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Platformisation in game development

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Abstract: This article examines how the process of platformisation is manifesting in videogame development. Rather than reinforcing a top-down perspective of platformisation centred on distribution platforms like app stores, we focus on often overlooked game-making tools and the independent, entrepreneurial, and fringe communities that govern and use them. We draw on case studies of Unity and Twine, two such tools that have transformed videogame creation and distribution. By considering how they complicate existing understandings and definitions of both 'platform' and 'platformisation', we move beyond reductive narratives that frame platformisation as a fixed, hegemonic process. Instead, we reveal a much more ambiguous and complex relationship between game makers and the platforms they use.

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Introduction

This article examines the platformisation of cultural production in contemporary videogame development. Through case studies of two software development platforms used in the production of videogame content, Unity and Twine, we interrogate, complicate, and challenge current understandings of platformisation. We argue that platformisation is neither a singular, monopolising *logic* of cultural production nor a *one-size-fits-all* concept for describing current technological transformations in the production, distribution, and consumption of media content. Instead, we argue that videogame development is undergirded by a plurality of platforms and platformisation techniques, some of which counter the top-down vision of platformisation to envision an alternative politics of game-making from the ground-up. The videogame industry is a key site for analysing the effects of platforms and platformisation on cultural production. Throughout much of its history, it has been a proving ground for various techniques of platformisation, many of which have filtered out into other areas of media production, distribution, and consumption. Both the *razor and blades* approach—selling hardware at a loss and recouping revenue through software sales—and the notion of a walled garden platform ecosystem (Anderson & Woolf, 2010) were perfected by videogame console manufacturers in the 1980s and 1990s (O'Donnell, 2014). More recently, the videogame industry laid the groundwork for the app economy by pioneering and normalising digital distribution through, for example, Valve's Steam marketplace. Valve was launched in 2003, the same year Apple transitioned iTunes into a storefront and five years before the launch of the App Store. Valve's business model now underpins platformisation in the creative industries more broadly, wherein cultural production is premised on closed platform architectures, microtransactions, a reliance on casualised labour, and the extraction of value from the extensive *undercurrency* of user activities (Boluk & LeMieux, 2017).

Discussions of platformisation in relation to the videogame industry often address the evolution of videogame distribution and labour practices (see e.g., Banks & Cunningham, 2016; de Peuter & Young, 2019; O'Donnell, 2014; Whitson, 2018; Tyni, 2017). In this article, however, we look at how processes of platformisation are playing out in the often overlooked realm of videogame creation and development, rather than distribution platforms themselves. Since the mid-2000s, an ex-

plosion of different game-making tools, practices, and communities have challenged the conventional approaches to videogame production in the blockbuster or *triple A* industry. Today, videogame development is just as, if not more, likely to be conducted by a team of a few precarious independent workers as it is by hundreds of full-time employees in a campus-sized studio. Skill-based barriers to entry have been eroded by the proliferation of low-cost and easy-to-use software development platforms known as *game engines*. We trace this shift through Unity, a commercial game engine purportedly used to create over half of all contemporary videogames (Dillet, 2018); and Twine, an interactive fiction editor that has been repurposed as a game-making platform by fringe developer communities. We contrast Unity's technologically deterministic claim of *democratising* videogame development with the community-driven practices of platformisation associated with Twine. These case studies showcase the multiple and uneven processes of platformisation that constitute videogame development: the top-down, universalising processes of platformisation advanced by the Unity game engine on the one hand; and the diverse multitude of player, hobbyist, and artistic development practices facilitated by Twine on the other. Through these contrasting case studies, we argue that familiar narratives of platform capitalism and imperialism (Dyer-Witheford & de Peuter, 2009; Jin, 2015; Srnicek 2017) do not manifest uniformly. Instead, platformisation in game development is a far more ambiguous and multiplicitous process than previous research has suggested.

In the first section we define key terms such as platform and platformisation, outline conceptual blindspots in the scholarly discussion and deployment of these terms, and suggest how critiques of game-making tools can help illuminate these blindspots. The next section introduces our case studies of Unity and Twine to explore what it means to consider game engines as platforms and what challenges they pose to current understandings of platformisation. These case studies reveal a plurality of platformisation techniques in videogame production, some of which cannot be easily assimilated into an all-encompassing, global conception of either platforms or platformisation. The final section then contextualises these case studies within literature on alternatives to platform capitalism.

Platforms and platformisation

The term *platform* has assumed multiple meanings and shifting connotations since its emergence in the 16th century. These range from the material to the figurative, passive to active: an elevated horizontal surface, a set of ideas and principles, a blueprint or plan for action, a type of shoe and, most recently and familiarly, the

combination of computer hardware and software that runs a particular operating system (Gillespie, 2010). As Peter Keating and Alberto Cambrosio (2003, p. 28) note, this last meaning has been extended by *high-tech domains* like the computer and biotech industries to present platforms as a "basis for change and innovation", fusing all of these connotations together: the material, political, and technical. This has given rise to the relatively recent definition of platforms as programmable infrastructures that facilitate and mediate exchanges between end users and complementors or content creators (see e.g., Poell, Nieborg, & van Dijck, 2019, p. 3). Typically, Apple and Google's app stores are held as canonical examples of platforms. They consist of complementors (app creators) who distribute their content for free, at an up-front cost or with in-app microtransactions to end users (smartphone owners). Meanwhile, the owners (Apple and Google) harness their users' data for profit or to improve their services. But there are many types of platforms, not all of which involve financial transactions or data extraction; and definitions even of digital platforms abound. In this article, we acknowledge these technical definitions of *platform*, while also accounting for the more diffuse and elusive meanings of the term beyond the technical and infrastructural.

