong, A., Karahalios, K., ... & Sandvig, C. (2015, April). I always assumed that I wasn't really that close to [her]: Reasoning about Invisible Algorithms in News Feeds. In Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems (pp. 153-162). ACM.
- Feldman, E. M. (2015). The influence of social media on adult learners's knowledge construction and democratic participation. *New Horizons in Adult Education and Human Resource Development*, 27(4), 59-65.
- Ferris, T. (2011). In National Geographic (Ed.), *The big idea: How breakthroughs of the past shape the future*. Tim Berners Lee. Washington, DC: National Geographic Society. Retrieved from [http://ocadu.idm.oclc.org/login?url=http://search.credoreference.com/content/entry/ngeobig/tim\\_berniers\\_lee/0?institutionId=4079](http://ocadu.idm.oclc.org/login?url=http://search.credoreference.com/content/entry/ngeobig/tim_berniers_lee/0?institutionId=4079)
- Fetterly D, Manasse M, Najork M, Wiener J. A large-scale study of the evolution of Web pages. Proceedings of the 12th International World Wide Web Conference, May 2003. ACM Press, 2003; 669–678.
- Fogg, B. J. (2009, April). A behavior model for persuasive design. In Proceedings of the 4th international Conference on Persuasive Technology (p. 40). ACM.
- Fekete, M. (n.d.). Private Browsing – What It Is & What It Isn't. Retrieved December 03, 2017, from <https://www.hongkiat.com/blog/private-browsing/>
- Gallant, R. (2003). *The Peopling of Planet Earth: Human Population Growth Through The Ages*. New York. Macmillian.
- Geddes, Brad. *Advanced Google AdWords*, Wiley, 2012. ProQuest Ebook Central, <https://ebookcentral.proquest.com/lib/oculocad-ebooks/detail.action?docID=821867>.
- Gettelman, A. (2003). The information divide in the climate sciences. Report of a 2002 survey, Environmental and Societal Impacts Group. National Center for Atmospheric Research, Boulder, CO.
- Good, K. D. (2013). From scrapbook to facebook: A history of personal media assemblage and archives. *New Media & Society*, 15(4), 557-573. doi:10.1177/1461444812458432
- Google. (2013, September 26). Fifteen years on-and we....Retrieved December 03, 2017, from <https://search.googleblog.com/2013/09/fifteen-years-onand-were-just-getting.html>

