THE AGE OF SURVEILLANCE CAPITALISM

THE FIGHT FOR A HUMAN FUTURE AT THE NEW FRONTIER OF POWER

SHOSHANA ZUBOFF

CHAPTER THREE

THE DISCOVERY OF BEHAVIORAL SURPLUS

He watched the stars and noted birds in flight;
A river flooded or a fortress fell:
He made predictions that were sometimes right;
His lucky guesses were rewarded well.

—W. H. AUDEN
SONNETS FROM CHINA, VI

I. Google: The Pioneer of Surveillance Capitalism

Google is to surveillance capitalism what the Ford Motor Company and General Motors were to mass-production–based managerial capitalism. New economic logics and their commercial models are discovered by people in a time and place and then perfected through trial and error. In our time Google became the pioneer, discoverer, elaborator, experimenter, lead practitioner, role model, and diffusion hub of *surveillance capitalism.* GM and Ford's iconic status as pioneers of twentieth-century capitalism made them enduring objects of scholarly research and public fascination because the lessons they had to teach resonated far beyond the individual companies. Google's practices deserve the same kind of examination, not merely as a critique of a single company but rather as the starting point for the codification of a powerful new form of capitalism.

With the triumph of mass production at Ford and for decades thereafter, hundreds of researchers, businesspeople, engineers, journalists, and scholars would excavate the circumstances of its invention, origins, and

consequences.[1] Decades later, scholars continued to write extensively about Ford, the man and the company.[2] GM has also been an object of intense scrutiny. It was the site of Peter Drucker's field studies for his seminal *Concept of the Corporation,* the 1946 book that codified the practices of the twentieth-century business organization and established Drucker's reputation as a management sage. In addition to the many works of scholarship and analysis on these two firms, their own leaders enthusiastically articulated their discoveries and practices. Henry Ford and his general manager, James Couzens, and Alfred Sloan and his marketing man, Henry "Buck" Weaver, reflected on, conceptualized, and proselytized their achievements, specifically locating them in the evolutionary drama of American capitalism.[3]

Google is a notoriously secretive company, and one is hard-pressed to imagine a Drucker equivalent freely roaming the scene and scribbling in the hallways. Its executives carefully craft their messages of digital evangelism in books and blog posts, but its operations are not easily accessible to outside researchers or journalists.[4] In 2016 a lawsuit brought against the company by a product manager alleged an internal spying program in which employees are expected to identify coworkers who violate the firm's confidentiality agreement: a broad prohibition against divulging anything about the company to anyone.[5] The closest thing we have to a Buck Weaver or James Couzens codifying Google's practices and objectives is the company's longtime chief economist, Hal Varian, who aids the cause of understanding with scholarly articles that explore important themes. Varian has been described as "the Adam Smith of the discipline of Googlenomics" and the "godfather" of its advertising model.[6] It is in Varian's work that we find hidden-in-plain-sight important clues to the logic of surveillance capitalism and its claims to power.

In two extraordinary articles in scholarly journals, Varian explored the theme of "computer-mediated transactions" and their transformational effects on the modern economy.[7] Both pieces are written in amiable, down-to-earth prose, but Varian's casual understatement stands in counterpoint to his often-startling declarations: "Nowadays there is a computer in the middle of virtually every transaction... now that they are available these computers have several other uses."[8] He then identifies four such new uses: "data extraction and analysis," "new contractual forms due to better monitoring," "personalization and customization," and "continuous experiments."

Varian's discussions of these new "uses" are an unexpected guide to the strange logic of surveillance capitalism, the division of learning that it shapes, and the character of the information civilization toward which it leads. We will return to Varian's observations from time to time in the course of our examination of the foundations of surveillance capitalism, aided by a kind of "reverse engineering" of his assertions, so that we might grasp the worldview and methods of surveillance capitalism through this lens. "Data extraction and analysis," Varian writes, "is what everyone is talking about when they talk about big data." "Data" are the raw material necessary for surveillance capitalism's novel manufacturing processes. "Extraction" describes the social relations and material infrastructure with which the firm asserts authority over those raw materials to achieve economies of scale in its raw-material supply operations. "Analysis" refers to the complex of highly specialized computational systems that I will generally refer to in these chapters as "machine intelligence." I like this umbrella phrase because it trains us on the forest rather than the trees, helping us decenter from technology to its objectives. But in choosing this phrase I also follow Google's lead. The company describes itself "at the forefront of innovation in machine intelligence," a term in which it includes machine learning as well as "classical" algorithmic production, along with many computational operations that are often referred to with other terms such as "predictive analytics" or "artificial intelligence." Among these operations Google cites its work on language translation, speech recognition, visual processing, ranking, statistical modeling, and prediction: "In all of those tasks and many others, we gather large volumes of direct or indirect evidence of relationships of interest, applying learning algorithms to understand and generalize."[9] These machine intelligence operations convert raw material into the firm's highly profitable algorithmic products designed to predict the behavior of its users. The inscrutability and exclusivity of these techniques and operations are the moat that surrounds the castle and secures the action within.

Google's invention of targeted advertising paved the way to financial success, but it also laid the cornerstone of a more far-reaching development: the discovery and elaboration of surveillance capitalism. Its business is characterized as an advertising model, and much has been written about Google's automated auction methods and other aspects of its inventions in the field of online advertising. With so much verbiage, these developments are both

over-described and under-theorized. Our aim in this chapter and those that follow in Part I is to reveal the "laws of motion" that drive surveillance competition, and in order to do this we begin by looking freshly at the point of origin, when the foundational mechanisms of surveillance capitalism were first discovered.

Before we begin, I want to say a word about vocabulary. Any confrontation with the unprecedented requires new language, and I introduce new terms when existing language fails to capture a new phenomenon. Sometimes, however, I intentionally repurpose familiar language because I want to stress certain continuities in the function of an element or process. This is the case with "laws of motion," borrowed from Newton's laws of inertia, force, and equal and opposite reactions.

Over the years historians have adopted this term to describe the "laws" of industrial capitalism. For example, economic historian Ellen Meiksins Wood documents the origins of capitalism in the changing relations between English property owners and tenant farmers, as the owners began to favor productivity over coercion: "The new historical dynamic allows us to speak of 'agrarian capitalism' in early modern England, a social form with distinctive 'laws of motion' that would eventually give rise to capitalism in its mature, industrial form."[10] Wood describes how the new "laws of motion" eventually manifested themselves in industrial production:

> The critical factor in the divergence of capitalism from all other forms of "commercial society" was the development of certain social property relations that generated market imperatives and capitalist "laws of motion"... competitive production and profit-maximization, the compulsion to reinvest surpluses, and the relentless need to improve labour-productivity associated with capitalism.... Those laws of motion required vast social transformations and upheavals to set them in train. They required a transformation in the human metabolism with nature, in the provision of life's basic necessities.[11]

My argument here is that although surveillance capitalism does not abandon established capitalist "laws" such as competitive production, profit maximization, productivity, and growth, these earlier dynamics now operate

in the context of a new logic of accumulation that also introduces its own distinctive laws of motion. Here and in following chapters, we will examine these foundational dynamics, including surveillance capitalism's idiosyncratic economic imperatives defined by extraction and prediction, its unique approach to economies of scale and scope in raw-material supply, its necessary construction and elaboration of *means of behavioral modification* that incorporate its machine-intelligence–based "means of production" in a more complex system of action, and the ways in which the requirements of behavioral modification orient all operations toward totalities of information and control, creating the framework for an unprecedented *instrumentarian power* and its societal implications. For now, my aim is to reconstruct our appreciation of familiar ground through new lenses: Google's early days of optimism, crisis, and invention.

II. A Balance of Power

Google was incorporated in 1998, founded by Stanford graduate students Larry Page and Sergey Brin just two years after the Mosaic browser threw open the doors of the world wide web to the computer-using public. From the start, the company embodied the promise of information capitalism as a liberating and democratic social force that galvanized and delighted second-modernity populations around the world.

Thanks to this wide embrace, Google successfully imposed computer mediation on broad new domains of human behavior as people searched online and engaged with the web through a growing roster of Google services. As these new activities were informated for the first time, they produced wholly new data resources. For example, in addition to key words, each Google search query produces a wake of collateral data such as the number and pattern of search terms, how a query is phrased, spelling, punctuation, dwell times, click patterns, and location.

