TWO GOOGLE'S WAYS AND MEANS

FAITH IN APTITUDE AND TECHNOLOGY

The American comedian Louis C.K. tells a story that illustrates the constant ratcheting up of expectations for newness, "nowness," speed, and convenience. He was traveling on an airplane in early 2009, C.K. told the television host Conan O'Brien, when the flight attendant announced that his flight offered a new feature that airlines had been working to install for some years: in-flight access to the Internet. "It's fast and I'm watching YouTube clips," C.K. said. "It's amazing. I'm on an airplane! Then it breaks down and they apologize that the Internet is not working. The guy next to me goes, 'Pphhhhhh. This is bullshit.' Like how quickly the world owes him something he knew existed only 10 seconds ago."[1] C.K.'s point is that when we become habituated to the amazing technological achievements of recent years, we forget to be thrilled and amazed. We lose our sense of wonder. We take brilliance for granted, and so we

ignore the human elements of fortitude, creativity, and intelligence that underlie so many tools we use every day. The dynamic of consumer expectations has been running at such high speeds for so many years that we become frustrated with devices and services (such as slow computer processors and Internet access) that did not even exist a few years ago.

This constant, insatiable hunger is sharpened by constant pressure on firms to expand markets and revenue, as well as by a widespread lack of historical perspective on technological change. But at its root is the black box of technological design. Although consumers and citizens are invited to be dazzled by the interface, the results, and the convenience of a technology, they are rarely invited in to view how it works. Because we cannot see inside the box, it's difficult to appreciate the craft, skill, risk, and brilliance of devices as common as an iPod or a continuously variable transmission in an automobile.

This chapter examines some of the cultural assumptions that underlie the enthusiastic reception of Google and our willingness to trust the company with information about us. First, the chapter examines how we discovered and celebrated Google in its early years and the values that it built on to earn our trust. Then it explores the values that have characterized Google's practices and people.

Google's first brilliant innovation was, of course, its search algorithm. Its second was the auction system for placing advertisements, which generates tremendous revenue for the company. But a close third is the way that Google measures us and builds its systems and services to indulge our desires and weaknesses. Google works for us because it seems to read our minds—and, in a way, it does. It guesses what you might want to see based on requests that you and others like you have already expressed. You can type a vague term into the search query box, not knowing exactly how to phrase your desire, and Google will most likely return a remarkably appropriate list of things you might want. Moreover, Google conditions us to accept and believe that that list does in fact deliver what we want. The suggestive power of Google Web Search, made explicit by the drop-down list of choices that appears when we start typing, is the magic that hooks us. In many

ways Google has measured and understood us better than we have assessed ourselves.

Google works so well, so simply, and so fast that it inspires trust and faith in its users. As the science fiction writer Arthur C. Clarke famously wrote, "Any sufficiently advanced technology is indistinguishable from magic."[2] And of course trust in magic, or suspension of disbelief, is a central part of the process of embracing the deific. That's why so much of what we say and write about the experience of Google sounds vaguely religious. It sure looks like magic from this desk chair. I send a string of text out into the ether, and less than a second later the glowing screen in front of me offers a list of answers. It's not quite an abundance; that would be overwhelming. It's a manageable set of choices—just enough to give me a sense of autonomy over my next move but not too many to paralyze me. If I am shopping for shoes, there is little spiritual about the process. But if I am searching for connection, affirmation, guidance, even directions, the interactions I have with this semi-intelligent system (and all the intelligent beings to whom it can connect) can verge on the spiritual. If I am seeking something meaningful, Google seems to help me find meaning.

If you are a lonely Muslim boy growing up in Berlin, offended by the spiritual poverty and sexual depravity you perceive around you, then Google can connect you with a community that understands. If you are gay young woman growing up in a suburb of Salt Lake City, Utah, Google could be the first place you go to seek affirmation and advice. If you are a commodities trader in the City of London, you might feel a rush of adrenaline and testosterone as you use Google to sift through business news and rumors. We all Google our various gods, no matter what we worship or how worthy those gods are of our devotion. And now we expect nothing less than a meaningful response. Google's success is a function of our collective cultural weaknesses, and it in turn encourages them by ratcheting up our expectations.

As Google vice president Marissa Mayer explained during her 2008 keynote speech at a software developers' conference, one of the most significant things that Google discovered in its early user studies was that speed mattered more than anything else in generating a "posi-

tive user experience." This fact has driven Google to push the Internet industry for faster broadband service, create faster-running Web applications, and invest in an expensive, complicated, and powerful infrastructure to conduct Google's core activity: copying and searching the World Wide Web. "Users really care about speed," Mayer told developers. "They respond to speed. As the web gets faster, as Google gets faster, people search more."[3] More searching yields more advertising links displayed, more advertising links clicked, and more revenue for Google's advertising clients and Google itself. Users clearly reward the speed and the quality of search results.

