


Apps of Empire: Global Capitalism and the App Economy

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Abstract

This article interrogates Dyer-Witheford and De Peuter’s *Games of Empire*. Since its publication in 2009, the game industry evolved significantly, adding billions of players, dollars, and devices. One of the driving forces of this transformation has been the global diffusion of mobile media. This raises the question: Do mobile platforms and the app stores operated by Apple and Google allow for a radical departure from global hypercapitalism? This question will be explored by taking on three themes: shifts in labor, the political economy of platformization, and the capital-intensive mode of app production and circulation. Doing so addresses two gaps in *Games of Empire*’s approach: a dearth of empirical economic analysis and the acknowledgment of work in critical platform studies and mainstream economics. It is concluded that rather than providing a staging ground for dissent or collective action, apps of empire signal the foreclosure of an exodus from global hypercapitalism.

Keywords

game industry, apps, app stores, platformization, apps of empire, game production, platforms, political economy

Games are “media constitutive of 21st century global hypercapitalism and, perhaps, also of lines of exodus from it,” as [Dyer-Witheford & De Peuter \(2009, p. xxix\)](#) stated in the introduction of *Games of Empire*. Hypercapitalism, in their understanding,

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should be understood as “a *system* of global ownership, privatized property, coercive class relations, military operations, and radical struggle” (Dyer-Witheford & De Peuter, 2009, emphasis theirs). This article revisits the first part of this argument by surveying the emergence of the global game app economy. More than a decade after *Games of Empire*’s publication, the game industry has evolved significantly, adding billions of players, dollars, and devices. One of the driving forces of this transformation has been the global diffusion of mobile media. As “the latest iteration of the software commodity,” mobile applications or “apps” have become both mundane and ubiquitous (Morris & Murray, 2018, p. 3). As a result, apps now contribute almost half of the 159.3 billion USD in annual global game revenue (Statista, 2020).

In its history, the game industry has seen radical shifts in audiences, business models, and technology before (Kerr, 2017, p. 31–63). Is the emergence of mobile media different and does it challenge *Games of Empire*’s understanding of hypercapitalism? More precisely, do mobile platforms and the app stores operated by Apple, Google, Tencent, and Amazon allow for a radical departure from global hypercapitalism? This article argues that the short answer to this last question is a resounding no. On the contrary, if there would be a superlative for hypercapitalism, it would apply to the app economy. While digital games still hold radical potential and thus “lines of exodus,” I would make the case that in their current form, game apps are far away from being a staging ground for collective action through counterplay.

To substantiate these points, this article draws on *Games of Empire*’s rich critical theory and revisits the themes of the first three chapters, which discuss “labor” (the precarious and immaterial nature of game work by both professional and amateur developers), “machines” (the political economy of game platforms), and last “capital” (the capital-intensive mode of game production and circulation). By addressing these issues, I aim to address two gaps that have become more pressing after *Games of Empire*’s publication: a more thorough engagement with empirical economic analyses and the recognition of work in neighboring disciplines, particularly critical platform studies, business studies, and mainstream economics.

The next section begins by resuming the debate on immaterial labor, which has been discussed extensively in game and media studies around the time *Games of Empire* was published. I will argue that the issues surrounding the practice of “modding”—amateur developers using proprietary game technology to develop extensions without remuneration—can be seen as a forerunner of much of the issues plaguing contemporary instances of independent app development. While modding and mobile game development hold radical potential by allowing developers to create subversive content, both practices are deeply embedded in a wholly proprietary production environment. Moreover, creative and political dissent is stymied by the ability of for-profit companies to exert full control over the means of distribution.