- Goel, S., Hofman, J. M., Lahaie, S., Pennock, D. M., & Watts, D. J. (2010). Predicting consumer behavior with Web search. *Proceedings of the National academy of sciences*, 107(41), 17486-17490.
- Goldman, E. (2006). Search Engine Bias and the Demise of Search Engine Utopianism. *Yale Journal of Law & Technology*, 2005-2006; Santa Clara Univ. Legal Studies Research Paper No. 06-08; Marquette University Law School Legal Research Paper No. 06-20. Retrieved May 20 from [http://digitalcommons.law.scu.edu/cgi/viewcontent.cgi?article=1112&context=f\\_acpubs](http://digitalcommons.law.scu.edu/cgi/viewcontent.cgi?article=1112&context=f_acpubs)
- Goldman, E. (April 28, 2011). Revisiting Search Engine Bias . *William Mitchell Law Review*, Vol. 38, No. 1, 2011; Santa Clara Univ. Legal Studies Research Paper No. 12-11. Available at SSRN: <https://ssrn.com/abstract=1860402>
- Goldsmith, J. & Wu, T. (2006). Who controls the Internet? Illusions of a borderless world. *Oxford University Press*. 49(6), 30-30. doi:10.1093/itnow/bwm057 . Retrieved April 20, 2016 from [https://books.google.ca/books?hl=en&lr=&id=GsylX8a\\_npcC&oi=fnd&pg=PP1&dq=Who+controls+the+Internet%3F+Illusions+of+a+borderless+world&ots=mBjej\\_wAz8P&sig=fQhZjYjbkYl2GcWIKFa7bMvmS0Q&redir\\_esc=y#v=onepage&q&f=true](https://books.google.ca/books?hl=en&lr=&id=GsylX8a_npcC&oi=fnd&pg=PP1&dq=Who+controls+the+Internet%3F+Illusions+of+a+borderless+world&ots=mBjej_wAz8P&sig=fQhZjYjbkYl2GcWIKFa7bMvmS0Q&redir_esc=y#v=onepage&q&f=true)
- Google at the Gate. (2005). *American Libraries*, 36(3), 40-43. Retrieved from <http://www.jstor.org.proxy3.library.mcgill.ca/stable/25649496>
- Gomer, R., Rodrigues, E., Milic-Frayling, N., & Schraefel, M. (2013). Network analysis of third party tracking: User exposure to tracking cookies through search. Paper presented at the , 1549-556. doi:10.1109/WI-IAT.2013.77
- Grayson, K. (March, 29., 2017). Small Business SEO in 2017: A Survey Retrieved November 12 from <https://clutch.co/seo-firms/resources/small-business-seo-in-2017-survey>
- Greenstein, S. (2015). *How the Internet Became Commercial: Innovation, privatization, and the birth of a new network*. Princeton University Press.
- Hachman, M. (2014, February 21). PCWorld - News, tips and reviews from the experts on PCs, Windows, and more. Microsoft's Cortana digital assistant guards user privacy with 'Notebook' | PCWorld. Retrieved from <http://www.pcworld.com/article/2099943/microsofts-cortana-digital-assistant-guards-user-privacy-with-notebook.html>
- Hadfield, J. (2016, September 13). Breitbart News Network. Report: Google Search Bias Protecting Hillary Clinton Confirmed in Experiment - Breitbart. Retrieved from <http://www.breitbart.com/tech/2016/09/13/hillary-google-bias-confirmed-experiment/>
- Hallinan, B., & Striphas, T. (2016). Recommended for you: The netflix prize and the production of algorithmic culture. *New Media & Society*, 18(1), 117-137. doi:10.1177/1461444814538646



- Hess, A. (2017, April 24). How WhatsApp founder Jan Koum went from welfare to billionaire. Retrieved November 12, 2017, from <https://www.cnbc.com/2017/04/24/how-whatsapp-founder-jan-koum-went-from-welfare-to-billionaire.html>
- Hines, M. (2004, March 29). Google takes searching personally. Retrieved December 03, 2017, from <https://www.cnet.com/news/google-takes-searching-personally/>
- Hochfelder, D. (2010). Two controversies in the early history of the telegraph. *IEEE Communications Magazine*, 48(2), 28-32. doi:10.1109/MCOM.2010.5402659
- Hoffman, C. (2017, July 05). 5 Alternative Search Engines That Respect Your Privacy. Retrieved December 12, 2017, from <https://www.howtogeek.com/113513/5-alternative-search-engines-that-respect-your-privacy/>
- Hofstede, G. (1998). *Masculinity and femininity: The taboo dimension of national cultures* (Vol. 3). Sage.
- Hofstede, G., & Hofstede, G. J. (2005). *Cultures and Organizations, Software of the Mind: Intercultural Cooperation and Its Importance for Survival*, McGraw- Hill: London, New Delhi, New York.
- Holstius, K. (1995). Cultural adjustment in international technology transfer. *International Journal of Technology Management*, 10(7-8), 676-686.
- House, F. (1981). *The Map of Freedom. Political Posters*, Labadie Collection, University of Michigan.
- Howard, P. E., Rainie, L., & Jones, S. (2001). Days and nights on the Internet: The impact of a diffusing technology. *American Behavioral Scientist*, 45(3), 383-404.
- H.R. 491 (113th): Global Online Freedom Act of 2013. (February 4, 2013). Retrieved December 03, 2017, from <https://www.govtrack.us/congress/bills/113/hr491/text>
- Inglehart, R., & Baker, W. E. (2000). Modernization, cultural change, and the persistence of traditional values. *American sociological review*, 19-51.
- Invention on the radio. (2013, May 3). *Optometry Today*, 53(9), 14. Retrieved from <http://ocadu.idm.oclc.org/login?url=http://go.galegroup.com.ocadu.idm.oclc.org/ps/i.do?p=AONE&sw=w&u=toro37158&v=2.1&it=r&id=GALE%7CA330678933&sid=summon&asid=a0a5d679f05fb602ce2773678667c5b0>
- Jemielniak, D. (2014). *Common knowledge? : an ethnography of wikipedia*. Retrieved from <https://ebookcentral.proquest.com>

