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Selling the American People

Advertising, Optimization, and the Origins of Adtech

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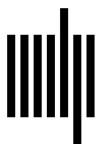
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INTRODUCTION: A WORLD MARKETERS CAN COUNT ON

The advertising industry chases its dreams. At a 1961 meeting of the American Marketing Association (AMA), the group's incoming president told executives from some of the country's leading corporations about an ideal method for deciding how much money to spend on advertising. "It calls for adding dollar after dollar to the appropriation until the point is reached where the last dollar produced no increase in profit."¹ The speaker was Albert W. Frey, a business school professor and one of a growing number of marketing experts who were dissatisfied with irrational and inefficient conventions in advertising management. Marketing had become an increasingly central and expensive factor in the US economy, with higher stakes and stricter scrutiny weighing on advertising strategies. The whole circulation of commodities seemed ripe for the sort of rationalization administered in manufacturing. As a 1962 article in *Harvard Business Review* explained, "In marketing, which represents over 50% of U.S. economic activity, or more than \$250 billion annually, the opportunities for productivity gains are so large and numerous that we practically stumble over them. And the *crème-de-la-crème* lies in advertising."²

It was time to clear a path to the future. Frey warned marketers against "hiding behind" comfortable excuses like the well-worn adage, "Yes, I know that half of our advertising dollars are wasted, but I can't determine which half."³ He urged management to face the challenge of carefully accounting for the financial return on those advertising investments. It was an imposing challenge, of course. To actually execute the optimal method Frey described would require "that the sales effectiveness of any given expenditure is known and

that relevant costs are applied.” That was not a practical reality for most companies. But it was something they could aspire to reach. And the possibility of maximizing profit on each dollar spent was a seductive reward for any company able to determine the exact effects of its advertising. “A few advertisers do claim to have this information to a remarkable degree,” Frey reported, “but they are very much the exception.”⁴

This book explains how companies dreamed of becoming the exception and what the advertising industry built as it tried to make the exception into the rule. By the late 1950s, some of the most prominent organizations in the US marketing system were busy trying to take advantage of computerization and the management sciences nurtured during and after World War II. They hoped dramatic improvements in their ability to produce and process information would allow them to subject advertising operations, and even consumer behavior, to more intensive accounting, calculation, and control. With algorithms, automation, and an army of applied researchers and mathematics experts all enlisted in the capitalist sales effort, it seemed possible for decision making in advertising to achieve machinelike regularity—efficient, precise, predictive, and quantifiably rational. Parts of the advertising business began to remodel themselves in the image of disciplines such as operations research, using mathematical models “to more or less automatically project the past and present into the future,” as Frey put it at the AMA meeting.⁵ Operations research was developed most famously as a science of optimization in warfare; its paradigmatic application is figuring out how to use an available stock of bombs to destroy the most submarines.⁶ Advertising saw its own reflection in that basic problem and went to work sizing up the commercial world for target practice.

The data-driven business cultures that animate digital advertising were incubated in the aftermath. Marketers learned to dream of optimization and to speak in the idiom of management science. A general commitment to these ambitions and techniques has been an enduring force throughout technological shifts within US capitalism, influencing design values and power dynamics in the many institutions and infrastructures that integrate advertising with various aspects of social life. Increasingly, that includes not just news, entertainment, and shopping but also education, employment, insurance, credit scoring—almost any context in which an assessment of someone’s value enters into decisions about how to classify and treat them.⁷ Many of the developments in media and technology that fire public debates

today have been fueled by marketers' desire to become more sophisticated accountants and engineers of everyday life. Pockets of the advertising business have exploded in recent years as people have come to claim, and to believe, that their dreams have come true, that the exception has become the rule, that new media have delivered a world marketers can count on.

Welcome to the frontier horizons of advertising technology. Advertisers and the many companies they work with imagine that new digital systems arm them with the data and analytical resources they need to realize a stubborn ambition: reaching a desirable consumer with the perfect marketing intervention at just the right moment to achieve their objective. More importantly, they believe these resources will allow them to predict and determine the financial return attributable to each strategic decision. They want to minimize any doubt about whether their ads succeed in generating sales or influence and to discern ever-narrower differences in profit and risk when evaluating the many options for allocating their budgets and orchestrating persuasive campaigns. Likewise, the companies that sell advertising inventory—search engines, social media, streaming services, mobile application developers, cable companies, and website publishers—all hope to maximize yield on what they sell. They try to do that by identifying potentially valuable consumers wherever they can be observed, sorting them into categories that capture something about their expected behaviors, and surrounding them with promotional messages and shopping opportunities adapted to those expectations. Brokering transactions between these parties is a dense sector of intermediaries providing personal data, auction platforms, trading-desk software, systems integrations, and various surveillance and analytics tools, often branded as artificial intelligence, that promise to help firms make better decisions and improve the efficiency of their marketing. These intermediaries provide logistical, transactional, and record-keeping services that try to turn any user action, any data flow, any instance of exchange into a billable event and a claim about some documented past or probable future. At its core, digital advertising is an automated technoscience, capitalizing evidence of attention and intention, correlation and difference, desire and disgust, value and cost. Welcome to the mercenary wilderness of “adtech.”

