Selling The American People: Data, Technology, And The Calculated Transformation Of Advertising

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Selling The American People: Data, Technology, And The Calculated Transformation Of Advertising

Abstract
This dissertation tells the history of a future imagined by advertisers as they interpreted and constructed the affordances of digital information technologies. It looks at how related efforts to predict and influence consumer habits and to package and sell audience attention helped orchestrate the marriage of behavioral science and big-data analytics that defines digital marketing today. My research shows how advertising and commercial media industries rebuilt their information infrastructures around electronic data processing, networked computing, and elaborate forms of quantitative analysis, beginning in the 1950s. Advertisers, agencies, and media companies accommodated their activities to increasingly calculated ways of thinking about consumers and audiences, and to more statistical and computational forms of judgement. Responding to existing priorities and challenges, and to perceived opportunities to move closer to underlying ambitions, a variety of actors envisioned the future of marketing and media through a set of possibilities that became central to the commercialization of digital communications. People involved in the television business today use the term “advanced advertising” to describe a set of abilities at the heart of internet and mobile marketing: programmability (automation), addressability (personalization), shoppability (interactive commerce), and accountability (measurement and analytics). In contrast to the perception that these are unique elements of a “new” digital media environment that emerged in the mid-1990s, I find that these themes appear conspicuously in designs for using and shaping information technologies over the course of the past six decades. I use these potential abilities as entry points for analyzing a broader shift in advertising and commercial media that began well before the popular arrival of the internet. Across the second half of the twentieth century, the advertising industry, a major cultural and economic institution, was reconstructed around the goal of expanding its abilities to account for and calculate more of social and personal life. This transformation sits at an intersection where the processing of data, the processing of commerce, and the processing of culture collide.

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SELLING THE AMERICAN PEOPLE: DATA, TECHNOLOGY, AND THE CALCULATED TRANSFORMATION OF ADVERTISING

Lee McGuigan

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For my family and friends
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This dissertation tells the history of a future imagined by advertisers as they interpreted and constructed the affordances of digital information technologies. It looks at how related efforts to predict and influence consumer habits and to package and sell audience attention helped orchestrate the marriage of behavioral science and big-data analytics that defines digital marketing today. My research shows how advertising and commercial media industries rebuilt their information infrastructures around electronic data processing, networked computing, and elaborate forms of quantitative analysis, beginning in the 1950s. Advertisers, agencies, and media companies accommodated their activities to increasingly calculated ways of thinking about consumers and audiences, and to more statistical and computational forms of judgement. Responding to existing priorities and challenges, and to perceived opportunities to move closer to underlying ambitions, a variety of actors envisioned the future of marketing and media through a set of possibilities that became central to the commercialization of digital communications. People involved in the television business today use the term “advanced advertising” to describe a set of abilities at the heart of internet and mobile marketing: programmability (automation), addressability (personalization), shoppability (interactive commerce), and accountability (measurement and analytics). In contrast to the perception that these are unique elements of a “new” digital media environment that emerged in the mid-1990s, I find that these themes appear conspicuously in designs for using and shaping information technologies over the course of the past six decades. I use these potential abilities as entry points for analyzing a broader shift in advertising and commercial media that began well before the popular arrival of the internet. Across the second half of the twentieth century, the advertising industry, a major cultural and economic institution, was reconstructed around the goal of expanding its abilities to account for and calculate more of social and personal life. This
transformation sits at an intersection where the processing of data, the processing of commerce, and the processing of culture collide.
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Introduction

From now on, please consider that every time that you see an ad, someone like me working for a company like mine has made a conscious effort, using incredibly sophisticated research, computer software, and analytics, to put it there and to reach out and touch someone just like you. As the buyers of time and space, in some sense we control what TV programs you get to watch, what magazines continue to get published, and how Google and Yahoo! stay in (very healthy) business. It’s a simple Faustian bargain that you’ve made, but one with enormous implications.

– David Verklin, then-CEO of Carat media-buying agency

The advertising industry chases a dream. It dreams of pairing the cultural force of national brand advertising with the precision and accountability of direct marketing. Perhaps nothing stirs imaginations more than the possibilities for television. By capitalizing on the data resources available in digital environments, many people working in advertising, marketing, media, and information technology industries hope to reorganize the television business in ways that depart from its historic structure but also approach the purest expression of its underlying commercial logic. Video advertising is being remodeled to target individual viewers, based on data-mined insights and predictions about their behaviors, and to attribute subsequent purchases to the influence of specific persuasive missives. Advertisers hope to calculate and increase their returns on investment (ROI), while programmers and video service providers aim to manage and maximize yield from advertising inventory. Advocates of this arrangement are trying to steer video advertising toward data-driven, “audience-based” buying—a new phase in ongoing efforts to disaggregate or re-sort mass audiences in ways that are useful for advertisers and profitable for the firms that package and sell them. Brokering the exchanges between these parties is a growing sector of intermediaries licensing consumer data, trading-desk software, and other surveillance, analytics, and optimization services that promise to help companies make better decisions and

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1 David Verklin and Bernice Kanner, Watch This, Listen Up, Click Here: Inside the 300 Billion Dollar Business Behind the Media You Constantly Consume (Hoboken, NJ: John Wiley & Sons, Inc., 2007), x-xi.
improve performance relative to their competitors. Collectively these companies imagine the
dawn of “advanced advertising,” a recent term of art in the TV business that stands for a set of
general and, I will argue, longstanding strategies for leveraging information technologies to
monetize individuals’ interactions with news and entertainment. While the video business is
trying to replicate capabilities already established in facets of internet marketing, the relationship
between television and the advertising industry helped forge a model—and a dream—for the
digital world.

This dream was not conjured overnight. The commercial media that have predominated
America’s information environment for the past century were shaped around advertisers’ desires
to produce consumers and consumption—that is, to influence people toward conforming, within a
flexible range, to habits, lifestyles, and ideologies that support the profitable existence of these
companies.2 Other values have competed against this priority, of course, but credible historical
accounts illustrate that the production of consumers has been an organizing principle across print,
broadcasting, and electronic media industries.3

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2 See, e.g., Dallas W. Smythe, “Communications: Blindspot of Western Marxism,” Canadian Journal of
Political and Social Theory 1, no. 3 (Fall 1977): 1-27; Herbert I. Schiller, Mass Communications and
Overview,” Mass Communication & Society 1, nos. 3-4 (June 1998): 175-94; Graham Murdock,
“Producing Consumerism: Commodities, Ideologies, Practices,” in Critique, Social Media and the
William Leiss, Stephen Kline, Sut Jhally, Jacqueline Botterill, and Kyle Asquith, Social Communication in

3 A range of authors have advanced variations of this point in different historical contexts. See, e.g., Stuart
Ewen, Captains of Consciousness: Advertising and the Social Roots of the Consumer Culture (New York:
Basic Books, 1976); Dallas W. Smythe, Dependency Road: Communications, Consciousness, Capitalism,
and Canada (Norwood, NJ: Ablex, 1981); Susan Strasser, Satisfaction Guaranteed: The Making of the
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Culture: Magazines, Markets, and Class at the Turn of the Century (London: Verso, 1996); Roland
Marchand, Advertising the American Dream: Making Way for Modernity, 1920-1940 (Berkley: University
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America (Chicago: University of Chicago Press, 1992); Thomas Streeter, Selling the Air: A Critique of the
Policy of Commercial Broadcasting in the United States (Chicago: University of Chicago Press, 1996);
Joseph Turow, Breaking Up America: Advertisers and the New Media World (Chicago: University of
Chicago Press, 1997); Mark Andrejevic, Reality TV: The Work of Being Watched (Lanham, MD: Rowman
The selling function presided from the outset over “the age of television.” In a 1957 address to the San Francisco Ad Club, the director of merchandising and promotion for a broadcast 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.” He joined a chorus of influential contemporaries in proclaiming television’s central importance to a consumer economy. Just three years earlier, as television penetration was about to cross the threshold of majority in U.S. homes, venerated management theorist Peter Drucker suggested that new technologies had transformed the practice of corporate management. Rather than supplying markets with the goods to match buyers’ demands, Drucker argued, “[management] must create customers and markets by conscious and systematic work. Above all, it must focus continuously on creating mass purchasing power and mass purchasing habits.” Drucker regarded television advertising as a form of “automation” for producing consumers, and he insisted that technological advancements in marketing and distribution would be as significant to the industrial system as the mechanization of manufacturing.


This dissertation is about “selling the American people.” When the station executive spoke these words in 1957 he was coaching advertisers to use television in marketing their goods and services to the public. Inadvertently, his syntax also evokes a set of processes and markets through which media audiences are produced, packaged, and sold to advertisers—what Fernando Bermejo calls “audience manufacture.” Turning the statement’s flexibility to our advantage, this study is concerned with both sides of this coin.

Clearly these operations have exploited and reinforced the cultural and commercial prominence of mass media. But while researchers and theorists have long acknowledged that audiences are manufactured, existing scholarship does not fully reveal how the production of audiences, consumers, and markets has depended upon and urged forward the importance of information, computer processing, and networked communications throughout the entire political economy. More than 80 years ago, John B. Watson, a pioneer of behavioral psychology and a longtime employee at the world’s leading ad 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,” Watson wrote. Ever since, and with increasing urgency, advertisers, their agencies, and many species of data brokers

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and analysts have scrambled to occupy that position, leaning on a scaffold of information technologies.8

Over a much longer period than we typically appreciate, related efforts to predict and influence consumers’ habits and to package and sell audience attention helped orchestrate the marriage of big data and behavioral science that defines digital marketing today. Especially throughout the second half of the twentieth century, participants in the advertising industry collectively imagined, appropriated, and reconstituted themselves around new abilities to manage information and commercial relationships. Responding both to the difficulties of coordinating an increasingly complex and data-intensive marketplace, and to perceived opportunities for advancing closer toward the ambition to determine advertising’s impact on sales, these actors came to envision the future of marketing and media through a set of possibilities that would be central to the commercialization of digital communications. Across more than six decades, efforts to reengineer advertising around 1) automation and optimization, 2) personalized targeting, 3) instant electronic shopping, and 4) vastly expanded capacities for observing and analyzing consumer behaviors have added up to a transformation in media and marketing. In many ways, these developments set blueprints for internet commerce.

This argument revises existing scholarship on advertising and new media. Historians remember the late 1950s as the start of a “creative revolution” that reshaped the profession and cultural resonance of advertising in the United States. The agencies representing national brands crafted new identities, rejecting bureaucracy, science, and other values from the preceding “organization” era. I argue, however, that this moment also marks an inflection point for an equally profound trajectory in the opposite direction. Across the 1950s and 1960s, the advertising industry began to rebuild its information infrastructures around electronic data processing, networked computing, and more sophisticated forms of prediction and analysis. Advertisers, agencies, and media companies accommodated their activities to increasingly calculated ways of thinking about consumers and audiences, and to more statistical and computational forms of judgement. Consumer research, direct marketing, and media buying were all elevated in stature as advertisers and their agencies used information resources to discriminate risks and profit opportunities more precisely. By the 1960s these and other actors had envisioned the possibility to reorganize mass media around more efficient, rational, and automated systems for managing consumers and monetizing audience attention—and already they were enlisting algorithms and other mathematical techniques to execute these designs. Over a matter of decades, a commitment to more detailed accounting of consumers’ past and probable behaviors moved gradually into the very heart of the sales effort and the digital media landscape. The escalation of quantitative strategies by marketers and “attention merchants” helped create conditions for both the public sphere and the intimacies of personal experience to be penetrated by computational and economic approaches to knowing, designing, and managing social worlds.

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By foregrounding information, logistics, and calculation in a study of how strategic actors interpreted the commercial potentials of new technologies, starting with the electronic computer, I uncover a history that complicates received wisdom about the relationship between digital media and marketing. It is widely believed that technological changes beginning in the 1990s have revolutionized advertising, forcing companies to become accountable and data-driven. A flood of recent commentary credits internet firms with orchestrating a coup by which quantitative “Math Men” have usurped from creative “Mad Men” the mantle of power in advertising and commercial media industries.\(^\text{11}\) Scholars have marked this shift as well. Referring to algorithmic means for channeling the attention and activities of consumers online, a 2016 book describes the prevailing logic of media platforms as a form of “calculative culture.”\(^\text{12}\)

Without disputing the entire diagnosis, I demonstrate that this is part of a much longer historical process, begun well before the dawn of the Web. I argue also that the melding of behavioral science and data analytics at the center of this development is not a sudden and exogenous disruption but, in fact, an intensification of perennial efforts to increase control, efficiency, and predictability in selling the American people. A calculative culture did not arise from the platform economy dominated by Google and Facebook; it began evolving much earlier, as the imperative to know and influence consumers was articulated to post-War visions of a socio-economic framework founded on the processing and organization of information.\(^\text{13}\)


\(^{13}\) For an insightful analysis of the “imaginaries” that animated notions of an “information society,” see Mansell, Imagining the Internet, especially chapter 3. See, also, Daniel Bell, “The Social Framework of the Information Society”, in The Computer Age: A Twenty-Year View, eds. Michael Dertouzos and Joel Moses (Cambridge: MIT Press, 1979), 163-211; Jorge Reina Schement, “Porat, Bell, and the Information Society...
Viewed this way, efforts to sell audience attention and, as Armand Mattelart put it, to “understand the black box of the consumer...[and] sound out the process of consumption” seem to provide a persistent motive force in the economic, cultural, and technological changes often attributed to digital convergence and rise of the internet. In chronicling the history of audience measurement techniques, a veteran media researcher reached a provocative verdict in the 1980s: “If, as the futurists state, we are entering an age to be dominated by information production and use, we can certainly point to electronic media ratings as being in the vanguard of that development.” This dissertation takes that proposition seriously. As an organizing priority for commercial media, selling the American people has been an engine for the development of methods and tools to extract, store, manage, analyze, and circulate data, and for the spread of informational resources, as both commodities and means of commodification, through the capitalist political economy.

In the following pages I introduce the conceptual and historical points of entry for my research, provide a warrant for this study, and outline the subsequent chapters. I begin by describing my institutional and information-centric orientation for understanding audience manufacture.

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14 Mattelart, Advertising International, 213.
Audience Manufacture

Data-driven methods for constructing, knowing, and managing reality have achieved remarkable currency across institutional settings.\textsuperscript{17} Developments in marketing and audience manufacture throughout the second half of the twentieth century open a window into the expanded authority of computation and quantification in parts of economic, political, and cultural life. Much of what defines and enables digital advertising belongs to this longer history of using information technologies for control in administration. Techniques and instruments for orchestrating the transactions and information flows involved in exchanging commodity audiences have helped chart a path toward what people today refer to as a “data-driven society,” or, more critically, as informational, cybernetic, or surveillance capitalism. A sociotechnical history of audience manufacture is also, therefore, a study in the imaginaries, institutions, and infrastructures of a data-driven form of capitalism.\textsuperscript{18}

A decisive contribution toward numerical decision-making in commercial media industries came from the introduction of electronic computers and data-processing technologies, beginning in the 1950s. Immediately, many organizations and individuals recognized that computerization would be of enormous importance in selling the American people. Tim Wu


recently called Arthur Charles Nielsen the “grandfather of today’s data geeks,” and with good reason. As historian Karen Buzzard explains, “A.C. Nielsen played a pioneering role in advancing the science of marketing and advertising by aiming his service at reducing the cost of moving goods from factory ultimately to the consumer.” The A.C. Nielsen company (ACN) “was part of a rapidly growing sector of the economy known as the ‘information’ industry, which helped to align production, distribution, and consumption in a changing industrial society.” As a leading provider of information about media usage, ACN was “an extensive and early user of IBM equipment,” employing punched-card machines to tabulate audience ratings since the late 1930s. In 1948 ACN contracted with the creators of the ENIAC—“America’s first full-scale electronic digital computer”—to purchase from them “the first commercial adaptation of the Univac Electronic Computer.” While this $500,000 order went unfulfilled, Nielsen’s initiative, followed soon by major advertising agencies, suggests that audience manufacture and market research stand alongside insurance, credit reporting, and other industrial processes that have been inseparable from developments in computing, data collection, and statistical techniques for knowing the past, predicting the future, and managing risk in the breach. The ENIAC emerged from efforts by engineers at the University of Pennsylvania to automate calculations of ballistics tables; it is irresistible to point out that the trajectory of marketing since then has been

23 “Nielsen Reports,” Broadcasting, September 6, 1948, 34.
characterized as a shift from a “shotgun” to a “rifle” approach. The goals, in both cases, are to anticipate the position of a moving target and to chart the flight of an intercepting missive.\(^\text{24}\)

Owing perhaps to our fascination with the current state of the art, we seem to forget that marketing and audience-making have always been information-intensive. The buying and selling of audiences, the placement of advertisements, and the efforts to quantify media exposure and correlate it with shopping behaviors all occasion enormous informational and administrative burdens. At least since the 1960s television advertising has involved more logistical complexity than the label “old media” admits. Keeping track of available inventory; defining and locating consumer targets; “trafficking” paid ad-units into a schedule; routing, cueing, and inserting the correct spot in the proper slot; negotiating prices; measuring audiences; settling accounts—these are just a few key elements in advertising transactions, executed through a complex assemblage of bureaucratic tools, techniques, and practices that order workflows within and across organizations. Simply deciding how to allocate expenditures has required marketers to invest in information resources. In explaining why media planning alone would ensure a permanent role for electronic computers in the advertising industry, an executive from the J. Walter Thompson agency acknowledged the difficult calculations puzzling him already in 1969. “The number of reasonable plans that can be designed to fit a particular plan and budget,” he admitted, “are

\(^\text{24}\) “As [Dallas] Smythe put it, ‘the shotgun is being superseded by rifles.’” William H. Melody, “Audiences, Commodities, and Market Relations: An Introduction to the Audience Commodity Thesis,” in The Audience Commodity in a Digital Age, eds. Lee McGuigan and Vincent Manzerolle (New York: Peter Lang, 2014), 27. It is worth noting that theories linking information, communication, and control, as well as “systems” approaches to engineering and management, migrated from weapons research into commercial applications in the mid-twentieth century. Thomas P. Hughes, Human-Built World: How to Think About Technology and Culture (Chicago: University of Chicago Press, 2004), 82-94. For more on the ENIAC, see Edwards, The Closed World, 49-52.
almost unlimited.” Any suggestion that the strategic importance of data is unique to our “new” digital media environment is not supported by historical evidence.

Furthermore, I proceed from an understanding that commodity audiences themselves are informational products, brought into existence through conventions, instrumentation, and routinized exchange relations. Commodity audiences are produced by historically specific and usually standardized ways of defining, observing, quantifying, and evaluating viewers’ behaviors and attributes. Audience manufacture involves making viewers visible to measurement instruments and constructing protocols to make the extracted data—the evidence of audience attention—intelligible and legitimate for those who would buy, sell, or act upon it. Changes in how information is organized and how transactions are processed do not just impact this market, they effectively reconstitute it. Information technologies shape the basis of decision-making among buyers and sellers by representing the market in specific forms. Analyses which ignore the ways of seeing and stabilizing “attention” that render it as an exchangeable commodity run the risk of mystifying the institutions and infrastructures supporting a “marketplace for attention.”

Much like in commodity futures trading, new information technologies and techniques have provided actors with resources for reimagining and reengineering audience manufacture in ways that come closer to economic ideals of rapid and “optimal” judgements. These developments give us a chance to consider more generally the mutual shaping of commerce, culture, and technology. Some social theorists have advanced an understanding of markets as architectures for “formatting calculative agencies.” In other words, markets are assemblages of technologies, practices, rules, organizations, and cognitive frameworks that produce economically “rational” thought and action. A key element in this process involves “framing” objects and relationships so as to set boundaries around what is admissible for the purposes of economic calculation and exchange. What portion of reality will be taken into account, and how will it be “known” and represented in commerce? The definition of consumer segments and the commodification of audiences likewise involve setting boundaries around what can and will be meaningfully accounted for. What counts as audience attention? What elements of identity can be discerned and used to classify someone for marketing purposes? I will show that advertising and media industries recognized developments in information technology as opportunities to expand and reformat their capacities for calculation.

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28 Caitlin Zaloom, *Out of the Pits: Traders and Technology from Chicago to London* (Chicago: University of Chicago Press, 2006); Caitlin Zaloom, “Markets and Machines: Work in the Technological Sensoryscapes of Finance,” *American Quarterly* 58, no. 3 (September 2006): 815-837. Consider similarities between finance markets and audience markets: both trade in futures, both products are abstract and intangible within the exchange relation, and both depend on information technology to constitute and represent the market to buyers and sellers.  
Marketers and “attention merchants,” as Wu calls them, have been working across decades to operationalize the individual as a target—to make identifiable persons (or profiles) the basis for planning, executing, and evaluating their attempts to influence behavior and to “valorize consciousness.” Comprehensive efforts to catalogue habits and attributes that can be factored into predictions about how an individual will act in marketplaces have amounted to what a *New York Times* reporter described as mapping the “consumer genome.” The result has been a contradictory process in which marketers have tried to expand the frame of calculation to take into account every discernable personal quality or experience, but, at the same time, the recording and processing of those experiences formats reality in particular ways—typically as numerical data that are machine-readable and suitable for algorithmic decision-making. As a data scientist at IBM explains, his mission to achieve complete personalization in marketing requires that the consumer be converted into “something [he] can reasonably apply math and computing to.”

The advertising industry, a major cultural and economic institution that exerts structuring influences on many of the organizations, devices, and environments that mediate our encounters with people and ideas, has reconstructed itself around aspirations, and material tools and practices, to expand its abilities to account for and calculate more of social and personal life. This transformation sits at an intersection where the processing of data, the processing of commerce, and the processing of culture collide.

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32 The “valorization of consciousness” is a term introduced by Sut Jhally and Bill Livant, “Watching as Working.”
In general, then, this research confronts a familiar theme. It tries to document and make sense of how advertisers have designed or accommodated new or existing technologies as part of their efforts to reach the right person, with the right message, at the right moment. But my topic and approach bring forward new historical details and potentially novel analytical insights. In a move that I hope will clear some new lines of sight for a critical political economy of media and technology, I conceptualize audience manufacture as a set of technical and administrative infrastructures for generating, processing, and coordinating flows of information and commerce. By approaching ad-supported media industries, even in the broadcast era, as sociotechnical arrangements designed (and redesigned) to negotiate challenges of metrology, knowledge, prediction, and logistics, we open to scrutiny a host of subterranean technologies, relationships, and modes of organization through which various sorts of information are produced, made meaningful, and used to motivate or justify decisions. Like the commodification of grain and risk, audience manufacture has “set quite a bit of paper in motion.”36 Google, Facebook, and other “ad tech” and data brokerage firms have consolidated power precisely by building themselves into logistical utilities—organizations that digest information, orchestrate transactions, and link those processes.

When we recognize audiences as informational products, we can see that selling the American people is, and has always been, a massive effort in datafication—in rendering more types of behavior in forms that can be observed, counted, classified, analyzed, and commodified. The process engages a vast connective tissue, comprising scientific paradigms, professional routines, communication facilities, and bureaucratic technologies, as well as the social scientists, statisticians, engineers, accountants, clerical workers, sales and procurement staffs, and corporate managers who animate these arrangements. These actors are searching almost constantly for

resources or strategies to cope with the challenges engendered by datafication and the manifold pressures to accelerate and streamline workflows. The appropriation of computerized data processing has made a decisive contribution to those efforts, shaping conditions of possibility for quantification, calculation, automation, and personalization to become increasingly central to advertising and commercial media.

Borrowing a phrase from Richard Ohmann, I regard this transformation as “the result of particular human efforts to negotiate difficulties and seize opportunities.”\textsuperscript{37} The empirical basis of my argument is drawn from an historical investigation of what has come to be called “advanced advertising,” introduced above. As an inherently relational and aspirational concept, it provides a unique view of how the advertising industry incorporated new technologies within visions about how to negotiate difficulties, seize opportunities, and “advance” toward its highest ambitions.

**Advanced Advertising: Imagining a Better Future**

The dream of advanced advertising described at the outset of this chapter provides an entry point into a broader story about efforts to achieve the existential priorities of ad-supported communications: to produce consumers and to verify and maximize returns on advertising investments. A range of predictive, surveilling, and analytical techniques have been enlisted to advance this mission and to calm advertisers’ central anxiety. The problem of attributing sales outcomes to specific promotional campaigns has haunted marketers at least since turn-of-the-twentieth-century magnates like John Wanamaker and William Lever worried that portions of their advertising outlays generated no measurable profit. This uncertainty, and the persistent desire to overcome it, have motivated considerable investments into schemes for collecting and analyzing data that would, first, help marketers isolate the individuals or groups most likely to be

\textsuperscript{37} Ohmann, *Selling Culture*, 13.
valuable customers, and then ultimately “close the loop” between advertisements and sales. Pronouncements that new media eradicate this uncertainty have become a commonplace in industry discourse. But this (still-incomplete) potential does not spring from digital magic; it has been engineered through a decades-long effort to manage risk and increase efficiency by improving controls over information and communication throughout the data-intensive and logistically-taxing process of producing consumers. Surveillance, algorithmic predictions and decision-making, and other features that orbit big data as a center of gravity in marketing today are elaborations of dynamics central to the twin dimensions of selling the American people—systematic efforts to influence consumer behavior and the commodification of audience attention.

I grapple with the elaboration of these dynamics by investigating a set of affordances, or abilities, that constitute advanced advertising. These are programmability (automation), addressability (targeting), shoppability (e-commerce), and accountability (measurement and analytics). As I will explain in the next chapter, an affordance is the potential for action a person or an organization recognizes in a resource. Investigating affordances allows me to take a sort of archaeological stance, to excavate ideas and strategies that spill across settings, surface in different guises, and become articulated to different technologies—including relatively unsuccessful ones. Long before anyone used the term “advanced advertising,” people were imagining and designing ways to advance advertising. My study starts from the initial computerization of advertising and market research industries in the 1950s, a development which both responded to existing priorities and demands, and also catalyzed new ways of thinking about

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38 The old saw that “I know that half of my advertising budget is wasted, but I’m not sure which half,” is a touchstone for much of what is discussed in this study. The phrase is usually attributed to John Wanamaker, but others, such as William Lever, are sometimes credited with saying it. See Joseph Turow, *Niche Envy: Marketing Discrimination in the Digital Age* (Cambridge, MA: MIT Press, 2006), 21; Mattelart, *Advertising International*, 213.

marketing, media buying, and audience construction. Tracing the history of advanced advertising through its embryonic forms and motivating logics, we find actors envisioning and reaching toward arrangements that could foster and exploit the perceived capacities of information and communication technologies to remake audience manufacture around verifiable ROI.

As we uncover evidence of these affordances and logics, it is hard to escape the conclusion that the history of “digital advertising” begins much earlier than we typically admit. To say that digital technologies enable unprecedented capabilities for tracking, targeting, and nudging individuals is true enough. But across more than half a century, the industrial production of consumers—and specific efforts to generate, process, and coordinate flows of information and commerce toward that purpose—beckoned, shaped, and reacted to technologies that now facilitate internet advertising’s sophisticated expressions. Since the 1950s in particular, advertisers and their agents have been honing more calculating mindsets and techniques. “When the internet came along,” Joseph Turow argues, “media buyers saw its interactive environment as terrific terrain for expanding their numerical understanding of audiences—and for using the measures and labels [they had developed to evaluate and classify consumers] directly to sell products.”

It might be reasonable to argue, then, that the internet did not create digital advertising, but instead collective pursuits of the values underlying advanced advertising shaped the digital environments we experience today. Programmability, addressability, shoppability, and accountability are, indeed, the defining elements of how internet and mobile advertising are now understood. As we will see, these capacities were envisioned, pursued, and assembled throughout most of the history of commercial broadcasting in the United States. It is often claimed that big data and digital surveillance transformed advertising; this dissertation forces us to consider causal forces acting in the opposite direction.

This argument runs counter to much of the discussion and scholarship about “new media.” Recent analysts have argued that a wave of digital technologies quite suddenly disrupted long-stagnant pools in advertising and video entertainment. But a closer look—one that focuses not on consumer-facing devices, textual production, and private reception, but rather on the logistical media and administrative practices that hold these industries together—reveals that the backwaters of ad-supported communications systems have been churning for decades. An article in *MediaPost* recently pointed out what many take for granted, that over the past decade or so “the [audience] marketplace has grown incredibly more complex, thanks to the proliferation of new media options, sources of data, and importantly, systems for managing and processing advertising buys.” The first two of those developments have been subject to countless scholarly treatments; the latter has been scrutinized hardly at all. And yet these so-called “ad ops” or “ad tech” underpin audience fragmentation and datafication, extend further back historically than supposed new-media disruption, and represent a pivotal connection with broader developments in informational capitalism. Long before video content was being encoded and transmitted digitally, the administration of audience manufacture was being reformed to accommodate networked, electronic facilities for processing information and transacting commerce. Companies like Google and Facebook represent the flowering of seeds planted decades ago; but, so far, the computerization of advertising and media buying has not been subject to an adequate critical account. I will to begin to remedy that.

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By taking the administrative and logistical elements of information, communication, and commerce as seriously in an investigation of new media and convergence as we do texts, personal electronics, and private consumption, we cast the emergence of digital advertising in a different historical light. We also gain a clearer view of profound developments that have been incompletely acknowledged. As a concentrated expression of ambitions underlying the media-marketing complex, advanced advertising provides a useful object for focusing in on a broader suite of historical developments which I will refer to as a calculative evolution in advertising and marketing.

The Creative Revolution and the Calculative Evolution

As mentioned earlier, the late 1950s mark the start of advertising’s “creative revolution.” But at almost the exact moment when commercial artists like Bill Bernbach began to redefine the public image of Madison Avenue, advertising and media industries embarked also on a different trajectory, a calculative evolution, in which individuals and organizations leveraged, redesigned, or invented an impressive array of technical and administrative capacities for improving control, efficiency, and predictability in the processes of selling the American people. Even as the symbols and stories produced by the ad industry seemed to disavow the “scientific” sales techniques and organizational values that had prevailed in the first half of the twentieth century, advertising was being consolidated within a comprehensive and integrated approach to marketing services. This actually deepened agencies’ commitment to managing consumer demand and motivated them to assemble and mobilize any analytical weapons that might help them advance this sales effort more systematically. Advertisers and their agencies embraced computerized data processing, networked communications, and statistical techniques to manage an increasingly complex media environment and to advance toward ambitions of calculation and control.
Through this development, many tactics, mindsets, and metrics from direct marketing—and, more generally, from operations research, systems engineering, cybernetics and surveillance, and financial management—were brought toward the center of the entire advertising system, elaborating the media-buying and research functions in the process. Turow cogently analyzes the social implications of advertisers’ and media organizations’ efforts to “search out and exploit [ever finer] differences between consumers.” Such segmentation strategies are one part of what I see as a more general effort to use information-processing technologies to identify and exploit ever finer profit opportunities throughout the many processes involved in producing consumers. As an intensification of historical developments, related also to the expanded importance of information, communication, and commercial surveillance throughout a networked market system, this calculative evolution has provided conditions for digital advertising and marketing to take shape and to claim a crucial role in the development and future of data-driven capitalism.

If the creative and the calculative advanced mostly on separate tracks after the late 1950s, a defining feature of our current moment, and the significance of developments in the 1990s toward this eventuality, lies is the recombination of these forces. The creative revolution posited individuality and difference as core values, creating a dynamic engine for consumerism. After an uneven struggle to operationalize those values within marketing and audience manufacture, the commercial shaping of online and mobile media represents the accommodation of individuality and difference within the frame of measurement, calculation, and meaningful rational action. In other words, databases, personal technologies, pervasive and precise tracking, and the analytical capacities to activate more and more data in making rapid discriminating judgments are all part of a calculative infrastructure. That infrastructure supports marketers’ efforts to account for

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43 Turow, Breaking Up America, 4.
uniqueness of experience, moments of creative expression, and subtle distinctions among identities and lifestyles, and to capitalize on a consumer culture animated by these values. The digital media environment has, in no small part, been engineered to enclose more of daily life within the boundaries of accounting and calculation—to operationalize individuality and mobility as the bases for marketing and audience manufacture.45

**Contemporary Relevance**

Recent and ongoing developments provide a strong warrant for this study. Apart from historical interest, it is relevant to current public issues. The calculative evolution of advertising and marketing has been part of, and often an engine for, developments in the mediation of social life that have had profound and, in some cases, quite monstrous consequences.

By integrating behavioral science and big data, marketers have built formidable technologies of social discrimination and control. Behavioral data science has developed reciprocally with the structure of digital media environments. Today, information provision, social services, and other essential aspects of citizenship and cultural participation are very often mediated by devices and platforms that afford pervasive monitoring and analysis of users’ behaviors, as well as algorithmic manipulation of content or interfaces to enhance strategic advantages for the organizations that own, operate, or sponsor parcels of those environments.46


Consolidating and leveraging data resources—both data themselves and the tools, techniques, and know-how involved in generating and exploiting them—has become indispensable to profit-strategies for marketers and companies across economic sectors. Despite claims that consumers have been empowered by the diffusion of information-retrieval and data-processing technologies, the massive and granular patterning of personal habits has yielded asymmetries that put individuals at a substantial disadvantage.\textsuperscript{47} As Callon and Muniesa write, “Facing the consumer are a multitude of professionals armed with computers, studying his or her movements and calculating margins down to the last cent or gram.”\textsuperscript{48} The eager embrace of neuroscience by marketers leaves little doubt that data power, and the broader field of behavioral influence, tilts decidedly toward corporate and state actors.\textsuperscript{49}

Mutual transformations in advertising, commercial media, and information technologies have been motivated by a desire to become more discriminating and calculating in recognizing profit opportunities. Efforts to leverage data and technology toward this purpose have reinforced the authority of quantitative and computational judgement, shaped the architecture of media and market settings, affected the circulation of ideas and stories in public spheres, and legitimized a paradigm of persuasion that exploits cognitive and habitual vulnerabilities.\textsuperscript{50} That the visions of


\textsuperscript{48} Callon and Musiesa, “Peripheral Vision,” 1238.


development discussed herein are filtered, in large part, through managerial, engineering, and behavioristic ways of seeing the world indicates the priorities at stake and the room for negotiating complex social issues. Few normative propositions are offered, except an unquestioned commitment to efficiency and economic growth. Yet some of the dangers are becoming clear. For example, critics have observed how the incentives prevailing in industries that traffic in clicks, likes, shares, and other indices of attentive behavior can encourage and amplify antisocial forms of interaction. The proliferation of disinformation, propaganda, and hateful invectives on social media (and elsewhere) has made it hard to ignore the troubling externalities of a business built to generate and valorize evidence of audience attention. Even beyond the structural tendency for commercial journalism to court sensationalism, the recasting of advertising as an engineering problem to be solved through automation and data processing has further evacuated the civic mandate from news media. As content is decoupled from the sale of audience impressions, and as ad tech intermediaries siphon as much as half of publishers’ advertising revenues, the hollowing out of news organizations has accelerated from an already precipitous decline. Considering advertising’s transition from a creative industry into a data-
driven business, one pundit called the implications of this shift “deeply sinister – not only for the consumer but for democracy itself.”

An historical perspective provides important insights into our current situation. I hope that by examining how we arrived at this point, we might gain a fuller understanding of the dynamics at the heart of these developments and find firmer ground from which to proceed toward a more just vision for societies saturated with information and digital technologies. As Dallas Smythe insisted, the industrial production of consciousness provides an entirely inadequate basis for achieving something like “fully human life.”

**Summary of the Arguments**

To summarize so far, in this dissertation I will develop three main lines of argument. First, I will show that selling the American people has always involved intensive demand for information, data processing, and communication facilities. This challenges the assumed contrast between “legacy” and “new” media, and it forces us to revise our historical understanding of when and how the “math men” presided over the merger of behavioral and data sciences that typifies today’s personalized and algorithmic media environments.

Secondly, I argue that demand for data and communication resources, to confront administrative burdens and to work toward the goal of verifying return on investment, helped catalyze developments in the capture and analysis of information which have shaped and been shaped by the rise of digital media. Elements that huddle around data-driven capitalism—including surveillance, automation, and predictive analytics—contributed to and benefited from efforts to increase control, efficiency, and rationality in marketing and audience manufacture. To meet various challenges and aspirations, actors appropriated information technologies and often

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53 Leslie, “The Death of Don Draper.”
54 Smythe, *Dependency Road.*
framed their trajectories within mindsets and strategies that have had lasting effects, even if those trajectories have been followed more gradually than advocates hoped. “Advanced advertising” is nothing if not a set of constructs for imagining and understanding the commercial potential of new technologies.

Finally, I argue that advanced advertising is one part of an unnoticed—or at least unnamed—transformation of advertising and marketing that I am calling a calculative evolution. This intervention amends the received history of advertising by demonstrating that the period typically identified with a revolutionary flowering of creativity, beginning in the late 1950s, is also a key moment when new ways of using and thinking about information and computing catalyzed a parallel but generally diametric tendency toward quantification, calculation, and administration. These latter developments have been no less transformative than the better-known creative revolution, especially in relation to the digital infrastructures supporting economic, cultural, and political life in the twenty-first century.

The calculative evolution is complex, entangled with other historical dynamics, and less cohesive than a single term seems to suggest. Still, the name gives us some traction for investigating and making sense of a bundle of transitions in the political economy of media and technology across the second half of the twentieth century and up to the present. As computer processing, information technologies, and networked communications were incorporated into advertising and media buying, efforts to imagine and engineer these four “advanced” affordances—automation, personalization, interactive shopping, and accountability—have contributed to structural adjustments in media and marketing environments. The reorganization of the technologies, institutions, and platforms that mediate reality around surveillance, predictive analytics, and a data-driven orientation is a legacy of this history that stretches back into an analog, broadcasting world so often dismissed by analysts today.
Chapter Layout

In the next chapter, I try to flesh out the notion of advertising’s calculative evolution by tracing its historical contours and stipulating some characteristic dynamics. I use this chapter to survey relevant literature and to describe the methods and analytical tools employed to collect and interpret my evidence.

The four subsequent chapters attend to the set of affordances that constitute advanced advertising. These ideas and developments have been interwoven, so to some extent they are all threaded throughout every chapter. But I will try to organize each chapter as an archaeology of an affordance, situating one of the potential abilities, and the actors and activities orbiting it, as the center of gravity. This narrative approach means that the chronology will overlap at times; but, I believe this is the most evocative way to present my argument, and I have ordered the chapters so that the main threads of each story follow in historical sequence. Probing the histories of these affordances helps us not only apprehend the state of the art today; it also provides a window into the underlying values and ambitions that have motivated participants in marketing and audience manufacture to design or make use of increasingly sophisticated capabilities for generating, processing, and coordinating flows of information and commerce.

Chapter Two historicizes programmability—efforts to automate and optimize media planning and buying. Since the late 1950s, a variety of tools and techniques have been developed and put into practice to accelerate transactions, to improve data management, to expand the range of phenomena that can be accounted for in predicting and evaluating marketing outcomes, and ultimately to encourage “friction-free” informational and commercial flows. Programmatic advertising did not emerge from the inherent properties of digital, online media; programmability is a capacity that had to be recognized and engineered into existence, both technically and administratively, and the 1950s and 1960s mark a critical inflection point in this development.
Turow’s *The Daily You* is perhaps the only critical work to broach the computerization of advertising and media buying in more than a few words. Chapter Two digs deeper into this history.\(^{55}\)

In the next chapter, “Addressing the American Person,” I examine the development of institutions and infrastructures necessary for producing an audience of one. Along with more flexible manufacturing and distribution systems, the appropriation of computerized data processing and the emergence of consumer segmentation as an influential marketing paradigm combined to intensify efforts to zero in on specific persons expected to be valuable and receptive to advertisers’ persuasions. The gradual movement toward targeting individual viewers, or *addressability*, is detailed through an historical analysis of spot cable advertising—that is, advertisements inserted by local cable systems. As with attempts to automate media buying, the organizational development of household-level addressable advertising within spot cable has been slow and frustrating, but also revealing of deep-seated ambitions to increase efficiency and control. The focus of the chapter is on efforts by the sales organizations representing cable operators to market hyper-targeted audiences to national advertisers. Readers should recognize the key features of this mission—interconnection and interoperability across systems, granular data about uniquely identifiable subscribers, and infrastructure services for coordinating this complex marketplace—as resembling the salient features supporting the commercialization of the internet.\(^{56}\)

Another defining feature of the commercial internet is its interactive marketplaces. Chapter Four explores how *shoppability* has been used to frame the future of information and entertainment systems since the emergence of cable television. Electronic commerce has settled

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\(^{56}\) For a thoughtful study that looks at how “infrastructure services” facilitated the commercialization of the internet, see Crain, “The Revolution Will be Commercialized.”
around internet-enabled devices and applications today; but, for 30 years, home shopping was imagined as the future domain of interactive TV. This chapter documents efforts to engineer interactive and, more specifically, transactive capabilities into the technologies and business models supporting video entertainment. Shoppability, as much as any of the affordances at issue, exemplifies what Vincent Mosco calls “pushbutton fantasies,” discursive constructions which, “explicitly or not, seek to occupy the image space that people turn to when they think about what the new information technology means.”  

The prospect of “selling Jennifer Aniston’s sweater” encapsulates the pinnacle of this dream—that viewers could instantly purchase the items appearing in television shows and advertisements by clicking their remote controls. Looking historically at the discursive construction of shoppability as an affordance of media convergence, we see how hopes and expectations about ubiquitous connectivity to electronic marketplaces have been operative in decisions about how to build, finance, and regulate information infrastructures in the U.S.

With interactive shoppability, advertisers can insert messages designed to stimulate desire for a product or service into an environment that allows for that desire to be expressed immediately as a purchase. Among its other benefits, this represents the potential for marketers to determine the effectiveness of their efforts. Chapter Five takes up directly this theme of accountability, perhaps the most important and frequently recurring of the advanced affordances. The quest for accountability—for tethering advertising services to verifiable sales impact—intensified considerably since the 1950s, both reflecting and shaping technological and organizational changes. This chapter examines recent efforts to integrate set-top box data with records of shopping behavior to “close the loop” between ad exposure and purchase activity.

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Calculating return on advertising investment is, in many ways, the ultimate and overarching goal that motivates much of the strategy and action discussed throughout this dissertation. As this and other chapters show, attempts to determine attribution precisely call into action vast sociotechnical arrangements for collecting, processing, and analyzing information from a staggering number of sources. While fraught with higher rates of fraud, uncertainty, and charlatanism than many in advertising and media industries would care to admit, the potential to account for ROI—to replace risk with deterministic confidence—is a seemingly irresistible force drawing a dominant and growing share of digital commerce toward Google, Facebook, Amazon, and a few other companies capable of tracking people across (almost) the entire purchasing process.58 This is the dream of perfect control, efficiency, and predictability at its data-driven zenith. It is the sales effort reimagined as an automatic sales engine. The final body chapter, “Data-Driven Television,” confirms that this dream has nestled into the center of the media and marketing universe.

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Chapter One – Outline of a Calculative Evolution: A Review of Theory, History, and Methods

This is, in many ways, a history of the future. My study revolves around the imagination, articulation, and engineering of a set of interrelated affordances, or potential abilities, for refining the production and sale of audiences and consumer data, and for developing more calculated approaches to persuasion. I try to understand the restructuring of advertising and media within mutually shaping dynamics of commerce, culture, and technology.

Throughout the past sixty years, advertisers have enrolled computers and other information technologies within their designs for sophisticated and systematic ways of knowing, classifying, and influencing consumer behavior. Beginning with the introduction of computerized data processing and communication in the 1950s and 1960s, and accelerating with the recognition soon after that cable television services could channel the convergence of entertainment, commerce, and telecommunications, ways of thinking about advertising and audience construction shifted toward putting as much stock in direct marketing and mathematical planning as in creative brand-building. Gradually and in concert with other social developments, more and more of our mediated environments have been recast around marketers’ visions of an advertising system centered on automation, personalization, instant shopping, and expansive collection and analysis of data about media usage and buying habits. Unfortunately, due to a dearth of historical scholarship on administrative uses of computers and information in advertising, and a tendency in contemporary work to associate transformations in commercial media with an internet revolution that began in the mid-1990s, the deep roots of data-driven marketing and the often-reciprocal relationship between advertising and new technologies have remained obscure.

This chapter serves three purposes: it introduces the conceptual tools I use to build my argument; it defines more clearly what I am calling a calculative evolution, including a sketch of
its historical contours; and it details my research methods. The review of theory and methods are straightforward. The historical portion may be unorthodox. It focuses mostly on secondary sources, but also integrates primary evidence. This historical review is important for demonstrating the interconnected dynamics of advertising’s evolution, and for establishing a broad context to frame the more detailed historical chapters that follow.

Situating Affordances

Imagination, anxiety, hope, and hype have been conspicuous elements in shaping technologies. Historians have confirmed as much in the development of broadcasting, cable, and the internet. Analyzing advanced advertising through the lens of affordances, imaginaries, and ambitions is consistent with these approaches to historicizing media. Advanced advertising warrants analysis not only because it looms large in discussions about the state of media today, but also because it has been an aspirational concept, representing a concentrated expression of the organizing logic underlying commercial media. It is defined by perceptions of the technological and commercial potentials for a networked digital media environment.


The concept of affordances was part of an “ecological approach” to psychology proposed by James Gibson, who defined affordances as the possibilities an environment seems to offer an actor, “what it provides or furnishes either for good or ill.”

Gibson suggested that when actors perceive resources, they began by recognizing opportunities for action. Not to be confused with the intrinsic materiality, or material agency, of a technology, affordances exist in a relation between that materiality and the human agencies that interpret the possibilities it enables or delimits. Paul Leonardi conveys this relational view succinctly:

Technologies have material properties, but those material properties afford different possibilities for action based on the contexts in which they are used…Affordances are unique to the particular ways in which an actor perceives materiality…Because people come to materiality with diverse goals, they perceive a technology as affording distinct possibilities for action…[A]ffordances arise when a person interprets a technology through his or her goals for action.

Defined this way, the notion of affordances provides a useful tool for analyzing how situated actors perceive and construct the significance of new information technologies through their needs, priorities, and ambitions. Recently scholars have even referred to “imagined affordances,” emphasizing the often forward-looking and hopeful orientation for identifying or designing a technology’s potential.

I want also to move from an individualistic orientation, and instead situate technology within social and political-economic relations. As Shoshana Zuboff writes, “The logic of [capital] accumulation organizes perceptions and shapes the expression of technological affordances at their roots…Technologies are constituted by unique affordances, but

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5 Nagy and Neff, “Imagined Affordance.”
the development and expression of those affordances are shaped by the institutional logics in which technologies are designed, implemented, and used.”

Consistent with these ideas, I interpret the historical evidence I collected using tools from the social shaping/construction of technology (SST/SCOT). This is a field of historical sociology that demonstrates, among other things, how the meanings and uses made of almost any technology are negotiated in processes of “heterogenous engineering,” involving not just technical matters, but also styles of management, cultural and economic visions, normative assumptions or prescriptions, and political battles. This perspective helps reinforce that affordances do not just reflect material properties of a technology, and certainly they are not neutral and value-free. Affordances emerge from how actors perceive the world, both as it is and as it could be; and new technologies can become physical and discursive resources for building (or denying) the possible futures actors envision.

I want to emphasize further—as adherents to SST/SCOT do sometimes, but not always—that the entanglement of social and technological matters presses in both directions. Technological systems, as Thomas Hughes puts it, are “socially constructed and society shaping.” I observe a process of change that unfolds in these two parts, involving the social construction of technologies and affordances, and the reciprocal shaping of social worlds. At

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8 For an insightful example that resonates with my own study, see Caitlin Zaloom, “Markets and Machines: Work in the Technological Sensoryscapes of Finance,” *American Quarterly* 58, no. 3 (September 2006): 815-837.
times, then, I will find it useful to refer to a *political economy of technology*, to indicate that technological developments are both imprinted by and imprinted upon institutional relations of power. In my historical research I find actors designing or appropriating technological capacities within existing ways of seeing the world, and then reimagining what is possible, and reformulating goals and strategies, in relation to those new resources and any organizations and practices built or adjusted around them. When actors reimagined possibilities for action, in the cases I studied, this was often expressed as the perception of an opportunity to advance toward aspirations that already existed, to some extent, within the institutional logic of ad-supported media. In other words, advertising and media industries accommodated new technologies to existing priorities and ambitions, and they also accommodated their priorities to the potentials attributed to new technologies. Programmability, addressability, shoppability, and accountability were all constructed as technological and commercial possibilities that both reflected and reshaped strategic dynamics involved in selling the American people.