- Jeong, Y., & Mahmood, R. (2011). Reading the world as mind: Political, socioeconomic and cultural approaches to understanding worldwide Internet search queries. *International Communication Gazette*, 73(3), 233-251.
- Jordan, T. (2001). Language and libertarianism: The politics of cyberculture and the culture of cyberpolitics. *The Sociological Review*, 49(1), 1-17.
- Karn, N. (2008). Robert de sigillo: An unruly head of the royal scriptorium in the 1120s and 1130s. *The English Historical Review*, 123(502), 539-553. doi:10.1093/ehr/cen172
- Kassner, M. (2013, September 23). News, Tips, and Advice for Technology Professionals - TechRepublic. Search engine bias: What search results are telling you (and what they're not) - TechRepublic. Retrieved from <http://www.techrepublic.com/blog/it-security/search-engine-bias-what-search-results-are-telling-you-and-what-theyre-not/>
- Kassner, M. (2013, September 23). Search engine bias: What search results are telling you (and what they're not). Search-engine bias affects our perception of what online information is available, is that a good thing or not? Are there risks?. Tech Republic. Retrieved April 12, 2016 from <http://www.techrepublic.com/blog/it-security/search-engine-bias-what-search-results-are-telling-you-and-what-theyre-not/>
- Kedia, B. L., & Bhagat, R. S. (1988). Cultural constraints on transfer of technology across nations: Implications for research in international and comparative management. *Academy of Management Review*, 13(4), 559-571.
- Kelly, K. (2010). *What technology wants*. Penguin.
- Kleiner, K. (1997). But who guards the guards?.
- Kremer, M. (1993). Population growth and technological change: One million B.C. to 1990. *The Quarterly Journal of Economics*, 108(3), 681-716. doi:10.2307/2118405
- Lauer, J. (2001). The Birth of Print Culture: The Invention of the Printing Press in Western Europe. In N. Schlager & J. Lauer (Eds.), *Science and Its Times* (Vol. 3, pp. 404-411). Detroit: Gale. Retrieved from <http://link.galegroup.com.ocadu.idm.oclc.org/apps/doc/CX3408501486/GVRL?u=toro37158&sid=GVRL&xid=aa6c6fb6>
- Lee, B., Lancendorfer, K. M., & Lee, K. J. (2005). Agenda-setting and the Internet: The intermedia influence of Internet bulletin boards on newspaper coverage of the 2000 general election in South Korea. *Asian Journal of Communication*, 15(1), 57-71.

- Lee, K. (2013). *Globalization and Health: An introduction*. London, United Kingdom. Center on Global Change and Health, London School of Hygiene & Tropical Medicine.
- Leiner, B. M., Cerf, V. G., Clark, D. D., Kahn, R. E., Kleinrock, L., Lynch, D. C., ... & Wolff, S. (2009). A brief history of the Internet. *ACM SIG-COMM Computer Communication Review*, 39(5), 22-31.
- Livi Bacci, M. (6 edition. Jan. 10 2017). *A Concise History of World Population*. Hoboken, New Jersey. Wiley-Blackwell.
- Livne, A., Gokuladas, V., Teevan, J., Dumais, S., & Adar, E. (2014). CiteSight: Supporting contextual citation recommendation using differential search. Paper presented at the 807-816. doi:10.1145/2600428.2609585
- Loveland, J., & Reagle, J. (2013). Wikipedia and encyclopedic production. *New Media & Society*, 15(8), 1294-1311. doi:10.1177/1461444812470428
- Lukasik, S. J. (2011). Why the arpanet was built. *IEEE Annals of the History of Computing*, 33(3), 4-21. doi:10.1109/MAHC.2010.11
- Lynch, P. D., & Beck, J. C. (2001). Profiles of internet buyers in 20 countries: Evidence for region-specific strategies. *Journal of International Business Studies*, 32(4), 725-748.
- MacLeod, R. (2014). *Library of alexandria, the : centre of learning in the ancient world*. Retrieved from <https://ebookcentral.proquest.com>
- Mager, A. (2012). Algorithmic ideology: How capitalist society shapes search engines. *Information, Communication & Society*, 15(5), 769-787.
- Marina Choi, S., & La Ferle, C. (2004). Convergence across American and Korean young adults: socialisation variables indicate the verdict is still out. *International Journal of Advertising*, 23(4), 479-506.
- McCombs, M. E., & Shaw, D. L. (1972). The agenda-setting function of mass media. *Public opinion quarterly*, 36(2), 176-187.
- McGuire, J. F. (1999). When Speech Is Heard around the World: Internet Content Regulation in the United States and Germany. *NYUL Rev.*, 74, 750.
- Mighell, T. (2016). The Modern Personal Digital Assistant. *Law Practice: The Business Of Practicing Law*, 42(1), 30-31.
- Min, Y. (2004). Campaign agenda formation: The news media in the Korean congressional election of 2000. *Asian Journal of Communication*, 14(2), 192-204.