More recently, numerous scholars have deployed the term *platformisation* as a concept to describe the growing integration of digital platforms' business models, infrastructures, algorithms, and the practices around them into every facet of society (Casili & Posada, 2019; Helmond, 2015). Notably, platformisation signals a shift from "a discussion of 'platforms' as 'things' to an analysis of 'platformisation' as a process" (Poell, Nieborg, & van Dijck, 2019, p. 4). Understanding platformisation as a process inherently means zooming out to consider the broader picture of how platforms are transforming society through economic competition, technological infrastructures, government policies, labour, and everyday practices. According to Thomas Poell, David Nieborg, and José van Dijck's (2019, pp. 5-6) definition in this journal, platformisation encompasses the relations between the ever-changing technical infrastructures, political economy, and governance of platforms on one end of the spectrum; and the cultural practices—work, consumption, sociality, representation, expression—that unfold within and around them at the other end. Dal Yong Jin (2015) argues that platformisation extends its hegemonic force into a global order that warrants its definition as a process.

Scholarship on digital games has foregrounded and informed the broader literature on platforms and platformisation. Formative texts in the field of game studies that focused on the business models and cultures of digital games and play emphasised the tensions and negotiations between manufacturers, game creators,

and players, and the tendency towards monopolisation and imperialism (Dyer-Witheford & de Peuter, 2009; Kerr, 2006; Kline, Dyer-Witheford, & de Peuter, 2003). The MIT Press's *platform studies* series, inaugurated by its series editors' book on the Atari 2600 videogame console (Montfort & Bogost, 2009), provides a methodological *platform* itself for examining the technological affordances and cultures surrounding specific platforms (see Anable, 2018; Apperley & Jayemanne, 2012; Benson-Allott, 2016; Leorke, 2012 for relevant critiques of this approach). Research both inside and outside game studies continues to draw on case studies from the videogame industry to examine the implications of platformisation for contemporary labour practices (see e.g., Banks & Cunningham, 2016; de Peuter & Young, 2019; O'Donnell, 2014; Whitson, 2018) and the political economy of software development in an increasingly platformised landscape of marketing, distribution, and sales (Boluk & LeMieux, 2017; Nieborg, Young, & Joseph, 2019; Tyni, 2017). Meanwhile, individual games themselves have become platforms for service provision, co-creative player governance, and value extraction almost on par with the platforms through which they are traditionally distributed (see Banks, 2013).

As Tarleton Gillespie (2017) notes, the platform's initial reference to a programmable infrastructure upon which other software can be built and run was adapted by social media platforms in the 2000s to naturalise relations and set expectations for their use, impact, and responsibility (see also Chia, 2012). Gillespie (2017) and Poell et al. (2019) point out that these connotations helped construct a *metaphor* or *imaginary* around platforms that sought to simultaneously attract users through the discourse of participatory culture and obscure the business models, infrastructures, algorithms, and labour practices behind them. By drawing on connotations of the platform as empowering, open, and collaborative—*springboards for future action* (Keating & Cambrosio, 2003, p. 27)—platform owners often obfuscate the intricacy, multiplicity, contested uses, and governance regimes that underpin their platforms. This in turn helps them discursively elude responsibility and accountability to users and regulators. As Gillespie (2017, n.p.) puts it, "the platform metaphor does a great deal of work, not only in what it emphasizes, but in what it hides".

Approaching platforms as an object of study is therefore particularly fraught, given the many semantic applications of the term platform and its interchangeability with other terms in the technology industry—application, service, console, network, and system—all of which can also be platforms or part of a platform's infrastructure. Aubrey Anable captures this elusiveness when she writes, "rather than being discrete objects, platforms, and the ways they connect us technologically

and socially to others, are porous, penetrating, and penetrable"(Anable, 2018, p. 137). Platforms, she points out, are inherently fluid, "promiscuous", even "slutty" in their exposure of our lives and data (Chun & Friedland, 2015); and our bodies and identities are inexplicably tied to their production and consumption (Nakamura, 2014). Research on platforms helps establish a critical lens to examine what Gillespie describes as the *distortion* of the term by platform owners themselves. But it also entails inheriting their distortion and semantic porosity through mainstream discourse, potentially leading down a paradoxical path of being simultaneously universalising and imprecise in its scholarly application as well (Anable, 2018, p. 138). Platformisation is also undeniably useful for understanding and critically examining the ongoing process of how platforms are reshaping society at the macro level, from the reinforcement of monopolisation and precarious labour (Grohmann & Qiu, 2020) to anxieties about data ownership, privacy, and disinformation. But it is also inherently abstract, as Poell et al. (2019, p. 6) themselves acknowledge in their definition. This abstract and diffuse nature of platformisation—both as an academic category and a process itself—has led to a disjuncture between research that focuses on the big picture, primarily from an infrastructural or economic perspective; and research centred on micro-level practices that unfold around platforms from sociocultural perspectives.

Platformisation is not just a way to understand the world, it also shapes the world by marginalising alternative configurations, histories, and politics of platforms. In their analysis of Google and Facebook, Jean-Christophe Plantin, Carl Lagoze, Paul Edwards, and Christian Sandvig (2018, p. 306) describe how corporations are reshaping public interests and infrastructure through "the economic logics typical of platforms", such as scale and monopoly. In conjunction with technical structures and political sentiments, this *logic of platforms* is reorganising expression, communication, and knowledge that coexist with, challenge, and even supplant infrastructures. Using the cases of Google and Facebook, Plantin et al. extend their analysis of profit-driven corporate ecosystems into a logic of platforms more generally. Within the humanities and social sciences at least, platformisation is almost always taken for granted as synonymous with capitalism, cultural imperialism, and/or colonialism, eliciting calls to regulate or resist its effects (see e.g., Couldry & Mejias, 2018; Jin, 2015; Srnicek, 2017).

However, since platforms vary in their orientations to the market, the utility of the platform concept is limited by this tether to commercial imperatives. While it is important to critically address these tendencies in platformisation, such arguments risk adopting a universalising, homogenising, and Western-centric perspective that

ignores the pluralities of platformisation across cultural, political, and geographic contexts (de Kloet et al., 2019; Milan & Treré, 2019; Nicoll, 2019). They also overlook the myriad open public platforms that seek to produce *network effects* (Rochet & Tirole, 2003) not for profit and competition, but to cultivate collectivism and cooperativism (Scholz, 2017, 2016; Vassilakopoulou et al., 2017). This variation in platform orientations and imperatives is better served by considering not what Plantin et al. call the logic of platforms, but what Bernard Miège (1987) calls a heterogeneous set of production logics that structure cultural industries. These logics arise primarily from an informational medium's market-orientation, and secondarily from its representational forms and modes of delivery. Miège emphasises that these logics should not be understood as deterministic; rather, "the practices of actors meet social logic with which they interact and which they, to a certain extent, modify while being subject to its structuring effect" (Miège, 1987, p. 288).

