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Published in:
New Media & Society

DOI:
[10.1177/1461444818769694](https://doi.org/10.1177/1461444818769694)

[Link to publication](#)

Citation for published version (APA):

Nieborg, D. B., & Poell, T. (2018). The platformization of cultural production: Theorizing the contingent cultural commodity. *New Media & Society*, 20(11), 4275-4292 . <https://doi.org/10.1177/1461444818769694>

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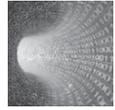
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Download date: 22 Sep 2019



Article

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new media & society
2018, Vol. 20(11) 4275–4292
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sagepub.com/journals-permissions
DOI: 10.1177/1461444818769694
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Abstract

This article explores how the political economy of the cultural industries changes through platformization: the penetration of economic and infrastructural extensions of online platforms into the web, affecting the production, distribution, and circulation of cultural content. It pursues this investigation in critical dialogue with current research in business studies, political economy, and software studies. Focusing on the production of news and games, the analysis shows that in economic terms platformization entails the replacement of two-sided market structures with complex multisided platform configurations, dominated by big platform corporations. Cultural content producers have to continuously grapple with seemingly serendipitous changes in platform governance, ranging from content curation to pricing strategies. Simultaneously, these producers are enticed by new platform services and infrastructural changes. In the process, cultural commodities become fundamentally “contingent,” that is increasingly modular in design and continuously reworked and repackaged, informed by datafied user feedback.

Keywords

Apps, cultural production, games, journalism, multisided markets, platformization, platforms, political economy, software studies

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The platformization of cultural production: theorizing the contingent cultural commodity

Over the past decade, digital news platforms, such as *BuzzFeed*, the *Huffington Post* (HuffPo), and *Upworthy* have pioneered a new mode of news production, distribution, and monetization. Typically, online publishers start the content production cycle by identifying trending social media topics and popular search terms, as well as by calculating production costs, traffic, and advertising or sponsorship revenue potential of a topic and format (text or video). And after content has been produced, users are “aggregated” by posting, promoting, and advertising content on, or via, a wide range of social platforms. These social media circulation efforts, in turn, generate relevant data on user engagement and retention in the form of social referrals, comments, search rank, and page views. Such metrics are employed to calculate whether it is profitable to further edit and optimize content, and invest in paid-for promotion, or halt the engagement–optimization–retention–acquisition cycle (Van Dijck et al., in press).

These emerging practices render cultural production and cultural commodities “contingent.” In previous work on digital platforms, contingency is understood in two distinct, but closely interrelated ways (Morris, 2015; Zittrain, 2008). First, it is argued that cultural production is progressively “contingent on,” that is, *dependent on* a select group of powerful digital platforms. In the West, these are Google, Apple, Facebook, Amazon, and Microsoft (GAFAM), which allow content developers to systematically track and profile the activities and preferences of billions of users. We discuss this increasingly close relation between cultural producers and platforms in this article as “platform dependence.” This allows us to clearly distinguish it from the second meaning of contingent. Products and services offered and circulated via digital platforms are contingent in the sense that they are malleable, modular in design, and informed by datafied user feedback, open to constant revision and recirculation. As such, we will speak of *contingent commodities*, which appear not only in the news sphere but also across all domains of cultural production, including video, fashion blogging, and music (Cunningham et al., 2016; Duffy, 2017; Prey, 2016).

This article develops a comprehensive framework for the study of the *platformization* of cultural production, and the consequent becoming contingent of cultural commodities.¹ Platformization can be defined as the penetration of *economic, governmental, and infrastructural extensions* of digital platforms into the web and app ecosystems, fundamentally affecting the operations of the cultural industries. So far, this process has been examined from three perspectives: business studies, political economy, and software studies. While each of these theoretical traditions offers valuable insights, these are also partial insights. Given that platformization has far-reaching cultural implications, a more comprehensive theoretical framework is needed that allows us to study how interrelated changes in market structures, platform governance, and infrastructure are taking shape.

Critically exploring these shifts is particularly important because the “platform” metaphor, as Gillespie (2010, 2017) argues, obfuscates as much as it reveals. It obscures how social media and other digital services, labeled as platforms, not just facilitate socio-economic, cultural, and political interaction, but very much organize and steer this interaction. The proposed analytical model aims to make these “politics of platforms” more

visible in processes of cultural production by systematizing the inquiry into key dimensions of platformization, which are often glossed over by cultural or media industries research. As cultural production is becoming increasingly platform dependent, the autonomy and economic sustainability of particular forms of cultural production is increasingly compromised.