These four affordances are the defining features of digital and online advertising. But as much as this research is about cutting-edge developments, it is more focused on how those edges were sharpened over time. In his study of the managerial revolution in American capitalism, Alfred Chandler writes, “Most histories have to begin before the beginning. This is particularly true for one that focuses on institutional innovation.”\(^\text{10}\) At the start of a long discussion about the topic at issue here, Paul Woidke told me similarly, “To try to understand advanced advertising without understanding television from the 1950s and the 1960s is sort of a fool’s mission, because the background is very important to what happened and how cable developed.”\(^\text{11}\) This study is organized, therefore, as a sort of archaeology of these affordances, examining how certain

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\(^{11}\) Interview with Paul Woidke, February 9, 2018.
possibilities were “recognized” and attached to new information technologies and business processes long before they came to anchor internet-based advertising and marketing.

While data-driven or algorithmic ideologies and practices are abundantly evident today, how we arrived at this state of affairs it is not understood as well as it could be. In explaining the authority of quantitative reasoning in modern society, Theodore Porter demonstrates that this “trust in numbers” developed through historical processes, involving not just technologies, techniques, and theories, but also the social and cultural architecture within which numbers have been made stable, legible, and useful for planning and action. The calculative evolution by which advertising and marketing have been reconfigured into what we recognize today is both a result of and a vessel for the increasing centrality of data and quantification in economic and social life. As a logic of calculation has expanded in and through our media systems and personal technologies, more of ordinary experience has been subjected to bureaucratic, statistical, and engineering ways of seeing, valuing, and managing resources. Advertising was hardly alone in this process, and it built upon earlier developments. But this study shows how the commodification of audiences, and related designs to know, predict, and influence consumer behavior, contributed to this shift, beginning well before the rise of the internet. Efforts to commodify audience attention have helped to shape new media just as much as those efforts have been shaped by new media.

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Commodifying Attention

Few people anymore are surprised to hear that “if you don’t pay for the product, you are the product.” But seldom is it specified how the sausage it made. I will argue that, in fact, these details provide an opportunity to analyze a set of developments that connects the production of audiences and consumers to broader transitions in the culture and political economy of capitalism. This study helps us specify the relationships and processes comprising the widely discussed “marketplace,” “industry,” or “economy” of attention.

Attention is described as a “newly important scarce resource” that sits at the center of value-creation today, especially, but not exclusively, in media and technology sectors.14 As Tim Wu suggests in The Attention Merchants, “the game of harvesting human attention and reselling it to advertisers has become a major part of our economy.”15 There can be no doubt that human attention is among the most valuable resources in existence, and industries that traffic in attention occupy privileged positions in the global economy. But attention does not exist naturally as saleable property.16 To have value in exchange it must be made into a tangible, discrete commodity. At a sociological level, media intervene crucially in allocations of human time, attention, and energy; in industrial terms, media systems deal in commodified information designed to represent those things—evidence of audience attention. This distinction might seem small, but it is important to understand that what is sold here is not a pure natural resource that exists independently of the platforms, devices, or media that attract our attention and the processes for “harvesting” and formatting that attention as something that can be priced and sold

in routine transactions. Evidence of attention is engineered, and it is shaped by the sociotechnical arrangements for generating, packaging, and exchanging it as an informational commodity.

A well-worn adage, often attributed to Peter Drucker, says, “You can’t manage what you can’t measure.”17 If attention is indeed a critical resource, then the technologies and organizations we encounter throughout this story not only manage this resource but help render it manageable—making it visible, countable, and controllable. This suggests that we can regard issues of audience commodification within the very long history of information technology in the administration of economics, politics, and culture.18 Dwayne Winseck recently warned political economists against leaning too heavily on ideas about the audience commodity because of financial declines in many “free” ad-supported media, like newspapers.19 By demonstrating that audience commodification is fundamentally about the institutions and infrastructures supporting systematic efforts to 1) generate and circulate data about media users and 2) observe, analyze, and influence consumer behavior, I show that this perspective is actually crucial for understanding both historical and contemporary developments. From this point of departure, we can begin to see that not only is the audience commodity still a useful heuristic for thinking about the digital media environment, but it also provides a way toward profound questions and insights regarding

information and technology in society, and, particularly, a shift toward a more data-driven form of capitalism.20

**Introducing a Calculative Evolution**

The “creative revolution” in advertising describes a shift whereby new idioms, iconographies, and tropes of hip consumerism reshaped the profession and cultural resonance of advertising in America, turning away from administrative and scientific values that had prevailed up to the 1960s.21 Without denying this development and its significance, I argue that it needs to be understood against a concurrent development I am calling a “calculative evolution” in advertising and marketing. As Turow points out, “lavishing attention on what trade parlance calls the ‘creative’ side of the business leaves out essential aspects of advertising’s social role.”22 By approaching advertising not as the production of commercial messages and campaigns, but instead as a set of relationships that integrates advertisers, agencies, media companies, and market researchers around efforts to accelerate and track the circulation of commodities, we see this history in a different light. Not only do administration and science—and the attendant values of efficiency, control, and predictability—not receded in stature, but they become more integral to the marketing complex in a political economy pervaded increasingly by information, knowledge,

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and communication.\textsuperscript{23} Just by recognizing the media planning and buying functions, and their reorganization around new means of processing and circulating data since the 1950s, we are forced to reach different conclusions than the received history offers about the balance between creative and calculative forces.

I am not suggesting that the second half of the twentieth century witnessed a uniform progression toward more rational economic action. But I am convinced that a bundle of interrelated developments has mutually shaped and been shaped by the role of information and communication technologies throughout the sales effort in capitalism. While the full realities are messier than a single term can capture, the notion of a calculative evolution, I argue, provides a useful tool for making sense of these developments and situating today’s algorithmic and big-data-driven configurations within a longer historical arc.

Before providing a sketch of key historical benchmarks, I want to introduce some defining features of this transformation as I understand it. Three general and constitutive dynamics stand out. By no means have these dynamics won universal supremacy, nor has creativity been eclipsed in full; but they have been powerful vectors across a range of settings. First, the calculative evolution involves pressure to \textit{eradicate the incalculable}. This is a form of rationalization and datafication aimed at reducing, to the extent possible, all relevant variables to standardized and usually quantitative data that can be calculated to yield predictions, risks, or probabilities, expressed with some degree of mathematical confidence. The tendency here is toward eliminating subjective human involvement that could introduce friction or uncertainty into commercial activity. Eradicating the incalculable is part of broader social processes by which

\textsuperscript{23} Armand Mattelart, \textit{Advertising International: The Privatisation of Public Space}, Translated by Michael Chanan (London: Routledge, 1991)
institutions make resources legible for purposes of control, and statistical reasoning has become a trusted and powerful form of administrative judgment.\textsuperscript{24}

Importantly, and on the other side of the coin, eradicating the incalculable has not only meant discounting parts of reality that escape quantification. It also has involved efforts to expand capacities for rendering the world as quantifiable data, such that less and less of reality exists beyond the scope of measurement, accounting, and calculation. “By enhancing the inventory of relations and events to be taken into account,” Michel Callon posits, “marketing tools promote calculations which constantly involve more and more elements and relations.”\textsuperscript{25} The reconstruction of media and marketing environments around surveillance, and the complementary project of building organizational and analytical capacities to make the collected data useful, is perhaps the most prominent expression of this dynamic.

The second and complementary pressure is toward using information technology to identify and exploit profit opportunities that were too fine to apprehend or too fleeting to pursue using only human faculties and analog means for processing informational and commercial flows. Consumer segmentation, just-in-time production, and high-speed commodities trading are related and largely co-extensive developments in the domains of marketing, supply-chain management, and finance. This is not only a matter of crunching numbers and plumbing databases more quickly and thoroughly than before. It also involves breaking apart relationships and practices that seem to harbor inefficiencies or irrationalities. In other words, it is an orientation for recognizing value and opportunity, even if they fall outside of traditional productive processes for


a firm or industry. The delegation of decision-making to machines and algorithms is conspicuous in both the first two facets of the calculative evolution.26

The third dynamic—most specific to audience manufacture—is the effort to verify and maximize returns on advertising investment, using techniques that combine surveillance, predictive modeling and analytics, and behavioral science. John Wanamaker is typically credited with expressing the concern that an unidentifiable portion of advertising expenditure is wasted, producing no discernable profit. In a nutshell, the calculative evolution of advertising has been a gradual, but still-incomplete project of using information technology to set Wanamaker’s mind at ease.

**An Historical Context for Advertising’s Calculative Evolution**

A variety of interrelated forces and conditions both stimulated and responded to this transformation in advertising and commercial media. I aim to situate this shift—commonly associated with the internet and big data—within a longer history of technological and social change. To draw out the mix of change and continuity that leads me to call this an evolution, I will make a partial inventory of key developments. The following functions as a literature review, but also as an attempt to stake out the contours of advertising’s calculative evolution, and so it includes evidence from primary research that advances my argument.

Modern advertising emerged in the late nineteenth century in tandem with a reformation of the United States’ material culture—that is, the networks and associations through which individuals acquired and used the goods, services, and symbolic resources needed for maintaining their bodies, identities, and relationships.27 With new energy, transportation, and communications

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infrastructures mutually shaping a reorganization of production, distribution, and consumption, more and more people used wages to buy branded commodities that were manufactured for and circulated in nationally integrated markets. Efforts to align purchasing habits with the volume and velocity of this expanding industrial system contributed to what Nick Dyer-Witheford calls “a massive project of social engineering—the creation of a consumer society.”

This project both required and generated information, communication capabilities, and new commercial institutions.

Mass retailers came to handle a growing portion of the consumer trade in the cities at the forefront of a “new American culture.”

Among other implications, the problem of establishing trust in relatively impersonal transactions between large merchants and mobile customers buying on credit catalyzed the expansion of a system for commercial surveillance. Personal credit facilitated the rise of consumer capitalism and at the same time enrolled millions of Americans into relationships with institutions and systems for identifying individuals and monitoring their purchasing habits. Historian Josh Lauer shows that “the systematic recordkeeping necessitated by mass credit” had already by the early decades of the twentieth century “produced vast


31 “Borrowing forces us into complex, rigid, and often unforgiving relationships with financial institutions and businesses that demand our personal information and ceaselessly collect data about us. It requires that we enter into bureaucratic systems of identification, record-keeping, accounting, marketing, and consumer research. Whenever we promise to pay we become subjects of intensive surveillance.” Lauer, Creditworthy, 4. Lendol Calder, Financing the American Dream: A Cultural History of Consumer Credit (Princeton, NJ: Princeton University Press, 2001).
reservoirs of valuable information,” which retailers used to analyze buying behaviors and personalize solicitations to customers.32

Credit was just one of many avenues by which scientific management techniques designed to discipline production processes were gradually incorporated into tactics for rationalizing consumption. Methods and organizations for surveying consumers, analyzing product choice and usage, and processing customers through retail spaces emerged as part of diverse efforts to make purchasing-behaviors, and markets in general, more knowable, predictable, and controllable.33 Personal information generated through commercial activities became both a valuable commodity and an input for managing the production and marketing of other commodities.34

Brands and retailers enlisted mass media to promote their businesses and to instruct the public about consumption habits. Constructing media systems around commercial sponsorship generated demand for information about how people encountered advertisers’ messages and how exposure to those messages correlated with shopping, voting, or other activities.35 Pressure to create evidence of audience attention deepened with broadcasting, as reception of radiated

32 Lauer, Creditworthy, 146.
frequencies was even harder to estimate reliably than circulations of print media. Television’s production costs and its institutionally engineered economics of scarcity further fueled demand for data to justify advertisers’ enormous expenditures and the rents extracted by networks.\textsuperscript{36} As an executive from the Ted Bates agency reflected, “Television produced an explosion of information which has required a whole new breed of media men. It generated new universes of research, and each medium produced a blizzard of research to counter the deadly thrust.”\textsuperscript{37}

From the outset, then, audience manufacture and efforts to systematically manage consumption have together been generative of strategies and instruments for observing, analyzing, predicting, and hopefully influencing the behaviors of individuals and publics. Referring to an “information industry” that grew concurrently with the commercialization of broadcasting, one historian of audience research writes, “The single largest category of data provided by the information industry was research on the marketing of products, including the use of the various advertising media to accelerate sales.”\textsuperscript{38} That firms such as CBS, Curtis Publishing, and the A.C. Nielsen company attempted to audit households’ pantries to help advertisers draw inferences about how their expenditures contributed to sales gives some indication of the extent to which market researchers were penetrating the domestic sphere already in the first half of the twentieth century.\textsuperscript{39} (And the failures to maintain and replicate these sorts of services at a viable cost indicates the technical and administrative difficulty of apprehending and taming such complex phenomena.)

The middle of the twentieth century witnessed an intensification of the twin tendencies to integrate marketing across all industrial activities and to marshal more scientific tools and techniques in marketing. Producing consumers and effective demand has always been intimately tied to the development of mass media. “The chief historical basis for advertising,” Dan Schiller writes, “is the pan-corporate need to harness consumption to production.”\(^\text{40}\) The potential problem of excess productive capacity had been seized upon, even before the end of World War II, to argue for the rapid development of television as a marketing technology. An RCA executive told an audience of advertisers in 1944, “We believe that television is the only tool that can increase consumer purchasing of all products to a point that is sufficient to produce a satisfactory national income…Television has the power to create in the minds of the people a greater desire for merchandise than they have for their hoarded cash.”\(^\text{41}\) Five years later, Stanley B. Resor, the president of J. Walter Thompson, warned similarly, “The achievements of American mass production would fail of their own weight without the mass marketing machinery which advertising supplies.”\(^\text{42}\)

As the post-war recovery in the U.S. reactivated industrial capacity for civilian production, a huge volume of goods needed to find buyers. America’s material culture was being remade again through developments in suburban planning, shopping malls, plastics, domestic appliances, and new expectations about style and disposability.\(^\text{43}\) Over the course of the 1950s, advertisers sought to promote habits and expand markets that would absorb industrial outputs and


sustain economic growth. U.S. advertising spending increased from $2.875 billion in 1945 to $9.194 billion in 1955, and it reached $15.255 billion a decade later. This period oversaw the emergence of what John Bellamy Foster and Robert McChesney call a “qualitatively new phase of consumer capitalism,” organized around the tripartite relationship among advertisers, agencies, and media companies, as well as a broader field of “corporate marketing” that encompassed the researching and engineering of consumer behavior, product designs, and sales strategies. Beyond just brokering the procurement of media space or time and crafting sales messages to fill it, the advertising industry began to embrace a fuller “marketing concept” that positioned agencies as stewards of a client’s business and of the U.S. economy in general. AT&T’s vice president for public relations attached an ideological valence to the sales effort, insisting that “marketing…must constantly demonstrate to the nation and the world at large that it plays a vital role in our free society and, indeed, that a free market is one of the principal elements of that society.” Utilizing corporate marketing and ad-supported media as “means of surplus absorption,” the sales effort was a leading force driving new types of surveillance and control, gradually adding “impetus…to the communications revolution, associated with the development of computers, digital technology, and the Internet.”


48 Foster and McChesney, “Surveillance Capitalism,” 2. The authors point to militarism/imperialism and, later, financialization as the other forces deepening capitalism’s reliance on surveillance, control, and communications.
The growing use of computers helped advertisers seek advantages by discerning and capitalizing upon finer distinctions among consumer populations. Soon after its articulation in the mid-1950s, the principle of market segmentation became orthodoxy in American consumer capitalism. Both stimulating mass consumption and sorting consumers into increasingly detailed categories created demand for the services provided by advertising agencies. “By embracing segmented markets,” Lizabeth Cohen writes, “advertisers and market researchers made themselves even more indispensable, as manufacturers and retailers required more sophisticated guidance to sell to a splintered purchasing public than to an undifferentiated one.” More precise and calculating approaches to defining and soliciting consumers advanced reciprocally with intricate means of data analysis, including statistical techniques for variable clustering and factor analysis that still power database marketing today. According to Foster and McChesney, “Marketing evolved quickly in its period of greatest advance in the 1950s into a highly organized system of customer surveillance, targeting propaganda, and psychological manipulation of populations.” By the early 1960s, Leo Bogart could call social science research “an accepted and integral part of the American marketing system.” As proof, he pointed out that, “Vast sums are expended to study the attitudes, preferences, and choices of consumers, and these studies have become increasingly relied upon by business managements in their decision making.”

The advertising enterprise was also adapting to new opportunities and challenges in media industries. With the transition in television toward participating sponsorship, in which advertisers paid for slots in a schedule of programming produced under control of the networks,

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50 Cohen, A Consumers’ Republic, 301. Presumably, Cohen means to include agencies when she says “advertisers.”  
51 Arvidsson, “On the ‘Prehistory of the Panoptic Sort.’”  
advertisers needed to dedicate more resources to selecting and procuring inventory from an expanded range of options and pricing possibilities. The supply side also needed to cultivate abilities to manage and sell inventory effectively. With TV’s shift to the spot format, Adam Arvidsson notes, “the medium generated an increasing pressure for audience segmentation, and hence more detailed research.”\textsuperscript{54} It is common today to hear laments about fragmentation as a recent blight; but media buyers were keenly aware by the mid-1960s that mass audiences were being divided, or “fractionalized,” and they expected television programming would become more customized.\textsuperscript{55} If we start from the perspective of audience manufacture, we recognize ongoing trends as intensifications of much longer processes whereby media buying and selling had to accommodate the complexities that resulted from not just an expanding menu of stations and channels but also an institutional restructuring of how the inventory within each venue would be packaged and exchanged.

Media planning and buying functions were significantly elevated in importance and sophistication across the second half of the twentieth century.\textsuperscript{56} As audiences redistributed themselves across new media options, marketers could no longer assume that indiscriminate TV spending would guarantee to put their messages in front of a satisfactory portion of potential consumers. Allocating a media budget became a much more calculating endeavor. Already by 1959 an agency research director recognized that advertising was responding to rising complexity and the high cost of TV by cultivating more specialized skills and building capacities for “better

\textsuperscript{54} Arvidsson, “On the ‘Prehistory of the Panoptic Sort,’” 462.
thinking and more analytic judgement.” Agencies were also contending with “an avalanche of new research techniques,” such as motivational research and operations research.  

Half a century before such promises were repackaged as “Big Data,” replacing subjective hunches with data-driven probabilities was the purview of operations research, a field of mathematical and engineering sciences that migrated from military applications into the corporate world in the 1950s. Quantitative information became a key resource for “optimizing” operations within and across complex organizations. Media planning and buying seemed like favorable applications for algorithmic techniques, such as linear programming mathematics, designed to guide decision-makers in choosing among a vast array of options.  

As we will see in the next chapter, the investments in electronic computers and innovative communications facilities complemented these developments. Dedicated computer installations made it economically feasible for media and market researchers to use methods of statistical inference that exceeded what human computers could calculate with adequate speed and accuracy. A media executive at the Young & Rubicam agency boasted in 1964 that its computer “enables us to thoroughly analyze infinitely more information than was ever possible before and to manipulate it speedily.”  

The use of computers not only expanded and accelerated information flows, but it also let advertisers see customers and markets in new ways. For example, a member of the research department at J. Walter Thompson explained that leasing an RCA 301 computer system would allow the agency to use “powerful methods of analyzing research findings,” such as multivariate regression and factor analysis.  

To repurpose James Carey’s statement about the

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telegraph, the computer “was not only a new tool of commerce but also a thing to think with, an
agency for the alteration of ideas.”

Ways of thinking about information in society changed dramatically in this period—
perhaps both responding to and encouraging ongoing developments. Theorists of an Information
Economy or Post-Industrial Society recognized information and communications as the bases of a
wholesale transformation of social and economic life. Mirrored closely by recent
characterizations of data as the “new oil” powering the global economy, prominent intellectuals
such as Daniel Bell argued that information was becoming the primary source of value in
technologically-advanced capitalist economies. In a recent examination of how the prevailing
“imaginary” of an information society has shaped conditions of possibility for constructing digital
worlds, Robin Mansell explains that this influential mindset was committed to “particular norms
and values about how the world is, or should be, organized.” She continues,

These norms and values are seen as consistent with the supposed benefits of
technological progress, the primacy of market exchange as the optimal way to solve the
problems of resource allocation, and the perception that it is only a matter of time before
everyone benefits from the evolution of the communication system…Visions of the
ubiquity of these technological solutions are emblematic of their proponents’ hopes for an
information society built upon a technologically-supported, rational, and calculable life.

The notion that the U.S. economy and workforce would be driven by knowledge work fit
neatly with a further integration of advertising and marketing functions into the center of
production processes, from designing products, packages, and sales plans, to furnishing the

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62 Dan Schiller, How to Think About Information (Urbana, IL: University of Illinois Press, 2007); Robert E. Babe,
Communication and the Transformation of Economics: Essays in Information, Public Policy, and Political Economy
(Boulder, Westview Press, 1995); Mansell, Imagining the Internet.
View, eds. Michael Dertouzos and Joel Moses (Cambridge: MIT Press, 1979), 163-211; Anthony G. Oettinger,
64 Mansell, Imagining the Internet, 17.
symbolic or cultural content of commodities—what has come to be called “immaterial labor.”

The commodification of information and knowledge, and the mobilizing of these as factors in production and planning, further altered the nature of services provided by ad agencies, management consultancies, and other stewards of consumer capitalism.

With the networking of the global political economy, advertisers, agencies, and media organizations enjoyed (and struggled to manage) an expanding array of information resources. Along with more granular and accessible census data, the assignment of zip codes in the 1960s facilitated efforts to sort consumers into geo-demographic clusters, most famously in Claritas Corporation’s “lifestyle segments.” Computerized systems for tracking warehouse withdrawals, recording retail sales, and controlling inventories made information about the circulation of commodities easier to generate, store, and transmit. Manufacturers and merchants reorganized packaging, sales processing, and supply-chain management around universal product codes and optical barcode scanning in the 1970s. Expansion of bank-issued credit cards and loyalty rewards programs lubricated consumer spending while also extending the infrastructures for monitoring, profiling, and evaluating consumers. As noted above, a system of payments that hinged on the credibility of a purchaser forged a tight informational link among shopping,

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65 Consider this description of production at Bristol-Myers, a Fortune 500 company making pharmaceuticals and other consumer goods: “This is an operation whose marketing, product development, and laboratory research are all organically related to the requirements and opportunities of advertising. Bristol-Myers does not, in general, develop its products in labs and then determine how they might be marketed. It ordinarily begins with extensive consumer testing and other market research, proceeds from there to develop some concept of a marketing opportunity, including even some notions about advertising campaigns; and only then does it turn to the labs for products that might meet these specifications.” T.A. Wise, “Bristol-Myers Hard Sell,” *Fortune*, February 1967, 120.

66 See Turow, *Breaking Up America: Wu, The Attention Merchants*


identity, and classification. “Without this infrastructure,” Lauer argues, “the modern credit economy and today’s digital commerce would be inconceivable.” 69

Together these constituted enormous and (sometimes loosely) coordinated efforts to track products and people. Such developments depended on and stimulated demand for computing, communications, and database resources. Procter & Gamble’s manager of information services, who oversaw a massive market research department, appreciated the opportunities available in the mid-1980s: “Over the past five years, new ways of reading consumer behavior have emerged, and most are electronic; that will continue. That provides people who study consumer behavior an immense, rich new database.” 70 Reflecting critically almost a decade later, Oscar Gandy characterized these electronic means of monitoring people and triaging them into categories of differential value as technologies of social control. They increased “the ability of organized interests, whether they are selling shoes, toothpaste, or political platforms, to identify, isolate, and communicate differently with individuals in order to increase their influence over how consumers make selections among these options.” 71

The initiative undertaken in the 1950s to divide the mass market into lifestyle and psychographic segments had, by the 1980s, been reiterated as an effort by marketers to identify and carefully manage relationships with their most lucrative customers. As an elaboration of systematic “customer control” efforts dating back to the 1930s, so-called “customer relationship management” relied on databases to record, to the extent possible, every interaction with identifiable individuals and to make quick, programmatic decisions about how to engage them with different marketing communications and quality of service, depending on knowledge of their

69 Lauer, Creditworthy, 5.
71 Gandy, The Panoptic Sort, 2.
habits and their projected value to the firm. With interactive media and new forms of self-service contributing to an increase in the measurable—and mutable—touchpoints between companies and individuals, a “one-to-one” communication environment became a holy grail to which marketers aspired. While this objective has been achieved unevenly, marketers have continued to invest in the capacity to ruthlessly distinguish a valuable “target” customer from one representing a “waste” of company resources. Endorsing the imperative to build holistic profiles of existing and potential customers, a textbook co-authored by an editor of the Journal of Advertising Research declared it axiomatic for advertising executives that “insight about consumers is the currency that trumps all others.” Today, with the near-ubiquity of computer-based sensors in our personal devices and throughout the public and private spaces we inhabit, opportunities to collect information about individuals and populations, and to use that information to try to influence behaviors, continually surpass existing precedents.

An overarching ambition here, especially in relation to the affordances of flexible digital environments, is “dynamic” control of marketplaces. Systems running algorithms against databases of information about past and probable behaviors can automatically and almost instantaneously calculate the “optimal” product offer, message strategy, and even price to be shown to an individual or type of consumer. The theory, for proponents, is that dynamically

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74 Turow, *The Daily You*.


altering commercial venues based on information about consumers can both augment markets’ allocative function—of matching supply to demand—and maximize efficiencies, by pricing items exactly according to each buyer’s willingness to pay. While this rationale may accurately describe many use cases, frequent revelations of discriminatory pricing that disadvantage individuals for unexpected reasons or, worse, that reinforce stratification across different social groups, raise questions about whose interests are “optimized” by a dynamic, calculative marketing environment.77 Electronic computers and, now, mobile media have been enlisted within the marketing complex to refine and accelerate these already cybernetic dimensions of capitalism, a system driven by commodification and accumulation, rather than equality.78

In parallel with the electronic networking of marketplaces, major changes internal to the advertising industry weighed in on the balance between creativity and calculation. In 1960, Marion Harper Jr., the head of McCann-Erickson, formed the Interpublic Group of Companies (IPG), integrating multiple marketing services within a single conglomerate. According to Leo Bogart, Harper was the first advertising executive to posit “accountability” as a core value.79 “The whole idea of accountability is the wave of the future—even a wave of the present,” Harper said in 1962.80 Harper proposed to link agency compensation to sales outcomes—an arrangement which would be enabled, in his view, by the increased availability and quality of information

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about media use and shopping behaviors.\textsuperscript{81} It is crucial to note that this arrangement implies a deepening entanglement of advertising services with the overall operations of client firms and the broader sales effort. Harper was a key figure in institutionalizing marketing communications and thus broadening the purview of “advertising” beyond paid placement of commercial messages, toward comprehensive services for managing the circulation of commodities. IPG deliberately fastened its “integrated marketing communications” philosophy to what it saw as an “information revolution.”\textsuperscript{82}

The economic downturn begun in the 1970s intensified the demand for accountability. “After the creative revolution of the 1960s,” Advertising Age points out, “the pendulum swung back to more serious, hard-sell advertising. Advertisers wanted efficient, effective, empirical campaigns, based on computer-generated research.”\textsuperscript{83} Furthermore, by the end of the 1960s a handful of advertising agencies had become publicly traded companies, responsible to shareholders.\textsuperscript{84} Later, in 1978, IPG merged McCann-Erickson with a London-based agency, inaugurating in full the reorganization of advertising agencies within diversified, global holding companies.\textsuperscript{85} The trend of consolidating advertising, public relations, and market research firms within massive, transnational networks continued throughout the following decades, and the growth of these enterprises proceeded along with demand and supply in ICTs. In its 1986 Annual Report, Saatchi & Saatchi, a major agency driving this process, gloated about how consolidation afforded “superior media-buying clout and better media-buying systems,” as well as greater

\textsuperscript{81} “Harper Proposes Agencies Share in Profits,” Broadcasting, October 22, 1962 32.
\textsuperscript{84} Fox, The Mirror Makers, 263.
\textsuperscript{85} Mattelart, Advertising International, 6. For more on how the major holding companies emerged, see Michael Farmer, Madison Avenue Manslaughter: An Inside View of Fee-Cutting Clients, Profit-Hungry Owners and Declining Ad Agencies (London: LID Publishing Ltd, 2017), 52-56
appropriations for research. More generally, the report claimed, “Power of scale in advertising…means improved global information systems, increased technological resources and increased access to a broad range of communications and consulting experience.”

Consolidation helped to further cement calculation and accountability as central corporate values, prioritized above creative brand-building. The financial engineer at Saatchi & Saatchi, Martin Sorrell, later went on to form WPP into the largest of the marketing holding companies. Throughout the 1980s and 1990s, WPP, as much as any of its ilk, fostered and capitalized on the growth of so-called “below-the-line” agencies that concentrated on direct marketing and sales promotion. The specialized skills honed by these firms were well-suited to ongoing changes in commerce and technology. These agencies were proficient in accounting, and the results of their efforts, such as direct-mail campaigns, were far easier to reckon than were broadcast expenditures. Importantly, “the below-the-line agencies were inevitably wedded to consumer and customer data, and technological and social developments were going to assure that data became more plentiful and powerful.”

Sorrell stands out as an icon of a general emphasis on financial management that helped remake the ad industry along a shareholder-value perspective. The restructuring of agencies since the 1960s has meant tight accounting protocols and pressure to meet profit targets. As management consultants and corporate procurement bureaus gained more influence in American business over the next decades, data resources became increasingly important tools in the hunt for cost savings. And as mergers and acquisitions reshaped the advertising landscape, the need to

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86 Quoted in Mattelart, Advertising International, 51.
87 Farmer, Madison Avenue Manslaughter, 90-91.
“service large debts” left agencies and their parent companies seeking “the most efficient ways to execute the process of media analysis and placement.”

These shifts spurred efforts to refine the media buying function—first to isolate it as a specialized function, independent of creative planning and execution, and then to turn it from a cost into a profit center by exacting efficiencies in procuring audiences. Well before Web advertising and “programmatic” (i.e., automated and data-driven) means for buying individual viewer impressions, we can see an impulse toward decoupling content from advertising opportunities. At a 1982 meeting of the American Association of Advertising Agencies (4A’s), an analyst from Drexel, Burhnam & Lambert, an investment bank (and criminal organization) that helped corporate raiders seize companies and wring out every drop of profit, advised agencies to ignore the quality of TV programs and focus instead on buying cost-efficient audiences, since “the weakest network may provide a more advantageous cost-per-thousand.” Distilling the spirit of this trajectory, an executive from Time Warner’s Turner division said recently, “Agencies, by their nature, were set up for the last 40 or 50 years to buy like machines.”

Both the restructuring of the global ad industry and the consequent shifts in media buying can be seen as part of a broader trend toward “financialization,” whereby the engineering of profitable investment opportunities and the mediation of economic activity by transaction brokers have become major elements in the political economy of capitalism. A recent observer, and a

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88 Robert B. Butler, “Planning for Tomorrow Today,” Broadcasting, December 5, 1988, 20. For more on the interpretation of communications and finance industries in the 1980s, and the implications for management, accountability, and the relative power of media buying agencies within the ecosystem, see Mattelart, 94-96.
92 On financialization, see David Harvey, A Brief History of Neoliberalism (Oxford University Press, 2005), 32-33; Dan Schiller, Digital Depression: Information Technology and Economic Crisis (Urbana: University of Illinois Press, 2014); Mattelart, Advertising International, 93-95; Bellamy and McChesney, “Surveillance Capitalism.”
defender of creativity in advertising, situates Martin Sorrell’s contribution within this wider trend toward calculation:

Largely following his inspiration, Madison Avenue has failed to achieve anything like a proper balance between fiscal strength and responsibility and creative brilliance, coming down firmly on the side of the former. The latter has invariably been the whipping boy with advertising holding companies increasingly coming to resemble the very corporations they serve. The digital era has further emboldened all to gravitate toward the enumerable as opposed to the inspirational.93

The “enumerable” is, indeed, the pole of gravity in advertising. Companies designing and furnishing what Matthew Crain calls “infrastructure services” for digital advertising seem intent on building a machinic assemblage to approach an ideal or optimized marketplace: a transactional architecture for supporting frictionless flows and rapid—almost instantaneous—calculative action. Contrasting the quantitative “ad business” of today’s “math men” with the creative and brand-focused “ad industry” of yesterday’s “mad men,” one author and strategist explains, “The ad business is obsessed with data science, and distrusts the messy stuff of story, image and idea…[I]t seeks to identify the precise moment that a consumer needs something so that it can trigger a sale.” Data-driven, automated media buying, he posits, has become the means by which “every scintilla of attention is transformed into money.”94

Anthropologist Caitlin Zaloom identifies a similar dynamic in her study of how the practices and materials structuring electronic futures trading have been designed to manifest economic principles of efficiency and rationality.95 Her work presents interesting parallels to mine, as both projects examine changes in the technologies for coordinating, processing, and representing a market for informational and future-based commodities. In fact, an article in the

95 Caitlin Zaloom, Out of the Pits: Traders and Technology from Chicago to London (Chicago: University of Chicago Press, 2006).
Harvard Business Review describes the emergence of programmatic advertising as “a change akin to what happened in the capital markets, as trading shifted from open-outcry exchanges to trading on fully automated exchanges.”

As with finance and futures trading, the goal of algorithmic media buying is not new: to use computing power and data resources to identify and exploit profit opportunities that are inaccessible to, or obscured by, human beings and their subjective, social entanglements. The calculative evolution is, in large part, about eradicating the incalculable.

The point I wish to make is that the development of infrastructure services to build markets and coordinate exchange, as well as the appropriation of technologies to realize efficiencies throughout these transactions, have been persistent and structuring dynamics in audience manufacture. Advertising service providers, responding to marketers’ demands, have leveraged certain affordances of the internet’s data communication protocols to construct a business model built around pervasive consumer surveillance and precise behavioral targeting.

What I assert in this dissertation is that, in many ways, these innovations were shaped by pressures, values, demands, and ambitions that have been manifested in selling the American people at least throughout the second half of the twentieth century, and in some ways since the late-1800s. As Inger Stole suggests, “The surreptitious collection of data on consumers to make it possible to better manipulate them is not a product of the internet; it is deeply embedded in the very nature of modern advertising.”

The architects of online advertising are only the latest contributors to the evolution of these technical and administrative infrastructures for generating, processing, and coordinating flows of information and commerce. The computerization of the ad

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industry has been a messy, uneven, but persistent effort to help John Wanamaker sleep soundly at night.

I want to be clear that efforts to subject advertising, marketing, and consumer behavior to calculation and control have not been all-encompassing or uniformly successful. Many ventures have perished along this path, and it is not at all certain that the survivors reliably deliver what they promise. Despite promotional rhetoric, eradicating the incalculable remains a painfully elusive dream. Consider, for instance, that some critics use the pejorative term “program-manual” to point out the still-substantial human resources needed to execute programmatic advertising.99 We should also remember that the disclosures documented throughout this dissertation may be selective and strategic, meant to promote a company, sector, or class of service. As the former director of media research at DDB Needham told me, in reference to the enthusiastic uptake of big-data science in advertising agencies, one consistent force shaping agencies’ services is the desire “to look smart for your client” and be unique from competitors.100 This observation adds support to Michael Schudson’s claim that advertisers’ embrace of psychology has tended to be “ad hoc and opportunistic.”101 Putting it bluntly, one ad sales executive described many apparently scientific advertising techniques as “complete bullshit.”102

But, as I will be at pains to show, these efforts have real consequences. Zaloom explains that while the work of designing systems to approximate economic ideals is never complete or perfect, “the long-standing and ever-changing project of creating purely economic spaces is not merely a fantasy. The drive to improve the conditions of economic action leads to the making and

100 Interview with Kevin Killon, April 30, 2018.
102 Interview with Bruce Thomas, February 2, 2018.
remaking of new technologies, reformed rules, creative calculative practices, and emergent classes of professionals who bring the market into being.”¹⁰³ However dubious and self-serving the science may be, the pursuit of calculation—leveraging information technologies—has been a consistent and forceful vector in the evolution of the media-marketing complex, especially since the mid-twentieth century. Google and Facebook represent the high-water mark of a tide that has been rising for decades. The dream of eradicating the incalculable has been a significant force shaping media systems in society.

**Research Methods**

This dissertation examines how actors and organizations envisioned, discussed, and accommodated developments in information and communication technologies from the 1950s to the present. To understand continuity and change in advertising and media industries, I undertook three methods of investigation: documentary and textual analysis; ethnographic observation of industry events; and interviews with expert witnesses. Across these approaches, I endeavored to “listen in” on conversations about and among the actors relevant to the phenomena under examination.¹⁰⁴

The documentary/textual analysis revolved primarily around industry trade press materials. These sources are useful for charting chronology and accessing otherwise unavailable empirical data about industries and organizations.¹⁰⁵ As venues for “managed self-disclosures,” these publications also provide data about how actors frame matters of concerns, position

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¹⁰³ Zaloom, *Out of the Pits*, 165.
themselves, and envision opportunities and challenges across time. I collected articles first with broad searches in key publications and, then, through a snowball protocol, as I discovered relevant events and actors. This research focused particularly on *Broadcasting/Broadcasting & Cable* and *Advertising Age*, the establishment journals in their respective industries, as well as more specialized outlets, including *Multichannel News, MediaPost, AdExchanger*, and *Adweek*. Materials were retrieved from the Entertainment Magazine Archive and other electronically-accessible databases. Additional documentary materials were consulted during a visit to the Cable Center’s Barco Library at the University of Denver, where I accessed, among other things, technology vendors’ product brochures and issues of *Cable Avails*, a magazine dedicated to the cable advertising business.

A second corpus of evidence was collected through participant observation of industry conferences. From 2015 to 2017 I attended eight events that assembled programmers, cable and satellite operators, technologists, advertisers, media buyers, data service providers, and futurists to discuss video advertising. Sherry Ortner labeled this strategy “interface ethnography”—observing occasions when usually-closed organizations present themselves publicly. Frequently, the discussions at these events are forward-looking, addressing expectations, opportunities, and persistent problems to be solved. While much of this forecasting is speculative and strategic, it provides evidence of the themes around which industry discourse and attention gravitate. The events also provided chances to develop relationships with expert informants.

The third aspect of my research involved semi-structured interviews with participants in the industries under investigation. I conducted 16 interviews, ranging from 30 minutes to more than 5 hours (across three sessions), with people who have experience and knowledge of key

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facets in advanced advertising—media planning, buying, and research, advertising sales, data and analytics services, and cable and advertising technology. Appendix A provides a complete list of interviewees and observed events.

All three of these approaches have strengths and limitations. First, it would be a mistake to accept as fact all that is presented in trade publications and industry events, which operate, in part, as promotional vehicles. However, two advantages of analyzing these discursive sites are: 1) these are spaces in which speakers and writers often assume an audience of insiders who share purpose and vision; and 2) these publications and events tell stories about how industry actors imagine and want to position themselves. Since part of my objective is to capture the industrial logics at work in the construction of technological affordances, these documents and materials provide vital evidence, even if we should always be careful in how we interpret what any actor chooses to disclose.

The processes involved in the calculative evolution, and in advanced advertising specifically, encompass a multitude of actors across industries and sectors. For this study, I concentrated on following those actors most centrally involved in audience manufacture. Advertisers—that is the producers or distributors of branded goods and services—are a constant force throughout the developments detailed herein. The agencies servicing those advertisers’ needs, and particularly the bureaus that handle the planning and buying of media time and space, are another major constituency, and the central focus of Chapter Two. The supply side of the audience marketplace is represented in my study mostly by sales organizations working within or on behalf of exhibitors. These actors headline Chapter Three, about addressable advertising. Audience and market researchers are present throughout the whole study, but they are at the front of the picture in Chapter Five. Equipment makers and software vendors in the ad tech universe are another key group involved across many of the aspects at issue in the study. Importantly, all
this activity unfolds within the structuring presence (or absence) of government and regulation. In its present form, this study may not give adequate attention to issues of law, policy, and formal politics. Moving forward, I hope to make further investigations into the extent to which the specifics of these domains need to take a greater position in the story I am trying to tell. The liberalization of telecommunications and the regulation of data collection strike me as the most important elements, and they will be touched upon occasionally.

A Spot of Departure

This dissertation approaches the history of advanced advertising through a relative backwater—what is called “spot” advertising. In contrast to network advertising bought from distributors like NBC and ESPN, the spot market refers to audience inventory controlled by exhibitors—broadcast stations and multichannel video programming distributors (MVPDs)—and sold either by local sales staffs or by sales firms (or “reps”) that represent exhibitors in transactions with the agencies that buy media for national or regional brands (see Appendix B). Spot advertising is rarely taken seriously in studies of media and culture. Decidedly less glamorous than network advertising, it is usually ignored in critical discussions about advertising—though, as I will show, it has provided a technical and organizational basis for attempting advanced techniques, including household addressability. It is not surprising that spot cable has been dismissed, given that even cable operators have regarded it as profitable but ultimately inconsequential to the core of their business. Spot broadcast, which cast the dye for spot cable, is harder to ignore; taken together, local and national spot spending have rivaled or topped network TV spending. But, again, it has
been relegated behind the glossier image advertising that has elevated promotional communication to a special place in American culture.\textsuperscript{108}

Recent and ongoing developments have forced critical researchers to reexamine the tools we use to analyze advertising and commercial media. One increasingly urgent conclusion from this reflection is that the semiotic approaches developed for understanding the socio-cultural significance of advertising need to be complemented by efforts to focus on the less-symbolic but, perhaps, equally powerful means by which advertising and commercial media facilitate social control. As we peel back the veil hiding digital advertising technologies from public view, it becomes impossible to ignore marketers’ efforts to observe, identify, profile, and influence consumers’ behavioral and cognitive habits.\textsuperscript{109} It is necessary, then, to engage with the logistical and calculative apparatus that support these efforts at both technical and administrative levels. An examination of spot advertising shows that such an apparatus has long been in development at the margins, out of view to analysts concentrating only on the symbols, images, and stories that register more obviously as “culture” than the tools for generating, processing, and coordinating flows of information and commerce.\textsuperscript{110}

Recovering these neglected dimensions of spot advertising reveals a missing chapter in the history of digital marketing. A closer look at spot and cable ad-buying surfaces a set of tools, strategies, and mindsets for coping with and capitalizing on informational resources. Spot advertising might seem simple and mundane, but the process, particularly in cable, depends on a


complex network of relationships and technologies, both for marketing available inventory
(“avails”) to advertisers and for coordinating message insertions in sophisticated ways. It involves
storage, splicing, and server equipment; asset identification, retrieval, and routing protocols;
signaling standards; accounting procedures; and other resource management techniques. I want to
emphasize that these are also constituent elements of digital advertising. While network TV
advertising used creative imagery and massive audience reach to build brands’ identities, spot TV
tracks the gradual incorporation of direct marketing into video entertainment, and with that the
paramount concerns of targeting the right consumer, verifying returns on investment, and
exploiting efficiencies on an increasingly minute scale. The state of the art in selling the
American people has been achieved by refining many elements confronted earlier by broadcasters
and cable operators.

To be clear, I am choosing to zoom in on spot advertising not because participants in this
sector have been wholly successful at negotiating difficulties and seizing opportunities. The point
is that this arena exhibits noticeably the strain of holding together a complex and logistically-
taxing market system, and therefore it also reveals more acute desires for refining that system to
approximate economic values of efficiency, control, and rapid calculative action. The effort to
advance advertising generated demand for information resources no less than it resulted from
their existence. We begin our archaeology of affordances at a time when spot TV was about to
skyrocket, and demands for new means of coordinating that market were reaching a fevered pitch.
Chapter Two – Automating the Audience Commodity: Data-Processing, Optimization, and the Unacknowledged Origins of Programmatic Advertising

The era of the computer is upon us...Our communications future will be an extremely tight web of data exchange.

– Lydia R. Reeve, media director, Foote, Cone & Belding—LA (1966)""""111

When *Billboard* magazine announced that “an era of ‘Automation TV Buying’” had dawned on Madison Avenue, it predicted that “much of the guesswork and crystal gazing in TV” could be eliminated thanks to the “tremendous investment by the agencies and media firms” in expanding their capacities to manage information, process transactions, and integrate more complex variables into media planning and buying. Automation in advertising promised to do more than just streamline clerical functions. A vice president at the Ted Bates advertising agency welcomed a profound advancement in technique that would bring capabilities into better alignment with underlying priorities and ambitions: “Not only will we be able to buy TV faster and more accurately than ever, but we may soon be able to relate television buys to the sales of individual products of clients and come up with rapid data on the sales effectiveness of TV on every station or network in the country.” The article concluded with a comforting assurance that the “mechanization process” would augment rather than eliminate “the human aspect” of media buying. “No machine, all parties stressed, will ever replace sound judgement.”

This notice was published in September of 1957.112 If you except that the “quick-thinking, multi-memoried business machines” being described were mostly UNIVAC 120 punched-card calculators, and that a Young & Rubicam executive marveled at the prospect of

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utilizing “as many as 30 or 40 factors” in TV buying decisions (a modest set of parameters by the standards of big data), this report hardly looks out of place sixty years later.

Programmatic advertising—the use of data and computer processing to automate and optimize aspects of media planning and buying—developed earlier and more gradually than conventional wisdom admits. A leading historian of how American businesses adopted digital computers acknowledges that advertising agencies were “some of the earliest users of the new technology.” Surprisingly, the history of electronic data processing and automation in the advertising industry is almost completely unknown. Excavating this past reveals that the foundation for data-driven, real-time audience buying was built across decades. The fossils of advertising’s evolution can be seen in the use of algorithms to allocate expenditures, in hardware and software for circulating information about available inventory, in trafficking and billing systems that coordinate orders, placements, and payments, in industry-wide efforts to interconnect computing facilities, and in organizational relationships designed to allow more data to be incorporated into media and marketing decisions. A consultant to the ad industry is ahead of scholars in recognizing that “big data” existed without a name for 50 years. “Computer power,” he writes, “has always made it possible for clever people to find and crunch consumer data and draw conclusions accordingly.”

115 Michael Farmer, Madison Avenue Manslaughter, 2nd edition (New York: LID Publishing Inc., 2017), 89. He includes programmatic advertising within his definition of “big data.”
In this chapter I demonstrate that by the time a “creative revolution” transformed messaging and branding strategies in the 1960s, the advertising industry was already becoming more calculating and data-intensive. Though less iconic than the taste-making campaigns that elevated branding to new cultural heights, the computerization of advertising and media buying began earlier, persisted longer, and, arguably, influenced business and society no less profoundly than the creative revolution. This process involved gradual realignments around what now rank among the most salient characteristics of advertising, including an insatiable appetite for data and a deepening entanglement of mathematical, computer, and behavioral sciences. Across the second half of the last century, advertisers and marketers appropriated information technologies in hopes of systematically refining the business of influence and audience-making.

To support this argument, I examine an inflection point in this evolution, finding precedents of modern “ad tech” in the adoption of electronic computer processing by advertising and media buying agencies, broadcasters and the sales organizations (“reps”) representing them, and media and market research firms, beginning in the mid-1950s. My analysis focuses on three main elements in advertising automation over the next two decades. These include efforts to: 1) “optimize” media spending using algorithms and predictive models; 2) accelerate and streamline administrative processes; and 3) establish “on-line” interconnections among buyers, sellers, and related service bureaus that would enable data to be circulated, and transactions to be executed, electronically and instantaneously. We see how the logistical complexities of spot TV buying, in the context of an increasing emphasis on speed, efficiency, and control-systems, precipitated mutually reinforcing developments in data-processing capacity and demand for data resources. Anxieties and skepticism about automation are discussed toward the end of the chapter.116

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116 For more on the leading ideas about technology and engineering during this period, see Thomas Hughes, “Technology as Systems, Controls, and Information,” in Human-Built World: How to Think About Technology and Culture (Chicago: University of Chicago Press, 2004), 77-109.
David Beer has argued recently that critical studies of big data need to examine how a data analytics industry “cultivates a particular type of vision of data and its possibilities.” The present chapter details an early episode in which data processing and algorithmic decision-making were positioned within “imagined futures” in advertising. Media buyers and researchers constructed the meanings and uses of computers to advance their status within the industry, framing advertising problems in ways that called for mathematical and engineering solutions. The result was a sociotechnical reformatting of the advertising industry’s spaces of calculation. This history demonstrates that programmatic advertising was not a consequence of the internet; rather, the development of modern ad tech reflects the deeper-seated desires among advertisers and their agencies to optimize resource management, control information flows, accelerate the speed and precision of commercial activity, and move from uncertainty toward predictability in accounting for returns to advertising expenditures. This chapter uncovers some of the earliest designs for a machinic assemblage to sell the American people.