In this paper, we draw on but also complicate Poell and colleagues' definition of platformisation in this journal as reprogrammable digital infrastructures that coordinate end users and complementors by systematically collecting, algorithmically processing, monetising, and circulating data; we also examine broader cultural accounts and implications of this conception of plaformisation. We acknowledge its usefulness as a descriptive term, but also seek to address these limitations. Platformisation, we argue, cannot merely be a normative framework for examining the extension of platforms into society, but neither can it always be conflated with capitalist expropriation and expansion. To explore these ambivalences, we examine how platformisation manifests rather more ambiguously through two distinct game-making platforms, Unity and Twine, which each promise contrasting modes of platform governance and democratisation.

Game-making platforms and the platformisation of game development

While a comprehensive history of videogame development is beyond the scope of this article, in this section we briefly spotlight key shifts that have occurred in the platformisation of game-making since the 1980s—shifts that prepared technological, economic, and cultural ground for the emergence of game engines such as Unity and Twine in the 2000s. For much of their history, videogames and videogame development have been irrevocably tied to the platform infrastructures and intermediaries that facilitate their production, distribution, and consumption (Nieborg & Poell, 2018, p. 3). During the US-driven videogame market crash of 1983, revenues plummeted as videogames from third-party developers flooded the

market without any quality control from console manufacturers like Atari. This market saturation coupled with growing competition from home computers effectively bankrupted Atari and other US manufacturers, almost ending the nascent industry. But industry dominance instead shifted from the US to Japan, where Nintendo introduced its third-party licencing system that required developers to seek an official *seal of quality* from Nintendo before they could publish their videogames on Nintendo's platforms. This seal used a combination of cultural, legal, and technological strategies to shift the centre of power in videogame development away from videogame developers and towards the console owners (see O'Donnell 2014, pp. 169-217). This system helped rebuild consumer confidence in the quality of home console games while ensuring developers remained tethered to manufacturers' cycle of console production, eventually ushering in the current oligopoly of Nintendo, Sony, and Microsoft.

Although console production, distribution, and development became increasingly platformised during this period, it is important to note that the PC and microcomputer industries, which flourished in the 1980s and were strongly associated with the playing and making of videogames (Kirkpatrick, 2013, pp. 74-75), initially followed a somewhat different trajectory. While the US and Japanese console markets stagnated in the early 1980s, the PC and microcomputer industries in, for example, New Zealand (Swalwell, 2007), the United Kingdom (Gazzard, 2013), and Czechoslovakia (Švelch, 2018) fostered their own, regionally diverse videogame development and playing communities. The PC and microcomputer industries were, like the console market prior to the US-driven crash, characterised initially by a *proliferation* of hardware and software standards—each unique to their local, national, and regional contexts—and, by extension, a proliferation of player and developer communities. Yet, as early as 1983, companies such as Microsoft were attempting to bring these deterritorialised hardware and software standards (and the unruly player and developer communities associated with them) under more centralised control, through techniques of platformisation. For example, the MSX platform, Microsoft's early (albeit largely failed) attempt to create a universal microcomputer operating system, was established in 1983 as a means of drawing "previously national computer manufacturers (and the unruly, oftentimes *bricolage* platforms they created) into Microsoft's increasingly transnational orbit" (Nicoll, 2019, p. 78). The PC and microcomputer industries, despite proliferating in the 1980s, eventually became dominated by a small number of platform companies and modes of platformisation.

Beyond the 1980s, this model of platformisation was deployed as a strategy to cu-

rate and editorialise content distribution. This gave rise to a period, from the late 1980s until the mid 2000s, of what Keogh (2019) has elsewhere called *aggressive formalisation*, wherein the most established commercial videogame developers were able to perpetuate an imaginary of the videogame industry as the only site where authentic videogame development could occur. Amateur work was, during this period, relegated to the domain of player (or *user*) activity, rather than professional development. Things began to shift quite dramatically in the 2000s, however, when the rise of digital distribution first broke the bottleneck of distribution that console manufacturers had constructed. But it was the increased availability of low-cost and easy-to-use game *development* tools that opened the floodgates of independent game development. These tools varied in terms of their accessibility. Some, such as RPG Maker, were intuitive even for people from non-programming backgrounds, while others, such as Flash, required a greater degree of programming knowledge. But they nonetheless opened game development to a wider group of people than was once possible in the period of aggressive formalisation. Game engines such as Unity, which we will examine in the following paragraphs, actively sought to capitalise on the vast *undercurrency* (Boluk & LeMieux, 2017) of player-oriented, amateur, and hobbyist videogame development practices that preexisted their emergence. These practices constituted an undervalued seabed of cultural production that was actively suppressed during the previous period of aggressive formalisation. By tapping into this seabed, game engines such as Unity brought the platformisation logics already dominating videogame distribution into the realm of videogame production; in effect *neoliberalising* game development through ostensibly user-friendly and free design tools.

At this point, it is necessary to clarify what exactly a game engine is. As Nicoll and Keogh (2019) argue elsewhere, a game engine is a software tool that enables interactive digital content (primarily, but not exclusively, videogames) to be created, and a code framework that enables said content to run on various devices, including smartphones, consoles, and virtual reality technologies. Game engines are, as John Banks (2013, p. 53) argues, *multiple objects* that coordinate and render interoperable the various knowledge boundaries and disciplinary roles that constitute the development process: design, art, programming, management, and so on. Historically, though, game engines have tended to delegate more power to programmers than, say, artists or designers. The reason for this is that in most instances, game engines have been created by programmers, meaning that designers and artists often have no choice but to filter their work through the expertise of a programmer (see Whitson, 2018). [1] Game engines have been used in videogame development since at least 1993 (Bogost, 2006, p 60; Lowood, 2016, p. 203) and,

since their emergence, have always operated as software platforms for videogame development—that is, as infrastructures and intermediaries that enable videogame developers to co-create, coordinate, and run videogame content. Game engines are, in this sense, more than simply neutral software development tools. They are platforms that facilitate very particular design methodologies, production workflows, and systems for convening the activities of their users. Until the mid-2000s, and coinciding with the period of aggressive formalisation described above, game engines were typically created in-house by videogame development studios. They were highly protected proprietary software, only accessible to other developers through steep licensing fees, and were thus unobtainable by most small- or mid-sized videogame developers. More recently, however, third-party and easily accessible commercial game engines such as Unity and Epic's Unreal engine have emerged to become not only platforms for cultural production but also key agents in the platformisation of cultural production in the videogame industry.