Advertising has been a powerful wedge for digital platform businesses to accumulate astronomical fortunes by exploiting data about consumers, audiences, and markets.⁸ In some ways, this marks a seismic shift. Economists used to concede that there is no accounting for taste. Today, companies

desperately try to account for almost any detail of consumers' lives that might reveal something about the economic value of a person and the bespoke populations they might be assigned to, at any moment, within a database or an identity graph. Tastes, habits, moods, and movements are just part of what marketers and adtech systems take into account as they calculate predictions and make rapid judgments about how to classify people, how to nudge them toward desired behaviors, and how to price each opportunity to nudge.⁹ Markets for personal data and data-derived services are sprawling and frenetic. In addition to data brokers such as Acxiom and Experian, these markets include broadband and cellular providers like Comcast and AT&T, retailers like Walmart and Kroger, payment processors like MasterCard, electronics manufacturers like Samsung, just about any application on a smartphone, and thousands of unseen or lesser-known businesses.¹⁰

Google, Meta (which owns Facebook and Instagram), and Amazon lead the pack of digital advertising companies.¹¹ They produce endless facts or inferences about people's activities, emotions, associations, and inclinations and process them along statistical assembly lines. Leveraging investments in computing power, user acquisition, elite expertise, corporate takeovers of competitors, and political and legal protection, these companies dissect everyday life so that they can claim to "know," with even a tiny fraction of additional accuracy, the value of each consumer target and every marketing maneuver. Observing what people do and where they go with unmatched detail, the largest adtech platforms document and monetize minuscule moments of user attention or behavior. They also profile publishers and advertisers to extract more value from the billions of transactions they orchestrate every day.¹² The "heterogeneous engineers" of these complex arrangements are working to align digital media with particular visions of a data-driven society,¹³ fueling ongoing efforts to disaggregate and re-sort populations in ways that seem useful for advertisers and profitable for the firms that package and distribute ads. These are technological dreams of optimization, and they are pervasive among the companies trying every day to sell you products or to sell you to marketers.¹⁴

Some analysts look at these developments and see more than just a shift. They see a decisive break from the past. Shoshana Zuboff blames tech giants like Google and Facebook for ushering in an unprecedented age of "surveillance capitalism."¹⁵ She and others argue that a new logic of surveillance and prediction has perverted capitalism and disrupted the business

of advertising. These analysts presume that advertising today looks nothing like the pre-internet world memorialized on the popular TV show *Mad Men*. As one writer put it in 2018, “Advertising, once a creative industry, is now a data-driven business reliant on algorithms.”¹⁶ Prominent commentators and executives, including the former CEO of Cambridge Analytica, like to say that advertising’s “mad men” have been dethroned by tech-savvy “math men.” Don Draper has drowned in a data deluge.¹⁷

This narrative of digital disruption is a dominant frame in public conversations about adtech, data, and surveillance capitalism. Without dismissing it entirely, I believe this diagnosis needs some radical revisions. Despite recent frenzies of excitement and anxiety, capitalist dreams of optimization were not conjured overnight. Across a much longer period than we typically appreciate, related efforts to predict and influence consumers’ habits, and to package and sell audience attention, have channeled and amplified currents in surveillance, information technology, and behavioral and management sciences. Advertising’s logistical and calculative operations, deeply tied to computerization in US business, have helped legitimate a data- and prediction-obsessed attitude in the capitalist sphere of circulation and in media industries. As platform companies have insinuated surveillance and profiling into more means of sociality, advertising’s role in the political economy of communication has, in important ways, been extended, clawing its way toward some fundamental and long-held ideals.¹⁸

The commercial media that have organized the flow of everyday information and cultural imagery in the United States for more than a century were shaped around advertisers’ desire to produce consumers and consumption—that is, to assemble affluent and upwardly mobile people, including wage earners with new needs and disposable income, and conduct them through flexible sets of habits, lifestyles, and ideologies that reproduce capitalist institutions and the power of dominant social groups.¹⁹ Other values compete against this priority, of course, and its success is far from uniform; but historical and contemporary research shows that the production of consumers, both as actors and as information, has been an organizing principle across print, broadcasting, and electronic media.²⁰

Building on work by Dallas Smythe, Oscar Gandy Jr., Joseph Turow, and many others, I argue that the business of producing consumers has contributed decisively to ongoing schemes for monitoring and managing individuals, populations, marketplaces, and more. Many advertising and media

professionals are compelled to engage in technoscientific performances of efficiency and advantage; to project authority within and across their organizations, they continually appropriate and publicize new means of generating and using information. The business traffics in a steady stream of data about consumers, their projected value to interested firms, and their anticipated and confirmed responses to marketing interventions.

Contrary to popular belief, this traffic is not exclusive to Silicon Valley or internet advertising, although its expansion and acceleration, its specific computing infrastructures and mathematical methods, and its deeper entanglements with financial speculation add up to something particular.²¹ Still, a careful explanation of how accumulation strategies centered around the datafication of existence came to define an era of history needs to consider the elements that made this alchemy possible. That means examining much earlier efforts to create markets that trade in traces of human behavior and attention, as well as some largely unknown efforts to provide scientific techniques for managing operations in those markets—and managing consumption itself. Throughout the history of modern advertising, and especially since the mid-twentieth century, corporations across industries have agitated for better data about consumers and media audiences and more systematic means of exerting and measuring influence.²² Dreams of optimization in advertising reflect forceful demands from practically all of business enterprise, including the suppliers of computers and information systems. Perhaps most interestingly, these dreams were tangled up with formidable technoscience disciplines that muscled their way toward the center of US universities, corporations, and parts of government. Surveillance advertising took inspiration and many of its marching orders from management science.

