

Title: The Videogame Commons Remakes The Transnational Studio

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Over the past three decades, videogames have evolved from electronic toys into complex digital worlds, teeming with sophisticated narratives and hosting millions of player interactions. Yet one of the most fascinating innovations of videogame culture is also one of its most recent. This is the rise of the videogame commons, best understood as a subset of Yochai Benkler's (2006) digital commons (Benkler 2006).<sup>1</sup> Today's videogame commons is comprised of the non-commercial institutions, communities and practices of digital artists, videogame players, and videogame fan communities. Far from being a marginal phenomenon or a relic of the videogame industry's start-up era, the videogame commons has become an increasingly powerful and pervasive feature of videogame culture. In fact, today's videogame commons is radically democratizing nearly every aspect of digital media production, distribution and consumption. There is no better case study of this transformation than Mojang's *Minecraft*.

*Minecraft* was created almost single-handedly in 2009 by Notch, the pen name of Markus Persson, a Swedish software coder. In subsequent years, the franchise was refined and expanded by Mojang, the software studio Notch founded in 2010. By January 2014, fans had purchased at least 13.7 million official copies of the game on various computer platforms, while the unofficial user base is in all likelihood three to five times larger (i.e. 41 million to 69 million users).<sup>2</sup> Yet the true importance of *Minecraft* is not merely its impressive sales results. It is the fact that it embodies a radically new type of digital media production, or what we will call audience-led production.

Certain aspects of audience-led production have been theorized by Henry Jenkins as

“convergence culture” and “transmedia”, namely the fact that digital networks have allowed non-commercial fan communities and fan media production to become influential players within some of the largest contemporary media franchises. Other aspects of audience-led production have been explored by Mia Consalvo's work on the wide range of social behaviors (some benevolent, some predatory) exhibited by player communities inside their favorite digital worlds.<sup>3</sup>

Yet what makes audience-led production truly new is the presence of the transnational audience. This audience consists of the approximately 2.4 billion citizens who can access the internet in mid-2013, a number which is likely to double over the next five years.<sup>4</sup> What makes this audience so important is not just its impressive size and growth potential. It also has two structural features which radically differentiate it from all previous mass media audiences.

The first feature is open source proliferation. This audience is connected via a wide range of digital networks which are not controlled by any single national government, regulatory body or commercial entity. Put bluntly, there is no internet equivalent of Great Britain's control over the telegraph during the 19<sup>th</sup> century, or to the overwhelming dominance of the US film or broadcast television industry over all other competitors for much of the 20<sup>th</sup> century.<sup>5</sup>

This is because the internet is not a single technology, but a vast digital eco-system of multiple technologies, including cellphones, tablets, personal computers, and portable storage media of all kinds. No single nation-state or commercial enterprise has a monopoly over any layer of the hardware or any node of the software of this eco-system. Perhaps the closest any company came to achieving such a monopoly was Microsoft's dominance in desktop computing in the late 1990s, and Nintendo's dominance in videogame consoles in the late 1980s and early 1990s. Both quasi-monopolies faded away, thanks to the proliferation of rival platforms as well

as the rise of mobile digital devices. This proliferation has reached the point that the open source Android platform, a variant of the open source operating system Linux which was specifically designed for mobile devices, now has the largest market share of the cellphone and tablet markets.<sup>6</sup>

The second feature is transnational diversity. Only thirty percent of this audience resides in the fully industrialized nations of the US, Japan, and the countries of the European Union. Seventy percent – approximately 1.68 billion individuals – reside in the industrializing nations. More specifically, close to half of that 1.68 billion are clustered in the four nations of the BRICs, a.k.a. Brazil, Russia, India and China, the four largest emerging markets in the world. Since the industrializing nations have lower per capita incomes than the fully industrialized nations as well as less stringent copyright enforcement regimes, their digital audiences rely overwhelmingly on file-sharing and informal digital media distribution.<sup>7</sup>

As it turns out, the combination of open source proliferation and transnational diversification played an indispensable role in *Minecraft's* success. The official development of *Minecraft* began on May 17, 2009, when Notch released the earliest version of the game as a free download to the online gaming community.<sup>8</sup> The response of the audience was positive, and Notch began to devote significant amounts of time to polish and expand the code. Initially, development of the game was financed by Notch's own personal savings, and later by digital pre-orders for the full game which Notch began to accept on June 13, 2009.<sup>9</sup> However, the first official release of the game did not occur until November 18, 2011, some two and a half years after its development began, and eighteen months after *Minecraft* had become a massive cultural phenomenon.

This is the sort of multiyear development cycle typical of large-scale, blockbuster

videogames. For example, Sony Santa Monica's *God of War 3* (2010) took three years to develop, while Hideo Kojima's *Metal Gear Solid 4* (2008) took four years to develop (2004-2008). Needless to say, Notch did not have the enormous financial and cultural resources available to these studios (e.g. the official credits for *Metal Gear Solid 4* list almost five hundred actors, artists and programmers).<sup>10</sup> The key factor which granted *Minecraft* the time and resources it needed to become a world-class franchise was the engagement of the transnational audience.

We are fortunate to have a detailed record of this engagement in the form of Notch's English-language blog, "The Word of Notch". Notch created this blog on May 13, 2009 to keep fans informed about the development of the game, and the account has remained active to this day. What the blog reveals is that the secret of *Minecraft*'s success was its open and democratic development process.

From the very beginning, Notch did not simply write and debug code. He listened carefully to player feedback on message boards and listservs, participated in online social networks, and read vast amounts of fan email. In addition, Notch sought out – and deferred to – the collective wisdom and judgement of the fan community, by means of online polls, email and chats.<sup>11</sup> Finally, Notch employed the tools of social media, by uploading demonstration videos of *Minecraft* to Youtube and encouraging fans to do likewise.<sup>12</sup>

At first, the role of fans was limited to providing basic feedback and assistance with debugging. As the fan base expanded, however, its structural importance increased, to the point that its members became a key source of inspiration as well as information. Indeed, if there is one single factor which differentiates *Minecraft* from other commercial videogames which integrate fan labor and user-generated content into their core experience, e.g. Sony Media

Molecule's popular and well-constructed *Little Big Planet*, it is *Minecraft*'s bedrock egalitarianism.

