

A Critical Political Economy of Web Advertising History

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The rise of web advertising over the past two and a half decades has been meteoric. Global online ad spending has risen steadily since the World Wide Web's creation, proving resilient in the face of two financial crises and generally tepid economic growth. Consulting firm McKinsey & Company (2015) predicts that 'digital media', which includes the web and mobile platforms, will account for more than 50% of worldwide advertising spending by 2019. The web has been the primary carrier of digital advertising and its expansion has been accompanied by a great build-up of consumer data collection capacity. For a majority of users, pervasive advertising and monitoring are now default components of web engagement.

As internet access continues its uneven proliferation, web advertising seems to grow apace. But why is this so? The web was created as an information retrieval tool and released into the public domain in the hopes that it might become a 'universal medium for sharing information' (Berners-Lee and Fischetti, 1999: 84). It was designed to be open-ended, but was hardly optimized to serve the marketing needs of business. Support for advertising was not a standard feature of web technology, nor was it particularly welcome within early web cultures. Yet today the web is saturated in commercial messaging and significant efforts are ongoing to enhance and extend digital advertising capabilities. Is it simply the natural state of affairs that the web's diffusion entails integration within advertising systems? A look at the origins of web advertising in the United States suggests otherwise. The capacities for

advertising and consumer monitoring had to be constructed along technical, but also political economic, lines.

Using the United States as a case study, this chapter outlines the history of web advertising from a critical political economy of media (CPE) approach. While web advertising does not have a sole country of origin, US companies, in partnership with the federal government, were among the first to bring advertising to ‘cyberspace’. As part of the broader privatization of the internet, policy-makers sought to position American businesses at the forefront of the web’s global commercial expansion. The US government embraced a hands-off regulatory approach to web advertising, hoping to bolster the industry’s early growth. Throughout the 1990s, US companies developed leading technologies, standards, and practices that brought fringe web advertising markets into the mainstream. At the time of this writing, US-based transnational corporations dominate the global digital advertising sector. At the forefront are Google and Facebook, both of which have come to stand among the world’s most valuable companies by pushing the technical and political boundaries of web advertising and consumer surveillance. In so doing, they have helped to solidify advertising’s place at the center of the digital media economy. CPE provides valuable insights into the historical roots of this state of affairs.

A Critical Political Economy Approach

One of the primary aims of CPE is to clarify how media and communications systems work in relation to larger structures of political and economic power (Hardy, 2014; Mosco, 2009; Wasko et al., 2011; Winseck and Jin, 2011). Historical analysis is foundational to this effort because it denaturalizes prevailing institutional arrangements and social relations, showing the structural forces and human agency at work in the construction of media systems. In her classic study of social construction of technology, Carolyn Marvin (1988) unpacks the history of electronic communication by taking readers back to the moments *When Old Technologies Were New*. In a complementary fashion, CPE posits that it is also necessary to consider what is ‘old’ about new technologies. Foremost among what is old about web advertising is that it

grew out of the century-in-the-making interdependency of media and marketing within capitalism. Adapting a term from John Sinclair (2016), a ‘marketing/media complex’ emerged in the late 19th century as manufacturers, retailers, advertising agencies, and commercial media outlets found common interest in building national consumer markets. These entities grew symbiotic as markets matured and advertising became a cornerstone of corporate strategy. In increasingly prevalent oligopoly scenarios, advertising functioned as a barrier to would-be competitors and a means of brand maintenance. Advertising expenditures grew rather quickly to account for around 2% of US GDP and have remained relatively stable ever since. Large swaths of the media sector became reliant on advertising revenues and, on the whole, business was good. Media empires were forged as advertising became a ‘leading edge of global consumerism’ (Schiller, 1969: 13), serving the ideological and market-building needs of an astonishingly productive corporate industrial economy.

In a word, advertising became integral to industrial capitalism and evolved in relation to its overarching political economic currents. A rich CPE literature chronicles these developments, unearthing the contested processes whereby marketing imperatives came to govern the structure and content of successive media systems and highlighting attendant social problems including constraints on journalism, class bias of media fare, and deepening commercialism (Baldasty, 1992; McChesney, 1993; Ohmann, 1996). From this perspective, the history of mass media is intertwined with the history of creating large markets for consumer goods and services. Advertising took a variety of forms, but mass marketing became the prevailing strategy in alignment with the affordances of industrial printing and broadcasting technologies, i.e. mass communication. As new information communication technologies developed, particularly computers and advanced telecommunications networks, the marketing/media complex responded with renewed dynamism, seeking to exploit emerging business opportunities and evade destructive competition. This lineage is the starting point for a CPE analysis of web advertising history.