Early on, these behavioral by-products were haphazardly stored and operationally ignored. Amit Patel, a young Stanford graduate student with a special interest in "data mining," is frequently credited with the groundbreaking insight into the significance of Google's accidental data caches. His work

with these data logs persuaded him that detailed stories about each user—thoughts, feelings, interests—could be constructed from the wake of unstructured signals that trailed every online action. These data, he concluded, actually provided a "broad sensor of human behavior" and could be put to immediate use in realizing cofounder Larry Page's dream of Search as a comprehensive artificial intelligence.[12]

Google's engineers soon grasped that the continuous flows of collateral behavioral data could turn the search engine into a recursive learning system that constantly improved search results and spurred product innovations such as spell check, translation, and voice recognition. As Kenneth Cukier observed at that time,

> Other search engines in the 1990s had the chance to do the same, but did not pursue it. Around 2000 Yahoo! saw the potential, but nothing came of the idea. It was Google that recognized the gold dust in the detritus of its interactions with its users and took the trouble to collect it up.... Google exploits information that is a by-product of user interactions, or data exhaust, which is automatically recycled to improve the service or create an entirely new product.[13]

What had been regarded as waste material—"data exhaust" spewed into Google's servers during the combustive action of Search—was quickly reimagined as a critical element in the transformation of Google's search engine into a reflexive process of continuous learning and improvement.

At that early stage of Google's development, the feedback loops involved in improving its Search functions produced a balance of power: Search needed people to learn from, and people needed Search to learn from. This symbiosis enabled Google's algorithms to learn and produce ever-more relevant and comprehensive search results. More queries meant more learning; more learning produced more relevance. More relevance meant more searches and more users.[14] By the time the young company held its first press conference in 1999, to announce a $25 million equity investment from two of the most revered Silicon Valley venture capital firms, Sequoia Capital and Kleiner Perkins, Google Search was already fielding seven million requests each day.[15] A few years later, Hal Varian, who joined Google as its chief

economist in 2002, would note, "Every action a user performs is considered a signal to be analyzed and fed back into the system."[16] The Page Rank algorithm, named after its founder, had already given Google a significant advantage in identifying the most popular results for queries. Over the course of the next few years it would be the capture, storage, analysis, and learning from the by-products of those search queries that would turn Google into the gold standard of web search.

The key point for us rests on a critical distinction. During this early period, behavioral data were put to work entirely on the user's behalf. User data provided value at no cost, and that value was reinvested in the user experience in the form of improved services: enhancements that were also offered at no cost to users. Users provided the raw material in the form of behavioral data, and those data were harvested to improve speed, accuracy, and relevance and to help build ancillary products such as translation. I call this the *behavioral value reinvestment cycle,* in which all behavioral data are reinvested in the improvement of the product or service (see Figure 1).

The cycle emulates the logic of the iPod; it worked beautifully at Google but with one critical difference: the absence of a sustainable market transaction. In the case of the iPod, the cycle was triggered by the purchase of a high-margin physical product. Subsequent reciprocities improved the iPod product and led to increased sales. Customers were the subjects of the commercial process, which promised alignment with their "what I want, when I want, where I want" demands. At Google, the cycle was similarly oriented toward the individual as its subject, but without a physical product to sell, it floated outside the marketplace, an interaction with "users" rather than a market transaction with customers.

This helps to explain why it is inaccurate to think of Google's users as its customers: there is no economic exchange, no price, and no profit. Nor do users function in the role of workers. When a capitalist hires workers and provides them with wages and means of production, the products that they produce belong to the capitalist to sell at a profit. Not so here. Users are not paid for their labor, nor do they operate the means of production, as we'll discuss in more depth later in this chapter. Finally, people often say that the user is the "product." This is also misleading, and it is a point that we will revisit more than once. For now let's say that users are not products, but rather

we are the sources of raw-material supply. As we shall see, surveillance capitalism's unusual products manage to be derived from our behavior while remaining indifferent to our behavior. Its products are about predicting us, without actually caring what we do or what is done to us.

To summarize, at this early stage of Google's development, whatever Search users inadvertently gave up that was of value to the company they also used up in the form of improved services. In this reinvestment cycle, serving users with amazing Search results "consumed" all the value that users created when they provided extra behavioral data. The fact that users needed Search about as much as Search needed users created a balance of power between Google and its populations. People were treated as ends in themselves, the subjects of a nonmarket, self-contained cycle that was perfectly aligned with Google's stated mission "to organize the world's information, making it universally accessible and useful."

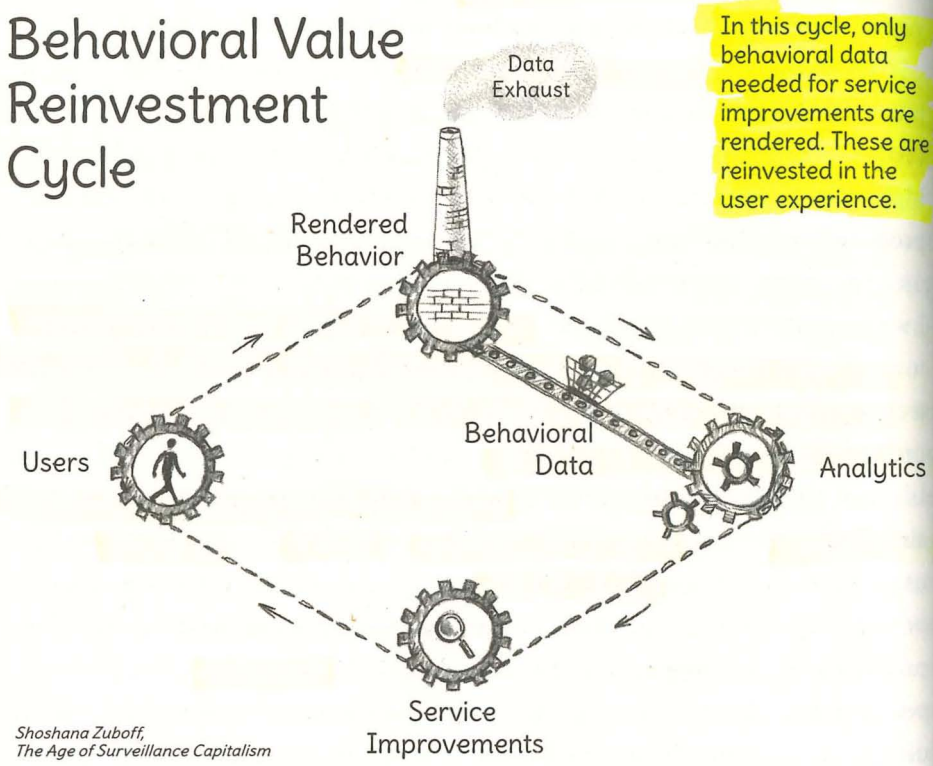


Figure 1: The Behavioral Value Reinvestment Cycle

III. Search for Capitalism: Impatient Money and the State of Exception

By 1999, despite the splendor of Google's new world of searchable web pages, its growing computer science capabilities, and its glamorous venture backers, there was no reliable way to turn investors' money into revenue. The behavioral value reinvestment cycle produced a very cool search function, but it was not yet capitalism. The balance of power made it financially risky and possibly counterproductive to charge users a fee for search services. Selling search results would also have set a dangerous precedent for the firm, assigning a price to indexed information that Google's web crawler had already taken from others without payment. Without a device like Apple's iPod or its digital songs, there were no margins, no surplus, nothing left over to sell and turn into revenue.

Google had relegated advertising to steerage class: its AdWords team consisted of seven people, most of whom shared the founders' general antipathy toward ads. The tone had been set in Sergey Brin and Larry Page's milestone paper that unveiled their search engine conception, "The Anatomy of a Large-Scale Hypertextual Web Search Engine," presented at the 1998 World Wide Web Conference: "We expect that advertising funded search engines will be inherently biased towards the advertisers and away from the needs of the consumers. This type of bias is very difficult to detect but could still have a significant effect on the market... we believe the issue of advertising causes enough mixed incentives that it is crucial to have a competitive search engine that is transparent and in the academic realm."[17]

Google's first revenues depended instead on exclusive licensing deals to provide web services to portals such as Yahoo! and Japan's BIGLOBE.[18] It also generated modest revenue from sponsored ads linked to search query keywords.[19] There were other models for consideration. Rival search engines such as Overture, used exclusively by the then-giant portal AOL, or Inktomi, the search engine adopted by Microsoft, collected revenues from the sites whose pages they indexed. Overture was also successful in attracting online ads with its policy of allowing advertisers to pay for high-ranking search listings, the very format that Brin and Page scorned.[20]

Prominent analysts publicly doubted whether Google could compete with its more-established rivals. As the *New York Times* asked, "Can Google create a business model even remotely as good as its technology?"[21] A well-known Forrester Research analyst proclaimed that there were only a few ways for Google to make money with Search: "build a portal [like Yahoo!]... partner with a portal... license the technology... wait for a big company to purchase them."[22]

Despite these general misgivings about Google's viability, the firm's prestigious venture backing gave the founders confidence in their ability to raise money. This changed abruptly in April 2000, when the legendary dot-com economy began its steep plunge into recession, and Silicon Valley's Garden of Eden unexpectedly became the epicenter of a financial earthquake.