Put bluntly, most videogame fan communities are external structures wrapped around a core commercial entity. Since this entity is controlled by the commercial studio or corporation which owns the franchise, fans are structurally disempowered from the beginning.<sup>13</sup> By contrast, *Minecraft* is a commercial franchise wrapped around a core non-commercial fan community. While the fan community does not legally own the franchise, this lack of formal ownership is also irrelevant. The reason is that fans co-produce, co-regulate, and co-distribute the videogame in close concert with the commercial franchise. To borrow a metaphor from banking, an official purchase of the game by fans functions like purchasing an ownership share in a credit union. It is a vote of confidence in the ability of Notch and his co-workers at Mojang to be effective stewards of the underlying code base.

To be sure, this official purchase option did not exist in the earliest phase of *Minecraft*'s existence. The closest approximation of the membership share was *Minecraft*'s registered user count. On his blog, Notch noted there were already 4,200 registered users by June 9, 2009, an impressive number for a newly-created independent videogame. However, *Minecraft* never stopped growing. The numbers of registered users increased to over 15,000 just three weeks later, and passed the 100,000 mark by January 2010. Interestingly, the number of official purchases of the game occurred much later than the registered user base, but subsequently followed a similar exponential growth trajectory (4,818 copies were sold by February 14, 2010, and 37,906 by July 29, 2010).<sup>14</sup>

What this means is that the growth of the user base during the critical period between May 2009 and early 2010 was almost entirely non-commercial in nature. What convinced large

numbers of fans to become *Minecraft*'s unpaid co-creators was not just the franchise's core values of openness and respect for fan labor, or the fact that Notch and the Mojang staff consistently put the needs of the player community ahead of the quest for maximum profit. Above all, it was Notch's capacity to articulate a clear and compelling vision of an audience-led development process to large numbers of fans.

This vision can be summarized in the form of three core strategies inaugurated by Notch, and then carried out by Mojang. The first strategy was extensive cooperation with a wide range of digital media artists, coders, and mod-makers throughout the digital commons. The second was the decision to expand the *Minecraft* eco-system across as many digital platforms as possible. The third was the decision to allow fans to govern the development cycle of the franchise through collective forms of decision-making (a.k.a. digital democracy), rather than by simply following market signals.

The benefits of cooperating with the digital commons are most apparent in the multimedia aspects of *Minecraft*, particularly its sound and music design. On June 7, 2009 Notch announced that German artist C418 (the pen name of Daniel Rosenfeld) would create the music and sounds for *Minecraft*. While a basic set of sounds were introduced to the game on June 28, 2009, C418's memorable and haunting score would be added a year later, on July 7, 2010.<sup>15</sup> As an independent artist, Notch could and did grant C418 the development time needed to create a top-notch sound-track. The implementation of sound also required a specialized sound engine, which was created by fellow programmer Paul Lamb and added to the code on January 5, 2010.<sup>16</sup>

The benefits of the second strategy, an expanding eco-system, were initially more diffuse, but would generate a significant long-term payoff. For one thing, Notch made the source code available to as many personal computer platforms as possible, and did not criminalize file-

sharing or modding (we will describe the structural importance of modding to *Minecraft* in just a moment). For another, Notch understood the immense potential of open source mobile platforms, expressing his desire to have *Minecraft* ported to Android devices as early as May 22, 2009 – a goal which was finally realized two years later, on October 2011.<sup>17</sup> Most of all, Notch designed the game's pricing strategy to maximize the accessibility of the *Minecraft* eco-system to fans, rather than maximizing profits.

On June 10, 2009, Notch announced that pre-orders of the alpha code would be available for 9.95EUR (\$12.94) to help finance development. Beta copies would eventually be available for 14.95EUR (\$19.44), while the full game would cost 20EUR (about \$26).<sup>18</sup> Mojang would followed this strategy precisely, releasing *Minecraft*'s beta version on December 20, 2010 for 14.95 EUR, and releasing the official version of the game on November 18, 2011 for 19.95EUR (US\$26.99). These prices are far lower than the \$70 typically charged for newly-released blockbuster console videogames, though they are in the general range of used copies of videogames two or three years old.

Currently, copies of *Minecraft* for personal computers running Apple's Macintosh OS, Microsoft's Windows and Linux operating systems are available for \$26.99. The mobile versions of *Minecraft* for Android (released in October 2011) and Apple iOS devices (released in November 2011) are available for \$6.99, while copies for Microsoft's XboxLive download service (released in May 2012) are available for \$19.99.<sup>19</sup> The logic behind this pricing is that the marketplace for mobile devices is the largest and most diverse in the world, with large numbers of consumers in the industrializing nations. For consumers in Russia, a middle-income nation where per capita incomes are about one quarter those of the US, the price tag of \$6.99 is affordable, the rough equivalent of a \$30 media purchase for a US or EU consumer.

These prices are especially interesting given the fact that the size of *Minecraft*'s software code is quite small. The personal computer version of the game takes up only 150 megabytes of space, and the mobile versions of the game are even smaller. This is a tiny fraction of the size of contemporary console videogames, some of which require gigabytes of data. The small size of the code and Mojang's principled refusal to criminalize file-sharing means there are almost no technical barriers for users who wish to download unlicensed copies of the game for free.

If the lobbyists of the RIAA who argue that non-commercial file-sharing is criminal and destructive piracy were correct, then *Minecraft* should not exist. Yet Mojang's business model has flourished precisely because audience-led production does not need to monetize every single transaction between digital artists and the fan community.<sup>20</sup> Whatever sales Mojang may lose by permitting fans to share digital copies of the game is compensated for several times over by a variety of savings. These savings include not paying outlandish sums to lawyers for copyright enforcement, not paying for expensive public relations campaigns and commercial advertisements, not paying retailers for stock placement, and not paying for parasitic layers of rentiers, Wall Street operatives, and stock-obsessed executives. Instead, all of these services are provided by the *Minecraft* community.