Public policy is a focal point for CPE, which emphasizes the central role of politics in media development. Successive media and advertising systems have been heavily shaped by the formative policy decisions that Paul Starr (2004) calls ‘constitutive choices’. For example, legislation, regulation, and government subsidy were foundational to the establishment of commercial broadcasting in the United States, particularly in the form of the Radio Act of 1927 and Communications Act of 1934. It was the Federal Radio Commission/Federal Communications Commission, at the behest of Congress and with executive branch backing, that ‘cleared the dial’ of many public and non-profit broadcasters to give exclusive licenses (for free) to a commercial broadcast oligopoly owned by some of the nation’s most powerful technology companies. Early policies often have structuring ‘path dependence’ effects on subsequent system development. Television’s brisk subsumption by commercial radio broadcasters is one example, though CPE scholars point out that early commercial broadcasting was highly controversial, as evidenced not only by organized citizen opposition, but also by the decisions of peer nations like Great Britain to reject advertising and establish alternative public broadcasting models (McChesney, 1993). CPE attends to such complexities by looking for moments of contestation and putting policy-making to questions of ‘for whom and for what’ (Schiller, 1978).

There are numerous examples of the US government’s historical stewardship of the marketing/media complex, from subsidizing basic communication technology research to chameleon-like public interest regulations to a tax code that allows companies to write off advertising as a business expense. The takeaway here is that public policy has always been fundamental to media system development and that, despite strong structural pressures toward commercialization, there are real political choices to be made, especially during a platform’s formative years (McChesney, 2007; Starr, 2004). The World Wide Web is no exception. Web advertising’s history is in many ways the story of the internet’s assimilation into the capitalist political economy. At the same time, important elements of web advertising’s construction can be attributed to variously contested policy choices, rather than inevitable technological advance or market predestination. The balance of this chapter demonstrates the CPE approach

by highlighting how public policy-making, financial investment, and the structural imperatives of capitalism shaped the web's formative moments, drove the rapid buildup of online advertising, and propelled consumer monitoring.

Four 'stages' of web advertising

The history of web advertising in the United States can be mapped into several cascading stages of development: electronic billboards, ad networks, search advertising, and surveillance advertising. Of course, reality has a habit of being too complex to fit neatly into distinct categories. There was and remains a great deal of experimentation, investment, and conflict within the institutions, technologies, and practices of web advertising. A new historical 'stage' does not come along and simply replace its predecessor. Instead, it is useful to think of these categories as trajectories, progressing in varying degrees of overlap, sometimes in opposition, but generally in an additive fashion. Tim Berners-Lee (1999) noted that the web's technical protocols were established by means of 'accretion'. The same is true of web advertising in that contemporary practices reflect an amalgamation of prior developments.

The first three stages come from the United States' pre-broadband era, roughly the mid 1990s to the mid 2000s, during which the economy was overtaken by a massive boom and bust of speculative investment that centered on information and communication technologies: the dotcom bubble. The web advertising trends of this period have since converged around the collection and exchange of consumer information for application to a wide range of digital marketing activities. Terms like 'one-to-one marketing' and 'big data' have been used to describe such practices, which signify the fourth and current stage of development. I use the term surveillance advertising to emphasize that targeted messaging and consumer profiling are now at the core of digital advertising. Surveillance also suggests a power imbalance among the watched and watchers that reflects a troubling disparity of control over contemporary advertising data practices.