By mid-April, Silicon Valley's fast-money culture of privilege was under siege with the implosion of what came to be known as the "dot-com bubble." It is easy to forget exactly how terrifying things were for the valley's ambitious young people and their slightly older investors. Startups with outsized valuations just months earlier were suddenly forced to shutter. Prominent articles such as "Doom Stalks the Dotcoms" noted that the stock prices of Wall Street's most-revered internet "high flyers" were "down for the count," with many of them trading below their initial offering price: "With many dotcoms declining, neither venture capitalists nor Wall Street is eager to give them a dime...."[23] The news brimmed with descriptions of shell-shocked investors. The week of April 10 saw the worst decline in the history of the NASDAQ, where many internet companies had gone public, and there was a growing consensus that the "game" had irreversibly changed.[24]

As the business environment in Silicon Valley unraveled, investors' prospects for cashing out by selling Google to a big company seemed far less likely, and they were not immune to the rising tide of panic. Many Google investors began to express doubts about the company's prospects, and some threatened to withdraw support. Pressure for profit mounted sharply, despite the fact that Google Search was widely considered the best of all the search engines, traffic to its website was surging, and a thousand résumés flooded the firm's Mountain View office each day. Page and Brin were seen to be moving too slowly, and their top venture capitalists, John Doerr from Kleiner Perkins and Michael Moritz from Sequoia, were frustrated.[25] According to Google chronicler Steven Levy,

"The VCs were screaming bloody murder. Tech's salad days were over, and it wasn't certain that Google would avoid becoming another crushed radish."[26]

The specific character of Silicon Valley's venture funding, especially during the years leading up to dangerous levels of startup inflation, also contributed to a growing sense of emergency at Google. As Stanford sociologist Mark Granovetter and his colleague Michel Ferrary found in their study of valley venture firms, "A connection with a high-status VC firm signals the high status of the startup and encourages other agents to link to it."[27] These themes may seem obvious now, but it is useful to mark the anxiety of those months of sudden crisis. Prestigious risk investment functioned as a form of vetting—much like acceptance to a top university sorts and legitimates students, elevating a few against the backdrop of the many—especially in the "uncertain" environment characteristic of high-tech investing. Loss of that high-status signaling power assigned a young company to a long list of also-rans in Silicon Valley's fast-moving saga.

Other research findings point to the consequences of the impatient money that flooded the valley as inflationary hype drew speculators and ratcheted up the volatility of venture funding.[28] Studies of pre-bubble investment patterns showed a "big-score" mentality in which bad results tended to stimulate increased investing as funders chased the belief that some young company would suddenly discover the elusive business model destined to turn all their bets into rivers of gold.[29] Startup mortality rates in Silicon Valley outstripped those for other venture capital centers such as Boston and Washington, DC, with impatient money producing a few big wins and many losses.[30] Impatient money is also reflected in the size of Silicon Valley startups, which during this period were significantly smaller than in other regions, employing an average of 68 employees as compared to an average of 112 in the rest of the country.[31] This reflects an interest in quick returns without spending much time on growing a business or deepening its talent base, let alone developing the institutional capabilities that Joseph Schumpeter would have advised. These propensities were exacerbated by the larger Silicon Valley culture, where net worth was celebrated as the sole measure of success for valley parents and their children.[32]

For all their genius and principled insights, Brin and Page could not ignore the mounting sense of emergency. By December 2000, the *Wall Street*

Journal reported on the new "mantra" emerging from Silicon Valley's investment community: "Simply displaying the ability to make money will not be enough to remain a major player in the years ahead. What will be required will be an ability to show sustained and exponential profits."[33]

IV. The Discovery of Behavioral Surplus

The declaration of a state of exception functions in politics as cover for the suspension of the rule of law and the introduction of new executive powers justified by crisis.[34] At Google in late 2000, it became a rationale for annulling the reciprocal relationship that existed between Google and its users, steeling the founders to abandon their passionate and public opposition to advertising. As a specific response to investors' anxiety, the founders tasked the tiny AdWords team with the objective of looking for ways to make more money.[35] Page demanded that the whole process be simplified for advertisers. In this new approach, he insisted that advertisers "shouldn't even get involved with choosing keywords—*Google would choose them.*"[36]

Operationally, this meant that Google would turn its own growing cache of behavioral data and its computational power and expertise toward the single task of matching ads with queries. New rhetoric took hold to legitimate this unusual move. If there was to be advertising, then it had to be "relevant" to users. Ads would no longer be linked to keywords in a search query, but rather a particular ad would be "targeted" to a particular individual. Securing this holy grail of advertising would ensure relevance to users and value to advertisers.

Absent from the new rhetoric was the fact that in pursuit of this new aim, Google would cross into virgin territory by exploiting sensitivities that only its exclusive and detailed collateral behavioral data about millions and later billions of users could reveal. To meet the new objective, the behavioral value reinvestment cycle was rapidly and secretly subordinated to a larger and more complex undertaking. The raw materials that had been solely used to improve the quality of search results would now also be put to use in the service of targeting advertising to individual users. Some data would continue to

be applied to service improvement, but the growing stores of collateral signals would be repurposed to improve the profitability of ads for both Google and its advertisers. These behavioral data available for uses *beyond* service improvement constituted a surplus, and it was on the strength of this *behavioral surplus* that the young company would find its way to the "sustained and exponential profits" that would be necessary for survival. Thanks to a perceived emergency, a new mutation began to gather form and quietly slip its moorings in the implicit advocacy-oriented social contract of the firm's original relationship with users.

Google's declared state of exception was the backdrop for 2002, the watershed year during which surveillance capitalism took root. The firm's appreciation of behavioral surplus crossed another threshold that April, when the data logs team arrived at their offices one morning to find that a peculiar phrase had surged to the top of the search queries: "Carol Brady's maiden name." Why the sudden interest in a 1970s television character? It was data scientist and logs team member Amit Patel who recounted the event to the *New York Times,* noting, "You can't interpret it unless you know what else is going on in the world."[37]

The team went to work to solve the puzzle. First, they discerned that the pattern of queries had produced five separate spikes, each beginning at forty-eight minutes after the hour. Then they learned that the query pattern occurred during the airing of the popular TV show *Who Wants to Be a Millionaire?* The spikes reflected the successive time zones during which the show aired, ending in Hawaii. In each time zone, the show's host posed the question of Carol Brady's maiden name, and in each zone the queries immediately flooded into Google's servers.

As the *New York Times* reported, "The precision of the Carol Brady data was eye-opening for some." Even Brin was stunned by the clarity of Search's predictive power, revealing events and trends before they "hit the radar" of traditional media. As he told the *Times,* "It was like trying an electron microscope for the first time. It was like a moment-by-moment barometer."[38] Google executives were described by the *Times* as reluctant to share their thoughts about how their massive stores of query data might be commercialized. "There is tremendous opportunity with this data," one executive confided.[39]

Just a month before the Carol Brady moment, while the AdWords team was already working on new approaches, Brin and Page hired Eric Schmidt, an experienced executive, engineer, and computer science Ph.D., as chairman. By August, they appointed him to the CEO's role. Doerr and Moritz had been pushing the founders to hire a professional manager who would know how to pivot the firm toward profit.[40] Schmidt immediately implemented a "belt-tightening" program, grabbing the budgetary reins and heightening the general sense of financial alarm as fund-raising prospects came under threat. A squeeze on workspace found him unexpectedly sharing his office with none other than Amit Patel.

Schmidt later boasted that as a result of their close quarters over the course of several months, he had instant access to better revenue figures than did his own financial planners.[41] We do not know (and may never know) what other insights Schmidt might have gleaned from Patel about the predictive power of Google's behavioral data stores, but there is no doubt that a deeper grasp of the predictive power of data quickly shaped Google's specific response to financial emergency, triggering the crucial mutation that ultimately turned AdWords, Google, the internet, and the very nature of information capitalism toward an astonishingly lucrative surveillance project.

Google's earliest ads had been considered more effective than most online advertising at the time because they were linked to search queries and Google could track when users actually clicked on an ad, known as the "click-through" rate. Despite this, advertisers were billed in the conventional manner according to how many people viewed an ad. As Search expanded, Google created the self-service system called AdWords, in which a search that used the advertiser's keyword would include that advertiser's text box and a link to its landing page. Ad pricing depended upon the ad's position on the search results page.

Rival search startup Overture had developed an online auction system for web page placement that allowed it to scale online advertising targeted to keywords. Google would produce a transformational enhancement to that model, one that was destined to alter the course of information capitalism. As a Bloomberg journalist explained in 2006, "Google maximizes the revenue it gets from that precious real estate by giving its best position to the advertiser who is likely to pay Google the most in total, based on the price per click

multiplied by Google's estimate of the likelihood that someone will actually click on the ad."[42] That pivotal multiplier was the result of Google's advanced computational capabilities trained on its most significant and secret discovery: behavioral surplus. From this point forward, the combination of ever-increasing machine intelligence and ever-more-vast supplies of behavioral surplus would become the foundation of an unprecedented logic of accumulation. Google's reinvestment priorities would shift from merely improving its user offerings to inventing and institutionalizing the most far-reaching and technologically advanced raw-material supply operations that the world had ever seen. Henceforth, revenues and growth would depend upon more behavioral surplus.