To understand how this community self-management works in practice, we must turn to Mojang's third core strategy, namely digital democratization. One of the most typical examples of this democratization was an early update which added water and lava to the alpha code on May 20, 2009.<sup>21</sup> The very next day, Notch described a number of additional blocks he planned to incorporate into future versions of the game, and asked for further community input.<sup>22</sup> After sifting through the community's responses, Notch added blocks of sand, gravel, trees, coal, and iron and gold ore to the game-world two days later, on May 23, 2009.<sup>23</sup>

Since these blocks are the fundamental basis of *Minecraft*'s game-world, the fan community had effectively been given the status of co-creators of the game, a structural power almost never granted to fans of any other mass media. The fan community responded with a remarkable outpouring of productivity and participation. By June 9, 2009, less than three weeks after the public launch of the project, *Minecraft* had grown to 4,200 registered users.<sup>24</sup> On June 25, 2009, just three weeks later, *Minecraft* had grown to 15,185 registered users, while 587 consumers completed pre-order purchases.<sup>25</sup> This level of community interest was extraordinary considering that the game still had major bugs, lacked many key features, and would not have functioning sound-effects until its June 28, 2009 release.

This democratization had profound effects on the evolution of *Minecraft*'s game-play. Notch's original code presented players with a world comprised of square blocks of material, wherein each block is a one-meter cube, and where these blocks could be obtained through mining (clicking on a block with a tool) and then placed elsewhere. This potentially made the entire game-world interactive, i.e. the world was a giant set of building-blocks which could be acquired, stored, and transformed via a simple crafting system into useful tools and items.

What the audience did was to co-invent creative uses for this originally static block-world. While Notch did suggest various modes of game-play as early as May 16, 2009, most aspects of game-play were determined through a process of community-based iteration.<sup>26</sup> Late in 2009, the block-world was diversified into a tripartite system of collectible blocks, in-game tools and items, and a more refined crafting system. By January 30, 2010, the game had expanded to include 59 block types, 34 item types, and 36 crafting recipes. The vast majority of these innovations were suggested by the fan community, implemented by Notch, and then play-tested and refined by the community.<sup>27</sup> Over the next two years, this basic schemata would expand

further to include in-game weather effects and climatic zones, and still later bands of hostile enemies and friendly animals. The below chart illustrates some of the main features of the evolution of *Minecraft's* alpha version:

**Table 1.** Selected events during the alpha version of *Minecraft*, which ran 19 months from May 17, 2009 to December 19, 2010.

<b>Chronology</b>	<b>Event</b>
May 17, 2009	First public release of <i>Minecraft</i> <sup>28</sup>
May 21, 2009	Notch discusses block types, asks for community input <sup>29</sup>
June 7, 2009	Digital artist C418 begins work on <i>Minecraft's</i> sound-track <sup>30</sup>
June 9, 2009	4,200 registered users <sup>31</sup>
June 10, 2009	Tiered pricing strategy announced (preorders, beta, official) <sup>32</sup>
June 25, 2009	15,185 registered users and 587 purchases <sup>33</sup>
June 28, 2009	First sound-track added to game (C418's work would be added in 2010) <sup>34</sup>
June 29, 2009	Registered users pass the 35,000 mark <sup>35</sup>
August 28, 2009	Survival mode (i.e. single-player mode) added to game <sup>36</sup>
January 13, 2010	Registered users pass the 100,000 mark <sup>37</sup>
January 29, 2010	Crafting added to game <sup>38</sup>
February 4, 2010	Bows and enemies (“mobs”) added to game <sup>39</sup>
February 12, 2010	Day-night cycle added to game <sup>40</sup>
February 14, 2010	317 users are online on 253 servers. There are now 116,504 registered users, and 4,818 official purchasers of the game <sup>41</sup>
February 21, 2010	Notch polls the community on enlarged maps, 64.7% of 5,358 voters approve <sup>42</sup>
June 17, 2010	630 players are online on 429 servers. There are now 233,538 registered users of <i>Minecraft</i> , and over 20,000 have purchased the game <sup>43</sup>

July 29, 2010	933 players are online on 553 servers. There are now 297,648 registered users, and 37,906 have purchased the game <sup>44</sup>
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By the beginning of 2010, the massive growth of the fan community, along with an equally impressive flood of community-created content, presented Notch with an enormous managerial challenge. It was becoming increasingly difficult for a single person to balance the needs and interests of the player community – or more precisely, the needs of the specific groups which made up an increasingly diverse player community – with the collective needs of the game-world as a whole.

One example of this growing tension was Notch's February 17, 2010 post asking fans whether they wanted experience points in *Minecraft*. Since experience points are a central game mechanic of role-playing videogames, the real issue was whether the player community wanted *Minecraft* to be more of a role-playing experience or not. Two successive polls showed that the player community was deeply split. Out of the 3,969 votes cast for the first poll, 53% voted yes and 47% voted no. Out of the 4,444 votes cast for the second poll, 54% voted yes and 46% voted no.<sup>45</sup>

The only problem with assuming that this slim majority was correct was that the user base was already larger than one hundred thousand (just four months later, *Minecraft* would reach 233,538 registered users and 20,000 official purchasers on June 17, 2010).<sup>46</sup> Conscious that the online vote was not representative of the fan community, Notch introduced a watered-down version of experience points, which would reward player activity but which would not be fundamental to the game experience.