Management science and operations research collectively describe an eclectic battery of techniques for making “rational” decisions under conditions of uncertainty.²³ These disciplines aspire to technocratic governance of complex systems, using formal and usually quantitative models to evaluate opportunities, to make selections from alternatives that are difficult to distinguish or compare, and to predict the payouts of different choices. Of particular interest is their fascination with mathematical methods of “optimum seeking.”²⁴ A 1957 textbook describes how experts used these methods to coordinate marketing systems: “the aim of the operations researcher is to find an appropriate optimization formula. That is to say that he is offering analytical help to management in minimizing costs, maximizing results, or

identifying the best possible pattern of activities in a complex operation.”²⁵ Martin K. Starr, a professor at Columbia University and a consultant to one of the world’s largest advertising agencies in the 1950s and 1960s, says simply that optimization is “the fundamental objective of management science.”²⁶

Optimization is also the dazzling and fundamental objective of digital advertising. Its appeal is irresistible in the abstract. Detached from the social and political matter of specifying what values should be maximized (and for whom), optimization just means *more perfect*. I argue that this is exactly what adtech represents. It stands for automated management science—a sleek technological promise of more efficient and rational governance of the internet’s vast marketing machines. But the details of that promise are contentious, irreducible to the bloodless elegance of technical perfection. Optimization represents a highly adaptable set of discourses that various companies and experts have harnessed in pursuit of their own status, power, and profit. These are fluid rivalries within contradictory but more or less collectively defended industrial formations. Convincing displays of optimum seeking have helped companies capture market share from their rivals while also reinforcing cultural and political-economic commitments to the idea that media systems should be organized largely—perhaps primarily—to produce consumers and to make moments of attention into investment opportunities.

Optimization in advertising has politics and a history, after all.²⁷ That history paved the way for today’s distinctively algorithmic mode of “knowing,” enacting, and packaging consumers and audiences. Beginning in the 1950s, computerization and management science—both thoroughly social as well as technoscientific developments—remediated the culture and material conditions of calculation and market exchange in advertising. They made optimizing return on investment into the holy grail of progress, a north star for sporadic efforts to define and exploit technological affordances. The data-driven, surveillance-based advertising that powers digital environments today did not pervert advertising’s traditional commercial logic; rather, it emerged from *within* that logic, as the internal movements of long-standing business processes became entangled with new information technologies and all the promises they represented. What we call adtech is an intimidating but often clumsy assemblage of computers, databases, code, metrics, models and algorithms, consumers and users, high- and low-wage workers, scoring and classification systems, technical standards, market mechanisms, professional loyalties, and apparently authoritative claims to expertise and truth.

These are management science machines designed to optimize the private but sometimes conflicting goals of marketers, marketing service providers, and media companies. Their history shows how commercial relations that were settled around compromises (e.g., paying to expose audiences to advertising messages, measured by ratings) both shaped and adapted to new forces that seemed capable of resettling those compromises closer to ultimate objectives (e.g., paying to produce consumption, measured by sales). It's a story of "particular human efforts to negotiate difficulties and seize opportunities," to borrow a phrase from Richard Ohmann.²⁸ And, like so much of capitalist innovation, the glitches and good-enough fixes that adtech promoters assure us are temporary—certain to disappear as technologies realize their full potential—turn out to be enduring features of a future-in-the-making that never arrives at its promised destination.

"SELLING THE AMERICAN PEOPLE"

The marriage of media and marketing systems in the United States was arranged long ago. This courtship heated up in the last quarter of the nineteenth century as manufacturers of branded goods, modern advertising agencies, department stores in metropolitan centers like Philadelphia, New York, and Chicago, and mail-order merchants serving outlying areas all got involved with the publishers of mass-distributed periodicals and daily newspapers. This dance continued throughout the struggles to define and control radio broadcasting, with big technology companies cutting in and a government chaperone calling tunes. It took some seduction and counseling to fasten advertising to radio, but the resulting knot was tied tight. Expectations that mass media exist as extensions of corporate governance and the capitalist sales effort presided from the outset over the "age of television."²⁹

In a 1957 address to the San Francisco Ad Club, the director of merchandising and promotion for a TV station in Los Angeles evangelized the young medium in suggestive terms: "My contention is that any activity which occupies the American people six and seven hours a day cannot be by-passed by advertisers interested in *selling the American people*."³⁰ He joined a chorus of influential contemporaries proclaiming television's importance to a consumer economy. Just three years earlier, as television was being welcomed into most US homes, revered business theorist Peter Drucker suggested that new technologies had transformed the practice of corporate management.

Rather than supplying markets with goods, he argued, management “must create customers and markets by conscious and systematic work.” Drucker regarded television advertising as a form of “automation” for producing consumers and their buying habits, and he insisted that technological advancements in marketing and distribution would be as significant to the industrial system as the mechanization of manufacturing.³¹

This book is about “selling the American people.” When the station executive spoke that phrase, he was extolling the power of television to influence consumer choices—selling people on advertisers’ products. But his particular syntax also evokes a set of processes through which media audiences and consumer populations are produced, packaged, and sold to advertisers—what we call audience manufacture or commodification. Turning the statement’s flexibility to our advantage, the book examines both sides of this coin: the “attention merchants” selling audiences to advertisers, and the “choice architects” trying to shape consumer behavior.³²

While it is obvious that these operations have exploited and reinforced the prominence of commercial media as economic and cultural institutions, we have more to learn about how the production of consumers, markets, and media audiences has depended on and amplified the importance of information, computing, and management sciences throughout broader political economies. The advertising industry is an organized field of knowledge production and data flows. Marketing and audience manufacture have hosted sustained, albeit opportunistic, encounters among forms of science and technology concerned with observing, recording, classifying, and evaluating the personal details and behavioral patterns deemed useful for defining countless consumer publics.³³ Advertising constructs claims about race, class, gender, age, and value not only by creatively encoding images about brands and the people who use them but also through its internal operations and its points of intersection with other institutions of social ordering. The process of distributing advertisements and planning and evaluating their effects is inseparable from the industrial and epistemological production of consumers.³⁴ Companies involved in selling the American people paved a crossroads for ongoing ventures to catalog social relations and to derive insights for tactical advantage. Almost ninety years ago, John B. Watson, a pioneer of behavioral psychology and a longtime employee at the world’s leading advertising agency, offered a marketing principle that hinged on the power of strategic intelligence: “It is getting yourself into a position where

you can predict the other fellow's behavior that puts you in command in a selling situation."³⁵ At least since then, and with increasing urgency, advertisers, their agencies, and many species of managers, analysts, and data brokers have scrambled to occupy that position, leaning on a scaffold of information technologies.³⁶