Google's many patents filed during those early years illustrate the explosion of discovery, inventiveness, and complexity detonated by the state of exception that led to these crucial innovations and the firm's determination to advance the capture of behavioral surplus.[43] Among these efforts, I focus here on one patent submitted in 2003 by three of the firm's top computer scientists and titled "Generating User Information for Use in Targeted Advertising."[44] The patent is emblematic of the new mutation and the emerging logic of accumulation that would define Google's success. Of even greater interest, it also provides an unusual glimpse into the "economic orientation" baked deep into the technology cake by reflecting the mindset of Google's distinguished scientists as they harnessed their knowledge to the firm's new aims.[45] In this way, the patent stands as a treatise on a new political economics of clicks and its moral universe, before the company learned to disguise this project in a fog of euphemism.

The patent reveals a pivoting of the backstage operation toward Google's new audience of genuine customers. "The present invention concerns advertising," the inventors announce. Despite the enormous quantity of demographic data available to advertisers, the scientists note that much of an ad budget "is simply wasted . . . it is very difficult to identify and eliminate such waste."[46]

Advertising had always been a guessing game: art, relationships, conventional wisdom, standard practice, but never "science." The idea of being able to deliver a particular message to a particular person at just the moment when it might have a high probability of actually influencing his or her

behavior was, and had always been, the holy grail of advertising. The inventors point out that online ad systems had also failed to achieve this elusive goal. The then-predominant approaches used by Google's competitors, in which ads were targeted to keywords or content, were unable to identify relevant ads "for a *particular* user." Now the inventors offered a scientific solution that exceeded the most-ambitious dreams of any advertising executive:

> There is a need to increase the relevancy of ads served for some user request, such as a search query or a document request... to the user that submitted the request.... The present invention may involve novel methods, apparatus, message formats and/or data structures for determining user profile information and using such determined user profile information for ad serving.[47]

In other words, Google would no longer mine behavioral data strictly to improve service for users but rather to read users' minds for the purposes of matching ads to their interests, as those interests are deduced from the collateral traces of online behavior. With Google's unique access to behavioral data, it would now be possible to know what a *particular* individual in a particular time and place was thinking, feeling, and doing. That this no longer seems astonishing to us, or perhaps even worthy of note, is evidence of the profound psychic numbing that has inured us to a bold and unprecedented shift in capitalist methods.

The techniques described in the patent meant that each time a user queries Google's search engine, the system simultaneously presents a specific configuration of a particular ad, all in the fraction of a moment that it takes to fulfill the search query. The data used to perform this instant translation from query to ad, a predictive analysis that was dubbed "matching," went far beyond the mere denotation of search terms. New data sets were compiled that would dramatically enhance the accuracy of these predictions. These data sets were referred to as "user profile information" or "UPI." These new data meant that there would be no more guesswork and far less waste in the advertising budget. Mathematical certainty would replace all of that.

Where would UPI come from? The scientists announce a breakthrough. They first explain that some of the new data can be culled from the firm's

existing systems with its continuously accruing caches of behavioral data from Search. Then they stress that even more behavioral data can be hunted and herded from anywhere in the online world. UPI, they write, "may be *inferred*," "*presumed*," and "*deduced*." Their new methods and computational tools could create UPI from integrating and analyzing a user's search patterns, document inquiries, and myriad other signals of online behaviors, even when users do not directly provide that personal information: "User profile information may include any information about an individual user or a group of users. Such information may be provided by the user, provided by a third-party authorized to release user information, *and/or derived from user actions*. Certain user information can be deduced or presumed using other user information of the same user and/or user information of other users. UPI may be associated with various entities."[48]

The inventors explain that UPI can be deduced directly from a user's or group's actions, from any kind of document a user views, or from an ad landing page: "For example, an ad for prostate cancer screening might be limited to user profiles having the attribute 'male' and 'age 45 and over.'"[49] They describe different ways to obtain UPI. One relies on "machine learning classifiers" that predict values on a range of attributes. "Association graphs" are developed to reveal the relationships among users, documents, search queries, and web pages: "user-to-user associations may also be generated."[50] The inventors also note that their methods can be understood only among the priesthood of computer scientists drawn to the analytic challenges of this new online universe: "The following description is presented to enable one skilled in the art to make and use the invention.... Various modifications to the disclosed embodiments will be apparent to those skilled in the art...."[51]

Of critical importance to our story is the scientists' observation that the most challenging sources of friction here are *social*, not technical. Friction arises when users intentionally fail to provide information for no other reason than that they choose not to. "Unfortunately, user profile information is not always available," the scientists warn. Users do not always "voluntarily" provide information, or "the user profile may be incomplete... and hence not comprehensive, *because of privacy considerations*, etc."[52]

A clear aim of the patent is to assure its audience that Google scientists will not be deterred by users' exercise of decision rights over their personal

information, despite the fact that such rights were an inherent feature of the original social contract between the company and its users.[53] Even when users do provide UPI, the inventors caution, "it may be *intentionally* or unintentionally inaccurate, it may become stale.... UPI for a user... can be determined (or updated or extended) *even when no explicit information is given to the system*.... An initial UPI may include some expressly entered UPI information, *though it doesn't need to*."[54]

The scientists thus make clear that they are willing—and that their inventions are able—to overcome the friction entailed in users' decision rights. Google's proprietary methods enable it to surveil, capture, expand, construct, and claim behavioral surplus, including data that users intentionally choose not to share. Recalcitrant users will not be obstacles to data expropriation. No moral, legal, or social constraints will stand in the way of finding, claiming, and analyzing others' behavior for commercial purposes.

The inventors provide examples of the kinds of attributes that Google could assess as it compiles its UPI data sets while circumnavigating users' knowledge, intentions, and consent. These include websites visited, psychographics, browsing activity, and information about previous advertisements that the user has been shown, selected, and/or made purchases after viewing.[55] It is a long list that is certainly much longer today.

Finally, the inventors observe another obstacle to effective targeting. Even when user information exists, they say, "Advertisers may not be able to use this information to target ads effectively."[56] On the strength of the invention presented in this patent, and others related to it, the inventors publicly declare Google's unique prowess in hunting, capturing, and transforming surplus into predictions for accurate targeting. No other firm could equal its range of access to behavioral surplus, its bench strength of scientific knowledge and technique, its computational power, or its storage infrastructure. In 2003 only Google could pull surplus from multiple sites of activity and integrate each increment of data into comprehensive "data structures." Google was uniquely positioned with the state-of-the-art knowledge in computer science to convert those data into predictions of who will click on which configuration of what ad as the basis for a final "matching" result, all computed in micro-fractions of a second.

To state all this in plain language, Google's invention revealed new capabilities to infer and deduce the thoughts, feelings, intentions, and interests

of individuals and groups with an automated architecture that operates as a one-way mirror irrespective of a person's awareness, knowledge, and consent, thus enabling privileged secret access to behavioral data.

A one-way mirror embodies the specific social relations of surveillance based on asymmetries of knowledge and power. The new mode of accumulation invented at Google would derive, above all, from the firm's willingness and ability to impose these social relations on its users. Its willingness was mobilized by what the founders came to regard as a state of exception; its ability came from its actual success in leveraging privileged access to behavioral surplus in order to predict the behavior of individuals now, soon, and later. The predictive insights thus acquired would constitute a world-historic competitive advantage in a new marketplace where low-risk bets about the behavior of individuals are valued, bought, and sold.

Google would no longer be a passive recipient of accidental data that it could recycle for the benefit of its users. The targeted advertising patent sheds light on the path of discovery that Google traveled from its advocacy-oriented founding toward the elaboration of behavioral surveillance as a full-blown logic of accumulation. The invention itself exposes the reasoning through which the behavioral value reinvestment cycle was subjugated to the service of a new commercial calculation. Behavioral data, whose value had previously been "used up" on improving the quality of Search for users, now became the pivotal—and exclusive to Google—raw material for the construction of a dynamic online advertising marketplace. Google would now secure more behavioral data than it needed to serve its users. That surplus, a behavioral surplus, was the game-changing, zero-cost asset that was diverted from service improvement toward a genuine and highly lucrative market exchange.

These capabilities were and remain inscrutable to all but an exclusive data priesthood among whom Google is the *übermensch*. They operate in obscurity, indifferent to social norms or individual claims to self-determining decision rights. These moves established the foundational mechanisms of surveillance capitalism.

The state of exception declared by Google's founders transformed the youthful Dr. Jekyll into a ruthless, muscular Mr. Hyde determined to hunt his prey anywhere, anytime, irrespective of others' self-determining aims. The new Google ignored claims to self-determination and acknowledged

no a priori limits on what it could find and take. It dismissed the moral and legal content of individual decision rights and recast the situation as one of technological opportunism and unilateral power. This new Google assures its actual customers that it will do whatever it takes to transform the natural obscurity of human desire into scientific fact. This Google is the superpower that establishes its own values and pursues its own purposes above and beyond the social contracts to which others are bound.