Developing this framework, the article first discusses how business studies, political economy, and software studies contribute to the study of the platformization and which blind spots characterize each perspective. This discussion results in the initial formulation of our model. To understand the economic, governmental, and infrastructural changes brought about by platformization, the second half of our article illustrates how the three theoretical perspectives can be brought into dialogue. Explicating our approach, we specifically draw from examples in the news and games industries, as these appear to follow distinctly different trajectories of platformization. Starting with the latter, digital games, arguably more so than many other types of cultural commodities, have been *platform dependent* from their inception. Because games are component-based software, their malleability and modularity allow for easy upgrading, extension, and recirculation, all of which play into the contingent nature of the cultural commodity (Nieborg, 2015). News production, by contrast, has historically been *platform independent*. It is only with the growing importance of online publishing that news production is progressively dependent on the tools, advertising revenue, and data and governance standards of the GAFAM platforms (Nechushtai, 2018), resulting in content becoming increasingly contingent as well. In this exploratory analysis, we primarily focus on Facebook and Apple, which occupy a central role in the news and games sectors.² By contrasting these two cultural commodity types, we show that each instance of cultural production, while both drawn into the economies and material infrastructures of platforms, follows a distinct trajectory in how production and circulation processes are reorganized.

Theorizing platformization

Business studies: analyzing multisided markets

The first important body of research on platformization is generated by a prolific and diverse collective of *business scholars*, who primarily focus on for-profit companies operating as intermediaries in platform markets. Studies in this field tend to adopt a transactional perspective to analyze the relationships among platform holders and between platform holders and users. Business scholars understand platforms as “matchmakers” (Evans and Schmalensee, 2016) or “platform-mediated networks” (McIntyre and Srinivasan, 2017), which interface among different “sides.” This can mean various kinds of institutional actors (or “complementors”), as well as “end-users” (i.e. consumers), thereby constituting *multisided* markets. While multisided markets are not new, over the last two decades, they became much more prevalent with the advent of digital technologies affording connectivity. For the study of the platformization of cultural production, the business literature is particularly relevant because it provides insight in the economic mechanisms and managerial strategies underlying platform markets. These mechanisms and strategies help to explain the increasingly dominant position of platform companies,

which by virtue of their roles as aggregators and mediators are able to exert significant control over the institutional relationships with end-users and complementors.

In terms of economic mechanisms, business scholars demonstrate that multisided markets are subject to *network effects*: the costs of the production and consumption of goods and services that affect third parties. These effects can be either direct (same-side) or indirect (cross-side) and positive or negative. Positive direct effects are observed in network industries that rely on standardization (e.g. railroads or telecommunications) where users derive utility from others joining the network (Rohlfs, 1974). By nature of their multisidedness, platforms are also subject to indirect network effects as actors joining (or leaving) one side of the platform indirectly affect the (perceived) value of the platform for actors on the other side (Rochet and Tirole, 2003). For example, one can speak of positive direct or same-side effects when more end-users join Facebook, making the platform more valuable for other end-users. This, in turn, increases value for a wide range of complementors, such as cultural content producers, advertisers, and many other third parties.

The business literature is also particularly helpful in gaining insight in the managerial strategies underlying multisided platform markets. Business scholars emphasize how network effects allow platform holders to set *pricing structures* where one side of the market, the “money side,” covers the costs of the other side, the “subsidy side” (Evans and Schmalensee, 2016). For example, end-user access to Facebook is free and subsidized by the money generated by businesses that are charged a fee when end-users click on an ad. As it is up to platforms to design and alter pricing structures, platform holders can favor one side of the market over the others. To facilitate platform entry, subsidies can be also used to offer an accessible computational infrastructure to complementors so they can effectively develop and distribute “complements,” such as apps (Tiwana, 2014). The business literature shows that if a platform holder manages to launch at the right time, adopt an optimal pricing structure, and provide an accessible infrastructure, strong *winner-take-all effects* can come into play, ultimately allowing a platform to aggregate a disproportionate amount of users, revenue, and/or profit (Brynjolfsson and McAfee, 2014). Taken together, the business literature is vital for the present inquiry as it draws attention to multisided markets as an increasingly dominant institutional configuration that is subject to powerful economic mechanisms and managerial strategies.

There are, however, also noticeable gaps in this literature. Particularly problematic is that business scholars tend to treat platforms as relatively static objects (Gawer, 2014; Tiwana, 2014). Expediting the becoming contingent of cultural commodities, digital platforms themselves are continuously in flux as well (Morris, 2015). Their holding companies constantly adjust platform technologies, business models, and governance structures. Therefore, a more historically informed perspective that accounts for the evolving nature of platforms and, thus, for the contingent character of cultural commodities is warranted. Moreover, there is a noticeable lack of scholarly analysis of the platform–complementor relationship in its different facets. Consequently, there is little guidance on the nature and composition of complementor communities: what motivates cultural content producers to contribute to platforms, what strategies do they develop, and how do platforms support, ignore, or bar them (McIntyre and Srinivasan, 2017). For our analysis, it is crucial to address these questions, as platformization fundamentally

changes the economic and institutional configuration in which cultural production takes shape, as content producers are always in a position of dependency. Particularly, in the later stages of a platform's evolution, there seem few opportunities for individual developers to mitigate winner-take-all effects or alter unfavorable pricing structures. By building on insights from political economy and software studies, it becomes possible to systematically address such issues pertaining to platform power, platform politics, and the long-term sustainability for *all* inhabitants of an ecosystem, as well as questions related to cultural plurality and accessibility.