This brings us to the second theme. Through an analysis of the political economy of app stores, it is argued that new “machines,” or in today’s parlance, platforms, are implicated in the process of “platformization” (Nieborg & Poell, 2018). The global diffusion of new game distribution platforms owned and operated by Amazon, Apple,

Facebook, and Google ushered in the era of “platform capitalism,” which signals the dominance of a “new type of firm” that offers an infrastructure to intermediate between “different user groups” (Smicek, 2017, p. 47). As we will see, the game industry has historically served as one of the primary staging grounds for this specific techno-economic logic that underpins what have become the most profitable corporations on the planet (Barwise & Watkins, 2018). While the fallout of platform capitalism is addressed by a broad swath of critical scholars, it is important for game scholars to consistently point to the game industry’s history. Digital games have been, and very much still are, the proverbial canary in the capitalist coalmine (Nieborg, Young, & Joseph, 2020) and provide insightful case studies to analyze historical and current instances of “platform-dependent” cultural production (Nieborg & Poell, 2018). For example, the by-now popular freemium or “free-to-play” business model may push technological and economic boundaries; it does so while challenging long-standing (game) design principles and ethical norms (Willson & Leaver, 2015).

Capital, the third theme, continues the conversation on platformization and takes an institutional perspective. Over the last decades, the game industry has seen the “growing concentration of ownership” and the “consolidation of control in the hand of large publishers” (Dyer-Witheford & De Peuter, 2009, p. 63). I will draw on recent exploratory financial analysis of app stores to argue that not only have these inequities not been resolved, but they are also exacerbated by the economic asymmetries inherent to how platform markets function. These recent insights support my argument that Empire is not only alive and kicking; platform capitalism is an intensification of the inequalities that are a result of their economies of scope and scale.

Labor: From Modding to Everyday Game-Making

What makes the game industry scholarship particularly relevant to wider conversations about platform economics, infrastructure, and governance is that unlike journalism, movies, or music, digital games have always been “platform-dependent” media (Nieborg & Poell, 2018, p. 4277). Platform-dependency in the 1980s meant something quite different from what it means in the 2010s. For much of the game industry’s history, Triple-A or blockbuster game culture reigned supreme, with large game publishers marketing high-end productions to a relatively well-defined group of consumers. These were self-proclaimed “gamers”: young men living in North America, Western Europe, and Japan who considered playing games as a marker of their shared identity (Kirkpatrick, 2013).

One could argue that blockbuster culture reached its “subcultural” peak around 2009 (Dymek, 2012). This was the time of the seventh generation of video game console—Xbox 360, PlayStation 3, and Wii—devices that started to fully leverage the affordances of digital distribution. The late 2000s were also a moment of widespread optimism, with media and communication scholars dishing up “celebratory” accounts of game culture (Dyer-Witheford & De Peuter, 2009, p. xxv). This view is echoed by game historian Suominen (2017), who points to the many historical monographs

he considers “enthusiast” if not “pathological,” which wax nostalgically about game history’s great men and machines.

In the early 2000s, academics and business consultants, on their part, pointed to the emergence of “Web 2.0” as a more open, emancipatory, and democratized instance of web culture, providing users an opportunity to engage in commons-based peer production, potentially even outside of the realm of capitalist culture (Van Dijck & Nieborg, 2009). Amidst this discursive wave of optimism, one aspect of game production that consistently popped up as a paradigmatic case of this more democratized, “participatory culture” was user-created modifications or “mods” to popular PC games (Jenkins, 2006, p. 131–168). With the purchase of a boxed game, amateur developers were granted access to the same high-end game production tools as professional developers. Modders then used these tools to create complementary material that ranged from small gameplay adjustments to more profound “total conversions,” particularly of first-person shooter games. Barring a handful of exceptions, these modifications rarely strayed far from the original game’s underlying game themes (i.e., warfare) and mechanics. Rather than harnessing the radical potential of access to technologically advanced game engines, amateur developers tended to recreate their favorite intellectual properties instead. This allowed rights-holders to firmly police amateur creations, while the game industry “learned to suck up volunteer production as a source of innovation and profit” (Dyer-Witheford & De Peuter, 2009, p. 27). Pointing to Dyer-Witheford and De Peuter’s work, Kirkpatrick concluded that “The most famous mods do not inspire critical theorists with their emancipatory potential” (2013, p. 126).

Today, the practice of modding has morphed into something else, as it is largely replaced by other, more diverse game-making practices and cultures that include “everyday gamemakers” (Young, 2018) alongside the “aggressively formalized” practices of publisher-funded studios (Keogh, 2019). Yet, despite the affordability and accessibility of a new generation of game development tools that propel this burgeoning ecosystem forward, these contemporary creative practices signal a continuation of modding rather than a radical break. Despite the increased access to and capabilities of open-source game engines, proprietary tools and frameworks are still dominant (Nicoll & Keogh, 2019).