V. Surplus at Scale

There were other new elements that helped to establish the centrality of behavioral surplus in Google's commercial operations, beginning with its pricing innovations. The first new pricing metric was based on "click-through rates," or how many times a user clicks on an ad through to the advertiser's web page, rather than pricing based on the number of views that an ad receives. The click-through was interpreted as a signal of relevance and therefore a measure of successful targeting, operational results that derive from and reflect the value of behavioral surplus.

This new pricing discipline established an ever-escalating incentive to increase behavioral surplus in order to continuously upgrade the effectiveness of predictions. Better predictions lead directly to more click-throughs and thus to revenue. Google learned new ways to conduct automated auctions for ad targeting that allowed the new invention to scale quickly, accommodating hundreds of thousands of advertisers and billions (later it would be trillions) of auctions simultaneously. Google's unique auction methods and capabilities earned a great deal of attention, which distracted observers from reflecting on exactly what was being auctioned: *derivatives of behavioral surplus.* Click-through metrics institutionalized "customer" demand for these prediction products and thus established the central importance of *economies of scale in surplus supply operations.* Surplus capture would have to become automatic and ubiquitous if the new logic was to succeed, as measured by the successful trading of behavioral futures.

Another key metric called the "quality score" helped determine the price of an ad and its specific position on the page, in addition to advertisers' own

auction bids. The quality score was determined in part by click-through rates and in part by the firm's analyses of behavioral surplus. "The clickthrough rate needed to be a *predictive* thing," one top executive insisted, and that would require "all the information we had about the query right then."[57] It would take enormous computing power and leading-edge algorithmic programs to produce powerful predictions of user behavior that became the criteria for estimating the relevance of an ad. Ads that scored high would sell at a lower price than those that scored poorly. Google's customers, its advertisers, complained that the quality score was a black box, and Google was determined to keep it so. Nonetheless, when customers followed its disciplines and produced high-scoring ads, their click-through rates soared.

AdWords quickly became so successful that it inspired significant expansion of the surveillance logic. Advertisers demanded more clicks.[58] The answer was to extend the model beyond Google's search pages and convert the entire internet into a canvas for Google's targeted ads. This required turning Google's newfound skills at "data extraction and analysis," as Hal Varian put it, toward the content of any web page or user action by employing Google's rapidly expanding semantic analysis and artificial intelligence capabilities to efficiently "squeeze" meaning from them. Only then could Google accurately assess the content of a page and how users interact with that content. This "content-targeted advertising" based on Google's patented methods was eventually named AdSense. By 2004, AdSense had achieved a run rate of a million dollars per day, and by 2010, it produced annual revenues of more than $10 billion.

So here was an unprecedented and lucrative brew: behavioral surplus, data science, material infrastructure, computational power, algorithmic systems, and automated platforms. This convergence produced unprecedented "relevance" and billions of auctions. Click-through rates skyrocketed. Work on AdWords and AdSense became just as important as work on Search.

With click-through rates as the measure of relevance accomplished, behavioral surplus was institutionalized as the cornerstone of a new kind of commerce that depended upon online surveillance at scale. Insiders referred to Google's new science of behavioral prediction as the "physics of clicks."[59] Mastery of this new domain required a specialized breed of click physicists who would secure Google's preeminence within the nascent priesthood of

behavioral prediction. The firm's substantial revenue flows summoned the greatest minds of our age from fields such as artificial intelligence, statistics, machine learning, data science, and predictive analytics to converge on the prediction of human behavior as measured by click-through rates: computer-mediated fortune-telling and selling. The firm would recruit an authority on information economics, and consultant to Google since 2001, as the patriarch of this auspicious group and the still-young science: Hal Varian was the chosen shepherd of this flock.

Page and Brin had been reluctant to embrace advertising, but as the evidence mounted that ads could save the company from crisis, their attitudes shifted.[60] Saving the company also meant saving themselves from being just another couple of very smart guys who couldn't figure out how to make real money, insignificant players in the intensely material and competitive culture of Silicon Valley. Page was haunted by the example of the brilliant but impoverished scientist Nikola Tesla, who died without ever benefiting financially from his inventions. "You need to do more than just invent things," Page reflected.[61] Brin had his own take: "Honestly, when we were still in the dot-com boom days, I felt like a schmuck. I had an internet startup—so did everybody else. It was unprofitable, like everybody else's."[62] Exceptional threats to their financial and social status appear to have awakened a survival instinct in Page and Brin that required exceptional adaptive measures.[63] The Google founders' response to the fear that stalked their community effectively declared a "state of exception" in which it was judged necessary to suspend the values and principles that had guided Google's founding and early practices.

Later, Sequoia's Moritz recalled the crisis conditions that provoked the firm's "ingenious" self-reinvention, when crisis opened a fork in the road and drew the company in a wholly new direction. He stressed the specificity of Google's inventions, their origins in emergency, and the 180-degree turn from serving users to surveilling them. Most of all, he credited the discovery of behavioral surplus as the game-changing asset that turned Google into a fortune-telling giant, pinpointing Google's breakthrough transformation of the Overture model, when the young company first applied its analytics of behavioral surplus to predict the likelihood of a click:

> The first 12 months of Google were not a cakewalk, because the company didn't start off in the business that it eventually tapped. At first it went in a different direction, which was selling its technology—selling licenses for its search engines to larger internet properties and to corporations.... Cash was going out of the window at a feral rate during the first six, seven months. And then, very ingeniously, Larry...and Sergey...and others fastened on a model that they had seen this other company, Overture, develop, which was ranked advertisements. They saw how it could be improved and enhanced and made it their own, and that transformed the business.[64]

Moritz's reflections suggest that without the discovery of behavioral surplus and the turn toward surveillance operations, Google's "feral" rate of spending was not sustainable and the firm's survival was imperiled. We will never know what Google might have made of itself without the state of exception fueled by the emergency of impatient money that shaped those crucial years of development. What other pathways to sustainable revenue might have been explored or invented? What alternative futures might have been summoned to keep faith with the founders' principles and with their users' rights to self-determination? Instead, Google loosed a new incarnation of capitalism upon the world, a Pandora's box whose contents we are only beginning to understand.

VI. A Human Invention

Key to our conversation is this fact: surveillance capitalism was invented by a specific group of human beings in a specific time and place. It is not an inherent result of digital technology, nor is it a necessary expression of information capitalism. It was intentionally constructed at a moment in history, in much the same way that the engineers and tinkerers at the Ford Motor Company invented mass production in the Detroit of 1913.

Henry Ford set out to prove that he could maximize profits by driving up volumes, radically decreasing costs, and widening demand. It was

an unproven commercial equation for which no economic theory or body of practice existed. Fragments of the formula had surfaced before—in meatpacking plants, flour-milling operations, sewing machine and bicycle factories, armories, canneries, and breweries. There was a growing body of practical knowledge about the interchangeability of parts and absolute standardization, precision machines, and continuous flow production. But no one had achieved the grand symphony that Ford heard in his imagination.

As historian David Hounshell tells it, there was a time, April 1, 1913, and a place, Detroit, when the first moving assembly line seemed to be "just another step in the years of development at Ford yet somehow suddenly dropped out of the sky. Even before the end of the day, some of the engineers sensed that they had made a fundamental breakthrough."[65] Within a year, productivity increases across the plant ranged from 50 percent to as much as ten times the output of the old fixed-assembly methods.[66] The Model T that sold for $825 in 1908 was priced at a record low for a four-cylinder automobile in 1924, just $260.[67]

Much as with Ford, some elements of the economic surveillance logic in the online environment had been operational for years, familiar only to a rarefied group of early computer experts. For example, the software mechanism known as the "cookie"—bits of code that allow information to be passed between a server and a client computer—was developed in 1994 at Netscape, the first commercial web browser company.[68] Similarly, "web bugs"—tiny (often invisible) graphics embedded in web pages and e-mail and designed to monitor user activity and collect personal information—were well-known to experts in the late 1990s.[69]

These experts were deeply concerned about the privacy implications of such monitoring mechanisms, and at least in the case of cookies, there were institutional efforts to design internet policies that would prohibit their invasive capabilities to monitor and profile users.[70] By 1996, the function of cookies had become a contested public policy issue. Federal Trade Commission workshops in 1996 and 1997 discussed proposals that would assign control of all personal information to users by default with a simple automated protocol. Advertisers bitterly contested this scheme, collaborating instead to avert government regulation by forming a "self-regulating" association known as

the Network Advertising Initiative. Still, in June 2000 the Clinton administration banned cookies from all federal websites, and by April 2001, three bills before Congress included provisions to regulate cookies.[71]

Google brought new life to these practices. As had occurred at Ford a century earlier, the company's engineers and scientists were the first to conduct the entire commercial surveillance symphony, integrating a wide range of mechanisms from cookies to proprietary analytics and algorithmic software capabilities in a sweeping new logic that enshrined surveillance and the unilateral expropriation of behavioral data as the basis for a new market form. The impact of this invention was just as dramatic as Ford's. In 2001, as Google's new systems to exploit its discovery of behavioral surplus were being tested, net revenues jumped to $86 million (more than a 400 percent increase over 2000), and the company turned its first profit. By 2002, the cash began to flow and has never stopped, definitive evidence that behavioral surplus combined with Google's proprietary analytics were sending arrows to their marks. Revenues leapt to $347 million in 2002, then $1.5 billion in 2003, and $3.5 billion in 2004, the year the company went public.[72] The discovery of behavioral surplus had produced a stunning 3,590 percent increase in revenue in less than four years.