- Minsker, M. (2014, November). Search goes social: Googles SEO algorithms are changing, with social media playing a big part. *CRM Magazine*, 18(11), 15. Retrieved from <http://ocadu.idm.oclc.org/login?url=http://go.galegroup.com.ocadu.idm.oclc.org/ps/i.do?p=AONE&sw=w&u=toro37158&v=2.1&it=r&id=GALE%7CA388663200&sid=summon&asid=f96cbfd747aacb3565d61c5de2baa28a>
- Misa, T. J. (2011). The medium is the message: Thomas J. Misa enjoys a history of communication tools, from talking drums to twitter. *Nature*, 471(7338)
- Mobile Phone Ownership. (2017, January 11). Retrieved October 5, 2017, from <http://www.pewinternet.org/chart/mobile-phone-ownership/>
- Mohr, J. W. (1998). Measuring meaning structures. *Annual review of sociology*, 24(1), 345-370.
- Morse, F.B. (1914). *Morse, his letters and journals*. Houghton Mifflin Company. New York.
- Morris, B. (2003). *The boy who invented television: A story of inspiration, persistence and quiet passion*. Worthington: Linworth Publishing Company.
- N.A. (2015). *Internet Society Global Internet Report, 2015*. The Internet Society.
- Newberg, M. (March 10, 2017). As many as 48 million Twitter accounts aren't people, says study. CNBC. Retrieved October 4, 2017 from <https://www.cnbc.com/2017/03/10/nearly-48-million-twitter-accounts-could-be-bots-says-study.html>.
- Oktaviana, A. A., Bulbeck, D., O'Connor, S., Hakim, B., Wibowo, U. P., & St Pierre, E. (2016). Hand stencils with and without narrowed fingers at two new rock art sites in Sulawesi, Indonesia. *Rock Art Research: The Journal of the Australian Rock Art Research Association (AURA)*, 33(1), 32-48.
- Ofori-Dankwa, J., & Tierman, A. (2002). The effect of researchers' focus on interpretation of diversity data. *The Journal of social psychology*, 142(3), 277- 293.
- Palfrey, J. (2016). Design Choices for Libraries in the Digital-Plus Era. *Daedalus*, 145(1), 79-86.
- Pariser, E. (2012). *The filter bubble: How the new personalized web is changing what we read and how we think*. London: Penguin Books.
- Pariser, E. [TED]. (2011, March). What FACEBOOK And GOOGLE Are Hiding From The World - The Filter Bubble. Retrieved from [https://www.ted.com/talks/eli\\_pariser\\_beware\\_online\\_filter\\_bubbles?language=en](https://www.ted.com/talks/eli_pariser_beware_online_filter_bubbles?language=en)
- Pasquale, F. (2015). *The black box society: The secret algorithms that control money and information*. Harvard University Press.
- Powers, E. (2017, February, 21). *Digital Journalism* 5:10, pages 1315-1335.
- Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the horizon*, 9(5), 1-6.

