Leaderboards, pushdowns, skyscrapers, expandables, interstitials, carousel ads, sponsored search results, promoted tweets, full-page takeovers, recommendation widgets—these are a few of the advertising formats that consumers are likely to encounter in their everyday internet use. Since the invention of graphical web browsers in the early 1990s, hundreds of ad formats have appeared and disappeared from the web, from familiar banners and billboards to bespoke video, audio, and mobile formats for specific platforms like Snapchat and Spotify. With the rapid development of mobile media, ad formats designed for smartphones have further proliferated and cross-pollinated with desktop-specific formats.

These formats are of interest to media scholars for several reasons. They have introduced new and diverse aesthetic forms into everyday digital culture; generated distinctive economic practices, including real-time bidding and complex “ad-tech” value chains; and, in the case of pop-ups and video ads, attracted criticism for degrading users’ online experience, spreading malware, wasting bandwidth, and spawning a new ad-blocking industry. Notwithstanding the important work of internet advertising scholars (Turow 2011; Gehl 2014; Crain 2013), and the parallel professional literature on the effectiveness of particular ad formats (Rejón-Guardia and Martínez-López 2017), research in this area remains somewhat scarce. Consequently, the histories of these ad formats, and the complex distribution and governance systems behind them, remain poorly understood.
This chapter tells one part of the larger story. Our focus here is on how internet ad formats came to be standardized (to some degree at least) and what this means for wider debates about the institutional and technical governance of media formats. For almost twenty years the industry’s key lobby and standards group, the Interactive Advertising Bureau (IAB), has been trying to “formalize” (Lobato and Thomas 2015) the unruly advertising markets of the internet, to establish interoperable technical standards, and to weed out aberrant formats and practices—with only limited success. In this chapter we explore the reasons for this partial failure of formalization. We argue that internet advertising, compared to older advertising formats in print and broadcast media, is characterized by a proliferation of formats as well as their instability. Beyond the legitimate concerns about internet advertising, automation, and surveillance, we suggest there is also another story to be told here about the limits of standardization—its success and failure—in a highly fragmented, increasingly automated, and internally conflicted sector of the media industries.

**Internet Advertising Formats**

The term *format* has a specific meaning within internet advertising. Beyond referring to the many different kinds of advertising that appear online (video, mobile, text, in-app, and so on), format also designates the technical attributes that determine how an ad appears and behaves to the user. These attributes include basic properties such as dimensions and ratio, as well as more technical attributes such as file type, file size, definition, CPU load, autoplay features, file requests, expandability, and the presence or absence of close buttons. We may also see a distinction between the formats of ad *inventory*, the spaces publishers provide on websites or in apps for ad content, and the formats of *creative*, the term used to denote actual ad content. The two are not always the same. In some cases, format is also used to refer to the trading and distribution systems underlying specific ad types, such as real-time bidding and retargeting. There is, in other words, a looseness in how the term is used both within and beyond advertising industry practice.

When studying internet ads, it is helpful to begin with a distinction between standard formats and custom formats. Standard formats, such as the billboard and the leaderboard, are the basic display units of web advertising. Most of these have evolved in an ad-hoc way over many years of trial and experimentation among publishers. Witnessing the enormous expansion of web and later mobile advertising since the 1990s and the simultaneous
proliferation of screen sizes and device types, advertising industry stakeholders have long recognized the need for standardization.

One of the industry bodies charged with responsibility for standardizing formats is the Interactive Advertising Bureau, which has been issuing standards and protocols to encourage interoperability in internet advertising since its founding in 1996. Based in New York, with 43 offices around the world, the IAB is the private standard-setting body for internet advertising. Its funding comes from annual member contributions paid by major brands, ad agencies, technology providers, and other companies seeking a seat at the table for regulatory and technical discussions affecting the industry. The IAB also performs a dispute-settlement function by mediating conflicts as they arise in the industry and proposing technical solutions to address industry problems (though IAB policies, which are private in nature and have no legal standing, are frequently ignored by advertisers). Over the last two decades, as internet advertising has migrated from the web to platforms, the IAB has been increasingly torn between its core membership base—most of whom are publishers, agencies, and ad-tech providers—and the new “duopoly” of Google and Facebook whose business models pose a direct threat to many of its other members. As such, the IAB is an inherently fragmented and conflict-ridden organization.