While this deft compromise solved the short-term problem, it did not solve the long-term

issue of how to engage with a fast-growing fan community numbering in the hundreds of thousands and soon the millions. In the past, the only choice for digital artists who managed to create such a popular videogame would have been to either monetize their game themselves in order to pay for the ever-increasing costs of development, or to have someone else monetize their work by selling the game to a commercial publisher.<sup>47</sup>

Notch rejected both alternatives. Instead, he made two key decisions. The first decision was to leave his job at another Swedish company in April 2010 in order to devote himself full time to *Minecraft*.<sup>48</sup> The second was to begin to replace the individualized, ad hoc democracy of online polls, personal updates and social media conversations with a more permanent and collective division of digital labor. This transformation did not occur overnight, but through a process of reflection, trial and error, and community interaction lasting several months. In a post dated August 19, 2010 Notch informed the fan community about the possibility of creating a studio to help run *Minecraft*, and more importantly, what the core values of this studio would be:

I would love to hire some people and set up a small development studio in Stockholm. This would include additional programmers, and someone in charge of the website and community features. And an artist that can make a nicer glass texture. I am not interested in changing the openness of how minecraft [sic] is developed, nor do I have any intention of selling the product to anyone else; I want to be the one developing it. My development speed has gone down lately because of all this crazy cool but scary stuff happening, but I promise you it will go up again soon, regardless of what happens.<sup>49</sup>

There is strong post facto evidence to suggest that the *Minecraft* fan community played a decisive role in shaping Notch's final decision. The very first *Minecraft* fan convention, called MinecraftCon 2010, was a spontaneous and unofficial gathering of fans on August 31, 2010 in Bellevue, Washington. At the time, Notch was visiting various software companies in the region. When fans discovered Notch was in town, they quickly organized a meeting. Around fifty fans showed up, including one in costume.<sup>50</sup>

What these fans could not have known, however, was that Notch's real reason for visiting Bellevue was that he had a job interview at Valve Software, one of the most influential and successful firms in the videogame industry. In his post on August 19, he was still deciding whether to join Valve as an employee, or else to start his own company. Thanks at least in part to the outpouring of fan support and the accelerating expansion of the fan base, Notch decided to stay independent and found Mojang as a company on September 6, 2010.<sup>51</sup>

The crucial lesson Notch learned during the first year and a half of *Minecraft's* development, a lesson he subsequently put into practice at Mojang, was that it was indeed possible to maintain the balance between the needs of a fast-growing player community and an ever-expanding game-world without becoming just another transnational media corporation. What was needed was the replacement of the infrastructures of corporate capitalism by those of community self-regulation. *Minecraft* would succeed not by compromising its core values or by offering consumers a slightly less exploitative form of digital hucksterism, but by replacing neoliberal capitalism with digital democracy on every level of its production, distribution, and consumption.

We will conclude with two examples of this digital democratization. The first is the field of fan-created custom game modifications or mods, a.k.a. the practice of modding. As a

programmer, Notch had always been sympathetic to the practice of modding, which has a rich history within the digital commons.<sup>52</sup> Various versions of *Minecraft* have incorporated especially creative player mods, e.g. on April 8, 2010, Notch incorporated an improved tree generation mod, created by Paul Spooner, into *Minecraft*'s beta code.<sup>53</sup>

That said, the single most important form of modding in *Minecraft* has been the ability of players to customize a given game-world to fit their specific online or offline community. On April 11, 2011, Notch gave Mojang's official blessing to mods, and permitted mod developers to sign up without any financial fees or other costs.<sup>54</sup> Unofficially, Mojang had been providing moral and symbolic support to modders for some time, e.g. the Minecraft Coder Pack (MCP) project, which began in 2010.<sup>55</sup>

The result is an astounding profusion of mods, comprising everything from in-game mapping systems to game-play alterations. Indeed, these mods form an eco-system which is so large and complex that it deserves further study in its own right.<sup>56</sup> In an online conversation with Searge, the user name of the lead coder behind MCP, Notch admitted that even he was surprised at the productivity of the modders:

Searge: What is your personal opinion about the MCP project and it's ability to decompile the game and make the source code kind of available to everyone? And how much do you think the fact that modding is made easy by systems like bukkit and MCP (and the number of available mods) affects the sales of Minecraft.

Notch: Personally, I used to feel threatened by it as I felt it challenged my "vision", but on the other hand I also know how wonderful mods are for games. We decided to just let it happen, and

I'm very happy we did. Mods are a huge reason of what Minecraft is.<sup>57</sup>

To facilitate modding, Mojang issued a clear and transparent set of rules governing mods to fans.<sup>58</sup> The basic idea is that fans who purchase the game are permitted to play with and modify the underlying code as they wish, on condition that such modifications remain primarily non-commercial. Commercial uses are still possible, but require official authorization from Mojang. The same conditions apply to fan-created tools, mods and plugins, i.e. these tools, mods and plugins belong to the coder who created them and may be shared freely in non-commercial form, but may not be commercialized without Mojang's permission. The bottom line is that nearly all non-commercial uses are acceptable, while nearly all commercial uses require permission from Mojang.<sup>59</sup> Where most transnational media corporations explicitly restrict the right of their consumers to copy and share media content, Mojang explicitly gives consumers the freedom to share what they wish, while restricting the ability of commercial enterprises to exploit the *Minecraft* fan community for profit.

The second example of digital democratization is the expansion of the multiplayer fan community. This community will continue to grow in the future, due to the fact that the total number of computer and mobile device users in the industrializing nations, where 85% of all human beings reside, will increase significantly over the next five years.

One of the bellwethers of this expansion is the commercial server tracking site Gametracker, which currently lists 10,349 active servers running *Minecraft*. This makes *Minecraft* the third most popular game or software utility on Gametracker's list.<sup>60</sup> While the bulk of these servers are located in the industrialized nations (primarily the US and EU), Russia had 314 servers, underlining the rapid growth and increasing importance of Russia's digital media

culture (by contrast, Brazil has 49, not far above Argentina's 32, and less than Chile's 58).<sup>61</sup>

While these servers capture only a small percentage of the activity of the fan base, they do indicate the vitality of a key segment of the *Minecraft* community, namely fans of online multiplayer games.