VII. The Secrets of Extraction

It is important to note the vital differences for capitalism in these two moments of originality at Ford and Google. Ford's inventions revolutionized *production*. Google's inventions revolutionized *extraction* and established surveillance capitalism's first economic imperative: the *extraction imperative*. The extraction imperative meant that raw-material supplies must be procured at an ever-expanding scale. Industrial capitalism had demanded economies of scale in production in order to achieve high throughput combined with low unit cost. In contrast, surveillance capitalism demands economies of scale in the extraction of behavioral surplus.

Mass production was aimed at new sources of demand in the early twentieth century's first mass consumers. Ford was clear on this point: "Mass production begins in the perception of a public need."[73] Supply and demand

were linked effects of the new "conditions of existence" that defined the lives of my great-grandparents Sophie and Max and other travelers in the first modernity. Ford's invention deepened the reciprocities between capitalism and these populations.

In contrast, Google's inventions destroyed the reciprocities of its original social contract with users. The role of the behavioral value reinvestment cycle that had once aligned Google with its users changed dramatically. Instead of deepening the unity of supply and demand with its populations, Google chose to reinvent its business around the burgeoning demand of advertisers eager to squeeze and scrape online behavior by any available means in the competition for market advantage. In the new operation, *users were no longer ends in themselves but rather became the means to others' ends.*

Reinvestment in user services became the method for attracting behavioral surplus, and users became the unwitting suppliers of raw material for a larger cycle of revenue generation. The scale of surplus expropriation that was possible at Google would soon eliminate all serious competitors to its core search business as the windfall earnings from leveraging behavioral surplus were used to continuously draw more users into its net, thus establishing its de facto monopoly in Search. On the strength of Google's inventions, discoveries, and strategies, it became the mother ship and ideal type of a new economic logic based on fortune-telling and selling—an ancient and eternally lucrative craft that has fed on humanity's confrontation with uncertainty from the beginning of the human story.

It was one thing to proselytize achievements in production, as Henry Ford had done, but quite another to boast about the continuous intensification of hidden processes aimed at the extraction of behavioral data and personal information. The last thing that Google wanted was to reveal the secrets of how it had rewritten its own rules and, in the process, enslaved itself to the extraction imperative. Behavioral surplus was necessary for revenue, and secrecy would be necessary for the sustained accumulation of behavioral surplus.

This is how secrecy came to be institutionalized in the policies and practices that govern every aspect of Google's behavior onstage and offstage. Once Google's leadership understood the commercial power of behavioral surplus, Schmidt instituted what he called the "hiding strategy."[74] Google employees

were told not to speak about what the patent had referred to as its "novel methods, apparatus, message formats and/or data structures" or confirm any rumors about flowing cash. Hiding was not a post hoc strategy; it was baked into the cake that would become surveillance capitalism.

Former Google executive Douglas Edwards writes compellingly about this predicament and the culture of secrecy it shaped. According to his account, Page and Brin were "hawks," insisting on aggressive data capture and retention: "Larry opposed any path that would reveal our technological secrets or stir the privacy pot and endanger our ability to gather data." Page wanted to avoid arousing users' curiosity by minimizing their exposure to any clues about the reach of the firm's data operations. He questioned the prudence of the electronic scroll in the reception lobby that displays a continuous stream of search queries, and he "tried to kill" the annual Google Zeitgeist conference that summarizes the year's trends in search terms.[75]

Journalist John Battelle, who chronicled Google during the 2002–2004 period, described the company's "aloofness," "limited information sharing," and "alienating and unnecessary secrecy and isolation."[76] Another early company biographer notes, "What made this information easier to keep is that almost none of the experts tracking the business of the internet believed that Google's secret was even possible."[77] As Schmidt told the *New York Times*, "You need to win, but you are better off winning softly."[78] The scientific and material complexity that supported the capture and analysis of behavioral surplus also enabled the hiding strategy, an invisibility cloak over the whole operation. "Managing search at our scale is a very serious barrier to entry," Schmidt warned would-be competitors.[79]

To be sure, there are always sound business reasons for hiding the location of your gold mine. In Google's case, the hiding strategy accrued to its competitive advantage, but there were other reasons for concealment and obfuscation. What might the response have been back then if the public were told that Google's magic derived from its exclusive capabilities in unilateral surveillance of online behavior and its methods specifically designed to override individual decision rights? Google policies had to enforce secrecy in order to protect operations that were designed to be undetectable because they took things from users without asking and employed those unilaterally claimed resources to work in the service of others' purposes.

That Google had the power to choose secrecy is itself testament to the success of its own claims. This power is a crucial illustration of the difference between "decision rights" and "privacy." Decision rights confer the power to choose whether to keep something secret or to share it. One can choose the degree of privacy or transparency for each situation. US Supreme Court Justice William O. Douglas articulated this view of privacy in 1967: "Privacy involves the choice of the individual to disclose or to reveal what he believes, what he thinks, what he possesses. . . ."[80]

Surveillance capitalism lays claim to these decision rights. The typical complaint is that privacy is eroded, but that is misleading. In the larger societal pattern, privacy is not eroded but redistributed, as decision rights over privacy are claimed for surveillance capital. Instead of people having the rights to decide how and what they will disclose, these rights are concentrated within the domain of surveillance capitalism. Google discovered this necessary element of the new logic of accumulation: it must assert the rights to take the information upon which its success depends.

The corporation's ability to hide this rights grab depends on language as much as it does on technical methods or corporate policies of secrecy. George Orwell once observed that euphemisms are used in politics, war, and business as instruments that "make lies sound truthful and murder respectable."[81] Google has been careful to camouflage the significance of its behavioral surplus operations in industry jargon. Two popular terms—"digital exhaust" and "digital breadcrumbs"—connote worthless waste: leftovers lying around for the taking.[82] Why allow exhaust to drift in the atmosphere when it can be recycled into useful data? Who would think to call such recycling an act of exploitation, expropriation, or plunder? Who would dare to redefine "digital exhaust" as booty or contraband, or imagine that Google had learned how to purposefully construct that so-called "exhaust" with its methods, apparatus, and data structures?

The word "targeted" is another euphemism. It evokes notions of precision, efficiency, and competence. Who would guess that targeting conceals a new political equation in which Google's concentrations of computational power brush aside users' decision rights as easily as King Kong might shoo away an ant, all accomplished offstage where no one can see?

These euphemisms operate in exactly the same way as those found on the earliest maps of the North American continent, in which whole regions

were labeled with terms such as "heathens," "infidels," "idolaters," "primitives," "vassals," and "rebels." On the strength of those euphemisms, native peoples—their places and claims—were deleted from the invaders' moral and legal equations, legitimating the acts of taking and breaking that paved the way for church and monarchy.

The intentional work of hiding naked facts in rhetoric, omission, complexity, exclusivity, scale, abusive contracts, design, and euphemism is another factor that helps explain why during Google's breakthrough to profitability, few noticed the foundational mechanisms of its success and their larger significance. In this picture, commercial surveillance is not merely an unfortunate accident or occasional lapse. It is neither a necessary development of information capitalism nor a necessary product of digital technology or the internet. It is a specifically constructed human choice, an unprecedented market form, an original solution to emergency, and the underlying mechanism through which a new asset class is created on the cheap and converted to revenue. Surveillance is the path to profit that overrides "we the people," taking our decision rights without permission and even when we say "no." The discovery of behavioral surplus marks a critical turning point not only in Google's biography but also in the history of capitalism.

In the years following its IPO in 2004, Google's spectacular financial breakthrough first astonished and then magnetized the online world. Silicon Valley investors had doubled down on risk for years, in search of that elusive business model that would make it all worthwhile. When Google's financial results went public, the hunt for mythic treasure was officially over.[83]

The new logic of accumulation spread first to Facebook, which launched the same year that Google went public. CEO Mark Zuckerberg had rejected the strategy of charging users a fee for service as the telephone companies had done in an earlier century. "Our mission is to connect every person in the world. You don't do that by having a service people pay for," he insisted.[84] In May 2007 he introduced the Facebook platform, opening up the social network to everyone, not just people with a college e-mail address. Six months later, in November, he launched his big advertising product, Beacon, which would automatically share transactions from partner websites with all of a user's "friends." These posts would appear even if the user was not currently

logged into Facebook, without the user's knowledge or an opt-in function. The howls of protest—from users but also from some of Facebook's partners such as Coca-Cola—forced Zuckerberg to back down swiftly. By December, Beacon became an opt-in program. The twenty-three-year-old CEO understood the potential of surveillance capitalism, but he had not yet mastered Google's facility in obscuring its operations and intent.