Political economy: examining commodification and corporate concentration

Political economic researchers are specifically concerned with platform power and politics, the second tradition on which our theoretical model builds. Critical political economists have taken a historical, normative, and critical approach toward theorizing the platformization of cultural production (Mosco, 2009). They do so by emphasizing (1) the inherent accumulative tendency of capital and corporate ownership and its subsequent effects on the distribution of power and (2) the precarious and exploitative nature of cultural and (immaterial) labor of both producers and end-users. A decade after Benkler (2006) suggested that the emergence of the “networked information economy” holds the potential for reversing the dominance of the industrial mode of information production, political economic research shows that the dominance of the GAFAM platforms signals a contrary trend (Fuchs, 2017; Van Dijck, 2013). User-driven cultural production is clearly thriving but is subsumed under the wider economic regime of “platform capitalism” (Srnicek, 2016). As these platforms represent a centralized, proprietary mode of cultural production, they effectively advance what Benkler (2006) calls “the project of control” and its two pillars of commercialization and corporate concentration (p. 32).

The broader issue of commercialization is theorized in-depth by a group of critical political economists who build on Marx's labor theory of value and Smythe's (1981) notion of the “audience commodity.” They draw attention to the ongoing commodification of content, the exploitation of cultural labor, and the (immaterial) labor of users (Cohen, 2016; McGuigan and Manzerolle, 2014). Along similar lines, critical scholars have been pointing toward the ongoing trend of corporate concentration. For our inquiry, their work is especially useful because they have been at the forefront of documenting corporate growth, ownership concentration, and institutional and corporate integration in the cultural industries (Winseck and Jin, 2011). Clearly, the integration of the GAFAM quintet in the everyday life of billions of global citizens is a continuation and an intensification of both trends, up to the point where “platform imperialism” is becoming a legitimate concern (Jin, 2015). Political economic research helps us to critically consider how platformization affects media plurality, the independence of cultural producers, access to media, and the influence of owners (Hardy, 2014: 79–105).

Yet, while political economists are acutely aware of the labor issues that arise from platform-dependent cultural production, less attention is paid to how this translates into the transformation of cultural commodities. Similar to business scholars, political economists rarely take the contingent nature of commodities into consideration. Moreover,

scholars in this critical tradition do not systematically engage with one of the roots of the unprecedented concentration of media ownership and control in the hands of a few major platforms—the evolution of multisided markets. Political economists rarely acknowledge the implications of network effects, especially for complementors, nor questions pertaining to platform governance and infrastructures. The absence of an intellectual dialogue across scholarly disciplines is particularly surprising given the widely acknowledged winner-take-all effects of platform markets, as analyzed by business scholars. A political economic understanding of multisided markets, such as Rieder and Sire's (2014) insightful analysis of Google's search business, is crucial to show how platform ownership incentivizes platform holders to promote certain sides over others. Critically engaging with multisided market theory is instrumental to understand the monopolistic tendencies inherent to platform markets as well as among complementors, and to structurally analyze inter- and intra-industry structures and relationships.

Software studies: exploring computational infrastructures

Finally, our theoretical framework builds on the emerging fields of software, platform, and app studies. Collectively, these overlapping approaches emphasize the material, computational, and infrastructural dimension of platforms (Helmond, 2015; Montfort and Bogost, 2009; Plantin et al., 2018). We will henceforth refer to this body of work as *software studies*. The starting point for much of this research concerns the end-user/platform relationship and comprises detailed explorations of how the sociotechnical features of platforms allow and prompt end-users to afford particular types of activities, connections, and knowledge. Particularly prevalent in this respect are contributions from a communication and information studies background that aim to investigate how corporate social media platforms “seek to enhance, format, encode and diagnose communication” (Langlois and Elmer, 2013: 3). In the words of Gillespie (2014: 192), we can see a new knowledge logic emerging, which “depends on the proceduralized choices of a machine, designed by human operators to automate some proxy of human judgment or unearth patterns across collected social traces.” This emerging algorithmic logic can be contrasted with the traditional “editorial logic,” which more explicitly relies on the “choices of experts” (Gillespie, 2014). As our examples from news and game production show, algorithmic logic becomes gradually more central to cultural production, as content developers are progressively orienting their production and circulation strategies toward the recommendation, ranking, and other kinds of end-user facing algorithms of major platforms.