Under the hood, Google runs an astounding set of machines and brilliant code. Mayer explained that every time someone types a simple query into the empty search box on the blank Google home page, that query fires up between 700 and 1,000 separate computers in several huge data centers around the United States. These computers generate 5 million search results by scanning indexes and previous search queries in a mere .16 seconds.[4]

To Google users, this amazing process is invisible. Making users wise to its power is not a priority of the company: quite the opposite. "It's very, very complicated technology, but behind a very simple interface," Mayer said. "We think that that's the best way to do things. Our users don't need to understand how complicated the technology and the development work that happens behind this is. What they do need to understand is that they can just go to a box, type what they want, and get answers."[5]

If Google users were to understand or appreciate the scale and complexity of Google's operation, their expectations for magical results might be tempered, their appreciation for human work and ingenuity bolstered, and their abilities to use the tools enhanced. Such changes would not benefit Google now, as it has bet the future of the company on being bigger, faster, better, and more embedded in the constant collective consciousness of human beings than any commercial firm in history. And by promoting its operations as almost magical, Google is not doing anything wrong. Its apparent omnipresence and omnipotence are merely functions of its abilities to capitalize on our weaknesses and desires, cravings, and curiosities.

Faith in Google is dangerous because it increases our appetite for goods, services, information, amusement, distraction, and efficiency. We are addicted to speed and convenience for the sake of speed and convenience. Google rewards us for our desires for immediate gratification at no apparent cost to us. There is nothing wrong with immediate gratification per se; it's certainly better than no gratification. Immediacy should not, however, be an end in itself. And providing immediate gratification draped in a cloak of corporate benevolence is bad faith.

THE TECHNO-FUNDAMENTALIST ESCHATOLOGY

Google spreads an eschatological ideology: a belief in fulfillment of prophecy. Those who profess eschatologies are uninterested in origin stories or accounts of miracles: instead, they look ahead. Eschatology is the study of the ultimate destiny of humanity. For Google, that destiny involves the organization and universal accessibility of the world's information. The road to that destiny is paved with the ideal expressions of techno-fundamentalism. Google believes that the constant application of advanced information technologies—algorithms, computer code, high-speed networks, and massively powerful servers—will solve many, if not all, human problems.

No firm operates independently of the culture in which it operates. Industry does not drive history any more than history drives industry. To grasp the full significance of a particular firm or institution, we must consider its place in culture and society—the work it does and the beliefs that value and enable that work. Google is both a product of early twenty-first-century American culture and an influence on global culture.

LIFE BEFORE GOOGLE

Google may be sui generis, but before Google, a number of search engines competed for business in the field. Each of them conducted indexing

and searching a bit differently. Like Google, they all originated from a rich academic field devoted to information coding and retrieval, one that lies at the intersection of computer science, linguistics, and library and information studies. It remains an exciting intellectual field. But the late-1990s market gurus of Silicon Valley did not necessarily see search as the key to riches. They saw it as an ancillary feature designed to hold customers' attention, along with all the other services and content that crowded pages such as Yahoo and Excite.[6] Early news coverage of Google generally folded the company in with other search companies launched around the same time. Rarely did a technology or business journalist declare that there was anything remarkable or distinct about Google, even though the simple act of using it demonstrated Google's superiority almost instantly.

Business Week first took note of Google in September 1998. In a brief entry about how search engines work and the challenge of assessing the quality of their results, its editors wrote: "There's another ranking system that may be even better for managers. Google (http://google.stanford.edu/) rates Web sites by the number of other sites linked to them. The rankings, in other words, are determined not by surfers, but by Webmasters who presumably took time to evaluate a site before setting up a link to it. It's an adaptation of the time-honored practice of assessing scientific papers by the number of citations they've gotten in other papers."[7]

It's notable that the link to Google given in that article was within the Stanford University computer system. This is the earliest reference I could find to the search engine that ten years later would dominate the Web experience in most of the world. The *Press* of Christchurch, New Zealand, mentioned Google as a new idea for Web search in December 1998. By then, the URL already stood alone as www.google.com.[8] *USA Today* also listed Google in a brief about interesting websites in December 1998.[9] Business and computer publications with specialized circulations started mentioning Google in mid-1999. The *New York Times* apparently did not consider Google important enough to write about until its columnist Max Frankel mentioned Google among a list of search engines in November 1999.[10]

