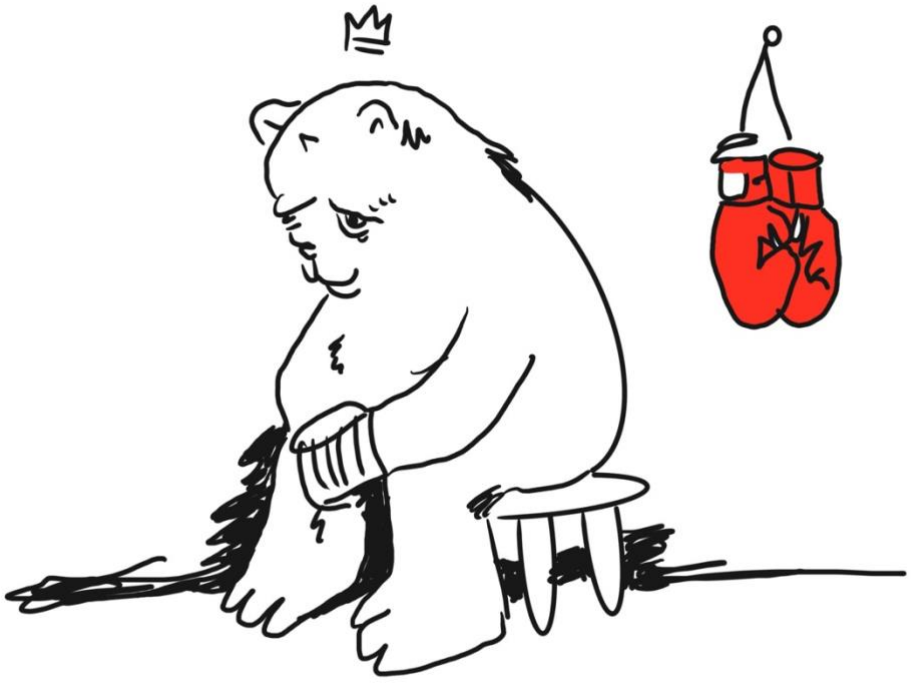
It's All a Game



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November 2023

This is an essay about the intersection of web3 and games. It's intended for anyone who enjoys games and is curious how web3 technologies may impact the gaming industry. Given the early stage of web3 enhanced games, portions of this essay require imagining how the future state of games may evolve.[1] I've written this essay in a modular fashion so folks can skip around and read the sections that are of most interest. Chapter 1 — which covers why I care so deeply about games — is personal and then I delve deep into the intersection of web3 and games beginning in Chapter 2.

I started this essay in March 2022 to solidify my thoughts on web3 enhanced games and figured I'd have it complete over the course of a month. What I didn't anticipate was the cascade of terribles that then shook the crypto industry to its core and caused me to set this essay aside repeatedly. And, just when we finally started to see green shoots, Silicon Valley Bank failed and crypto veered back into the darkness as the regulatory fallout from 2022 commenced. I've been in the crypto industry for over 10 years and the last ~18 months have been astonishing. In 2022, bad actors often succeeded in harming the very people who crypto was created to protect — those on the wrong side of the wealth gap, who continue to struggle under the long shadow of the Great Financial Crisis. In the United States, it's imperative that the private and public sector work collaboratively on reasonable regulation that finds the appropriate balance between the tremendous opportunity this technology offers and the risks that come along with it. Other non-US jurisdictions have taken more steps to strike this balance and I'm confident the US will too — whether through the legislative process or the courts.

Nothing in this essay is endorsed by Brevan Howard Digital and/or any of its affiliates. I am publishing this essay entirely in my personal capacity. Errors and omissions are mine alone (so I'm the only one falling on the (virtual, NFT based) sword!)). ***Please see disclaimer on the last page of this essay.***

[1] According to Pitchbook, $3.475 billion of venture capital has been invested in web3 games from the start of 2019 through the end of June 2023. Games can take a long time to make so it isn't necessarily surprising that we haven't seen a game with web3 enhancements achieve mainstream, sustained adoption. AAA web2 games generally take at least four years to make and can cost hundreds of millions of dollars to develop and market. Most of the venture capital investments in web3 gaming — $2.8 billion — occurred during 2021 and the first half of 2022 so I would expect that we start to see some very exciting games with web3 enhancements in 2024 and 2025. Note that Jon Jordan, co-founder of Pocket Gamer, launch editor of Blockchain Gamer, founder of GamesTX, and creator / maintainer of the Big Blockchain Games List, who tracks both equity and *token* investments in web3 gaming across the full ecosystem of games, community, metaverse, platforms, tools, and other infrastructure shows investment of $13.56 billion across those categories from 2020 through August 2023. Game 7, in its State of Web3 Gaming 2023 research report, shows investment of $19 billion from 2018 – Q3 2023 in "web3 gaming related projects," which are defined as including "gaming-exclusive and cross-vertical rounds that target gaming applications or use-cases. NFT sales, public token sales or rounds for investment funds are not included."

Illustrations are hand drawn by me based on NFTs that I own or that are owned by my colleagues, each of whom gave me permission to draw and include their NFTs in this essay. Each drawing is footnoted. The drawing on the front page of this essay is based on an NFT that I own called "Reflecting" from The Bear Champ Collection by JC Rivera[2], a legendary Street Artist from Chicago.

There is a glossary at the end of this essay intended to assist with terms that may be unfamiliar to readers. Also, read the footnotes! ☺

Thank you to my friends, family, and colleagues who have provided valuable feedback on this essay, including: Joe, Rosie, Mack, Sadie, and Sunny Klein and Pat Sullivan (dad), Pat Sullivan (brother), Anne Sullivan, Peter Johnson, Ross Trachtman, Alex Matthews, Drew Van der Werff, Andrew Nelson, Rebecca Rettig, Brad Koeppen, Scott Fletcher, Peter Kieltyka, Michael Sanders, Lewis Cohen, Kim Trautmann, Rita Williams, Cem Paya, and Jami Chiang. And a very special thank you to the team at Messari, especially Ryan Selkis and Maartje Bus, for publishing this essay and always giving me a wonderful forum to talk about web3 games at Messari's exceptional Mainnet conference.

This essay is dedicated to June Klein, who I loved playing games with.

[2] See here for more information on The Bear Champ and JC Rivera.

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Chapter 1: Lessons Learned in the Game of Life, Basketball … and we have an ownership problem!

My dad was a college basketball coach, which is why my earliest memories are all of basketball: spending most of my youth at the gym, looking up at giant basketball players; dribbling a basketball on my walks back and forth to school; the dingy, leathery smell when you first walk into the gym; my dad and siblings spending countless hours rebounding and then passing to me so I could shoot over and over; the creak of old, wooden bleachers when you bounce up them to find your seat to watch a game; the sound of the tip of high-tops gently touching the floor after a sweet jumper; and March Madness, the only holiday season I ever cared about. I understood earlier than most that *life is a game*; my well-being and that of my four siblings depended on how well that game was played and coached.

I learned a lot about *community* and *loyalty* from basketball. My dad, who coached at a small NCAA Division II / NAIA Division I university, was talented enough to coach at the NCAA Division I level, but he cared about two things more than his career path:

- feeding me and my siblings, which meant he couldn't afford to be at a school that would fire him if he had a losing season, and

- staying loyal to the community he grew up in, which he did by coaching and mentoring student-athletes primarily from Chicago.

My father grew up poor, but he will tell you that he was wealthy in every way that mattered, and much of that is attributable to the diverse, working-class community he was raised in, which he considered family. To this day, my father is utterly and thoroughly loved by this community; he is one of theirs and has never left them. I used to be embarrassed by my working-class roots, but as I've gotten older, I've realized that my upbringing is one of the greatest gifts I ever received. It's my community that brought me into crypto; I understood from firsthand experience that the US financial system excluded certain people (*e.g.,* my community) from participating in certain products, services, and markets based on lack of wealth rather than ensuring that information and appropriate disclosures were made available and allowing people to make risk-based decisions for themselves. I also learned from my community that no one gets rich from their salary; that only happens through *ownership*. While I'm sure this system of "access to private investments for the wealthy only" has protected some people from hurting themselves and losing money, it has also prevented a significant number of people from keeping up. Notwithstanding the crypto trauma we all suffered in 2022 and

the regulatory hurdles in front of us[3], I believe that crypto democratizes access to money itself as well as financial products, services, and markets.

Basketball also taught me quite a bit about *culture and storytelling*. Growing up, the right vintage Jordans were *everything* and I still wear the gold "Colleen" nameplate that I worked so hard to pay down weekly by working at a hot dog stand. Many of the girls on my high school basketball team had them and "proof-of-nameplate" was required for admission to our community/basketball team. When I was a kid, my dad brought me on his recruiting visits; I attended basketball games at just about every high school in Chicago and sat in living rooms all over the city while I listened to my dad tell stories. Stories of why these players should come to play for him — often over D1 schools he was competing against — and why parents should trust him with their kids' athletic and academic well-being. My dad was (and is) incredibly intelligent, warm, funny, and kind. Like centuries of Irish before him, my father is a master of *storytelling and narratives*. Telling stories (backed up by the substance of his win/loss record and his ability to help kids graduate) is how he recruited and his ability to recruit exceptional talent is what ultimately led to wins.

[4]

Through sports and games, I also learned about *flow*; there is nothing like a game of basketball or a long run to put my brain into a flow state. Mihaly Csikszentmihalyi's research shows that flow is most reliably and most efficiently produced by the specific combination of self-chosen goals, personally optimized obstacles, and continuous feedback that make up the essential structure of gameplay. *"Games are an obvious source of flow,"* he wrote, and *"play is the flow experience par excellence."* Jane McGonigal defines games as *"unnecessary obstacles*

[3] Crypto is not alone in terms of innovative technologies in need of new regulatory frameworks. Policymakers and regulators will also need to grapple with how best to regulate (or not regulate) AI. Further, antitrust laws in the US are antiquated; they are rooted in the physical world and do not carry over well to fully digital worlds like video games (*e.g.,* the FTC's action against Microsoft in its acquisition of Activision Blizzard).