Particularly important for our inquiry are software studies explorations of the *computational back-end* of platforms. As the GAFAM platforms become central actors in all realms of cultural production, it becomes a crucial question under what conditions platforms allow complementors access to the means of production and circulation. Recent work by Plantin et al. (2018: 294) points toward the ubiquity of platforms, not only for end-users, but also for developers of cultural content. Building on their work, we understand a platform's infrastructure as a sociotechnical system that is widely shared and increasingly perceived as essential. Infrastructural access to Application Programming Interfaces (APIs) and Software Development Kits (SDKs) is among the primary ways in

which platforms control complementors. Similarly, it should be observed that data infrastructures, such as APIs, not only preformat, process, and articulate end-user activities (Kitchin, 2014), but they also push complementors to align and subsequently integrate their own data infrastructures and strategies with those of the GAFAM platforms. Consequently, content developers have to align their own business models and production and circulation philosophies with those of leading platforms (Nieborg, 2015).

While software studies scholars devote ample attention to the intricate connections between platform business models and technologies, less attention is paid to how the economic strategies of platforms and complementors become entangled and what the political economic implications of these relationships are. Although a number of authors are acutely aware of the economic dimension of for-profit platforms, either from a purely administrative or from a more overtly political economic perspective, few authors add empirical depth to such observations. Notable exceptions show the value of developing a critical perspective on the political economy of computational infrastructures (Bechmann, 2013; Rieder and Sire, 2014). Finally, work in software studies acknowledges both platform integration and dependency, as well as the evolving nature of platform design, but is less concerned with questions pertaining to cultural production, let alone cultural commodities.

Combining approaches

As the discussion of the three theoretical perspectives suggests, to understand how the platformization of cultural production unfolds we need to untangle the mutual articulation of market arrangements, infrastructures, and governance of content production, distribution, and advertising. To enable such research, our theoretical framework, informed by the three bodies of literature, aims to systematize the exploration of these political economic and sociotechnical relations.

It starts with the transformation of the larger *market structures* in which contemporary modes of cultural production take shape. Drawing especially from business studies, we call for a careful examination of how platformization brings about a shift from single- and two-sided markets to complex multisided markets. This shift, which triggers new economic mechanisms and managerial strategies, strongly affects the economic position of cultural producers. These producers, as we will see, are impelled to develop publishing strategies that are aligned with the business models of platforms. Furthermore, building on software studies, we encourage researchers to be attentive to how the reorganization of market structures differs across fields of cultural production, depending on how these fields have historically been tied to platforms.

The second step in our model discusses how cultural production is *governed* through platforms. Drawing from software studies and political economic research, we focus on how platforms exercising significant political economic and infrastructural control over relations between complementors and end-users. This potentially has major implications for the distribution of economic and cultural power, as well as for the autonomy of cultural producers and the kinds of content these producers can distribute through platforms.

Finally, mostly building on software studies, our framework invites researchers to interrogate how platformization transforms the *infrastructure* of cultural production.

This means exploring how algorithms, data services, structures, and interfaces, such as SDKs and APIs, tie cultural production and distribution to platforms. This last analytic step takes us to the actual production and circulation practices. As cultural producers are transformed into platform complementors, they are incentivized to change a predominantly linear production process into one in which content is contingent, modularized, constantly altered, and optimized for platform monetization. This results in the rise of the contingent cultural commodity, which further destabilizes the neat separation between the modalities of production, circulation, and monetization.

Exploring three dimensions of platformization

Shifting markets

Drawing on business studies, we can observe that the emergence and subsequent entrenchment of the GAFAM quintet entails two major market shifts: (1) from one- or two-sided markets to intricate *multisided platform configurations* and (2) strong *winner-take-all effects* affecting all sides in platform markets. Vital to observe is that before digital platforms became ubiquitous, the print segment of the news industry and the console segment in the game industry operated as prototypical two-sided markets. News organizations and media publishers were matchmakers between readers or viewers and advertisers, and game consoles brought together game publishers and players. These two-sided configurations allowed content developers to exert control over the means of production and distribution; in the news industry, large media publishers occupied a top position in the advertising food chain because of their ability to attract and retain large audiences (Turow, 2011).

In the emerging platform ecosystem, a small number of transnational corporations are able to aggregate unprecedented numbers of end-users (and thus attention), and then, by ways of *indirect network effects*, advertisers. Next to these two sides, digital platforms have been proactive in adding other sides to their businesses, most notably advertising intermediaries, societal institutions, and cultural content producers. Facebook, for example, started out operating a relatively straightforward two-sided market model, match-making US college students with advertisers (Brügger, 2015). Today, it is a dominant data-intermediary, sporting millions of connections with companies, institutions, and content developers, each of which operate in different regions and have different histories, incentives, and business models.