Unity: disrupting videogame platformisation through democratisation

Unity, which was first released for public consumption in 2005 but has subsequently gone through multiple updates, is the dominant commercial game engine in use today. Unity is more than just an intermediary tool that enables videogame developers to create and run videogame content. It is also a technology that platformises videogame development in the way that it seeks to mediate, govern, and monopolise videogame production processes, developer identities, and career aspirations. For example, Unity's design interface, which resembles that of a programme such as Adobe Photoshop, foregrounds "user-friendly" production workflows—a far-cry from the opaque and unintuitive proprietary game engines of the past. Despite its appearance as a *blank slate* upon which any game idea, genre, or project can be realised, Unity ultimately encourages users to follow the "grain" of its default design methodologies, thus orienting the creative process toward conventional and even conservative outcomes (see Nicoll & Keogh, 2019, pp. 67-70). It restricts access to its underlying source code, thus sealing over "the otherwise latent potential of code" (Freedman, 2018, n.p.) and preventing users from reengineering the tool from the ground-up. More broadly, Unity positions itself as a meta-platform that can play host to other software platforms and the standardised design techniques and data types associated with them (including graphic design tools, middleware programmes, and code editors), thereby establishing itself as a

1. It should be noted, however, that this power hierarchy in software development has shifted somewhat with the emergence of game engines such as Unity. See Nicoll & Keogh, 2019, pp. 53-57.

bottleneck through which all software-based workflows can conveniently pass through. Most users can develop and publish Unity-developed content "for free"—that is, in exchange for their data and their commitment to an end user license agreement (EULA), which results in a certain percentage of royalties on Unity-published content being owed to Unity—thus contributing to the engine's network effects and its (hegemonic) identity as a *democratised* game-making platform.

As Nicoll and Keogh (2019) argue elsewhere, commercial game engines such as Unity can, for the above reasons, be considered *cultural software* (see Manovich, 2013) that, in a similar vein to software platforms such as GarageBand, Photoshop, and Final Cut Pro, give shape to the material basis of cultural production. Cultural software "*provide code frameworks for actions we normally associate with cultural production*"—they seek to superimpose themselves upon the entire production pipeline, from individualised workflows to modes of collaboration to publishing processes—and, in this sense, they are consonant with a broader platformisation of cultural production (Nicoll & Keogh, 2019, p. 4, italics in original). In this way, Unity, and related commercial game engines such as Unreal, have radically altered just who is able to produce commercially viable 2D and 3D videogames. They have facilitated a shift in the videogame industry from predominantly triple A, large-scale, and corporatised videogame production to small-scale, entrepreneurial, and independent videogame production. This is not dissimilar to the broader neoliberalisation of creative labour, of which platformisation is but one aspect (de Peuter, 2011; McRobbie, 2018; Nieborg & Poell, 2018).

Unity, as proclaimed in its marketing discourses and by its proponents (see Unity, 2018), promises to democratise game development in a direct response to the videogame industry's previous state of aggressive formalisation. It is free to download and use (with certain caveats, as described above), its editing interface is moderately intuitive (at least in comparison to proprietary game engines of the past), and it establishes something akin to a common set of design standards in videogame development, almost by virtue of its sheer popularity (developers have not collectively agreed upon these design standards, but rather adapted to Unity's design standards). For these reasons, Unity's *discourse of democratisation* (Nicoll & Keogh, 2019) has gained enormous traction in most videogame development communities and industries. Unity's CEO, John Riccitiello (in Takahashi, 2018, n.p.), boasts that Unity is "responsible for more than half" of all videogames published on commercial platforms, and that it is used by developers in almost all countries and regions, except for the Vatican, South Sudan, and North Korea.

Unity conscripts developers in the co-creation of its underlying platform infrastruc-

ture under the guise of an open, participatory, democratic system of governance. It has an *asset store* that enables Unity developers to create, sell, and share assets, including graphical assets such as user-developed 3D models and textures, as well as plugins that augment Unity's underlying toolset. These user-made assets and plugins are essential for most Unity developers, and it is not uncommon for popular user-made assets and plugins to be incorporated into official Unity updates. As such, Unity has created a platform environment wherein users are encouraged to feel as though they have a "say" in how Unity is further developed (see Nicoll & Keogh, 2019, p.: 42). However, it is important to recognise that Unity built popularity not only by utilising techniques of platformisation, but also by capitalising on the groundswell of calls, made largely by marginalised developers in the 2000s and early 2010s, for greater accessibility, transparency, and equality in the videogame industry (Anthropy, 2012; Harvey, 2014; kopas, 2013). By capitalising on these existing calls for democratisation, Unity strategically aligns itself with the creative, political, and economic ambitions of students, indies, artists, programmers, marginalised developers, and studios alike. By extension, it also conceals the imperialistic undertones of its aim to "bring democracy" to all videogame developers, communities, and industries, regardless of culturally specific game-making practices, preferences, and identities (see Vogel, 2017).