Electronic Billboards and Corporate Home Pages

By the time the web came on the scene in the early 1990s, the multi-faceted privatization of the larger internet was well underway (Abbate, 1999; Greenstein, 2017). In the midst of a recession, policy-makers at the highest levels of government sought to catalyze economic growth through privatizing and deregulating finance and telecommunications. There was bipartisan support among policy-makers for the commercial development of what was often called the ‘information superhighway’. President Bill Clinton’s administration, taking power in 1993, made private sector investment and control the cornerstone of federal internet policy, which enabled web advertising to flourish. Major technology and media companies were afforded high-level access to policy-making processes and were ultimately given broad leeway to develop the web as they saw fit. This extended to the advertising industry, members of which quite literally wrote a laissez-faire approach to web advertising into the administration’s 1997 internet policy manifesto, *A Global Framework for Electronic Commerce*. Notwithstanding exceptions concerning encryption and regulation of ‘indecent’ content, the government made good on its promise to ‘let the private sector lead’. This established a baseline of so-called ‘self-regulation’ for the web advertising industry, a regulatory approach Des Freedman (2014) describes as ‘negative policy’, a form of non-intervention where the private sector charts its own course relatively free from public oversight. These measures fell under the presiding logic of what scholars have variously described as ‘marketization’ (Hesmondhalgh, 2013), ‘corporate libertarianism’ (Pickard, 2015), and, more broadly, ‘neoliberalism’ (Harvey, 2005).

Despite a favorable policy environment, online advertising did not advance smoothly. The first web advertisement is usually attributed to the online tech magazine HotWired.com in the fall of 1994; however, marketers had been experimenting with older ‘interactive services’ for at least a decade (Mosco, 1982). Though limited in scope, commercial messaging appeared on early data transmission systems like teletext and videotex, bulletin

board services like Usenet, and to a greater extent on commercial online services such as CompuServe, Prodigy, and America Online (AOL). For our purposes, all of these efforts fall under the electronic billboard stage, whereby primarily static ad messages were placed in front of audiences as they navigated through content. The most prevalent format was the banner ad, known in the industry as ‘display advertising’ because it mixed text and graphical elements in a manner similar to print and outdoor advertising. But web banners went beyond existing forms by adding layers of interactivity, the most notable of which was the click-through function. HotWired.com’s famous first banner was a partnership with AT&T that read: ‘Have you ever clicked your mouse right HERE? You will’. Users who clicked were transported to AT&T’s website, which, along with sparse information about long-distance telephone services, featured hyperlinks to a handful of websites created by fine art museums.

The unpolished and scattershot nature of early banners and corporate sites reflected the medium’s unfamiliarity, but also exposed the ambivalence among marketers regarding the web’s utility as an ad channel. The broader ‘information superhighway’ was still shaking out and it was by no means certain that the web would prevail over competing systems such as AOL’s ‘walled garden’ online service or the cable industry’s pilot programs for ‘interactive television’. As a result, very few marketers spent any money on the web in the mid 1990s and those that did only carved out a fraction of their ad budgets to test the waters (Turow, 2006). A handful of ‘digital ad agencies’ cropped up to help marketers experiment on the web, but many traditional agencies remained cautious about the new interactive landscape. In 1995 web ad spending barely registered on the scale compared with more established media, but rapid growth was just around the corner.

Ad Networks and the Dotcom Bubble

By 1996 it was clear that the web would emerge as the winning interactive platform for popular use, due in no small part to Netscape’s ‘killer app’, the graphical web browser and competitive internet service provision markets. Commercial online services were compelled to open their walled gardens, giving millions of users new access to the open web. The

dotcom financial bubble funded a host of web start-ups seeking to draw users to their sites, which generated the first big wave of demand for web advertising (Crain, 2014). But the young industry was plagued by logistical problems. There was an absence of standard business practices to grease the wheels of ad sales. Web publishers lacked sales staff and technical expertise to implement banner campaigns. For marketers, it was difficult to reach users at scale and to measure the impact of advertising outlays. Despite attempts from television ratings companies like Nielsen to establish audience metrics systems on the new medium, it proved difficult to build consensus about how ads should be bought, sold, and evaluated.

Finding opportunity in this disorder, a new breed of advertising company emerged: the ad network. Blending well-established practices of ad sales outsourcing with the web's capacity for multi-directional communication, ad networks positioned themselves as intermediaries between web publishers looking to sell ad inventory and marketers seeking sizable audiences. The 'third party' ad network strategy relied on centralized ad serving systems to manage banner delivery across bundles of disparate websites, an innovation enabled by the distributed nature of the web's communication protocols. Web publishers could use their own servers to host content, while ad networks hosted and delivered the ads from afar. By building their own distribution infrastructure, ad networks offered publishers fully outsourced advertising services, easing the burdens of labor and technical expertise and effectively lowering barriers to participation in the web advertising market. Various iterations of outsourced ad services proliferated and were utilized by most major publishers, from start-ups like Yahoo to established media companies like NBC and the *Wall Street Journal*. Leading ad networks such as DoubleClick and MatchLogic were able to aggregate far more users than any single publisher and thereby brought the first iteration of large-scale advertising to the web.