For developers across the globe, game engines have undoubtedly lowered the bar to create games. In the words of Keogh (2019, p. 26), “Videogames have obtained their printing press through the rise and acceptance of third-party engines.” Yes, but in moves fully in accordance with the broader process of platformization, these “platform tools” have locked-in “industry ideologies in the ideation, production, implementation, and distribution of digital creative work” and by doing so constricting creative and ideological alternatives (Foxman, 2019, p. 1). By virtue of its industry dominance, Unity has set expectations about the standards for content genres, the identity of its users, and the very future of new technologies, particularly virtual reality applications (Foxman, 2019). On top of that, platform tools lock developers into specific distribution outlets. One of the causes of Unity’s widespread

adoption is its ability to export games to dedicated game consoles and app stores (Nicoll & Keogh, 2019). This latter category of distribution platforms, I argue below, marks a further concentration and centralization of control over game distribution, and, equally important, advertising.

Machines: Platform Leaders Picking Winners

The history of modding and how it morphed into everyday game-making tell us that if we want to understand current manifestations of platform capitalism and platformization, we should be attentive to the game industry's recent history. Notwithstanding the valuable interventions of critical political economists and critical platform scholars, one domain of scholarship that has yet to be explored more fully by game and media production scholars is mainstream or "orthodox" economics and strategic management (Constantinides, Henfridsson, & Parker, 2018). In these two overlapping fields of study, we find valuable insights into the economics of platform markets and the strategic challenges faced by platform operators and developers. Despite its value-free epistemology, this work is empirically rich and methodologically rigorous. While questions pertaining to labor, culture, and power are notably absent in this burgeoning body of work, it does give us a good sense of the sources of the structural inequalities inherent to platform economics, or, as mainstream economists call them, two-sided markets. Allow me to elaborate on this last point.

Nearly two decades ago, mainstream economists started theorizing two-sided businesses. The French economists Rochet and Jean Tirole, the latter of whom was awarded the 2014 Nobel Prize in Economic Sciences, wrote an influential article that starts with: "Buyers of video game consoles want games to play on; game developers pick platforms that are or will be popular among gamers" (2003, p. 990). Platform operators, such as Sony, Sega, and Nintendo, operate markets that bring together a demand side (players) with a supply side (publishers), hence their two-sidedness. They also observed that the more players bought a device, the more valuable the entire market or "network" became, a dynamic theorized as "network externalities" or "network effects." Moreover, and this was a particularly crucial insight, they found that an increase in the demand side *indirectly* impacted the supply side, understood as "indirect network effects." The more players, the more lucrative it became for publishers to join a platform market.

The reason to engage with mainstream economics is because the game console segment has been one of the go-to case studies to analyze how platform markets *evolve*. One of the challenges faced by platform operators is to get a positive feedback loop (i.e., network effects) going. This is most urgent when launching a new platform. What to attract first—players or publishers? If neither joins a platform, there will be no growth. Since the game industry sported over seven distinct hardware generations, there is ample empirical material to analyze and theorize these complex strategic trade-offs. What emerges from such strategic studies is that platform operators, such as Sony and Nintendo, are inclined to play favorites by partnering with incumbent

publishers and to keep their portfolios relatively small. Thus, these studies unpack the rationale for platform operators to play it safe, economically and creatively. Platform operators are incentivized to favor best-sellers, proven franchises, and incumbent publishers. This may sound self-evident. Yet, the *exact* extent to which platform strategies impact individual developers economically has yet to receive widespread scholarly attention. Mainstream economics provides the theoretical and conceptual starting point for such investigations, but it is up to critical political economists to conduct empirical studies of their own.