In Facebook's ecosystem, content producers are on the subsidy side and occupy a precarious position. What distinguishes multisided platform markets from past market configurations is that for platform holders, content developers can become dispensable. For Facebook, content developers were not a crucial part of the chicken-and-egg equation. That is, when it came to launching the platform and kick starting positive direct and indirect network effects, the most critical sides for the platform were users and advertisers. Content developers are just another side, and *individual* games, magazines, and newspapers are increasingly interchangeable cultural commodities. Compare this to the aforementioned two-sided nature of print news, in which the news publisher controlled the relationship between readers and advertisers. Or compare this to the two-sided game

console configuration, where game publishers are the money side and revenue is generated via the sale of premium-priced software, thus incentivizing more sustainable platform-complementor relationships. Conversely, social media and mobile media are general-purpose platforms. Although news and game offerings do hold value for users, and thus for platform holders, they are not the primary money side for Facebook or Apple and thus less important when platform managers consider pricing, governance, and platform data strategies. Recent changes in Facebook's News Feed demonstrate not only the platform's indifference to the plight of news publishers, but also how such seemingly impromptu changes have a global impact (Frenkel et al., 2018).

Thus, for researchers studying contemporary processes of platformization in the cultural industries, it is crucial to examine how these processes affect market structures and platform management strategies in specific fields of cultural production. Such an examination reveals the fundamental economic shift brought about by the rise of platforms and provides insight in how it changes the horizon of opportunities for cultural producers. Depending on how market structures shift, these producers have to develop new ways to generate revenue in an environment in which they often find themselves in a subordinated position.

This is particularly clear in the news industry, which over the last two decades has come under increasing economic pressure. In their attempts to adapt to the new economic reality, news organizations have been forced to fundamentally reinvent how they monetize editorial expertise and content. Spurred by digital publishers, such as *BuzzFeed* and the *HuffPo*, news organizations have developed *networked strategies* to profit from platform network effects. These organizations optimized news production and circulation for multisided digital platforms to maximize user traffic and advertising revenue. While for some this strategy has been effective in generating significant user traffic, in economic terms it has not necessarily made these organizations more sustainable businesses. As documented by Turow (2011: 78), the rapidly falling returns on online display advertising makes it increasingly difficult to generate sufficient income from networked audiences, which in turn has profound democratic implications (Couldry and Turow, 2014).

Ironically, rather than concentrating on business models that provide an alternative to platform economics, most leading news organizations, with a few notable exceptions, have started to pursue what can be understood as a *platform-native strategy*: the hosting and monetization of editorial content and expertise on the GAFAM platforms, rather than on their own digital properties. A number of platform-initiated programs, such as Facebook's Instant Articles, Apple News, and Google AMP pages entice publishers to unbundle their content and host it on a platform's servers (Bell and Owen, 2017).

Hence, for researchers it is crucial to observe that platformization has both significant economic and cultural implications; it makes publishers increasingly dependent on platforms (Nielsen and Ganter, 2018) and, thus, subject to the political economy of multisided markets. Publishers pursuing platform-oriented distribution strategies are subject to strong direct network effects, as platform sharing practices and algorithmic curation tend to favor viral content. Moreover, these strategies lead to a shift in control and oversight. The direct relationship newspapers enjoyed with their readers is increasingly intermediated by platforms, which are known to be reluctant to share valuable data. In terms

of monetization, this loss of autonomy, at least in the short run, does not appear to solve the economic difficulties of the news industry. Although launched with much fanfare, platform-native content hosting programs do not appear to generate the anticipated amount of advertising revenue (Bell and Owen, 2017).

Exploring how the rise of online platforms affects particular cultural industries, researchers need to be attentive to the variation in trajectories of platformization. This can be clearly observed when comparing the platformization of news and games. As software studies scholars have argued, since digital games are component-based software, they are necessarily platform dependent. Consequently, contrary to news organizations, game publishers have always followed platform-native distribution and publishing strategies, which affected the organization of market structures. For over two decades, dedicated game consoles functioned as two-sided markets that served as an attractive venue for game publishers to reach players (Kerr, 2017). As a result of this market configuration, the game industry has historically been subject to strong winner-take-all effects with a relatively small number of premium-priced blockbuster franchises, such as *Call of Duty* and *FIFA*, dominating the market.

The rise of major digital platforms in the mid-2000s, launching social network services, smartphones, and tablets, radically transformed the game industry. Game developers gained access to much wider and diverse audiences as these new platforms offered games that were more accessible both to players and developers (Kerr, 2017). As a result, game apps emerged as a vibrant new sub-segment in the wider game industry, which continues to see double-digit revenue growth on a global basis.