The first serious consideration of Google by the *New York Times*, the leading American newspaper, was a de facto endorsement by the technology writer Peter Lewis in September 1999. "Until recently my favorite search engines were Hotbot (www.hotbot.com) and Alta Vista (www.altavista.com)," Lewis wrote. "Hotbot is useful for finding popular Web sites, and AltaVista is good at ferreting out obscure information. Alta Vista in particular returns a bazillion potential hits when it is asked to scour the Net for a word or phrase. But the larger the World Wide Web becomes, the more important it becomes for search engines to return fewer results, not more. Few people have time to click through 70,482 query matches hoping that the one they want, the most relevant one, is in there somewhere. The engines not only have to be smarter, but also faster." Lewis noted that "several search engines introduced recently deserve serious consideration, including the revamped version of MSN.com Search (msn.com), introduced by the Microsoft Network last week, and AOL.com Search (aol.com), to be introduced by America Online next week. But if you are searching for the next generation in search technologies, look for Gurunet and Google."[11]

Gurunet did not last long after Lewis wrote about it, and he offered only qualified interest in its methods. He was smitten with Google, however. At the moment when the president of the United States was enmeshed in a tawdry scandal involving sex with a White House intern, Lewis found that Google filtered for relevance effectively enough to avoid pornographic sites when searching for terms such as "Bill Clinton" and, more important, "sex." As Lewis wrote,

> What Google does do, however, is to come up with a list that starts with a guide to marriage and sex, not the long string of pornographic sites that would pop up in the search listings of most other engines. Many disreputable Web site operators attempt to fool search engines by salting their pages with bogus key words in an attempt to lure unsuspecting users. Google does not ogle. Instead, Google determines the relevance or importance of a page in part by measuring how many other sites have links to it. That technique enables Google to rank even those sites that it has not visited. Many Web sites do not allow search engines to catalogue their content, but they may hold the information a searcher wants.

Unlike other search engines, Lewis wrote, "Google . . . takes into account the importance, measured in popularity, of the sites that are linking to the page. Links from popular sites are given more weight than links from obscure sites. If a lot of important sites establish links with the page, the reasoning goes, it must be important too. It is the cyber-age variant on the common wisdom that the best roadside diners are the ones with all the big trucks parked outside." Once the *New York Times* parked its truck outside Google and explained the virtues of PageRank to the elites of America, it was impossible to stop Google's proliferation.[12]

Still, through its early years of rapid growth, Google never advertised on television or in standard print media (although it did purchase a gratuitous, albeit clever, advertisement during the Super Bowl in 2010). Its growth in popularity was in part sparked by glowing reviews among technology writers, but the most significant factor in its growth was word-of-mouth recommendation. Most of us discovered Google because it worked for our friends. It took a mess and put it in order. It took a frustrating task and made it simple. And it seemed so unassuming about the whole matter.

This is a story of commercial success rarely seen in business history. The business was all about leveraging technology and science. Those, after all, were what lay behind Google's mission, however humanistic its statement might be: "To organize the world's information and make it universally accessible and useful." The larger question that we need to ponder, however, is why we all welcomed such an enterprise with open arms and why we have unreflectively trusted it with such massive amounts of our personal information and with control over our access to knowledge.

"TRUST BIAS" AND THE PRAGMATISM OF PAGERANK

Questions of trust and control are not merely matters of abstract speculation. The core practices of Google—the massive accumulation of data on consumer and citizen preferences, the ability to accurately and precisely target small advertisements for small services for a small fee billions

of times per day, and the appearance of offering access to information for no monetary cost—could soon be dominant modes of information commerce.[13] Google has already forced big media companies and mobile-phone services to alter their expectations and services. Soon other companies will no doubt try to mimic Google's style, philosophy, and moves.[14]

We trust Google with our personal information and preferences and with our access to knowledge because we trust technology that satisfies our prejudices. We want fast access to relevant and reliable information. Google has ascended to great heights in twelve short years by emphasizing three characteristics of its technology that build trust among users: speed, "precise comprehensiveness," and honesty. On one level—that of simple practicality—we trust Google because, compared with the alternatives, it indeed works fast, produces information that usually seems relevant, and, as a result, seems trustworthy.

Precise comprehensiveness is the term I give to the list of results that appears to be clear and ranked in order of relevance. If a number of users doing the same search click on the third result instead of the first, then, over time, Google will raise the rank of that result. Google Web Search presents us with a linear pattern of display—the ordered list—that offers a sense of precision. The impression of comprehensiveness derives from the declarations of (largely useless) abundance that Google offers along the top of each search results page, such as "Results 1–10 of about 481,000,000 for God." The sense of precision derives from the short list of ten results returned on the first page.