[4] This isn't an NFT. It's a drawing of my Colleen nameplate necklace (my first skin!).

that we volunteer to tackle." I've learned a lot about flow from sports and games. I love to run and the more gnarly the experience, the better. My favorite race was in Alaska and started in scorching heat, then biting cold, and then pelting, unmerciful rain; it was uphill on uneven, rocky trails, and I mostly ran alone. My body was completely broken, but my mind was in a flow state, and it was flow that carried me across the finish line. That same flow mindset kicks in when I play a challenging round of Rainbow Six Siege with my son, Fortnite with friends, or solo Pokémon Go. It's far past time that we start acknowledging the mental and social benefits that we get from video games.[5] Just as society favors those participating in physical games, I believe video gamers should be held in a similar regard.[6] I've probably run over 50,000 miles and played more than 2,500 hours of Pokémon Go. Running and Pokémon Go are like having two different therapists, who treat a variety of issues depending on the day and who are open for me 24/7/365. Generally, with some exceptions, gaming — whether physical or digital — is good for our brains, communities, and society.[7]

Basketball also taught me all I needed to know about playing a game because it's *fun.* In Malcolm Gladwell's book "Outliers," he posits that it takes 10,000 hours of intensive practice to achieve mastery of complex skills and materials. While Gladwell's 10,000 theory has come under fire from others, I could have single-handedly debunked it; I most definitely spent more than 10,000 hours playing basketball and I wasn't good! I played because I loved it: basketball was my *community*, it was where my friends were, it was part of my identity (my Jordans and my nameplate were my first "skins"), and it was *fun.* Even though I was terrible, I won every time I stepped on the court. This is precisely why we look to invest in web3 games that are fun first. *You can monetize fun because people want to spend their valuable and scarce time on fun, especially when it's fun with friends.* The numbers bear this out. In his February 2020 DICE keynote presentation[8], Epic Games founder and CEO Tim Sweeney said that if a player plays Fortnite (a really

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[5] I love this quote from C. Thi Nguyen*: "I'm more worried about games breeding more Wall Street profiteers than I am about their breeding serial killers."*

[6] As with most things in life, moderation is key — in both physical and digital games.

[7] Please listen to: Invest like the Best: Jane McGonigal: How Games Make Life Better, July 2019. From McGonigal: *"So one of the things that I often do in my work is I help people find the right games for anxiety attacks or for depression. If you're trying to kickstart the parts of the brain that remember how to anticipate something good could happen so that you can feel more motivated by everyday things. There are different games that will do that. A game like Pokémon Go is good to kind of trick your brain into going into a very rapid cycle of, 'Something good could happen anywhere,' because literally, Pokémon can pop up anywhere, 'And it might be really powerful, and I might get a gift today from my friend,' like, 'Oh my gosh.' Something good could happen anytime. That's good for depression. But if you're anxious, you might want a small game, a tiny game, a single-player game. It could be a mini golf on your phone, or a gentle meditative puzzle game because what you're trying to do is stop your brain from thinking thoughts, imagining things other than just this very tiny, tiny piece of work that you can focus your brain on. So, whereas Pokémon Go is big and diffuse and dynamic, for anxiety, you want something like Tetris, that's kind of small and focused."*

[8] https://www.ign.com/videos/tim-sweeneys-full-dice-2020-talk

fun game!) with friends, the player spends *two times* the amount of time playing Fortnite and more money than when playing alone.

I also have three *Gen Z* teenagers! They are all fantastic athletes in physical sports: ice hockey[9] and lacrosse and in digital sports: Fortnite, Rainbow Six Siege, Red Dead Redemption, NHL, Among Us, Call of Duty, The Last of Us (before the HBO series), and Roblox. In March 2020, at the start of the pandemic, I remember feeling absolutely sick to my stomach when I realized that my kids were about to lose their entire IRL social networks. Throughout 2020, Fortnite was the "place" my kids went every single day to "see" their friends. While I would use FaceTime or Zoom to see my friends in human form, my kids would jump into a game of Fortnite to see their friends in avatar form. And that's when I realized that for Gen Z and Gen Alpha, physical and digital are not separate experiences; rather, they have blended into each other as a *singular experience*.[10] Friends in real life and friends in Fortnite are just "friends" and there's not much distinction between the two. As physical and digital increasingly become one, it seems logical that if ownership of physical items has value, so too will ownership of digital items. We tend to overcomplicate the technical aspects of web3, but I believe the *ownership* attribute of web3 is really that simple.

…but we have an Ownership Problem!

But we have a problem! Today, web2 gamers don't own the digital items they purchase or earn in games. As of mid-2020, Fortnite had been played for a cumulative total of 3.8 billion days.[11] That's 10.4 million years, which means gamers have spent more time playing Fortnite than humans have existed. And this data is three years old and that's just one game! In 2021, gamers spent more than $135 billion[12] on virtual gaming goods that they don't own and can't trade. All that time and all that money — with no ownership in return.

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[9] https://teamusa.usahockey.com/2022u18series-rosieklein

[10] To better understand how physical and digital experiences are increasingly becoming one, look no farther than virtual K-pop band, Mave, which had over 25 million views of its music video "Pandora" on YouTube within seven months of its release. Previously, it was only possible for top K-pop artists such as Blackpink (made up of actual, non-virtual humans) to see this level of viewer numbers in such a short period of time. Interestingly, Mave was co-founded by a division of the big South Korean gaming company, Netmarble, and the appearance of the virtual artists in the band was developed in Epic Games' Unreal Engine. See also Roblox Connect, which is expected to launch in late 2023, and will enable gamers to call each other with their respective avatars. The avatars then mirror the gamer's facial expressions "right down to the same blink rate" through using the gamers' laptop and mobile camera along with Roblox's facial motion tracking software.

[11] https://screenrant.com/fortnite-play-time-longer-human-existence-earth/?utm_source=pocket_reader

[12] https://www.wsj.com/articles/virtual-guns-in-videogames-could-soon-be-worth-real-money-11640286622

I would guess that some of your kids spend your money in Fortnite like my kids do. Imagine that your daughter buys a $15 skin for her avatar and she has the option of owning it or not owning it. Which option should she choose? Ownership seems obvious. Even if the price of the skin goes down, she can sell it when she's tired of playing Fortnite and use the proceeds to buy virtual goods in the next game she wants to play. This is how games used to work. You would buy a game at GameStop and when you got tired of it, you'd sell it for less than what you bought it for and use the proceeds to buy the next game.

In my opinion, it's simply inevitable that gamers — particularly the younger generation of gamers — will demand ownership of virtual gaming goods, and web3 enables just that. You've now read "web3" a few times. One of the biggest problems my industry has is overcomplicating things. I'm assuming most of you know what web3 is given you're reading this essay, but here's a really simple way to think about web3 in the context of gaming — continuing with the Fortnite skin example:

- In web2, the Fortnite skin is owned by Epic Games — not your daughter — and is secured by Epic's centralized servers.

- In web3, the Fortnite skin is owned by your daughter in her digital wallet and is an NFT secured by a decentralized blockchain.

Web3 simply adds a value layer to the existing internet enabled by various forms of tokens. So, we have a few things converging here:

- A new technology that enables ownership of digital goods;

- A younger generation that increasingly views digital and physical as one; and

- Games are becoming the next evolution in communication: the telephone was our parent's era; the Internet, including messaging apps, Instagram, and Zoom are my generation; and gaming, which includes metaverse and AR/VR, is the Gen Z and Gen Alpha era.

I remember playing Pac-Man at the arcade and I never could have imagined that games would someday be connected to the Internet and that I would play games with millions of other gamers from all around the world. It would be a huge mistake to think that the way mainstream games look today — no ownership of virtual assets or properly sharing upside with creators — is how games will look in the future. When these big paradigm shifts happen, we usually can only see and understand them in retrospect and in this essay, I'm trying to pull the future of gaming forward. Over the next 10 years, I believe most games will incorporate web3 technologies and that monetization enabled by web3 will become a dominant business model in gaming. I also believe that most luxury and streetwear brands

will start to operate like video game companies — more on that in Chapter 7 of this essay.

I'm starting this essay with my background story[13] because I fundamentally understand how important games are. I love games, whether physical games or video games; they are part of who I am. I sit in this seat investing in web3 enhanced games solely because of the opportunities that a game afforded me and the lessons I learned from that game about *community, loyalty, culture, storytelling, flow,* and *fun*. My entire life sits on the foundation of the game of basketball and because of this, I understand that *life is a game.* Case in point, this essay is a game; it's an unnecessary obstacle that I have chosen to take on that will be scored by web3 founders, fellow investors, and anyone else who spends their valuable time reading it. How many "points" I get from this essay will ultimately be determined by the success of the web3 gaming studios and infrastructure companies I invest in. Some of you may love what I write and others may not. But you know what else a lifetime of playing games has taught me? It's always better to be in the game taking risk than sitting on the sidelines watching other people play — so LFG!

[13] My knowledge and love for games comes from playing them, not working professionally in the gaming field and because of that, I'm sure I get some things wrong in this essay. I expect readers to make me aware of errors, misunderstandings, and the like and I'm looking forward to continuing to learn!