The IAB’s key standards document is the IAB Ad Portfolio, which is published annually and contains a list of approved formats and their technical specifications. The aim of the portfolio is to minimize production costs for advertisers and enable automated placement of their artwork across millions of different websites, platforms, and apps. Because the ever-increasing number of mobile devices and screen sizes poses a challenge for any standardized portfolio, the IAB has in recent years moved away from fixed-size ads toward flexible size ad formats (22 in total) that can be scaled up and down as needed. These flexible size formats are shown in table 1. Also included is a selection of other current and some historic “delisted” ad formats, which have disappeared from mainstream use but still appear at the margins of the web (on casino and torrent sites, for example).
<table>
<thead>
<tr>
<th>Current IAB flexible display formats</th>
<th>Other common formats in use</th>
<th>Older display formats delisted by IAB</th>
</tr>
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<tr>
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<td>Paid search</td>
<td>Pop-ups</td>
</tr>
<tr>
<td>4x1 horizontal (Billboard)</td>
<td>Recommendation widgets</td>
<td>Floating ads</td>
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<tr>
<td>6x1 horizontal (Smartphone banner)</td>
<td>Promoted listing</td>
<td>Auto-expansion</td>
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<td>8x1 horizontal (Leaderboard)</td>
<td>In-game ads</td>
<td>Hover or rollover expansion</td>
</tr>
<tr>
<td>10x1 horizontal (Super leaderboard/pushdown)</td>
<td>In-banner video</td>
<td>Forced countdown</td>
</tr>
<tr>
<td>1x2 vertical</td>
<td>Video 360</td>
<td>Scroll over / scrolling overlay</td>
</tr>
<tr>
<td>1x3 vertical (Portrait)</td>
<td>Push notifications</td>
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<tr>
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<td>Lockscreen ads</td>
<td>Adhesion / sticky ads</td>
</tr>
<tr>
<td>1x1 tiles (Medium Rectangle)</td>
<td>Audio in-stream ads</td>
<td>Expand while scrolling</td>
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<tr>
<td>2x1 tiles (Financial)</td>
<td>Chatbots</td>
<td>Underlay ads</td>
</tr>
<tr>
<td>Full page portrait (various dimensions)</td>
<td>VR and AR ads</td>
<td></td>
</tr>
<tr>
<td>Full page landscape (various dimensions)</td>
<td>Branded emojis</td>
<td></td>
</tr>
<tr>
<td>Feature phone sizes (small, medium, large banner)</td>
<td></td>
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</tbody>
</table>

[Table 1] Interactive advertising formats. Sources: IAB (2017) and Reina (2017).

Custom formats are the second family of internet advertising formats. Unlike standard formats, which require a high degree of technical uniformity, custom formats are owned and controlled by specific platforms. For example, Twitter’s signature ad format is the Promoted Tweet; Snapchat is known for its Lenses and Filters that overlay brand information onto users’ photos; and Spotify offers Sponsored Playlists and Sponsored Sessions. Custom formats, in other words, are all about differentiation and novelty, rather than standardization.

One of the most famous custom formats is Adwords, Google's signature ad product, which was launched in beta in 2000. The Adwords format is deceptively simple. Advertisers provide a few lines of text, a target URL, and the search terms they want their ads to appear alongside (for example, “toothache” is an attractive term for local dentists). Every time a user searches on Google, a real-time auction occurs between potential advertisers bidding on the designated keyword(s) to determine whose ad appears in the results. Where the ad appears then depends also on its relevance to the search, calculated by Google's algorithms. The humble Adwords format, with its unfashionable plain-text aesthetic and its self-serve, cost-per-click model, has been extraordinarily successful; it is the core of Google's vast advertising and artificial intelligence enterprise.
While Google phased out the Adwords brand in 2018, replacing it with the moniker Google Ads, this was a purely cosmetic change; the underlying technology and business processes of Adwords continue to generate most of Google’s revenues.