The pressing question in Facebook's headquarters—"How do we turn all those Facebook users into money?"—still required an answer.[85] In March 2008, just three months after having to kill his first attempt at emulating Google's logic of accumulation, Zuckerberg hired Google executive Sheryl Sandberg to be Facebook's chief operating officer. The onetime chief of staff to US Treasury Secretary Larry Summers, Sandberg had joined Google in 2001, ultimately rising to be its vice president of global online sales and operations. At Google she led the development of surveillance capitalism through the expansion of AdWords and other aspects of online sales operations.[86] One investor who had observed the company's growth during that period concluded, "Sheryl created AdWords."[87]

In signing on with Facebook, the talented Sandberg became the "Typhoid Mary" of surveillance capitalism as she led Facebook's transformation from a social networking site to an advertising behemoth. Sandberg understood that Facebook's social graph represented an awe-inspiring source of behavioral surplus: the extractor's equivalent of a nineteenth-century prospector stumbling into a valley that sheltered the largest diamond mine *and* the deepest gold mine ever to be discovered. "We have better information than anyone else. We know gender, age, location, and it's real data as opposed to the stuff other people infer," Sandberg said. Facebook would learn to track, scrape, store, and analyze UPI to fabricate its own targeting algorithms, and like Google it would not restrict extraction operations to what people voluntarily shared with the company. Sandberg understood that through the artful manipulation of Facebook's culture of intimacy and sharing, it would be possible to use behavioral surplus not only to satisfy demand but also to *create* demand. For starters, that meant inserting advertisers into the fabric of Facebook's online culture, where they could "invite" users into a "conversation."[88]

VIII. Summarizing the Logic and Operations of Surveillance Capitalism

With Google in the lead, surveillance capitalism rapidly became the default model of information capitalism on the web and, as we shall see in coming chapters, gradually drew competitors from every sector. This new market form declares that serving the genuine needs of people is less lucrative, and therefore less important, than selling predictions of their behavior. Google discovered that *we are less valuable than others' bets on our future behavior.* This changed everything.

Behavioral surplus defines Google's earnings success. In 2016, 89 percent of the revenues of its parent company, Alphabet, derived from Google's targeted advertising programs.[89] The scale of raw-material flows is reflected in Google's domination of the internet, processing over 40,000 search queries every second on average: more than 3.5 billion searches per day and 1.2 trillion searches per year worldwide in 2017.[90]

On the strength of its unprecedented inventions, Google's $400 billion market value edged out ExxonMobil for the number-two spot in market capitalization in 2014, only sixteen years after its founding, making it the second-richest company in the world behind Apple.[91] By 2016, Alphabet/Google occasionally wrested the number-one position from Apple and was ranked number two globally as of September 20, 2017.[92]

It is useful to stand back from this complexity to grasp the overall pattern and how the puzzle pieces fit together:

1. ***The logic:*** Google and other surveillance platforms are sometimes described as "two-sided" or "multi-sided" markets, but the mechanisms of surveillance capitalism suggest something different.[93] Google had discovered a way to translate its nonmarket interactions with users into surplus raw material for the fabrication of products aimed at genuine market transactions with its real customers: advertisers.[94] The translation of behavioral surplus from outside to inside the market finally enabled Google to convert investment into revenue. The corporation thus created out of thin air and at zero marginal cost an asset class of vital raw materials derived from users' nonmarket online behavior. At first those raw materials were simply "found,"

a by-product of users' search actions. Later those assets were hunted aggressively and procured largely through surveillance. The corporation simultaneously created a new kind of marketplace in which its proprietary "prediction products" manufactured from these raw materials could be bought and sold.

The summary of these developments is that the behavioral surplus upon which Google's fortune rests can be considered as *surveillance assets.* These assets are critical raw materials in the pursuit of *surveillance revenues* and their translation into *surveillance capital.* The entire logic of this capital accumulation is most accurately understood as *surveillance capitalism*, which is the foundational framework for a surveillance-based economic order: a *surveillance economy.* The big pattern here is one of subordination and hierarchy, in which earlier reciprocities between the firm and its users are subordinated to the derivative project of our behavioral surplus captured for others' aims. We are no longer the *subjects* of value realization. Nor are we, as some have insisted, the "product" of Google's sales. Instead, we are the *objects* from which raw materials are extracted and expropriated for Google's prediction factories. Predictions about our behavior are Google's products, and they are sold to its actual customers but not to us. *We are the means to others' ends.*

Industrial capitalism transformed nature's raw materials into commodities, and surveillance capitalism lays its claims to the stuff of human nature for a new commodity invention. Now it is human nature that is scraped, torn, and taken for another century's market project. It is obscene to suppose that this harm can be reduced to the obvious fact that users receive no fee for the raw material they supply. That critique is a feat of misdirection that would use a pricing mechanism to institutionalize and therefore legitimate the extraction of human behavior for manufacturing and sale. It ignores the key point that the essence of the exploitation here is the rendering of our lives as behavioral data for the sake of others' improved control of us. The remarkable questions here concern the facts that our lives are rendered as behavioral data in the first place; that ignorance is a condition of this ubiquitous rendition; that decision rights vanish before one even knows that there is a decision to make; that there are consequences to this diminishment of rights that we can neither see nor foretell; that there is no exit, no voice, and no loyalty, only helplessness, resignation, and psychic numbing; and that encryption is

the only positive action left to discuss when we sit around the dinner table and casually ponder how to hide from the forces that hide from us.

2. ***The means of production:*** Google's internet-age manufacturing process is a critical component of the unprecedented. Its specific technologies and techniques, which I summarize as "machine intelligence," are constantly evolving, and it is easy to be intimidated by their complexity. The same term may mean one thing today and something very different in one year or in five years. For example, Google has been described as developing and deploying "artificial intelligence" since at least 2003, but the term itself is a moving target, as capabilities have evolved from primitive programs that can play tic-tac-toe to systems that can operate whole fleets of driverless cars.

Google's machine intelligence capabilities feed on behavioral surplus, and the more surplus they consume, the more accurate the prediction products that result. *Wired* magazine's founding editor, Kevin Kelly, once suggested that although it seems like Google is committed to developing its artificial intelligence capabilities to improve Search, it's more likely that Google develops Search as a means of continuously training its evolving AI capabilities.[95] This is the essence of the machine intelligence project. As the ultimate tapeworm, the machine's intelligence depends upon how much data it eats. In this important respect the new means of production differs fundamentally from the industrial model, in which there is a tension between quantity and quality. Machine intelligence is the synthesis of this tension, for it reaches its full potential for quality only as it approximates totality.

As more companies chase Google-style surveillance profits, a significant fraction of global genius in data science and related fields is dedicated to the fabrication of prediction products that increase click-through rates for targeted advertising. For example, Chinese researchers employed by Microsoft's Bing's research unit in Beijing published breakthrough findings in 2017. "Accurately estimating the click-through rate (CTR) of ads has a vital impact on the revenue of search businesses; even a 0.1% accuracy improvement in our production would yield hundreds of millions of dollars in additional earnings," they begin. They go on to demonstrate a new application of advanced neural networks that promises 0.9 percent improvement on one measure of identification and "significant click yield gains in online traffic."[96] Similarly, a team of Google researchers introduced a new deep-neural network model,

all for the sake of capturing "predictive feature interactions" and delivering "state-of-the-art performance" to improve click-through rates.[97] Thousands of contributions like these, some incremental and some dramatic, equate to an expensive, sophisticated, opaque, and exclusive *twenty-first-century "means of production."*

3. ***The products:*** Machine intelligence processes behavioral surplus into *prediction products* designed to forecast what we will feel, think, and do: now, soon, and later. These methodologies are among Google's most closely guarded secrets. The nature of its products explains why Google repeatedly claims that it does not sell personal data. What? Never! Google executives like to claim their privacy purity because they do not sell their raw material. Instead, the company sells the predictions that only it can fabricate from its world-historic private hoard of behavioral surplus.

Prediction products reduce risks for customers, advising them where and when to place their bets. The quality and competitiveness of the product are a function of its approximation to certainty: the more predictive the product, the lower the risks for buyers and the greater the volume of sales. Google has learned to be a data-based fortune-teller that replaces intuition with science at scale in order to tell and sell our fortunes for profit to its customers, but not to us. Early on, Google's prediction products were largely aimed at sales of targeted advertising, but as we shall see, advertising was the beginning of the surveillance project, not the end.