These logistical improvements were significant, but the industry had still other equally vexing problems. As banners spread their novelty quickly wore thin. It was something of an

open secret among publishers and ad networks that the vast majority of users never clicked on ads. This was especially troublesome because much of the hype surrounding the web's commercialization hinged upon its interactivity, which was supposed to enable marketers to engage consumers directly rather than simply shout in their general direction. Without interactivity the low-bandwidth web seemed a poor substitute for existing branding platforms like television. As marketers began to complain about dismal click-through rates, a flurry of activity centered on ways to move 'beyond the banner'. There were attempts to jazz up ads with 'rich media' experiences and pop-up formats that were harder to ignore, but the idea that gained the most traction was that ads simply needed to be more 'relevant' to consumers. Through much trial and error, greater personalization of messaging was positioned as a solution for making advertising work on the web. Of course, these efforts required increased knowledge about web users, which dovetailed with emerging needs for data collection and user identification in the nascent online retailing and banking sectors.

The web's broader commercialization impelled its transformation from an anonymous to an identifying platform. Without delving too deeply into the technical details, the web's data protocols had originally been designed to facilitate series of discrete communications, rather than persistent connections. This made web browsing anonymous, but limited the scope of applications, especially those of a commercial nature. For example, in order for online shopping to function, web sites had to recognize that a given series of actions (like putting items into a virtual shopping cart) were connected to a single user. The commercial web needed the ability to collect and store user data. It needed a memory. Netscape developed an elegant solution in the HTTP cookie, which gave web browsers a unique identifier and enabled a new frontier of data collection practices. Released as an open technical standard, cookies were rapidly adopted by major browser makers and websites.

The web advertising industry seized upon cookies as a means to gather information about consumers to inform ad targeting. Though disquiet persisted regarding whether clicks or impressions were the most appropriate metrics, it quickly became standard practice to pair tracking cookies with banner ad delivery. Ad networks led this charge as they sought to

leverage the scale of their distribution networks to offer new forms of targeted banner advertising across their partner sites. To achieve these goals ad networks developed proprietary ad serving technologies that used databases and algorithms to store, combine, and deploy consumer data for targeted advertising. As early as 1997, DoubleClick's DART (Dynamic Advertising, Reporting, and Targeting) system could serve targeted ads in near real-time by cross-referencing its profile databases with information collected on the fly. The company's tagline during this period spoke of delivering the 'right message to the right person at the right time'. It is important to note that the data collection and ad targeting practices implemented in the 1990s were rudimentary by today's standards. Information gathering was largely limited to standard browser meta-data like IP addresses and time stamps, which could be strung together to create records of browsing history, but were bounded by a range of technical and organizational factors.

Nonetheless, the ad network stage represented web advertising's first generational leap. Early ad networks solved basic logistical problems and pioneered not only targeted advertising, but targeted advertising at scale in which every ad served was also an opportunity to gather consumer information. Moreover, since third-party tracking was implemented behind-the-scenes, most web users remained oblivious. These components would become important building blocks of the contemporary surveillance advertising model, which integrates targeting and profiling across the gamut of advertising practices. As consumer data increasingly occupied the center of the web advertising economy, the brunt of the industry's technical, organizational, and, as we shall see, political efforts went towards deepening and expanding web surveillance. By 2000, a cadre of top-tier ad networks were serving billions of ads per day across thousands of popular websites and building large profile databases to improve their targeting capacities. Though much of this activity was based in the United States, DoubleClick in particular worked to globalize its reach, creating sales offices and operating partnerships in some 30 countries.