Chapter 2: Gaming is Bigger Than You Think

I started investing in start-ups building at the intersection of web3 and gaming a few years ago at a firm I co-founded, CMT Digital. Back then, we were early investing in this area. Now it's the norm[14] — and for good reason, once you start examining overall gaming metrics:

~3.38b global gamers

~$184b in revenues 2023

75% of gaming revenue comes from in-game purchases of virtual goods

> 11.5m creators designed over 62m virtual clothing & accessory items on Roblox

3.2b virtual transactions on Roblox, 1.8b avatar items on Roblox's Marketplace

75% of kids ages 9–12 in the US, UK, Canada, New Zealand, and Australia play Roblox, which has 70.2m DAUs

Fortnite's revenues from 2018–2022 ~ $20b, primarily cosmetics, Fortnite has 200m MAUs

Time spent in video games ~12 hours / week; for Gen Z in the US, 15 hours / week

84% of US consumers engage with video games

Games are #1 entertainment for Gen Alpha & #3 for Gen Z

90% of Gen Z engage with games & virtual worlds

50% of Gen Z and Gen Alpha spend money in games

Gen Z has $360b in spending power

[15]

Let's take a deeper dive into some gaming data:

- There are ~3.38 billion gamers globally, or 1 in every 2.36 people.[16] This number is expected to grow to 3.6 billion by 2025.[17] Ubisoft CEO Yves Guillemot says that gaming will hit an audience of 5 billion people by 2028.[18]

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[14] I wrote this essay during a crypto bear market when many VCs lost interest in web3 gaming. VC sentiment on web3 gaming will inevitably revert back to positive as/when the crypto bull market returns.

[15] This drawing is based on my NFT, Akutar #12773 by AkuDreams. Akutars are a collection of 15,000 unique, 3D avatars living on the Ethereum blockchain. Each Akutar grants its owner entry into the ever-expanding Akuverse, there lines are blurred between the digital and physical worlds.

[16] Newzoo Global Games Market Report August 2023

[17] Id.

[18] https://venturebeat.com/games/ubisoft-ceo-yves-guillemot-predicts-gaming-will-hit-300b-by-2030-and-5b-people-by-

- The global games market is expected to generate $184 billion in 2023, +0.6% YoY growth.[19] According to Konvoy's Q3 2023 Gaming Industry Report, the current market size of gaming is $188 billion, +3% YoY growth.[20] Guillemot says gaming will achieve revenues of $300 billion by 2030.[21]

    - The gaming revenue figure ignores gaming hardware and equipment (including consoles) as well as gaming software such as streaming services (Twitch), gamer communication (Discord), and game engines (Unity, Unreal). Incorporating gaming specific hardware and software – and complementary markets (streaming, esports) – equated to $335 billion in 2021.[22]

- In 2021, 75% of the then $180 billion in gaming revenue was attributable to in-game purchases of virtual goods.[23] DMarket[24], which has a platform for secondary trading of skins, estimated in late 2020 that the skin market for web2 games was $40 billion / year.[25]

    - In 2022, more than 11.5 million creators designed over 62 million virtual clothing and accessory items on Roblox. To put that in context, there are at least 200x as many creators designing clothing and accessories on Roblox as the estimated number of fashion designers creating physical collections in the United States. That's also at least 6x as many creators as the estimated 1.8 million people employed in the US fashion industry across manufacturing, textiles, and other fashion items.[26]

2028/#:~:text=He%20expects%20gaming%20to%20hit,mobile%20devices%20and%20other%20platforms.

[19] Newzoo Global Games Market Report October 2023

[20] Konvoy Gaming Industry Report Q3 2023

[21] https://venturebeat.com/games/ubisoft-ceo-yves-guillemot-predicts-gaming-will-hit-300b-by-2030-and-5b-people-by-2028/#:~:text=He%20expects%20gaming%20to%20hit,mobile%20devices%20and%20other%20platforms.

[22] https://www.bitkraft.vc/gaming-industry-market-size/

[23] https://www.wsj.com/articles/virtual-guns-in-videogames-could-soon-be-worth-real-money-1164028662

[24] DMarket was acquired by Mythical Games, a web3 gaming company, in January 2023. According to Mythical's CEO John Linden, the company is doing $40m / month in sales. After looking at Mythical's onchain data, we estimate that the vast majority of that revenue is derived from DMarket web2 skin trading (primarily web2 CS:GO skins).

[25] https://venturebeat.com/games/newzoo-u-s-gamers-are-in-love-with-skins-and-in-game-cosmetics/.

[26] Metaverse Fashion Trends 2022. A colleague pointed out that this could be an "apples to oranges" comparison because it's comparing specialized employment as livelihood with amateurs/hobbyists. With I agree with that sentiment in part, it's important to note that creating virtual goods in Roblox *is* specialized fulltime employment for many creators. In 2022, the 10 highest-earning creators on

- There were more than 3.2 billion virtual transactions on Roblox in 2022 and 900 million during the first quarter of 2023. In 2022, people purchased 1.8 billion avatar items on Roblox's Marketplace, where 40% of Roblox's MAUs visit each month to update their avatars.[27] Roblox made $2.2 billion in 2022.[28]

- Fortnite's revenues from 2018 - 2022 were estimated at an aggregate ~$20 billion [29] and most of those revenues were derived from the purchase of cosmetic skins and emotes, which the gamers do not own and that have no utility. These are also one-way transactions because there is no secondary market for Fortnite skins and emotes[30]. Tim Sweeney recently said, "*I firmly believe there's going to be a multi-trillion-dollar economy around digital goods in the future."*[31]

  - Fortnite has 350 million registered users and 200 million MAUs[32]. Epic Games, the creator of Fortnite, itself has 600 million user accounts with 4.7 billion social connections.[33]

  - In 2021, 70% of Fortnite players said they purchased special outfits and characters — for no in-game benefit other than looking cool.[34]

- Time spent in video games is only increasing, from ~7 hours / week in 2019[35] to ~12 hours / week in 2023[36], a 41% increase, which was accelerated by the

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Roblox earned an average of $23 million each and nearly every creator in the top 100 earned at least $140,000.

[27] https://blog.roblox.com/2023/07/vision-roblox-economy/

[28] https://ir.roblox.com/news/news-details/2023/Roblox-Reports-Fourth-Quarter-and-Full-Year-2022-Financial-Results/default.aspx

[29] https://www.theverge.com/2021/5/3/22417447/fortnite-revenue-9-billion-epic-games-apple-antitrust-case & https://www.businessofapps.com/data/fortnite-statistics/. Specifically, 2018 and 2019: $9 billion, 2020: $5.1 billion, and 2022: estimated at $5.8 billion

[30] https://www.epicgames.com/help/en-US/fortnite-c5719335176219/save-the-world-c5719367703579/can-i-trade-items-in-fortnite-a5720288328475#:~:text=Trading%20with%20other%20players%20is,result%20in%20losing%20your%20items.

[31]https://www.fastcompanyme.com/technology/epic-games-ceo-tim-sweeney-talks-the-metaverse-crypto-and-antitrust/?utm_source=pocket_mylist

[32] https://newzoo.com/resources/blog/over-80-of-us-consumers-play-video-games-how-can-brands-accelerate-engagement-with-this-big-audience-of-game-enthusiasts

[33] Id.

[34] https://www.voguebusiness.com/technology/how-epic-games-became-fashions-unlikeliest-bedfellow?status=verified

[35] https://www.forbes.com/sites/kevinanderton/2019/03/21/research-report-shows-how-much-time-we-spend-gaming-infographic/?sh=2706c27d3e07

[36] Newzoo A New Era of Engagement in Media & Entertainment Report

Covid-19 pandemic. As of the quarter ending June 2023, Roblox users engaged for 16 billion hours, up 20% YoY.[37]

- 84% of US consumers engage with video games, spending 11.8 hours / week playing and interacting with them.[38]

- Gen Z[39] and Gen Alpha[40]:

    - 75% of kids ages 9 - 12 in the US, UK, Canada, New Zealand, and Australia play Roblox[41], where there are 70.2 million average DAUs.[42]

    - 90% of Gen Alpha and Gen Z engage with gaming through playing, viewing, owning, and/or social behavior.[43]

    - 50% of Gen Alpha and Gen Z spend money in video games.

        - Of those who spend, 93% of Gen Alpha and 91% of Gen Z spent money on in-game items.[44]

    - In a recent study by Roblox and Parsons School of Design[45], 75% of Gen Z said they will spend money on digital clothing and accessories.

        - 31% say they spend $5 / month, 30% spend $10-$20 / month, and 12% spend $50-$100 / month.

            - 25% say they own over 50 items their avatar can wear.