Selling the American People helps us make sense of today's attention merchants and choice architects by getting to the bottom of a few key questions: How did technical experts working at the intersection of data processing and management sciences come to command the center of gravity in advertising and media industries? How did their ambition to remake marketing through mathematical optimization shape and reflect developments in digital technology? In short, where did adtech come from, and how did data-driven marketing become a discernible configuration mediating daily encounters with people, products, and public spheres? Political and business elites have located the answers to those questions in a technological revolution that began in the 1990s with the market-led popularization of the internet and the eventual rise of mobile and social media. Critical researchers have given us a much clearer picture than that. Defense spending, economic crises, and cultural trends all brought information and communication toward the forefront of capitalist societies in the late twentieth century.³⁷ Policy choices created a governance structure for the internet that centered commodification and private profit.³⁸ Advertising's appropriation of new data extraction capabilities solidified an infrastructure for identifying and profiling consumers online and across devices.³⁹ Cybersecurity and government intelligence put the legitimizing force of statecraft behind commercial surveillance.⁴⁰ And finance capital helped funnel money, hype, and professional energy into adtech, digital marketing, and data analytics.⁴¹

A complex web of relationships institutionalized surveillance advertising as the beating heart of the internet across the last three decades. This book provides a detailed historical prelude to these formations. It looks back to show how particular calculative cultures and futuristic visions allowed optimization to take root as a powerful ideology and performative repertoire in advertising and marketing. The business of selling the American people provided a theater for acting out dreams of rational management and a workshop for preparing the technical and organizational capacities that let surveillance advertising flourish. I refer to this trajectory of continuity and change as advertising's calculative evolution.

ADVERTISING'S CALCULATIVE EVOLUTION

During the 1950s and 1960s, at the same time advertising underwent a well-known “creative revolution,” the industry was also rebuilding its knowledge and decision-making infrastructures around electronic data processing and algorithmic and actuarial techniques. Advertisers, agencies, and media companies accommodated their activities to more statistical ways of thinking about consumers and audiences and more computational forms of reasoning and justification. By the 1960s, these and other actors recognized possibilities to reorganize mass media around efficient, automated systems for managing consumers and exchanging audience commodities—and they were already enlisting digital technologies and mathematical formalisms to press on the limits of established business processes. Power roles inside and across organizations were gradually renegotiated to favor functions suitable for or supportive of numerical modeling and optimization. Consumer research, media planning and buying, direct marketing, and data and computing services were all elevated in stature as advertisers and their agencies tried to discriminate risk and profit potential more precisely—drawing inspiration, legitimacy, and personnel from war-tested sciences of decision making and control.

Explicitly or not, these calculative corners of the advertising business promoted a technoscientific and financialized definition of progress as they worked to build markets where more dynamic units of attention or behavior could be packaged into finely graded investment opportunities. Throughout the second half of the twentieth century, the commitment to more detailed accounting of consumers' past and probable behaviors moved toward the very core of the sales effort and the digital media landscape. The escalation of these strategies and styles of industrial truth-telling made way for both public life and the intimacies of personal experience to be penetrated by computational approaches to knowing, designing, and managing social worlds.

This calculative evolution shows how advertising and marketing tried to leverage computer-centric management sciences and how an ideology of optimization inflected their orientation to information and technology. It is the history of a future imagined by marketers as they constructed the affordances of impressive new tools and techniques. Responding both to the difficulties of coordinating increasingly data-intensive business operations and to perceived opportunities to advance toward the dream of determining advertising's impact on sales, participants in advertising animated visions of

progress through a set of affordances, or potential abilities, that became central to the commercialization of interactive and internet-enabled media. Efforts to reengineer advertising around automation, personalized targeting, electronic shopping, and expanded capacities for documenting, analyzing, and assigning value to consumer behaviors all contributed to a certain structure of feeling at the horizon of digital capitalism. These uneven and often flawed attempts to optimize the business of selling the American people helped create the conditions of possibility for today's behavioral advertising.

Advertising and marketing are among the many institutions in US capitalism that have gravitated toward actuarial and accounting logics and embodied those values in technologies of automation, surveillance, and quantification. This is the historical context in which adtech should be analyzed. The term "adtech" is usually reserved for internet-based advertising companies, particularly those involved in programmatic advertising, where individual opportunities to serve advertisements are sold in automated auctions. Google, Meta, and Amazon are the giants of adtech, leading a crowded field of variably familiar (and reputable) companies such as Microsoft, Adobe, Oracle, Roku, LiveRamp, The Trade Desk, FreeWheel (Comcast), Criteo, and MediaMath. Despite its typically narrow connotations, I suggest that adtech is essentially about generating, processing, and coordinating flows of information and commerce. The term can refer to the entire range of knowledge infrastructures, logistical utilities, and technoscientific practices involved in selling the American people.

By analyzing adtech within a longer history of information technology and management science in advertising, we get a different picture from that offered by the conventional wisdom about the origins of the systems we know today and the dynamics and actors involved in building them. This is not to deny that advertising has changed; but it has changed into something certain people in the business started to imagine, quite vividly, in the 1950s and 1960s. For all the differences between now and then, the performances and discourses that have legitimized adtech in recent decades profoundly resemble the many little dramas staged more than half a century ago to showcase the power of management sciences and digital computers, with similar promises of rational efficiency draped in technoscientific expertise.