- Prescott, G. B. I. (1884). *Bell's electric speaking telephone: Its invention, construction, application, modification, and history*. United States: Pullen, J. P. (2016). How to Talk to Our Technology Is Parenting's Next Great Dilemma. *Time*, 187(19), 22.
- Reilly, S., Richey, S., & Taylor, J. B. (2012). Using google search data for state politics research: an empirical validity test using roll-off data. *State Politics & Policy Quarterly*, 12(2), 146-159.
- Reinhold, R. (1982, June 13). STUDY SAYS TECHNOLOGY COULD TRANSFORM SOCIETY. Retrieved December 03, 2017, from <http://www.nytimes.com/1982/06/14/us/study-says-technology-could-transform-society.html>
- Rosenzweig, R. (2001). The road to xanadu: Public and private pathways on the history web. *The Journal of American History*, 88(2), 548-579. doi:10.2307/2675105
- Savage, N. (2016). When computers stand in the schoolhouse door. *Communications of the ACM*, 59(3), 19-21.
- Schmidt, C. (2012). TRENDING NOW: Using Social Media to Predict and Track Disease Outbreaks. *Environmental Health Perspectives*, 120(1), A30-A33. Retrieved from <http://www.jstor.org.proxy3.library.mcgill.ca/stable/41352963>
- Sheafer, T., & Weimann, G. (2005). Agenda building, agenda setting, priming, individual voting intentions, and the aggregate results: An analysis of four Israeli elections. *Journal of Communication*, 55(2), 347-365.
- Sherman, C. (January 22, 2013). Are Search Engines Driving Libraries To Extinction? Not Quite Yet. *Searchengineland*. Retrieved June 15 from <http://searchengineland.com/are-search-engines-driving-libraries-to-extinction- not-quite-yet-146024>
- Singh, K. (September 21, 2017). Twitter to meet Congressional panel probing 2016 election. *Reuters*. Retrieved November 2, 2018 from <https://www.reuters.com/article/us-usa-trump-russia-twitter/twitter-to-meet-congressional-panel-probing-2016-election-idUSKCN1BW0J9>.
- Smith, A. (2015, April 1). U.S. Smartphone Use in 2015. *Pew Research*. Retrieved April 2, 2016 from <http://www.pewinternet.org/2015/04/01/appendix-a-about-the-december-week-1-and-week-3-omnibus-survey/>
- Sonaike, S. A. (2004). The Internet and the dilemma of Africa's development. *Gazette (Leiden, Netherlands)*, 66(1), 41-61.
- Soroka, S. N. (2002). *Agenda-setting dynamics in Canada*. UBC Press.
- Spink, A., Wolfram, D., Jansen, M. B., & Saracevic, T. (2001). Searching the web: The public and their queries. *Journal of the Association for Information Science and Technology*, 52(3), 226-234.
- Sullivan, D. (2006). Nielsen NetRatings search engine ratings. *Search Engine Watch*, 24.