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[37] https://ir.roblox.com/news/news-details/2023/Roblox-Reports-Third-Quarter-2023-Financial-Results/default.aspx
[38] https://newzoo.com/resources/blog/over-80-of-us-consumers-play-video-games-how-can-brands-accelerate-engagement-with-this-big-audience-of-game-enthusiasts#:~:text=In%20the%20US%20alone%2C%2084,Video%20games%20are%20incredibly%20popular.
[39] Gen Z includes people born between 1997 and 2012. Note that there is no definitive range for Gen Z and some others use 1995 – 2012.
[40] Gen Alpha includes people born in 2013 and later. Like Gen Z, there is no definitive date for when Gen Alpha starts, and some others say it begins in 2010.
[41] https://conversationswithtyler.com/episodes/matthew-ball/
[42] https://ir.roblox.com/news/news-details/2023/Roblox-Reports-Third-Quarter-2023-Financial-Results/default.aspx
[43] Newzoo Gamer Insights: Gen Alpha & Gen Z: The Future of Gaming
[44] Id.
[45] https://blog.roblox.com/wp-content/uploads/2022/10/FINAL_2022-Metaverse-Fashion-Trends-report_Roblox-x-Parsons.pdf?utm_source=Blog&utm_medium=download&utm_campaign=self+expression

- Games are the #1 entertainment source for Gen Alpha and #3 for Gen Z (following social networks and streaming movies / series).[46]

- 90% of US Gen Z consumers engage with games and virtual worlds[47] and 70% of Gen Z are interested in socializing in game worlds beyond play.[48]

- Gen Z in the US spends ~15 hours / week engaging with game content.[49]

- 69% of Gen Z creates digital content.[50]

- Gen Z has $360 billion in spending power, up from $143 billion four years ago.[51]

While I focus primarily on the younger generations in this essay, it's important to note that video games aren't just for kids[52]:

- 80% of Millennials play games
- 63% of Gen X play games
- 44% of Baby Boomers play games

Candy Crush[53], a hyper casual mobile game that launched in 2012 and is hugely popular with older generations, recently hit $20 billion in revenues.[54]Not only do the older folks play games, but they also spend! That said, as the percentages above show — currently — the tendency to play games drops off as gamers age. This makes sense — as gamers age up and start their professional careers and families, they simply have less time to game. That said, although it's too early to know, I believe that as fully digital Gen Z and Gen Alpha age up, they will continue to play games in higher percentages than the older, non-fully digital

[46] Id.
[47] https://newzoo.com/resources/blog/over-80-of-us-consumers-play-video-games-how-can-brands-accelerate-engagement-with-this-big-audience-of-game-enthusiasts
[48] Newzoo Gamer Insights: Gen Alpha & Gen Z: The Future of Gaming
[49] Newzoo A New Era of Engagement in Media & Entertainment Report
[50] Id.
[51] https://www.theshelf.com/the-blog/gen-z-spending-habits/?utm_source=substack&utm_medium=email
[52] https://www.visualcapitalist.com/sp/video-game-engagement-by-generation/
[53] King, the developer of Candy Crush, was acquired for $5.9 billion by Activision Blizzard in 2016. At the time of this Verge interview with Phil Spencer, the CEO of Microsoft Gaming, in November 2022, King was making more than the Activision and Blizzard divisions of Activision Blizzard.
[54] https://www.reuters.com/technology/candy-crush-saga-hits-20-billion-revenue-milestone-maker-king-says-2023-09-26/

generations.[55] Further, relatively new research shows that video games may help prevent dementia[56] and Alzheimer's disease[57] as well as offer social and mental health benefits for folks age 65 and older.[58] I believe this evidence suggests that video games could even become a prescribed component of holistic healthcare for older adults, potentially increasing gaming rates among older generations. Finally, it's also possible that older generations will prefer web3 enhanced games, where they own, and can trade for real value, the assets they acquire. Specifically, adding these attributes to games may address some of the reasons Theo Karasavvas believes adults play less games as they age:[59]

> *"There is a general lack of reward when it comes to gaming—at least in terms of how adults interpret the concept of reward. The repetition of an activity that doesn't produce a visible benefit can decrease the feeling of novelty, and that's when boredom may strike. Breaking virtual records and topping the scoreboards may be bigger goals for a teenager, but for a young professional in their early thirties, something with a concrete output—think cooking, painting, gardening, or bodybuilding—may appear to be much more rewarding."*

As noted in the immediately following chapter, I include "metaverse" (which I prefer to call the "Betterverse"[60]) in my definition of a game. I believe the "metaverse" is already here through games like Fortnite, Roblox, and Minecraft, where gamers can do many things outside of just gaming. In those experiences,

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[55] There's also a reason (probably data driven) that former Netflix CEO Reed Hastings infamously said *"We compete with (and lose to) Fortnite more than HBO"* in a 2019 shareholder letter. It's a brutal competition right now across games, sports, and other forms of media for a consumer's time and attention and games are increasingly winning — and likely winning over some folks in older generations.

[56] https://www.straitstimes.com/world/united-states/study-shows-video-games-could-cut-dementia-risk-in-seniors

[57] https://go.skimresources.com/?id=100098X1555750&isjs=1&jv=15.4.2-stackpath&sref=https%3A%2F%2Farstechnica.com%2Fgaming%2F2019%2F01%2Ftales-of-an-aging-gamer-why-dont-i-pick-up-a-controller-as-often-as-i-used-to%2F&url=https%3A%2F%2Fwww.sciencedaily.com%2Freleases%2F2017%2F12%2F171206141648.htm&xs=1&xtz=360&xuuid=f457d6f9bcc9fc67c6b8e8614ebcb86f&cci=402a539e580e01be1089e779329ed907

[58] https://www.fandomspot.com/us-senior-gamers-study/

[59] *Tales of an aging gamer: Why don't I pick up a controller as often as I used to?"*

[60] I'm sure I'll lose this battle, but the term "metaverse," which is generally credited as originating from the novel, Snow Crash by Neal Stephenson, has dystopian origins. Stephenson's "metaverse" is more of a warning as to what we should *not* build, which is why I like the word *Betterverse*. In the Betterverse, we want to build spaces that are healthy for humans, where there is empathy and inclusiveness. It's hard to leave a *physical* geography when you aren't treated right, but it's very easy to leave a *digital* one (although this distinction blurs in autocratic regimes where citizens may be prevented from accessing certain websites outside of their home jurisdiction). People will generally choose to spend their time in a *Betterverse* versus a *metaverse* (as that term was originally defined). I also like to imagine that the Betterverse will be jointly owned by companies and people, where both are incentivized through *ownership* to take care of each other.

gamers can go to concerts, hang out with their friends and chat, they can shop, they can create avatars, maps, and items – the list goes on and on. 77% of gamers participate in non-gaming activities inside of games, including socializing and meeting new people, avatar creation, purchasing virtual goods, and creating new games or levels.[61] Games serve as the entry point, foundation, and embodiment of the metaverse. We're currently at that point of the cycle where folks say "the metaverse concept will never deliver on its promise."[62] I think the best of the metaverse is yet to come[63]:

- Goldman: "the metaverse could be an $8 trillion opportunity."[64]
- Morgan Stanley "predicts the metaverse could be worth $8 trillion."[65]
- Bank of America: "the metaverse is where we're going to start using cryptocurrencies as currencies; they will be widely used for transactions."[66]
- Citi: "the metaverse economy will be worth $13 trillion by 2030 and more than 5b people will live there."[67]
- McKinsey: "the metaverse could be worth $5 trillion by 2030" and "the average user will spend up to six hours a day exploring metaverse experiences by 2030."[68]

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[61] https://activate.com/#outlook
[62] https://www.wired.com/story/metaverse-video-games-fortnite-zuckerberg/
[63] For example, I can't wait for launch of the Lego / Epic Games metaverse (Betterverse!) experience. Lego invested $1b in Epic in 2022 and its Chief Marketing Officer recently said that Lego worked in Unreal Engine to create a "digital twin" for over 10,000 Lego building pieces to "allow its designers and communities to build, unbuild, and rebuild limitless Lego products, sets, digital experiences, and new content within a range of digital playgrounds." This Epic / Lego metaverse will most definitely compete with Roblox and cater to a younger audience, which is important as some Fortnite gamers age out of the game. (I use the word "some" intentionally. I think Fortnite is a "forever game" that will continue to be played (albeit less frequently) as kids become adults.)) It's also fantastic to have a 90+ year old trusted brand like Lego, whose business depends on building safe products for young kids, inevitably building metaverse safety standards along the way. Finally, I would not be surprised if over time certain "digital twin" Lego creations become NFTs; young creators will eventually demand *ownership* of the UGC they develop on metaverse platforms.
[64] https://www.gsam.com/content/gsam/us/en/institutions/market-insights/gsam-connect/2022/into-the-metaverse.html
[65] https://www.morganstanley.com/ideas/metaverse-investing
[66] https://markets.businessinsider.com/news/currencies/metaverse-crypto-cryptocurrencies-blockchain-technology-decentraland-bank-of-america-2021-11
[67] https://www.barrons.com/articles/metaverse-web3-internet-virtual-reality-gaming-nvidia-51648744930
[68] https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/value-creation-in-the-metaverse

- Tim Sweeney says, *"over the coming decades, the metaverse has the potential to become a multi-trillion-dollar part of the world economy."*[69]

The problem with these numbers is that they don't scratch the surface of where we're going. This is because you should assume, by my definition of a "game" (see Chapter 3: *What is a Game*), that every single one of the 385,000 babies born every day globally is a gamer — subject to internet connectivity, which is currently 5 billion people or 64.6% of the population and growing.[70] Accordingly, we are increasing the gaming ecosystem by ~91 million people annually.[71]

If the above stats don't grab your attention, note that seven of the world's ten most valuable tech firms are materially active in gaming: Microsoft, Amazon, Tencent, Apple, Meta, Nvidia, and Google.[72] I believe that every major technology company will build a presence in games and that most video game companies will eventually be owned by tech platforms[73] or perhaps vice versa, especially as games increasingly become social networks. Moreover, as discussed in Chapter 7, I also believe that most streetwear and luxury brands will start to behave like video game companies.

[69] https://www.bloomberg.com/news/articles/2021-11-17/metaverse-is-a-multitrillion-dollar-opportunity-epic-ceo-says#xj4y7vzkg
[70] https://www.statista.com/statistics/617136/digital-population-worldwide/
[71] https://www.matthewball.vc/all/netflixgames
[72] https://www.economist.com/special-report/2023/03/20/ready-player-four-billion-the-rise-of-video-games?utm_source=pocket_saves
[73] Microsoft's acquisition of Activision Blizzard is case in point. These are two of the biggest companies in their respective industries. Microsoft made $198 billion in 2022 and Activision Blizzard made $7.5 billion in 2022. I believe this deal finally going through may set a precedent for other significant combinations in tech and gaming.