Understood in these terms, the success of Adwords can be seen as a reaction to the inefficiencies or perceived failures of its rival formats, and the banner format in particular. In the context of the tech crash of the early 2000s, the banner was an expensive, intrusive format. It was the creation of print media publishers (the first banner ads appeared in *Wired*'s online publication *Hotwired* circa 1994), and it emulated the display ads of print media. As the trade paper *Digiday* put it, “For years, the banner ad was the workhorse of digital advertising, and what a miserable nag it was: Banners had diminished click-through rates, stymied publishers’ web designers and infuriated a generation of readers who saw sites get more and more crowded with ads” (Willens 2016). In contrast, the Adwords format was new, inexpensive, lower-bandwidth, and automated. And unlike the banner, its price reflected a market operating in real time and its relevance to users rather than a price set by publishers. We return to the Adwords format below in the context of automation.

Other titans of the tech economy have their own custom formats. Amazon, an e-commerce platform with a lucrative advertising and infrastructure business on the side, sells a range of custom formats, including landing pages for brands, sponsored search results, and daily deal “site stripes.” At the same time, Amazon also sells display ads in standard IAB formats, such as banners and rectangles, which appear in various places as the user searches for products on the Amazon website or app. The end result is an unusually dense commercial environment offering a wide array of touch points. A user shopping for jeans, for example, might see a Levi’s video ad, a Levi’s landing page, or Levi’s-sponsored search results at various points in their search. Each of these formats is the result of a long process of research and development, as well as careful calculation weighing the revenue potential against the risk of user experience degradation.

As these examples suggest, novel, custom ad formats are a key foundation of the internet economy. More than simply technical specifications to ensure interoperability, formats are nexus points where the media buying side of advertising interacts with the creative side; where commercial, aesthetic and technical logics intertwine; and where the dueling forces of standardization and differentiation enter into productive tension.
The Political Economy of Ad Formats

Internet advertising relies on a constant churn of formats. Compared to other areas of the media industries—such as broadcast and radio—interactive formats are highly unstable. While the 30-second ad has been the mainstay of television advertising since the 1970s, many formats used in web, mobile, and online video advertising are barely a few years old. In other words, there is enormous innovation, and instability, in this sector of the media industries.

The long reign of the 30-second television commercial relied on the extended postwar hegemony of the commercial TV broadcasting system. Hardware and technical standards evolved slowly and incrementally, and standard analog screen resolutions persisted over an extended period, with a gradual transition to digital equivalents from the turn of the century. Periodic user-driven disruptions—remote controls, video recorders—challenged ad formats and shaped industry responses, just as ad blockers are now disrupting internet advertising. But screen sizes and program formats remained relatively stable.

The contemporary situation is different. Convergence has destabilized the format system, as advertisers, publishers, and platforms experiment with new ways to command user attention. It could be argued that formats themselves are the basic “products” of the internet advertising industry, even though they cannot be bought by a consumer. For platforms especially, formats are a point of competitive difference: the business of running a platform involves inventing, refining, and marketing new ad formats that can reach audiences in effective ways. These formats can then be priced as premium ad products delivering effective, targeted messaging that cannot be replicated by other platforms.

Consider the case of Facebook, which has developed dozens of custom formats since its early years as an online college directory. Facebook’s first ad format was the Flyer, a vertical text-and-image display box that appeared on the side of the home screen. The Flyer was akin to a classified advertisement and was used mostly by US college students and local businesses catering to those students. Later Facebook ad formats included Pages, Sponsored Groups, and Sponsored Stories (fig. 1). Facebook has full control over these formats and can therefore specify what constitutes appropriate conduct, context, and disclosure. This gives Facebook a clear competitive advantage over other publishers and platforms that rely on standard ad formats.
The vital context here was the shift to mobile media. From around 2010 onwards, the smartphone changed advertising, and therefore advertising formats, in ways that amounted to a bifurcation of the “interactive” advertising world into mobile and desktop domains, each with specific characteristics, constraints, and dynamics—and distinct political economies. Mobile meant many things: smaller screens and touch-based interfaces, dramatically refined locational services, and an app economy that began to displace the central role of the browser in desktop media (Burgess 2012; Snickars and Vonderau 2012). Mobile platforms were more controlled than desktop environments, especially in the case of Apple’s iOS ecosystem. Users spent more time connected. The smartphone was a personal device, designed with single users in mind, in contrast to the multi-user affordances of desktop systems.