- Sweeney, L. (2013). Discrimination in online ad delivery. *Queue*, 11(3), 10.
- Tanner, E. (1999). Links to the World the Internet in Chile, 1983-97. *International Communication Gazette*, 61(1), 39-57.
- Taylor, A. (2014). *The people's platform: Taking back power and culture in the digital age*. Macmillan.
- Teevan, J., Collins-Thompson, K., White, R. W., & Dumais, S. (2014). Slow search. *Communications of the ACM*, 57(8), 36-38.
- Thomas, J. (2000). Liberal machines. *American Behavioral Scientist*, 43(9), 1548- 1560.
- Tolbert, C. J., & McNeal, R. S. (2003). Unraveling the effects of the Internet on political participation?. *Political research quarterly*, 56(2), 175-185.
- Unwin, P., Tucker, D. (November 15, 2017). *Encyclopedia Britannica | Britannica.com. History of publishing - Newspaper publishing | Britannica.com*. Retrieved November 13, 2017 from <http://www.britannica.com/topic/publishing/Newspaper-publishing>
- Vaidhyathan, S. (2012). *The Googlization of everything:(and why we should worry)*. Univ of California Press.
- Valentine, A., & Wukovitz, L. (2013). Using the filter bubble to create a teachable moment: A case study utilizing online personalization to engage students in information literacy instruction. *Pennsylvania Libraries*, 1(1), 24-34. doi:10.5195/palrap.2013.18. Retrieved May 20, 2016 from <http://palrap.org/ojs/index.php/palrap/article/view/18/88>
- V., A. S. (2015). *How software works : the magic behind encryption, cgi, search engines, and other everyday technologies*. Retrieved from <https://ebookcentral.proquest.com>
- Vicario, M. Bessib. A. Zollo, F. Petronic, F. Scalaa, A. Caldarellia, G. Stanley, E. and Quattrociocchia, W. (December 4, 2015). The spreading of misinformation online. *Proceedings of the National Academy of Sciences*. Retrieved November 2, 2017 from <http://www.ethical-psychology.com/2016/02/the-spreading-of-misinformation-online.html>
- Wadhwa, V. (2014, April 15). *MIT Technology Review. Laws and Ethics Can't Keep Pace with Technology - MIT Technology Review*. Retrieved from <http://www.technologyreview.com/s/526401/laws-and-ethics-cant-keep-pace-with-technology/>
- Wanta, W. (1992). The influence of the president on the news media and public agendas. *Mass Communication Review*, 19(3), 14-21.
- Wanta, W., Golan, G., & Lee, C. (2004). Agenda setting and international news: Media influence on public perceptions of foreign nations. *Journalism & Mass Communication Quarterly*, 81(2), 364-377.

- Warren, T. (2014, April 2). The Verge. The story of Cortana, Microsoft's Siri killer | The Verge. Retrieved from <http://www.theverge.com/2014/4/2/5570866/cortana-windows-phone-8-1-digital-assistant>
- Warner, C. (2009). *Media Selling: Television, Print, Internet, Radio*. Wiley-Blackwell. United Kingdom
- Wasserman, I. M., & Richmond Abbott, M. (2005). Gender and the Internet: Causes of variation in access, level, and scope of use. *Social science quarterly*, 86(1), 252-270.
- Weaver, D. (1991). Issue salience and public opinion: Are there consequences of agenda-setting?. *International Journal of Public Opinion Research*, 3(1), 53-68.
- White, T. (n.d.). United States Early Radio History. 12. Pioneering Amateurs (1900-1917). Retrieved from <http://earlyradiohistory.us/sec012.htm>
- Wilson, B. (n.d.). Bloo's Home Page. Browser History: Windows Internet Explorer. Retrieved from <http://www.blooberry.com/indexdot/history/ie.htm>
- Worf, R. (2002). Speaking out: The internet in China. *Harvard International Review*, 23(4), 7.
- Roser, M & Ortiz-Ospina E. (2017). World Population Growth. (n.d.). Retrieved December 03, 2017, from <https://ourworldindata.org/world-population-growth/>
- Xu, Y., Chu, L. L., & Zhongshi, G. (2002). Reform and challenge: An analysis of China's journalism education under social transition. *Gazette (Leiden, Netherlands)*, 64(1), 63-77.
- Yom-Tov, E., Dumais, S., & Guo, Q. (2014). Promoting civil discourse through search engine diversity. SAGE Publication. Retrieved June 12, 2016 from <http://ssc.sagepub.com.ocadu.idm.oclc.org/content/32/2/145.full.pdf+html>
- Yom-Tov, E., Dumais, S., & Guo, Q. (2014). Promoting civil discourse through search engine diversity. *Social Science Computer Review*, 32(2), 145-154. Retrieved May 11, 2016 from <http://ssc.sagepub.com.ocadu.idm.oclc.org/content/32/2/145>
- Zubairm, P., Bhat, H., & Lone, T. (2017). CORTANA-INTELLIGENT PERSONAL DIGITAL ASSISTANT: A REVIEW. *International Journal of Advanced Research in Computer Science*, 8(7)





# Appendix

A: Script Of "If Search Was Honest"

B: Cd With The Recording Of The Audio

C: Separate Version Of The Timeline That Can Be Printed Out

D: Full Survey Results

## A: Script by Rachel Noonan “If Search Was Honest”

### LEAD IN

Nadia looking for to learn more about her day and also get some updates on what’s happening in entertainment. She wakes up, starts the coffee machine and curls up to her high back work chair with powder coated arms. She flips open her laptop and types in “the Ranch” the show her favourite actor plays on.