The US government's stewarding of the dotcom investment bubble was a key policy program that impacted this stage of web advertising's development, funneling large amounts

of capital to both the supply and demand sides of the nascent industry. Most concretely, ad networks like DoubleClick used venture capital and sky-high stock valuations to pursue aggressive growth strategies, roll out new services, acquire competitors, and invest in infrastructure, all while operating at losses. On the demand side, start-ups were among the web's biggest ad spenders. Venture capitalists, eager to maximize returns on dotcom investments, used their managerial power to direct resources to ad campaigns in order to build market share and 'get big fast', increasing valuations before public stock offerings and buyouts. These activities accelerated the construction of web advertising markets and legitimized the medium at a time when many traditional marketers were still ambivalent about the web's prospects as a sales channel.

Search Advertising

Search advertising developed in parallel to the ad network model. As the number of web users and websites increased, portals and search engines emerged to organize and curate the online experience. Companies like Yahoo, AltaVista, and Lycos experimented with banner advertising to monetize their growing user bases, often partnering with ad networks to get their start. As portals gave way to the more user-directed and comprehensive search engine model, search engines like Infoseek, GoTo (later called Overture), and Google developed paid search advertising as an alternative to the ad network banner model.

Search ads, like web advertising more broadly, exhibited many variations but coalesced in the early 2000s around the approach advanced by Google, far and away the sector's most successful company. Like the ad network approach, search advertising utilized sophisticated software and hardware and hinged upon the promise of making ads relevant to consumers. But instead of targeting ads based on inferences made from stores of consumer data, search advertising used the search terms keyed in by users. For example, a person using Google's search engine to research a trip to Yellowstone National Park might see ads for nearby hotels or campsites alongside their search results. While the ad network model was growing

increasingly complex and multivariate, search advertising emphasized simplicity and speed. Google heavily monitored the format and quality of its ads, limiting them to text only and weeding out misleading and poorly executed appeals. Google also demarcated paid advertising from so-called “organic” results, helping to build user trust. Importantly, search advertising also introduced major changes in the ways that web ads were bought and sold. Banners were generally peddled on a cost-per-impression basis at a negotiated rate, so marketers paid for every ad delivered regardless of whether users clicked or not. Search ads came to be sold via auctions on a cost-per-click basis, meaning marketers bid on the rights to display ads in conjunction with search terms of their choosing and only paid when an ad was clicked.

Many marketers were enticed by search advertising’s contextual approach to targeting and the cost-per-click pricing scheme in particular. A group of national marketers led by Procter & Gamble had already been pushing for cost-per-click pricing since web advertising’s early days. Responding to these demands, contextual search ads moved away from impression-based pricing and placed greater emphasis on measurable results. Finding early success with paid search ads on its own sites, in 2003 Google took a page from the ad network playbook and created a program called AdSense that enabled any web publisher to host Google contextual ads, broadening its reach considerably. Search advertising exploded in the early 2000s, quickly growing to account for 40% of all web advertising expenditures, while banner advertising began to level off (Pricewaterhouse Coopers, 2005). Google rapidly became web advertising’s most dominant company, capturing not only the lion’s share of the search advertising market but a significant chunk of the entire online advertising sector. Google’s incredible success in the early 2000s seemed to suggest that web advertising could work without relying on consumer surveillance.

Surveillance Advertising: Profiles, Platforms, and Data

Fusion

After a brief but dramatic stall in the wake of the dotcom stock market crash, web advertising resumed strong growth, outpacing all other US media sectors. By the mid 2000s the two major thrusts in web advertising were paid search, grounded in contextual placement, and targeted display, which relied upon consumer monitoring. Together these formats accounted for three-quarters of industry revenues (Pricewaterhouse Coopers, 2005). The archetypes were Google and the ad network DoubleClick, which emerged from the dotcom stock crash considerably leaner, but newly profitable. Each company relied on scale to achieve ‘relevance’ in ad targeting, but took different approaches to consumer data collection. While Google analyzed user data to improve its search engine and other services, it did not monitor and profile users for advertising purposes like DoubleClick.

In the second half of the 2000s the distinctions between targeted display and search advertising fell away, most literally when Google acquired DoubleClick in 2007. After a bidding war with Microsoft (which was rapidly advancing into web advertising), Google bought DoubleClick at a \$1 billion premium over its estimated valuation. No doubt the search giant wanted to move into the display advertising market, but also up for grabs were DoubleClick’s massive trove of consumer data and surveillance infrastructure. Soon after the acquisition, Google reversed its policy on collecting consumer information for advertising purposes and in the years since has integrated surveillance into the core of its operations, including its flagship search advertising products. Google’s buyout of DoubleClick was a high-profile marker for web advertising’s industry-wide embrace of consumer surveillance.