Chapter 3: What is a "Game" & What are "web3 Games"?

Given that I view life itself as a game, my definition of a "game" is unsurprisingly broad. I believe that games are:

The ultimate social networks

Places to hang with your friends and build communities

Places for creative expression and building

Digital theme parks

Places to engage with brands and launch immersive, authentic experiences, including loyalty programs

Places for direct-to-avatar commerce

Places of work

Places for educational experiences

"Metaverse" and AR/VR experiences

NFT experiences

Places for therapy and meditation

Simulations to "imagine the unimaginable"

Eventually, a form of bank account

74 75 76

I also believe that a great game is filled with captivating stories, where gamers and their friends want to spend their precious time, and because these games deliver delightful experiences, game developers and gamers can both create and monetize the success of games *together*.

I view web3 technologies as *accretive to* traditional games and not necessarily as a *replacement of* traditional games. Developing core game loops that drive fun, engagement, and retention remains the foundation of any game. When I refer to "web3 gaming", what I mean is using new technologies to expand the aperture of game design, providing both gamers and developers with a broader range of creative options and unique ways to foster *ownership, community, loyalty* and *flow*. The consequence of which should be increased user acquisition (UA), engagement,

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[74] Here is more context for why I include "simulations to imagine the unimaginable." Game designer Jane McGonigal builds simulations as games to harness the power of gamers' collective intelligence and imagination to "imagine the unimaginable." In 2010, McGonigal created a simulation of a respiratory pandemic that 20,000 people "played." When the Covid-19 pandemic hit in 2020, the gamers who participated in the simulation felt prepared. McGonigal believes that gamers can help "solve real-world challenges." McGonigal mentions other potential game simulations related to government-mandated internet shutdowns and climate migration. See McGonigal's outstanding book Imaginable for more.

[75] I also include "a form of bank account" in my definition of a game, which probably seems strange. I believe US dollar backed stablecoins will eventually become a widely adopted form of in-game stable currencies. As gaming shifts more and more to include web3, US dollar backed stablecoins could potentially, eventually reach 3.27 billion non-US people (the number of non-North American gamers) through web3 gaming. For some non-US gamers, games will become a pseudo-US dollar bank account and allow non-US folks to save and spend in US dollars, which is highly desired in countries where the currency is not stable and/or not viewed as legitimate — generally due to a combination of inflation, poor governance, or arbitrary confiscation. It has been surprising to see the US government fail to embrace and enact reasonable federal legislation with respect to US dollar backed stablecoins, especially at a time when US dollars as a share of reserves held by foreign central banks have fallen: in 2000, US dollars represented 73% of global central bank reserves, today that figure has fallen to 59%. It doesn't make sense to me why the US government wouldn't do everything it can to get US dollar backed stablecoins into the hands of as many global citizens as possible, regulated under US federal law. Note that PayPal's US dollar backed stablecoin, PYUSD, is issued by Paxos Trust Company, which is regulated by the New York State Department of Financial Services. PayPal itself is licensed as a money transmitter on a state by state basis. Circle is regulated in the United States by FinCEN as a money services business and is also licensed as a money transmitter on a state by state basis. Circle also has the New York Department of Financial Services "Virtual Currency License" (BitLicense). The point is that while PayPal / Paxos and Circle are regulated, they are regulated at the state versus federal level.

[76] This is a drawing based on Kanpai Pandas NFT #5762 owned by Alex Matthews, an analyst on the Brevan Howard Digital venture team. Kanpai Pandas is an omnichain NFT collection that merges exclusive collaborations and major brand partnerships with on-chain game theory to provide tangible real-world utility to holders. Alex works on web3 gaming deals with me and other than my son, Mack, I don't know anyone who loves all games (but mostly AAA FPS games (like Shrapnel!)) more than Alex. Brevan Howard Digital is an investor in Neon Machine, the game developer of Shrapnel.

retention, and hopefully supercharged monetization. For now, games that add web3 may want to follow the Sid Meier 33-33-33 Rule[77]: 33% new (in this case, adding web3), 33% improved (if it's a mod or subsequent version, it should be better / differentiated than the original game), and 33% what everybody already expects to be there (fun, core game loops). This doesn't mean that I don't believe in a future where games operate entirely on-chain or use fully decentralized game engines, both of which exist in some form today. Although it may take longer for fully on-chain games to achieve mainstream adoption and scale, I expect significant, novel innovation to come from this area of gaming.[78]

Finally, due to the events of 2022 and general NFT backlash (which I discuss next), we're presently seeing an *overcorrection* where game developers are trying to completely hide the web3 elements of their games. This is a mistake and, frankly, makes no sense. If the goals of adding web3 to games are to increase UA, engagement, and retention — all of which lead to enhanced monetization — how do you do that if the gamer, for example, doesn't know they own their assets and/or that there is a secondary market where they can trade them?

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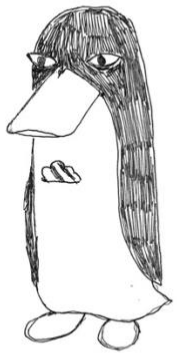
[77] While Meir adopted this rule for new versions of his game Civilization, I think it's a sound rule to apply here given that many "new" games are really just improvements / reskins of other games.

[78] Will Robinson, who has a PhD in Game Studies and is a member of the web3 accelerator Alliance team, is an expert in fully on-chain games (FOCGs). Will recently did an episode of the Good Game podcast on this topic. I highly recommend following Will on Twitter @DangerWillRobin. When I get asked if games should be fully on-chain, I encourage folks to consider the answers to the following three questions:

1. What kind of game? For example, is the game a simple turn-based game or a AAA TPS (third person shooter, not transactions per second!) like Fortnite? Scopely's CTO recently posted that Monopoly Go does 2.1 million database writes per second — blockchains generally cannot handle that today (eventually, public blockchains will exceed that).
2. What is the goal? If the goal is to take a first step into *ownership*, then it's possible to bring in-game virtual items fully on-chain today. Many games using web3 technologies do this (83% of active web3 games have on-chain assets), which is a significant improvement from all in-game virtual items living on centralized servers. If, on the other hand, the goal is complete trustlessness, then that implies game logic and game state being fully on-chain (only 5% of active web3 games are fully on-chain), which could be complicated depending on the type of game and blockchain ecosystem the game is being developed in (*e.g.,* Solana supports more transactions per second than Ethereum).
3. Who is the intended audience? If the intended audience for a game is primarily web3 natives and the game has solid core game loops, then web3 natives will show up to a game with wallets/crypto ready to spend. To the extent it turns out that web3 native gamers spend more in-game than non-web3 gamers (which early evidence suggests), it may be possible to sustain a FOCG with a smaller number of gamers than typically required for a web2 game. If a game is intended for a more mainstream, web2 audience, however, then a FOCG may have UA and retention issues until as / when web3 infrastructure gets better / easier for non-crypto natives to use, which will inevitably happen over time.

Chapter 4: But …Don't Gamers Hate web3 and NFTs?

Before we address this topic, do yourself a favor and google some iteration of "why do gamers hate free to play" and you'll see that gamers hating NFTs today is not so different from how much gamers hated free-to-play (F2P) games.[79][80] Indeed, F2P hate was so bad that in 2015 GamesIndustry.biz opined that the most significant risk to the burgeoning F2P industry was Apple pulling F2P games from the App Store:[81] [82]



"…if the negativity around the perception of F2P games were ever to start to outweigh the positive benefits of all that free software, do not doubt that Apple would reverse course fast enough to make your head spin. Reckon that its 30 percent share of all those Puzzle & Dragons and Candy Crush Saga revenues would be enough to make it think twice? Reckon again; App Store revenue is a drop in the ocean for Apple, and if abusive F2P ever starts to significantly damage the public perception of Apple's devices, it will ban the model (in part, at least) without a second thought to revenue."

GamesIndustry.biz
February 27, 2015

It's shocking that gamers and developers disliked F2P games so much that *anyone* — let alone a prominent gaming publication — thought Apple may remove F2P games from the App Store. Apple made $50 billion in App Store gaming revenue in 2022[83], which was 12.6% of Apple's 2022 revenues! Not really a "drop in the ocean" for Apple. In any case, despite all the F2P hate, Tim Sweeney knew 11 years ago that F2P games would come to dominate gaming:

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[79] https://www.forbes.com/sites/erikkain/2012/06/27/epics-tim-sweeney-says-free-to-play-is-the-future-of-gaming-industry/?sh=2af5ce0f18a6

[80] I can't blame gamers for the NFT hate given all the scams and rug pulls we've seen in these early days of web3. However, traditional gaming is also partly to blame for this "gamer NFT backlash" given that gamers feel like they've been taken advantage of for a long time in web2 gaming with random loot boxes and "pay to win." I'm guessing random loot boxes won't entirely disappear in web3 games, but at least gamers will own, and be able to sell, the random items they receive. Well, maybe. In addition to web3 legal/regulatory issues, game developers also need to consider how jurisdiction specific gambling rules may apply.

[81] https://www.gamesindustry.biz/free-to-play-hate-threatens-the-health-of-the-industry-at-large

[82] Peter Johnson's iconic Wassie NFT #4340. Drawn and included in this essay with Peter's permission.