The Creative and the Calculative

As industrial values, efficiency and calculation were not new to advertising in the 1950s. Science and rationality have been always been pillars in modern advertising’s claims to cultural authority, and over the first half of the twentieth century they came to predominate in professional orthodoxy over the competing impulse toward what Jackson Lears calls the “carnivalesque.” The best-known advertising professionals of the era held to the conviction that their purpose was to sell the client’s product. They believed that with research and discipline, their persuasive techniques could be codified as empirical laws and the effects of their efforts could be verified

with scientific certainty.\textsuperscript{119} For adherents to this mindset, creative fancy and other soft-sell elements that have come to typify brand advertising not only deviated from legitimate principles, but they seemed hopelessly dissociated from the goal of producing a measurable impact on sales.\textsuperscript{120} According to a 1947 article in \textit{Fortune} about the J. Walter Thompson agency, whose president subscribed to both behaviorism and a managerial philosophy centered on science, efficiency, and control, “Thompson wants to sell its clients’ products, not make splashes with individual ads.”\textsuperscript{121}

Thomas Frank argues that in the 1960s, agencies abandoned this spirit and its organizational culture. “The authority of ‘science’ in advertising theory,” Frank writes, had been “diminished considerably by the mid-1960s.”\textsuperscript{122} Frank makes an important contribution to our understanding of how advertisements and management styles exerted forms of cultural power. But he limits his analysis mostly to the production of commercial messages, rather than approaching advertising as a set of relationships and processes that links together advertisers, agencies, media, and related organizations providing research and marketing services. By ignoring media buying and downplaying the broader integration of advertising and marketing (not to mention business uses of computing), Frank fails to recognize that the segmentation of consumer markets that helped catalyze advertising’s reorientation around individuality and difference was facilitated in practice by an intensification of research and calculative procedures. While a loosening of bureaucracy allowed for unorthodox creative expressions that tapped into the zeitgeist of the 1960s, to actually identify narrow audience segments and place commercial messages in front of the right people depended on enormous organizational efforts and a deep

\textsuperscript{119} Frank, \textit{The Conquest of Cool}, 38-47.
\textsuperscript{122} Frank, \textit{The Conquest of Cool}, 93.
commitment to systematic and data-driven planning. Agencies may have retreated from scientific approaches to preparing copy, but they moved decisively in the opposite direction in making and evaluating decisions about allocating advertisers’ dollars. As the Television Bureau of Advertising observed in a plea for more research on commercial effectiveness in 1961, “larger budgets, increased competition, [and] narrowing profit margins demand greater accuracy in recognizing and making each decision in this complex age of possibilities, and insist upon finer measures of this accuracy.”

Advertising Age recalls that unencumbered creative freedom did not even last a full decade: “In the late 1960s, when it became apparent that an economic recession was likely, marketers moved away from image advertising and toward research-backed, results driven strategy.” By 1967 a media buying and research director observed that, in his domain, “With the advent of more research the pendulum [had] swung again to reliance on ‘numbers.’” That same year the president of a marketing firm owned by Interpublic “predicted that selection of advertising media in the future would rely more heavily on the behavioral sciences.” The co-designer of America’s first electronic computer even imagined that sometime between the 1980s and 2010s marketing planning would come to “be handled by a psychologist who is a psychologician of the computer age, fully capable of relating his knowledge of human behavior to the machine”—a prescient, if oddly worded forecast of today’s behavioral data scientists. Even earlier, it was reported, “Creative men are being asked to boil down a minute tv commercial to 30

seconds because of the computer’s search for ‘optimum efficiency’ of an ad budget.”¹²⁸ A calculating mindset was not evacuated from the advertising industries, it simply permeated other areas—ones which gained considerably in power over the next two decades.¹²⁹ No less a creative shop than Doyle Dane Bernbach reorganized its media operations in 1970, citing as one factor in the decision “the marriage of computer systems to media departments.”¹³⁰ The leading trade publication for commercial television went so far as to posit, “The computer will be as important a tool in the business of broadcasting in the 1970’s as the transmitter.”¹³¹

Without denying the significance of a creative revolution, I argue that we must understand the late-1950s and 1960s as an inflection point in an evolution toward calculation, efficiency, and control. Even as advertising’s place in the popular culture became aligned with creativity and hipness, the intensification of a quantitative logic within marketing and media buying slowly transformed the marketing complex in ways that steered the whole enterprise profoundly toward the goal of efficient and systematic behavioral influence that held sway when the computer arrived. The computer did not create the will to calculation in advertising so much as it presented new resources that could be adapted to that purpose. Under continued pressure from advertisers and the shareholders of the major advertising conglomerates, the institutions and infrastructures supporting and shaping the marketing complex were gradually reengineered to facilitate calculation, as much as to promote creativity.

¹³⁰ “Tooling Up for Sharper Buying in the 70’s,” Broadcasting, February 16, 1970, 54-55. In later years, DDB Needham was ahead some larger agencies in installing micro-computers in its offices, and the more open corporate culture encouraged experimentation with computer facilities. Interview with Kevin Killon, April 30, 2018.
Computing, Calculating, Optimizing

An executive at J. Walter Thompson (JWT), perhaps the world’s leading advertising agency, described the computer in 1962 as “a new tool for the human mind, enlarging its possibilities just as the telescope and microscope did.”\(^\text{132}\) JWT was among the first agencies both to acquire a UNIVAC computer from Remington Rand and to announce plans to install a more advanced transistor-based data-processing system. Preparations for the latter equipment—which was leased from RCA, an agency client, in 1963—were overseen by JWT’s assistant treasurer, whose “primary job at Thompson [was] to study the flow of information and documents within departments, between departments, and to clients.”\(^\text{133}\) In addition to organizing routine accounting procedures, computerization sustained hopes about new possibilities for efficiently allocating advertising spending, forecasting sales trends, and conducting market and media research. Perhaps no application of data processing exited advertisers and agencies more than the potential to help them place ads in front of consumers more effectively and economically.

By 1963 the director of media at JWT observed that the “computer” was often being invoked as a metonym for a suite of changes affecting media planning and buying. He claimed that computing, as a generic process, was one element in the larger sweep of “operations research.”\(^\text{134}\) Operations research is a mathematical science of efficiency; it describes uses of statistical tools, such as algorithms and predictive models, to help organizations approach optimal outcomes when confronting complex decisions. It is an example of the “intellectual technologies” for managing organizations and defining rational action which Daniel Bell expected to provide the bedrock for an information economy. Bell saw algorithms that substituted for “intuitive

judgement” being “embodied in an automatic machine or a computer program, or a set of instructions based on some statistical or mathematical formula,” effectively formalizing routine decision-making.\textsuperscript{135} This paradigm moved from military to corporate management in the 1950s, and by the mid-1960s a subfield of operations research dedicated to marketing and media planning accounted for dozens of scholarly articles. For JWT’s media director, operations research was, essentially, “a collective term covering all types of mathematical analyses of business problems: in our case, the problem of allocating media dollars in such a way as to \textit{maximize the return to the advertiser}.\textsuperscript{136}

Maximizing returns to an advertiser is the existential purpose and challenge for marketing communications. Toward this goal, ad agencies, media researchers, and information service bureaus programmed electronic computers to calculate “optimization models.” Expressing values of control and scientific precision, participants in the media-marketing complex hoped to engineer systems that could allocate resources with maximal efficiency. As a marketing professor explains, once the relevant data, assumptions, and parameters have been codified in forms that the computer can digest, “a mathematical algorithm is used to determine the ‘best’ possible media schedule.”\textsuperscript{137}

Examining discourses about how media buyers and sellers accommodated new data-processing technologies into their operations illustrates that managing information and taming complexities were already pressing concerns in audience manufacture in the 1950s, and that visions of the future pointed toward computational techniques for systemically controlling, expanding, and accelerating informational and commercial flows. Some of the earliest efforts to automate and optimize media planning and buying reveal expectations and ambitions that have

been part of durable cognitive frameworks for how many actors have understood or imagined the potential of new information technologies. A closer look at the first halting steps toward optimization also provides a way into the history of computerization in advertising.

“Electronic Brain for Timebuying”

American Research Bureau (ARB), an audience measurement firm which later became a subsidiary of a leading computer vendor, trumpeted an early contribution to “automated timebuying” in 1959.\(^\text{138}\) ARB planned to install the newest UNIVAC model, institute a more comprehensive data collection protocol (nationwide, county-by-county TV ratings), and establish rapid communications channels with advertising agencies. *Broadcasting* reported that this new electronic system “will automatically lay out a complete tv campaign.” ARB’s president, James W. Seiler, claimed that combining this computing power with the company’s ambitious audience measurement system “will fulfill the timebuyer’s dream of a complete information service. It will give timebuyers precise sets of facts to use in placing television advertising.”\(^\text{139}\) With the “data delights” afforded by ARB’s “electronic brain,” to use *Broadcasting*’s terms, audience manufacture could approach economic theory’s ideal market setting: a system of rational, calculative action supported by full and perfect information. “Agencies,” Seiler promised, “will be able to buy spot tv on a completely logical basis.” Anticipation of the UNIVAC and the forthcoming data deluge left the new personnel recruited to work with these resources “indulging in statistical fantasies.”\(^\text{140}\)

By 1961, working with the agency Batten, Barton, Durstine & Osborn (BBDO), ARB and its parent company had “developed, tested and placed into pilot use [a] computer process for

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\(^\text{138}\) ARB was bought by a data processing bureau, C-E-I-R, in 1960, and both organizations were absorbed by Control Data Corporation around 1967.


\(^\text{140}\) “Electronic Brain for Timebuying,” 32.
selecting advertising media.”141 This optimization process used linear programming mathematics—an algorithmic approach for finding maximum or minimum outcomes—to sort through a set of important variables for media decisions. Those variables included a “detailed ‘profile’ of the advertiser’s customers,” information about audiences for various media options, the availability and cost of commercial inventory, and the advertiser’s budget. “With this information,” one report explained, “the computer in minutes examines all possible combinations—which can run into the millions—and comes up with the one which, mathematically, best meets the advertiser’s requirements.”142 While trade sources show no mention of this specific service after just a few years, we can see that from the outset optimization was part of a more widely shared agenda for computerization.

BBDO was a leading combatant in what Broadcasting called “a continuing battle on Madison Avenue to simplify by electronic means the highly complex and often highly subjective act of media selection.”143 BBDO began by hiring ARB’s parent company, CEIR, as an outside computer service, but it soon leased its own machine from Honeywell, a client of the agency, at a cost of $100,000. BBDO’s general manager boasted that the Honeywell installation “will mark the first case in advertising history where an advertising agency has totally integrated its marketing service operations with modern computer equipment.” The agency organized its computer usage around what it called SIMAD, the “system for the integration of marketing and advertising data,” which generated media plans using linear programming, and automated “bread and butter” functions, such as processing orders, contracts, and billings.144

141 “Automation Buying in Pilot Use at BBDO,” Broadcasting, November 13, 1961, 9
143 “Two Big Agencies Pack Electronic Hardware,” Broadcasting, October 1, 1962, 34.
BBDO was one of a growing number of agencies endeavoring to “use high-speed methods to improve the mathematical bases upon which media selection can be made.”\textsuperscript{145} By 1963 a quarter of national television business was estimated to be “handled by so-called computer agencies.”\textsuperscript{146} A study released that year found that 16 advertising agencies were “equipped for automatic data processing,” of which three currently had dedicated electronic computers and eight more had installations scheduled for the near future. At least seven agencies, including D’Arcy, DDB, McCann-Erickson, and Ogilvy, Benson & Mather, procured data-processing services from outside bureaus.\textsuperscript{147} By another estimate, more than half of “the major agencies” were “using or experimenting with computers in media evaluation and selection,” as well as for routine administrative tasks.\textsuperscript{148} Broadcasting reported in June of 1964 that “agency computer usage has tripled” in the preceding 10 months.\textsuperscript{149} An IBM salesman observed two years later, “There’s hardly an agency billing more than $20 million annually that doesn’t have its own computer or use a computer service bureau.”\textsuperscript{150} Thirty agencies spent at least $20 million on broadcasting alone that year.\textsuperscript{151}

Along with BBDO, major agencies setting the pace in digital computerization included Young & Rubicam (Y&R), Leo Burnett, and JWT. In 1960 these firms ranked first (JWT), second (Y&R), fifth (BBDO), and seventh (Leo Burnett) in broadcast billings, accounting for $345 million in combined television spending.\textsuperscript{152} By 1966, they were the top four spenders, doling out more than $646 million on TV for their clients.\textsuperscript{153} They recognized the ability of the

\textsuperscript{145} “Two Big Agencies Pack Electronic Hardware,” 34.
\textsuperscript{148} “Data Processing at H-R in ’64,” Broadcasting, June 17, 1963, 44.
\textsuperscript{149} “A World of Computers Plugged in by Humans,” Broadcasting, June 1, 1964, 30.
\textsuperscript{150} “Are Computers Worth What They Cost,” Broadcasting, June 13, 1966, 42.
\textsuperscript{153} “Top 50 Agencies … And Their 1966 Radio-TV Billings.”
computer to accelerate informational and commercial flows. A vice president at Y&R told an audience of broadcasters, “To us it has the positive advantage of doing tremendous quantities of analytical arithmetic with great speed and complete accuracy. It enables us to make better buys faster with fresher availabilities.” Y&R’s commitment to automation was perhaps the greatest of its early rivals. A study conducted in 1962 found it to be “the only agency making ‘media decisions’ through use of equipment.” Y&R declared itself “in a race to the moon with our competition.” This statement encapsulates the strategic escalation that gripped the industry. By the mid-1960s, consensus held that agencies both required computers but still operated them at a financial loss. The president of a station rep firm characterized the agency situation uncharitably: “At this point they can’t afford not to have them, they’re important in attracting new business, but many agencies have expensive hardware that’s being used for kindergarten purposes.”

Y&R’s equipment was undeniably expensive. The agency spent $1,000,000 to purchase a UNIVAC in 1960, and two years later it installed a cheaper IBM 1620, leased for $25,000 per year. By 1966 it was renting a Burroughs B5500 for $28,000 a month, under the supervision of a data and systems division created two years earlier. Y&R was also committed to graduating beyond kindergarten. It tried but soon abandoned linear programming, claiming the approach was incapable of contending with all the variables the firm considered relevant to media selection. Instead, Y&R adopted what it called a “High Assay Media Model,” developed in consultation with a professor at Columbia University who specialized in operations research. Basically, the high assay technique involved a set of iterative instructions, or algorithm, that told the planner how to spend an advertising budget. It was programmed to recommend maximum investment in

156 “Y&R, BBDO Unleash Media Computerization,” Advertising Age, October 1, 1962, 118
157 “Are Computers Worth What They Cost,” 43.
158 “Are Computers Worth What They Cost,” 43.
what was defined as the “best” option available before moving on to other options. The firm described the technique as analogous to “gold mining”: “Think of the mines as being different media, and the gold as sales prospects.” The high assay principle, then, was to mine all available gold from the choicest medium—that is, the most cost-efficient vehicle for meeting a target—and then move to the next best choice. Y&R’s director of data and systems explains, “the high-assay model goes as far as advising what markets to buy, what media to buy in them, how much of each to buy and when to buy.” The model would not go so far as to recommend a particular spot on a specific station.

By the mid-1960s, more and more agencies were taking steps in this direction, imitating or extending the efforts of BBDO and Y&R. McCann-Erickson, for example, developed something called the “marketing communications investment decision analysis systems.” The agency described it as “a highly sophisticated and completely computerized system for comparative media analysis and allocation of advertising investment.” In an even grander effort, ten agencies, including Ted Bates, DDB, Ogilvy & Mather, Grey Advertising, and Leo Burnett, formed a consortium to share costs and resources in developing COMPASS, the “computer optimal media planning and selection system.” The technique reportedly combined elements of computer simulation (see below) and linear programming algorithms toward generating “a mathematical media model” capable of maximizing efficiencies—though it was expected to offer only quite broad recommendations about media plans.

A competing approach to linear programming and high assay was computer simulation. Simulation could not promise “mathematical optimization,” but it rapidly computed expected outcomes for alternative media plans, and since it did not require parameters and assumptions to

161 “Are Computers Worth What They Cost,” 44.
162 “Are Computers Worth What They Cost,” 43.
be as tightly controlled as in optimization models, proponents claimed that the simulation approach represented reality more faithfully. An independent data service provider called Simulmatics Corp. attracted considerable attention for a “media-mix” model that generated a hypothetical but statistically representative “sample” of the U.S. population and its media habits. The company used this simulated sample to forecast the audience exposure that would be achieved by a given media plan. Unlike linear programming, which takes as inputs the budget, audience targets, viewership data, and availability and cost of ad slots and then outputs an optimal schedule, the Simulmatics model started with an array of possible schedules and evaluated their probable success in reaching viewers. The firm claimed that its service enabled advertisers to realize efficiencies of up to 30% in their media spending.163 The media-mix model was also designed to incorporate behavioral data that went beyond basic demographic classifiers, “For instance: What kind of car does each individual own and how old is it? How does he or she distribute purchases between supermarkets and small stores? Between grocery and drug-stores? Does he live in a hard-water or a soft-water area?”164

James S. Coleman, a sociology professor at Johns Hopkins and a member of Simulmatics’ research board, predicted that computer simulation would afford more complex, sophisticated advertising campaigns, utilizing a selective mix of media vehicles and formats. Coleman envisioned electronic computer simulation precipitating a “revolution in the development of advertising and marketing techniques.”165 The company planned to eventually “shoot for the ultimate goal in advertising prediction: forecasting a campaign’s sales effectiveness.”166

163 “Mechanized ‘Dry Runs’ for Ad Campaigns,” Broadcasting, May 28, 1962, 40
164 “Mechanized ‘Dry Runs’ for Ad Campaigns,” 44
166 “Mechanized ‘Dry Runs’ for Ad Campaigns,” 45.
Simulmatics found at least one customer in DuPont, but its media-mix service was not a success. The company had difficulty convincing agencies and clients that the habits assigned to its simulated population would accurately reflect reality, and nobody seemed willing to pay for national surveys to confirm its validity on an ongoing basis. “Perhaps,” one marketing scholar reflected, “it was too far ahead of its time and the data needed to support it.”

Although Simulmatics did not reach it, the dream of determining sales outcomes attributable to ad expenditures was shared throughout the industry, and these new developments stimulated hopes that it could be realized in the near future. In concluding a list of how the use of computers was changing the advertising business in the early 1960s, one journalist wrote, “Finally, and perhaps most important, computers are steering new attention to the old problem, the measurement of advertising effectiveness.” When Needham, Harper & Steers began using an RCA Spectra 70 later in the decade, a senior vice president at the company counted as an “important feature” of the system “the ability to compute almost instantaneously the correlation between audience delivery and sales on a market-by-market basis.”

Starting in the early 1960s, Marion Harper Jr. of Interpublic and McCann-Erickson proselytized “accountability” as a central value for advertising and marketing. He estimated that new tools and techniques for collecting and analyzing information about media and markets would allow advertisers to determine how their spending translated into sales. “It will now be possible, with the help of social sciences and mathematics,” Harper maintained, “to measure advertising as a single influence, isolated from all the many variables involved in carrying on a business.” A 1967 profile of Harper in the Journal of Marketing testifies to his conviction that

information technology could be used to analyze advertising’s contributions to the selling function:

His success with clients is grounded in the belief that advertisers seek above all else an assurance that their advertising dollars are being spent wisely. Therefore, the Interpublic organization places a great deal of emphasis on scientific approaches to advertising problem solving...Interpublic has recently formed the Institute of Marketing Communications which serves as a center for publishing, seminars, and teaching as well as for research activities. The avowed purpose of the Institute is to harness the ‘information revolution’ as applied to marketing communications. Marion Harper believes that there will be an increased emphasis on the use of the social and physical sciences in decision-making in marketing.¹⁷¹

Already by this time Harper’s Interpublic Group (IPG) had convened an Applied Science Division (within a subsidiary called Marplan), which, according to its manager from the mid-1960s, “brought together media researchers and operations researchers to create systems to improve the effectiveness of media decisions for the clients of all Interpublic agencies.”¹⁷² The expectation that computerization would advance advertising toward better targeting and efficacy was apparent in the view, ascribed to Harper and IPG, that “New technologies will lead to more precise definitions of markets and better alignments to specific objectives of advertising programs.”¹⁷³

Harper was not alone in his conviction that the uses of information technologies by social scientists and mathematicians could tether advertising to sales outcomes. In 1963, Y&R’s vice president admitted that while present systems and data needed to improve, computers and optimization models “force us to be much more scientific about ways in which we invest our

¹⁷² Bill Harvey, “A Brief Personal History of Media Optimization” (no date), 5 (shared by courtesy of its author). Among other innovations in advertising research, Marplan was an early adherent to the “science of pupilmetrics,” a precursor to eye-tracking. Providing the service to roughly 50 clients by 1968, Marplan researchers used cameras to study viewers’ eyes and then draw inferences about minute responses to ad messages, which could then be fed back to fine-tune creative decisions. “For Commercials It’s Love or Hate at First Sight,” Broadcasting, May 6, 1968, 50.
¹⁷³ Wright, “Marion Harper, Jr.,” 70.
clients’ advertising dollars.”¹⁷⁴ A year earlier, the president of the MacManus, John & Adams agency told the Association of National Advertisers (ANA), “All of us in advertising are going to have to justify and measure our efforts far better than we have been doing.”¹⁷⁵ Anticipating a present-day preoccupation, he added, “The value-return of every dollar we spend must be justified as best we are able—and with all the scientific assistance we can command—against the supreme criteria of today’s industrial dollar.”¹⁷⁶

Pressure toward scientific standards of accountability was not just a result of technological improvement. Increased emphasis on marketing among major corporations, and efforts by agencies to attend to the full range of marketing services, brought advertising, media buying, and market research into tighter integration with industrial operations. Agencies found that in dealing with clients, “top management is paying more and more attention to the advertising function. The result is a growing demand for a more efficient and higher professional approach to every facet of the advertising and marketing process.”¹⁷⁷

These early discussions about computerized media buying reveal frameworks for thinking about advances in advertising that have gradually become central to the industry. Although the degree of accountability imagined above is still largely aspirational, these statements illustrate that from the outset of computerization actors were trying to appropriate new information technologies and bend them—at least discursively—to advertisers’ ambition of verifying return on investment. In contrast to claims that interest in data-driven advertising emerged with the arrival of the internet, we see clearly that advertisers and their agencies have

¹⁷⁶ “Admen Must Improve Measurement Justification of Efforts, Jones Says,” 120.
long been hungry for information that could help them market more effectively, and they have tried to develop methods for generating, managing, and leveraging that data.

The stated goal of computerized media planning was to approach a mathematical science of optimization, capable of maximizing efficiencies, enabling predictability and better control, and ultimately confirming sales effectiveness. But ambition clearly outstripped ability. Skillful displays of “science” served, at least in part, in the art of attracting or impressing clients—including the computer manufacturers themselves, who typically sold their systems to the agencies handling their accounts, and were becoming major advertisers in their own right, trying to outmaneuver competitors and define a new media technology in the public mind.178 For all the apparent sophistication of optimizers and simulation models, one had to squint hard to see them really delivering on their promises—though they have persisted as staple elements in the buying services rendered by most agencies. An operations researcher diagnosed vividly the problem, as he saw it, in 1962:

what we are all lacking is a coherent, significant and indisputable mathematical theory of advertising response. Advertising is where chemistry was in the 14th century—in the alchemist’s cell, with the dried frogs-legs and the magical incantations...Without a quantitative mathematical theory to guide its application, a computer—except for trivial data-sorting and arithmetical operations—is useless. Frogs-legs and incantations are cheaper, and possibly just as effective.179

In fact, “data-sorting and arithmetical operations” were hardly trivial to media buying and selling. While the visions detailed above helped set a path for the future, reflecting grand hopes and expectations, the buyers and sellers of TV audiences were actively appropriating computing technologies to confront more immediate priorities. Perhaps surprisingly, talk about automating mundane and routine operations reveals definite precedents of programmatic advertising, adding evidence to the claim that programmatic techniques have grown out of the consistent demand for

information, data-processing, and communications facilities in audience manufacture. As Matthew Crain demonstrates in his history of internet advertising, a major innovation through which companies like DoubleClick commercialized the Web was the provision of “infrastructure services” that coordinated marketplace activity.\(^{180}\) Looking back to the 1950s and 1960, we can see very similar sorts of efforts in spot TV.

The next section considers two dimensions of how computers were used to process transactions: reductions in paperwork and clerical work, and the networked interconnection of buyers and sellers for electronic communication and computer-based buying. It starts by considering the problems facing buyers and sellers when computers arrived on the scene.

**Coordinating the Spot Market**

The commercial media environment was growing in scale and complexity in the middle of the century. In 1950 there were 107 commercial TV stations reporting revenues, which totaled just over $1 million; by 1965, the 588 stations broadcasting throughout the U.S. accounted for almost $2 billion in revenue.\(^{181}\) The number of sales organizations representing stations to national and regional advertisers more than doubled from 66 in 1950 to 130 in 1960.\(^{182}\) To this extensive development of the market was soon added new intensive challenges. The transition beginning in the 1950s toward participating sponsorship—or the “magazine concept” of sales—meant that advertising inventory was divided into smaller units and sold to a wider range of buyers.\(^ {183}\) One study found that the number of prime-time programs on the three TV networks sponsored by


multiple advertisers rose from just 10 in the 1955-56 season to 57 in 1964-65.\textsuperscript{184} Although it is not usually recognized in discussions of audience fragmentation, the move to participating sponsorship is tantamount to increasing the number and diversity of products manufactured and exchanged.

Already by 1957 television was considered “the most complex and paper-work ridden advertising media.”\textsuperscript{185} The television networks had invested in data-processing in the 1950s, mostly for routine accounting and billing functions.\textsuperscript{186} CBS claimed that clerical savings alone compensated for the $12,000 per month it spent to rent a UNIVAC system. But the networks looked forward to “harnessing [the] full capacity” of these machines, and they recognized them as essential administrative technologies for a maturing business. The need to manage information and coordinate transactions with advertisers clearly registered as pressing issues. “Large quantities of inventory segments are making the machine virtually a must in network billing and compensation control,” Broadcasting reported in 1966. “The computer’s advantages as a sales tool to pick and chose [sic] between increasingly fragmented network inventories for optimal sponsor benefit are clear.”\textsuperscript{187} Two years earlier, a sales director at NBC Television admitted, “Data Processing is a competitive way of life. Today’s executive must accept and understand it.”\textsuperscript{188}

While networks incorporated computers into office work, many observers saw greater potential for automation in the planning, buying, and selling of “more flexible media,” like spot TV.\textsuperscript{189} Purchasing spot TV presented the “most difficult media buying job,” in the opinion of one

\textsuperscript{184} Boddy, \textit{Fifties Television}, 159.
\textsuperscript{185} Sinclair, “‘Automation Buying’ Era Dawns on Agency Row,” 1.
\textsuperscript{186} Cortada, \textit{The Digital Hand, Volume II}, 352-356
\textsuperscript{188} “A World of Computers Plugged in by Humans,” 34
\textsuperscript{189} “Are Computers Worth What They Cost,” 43.
agency executive.\textsuperscript{190} Even compared to network advertising, spot television was a challenging market, with decentralized actors, formidable paperwork, frequent errors, long-outstanding debts, and generally high transaction costs. Just ensuring that spots aired as planned, and then sorting out billing discrepancies when they didn’t, required frequent communications between buyers and sellers, including consultation of contracts and invoices printed in triplicate for agencies, reps, and stations. By the early 1960s sales rep firms could expect to allocate 7\% of expenses to communications facilities, such as telephone and teletype, which could sum up to $300,000 for the large independent reps.\textsuperscript{191} The president of Data Communications Corporation, a technology supplier to the industry, hit upon a keen insight when he remarked that “the business information systems that most resemble the requirements of broadcast are those developed by the airline companies for reservations.”\textsuperscript{192} The managing and marketing of spot TV availabilities (“avails”) precipitated what one sales executive called a ”constant churning of information.”\textsuperscript{193}

Throughout the 1960s, the administrative burden of processing transactions in this market reached unprecedented levels, taxing the capacities of existing systems and protocols. National non-network TV time sales ballooned from $345 million in 1958 to an estimated $1.01 billion in 1968.\textsuperscript{194} By 1970, and not for the first time, spot sales to national advertisers ($1.10 billion) and local advertisers ($589 million) together comprised more than half of television ad revenues.

\textsuperscript{190} “NAB Convention: Computers Work Praised,” 66.
\textsuperscript{191} “Reps Surviving Greatest Crisis,” \textit{Broadcasting}, February 26, 1962, 70.
\textsuperscript{192} “There’s No Business Like Computer Business,” \textit{Broadcasting}, June 27, 1977, 47. Airline reservations and spot TV present similar logistical challenges—both involve accounting for an ever-changing stock of inventory, for goods that exist in the future and perish instantly after a set time, and which are exchanged at fluctuating prices. This comparison made with some frequency. For example, when the Society for Cable Telecommunications Engineers developed a system for automating ad-insertion in the set-top box in 2010, it used airplane reservations as a heuristic model. “Understanding the SCTE 130 Technical Framework,” SCTE Live Learning Webinar Archives, May 2010. \url{http://www.scte.org/SCTE/Live_Learning_Archives/Understanding_the_SCTE_130_Technical_Framework.aspx}
\textsuperscript{193} “For Reps, Computers are the Rainbow’s End,” \textit{Broadcasting}, June 13, 1966, 52.
\textsuperscript{194} “Shake-Out Among the Station Reps,” \textit{Broadcasting}, May 19, 1969, 67.
($3.24 billion). The volume of inventory managed annually by all TV stations was becoming overwhelming, estimated at roughly 23 million advertising spots in 1967, and as many as 30 million in 1968. The vice president of media at Leo Burnett reported that his agency bought 350,000 broadcast avails in 1962, of which 160,000 were TV spots; on a monthly basis, this trade generated 1,500 TV contracts and at least 6,000 pages of buying estimates.

As one source acknowledged, “The problem of accurate accounting between agencies, advertisers, stations and performers has increased in direct proportion to commercial volume, to the point where it is inadequately handled by procedures largely carried over from old radio days.” The sales side often had to wait 90-120 days to close accounts receivable, and agencies struggled to document errors and negotiate make-goods (i.e., compensation for failing to run an ad as scheduled or for failing to deliver the promised audience). The media manager at Benton & Bowles admitted that for a routine campaign, buying spots across 132 stations, the agency experienced discrepancies on 32% of its billings. Perhaps less reliably, a 1973 advertisement for firm marketing a range of transaction-processing services claimed that “the broadcast advertising industry is paying $50,000,000—mostly in unaccounted for expense—to reconcile discrepant paperwork and payments.” These sorts of difficulties left Broadcasting wondering to its readers: “Can automation organize the buying and selling of broadcast advertising? Nobody knows yet, but lots of people and hardware are at work on it.”

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197 “Lavin Says TV Rates are High,” Broadcasting, November 25, 1963, 57.
Leo Burnett was one of the earliest firms to assign electronic computers to the administrative problems of media buying and accounting, with special emphasis on spot TV. As early as 1955 Burnett “entered automation...to attack the paper problem.” The company installed an IBM RAMAC 305 in 1960, and less than two years later began leasing an IBM 1401 system that “automate[d] much of the clerical functions of television and radio spot buying.” The computer provided a central facility for generating and printing station contracts, ad schedules, and invoices for clients. It was especially useful for calculating spot rates, factoring in discounts that applied at certain volume or frequency thresholds; without a machine that can store this information in memory and automatically adjust rates as necessary, estimating the relative costs of different schedules is a laborious process. Leo Burnett’s media director boasted, “in the old days we needed several weeks to prepare a detailed broadcast estimate for a client. Today it’s a matter of minutes or seconds for computation and printing by our programmed computer method.”

This application of data-processing technology reportedly halved the amount of “handwritten data” required of the agency’s buyers and estimators. The vice president of an agency managing $10 million in billings, concentrated mostly in spot broadcasting, claimed that the use of computers allowed his firm “to compress the entire buying procedure” into 11 working days, down from the 29 days typically required to process a transaction manually. Another smaller agency adapted a computerized system to better organize the information that represents the market to buyers, so as to make the relative value of each avail easier to recognize. “The

program we finally put together,” the agency’s general manager explained, “is designed to bypass the endless hours of manual computations and put in our buyers’ hands a simple ranking of television programs and radio time periods that fall in descending order from the most desirable to the least desirable for any given product.”207 Decision-making then becomes programmatic.

Life-Blood Data

The needs of clients drove agencies to invest in data-processing systems. For example, Y&R was one of fourteen agencies servicing accounts for Bristol-Myers, a leading marketer of pharmaceuticals and consumer packaged goods, whose $130 million advertising budget included roughly 300,000 TV spots in 1966. “Just to keep track of all the television time it buys, on all the stations it uses,” Fortune reported, “the company needs several computers. One, owned by Young & Rubicam, is the heart of a tele-type-linked network of agencies reporting on Bristol-Myers’ daily purchases of TV station time around the country.”208 And Bristol-Myers was hardly in a league all its own. Its $25.5 million in spot TV spending was only good enough for fifth on the list of top spot buyers in 1966—and just 1% ahead of sixth-place Lever Brothers.209

Coordinating buying and selling processes around information and communication protocols was becoming an unavoidable necessity for the spot TV business during the 1960s—even though advertisers’ complaints about spot TV’s “paperwork jungle” persisted into the 1970s.210 When the H-R sales rep firm announced plans to implement an electronic data-processing center, running on an IBM 1401, agencies celebrated the step toward integrating computer facilities across the demand and supply sides of the market. “The potential for

210 The manager for media buying at Gillette said one the “major goals” of his organization “is to deliver the right message to the right audience at the right time,” but “achieving that goal can involve unlimited hours of paperwork.” Tom Lux, “Computer Power: Taking the Machete to Advertising’s Paper Jungle,” Broadcasting, June 24, 1974, 22. See also “Why Computers Can Aid Spot Paperwork,” April 6, 1970, 50.
combining agency use of computers in processing spot availabilities and purchases with computer programs operated by rep firms would appear to be almost limitless,” Y&R’s vice president and director of computer applications declared. “The result should be greater efficiency, greater accuracy, and very importantly, greater speed in processing that highly perishable commodity—spot availabilities.”211 A few years later, the vice president of the Katz Agency, another of the major station rep firms, “hailed the advent of the ‘machine’ and chided doubters as standing in the way of more efficient time buying and selling and more dollars for spot television and radio.”212 Given the potential to coordinate with greater speed and accuracy the processes of compiling, analyzing, and circulating information involved in spot buying and selling—including changes in available inventory, audience ratings, and other media or consumer data—BBDO’s media director expected that “In five years [from 1963], computer usage will be as common to good business as the typewriter.”213

By 1966 H-R was spending $300,000 on yearly computer-program, -hardware, and -staffing expenses, and it was poised to install a “third-generation” (integrated circuit) system, IBM’s 360. Its investment in data processing was designed specifically to accelerate and increase control over paperwork processing, and to centralize billing operations for the many stations it represented.214 Further illustrating the centrality of information flows to the spot TV business, the firm reorganized its corporate space “so that offices radiate out from the computer.” Not to be outdone, the rival Katz Agency planned that year to bolster its $100,000 annual outlay on computer-program development with another $400,000 for data-processing personnel.215 Before long, the Blair company joined the list of national rep firms that had “recently installed

214 “Data Processing at H-R in ’64,” 44.
immensely sophisticated systems for both radio and television which supply their salesman [sic] with dozens of availability, sales and demographic reports that, it would seem, all but eliminate the need to sit behind a book filling out forms.”

Broadcasting called H-R “a pioneer in computerizing the TV sales business,” but it was not the first rep firm to make use of electromechanical information technology. Peters, Griffin, Woodward (PGW) developed a system around UNIVAC punched cards in 1957 to meet the challenges of a growing spot TV and radio market. Information about availabilities, audience ratings, order confirmation, schedule changes, and a range of statistics about media markets constituted “life-blood matters” in the spot sales business. Echoing theories of an ideal market, PGW installed its “robot genius” to “meet the demands for complete and accurate information” at rapid speed. The system was designed to provide this information to prospective buyers at a fraction of the time and effort previously required. PGW planned to “deliver availability reports in about one-sixth the time that it takes a trained secretary and salesman to do the same job.”

As a specific example, the company claimed its machine could print 100 lines of availabilities per minute, compared to the roughly 30 minutes needed to complete an average 15-line availability sheet. The IBM system used by H-R promised even greater improvements on manual data input and retrieval; its “random access” storage would “permit[ ] a search for information at fantastic speeds.”

Information has always been the “life-blood” circulating in the spot TV market, and from the 1950s onward computers were adapted to the demands expressed by buyers and sellers both for timely information and for resources to help them contend with so much data. A media

216 “There’s No Business Like Computer Business,” 56.
218 “Univac to Invade Timebuying, Selling,” Broadcasting-Telecasting, November 19, 1956, 98.
220 “Automation Speeds Spot Sales,” 70, 72.
221 “Data Processing at H-R in ’64,” 44.
executive from Benton & Bowles was not alone in recognizing “the inherent complexity of the spot-TV business—particularly as it relates to the communication and paperwork processes among buyer, seller and station.” He also acknowledged these difficulties as critical to motivating technological and organizational change: “that complexity has helped spawn the development of outside buying services, electronic monitoring systems and firms specializing in computerized post-buying analysis, as well as the development of standardized availability forms, contracts, invoices and billing cycles.”222 Advertisers themselves found computers indispensable to circulating the information required by spot advertising, especially as they sought tighter integration across marketing functions. “As soon as we were established,” Gillette’s manager for media buying said of the company’s efforts to target spending geographically, “we became aware that we could not function effectively without an efficient computer system in the spot area, if only to contribute information to our division product managers and their agencies.”223

One of the fascinating elements of this story is that the increasing supply of data-processing power did not satisfy demands for information and its management. Instead, demand for and supply of data resources reinforced and reshaped each other.224 The expansion of major advertising agencies, for example, generated a need for data-processing and communications facilities to orchestrate standard operations at greater scale and speed, and these resources also opened possibilities for firms to supply clients with more diversified information-based services. When JWT ordered an RCA 301 computer system in 1962, its vice president of finance commented in the company’s newsletter on the significance of this investment in computing

224 Examining the period leading up the 1950s, JoAnne Yates argues similarly that the appetite for information among managers of growing industrial concerns and the innovations in office technologies, such as the punched-card tabulators used by agencies and sales reps in the 1950s, were mutually reinforcing trends. JoAnne Yates, “Business Use of Information and Technology During the Industrial Age,” in A Nation Transformed by Information, eds. Alfred D. Chandler, Jr. and James W. Cortada (New York: Oxford University Press, 2000), 107-135.
capacity: “Recent new developments in equipment and approach have made it apparent that electronic data processing within JWT is not only feasible but is also, in view of our increased growth, essential for providing a range of information and services that is already or will soon become necessary in our business.” Advertisng Age reported just three months after JWT’s announcement, “Mindful of the computer’s voracious appetite for data, advertisers are frantically beating the bushes for better information on who their customers are, and where and when they buy. Even dusty product warranty cards are being hauled out of warehouses and examined for possible information.”

As early as 1962 BBDO complained that its computer was “starving for more data” about audiences and advertising effects, and reportedly the agency was paying as much as $50,000 to cross-tabulate information from A.C. Nielsen and other market and media researchers. The vice president and director of marketing services at Foote, Cone & Belding admitted similarly that “the use of computers ‘has sparked an intensified demand’ for information in advertising and media.” In 1964, a representative from Leo Burnett claimed that the firm spent $250,000 annually to buy “raw data” for research purposes, plus another $130,000 for the “‘machinery’ to process it.” Two years earlier, a media executive at Burnett told a gathering of the American Association of Advertising Agencies (4A’s), “we need far more and far more accurate media data than we are now getting. To be really useful in handling complex media problems, the machines need reliable information on the effectiveness of actual exposure of advertising to real individuals

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227 Robert Heady, “Computer Taking Over Media-Market Selection,” Advertising Age, December 17, 1962, 25. The source does not stipulate if this was a one-time or recurring expense.
229 “A World of Computers Plugged in by Humans,” 32.
in real households.” He spoke for agencies and advertisers generally in demanding information to fortify the “data banks” they built to guide media planning and buying decisions. Stations, rep firms, and media researchers all noted “the explosion in demographic data now demanded by ad agencies.” In just the second half of the 1960s, the columns of data reported in the syndicated ratings books issued by ARB expanded from 11 to 49. An executive at a leading rep firm recalls, “research that was being demanded by the advertiser and the agencies forced companies’ research departments to become more sophisticated. You needed more research to analyze the data available and to create new ways of measuring data.”

Not all parties welcomed the demand for data—namely the publishers and stations from whom agencies demanded it. “The data vacuum has hit some media right in their pocketbooks,” one journalist remarked. The president of a station ownership group complained at the 4A’s annual meeting, “No medium has provided its agencies and advertiser customers with as much ‘buying’ information as broadcasters. We have researched ourselves almost to death, and your new electronic pets, the computers, threaten to finish us off.” Frustrated by the growing supremacy of ratings numbers in spot buying, the president of a marketing communications firm described his experience in terms worth quoting at length:

There was a time, back in TV’s black-and-white days, when those of us in small agencies could buy TV time by hunch—by the seat of our pants, so to speak…How times have changed…[S]oon a new breed of cat emerged: the really ‘with it’ agency time buyers or account executives who had discovered the rating books and were infatuated with all those columns and abbreviations: HUT, DMA, LOH. Suddenly their conversation was filled with references to “target consumers” and “primary demographics.” And before they could buy time, they needed from the station representative a full-scale breakout: ratings, men reached, women reached, C-P-M per spot, C-P-M per schedule and so

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230 “Computers Make Media Buying More Marketing-Oriented, 4A’s Told,” 108.
231 “Shake-Out Among the Station Reps,” 66.
on…And suddenly audience measurement surveys became the new toys of the time buyers. No buy was made without its being scientific…\textsuperscript{235}

Again, we find good reason to reject the notion that the substitution of data-based judgement for intuitive hunches is a recent phenomenon, unique to the age of “big data.”

\textit{Formatting a Market}

As the foregoing suggests, the process of computerization placed demands not just on the volume of information but also on its format. “The computer age will ‘implore’ media to seek more data, and to make data uniform,” \textit{Advertising Age} suggested.\textsuperscript{236} “Media, across the board, have been told bluntly to come up with more definitive, standardized data on their audiences.”\textsuperscript{237} Presaging problems of incommensurability and siloing that continue to plague automated, data-driven advertising, \textit{Broadcasting} reported, “Lack of standard computer coding among segments of the advertising industry—agency, media and reps—is already seen as a deterrent to eventual computer integration of the advertising process.”\textsuperscript{238} Ideas about segmentation were likewise coupled with information technologies. In publicizing a 1963 report by the 4A’s, \textit{Broadcasting} conveyed, “There was no question that the need for an attempt to set up a guide or standards for data on audience types has been hastened by the computer age.”\textsuperscript{239}

These developments revealed the conflicting pressures to collect more specialized, qualitative data, on the one hand, and to make that data conform to routine procedures and the abilities of computing machines, on the other. Demands for granular yet comparable audience data have been fairly persistent ever since, reaching a crescendo in recent years. Current initiatives to establish commensurable definitions and data sets for customized audience segments

\textsuperscript{236} “Y&R, BBDO Unleash Media Computerization,” 118.
\textsuperscript{237} Robert Heady, “Computers Bring New Dimension to Ad Field,” 88.
\textsuperscript{238} “Are Computers Worth What They Cost,” 44.
must be seen as only the latest iteration of a longstanding effort to negotiate durable frameworks for targeting and accountability. One early institutional response to these challenges illustrates that the core of such activities is establishing infrastructure to format and coordinate marketplace activity—building sociotechnical scaffolding to enable rapid calculative action.

In 1966, the Television Bureau of Advertising (TvB), a trade association representing commercial broadcasters, announced that it was budgeting $300,000 over the next five years for “liaison work” to help agencies, stations, and reps cohere around standardized information and communication protocols, which observers considered a necessary prerequisite for “industrywide integration of computerized buying and selling procedures.” The next year, TvB touted a “[b]lueprint for a uniform, computer-based system of spot television buying that could revolutionize the business.” The System of Spot (SOS) was designed to streamline administrative procedures and make spot TV easier to buy and sell. SOS introduced new paper forms which would create uniformity, reduce duplication of clerical work, and assign consistent codes for classifying actors, inventory units, and types of transactions. Most importantly, the forms were designed to format information and commerce in ways that would prepare the field for the “ultimate plan to computerize the buying and selling functions.” The manager of the project claimed that replacing the variety of forms and conventions in use across agencies, stations, and reps with common, codified procedures for requesting avails and confirming orders would rationalize the presentation of information—and, indeed, the representation of the market itself—to buyers and sellers. Formatted thusly, the information representing the market could be entered into, interpreted by, and exchanged among machines. Even as this initiative developed

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slower than hoped, TvB continued to recognize that it was essentially trying to establish connectivity and eliminate friction from commercial and informational flows: “The idea is to make it easier for everyone to talk to one another. The goal: to make spot advertising easier to buy.”244 “Eventually,” one report confirmed, “the plan envisions a wired network linking agencies, reps and stations with a central computer into which orders would be fed and which would then make all the necessary calculations and automatically feed the information back to the agencies, reps and stations.”245

Like the new columns in ratings books and, later, computer spreadsheets and software for managing inventory and expenditures, the System of Spot introduced new “calculative spaces”246 for organizing market activity. As with so much of what is documented throughout this dissertation, information and communication technologies, including mundane implements like paper forms and alphanumeric codes for identifying elements in these transactions, were applied in the 1960s to lubricate commerce—to make it easier to buy and sell audiences. The TvB plan points toward two frontiers for advancing this mission that have since been engineered into programmatic advertising systems. We now consider the complementary projects of establishing interconnections to facilitate instant data exchange between buyers and sellers, and movements toward completely automated, machine-to-machine transactions

**Virtually Instantaneous: Networked Communication and Commerce**

Almost as soon as advertising agencies invested in computerization, some firms recognized the potential for networked data communications between media buyers and sellers. Leo Burnett began using IBM machines in December of 1960, and two years later *Advertising Age* reported

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244 “There’s No Business Like Computer Business,” 50.
that “Burnett sees the day when leased lines will be used for simultaneous input and output of information between agencies and clients.” An executive from the agency mused in 1963, “I think it’s very reasonable to assume that the rep and the agency will directly tie-in into one another’s installations” in order to immediately access information about availabilities. By “linking” computer systems, he argued, the industry could automate “as much as possible the entire TV spot ordering, buying, billing, paying, reporting operations.”

Before the end of the decade some of the largest agencies had established direct data communication with rep firms via dedicated phone lines. The director of media and research at one agency explained how this altered daily routines: “Each evening the agency computer queries the reps’ computers for the latest availabilities in a given set of markets. Then, by tapes of ARB or Nielsen data, the agency computer can complete the rating and cost-per-thousand information the buyer requires. Each night a print-out is prepared and placed on the buyer’s desk for immediate action the next morning.” Compared with the chains of interactions previously required to obtain this information, he claimed, “this method employing computers is virtually instantaneous.”