All this created, very rapidly, whole new realms of advertising opportunity and, at the same time, an urgent need to reconsider and reinvent formats from the ground up. The display ad formats that worked on the desktop web failed on the phone. “Mobile [banner] ads are easily ignored,” recalled one industry observer, “and when they aren’t, they’re accidentally clicked” (Bilton 2014). Formats tailor-made for smartphones, however, were very successful. Pop unders became pointless; notifications emerged.

Facebook’s response was to evolve its signature ad formats to align with the smartphone user experience. “In-feed” mobile ads became the new gold standard because they were integrated into the flow of the news feed and therefore difficult to avoid. The Sponsored Stories format, which effectively broadcast a user’s Likes to all their friends, was particularly
important: it revealed the extraordinary potential of in-feed formats, and
the problems they raised. The format was phased out in 2014, partly as a
result of privacy concerns and a related US$20 million class action lawsuit.

Facebook has also trialed a number of video ad formats over the years,
including short GIFs, cinemagraphs, and video takeover ads, all designed
for in-feed viewing. Clearly, Facebook’s success has been premised on the
continual invention of new advertising formats that integrate paid ads
into the stream of user-to-user communications as discreetly (some would
say deceptively) as possible. A further advantage of Facebook’s custom
formats is that they are somewhat more difficult for adblockers to detect.
Since 2016, Facebook has been claiming it can outsmart desktop adblockers
because of the way it embeds its ads in the platform, although Adblock Plus
developers have also invented new workarounds in response (Bosworth
2016; Tan 2017). The end result is the familiar “whack-a-mole game of con-
stantly creating ad formats to block the blockers, only to have them figure
out a work-around” (Innovation Media 2017). So, while no format is totally
impervious to adblocking, custom formats may be harder to block because
of their deep integration into the platform.

As these examples suggest, the political economy of formats helps us to
understand why and how the internet advertising economy has evolved in
recent years into a “duopoly” of Facebook and Google, the two companies
that now command the vast majority of new advertising expenditure
and whose domination of advertising and media is so bitterly contested.
Control over formats was a precondition for this massive concentration of
industry power.

Format Governance
The story of Google and Facebook, and their mastery of custom ad formats,
reminds us of what is at stake here commercially. Both companies have
invested enormous resources in standardizing, scaling, and automating
their advertising infrastructure. They now offer end-to-end advertising
solutions in which all elements of the transaction are controlled and
monitored in-platform. However, the situation is different in advertising
supply chains that rely on standard display ad formats, such as those
shown on most websites and in apps. These supply chains remain highly
complex, volatile, and conflicted. In the display advertising ecology, the
process of standardization has been only partially successful.
These tensions can be seen plainly in the history of the IAB, the industry’s reluctant and ineffectual watchdog. As explained earlier, the IAB was founded in 1996 to lend some order to an increasingly disorganized industry. Many readers will recall that the mid 1990s were the rough-and-ready years of banner advertising, when banners were proliferating across the web in a wide range of sizes, shapes, and color schemes. By 1996, there were an estimated 250 different banner sizes in use (Collins 1996). As Robert Gehl (2014) notes,

Websites varied wildly; even with the standards-setting body the W3C, the “browser wars” between Microsoft’s Internet Explorer and Netscape’s Navigator, coupled with the inevitable growing pains of any new medium, meant that users confronted a sometimes bizarre mediascape of sites “under construction,” dead links, and pop-up ads. A common metaphor of the 1990s was that the World Wide Web was the “Wild Wild West.” In this space, interaction was as open-ended as many other human activities; uncertainty, surprise, and anxiety were the order of the day. (99)

The IAB’s first mission was to dramatically reduce the number of banner ad sizes from 250 down to eight. The organization issued a “Proposal for Voluntary Model Banner Sizes” (IAB 1996) in December 1996 which defined specs for the eight most common web advertising banners. These became the standard IAB units, which publishers and advertisers were encouraged to adopt. In later years, the IAB would extend its standardization agenda to include video ads, mobile ads, and other issues like privacy and tracking (table 2). It would also change its name to the Interactive Advertising Bureau to indicate its newly enlarged focus.
The IAB standards process formed the basis for a wider rationalization of internet advertising (Gehl 2014, 100). The clean-up operation enabled the growth of ad networks, which emerged around 1997 and whose primary function was to sell banner advertising across multiple sites (which was only feasible at scale for websites that adopted IAB standard sizes). IAB standards were thus integral to the automation of advertising generally and the advertising architectures that would emerge in the social media platforms of the 2000s. In effect, as Gehl (2014) suggests, the IAB “produced the standards necessary for effective social media surveillance” (94). This process of size standardization was relatively uncontroversial and therefore relatively effective in its stated objective. A diverse and unruly set of formats and commercial practices was rationalized into something more uniform. However, other IAB campaigns have been notably less effective, especially those related to usability and privacy.