Users thus believe that Google's rankings are honest expressions of probable importance and relevance. They demonstrate a "trust bias" when selecting one of these links to click: they inherently trust Google's algorithmic judgment about which links are appropriate for them.[15] This trust bias is reinforced by the fact that most people who use Google do so in a very unsophisticated way while nonetheless expressing a high level of confidence about their own skills at navigating a search system.[16]

Whether or not users know the company's motto, "Don't be evil," this trust bias reflects a faith, avowed or latent, in Google's corporate ethos.

I examine this faith at greater length in the next chapter. Users believe in Google's honesty regardless of whether they understand the way its core algorithm, PageRank, chooses what to display and how to rank links. Users trust Google to make choices for them, or at least to guide them toward a few choices that attract the most attention.[17] Needless to say, appearing on the first page of results is of paramount importance for firms competing for attention and sales.[18]

Despite a shallow understanding of how search engines work, Web users express deep satisfaction with them. Only 19 percent express a lack of trust in search engines. More than 68 percent of Web search users report that they consider search engines to be fair and unbiased. About 44 percent of those surveyed by the Pew Internet and American Life Project in 2005 said they use only one search engine, and 48 percent use only two or three. Only 38 percent said they were aware of the distinction between the sponsored advertising links that Google and other search services offer and the algorithmically generated "organic" results that dominate the page. Only one in six search users could testify that they can always tell the difference between the sponsored links and the generated results.[19]

Thus Google is inherently conservative in its effects on the information world: winners keep winning, unless Google changes the rules of the system or intervenes with human judgment.[20] By favoring the majority or the consensus among search sites, Google Web Search results also favor the comfortable middle ground of controversial subjects.[21]

THE PRAGMATIC THEORY OF SEARCH

Our trust in Google is pragmatic in more than just the ordinary sense of the term, however. We believe that a consensus about what's important, arrived at by apparently democratic means, is probably trustworthy. Google's method of relying on the collective and active judgment of millions of Web users seems in the abstract to realize one of the most influential theories of epistemology: American pragmatism. As Charles Sanders Peirce and William James developed it in the 1890s and Richard

Rorty refined it almost century later, the pragmatic theory of truth states that truth is generated through a process of experimentation, discovery, feedback, and consensus.[22] The true statement is therefore one that works in the world, James would say. It conforms to experience and observation, yet is under constant pressure of revision, as Peirce explained.[23] Truth is not attached to a thing in the world per se, but to our experiences of that thing and to our conversation about and collective understanding of it. People and peoples can disagree over what is true, and that disagreement is a part of the process of lurching toward truth.

Thus truth is not merely a thoughtful reflection of reality. It's different for everyone, depending on differences of perspective and experience. What is true about a clock is different for a clockmaker than for a person who merely knows how to tell time, James explained. "The truth of an idea is not a stagnant property inherent in it," James wrote. "Truth happens to an idea. It becomes true, is made true by events. Its verity is in fact an event, a process: the process namely of its verifying itself, its veri-fication."[24]

James's focus on the dynamism of truth—what Rorty later called "contingency"—is embodied in Google PageRank.[25] Rank is assigned to a site through a dynamic process of verification by communal affirmation. The instrument of that affirmation is the hyperlink. The secondary instrument is the click on the hyperlink. The field in which the affirmations are transformed into contingent, temporary judgments of relevance or, as James might say, truth, is the PageRank algorithm. And this is the brilliance of PageRank and Google's Web Search system in general: how else would one make sense of something as dynamic and messy as the World Wide Web? Just as pragmatism helps us understand what we mean when we say something in the world is "true" or that we "believe" something, Google sifts through an enormous array of documents and orders them in a way that reflects a rough—very rough—consensus among Web users. However, pragmatism also helps us understand that the contingency of truth and value demands that we interrogate the biases and flaws in our collective judgments and the language we use to describe what is true and valuable.