Some commentators were careful not to get too swept up in futurism. Even strong proponents admitted that an “imaginary miracle machine” capable of automating the entire process of media buying was “not yet on the horizon” in the mid-1960s. Broadcasting observed in 1966, “The histories of companies born to supply the station-rep-agency triangle with automated central billing are replete with disappointments or, more to the point, failures.” Still, in spite of doubts, sober skepticism, and anxieties about human replacement, many observers

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247 Heady, “Computers Bring New Dimension to Ad Field,” 89.
249 “Lavin Says TV Rates are High,” Broadcasting, November 25, 1963, 57.
251 “A World of Computers Plugged in by Humans,” 30
looked forward to a future in which more of media planning and buying would be handled entirely by programmed machines.

For example, Dan O’Neill, president of the Advertising Data Processing Association and a researcher at McCann-Erickson, was one of what Broadcasting called “a growing school of media men who are trying to turn mechanical media selection into a more reliable science.” O’Neill predicted that “the mechanical revolution” would result in “fewer and larger rep houses in the future, all eventually working on an integrated real-time computerized system.” The “ultimate in computerized inventory control” imagined by others like O’Neill was “an on-line representation system [in which] all sales offices and stations would be connected by wire to a central computer, feeding sales information as quickly as it becomes known.” Foreshadowing much later developments in self-service dashboards and trading-desk software, the president at H-R expected that by the early 1970s such a system would allow a salesman to “punch a keyboard at his desk with availability requirements and get an immediate visual response from the computer on a TV monitor.”

Looking back on rep firms’ computer plans, Broadcasting reflected, “in general they tended to envision the machines as providing virtually instantaneous links to stations and agencies and serving as storehouses for avails that they rep could sell faster, in more quantity that ever before.”

Discussing a similar “console” spot buying system that his agency would implement over the next few years, a vice president at Benton & Bowles looked forward from 1967: “The computer will give the agency media buyer instant access to spot availabilities in every market. With a simple desk console he will be able to check availabilities and buy spots—without ever using a pencil or picking up a phone.” By 1972, he expected, “the entire spot-buying

\[253\] “For Reps Computers are the Rainbow’s End,” 50-51.

process—all the way from order, to conformation, to bill, to final payment—will be computerized.”  

At a 1973 workshop convened by the ANA, participants continued to hope that computers could be used to create “a kind of stock-market approach” to buying spot TV. Within a few months Broadcasting reported that the two leading providers of “on-line computerized information systems” to the commercial television industry had undertaken construction of a “three-way computer tie-in linking stations, ad agencies and rep firms.” Data Communications Corp. operated an on-line system for 67 radio and television stations, and Donovan Data Systems provided a comparable service to 14 of the top 20 ad agencies in the U.S. With the top three rep firms committed to participating, Broadcasting called it “the first step in an ‘industry-wide common use of computers’ to handle national- and local-spot accounting ‘from the point of buy right through to the final payment of the invoice.’” By January of 1976, the Katz Agency, which was not in that group, claimed to be “the first independent station rep to operate [an] on-line availability-retrieval system,” which linked 12 sales offices to its New York computer facility.

In many ways, these were primitive attempts to establish the ad exchanges that interconnect supply- and demand-side platforms in the digital advertising ecosystem. The facility for speculating, or even confidently envisioning, a programmatic future should signal to us that even if the technical ability was still off in the distance, the desire and demand for information technologies that could manage more data at greater speeds and with mathematical precision existed at the dawn of the computer age. Generating, processing, and coordinating flows of information and commerce was, even then, the bedrock of audience manufacture, and in early

255 “What Will Television be Like in ’72,” Broadcasting, November 30, 1967, 39, 42.
efforts to cope with mounting administrative pressures we glimpse the underlying dynamics that have continued to motivate developments toward automated and data-driven advertising. A media executive from Benton & Bowles testified succinctly to this point in describing his agency’s “on-line computer system” in 1970: “The system has been built for the specific purpose of enabling us to handle more efficiently spot TV’s complexities.”

But as computing resources were appropriated to service existing demands, the expectations of what was possible changed. No doubt interested to see expanded use of his company’s products, a representative from RCA urged advertisers, agencies, and reps to take “initiative” in testing the computer’s capabilities. Suggesting that they dream up exotic questions to ask the new machines, he said, “computers can provide more answers than we have intelligent inquiries.” The implication, born out as researchers attempted more sophisticated forms of statistical inference, is that new technologies allowed for new ways of seeing, knowing, and managing the world. Practical consequences of this were experienced at the organizational level, as agencies such as Campbell-Ewald reoriented office spaces, shuffled personnel, and adjusted routines and responsibilities within and across corporate departments so as to “tie in with the hot computer system.” Executives at Needham, Harper & Steers noted similarly “the unlimited potentials of the computer for media research and planning.” The agency’s president declared the value of the computer to be constrained “only by the imagination of the people who plan its use.”

Before concluding this chapter, we consider these people and how others reacted to their arrival.

Here Come the Math Men

Marshall McLuhan began *The Mechanical Bride* (1951) with a startling observation about advertising and entertainment: “Ours is the first age in which many thousands of the best-trained minds have made it a full-time business to get inside the collective public mind. To get inside in order to manipulate, exploit, control is the object now.” A decade later, even more of the best-educated people in America were enrolled in the marketing complex, and they had enlisted the service of the “mechanical brain.”

Often today we hear about how “math men” are replacing advertising’s “mad men.” But this is not a new story. Early in the second half of the twentieth century, market research and positivistic social science became more tightly integrated, including in the area of media planning. By the 1960s, MIT professor Ithiel de Sola Pool was chairman of Simulmatics Corp., a company most famous for its involvement in the 1960 presidential election. Simulmatics’ “people machine” used mathematical simulations of voter behavior to help the Kennedy campaign make strategic decisions about how to communicate with parts of the electorate. As discussed above, Simulmatics also offered a “media-mix” product designed to instruct advertisers about how to spend their media budgets. A 1962 profile of Pool in *Advertising Age* cast him as the face of a cohort spurring the industry’s calculative evolution: “He is one of the new scholarly breed that has joined the advertising fraternity. It is composed of mathematicians, scientists and professors in the behavioral sciences who are attempting, with the help of computers to explore the great unknown areas in advertising.” Simulmatics’ media-mix was designed by a team that included a former director of economic and statistical services at CEIR, faculty from Columbia,

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Yale, and Johns Hopkins, and a mathematician who developed a chess-playing computer program while working for IBM.  

Of course, researchers were not new to advertising. John B. Watson, the “founder” of behavioral psychology, joined JWT in 1920, where the behaviorist project of predicting, conditioning, and controlling behavior found a generous welcome from an industry eager to both engineer consumer demand and present an image of scientific legitimacy. As a general matter in the development of modern advertising, “when difficulties in the coordination of selling and manufacturing began to develop” in the nineteenth century, “science was increasingly called upon to control the ‘human element’ in the distribution process.”

The forceful arrival of more mathematicians and behavioral scientists, then, was an intensification rather than an unprecedented development. Still, these experts brought special skills in new disciplines, and they portended fuller use of the computer’s capabilities. Noting the increasing demand within advertising and marketing industries for all manner of professional social scientists over the next two decades, Mattelart argues, “This qualitative shift in the recruitment of consultants and experts undoubtedly suggests a new phase in the attempt to penetrate the secrets of the black box [that is the ‘consumer’].”

Furthermore, the rise of calculation and optimization as core operational values signaled a transition in the nature of the media function, the composition of agency personnel, and power dynamics within the business that ultimately determined which sources of news and entertainment would be financed. Grey Advertising was one of many agencies to restructure its media department to keep “in step” with data-processing technology; it designated its spot buyers

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specifically to become “specialists in using computerized data.” Independent service bureaus presented a particular threat to the status quo. “A small army of mathematicians and scientists has captured a share of agencies’ and advertisers’ media work,” one writer observed in 1962. “On the media front, salesmen are becoming statistically oriented or disgruntled or just plain ‘bewildered.’” Already by then there was an expectation that “the ‘lush life of three-hour-luncheons-and-cocktails’ may be over for some media salesmen, whose statistics are being increasingly scrutinized by computers.” The president of a leading rep firm admitted in 1969, “The old basis of buying on personality alone had 90-95% disappeared because of the increased demand for information.” An executive in RCA’s data-processing business suggested with that the ability to delegate spot-selection to computers, the “time buyer” would transition into something more like a “market analyst.” “A more sophisticated approach to media buying has been emerging for some time,” Broadcasting reported in 1970, “with the promise of more efficient budgets for advertisers and better utilization of the broadcast media.”

The institutional force of this shift is best expressed by the ascent of media buyers. Specialist media buying agencies began to emerge in the mid-1960s, promising clients campaign costs anywhere from 10% to 40% below what the media departments at full-service agencies delivered. By 1968 these “negotiator-buyer” companies were handling billings estimated to be as much as $225 million, with the overwhelming majority of that spending concentrated in spot TV. At the end of the decade, independent media buyers were managing 8% to 12% of national

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273 “Shake-Out Among the Station Reps,” 66.
spot spending, according to one estimate; and by the late 1980s, their share of spot TV buying was close to 30%. They figured into industry-wide changes in the media function. Ruthless negotiations toward maximizing cost-per-ratings-point became the default orientation, particularly in spot-buying, across both independent media services and within agencies’ own media departments. Even leading agencies, such as BBDO and DDB, availed themselves of these outside services, “often at the instigation of advertisers.”

Dedicated buying firms first courted clients by using bulk-buying to realize cost-efficiencies, and by undercutting full-service agencies’ 15% commission on media spending. Gradually, though, these buyers repositioned their services. Placing less emphasis on their abilities to negotiate low prices, they promised customers the benefits of “scientific” techniques for “optimizing” advertising spending. Technical expertise became a hallmark of their role in the value chain, and thus a lever of influence in the media system. As electronic media and audiences underwent further “fractionalization” in the 1980s, the “multiplicity and complexity” of this marketplace deepened the reliance on specialized buyers, especially those with computer skills. By packaging their services partly around optimization, these firms—as well as the media departments within agencies—were catalysts encouraging more calculative practices and a more quantitative disposition. “The rise of the buying services,” Leo Bogart writes, “has quickened the demand for numbers to feed into the [computer] models.”

Two media agency executives captured the prevailing spirit in 1976, predicting that for media buyers (and sellers),

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279 “Middlemen—The Specialist of the Future?” 33.
“productivity and prosperity in the 1980’s will belong to those who can harness the technology of the computer.” Reflecting on the “era of data explosion” that followed in the 1980s, one researcher concluded that “the extent of computerization in media departments,” which outpaced other parts of agency operations, “suggests they are in the vanguard of change.” As these agencies were consolidated within global holding companies, claims to specialized knowledge, computing capabilities, and information resources further defined the media-buying mindset and vaulted the buying function into a position of “outsized importance” within communication systems.

**There Goes Everyone Else?**

Despite considerable excitement and expectation surrounding computers, appreciation for these “high speed electronic wizards,” as the media manager at Benton & Bowles called them, was not universal. Responding to the demands of clients, and the needs of American business generally, ad agencies accommodated computers quickly. The supply side of the audience marketplace was more resistant. Reps worried that they might be eliminated entirely. In 1958 a vice president at the H-R rep firm cautioned against simply feeding ratings data into an electromechanical decision engine. “If we continue to play at the numbers game,” he warned, “we may all be replaced by a single Univac machine.” Although most doubted this eventuality, expert opinion was not always comforting. “While there are still a lot of problems to be solved,” a consultant to Leo

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285 Turow, *The Daily You*, 13, 22-33. Today, dedicated media buying agencies occupy prominent positions within global advertising conglomerates. For example, with $5.29 billion in revenue GroupM contributed more to WPP’s balance sheet in 2016 than any other part of the company—more than the combined income of Young & Rubicam Group and J. Walter Thompson Co. “Agency Family Trees 2017,” *Advertising Age*.
Burnett speculated, “it is only a matter of time before any piece of information about any advertising medium will be obtained instantaneously without having to go through a salesman intermediary. There will no longer be a need to have the media salesman per se on the other side of the desk.” 288 Other “prophets” predicted similarly “the total eradication of repping in favor of rows of buttons and computer displays.” 289

Broadcasters were equally wary. As one observer said about the prospect of a centralized on-line exchange, “Stations aren’t going to put themselves at the mercy of the machine. They’d go bankrupt. And no good station manager lets all his inventory out of his control.” 290 Throughout this history of automation, the supply side has feared and warned against a “nightmare of lowball rates submitted to reps by buying scavengers.” 291 To this day, programmers guard their inventory fiercely, and nearly all programmatic advertising in premium video environments trades in private marketplaces, rather than the open auctions more typical of display and search advertising. 292

But automation anxieties went deeper, it seemed. Station managers exhibited “psychological resistance” to computers. Fearing “they would lose their jobs or be reduced to mechanical handmaidens,” they “weren’t quite prepared to turn over the nuts and bolts of their livelihood to a piece of blinking hardware.” 293 An ad for the Cosmos Broadcasting Corporation made a further plea for humanity: “In these days of audience delivery based on computer-analyzed demographics, cloned programs, media buying untouched by human minds, computer-controlled this and automatic by-the-numbers that, we’d like to express a few thoughts about the

289 “Shake-Out Among the Station Reps,” 66.
290 “For Reps Computers are the Rainbow’s End,” 51.
293 “There’s No Business Like Computer Business,” 49.
human equation…Computers are our tools, but until we find one that can say ‘ouch’ or ‘wow’
we’ll keep striving to build warm human relationships with all those to whom we hold ourselves
responsible.”294 The tone of this copy suggests that by the end of the 1970s “human relationships”
were perceived to be under assault from automation, if not already subjugated.

These themes did turn up in discussions on the buy-side, including skepticism about the
actual capacities of computers and anxieties about whether “that monster in the air conditioned
room” would make personnel redundant.295 Reacting against a swelling tide of numeracy already
in 1961, a Y&R executive complained, ‘The moment we bet our all on one-tenth of a rating point
or on a five-cent difference in cost-per-thousand, then we have departed from reality.”296 Overall,
though, the tenor among agencies was more sanguine, and these conversations usually ended with
a reassurance that human judgment could never be eradicated.297 For example, when someone
from Grey Advertising’s TV research department was asked if the computer would replace media
buyers, she replied, “Not until they can make one that thinks. It’s still a machine. It will probably
be a terrific step forward but it can’t know all the intricate problems or the details of coverage or
all the other things a timebuyer must know.”298 Indeed, there were efforts to reinforce the
His Spots,” to educate readers about how its computer helped the agency make decisions. The
machine “does not supersede a media buyer’s judgement,” the pamphlet promised readers;
instead, it supplements buyers with “its ability to do tremendous quantities of analytical
arithmetic with unparalleled speed and chilling accuracy.”299 An economics professor at

295 Heady, 88.
296 “Media Buying: With or Without the Numbers?” 56.
297 E.g., “People Not Computers, Make Agency Buying Decisions,” Broadcasting, October 5, 1964, 40;
298 Electronic Brain for Timebuying,” 31.
Princeton University added authority to such claims, maintaining that the computer could be an invaluable tool, but “ultimate decisions and judgements will always remain in human hands.” “Unemployment does not threaten the media planner,” he added, “because the machine can never replace him—it can only act as an efficient assistant in his decision processes.”

Conventional thinking held that computing machines would liberate these knowledge workers from the drudgery of clerical chores and tedious calculations, allowing them to concentrate their time and energy on more creative, higher-order labors—a rationale that has been remarkably durable. “The computer is an expediting tool to improve human decision-making in advertising, not replace it,” Broadcasting declared in 1963. Of course, with agencies’ financial managers always welcoming savings on salaries, these reassurances seemed too loud and confident to be believable. And more than a few reports confirm that agencies made substantial cuts to “low-skill” staffers, even as they were compelled to hire personnel trained in the use of computers.

It was deeply ironic that the language used to describe computers as convenience technologies sparing workers from “drudgery” mirrored the appeals made to sell homemakers on electrical appliances and preprocessed cooking and cleaning products. Although trade press coverage does not confront the issue in full, a gendered dimension inflects anxieties about automation and job-loss. When Y&R and BBDO “unleash[ed] media computerization,” Advertising Age reported, “Both agencies denied rumors that computers will take over media

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300 “The Ad Thinkers and the Computers,” 36.
men’s jobs. ‘Only statistical-type positions will be affected.’"305 While “media men” may be an artifact of the idiom, it is conspicuous here since those “statistical-type positions” were far more likely to be staffed by women.306

Both the gendered nature of the labor redundancies owing to automation, as well as the fascinating shift in perceptions of automated media buying and selling—from deep skepticism and anxiety to today’s exuberance for anything that eliminates subjectivity from programmatic advertising—are important areas for further investigation. Throughout this evolution of advertising, a key dynamic, it seems, is the tension between managerial efforts to eradicate the incalculable human element from rational economic activity and the resistance of workers to being eradicated from their jobs.

**Conclusion**

What we see in the discourse of the late 1950s and 1960s are attempts to work out and define the affordances of computers and other information-processing technologies for advertising and media buying. Actors positioned those affordances in relation both to the challenges of routine business operations and to potential opportunities for advancement toward grander, evolutionary ambitions. While the introduction of new technologies and techniques excited imaginations and stretched conceptions of what could be possible, the affordances attributed to these resources had a basis in existing conditions, demands, and motivating values. Specifically, they reflected and extended the need to manage complex flows of information and commerce, as well as the dreams of reducing judgments to mathematical probabilities, approaching optimal allocative decisions, and verifying advertising’s effect on sales. During this period, the media-marketing complex

305 “Y&R, BBDO Unleash Media Computerization,”, 118.
306 The gendered dimension of computing work in advertising and marketing industries is an area calling out for more research than I was able to undertake for this study. On women’s historical roles in computing in general, see Jennifer S. Light, “When Computers Were Women,” *Technology & Culture* 40, no. 3 (July 1999): 455-483.
began to appropriate digital computers within its technical and administrative infrastructures, and to articulate their functions to the priorities and processes of selling the American people. The materiality and organization of media planning, buying, and selling were adjusted to new resources for expanding, accelerating, and reformatting calculation.

As in other areas of the U.S. economy, computerization was tentative at first and then increased as the technology became better understood and more affordable. Although many of the early visions escaped immediate realization, the discourse analyzed in this chapter helped shape the meanings and expectations surrounding information technology and calculative techniques. These visions provided conceptual frames for imagining advancement in advertising and audience manufacture. They also constructed the uses of computers in ways that reinforced the authority of operations that were suitable for or supportive of mathematical optimization. The fact that current debates echo so many of the statements revealed in this historical research suggests that programmatic advertising belongs to a longer arc of development in the appropriation and use of information technologies to pursue numerical precision, efficiency, and control in producing consumers and commodity audiences. Efforts to eradicate the incalculable, exploit new profit opportunities, and verify ROI are not recent trends in advertising, but rather engines driving developments over the past 60 years.

While advertisers were getting more creative about how they reached out to prospective customers, appealing to irony and individuality, they were also getting more calculating about how they constructed the public. Computers and databases helped them become more discriminating in deciding who they should try to reach and how certain groups and individuals could be classified, evaluated, and targeted. The next chapter looks at how advertisers and ad sales organizations continued to leverage ICTs and data resources toward improving efficiency—

this time by dividing the consumer population into smaller and more precisely defined units. To eliminate waste, organizations selling cable audiences tried to package specific households so that advertisers could exclusively engage the people they deemed valuable.
Chapter Three – Addressing the American Person: Designs for Producing an Audience of One

Imagine a world where you’re connected to your target audience at home, or on the go, across devices, maximizing return on video advertising by serving ads to the right consumers on the right screen at the right time. Delivering your brand message at scale, across the nation, with no waste, now at a device level. This isn’t science fiction. This is AT&T AdWorks. Taking addressable advertising further than ever before. Welcome to the point of more return.”

– AT&T AdWorks promotional video308

In a generous appraisal of foresight, business historian Margaret Graham posits, “With the advent of the transistor it was possible to foresee the arrival of truly individualized (or at least customized) information, and with that a resulting fragmentation of the collective experience.”309 Considerable effort was needed to make way for that “arrival.” This chapter examines the maneuverings of a faction within the welcoming committee, and their migration from obscurity to the center of advertising and commercial media. It is about efforts to reshape audience manufacture around the targeting of individual consumers. With advertisers using computers to become more discriminating about how to buy attention and influence people, and with ideas about an “information society” penetrating visions for the future of mediated commerce, cable television became a bridge toward a direct marketing world. The next chapter looks at interactive merchandising via cable. This chapter shows how people recognized the new media environment as offering opportunities to move beyond segmentation, toward individualization.

A “Death Knell” for Demographics?

Marketers have always used demographics as a proxy for information they wanted but could not easily acquire or exploit. Like audience ratings, and market research generally, demographics exist to tame complexity so that strategic actors can “know” and orient themselves toward the realities in which they operate. Technologies for collecting and analyzing data have both responded to and urged forward marketers’ efforts to sort customers into finer segments. Working with data brokers, technology vendors, and other partners, marketers have sought increasingly detailed predications about correlations between observed attributes and probable purchasing behaviors. But even as these developments brought demographics into sharper focus within industrial discourse and strategy, they invited speculation about an approaching horizon where demographics might become less useful, even obsolete.

Already by 1994 an article in Advertising Age wondered whether industry pressure toward more precise behavioral targeting signaled the “death knell” for age and sex demographics. The vice president and group supervisor of communications and information services at Young & Rubicam put it bluntly: “When you come right down to it, talking about a demo like women 25 to 54 means absolutely nothing…Yes, women buy a lot of products, but different women buy different products. Our job is to figure out which women buy our clients’ products and target them.” Some on the supply side promised to deliver the capabilities these buyers wanted. Tele-Communications Inc. (TCI), then the largest cable operator, was “promoting

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the concept of ‘cream zones’ that will enable advertisers to reach only the households they want: single-parent families, Cadillac owners, frequent fliers or any other consumer profile.” The company’s corporate director of ad sales captured the spirit of direct marketing, boasting, “The universe will be as few as one and as many as an advertiser would like.”

These were not new ambitions. Far from it. Since at least the 1960s marketers had discussed and invested in more sophisticated techniques for segmenting consumer populations—by classifying psychographic attributes, analyzing geographic clustering of lifestyle groups, and collecting and integrating data from more sites of observation to gain comprehensive portraits of individual consumers. These efforts derived from several factors, including a recognition that understanding, predicting, and influencing how individuals behave in marketplaces required marketers to contend with personal characteristics that spilled across the simplistic categories of “age” and “sex.” The “death knell” heard in the 1990s was, in fact, an echo of noises sounded three decades before. As early as 1967 Broadcasting reported, “Demographic measurements currently used to define audiences are becoming less and less meaningful as the ‘life styles’ of people are becoming more and more diverse.” The proposed remedy—as in the 1990s—was to understand audiences “in behavioral as well as demographic terms.”

An interest in disaggregating mass audiences into more unique lifestyle categories and behavioral profiles has been a part of marketing thought for more than half a century. But to operationalize within the processes of audience manufacture definitions of consumers that are more complex and less standardized presents serious administrative challenges. Even as Advertising Age contemplated a post-demographic future in the 1990s, David Poltrack, the senior

vice-president of research and planning at CBS, pointed out that demographics provided a “currency” for media buying. “This is essentially a commodity marketplace,” he said, “and in a commodity marketplace, you need something to base your pricing on.”315 Despite extensive efforts to refine targeting in the past 25 years, demographics have not died. As recently as 2017, the president of North American operations at IPG’s media agency, Magna Global, complained that media buyers devote an “inordinate amount of time” to defining precise, custom target audiences for their advertising clients, “and then ultimately, when we go to market, we end up buying a Nielsen age/sex demo, adults 18-49. It’s entirely disingenuous to the front part of the process.”316 He is hardly alone in expressing frustration with established business protocols that have required data-derived audience segments to be “translated” into a less precise currency for “deal-making.”317 To conform to standard procedures for packaging audiences, one source told me, the media buyer sacrifices “a tremendous amount of fidelity” from the targeting prescribed by the agency’s media planners.318 Like Poltrack’s rejoinder to forecasters, these testimonies alert us to the important fact that audience manufacture is enmeshed within an institutional and infrastructural fabric that has tended to resist change. Indeed, a central contradiction in audience manufacture involves the ambition to collect more granular information and target more exactly, on the one hand, and the difficulties (and costs) of incorporating detail and precision into commercial routines, on the other hand. It is not totally surprising, then, that industry actors still

318 Interview with Mike Rosen, May 30, 2018.
look forward to a one-to-one future in television, and still grouse about the limitations of demographics and ratings.

“Welcome to the Point of More Return”

Not for the first time, practitioners and pundits today claim that the advertising industry has arrived at a watershed moment in its pursuit of the individual. Recently, the head of global data partnerships at IBM’s Watson Advertising division—which provides services rooted in artificial intelligence and big-data analytics—linked individual-level targeting to the state of the art for managing information. He suggests that the settlement around broad targeting criteria like age and sex reflected the properties of the administrative technologies used historically in commercial media industries. He frames the issue in terms sufficiently intriguing to warrant extended quotation:

I think demographics are a kind of historical artifact. The way media was distributed, the way analytics functioned—up until recently, essentially, on paper—demanded a way to simplify information, to separate who you want to reach versus who you don’t want to reach and assign value to those that will likely buy your product, and not waste your money by going after people that don’t. And demographics provided a very uniform, very stable, very consistent way to wrap people’s investment in nice bundles and then deploy them…But now that technology and infrastructure allow us to really have [a] high resolution [profile] of the individual, really understand how the individual functions—what they buy, where they go, what their interests are, what media they’re consuming—there really is no need for that kind of generalization at the demographic level.

He is suggesting that demographics provided a way of coping with the limited capacities of existing technologies—like paper forms—to manage all the data about individual behaviors that could be relevant for marketing. He goes on to argue that big-data analytics afford the opportunity to advance beyond rationalization, incorporating more information into calculations about whom to target and how:

[N]ow we can try to at least calculate the value of the individual and what that represents for a marketer at a moment in time and at a place. And, so, the demographic
simplification of the complexity of the real world, I would say, is not necessary anymore because we have other means to get to that value for the marketer.\textsuperscript{319}

In other words, demographic categories substituted conveniently for an abundance of information that could not be effectively collected, managed, and incorporated into business processes. If, in the past, advertisers had to pare away information that was unsuitable for computation, he argues that today the capacities for analyzing data have advanced to a point where there is nothing that cannot be counted and calculated.

In many ways this opinion is typical of the breathless enthusiasm for behavioral targeting one finds in industrial discourses. But the characterization of demographics and audience aggregation as “artifacts” of the available technologies for managing information and commerce is more provocative than most prognostications. It acknowledges the centrality of data processing and communication in audience manufacture, and it casts back-end, administrative infrastructures in a role no less important than technologies for distributing and accessing content. Setting aside its deterministic undertones, we can use this idea to point our compass toward an investigation of the historical processes by which the capability to target individual consumers has been designed and constructed.

This chapter examines efforts to develop\textit{ institutions and infrastructures for producing and selling an audience of one}. We will see that addressable advertising did not emerge, naturally and new-born, from the internet’s architecture for routing communications to a specified recipient. Achieving the one-to-one future, as it was once called, has an older legacy than online advertising, and it has involved the assembly and refinement of organizational as well as technological capacities. To understand this historical process, we return to the informational and commercial flows in the spot advertising market. Once again, it is a story about how the

advertising industry has appropriated information technologies to transact more easily and efficiently. And, once again, it is at least as much a tale of evolution, driven by dynamics and tensions at the heart of the media-marketing complex, as one of an abrupt and exogenous disruption.

The Long History of Waste Management

Advertisers have always been concerned about wasting money to solicit people who contribute nothing to sales. “The idea [for addressable advertising] definitely comes from Wanamaker,” Tracey Scheppach told me, “and that goes back 100 years.” 320 Half a century later, the theory of market segmentation arrived just as major advertising agencies were reorganizing operations around the affordances of digital computers. Discrimination, precision, and speed were hallmarks of how media planners and buyers understood the potential of electronic data processing. Segmentation and computerization made obvious allies. Capturing the hope surrounding this pairing, Advertising Age began its coverage of a 1964 seminar organized by the Broadcast Advertising Club of Chicago with a headline reading, “Computers Open New Vistas in Pinpointing Audiences.” 321 Twelve years later, two media executives recognized the “precision and control afforded by computers” as a boon both to the sellers of inventory and to buyers, who could better calculate the value of that inventory and “zero in on audiences that are the most lucrative prospects for their products.” 322 The ability to apprehend and exploit finer differences—and profit opportunities—became an irresistible force bending the trajectory of commercial media.

320 Interview with Tracey Schappach, November 6, 2017.
Looking back at the inflection point in advertising history discussed in the last chapter, we can see that automation and accountability were not the only “advanced” affordances recognized by advertisers and agencies. Proponents of linear programming algorithms, for example, appreciated that their optimization models could be designed to isolate preferred audience segments. “Linear programming aims its primary emphasis against the marketing concept and who buys the product, instead of delivering just any kind of people at the lowest cost,” wrote Herbert Maneloveg, BBDO’s media director. “By relating marketing profiles of the consumer to the media audience we now determine through the computer’s mathematical process how to maximize exposure opportunities against our best prospects. We can come out with a cost per thousand against those people likely to buy.”\(^3\)\(^2\)\(^3\) Anticipating developments that have intensified since then, Maneloveg identified targeting and efficiency as the media buyer’s twin priorities: “It’s not how much mass he buys, but how little waste. Linear programming helps show us how to minimize waste.”\(^3\)\(^2\)\(^4\)

These early discussions of computerized media buying reveal frameworks for thinking about advances in advertising technique that have gradually become central to the industry. Anticipating addressability, a media executive from Benton & Bowles inferred that computers allow marketers to “place emphasis on individuals, rather than households.”\(^3\)\(^2\)\(^5\) Perceiving the broader trend toward data-driven targeting, a contemporary observed, “the machines are simply another tool in a continual search to refine information as to who are the clients’ best prospects and which are the media that can best speak (and as exclusively as possible) to these


\(^3\)\(^2\)\(^5\) “Computers to Make Media Buying More Marketing-Oriented, 4A’s Told,” 108.
Another agency executive said the “key” to extracting efficiencies from his company’s computer system was to “delineate product buyer profiles with extreme accuracy.”

Consistent with general dynamics in the calculative evolution, Seymour Banks, a vice president at Leo Burnett, explained that as his firm oriented more operations around its computer system, “we find it necessary to go into finer and finer detail on marketing strategy.”

In the same spirit, Banks pointed toward what is now called audience-based buying: “The reason why this computer work is so important is not merely to save paperwork—although this is obviously important. The real value to clients is that we’re regarding media as the means of reaching pre-designated marketing targets.”

An early example of this strategy in action was reported by Broadcasting in 1966. Needham, Harper & Steers was trying to buy spots in a southern market to promote its client’s hair treatment. The agency had initially agreed to one station’s proposal of showing the company’s advertisement weekly in the local evening news—a reliable vehicle for reaching an audience. But the agency’s business was later won by a rival station represented by a sales firm that based its pitch on a computer-generated schedule. In contrast to the popular news program, the winning schedule “seemed on the surface to be a haphazard group of four spots.” The computer analysis apparently convinced the sponsor that this mix was better suited to meet its marketing objectives. This process of “switch-pitching”—winning business from a competitor by better matching the customer’s needs—was not new to spot buying; what was novel about this case was that by crunching numbers mechanically and revealing hidden value in available inventory, the rep firm was able to win the pitch with a schedule that defied conventional wisdom. It illustrates an early effort to find audiences,

328 “Lavin Says TV Rates are High,” Broadcasting, November 25, 1963, 57.
irrespective of the surrounding content. The chairman of the Television Bureau of Advertising articulated the general strategy with remarkable clarity the next year, when, as Broadcasting reported, “He urged advertisers…to buy the audience rather than the time period.”

By the 1970s the notion that advertisers were buying a demographically-defined audience rather than a time slot was understood and becoming institutionalized in the television business. Computers and calculative protocols contributed to this situation, as Erik Barnouw explains in the case of network advertising: “Negotiations between sponsor and network, via the sponsor’s advertising agency, now resembled transactions to deliver specific blocks of viewers…Gone were the days when sponsor decisions might derive from personal reactions to program…Hunches were out, science in. A sponsor did not even need to watch programs. He watched charts and computer terminals.”

This was the state of thinking in media and marketing when cable television began lurching toward maturity. As national advertisers in the U.S. looked for ways to profitably exploit minute distinctions among, and even within market segments, the mindset of targeting people based on differences in class, race, location, or other lifestyle categories, which could be multiplied through the use of database technology, exerted a structuring influence on the media system. But efforts to target individuals pressed against the limits of the satellite distribution system that delivered the same video stream to cable headends across the country. While networks like MTV, BET, and Bravo tailored programming to attract only desired consumers, these distributors had no technical means for targeting specific viewers. The potential ability to address a video message to an individual consumer resided with the cable operators who exhibited programs and ads. The move from segmentation to addressable advertising, therefore,

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331 “TVB Searches for Guiding Light,” 34.
goes through cable operators and the spot cable market, and it involves the dual problems of isolating specific viewers and marketing those individuals to advertisers.

The history of cable advertising reveals various actors groping toward the goal of placing the right ad in front of the right viewer—collecting and utilizing personal data throughout the process. The goal of addressable advertising confronted overlapping administrative and technical challenges. In particular it involved the building up of organizational capacity for packaging and selling cable inventory in ways that conformed to the routines and expectations of large brand marketers. This process manifested a contradiction between the size and standardization needed to appeal to these advertisers and their agencies, and the granularity and precision touted as cable’s direct marketing advantage. Navigating between mass marketing and direct marketing occasioned logistical dilemmas for the supply side of the market, which (like we saw in the previous chapter) enrolled ICTs in bureaucratic capacities. We work toward the present by considering how ambitions for addressable advertising intensified as the promise of new digital and interactive devices became a wishing well into which actors poured their hopes for the future. (Before proceeding, you may want to see Appendix C for a brief primer on spot cable.)

**A March Toward Addressable Advertising**

In many ways, addressability and cable advertising developed on parallel tracks, seldom intersecting until the late 1980s and early 1990s. Serious discussions about local cable advertising began around 1970, soon after the Federal Communications Commission proposed a number of rules regarding the development of cable television, including a mandate that systems with at least 3,500 subscribers (roughly 300 of the 2,500 systems in operation at the time) begin originating programming locally.\(^{334}\) Despite doubts that ad sales could cover program costs,

\(^{334}\) Often local origination meant a channel displaying time, temperature, and advertisements printed on small cue cards, orchestrated by a clever but somewhat ramshackle mechanism that automatically rotated a
which by one operator’s estimate would require selling spots for anywhere from four to 20 times the price of a comparable radio ad, some observers saw a promising future, and a few firms prepared to act as sales reps to national and regional advertisers.\textsuperscript{335} By the middle of the decade, more than 600 cable systems were originating programming, and these operators reported median advertising sales of $7,500 in 1974, with the most lucrative systems claiming as much as $225,000.\textsuperscript{336}

Advertising agencies budgeted funds for cable only tentatively, in part because, as J. Walter Thompson discovered, there was “simply no way to evaluate efficiency.” The vice president of Compton Advertising listed two major reasons for national advertisers’ reluctance to invest in cable, one being “the abject lack of statistical information,” and other being administrative deficiencies that made buying difficult—chiefly, the lack of sale agents representing more than a single cable system. “Like the snake eating its own tail,” he warned, “the advertising budgets will not include consideration of cable till cable operators organize themselves better. And the latter will not organize into better ‘networked’ groups until they can see the big dollars coming their way.”\textsuperscript{337}

As a satellite-distribution system connected cable operations across the country, the early success of advertiser-supported networks both inspired optimism about advertising on local systems but also magnified the challenges of administering this market. According to one source, United Press International pioneered the practice of allowing operators to insert local

\textsuperscript{337} Cox, “Cable Advertising: Where to Buy It,” 14.
advertisements into commercial time on a nationally-delivered channel, as an incentive for operators to carry its news service. The UPI offering was short-lived, but CNN and others successfully replicated the strategy.\textsuperscript{338} By 1980, a leading vendor of ad-insertion equipment counted eleven networks offering local availabilities to cable operators, including ESPN, BET, and USA Network. Already there was an awareness that the “specialization” of cable programming “allows advertisers to ‘zero-in’ on a selected target audience.”\textsuperscript{339} But only about 15 percent of cable systems were generating ad sales, and cable’s $60 million in total advertising revenues looked puny next to subscription income exceeding $2.5 billion.\textsuperscript{340} At just $8 million, spot advertising constituted about a third of one percent of those combined revenues. A sales manager at one of the first cable systems to build a successful advertising business put the incremental revenue he helped deliver into perspective, saying, “It takes my 35 people a whole year to get the same amount of revenue that the system gets in one month from subscription fees.”\textsuperscript{341} Advertising sales, therefore, ranked low among cable operators’ priorities. Stating the matter frankly, the chief financial officer at Warner Communications told managers from Warner’s cable division in the early 1980s that their local advertising revenue did not even register as a rounding error on the conglomerate’s balance sheet.\textsuperscript{342}

Making this market would take a lot of work. Gerry Levin of Time, Inc. urged the cable industry to commit to establishing bedrock organizational capacities to sustain a reliable business. He encouraged operators “to build the infrastructure simply to make advertising sales meaningful at the local level…This is going to take a few years,” he warned. “So anyone who has entered the

\textsuperscript{338} Interview with Jim Chiddix, January 28, 2018.  
\textsuperscript{342} Interview with Larry Zipin, January 26, 2018.
business with the notion that there will be a lot of advertising revenues early on its [sic] going to be disappointed.”³⁴³ By 1984, more than 800 cable systems had established “local advertising sales capabilities,” and this was a revenue source of increasing importance, with at least 30 technology vendors claiming to “design and build commercial insertion equipment for the cable industry.”³⁴⁴ But, selling and inserting ads—especially from national sponsors—still proved more challenging than many had hoped. That year a financial analyst elaborated the “problems and potentials” for cable advertising, which he considered the “most important new cash flow source for the cable operator.” Among the problems—beyond cable operators’ reluctance to invest the $100,000 he estimated as necessary to install capital equipment, including ad-insertion technology and traffic and billing systems—the analyst noted barriers within the organizational culture: “selling advertising is not in the mainstream of ‘traditional’ cable operations. It requires a different technology, creates a different set of operating problems, requires a different mindset.”³⁴⁵

The mindset at the heart of the cable business continued to see advertising as a petty adjunct to subscription. But over the course of the 1980s, a sales infrastructure emerged around the periphery, and with it a mindset fixed on extracting new value from available inventory. Larry Zipin was the corporate head of ad sales at Time Warner Cable. He explained the maturation of spot cable as being about refinements in packaging and selling audiences.

Me and my peers at the other cable companies, we kept saying, again, “The inventory is finite at the macrolevel. But, how many different ways can we slice it?” Cuz, you know, if you sell a loaf of bread for a dollar, you get a dollar. If the bread has 50 slices and you can sell each slice for a dime, how much money are you making? Now, if I can slice the bread 50 [more] ways and sell each one for a nickel, how much am I making? … We kept slicing that loaf of bread and started making more and more money with the inventory we

³⁴³ “Here Comes Another Quantum Leap,” Broadcasting, November 15, 1982, 68
³⁴⁵ Charles Kadlec, “Problems and Potentials of Cable TV Advertising,” Broadcasting, September 3, 1984, 16
already had. And that’s how [the] business goes from being a mom and pop shop to being a multi-billion-dollar enterprise.346

But as we will see a bit later, slicing that inventory was no piece of cake.

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Figure 3.1 The cartoon in this early advertisement for cable ad-insertion equipment gestures toward the complexities of the process and the importance of automation. Though spot cable was still in its infancy, the ad touches on logistical capacities that would become central to more sophisticated ways of serving ads, including remote control of interconnected operations, random-access sequencing of spots, and integration with automatic verification and billing systems. It might be a stretch too far to see this many-handed machine as an analogy for “digital” ad tech. (Cable Television Business, April 15, 1983, 32)

Meanwhile, closer to the core subscription business, cable operators were developing addressable capabilities. As a technology for discriminating between households and devices that are or are not authorized to access certain products or services, addressability has a long history in

346 Interview with Larry Zipin, January 26, 2018.
cable television. Addressable set-top converter boxes (STBs) and control systems were designed to administer “conditional access,” meaning that the central computer could recognize a specific device and determine if it was eligible to receive a given signal. “In an addressable system,” Broadcasting explained, “the headend and the home terminals are tied together by a computer,” which allows the operator to control the system remotely.\textsuperscript{347} As a 1983 advertisement from Zenith put it, the company’s addressable set-top converter let operators “‘talk’ to over one million individual subscribers from the headend.”\textsuperscript{348} Addressability provided a basis for packaging programming into tiers, for excluding non-subscribers from premium channels like HBO, and for enabling certain pay-per-view functions. It also meant that customer services could be initiated, altered, or discontinued with a few keystrokes at the headend instead of sending a technician on an expensive “truck roll” to a customer’s premises.

By the 1980s, home terminals and the computer equipment for headend facilities were becoming more sophisticated and affordable. Operators could expect to pay approximately $135 for an addressable converter box and $150,000 for the computer control system.\textsuperscript{349} While still a considerable expense for most operators, it was within reach of large multiple system operators (MSOs), and so addressable cable systems began to gain a “foothold.”\textsuperscript{350} The president of the Motion Picture Association of America, interested in the implications for pay-per-view, estimated that in 1983 about 500,000 homes were connected to addressable technology.\textsuperscript{351} By 1990, some

\textsuperscript{347} “Addressing Addressability,” Broadcasting, June 8, 1981, 85.
\textsuperscript{348} “Zenith Z-TAC” (advertisement), Cable Television Business, April 15, 1983, 24.
\textsuperscript{349} “Applications of Addressability Examined by Panel,” Broadcasting, May 10, 1982, 75, 78.
9.3 million addressable set-top boxes had been deployed. While addressability enabled a cable operator to identify and communicate exclusively with each set-top box from the headend, the idea of sending individually targeted video ads was not close to being accommodated by the capacity of the analog cable plant, since it would have required reserving dedicated channels for advertisements. That made no financial sense when state of the art systems had 54 to 66 channels, and most operators had 36 or fewer. Still, fairly early in this development, observers glimpsed portends of profound change.

By the early-1970s, the cable industry recognized that home terminal equipment, networked to an operator’s central computers, could be the gateway to a suite of futuristic functions and services, including interactive (or “two-way”) communication, e-commerce, and market research. In a technical paper prepared for the National Cable Television Association (NCTA), the general manager of planning for Pioneer Corporation, a maker of cable system equipment, cast addressability as the foundation for a transformative process of media convergence. “At Pioneer,” he wrote in 1981, “we view ‘Addressable Control’ not as an end, but rather the start of a new beginning for cable…A first big step toward the marriage of computer, cable, and the consumer.” He went on, wondering, “Could it be that the computer technology called ‘Addressable Control’ will eventually breed such changes in our industry that some day ‘cable television’ might even be a misnomer for the services we provide?” The next year, a

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355 Brown, “Addressable Control,” 42. Pioneer manufactured the set-top boxes that supported Warner’s futuristic Qube system. Qube provided a template for a wide range of interactive applications, as well as incubating program networks that would mature into MTV and Nickelodeon. For an analysis of Qube, see
product brochure for Scientific-Atlanta’s addressable STB underscored the effort to engineer this convergence: “Scientific-Atlanta introduces the computer that thinks it’s a set-top terminal.”\(^{356}\) In describing a packet-switched network for two-way data communications, Paul Baran, one of the architects of the internet, suggested that cable operators’ need for “addressable converter capability to control pay TV delivery” would allow for new interactive services to “come along as a byproduct.”\(^{357}\) Although rarely acknowledged in scholarship, addressable cable systems represent an early and significant step in the introduction of networked computing devices—reporting to a remote control center and integrated with a customer management database—into millions of American homes.

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Figure 3.2 This 1982 promotion for Scientific-Atlanta’s 8500 addressable terminal, powered by microprocessors, informed the cable operator that it’s “central billing computer can ‘talk’ to the addressable 8500” by way of what it called an “Intelligent Control Unit.” (Courtesy of the Barco Library, the Cable Center)

Direct marketing figured into the services cable operators and technology vendors imagined following from addressability, but targeted national advertising was not a priority. That would begin to change over the course of the decade. Spot cable was a modest but rapidly

Spot advertising had become more important to a cable industry that saw new subscriptions approaching a plateau and that faced rate regulation of its main revenue source in 1992. With “advertising loom[ing] as among the most promising lines of business not touched by government oversight,” one cable sales manager from Atlanta said in 1993, “We’re going from the ugly stepchild of the cable industry to a group they’ll bow in reverence to.”\footnote{“Sure, Boss!” \textit{Cable Avails}, June 1993, 16.}

The most successful ad sales operations were generating up to $32 per subscriber per year at the start of the 1990s,\footnote{Gary Kim, “New Gear, New Markets Promise Higher Ad Gains,” \textit{Multichannel News}, September 24, 1990, 58.} and by the mid-1990s, spot advertising was contributing significant free cash flow straight to the bottom line. From 1990 to 1994, the yearly cash flow margin on ad sales across MSOs ranged from about 43 to 51 percent.\footnote{“By the Numbers,” \textit{Cable Avails}, September 1995, 20.} At Time Warner Cable, it represented the third most important source of cash flow, behind subscription and consumer equipment, but ahead of pay-per-view.\footnote{“Local Cable Requires Major Overhaul,” \textit{Advertising Age}, April 14, 1997, S9.} In 1996 one observer called local advertising “the fastest-growing portion of cable.”\footnote{“The Hot Market in Local Cable Ad Sales,” \textit{Broadcasting & Cable}, June 24, 1996, 58.} No less a figure than John Malone, the CEO of TCI, trumpeted the significance of advertising to cable systems, projecting its contribution as a percentage of TCI’s cable TV revenues to triple between 1993 and 1998.\footnote{“Sure, Boss!” 16.} The next year, TCI reported a 27 percent increase in ad sales, and soon after it hired new staff as “part of a sweeping new emphasis on its advertising sales operations.”\footnote{“Machinova Named to Top TCI Post,” \textit{Cable Avails}, February 1995, 1.}

finishing the decade at $2.667 billion. All this was set against a context in which cable’s share of audience viewing was rapidly approaching parity with broadcasting.

Interest in engineering cable systems for addressable advertising increased with the maturation of the spot business and optimism about the computer-processing power of digital set-top boxes that operators planned to install in subscribers’ homes. In 1989 General Instrument, which made set-top boxes for TCI and other operators, applied for a patent covering a “method and apparatus for providing demographically targeted television commercials” on cable systems through an addressable converter.366 In a contribution to the NCTA’s 1992 collection of *Technical Papers*, engineers at Cable Laboratories Inc. (CableLabs), a research consortium mandated to coordinate and advance developments in cable technology, characterized targeted advertising as a structural advantage cable enjoyed against emergent direct-to-home satellite services: “The cable industry is uniquely positioned to implement architecture which enables advertisers the ability to ‘precision market’ its [sic] products on the basis of geographic and demographic boundaries.”367 Bill Harvey, a veteran of advertising and media research, was among those recognizing this potential. In 1993, as CEO of Next Century Media, Harvey told *Cable Avails* magazine, “As soon as you add interactivity and addressability you’ve got a direct response medium…The ability to database and manage this subscriber base will move spot cable beyond traditional TV…Spot cable will become the most interesting medium out there.”368 Harvey and other enthusiasts saw in digital set-top boxes the potential to customize spot cable commercials for specific viewers. “That’s the promise of advertising executives,” one journalist

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366 David E. Wachob (General Instrument Corporation), Method and Apparatus for Providing Demographically Targeted Television Commercials.” United States Patent Number 5,155,591. October 13, 1992. The proposed technique required reserving dedicated channels for advertisements; so, as mentioned before, no cable operator would consider this economical until the cable plant had much more channel capacity.
wrote in 1996, “who say that new digital technology will not only let cable spot advertisers reach geographic zones but will someday create the cable equivalent of direct mail: individualized ads targeted to neighborhoods and households.” The media director at TBWA Chiat/Day warned, however, “It will take the commitment to invest in the technologies that allow us to deliver these ads to an individual household.”

This overview has been bookended by exhortations for “commitment” to building infrastructures on which a meaningful spot cable advertising business could be built. Considering the promises and expectations for a digitalized advertising system that were beginning to frame discussions about near-term and future capabilities, David Verklin, the corporate media director at Hal Riney & Partners, encapsulated the perspective of national buyers in 1992. “I think we’ll beat a path to their door,” he said of agencies’ interest in what cable systems may be able to offer, “but they’ve got to play by the same rules that we use to buy spot television.”