Surveillance advertising gathered momentum along various fronts in the second half of the 2000s. Google’s acquisition of DoubleClick paralleled a number of similar mergers, with Microsoft, AOL, Yahoo, and the advertising holding giant WPP all buying major ad networks with core competencies in consumer monitoring. Again, policy impacted these institutional

changes. The largest of these mergers raised anti-trust concerns, triggering reviews and subsequent approvals by the Federal Trade Commission. The continued diffusion of broadband internet service, which reached over 50% of US households in 2007, enabled bandwidth-intensive applications like video streaming to flourish (Organization for Economic Co-operation and Development, 2011). User-generated video sites like YouTube achieved popularity, as did hubs for commercial content like Hulu, a joint partnership between major television networks. Video presented opportunities for marketers to bring familiar TV ad formats online, which were then augmented by the surveillance-based targeting methods of banner and search advertising. For example, after purchasing YouTube in 2006, Google began to integrate targeted advertising services into the video platform, building out new capabilities over time. Today marketers can target YouTube ads based on Google's profiles of individual users, which include information like web search histories, demographics, and interest categories.

Social networking services characterized by sites like MySpace, Facebook, and Twitter also factored heavily into the development and normalization of surveillance advertising. Immensely popular with web users, social networks amassed vast stores of personal information that could be deployed to inform advertising campaigns, including data on demographics, attitudes, and social connections – what Facebook CEO Mark Zuckerberg called the 'social graph'. The core 'value-added' from social networks stemmed from their arguably superior capacities to collect and deploy consumer data, and the explosive growth of Facebook in particular, which amassed over 1 billion worldwide users in its first decade, put strong competitive pressure on the entire web advertising industry to ramp up data collection efforts.

As digital media moved from the fringes to the center of the 'marketing mix', the industry pursued several threads that had been percolating since the 1990s, but had not achieved widespread implementation. Many of the biggest players adopted a 'platform approach', brokering a broadening array of advertising transactions among publishers, marketers, and ad agencies, all grounded in the collection and exchange of increasingly

detailed consumer information. Google, Facebook, and their competitors prioritized ease of use, emphasizing simple set-ups, low-budget options, automation, and customization. The recent trend of ‘programmatic’ advertising aims to automate much of the ad buying process while giving campaign managers the tools to make highly specific adjustments as needed. These efforts have lowered barriers to participation in surveillance advertising, effectively turning the collection and monetization of consumer data into an ‘app’ accessible to anyone on the web.

The trajectory of surveillance not only broadens, but also deepens as companies collect new forms and greater quantities of data. Moving beyond HTTP cookies, the industry has developed myriad new types of ‘digital fingerprinting’ methods to monitor web users, embedding surveillance into technical architectures of web communication such as the flash video format. Another major trend is what might be called data fusion, whereby various entities collaborate to merge disparate consumer information for marketing purposes. The biggest development along these lines has been the combination of online and offline data, including personally identifiable information such as names and addresses, to ‘close the loop’ between advertising campaigns and consumer behaviors like retail transactions and movement through physical space. For example, Facebook partners with third-party data brokers to help marketers link their ad campaigns to product purchases. One way this is accomplished is by tracking the movements of users who have downloaded a Facebook-owned application to their mobile device and cross-referencing this data with ad campaign metrics. Here web advertising becomes increasingly indistinguishable from activities like credit reporting and consumer information reselling, business sectors that took hold decades before the web’s creation, but have accelerated in recent years.

‘Negative policy’ (Freedman, 2014) has been instrumental in enabling surveillance practices to flourish. As data collection became more prevalent, civil liberties groups and journalists began to put public pressure on web advertising companies to address mounting privacy concerns. Privacy policy has been at the forefront of web advertising’s political agenda ever since. An early backlash against the combination of offline and online data in the

late 1990s produced a potential crisis for the industry as an emergent advocacy community, led by groups like the Electronic Frontier Foundation and Center for Media Education, pressured Congress to consider ‘opt-in’ legislation mandating that companies obtain prior consent from users before collecting their data. Seeing affirmative consent as a threat to the developing surveillance business model, a coalition of marketing trade associations and newly formed online ad industry groups successfully lobbied to install a regime of advertising ‘self-regulation’. Privacy concerns have remained and periodically resurface when particularly egregious abuses come to light, but industry lobbies have been largely successful in maintaining self-regulation, cementing a policy framework based on principles of ‘notice and choice’. The implementations of this ‘consumer empowerment’ approach are deeply flawed, primarily relying on unintelligible privacy policies and tepid opt-out mechanisms (Crain, 2018). With little access to the levers of political power, web users have become resigned to commercial surveillance, believing it ‘futile to [attempt to] manage what companies can learn about them’ (Turow et al., 2015: 3).