As an example, consider the IAB’s largely ineffectual campaign against pop-up ads. The pop-up—an ad that suddenly appears as a new window either in front of the user’s browser, or even behind it (the pop-under)—began to rival the banner as the internet’s default ad format during the late 1990s. Initially appearing on sites like Tripod.com, pop-ups were awful for the user experience. Over time, key stakeholders in the industry began to wonder whether pop-ups might be damaging the reputation and integrity of internet advertising as a whole. The IAB—whose members were often reliant on revenue from pop-ups—took a long time to come around to this way of thinking. While it issued a 2004 pop-up guidelines document requiring
advertisers to include close buttons and frequency caps, it wasn’t until 2016 that the IAB finally “delisted” the pop-up, removing it from its Portfolio of approved ad formats. By this time, users had taken matters into their own hands by installing adblockers. The major browsers—Firefox, Chrome, Internet Explorer, Opera, Safari—had also introduced pop-up blocker functions.

[Figure 2] The dreaded pop-up ad. Image by Random Literature Council. Available from Flickr (CC license).

The IAB is now starting to govern bad formats more proactively. In recent years, it has issued guidelines restricting the use of forced countdown ads, non-closable interstitials, and the older-style flashing ads. It is also developing guidelines and standards of practice on other contentious issues, such as autoplay video, data allowance, battery use, and tracking script within ad code and cookies. Through these processes, the format is called upon to perform a kind of technical governance: IAB standards aspire to formalize a chaotic and opaque industry by specifying acceptable and unacceptable practices; to smooth out the industry’s rough edges; and, in general, to professionalize what is still a fragmented and conflicted sector of the media industries that has had relatively little regard for usability, transparency, or privacy.

**Formats in the Age of Automation**

Advertising has long been at the forefront of automation in the media industries, and ad formats have played a central role in the automation process. We have already seen how Google combined an automated auction with a relevance algorithm to determine the purchase and placement of Adwords in the early 2000s. Clearly, the simple, text-based Adwords format facilitated the development of Google’s system, and its commercial success. Adwords was framed as advertising “for the rest of
us,” to borrow the rhetoric of an earlier era of personal computing. It was designed for a burgeoning and diverse web, with the promise of expanding markets and latent commercial opportunity. In its early phase, the service was marketed with a question and invitation that underlined the system’s speed and ease of use: “Have a credit card and 5 minutes? Get your ad on Google today” (Levy 2011, 86).

The Adwords format took on the stripped-back, minimal aesthetic of Google’s overall search design, setting ads alongside “organic” search results in a way that offered some differentiation from them—in order to meet Google’s legal and consumer obligations—while giving them consistency with the “house style” of Google’s website. The question of whether the format enabled consumers to distinguish clearly between the ads and actual search results remains contentious (Daly and Scardamaglia 2017). Like Facebook Stories or Twitter’s promoted tweets, the potential value of the custom ad format lies at least in part in the implication that this particular content has been produced under the auspices of a trusted service (a search engine, social network, or micro-blog). In any case, the stability and simplicity of the Adwords format seems to have provided a form of assurance for both would-be advertisers and consumers while at the same time simplifying the integration of ads into Google’s websites. A simple, standardized format, made possible by complex, large-scale automation, served aesthetic, technical, and commercial purposes.