Stepping back from addressability for a moment, let’s take a closer look at how the spot cable business negotiated those rules and assembled itself into a billion-dollar sector of audience manufacture and a testing ground for ad tech and digital marketing strategy.

Packaging Cable Audiences

From the mid-1980s onward, actors involved in cable ad sales tried to build technical and administrative capacities that would help them appeal credibly to national advertisers, while also accentuating cable’s direct marketing capabilities. The demand side exerted continued pressure on cable operators to make their audiences easier to buy and measure. Cable experienced a set of

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369 Jim McConville, “Direct-Mail Cable on Tap,” Broadcasting & Cable, December 16, 1996, 88. Even earlier, a company called Adlink, discussed in detail below, was describing its cable advertising service in these terms: “It brings the targeting ability of direct mail to a televised video program.” Glen Dickson, “Digital Goes to Work for Adlink,” Broadcasting & Cable, November 6, 1995, 110.

370 Rich Brown, “Cable Moving to Digital Ad Inserts,” Broadcasting, April 6, 1992, 52-53. Almost two decades later Verklin went on to serve as CEO of a consortium formed by the leading MSOs to coordinate their technologies and business practices in ways that would make addressable advertising easier to buy and sell for national brands.
tensions similar to other media involved in selling the American people. On one hand, audience manufacture calls out for standards, protocols, and routines to facilitate transactions; on other the other hand, producing verified sales involves a thrust toward personalization and granularity that complicates the buying and selling of audiences. Cable was a vehicle for advancing the convergence of these two domains—the production of audiences and the production of sales. But to begin this movement required some conformity to prevailing norms and habits. Several industry-wide developments shaped the spot cable business in ways that provide insights about the broader evolution of targeted advertising.

Getting to Know the Audience

For starters, advertisers wanted evidence of audience attention by which they could account for their spending. In general, advertising agencies preferred to transact around the same metrics used in the market for broadcast audiences; but, near the margins of the business, some people were open to a certain amount of flexibility, on the belief that cable was by nature a medium for targeted rather than mass advertising. Even in the latter case, though, advertisers and agencies insisted in the mid-1980s that the “cable industry must supply more subscriber data,” including “thorough statistical profiles” of the people and communities served by their systems. The president of the Cabletelevision Advertising Bureau (CAB), a trade group representing the industry’s advertising interests, expected Nielsen ratings to persist as “the strongest currency in the television marketplace,” but, like others, he saw in cable an opportunity to move from a mass exposure paradigm toward an orientation that would privilege targeting and a sensitivity to results: “the challenge is to process and analyze audience data in a more precise relationship to marketing goals.”

371 “Exhorting Cable Advertising’s Faithful,” Broadcasting, April 2, 1984, 62, 64.
372 “Cable TV: An Advertising Medium Coming of Age,” Broadcasting, April 18, 1988, 87.
Even as broadcasters liked to remind advertisers of the deficiencies in cable audience measurement, it was recognized by many at the time that in the long run cable was in a superior position to generate data about its viewers.\textsuperscript{373} As early as 1982, a letter to the editor of \textit{Broadcasting} insisted that set-top boxes—especially “intelligent” devices equipped with microprocessors—could be used to “poll” the entire cable system and measure precisely who was watching what. “Amazingly,” the author wrote, “such on-line, realtime data gathering capability is within reach of the industry using currently available technology.”\textsuperscript{374} Equipment vendors used this as a selling point in product catalogs. A 1992 brochure for Pioneer’s addressable technology products told cable operators, “Viewer Statistics – can be used as an advertising and marketing tool which allows you to take five global or individual ‘snapshots’ of the programming subscribers are viewing at a given instant in time.”\textsuperscript{375} Already by 1988 Pioneer’s marketing materials described these lists of “the programming every subscriber watched at a single instant in time” as “invaluable information for advertisers on subscriber viewing habits.”\textsuperscript{376} While at least one equipment-maker pointed out that viewer statistics would be reported anonymously in aggregate, a main component of addressable control systems was that they integrated software and databases for billing and other clerical functions, which linked a subscriber file to a specific set-top device. When General Instrument patented a technology for demographic targeting of TV ads, as mentioned above, it acknowledged the ability of addressable cable systems to identify and observe individuals.

\textsuperscript{376} Pioneer, “The BA-6000,” brochure (1988). Accessed at Barco Library. The ability to take a “snapshot” of the channel each set-top box in a system is tuned to remains the basis for how addressable advertising software selects which ad to insert to a specific household. Interview with Bruce Anderson, February 20, 2018.
Demographic data can be input by a viewer via a remote control, downloaded to a subscriber’s converter from a remote headend, or programmed into the converter at installation...Statistical data can be maintained concerning the number and identity of subscribers viewing specific commercials.\textsuperscript{377}

With new forms of user interactivity being imagined and built into cable systems, the flow of consumer data to operators and their advertising partners promised to cascade beyond any previous limit. “Every time a viewer presses a button to make a viewing choice,” \textit{Broadcasting} reported in describing a venture financed in part by Coca-Cola, “demographic information is recorded and a custom-selected commercial can be shown to that viewer.”\textsuperscript{378} That venture, called ACTV, received a patent in 1986 for a method of creating profiles of users that would inform real-time selection of the content to be delivered over an interactive cable channel, including “tailored television commercials for particular subscribers.”\textsuperscript{379} Even apart from interactive services, cable operators were amassing enormous databases as a matter of course. When the largest national cable rep firm sold a 30% interest to three leading MSOs in 1988, its president boasted that the cable industry possessed “a lot of hidden assets.” As \textit{Broadcasting} elaborated, “cable operators have gathered extensive information about their subscribers—demographics, likes and dislikes—through their everyday business.” These data resources, the rep firm’s president said, would enable cable operators to combine “the power of television with the effectiveness of print.”\textsuperscript{380} Bristling at criticisms of cable research in the early 1990s, the president of Cox Cable asked an agency executive, “Are you really ready for all the information we have?”\textsuperscript{381}

\textsuperscript{380} “More MSO’s Want into Rep Business,” \textit{Broadcasting}, April 18, 1988, 89.
\textsuperscript{381} “Changing Nature of Cable Advertising,” 79.
With all this data, concerns about privacy began to surface. Perhaps surprisingly, viewed from our vantage point when media industries revolve in large part around surveillance and commodification of personal information, cable operators were cautious about wading into these waters. Not for ethical reasons necessarily, but rather because they and their lawyers were disinclined to jeopardize any part of a booming subscription business by trying to advance an advertising market that, relatively speaking, was worth a pittance to them. Still, one interviewee told me that by 1992 the CAB had invited him to investigate commercial applications of the data that could be collected by set-top boxes.382

By the end of the decade, with several dramatic technological and cultural shifts, the wind was starting to change. The chief technologist at a firm called Invidi explained that the genesis of the company around 2000, which went on to become the leading provider of addressable ad technology to the television industry, was an effort to use STBs to figure out who was watching and how to advertise to them. “The original concept,” he told me, “was through monitoring behavior you could anonymously determine the likely age, gender, maybe even income and education level of the current viewer and use that information to target ads against. So, early on, we did a tremendous amount of machine learning research to come up with algorithms that actually could give you those kinds of guesses.”383 At the turn of the twenty-first century, ad tech companies were developing software to collect every interaction users had with cable service via the STB. By the mid-2000s, a company called Navic Networks (later bought by Microsoft) had this capability deployed in roughly 10 million homes across major providers (including Cox, Charter, and Time Warner Cable), automatically generating daily data reports about every subscriber’s activity. Among its other uses, this data was leveraged by spot ad sales staff in negotiations with advertisers and used for demographically-targeted interactive

382 Interview with Bill Harvey, February 5, 2018.
383 Interview with Bruce Anderson, February 20, 2018.
advertising.\textsuperscript{384} Other firms, including Rentrak/ComScore and TiVo, as well as operators like Comcast, now collect and use set-top box data both for audience measurement and consumer targeting. Even Nielsen is looking toward a future in which set-top box data forms a major part of its TV ratings products; last year it began including set-top box data from Comcast and other operators in its local audience measurement, signaling that the “census level” data STBs can collect from the entire population of subscribers is becoming a part of industrial routines.\textsuperscript{385} The surveillance capacities of cable have come a long way toward what advertisers demanded and operators promised.

Across the 1980s and into the 1990s we see cable MSOs recognizing a trajectory toward personalization and direct marketing, the utility of customer data for advertising purposes, and the advantages of their position, both as data-collector and gatekeeper of the direct connections into individual homes. Given these expectations, it seems ironic that the other major innovations in spot cable involved \textit{aggregating} audiences to compete with broadcast stations. One might be confused at first to hear the president of the USA Network insist that cable “must reach a target audience with big enough numbers to make it important to advertisers.”\textsuperscript{386} This statement gestures, in fact, toward a central contradiction of individual addressability. To construct audiences of individuals efficiently requires a system to be scaled up until it embraces as much of a population as possible. Getting granular requires first becoming giant. The co-founder of DoubleClick, an online ad network and service company that was central to the commercialization of the Web, confirmed this challenge: “The great paradox with targeting ads is

\textsuperscript{384} Interview with Chet Kanojia, February 12, 2018.
\textsuperscript{386} “Changing Nature of Cable Advertising,” \textit{Broadcasting}, April 15, 1991, 78.
that the more you are micro-targeting, the more reach you have to have.”

As Fernando Bermejo explains, the internet combined the ironically complementary trends in advertising toward globalization and hyper-targeting. The cable business was engaging a similar balancing act, albeit within regional and domestic boundaries. One sales executive told me, “Until you could create a unified, consist, solid whole for a [cable] market, you couldn’t rationally divide it” for targeted ad sales. Scale, here, is not just a matter of sheer size, but of interconnection and interoperability; marketing an audience of one benefits from operating in one integrated market. Three interrelated developments dealt with this problem, beginning in the 1980s: clustering, repping, and interconnection. The main thrust of these efforts was to coordinate the spot cable market around advertisers’ demands for a “one stop shop” for buying audiences.

*Clusters, Reps, and Interconnects*

Geographic specificity was both cable’s value proposition and its arch limitation. The pitch to a local grocer was simple: *Why pay for all of Philadelphia when most of your customers live in Chestnut Hill? No one is going to cross the city to shop for sundries.* For national marketers, though, buying local cable seemed expensive on a per-viewer basis, and to reach beyond the small territories covered by each cable headend meant dealing with scores of sales people and likely a range of incompatible traffic, billing, and insertion systems—creating what observers called “administrative headaches” and a “logistical nightmare.”

Reflecting on the view from the 1980s, Paul Woidke told me, “if you said, ‘OK, I want the first spot in *Sportscenter* on the 80 cable systems in Los Angeles,’ and they all agreed to reserve it for you, by the time you did the

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389 Interview with Paul Woidke, February 9, 2018.

80 negotiations, executed the 80 contracts, distributed 80 sets of content, reconciled 80 invoices, and wrote 80 checks, it cost you more than buying one spot on the CBS evening news. Because the execution costs were astronomical.”

For TV buyers trained to maximize reach and minimize cost-per-thousand-viewers (CPM), local cable made little sense.

Consistent with longstanding pressures from advertisers and agencies to reduce any barriers to commerce, DDB’s vice president of video technology and programming said in 1983, “Local cable advertising probably isn’t going to be a big business until you can buy local cable in virtually all cable systems across the country easily.” An executive from BBDO told Broadcasting a year later that media buyers “don’t have time” for a salesperson selling access to even the tens of thousands of viewers subscribed to a single cable system. “Without interconnected capabilities, [cable operators] will not get much of a reception from Madison Avenue.” The general manager of a firm representing cable operators across San Francisco agreed that “no advertisers will buy separately on 37 different systems.” Failing to coordinate into networked sales operations, he stressed, would leave cable operators “stuck with mom and pop shops and nickel and dime spots.”

As the typical ownership structure in the cable industry shifted decisively from “mom and pop” companies toward the multiple systems operators that dominate today, these MSOs sought the advantages accruing to “clustered” operations—owning adjacent systems across a city or region. Although the strategy was motivated far less by advertising interests than by other core priorities, such as centralizing management and customer service, clustering did increase scale and efficiency in ad sales. By the early 1980s, large cable outfits, such as Time Inc.’s ATC and

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391 Interview with Paul Woidke, February 9, 2018.
393 “Exhorting Cable Advertising’s Faithful,” 62, 64. Paul Woidke added a bit more color from his experience in L.A.: “the last thing a buyer wanted was the 67th sales rep of the day showing up and trying to explain why he just had to buy Diamond Bar as opposed to El Segundo. I mean, it was wacko land.” Interview, February 9, 2018.
Westinghouse’s Group W Cable, recognized that clustering would allow an MSO in a given territory to become a “legitimate competitor” to newspapers, radio, and broadcast TV in the market for local advertising.\(^4^\)

Courting national advertisers was a bigger challenge. In the late 1990s, Time Warner Cable estimated the percentage of spot cable sales to national buyers was still only around 11 percent. However, the proportion of purchases executed through advertising agencies had doubled, from 30 percent to 67 percent, since the 1980s. TWC’s vice president of ad sales called this “a paradigm shift in cable advertising.”\(^5^\) A contributing factor was that MSOs became increasingly invested in sales rep firms in the second half the 1980s, expanding their ability to transact with national and regional advertisers and their agencies. Cable reps emerged soon after local operators began inserting ads. In 1983, Cable Networks Inc. (CNI) generated about $4.5 million in ad sales in the New York area, and four years later it was bought by Cablevision. CNI’s chief rival, National Cable Advertising (NCA), posted just over $7 million in revenues in 1987, and the next year three MSOs took an equity stake in the firm.\(^6^\) NCA merged with the Katz’s Cable Media Corp. in 1995 to form National Cable Communications (NCC), which continues as the main organization representing cable operators to national advertisers. By the end of 1996, Comcast had joined the other MSOs as part owner, and the firm represented roughly 60% of cable systems in the U.S.\(^7^\) When TCI took an equity stake in NCC in 1998, the latter’s marketing footprint covered 97 of the top 100 markets and included 82 percent of the cable

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\(^7^\) “Sawhill Takes Over at NCC,” *Broadcasting & Cable*, December 9, 1996, 105.
households receiving locally-inserted ads. By then, NCC and CNI represented about $350 million in total billings.

The point of the rep firms, as one sales executives explained to me, was essentially to mimic the coverage area and buying protocols of a broadcast station. But MSOs and rep firms also demonstrated “an awareness about upgrading technology to develop more psychodemographic information.” Trumpeting cable’s direct marketing ambitions, the president of CNI declared, “It’s no longer cost per thousand. It’s cost per ZIP code.” National cable reps were an organizational embodiment of the transition and translation between mass and targeted advertising.

A related and significant development was the interconnection of cable systems. As its name suggests, cable interconnection refers to the networking of cable systems. It is similar to clustering, but “interconnects” embraced systems operated by multiple companies. For advertising purposes, the idea was to expand coverage while consolidating sales within a single bureau, so that an advertiser could buy locally-inserted spots across all the cable systems in a city or region through one point of contact. In concert with sales reps, interconnect companies were, in part, a legal expediency for cable operators to compete collectively against local broadcasters without violating laws prohibiting collusive price fixing. The legal argument envisioned by the MSOs’ lawyers was that by forming an interconnect, they were, through this newly created third-party firm, marketing a novel product that the local operators could not produce and sell on their own—a potential audience of all cable households within the network.

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400 Interview with Bruce Thomas, February 2, 2018.
402 Interview with Larry Zipin.
like a regional rep firm, and national rep firms represented these interconnects to advertisers and agencies in other parts of the country.

Interconnects were described as being either “soft” or “hard.” In “soft” interconnects, tapes containing advertisements would be physically circulated (or “bicycled”) from system to system for simultaneous insertion into a network like ESPN. More significant were the “hard” interconnects, wherein systems were networked using microwave relays, shared satellite links, or coaxial and fiber optic cables. A central facility became a hub for processing transactions and distributing ad copy across the web of affiliates.

Interconnects were established in major markets across the country, and they recorded growing ad billings in the early 1990s. By streamlining an ad buy that covered multiple cable systems with one sales order, invoice, and content delivery, complexity and transaction costs were reduced, and spot cable became closer in price to broadcast inventory. Perhaps the most innovative interconnect was Adlink, which formed in 1988 and eventually connected more than 75 cable systems in Los Angeles and other parts of southern California. In partnership with the NCA rep firm, Adlink became the “exclusive national advertising rep” for L.A. and the adjacent markets of San Diego, Santa Barbara and Bakersfield. Adlink was owned by five cable operators and Prime Ticket, a regional sports service that had a transponder on the Satcom IV satellite, which it used, in the early years, to distribute ad spots to the interconnected systems. Adlink reported revenues of almost $30 million in 1995. While a tidy sum, that was, as one report put it, “only the proverbial crumbs that fall off the table” in the $1.2 billion TV ad market in L.A.

403 “Exhorting Cable Advertising’s Faithful,” 62, 64.
404 “Satellite Cable Interconnect,” Broadcasting, September 19, 1988, 77. Using a computer that acted as a central control facility for tape decks at Adlink’s headends, a technician would program the latter machines to record a one-hour feed of ads from the satellite, usually during the middle of the night, when Prime Ticket was not televising and when no ads had to be inserted. At first this happened twice a week and eventually 4 or 5 times weekly.
405 Katz, “Local Cable’s Ace in the Hole,” 58.
Although Adlink built itself up to be like “the ninth TV station in Los Angeles,” by this time it was coming to understand local cable as being in competition for the nearly $5 billion spent on all media in L.A., including newspapers and direct mail. Its ambition was rewarded with surging gross revenues—$62 million in 1997 and $83 million in 1998. Later we will return to Adlink as a touchstone for discussing the role of interconnects in facilitating some of the first tentative steps toward addressable video advertising.

Figure 3.3 (Source: “By the Numbers,” Cable Avails, February 1995, 1.)

Digital Tech Before the Digital Transition

There can be no denying the importance of digital technology in the elaboration of targeting advertising. Bruce Anderson described to me the realization he and others had when he was the managing director of digital television at Sarnoff Corporation in the early- and mid-1990s:

406 Interview with Paul Woidke, February 9, 2018.
Once you packetize the video stream, it’s pretty obvious you don’t necessarily need to send the same information to every receiver. So, even back then, there were people starting to think about how you possibly do addressable or targeted advertising. The TV industry, pretty much since it started having paid advertising, was looking for ways to have specific audience segments see particular ads...Ultimately, what you’d love to do is be able to have a one-to-one conversation. So, DMAs [designated market areas] became chunks of cities, which became neighborhoods, which now, with the advent of true addressable advertising, is down to individual households...The switch to digital is really what accelerated the whole process.\textsuperscript{408}

Of course, the transition to digital television transmission was painfully slow.\textsuperscript{409} A decade before programming became digital, cable operators began integrating digital technologies into their backend advertising infrastructures. Our examination of how digital technologies were incorporated into cable advertising will focus on two key logistical functions: ad-insertion and trafficking.

In 1992, representatives from CableLabs explained, “new technology platforms based on integrating compressed digital video mass storage systems and powerful communication network architectures should allow an infrastructure which supports future revenue growth for cable advertising sales.”\textsuperscript{410} The authors understood the importance of coordinating flows of information and commerce in the spot cable market, and they pointed toward the sorts of services that later emerged to facilitate advertising on the Web: “the purpose of creating this [digital commercial insertion] network is to promote the interconnection and interoperability of hardware and software which subsequently allows advertisers to buy local, regional, and national spot avails easily and conveniently.”\textsuperscript{411} They added, “the convergence of cost-effective computing plus the

\textsuperscript{408} Interview with Bruce Anderson, February 20, 2018.
\textsuperscript{409} Hernan Galperin, \textit{New Media, Old Politics: The Transition to Digital TV in the United States and Britain} (Cambridge, UK: Cambridge University Press, 2004).
\textsuperscript{410} Bachman and Dukes, “Compressed Digital Commercial Insertion,” 447.
\textsuperscript{411} Bachman and Dukes, “Compressed Digital Commercial Insertion,” 448. Emphasis added.
use of cost-effective communication networks” could provide the “enabling architectures” for solving difficulties in trafficking, inserting, and verifying spot ads.\(^{412}\)

By then cable operators were actively discussing digital interconnection of systems, with these conversations catalyzed by broader developments in the liberalization of telecommunications markets, as well as continued pressure from advertisers and agencies to iron out seams in the spot cable business. Although details about the future were unclear, \textit{Broadcasting} reported, “experts agree that multichannel, digital ad insertion is on the horizon.” Industry groups began to mobilize and coordinate collective efforts. The CAB convened a task force on the issue. Engineers solicited ideas for building “a national highway and reservation system” for routing ads to headends around the country, as well as the hardware “able to store and access thousands of spots for insertion” into an increasing number of channels.\(^{413}\)

When CableLabs invited engineers and technologists to submit designs for tools to manage digital ad-insertion, the consortium’s director of technical operations projects estimated that by using digital storage and insertion systems to increase capacity beyond the limits of videotape players, cable operators could boost their annual spot advertising revenues from $1.25 per subscriber to as much as $25 per subscriber, on average.\(^{414}\) As Paul Woidke of Adlink explained in 1993, “In a tape-based insertion environment today, you require three to four tape decks for every insertion channel on which you want to do full random insertion—that is to say be able to hit every avail with a different spot.”\(^{415}\) With the number of cable networks exploding in the early 1990s, operators saw the opportunity and challenge of inserting on 30 or 40 channels. For a headend to manage “as few as four 30-second spots across even 30 channels (120 total

\(^{412}\) Bachman and Dukes, “Compressed Digital Commercial Insertion,” 453.


spots) per hour” was considered “cost- and space-prohibitive” in a videotape environment. A central server linked to affiliated systems, Woidke and others suggested, can take over the “command and control” function of routing ads into content streams. “Our focus on the digital revolution,” Woidke declared, “is simple, is straightforward, and is direct. It is to provide an immediate payback for our clients—that’s the advertising community—by providing a more efficient, and a more effective, and a more economical means of spot delivery in the cable universe.”

Interconnects in Detroit, New England, and elsewhere invested in digital ad-insertion infrastructures in the early and mid-1990s, and by 1996 New York, Los Angeles, and Chicago—the largest interconnects—were in the process of “adopting systemwide server-based insertion systems.” Interconnects paid anywhere from $1 million to $10 million and up to install MPEG-2 encoders/decoders, servers, and switching equipment and to integrate them across the headends for which they administered advertising business. Sony and Channelmatic, a leading tech vendor, provided the Chicago Interconnect with video serving and switching systems capable of storing 2,500 30-second spots, inserting on 80 channels, and splitting the interconnect’s territory into five zones for targeting. The MPEG-2 system that Adlink procured from Digital Equipment Corp. to serve ads across its 57 headends, via T-1 fiber lines, cost $10 million, paid by the MSOs with

416 “Digital Compression: Cable Insertion’s Enabling Technology,” 53. By 1990, one ad tech vendor was reportedly pricing sequential insertion systems (meaning a tape is edited together and spots are played-back in order) at $10,000, $24,000, and $45,000, respectively, for one-, four-, and eight-channel capacities. The prices for those same channel capacities in random access systems, allowing spots to be retrieved more flexibly, were $15,000, $48,000, and $95,000. The difference to understand about sequential vs. random access insertion machines is that the former requires the operator to make a tape every day for each network with the log, in order, of the spots to be inserted, and then assign it to a dedicated VHS unit. This meant more work in preparing for insertion, less capacity in the number of spots available in storage, and less flexibility in how to inventory could be packaged and sold to buyers. Kim, “New Gear, New Markets Promise Higher Ad Gains,” 58.

417 “Digital Advertising,” Cable Week [TV show].

equity stakes in Adlink. Adlink’s central server facility distributed video files to smaller servers at each headend, capable of storing more than 300 30-second spots.

Although cable systems did not yet transmit digital video to customers (and, in fact, at the cable headend the digital ad files had to be converted back into an analog signal), digital infrastructure on the back-end provided many benefits for the advertising business, including greater storage capacity, more flexibility in routing ads to affiliates and retrieving them for insertion, easier editing and splicing processes (with less picture degradation than analog tape reproduction), a more comprehensive and automated system for verifying that ads ran as promised, and the prospect of more precise targeting. Centralized digital video servers also helped cable operators reduce from days to hours the turnaround time needed to incorporate ad copy into the insertion lineup; and digital processes reduced the human resources required across spot cable buying and insertion, which were notoriously labor-intensive. As Broadcasting & Cable reported in 1996, “digitalization of interconnects, such as Adlink in Los Angeles, has removed many of the barriers and disadvantages that dissuade advertisers from choosing cable over broadcast.” For example, moving from satellite interconnection to dedicated T-1 lines meant a shift from three satellite feeds per week to affiliated headends to “a 24-hour-a-day dedicated bandwidth network.”

The arrival of digital servers at cable advertising interconnects was part of larger developments in server-based storage and retrieval of video assets. Most famously, Time Warner Cable spent a fortune on an ambitious project called the Full Service Network, which deployed an array of futuristic multimedia applications in 4,000 homes in Orlando in the mid-1990s.

419 “Digital Insertion Vendors Hit CAB on a Roll,” 60.
421 Katz, “Local Cable’s Ace in the Hole,” 58.
Excessive hype and runaway costs blunted any public perceptions of success; but, TWC ended up actualizing, for the first time, video-on-demand (VOD). Digital compression and storage technologies, coupled with the installation of fiber optic cable infrastructure, contributed to a situation in which, according to Jim Chiddix, TWC’s top technologist at the time, “we had enough channel capacity in each neighborhood where the fiber went to deliver a different stream to each home. And that was really a revolutionary idea.” He went on to explain the scope of TWC’s expectations for the FSN when it launched in 1994:

“From a technology standpoint,” Chiddix told me, “video on demand and targeted ad-insertion are almost indistinguishable. You’re really doing the same thing. You’re switching a stream from a server to a given neighborhood and an individual set-top box in the home.” The difficulty was “building a business around those capabilities.”

On a more modest level, cable interconnects were trying to build this digital advertising business. Leveraging its digital infrastructure, Adlink took a pioneering approach to targeted advertising. Around 1995 Adlink introduced two products—Adtag and Adcopy—that allowed advertisers to tailor their messages to geographically (and therefore demographically) defined audiences within the Adlink footprint, covering about 57 cable headends and 2.3 million subscribers at that time. With Adtag, an advertiser appended to the end of an advertisement a bit of textual information with specific relevance to viewers in a particular geography—such as the

423 Interview with Jim Chiddix, January 28, 2018.
location of a merchant’s nearest retail outlet. Everyone in the Adlink footprint would see the ad, but the text at the end would be customized for different neighborhoods. Adcopy, by contrast, allowed advertisers to buy the whole interconnect but send different versions of creative messages throughout specified portions of Adlink’s network. As one trade press source explained, “Adlink advertiser Chevrolet might run an SUV commercial on cable systems in L.A’s beach communities and a spot for its Malibu model in less-upscale areas.”

As mentioned earlier, one of the tendencies in the calculative evolution is toward making marketplaces more dynamic, or responsive to new information. An early sophisticated use of neighborhood addressable advertising that expressed this idea was related to me by Paul Woidke from Adlink. In the late 1990s, he told me, a company marketing flowers initiated a campaign for which it classified the targetable zones in L.A. according to data it had about the expected willingness of customers in the respective regions to pay for a bouquet of flowers. It then sent different ad messages featuring different price offers to each zone. As the company evaluated subsequent sales in those areas, it altered the prices and messages advertised. This illustrates the principle of A/B testing that has become a hallmark of interactive marketing.

Adlink made clear that it was bringing direct marketing to television. In an advertisement placed in Broadcasting & Cable in 1998, Adlink described its service as “the innovative approach to television advertising that will help you reach more of the audience you really care about—the customers most likely to buy your products...Now you can tailor the buy and your creative mix. Geographically, demographically and with one buy, one tape and invoice. It’s as close to direct marketing as the medium and the technology allow. It’s Targeted TV.”

Adlink’s director of marketing explained later that year, “We’re more than just local cable. We’re...

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426 “Adlink” [advertisement], Broadcasting & Cable, October 26, 1998, 47.
delivering advertisers’ messages to the people most likely to respond to them. It’s the closest thing to addressable advertising being offered today.”

“Our goal,” she added, “is to offer advertisers a technology platform, a research process and marketing applications.”

To call Adlink’s products “addressable” was a bit of an exaggeration. Adtag and Adcopy both worked on the principle of “zoning.” A market with dozens of headends, which had been aggregated for ad sales through the interconnect, would be again disaggregated into regions that could be classified by demographics, income, ethnicity, lifestyle categories, and so on. Zoning allowed advertisers to “send different commercials to different neighborhoods on the same channel at the same time, allowing them to customize their pitch to fit the demographic characteristics of audience segments within the same market.”

In effect, zoning made good on cable’s promise of geographic targeting while also working within a sales infrastructure that bundled headends for market-wide scale and streamlined the buying and insertion processes through a single bureau. But zoned ads did not discriminate among households within the footprint of a headend; in other words, they could not target a specific set-top box. Moreover, an advertiser buying from Adlink had to buy a spot across the entire interconnect and then decide if and how to customize messages for different zones, and the advertiser paid the same CPM for the entire market. Zoning through the interconnects, therefore, involved a sort of tension between being able to tailor messages to different neighborhoods, but having to buy entire markets, and absorb the consequent waste, just like in the broadcast model. Still, zoning “was the rudimentary first step toward addressability.”

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430 Interview with Paul Woidke, February 12, 2018.
Interconnects invested in abilities to better control the circulation, storage, and insertion of video advertisements. By now you might not be surprised to learn that this advancement planted the seed of a new (old) problem. As one reporter noted, “Digital insertion makes possible all sorts of initiatives, such as zoning and same-day insertion. But traffic and billing systems have to be able to keep up with new demands.”\textsuperscript{431} Traffic and billing, to repeat, refers to the process of scheduling an ad insertion, verifying that it ran, and managing payment. The more granular the targeting, the more complex the processes of trafficking and pricing those ads.

Complexity was a scary word for a cable industry that started with very limited competency in the logistics of ad delivery. Larry Zipin recalls that in the early days of local cable, when an operator was inserting on just a handful of national cable networks, spot cable traffic systems often consisted of “two ladies in their 30s or 40s, a big white board, and erasable pens.”\textsuperscript{432} Paul Woidke remarked that even a white board would have been an extravagance for some operators in the 1980s.\textsuperscript{433} As the inventory and business grew, however, spot cable needed to develop means of administering transactions at greater volume and intricacy. Adding geographic zoning and customized ad delivery could multiply tenfold the number of avails managed by a cable operator, according to a CAB representative.\textsuperscript{434} One vendor of traffic and billing technologies tried to reckon the scale of the administrative challenges confronting targeted cable insertions: “If you’re running 30 networks, 30 zones at an average of 50 30-second spots a day on that, that’s 30x30x50 for one day. That turns out to be tens of thousands of spots that you’re running in one day.”\textsuperscript{435} The general manager of advertising a TWC system in San Antonio explained that his operation inserted on 40 cable channels, selling more than 3 million spots a

\textsuperscript{432} Interview with Larry Zipin, January 26, 2018.
\textsuperscript{433} Interview with Paul Woidke, February 12, 2018.
\textsuperscript{434} McConville, “Direct-Mail Cable on Tap.”
year. A broadcast station would more typically run roughly 120,000 spots, he estimated. “It’s not unusual for somebody to buy 5,000 spots a month from us.” Early on sales managers struggled to convince cable operators to invest in the insertion equipment needed to grow the business; now, having achieved greater insertion capacity, they needed new control systems to cope with their growth. Zipin’s recollections add color to how administrative challenges intensified in cable ad sales, far beyond what was required for spot broadcasting:

[K]eep in mind, if you’re a local ABC station, your traffic system doesn’t have to be very complicated because you’re only trafficking on one station. And you’re trafficking, you know, two minutes an hour, you know, for 24 hours a day, for seven days a week…That’s logical, sequential—in a straight line. Ours is four-dimensional. And then it becomes 12-dimensional. And then it becomes 20-dimensional. So…[maybe] the cable company gets generous and gives us enough ad-insertion equipment to go on 20 networks, and [now] I have two ladies in the traffic department who are ready to commit suicide. We literally have total chaos.

Understandably, cable operators faced pressures to invest more in their information systems. According to one estimate, the spot cable advertising business, with revenues of $1.25 billion in 1994, spent roughly $3.2 million on information systems that year—much less than the 2 to 4 percent of revenues spent on information systems by broadcasters. One trade journalist captured the exasperation of buyers and sellers in the late-1990s, writing, “Today, the complexity of avails planning, creating orders, moving tapes and counting spots would be comical if it weren’t so frustrating.” By 1997, NCC accounted for 66 percent of the national spot market, and the firm “was manually processing 8,000 to 10,000 paper affidavits per month.” Given the errors involved in administrating these transactions, one analysis concluded that cable operators were losing up to $4 on CPMs due to inefficiency. A cable sales executive from Chicago figured even in 1999 that the cost to “administer” transactions for local cable spots might be five times

437 Interview with Larry Zipin, January 26, 2018.
higher than typical broadcast buys due to the paperwork alone.\textsuperscript{440} When TCI joined NCC in 1998, the rep firm “call[ed] for the MSOs to accelerate upgrades” in their advertising operations “to allow advertisers to take full advantage of evolving digital technologies and targeting.”\textsuperscript{441} Larry Zipin recognized that further refinement of backend operations was essential for achieving breakthroughs in precise targeting. “What’s keeping us from being able to go to specific neighborhood nodes and homes right now,” Zipin claimed, “is limitations in the trafficking, schedule and inventory software.”\textsuperscript{442}

Certainly, Zipin was pointing to part of the problem. But difficulties ran even deeper. The technical aspects of trafficking were generally understood, and they could be fixed if organizations committed to the job. What was harder to settle was a profound conflict about the business model, which would need to be resolved before anyone would feel moved to invest in better software. As Jim Chiddix told me, “the idea of actually sending different ads to different homes took decades really to gestate. And that was in fair measure because of the inertia of the advertising business.”\textsuperscript{443} Instituting targeted advertising required reconciliation of competing philosophies about how audiences should be sliced and priced. With respect to slicing, there are two general approaches to addressability. In one model, an avail is sold in full to a single advertiser who then customizes the ad copy for different parts of the population. In the other model, instead of selling an avail to one advertiser, any number of advertisers can buy “impressions” within that avail, so that rather than buying all of Center City Philadelphia, you buy just the households that fit certain parameters. The latter version has been much more promising and much less popular. This had less to do with technical limitations—although it is harder to traffic spots as the inventory is splintered—and more to do with concerns among

\textsuperscript{440} Kate Fitzgerald, “Shopping for Cable Time Gets Easier,” \textit{Advertising Age}, August 2, 1999, S10, S70.
\textsuperscript{441} “NCC Advancing EDI After TCI Deal,” 8.
\textsuperscript{442} “Big-Time Breakout Boosted in Buying Local Cable Time,” S7, S13.
\textsuperscript{443} Interview with Jim Chiddix, January 28, 2018.
operators that by breaking up avails into targeted impressions and selling them on a more individualized basis they would risk being left with “remnant” inventory. In other words, the fear is that advertisers will buy only the desirable homes and the operator will be left with unsellable impressions within an avail. Software for automating the management of inventory seemed like a promising solution to this problem; but operators worried that this route, especially insofar as it pointed toward auctions and bidding, would drive down prices. Since avails almost always sold out, operators were not compelled to do anything except try to negotiate higher prices.

Envisioning a rosy future in 2000, one agency’s convergence media director explained, “Addressable advertising is a win-win for the advertiser and the provider because the [multiple systems operators] can increase inventory and revenue and the advertiser will pay a higher CPM to reach a true target than they will to reach their target mixed in with a bunch of non-prospects.” Reality turned out to be much thornier. In the opinion of Paul Woidke, battles over the pricing of targeted audiences delayed for years the introduction of addressable cable advertising. Setting aside transaction costs, the issue boils down to a dispute between buyers and sellers about waste. Sellers argued that because they could discriminate qualified consumers from the rest of the audience universe, advertisers should pay more for each viewer. Advertisers and their agencies countered that they were already paying an inflated price because of those wasted exposures, and so now they should continue paying the same CPM for the people they really wanted to reach in the first place. “[T]he two parties can’t agree whether there should be a premium or a discount,” Chet Kanojia told me. “That’s how far apart they were…The buyer

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444 Kevin Bowe, “Thinking All the Way Through the EDI Proposition,” *Cable Avails*, June/July 1999, 28.
446 Interview with Paul Woidke, February 12, 2018.
wants a discount because he wants to get rid of excess audience, and the seller wants a premium because he or she is enabling them to do targeting. “\(^{447}\)

According to a 2014 estimate, CPM rates for addressable television can range from $20 to $500. \(^{448}\) By comparison, cable networks on average charge CPMs closer to $17 today. The solution from the supply side is to reckon costs not in terms of how many people are reached in total, but instead how many of the people reached are among an advertiser’s target audience. Proponents advocate for calculating effective CPM. The math, they say, reveals addressability to be more cost-effective.

The technical details of insertion, trafficking, and pricing could fill another volume. Without wading further into the weeds, the point of bringing all this up is to demonstrate that local cable advertising presented challenges far beyond what networks and broadcast stations dealt with, in terms of volume and complexity. It also presaged some of the issues required to reconstruct the internet business around personalized advertising. As an interconnected network of networks, the internet allowed for a much less fractured technical environment, and one with basically no revenues or incumbencies put at risk by a new business model. But as the Web was beginning its commercialization, the cable industry tried more than ever to present itself as the leader in interactive and addressable advertising.

**Selling the Future**

In the first half of the 1990s, the advent of digital video servers, and their integration into advertising delivery, hastened the arrival of a distinct period in the development of addressable and interactive advertising. The prospect of marrying television advertising with direct marketing

\(^{447}\) Interview with Chet Kanojia, February 12, 2018.

became a clear ambition, and efforts intensified to build software, hardware, and business relationships to manifest it. Speculation about digital STBs poured gasoline on hype about the convergence of television and personal computers.

Toward the end of the decade, addressable advertising was entering a new age of action and experiment. Interactive television firms, such as ACTV, OpenTV, and Wink implemented advertising and e-commerce products and, importantly, made apostles of a group of employees who went on to major positions in ad buying and selling. Perhaps most notably, Tracey Scheppach left Wink to become a media buyer at one of the leading holding companies, because she decided, “I’d rather be in a position at a big agency to pull through the innovation and kind of shape it. And, so, that’s what I did.”

Scheppach was not alone in trying to shape the direction of advertising technologies. In 1994, Procter & Gamble’s CEO issued a famous battle cry to marketers, urging them to seize the opportunity to assert control over the direction of new interactive media, lest they be shut out. “Let’s grab all this new technology in our teeth once again,” he said, “and turn it into a bonanza for advertising.” Around 1998, TCI invited a group of blue-chip marketers, including Kraft and General Motors, to its offices in Denver, where it proposed that those companies give over $2 million each to finance the development of addressable ad tech in return for local cable inventory. This summit came on the heels of an effort begun earlier in the decade by TCI to drum up interest among major advertisers and their agencies around addressable and interactive advertising. In 1996 TCI hired a vice president of national ad sales and sent him to Madison Avenue. His mission was both to proselytize the interactive and addressable vision that John Malone and TCI had been articulating for years, and to solicit advertisers’ guidance about how such a system

449 Interview with Tracey Scheppach, November 6, 2017.
could be built to their needs. Eventually, this national ad sales executive came to realize that most of the things he was promising, including the digital STBs designed for the job, existed only as blueprints (and dubious plans, at that). Reflecting on his mission years later, he concluded, “What I was selling was the future, against your competitor.” Most of the advertisers invited to Denver were not much interested in local cable avails. “But they were interested in the future of addressability and the future of interactivity.”

The future arrived very slowly, interrupted in part by TCI’s sale to AT&T. Despite being hyped as the bridge to a personalized multimedia future, the earliest digital boxes were nothing to marvel at. When companies like Visible World and Invidi began trying to engineer software to enable household addressability in the second half of the 1990s, Paul Woidke joked, “you had set-top boxes that had less capability than a transistor radio.” These devices had limited memory and the capacity to accommodate only a few crude binary categories for classifying the box and assigning its associated household to a marketing segment (e.g., apartment vs. house; kids vs. no kids; income above or below a defined threshold). Ad tech providers were competing against engineering priorities, such as the user interface and program guide, that facilitated cable operators’ core subscription business and promised better short-term returns and less risk than addressable advertising. General Instrument—the box-maker tasked with realizing TCI’s vision—did not program its devices around an operating system that was at all hospitable to app developers. It also subjected potential software and middleware installations to a certification process that lasted weeks in the best cases. Building and deploying boxes capable of facilitating household addressability was, therefore, a far bigger challenge than boosters hinted. Not so much

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451 Interview with Bruce Thomas, February 2, 2018.
452 Interview with Paul Woidke, February 26, 2018.
453 Interview with Bruce Anderson, February 20, 2018.
because it wasn’t technically possible, but rather because it was not a priority for engineers and managers concerned respectively with the cable plant and subscription revenue.

The sales organizations and the marketing community, of course, had different priorities, and their agendas were starting to come into focus as various groups envisioned the future of commercial media. Advertising Age reported in 1999, “The nation’s leading cable-systems operators are proposing a $100 million plan to make addressable and interactive advertising a seamless process for marketers.” Through NCC, its MSO owners—AT&T Broadband (TCI), Comcast, Cox, and Time Warner Cable—engaged in “talks with representatives of the ad industry about an ambitious plan that would allow marketers to easily target local ads to specific communities.” The plan involved national electronic interconnection for billing and trafficking, a national satellite distribution network, and the promise of addressable and interactive ads. The North American media director at Saatchi & Saatchi admitted, “This could indeed be a sea change in the way we do business.” The top ad sales executive for AT&T’s cable business said, “We think this is the future of a lot of advertising. It will move from passive advertising to more direct marketing.”

Eventually, after several delays, the first major trial of household addressable advertising was implemented in Aurora, Colorado in 2001. Although the results were promising, the protracted rollout of digital STBs denied operators and advertisers the scale they needed for a viable business. That remained the prevailing condition for a decade or so. In the interim, video-on-demand allowed a new area for trying addressable ad delivery. While elements of the technology were conducive to targeted and dynamically-inserted advertisements, negotiating the rights among operators and programmers—as well as questions about how to reconcile VOD

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impressions with the audience ratings currency—presented impediments to this potential. But by the late 2000s, a variety of companies—including Navic, Visible World, Invidi, BlackArrow, and others—had developed ad tech for using data and software in the set-top box to automate the trafficking and ad-decisioning processes needed to identify and serve a targeted ad to a specific household. And, as the cable plant became digital, operators able to fit 10 video streams into the 6 MHz channel previously occupied by just one analog signal could realistically reserve bandwidth for addressable ads. Comcast launched a test in 4,000 homes in Huntsville, Alabama, in 2006. Another big trial in Baltimore (80,000), and the formation by the largest MSOs in the U.S. of a consortium dedicated to this vision, put wind in addressable advertising’s sales in 2008. Google looked to acquire TV ad tech and it tried to launch an advertising exchange, hosting bidding auctions for ad inventory on behalf of MVPDs. For a variety of reasons—including a financial crisis and reluctance to let Google have much access to anything but the lowest quality inventory—the business sputtered for the next five or six years.

Jim Chiddix characterizes slow march toward addressable TV advertising in a way that corresponds to the conclusions one reaches from examining historical sources. Despite technological innovations and recognition of the potential at by early-1990s or sooner,

the full advertising capability grew slowly. And, ironically, at the same time it was really booming on the internet with companies like DoubleClick and so forth. Because there you did have critical mass. Anybody who’s using the internet, potentially, could receive targeted advertising or targeted clickable advertising or whatever you wanted to create. Whereas in television you’re waiting for this universe of set-top boxes to grow, and for advertisers to change the way they thought about television advertising. Internet advertising…was a greenfield. So, you weren’t threatening any revenue. Any money you made was found money. And so, it was a much more fertile market for innovation.456

Although the internet ad market sprinted ahead of addressable television, the rise of the spot cable business occasioned developments in tools and techniques for a variety of logistical functions that constitute the basic processes of buying, inserting, and tracking ads in online and mobile media.

456 Interview with Jim Chiddix, January 28, 2018.
These include managing avails, identifying ad assets, storing and serving digital video files, machine-to-machine communication for signaling when and where to insert a specific spot and confirming that it was inserted as planned, and controlling transmissions to and information collection from individually identifiable devices.

In working through technical and administrative obstacles, and recognizing opportunities on the horizon, the cable ad business was a petri dish for engineering the evolution of targeted and data-driven advertising and marketing. As Paul Woidke admitted to me, “The way that we always envisioned advanced advertising being implemented in a TV environment—it’ll never be what we projected and forecast and hoped and struggled [for]… But it’ll be something different. It’ll be something different. And the amount of money isn’t going to diminish.” Tim Hanlon told me in 2017, “I think we’re only kind of scratching the surface of what’s possible.” He said the term addressable advertising “is a very basic, first-generation concept” based on a primitive set-top box architecture. As cloud-based computing power is allocated to making ad decisions and routing spots to individuals in real-time, the sky is the limit.

**Conclusion**

It is well-known that in the mid-1990s and beyond, advertisers intervened into the advancement of digital technologies and took advantage of changes in the administration and regulation of computing and telecommunications networks, reshaping the media environment around their vision for personalized marketing. What has not been examined in depth, and what this chapter has aimed to illuminate, is a set of developments that ushered in an era of personalization by establishing infrastructures for communicating with uniquely identifiable devices, assembling institutions for packaging and marketing more finely segmented audiences, and cementing

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457 Interview with Paul Woidke, February 26, 2018.
458 Interview with Tim Hanlon, October 27, 2017.
imaginaries about a one-to-one marketing future wherein efficacy would be increased, and waste virtually eliminated. These developments carried on from the computerization of advertising, media buying, and audience construction in the 1960s and intensified in the 1980s with the engineering of both addressable cable systems and a spot cable business that took market segmentation as an organizing principle from its inception. Even before the first banner ads appeared on websites in 1994, and before companies like DoubleClick began to organize the online ad market over the following years, the cable ad industry was leveraging computer-like set-top boxes, digital video servers, customer databases, command and control systems, and wired connections to individual households to become more exacting in its efforts to produce consumers. Despite delays and limitations, there can be little question that the history of spot cable advertising is also the history of how direct marketing pierced the heart of national brand advertising and the mediated environment that prevails today. Before the commercialization of the internet, advertisers, cable operators, and other actors—still answering to the ghost of John Wanamaker—moved haltingly but undeniably toward addressing the American person.

The reason for detailing this history is to argue that the evolution of cable advertising has involved a tooling-up of technical and administrative infrastructures for producing, packaging, and exchanging audiences of individuals. Various actors confronted the challenges of coordinating a more personalized advertising business, and they tried to make sense of and legitimize the opportunities they recognized in technological change. An important point to take away is that targeted advertising depends not only on the technical capacity to address a transmission to a specific recipient, but equally on the administrative capacity to coordinate market activity around a personalized definition of “audience.” The supreme success of Facebook and Google owes to how they have built themselves into sophisticated logistical utilities for an advertising market with a far greater number of buyers and sellers, and much more detailed
definitions of target audiences than ever existed in broadcast television. Perhaps the key
innovation of internet advertising, represented, for example, by DoubleClick’s Dynamic
Advertising Reporting and Targeting system,\textsuperscript{459} is the automation of trafficking and billing
functions. The online ad business blossomed around databases, algorithms, machine-to-machine
communication, and identification and tracking technologies (e.g., cookies) that were developed
to accommodate more variables in rapid decisions about ad placement, to route messages to
specific recipients, and to observe this traffic (and hopefully eventual sales outcomes) more
pervasively and precisely. On a smaller scale, this was what the sales organizations in the spot
cable market were trying to accomplish.