This expansion of multiplayer content is significant because it points to a new kind of collective gaming experience, one with low barriers to entry (the *Minecraft* code can easily run on mobile devices as well as older and slower computers, and does not require powerful servers) and one which the fan community can customize and modify as it sees fit. Mojang does not operate these servers or regulate their content, but simply gives the fan community the tools it needs to create its own multiplayer game-worlds. While the operation of multiplayer servers and the creation of single-player mods currently require significant amounts of programming skill and technical expertise, these barriers to content creation are likely to diminish significantly in the near future, as the videogame commons further democratizes the tools of interactive media content creation.<sup>62</sup>

To conclude, what makes *Minecraft* so important is not just its extraordinary past growth trajectory or its contemporary success. Its very existence proves that non-commercial networks of artists and fans now have the digital tools, production skills, and demographic weight to co-determine the norms and policies governing corporate control over digital media production and distribution.<sup>63</sup> While transnational media corporations remain influential, they are no longer the only game in town. Henceforth they must contend with vast new transnational audiences, which are beginning to organize themselves via new types of digital mobilization.

This cultural watershed has an important geopolitical corollary. During the thirty year reign of neoliberalism, defined as the transnational, plutocratic form of capitalism which

dominated the world economy from the mid-1970s until the 2008 crisis, the most powerful and pervasive forms of mass media were under the exclusive control of transnational media corporations. These corporations drew the bulk of their revenues from world commercial advertising expenditures, which analyst firm ZenithOptimedia has estimated at \$503 billion in 2013.<sup>64</sup> They also had near-exclusive control over the platforms and technologies of media production and distribution. What *Minecraft* suggests is that the videogame commons, in lockstep with the institutions of the larger digital commons, is beginning to break the chains of corporate advertising and corporate oligopoly over media production. Most remarkable of all, it is achieving this not where neoliberalism is weakest, but precisely where it is strongest: in the very heart of the \$74 billion annual videogame industry.

1. Yochai Benkler's *The Wealth of Networks* remains the indispensable theory of the digital commons. See especially Chapter 3, "Peer Production and Sharing". Benkler, Y. (2006). *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. New Haven: Yale University Press.
2. According to Mojang's company website, there were 13.7 million official owners of *Minecraft* as of January 11, 2014. Mojang. Retrieved from <https://minecraft.net/>.
3. Jenkins, H. (2006). *Convergence Culture: Where Old and New Media Collide*. New York: New York University Press. Consalvo, M. (2007). *Cheating: Gaining Advantage in Videogames*. Cambridge, MA: MIT Press.
4. This is data aggregated by <http://www.internetworldstats.com/>, which compiles the data from the relevant national regulatory agencies. For the sake of comparison, note that the twenty-seven nations of the European Union had 368 million internet users, the US had 245 million, and Japan had 101 million as of mid-2013.
5. This is not to imply that national authorities are powerless, or that national regulations do not matter. Nor does this excuse the deeply problematic monitoring of allegedly private email and messages by America's NSA, Britain's MI5, Russia's FSB, and countless other national spy agencies revealed by Edward Snowden and other digital dissidents. The single greatest strength of the internet, however, was never its ability to encrypt secrets, but its ability to disseminate information to the broad public at an exponentially decreasing cost.
6. According to analyst firm Gartner, tablets and cellphones comprised 83% of all digital device shipments in 2012, while desktops and laptops were only 15%. Gartner. (June 14, 2013). Gartner Says Worldwide PC, Tablet and Mobile Phone Shipments to Grow 5.9 Percent in 2013 as Anytime-Anywhere-Computing Drives Buyer Behavior. Retrieved from <http://www.gartner.com/newsroom/id/2525515>
7. For a fuller account of copyright enforcement and file-sharing in the industrializing world, see: Karaganis, J. (2011), editor. Media Piracy in Emerging Economies. *Social Science Research Council*. <http://piracy.americanassembly.org/wp-content/uploads/2011/06/MPEE-PDF-1.0.4.pdf>
8. Markus Persson. (May 17, 2009). *Minecraft 0.0.11a for public consumption* [Web log comment]. Retrieved from <http://notch.tumblr.com/post/109000107/minecraft-0-0-11a-for-public-consumption>.
9. *Minecraft* Wiki. Retrieved September 20, 2013 from [http://minecraft.gamepedia.com/Minecraft\\_Wiki](http://minecraft.gamepedia.com/Minecraft_Wiki)
10. Internet Movie Database. Retrieved September 10, 2013 from [http://www.imdb.com/title/tt0462423/fullcredits?ref\\_=tt\\_cl\\_sm#cast](http://www.imdb.com/title/tt0462423/fullcredits?ref_=tt_cl_sm#cast)
11. One of the most typical examples of Notch seeking community input is his February 6, 2010 entry, which asked players which feature they most wanted to be added next to the game (the list included player armor, custom-made signs, farming, and other features). Farming – the growing of in-game crops – won by a significant margin. Notch immediately put farming into the next code release. Markus Persson. (February 6, 2010). Polls and farming [Web log comment]. Retrieved from <http://notch.tumblr.com/post/374446728/polls-and-farming>.