4. ***The marketplace:*** Prediction products are sold into a new kind of marketplace that trades exclusively in future behavior. Surveillance capitalism's profits derive primarily from these *behavioral futures markets*. Although advertisers were the dominant players in the early history of this new kind of marketplace, there is no reason why such markets are limited to this group. The new prediction systems are only incidentally about ads, in the same way that Ford's new system of mass production was only incidentally about automobiles. In both cases the systems can be applied to many other domains. The already visible trend, as we shall see in the coming chapters, is that any actor with an interest in purchasing probabilistic information about our behavior and/or influencing future behavior can pay to play in markets where the behavioral fortunes of individuals, groups, bodies, and things are told and sold (see Figure 2).

The Discovery of Behavioral Surplus

Surveillance capitalism begins with the discovery of behavioral surplus. More behavioral data are rendered than required for service improvements. This surplus feeds machine intelligence - the new means of production - that fabricates predictions of user behavior. These products are sold to business customers in new behavioral futures markets. The Behavioral Value Reinvestment Cycle is subordinated to this new logic.

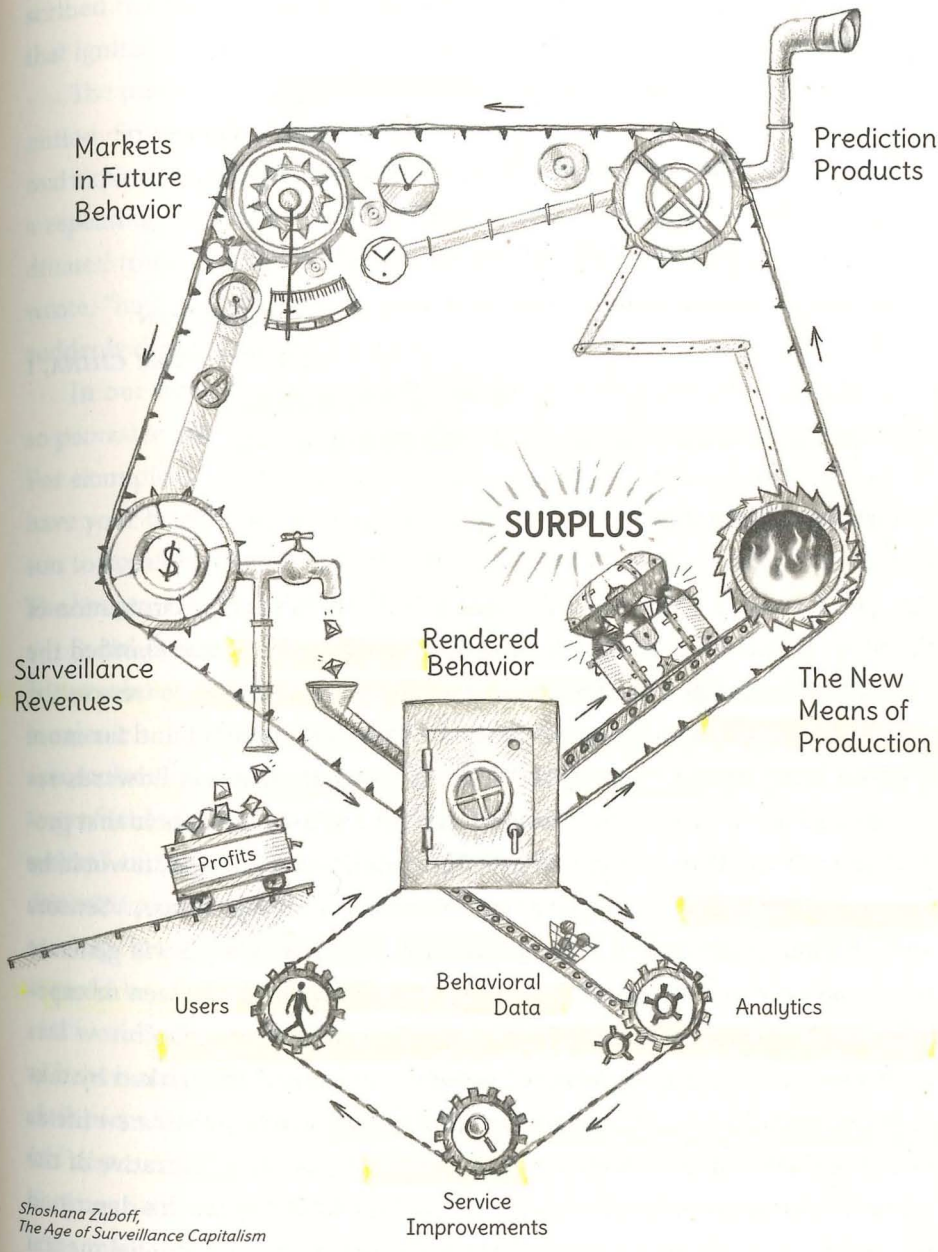
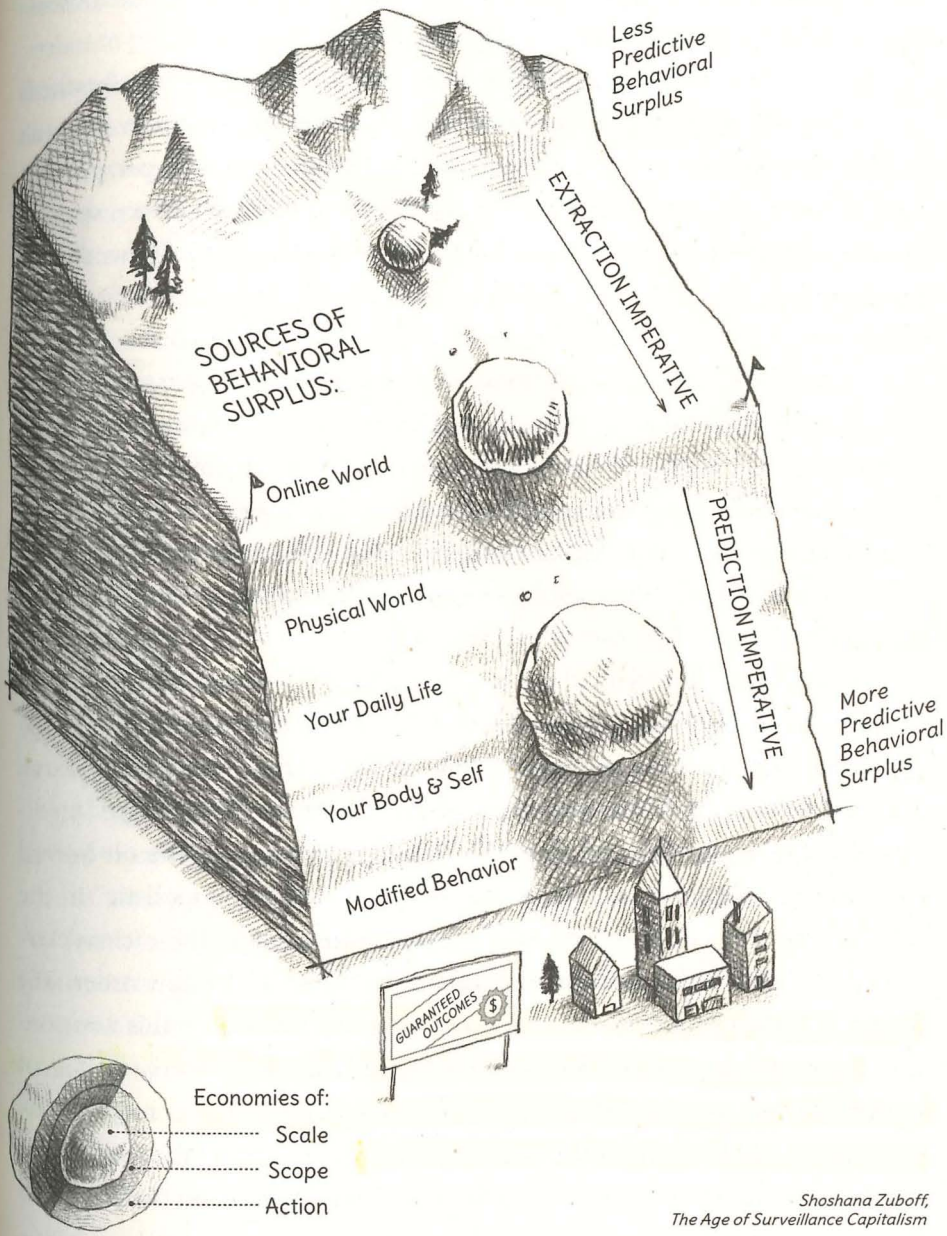


Figure 2: The Discovery of Behavioral Surplus

The Dynamic of Behavioral Surplus Accumulation

Surveillance capitalism's master motion is the accumulation of new sources of behavioral surplus with more predictive power. The goal is predictions comparable to guaranteed outcomes in real-life behavior. Extraction begins online, but the prediction imperative increases the momentum, driving extraction toward new sources in the real world.



Shoshana Zuboff, The Age of Surveillance Capitalism

Figure 3: The Dynamic of Behavioral Surplus Accumulation