One thing is certain: Without exception, platform markets trend toward concentration, or as economists call them—“winner-take-all” markets (Barwise & Watkins, 2018), the winners being one to three platform operators who typically operate oligopolies (i.e., highly concentrated markets with limited competition). For platform operators, becoming a winner is the Holy Grail, and the mainstream economic literature provides the road map to become digitally dominant (Constantinides et al., 2018). Once game platform operators have solved their first major strategic conundrum, namely, to get both players and publishers on board, network effects will spur further growth. When adopted more widely, platform operators unlock a number of technological, economic, and governance strategies to lock-in players and publishers, and to steer attention to any game or publisher they see fit (Rietveld, Schilling, & Bellavitis, 2019).

When reflecting on how game culture evolved from the 1980s until today, there is broad agreement among critical game scholars that platform operators have done little to mitigate the industry’s cultural and creative conservatism (Dyer-Witheford & De Peuter, 2009, p. 80–81; Kirkpatrick, 2013). As argued by Keogh, “As necessity-driven entrepreneurs that rarely transcend a position of precarity, informal videogame creators remain subservient to the whims of distribution platforms setup, primarily, to serve the formal videogame industry and its cultivated audience” (2019, p. 30). Recent work in business studies provides empirical evidence for such strong claims. Analysis of the seventh console generation (2007–2011) considers how platform operators engage in “selective promotion” of game titles (Rietveld et al., 2019). Rather than cultural or regional diversity, the authors argue that games of “high quality and good initial sales” and games in “high-value genres” were more likely to be endorsed than others (Rietveld et al., 2019, p. 1238). Moreover, the more games were sold by game publishers during this cycle, the less royalties they had to pay, thus incentivizing winners to, indeed, take all. What we can take away from this is that the operating logic of platform markets is both the source and potential solution to digital play’s enduring subcultural position.

Capital: “Social” and Mobile Machines

During and shortly after the publication of *Games of Empire*, a new wave of game “machines” was introduced, which afforded a slew of novel game experiences. Few could have predicted to what extent the diffusion of mobile phones coupled with the

adoption of new business models would transform the industry. To be sure, the console and PC industry segments are still highly profitable and culturally significant. The understanding of consoles by *Games of Empire* as “technological,” “corporate,” and “time” machines has not changed much either.

What did change is where games are played, by whom, and on which devices. Whereas premium priced, physically distributed PC and console games sold in Japan, Western Europe, and North America were the main revenue drivers two decades ago; today “freemium” games played in the Asia Pacific region account for the majority of global game revenue (Statista, 2019). Add to that the intensification of the process of platformization, where Google, Apple, Amazon, and Facebook have ensured that each aspect of the production, distribution, marketing, and consumption of games has become “platform dependent” (Nieborg & Poell, 2018). This last point is particularly relevant to understand the political economy of game apps. For example, the rise and subsequent collapse of Facebook as a game platform is illustrative of the rapid pace of industry innovation, the power of network effects, and the ability of the company to commodify every aspect of digital play.

For a brief period, Facebook was the go-to destination to play “social games,” a misleading but admittedly savvy descriptor for games that leveraged the connective properties of Facebook’s social graph. Around 2009, Facebook needed new users and sticky content, and in game developer Zynga, it found the perfect corporate match. Both companies were unapologetically growth driven and chasing the unicorn status (i.e., a billion-dollar valuation followed by an initial public offering). As argued by their founders, they were “not here to make money,” but in the case of Facebook’s Mark Zuckerberg, “to make the world more open and connected” or in Zynga CEO Mark Pincus’ case, to connect “the world through play” (Dror, 2015). For two founders not focused on making money, they were remarkably successful in generating billions in personal wealth. While Facebook did so by breaking civil and democratic norms (Vaidhyanathan, 2018), Zynga did so by breaking established norms in game design by valuing data over creativity (Willson & Leaver, 2015). The point here is not that Zynga’s games, particularly its superhit *FarmVille*, are not “real” games because they lack meaningful progression or require no skill to play whatsoever (Consalvo & Paul, 2019). Rather, it is the disingenuousness of a company that “on the one hand purporting to be a games company, while company executives openly touted that they were running an analytics corporation whose main product happened to be social games” (Willson & Leaver, 2015, p. 149).