The point is not to overstate the cohesion and sophistication of surveillance advertising practices, but rather highlight the major trends of the web advertising industry that are discernable from the strategies of market leaders. By the end of the 2000s, the five most powerful US internet advertising companies – Google, Facebook, Microsoft, AOL, and Yahoo (the latter two now owned by Verizon) – all served profile-based targeted advertising and collected consumer data across expansive networks that included their own web properties and millions of other sites and applications. Numerous studies have shown that the web’s most popular sites and services not only overwhelmingly monitor their users, but share user data with third parties, often by giving them direct access to collect user information via their platforms (Nordrum, 2016). On a global scale, from banners to search to video, surveillance has been embedded into advertising on the web to a greater extent than any other marketing channel in history.

Why surveillance?

Technology looms large in scholarly and popular understandings of the web for self-evident reasons. Few would deny that the character and speed of technology change during the web's formative decades have been remarkable. The stages of web advertising presented above might be read as functions of various technological innovations: the centralized ad server, HTTP cookie, search term auction, profile database, targeting algorithm, and so on. Without a doubt these technologies have played a central role in shaping the particulars of web advertising. An important thrust of media history scholarship has been to interrogate and unpack technological forms and practices, as evidenced by a flowering of research approaches including science and technology studies, infrastructure studies, and media archaeology. At the risk of oversimplification, what is collectively useful about these various approaches is their attempt to weave together technology's determinative effects and social construction, to bring specificity to complex questions about the composition and consequences of the social-material assemblages we call 'technology'.

Critical political economy of media brings an important 'decentering' dimension to this research program, situating media and communications technologies within a historical context that foregrounds the structural dynamics and differential power relations that characterize capitalism. This is not to deny that technologies can exhibit significant biases or affordances, but to emphasize how and why specific technologies and elements thereof have been elevated or suppressed as media systems congeal around capitalist imperatives. Specifically, CPE draws attention to how web advertising has been constructed by human beings making decisions within organizational and political economic bounds that exert what Raymond Williams (1971) referred to as 'pressures and limits'. In other words, research in CPE puts front and center the notion that, as Jonathan Hardy (2014: 112) succinctly put it, 'capitalism influenced the internet more than vice versa'.

Situating web advertising within the broad currents of capitalism helps to answer the question: why surveillance? Media business relations began to shift around 1970 as US capitalism in particular faced a crisis of profitability (Brenner, 2002) that spurred a host of political economic activity around information and communication technology (ICT) development. It is no coincidence that this is the period when packet-switched networks and computerization began to kick off major changes in the composition of global capitalism. Nor that the ideology of neoliberalism and its policies of privatization, deregulation, and ‘free trade’ would soon achieve mainstream political orthodoxy. Dan Schiller (1999, 2007) has shown that while commodification of information has always been involved in capital accumulation, the last 50 years have seen ICTs become a foundational pole of growth for an emergent ‘digital capitalism’. Web advertising is part and parcel of this broader political economic project.

Capitalist investment, innovation, and appropriation of ICTs induced significant changes not only in production, but also consumption, and, most importantly for our purposes, the production of consumption otherwise known as advertising. Audience fragmentation, shifting demographics, and profit squeezes put national marketing under growing strain. In 1965, a marketer could reach 80% of 18- to 49-year-old women by purchasing just three television commercials; three decades later it required nearly 100 prime-time spots to achieve the same reach (Narisetti, 1998). These dynamics manifested in the marketing/media complex in significant ways, catalyzing and expanding advertising practices and technologies related to what Philip Napoli (2011) calls the ‘rationalization of audience understanding’. Such rationalization boils down to efforts to enhance the comprehension, predictability, and control of consumer behavior (Pridmore and Zwick, 2011). Advertising began to recompose around an increasingly segmented system. Just as inventory was tracked across transnational commodity chains, pressure mounted to track audiences as they moved from activity to activity, both nationally and internationally (Schiller, 2014). A succession of new media technologies were incorporated into these functions, with the web and surveillance advertising forming a center of gravity in the 1990s and beyond.