Previously, we observed that the process of introducing and reorganizing commercial
activities around digital computers and automation capabilities both reflected and refracted ways
of thinking about efficiency, control, and optimization. In this chapter we saw a commitment to
reducing waste in advertising both framing and finding even more concentrated expression in
discussions about the ability to target identifiable households with customized advertisements and
marketing opportunities. The next chapter details another affordance attached to cable, broadband,
and interactive technologies. Shoppability is the ability to buy items directly from
advertisements and media content. It embodies some of the oldest and deepest impulses
underlying commercial broadcasting. One pronounced and recurring theme in the history of
electronic media in the U.S. is that the arrival of a “new” medium is accompanied by intensive
excitement about its merchandising applications. The next chapter introduces these deep roots
before focusing on the battle in the 1990s and 2000s to make television into a shoppable
showroom—to turn the medium into a marketplace.

\textsuperscript{459} Matthew Crain, “The Revolution Will Be Commercialized: Finance, Public Policy, and the Construction
Chapter Four – Selling Jennifer Aniston’s Sweater: The Persistence of Shoppability in Framing Television’s Future

“Consumers view a TV commercial and then simply press a button to buy a product—this has been one of the oldest and most widely touted features of interactive advertising.”

This chapter presses forward with the idea that expectations about the commercial potential of new technologies have been imprinted in the policies, practices, and apparatus that make up industrial media systems. Following Patrick Parsons’s directive to examine the “hopes people have for technology,” I analyze the persistence of a prominent theme in discussions about the future of video entertainment: shoppability. “CBS founder William Paley once said that television was the ideal selling medium,” Robert McChesney and colleagues point out. “Left to Madison Avenue, the interactive digital world will be the ideal medium for closing the deal altogether.”

Examining this theme historically though discourses in and about cable television, advertising, electronics, and information technology industries, we see how ideas about cable’s potential, reflecting long-standing ambitions, shaped the digital media environment.

“Shoppability” is a recent term of art in media industries, but the concept it captures—that items featured in advertisements and entertainment are available for immediate purchase—has surfaced throughout the history of commercial broadcasting. Pressures to connect advertising with sales and to exploit the marketing capacities of new media have motivated many attempts at engineering interactive and, more specifically, transactive television systems. This chapter examines efforts to imagine and implement the technological capability for viewers to use their

460 George Winslow, “Getting TV Ads to Click with Consumers,” Broadcasting & Cable, February 20, 2012, 27.
461 Parsons, Blue Skies, ix.
remote controls to buy the things they see when watching video content or accessing interactive applications through a TV set-top box (STB). The focus, in other words, is on the convergence of *marketing communication* and *marketplace infrastructure* within a single user touchpoint oriented around the entertainment services provided by cable companies and other multichannel video programming distributors (MVPDs). While shoppable applications have proliferated across internet-enabled devices, our preoccupation here is with forms of transactivity built into cable systems, STBs and, to a lesser extent, other “connected” technologies used for viewing television content—especially advertiser-supported material.

To probe this marriage of entertainment and merchandising, this chapter dwells on an influential way of thinking about selling wardrobes and furnishings from narrative television programming, as well as the related goal of combining features of direct marketing and television advertising. In this vision’s fullest expression, viewers click their remotes to purchase almost anything appearing in or related to programs and advertisements; MVPDs bill customers via subscribers’ existing accounts and share in the sales revenue, along with intermediaries managing software, order processing and fulfillment, and product licensing. The strategy has been distilled in a deceptively inane slogan: “selling Jennifer Aniston’s sweater.” This theme has been a persistent and conspicuous part of how many people have envisioned the future of television and broadband services. This history invites us to consider how marketing strategies shape not only media texts, but also the infrastructures and platforms that set conditions of possibility for

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463 Because I focus on the project of building shoppability into TV technologies and ad-supported content, direct-response infomercials and home shopping channels are set aside in this analysis, though not for lack of importance. See Parsons, *Blue Skies*, 530-33.
programming, applications, and user engagement. Even failed ambitions can exert lasting influence on a media system’s development.\textsuperscript{464}

**Shoppability as Affordance: Imagination, Potential, Strategy, Discourse**

Shoppable television of the type introduced above has been plagued by technical challenges, prohibitive costs, uninterested consumers, and ongoing cycles of hype and disappointment. Because of technological advantages, cultural differences, and less-entrenched institutional and infrastructural legacies, internet-based platforms and devices have been far superior to linear television as venues for presenting end-users with shoppable entertainment and advertising. Today, ads in most internet-enabled media environments—such as YouTube, Spotify, and Instagram—link directly to e-commerce opportunities. Uses of Internet Protocol (IP) for distributing premium video and enabling long-imagined forms of interactivity are part of a restructuring of roles, relationships, and commercial possibilities within media industries. But to understand the conditions that provided for a deepening entanglement of entertainment and electronic commerce, we must take a longer journey through broadcasting and cable television.

In this spirit, I suggest that shoppability be regarded not just as a functionality, but as an imagined affordance—a commercial and technological potential that actors perceived, and tried to activate, in the convergence of television, computing, and telecommunications.\textsuperscript{465} Shoppability has been part of a story about possibilities; it is a way of imagining and taking advantage of what a set of sociotechnical resources can enable. That story has been revised strategically to meet challenges and opportunities, but its iterations cohere around hopeful visions of a transactive media future. The expectation of shoppable advertising and entertainment has been a tantalizing


prospect that has helped to frame the messy and ongoing development of digital infrastructures for televisual systems.

From this perspective, shoppability belongs to the history of cable television as a “new medium,” which covers not only the introduction of community antenna television (CATV), but also the continuing redefinition of wired communications services within a broader ecology and political economy of media. When technologies are “new” or unsettled, and their meanings and prospects are uncertain, expectations and promises about their trajectories can have profound, if unpredictable, consequences.  

Stakeholders therefore leverage assets and opportunities toward establishing legitimacy for visions of development that favor their interests. As Tarleton Gillespie notes, firms and industries mobilize discursive strategies to “frame their services and technologies” in ways that help them pursue business objectives, secure regulatory privileges and protections, and “lay out a cultural imaginary within which their service makes sense.” As industries that are capital-intensive, structured by government policy, and articulated to financial speculation, cable and telecommunications are thoroughly interpenetrated with visions about the future of technology. Discourses centered around the complementary affordances of advanced advertising intensified during the development of cable television, reflecting shifting marketing strategies and cable operators’ competitive advantage of controlling a high-capacity, (potentially) two-way connection into an individual home. Shoppable television became an aspirational

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waypoint that oriented ambitions and expectations about the commercial potential of media convergence.

This chapter identifies early examples of this marketing logic, traces its contributions to the building of cable systems, demonstrates its continued salience for digital media, and then considers why the idea of shoppable television has survived decades of disappointment. Tracing the history of these strategies provides clues about how our communications systems have been shaped by the commitment of attention, imagination, energy, and capital toward developing shoppable media. At least two insights emerge: 1) the discursive construction of shoppability as an affordance of media convergence influenced corporate and cultural perceptions of broadband infrastructure and digital video and marketing technologies; and 2) as with addressability, strategies for using interactive television as a merchandising platform helped prepare the stage for a commercialized internet. For a launchpad, and a recurring point of contact, we look to one shoppable scheme that stands out as a powerful expression of marketers’ dreams.

**Industrial Logic and Lore**

*An Interactive Storefront*

Generally, in the U.S., advertising and marketing have been prominent among the ambitions of stakeholders engineering television’s technologies and cultural forms. As Jonathan Gray puts it, “a commercial television industry is guided first and foremost by the desire to sell all manner of consumer goods and services.”  

![Image](https://example.com)

New initiatives have proceeded by this logic. In the mid-1970s Raymond Williams recognized that within a commercial model of television, interactivity would

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tend to be exploited for its marketing affordances. Despite the technical capacity to facilitate civic participation, Williams worried that two-way TV, in its historical-institutional configuration, would confront “reactive consumers” with quite limited prospects, such as “choosing an item from a shop display or from an advertisement.”

After more than two decades of failures to establish a viable interactive television business, stakeholders in the 1990s seized on advances in technology and marketing strategy. Their maneuverings continue to validate Williams’s appraisal.

In his bestselling book, *The Road Ahead* (1995), Bill Gates envisioned TV as an interactive catalogue from which viewers could buy anything appearing on-screen. Within three years, computer programmers at MIT’s Media Lab—one of whom was later put in charge of “direct-to-consumer retailing via iTV” at NBCUniversal—had designed a prototype for such interactive shopping, which they called HyperSoap. As Gates captured the imaginations of technologists and entrepreneurs, an analyst at an influential consultancy curried favor with marketers. In 2000, Josh Bernoff of Forrester Research predicted that television would embrace HyperSoap-style platforms “in which viewers can buy every item the actors are wearing or using.” HyperSoap’s name and format seemed to betray a gendered assumption that soap operas, as well as scripted sitcoms and dramas, would be felicitous venues for selling jewelry and apparel to female viewers emotionally invested in characters and storylines. Attaching a

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470 Williams, *Television*, 114.
personality to the idea, Bernoff planted a seed that continues to attract fertilizer: viewers could buy Jennifer Aniston’s sweater.475

Selling the Friends-star’s sweater became a trope in industry parlance, setting a hopeful benchmark for interactive TV. Writers in the trade press continue to invoke it as a threshold marking the dawn of entertainment-based e-commerce.476 The idea is still summoned—sometimes pejoratively—at industry meetings.477 The proposition has even been acknowledged by academic researchers testing new advertising techniques.478 While the plan to sell Jennifer Aniston’s sweater has disappointed expectations and been disavowed by its original proponent,479 many marketers and analysts remain possessed of the idea that television should be a storefront for showcasing and selling merchandise associated with programming or ads.480 In this conviction, contemporary marketers preserve and extend a long-standing ambition underlying commercial media systems. As a recent observer puts it, “The idea of being able to cash in viewer demand for, say, the sweater Jennifer Aniston was wearing in Friends has been around longer than Friends.”481

The Deep Roots of Shoppability

475 Bernoff, Smarter Television, 6-8.
Commercial broadcasting in the U.S. has always been wedded, in some way, to marketing. National advertisers, recognizing radio’s potential as a “major selling medium,” produced some of the earliest programs as venues for introducing homemakers to branded domestic products.\textsuperscript{482} Department stores were also a leading force in the commercialization in radio, establishing some of the first stations, orchestrating programming around merchandising priorities, pioneering advertising practices, and ultimately enlisting radio as part of the sales force.\textsuperscript{483} Some retailers promoted their inventories by broadcasting from the shop floor. One store reported that “listeners at home come in to see the things of which [host] Enid Bur has spoken, with the desire to buy already created.”\textsuperscript{484} As early as 1944, Macy’s brought this concept to television, scheduling \textit{Tele-Shopping with Martha Manning} (later renamed \textit{Macy’s Teleshopping}) on DuMont’s WABD New York.\textsuperscript{485} Over the next two years, Gimbel’s of Philadelphia and Kaufmann’s department store in Pittsburgh commissioned short television productions, for in-store exhibition, to showcase merchandise such as women’s apparel.\textsuperscript{486} By 1949, WTAG Worcester described its product integration strategy as “Sell-A-Vision,” bragging that one sponsor “sold out its supply [of scented wrapping paper] in a matter of hours” after a broadcast.\textsuperscript{487} These ventures advanced the idea that what appears on-screen is for sale; but, the radiated flow of linear broadcasting did not allow for purchasing, and “intra-store television” was really a point-of-sale promotion. The construction of cable television would accelerate ambitions to make the medium itself into a marketplace.

\textsuperscript{482} Bill Bailey, “P\&G, Biggest Air User Doubles Sales,” \textit{Broadcasting}, June 4, 1945, 18, 28.
\textsuperscript{484} “Lapel Mike for Department Stores,” \textit{Broadcasting}, May 1, 1933, 14.
\textsuperscript{485} “Macy’s Going to Try WABD for Retail Selling,” \textit{The Billboard}, December 30, 1944, 7. For more on WABD’s \textit{Television Department Store} and “armchair shopping” strategy, see Spigel, \textit{Make Room for TV}, 79.
\textsuperscript{486} “RCA May Market Video Receivers,” \textit{Broadcasting-Telecasting}, December 10, 1945, 79; “Television May Aid Shopping Say 77%,” \textit{Broadcasting-Telecasting}, August 26, 1946, 46.
\textsuperscript{487} “Sell-A-Vision,” \textit{Broadcasting-Telecasting}, December 12, 1949, 64.
Within two decades after CATV operations began distributing television signals by cable in the late-1940, entrepreneurs, analysts, and policymakers apprehended the prospect of delivering multiple services over an integrated wire infrastructure. Enthusiasts predicted sweeping changes in the production and consumption of information and entertainment, culminating in a “wired nation” wherein cable would accommodate a host of services, including news delivery, telephony, and home shopping. A 1966 article in *U.S. News and World Report* anticipated Raymond Williams’s aforementioned assessment, suggesting that “Merchants will use extra channels to display their wares more fully than they can on the usual spot commercial.” A “housewife,” the article continued, can “select a dress from the television screen, electronically place her order for the dress, and direct her bank to make the payment.” Two years later, much fanfare accompanied a demonstration of two-way functionality at the National Cable Television Association’s (NCTA) annual convention. Cable went through what became known as a “Blue Sky” period, in which lofty goals, expectations, and promises painted an optimistic future for the wired, information society. As Parsons explains, this era began in the mid-1960s, but, “in one form or another, Blue Sky thinking would shape the business through its next thirty-plus years.”

By the 1970s, the Federal Communications Commission proposed new rules permitting cable operators to import distant signals into the 100 largest U.S. markets, contingent on some stipulations, including a requirement that new systems build two-way capacity into their plant.

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490 Quoted in Parsons, *Blue Skies*, 239.
492 Parsons, *Blue Skies*, 233.
These proposals spurred considerable prospecting. Perceiving limited demand for services that merely conveyed broadcasters’ outputs, analysts suggested that to penetrate large urban markets, and “[r]ealize the full potential of cable,” operators would need to offer interactive features that exploited the technology’s varied capacities, among which electronic shopping was consistently listed. At the 1971 NCTA convention, FCC Chairman Dean Burch warned cable operators that they could expect regulatory disfavor if they did not augment their importation and retransmission functions by offering innovative services and experimenting with “such two-way operations as shopping from the home.”

In 1971, a report from Rand Corporation admitted that remote shopping was “technically feasible” but not yet economically viable. Acknowledging that “Remote shopping would be attractive to advertisers eager to stimulate impulse buying,” the report’s author doubted that subscribers would share marketers’ enthusiasm for these services. Notwithstanding this caveat, the promise of interacting with consumers through the television urged substantial excitement and shaped the development of cable in the U.S.

**Industrial Prospecting and Predicaments**

**Building a Business**

Soon after two-way functionality was demonstrated at the 1968 NCTA Convention, stakeholders began asserting visions for an interactive television business. Already by 1970, Teleprompter, Inc., the largest multiple system operator (MSO) at the time, recognized itself as a “broadband communications company.” Similarly, the vice president of Cox Cable urged the industry to

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exploit television’s “unused capacity” by deploying shopping services and other applications.498 Teleprompter’s president saw two-way services as a beachhead for cable operators to establish themselves in the data-transport and market research businesses, and he acknowledged “a tremendous opportunity for merchandising of goods.”499 This “opportunity” soon became part of the cable industry’s value proposition. In negotiating a franchise agreement with New York City, Teleprompter touted its development of “armchair shopping.”500 The next year, Telecable Inc. tested a home shopping application in Kansas City, featuring live presentations from a Sears, Roebuck store and using an advanced home terminal to let “the housewife…make choices on the spot by punching the appropriate buttons.”501 In 1973, Theta Cable and American Television & Communications tested interactive services, including shopping, in California and Florida, respectively.502 Warner Cable launched its pathbreaking QUBE system in 1977. Among other two-way features, QUBE let users “order merchandise displayed on the screen, and even pay for it—by punching out credit card number and other required information.”503 In 1979, a former NCTA president started a cable company to realize “the medium’s unfulfilled technological promises,” using interactive services, such as shopping, to expedite cable’s maturation as a general information infrastructure.504 Cox Cable followed suit by the early 1980s, designing Indax, a two-way data exchange system that facilitated banking and shopping.

While these services were costly and slow to materialize, futuristic promises became strategic resources for cable operators. Interactive applications, with home shopping consistently

499 “On the Brink with Cable TV,” 19.
502 “Where Pay Cable is Getting Started,” Broadcasting, April 9, 1973, 47-49.
503 Barnouw, Tube of Plenty, 498. One application of this ability was Majic Touch, a Columbus, Ohio, game show that let viewers purchase merchandise from its sponsor, Lazarus department stores. “Horatio Alger Advice to Cable Advertising,” Broadcasting, February 15, 1981, 66.
504 “Schmidt Re-emerged with New Company in Cable World,” Broadcasting, December 3, 1979, 64-65.
listed among them, were bargaining chips in pivotal franchise negotiations during cable’s urban expansion in the 1970s and 1980s. According to L.J. Davis, “Nothing, absolutely nothing, won the hearts and minds of the targeted cities like interactive television.” 505 QUBE helped Warner Cable acquire franchises in several large markets, including Cincinnati, Dallas, Milwaukee, Pittsburgh, and Houston. Reporters identified Indax as a decisive factor in Cox’s winning bids in Omaha and New Orleans. 506 Mile Hi Cablevision secured a franchise in Denver with a proposal that included “full interactive services, including home security, shopping, and banking.” 507 And all six bidders for five franchise areas in Chicago promised interactive services, such as home shopping. 508 Within just a few years, however, most cable prospecting proved to be more fanciful than feasible, with “beleaguered operators…trying to get out of agreements to provide extravagant services and facilities.” 509 Watching cable companies postpone or abandon the interactive offerings touted during franchise negotiations, critics alleged that the main purpose of interactivity was bargaining leverage. 510

Interactive ambitions thus helped to draw the map of cable service in the country, both by influencing franchising decisions that granted lasting incumbencies and by creating conditions for opportunistic MSOs to expand by absorbing overextended operations that had promised more than they could afford. Well-publicized misfires helped rein in speculation, and as the industry found its footing with satellite interconnection and a national policy set by Congress in 1984, cable become a reliable investment even without resorting to exotic imaginations. But by the end of the 1980s, a movement by telephone companies to market television services renewed

507 “ATC-Daniels Partnership Takes Denver Cable Franchise,” Broadcasting, March 1, 1982, 34.
510 See Barnouw, Tube of Plenty, 500.
shoppability’s salience in the narrative of media convergence and its currency as a strategic asset in system-building. Following legal victories and favorable rulemaking, in which their lobbyists used the promise of interactive services to justify “deregulation,” telephone companies announced plans to build video distribution systems. While considered, by some, a ruse by the regional Bell operating companies (RBOCs) to gain entry into the long-distance telephone market, these designs were elaborate, costly, and consequential.

GTE, the largest independent telephone operator (which became Verizon after its acquisition by Bell Atlantic), began testing a home shopping portal, called Main Street, in several markets in 1988 and then embarked on a plan to construct a fiber optic-coax infrastructure for interactive services in California. By 1994, GTE had deployed Main Street near Boston and anticipated up to 7 million new customers for its interactive products over the next decade. Ameritech won franchises throughout the Midwest and earmarked $29 billion over 15 years to build hybrid fiber-coax systems capable of supporting interactive shopping. As U.S. West developed an “interactive mall” showcasing merchandise from Virgin Records, Nordstrom, J.C. Penney, and Ford, the executive vice president of the venture distinguished it from traditional home shopping: “We are creating short-term television with an impact, and it is important to remember we’re in the business of direct marketing.” The company’s plan for “combin[ing] entertainment and electronic retailing” envisioned a future in which digital marketplaces would learn, predict, and cater recommendations to users’ viewing and shopping habits. Meanwhile,

512 See Parsons, Blue Skies, 600-08, 643-47, 686-88.
516 Mark Berniker, “US West Building an Interactive Mall,” Broadcasting & Cable, August 1, 1994, 34, 36.
Variety called Bell Atlantic “the most aggressive” entrant into television among the RBOCs, with its “Stargazer” system. The company planned to spend $15 billion between 1993 and 2000 to equip 8.75 million homes with five “killer applications,” including home shopping and direct-response advertising. Larry Ellison, CEO of Oracle, the database-software firm managing Bell Atlantic’s system, animated his vision in terms of frictionless impulse buying: “You’re sitting there watching the ABC News, an ad from Time Life comes on and suddenly you’ve got an opportunity to order the entire works of Nat King Cole on CD. One click of the button and it’s yours.”

Although these ventures ended mostly in retreat from video provision, in the discourses about them we see vivid impressions of the modern internet, including high-capacity servers that store digital video for on-demand retrieval, easily navigable retail portals, click-to-buy shopping, dataveillance, and behavioral ad-targeting. The efforts by telecoms to provide converged information and entertainment services, in which long-standing dreams of interactive television were routinely evoked, influenced the building, financing, administration, and regulation of America’s information infrastructure.

To outdo telephone companies, exert a competitive advantage against fledgling direct broadcast satellite (DBS) businesses, and search for new billable services to skirt the rate regulations Congress imposed in 1992, cable MSOs invested billions in plant upgrades and plotted adventurous schemes. In 1993, Time Warner Cable (TWC) announced ambitious plans for its Full Service Network (FSN). As discussed in the previous chapter, FSN is best remembered as a very expensive demonstration of video-on-demand. But another widely publicized feature let viewers use the television to order from Pizza Hut and purchase from an “interactive digital

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shopping mall.” TWC claimed to be transforming the television into a multimedia portal akin to what we would soon come to recognize as the Web. At the same time, in Omaha, Cox Cable implemented a large-scale test of an interactive offering that included home shopping. Even though these experiments inflicted financial wounds and exposed the gulf between rhetorical hype and the actual feasibility of these plans, Microsoft’s $1 billion investment in Comcast in 1997 signaled that Bill Gates expected cable operators to build the interactive video systems he had imagined in *The Road Ahead*. *Broadcasting & Cable* regarded Gates’s financial blessing as visionary: “In the past 12 months, maybe in the history of cable, no other single event has done more to highlight the industry’s potential and endorse its technology.” The billionaire who hoped television could become a shoppable catalogue helped position cable as the backbone of the U.S. internet industry.

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Even earlier, Microsoft had dedicated resources toward designing “software and network facilities for interactive television,” in partnership with Tele-Communications Inc. (TCI), the nation’s largest MSO for most of the 1980s and 1990s. While TCI’s dominance owed more to corporate maneuvering than technical sophistication, the company’s CEO is said to have “single-handedly launched the start of the interactive age.” In 1992, John Malone announced his intention to provide customers 500 channels and advanced information services, “and for the next couple of years, the cable industry spun interactive dreams, visions of videos ordered at a whim,

electronic shopping, instant-response advertising, and paying bills with the click of a button.”

Later on, in trade-press coverage of TCI’s digital cable offering, we find affordances and expectations that had been discursively constructed decades earlier continuing to frame the future of entertainment and information services:

It is simultaneously a step back to the much-ballyhooed interactive TV and a leap forward into the world of digital bits...Digital cable represents the beginning of the cable industry’s ability to exploit the full power of its bandwidth by opening up the coaxial pipeline to any kind of traffic...Moreover, that traffic can travel in both ways, easing the way for faster impulse buys, interactive games and Web-like features.

Still, despite Malone’s rhetoric, enthusiasm outpaced the translation of these ambitions into reality. One major bottleneck was the electronic equipment for bringing a digital revolution into customers’ homes.

*Building a Better Box*

Providing shoppable services required upgrades to “next generation” set-top boxes. STBs emerged in the late-1960s as converters that enabled TV sets to tune cable transmissions from frequencies outside VHF and UHF bands. They became important instruments of control when subscription channels, tiered services, and pay-per-view offerings required cable operators to scramble signals and discriminate among customers, using “addressable” systems controlled by computers at the operators’ headend facilities. By the early-1970s, the cable industry recognized home terminal equipment as the means for furnishing interactive services, such as “point-to-point merchandising,” and venture capitalists began to exhibit a conspicuous interest in cable hardware. Anticipation of the possibilities presented by addressable and two-way-capable STBs simmered for the next two decades, before boiling in the 1990s, when advances in digital technologies seemed to promise the arrival of a long-awaited interactive future. The potential for

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525 Robichaux, *Cable Cowboy*, 125.  
interactive direct marketing seemed to promise revolutionary change. As a product brochure from leading box-maker General Instrument boasted in 1996, the “addressable intelligence” in its cutting-edge set-top box “turns television into a video store, shopping mall, library, brokerage house and more.” Despite nagging doubts about viewers’ appetites for dramatically new TV experiences, outfitting STBs with microprocessors and internet modems to support a suite of multimedia and marketing services was part of long-term strategies for leading actors in cable, software, and electronics industries. It was also a priority for the FCC following the 1996 Telecommunications Act.

The set-top box, which was being redesigned to materialize the hopes of an interactive future, became a locus for the collision of television and networked personal computing. As an article in Broadcasting & Cable put it, “the set-top box is a nexus where different technologies can come together and generate new revenue.” The 1990s witnessed a gold rush into STB markets, as many people at the time expected these devices to be the main consumer gateway to an “information superhighway.” Broadcasters, marketers, and MVPDs invested in hardware and software to support shoppable applications. The ranks of companies designing and manufacturing apparatus for multichannel television—led by General Instrument (now Arris) and Scientific-Atlanta (now Technicolor)—swelled to include giants from the computer industry, notably Microsoft, Intel, IBM, Apple, and Hewlett-Packard. These firms coded and built digital

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531 Price Colman, “CableLabs in the Middle on Set-Tops,” Broadcasting & Cable, October 20, 1997, 56.
533 General Instrument and Scientific-Atlanta were both bought by larger manufacturers of networked information technology equipment—GI by Motorola in 1999 and S-A by Cisco in 2005. Google later bought Motorola’s STB business before appropriating the company’s patents and then selling the business again.
set-top box technologies for cable, DBS, and telecom operators who requested electronic shopping and other interactive capabilities.\textsuperscript{534} Tech startups rushed to design shoppable applications; for example, Wink Communications, an early standout in television commerce, enabled viewers to click their remotes to buy CDs from musical guests on \textit{The Tonight Show with Jay Leno}.\textsuperscript{535} Collectively, these efforts were, as the title of one consulting report put it, “Turning TV Sets into Cash Registers.”\textsuperscript{536}

To some, these developments heralded “a whole new phase of the cable and computer industries,” positioning television companies to tap “the home retail market, which may be worth hundreds of billions of dollars every year.”\textsuperscript{537} TCI’s executive vice president of ad sales suggested that advertising within the “direct-response environment” enabled by digital, addressable STBs constituted “a whole new way of using television.”\textsuperscript{538} By the late-1990s, the perceived affordances of digital cable systems—to monitor viewing habits, execute behavioral profiling and targeting, evaluate the effectiveness of ads, and facilitate immediate purchases—had aroused considerable excitement: “The broadband pipe is primed and advertisers are pumped up about the prospects of translating the PC ‘click through’ to the TV.”\textsuperscript{539} Microsoft in particular looked to position itself as an indispensable intermediary within this stack of technologies by using its operating system to control the set-top box. Dan Schiller explains, “Microsoft thought it saw prospectively vast markets in the digital set-top boxes that cable operators would need to transform TV sets into versatile interactive terminals.” He continues, “by seeking to use technical standards as a strategic weapon, Microsoft made yet another bid for a privileged place on the

\begin{itemize}
\item Skelly and Weiss, \textit{Turning TV Sets into Cash Registers}, 101.
\item Scully, “Preparing to Convert the Converter.”
\item Colman, “Interactive TV Ads on the Horizon,” 66.
\end{itemize}
platform that would link PCs and TVs to consumer programming and information services.”

Beyond licensing its software, Microsoft hoped to capture fees on e-commerce transactions, which were expected to skyrocket in the near future. Even in 2002, when internet browsing had settled around desktops and laptops, Fortune called the STB “the most valuable square of real estate in America.”

Analysts responded to the commercial and technical convergence of television and personal computing with predictions of robust growth for interactive TV. One study projected interactive television shopping revenues to total $4.3 billion in 2005, with “the bulk of this buying” executed directly with a remote control. Other estimates were even grander. But these predictions were too optimistic. To begin, building a digital STB to actualize the dreams publicized by cable operators was difficult and expensive. For years, General Instrument struggled to produce a box that matched John Malone’s vision, and the set-top terminal running Time Warner’s FSN reportedly cost $7,000. One observer joked recently that Time Warner could have saved money on FSN’s pizza-ordering function by hiring someone to stand beside each subscriber’s TV and wait for the viewer to request a pie. Even in more modest systems planned in the mid-1990s, the price tag for next-generation STBs ($400–$1,000) was well above the perceived threshold of viability ($200–$300). Activating the capacity implied by digital STBs also required outlays for home installations and upgrades to headend facilities, and cable operators were reluctant to replace equipment for which expenses were still being amortized over

540 Schiller, Digital Capitalism, 109.
543 Skelly and Weiss, Turning TV Sets into Cash Registers, 38-43.
545 Robichaux, Cable Cowboy, 171, 220.
expected lifespans. Even for MSOs with enough scale and cash flow to absorb these expenditures, the process was complicated by the patchwork nature of their footprints, which they had built by acquiring local cable systems whose facilities ranged widely in age, quality, and compatibility. These pressures, in a context of chaos and uncertainty, depressed STB orders, kept manufacturing costs high, and discouraged enterprises that required mass-scale deployment of digital equipment.

Furthermore, as an infrastructural technology, STBs are entangled with actors, institutions, and interests across industries and sectors. While shoppable television excited imaginations, STBs are essentially designed to transmit and control access to video content. Building an interactive storefront held an outsized place in expectant discourses about the future of entertainment compared to more pressing concerns, such as program licensing, signal security, and digital video standards. Futuristic services made for good publicity, but filling the bandwidth unleashed by digital compression with more programming was a safer bet for cable operators. Fighting for space on STBs, the engineers designing middleware and applications for interactive shopping were up against the needs of the electronic program guide, a crucial user interface for navigating hundreds of channels, which nearly monopolized a box’s memory and computing power. Moreover, the coordination needed to stabilize a network of interoperable devices and protocols that could support the elaboration of shoppable television in ways that would appeal to the national marketers needed to finance these expensive ventures was undermined by proprietary dispositions among system operators, equipment makers, and software developers.548 Beyond the “chicken and egg” problem of deployment and investment, the tensions involved in building and exploiting industrial capacity were aggravated by conflict between the conservative influence of fixed capital—that a rigid infrastructure would limit innovation—and a climate of rapid technological and cultural change—wherein an STB might be outdated by the time it was

installed. As the *Fortune* article referenced above admitted, TCI, TWC, and Microsoft “have spent billions in pursuit of this Holy Grail, with next to nothing to show for it.”\(^{549}\)

Consumers, meanwhile, encountered frustrating interfaces, unfamiliar behaviors, and a dearth of appealing interactive content. For their part, advertisers and marketers continued to face a promising but largely incoherent technical and administrative environment. While technologies existed to facilitate shoppable television, the potential had not been manifested in industrial process or cultural habit. As TWC’s chief engineer, Jim Chiddix told me, “It took years for digital boxes to get deployed sufficiently to have a realistic business model for something like interactive television or interactive advertising. And, in fact, those things both stayed pretty elusive for a long time. Everybody sort of got the idea that you could do these things technically, but turning them into a business was hard. And, again, the Web sort of ran off with the low-hanging fruit for things like interactive shopping and interactive advertising. But the potential was still there.”\(^{550}\)

Ongoing struggles suggest that the assessment of one cable executive remains topical twenty years later: “Sometimes the dreamers dream faster than the implementers.”\(^{551}\)

Despite disappointing expectations, shoppability has been a resilient part of discourses about the future of television, and the logic has colonized significant territories in the digital media landscape. We now return to perhaps the most potent narrative frame for imagining the merchandising potential of interactive video entertainment, which carries the story of shoppability from the 1990s toward the present.

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\(^{549}\) Leonard, “The Most Valuable Square Foot in America.”

\(^{550}\) Interview with Jim Chiddix, January 28, 2018.

The Acme of Shoppable Media

In 2000, Josh Bernoff predicted that soon viewers would be able to purchase Jennifer Aniston’s sweater while watching *Friends*. This was only one among his many prescriptions for refining the television business, most of which have been much more successful than “t-commerce.” Bernoff even elaborated problems with selling wardrobe items. For example, how to share revenues among the merchant, the t-commerce service provider, the broadcast network, the affiliate station, the MVPD, the show’s producers, and the actor herself remained unresolved. As skeptical observers perceived, with “too many fingers in the t-commerce pie…the economics of Jennifer’s sweater quickly unravel.”

“Selling Jennifer Aniston’s sweater is not a business model,” one critic opined. Another doubter called the idea “pure rubbish,” adding, “I don’t think anyone will want to watch *Friends* to buy a sweater.” Bernoff soon admitted that “T-commerce expectations have been way overblown.” Nevertheless, Jennifer Aniston’s sweater became a touchstone for television’s future—and its failures. A 2008 article in the *New York Times* called “Rachel’s sweater” a “catchphrase…for what devotees of interactive television are trying to accomplish.” It was “Blue Skies” for a digital age.

The potential to enable impulse buying—reducing to a minimum the steps between introducing and consummating a purchase-opportunity—was already recognized by the 1970s and was a motivating factor in designing systems that could support impulse pay-per-view. The vision of shoppability articulated by Gates and Bernoff seemed to further captivate imaginations, aided perhaps by television’s history as a showcase for attractive goods, services, and lifestyles.

In 2005 *USA Today* imagined a prosperous future for contextual shoppability in cable

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programming: “Talk about impulse buying. You’re watching your favorite cable channel and admire a product on the show. With a few clicks on your TV remote, it’s yours.”

Enthusiasm swelled as digital STBs were installed in 38 million cable homes by 2008 and interactive television, according to a Cablevision executive, was no longer the “wave of the future,” but rather “the wave of now.” That year, a consortium of the six largest cable operators in the U.S. directed their resources and clout toward establishing technical and administrative standards for making interactive TV work at the scale required to entice national marketers. Even as the consortium tried to distance itself from false promises woven into Aniston’s sweater, its CEO counted t-commerce among the “four flavors” of interactivity it intended to develop. By 2009, the New York Times observed that “cable companies are starting to slowly move” toward “the promise that consumers could instantly buy Jennifer Aniston’s sweater on ‘Friends.’” In 2012, the consortium abandoned its t-commerce venture and dismissed 80% of its staff.

Long after critics eulogized the plan, selling Jennifer Aniston’s sweater remains a tantalizing symbol for a still-nascent technology. More current references have been proposed, such as Serena’s handbag from Gossip Girl, Sarah Palin’s red jacket from Sarah Palin’s Alaska, and Effie Trinket’s wig from The Hunger Games. But however personified, the logic remains intact. This imagery has been inherited also to describe initiatives that let TV viewers use “second screen” devices (laptops, tablets, and mobile phones) to buy products related to the programs and

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557 Lorrie Grant, “Networks Hope Remote-Control Shopping Clicks,” USA Today, May 25, 2005, 1B.
558 Laura Petrecca, “Interactive TV Ads Click with Viewers,” USA Today, July 6, 2008, 1B.
As more TV viewing occurs within reach of internet-enabled devices, advertisers, programmers, and MVPDs are leveraging second-screen connectivity to “turn any network, app, multichannel provider and TV set into a kind of home shopping network.” As early as 2006, Delivery Agent, an e-commerce company, began operating an online “tour” that turned the Desperate Housewives set into a shoppable showroom. The next year an executive from a media buying agency depicted the convergence of television and internet video through this lens, describing a scenario in which viewers “mouse over…and click” on Aniston’s sweater. More recently, Shazam, a mobile application designed for music discovery, has been engineered to “reinvent the 30-second spot” by allowing “viewers to buy products from mobile devices.” And in 2016, A+E Networks produced “the first ‘fully-shoppable’ TV series,” in which every item featured on the home improvement show can be purchased from Wayfair.com. With mobile carrier AT&T taking on a bigger role in video advertising and Comcast expanding its mobile carriage business, these operators expect to push forward the practice, already in limited use, of sending to viewers’ mobile phones advertisements, coupons, or shopping opportunities related in some way to either the ads or programming they are watching on the big screen. Brian Lesser, the CEO of AT&T’s advertising business recently explained, “Imagine, you’re watching content and instead of us interrupting the content with a traditional commercial break, we can show an icon on the screen that indicates to you that there might be a mixed reality experience where you can get more information about the car you just

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567 Winslow, “Tune In,” Broadcasting & Cable.
saw or the dress you just saw.” Before joining AT&T, Lesser tried to implement a similar program when he led Xaxis, WPP’s programmatic platform.

While these and other developments blur the lines of “television commerce,” since they operate through equipment and services provided by someone besides the MVPDs (though they typically depend on the latter for internet connectivity), they contribute to the broader project of making video entertainment shoppable. Indeed, increased connectivity to digital marketplaces has helped sustain hopes that selling merchandise directly through television devices is finally becoming mainstream, especially as firms with core competencies in electronic retailing have assumed larger roles in video distribution (e.g., Amazon). Such initiatives follow an established legacy. “Click-to-buy” functions appeared on TiVo in 2008 and on Apple TV and Roku devices soon after. Rovi Corp. (now TiVo), which operates electronic program guides for MVPDs, launched a shoppable guide in 2011. Delivery Agent—which provided commerce services for Rovi, Twitter, YouTube, and others—equipped Samsung and Sony smart TVs with ShopTV, an app that “allows television viewers to shop for products seen in network programming and advertising via their remote control.” Even before introducing ShopTV in 2013, Delivery Agent was supporting a variety of t-commerce functions, including letting Verizon FiOS customers buy memorabilia related to programs on the History Channel. By 2013, Delivery Agent counted three broadcast networks and more than 50 cable channels among the clients for which it “sell[s] licensed merchandise from TV programming.” Having overcome the barrier of “getting that living room connected,” Delivery Agent’s CEO, Mike Fitzsimmons, told CNBC in

570 Alex Kantrowitz, “Your TV and Phone May Soon Double Team You,” Advertising Age, April 28, 2014, 8.
573 Winslow, “Tune In,” Broadcasting & Cable.
December 2015, “this idea of having a tethered experience between the content that you’re viewing and the ability to purchase is becoming a reality.” A year earlier, when he announced that a shoppable H&M advertisement would air during the 2014 Super Bowl, Fitzsimmons said t-commerce at last had realized “the potential associated with buying Jennifer Aniston’s sweater.”

Less than a year after Delivery Agent filed for bankruptcy protection in 2016, Fitzsimmons started another company, Connekt, to continue chasing this elusive dream. According to a flattering company profile in Broadcasting & Cable, “the technology appears to have finally caught up to the idea.” By bringing t-commerce to IP-connected devices, including Roku players, smart TVs, and set-top boxes, “Connekt appears to have figured out how to turn viewers into instant consumers with the touch of a remote button.”

These enterprises remain committed to an ambition that courses through the history of commercial media. Yet, despite the promotional hype, equipping the television screen for shopping has been a serious challenge. Can we account for the tenacity of this idea and for what has delayed its implementation?

Persistence and Resistance

The persistence of shoppability is not totally surprising. Convinced that t-commerce is imminent, an executive at Acxiom expressed the common sentiment that “TV remains the most powerful medium for engaging consumers.” In addition to its reach, television is thought to be the

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574 “Connecting your living room for shopping,” CNBC, December 24, 2015.
577 Herman, “Addressable TV Momentum,” AdExchanger.
premier venue for exhibiting products and brands. The emotional register achievable on television, and the connections viewers form with programs and characters, help explain why marketers exhibit a stubborn attachment to the model of interactivity devised by HyperSoap, a project which was described in retrospect as having begun “with dreams of buying the sweater off Jennifer Aniston’s back.” Researchers have even singled out Friends for its extraordinary influence on consumer attitudes. But what dynamics underlie and undermine efforts to merchandise television entertainment?

“Persistent patterns of technological change,” Donald MacKenzie observes, “are persistent in part because technologists and others believe they will be persistent.” The expectation of a “technological trajectory” can function like a self-fulfilling prophecy, as actors invest financially and symbolically in prevailing ambitions. The evidence detailed above shows how expectations and ambitions framed problems and potentials for systems-builders. Shoppability was a compelling answer to important questions confronting cable operators beginning in the 1970s, including how to win valuable franchises, diversify revenues, and excite investors and regulators. For the broader multichannel television industry, shoppability was part of a wedge for expanding the cable business beyond retransmission, and it complemented larger efforts to exploit the capacity of broadband wires and addressable set-top boxes. As an alluring and long-imagined consumer service, interactive shopping was also a public relations device for a political-economic agenda of convergence; it shimmered on the surface of a wave that swept through communications markets and policy in the 1990s. From the 2000s onward, shoppability has been

579 Johnston, “The iTV evangelist” Broadcasting & Cable.
581 MacKenzie, Knowing Machines, 56.
a hopeful bulwark against existential threats to television, as financial support is imperiled by audience fragmentation, advertising avoidance, and competition from digital advertising platforms. The vigorous return of product placement and brand integration strategies during these years added fuel to t-commerce aspirations.\textsuperscript{582} Along the way, these dreams and efforts spawned legions of firms committed to aspects of shoppability and advanced advertising, many of which understand themselves to be working within some part of the “television” business. Their collective energies, associations, and histories (including employees’ training and career paths) help sustain a shoppable agenda within particular industrial paradigms, networks, loyalties, and boundaries.\textsuperscript{583}

Across these decades, shoppability aroused marketers’ fundamental interest in using communication technologies to accelerate the circulation of commodities. Transactive television promises advertising’s holy grail—merging medium and marketplace. Shoppability is built to match the logic of commercial media, put succinctly in Advertising Age: “The business of marketing and the business of entertainment are fundamentally about the same thing: Turning audience attention into commerce.”\textsuperscript{584} Without marketplace connectivity for transacting sales, though, this system operates below capacity. For the CEO of Delivery Agent, shoppability actualizes television’s full potential: “Entertainment properties create demand for consumer product, and there’s a broken link between viewers and networks.”\textsuperscript{585} “We’re trying,” he says, “to take a passive viewing audience and turn them into an active, purchasing consumer.”\textsuperscript{586} Whether or not this corresponds to the experiences of viewers, shoppability clearly is a concentrated

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\item[582] Turow, Niche Envy, 99-108.
\item[583] For more on how industrial boundaries shape the practices and identities of media workers and organizations, see Brooke Duffy, “Magazines…Without the Magazine: Remaking Boundaries in an Era of Media Convergence,” PhD diss, University of Pennsylvania, 2011.
\item[586] “Connecting,” CNBC.
\end{footnotes}
expression of a marketing logic that has contributed to the meaning of “television” and its industrial, technological, and cultural dimensions.

But if shoppability satisfies these functional roles, why has the “prophecy” of selling Aniston’s sweater gone mostly unfulfilled? As historians demonstrate, technologies become operative not through pure affordance, but through the work of binding them to durable organizational and cultural forms. In commercial TV, the potential implied by shoppability—to accelerate the circulation of commodities—confronts the limitations of a sociotechnical system situated historically in an institutional setting, wherein the uses of specific technologies are circumscribed by established practices, priorities, competencies, rules, and norms. Commercial television was built to use video content to attract the attention of viewers which could be sold to advertisers. While t-commerce teases the prospect that advertisers could pay only for verified sales, it conflicts with some processes for commodifying audiences that have been institutionalized over decades. Furthermore, the idea of shoppable television began inching toward reality across a period in which program networks remained extremely powerful and profitable, cable operators were still years away from having digital boxes in a critical mass of homes, and the bursting of the dot-com bubble tempered enthusiasm. To reconfigured TV viewing habits to accommodate shopping was no simple matter either, and the fact remains that laptops and mobile devices support friendlier and more familiar shopping experiences than TVs. Despite the potential to enable consumption behavior, which is the inferred basis of audience value, shoppability has not been institutionalized to supplant many taken-for-granted and still-lucrative ways of thinking and acting that emerged within television’s historically-specific configurations. In a final irony, the expensive and protracted deployment of digital STBs, fueled

by futuristic promises, now discourages MVPDs from shifting en masse to IP delivery systems that could better accommodate interactive advertising and shopping.588

The aspiration of exploiting television’s full marketing capacity, encouraged by the technological possibilities elaborated throughout the development of cable TV, brought innovative pressure into conflict with entrenched industrial practices. Recognizing these contradictory influences helps to explain the disjunction between revolutionary forecasts and the stubborn pace of sociotechnical change. The translation from imaginable affordance to instituted capacity is seldom swift or smooth.

Conclusion

This chapter has documented the persistence of shoppability as an aspiration in television and cable industries. From the late-1960s through the 1990s, as the cable television and telecommunications industry worked to define its place in a convergent media landscape, interactive home shopping starred in seductive stories about the future of entertainment and information services. These stories influenced the contours of cable’s footprint and regulatory framework and were built into hardware and software as part of an effort to position digital cable boxes as the domestic portal to a version of the information revolution that was inflected, in part, by mindsets and structures from commercial television. From 2000 to the present, the prospect of selling Jennifer Aniston’s sweater lingers as the purest expression of marketers’ ongoing efforts to turn any medium into a marketplace. But the failures to realize shoppability as it has been imagined show the ways in which media systems become bound to relatively durable institutions and infrastructures. The story of shoppability shows both the general pressures on communication

systems in capitalism to expand and accelerate commodification and market exchange and the contradictions manifested in that process.

As ongoing developments reopen technological and industrial possibilities, as confidence in the legitimacy of legacy institutions wanes, and as new stakeholders pursue points of entry to implement their visions, shoppability remains a potent discursive tool. Perhaps more importantly, shoppability, as first constructed around television, has become a quintessential feature of advertising (and, increasingly, entertainment) in online environments. Popularization of the internet and the emergence of graphical Web browsers coincided with pervasive discussions about how to engineer interactive media systems into platforms for targeted advertising and electronic commerce. As it exists today, the Web is the fullest expression of what many people imagined as television’s future: a commercial platform affording, among other things, interactive advertising and shopping.

While specific visions of shoppable television developed more slowly than many hoped and expected, for a variety of technical, economic, cultural, and political reasons, it is hard to deny that the efforts to construct shoppability as an affordance of interactive and convergent media systems have not influenced profoundly the meanings and, increasingly, the commercial and cultural practices associated with many digital environments. Within the last decade, and accelerating in recent years, the logic of shoppability is colonizing all sorts of media content, devices, platforms, and applications. From digital magazines, to display ads on music apps, to both commercial and editorial content on YouTube, the notion that the medium is a marketplace is beyond dispute. As mobile phones have been equipped with better cameras and image-recognition software, marketers have linked their online storefronts to apps that let users turn their physical surroundings into a showroom, as a person can photograph what they see on a

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589 Schiller, *Digital Capitalism*; Turow, *Breaking Up America*. 
billboard, a clothing rack, or even worn by fellow passersby, and then find an online merchant selling that apparel, accessory, furnishing, or whatever else.

Across all of these domains, the linking of media usage to shopping opportunities arouses the desire that motivates so much of what we have detailed so far—the ability to know that a viewer bought what he or she saw advertised. In the next chapter, we turn to accountability, the affordance that has been a pervasive backdrop to advanced advertising ambitions.
Chapter Five – Vive le ROI!: Accounting, Attribution, and Set-top Box Data

In 1961, the incoming president of the American Marketing Association prescribed to the group an ideal approach for preparing an advertising budget: “[It] calls for adding dollar after dollar to the appropriation until the point is reached where the last dollar produced no increase in profit. This assumes that the sales effectiveness of any given expenditure is known and that relevant costs are applied. A few advertisers do claim to have this information to a remarkable degree but they are very much the exception.”

A great deal of this dissertation has been about companies’ efforts to join these exceptional ranks. In many ways the transformation of advertising and commercial media over the past 60 years has been fueled by desires for a more comprehensive and sophisticated accounting of advertising’s effect on sales. The loudest boast from proponents of digital and internet-based marketing has been that the new media world, featuring interactivity and pervasive surveillance, would provide a more accountable environment for advertising and media buying. By refining and implementing the means for “attributing” purchases to the impact of specific ads and marketing interventions, the logic goes, advertisers can calculate their return on investment (ROI), and this metric can become the new basis for how audiences are packaged, bought, and sold. Accountability indulges the highest ambition for setting advertising on a firmly “scientific” footing. As the former chief marketing officer at Coca-Cola wrote more than fifteen years ago, “Advertising is not an art form. It’s about selling more stuff more often to more people for more money. Success is the result of a scientific, disciplined process, and absolutely every single expenditure must generate a return.”