The discourse of democratisation makes an enticing promise to prospective Unity developers. It implies that anyone can become a videogame developer and that anyone can become successful. It conflates democratisation with meritocratic ideals of individualised success, creative autonomy, and flexible, decentralised work arrangements. Jennifer Whitson argues that these promises are consonant with a "new spirit of capitalism" in the videogame industry, wherein democratised and data-driven design tools "promise access to autonomous and creative work, which is perceived to be lacking in the hits-driven, risk-averse AAA industry" (Whitson, 2019, p. 790). Angela McRobbie, in the context of creative labour more broadly, describes these same processes through her concept of the *creativity dispositif* or the "toolkits, instruments and new entrepreneurial pedagogies" that encourage prospective media creatives to embark on careers in the risk economy of creative work (McRobbie, 2016, p. 86). In a similar way, Unity positions itself as a politically neutral or even progressive actor in the videogame industry through what Nicoll and Keogh (2019) call a *democratisation dispositif*. It does this both through its business model, which is premised on providing developers with free software in exchange for their commitment to an EULA, and through its user interface, which provides the illusion of a *blank slate* upon which any game idea, genre, or project can be realised. In this way, Unity's self-positioning as a neutral actor echoes con-

notations of the term *platform*, although interestingly, Unity does not refer to itself as a platform. Nonetheless, in line with other commercial platforms that present themselves as public infrastructures and/or services, Unity leverages its discourse of democratisation to disarm critique and naturalise its monopolistic tendencies. As Whitson argues, in an era of "democratised" videogame development, "[c]reative autonomy and the ability to work on 'passion' projects [...] are deemed a reasonable trade-off for long-term jobs and predictable wages" (Whitson, 2019, p. 4). Within this milieu, traditional modes of critique, such as those centred on unionisation in the interest of a collective (rather than individual) good are undermined.

Despite its sustained effort to become the default engine for videogame development, Unity has, for the most part, successfully offset critiques of monopolisation and evaded calls for its regulation. As argued above, this is partly due to Unity's deployment of a *democratisation dispositif*. But Unity's success can also be linked to its strategic intervention in the history of videogame development. For at least two decades prior to Unity's emergence, videogame development was, as discussed above, characterised by an aggressive formalisation of the means of production. As Casey O'Donnell writes, the industry was, during this period, characterised by secrecy, protectionism, and the rampant patenting of software development tools and techniques], "both [from the] *top-down*—non-disclosure agreements, closed licensing structures, proprietary hardware and software—and [from the] *bottom-up*" (O'Donnell, 2014, p. 273). The reason so many developers have warmed to the idea of Unity as a default game-making tool is, quite simply, because Unity seeks to platformise videogame development (see Nicoll & Keogh, 2019, pp. 72-75). It provides common design standards—common production workflows, default design methodologies, and accessible 3D game-making toolsets—where previously such standards only existed in the amateur space. It enables developers to export builds of their Unity-developed content to various platforms—PlayStation 4, Nintendo Switch, Oculus Rift, Mac, PC, and so on—with, effectively, the click of a button. Previously, if developers wanted to optimise their content for different platforms, they would need to re-develop said content from the ground-up, often by tweaking the underlying proprietary engines that were themselves developed from the ground-up. For David Nieborg, game engines such as Unity therefore "lock developers into specific distribution outlets", which ultimately "marks a further concentration and centralization of control over game distribution and, equally important, advertising" (Nieborg, 2020, pp. 4-5). In this way, Unity is an important example of how game engines have utilised techniques of platformisation in an attempt to consolidate *winner-take-all* markets at the level of

videogame production (Nieborg, 2020, p. 6). Despite this fact, Unity is not the only game engine in existence, and nor is its specific model of platformisation the only one that has taken hold in videogame development.

Twine: platfomisation at the margins

Commercial game engines such as Unity deploy and extend techniques of platformisation in ways that fit more-or-less neatly into the singular, all-encompassing notion of platformisation as it is typically deployed in scholarly research. But there are a variety of lesser-known game-making tools that challenge, complicate, and even undermine platformisation as a fixed process of cultural production. One such example is Twine, a free open source HTML-based interactive fiction editor. Through Twine users can create and publish hypertext narratives as HTML files, which can then be shared online: on a self-hosted website or made available for free, at a set price or *pay what you want* model through services like itch.io. Twine was originally created by Chris Klimas in 2009 as hypertext editing tool, but it was soon mobilised by videogame developers, many of whom occupied marginal positions in videogame culture and, in some cases, had vocally critiqued the formal videogame industry (see Anthropy, 2012; kopas, 2015). Importantly, Twine was not simply used as a game-making platform but, more specifically, it was leveraged as a tool for the platformisation of informal game-making communities. Twine is, to borrow Nancy Baym, Lana Swartz, and Andrea Alarcon's (2019, p. 403) terminology, a platform that, through the activities of its diverse developer and player communities, acts as a *convening technology* around which a shared, political project can be articulated. Through Twine and independent commercial platforms like itch.io, a community of players and developers have proposed an alternative platform ecology for the making and playing of videogames—one that has allowed them to disinvest from the presumed logics of platformisation that characterise mainstream videogame development, distribution, and consumption.

In contrast with commercial game engines such as Unity, Twine does not demand knowledge of typical programming languages such as C#, and its minimal *what you see is what you get* interface is in stark contrast to the vast number of options available when first opening Unity. That *Twine games*—a label that has become as much a genre as a descriptor of the tool used—are less demanding to make in terms of technical skills than traditional videogames is not to suggest that Twine authors are unskilled or do not possess or utilise programming knowledge (see Ruberg, 2019, p. 780). While Unity is experienced as democratising by those who are already inculcated in the culture of videogame development and computer science (see Nicoll & Keogh, 2019, pp. 72-73), Twine's editing interface "most closely emu-

lates the brainstorming, content generation, and organizational process of writing" (Friedhoff, 2013, p. 4). While Unity's vision of democratisation implies the promise of a universal game engine—a meta-platform that can do anything and everything; that can facilitate any possible production workflow, design methodology, or videogame type—Twine is explicitly *non-neutral* in its affordances as a game-making platform. It does not leverage the platform metaphor to obscure its technical biases and naturalise its monopolising tendencies. Instead, it encourages users to embrace its technical constraints, and it utilises its network effects to orient users toward alternative ways of engaging with platforms and techniques of platformisation in ways that point towards an alternative platform politics centred on openness and cooperativism, as we discuss further in the final section below.