Contrary to the news business, the dominant revenue stream in the game industry has been through the commodification of content, that is, via premium business models (i.e. direct unit sales). Coinciding with the launch of new game platforms has been the widespread adoption of the freemium or “free-to-play” business model, in which revenue is generated via a mix of optional in-game purchases and advertising (Nieborg, 2015). Not only did the freemium model remove another barrier for players, particularly in the mobile segment, but also their development and circulation practices align directly with the technological and economic affordances of the GAFAM platforms. For game developers looking for sustainable revenues, the low barrier to market entry demands a different strategic approach to content development, which necessitates heavy investments in player acquisition and retention. Similar to the news industry, game developers have to adjust their business models to an ecosystem flushed with content.

This new era of abundance favors data-driven game design strategies, intensifying the contingent nature of cultural commodities. Game developers leverage the contingent nature of games as software by continuously altering, extending, and upgrading game content and functionalities, while simultaneously optimizing its monetization model. For example, games in the popular *Candy Crush Saga* franchise leverage the connective affordances of Facebook by suggesting players to directly contact their Facebook Friends to ask for bonuses or to unlock additional game content. Next to directly integrating platform functionalities in a game’s design, developers are increasingly reliant on the GAFAM platform’s data-driven advertising ecosystems (Nieborg, 2017). Expectedly, this techno-economic alignment has profound political economic implications. Mobile multiplayer games such *Clash Royale* and *Mobile Strike*, each of which generate hundreds of thousands of dollars in global

revenue on a daily basis, are subject to strong direct network effects that increase player retention. This makes it difficult for new market entrants to gain market share. While platform owners have a number of curatorial and algorithmic tools at their disposal to (re)direct players or readers away from incumbents and toward novel content, as we will argue in the next section, their current platform politics and governance policies belie such approaches.

Changing governance

To develop a comprehensive understanding of how platformization shapes cultural production and distribution, we cannot restrict the analysis to shifting market structures, but we also need to account for how digital platforms affect power relations in the cultural industries and the autonomy of complementors. Hence, informed by work in political economy and software studies, the second step in our model focuses on how platform power is operationalized through platform governance frameworks.

Examining platform governance, we can observe that transnational platform companies tend to set global, rather than local, standards regarding content. Informed by political economic research on corporate concentration, we note that the dominance of the US-owned and operated GAFAM platforms effectively entails a globalization of US cultural standards concerning what is and what is not permitted (Jin, 2015). Such standards are operationalized through platform policies, codified in Terms of Service, Terms of Use, and developer guidelines, such as Apple's App Store Review Guidelines. On the basis of such policies, platforms filter content, block users, and remove content from platforms and app stores. Typically, these regulations prohibit violence, nudity, and discrimination, which can scare away advertisers and end-users or become a source of legal issues (Van Dijck, 2013). How such rules are interpreted and acted upon is, however, opaque and it frequently causes controversy (Frenkel et al., 2018), as platforms intervene deeply in the curation of culture and the organization of public communication.

Exploring how platform governance influences particular cultural industries, it is important to consider the histories of specific fields of cultural production. Historically platform independent modalities of news production and circulation have always enjoyed a large degree of autonomy in content development and distribution, mostly limited by national policy frameworks and journalistic cultures of news production. The impact of novel norms and rules introduced by platforms has been particularly controversial in the news industry. Global platform policies tend to ignore historical, cultural, and political values and sensitivities, central to news production.

This is most noticeable when platforms filter content that is considered historically, culturally, and politically significant, or when they fail to filter content that is considered damaging. A prominent instance of the latter is, of course, the failure of Facebook and other digital platforms to prevent the circulating of misinformation during the 2016 US elections. As the volume of platform communication continues to grow, these kinds of problems are increasingly likely to occur. For the study of the platformization of the cultural industries, it is especially important to systematize the analysis of these instances of content moderation. Given the social and political importance of news and other forms of cultural production, a platform's editorial function should be continuously scrutinized, just as news organization are held accountable for editorial decisions.

The issue of accountability concerns content moderation, but also *algorithmic content curation*, which, as software studies scholars have pointed out, has a large impact, but is much harder to observe, let alone audit (Sandvig et al., 2016). Algorithmic curation affects the visibility of individual content items, but also of entire news outlets. Every major change in Facebook's News Feed algorithms tends to have a dramatic impact on the traffic volumes of particular news outlets (Nielsen and Ganter, 2018). Furthermore, the impact of platform sorting practices is exceptionally strong because many news organizations are incentivized to align their content strategies with platform-defined markers of popularity, rather than traditional quality indicators (Van Dijck, 2013). By doing so news organizations are effectively reifying dominant platform governance strategies.