591 Sergio Zyman, The End of Advertising as We Know It (Hoboken, NJ: John Wiley & Sons, Inc., 2002), 1.
The migration of this logic from the margins to the heart of commercial media systems represents a gradual, if incomplete, eclipse of creativity by calculation. Across this century, advertising and media executives have been claiming, with as much hope as confidence, that digital technology will resolve the endemic dilemma of uncertainty in advertising. As one television executive put it, “You know the old John Wanamaker saying, ‘Half of what I spend on advertising is wasted, I just don’t know which half’? I think we’ll know which half…And we’ll charge double for the other half!”

As the reference to Wanamaker implies, the quest for accountability has been a persistent force shaping the tools and techniques used in advertising throughout its modern history. This force intensified markedly in the second half of the twentieth century, amplified by the application of electronic computer processing and other information technologies to aspects of audience manufacture. Rather than being a consequence of the internet, as is often claimed, accountability has been a catalyst driving and shaping the commercialization of the internet and other digital media. Technical and institutional features of the internet presented opportunities for marketers to organize this environment around a more calculating approach to audience construction and to try to implement more fully than ever before their longstanding vision for a commercial medium defined by automation, precise targeting, always-on electronic marketplaces, and the measurement capabilities to account for ROI. Companies like DoubleClick, Google, and Facebook stepped forward to build the infrastructure for this vision of advanced advertising. Selling the American people has mobilized conquests that profoundly shaped our information environments, personal technologies, and public spaces and cultures. ROI has been the king presiding over many of those crusades.

This chapter focuses on efforts to measure audiences, monitor shopping behaviors, and draw inferences about how media exposures influence purchases. I will briefly survey some of the history of audience measurement both to demonstrate the persistence of demands for evidence of sales effectiveness and to reiterate some of the institutional factors that make it difficult to institute a business model around ROI metrics, even beyond the challenge of making scientifically valid claims about attribution. I then use a detailed examination of household addressable advertising via the set-top box to illustrate the state of the art in a sphere of marketing activity that promotes accountability as a hallmark.

To reiterate what might already be clear, in this context accountability does not connote public, prosocial, or democratic responsibility. Rather more literally, it means that companies’ chief financial and marketing officers, or the managers reporting to those executives, can account for how the money spent on advertising impacted sales or other “key performance indicators.” By accounting for advertising exposure and shopping activities, marketers want to confidently attribute outcomes to specific advertising efforts. A bit more liberally, the term embraces all manner of designs to account, measure, and quantify in the advertising business. To the extent that accountability refers to a form of transparency, it is about rendering individuals’ consumption behaviors transparent to observation and analysis, and gaining a fuller strategic (and economic) understanding of persuasion.

**Moving Needles, Ringing Registers**

Ever since modern advertising became understood as a mediated form a salesmanship, as Daniel Pope explains, “advertising people of all stylistic bents have agreed upon the purpose of the work: the task of advertising is to sell. The only legitimate measure of success is at the cash register.” This “credo” not only unites quantitative and creative techniques around a common objective,
Pope says, but “it is a fundamental element of continuity in advertising from the beginning of the [twentieth] century until today.”

The dream of determining the effect of media exposure on sales and purchasing behaviors has been a through-line in the history of audience measurement. The Nielsen company, which has been the dominant provider of television audience ratings for more than half a century, originated in market research. One of its earliest services involved attempts to “audit” the pantries of radio listeners to see if the representation of sponsors’ products there was correlated with the household’s media usage. For a variety of reasons, the industry cohered around ratings that claimed to represent the size and composition of listeners or viewers exposed to programming. But dissatisfaction with exposure-based audience measurement has endured since the broadcast era. Responding to publicity about a new approach for measuring radio and TV audiences in the late 1940s, the executive vice president of a Massachusetts station wrote, “I don’t think that any radio research technique can be termed revolutionary until a method is developed which will determine and disclose the impact of radio on the mind of the listener…The success of a program can be known only by its effect upon its hearers, whether its purpose is to entertain, to sell merchandise or both.”

Despite its obvious appeal to sponsors, the cost and difficulties of sustaining this sort of research contributed to the broadcast industry’s settlement around panel-based, nationally representative samples for quantifying the audiences tuning in to specific networks, channels, and shows. While audience measurement originated from advertisers’ demands for information to justify their investments in programming, by the 1940s the ratings industry began servicing the

supply side as its primary customers, meaning networks and stations paid the freight for research about the audiences gathered around their programming. Because the system was institutionalized to facilitate the sale of an abstraction (attention) that had to be manifested as a discrete commodity (an audience), inadequacies in measurement technique were weighed against the benefits of standardized information that enabled efficient and routine transactions in the audience marketplace. Consider one example: In the late 1950s, American Research Bureau (ARB) introduced a form of instantaneous audience measurement. A meter attached to a television set recorded usage and tuning information and transmitted that viewing data every 90 seconds to ARB’s control center via dedicated telephone lines leased from AT&T. ARB’s initial test in Chicago ran into difficulties, however, when data reported by the meters suggested declines in houses using television during prime time, compared to data reported by viewers in paper diaries. Whatever the basis of the discrepancy, a complaint from the manager of one Chicago station neatly demonstrates that the commodity audience is an abstraction brought into tangible existence by instrumentation and institutional decisions about what to accept as legitimate. “We pay $250 a month for the diary service and are satisfied with it. After the trial period, they’ll want $2,000 a month for Arbitron [the metered service]. Now why should we spend $1,750 more for a rating service that will only cause us to lose money on our best nighttime periods?” In other words, the existing system produced more favorable evidence of audience attention at a cheaper rate. Philip Napoli’s general comment on how struggles over ratings methods are as political-economic as social-scientific is applicable here: “The end result of these processes of resistance and negotiation are conceptualizations of the media audience that do not


necessarily reflect technology’s full potential to capture audience information, and that reflect, to some extent, the specific interests of stakeholder groups.”

As historians and analysts of audience ratings have made abundantly clear, technical and administrative changes by measurement organizations affect the very nature of the audience product, and so the introduction of new instruments or techniques has almost always been met with controversy. Importantly, because media distributors and exhibitors supply most of the ratings industry’s revenues, they have leverage in preserving conventions that advantage their interests. While advertisers have dreamed of a paying only based on observable effects on the minds and behaviors of viewers, media companies generally prefer to monetize any and all discernable audience attention, rather than risking lost payments for audience members who don’t cooperate with sponsors’ solicitations—a matter deemed to fall beyond the control of networks, broadcasters, and cable operators.

Still, advertisers have provided the lifeblood of these media systems, and so their preferences and pressures are never completely ignored. Nielsen and others like it have been attentive to continued demands by advertisers and their agencies for more information about consumer behavior. As indicated throughout this study, the introductions of computing, database, and surveillance technologies have provided stimulus to thinking about accountability in marketing. In 1961, representing his firm’s market research business more than its rating business, A.C. Nielsen Jr. “stated that the opportunity for profit in marketing today lies where it has always been: in a thorough knowledge of potential buyers’ needs.” Responding to the era’s calls for comprehensive tracking of products and purchases, Nielsen Jr. proposed “an effective marketing intelligence system which keeps management constantly in touch with consumer

demand; a carefully administered program of controlled experimentation in which two or more plans are evaluated for their relative contribution to volume, sales share and ultimate profit; with the most effective program decided upon, a continuing series of controlled experiments to determine the optimum level of marketing expenditure, and a continuous study and analysis of the components which make up the marketing plan.”\footnote{“The Curse of Stereotyped Marketing,” \textit{Broadcasting}, June 26, 1961, 48.} Though painfully worded, this sounds very much like the sorts of A/B testing and attribution metrics that are the stock in trade of internet marketers today.

This line of thinking has carried lasting influence, especially as electronic surveillance and personalization strategies crept closer to the center of marketing in the 1970s and 1980s. Proposals for media buying and audience measurement protocols that isolated the relationship between advertising exposure and sales outcomes gained renewed vigor. As one observer wrote in 1987, “If we believe half of what we hear and read lately, the day is coming when advertisers will be planning and buying media on a cost-per-target or cost-per-shopper basis.”\footnote{Dick Williams, “The Case for Moving to Cost-Per-Shopper in Media Planning,” \textit{Broadcasting}, November 23, 1987, 31.} At almost that same moment, Arbitron (formerly ARB) was in the process of developing a service called ScanAmerica, a so-called “single-source” rating in which panel members both recorded their viewing activity and also used a UPC-reader to provide an inventory of the household’s purchases. This venture soon folded—and was it not the first or last foray into the field of single-source ratings. It arrived at a time when broadcast television remained exorbitantly lucrative, with networks still near the height of their power, and so “rocking the boat” was not a top priority for anyone.

Those dynamics would change drastically over the next decade or so, along with improved systems for monitoring media users and continued expansion of retail surveillance
through electronic payment processing. By the turn of the century, of course, sophisticated audience measurement—perhaps even sales attribution—was being polished as a crown jewel for digital advertising, both online and in interactive television. The impetus and historical precedent for this was not surprising. As Broadcasting & Cable reported in 1998, “What advertisers and their agencies want is simple: ads that translate into sales.” 602

Cable operators like TCI and Time Warner Cable seemed poised to provide not just consumer targeting and interactive shopping, but also the granular, comprehensive, and pervasive measurement capabilities on which truly personalized commerce depended. The vice president and media research director at Starcom USA, a media buying department at the Publicis conglomerate, speculated in 1999, “As we move forward five years, I don’t believe we’re going to be looking at traditional TV panel measurement—we’re going to be looking at more universal measurement using cable TV set-top boxes.” 603 Later that year, Advertising Age elaborated on this vision for the future:

Clearly, the model being worked on has cable system operators investing in an infrastructure that will allow them to…’slice and dice their audience’ in ways marketers will find attractive…What will make the slicing and dicing possible is the information cable operators will be able to get from digital set-top boxes in their customers’ homes. That data, which can give the cable operators literally a second-by-second account of subscribers’ viewing habits, will be combined with other database information on demographics and buying habits for the ultimate in one-to-one communications.

The CEO and president at Time Warner’s TBS network articulated the progressive implications: “We can move from selling the audience we think is there to selling the audience we know is there to selling the behavior of the audience we think is there to actually making sales.” 604

By the early 2000s, the rapid emergence of online advertising, along with changes in how people accessed entertainment, were aggravating “cracks in the foundation” of TV’s measurement system. Industry observers saw both an impetus and an opportunity for reform. One writer in Advertising Age captured a view held by many people on the demand side, arguing that media measures “need to be rethought and reset to meet marketers’ needs. In the end, key metrics need to help measure what matters most: advertisers’ return on investment.”

The consensus opinion was that STBs would be the lever of change. Unfortunately for advertisers and buyers hoping STBs would be a “golden goose,” cable operators turned out to be in no great rush to invest billions in upgrading their plant and replacing still-functional set-top boxes that generated revenue and were amortized as capital expenditures over a matter of years. While ad tech vendors were installing software onto digital STB that enabled the pervasive surveillance imagined above, the rollout of those boxes into customers’ premises moved slowly. Furthermore, despite the promise of census-level, second-by-second measurement—meaning the whole universe of households is accounted for at every moment—STB measurement is not perfect. To begin, this “universe” includes only pay TV subscribers, and it takes work and negotiations to fuse the splintered data from different operators into any cohesive whole. Furthermore, few people turn off the box at the end of a viewing session, and so complex math is required to make guesses about when someone is or is not watching. Knowing who within a house is watching is also harder than with Nielsen’s ratings system, which requires viewers to log in. Again, much ingenuity was applied to design computer-based models that could reliably predict who was watching.

Despite these nagging concerns, by the second half of the 2000s, tens of millions of homes were equipped with digital STBs, and more efforts were underway to realign the audience

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ratings currency. With “increased usage of the web...pressing vendors of traditional media to become more accountable and more efficient,” advertisers and media buyers were better positioned to influence the system.\textsuperscript{607} At the national level, Nielsen introduced commercial—rather than program—ratings, which factored in time-shifted viewing on DVRs.\textsuperscript{608} The idea of measuring “engagement” also surfaced prominently in industry discourse. Reflecting anxieties about ad-skipping and commercial clutter, as well as optimism about translating the Web 2.0 trend into video entertainment, engagement was a loosely defined idea that basically stood for whether viewers felt invested enough in content to dedicate serious time and attention. Assuming engagement in content would make advertisements more effective, engagement measurement was a middle-ground in the pursuit of ROI metrics, and a potential way to squeeze more value from an audience. Mark Burnett, executive producer of spectacles like \textit{Survivor} and \textit{The Apprentice} explained in 2007, “In the end you should never lose sight of what the advertisers really want. Actual companies such as General Motors and Procter & Gamble, they just care about selling products. There’s never really been a connection between someone viewing an ad and actually buying something. And that’s what they really care about. The engagement has to be there. If engagement numbers are true, a sponsor might pay 10 times cost-per-thousand. It’s like lead generation in advertising: an almost-guaranteed sale is worth 50 times what a cold call is worth.”\textsuperscript{609}

To the extent that engagement has been much more than a fad in TV, it’s been part of a defensive posture among programmers trying to convince sponsors that TV possesses a special immersive power above what online publishers can offer—and, in some cases, engagement was included within a proprietary brew of calculations used by media agencies to differentiate their

\textsuperscript{608} Napoli, \textit{Audience Evolution}, 142-144.
\textsuperscript{609} Paige Albiniak, “Measuring ‘Engagement,’” \textit{Broadcasting \\& Cable}, October 1, 2007, 16.
buying services. Advertisers are surely happy to have engaged viewers, but as Burnett’s remarks imply, sales are the true barometer. So, as “engagement” gave way to trendier buzzwords, the quest continued toward a more encompassing measurement system that could answer advertisers’ call: “Get me data that goes beyond reach to show me how consumers behave.” For the CEO of GroupM, the world’s leading media buyer, “what’s important is getting better information that can marry product choice, preference and usage to TV viewing.”

By the late 2000s the hope of mining information from STBs had drawn a crowd that included Google, Nielsen, and Microsoft. Companies were renewing efforts to offer household-level data about viewing and to match that with purchase records, in the tradition of “single-source” metrics. One such firm was TRA, Inc., whose full name was squarely on the nose: “True Return on Investment Accountability.” The CEO and co-founder explained the company’s proposition in 2008: “Advertisers advertise to sell products, and for 50 years TV has been bought on sex and age demographics…What we are saying is, ‘Why not buy based on purchases?’”

More forcefully, he added, in another venue, “We live in an age of accountability. Everything needs an ROI component.”

Companies like TRA were trying to fill a need that has been recurrent throughout the history I’ve documented—to match a technical capability to collect information with an administrative infrastructure for coordinating commercial activity around that information. As one media buyer put it in 2008, “Cable-systems operators offer a virtual treasure trove of consumer data. Their set-top boxes could track how viewers scamper across their channels second-by-second. But getting that information for advertisers on a wide-scale national basis is,

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610 Steinberg, “What TV Metrics the Buyers Want.”
611 Megan McIlroy, “Another Piece that Aims to Solve ROI Puzzle,” Advertising Age, April 23, 2008
http://adage.com/article/media/piece-aims-solve-roi-puzzle/126611/ 
612 Buzzard, Tracking the Audience, 147.
as it turns out, not so easy to do.” Similarly, a vice president of business development at Cisco, then a leading producer of STBs, told the cable industry’s engineering journal, “There’s a lot of technology in place for data collection…We can collect almost an unimaginable amount of data at a granular level. The industry grapples with what’s the right architecture that would make this enormous fire-hose of data more useful.” Historian Thomas Hughes might have described this as a “reverse salient,” a military analogy that points to an imbalance among components of technological system that prevents the whole system from operating at maximum capacity. In effect, the cable industry was collecting more data than it could meaningfully handle.

The driving preoccupation for audience measurement in recent years has been to integrate data from more sources within the institutionalized frame of calculation—including evidence of media use from different screens and platforms and records of shopping or other consumption-related activities. Marketing consultants at Forrester Research, for example, insist on gaining a “360-degree view” of consumers—or sometimes even a (somehow) “720-degree view,” which includes sensor data and knowledge of a person’s “circle of social relationships.” As I discuss further below, the video advertising industry has established capabilities and relationships that allow for the lawful circulation and combination of information drawn from seemingly discrete part of a person’s life. The increasing involvement by a host of data brokers, management consultancies, and software-, platform-, and cloud-based services both responded to and inched forward the ultimate goal of verifying ROI.

Confirming Pope’s assessment cited above, participants in audience manufacture have understood, and sometimes admitted, that the whole purpose of commercial television is to “move the needle” on marketing objectives, and that the essential measure of success is whether an advertisement led to the “ring of a cash register.” Through advances in consumer surveillance, data management, and the partnerships necessary to facilitate the matching and modeling of media and shopping data, the video advertising business has been positioning itself to actually hear the register ring. Lung Huang, a senior vice president at Merkle, a database marketing agency owned by Denstu, spoke frankly about the level of insight available to merchants collecting transaction-generated data. Drawing on his experience working at the consumer insights company created when Kroger bought a part of the analytics firm Dunnhumby USA, Huang told attendees at the TV of Tomorrow Show how marketers understand their customers:

[Y]ou are what you buy. You can say all these things about yourself, you can lie on a survey…but you are what you buy…I spent many years in the grocery business; we saw what you bought. And, you know what? You guys don’t buy very well. So, you are what you buy; we don’t care what your demographic [is]; what was in your basket and you actually purchased really is indicative of who you actually are.

Finding out what’s in our shopping baskets, and why we chose to fill it as we did, has been a guiding light throughout the history of media and market research. Fifty years after the radio station manager quoted above complained that exposure-based ratings were inadequate to the underlying purpose of broadcasting, the director of U.S. media research the J. Walter Thompson agency expressed the same sentiment: “I don’t really care what the rating is for ‘ER,’ nor if it’s on cable, or syndication, or a broadcast network. I want to know, for a target audience

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that we’ve selected, how many of them are viewing the [Ford] Taurus or the Listerine commercial during the break. And, ideally, what influence the commercial has on them.”

Almost 20 years later, this hope still colors expectations for the future. Putting confidence ahead of caution, the vice president of programmatic TV at a data management platform called Lotame told an audience of peers in 2017 that they should assume they are headed for a world of perfect data, perfect targeting, and definitive attribution—it’s not a matter of “if,” but “when.”

One year later an executive from TiVo—a firm best known as a pioneer in DVR devices, but which has morphed into a software and data analytics company—boasted that with STB data today advertisers and media firms “truly can understand how TV advertising changes consumer behavior…No longer using proxies, no longer using correlation metrics, but truly in a deterministic fashion understand how we can change consumer behavior through TV advertising.”

**Attribution in Addressable Advertising**

In 1999, David Poltrack told *Advertising Age* that the meter technology for recording viewer behaviors would have to be made “adaptable to the interactive nature and the addressability of TV in the future.”

Despite anticipation about the prospect of using set-top boxes for audience measurement, beginning at least as early as the 1980s and intensifying throughout the 1990s and 2000s, the data collected by STBs has been only slowly incorporated into media buying and selling. The boxes, although capable of collecting tuning data, were not designed primarily for that purpose, and, moreover, established industrial routines presented barriers to change. But set-

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619 “Why Can’t We Count?”


622 “Why Can’t We Count?”
top box data provides the essential foundation for all household-addressable advertising executed by cable and satellite operators. A closer look at addressable advertising will show us how accountability and attribution operate in practice today in as many as 64 million U.S. homes.

Consistent with a variety of sources, the Video Advertising Bureau defines addressable TV advertising as “The ability of an advertiser to deliver household-level TV advertising via the set-top box based on a defined audience target developed through first-, second-, and/or third-party data. Under this method, the advertiser buys the audience and not specific networks or programs.”

Contrasting this with earlier approaches to segmenting audiences, the CEO of an addressable advertising broker called one2one media told me, “Instead of matching third-party data against viewing data and determining which network and programs and dayparts index high against [people] in the market to buy a luxury station wagon, we’re now matching against subscriber files and determining which households are in the market to buy a luxury station wagon.”

Describing the appeal to advertisers, one industry report explains, “This household-level targeting is made possible by ‘enriching’ viewing information with consumer transaction data, first to pinpoint the households that are the prospects, and then to monitor the sales impact after the campaign has run. In effect, precision targeting is a means to achieve the ultimate advertiser end goals: improved return on ad spend (ROAS) and better accountability.”

According to the latest data available from eMarketer, advertiser spending on addressable TV in the U.S. totaled $1.22 billion dollars in 2017, with expectations for spending to reach $3.37 billion by 2020. These are relatively small numbers. By one estimate, addressable, interactive,

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624 Interview with Michael Bologna, March 30, 2018. “Index” buying refers to the practice of placing ads in shows, networks, or timeslots that have audiences comprised of an above average proportion of a given type of person.
626 eMarketer’s definition of addressable TV—“targeted TV ads delivered on a home-by-home basis via cable and satellite boxes”—includes video-on-demand but not connected TV or OTT spending. It must be
and VOD advertising together will represent just 2% of the $54.6 billion in national TV ad spending expected in 2018. Still, this growth suggests that longstanding hopes for addressable advertising are beginning to translate into realities. Michael Bologna was the president of Modi Media, a company created by WPP’s GroupM media buying agency to focus on addressable advertising. In 2016, Bologna reported,

> There are well over 100 advertisers and well over 350 campaigns running right now where advertisers take data, match it against subscriber files, identify households that are the real people they want to reach. And they send commercials to the households of only the homes that they want, ignore the balance, and on the back end, we return to the advertisers, ‘Here’s how many cars you sold. Here’s how many cans of soup you sold.’

Tracey Scheppach occupied basically the same role as Bologna, as the principal addressable buyer at Publicis’s Starcom MediaVest. Buying 2 billion impressions from DirecTV a few years ago, she told me, “I built a $15 million business with 250 addressable campaigns all with essentially census-level measurement and attribution on the backend. So, it’s like everything the advertisers were ever looking for, and now it just needs to scale.” When a top advertising sales executive at NBCU described the firm’s ability to take an advertiser’s customized target segment and “match it on a name and address level,” both for targeting and attribution, Scheppach responded, “It’s like a dream come true, I have to say.”

At this point, let’s take a closer look at the process of buying and inserting addressable ads at the STB level. The key actors in the transaction are the advertiser and its agency, the MVPD, and a neutral party like Experian or Acxiom who matches datasets from the buyer, seller,

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pointed out that eMarketer’s projections fluctuate widely over time. Estimates from 2017, for example, forecast addressable ad spending in 2019 to be almost a billion dollars higher than more recent projections—a difference of more than 30%.

629 Interview with Tracey Scheppach, November 6, 2017.
and/or third parties. Insertion is facilitated by ad tech companies, such as Invidi and FreeWheel, which have developed and deployed software that enables a set-top box to automatically decide which ad from a menu of options should play in that household, based on the subscriber’s assignment to a specific marketing category.

To begin the process, an advertiser decides whether household targeting makes sense for their business. Reportedly, the best candidates are companies whose target customers comprise between about 5% and 30% of the audience universe—any less and it’s too expensive, any more and it’s more economical to pay for a normal spot.\(^\text{631}\) The advertiser then works to specify its audience. The advertiser might have information in a customer-relationship management database (first-party data) or from relationships with business partners (second-party data), or it might procure a dataset from a broker that is not party to the advertiser’s transactions with its customers (third-party data). The president of GroupM’s addressable buying unit—by far the industry leader at the time—described its data partnerships in 2014, saying “We work with every data company from Experian to Dunnhumby to Polk to Acxiom to MasterCard. Whatever data source I need to help create and define the target segment that advertisers need, that’s who we work with. Having WPP’s involvement in companies like Kantar and Shopcom helps. Our recent partnership with Rentrak helps. It’s really just assembling a lot of different pieces to make this work.”\(^\text{632}\)

Once these pieces are assembled, these lists of customers and targets will go to the neutral intermediary, sometimes called a “safe harbor” or “safe haven,” for “anonymized” data matching. Experian and Acxiom seem to be the dominant providers of this service; reportedly, Experian has information to match 500 million devices to television households.\(^\text{633}\) At the other end, an MVPD provides that intermediary with subscriber files, which are translated by Experian

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into an anonymized code that assigns each household’s set-top box a unique identifier. Experian matches the advertiser’s data with the MVPD’s data to construct the addressable audience. This may involve specific matching of individuals from both datasets; often it involves modeling a “lookalike” audience to fit the advertiser’s specifications. As long as this matching is executed within a “safe haven,” and the data is encrypted so that neither the advertiser nor the MVPD can recognize a specific name and address as belonging to a given target, this complies with privacy regulations. Privacy compliance is fussed over in technicality and largely disdained in spirit.

A central value proposition for addressable campaigns is that they afford superior “accountability” compared to broadcast and network advertising. The two key dimensions of this promise are census-level measurement of exposure, collected from set-top boxes, and attribution of sales outcomes. Bruce Anderson of Invidi explains the reporting process for exposure:

[E]very time an ad gets shown in a set-top box, we put a bean in the bucket. We count that we just got an impression. And periodically, we push those impression counts back up to the headend; they all get aggregated together into a report that gets pushed off to a third-party company like ComScore or Nielsen. They verify that our results are accurate. And then that information gets passed into the accounting departments, and a bill is generated, and the advertiser eventually gets a thing that says, “You wanted 100,000 impressions over this four-week period against this audience segment. And, here, we delivered that for you. Send us our check for however many thousands of dollars.”

More importantly for advertisers, addressable advertising providers try to tell Mr. Wanamaker if his budget was wasted. “Every campaign is tied back to some type of return on ad spend,” one2one’s Michael Bologna said, “whether it’s how many saw the ad and bought the soup, how many saw the ad and bought the car, how many saw the ad and became a Mastercard customer, how many saw the ad and switched prescriptions.” Tracey Scheppach described to me what the back-end attribution process looks like (I’ve removed the name of the retailer she mentioned). At the end of the campaign, the advertiser

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634 Interview with Bruce Anderson, February 20, 2018.
635 Interview with Michael Bologna, March 30, 2018.
will send its sales file [to a data-matching partner like Experian]. And the [advertiser’s] website’s all pixeled, so we know when an IP [address] is going to the website. And so, at the end of the campaign, the viewership file will be sent from DirecTV to Experian, with the boxes attached to it. So, Experian can understand, “That box saw the ad; that box went to the website. That box saw the ad; that box went to the store.” Cuz we’re also geolocating—we’re using a company called Ninth Decimal that helps you understand people that go to stores or locations. So, we can tell that you went to [the store]. [The retailer] then sends the purchase file to Experian, and we can tell you bought the product.636

In the small but growing business of STB-based addressable advertising, it has become standard practice for transactions to include an accounting of whether ad exposures led to purchases. As more video consumption takes place on platforms and identifiable devices that connect to the internet, this will become the new normal for the video advertising of national brands.

Conclusion

Advertisers have always wanted to know whether or not their persuasions worked. For a variety of reasons, the video advertising business has not been able to install guarantees of sales effectiveness within the routines of constructing, exchanging, and measuring audiences. These ideas have persisted as ambitions and as (largely experimental) practices at the margins of the business. Very gradually, ROI metrics have started to become more prominent in parts of the media system. In the final body chapter, we see the mainstream of advertising and video entertainment reinventing itself as “data-driven television.”

636 Interview with Tracey Scheppach, November 6, 2017.
Chapter Six – Data-Driven Television: Ongoing Transformations in Advertising and Video Entertainment

The previous four chapters detailed the historical development of a set of ideas that have constituted a dream for “advancing” advertising toward existential ambitions and priorities. To become more calculating and efficient in deciding how to place commercial messages, commodify the attention of audiences, and “know” and influence consumer habits, advertisers, media companies, and related service and research agencies interpreted and shaped new information technologies as resources for making advertising programmable, addressable, shoppable, and accountable. Throughout the second half of the twentieth century, a variety of actors operating near the periphery of commercial media industries attempted to legitimize this logic in the television business—especially via cable and interactive video services. This project was plagued by challenges owing in part to technology, but equally to institutional, economic, and cultural contexts. While these difficulties hampered attempts to turn prototypes and proofs of concept into fully scaled businesses, these fours ideas were seized upon and distilled in the commercial consolidation of internet and mobile communications from the 1990s to the present. Through their efforts to reshape television around these affordances, advertisers and technologists helped both to draft a blueprint for a commercial internet and to establish some of the technological and organizational resources necessary to build media platforms that provide marketing services anchored in automation, personalization, marketplace connectivity, and enhanced measurement and analytics. When companies emerged to provide infrastructure services for coordinating an internet ad market, these companies could draw on a legacy of more than three decades of work toward the goal of advancing advertising. The archeology of affordances developed in the previous chapters shows the engineering of administrative and
technical capacities, as well as what could be considered a commercial structure of feeling, which provided material and intellectual building blocks for the digital, internet-connected world.

In this final body chapter, I briefly demonstrate that the commercial internet has brought to fruition the dream of advanced advertising, orbiting around these four goals or strategies. I then detail some recent efforts within the television industry to try to follow through on the dream that participants in that industry helped to conjure. While commercial television provided a training ground for data-driven advertising, the internet industry sprinted ahead, and now video distributors and service providers are frantically trying to catch up in the race toward the future they imagined.

Four Pillars of Internet Commerce

The future imagined for marketing looks a lot like the history I have presented. Expectations hold that targeting, automation, interactivity, and measurement will all expand and deepen. According to a writer in the Harvard Business Review, “Soon, every display will be an addressable medium—that is, each will be individually targetable by device and, in many cases, down to a specific user; and interactive displays will not only deliver ad messages but also track consumer response. The result is a new era of marketing accountability, in which advertising ‘budgets’ will have turned into marketing ‘investments.’ This sea change in mindset will transform marketing forever.” The future of marketing, he says, is programmatic.637

Programmatic advertising refers to a collection of techniques for buying and selling advertising impressions that revolve around relatively sophisticated uses of data and decision-making software. Often involving “real-time” computer-based auctions that allow media buyers’ machines to bid on impressions automatically in the moment that available audience inventory is

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created (e.g., when a user clicks on a link or opens an app), programmatic advertising has become the principal method for brokering exchanges in much of internet and mobile advertising. According to current estimates, programmatic digital display ad-spending in the United States totaled $36.85 billion in 2017, almost 80% of all U.S. display advertising. That year programmatic spending also constituted a majority in mobile display (80.6%), digital video (69.3%), and native (84%) advertising. Another financial analyst forecast recently that by 2022 programmatic buying would account for $9.76 billion, or almost 12% of overall spending, in linear television. According to the chief technology officer at Invidi, an ad tech company that places software on set-top boxes to facilitate household-level targeting, “Automation is where all of this is headed. And every year it gets more and more automated, and so our software package is one more step along the way to just being able to, in real time, identify for you, personally, this is the right ad for you to see.”

For all the excitement surrounding automated and data-driven advertising, including claims of revolutionary technological change, it is almost never acknowledged that media buyers, sellers, and researchers in the 1960s and 1970s envisioned the general shape of the programmatic ecosystem. As we saw in Chapter Two, these actors were imagining and engineering ways of using electronic computers and data communication networks to enable instantaneous connectivity between supply and demand sides and to establish “on-line” systems for representing the market. The designers of these systems hoped to make the market responsive to real-time changes in inventory, price, or other variables. While the scarcity of linear television inventory inspired an aversion to auctions, many advertisers and media buyers predicted and advocated for

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640 Interview with Bruce Anderson, February 20, 2018.
a stock-market style for trading audiences, and they were already experimenting with algorithms and other statistical techniques to identify customer targets more precisely and approach “optimal” decisions about efficient ad spending. These ideas were taken up and built into the defining elements of the online ad market today, including: supply-side platforms that bundle publishers’ inventory in ways that aim to maximize the value of the impressions generated by users of their websites or applications; demand-side platforms that let advertisers manage their spending in combination with data analytics tools; and the advertising exchanges that facilitate the interconnection of supply and demand across numerous publishers and advertisers. Machine-to-machine communication circulates data throughout this market with increasing immediacy. And the integration of marketing and advertising information systems, which was part of some of the very first computerization initiatives at major ad agencies, is now a core feature of leading programmatic platforms and services, like Adobe Advertising Cloud. Even a cursory look at industry discourse today should convince readers that programmability has become conventional wisdom and a majority practice in internet advertising and marketing.

As a 2017 article in the Journal of Advertising Research posits, “programmatic buying and selling have paved the way for digital advertising to benefit from improved efficiency and a means of reaching more targeted audience segments…Programmatic technology has enabled a powerful combination of scale and targeting that was not possible in the days of directly bought inventory.” What that opinion fails to admit, and what my research reveals, is that the push

641 Recall that BBDO used its computer to implement the “System for the Integration of Marketing and Advertising Data.” Likewise, today, “Adobe Advertising Cloud combines your marketing and advertising technology in a single end-to-end platform.” https://www.adobe.com/advertising/adobe-advertising-cloud.html#featured-video.
toward automation and data-driven optimization has been ongoing at least since the advertising industry appropriated computerized data processing in the 1950s.

Personalization is even more cemented as a pillar supporting online commerce. Since the mid to late 1990s, the commercialization of the internet has involved the construction of a business model that revolves around and links together surveillance, consumer profiling, and device-level targeting. By collecting, storing, and analyzing information about internet users’ behaviors, and by connecting those insights with data from observable offline consumer habits, marketers try to categorize and predict the interests and probable purchasing behaviors of the individuals accessing media content or services through uniquely identifiable devices. Advertisers and publishers use personalized tracking, algorithms, and other means to curate the information and commercial opportunities presented to individuals based on what is “known” about them. A system for addressing messages to individual recipients is central to the architecture and transmission protocols of internet communication. When the net was opened to commercial applications in 1995, advertisers and companies providing infrastructural products and services for maintaining an online ad market were able to take the ideas already articulated around the affordances of cable’s addressable control systems and elaborate them in a more interconnected and interoperable technical environment—one that embraced all users on the network of networks, unlike the geographical patchwork of (often unaffiliated) franchisees that developed in cable television. As earlier work has demonstrated, the lessons learned from experiments with

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interactive television were at the top of mind as powerful advertisers embarked on a concerted mission to bend the new digital media environment to their interests.644

Connectivity to marketplaces, or e-commerce, was one of the earliest applications of the Web to generate widespread excitement and cultural change. From 2000 to 2016, the percentage of people in the U.S. reporting that they have made a purchase online almost quadrupled, from 22% to 79%. More than half of Americans by then had used a mobile phone to make a purchase.645 E-commerce now makes up almost 10% of all U.S. retail spending.646

Not only did cable services, like pay-per-view, begin to establish transactive entertainment systems, as well as the business and cultural practices to animate them, but the more imaginative forms of shoppability promoted throughout the history of cable, and particularly since the 1990s, set a template for a commercial logic that is colonizing more and more of our public and private spheres, both online and offline. With visual recognition technologies, and related forms of augmented reality and artificial intelligence, marketers are trying to reengineer our experiences of reality by linking the physical and virtual spaces we inhabit to digital retailing platforms.647 Shoppability involves a pioneering approach to producing consumers: anywhere we go with smartphones, or even when we use internet-connected devices in our homes, we have a storefront constructed around us, making us potential consumers. The goal of building a storefront in every home has been a persistent theme in the history of television, especially in how people have imagined TV’s convergence with personal computers

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and the internet. The notion that an advertisement, or even editorial content, should link directly to a shopping opportunity has become taken for granted in internet commerce, and it is rapidly spreading across the social media platforms, such as YouTube and Instagram, at the forefront of audience manufacture.\textsuperscript{648} Slyce—a technology vendor that supports mobile apps for retailers like Tommy Hilfiger and Nieman Marcus that allow users to snap photos of items they see in public and instantly locate comparable merchandise—captures the expansive spirit of shoppability: “Through the power of visual search, the physical world becomes a storefront.”\textsuperscript{649}

The potential for shoppable media to “close the loop” between advertising and sales has been recognized as a monumental opportunity for decades.\textsuperscript{650} As the internet has been cultivated in ways that capitalize on this opportunity, Amazon, Google, and Facebook have been “siphoning off TV dollars as marketers look for better data on whether their ads are reaching the right consumers and are driving business results.”\textsuperscript{651} Amazon’s position as the terminus point for roughly half of online purchasing in the U.S. strengthens its claim to knowing how well advertisements work. Overall, the supply of data in digital advertising has helped normalize the expectation of, and the demand for, more precise attribution metrics across commercial environments. Tracking customers’ movements in and around retail environments has become \textit{pro forma} in the terms of use for many smartphone applications, and a variety of marketing firms are working to connect this data with records of advertising exposure.

\textsuperscript{648} Victor Luckerson, “Here’s Why ‘Buy Buttons’ are Invading the Internet,” \textit{Time}, October 16, 2015. \texttt{http://time.com/4075560/buy-button-facebook-youtube-pinterest/}.


In its latest annual report, the Interactive Advertising Bureau admitted the essential historical importance of accountability: “No matter the medium on which a marketer is advertising, the same questions have always persisted with respect to advertising efficacy: What is working? Where? With whom? At what cost? With real-time feedback, advertisers can now see what is working and quickly adjust their ad campaigns to improve overall effectiveness.” The report goes on to boast about how the “transparency” afforded by the platforms used to trade and measure online audience impressions allows companies to “quickly ramp up or turn down budgeted spend, based upon their achieved ROI,” effectively reducing risk for marketers. The IAB, not surprisingly, credits internet technology with enabling this and other opportunities for advancement in marketing. But the report fails to recognize what its historical adage implies—that these technological solutions did not fall from the sky; they were shaped over a long period in an industrial context.

Contrary to the typical tone of contemporary discourse about marketing and new media, the internet did create these four possibilities; rather, these ambitions provided a framework for interpreting and organizing the commercial and technological potentials of the internet and mobile media. As this review suggests, the commercial internet has been constructed in ways that realize, or at least better approximate, the dream for advancing advertising that was conjured and pursued throughout the second half of the twentieth century. For a variety of reasons having to do with technical interoperability, organizational and geographic legacies, and liberalized policies, the internet provided an auspicious opportunity for advertisers to implement and continue refining their calculative approaches to selling the American people. Appropriating the visions laid out for cable television, the internet industry raced ahead in providing automated media buying,

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652 Interactive Advertising Bureau, *IAB Internet Advertising Revenue Report* (May 2018), 4-5. Recall from the previous chapter that this is almost precisely what the AMA’s president envisioned in 1961 as the optimal approach to ad spending. See page 189 in this dissertation.
personalized targeting, marketplace connectivity, and more granular and pervasive behavioral observation and analysis. For all the talk about advancement, most powerful actors in the television industry remained fairly complacent, reluctant to disrupt an enormously lucrative business model. Even today, networks and MVPDs almost always sell out of ad inventory. Still, over the past two decades, the writing on the wall has begun to convince people that the threats to TV’s dominance as an ad medium are imminent, and opportunities are also presenting themselves for the TV business to move closer to its dream, which by now means becoming more like the internet.

In a 2017 interview, consultant and former media-buying executive Tim Hanlon captured succinctly, and in typical terms, a perspective that is widely shared in media and advertising industries:

> Television is the supreme medium, especially for advertising. It’s sight, sound, it’s motion, it’s a combination of all those three things that [is] probably the best, most robust environment to influence, to cajole, to persuade—all the magic sort of things that marketing’s supposedly supposed to do...And there’s a reason it’s the most advertised medium, and it’s the biggest of the pack. And it’s a very profitable and successful business model for many of the traditional players of such. But, I think it’s folly to deny that that sort of relatively closed system can’t be further enhanced and augmented by some of the best approaches to digital and data.\(^{653}\)

This is the rallying cry for advanced TV advertising. As participants repeated at an industry gathering I attended in 2016, “Television advertising works. Addressable advertising works harder.”\(^{654}\) Evocative of Sut Jhally and Bill Livant’s discussion of “the work of watching” and the

\(^{653}\) Interview with Tim Hanlon, October 27, 2017. Mike Rosen, executive vice president of advanced advertising and platform sales at NBCU, told me the same thing, using the same terms. Interview, May 30, 2018. Dan Schiller quotes TCI’s John Malone saying, “TV is the best sales mechanism we’ve ever had.” Schiller adds, “Simplifying somewhat, it was because of its ability to accommodate live-action demonstration, over and above identification and endorsement of products and product applications, that TV succeeded radio as the foremost advertising medium.” *Digital Capitalism*, 116.

\(^{654}\) “Taking Addressable to the Next Level,” Advanced Advertising Summit, April 5, 2016, New York City.
use of segmentation strategies to make viewers “watch harder,” advertisers, programmers, and service providers are trying to leverage all the technical resources at their disposal to become more systematic about influencing consumption and commodifying viewers’ attention and personal information.

The rest of this chapter pursues two objectives. First, it assembles evidence from across trade press analysis, interviews with insiders, and participant observation of industry events to characterize the ways that advertisers, agencies, and video distributors and exhibitors are thinking about data resources and incorporating them into their organizations and strategies. We will observe in this survey that many of the historical themes documented throughout the previous chapters resonate loudly today. Secondly, the chapter provides a sketch of ongoing shifts in TV ad markets. Most of this dissertation has focused on spot TV advertising because, as a complex transactional environment, it offers a useful and underappreciated window into of the ancestry of online advertising. The sketch provided in this chapter touches on some of the efforts at the network level to use data and technology to improve efficiencies in buying and selling audiences. It demonstrates that ideas and practices that emerged around the margins of advertising and commercial media are becoming, more and more, the beating heart of these industries—necessities for competing in a world of internet-enabled devices and apps.

**Moneyball and Math Men: Calculative Industries Come of Age**

A logic of data-driven calculation has become orthodoxy in media and technology industries. Two management scholars argued recently that the success of technology companies in displacing incumbents as producers and distributors of entertainment content—and the only hope for “legacy” media firms to survive this disruption—resides in the capacity and conviction to

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replace “gut-feel” with “moneyball” analytical tactics. Similarly, journalists and news organizations have been adjusting to what Robyn Caplan and danah boyd describe as a pervasive “focus on numeracy and digital data.” Suggestions that data is the “new oil” of the digital economy only strengthen the belief that a firm’s most precious assets are its information stores and the capabilities to extract insights and value from them.

As illustrated in the foregoing chapters, of course, numbers have always been levers of power in entertainment industries. The economics of film and television—where costs are high, fixed, and sunk upfront, products vary infinitely, and the value consumers assign to those products is unknown until they have been “experienced”—have motivated efforts to reduce uncertainty, or at least to justify decisions amidst uncertainty. By the middle of the twentieth century Theodor Adorno discerned that “the products of the culture industry…are themselves planned from a virtually statistical point of view.” Later, Todd Gitlin found that a command of numbers could be wielded to secure influence and corporate advancement in network television. With the ascent of “people who specialize in gathering and evaluating the numbers,” Gitlin observed, “the language of numbers has become the language of first and last resort.” Many analysts have noted the authority granted to Nielsen ratings in determining what survives on

656 Michael D. Smith and Rahul Telang, Streaming Sharing, Stealing: Big Data and the Future of Entertainment (Cambridge, MA: MIT Press, 2016). “Moneyball” is a term adapted from a baseball team that found surprising success by fielding players with previously unnoticed value. It refers, generally, to decisions made by adhering to data rather than convention.


TV. 662 As one writer put it, referring to adjustments in audience ratings, “Change the way you measure America’s culture consumption…and you change America’s culture business. And maybe even the culture itself.”663

What we are witnessing, then, is more evolutionary than many heralds of digital disruption tend to imply. The general manager of data and analytics in the media sales division of Dish Network admits, “Television has always been data driven. But now we’re working with different—and better—kinds of data.”664 Echoing this almost exactly in describing “audience-based” or “data-driven” TV advertising, one media buyer told me, “At the end of the day, all it really is is taking the same fundamental practice and principles that we’ve been doing for years, just applying newer forms of data and better forms of data.”665 Statistical and computational ways of knowing, planning, and acting are not new to the relationships comprising media industries; rather, reflecting underlying values of efficiency and control, they have been gradually integrated as more pervasive and foundational elements in administration.

Marketers have led the quest to find fortune in numbers. A decade ago, a popular textbook welcomed a calculated, direct-marketing approach into the core of the advertising enterprise: “The exploding availability of digitally driven consumer data has transformed marketing into a new frontier application for business mathematics…Just as mathematics has revolutionized finance, it is reinvigorating marketing, as new models and algorithms extract value from consumer and business databases, enabling more precise targeting of messages to each

665 Interview with Michael Bologna, March 30, 2018.
consumer.” Marketers in the U.S. spent an estimated $20.19 billion on data and data services in 2017. While expenditures for paid placements in freely accessible media vehicles—what we typically think of as “advertising”—comprise a diminishing portion of marketing outlays, companies only continue to increase their investments in trying to “know” and influence customers. “The huge growth,” McChesney and colleagues wrote in 2009, “is in direct marketing.”

Over the last decade, marketing service conglomerates like WPP and Publicis have tried to position themselves as science-first, data companies. Further intensifying what Armand Mattelart diagnosed in the 1980s as a tendency among advertisers and their agencies toward assembling facilities, personnel, and competencies for penetrating the “black box” of consumer behavior, the composition of industries and organizations continues to react to and advance this impetus for data-driven strategy and decisioning. As the Wall Street Journal reported in 2018, “The ad industry is in upheaval as it grapples with the rise of big data and analytics. Ad giants such as WPP PLC, Omnicom and Publicis have gone on acquisition sprees, bringing legions of information-technology experts into their ranks.” Agencies are courting what Cambridge Analytica’s CEO calls “Math Men,” the quantitative successors to Madison Avenue’s creative gurus. “[I]n a world where both consumers and brands want accountability,” he says, agencies

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“that don’t start to embrace data will die.”

With management consultancies like Accenture and Deloitte expanding their purview into new advertising services—leveraging the knowledge and analytical capacities that are their stock in trade—that pressure continues to mount.

Over the past decade, high-profile agencies, including Ogilvy & Mather, Leo Burnett, and Foote, Cone, and Belding, have moved decisively in this direction, establishing organizational divisions or research ventures to take advantage of what behavioral scientists have learned about how consumers’ habits and decisions can be predicted and influenced. When Interpublic (IPG) announced plans to acquire the marketing-solutions unit of Acxiom, a leading data brokerage, IPG’s chairman and CEO explained, “In a world where everything is becoming data-driven, Acxiom Marketing Solutions offers the deepest set of capabilities for helping companies navigate the complexity of creating personalized brand experiences across every consumer touchpoint.” Bulking up on these capabilities, he said, would help IPG “shape the future of our industry.”

Advertisers are also retaining artificial intelligence services from IBM, Quantcast, and others in the hope of making their solicitations sensitive to intimate details about individuals, such as dietary preferences or one’s emotional mood in a given moment. Quantcast’s chief marketing officer warns, “if brands don’t get religious about this…they’re going to be left

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673 E.J. Schultz, “The Race is on!” Advertising Age, May 1, 2018, 12.


out in the cold.”⁶⁷⁶ As a writer posits in one of the many recent eulogies for Don Draper, “Advertising, once a creative industry, is now a data-driven business reliant on algorithms.”⁶⁷⁷

The same impulse that puts science and technology to work in monitoring, modeling, and managing consumers’ proclivities at a more personal level has also motivated efforts to eradicate personality from advertising’s back-end infrastructures. In 2011, the two leading providers of software systems used by agencies to process their transactions with media firms merged to form a company called Mediaocean. The deal provided observers an occasion to reflect on how organizations “offering an array of techniques for buying, targeting and measuring ads across a range of media” were overseeing a transformation of the advertising business. Under a number of influences, advertising was said to be moving “from a clubby, relationship-driven industry where ad deals are negotiated over dinners and drinks into a technology-driven industry where ad space is bought through technology systems similar to stock exchanges.”⁶⁷⁸ The hope is that by building platforms to integrate diverse datasets and to automate media planning and buying procedures, decisions about whom to target, where to find them, how to engage with them, and what price to pay could be made more rapidly and rationally. Competitive threats from the Google-Facebook duopoly, as well as general pressures to normalize across media platforms the targeting and measurement capabilities typical of internet and mobile advertising, have catalyzed these developments in the television business.