Overall, the advertising business—a cultural and political-economic institution connected to many of the organizations, devices, and environments that mediate everyday experiences and power relationships—gradually

reconstructed itself around aspirations to optimize a consumer society. Its efforts to leverage data and technology have reinforced the authority of quantitative and computational decision making, shaped the architecture of media and market settings (including privatized public spaces), affected the circulation of ideas and stories, and legitimized a paradigm of behavioral nudging that tries to exploit inferences about people's habits, emotions, and cognition.⁴² Google claims that it exists to organize the world's information; it is better thought of as a stack of advertising utilities that organizes the world's people according to their apparent economic worth for certain marketers. Safiya Umoja Noble sets our focus with piercing clarity when she writes, "We need a full-on reevaluation of the implications of our information resources being governed by corporate-controlled advertising companies."⁴³ Collective action against surveillance-based behavioral advertising has been sidetracked by debates that misconstrue the problem as one of balancing trade-offs between "privacy" (defined in individualistic or even cryptographic terms) and the efficiencies and pleasures said to emerge from data-driven personalization. As Noble's prompt suggests, the larger and more pressing issue is to grapple with specific relations of power involved in creating and managing publics, public spheres, and public life.

DIFFERENCE ENGINES: DISCRIMINATION IS THE POINT

Digital advertising's hazards are well documented. Adtech companies slurp and slosh personal data all over the internet; they siphon funds away from journalists and other creative workers; and they monetize and profit from hateful and dishonest communications, either willfully or because they are incapable of handling the magnitude of their business.⁴⁴ Adtech's externalities become literally toxic when we consider the ecological cost of powering machines that spend day and night crunching numbers, making guesses, and placing bets, trying to accelerate consumerism. Moreover, since corporations can deduct advertising expenses from their tax bills,⁴⁵ and since advertising transactions are structured in ways that let intermediaries collect fees from all sorts of services and events, adtech facilitates an upward transfer of wealth toward certain classes of media and marketing professionals, including fraudsters.

Digital advertising companies also have a shameful record of discrimination.⁴⁶ Facebook has been beset by lawsuits and backlash for violating

laws meant to protect people against prejudicial disadvantage in particular categories of business activity. Audit studies have repeatedly found that Facebook's ad delivery systems selectively bias specific populations, even if advertisers' targeting parameters do not stipulate those actions. One group of researchers calls this "discrimination through optimization."⁴⁷

It is well known that algorithms and artificial intelligence systems reflect and reproduce social power and injustice as they "learn" from data that materialize existing relationships of inequality.⁴⁸ Clearly, we need public institutions, backed by the force of law, to intervene in the governance of the platforms and systems corporations use to manage affairs with customers and workers. In this book I add empirical force to one particular argument in these discussions: Discrimination is not a side effect of adtech. Discrimination is the point.

The purpose of data-driven marketing is to identify and isolate differences in the value assigned to profiled consumers or specific advertising events. Adtech embodies this purpose in machines that act rapidly on recognized distinctions in the risk or revenue potential of alternative courses of action—splitting hairs as finely as economy dictates. The goal is to find profit opportunities that are invisible or incalculable to humans or too fleeting for manual transactions to exploit. With big-data surveillance, marketers try to gain a better view of individuals as well as to recognize patterns and anomalies that could have predictive power for their valuations and probabilistic bets. In other words, the array of variables that can be used to judge someone as similar to or different from others in a customized population or audience is vast, constantly shifting, and often far removed from how a person or group might define their own identities, interests, inclinations, and solidarities.⁴⁹ The principle behind data-driven advertising is essentially to increase corporate capacities to assess a range of barely distinguishable options and select whichever choice is most likely to yield or save two pennies instead of one. Whether adtech companies like Facebook deliver on these promises is debatable, but businesses of all stripes have committed to this worldview. There is no question that *optimization through discrimination* is what adtech is selling and what advertisers are buying.

It is not necessarily bad to recognize differences, of course. Equity, for example, is a way of accounting for different needs and abilities. But it matters whose interests and priorities direct this social sorting. The discrimination of race, gender, class, age, ability, sexuality, and other propensities

or associations is an active element of contemporary capitalism. Advertising participates in efforts to differentiate people, or even components of an individual's life, according to their predicted economic or political worth and to maintain these inequalities for surplus extraction.⁵⁰ Adtech doesn't just *discern* differences that exist within an external ground truth; it effectively *divines* differences from a reality of its own making. Many digital media environments engineer situations that produce distinctions among consumers or marketing moments. Adtech packages these as differentiated investments, converting evidence of variation into actionable claims of potential value, formalized for automated decision making. Digital advertising's machine-market configurations flatten the social texture of needs, abilities, and identities into commensurable units of probability and profitability.

Importantly, then, optimization through discrimination is not only a disposition in advertising but also a practical and historical achievement. That achievement depends on the building and maintenance of complementary infrastructures. It requires *technical* capacities to identify and isolate message recipients so that individuals or groups can be addressed exclusively. And it requires *administrative* capacities to make that technical addressability meaningful within business institutions—to buy and sell advertising opportunities in ways that capitalize on precise and dynamic variances in the apparent value of consumer targets or advertising events, while preserving enough standardization to prevent market actors from being overwhelmed by transaction costs and complexities. These ever-evolving capacities constitute the problem space for adtech.