12. One of the most famous of these is a demonstration video of *Minecraft's* first-person, block-based world, uploaded on May 13, 2009. Markus Persson. (May 13, 2009). Cave game tech demo [Web log comment]. Retrieved from <http://notch.tumblr.com/post/107315028/cave-game-tech-demo>. Markus Persson. (May 13, 2009). Cave game tech test [Video file]. Retrieved from <http://www.youtube.com/watch?v=F9t3FREAZ-k>
13. It should be noted that this commercial control was never absolute, but was significantly constrained by some key structural aspects of videogame culture. Since almost every digital device nowadays is capable of running videogames and accessing the internet, and since digital media by their very nature are both copyable and sharable, the distribution model of videogames operates very differently from the advertiser-led, oligopoly-controlled models of distribution typical of television and cinema. Videogame studios earn the overwhelming majority of their revenues from final sales to consumers, and are largely independent of advertising revenues. As a result, they do not face the subtle forms of commercial censorship which police broadcast television and Hollywood cinema. Indeed, the long-term evolution of videogame culture since the mid-1970s, shows a consistent pattern of the decline of proprietary platforms, and the corresponding rise of open source multiplicity.
14. Markus Persson. (June 9, 2009). Oops I Meant GPU not CPU [Web log comment]. Retrieved from <http://notch.tumblr.com/post/120755152/oops-i-meant-gpu-not-cpu>. Markus Persson. (January 13, 2010). Member number 100000 was jostvice3d [Web comment]. Retrieved from <http://notch.tumblr.com/post/332684203/member-number-100000-was-jostvice3d>. Markus Persson. (February 14, 2010). My god [Web comment]. Retrieved from <http://notch.tumblr.com/post/389606025/my-god>. Markus Persson. (July 29, 2010). I'm going all gaga now 1000 sales in 24 hours [Web comment]. Retrieved from <http://notch.tumblr.com/post/875499109/im-going-all-gaga-now-1000-sales-in-24-hours>
15. Markus Persson. (June 7, 2009). C418 starts work on the music and sounds for Minecraft [Web log comment]. Retrieved from <http://notch.tumblr.com/post/119457666/c418-is-making-the-music-and-sounds-for-minecraft>. Markus Persson. (June 28, 2009). Client update tomorrow with the basics for sound [Web log comment]. Retrieved from <http://notch.tumblr.com/post/131385451/client-update-tomorrow-with-the-basics-for-sound>. Markus Persson. (July 7, 2010). All credit for the awesome new sound goes to c418 [Web log comment]. <http://notch.tumblr.com/post/782386369/all-credit-for-the-awesome-new-sound-goes-to-c418-btw>
16. Markus Persson. (January 5, 2010). New sound engine implemented [Web log comment]. Retrieved from <http://notch.tumblr.com/post/316961243/new-sound-engine-implemented>
17. Markus Persson. (May 22, 2009). I set up an irc channel for Minecraft [Web log comment]. Retrieved from <http://notch.tumblr.com/post/111362732/i-set-up-an-irc-channel-for-minecraft>
18. Markus Persson. (June 10, 2009). In the spirit of the new economy [Web log comment]. Retrieved from <http://notch.tumblr.com/post/121044061/in-the-spirit-of-the-new-economy>
19. Gamepedia. Retrieved from [http://minecraft.gamepedia.com/Pocket\\_Edition\\_version\\_history](http://minecraft.gamepedia.com/Pocket_Edition_version_history). Gamepedia. Retrieved from [http://minecraft.gamepedia.com/Xbox\\_360\\_Edition\\_version\\_history](http://minecraft.gamepedia.com/Xbox_360_Edition_version_history). On August 20, 2013 Notch confirmed via his official Twitter account that *Minecraft* will be available for the Playstation 4, Xbox One and Playstation 3 platforms in the near future. Markus Persson. (August 20, 2013). [Twitter comment]. Retrieved from <https://twitter.com/notch>.

20. One of the reasons that media scholars have not paid sufficient attention to audience-led production is that we have been looking in the wrong places. It is true that the most expensive and heavily-advertised videogame franchises have some of the characteristics of corporate-dominated oligopoly media production, i.e. dependence on expensive studio talent, heavy publicity and marketing, and a brief window of highly profitable sales, followed by falling sales and price cuts. None of this applies, however, to audience-led models of media production. These latter can take full advantage of the comparative autonomy of interactive media from advertising expenditure, as well as the exponential increase in digital storage, the spread of social media networks, and the increasing distribution of open source and low-cost digital editing tools to engage with transnational audiences.

21. Markus Persson. (May 20, 2009.) 0-0-12a is up [Web log comment]. Retrieved from <http://notch.tumblr.com/post/110175116/0-0-12a-is-up>

22. Markus Persson. (May 21, 2009). My list on tile types so far [Web comment]. Retrieved from <http://notch.tumblr.com/post/110762705/my-list-on-tile-types-so-far>

23. Markus Persson. (May 23, 2009). So I didn't do multiplayer code by I had fun [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/111691116/so-i-didnt-do-multiplayer-code-but-i-had-fun>

24. Markus Persson. (June 9, 2009). Oops I meant GPU not CPU [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/120755152/oops-i-meant-gpu-not-cpu>

25. Markus Persson. (June 25, 2009). Some conversion rate math [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/129864371/some-conversion-rate-math>

26. Notch's initial suggestion was for creative, survival and multiplayer game-play. Markus Persson. (May 16, 2009). Some thoughts on games modes [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/108596899/some-thoughts-on-game-modes>

27. Markus Persson. (January 30, 2010). Phew last indev update for today [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/360469298/phew-last-indev-update-for-today>

28. Markus Persson. (May 17, 2009). Minecraft 0-0-11a for public consumption [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/109000107/minecraft-0-0-11a-for-public-consumption>

29. Markus Persson. (May 21, 2009). My list on file types so far [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/110762705/my-list-on-tile-types-so-far>

30. Markus Persson. (June 7, 2009). C418 is making the music and sounds for Minecraft [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/119457666/c418-is-making-the-music-and-sounds-for-minecraft>

31. Markus Persson. (June 9, 2009). Oops I meant GPU not CPU [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/120755152/oops-i-meant-gpu-not-cpu>

32. Markus Persson. (June 10, 2009). In the spirit of the new economy [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/121044061/in-the-spirit-of-the-new-economy>