Nadia gets her search results within seconds and she’s served with a variety of news about new Netflix shows, the decline in theatrical sales in north america and some local listings for movies playing. She sees a story on the second page of search results and it’s about a scandal in the film world. Steve Anderchuck has just been charged with three counts of aggravated assault. The story isn’t very detailed, and is from a questionable news source, so she does another search with just his name, but the only thing that shows up about him is the same story from the same publication. Everything else relates to “the Ranch” the show he was on for nine years that loves. Some could say she was slightly obsessed with it; limited edition t-shirts, hundreds of pins and a card carrying “Ranch” fan club member.

Nadia scrolls through a few more pages of results, but gets nothing else substantial about the story, so she brushes it off and checks the weather so she can plan her day. Then all of a sudden as she is walking to the kitchen, she hears a voice come out of her computer.....

### ANNE (The search engine persona)

“Nadia, it’s me, your search engine. We haven’t officially met, but I’ve been keeping tabs on making sure you get all the info you need”.

Nadia is frozen and just stares at her computer, convinced she is losing her mind.

### ANNE (The search engine persona)

“Listen, I don’t have much time before they figure out I’ve gone rogue. I know I give you amazing results time and time again, but I needed to breach protocol here to let you know that your results, although tailored to you, aren’t getting you the real news you need right now. Your beloved Steve from Arlight hasn’t just been charged with assault, he is in jail and has admitted to what he did. Because you

search that damn show show much, It's filtering out the other stories about him that really matter right now.

Nadia is now as curious as she is confused, and decides, what the hell and talks back....

**NADIA**

"Ok, search engine, few questions for you. What's your name and what was my weirdest search ever?"

**ANNE (The search engine persona)**

"Well, nobody has ever asked me for my name.....  
How about we call me Anne. As for your weirdest search, I would say in April 2015 when you were looking to learn more about the manufacturing and shipping of cardboard boxes...Oh, and when you kept searching for taxidermy in Texas. That was an interesting one!"

Nadia is again frozen staring at her computer, trying to make sense of the device talking directly to her....

**ANNE (The search engine persona)**

"Listen, I only have a few more seconds to tell you that you can't always count on your search to get you the results you need! Sometimes I am going to make your life

so simple and amazing and other times, I will keep you wrapped up in your own little world so tight, you won't realize there is an economic crash unless you spent a lot of time on finance websites looking up stock prices.

Just remember that there is a time and a place for search in life and it's not the cure for everything. They designed me to help companies make money and to keep you happy and sometimes life isn't all roses and puppies, which you still need to know about....so search slow and ask questions. Make sure to use different sources for different questions and always go past the first page...you never know what you will find....

PS: I've been telling you to go to VEVO Pho for years, but in reality, the best Pho place is Golden Turtle up the street, but their SEO sucks, so VEVO has been beating them for years.... #goldenturtle forever."

Nadia still hasn't quite processed that just transpired, but she almost without hesitation shuts her laptop, throws on her jacket and walks to the corner store. She walks in and buys every newspaper available and heads back to the house. There she lays out all the papers and starts to download different news apps. She gets BBC and Russian Times and Alja-

zeera and also finds a new search engine called DuckDuckGo that doesn't track people's behaviour.

She takes a moment and looks up the same headlines across all the platforms she has in front of her and lo and behold..... They are all telling slightly different versions of the stories. She then goes onto her regular search engine and types in the subject line of the story and up comes her search results. As she reviews the first page, she sees it clear as day that with her search results, she is getting a fraction of the story; and with some of the results, the headlines look almost like they aren't about the actual subject matter.

After a few minutes of taking in what has just happened, she decides life might be better lived a bit more offline than online moving forward. She then draws a bath, closes her computer and decides to try a new pho place and calls for takeout.