Situated at the opposite end of the spectrum in terms of platform dependence, the impact of platform governance on the game industry has been less controversial than in the news industry. Game developers are accustomed to grapple with hardware, software, and platform governance frameworks that are relatively standardized across regions and hardware generations. Nevertheless, the growing importance of online platforms which are not specifically designed for gaming has complicated the governance of game production, circulation, and monetization. Nowhere is this more visible than in the mobile game segment, in which Apple's App Store plays an important role. App developers are faced with a constantly shifting, intricate, and often opaque set of developer guidelines (Bergvall-Kåreborn and Howcroft, 2013). This item in Apple's "App Store Review Guidelines" speaks volume about the policy's arbitrary nature: "We will reject apps for any content or behavior that we believe is over the line. What line, you ask? Well, as a Supreme Court Justice once said, 'I'll know it when I see it.' And we think that you will also know it when you cross it."³ This guideline is emblematic of the platform's strict content control, heavy curatorial bias, and above all, a low level of accountability.

Whereas suppressing news content has clear moral and ethical implications, the non-trivial costs of developing an individual game app, only to see it rejected after submission, increase the precarity of this particular mode of game development. Game developers are at a platform's full mercy, which not just affects the economic sustainability of game production, but also its viability as a form of artistic expression. Arguably one of the most striking examples how Apple limits game developers' freedom of expression are guidelines related to "defamatory or mean-spirited content" and "overtly sexual or pornographic material." A notable example is Apple's banning of Molleindustria's (meta)game *Phone Story* (2011), which critiques smartphone developers by making "the player symbolically complicit in coltan extraction in Congo, outsourced labor in China, e-waste in Pakistan and gadget consumerism in the West."⁴ These kinds of platform provisions have a clear chilling effect on developers who want to make artistic or political statements about, gender (in)equality, labor exploitation, organized violence, or repressive governments.

In sum, to understand how platformization shapes cultural expression, it is crucial to carefully examine the seemingly serendipitous and minor changes in platform governance, ranging from content sorting and filtering to algorithmic curation. And, while these affect all cultural industries, we simultaneously should be attentive to the variations between industries. Given different traditions of governance and platform dependency,

each industry is characterized by its own set of power relations and questions and concerns regarding the autonomy of cultural producers.

Infrastructural transformation

Platformization, as suggested, is not only an external process in which platforms transform market structures and curate content, it is also driven by cultural industries actively organizing production and distribution around platforms. This comes clearly into view when we examine how platformization transforms the material infrastructure of the cultural industries. This last analytical step especially builds on insights from software studies, focusing the attention on interfaces, data flows, and the availability and functions of software development tools and documentation. Here, the contingent nature of commodities comes back into view. As cultural producers are transformed into platform complementors, they are incentivized to change a traditionally linear production process into an iterative, data-driven process in which content is constantly altered to optimize for platform distribution and monetization.

Over the past decade, digital platforms have initiated a range of services, enticing producers to host, distribute, and monetize their content via their platforms. By offering ready access to APIs, SDKs, and developer documentation, platforms offer news publishers and game developers a seemingly attractive alternative to physical distribution infrastructures, or self-operated digital properties. Next to hosting content, platforms also provide a variety of integrated services to complementors, all of which leverage the infrastructural features—ubiquity, accessibility, reliability, invisibility—of platform technologies (Plantin et al., 2018). Prominent examples of such services are Facebook Login, its “social” plugins (Gerlitz and Helmond, 2013), as well as payment systems, advertising technology and various kinds of data analytics.

Starting from a software studies–guided exploration of platforms, the question then becomes: how does the use of these infrastructural services affect particular modes of cultural production and circulation? In the news industry, platform integration has led to large-scale content unbundling. Instead of focusing on highly curated content packages (i.e. newspapers), news organizations are increasingly investing in the platformed distribution of individual stories, which are contingent in their structure and content. This is most apparent in the case of digital news organizations, such as *BuzzFeed* and *HuffPo*, which have completely organized their operations around platform data. These publishers employ platform-native strategies and thus data, as well as a range of specialized third-party services, such as *Chartbeat*, *NewsWhip*, and *Parse.ly*, to gain insight into key metrics such as unique visitors, page views, attention minutes or referrals from specific sources. The ubiquitous use of data analytics enables precise user targeting, the ability to respond to real-time trends, “A/B” or split testing content such as headlines and formats, as well as the development of long-term strategies on how to continue drawing platform users (Bowman, 2014). Strikingly, the last few years, many legacy news media have adopted similar strategies, datafying their operations to more adequately respond to evolving interests of platform users (Cherubini and Nielsen, 2016). Thus, similar to music and games, news content is increasingly modularized, revised, and recirculated, transforming it into a contingent cultural commodity.

From the perspective of platforms, the next logical step has been to replace a news organization's distribution infrastructure altogether. Recall Facebook's Instant Articles, which entices publishers under the guise of "incredibly fast," "interactive and immersive reading experiences."⁵ Other major platforms, including Google, Twitter, Snapchat, and Apple, have developed similar native hosting and monetization programs. Taken to the extreme, these instances of platformization decontextualize and unbundle news content even further, and potentially reduce news organizations to mere content developers.