By playing “social” games on Facebook, tens of millions of new players became instantly integrated into the connective logic of platform capitalism. Facebook was not (and still is not) a game machine similar to the PlayStation and Xbox, machines that one can switch off and walk away from. Logging out of Facebook is not very effective to escape the company’s data collection efforts. After all, Facebook is strategically positioned to become, in the words of its founder, “a social infrastructure” (Vaidhyanathan, 2018, p. 2). Facebook’s advertising-driven business model pushed developers to focus on player retention; to have digital play become

a “digital ritual,” a part of daily visits to the social media platform (Burroughs, 2014, p. 152). Facebook benefitted from social games immensely. First, social games spurred indirect network effects, that is, users joining the platform to enjoy third-party content (in this case, games). Second, players coming back several times a day also made Facebook use more habitual.

As prototypical *Games of Empire*, social games are therefore best understood through the lens of immaterial labor, which Dyer-Witheford and De Peuter (2009, p. 31) defined as “the cognitive and affective aspects of the commodity produced,” using connective technology and blurring the line between labor and leisure. In Zynga’s *FarmVille*, Burroughs observed “play and labor (playbor), consumption and circulation” collapse into each other (2014, p. 163). If one follows the classical political economic reasoning underlying the “audience commodity” thesis—watching tv and advertisements is a form of work—then playing Facebook games is a triple articulation of the audience commodity (Nieborg, 2015). First, play is commodified, as players (i.e., their data and digital identities) are traded across advertising networks. Second, by connecting with Facebook Friends, social games commodify players’ connective bonds. And third, the mere act of playing itself is constantly commodified, as every click becomes a data point to optimize the game and its business model.

Despite Facebook’s accessibility as a game platform to developers and players, an in-depth empirical study of data-driven design shows that the freemium business model “restricts creative autonomy, exacerbates the burden of risk on developers, and reinforces existing market and gender inequities” (Whitson, 2019, p. 789). All of these issues became even more urgent when Apple and Google introduced mobile machines and subsequently popularized app stores as the primary destination for game apps. Similar to other modes of cultural production, the production, distribution, and monetization of apps have become subject to the economic, infrastructural, and governance frameworks of Apple and Google (Nieborg & Poell, 2018).

Consider Apple, which operates one global, uniform set of “app store reviewer guidelines” that rule each national instance of the iOS App Store. These guidelines are highly subjective: “Apps should not include content that is offensive, insensitive, upsetting, intended to disgust, in exceptionally poor taste, or just plain creepy.”¹ The understanding of what is or is not “offensive” or “poor taste” as it is understood in Cupertino, California, is of course very different than in Hong Kong, Amsterdam, or Brisbane. While all platforms engage in some form of content curation, Apple’s guidelines are particularly opaque and restrictive (Mosemghvdlshvili & Jansz, 2013). As dictated by Apple, “if you’re looking to shock and offend people, the App Store isn’t the right place for your app.” For game developers, this undoubtedly has had a chilling effect. Over the last decade, Apple rejected “a number of ‘serious games’ apps, which explore publicly relevant or politically challenging issues in game form” (Gillespie, 2018, p. 53). Put differently, since any message challenging the logic of capital must be shocking, if not deeply offensive to Silicon Valley inhabitants, apps may be fun and engaging; they are also destined to be ideologically uniform and conformist.

Apps of Empire

Apple's arbitrary politics would not be such an issue if it was not for the crucial position of its App Store in the wider ecosystem of platforms. This brings me to the global dimension of platform capitalism. How Apple manages its virtual storefront deeply impacts the game industry's spatial dynamics. If the Xbox and PlayStation are to be considered "imperial consoles" (Dyer-Witheford & De Peuter, 2009, p. 92), then app stores give way to Apps of Empire as they mark an intensification of a discursive and economic logic rooted in a distinctive U.S., or, more precisely, a Silicon Valley-based ideology. Under the guise of openness and democratization, the platform services operated by Facebook, Apple, and Unity signal a centralization and concentration of economic, infrastructural, and governmental power. As such, the platformization of cultural production—and Apps of Empire specifically—marks a continuation and intensification of hypercapitalism in all of its facets.