Real-time bidding and automated placement did not emerge in the wider advertising market for display ads until around 2010, heralding the era of “programmatic advertising,” a general term for the large-scale automation of buying and selling advertising. A diverse array of new intermediaries appeared to manage the complex interactions between the suppliers of advertising inventory and the market of media buyers: some in competition with each other, some playing complementary roles, and some controlled by large tech platforms or advertising conglomerates. Ad exchanges, supply-side and demand-side platforms (SSPs, DSPs), and data management platforms (DMPs) emerged to coordinate and control transactions in what was a rapidly growing market, with the spectacular growth of mobile media, the appearance of in-app advertising, and a strong trend toward video. A precondition of this new ecosystem, as noted above, was the standardization and modernization of formats, a process heavily promoted by the IAB, without which automated buying and selling would not be possible. In this system, ad formats comprise one of a range of “ad slot parameters” involved in automated market calculations, alongside geographic, demographic, system, and user information.
If the automation of advertising has driven the standardization of formats, the currency of algorithmically valued impressions has also enabled new forms of malpractice. Many forms of ad fraud become possible in a system involving an array of different parties, and the format and placement of ads is also subject to misrepresentation. Two techniques are notable: “pixel stuffing” involves resizing paid ads to 1x1 pixel size, rendering them effectively invisible on the page, while “ad stacking,” another technique, involves the vertical stacking of large numbers of ads of the same format, so that only the top few may be visible. There are now so many intermediaries involved in programmatic ad placements that it is often difficult to pinpoint the source of the fraud. These deceptive practices, and the wider problem of opacity and revenue leakage within ad-tech, are major challenges for publishers. For example, The Guardian’s Chief Digital Officer Hamish Nicklin has stated that up to 70 percent of the revenue generated from ad placements on The Guardian’s websites is siphoned off to ad-tech intermediaries.

The problems of ad fraud and revenue leakage underline the degree to which questions of ad formats are also questions of control, governance, and power across the industry. Students of media history are familiar with debates about “format wars,” such as Beta vs. VHS, which emphasize the heady and contingent mix of technological change, capital investment, first-mover advantage, and intellectual property control that tend to decide such wars. There is also a rich literature in the history of science and technology that emphasizes the social as well as technical factors that have determined the outcome of many other standard and format wars, from railway gauges to electrification (Hughes 1983). Invariably, these are stories of power, politics, and money. There is no virtuous victory for the best idea, the best invention. Out of this process, new formats and standards and codes emerge as phenomena that “take on a sheen of ontology when they are more precisely the product of contingency” (Sterne 2012, 298).

These histories reveal the difficulty of building and maintaining consensus around formats in any large industry. Consensus is especially challenging in internet advertising because the supply chain has so many participants with wildly divergent incentives. Publishers want to increase their ad revenue, platforms want to build and monetize a user base, ad exchanges and middle-men want to optimize auction bids and take a cut along the way, third-party ad-tech suppliers offer proprietary tweaks to the auction formula, data management platforms sell user data overlays (often unethically obtained) to improve ad targeting, ad networks aim to build the largest possible inventory base, and so on. Together with that
systemic complexity, there is also ongoing change in the composition and interests of the key actors. Publishers, for example, range from legacy media businesses with print or broadcast markets to entirely web-based media firms and app creators for smartphones or tablets, all with different problems and competitive pressures.

This gives some sense of how difficult it is to govern such a complex system. While the size and shape of ads can, and has been, standardized, it is much harder to police other transgressions like the use of invasive tracking scripts in ad code that slow down page load times. Advertisers get away with this because most users do not realize that the ads are causing the delay, or latency; nor do users understand that the ad script may be draining their phone batteries and causing sluggish phone performance. This provides an alibi for poorly designed ad creative because the advertiser’s incentives to reduce ad file size are not in place. In this context, the “end-to-end” offering of the platforms starts to look appealing to advertisers as well as to consumers, who despair of the inefficiency, opacity, and poor user experience inherent in web advertising. In other words, the chaos of web-based display advertising and its apparent impossibility of formalization is contributing to what many in the industry—publishers especially—see as a greater threat: the further empowerment of Google and Facebook at the expense of the open web business model (Hern 2018; Orlowski 2018).

The main effect of the technical and formal transformations described here—both industrial and cultural—has been to open huge new advertising markets over a short historical period. These new markets have stimulated the growth of extraordinarily powerful advertising platforms, resulting in a degree of consolidation with few precedents in the pre-internet media environment. In the case of advertising, however, standardization of ad sizes has created chaos as well as concentration. Standardized and automated ads feed not only are the titans of the internet but also create spaces for its demimonde: the bots, spammers, scammers, and skimmers who evolve and adapt fastest in a huge and complex ecosystem. When it comes to formats, their expertise continues to match that of the largest media companies on the planet.

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