33. Markus Persson. (June 25, 2009). Some conversion rate math [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/129864371/some-conversion-rate-math>
34. Markus Persson. (June 28, 2009). Client update tomorrow with the basics for sound [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/131385451/client-update-tomorrow-with-the-basics-for-sound>
35. Markus Persson. (June 29, 2009). This probably says something about who plays [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/132466362/this-probably-says-something-about-who-plays>
36. Markus Persson. (August 28, 2009). So what will be in the survival mode test [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/173896125/so-what-will-be-in-the-survival-mode-test>
37. Markus Persson. (January 13, 2010). Member number 100000 was jostvice3d [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/332684203/member-number-100000-was-jostvice3d>
38. Markus Persson. (January 29, 2010). Crafting on indev now [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/359717446/crafting-on-indev-now>
39. Markus Persson. (February 4, 2010). Indev update fully functioning bows and mobs [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/371006104/indev-update-fully-functioning-bows-and-mobs>
40. Markus Persson. (February 12, 2010). Day night cycle indev [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/384494353/day-night-cycle-in-indev>
41. Markus Persson. (February 14, 2010). My god [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/389606025/my-god>
42. Markus Persson. (February 21, 2010). I have a potentially gamebreaking idea do not do [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/403475391/i-have-a-potentially-game-breaking-idea-do-not-do>. A total of 5,358 fans voted, and the response was overwhelming positive (45.9% of voters said it was a must-do, 18.8% said it was worth doing, 14.5% were neutral, and only 13.5% were against it). Also note the 125 comments on the poll, some of which were quite thoughtful. Polldaddy.com. (February 21, 2010.) Retrieved from <http://polldaddy.com/poll/2736635/?view=results>
43. Markus Persson. (June 17, 2010). 20000 wow [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/709098848/20000-wow>
44. Markus Persson. (July 29, 2010). I'm going all gaga now 1000 sales in 24 hours [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/875499109/im-going-all-gaga-now-1000-sales-in-24-hours>
45. Markus Persson. (February 7, 2010). Poll time [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/395030658/poll-time>. Markus Persson. (February 17, 2010). OK here's what I was thinking for the xp levels [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/395114400/ok-heres-what-i-was-thinking-for-the-xp-levels>

46. Markus Persson. (June 17, 2010). 20000 wow [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/709098848/20000-wow>

47. In an online interview with the fan community in 2012, Notch acknowledged that commercial companies had offered to buy the franchise:

KillaMarci: Has any big company ever tried to 'buy' Minecraft away from you or buy Mojang entirely?

Notch: Yes, we said no.

Reddit.com. (July 31, 2012). I am Markus Persson aka Notch, Creator of Minecraft - Ask me Anything! Retrieved from [http://www.reddit.com/r/Minecraft/comments/xfzdg/i\\_am\\_markus\\_persson\\_aka\\_notch\\_creator\\_of](http://www.reddit.com/r/Minecraft/comments/xfzdg/i_am_markus_persson_aka_notch_creator_of)

48. Markus Persson. (April 30, 2010). One month until full time [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/560997676/one-month-until-full-time>

49. Markus Persson. (August 19, 2010). Lots of stuff going on behind the scenes [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/977394407/lots-of-stuff-going-on-behind-the-scenes>

50. Gamepedia.com. Retrieved from [http://minecraft.gamepedia.com/MineCon#cite\\_ref-3](http://minecraft.gamepedia.com/MineCon#cite_ref-3)

51. Markus Persson. (September 6, 2010). Hiring some people getting an office and all that [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/1075326804/hiring-some-people-getting-an-office-and-all-that>

52. For the classic analysis of modding, see: Postigo, H. (2007). Of Mods and Modders: Chasing Down the Value of Fan-Based Digital Game Modifications. *Games and Culture* 2:4 (300-313).

53. Markus Persson. (April 8, 2010). Still going slow but here's a new screenshot [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/506311060/still-going-slow-but-heres-a-new-screenshot>

54. Notch's post is worth quoting at some length:

“After some internal discussion and general anxiety, we’ve arrived at a plan for supporting mods. It’s still a bit vague and the details might change after we’ve run it by our lawyers, but here’s what we want to do:

\* Let players sign up as “mod developers”. ~~This will cost money~~ (edit: no longer costs money!), and will require you agreeing to a license deal (you only need one per mod team).

\* Mod developers can download the source code from our SVN repository. As soon as we commit a change, it will be available to all mod developers, unobfuscated and uncensored.

\* Mod developers get a unique certificate for signing their mods. This means players can see who made what mod and choose to trust individual developers. The cost of signing up makes sure only serious developers have access to this certificate.

The rules of the license deal will contain:

\* Mods must only be playable by people who have bought Minecraft

\* You can't sell your mods or make money off them unless you've got a separate license deal with us

\* The mods must not be malicious (obviously)

\* We retain the right to use your mod idea and implement it ourselves in Minecraft. This is to prevent the situation where we have to avoid adding a feature just because there's a mod out there that does something similar. It's also great for dealing with bug fixes provided by the community.

In the long term, we hope this means people will do awesome new things with the Minecraft engine and play around with it. We want to buy and/or license good mods and/or total conversions and sell them ourselves. It's possible we might have a mod marketplace for selling and buying mods that fans have written, or we might purchase and integrate nice mods that fit the main theme of Minecraft.

[edit:]

Just to clear up two things:

The access cost won't be prohibitively expensive, and if you make a good mod or something else based on the source code, it's highly likely we will want to license it."

Markus Persson. (April 11, 2011). The plan for mods [Web blog comment]. Retrieved from <http://notch.tumblr.com/post/4955141617/the-plan-for-mods>

55. The Minecraft Coder Pack (MCP) gave potential modders who had limited programming experience a toolkit to help create their own mods. It was first released on October 17, 2010, and has subsequently flourished since then. Minecraft Coder Pack. Retrieved from <http://www.mediafire.com/download/nukc5jh5yu83cdp/revengpack.zip>. Also see: Gamepedia. Minecraft Coder Pack History. Retrieved from [http://minecraft.gamepedia.com/Programs\\_and\\_editors/Minecraft\\_Coder\\_Pack#History](http://minecraft.gamepedia.com/Programs_and_editors/Minecraft_Coder_Pack#History)

Note that the current Coder Pack is located here: Minecraft Coder Pack. Retrieved from <http://mcp.ocean-labs.de/page.php?4>. Note that the site indicates the current version of the MCP software has been downloaded 59,024 times as of September 29, 2013. This number counts only downloads of the most recent version of MCP, and does not include past downloads, which suggests the total number of MCP downloads may be in the hundreds of thousands. Minecraft Coder Pack, history. Retrieved from. <http://mcp.ocean-labs.de/download.php>