Twine's diverse player and developer communities—its rise in prominence among videogame developers driven overwhelmingly by women, people of colour, and LGBTIQA+ communities (see kopas, 2015; Harvey, 2014; Ruberg, 2019)—leverage the platform for the creation of games and the articulation of play experiences that overtly "challenge many of the dominant norms and values of mainstream game design, from process to mechanics to content" (Harvey, 2014, p. 99). Due to its accessibility to those who lack the dominant skills traditionally required of videogame development, Twine found itself picked up by a fringe of otherwise marginalised videogame developers. They consequently produced a range of games that directly contravened accepted videogame conventions such as challenge, choice, and graphical fidelity. This includes narratives that deal with disempowerment rather than conquest, and mechanics favouring introspection over agency. As videogame developer, critic, and twine author merritt k (formerly known as merritt kopas) puts it in her edited collection on Twine games,

> these works exist in the context of a medium that historically hasn't made any space for explorations of weakness, hurt, or struggle. And far from being simple excursions in empathy tourism, many Twine games use interactivity to explore complex issues around embodiment and affect in wildly divergent ways (kopas, 2015, p. 14).

A key example is Anna Anthropy's *Queers in Love at the End of the World* (2013). As a ten-second timer in a corner of the screen counts down to the end of the world, the player reads short passages of their interactions with their lover, and makes split-second choices as to how to spend the final moments of their lives. A powerful experience, the entire game is only ten seconds long, presented solely as white text on a black screen, and will always end with the player's death regardless of

the player's choice. Further, while not represented in the game, the title explicitly and deliberately suggests a player subjectivity at odds to the dominant techno-masculine subjectivity of the *gamer* (Bulut, 2020; see also Keogh, 2018).

Elsewhere, Nicoll (2019) calls Twine a *minor platform* that enables its users to explore alternative ways of thinking, playing, and making videogames by deviating from the monopolising tendencies of platformisation. Like Jessa Lingel's (2020) analysis of craigslist's alternative platform politics, Nicoll urges researchers to consider how the player and developer communities associated with minor platforms defy assumed measures of success, progress, and profit, and can therefore help us to think differently about the presumed purpose and trajectory of platformisation. Through its design interface, its adoption as a game-making tool, and its capacity to facilitate communities of practice that undermine dominant modes of playing, making, distributing, and evaluating videogames. Twine reveals that platformisation need not be a singular and all-encompassing logic, but rather, as Anable puts it, a way of mobilising the "porous, queerly promiscuous, and radically leaky" nature of platforms (Anable, 2018, p. 139). Perhaps the most concrete evidence of this is the fact that Twine was never meant to be used as a game-making platform; it was appropriated as one by players and developers who, for various reasons, were unsatisfied with game engines such as Unity (see kopas, 2015). Despite producing network effects, Twine does not *monopolise* its network effects; it remains free for anyone to use and modify, and continues to be a "site of an incredible artistic flourishing at the intersections of digital games and fiction" (kopas, 2015, p. 10). Twine, though, is not immune to the formal videogame industry's various attempts to *capture* and *contain* its network effects and its unruliness as a platform. For example, Twine developers often find themselves held up by the industry as evidence of the videogame industry becoming "more diverse". Such developers are thus burdened with the unenviable task of making the videogame industry "better" (Ruberg, 2019) via their creative practices, political activities, and community engagement initiatives, even as they remain highly precarious, frequently unpaid, and very often unemployed (Harvey, 2014, p 103). Likewise, the emergence of Twine was one among several factors that provided an *opportunity space* of diversified videogame development cultures to emerge, which commercial game engines such as Unity appropriated and capitalised upon (Nicoll, 2019, p. 164).

In addition to this discursive appropriation of Twine, many of the motifs, styles, and genres associated with Twine games, such as the use of interactive, text-based narratives, have filtered into formal videogame development practices. The popular commercial independent title *Firewatch* (Campo Santo, 2018), for example,

utilised a Twine-esque interactive narrative in its introductory sequence as a means of introducing players to its characters, setting, and narrative, before transitioning to a more conventional first-person adventure for the remainder of the game. More recently, Twine received renewed popular attention when Netflix's flagship interactive TV feature *Black Mirror: Bandersnatch* (Slade, 2018) was written in Twine by executive producer Charles Brooker, but with little recognition of Twine's history in (and from) fringe communities (Rubin, 2018). kopas herself seemingly predicted this co-optation of the internal and collaborative labour of Twine's fringe communities in 2015, writing "this is what an artistic revolution looks like: some people get a little famous, nobody gets rich, and years later, people who have more resources than you steal your ideas and use them to get richer and more famous than they already were" (kopas, 2015, p. 8).

Crucially, Twine's network effects are not the result of a hierarchical process of platformisation—that is, a process whereby Twine and/or its key stakeholders imposed a particular business model or means of cultural production on its users. Instead, Twine's network effects are a associated with grassroots, cooperative, and community-driven processes of platformisation facilitated by Twine developers, many of whom distribute their games freely, run Twine-oriented community events, and advocate widely for the use of Twine as a game-making tool (see Nicoll, 2019, pp. 180-184). Moreover, Twine developers have never leveraged the platform's network effects to systematically collect, algorithmically process, and monetise data from users; Twine's developers have never tried to create a monopoly by edging out similar community-oriented platforms like Bitsy, Puzzlescript, or Pico-8. Twine's design interface has not expanded to incorporate a wider variety of techniques, styles, or genres of videogame development. It has always remained, quite simply, a tool for creating and publishing hypertext fiction as one part of a wider platform ecology of independent game-makers. Finally, due to the deeply institutionalised and ideological ways in which the videogame industry valorises certain types of videogames over others (Consalvo & Paul, 2019), combined with Twine's seemingly consistent identity as a minor platform, it is difficult to imagine Twine and its games being distributed and sold in a similar fashion to, say, the PlayStation 4 platform. Indeed, many Twine authors opt to distribute their games via *pay-what-you-want* donations, if they decide to sell their games at all (Alexander, 2013). Importantly, this approach to videogame development is fraught with precarious realities, and should not be fetishised or idealised. It does, however, suggest that platforms and techniques of platformisation can be used to support and facilitate communities of practice that resist, exceed, or simply confound any singular reified process of platformisation.