This process of infrastructural alignment not only subjects complementors to platforms' governing frameworks and algorithmic logics, but it also creates strong technological and economic dependencies, if not "infrastructural capture" (Nechushtai, 2018). Content developers are increasingly "locked in," as they are not only reliant on platform-data, but they also have their training, tools, and payment systems fully integrated with platforms. Algorithmic sorting practices, such as seen in Facebook's News Feed, further enhance this dependency, introducing new regimes of visibility to complementors (Bucher, 2012).

By comparison, the infrastructural transformation in the game industry has not been as fundamental, as games have always been platform dependent. Platformization has not led to a radical process of unbundling, which is near impossible for games. That said, just as in the news sector, digital infrastructures enable game producers to transform largely linear production processes into ones in which content is constantly adapted and optimized. Consequently, games have become contingent commodities par excellence. The industry-wide adoption of advertising-dependent monetization schemes necessitates complete integration with platform infrastructures, which is most apparent for free-to-play mobile games. Here the GAFAM platforms fulfill key functions in terms of attracting, retaining, and monetizing players. Consequently, mobile game developers tend to subject themselves readily to the algorithmic and editorial-sorting practices of the app stores operated by Google and Apple.

Conclusion

To develop a more comprehensive understanding of the platformization of cultural production, we have staged a dialogue between three disparate bodies of scholarly work: business studies, critical political economy, and software studies. Each research tradition offers a valuable avenue to analyze the multidimensional playing field in which platformization takes place. Combining these perspectives in a three-step model, we invite researchers to systematize the study of the platformization of the cultural industries, exploring related changes in market structures, governance frameworks, and infrastructures. This article illustrated through brief examples how this analytical model can be employed. The challenge ahead is to develop in-depth case studies of how platformization unfolds in particular geographies, fields, and instances of cultural production. Pursuing such research, it is especially important to examine how shifts in market structures, forms of governance, and infrastructures mutually articulate each other. Furthermore, while we have demonstrated that there are differences between cultural industries in trajectories of platformization, the exploration of this variation needs to be much more thoroughly developed, broadening the empirical scope. And as the platformization of cultural

production is decidedly a global phenomenon, future research would also benefit from a wider geographical lens, including non-Western platforms and complementors.

Such research is not just important from an analytical perspective, but especially also in light of the socio-economic and cultural issues triggered by platformization. The potent combination of ballooning market capitalization, ready access to (venture) capital, and positive network effects has resulted in an unprecedented accumulation of economic resources by the platform behemoths GAFAM. Their current dominance warrants sustained and relentless critique, as power continues to shift in an constantly evolving ecosystem that, for complementors, is fraught with a loss of autonomy, risk, and uncertainty.

Particularly interesting for future research is the profound effect of platformization on the structure and nature of the cultural commodity form. Platformization, as this article suggests, marks the reorganization of cultural production and circulation, rendering cultural commodities contingent. This contingency poses new problems for cultural theorists and critics, who are confronted with cultural objects that resist stabilization. Unstable texts raise a wealth of methodological and cultural challenges. Instead of fixed, physical cultural commodities, digital distribution turns games and news into personalized services that differ for each individual, based on time, location, user profile, and behavior. Developers can alter content in real-time and combined with advertising-driven platforms, this has profound implications for content accessibility, accuracy, and diversity.

We have pointed toward free-to-play games and platform-native news as paradigm cases of platform-dependent contingent commodities. These examples challenge the neat separation between modalities of production, distribution, and monetization. Thus, researchers exploring how platformization shapes cultural production and distribution practices are advised to carefully untangle the intricate interplay between the development of new platform services to distribute, datafy, and monetize content, as well as the evolving strategies of cultural producers to find, target, and monetize audiences. For developers, being dependent on the GAFAM platforms is a double-edged sword. Network effects ultimately favor all but a handful of winners, thereby crowding out exceptions and alternatives. And because contingent cultural commodities are inherently platform-dependent, their producers are effectively complicit in accepting economic mechanisms, managerial strategies, and governance frameworks and infrastructures that equal disproportionality, dependency, and inequality.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Notes

1. Our work is informed by and builds on the notion of platformization as developed by Helmond (2015), who discusses it as the penetration of platform extensions into the web, and the process in which third parties make their data platform-ready.
2. In free-to-play mobile games market segment, Apple's iOS App Store is widely considered the primary channel for publishing game apps, capturing the majority of revenue. In turn, we focus primarily on Facebook when discussing journalism as this platform follows a distinctive

“data strategy” (Bechmann, 2013), persuading news organizations to adopt platform-native strategies.

3. <https://developer.apple.com/app-store/review/guidelines/>
4. <http://www.phonestory.org/>
5. <https://instantarticles.fb.com/>

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