Engaging with business and management studies helps us to deconstruct the sources of hypercapitalism. This body of work also provides much-needed empirical contributions. Yet, many critical questions remain unanswered: How does the capital-intensive mode of app circulation and the supposedly global adoption of mobile platforms impact national (game) industries? How global is the app economy exactly? Which developers are visible and who are left behind? The global diffusion of U.S.-based platform companies—their infrastructural ambitions and intellectual property regimes—points to "platform imperialism" (Jin, 2013). In line with *Games of Empire's* general thesis, Jin argued that: "Platforms can be situated within more general capitalist processes that follow familiar patterns of asymmetrical power relations between the West and the East, as well as between workers and owners, commodification, and the harnessing of user power" (Jin, 2013, p. 168). As Empire can be seen as "governance by global capitalism" (Dyer-Witheford & De Peuter, 2009, p. xx), then U.S.-based platform companies have taken an increasingly crucial position in this project because of their ability to exert economic as well as infrastructural power.

These economic asymmetries extend beyond the platform level and impact national and regional development communities. For example, elsewhere we analyzed the ability of local developers to carve out a space in national instances of Apple's App Store, in our case, the Canadian instance (Nieborg et al., 2020). One would expect countries with vibrant game industries, such as Australia, Finland, the United Kingdom, and Canada itself, to be able to capture a large share of app-related revenue in Canada's App Store. Instead, we found that most app revenue generated via in-app purchases flowed directly back to the United States and increasingly China. From 2015 to 2017, companies headquartered in these two countries collectively captured nearly 80% of Canadian game app revenue. In the Canadian App Store, the revenue distribution among the top-performing apps is similarly stratified; in 2015, the top 100 of apps took in 85% of all direct in-app revenue. Again, many, if not all, of the studios distributing the top performers are located in countries with existing developer communities.

While app stores afforded developers an appealing distribution channel that certainly has had a quantitative impact on app availability, they are simultaneously subject to the predatory logic of finance capital; well capitalized conglomerates in the United States and China had, and still have, free reign in the global app economy. Economic analysis by [Bresnahan, Davis, & Yin \(2014\)](#) confirmed that Google and Apple's app stores heavily favor conglomerates and incumbents over independent studios and new entrants. So far, platforms have a poor track-record when it comes to providing adequate support to matching consumers with a broader selection of games: "app stores are a 'greatest hits' recommendation system" ([Bresnahan, Davis, & Yin, 2014](#), p. 251). The result, as argued by Whitson, is that "small-team mobile development work is risky, riddled with inequalities, and arguably no more creative than [blockbuster games]" ([2019](#), p. 797).

Last, the process of platformization is a propriety logic operated by app stores and platform tools, both of which frustrate any real potential of open-source development. Apps, then, despite their frivolous appearance and radical potential, are deeply embedded within global capital. Their business models are aligned, if not fully integrated, with the hypercapitalist practices of global platform infrastructures. More than anything else, Apps of Empire, in their mundane banality, signal the foreclosure of exodus.

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Note

1. See: <https://developer.apple.com/app-store/review/guidelines/>

References

- Barwise, T. P., & Watkins, L. (2018). The evolution of digital dominance: How and why we got to GAFA. In M. Moore & D. Tambini (Eds.), *Digital dominance: The power of Google, Amazon, Facebook, and Apple* (pp. 21-49). Oxford: Oxford University Press.
- Bresnahan, T. F., Davis, J. P., & Yin, P.-L. (2014). Economic value creation in mobile applications. In *The changing frontier: Rethinking science and innovation policy* (pp. 233-286). Chicago: University of Chicago Press.