The politics of platform alternatives

Few would disagree that platfomisation is contributing to the monopolisation and consolidation of digital media distribution in the hands of a few dominant companies, primarily based in a few specific geographic clusters within the US and China. There are measurable gains in users' connectivity, sociality, and access to tools, knowledge, and ideas. Yet this process is also cementing labour precarity, the erosion of privacy, and the spread of disinformation that began to form in the early days of the internet (Terranova, 2004) and are now accelerated by populist governments around the world exploiting these conditions (see Klein, 2020). Our analysis of the divergent trajectories and politics of videogame development platforms suggests that platformisation is not monolithic but messy and promiscuous. Yet, the crux of this analysis is not additive but critical. We present our case studies not to diversify, but to decentre, platformisation as a logic.

A *logic*—-whether of platformisation or capitalism—is a crystallisation as well as a reduction of instabilities, divergences, and alternative courses to what is conceptually manageable. Sherry Turkle and Seymour Papert (1990) maintain that the determination and deployment of logics are a kind of formal thinking that emphasises control through structure and planning, hierarchy and abstraction. In Western cultures, this style of thinking has been given a privileged status over other styles of thinking, knowing, and doing that favour concrete and contextual instead of abstract forms of reasoning. Turkle and Papert add that concrete and formal thinking are ideal types that scaffold the social construction of gender—the objectivity of abstract thinking and by extension, reason, are aligned with Western male gender norms. The feminist critique of reason does not challenge rational forms of thinking *per se*, but attempts to overcome the traditional masculinisation of reason (Nagl-Docekal, 1999). Citing Luce lrigaray (1987), Herta Nagl-Docekal (1999) offers that logical thinking strives for a kind of unity that is expressed through property, quantity, and binary opposition. This style of thinking minimises ambiguity, ambivalence, polyvalence [2]—qualities that animate the pluralities of platformisation suggested by our case studies.

Contrary to Poell and colleagues' (2019) unifying definition, videogame development platforms do not invariably operate according to the logic of datafication and monetisation. Both Unity and Twine provide contrasting models that expose the difficulty of simply calling for platforms to be regulated or resisted through policy

2. Nagl-Docekal (1999) notes that Irigaray's critique of reason does not adequately acknowledge the breadth of reason in philosophy beyond scientific rationality—including practical, aesthetic, and moral judgement—that underscore feminist scholarship.

interventions and collective action (see de Kloet et al., 2019). Unity conscripts videogame developers into its business model by offering a seemingly benign, neutral, free, and accessible platform, echoing Google's own approach to popularising its Android platform by making it free to manufacturers (Srnicek, 2017, p. 104). Meanwhile, Twine is an open-source tool stewarded by a community that collectively develops strategies, tutorials, and modifications. Instead of collecting its users' data, Twine builds its network effects through (and for) the community that co-opted it for game development purposes, and through mainstream and social media attention around games its users create.

The differences between Unity and Twine point to how platforms do not all operate according to what Shoshana Zuboff (2018) calls *surveillance capitalism*. For example, Wikipedia has held onto values of the early web such as collaboration and openness, even as it has also destabilised these values (Tkacz, 2015). In doing so, it has steered away from commodification of user content and data, maintaining its course towards commons-based peer production as a nonprofit organisation (Benkler, 2017). Another holdout from the early web, craigslist, has similarly remained profitable while resisting banner ads and monetising user data. Against a platform economy scrambling towards user expansion, venture capital, and revenue growth, craigslist's design values and business practices have remained committed to user autonomy, update minimalism, and transparent monetisation (Lingel, 2020). As the giant tech platforms such as Google, Amazon, and Facebook monopolise digital culture by setting the terms and conditions of online experience, platforms with alternative politics challenge assumptions about platform politics that seem unassailable.

The tendencies of platforms towards monopoly and growth do not stem from inexorable logics, but from historically contextualised political choices. By reproducing the hegemony of scale from their objects of study, existing platform scholarship risks marginalising platforms that keep digital culture accessible—both in terms of required skills and required finances—as demonstrated by the contrasting models of Unity and Twine. These case studies urge platform scholars to reflect on the desire for and satisfaction of stable definitions and generalisable logics. Challenging deeply entrenched assumptions about the value of hierarchical reasoning, Turkle and Papert (1990, p. 143) advocate for epistemological plurality that asserts "the validity and power of concrete thinking in situations that are traditionally assumed to demand the abstract" (Turkle & Papert, 1990, p. 143). The validity and power of concrete thinking has the potential to enrich Turkle and Papert's field sites of computer culture, as well as the study of computer culture in fields such as platform

studies.

In line with this epistemological plurality, it is useful to consider the hegemony of platformisation as enacted in the sticky materiality of practical encounters, through what Anna Tsing (2005) calls friction. Friction is not resistance to universalising forces; rather, it is the worldly engagement and encounter through which universalising trajectories such as platformisation take shape. Minimum-profit platforms like craigslist and minor platforms like Twine are part of "the awkward, unequal, unstable, and creative qualities of interconnection across difference" (Tsing, 2005, p. 4) that characterise the innate friction of platformisation. The recognition of marginal and contradictory cultures of work, creativity, and sharing in accounts or definitions of platformisation are often analysed as symptoms of a broader inexorable process imposed from above: the "'surface effects' of a deeper and more significant technological structure" (Anable, 2018, p. 137) whose study is primarily the purview of cultural theorists and ethnographers. Similarly, in her critique of Michael Hardt and Antonio Negri's singular portrayal of capitalism in *Empire* (2000), Tsing (2009) laments that such masculinist accounts of capitalism often marginalise and disregard feminist work as too particularistic and not worth reading.