The web presented a range of prospects for ‘one-to-one’ marketing, a chance to improve return-on-investment by separating ‘targets’ from ‘waste’ (Turow, 2011), to perhaps solve once and for all the legendary problem posed by department store magnate John Wanamaker: ‘Half the money I spend on advertising is wasted; the problem is I don’t know what half’. Evaluative methods such as A/B testing proliferated, offering improved ad campaign optimization and increasingly granular measurements of outcomes. As Joseph Turow (2006) put it, the web became a ‘test bed’, a prototype for a mode of advertising that found its purchase in distributing data gathering capacities, connecting heretofore disparate data silos, building out what Julia Angwin (2014) calls a surveillance ‘dragnet’, and creating a dispersed but integrated digital enclosure movement (Andrejevic, 2007) to power increasingly intensive information commodification.

This does not mean that web advertising developed smoothly or without episodes of contestation, dysfunction, or resistance. Competition and the struggle to overcome it are definitional to capitalism and drive its dynamism. Disparate entities within the marketing/media complex worked in conjunction *and at odds* to construct a social-material infrastructure for online advertising. The web emerged in the 1990s, simultaneously a threat and opportunity, at once conceivable as a platform for individual empowerment, commercial media’s mortal wound, and potential horn of plenty for consumer data gathering. It was an unknown quantity, threatening to further splinter audiences and provide individual consumers with new degrees of autonomy, perhaps even the power to excise media advertising altogether. Marketers risked the loss of control over a media system that had long been dictated by their interests. As the CEO of marketing giant Procter & Gamble famously put it: the ad industry needed to ‘grab technology change in its teeth’ or chance obsolescence in the digital future (Artzt, 1994). Workaday rivalries aside, a broad range of companies maintained a common interest in bringing advertising to as many areas of social life as possible and sought to redefine the web accordingly. As the stages presented above highlight, policy-making was a preferred venue for action, as has been the case throughout US history.

This sketch of a critical political economy approach contributes to a web advertising historiography that denaturalizes technology, accounts for continuity and change, foregrounds policy-making, and situates marketing and media within the dynamics of the global capitalist political economy. As Robert McChesney (2008: 12) notes, ‘assessing policies, structures, and institutions cannot answer all of the important questions surrounding media, but [political economists] believe their contributions are indispensable to the comprehensive study of media’. Calling out the undemocratic history of US media policy-making and web advertising in particular, CPE continues to articulate politics as a necessary site of intervention into the structural composition of media. Historical work in this tradition provides valuable lessons about future prospects (see Dolber, 2017; Dunbar-Hester, 2014; Gillespie, 2007; McChesney, 1993; Niesen, 2012; Pickard, 2015; Stole, 2006). Comparative and international studies represent a particularly important area for further research. The European Union, for example, has proven much more willing to constrain online commercial surveillance, prompting major regulatory conflicts and legal challenges from the transnational web advertising sector.

Another area in need of further study is the continuing role of finance capital, which has remained a potent driver of web advertising and consolidator of market power. Google and Facebook have relied on finance capital to expand, building up powerful barriers to competition. In the United States, three-quarters of digital ad revenues are divided among just ten companies, while European and Asian markets also exhibit high degrees of concentration (Pricewaterhouse Coopers, 2016). Google alone claims its ads can reach over 90% of global internet users. One estimate put the number of ads Google serves on a daily basis close to 30 billion, roughly ten times the number of people on the planet with internet access (Koetsier, 2012). This kind of market dominance raises important concerns about the bottlenecking of surveillance and influence capacities, especially when digital advertising intermingles freely between the ostensibly separate domains of commerce and politics. At the time of this writing, Facebook and other purveyors of surveillance advertising face mounting scrutiny over their roles in political manipulation and what, if any, civic responsibilities fall on their

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shoulders. One thing is certain. If the surveillance status quo is to be confronted, political activism and public policy must play fundamental roles.

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