As we have seen, of course, the demand for information technologies and communications facilities for rationalizing and accelerating clerical work and transaction-processing has been a constant over the past sixty years. Early in the second half of twentieth

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century the same sort of tropes—like boozy lunches giving way to stock-market trading—were mobilized in promises about a transition from subjective, interpersonal relationships to objective, data-driven decision-making. Advertising Age’s explanation of programmatic advertising in 2014 is almost indistinguishable from what we saw in Chapter Two: “The term covers a wide range of technologies that have begun automating the buying, placement and optimization of advertising, replacing human-based methods like phone calls, faxes and, yes, three-martini lunches.”

Media analyst Ken Auletta submits as evidence of the ad industry’s “preoccupation with Big Data” the rise of media agencies into the “prime seat” in dealings with advertising clients. The media agency, he says, is responsible for putting data to work in reaching marketers’ targets more precisely and efficiently. Mike Rosen, a top executive in NBCU’s advanced advertising division and a former media buyer at full-service agencies, confirmed from his experience that buyers have indeed transitioned from apparently simple functionaries to major power brokers.

As we saw earlier, however, the rise of media buyers was spurred by the introduction of computerized data-processing in the 1950s and 1960s, cemented through the restructuring of the advertising industry in the 1970s and 1980s, and mutually reinforced with the quantitative transformation in marketing and audience construction over the following decades. The math men had already arrived on the scene at the dawn of the creative revolution, and the supremacy of big data today follows from their rise as much as it facilitated it. Still, these longstanding efforts to automate the audience commodity have indeed moved from the margins into the center of how attention is packaged, bought, and sold.

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680 Ken Auletta, “How the Math Men Overthrew the Mad Men.”
681 Interview with Mike Rosen, May 30, 2018. See also Turow, The Daily You.
Sellers of advertising inventory are also looking to obtain a calculative advantage. Viacom executives revealed at industry gatherings that the company has built a 60-person advanced-advertising team by recruiting people with PhDs in physics, mathematics, psychology, and neuroscience and then training them to apply their skills to the TV and advertising businesses.\(^6\)\(^8\)\(^2\) Variety reports that Viacom has “lured” data scientists from Microsoft and other technology firms and set them about “busily calculating ways to help marketers place their commercials with more precision.”\(^6\)\(^8\)\(^3\) Lachlan Murdoch, the executive chairman of 21\(^{st}\) Century Fox, explains that through advanced advertising his company is “extracting more per subscriber in every way. Also in addition to that, we share more data or we get more data shared with us, which allows us to monetize the advertising significantly better as well.”\(^6\)\(^8\)\(^4\) Along the same tack, Comcast, AT&T, and Verizon have been actively acquiring companies and personnel to bolster their ad-tech armories.\(^6\)\(^8\)\(^5\) The senior vice president of advanced advertising products and strategy at Comcast’s NBCUniversal states plainly her organization’s strategic position: “We feel that data

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is essential to everything that we do...[E]verything we do revolves around data." Not surprisingly, Nielsen has continued its historical tendency of absorbing companies and technologies that either compete with or complement its services, including recent acquisitions of firms with competencies in big-data analytics.\(^{687}\)

A similar pattern as that drawing “quants” to the center of global finance has reshaped practices and workforce composition in the media-marketing complex. With unprecedented data storage and computing power, the thinking goes, profit opportunities that would have been too tiny or unusual to notice or too transitory to pursue can now be identified and exploited. By the same token, supposed inefficiencies and irrationalities will be exercised through a more mathematical and machine-like approach to marketing and audience manufacture. As Mayer-Schönberger and Cukier see it, going forward it will be typical for “specialists in data analysis, artificial intelligence, mathematics, or statistics...[to] apply those skills to specific industries."\(^{688}\) With the “science of habit formation” becoming a mainstay in university and corporate research labs over the past twenty years, Amazon’s former chief scientist confirms this general application of calculative expertise toward analyzing and influencing behavior, admitting, “It’s like an arms race to hire statisticians nowadays. Mathematicians are suddenly sexy.”\(^{689}\) Perhaps no enterprise has profited more from behavioral data science than Google, a company that, according to a 2017 headline, “Wants to Own the Future of TV Ad Infrastructure.” Google’s director of product management for video explains, “We use millions of signals. This is really about how to make TV ads smarter. Understanding people’s interests and intent will help you really capture their


\(^{688}\) Mayer-Schoenberger and Cukier, Big Data, 142.

Google recently embarked on its second foray into building an advertising exchange for premium video content. In a 2016 report describing its plans, Google captured the “evolution of TV” succinctly: “Data is at the very core of the move to addressable advertising—from deciding which ad to serve and when to an individual, to giving real-time and actionable feedback to advertisers, to providing an absolute picture of the return on investment for an ad spend.”

Over the past 60 years, television and advertising have transitioned from being understood as creative industries to being recognized, at least as much, as calculative industries. We continue to take stock of this shift by detailing developments in what has come to be called “audience-based buying”—meaning that advertisers search out consumer targets irrespective of the content they are watching.

**Audience-Based Buyers, Sellers, and Brokers**

Under a range of mounting pressures, video distributors and exhibitors have been making deliberate efforts to speak to advertisers in a register more like that which brands have come to expect from internet- and mobile-based marketing platforms. David Cohen, the president of Magna North America, a major media buying agency, was quoted recently as saying “I believe TV will figure out how to operationalize similar to the Googles and Facebooks of the world, maybe in as soon as 2-3 years from now.” With the four pillars of advanced advertising shifting from aspirations to normalized expectations, the cable business is scrambling to institute the technologies and organizational relationships needed both to match the capacities of other media

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692 The quote was circulated on Twitter by Adobe Advertising Cloud (October 2, 2018). [https://twitter.com/AdobeAdCloud/status/1047196499933843456](https://twitter.com/AdobeAdCloud/status/1047196499933843456).
and to help television interconnect seamlessly with the ubiquitous, cross-device marketing environment demanded by advertisers.

Audience manufacture relies, and always has relied, on what Joshua Braun calls “transparent intermediaries.”693 These are firms that do not interface with or present themselves to viewers, but which support essential functions, such as encoding and routing video content, trafficking and billing ad units, or managing a range of media buying and selling procedures. These companies “continue to innovate, and bring change in the national and local TV markets through technology, data, and new forms of automation and efficiency.”694 For example, Acxiom and Experian “are working to streamline the flow of data needed to power addressable buys.”695 These firms facilitate the data matching procedures that allow marketers and MVPDs to take advantage of the moment-to-moment viewing data collected by set-top boxes and smart TVs, to pair that with household- or individual-level behavioral data from credit cards, loyalty rewards programs, or other sources (e.g., vehicle and home-ownership registries), and to then find and target specific consumers without running afoul of privacy protections. Firms such as Adobe, Lotame, LiveRamp, and Cadent provide “data management platforms” that let buyers and sellers utilize, in combination, bits of viewership data, customer-relationship management files, and data from syndicated source, like SRI, Polk, and Nielsen Catalina Solutions. Lesser known firms like Simulmedia and 605 analyze these data to try to establish verifiable effects of advertisements on sales outcomes or other “key performance indicators,” and to put these insights to work in helping buyers and sellers optimize the value of their outlays and inventories.

694 Gary Arlen, “Digital Catching Up to Cable in Local Ad Sale,” Multichannel New, October 2, 2017. URL
Other technology vendors provide hardware, software, and infrastructure services that orchestrate the routing and insertion of targeted ads—such as Invidi and FreeWheel (a Comcast-owned company that recently absorbed Visible World, one of the first companies to enable advertisers to distribute different versions of ads to different TV audiences). They also execute “dynamic” insertion of ads (mostly in video-on-demand), meaning that a decision about what advertisement to insert in a given slot is made by computer code just moments before the commercial break in the show. DAI functions similarly to an online advertising architecture. In fact, some operators, including Comcast, which enables “one-to-one advertising…data-matched at the name and address level” in VOD across its more than 20 million subscribers, executes VOD transmission and dynamic ad insertion via Internet Protocol.696

I have treated advanced advertising through the lens of affordances—or potential abilities—both to reveal the histories and deep-seated logics of a seemingly recent set of developments, and also to reinforce that to become operative technologies, these abilities need to be articulated to relatively stable organizational forms and practices. This has presented major challenges for advanced advertising, often involving conflict between new and existing protocols. Compared with traditional linear television, the multiplicity of digital platforms for viewing video entertainment provides opportunities to sell more impressions, at a more granular level of targeting, and with improved feedback mechanisms. But both buyers and sellers face difficulties in reconciling the diverse workflows that have developed to handle different types of transactions. The process of buying or selling linear TV inventory involves personnel, sales and data management tools, ratings currencies, software services, internal communications channels and accounting procedures, and other forms of organizational authority and coordination that can differ substantially from the routines built to manufacture audiences on a different platform or

device. For example, the executive in charge of addressable advertising sales at NBCU told me that after explaining to an agency buyer that VOD ads bought in prime-time NBC shows like *This Is Us* and *The Voice* would be delivered by FreeWheel, a leading server of video advertising online, the buyer determined that the transaction would have to be negotiated by the agency’s digital media personnel, rather than its TV buyers.\(^{697}\)

These and other challenges have motivated various groups to take steps toward making it easier to transact around customized audience targets, granular and massive datasets, and automation technologies. In a recent attempt to institutionalize audience-based buying procedures at the network level, three programming groups—Turner, Viacom, and Fox (later joined by NBCU)—introduced a collaborative platform called OpenAP that allows for consistency across the datasets used to define audience targets. Typically, due to a lack of standards regulating how buyers and sellers define customer segments, a marketer has to define its target audience differently across the networks or platforms it patronizes and then struggle to reconcile the incompatible campaign data those suppliers report on the backend. OpenAP is, essentially an administrative service for managing information and pre-processing transactions; it is about “making people likely in the market for pickup trucks, for example, almost as easy to transact against as adults 18 to 49.”\(^{698}\) With OpenAP’s web-based platform, advertisers can use set-top box data from comScore and ratings and consumer information from Nielsen, as well as their own first-party data, to look across these networks’ portfolios “to figure out where to reach narrower consumer targets such as first-time car buyers, expectant mothers or avid moviegoers.”\(^{699}\)

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\(^{697}\) Interview with Mike Rosen, May 30, 2018.


industry analyst counted OpenAP among the “first signs of an industrywide move to ad targeting.”

The intermediary firms swarming to pollinate advanced advertising offer a range of products and services that help manage information and coordinate a complex and not yet stabilized marketplace. They provide technical and administrative means for processing transactions, constructing a scaffolding for comprehending and putting to use a deluge of data. Essentially, they strive to make commerce easier. As an instructive example of what these intermediaries are driving at, consider the language used in a press release to describe a partnership between Nielsen and clypd, a “supply-side platform” that helps TV networks manage and maximize yield from their inventory. Like OpenAP, the Nielsen-clypd collaboration makes narrowly defined audience segments more standardized and thus more portable across buying and selling situations: “It allows linear TV audiences to be defined based on thousands of additional consumer attributes and helps marketers reach these audiences across all marketing channels, as well as analyze and optimize their performance of their campaigns.” The service is described as “creating a streamlined workflow to bring efficiency to marketers looking to transact on TV with their own data,” and it also integrates consumer profiles from other sources.

A cadre of firms like clypd provide sales services and operate exchange platforms that package audience inventory from a roster of participating exhibitors and distributors and make it available to buyers. These companies essentially extend the sales rep function, using algorithms to unearth audience impressions, to find advertisers’ target audiences in places that buyers and sellers might not have been looking. In short, the brokers of audience-based buying use information technologies—both databases and trading-desk software—to decouple advertising

701 “Nielsen and clypd Collaborate to Take Audience-Based Buying to the Next Level,” Nielsen (press release), September 21, 2017.
opportunities from the content surrounding them. The promise for television is that programmatic techniques will help networks, stations, and system operators maximize prices for typically undersold or undervalued inventory; advertisers, meanwhile, can find their target audiences outside the usual range of time slots and programs, paying lower unit costs. The CEO of one programmatic TV company explains, “If you have undervalued inventory, [our platform] provides a set of tools for bringing in national advertisers. That creates a way to value those audiences that didn’t exist two years ago.”702 In other words, data and information technologies are used to reconstitute audience impressions in ways that change their worth. Extracting maximum value is becoming a top priority for the supply side. Although traditional video providers continue to sell out of their inventory and worry that programmatic exchanges will erode prices and control, the material decline in measurable viewership “is driving more data-based ad selling among programmers as they look to capture every dollar possible.”703

Much of the effort described above has been aimed at liquidating the huge volume of “long-tail” inventory spread across the thousands of broadcast stations and cable systems around the country. But initiatives are underway to better integrate these technologies into the network ad market. Comcast-NBCU has been lighting the way. The company generated headlines in 2017 when it made $1 billion worth of ad inventory available in transactions for which audience delivery guarantees would be based on customized viewer targets rather than Nielsen’s demographic categories. In March of 2018, NBCU announced that it would be integrating into its offerings Adobe’s Advertising Cloud platform, “the most widely used solution in the industry for automated, data-driven planning and buying of television advertising.” Publicizing the deal, NBCU’s executive vice president of advanced advertising and platform sales said that it was

designed “to give current clients what they want: automation, data, and precision.”

As he told me in describing the company’s ability to find the types of people an advertiser wants to target anywhere across NBCU’s content properties, “we’re kind of deconstructing the packaging of television to let the data get more granular.”

I hope it is evident that the examples brought forward in this section reflect key elements of the calculative evolution I have been tracking. Clearly, addressable television, programmatic advertising, and many analytics services are designed to identify previously hidden profit opportunities and to verify return on investment. More importantly, they aim to account for more of reality—more of consumers’ attributes and observed behaviors—and to draw them into the frame of rational planning and action. In other words, they are meant to adjust the institutions of ad-supported television so that the calculations and decisions that structure routine commercial activity can accommodate the enormous troves of available data. The TV business is being reorganized so that its administrative infrastructures align better with a personalized and surveillant digital environment assembled for internet marketing. As I indicated above, though, this mission is not without difficulties. Large-scale efforts are underway to break down the remaining barriers holding back premium video advertising from fully imitating the internet.

**Vertical Integration: More Inventory, More Data, More Control**

One major roadblock to addressable and programmatic TV advertising is the limited and local nature of the inventory available for household-level targeting. National programming networks, in the context of linear TV at least, control no direct connection with viewers; the route to a specified household goes through the MVPDs that manage the network to which customers’ set-

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top boxes are linked. The only linear inventory available for addressable insertion, therefore, is the two minutes per hour sold by individual cable and satellite operators or their representatives. Networks, with the support of technology vendors and data brokers, can promise advertisers that certain programs or time slots “index” highly with a desirable audience segment (meaning that a particular segment comprises a higher proportion of the audience than the population at large), but the network has no means of discriminating among viewers.\textsuperscript{706}

Expanding the market for addressable TV advertising will require negotiations between programmers and MVPDs. For networks to make the national inventory that constitutes the bulk of their ad revenue actionable for household- or device-level targeting, they must partner with, and likely compensate, companies like Comcast and AT&T. For this reason, consolidation of content and conduit firms has always raised hopes for advanced advertising. Tim Hanlon told me, “We are literally only one carriage deal away from being able to allow ad units outside of the two minutes of local into a national addressable avail environment. Arguably, that’s the bigger picture of what, supposedly, an AT&T-Time Warner and a Comcast-NBCUniversal [means]—those are the first place that that should be done.”\textsuperscript{707} When Comcast negotiates with Disney over the cost of carrying ESPN, for example, negotiating down the per-subscriber price by a couple of cents is

\textsuperscript{706} This situation is changing along with a few developments that give content owners and distributors more opportunities to enable their commercial inventory to be used for addressable advertising. Programmers like CBS are offering direct-to-consumer services streamed over IP to smart TVs, mobile devices, and other internet-connected screens. Hulu, an over-the-top video-on-demand service owned by Comcast, 21st Century Fox, Disney, and AT&T, is starting to execute target advertising on what would have previously been considered prime-time inventory. A company called Sorenson Media is making deals with broadcasters whereby it takes their promotional inventory, sells it to advertisers, and then preempts insertion at the device level through partnerships with smart TV makers. And, finally, the new ATSC 3.0 broadcast standard will allow broadcast advertising to be addressed to specific audience targets and delivered over IP.

\textsuperscript{707} Interview with Tim Hanlon, October 27, 2017. Hanlon added, “I think it could have been done earlier on with Comcast-NBCUniversal; but they have not chosen to really pursue national addressability, combining those two pieces of the world that they own, until the threat of AT&T and Time Warner was actually real. And now you’re starting to see the Comcast-NBCUniversal people actually actively grapple with that.”
probably more lucrative for Comcast than getting access to national ad inventory. But if Comcast deals with a network it owns, the calculus might change.

When Comcast announced its plan to buy NBCU in 2009, Advertising Age called it a “bet on [the] future of advertising.”708 Such expectations are beginning to look well-founded, as services like NBCU+ Powered by Comcast—an addressable advertising platform that uses Comcast’s STB data to target viewers of NBCU programming—are at the cutting edge of what programmers are offering in the way of targeting.709 Describing the company’s suite of data-driven ad tech offerings in 2017, NBCU’s senior vice president of advance advertising products and strategy explained, “The core value proposition in the market is helping marketers reach their target audience more efficiently. At this point in time, on many of the platforms, we know who is consuming the content. So, from that perspective, shame on us, really, if we’re not giving them relevant products and advertisements.” The principal goal, she repeated, “is really to speak to consumers individually and to make sure that we’re providing the best return on ad-spend for our advertisers.”710 In addition to leveraging its own assets, Comcast has formed a partnership with Viacom, in which the cable operator’s ad-tech platform, FreeWheel, will enable advertisers to execute household addressability and dynamic ad-insertion within Viacom programming viewed on-demand. Viacom’s chief operating officer of ad sales spoke for both sides when he called the partnership with Comcast “an alignment around the vision of the future of the TV ecosystem.”711

708 Brian Steinberg, “Comcast Play for NBC Universal is a Bet on Future of Advertising,” Advertising Age, November 9, 2009, 3, 32.
AT&T’s CEO, Randall Stephenson, has announced similar ambitions to exploit advertising advantages that accrue to a company with a combination of distribution, content, and data assets. “Once we complete our acquisition of Time Warner Inc.,” he said in 2017, “we believe there is an opportunity to build an automated advertising platform that can do for premium video and TV advertising what the search and social media companies have done for digital advertising.” Leveraging AT&T’s “incredibly rich trove of data,” Stephenson hopes, will let Time Warner offer precise targeting and comprehensive audience measurement, and ultimately extract advertising prices that are two- to three-time higher than its current rates. AT&T, which owns DirecTV, the nation’s leading satellite operator, is perhaps the utility best positioned to compete with Google and Facebook as a marketing platform. In addition to a growing armory of ad tech, the company has first-party data from more than 170 million customer relationships. As one media buyer told me, pointing to its ability to know what subscribers watch and to track mobile customers through space, “AT&T knows a lot about you.” AT&T’s Stephenson boasted as much recently: “When you have those kind of direct-to-consumer relationships, you have, we believe, incredible insights to those customers. What are they watching? Where are they when they watch it? What times are they watching it? You begin to have understanding of the customer that is really, really unique. With ad technology, we’re demonstrating already with the small ad inventory we have today, that’s very powerful that you can create some serious value when you combine those.”

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In what may come to be regarded a signal event in the complete commercial integration of television and internet advertising, AT&T recently acquired AppNexus, a decade-old ad tech company providing widely-used software platforms to both suppliers and buyers. It then rebranded its entire advertising and data services businesses as Xandr. With AT&T absorbing a fixture of the programmatic advertising ecosystem, and with Facebook, Google (again), and now Amazon making stronger inroads into video advertising, marketers’ data-driven dreams are inching closer and closer to reality.

**Conclusion**

In a 2018 promotional video produced by FreeWheel, the executive vice president of business operations and strategy at NBCU encapsulates what he and others see as the future of television advertising: “We believe TV is evolving in a number of ways. Better measurement across all platforms to deliver on a total audience perspective. Automation, to increase the efficiency of the workflow. And data, in order to make premium video more intelligent through targeting and optimization.” In foregrounding targeting, measurement, and automation, he glosses three of the constitutive affordances of advanced advertising. Together, *addressability, accountability*, and *programmability* are the prevailing features of what people in television, advertising, marketing, technology, and database industries call “data-driven television.”

The above statement also signals that these affordances reflect deeper values being pursued through technological means, including efficiency and optimization. The dominant perception of advanced television advertising, as mentioned throughout, is that this “advancement” is the result of applying digital technology—and the techniques typical of internet

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715 Like IBM (Watson) and Publicis (Marcel), which have named their AI and big data initiatives after company founders, AT&T is paying homage to Alexander Graham Bell.

advertising—to commercial television. This is true enough. But such a characterization also risks distorting the historical development of advertising and marketing, implying that the defining elements of digital advertising discussed herein—chiefly, targeting, automation, e-commerce, and attribution metrics—are products of digital technology. While the capacities of digital technologies have indeed enabled these elements to be implemented, historical evidence suggests that it is equally important to recognize that advertising and marketing interests have shaped digital technologies to approximate these values, which predate by decades the popularization of the internet and mobile devices. Examining advanced advertising through the lens of affordances has allowed us to keep these values within our view, and consequently to look back historically not just at particular technologies or ventures, but also at the situated imaginaries, ambitions, and cultural and industrial logics that specific formations reflect. What we gain from this perspective is a clear understanding that efforts to know the audience, target profitable consumers, automate workflows, and optimize resource management are every bit as central to how television advertising has evolved over the past 60 years as to how it is evolving today.
Conclusion

Perhaps one of the leading narratives about digital media and economic and cultural change posits that starting around the mid-1990s a variety of new technologies arrived suddenly and fundamentally disrupted advertising and commercial media. An inevitable tendency toward digital convergence, and demand from sovereign consumers for more convenient and relevant experiences, are credited as the engines of change. After a closer historical look at the political economy of advertising technologies, I am convinced that this interpretation requires substantial revision. Through that revision, we get a clearer understanding of how advertising and media industries have been connected to the expanding authority of statistical, behavioral, and computer sciences in business and everyday life.

Across the 1950s and 1960s, the advertising industry began to rebuild its information and knowledge infrastructures around more sophisticated forms of electronic data processing. It also took the first clumsy steps toward instituting networked, computer-based communications facilities capable of hosting “on-line” marketplaces and executing machine-to-machine transactions. Automation and optimization were goals that framed the appropriation of computer technologies within existing routines and challenges and as part of ambitious visions for the future. Electronic data processing and networked computing were interpreted, constructed, and leveraged both to handle the administrative and informational load in a marketplace where complexity and rising costs motivated the search for analytical advantages, and also to advance marketing and audience manufacture toward an underlying dream of rapid and perfectly rational decision-making. Mathematics, machines, and behavioral sciences were assembled around more calculating and data-intensive systems for commodifying attention and influencing consumers.
Attempts at using information technology to identify and exploit ever finer profit opportunities paired favorably with market segmentation, a theory advocating the discrimination of minute differences within consumer populations. As the cable television and telecommunications industry engineered a “wired world,” both physically and discursively, prospects for a more personalized and interactive media environment seemed to flourish in the 1970s and 1980s. Addressable technologies manifested the principle of discrimination in cable systems’ infrastructures; and with direct lines into subscribers’ homes—connecting identifiable devices to a computer database and control center—cable operators were positioned to further disaggregate mass audiences and reshape commercial information and entertainment services around a direct-marketing paradigm. Selling household-level audiences to national advertisers engendered logistical complexities beyond anything experienced in broadcast television. The process of coordinating and scaling up a marketplace for hyper-targeted audiences involved establishing interconnection across organizations and facilities, interoperability of technical and administrative protocols, more extensive and intensive data-collection, and increasingly sophisticated approaches to trafficking, routing, and verifying the circulation of ads, orders, and payments. The history of spot cable is, in a sense, the history of infrastructure services for producing and selling audiences of individuals, targetable at the device level. The commercialization of the internet was, in many ways, an extension of this general process to a technical and institutional environment free of many challenges that beset cable television. Companies like Google and Facebook thrive by doing what cable sales organizations and other intermediaries tried to do across the 1980s—build logistical utilities to coordinate a dynamic, flexible, and personalized ad market.

The same wires and electronics that afforded addressability also aroused intense desires to market products directly to viewers. The ultimate hope of making television into an interactive
storefront, wherein programs and applications are shoppable showrooms, has been a resilient feature in popular imaginations about the future of video and entertainment services. The internet has factored into a massive transformation of retailing not only because of its interactivity, but also because of its transactivity.\textsuperscript{717} The ability to transact commerce was built physically and organizationally into cable systems, and it matured as a cultural expectation, as more electronic venues became marketplaces. The long-held hope to turn television into a shoppable catalogue has triumphed as a pervasive logic and a matter-of-course-practice in online entertainment and commerce, from almost any digital advertisement, to more and more of the user-generated content on Instagram and other social media.

An essential ambition overarching these developments is to “close the loop” between marketing communications and marketplace outcomes. The impulse to know whether ad spending is profitable or wasteful is endemic to the institution of modern advertising. As the president of AT&T AdWorks wrote recently, “What’s the purpose of doing all this advertising if you’re not sure that it’s working?”\textsuperscript{718} Efforts to increase accountability in advertising—to become more rigorous in planning and evaluating returns to expenditures, and more capacious in the volume of data admitted into the frame of calculation—have been persistent since at least the start of the 1960s. To minimize uncertainty and put advertising on a seemingly more scientific and mathematical footing, marketers, ad agencies, and other intermediaries have developed or adopted many tools and techniques for identifying individuals and collecting and analyzing information about their media usage and buying habits. The ubiquity of sensors and tracking technologies throughout our physical and virtual environments, and in our most intimate personal devices, owes to multiple causes; but one of them is the long-standing desire to penetrate the

\textsuperscript{717} For more on this distinction, see Darin Barney, \textit{Prometheus Wired: The Hope for Democracy in the Age of Network Technology} (Vancouver: UBC Press, 2000), 163-167.

\textsuperscript{718} Rick Welday, “Five Things to Know About Addressable Ads,” \textit{Adweek}, September 26, 2016, 20.
black box of the consumer, as Armand Mattelart put it. Marketers have tried desperately not only
to put themselves in a position to predict potential buyers’ behaviors, as John B. Watson advised,
but also to quantify their success. Google, Facebook, and countless others ranging from the well-
known (e.g., Amazon, Adobe, Experian, Acxiom) to the obscure (Simulmedia, Data Plus Math),
have staked their claim on the ability to attribute sales outcomes to specific marketing efforts. The
validity of these claims is dubious in many cases; but, the effort has and will continue to nestle
surveillance and datafication into ever tinier interstices of existence.

Despite what discourses about the disruptive and revolutionary force of “new media”
 imply, I have found that the buying and selling of audiences, and the systematic efforts to profile
and influence individuals and publics, have always involved heavy informational, administrative,
and logistical burdens. The core operations within these industries, long before the internet and
big data entered the picture, created an enormous appetite for information, for data-processing
facilities, and for forms of organization that would allow corporations to accrue and leverage
strategic intelligence. In trying to improve routine activities, and in pursuing designs for more
efficient and calculative market activity, advertising and television industries helped to shape the
emergence of digital media and the data-driven techniques that are more often credited with
disrupting those industries. The marriage of behavioral science and big-data analytics that defines
media and marketing today developed over decades from within the central dynamics of selling
the American people.

The emergence of this paradigm has been part of a larger shift which I have called a
calculative evolution—an elaboration of the existing tendencies within capitalism to expand
commodification and market-based forms of exchange that has both influenced and been
catalyzed by new information technologies. The creative revolution in advertising began almost
simultaneously with the initial computerization of the industry, starting in the 1950s. From then
until the present, the materiality and organization of marketing, market research, and media planning, buying, and selling have been reformed around resources for expanding and accelerating calculative action. The 1990s mark a critical juncture for the entanglement of media and marketing not because the internet gave birth to a quantitative and data-driven ethos, but rather because the long-standing desire to account for more of consumers’ behaviors and become more calculating about how to classify and influence individuals was realized to an unprecedented degree in the commercial construction of online and mobile media. The digital world has been built and bent in ways that have allowed more of the individuality, mobility, and uniqueness championed in advertising since the 1960s to be accommodated within marketers’ and media companies’ fields of observation, measurement, management, and commodification.

This evolution has deepened the reliance on computing machines and programs in advertising. Automation is a necessity for coordinating audience and personal-data markets today, when advertisers and publishers number in the millions and available inventory tends toward infinity—or at least exceeds 100 billion impressions daily. But algorithms and networked databases are also key resources for harnessing commodification and accumulation strategies to the diverse experiences, lifestyles, identities, and creative interactions that constitute today’s consumer society. From the creative revolution of the 1960s through the later turns toward neoliberalism and post-modernism, the United States and other advanced capitalist societies have presided over what David Harvey calls “the construction of a neoliberal market-based populist culture of differentiated consumerism and individual libertarianism.” Digitalization and the rapid spread of personal technologies have facilitated the “enclosure” of this culture of consumer sovereignty within the boundaries of calculation for advertisers, market researchers, and media

720 David Harvey, A Brief History of Neoliberalism (Oxford: Oxford University Press, 2005), 42.
organizations trying to valorize evidence of attention or place bets on probable consumer behaviors.\textsuperscript{721} As Adam Arvidsson puts it, “The physical, social and cultural mobility of social life, the moving about between environments and activities that has become a key characteristic of post-modern life, has also become a source of value to be realised on the market for commodified information.”\textsuperscript{722} While the expansion of commercial surveillance has been well-documented, the less conspicuous institutions and infrastructures for managing information flows in marketing and media buying have attracted relatively scant scholarly attention, even though, as I argue, they helped set a pattern for the personalized and predictive marketing paradigm that reigns in our digital age. Notwithstanding the differences between the 1950s and today in terms of computing, storage, and analytical capacities, the computerization of media-buying and marketing processes presaged the logistical and, in some ways, epistemological challenges involved in reorganizing the attention-selling and persuasion businesses around the precision, speed, and discriminating abilities of new information technologies.

The calculated transformation of advertising and marketing is not attributable to a grand conspiracy—though, undoubtedly, it has mobilized strategies for profiting from social control. It reflects structural tendencies of communication in capitalism, of organizing media systems to produce audiences as commodities and to accelerate the circulation of commodities throughout the economy. Marketers, media companies, and information technology firms fighting to protect and extend their own interests—and working within rules set by the state (and often working with


the state)—have assembled a vast data-driven apparatus for monitoring, predicting, and manipulating individuals’ behaviors. According to Shoshana Zuboff and others, this ushers in a surveillant or cybernetic regime of economic accumulation, oriented around the commodification of personal information.723

To be sure, the goal of total information awareness—and the ability to respond effectively to all this “knowledge”—is far from complete. But it is not just a functional Big Brother system that should concern us. We should also be wary of a clear, if often unstated, Orwellian ambition that substitutes a faith in statistical and computational judgement for a willingness to acknowledge the system’s many inabilities, failures, and biases. A commitment to counting everything and making everything count—to eradicating the incalculable—only makes it more difficult to reckon with what falls outside the frame of rationality, to confront the inevitable incompleteness of calculative agency, and thus to redress the injustices programmed into our social infrastructures. Whether or not marketers can achieve the control they dream of, their efforts to engineer their dreams into existence have made a profound impression on how we experience reality.

There is no denying that behavioral data science points in some promising directions. But, when we evaluate it within our specific historical circumstances—and especially in market-based contexts—it should give us cause for serious concern. The power of organizations possessing a mastery over these data resources to intervene in our choices and opportunities raises

difficult questions about autonomy and agency. Worlds may be closed off to us, or our futures might be guided toward undesirable trajectories without our (reasonable) authorization or even awareness. Oscar Gandy and others have diagnosed how the use of databases and information technologies for social sorting have reinforced and exacerbated forms of inequality.\footnote{Oscar Gandy, *The Panoptic Sort: A Political Economy of Personal Information* (Boulder, CO: Westview Press, 1993). See also Seeta Peña Gagadharan, Virginia Eubanks, and Solon Barocas, eds., *Data and Discrimination: Collected Essays* (Washington, DC: New America, 2014). For a recent critique of the anti-democratic implications of big data, see Cathy O’Neil, *Weapons of Math Destruction How Big Data Increases Inequality and Threatens Democracy* (New York: Crown, 2016).} Despite the veneer of objectivity attributed to automated decision-making, designers and engineers encode values, priorities, and biases into algorithms and complementary systems for collecting and analyzing information. As one recent analyst argues, the data generated from our transactions in marketplaces and media environments, which make individuals legible and subject to categorical profiling, “produce knowledges that ‘conduct’ who we are seen to be, who we see ourselves to be, and how we are assigned resources.”\footnote{John Cheney-Lippold, *We Are Data: Algorithms and the Making of Our Digital Selves* (New York: NYU Press, 2017), 98.} Citizens disfavored by these systems—often due to errors or, more troublingly, because longstanding forms of social exclusion that would be illegal if formalized in corporate policy have been reproduced within algorithms—can become mired in vicious cycles that adversely affect their life chances and yet may be difficult to redress due to secrecy, opacity, or the authority bestowed on an automated decision.\footnote{Frank Pasquale, *The Black Box Society: The Secret Algorithms That Control Money and Information* (Cambridge, MA: Harvard University Press, 2015).}

Advantages have accrued to the organizations best able to leverage behavioral big data, in ways that ripple throughout the broader political economy. Concentrations of corporate power, realignment of industries, and large-scale restructuring of markets and governance are not the worries of alarmists; they are, in many cases, claims and prescriptions submitted by data scientists
and management theorists.\textsuperscript{727} Ostensibly for the purpose of “optimizing” markets by making them react dynamically to information about individuals or types of consumers, principles of discrimination have been pursued through data-driven niche marketing in ways that undermine prosocial values and reverse the expectations of fairness and transparency supposedly fundamental to a democratic marketplace.\textsuperscript{728} Legal scholar Ryan Calo enumerates ways in which the application of big data for the purposes of identifying and exploiting increasingly minute profit opportunities and competitive advantages makes “market manipulation” and exploitation of consumers’ vulnerabilities into systemic features of digital marketing environments.\textsuperscript{729} Many commentators and researchers have maintained that ICTs would help consumers become the perfectly rational and calculating agents idealized in economic theory.\textsuperscript{730} Instead, corporations have used these technologies to become both intimately and massively acquainted with human habits. What becomes of rationality when a marketer knows that someone is recently divorced, or is suffering with depression, or is likely to respond to a “nudge” after a long shift at work? And what happens when parties to this “knowledge” have the power to manipulate the information and marketplace conditions surrounding that person? Vulnerability is a conditional state, activated in specific circumstances, and not just an endemic and enduring characteristic of certain types of

\begin{footnotesize}


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people (e.g., children),\textsuperscript{731} it may be that the data-based arsenals aligned with digital marketers increases the possibility for anyone to be exposed and exploited as a vulnerable consumer.\textsuperscript{732} Mattelart’s remarks still resonate almost thirty years later: “Marketing pursues its mad dream: to predict behaviour and maybe manage to control it. To penetrate 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.”\textsuperscript{733}

The fundamental purpose of this research has been to complicate received wisdom about the sources of change in advertising and commercial media. Critical historical analysis requires us to reconsider the conventional interpretation that digital and internet technologies have disrupted and revolutionized advertising and media. At least as much evidence suggests that those technologies have been influenced by the ideas, ambitions, practices, and institutions of advertising and audience manufacture. The significance of material increases in various capacities associated with digitization is undeniable (e.g., storage, bandwidth). But we should resist the temptation to attribute the expanding enclosure of personal and public life to purely technological explanations. The relationship between advertising/marketing and new technology must be regarded as one of \textit{mutual} shaping. When we look from this vantage point at questions about the sources of change, we see the (shifting) political economy of capitalism, and the underlying efforts of marketers and attention merchants to influence consumer habits and commodify attention and personal data, both urging forward and reacting to developments in information and communication technology.


The impulse to subject consumers and markets to more systematic forms of accounting and calculation has been part of advertising from the turn of the twentieth century onward. Since the 1950s, the desire to know and modulate consumer habits within the strategic epistemologies of behavioral science and operations research has been lashed to the computer and other technologies for generating, storing, processing, and circulating information. These ideas, organizations, and machines have been co-evolving ever since. Without denying the profound changes wrought by these developments, we can conclude that to characterize today’s programmatic and data-driven marketing environment as the result of a radical discontinuity is to ignore this historical and reciprocal shaping of technology and the political economy of capitalism. I hope this dissertation has made some inroads in uncovering the long historical entanglement of marketing and new media.

Yet, while I have insisted that much is revealed by looking carefully in the rear-view mirror, the fact remains that we must navigate the road ahead. It may be that lifting a fog from the received history of ad tech is light work compared to the job of curbing the worst possible outcomes for a future imagined (and now substantially implemented) around selling the American people. By harnessing ambitions of observing, predicting, controlling, and monetizing consumer behavior to technologies with remarkable capacities for surveillance, calculation, and numerical management, marketers and media organizations have built a sort of momentum, or forward propulsion, into their project of “advancing” advertising. The combined vectors of automation, personalization, marketplace connectivity, and expanded powers of accounting and analysis have come to define the commercial media world, and they will continue to intensify unless people question the basis of this trajectory and mobilize the collective will and energy to deflect it in a direction more aligned to human values. I have tried to provide a better understanding of this trajectory and its motive force than was previously available. As I continue this research, I intend
to use these insights to formulate strategies for intervention that might help bend the arc of
development in media and communication away from the commodification of consciousness and
human life, and toward something aiming for equality, justice, and an ability to take meaningful
public steps toward confronting the truly existential threats on our immediate horizon.
Appendix A: Interviews and Industry Events

In the course of my research, I interviewed 16 people with direct experience in the industries and organizations under analysis. I list the interviews chronologically, with descriptions of the interviewee’s professional positions relevant to advanced advertising.

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<tr>
<th>Date</th>
<th>Name</th>
<th>Professional Position</th>
<th>Previous Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 27, 2017</td>
<td>Tim Hanlon</td>
<td>Founder and CEO, Vertere Group, LLC</td>
<td>Starcom MediaVest Group, Publicis Media Groupe</td>
</tr>
<tr>
<td>November 6, 2017</td>
<td>Tracey Scheppach</td>
<td>CEO and co-founder, Matter More Media</td>
<td>Wink, OpenTV, Starcom Worldwide, Publicis Media Groupe</td>
</tr>
<tr>
<td>November 10, 2017</td>
<td>Ben Tatta</td>
<td>President and co-founder, 605</td>
<td>Cablevision</td>
</tr>
<tr>
<td>November 17, 2017</td>
<td>Gerard Broussard</td>
<td>Principal, Pre-Meditated Media (analyst)</td>
<td>WPP, OgilvyOne, Mindshare, Canoe Ventures</td>
</tr>
<tr>
<td>December 12, 2017</td>
<td>Helen Katz</td>
<td>SVP and Director of Global Analytics &amp; Insight Practice, Publicis Media</td>
<td>DDB Needham, ZenithOptimedia, Starcom MediaVest Group</td>
</tr>
<tr>
<td>January 26, 2018</td>
<td>Larry Zipin</td>
<td>Former Corporate Vice President of Advertising Sales, Time Warner Cable</td>
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<tr>
<td>January 28, 2018</td>
<td>Jim Chiddix</td>
<td>Former Chief Technical Officer, Time Warner Cable</td>
<td>Former President of Interactive Video Group, Time Warner Cable, Former CEO and Chairman, OpenTV</td>
</tr>
<tr>
<td>February 2, 2018</td>
<td>Bruce Thomas</td>
<td>Former Vice President of National Ad Sales, Tele-Communications, Inc.</td>
<td>Former General Manager, Comcast Spotlight</td>
</tr>
<tr>
<td>Date</td>
<td>Name</td>
<td>Title/Position</td>
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<td>-------------------</td>
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<td>-------------------------------------------------------------------------------</td>
<td></td>
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<tr>
<td>February 5 and 9, 2018</td>
<td>Bill Harvey</td>
<td>Principal, Bill Harvey Consulting</td>
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<tr>
<td></td>
<td></td>
<td>Previous experience at: American Research Bureau/Arbitron, Gray Advertising, Next Century Media, TRA, Inc., OpenTV</td>
<td></td>
</tr>
<tr>
<td>February 9, 12, and 26, 2018</td>
<td>Paul Woidke</td>
<td>Former Chief Technology Officer, Adlink</td>
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<td></td>
<td></td>
<td>Former SVP of Technology, Comcast Spotlight</td>
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<tr>
<td>February 12, 2018</td>
<td>Chet Kanojia</td>
<td>Former CEO, Navic Networks</td>
<td></td>
</tr>
<tr>
<td>February 20, 2018</td>
<td>Bruce Anderson</td>
<td>COO and Global CTO, Invidi Technologies Corporation</td>
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<tr>
<td></td>
<td></td>
<td>Previous experience at: Sarnoff Corporation, DIVA Systems Corporation</td>
<td></td>
</tr>
<tr>
<td>March 30, 2018</td>
<td>Michael Bologna</td>
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I attended and observed the follow eight events, all in New York City: 6th Annual Multichannel Summit (November 19, 2015); Advanced Advertising (April 5, 2016); 7th Annual Kagan Multichannel Summit (November 16-17, 2016); TVOT 10: TV of Tomorrow – TV at the Speed of Light (December 8, 2016); Advanced Advertising (March 27, 2017); The Programmatic
Summit (June 13, 2017); Advanced Advertising (October 18, 2017); TV of Tomorrow NYC 2017 (December 7, 2017).
Appendix B: Overview of Television Advertising Markets

The supply or sell side of the market comprises distributors and exhibitors of video content who have inventory available for sale. Exhibitors often contract with sales firms, or “reps,” which represent them in marketing their inventory to regional and national advertisers. Some of the rep firms discussed in this study include Katz, H-R, Blair, and National Cable Communications. The demand or buy side includes advertisers who want to promote the products and services manufactured, distributed, or rendered under their brand names, as well as the agencies that work for those advertisers to conduct market research, plan campaigns, produce commercial messages, and procure audience inventory (i.e., pay to place ads in front of potential consumers—what is called media buying). These latter functions of market research, campaign creation, and media planning and buying are typically undertaken either by a full-service advertising agency, or by a complement of specialized firms, often under the banner of a marketing “holding company.” The major marketing holding companies are WPP, Interpublic Group (IPG), Publicis, Omnicom, and Dentsu.

National networks like NBC and CNN distribute programming to affiliate broadcast stations and cable systems; they use the commercial time within their programs (about 14 minutes per hour) to sell audiences to national advertisers, such as Coca-Cola, General Motors, Mastercard, Apple, and Geico Insurance. Most of this network inventory (often 75% to 90%) is sold in the “upfront market,” which is a negotiating process each spring wherein programmers unveil their upcoming schedules and national advertisers reserve space in those schedules, based on existing relationships between buyers and sellers. The remaining inventory is sold in “scatter markets,” closer to the date of airing. Regional networks—like Comcast SportsNet Philadelphia—distribute content to interconnected cable systems in a geographical area, and they sell ads to both national brands and to merchants or other organizations that operate within or
near the network’s coverage range, such as retail chains concentrated in certain parts of the U.S. (e.g., Wawa).

A portion of the commercial time in the content described above is given over to the affiliates that exhibit the content—i.e., that transmit signals to viewers’ premises either by wire, satellite, or terrestrial broadcast. These outlets also control inventory in locally produced content. These two sources of inventory comprise the spot market. Exhibitors—like WPVI-TV, ABC’s owned-and-operated station in Philadelphia, or Comcast of Philadelphia (NE), the headend facility serving the northeast part of the city—have usually two to three minutes of time to use for promotion of their shows and services or to sell audiences to local, regional, and national advertisers. Often, sales rep firms act as liaisons between exhibitors and advertising agents beyond the exhibitor’s territory. Cable systems, furthermore, are often “interconnected” and represented by sales firms that help ease the administrative burden of spot cable advertising by coordinating between the parties wishing to buy spot cable inventory and the many operators with inventory for sale.

The third leg of the stool is audience measurement. Because this market trades in a product that, unlike steel or toasters, exists more as potential and promise than as a tangible thing, an ostensibly independent and neutral party is needed to determine whether advertisers get what they were promised and to help set the price. Historically, this role has been filled by Nielsen, which has established a representative panel of TV households, whose viewing habits are measured through a combination of meters that detect what channel a TV set is tuned to, and paper diaries that provide demographic information about participating households. A firm called Arbitron (formerly American Research Bureau) also provided local TV ratings for much of the history covered in this study. More recently, comScore/Rentrak has begun providing data from set-top boxes to facilitate audience buying. The point of these organizations is to provide a
currency by which sellers “guarantee” to buyers a specified delivery of audience size and quality; essentially, they package evidence of audience attention as an information product. The history and practice of audience measurement has been studied extensively. What you need to know for now is that 1) these actors are crucial for brokering advertising buying/selling and 2) many conventional routines are in a process of reconstruction due to changes in media options and uses, and the explosion of data sources.
Appendix C: Spot Cable – The Basis for Addressable Advertising

The action in this dissertation unfolds mostly in spot markets, especially for spots inserted by cable and satellite operators, which provide the basis for addressable advertising. To repeat, for decades broadcast stations have reserved a few minutes of time during each hour of network-affiliated or syndicated programming either to insert promotions for the station or to sell audiences to local, regional, or national advertisers. A similar spot market exists in pay television.

As part of their negotiations to secure carriage on the systems operated by cable, DBS, and telecom providers (which are, collectively called multichannel video programming distributors, or MVPDs), most national, satellite-delivered networks grant affiliate operators the right to insert ads or promotions. In most agreements, two or three minutes per hour of available inventory ("avails") are given to the MVPD. You might be watching ESPN’s *Sportscenter* as a Comcast subscriber in Philadelphia, and during an ad-break you see an advertisement for Barbera’s auto dealership on Roosevelt Boulevard and a spot publicizing a limited-term discount on hoagies at Wawa. These ads have been bought from your local cable operator or from a sales firm representing a collection of cable systems in the region (like Comcast Spotlight). Viewers watching the same program at the same time in Albany, New York, will not see those ads. They will either see an ad spliced into the program stream by their local cable provider or, if their provider does not have the right to insert on that channel, they will see whatever content is in the feed that ESPN beams via satellite to all the affiliate cable systems carrying its signals—which usually will be either a promotion for a Disney property or a direct-response advertisement that has been priced based on viewer responses rather than audience size and composition. National brands also purchase spots from sales rep firms (NCC) and interconnected cable systems (Adlink). These locally-inserted spots may be difficult for the viewer to distinguish from the network’s national feed.
Typically, spot inventory is apportioned with half being sold directly to local advertisers by a system’s sales staff, one quarter being used to promote the cable operator’s services or programming properties, and one quarter being sold to national advertisers, brokered by a national sales rep and an ad agency. Satellite operators like DirecTV (owned by AT&T) and Dish Network also sell these avails; but since they have no local operators, all of this inventory is typically sold to national advertisers.

In cable, the insertion process takes place at the headend, which is essentially a command and control center where an affiliate cable system receives the satellite downlink from national networks like CNN and then routes those signals to subscribes over the cable plant. In the early days of spot cable, an advertiser or its agency would deliver to the operator a video tape containing a commercial spot. A technician would edit that spot onto a master tape that matches the daily log (i.e., sequence of commercials) that a “traffic manager” has prepared for a given channel. “Trafficking” is an important logistical function for determining when a purchased spot will air, and usually it involves verifying that the ad was inserted as planned. When an insertion opportunity is about to occur, something called a “cue tone”—an audio signal embedded in the program stream—triggers the video deck to prepare for playback and then switches the feed from the network to the analog ad server. This signaling process happens in reverse when the avail is about to end and the programming is to resume. SeaChange, Channelmatic, and Texscan were some of the first vendors of ad-insertion technology to cable operators.\footnote{The cue tone is an interesting example of machine-to-machine automation, and at least two innovations in the technology have earned technical Emmy awards. It also reflects coordination among programmers, MVPDs, and equipment makers around a standard with important logistical functions for ad insertion.}

By and large, spot cable ads are not addressable; every subscriber wired to given cable headend will see the same thing on each channel most of the time. But it is from this inventory (particularly the portion of that time sold nationally) and through this insertion process that
addressable TV operates. Therefore, to understand addressable advertising, we must first understand spot cable advertising in general.
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