Moreover, the conceptualisation of platform processes as a logic has implications not just for citational politics, but also for imagining possibilities of collective action. J.K. Gibson-Graham contends that masculinist theories of capitalism based on structural imperatives, tight causality, and constrained eventuation can be understood as a form of epistemological realism: "The way we represent capitalism (as all-encompassing and pervasive, or as uneven, fragile, and less extensive than imagined) has an important impact on the way we imagine, act, and claim new spaces of intervention" (Gibson-Graham, 2006, p. 74). Indeed, the platform concept is itself a product of management theory and therefore is not just representational, but operational (Steinberg, 2019). The platform concept—in its reification as logic—is not just a way to understand the world; it also shapes the world by marginalising alternative configurations, histories, and politics of platforms. In this sense, to conceptualise platformisation as a logic that can be encapsulated in a unifying definition is to mistake the map for the territory. Game engines like Unity and Twine illustrate the need for scholarship on platformisation to engage with alternative trajectories and potentialities of platform governance, like minor platforms (Nicoll, 2019), platform cooperativism (Scholz, 2017; 2016), and platform alternatives (Oxford Internet Institute, n.d.).

Platform cooperativism is mission- rather than profit-driven and emphasises com-

munal ownership and democratic governance (Schneider, 2018). Twine, for instance, adapts elements of a minor platform, commons-based peer production, and platform cooperativism. Cooperativism is a crucial intervention in on-demand labour platforms and online labour brokerage platforms. It offers workers and stakeholders solidarity that has been stripped away by the platform configuration that intentionally isolates, distributes, and anonymises their workers and complementors so as to maximise the extraction of value from them—features that resonate with the shift to more accessible game engines. Yet, as numerous scholars point out, democratic governance is elusive even within platform cooperatives, which can reinforce existing disparities centred on class, race, and gender (see e.g., Kaplan, 2019; Lampinen et al., 2018; Schor, 2017). The diversity of Twine's user base provides a counterpoint to these criticisms, but it is also important to recognise that such platforms do not offer an alternative to platform monopolisation and imperialism. Instead, they provide avenues for living within platform *capitalism* and *colonisation* while reminding us that the diversity of platform politics and governance are not just avenues of future possibility, but part of current lived realities.

Similarly, Unity and Twine reveal contrasting visions of regulatory responses to precarious labour. While Unity enables videogame developers to create videogames without making their own engine first, it also does not provide even the limited employment security and benefits that traditionally come with working in a studio. Like app stores, it opens up software production while shifting the costs, labour, and risks associated with videogame development to individuals and profiting when they are successful (Morris & Elkins, 2015, p. 26). Twine, on the other hand, provides an alternative—albeit marginal—outlet for game-making that allows developers to distribute their work without the pressures of meeting the expectations of the mainstream videogame industry.

Both game-making platforms reinforce how pervasive platformisation is, but also highlight the varied and sometimes contradictory paths it can take. These paths do not always easily conform to familiar narratives of platformisation—neither pessimistic visions of capitalist expansion and imperialism, nor optimistic accounts about their emancipatory potential through disruption, democratisation, and participatory publics. As we have shown, Unity is more closely aligned with the former pessimistic account of platformisation (even as it has undeniably assisted a much greater expansion of who has access to commercial videogame development); and Twine with the latter, more hopeful, vision (even as many of its most prolific and acclaimed creators continue to live on subsistence-level incomes). But while both platforms do not interoperate, they do interrelate in creative fields,

identities, and livelihoods. They reinforce the need for a more complex, nuanced account of platformisation that recognises its diversity, complexity, and specificity without lapsing into easy conclusions or simplistic gestures towards this understanding.

Conclusion

One alternative narrative of platformisation might see a videogame developer crunching during the day to finish their commercial videogame within Unity in the—statistically unlikely—hope that it will become a breakout hit akin to *Untitled Goose Game* (House House, 2019; see Reich, 2020). Meanwhile, in the evening they might turn to Twine to elaborate a design idea or express themselves creatively without the pressure of commercial success. Yet even this narrative does not reveal the nuances or contradictions of either of these platforms. For instance, although we have dissected the problems underlying Unity's claim to democratise videogame development—its tendency towards monopolisation and reinforcement of existing exploitative and precarious labour conditions—there is no denying videogame developers *have* benefited from its emergence. It does not represent a shift akin to the overthrow of the existing videogame platform oligarchy, nor can it be said to be modelled on cooperativism, communality, and openness. But it has upended the affordances for who can make and distribute videogames. Similarly, Twine has *revolutionised* videogame development by providing a platform for marginalised developers. But as we have pointed out through the example of *Bandersnatch* and kopas's prescient remarks, it is not immune to appropriation by dominant platforms—whether as an under-acknowledged tool to produce commercial products or an excuse for the mainstream videogame industry to resist including more diverse perspectives. Meanwhile, the marginalised developers that first innovatively used it for videogame creation remain marginal.

Both Unity and Twine highlight the challenge of pinpointing a precise definition of *platform*. Unity is first and foremost identified as a game engine, but as our analysis demonstrates it clearly operates as a platform through a business model focused on expanding network effects and data collection alongside a rhetoric of neutrality and democratisation. Through this rhetoric, Unity has disrupted the existing videogame platform ecology in concert with digital distribution models like app stores, while seeking to establish its own monopoly among game development tools. Twine cannot easily be labelled a platform either, given its similar origins as an interactive fiction editor. But it too has been leveraged *as* a platform by marginalised developers for the creation and sharing of a particular genre of

games and stories. It follows a recognisable pattern of platformisation, albeit harnessing its users' largely unpaid labour to extend its reach as an alternative to traditional videogame platforms, rather than for its creator's profit. In this sense, recognising the imprecision and porosity of how different actors mobilise, format, and conceptualise platforms helps us account for the broader ecology of platform governances. This recognition is vital to van Dijck, Poell & de Waal's (2018) call to realign platform mechanisms with public values.

Through our case studies of game-making under platformisation, we conclude that we need granularity, specificity, and attention to what Jeroen de Kloet and colleagues have already underscored as platformisation's "alternative connections, assemblages, and futures" (de Kloet et al., 2019, p. 254). But rather than merely arriving at this "rather conventional conclusion" as de Kloet et al. put it, scholars must perform this critique better by resisting easy distinctions between *layers* of infrastructure, distribution, regulation, governance, labour, and practice. By tracing how the complex and contested process of platformisation is enacted through game-making tools, we hope to illustrate how this critique might unfold in dialogue with all dimensions of platforms and platform scholarship.

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