[83] https://www.businessofapps.com/data/apple-app-store-statistics/

"North American and European developers are far, far behind the state of the art Asian business models," Sweeney said at GDC Taipei. "We've been building these games like Gears of War where you go into the store and you buy a piece of plastic! You just buy this DVD. That is going to change rapidly."[84]

Sweeney was correct: F2P games currently account for more than 80% of gaming industry revenue (with 50% of gaming revenues coming from mobile games, which are predominantly F2P).[85] F2P games, which are accessible by anyone, anywhere with a smartphone (no need to buy a console or PC), have helped to materially grow the number of gamers worldwide.[86] Gaming seems to go through paradigm shifts every ten years or so, primarily driven by hardware[87], but as hardware has become more stabilized, recent transitions have been driven by software.[88] We're about ten years post the mainstreaming of F2P and I believe the next transition will be enhancing games through web3 technologies (software). Just like the rise of F2P games led to an increase in the total number of gamers, so too will adding web3 technologies to games, but I also believe that adding web3 to games will lead to an increase in the total number of gamers who *spend* in games. I recently heard someone say that Roblox's 2023 growth in DAUs doesn't matter because Roblox is probably growing users in emerging market jurisdictions where gamers don't spend. While that may be true, it may be more nuanced than that because some gamers may want to spend but are structurally *unable* to spend. Let's take a quick look at where gamers reside[89]:

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[84] https://www.gamedeveloper.com/business/epic-s-sweeney-platform-convergence-freemium-the-inevitable-future

[85] https://www.konvoy.vc/newsletter/the-good-and-bad-of-free-to-play and https://newzoo.com/resources/blog/the-games-market-in-2022-the-year-in-numbers. Note that I think this percentage is higher, but I decided to go with the most conservative figure I could find.

[86] F2P refers to video games that give players access to a game without the need to pay for it. Generally, to access additional content, progress further in the game, and/or attain cosmetic items, the user needs to pay via microtransactions / IAPs. Developers of F2P games also monetize via in-game advertising. Most credit Nexon with creating the F2P business model, which was initially used in MMOs and kids' games. We then saw the rise of F2P games on smartphones, but what really brought F2P games to the mainstream was launch of the iPhone in 2007 and the App Store in 2008. F2P games then hit explosive growth and officially went mainstream: in December 2009, Rovio released Angry Birds; in 2012, King released Candy Crush and, by the end of 2013, Candy Crush had 400m players and revenues of $1.88 billion from advertising and IAPs; then came Clash of Clans, Flappy Bird, Crossy Road, Temple Run, Subway Surfers, Pokémon Go, PUGB mobile, Call of Duty Mobile, and Fortnite.

[87] *E.g.,* arcade, console, PC, handheld, and mobile. The most recent example being the technical improvements in mobile and tablet that helped usher in F2P. Here is a cool visualization of the history of gaming based on gaming revenues.

[88] That is, until the Apple Vision Pro starts to attain mainstream adoption.

[89] Global games Market Report Newzoo August 2023

- 53% of gamers are Asia-Pacific, 46% of gaming revenues
- 17% Middle East & Africa, 4% gaming revenues
- 13% Europe, 18% gaming revenues
- 10% Latin America, 5% gaming revenues
- 7% North America, 27% gaming revenues

[90]

There are 1.7 billion adults globally who are underbanked[91] and it's probably safe to assume that a significant number of underbanked people reside in regions with considerable gaming populations. Underbanked folks generally do not have access to traditional payment systems that are supported by, for example, the Apple App Store or the Google Play Store. Underbanked does not mean no income/no ability to spend. Folks could be underbanked for many reasons, including: immigrant/refugee with no credit history, language barriers, discrimination, living in an inconvenient location, lack of trust (in parts of the world, the official system is untrustworthy (*e.g.,* inflation, arbitrary confiscation)). Also, some people choose to be underbanked because they don't trust the traditional financial system, which can leave them at the mercy of payday lenders and money transfer services, which can be more expensive than the traditional financial system, but more convenient, trustworthy, or accessible for some people. Therefore, underbanked people may be unable to make in-app-purchases (IAPs) even if they have money to spend/want to spend. Notably, 2/3 of underbanked people have smartphones and, if they have a smartphone, they have access to blockchain-based payment systems and can acquire and spend cryptocurrency in games, including stablecoins like USDC, USDT, and PYUSD. I discuss this in greater depth in Chapter 5.7.F: *The Blockchain is the IAP System*, but that's what I mean when I say that adding web3 technologies to games broadens the number of gamers who can spend in games.

As Sweeney noted, the F2P business model took off in the East first, with game developers in South Korea, China, and Japan embracing the model until it finally made its way to the West. History doesn't repeat, but it does rhyme, and

[90] This is an illustration of Ross Trachtman's CloneX NFT # 14653. Ross is an analyst on the Brevan Howard Digital venture team. Ross was the first person to read this essay and he provided incredibly valuable and thoughtful feedback.

[91] https://www.worldbank.org/en/topic/financialinclusion/overview

we're seeing the same pattern emerge with web3 enhanced games. Nexon[92], the largest gaming company in South Korea, which had ~$2.7 billion of revenue in 2022, is considered by many as the creator of the F2P business model. Twenty years ago, Nexon launched a F2P game called MapleStory, which now has 180 million registered users and ~32,000 items (equipment, cosmetics, pets, and others). At GDC 2023[93], Nexon announced that it will be transforming MapleStory into a blockchain-enabled game:

> "*…blockchain technology will be applied to the game with a vast amount of content and live service know-how accumulated over 20 years, creating an NFT-centered ecosystem that will develop the IP together with participants. By combining the advantages of blockchain with Nexon's long-term live service capabilities, the company aims to provide a service that allows users and game companies to continue to grow together in a healthy way by leveraging the irreplaceable IP of MapleStory."*[94]

Netmarble, another large South Korean game company, with $2.1 billion of revenue in 2022[95], launched three blockchain games in 2022 on its blockchain

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[92] Nexon was founded in South Korea in 2002 and is currently headquartered in Tokyo. Nexon had ~$2.7b in revenue in 2022.

[93] Nexon further said: *"This is not merely a sudden decision based on a trend, but rather a carefully considered endeavor and challenge by Nexon to overcome the limitations it has faced. Nexon has been conducting research on the blockchain-based gaming ecosystem even before blockchain came to the forefront, exploring various options for blockchain game services and the use of NFTs in games. We have been steadily paying attention to the blockchain ecosystem by continuing to put energy into blockchain-related R&D through its specialized research organization, Intelligence Lab."*

[94] There are a couple caveats to the Nexon web3 story: (i) in January 2023, the Seoul Administrative Court dismissed an appeal from South Korean developer SkyPeople with respect to its game Five Stars, which allows players to mint NFT characters and then trade them on the Klaytn blockchain. SkyPeople was appealing a decision of South Korea's Game Rating Administrative Committee (GRAC), which refused to rate Five Stars (all video games in South Korea must acquire an age rating from the GRAC for the release of the game in South Korea). Games that involve cryptocurrencies or NFTs have been banned in South Korea by GRAC due to local law that prohibits firms from promoting speculative behaviors to players via cashable rewards. This means that while Nexon and others can develop games with NFTs and cryptocurrencies, they can't offer them to South Korean gamers (some of whom, I've heard, do make frequent use of VPNs) (It's striking that South Korea's gaming giants — despite an NFT ban in local games — keep weaving web3 tech into their titles, which indicates deep conviction in the future of web3 technologies in games.); and (ii) Nexon's CEO Owen Mahoney says the "jury is out" on how important web3 will be for games. Mahoney seems to believe that web3 is important for game economies but that (I'm summarizing here) web3 doesn't work unless the user experience is better than it was before and that web3 needs to make gamers' lives better in some way. You can listen to Mahoney's excellent interview with Aaron Bush, Co-Founder of Naavik, on a recent Naavik podcast (start around the 51 min mark). On the GRAC issue, it's also important to note that in July 2023, the Korean government charged the GRAC with embezzlement. Oddly, the embezzled funds were allegedly used for Bitcoin mining. Despite what the length of this essay may imply, I'm really at a loss for words on this one.

[95] https://company.netmarble.com/en/invest/finance
https://forum.netmarble.com/kofg_en/view/19/78258

MarbleX and attained 13 million users and 22.5 million downloads.[96] Netmarble's blockchain based games may be early indicators of the ability for web3 to enhance revenue and retention, although it's too early to tell for certain[97]:

- After Netmarble adopted blockchain:
    - its MMORPG, A3, saw a seven-fold increase in revenue, a six-fold increase in DAUs, and more than a two-fold increase in retention; and
    - another MMORPG, Ni no Kuni, showed a 4% improved 30-day retention rate

Further, in October 2022, an EVM-compatible gaming-specific blockchain called Oasys was launched by a team in Japan with Square Enix, SEGA, Ubisoft, and Netmarble acting as validators. The Oasys team recently said that Japanese gamers remain enthusiastic about web3 gaming[98], which may be attributable, at least in part, to no Japanese retail investors being harmed in the FTX bankruptcy.[99][100] Also, the type of games popular in the East — *e.g.*, RPGs and MMORPGs — are well-suited for blockchain (lots of materials, crafting, characters to collect), which are then supercharged by the strength of Japanese and South Korean gaming IPs. As noted earlier, only 7% of gamers globally are in North America, with most gamers — 53% — being in the East, and how developers and gamers feel about web3 differs wildly based on jurisdiction. Below is list of prominent web2 game companies currently building in web3 — unsurprisingly, like the rise of F2P, most of them are based in Asia. I included 2022 revenues beside each of them to give folks an idea of how big some of these companies are. It's also interesting to note that the APAC region currently holds the largest share of web3 game development teams at 40% and attracts the most new web3 games at 49%.[101]

[96] https://chaindebrief.com/asia-will-be-the-engine-for-blockchain-gaming/
[97] Id.
[98] https://podcasts.apple.com/us/podcast/bcgw-126-why-japanese-game-companies-are-going-blockchain/id1422260545?i=1000599386098
[99] https://www.coindesk.com/consensus-magazine/2023/01/26/japan-embracing-crypto-industry-web3-dao-nft/
[100] The Japanese government, which is openly supportive of web3, proactively established a robust regulatory framework for crypto, including the requirement that all Japanese consumer assets must be fully segregated on crypto exchanges.
[101] https://research.game7.io/state-of-web3-gaming-2023