When James described and defined truth, he did not consider that some people would have more power to influence the consensus than others do. He was not a sociologist or political scientist of truth: he was a philosopher. But we can't unquestioningly accept the assumption of neutrality and equality, the belief that Google ranks are generated fairly by a large, disinterested collection of "users" who feed Google enough information to generate a rough and neutral consensus. We need to pay attention to power—to biases—in the system.[26]

All information technologies favor some content or users over others. One cannot design a neutral system. To use technologies wisely, we need to grasp the nature of biases and adjust expectations to accommodate or correct for them. So a declaration or description of bias is not an indictment of a system or a firm. A bias is not necessarily bad: it is necessary. A search system cannot rank and choose information without some criteria on which to do so. The Google search algorithms are built to favor certain types of content over others, and to reward the accumulation of acts and behaviors of users. So the biases are rarely direct and obvious.[27]

It's essential to grasp some of the major biases inherent in Google's Web Search. First of all, no search engine indexes everything. All of them make choices based on characteristics of a page. They try to exclude sites that match computer-generated profiles of junk pages intended to manipulate users, computers, or search engines themselves. And as we will see, sometimes search engines such as Google impose human editorial judgment on indexes and results if the search results are troublesome or potentially illegal.[28]

More important, not all hyperlinks are created equal. Many, perhaps most, are "votes" of support or affirmation. Many hyperlinks are votes of derision, generated by a critic to point to flaws, falsehoods, or weaknesses. Still others exist for purely functional purposes, such as to enable the downloading of a file.[29] And not every page creator employs links the same way or to the same extent. There is an ethic of link reciprocation among bloggers, for example, by which one blogger will link to another's page when she refers to or discusses it. Links are a sort of currency on the Web because those who make Web pages usually understand that

Google rewards them, but no such ethic exists generally among commercial sites. By relying on PageRank, Google has historically favored highly motivated and Web-savvy interests over truly popular, important, or valid interests. Being popular or important on the Web is not the same as being popular or important in the real world. Google tilts toward the geeky and Webby, as well as toward the new and loud.

For example, if you search for "God" on Google Web Search, as I did on July 15, 2009, from my home in Virginia, you could receive a set of listings that reflect the peculiar biases of PageRank. The Wikipedia page for "God" ranks highest. That's interesting for a number of reasons. Sometime in 2006, Wikipedia pages began ranking very high in many Web searches on Google. This could be a result of Wikipedia's widespread use and good reputation for usefulness, if not accuracy and comprehensiveness. It is just as likely, however, that Google's engineers decided around that time that for searches on controversial or emotionally charged topics, it was wise to hand off the responsibility of expressing and describing such a concept to a community that has already worked out norms and processes for mediating differences of opinion.[30] Wikipedia serves Google well in that way. In turn, Google serves Wikipedia well, because the editing standards for inclusion in Wikipedia depend on an entry's relevance; and relevance, circularly, depends on how prominently Google presents that subject.[31] Google could have presented another authoritative source about the idea of God. However, the synergy between Google and Wikipedia seems strong enough that it's unlikely any reference source could unseat Wikipedia.[32] Still, Wikipedia, like Google, is biased toward the digital. Any person or concept showing up frequently in the pages of *Wired* magazine is likely to enjoy prominence in both Wikipedia and Google results.[33]

That set of results for "God" reveals other biases inherent in Google Web Search. The second result I generated is for something called "God .com," sponsored by the Evangelical Media Group. It promises to recommend books that can answer questions such as "Why are there so many religions and which one is right?" In rural Virginia, this might be one of the more "relevant" results, because it clearly serves evangelical

Protestant Christianity, which is the most significant religious community here. The page for God.com is free of clutter, and it must have many highly popular referrals. It's thus well suited to Google's standards for inclusion and high scoring with PageRank. But one would hope that in Cairo or Venice a different result would end up second behind Wikipedia's entry for "God."

The first page of my search results shows a limited range of sites, considering the wide array of possible references to "God" in the world. It includes a video of John Lennon singing his song "God" (a search for "Mother" also links to a video of the Lennon song of that name, however—above a link to Mother brand polishes and waxes). There are links to a number of atheistic sites, as well as a link to the Twitter feed of someone who calls himself "God." There are no links to Islamic, Hindu, or Jewish sites, or even to Catholic sources. Here in Virginia, we are led to believe that the answers about God come from Wikipedia, evangelical Christianity, atheist sites, and John Lennon.

HUMANS IN THE MACHINE

Despite the pragmatic devotion to the technological virtues of speed, precision, comprehensiveness, and honesty in computer-generated results, and despite our pragmatic faith in truth arrived at by process and consensus, the local apparently matters more than the global in Web search. In addition, because of some awkward results, Google has on occasion intervened to impose human judgment from within the system, rather than rely on the slow-changing collective judgment of the users. Google's general response to complaints about the content of particular sites, even if the sites are offensive, untrue, or dangerous, is to refer the complainer to the author or Internet service provider of the offending site. However, the attention generated by the results for some searches has pushed Google to intervene.[34]

Google intervened, for instance, in April 2004, when the home page of an anti-Semitic site called Jew Watch displaced the Wikipedia entry for "Jew" as the top result for that search on Google.[35] It also took action