- Burroughs, B. (2014). Facebook and FarmVille. *Games and Culture*, 9(3), 151-166.
- Consalvo, M., & Paul, C. A. (2019). *Real games. What's legitimate and what's not in contemporary videogames*. Cambridge: MIT Press.
- Constantinides, P., Henfridsson, O., & Parker, G. G. (2018). Introduction-platforms and infrastructures in the digital age. *Information Systems Research*, 29(2), 381-400.
- Dror, Y. (2015). 'We are not here for the money': Founders' manifestos. *New Media & Society*, 17(4), 540-555.
- Dyer-Witheford, N., & De Peuter, G. (2009). *Games of Empire: Global capitalism and video games*. Minneapolis: University of Minnesota Press.
- Dymek, M. (2012). Video games: A subcultural industry. In P. Zackariasson & T. Wilson (Eds.), *The video game industry. Formation, present state, and future* (pp. 34-56). New York: Routledge.
- Foxman, M. (2019). United we stand: Platforms, tools and innovation with the unity game engine. *Social Media + Society*, 5(4), 1-10. doi:[10.1177/2056305119880177](https://doi.org/10.1177/2056305119880177)
- Gillespie, T. (2018). Exodus international. Banned apps, app stores, and the politics of visibility. In J. W. Morris & S. Murray (Eds.), *Appified. Culture in the age of apps* (pp. 51-60). Ann Arbor: University of Michigan Press.
- Jenkins, H. (2006). *Convergence culture: where old and new media collide*. New York: New York University Press.
- Jin, D. Y. (2013). The construction of platform imperialism in the globalization era. *TripleC: Communication, Capitalism & Critique. Open Access Journal for a Global Sustainable Information Society*, 11(1), 145-172.
- Keogh, B. (2019). From aggressively formalised to intensely in/formalised: Accounting for a wider range of videogame development practices. *Creative Industries Journal*, 12(1), 14-33.
- Kerr, A. (2017). *Global games: Production, circulation and policy in the networked era*. New York: Routledge.
- Kirkpatrick, G. (2013). *Computer Games and the Social Imaginary*. Cambridge: Polity.
- Morris, J. W., & Murray, S. (2018). Introduction. In J. W. Morris & S. Murray (Eds.), *Appified. Culture in the age of apps* (pp. 1-19). Ann Arbor: University of Michigan Press.
- Moseghvdlishvili, L., & Jansz, J. (2013). Negotiability of technology and its limitations. *Information, Communication & Society*, 16(10), 1596-1618.
- Nicoll, B., & Keogh, B. (2019). *The Unity game engine and the circuits of cultural software*. London: Palgrave Macmillan.
- Nieborg, D. B. (2015). Crushing candy: The free-to-play game in its connective commodity form. *Social Media + Society*, 1(2), 1-12. doi:[10.1177/2056305115621932](https://doi.org/10.1177/2056305115621932)
- Nieborg, D. B., & Poell, T. (2018). The platformization of cultural production: Theorizing the contingent cultural commodity. *New Media & Society*, 20(11), 4275-4292.
- Nieborg, D. B., Young, C., & Joseph, D. (2020). App imperialism: The political economy of the Canadian app store. *Social Media + Society*, 6(2) doi:[10.1177/2056305120933293](https://doi.org/10.1177/2056305120933293).
- Rietveld, J., Schilling, M. A., & Bellavitis, C. (2019). Platform strategy: Managing ecosystem value through selective promotion of complements. *Organization Science*, 30(6), 1232-1251.

- Rochet, J.-C., & Tirole, J. (2003). Platform competition in two-sided markets. *Journal of the European Economic Association*, 1(4), 990-1029.
- Srnicek, N. (2017). *Platform capitalism*. Cambridge: Polity.
- Statista (2020). *Games market revenue worldwide in 2020, by segment*. Retrieved May 4, 2020, from <http://statista.com/statistics/278181/video-games-revenue-worldwide-from-2012-to-2015-by-source/>
- Suominen, J. (2017). How to present the history of digital games: Enthusiast, emancipatory, genealogical, and pathological approaches. *Games and Culture*, 12(6), 544-562.
- Vaidhyathanan, S. (2018). *Antisocial media: How Facebook disconnects us and undermines democracy*. Oxford: Oxford University Press.
- van Dijck, J., & Nieborg, D. (2009). Wikinomics and its discontents: A critical analysis of Web 2.0 business manifestos. *New Media & Society*, 11(5), 855-874.
- Whitson, J. R. (2019). The new spirit of capitalism in the game industry. *Television & New Media*, 20(8), 789-801.
- Willson, M., & Leaver, T. (2015). Zynga's farmville, social games, and the ethics of big data mining. *Communication Research and Practice*, 1(2), 147-158.
- Young, C. J. (2018). *Game changers: Everyday gamemakers and the development of the video game industry* (PhD dissertation). Toronto: University of Toronto.

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