Nexon (South Korea)	~$2.7 billion revenue 2022
NC Soft (South Korea)	~$2.15 billion revenue 2022
Netmarble (South Korea)	$2.1 billion revenue 2022
Krafton (South Korea)	$1.47 billion revenue 2022
Kakao Games (South Korea)	~$889 million revenue 2022
Come2uS (South Korea)	~$555 million revenue 2022
WeMade (South Korea)	~$355 million revenue 2022
Pearl Abyss (South Korea)	~$300 million revenue 2022
Bandai Namco (Japan)	$6.79 billion revenue 2022
Square Enix (Japan)	$2.5 billion revenue 2022
Sega (Japan)	$2.45 billion revenue 2022
Konami (Japan)	$2.28 billion revenue 2022
Ubisoft (France)	$1.9 billion revenue 2022
Voodoo (France)	$20 - $100 million 2022
CCP Games (Iceland)	$56.1 million revenue 2022
Scopely (Saudi Arabia)	$1.63 billion revenue 2022
EA (United States)	$7.42 billion revenue 2022
Epic Games (United States)	~$6.27 billion revenue 2022
Zynga (United States)	$2.44 billion revenue 2022
Jam City (United States)	~$868 million revenue 2022
Atari (United States)	$10.55 million revenue 2022
Tilting Point (United States)	~$25 - $100 million revenue 2022

[102]

Importantly, *unlike* the rise of F2P in Asia, we also see large gaming companies in Europe and the United States building games with web3 technologies.[103] I've linked below to the web3 efforts of each of the gaming companies in the list above as well as footnoted to 2022 revenue figures:

- Nexon, South Korea[104]
- NCSoft, South Korea[105]
- Netmarble, South Korea[106]
- Krafton, South Korea 2022[107]
- Kakao Games, South Korea[108]
- Come2uS, South Korea[109]

[102] This drawing is based on my Sugartown Ora NFT #1287. I'm a big fan of Matt Wolf, VP web3 Gaming at Zynga, and what he and his team are building with Sugartown.
[103] As noted in an earlier footnote, Jon Jordan, Editor of Blockchaingamer.biz, publisher of GamesTX (it's outstanding – I'm a paying subscriber!), and co-founder of Pocketgamer.biz – maintains a comprehensive list of all web3 enabled games here. There are over 1,000 web3 games on Jon's list!
[104] https://www.businesswire.com/news/home/20230208006048/en/Nexon-Releases-Earnings-for-Fourth-Quarter-and-Full-Year-2022
[105] https://kr.ncsoft.com/en/pr/newsDetail/5341.do
[106] https://company.netmarble.com/en/invest/finance
https://forum.netmarble.com/kofg_en/view/19/78258
[107] https://press.krafton.com/en-US/KRAFTON-INC-REPORTS-2022-SALES-OF-1854-TRILLION-KRW-147-BILLION-USD
[108] https://www.kakaogamescorp.com/ir/finance/consolidated?year=2022
[109] https://com2us.com/corporation/ir/eng/finance

- WeMade, South Korea[110]
- Pearl Abyss, South Korea[111] (see also, CCP Games)
- Bandai Namco, Japan[112]
- Square Enix, Japan[113]
- Sega, Japan[114]
- Konami, Japan[115]
- Ubisoft, France[116]
- Voodoo, France[117]
- CCP Games, Iceland[118] (acquired by Pearl Abyss (South Korea) in 2018))

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[110]https://file.wemade.com/homepage/upload/20230214225423844_FY22%204Q%20Earnings%20Release%20PT(ENG)_20230215.pdf

[111] https://massivelyop.com/2023/02/16/pearl-abyss-q4-2022-revenues-decline-as-black-desert-and-eve-hold-steady-and-crimson-desert-malingers/

[112] https://www.bandainamco.co.jp/en/ir/financial/index.html

[113] Square Enix was founded 20 years ago in Tokyo, has a $5.6 billion market cap, had ~$2.5 billion in net sales in FY 2022, and has 5,600 employees. Square Enix is best known for its RPG franchises, including Final Fantasy, which has 24 million players. In Square Enix's YE 2022 letter, the company said it would invest in blockchain entertainment *"to which we have devoted aggressive investment and business development efforts."* In the letter, the company also noted that it has multiple blockchain games based on original IPs under development and that it will *"continue to take stakes in promising businesses whether we find them in Japan or aboard." "Blockchain has been an object of exhilaration and a source of turmoil, but with that in the rearview mirror, we hope that blockchain games will transition to a new stage of growth in 2023."* Indeed, in February 2023, Square Enix announced that it was partnering with Polygon to launch a web3 interactive digital collectible art experience called Symbiogenesis.

[114] https://www.segasammy.co.jp/cms/wp-content/uploads/pdf/en/ir/ir_2022_web_all_e-1.pdf

[115] https://img.konami.com/ir/en/financialinfo/

[116]https://staticctf.ubisoft.com/8aefmxkxpxwl/3TL97lhdKScWJxj25qA1ks/ef2acae5a3137fc9c10fa8d988a4a423/UBISOFT_DEU_UK_BAT_2023_MEL.pdfhttps://staticctf.ubisoft.com/8aefmxkxpxwl/3TL97lhdKScWJxj25qA1ks/ef2acae5a3137fc9c10fa8d988a4a423/UBISOFT_DEU_UK_BAT_2023_MEL.pdf

[117] https://europeangaming.eu/portal/latest-news/2023/05/05/135107/voodoo-sets-sights-on-making-100m-revenue-per-game-with-hybrid-strategy/, Voodoo was founded in 2013 in Paris and specializes in F2P, hyper-casual mobile games, which have 6 billion downloads on iOS and Android. Voodoo has launched 200+ games, which have 150 million MAUs. According to Pitchbook, Voodoo was last valued at $2 billion post money as of July 2021 and has 500 employees. In January 2023, Voodoo announced Voodoo Infinity, its new blockchain gaming ecosystem and "Voodoo Coin," the fungible cryptocurrency that will underlie Voodoo's new web3 enhanced games. Voodoo has been working on Voodoo Infinity for at least three years. Voodoo is expected to launch 10 web3 based games in 2023 and 2024.

[118] https://drive.google.com/file/d/16Y-Wnx7FA_6L04_OHVUbGbjaA37O5GN4/view. CCP (Crowd Control Productions) Games, the creator of EVE Online, announced at GDC 2023 that it raised $40 million in funding to make a new blockchain based AAA game set in the EVE universe. EVE is estimated to have ~9.5 million players and ~270,000 active players. CCP was founded in 1997 in Iceland and was acquired in 2018 by Pearl Abyss, a South Korean publisher, for $425 million. Pearl Abyss, founded in South Korea in 2010, is best known for Black Desert Online, a MMORPG with more than 50 million registered users and available in 150 countries. Pearl Abyss currently has a market cap of $2 billion and 895 employees.

- Scopely, Saudi Arabia,[119] although the team is still headquartered in the United States post Scopely's acquisition by Savvy Games[120]
- Zynga, United States[121]
- EA, United States[122]
- N3TWORK Studios, United States (no publicly available financial information)
- Atari, United States[123]
- Jam City, United States[124]
- Tilting Point, United States[125]

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[119] https://www.reuters.com/breakingviews/saudi-5-bln-gaming-play-only-works-some-levels-2023-04-06/

[120] Savvy Games announced its acquisition of Scopely for $4.9 billion in April 2023 and the deal formally closed in July 2023. Founded in 2021 by the Public Investment Fund of Saudi Arabia, Savvy's mission is to become a leading force in the global games industry. They aim to achieve this by:

- Investing heavily in gaming companies: Savvy has already made several significant acquisitions, including Scopely (mobile gaming), ESL Gaming (esports), and a stake in Embracer Group (PC and console gaming).
- Building a strong gaming ecosystem: They're not just buying companies; they're also creating a network of studios, esports organizations, and technology platforms to support game development and growth.
- Driving long-term growth: Savvy's focus is on the future of gaming, with an emphasis on new technologies like web3 and esports, and a desire to expand their reach into new markets, including the Middle East.

In 2022, I predicted that Savvy would make a move into web3 games, which now appears to be happening.

[121] https://ir.take2games.com/static-files/95f7a2f1-4449-41c2-98c2-cad88aa29662

[122] https://ir.ea.com/press-releases/press-release-details/2023/Electronic-Arts-Reports-Q4-and-FY23-Results/default.aspx

[123] https://atari-investisseurs.fr/wp-content/uploads/2023/08/Atari-2023-Consolidated-and-Annual-Financial-Statements-F.pdf

[124] https://www.sec.gov/Archives/edgar/data/1821742/000121390021028051/ea141328ex99-1_dpcmcap.htm
Jam City was founded 13 years ago, has over $4 billion in lifetime bookings, and has generated billions of downloads for hundreds of millions of players around the world. Jam City's biggest franchises are Cookie Jam and Panda Pop and Jam City is also a partner for big global IP holders, including Universal, Disney, and Warner Bros. Games. In December 2021, Jam City announced a new division specializing in blockchain games and its first web3 game, Champions: Ascension. In May 2022, Jam City released the white paper for Champions Ascension and CEO Chris DeWolfe has said that NFTs are as big an opportunity as F2P games were at the dawn of iPhone and Android games a decade ago.