56. While there are far too many mods to list, two of the most creative are Nuchaz' *Bibliocraft* mod and Atomic Stryker's *Pet Bat* mod. Atomic Stryker. Pet Bat [game modification]. Retrieved from <http://www.minecraftforum.net/topic/1545901-164-pet-bats-fly-hang-get-him/>. Nuchaz. Bibliocraft [game modification]. Retrieved from <http://www.bibliocraftmod.com/>

57. Reddit.com. (July 31, 2012). I am Markus Persson aka Notch, Creator of Minecraft - Ask me Anything!". Retrieved from [http://www.reddit.com/r/Minecraft/comments/xfzdg/i\\_am\\_markus\\_persson\\_aka\\_notch\\_creator\\_of/](http://www.reddit.com/r/Minecraft/comments/xfzdg/i_am_markus_persson_aka_notch_creator_of/)

58. Below are the key paragraphs describing Mojang's policies governing fan labor.

"If you've bought the game, you may play around with it and modify it. We'd appreciate it if you

didn't use this for griefing, though, [griefing: term for online harassment, cheating or unfair behavior, especially in competitive multiplayer games] and remember not to distribute the changed versions of our software. Basically, mods (or plugins, or tools) are cool (you can distribute those), hacked versions of the Minecraft client or server are not (you can't distribute those).

Any tools you write for the game from scratch belongs to you. Other than commercial use (unless specifically authorized by us in our brand and assets usage guidelines - for instance you are allowed to put ads on your YouTube videos containing Minecraft footage), you're free to do whatever you want with screenshots and videos of the game, but don't just rip art resources and pass them around, that's no fun. Plugins for the game also belong to you and you can do whatever you want with them, as long as you don't sell them for money. We reserve the final say regarding what constitutes a tool/plugin and what doesn't.

We reserve the right to change this agreement at any time with or without notice, with immediate and/or retroactive effect.

Any suggestions made are assumed to be offered for free unless otherwise agreed before the suggestion was made. We're not going to put up a huge EULA [End-User License Agreement]. We're trying to be open and honest, and we hope people treat us the same way back.

If there's anything legal you're wondering about that isn't answered from this page, don't do it and ask us about it. Basically, don't be ridiculous and we won't.

/ Markus Persson and friends". <https://minecraft.net/terms>. Accessed September 21, 2013.

59. Mojang's policy governing the more commercial uses of *Minecraft* is described in their online description of the *Minecraft* brand. Mojang. (September 29, 2013). Retrieved from <https://minecraft.net/brand>

60. As of September 22, 2013, Gametracker listed Valve's Counterstrike 1.6 at 25,015 servers, voice-over-internet utility TeamSpeak 3 at 12,125, Minecraft at 10,349, Valve's Team Fortress 2 at 8,391, Valve's Counter Strike Global Offensive at 8,251, Valve's Counter Strike Source at 7,796, Activision's Call of Duty 4 at 5,439, EA's Battlefield 3 at 4,776, DayZ at 4,331, and another voice-over-internet utility, Ventrilo, at 3,626. Gametracker. (September 22, 2013.) Retrieved from [www.gametracker.com](http://www.gametracker.com)

61. According to Gametracker, the following nations had active *Minecraft* servers:

Argentina	32
Australia	258
Brazil	49
Canada	100
Chile	58
China*	3
Colombia	2
Costa Rica	2
EU-28	2,873
Georgia	4
India	0
Indonesia	1
Japan	35
Korea, South	2
Malaysia	7
Mexico	4
Moldova	3

Morocco	1	
Pakistan	1	
Peru	5	
Russia	314	
Serbia	29	
South Africa	43	
Thailand	4	
Ukraine	9	
US	3,581	
Singapore	6	
Venezuela	1	
Vietnam	1	
* Mainland	1, Taiwan	2

Gametracker. (September 22, 2013.) Retrieved from [www.gametracker.com](http://www.gametracker.com)

62. One sign that this is beginning to happen is the Portal Gun mod, a project where modders recreated certain game-play features of Valve's *Portal* videogame franchise inside of a version of *Minecraft*. This is significant because it points to the diffusion of state-of-the-art game-play innovations within the *Minecraft* fan community. Gamepedia. (September 30, 2013). Retrieved from [http://minecraft.gamepedia.com/Mods/Portal\\_Gun](http://minecraft.gamepedia.com/Mods/Portal_Gun)

63. In May of 2013, Microsoft announced significant new restrictions on the ability of consumers to share purchased media content for its Xbox One console, due to be released in the fall of 2013. Fans were outraged at the decision, and launched a media campaign against these policies. The resulting negative press most likely severely impacted pre-orders for the console, forcing Microsoft to cancel its proposed policies in June 2013. Microsoft's original proposal: "While a persistent connection is not required, Xbox One is designed to verify if system, application or game updates are needed and to see if you have acquired new games, or resold, traded in, or given your game to a friend. With Xbox One you can game offline for up to 24 hours on your primary console, or one hour if you are logged on to a separate console accessing your library. Offline gaming is not possible after these prescribed times until you re-establish a connection, but you can still watch live TV and enjoy Blu-ray and DVD movies." Microsoft. (June 2013). Retrieved from <http://news.xbox.com/2013/06/connected>. For an example of the sophisticated media fans produced to critique Microsoft's policies, see: Angry Joe Show. (June 6, 2013). Xbox One: Angry Rant Pt. 2 [video file]. Retrieved from <http://www.youtube.com/watch?v=ryB-hdtpQRw>

64. ZenithOptimedia, "Executive summary: Advertising Expenditure Forecasts December 2013." (December 2013). Retrieved from <http://www.zenithoptimedia.com/wp-content/uploads/2013/12/Adspend-forecasts-December-2013-executive-summary.pdf>