Adtech is an adaptable discrimination engine—a capitalist technoscience producing and exploiting profitable correlations and deviations and operationalizing difference as revenue potential. It is an extension of what Gandy calls the “panoptic sort,” a “complex discriminatory technology” that “considers *all* information about individual status and behavior to be potentially useful in the production of intelligence about a person's economic value.”⁵¹ Crucially, though, that does not mean marketers see people in whole. These are selective and distorted accountings, derived from indices of identity and sociality that are taken to be predictive of behaviors that marketers or platforms can monetize.⁵² This sorting starts from often implicit but always political design choices and assumptions about what it means to be a valuable consumer or citizen.⁵³

TAKING EVERYTHING INTO ACCOUNT

Discrimination implies an eye for detail. A central vector in the decades-long construction of adtech has been the expansion and reformatting of marketers' capacities to account for the elements of reality they care about and to admit those details into strategic calculations. Although we tend to think of advertising and media as creative industries, some of their most important activities mobilize scientific, administrative, and logistical assemblages. This is especially true with the distribution of advertisements—the processes involved in determining what ads are served, when, to whom, and at what prices. Advertising and media industries have been adapting their institutions and infrastructures so that a more comprehensive view of consumers' past and probable behaviors can be meaningfully incorporated into claims about someone's identity, value, and susceptibility to influence. Adtech's profiling, prediction, and decision-support systems recommend whether or how to engage with individuals or "types" of people based on countless data inputs, including the places they go, the websites they visit, the devices and applications they use, the things they buy, and even biometric cues about their personalities or emotions (although simple proxies for race or gender may overpower other signals). These data provide a basis for configuring media users, sometimes just momentarily, within computable consumer categories.⁵⁴ Automated agents acting on behalf of the companies that buy and sell access to consumers process these data and continually adjust their estimates of how much each advertising opportunity is worth. Surveillance, analytics, and algorithmic trading in advertising all help expand the "frame" of rationality—increasing the inventory of events, attributes, and relationships that can be taken into account when assessing choices, making decisions, and executing transactions.

The whole project of using management science to optimize advertising starts from these efforts to better account for consumers' behaviors and profitability. The goal, in a sense, is to enclose the sphere of consumption within the scope of corporate management.⁵⁵ That way, consumers—who exist outside of companies' direct control—can be incorporated into the quantitative models designed to represent and inform marketing processes. These models format consumers as probabilities and patterns that can be condensed into commensurable units of value, leveraging what Luke Stark calls

“an investment in applying calculability to human subjectivity.”⁵⁶ Digital advertising depends on accounting methods that make consumers calculable.

Computerization has shaped the backdrop for this strategic science. New information technologies seem capable of multiplying the phenomena available for measurement, increasing the precision of the resulting data, and amplifying the power to extract actionable insights. This is a threefold expansion of what counts: more sensors are installed in the world, more of reality is quantified, and more of that data matters in planning and evaluation. Not all accounts are treated equally, however. The preferences consumers “reveal” through observed behavior, or the propensities and identities that big-data analyses infer, are often considered more useful than anyone’s own narrative accounts of who they are and what they want. For the most part, adtech’s calculable consumers are produced by and for “machine intelligence.” Individuals may not conform easily to this modeling and management, but failures have tended to motivate additional investments in invasive measurement and analysis.

Advertisers have committed to this elaborate project in part because they hope it will calm one of their deepest anxieties. The problem of *attribution*—isolating the relationship between advertising and consumer behavior—has haunted marketers at least since turn-of-the-twentieth-century magnates such as John Wanamaker worried that a sizable portion of their advertising had no measurable effect on profits. This uncertainty, and the dedication to taming it, inspires ongoing schemes for collecting data that could help marketers identify the people most likely to be valuable and then “close the loop” between advertisements and sales. The intention is to verify which marketing actions contributed to marketplace outcomes. Attribution implies both *taking* account (recording market-related events) and *giving* account (making claims about advertising effects and return on investment). The credibility of these accounts rests on the capacity to follow a consumer’s path to purchase—or, at least, to know what ads a person saw and what things they bought. This means that these moments and events must be visible and available for analysis. Important parts of the digital media people engage with every day have been designed to generate massive evidence of consumer existence.

A historical look at attribution shows us that surveillance capitalism’s data extraction imperative, as Zuboff calls it,⁵⁷ is not only about predicting

behavior but also about enacting and confirming it. As Gandy points out, the instrumenting of marketplaces with intensive feedback mechanisms has served “to provide critical information about the extent to which advertising and promotional efforts have produced their desired effects on consumers.”⁵⁸ Surveillance advertising reflects the dream of determining advertising’s influence on sales—where “determine” means both to control and to ascertain.

Advertisers’ attribution anxiety has sustained frantic aspirations of omniscience and stimulated demand for the information and services provided by ad agencies, management consultants, audience ratings firms, data brokers, today’s platform giants, and the new retail media networks that leverage large merchants’ customer relations and sales databases. One of the most alluring claims that Meta, Google, Amazon, and, to some extent, companies like Walmart make to advertisers is that they witness critical parts of the customer journey within their “walled gardens.” They can give fuller, more convincing accounts—of behavior, value, effects, correlations, and probable futures—than other attention merchants and choice architects. Producing a constant stream of information about how people use media and behave in marketplaces, these platform companies live out a situation Marshall McLuhan saw taking shape. “The new human occupation of the electronic age has become surveillance,” he said in a 1972 interview. “Whether you call it audience rating, consumer surveys and so on. . . . Espionage at the speed of light will become the biggest business in the world.”⁵⁹

DREAMS, DESIGNS, AND AFFORDANCES

A sociotechnical history of marketing and audience manufacture is a study in the imaginaries, institutions, and infrastructures of a data-intensive form of capitalism. Developments in advertising open a window into the expanded authority of computation and quantification in economic, political, and cultural life. Advertising was certainly not alone in this process, and it built on earlier and larger tendencies,⁶⁰ including surveillance and management techniques implemented to commodify enslaved people.⁶¹ By the early twentieth century, some advertising professionals gazed longingly at the calculating ethos already developed in insurance, credit reporting, and other areas of American business that had been measuring, modeling, and risk-analyzing populations since the nineteenth century.⁶² That ethos received an added technoscientific and geopolitical imprimatur after World War II. The hegemonic

thrust of capitalist democracy reframed labor-capital relations as a collaboration to expand participation in a consumer society where citizens were defined by their purchasing power and marketplace choices. The production and management of consumers linked America's largest corporations, the advertising and public relations agencies they paid to engineer hospitable political and economic cultures, emergent vendors of digital technologies and information services, and a cadre of researchers employed by prestigious universities and bankrolled from the deep pockets of the military-industrial complex. Sciences of war were repackaged as authoritative but ostensibly neutral sciences of optimization, and they were integrated into advertising and marketing and the media industries they financed.

For well-placed actors, these changes in advertising's calculative capacities provided resources for telling stories about the future. Information technology and management science became harbingers of progress toward optimal economic activity. Caitlin Zaloom identifies a similar dynamic in financial markets. She shows how the promise of new electronic equipment created opportunities for trading spaces and procedures to be reconfigured in ways that better approximated economic principles of efficiency and rationality.⁶³ Likewise, from the late 1950s onward, advertisers, media buyers and sellers, and marketing researchers mutually accommodated computers and transactional routines to the goals of facilitating more rapid and expansive data analysis and rationalizing decision making. Each exciting advance created openings for advertisers to demand more and for agencies and media to promise better.

This book showcases a succession of moments when advertisers or the companies serving them looked around and asked: How can we take advantage of new technologies and sciences? How can we exploit an information revolution? Advertising professionals treated new technologies or scientific tools as not-quite-blank screens for projecting capital's hopes and dreams, tinted to accentuate the importance of their own expertise. Anything that seemed to afford better knowledge and management of social relations could be animated as a mechanism for delivering efficiency, rationality, and optimization.

Across the second half the twentieth century, industrial discourses rallied around a set of affordances that tell us something about how marketing—the circulatory system of capital—viewed information, technology, and society. Advertisers, agencies, and other intermediaries tried to define new technologies' potential by associating them with imagined abilities that stand out

now as the most salient features of digital adtech: programmability (automation), addressability (discrimination and personalization), shoppability (interactive commerce), and accountability (measurement and analytics). The advertising industry exercised this repertoire to make sense of technological possibilities across a range of settings, with mixed results. An archaeology of these affordances—showing how they have been repeatedly and flexibly attached to new information technologies and techniques—offers insight into both continuities of logic and priority and new articulations of power. It provides a view of “disruption” that is not about the reversal or demise of an established order but about opportunities to seize a potential future where existing relations are deepened, extended, or accelerated.

CHAPTER DESCRIPTIONS

Chapter 1 describes the state of the art in digital advertising to illustrate some logistical and epistemological dimensions of adtech. Chapter 2 introduces the idea that advertising has undergone a calculative evolution and identifies an inflection point in that evolution in the 1950s and 1960s, associated with computerization and the influence of management sciences. The chapter then surveys earlier historical examples of calculative cultures in US advertising. Chapters 3 and 4 focus on the midcentury inflection point to show how operations researchers and management scientists sold advertisers on the promise of determining advertising effectiveness and helped agencies develop mathematical models to formalize decisions about where to advertise and how to spend clients’ money. The four subsequent chapters examine the set of affordances introduced above. These ideas and developments have been interwoven to some extent and are therefore threaded throughout the book. But each chapter is devoted to one of the potential abilities and the actors and activities orbiting it.

Chapter 5 historicizes programmability—efforts to automate media planning and buying. From a midcentury management paradigm preoccupied with “systems” and “efficiency,”⁶⁴ many imagined a future where computers and algorithms could be programmed to select advertising placements with speed and precision exceeding human capabilities. Automation made it seem possible to accelerate the flow of information and the pace of transactions. These ideas gave certain professionals and businesses the leverage to assert power and expertise. In particular, this discourse channeled

advertisers' existing demands for better data and more rational management and aligned those priorities with the technological and scientific authority of the media planning and research departments at large advertising agencies. Those departments accentuated the computational nature of their work, tethered their status to computers, and claimed to be best positioned to make the most of those expensive machines.

Chapter 6, on addressability, examines initiatives for producing an audience of one. Computerization and market segmentation combined to intensify efforts to zero in on the people expected to be receptive to advertisers' messages. By the 1970s and 1980s, cable TV operators were installing "addressable" systems that connected set-top devices in subscribers' homes to computer databases and control centers at cable distribution facilities. This allowed operators to identify and discriminate among individual households at a technical level. Addressability was intended to restrict unauthorized access to premium channels or exclusive content, but advertisers, cable advertising sales departments, and set-top box makers recognized the ability to isolate a specific device for targeted messaging and collect granular data about viewers. Addressability is fundamentally a technology of discrimination, specifying inclusion or exclusion. The chapter focuses on efforts by cable operators' sales representatives to market this capability to national advertisers—efforts which prefigured some foundational elements of internet advertising. Addressable cable advertising was a trial run in operationalizing the individual as a salable unit of audience.

Excitement about cable television and telecommunications also included a fixation on interactive shopping. Chapter 7 explores how shoppability has been used to frame the future of new media systems. Although laptops and mobile devices are the taken-for-granted gateways to e-commerce today, for thirty years, virtual shopping was imagined as the domain of interactive TV. This chapter documents efforts to engineer interactive and, specifically, transactive capabilities into the technologies and business models supporting entertainment and information services. Shoppability exemplifies what Vincent Mosco calls "pushbutton fantasies," discursive constructions that, "explicitly or not, seek to occupy the image space that people turn to when they think about what the new information technology means."⁶⁵ The prospect of "selling Jennifer Aniston's sweater," which became a recurring slogan in the advertising and television industries, encapsulates the pinnacle of this dream—that viewers could instantly purchase items appearing in programs

and advertisements by clicking a button on their remote controls. The chapter shows that ideas about connectivity to electronic marketplaces surfaced repeatedly in discussions about the convergence of media technologies and industries. Although cycles of hype and frustration punctuate this history, “buy buttons” are now fixtures of online advertising, from YouTube to Instagram to TikTok. The shoppable feeds of popular influencers carry on the dream of selling Jennifer Aniston’s sweater.

Chapter 8 examines accountability—meaning, literally, the ability to take into account. Because this theme has been a constant presence in talk about what information technologies make possible, the chapter spans the whole second half of the twentieth century. Calculating return on advertising investment is an overarching goal that motivates much of the strategy and action shaping adtech. Attribution—making claims about advertising’s effects on sales—requires vast arrangements for collecting, processing, and analyzing information. These claims are rarely airtight, but the will to determine return on investment helps draw a dominant share of digital commerce toward Google, Meta, Amazon, and other companies that track people across the purchasing process. This is the production of consumers at its data-driven zenith. It is the sales effort reimaged as an automatic sales engine.

WHAT A NIGHTMARE

By now, readers may be feeling a desperate sense of foreboding. Both boosters and critics sometimes portray digital marketers as all-powerful puppet masters. But in many ways, the story that follows is one of ambition persisting through repeated disappointments. The list of debacles is long and growing. It is commonplace for web users to be stalked by ads promoting things they don’t want or already bought. Programmatic advertising involves so much invisible human labor that critics call it “programmmanual.” Advertisers obsess over efficiency while they collectively lose tens of billions of dollars a year buying fraudulent inventory and paying mysterious fees to adtech vendors.⁶⁶ An early attempt at using interactive television to let viewers order pizza was so expensive to operate that one observer wondered whether it would have been cheaper to pay someone to bring pizzas to each subscriber’s home and wait for them to get hungry.⁶⁷ Claims of optimization exist in a haze of marketing hype—from the service providers who want to lure clients and investors and from the clients who want to impress executives

and shareholders. And, as Meta often demonstrates, companies can project a veneer of technocratic rationality while their leadership flails through a muck of politics and public relations.

The spectacular failure of schemes to optimize advertising has renewed existential reflection. Does advertising work at all? Does data-driven advertising work any better? For more than a century people have fought to answer, or avoid, these sorts of questions. Lately, some researchers and writers have claimed to expose the embarrassing secret that the effects of advertising are probably small, sometimes negative, and always difficult to prove. That's nothing new. The advertising industry has always assured worried publics—especially policymakers—that advertising informs but never manipulates people (although media companies and ad agencies tell much different stories to their customers). The novel claim from today's skeptics is that data-driven advertising, despite its high-octane artificial intelligence, is less powerful than people believe. It's mostly just snake oil, more artifice than intelligence.

This debate is interesting, sometimes scandalous, but mostly beside the point I want to make. Regardless of whether specific ads shape individuals' behaviors, the commitment to data-driven advertising shapes the social environments, the information environments, and even the built environments people encounter every day.⁶⁸ And it has done so for decades. The purpose of this book is not to answer the question does data-driven advertising work; it's to show that the dream of data-driven advertising is *doing* work. Efforts to predict and produce evidence of advertising effectiveness have motivated extensive investments in data extraction and analysis and helped cement surveillance and discrimination into the culture of modern business. The problem, in other words, is not just that Google and others claim to know what you will do next, but that countless companies are willing to pay them to find out. Adtech sells the ideal that Frey imagined back in 1961: with enough information, advertising experts can determine the return on every dollar they spend.

These commitments—to optimization, to identifying and exploiting finer profit opportunities, to making better predictions and decisions—have all helped build a world that marketers can count on: where media systems serve commercial priorities and quantify the elements of reality that all sorts of businesses and influencers want to manage. Chasing this dream has foreclosed other possible futures. Even if designs to optimize advertising feature plenty of pure fantasy, alternative ways of mediating

social worlds have been overwhelmed by the habitual recruitment of digital technologies as means for accelerating the circulation of commodities and turning almost any observable signs of life into information products or assets. Despite all the skepticism about data-driven advertising's efficacy, that critical reflection has done little to unsettle the behavioral and management sciences that underwrite adtech from their place near the center of US research, policymaking, and business education. The economics profession hands out Nobel Prizes for the ideas adtech implements, and elite universities reproduce an influential class of optimum seekers, feeding graduates into tech companies that interlock with all sectors of the economy and the state and essentially sell management science as software platforms and information services. Critics who want to dismiss data-driven advertising as humbug need to contend with the larger, cross-institutional life of these ideas and practices. And while the growing currency of privacy as a regulatory issue and branding strategy may pour cold water on adtech's behavioral data gold rush, the zeitgeist is not finished with optimization, so struggles to control these circuits of information, culture, and capital will continue.

Surveillance capitalism is not inevitable. It has taken considerable effort to move society in this direction. But surveillance capitalism is not a disruptive reversal of the capitalist media and marketing systems of the twentieth century. It is an intensification of the orienting mission they have clung to for decades: to extend the optimizing power of management science to the commodification of everyday life—in other words, to produce consumers. The heinous social failures all around us go well beyond anything media reform can achieve on its own—failures of intersectional justice, environmental action, and democracy writ large. Adtech and social media are by no means singular causes of these cascading crises. Nevertheless, an organized response to current problems must include, among many political battles, a radical departure in the design, ownership, and control of media and information systems. Our means of communication, culture, and sociality need to be shaken from capitalist dreams of selling the American people and adapted to the messy but vital work of supporting public life. As we battle on, let's keep in mind Armand Mattelart's warning, still poignant thirty years later: "Marketing pursues its mad dream: to predict behaviour and maybe manage to control it. To penetrate the secret of the black box of the 'consumer.' For the future of the democracy of daily intercourse, one can only hope that the day on which they find the key . . . is far away."⁶⁹

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