[125] https://www.owler.com/company/tiltingpoint
Tilting Point, a "progressive publisher" that identifies promising games and then uses its platform to help games reach larger audiences in different geographies (including bridging from web2 to web3) announced in March 2022 that it entered into a multi-year partnership with Polygon to publish 10 web3 games and would be working with Stardust to help integrate NFTs into its games. Tilting Point includes a "web3 marketing strategy "as one of its core strategic pillars. Tilting Point was founded 11 years ago and has 460 employees.

- The Epic Games Store, United States now offers 69 blockchain games[126]

Moreover, how do we even know if gamers hate NFTs and web3 enhanced games when game developers have been so hamstrung in attempting to build them? Until October 2022, it was unclear (at best) if games enhanced by web3 technology were permitted in the Apple App Store and no web3 games had been launched in the Epic Games Store. Further, it wasn't until July 2023 that Google (sort of) clarified its rules concerning web3 enhanced games and Steam still bans any games that touch crypto.[127] This effectively means that game developers who wanted to experiment with web3:

- had to do so via browser-based games, where it's technically impossible to launch high quality, beautiful AAA games; and

- could not leverage distribution to billions of gamers via traditional gaming platforms like Steam, the Apple App Store, and the Google Play Store.

We're also still at the very early stages of web3 infrastructure improvements necessary for web3 games to succeed:

- We need better, smoother onboarding and in-game experiences that work more like web2 games if we want to reach traditional gamers.

- We need fiat onramps that work for purchases of fungible cryptocurrency.

    - *E.g.*, a gamer wants to play a web3 game, but is new to crypto so she doesn't have a wallet with USDC or ETH to make purchases in the game. The gamer instead attempts to use a credit card or debit card to make a purchase of USDC, ETH, or the native in-game cryptocurrency and the transaction nearly always fails.[128]

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[126] Epic Games is also an investor in Manticore Games, which is attempting to compete with Roblox, but at the 13+ age group. In mid-2022, Manticore announced that it was moving into web3 and allowing creators to build experiences that are responsive to NFTs in a user's wallet. Manticore's Core is one of the blockchain based games available on the Epic Games Store.

[127] Games that use blockchain technology or let users exchange NFTs or cryptocurrencies aren't allowed on Steam. That said, it appears that some games with web3 enhancements are launching on Steam by removing all web3 elements from the Steam version of the game, which are only accessible via browser.

[128] While the nuance of online ecommerce payments is outside the scope of this paper (and outside my area of expertise), generally, the challenge with using debit or credit cards for purchases of *fungible* cryptocurrencies has to do with these transactions being labeled as "cash equivalents". On the other hand, purchases of *non-fungible* crypto assets like NFTs are labeled as "virtual goods" and generally *do* go through. Why do purchases of fungible crypto fail while purchases of non-fungible crypto assets succeed? This is because there have been billions of dollars worth of purchases of virtual goods in ecommerce over the decades — which is the category that NFTs fall into — but very few purchases of "cash equivalents." Credit and debit card issuers monitor patterns and behavior

- We need improved (invisible) wallet creation, delegation, attestation, in-box filtering, spam control, and gasless transactions. More on this in Chapter 6: *web3 Wallets… the thing that gets you to the thing.*

- We need to continue improving scalability and performance of blockchain networks. It's also important to keep in mind that the Ethereum blockchain itself is only eight years old and its transition to proof of stake is just one year old.

    - The CTO of Scopely posted stats from Scopely's wildly popular Monopoly Go game, which included 2.1 million database writes per second.[129] Blockchains generally aren't ready for that type of scale (yet).[130] This is similar to the early days of the Internet. In 1995, bandwidth wasn't yet sufficient to stream videos, but 10 years later it was. Nonetheless, blockchains are ready today to bring portions of a game fully on-chain like virtual items and leaderboards.

    - Ethereum's move to proof of stake is material because many web2 game companies would not build in the Ethereum ecosystem when it was proof of work due to environmental concerns. This was problematic because most of the liquidity, users, infrastructure, and battle-tested security reside in the Ethereum ecosystem.

- No-code builders that make web3 accessible for all game developers and creators. Sequence's no-code Builder went live on November 30, 2023![131]

Stated differently, games with web3 elements have had two hands tied behind their backs since inception[132] — so how can gamers even know if they hate

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and reject those that are unusual, like "cash equivalents." We will find solutions to this problem over time, including acquiring banks that process credit card transactions on behalf of merchants getting comfortable with fungible cryptocurrency transactions and better fraud detection software.

[129] https://www.linkedin.com/posts/ankurbulsara_some-face-melting-operational-stats-from-activity-7104869337483657216-71tZ?utm_source=share&utm_medium=member_desktop

[130] For context, Solana averages 400 user-generated transactions per second (TPS) and increases to more than 2,000 user-generated TPS during periods of peak demand. Ethereum averages 12 TPS and Bitcoin manages ~7 TPS. Jump Crypto developed Firedancer (not yet live), which in a live demo increased TPS on Solana to 600,000 and is showing potential for up to 1.2 million TPS.

[131] https://sequence.build. Brevan Howard Digital is an investor in Horizon Blockchain Games, the developer of Sequence.

[132] In Matthew Ball's essay, Big Tech's Biggest Bets (Or What it Takes to Build a Billion-User Platform), Ball sums up this problem best: "*None of this to say crypto is a good idea or that blockchains are a good system. But we can't underestimate the significance of these impediments. Last year, many headlines touted that "gamers beat NFTs," but the truth is, gamers never really got a chance to do so. Call of Duty couldn't have crypto, for example, and the Minecraft mods that use NFTs were banned. The president and COO of Activision Blizzard left the company in December 2022 to become CEO of Yuga Labs (Bored Apes) and presumably would have liked to give the technology a test*

them? The next time someone says they hate NFTs and games with web3, remind them that the industry once felt the same way about F2P, which eventually became the dominant business model in gaming. Like the rise of F2P, I believe that over the next 10 years, most games will incorporate web3 technologies and that monetization enabled by web3 will become a dominant business model in gaming.

Of course, it's impossible to discuss web3 games without mentioning Axie Infinity, one of the earliest examples of a web3 game that achieved popularity in the East before spreading to a broader, more mainstream audience.[133] In my admittedly biased opinion, the Sky Mavis[134] team accelerated growth of the crypto gaming ecosystem materially by giving us all a front-row seat to: what worked and did not work in Axie's economy; what it means to earn a living in a game[135]; why a game must be fun first and foremost; and the fragility of certain pieces of infrastructure and internal security best practices when building on the bleeding edge.[136] During the height of Axie's virality, I often heard: "crypto games only need to be more fun than work"[137] (speaking specifically to the play-to-earn model (P2E))." As you can tell from this essay, that's not necessarily something I agree with. I believe that a game has a stronger likelihood of success if it's a *fun* game first. That said, it's important to note that P2E in games isn't a web3 phenomenon. In Second Life, which launched 20 years ago, landowners paid cash-poor residents of Second Life with the virtual currency, Linden Dollars (which was convertible into a variety of fiat currencies), to sit in chairs on the landowner's property. The landowners initially did this because Linden Labs, the creator of Second Life, paid "Traffic Incentives" to landowners who brought visitors to their property. Even when the

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run if not more. In April 2023, Epic Games' EVP of Development also joined Yuga Labs as CTO. If games, among other applications, cannot test blockchain integrations unless they give up most of their audience and some of their technical stacks, then audiences cannot reject them and developers can't figure out how to improve them."

[133] Credit should also go to Dapper Labs, the first web3 company to innovate in web3 games with CryptoKitties, which I considered a fun collecting game, and NBA Top Shot, another collecting "game" that was the first "game" to reach non-crypto natives. In fact, less than five months into its open beta, NBA Top Shot had $500 million in sales, more than 800,000 registered accounts, and 338,000 customers with at least one NFT, and over 3 million transactions and as of today, over $1 billion in sales and 22 million transactions. CMT Digital invested in Dapper Labs in 2019.

[134] CMT Digital invested in Sky Mavis in May 2021.

[135] Including the long-term benefits (*e.g.,* in a future state, workers may no longer need to immigrate to places like America if they can stay home with their families and earn a living in web3 games) and the downsides (*e.g.,* when in-game assets like SLP dip below livability levels).

[136] In March 2022, Ronin, a sidechain developed by the Sky Mavis team and linked to Axie Infinity, suffered the largest hack in crypto history for > $600 million. The hackers gained access to five of the nine validators nodes that controlled the Ronin network, which was enough to approve fraudulent transactions. The US Treasury's Office of Foreign Assets Control (OFAC) announced in April 2022 that the Lazarus Group, a North Korea state-sponsored hacking group, was believed to be behind the Ronin hack.

[137] Many folks in the Philippines started playing Axie Infinity during the Covid-19 pandemic and some gamers, for a time, earned more playing the game than they did in their regular jobs. At one point, Axie Infinity's website said: "We believe in a world future where work and play become one" — highlighting the "play-to-earn" aspect of Axie Infinity.

"Traffic Incentives" ended, landowners continued to pay residents to sit in chairs because then the landowner's property looked busy on the Second Life Map and would attract more people to it. [138]

I'm simplifying things quite a bit but, generally, Axie's economy wasn't sustainable because not enough gamers wanted to engage with the game in a non-extractive way. Depending on the design and type of game and how web3 elements are added to it, there could be four core participants in web3 enhanced games (the first two are also in web2 games)[139]:

- Paying, engaged players who love the game;
- engaged players who love the game, but haven't yet been convinced to spend;
- financial actors, *e.g.,* speculators and investors — people who are in the game for financial gain and/or to extract value; and
- laborers, who are also playing the game for financial gain and/or to extract value.

Axie, for the most part, was the latter two and when a game economy consists predominately of speculators and laborers, it is highly likely to overheat and break.[140] It's also important to consider whether Axie Infinity was simply too early. As discussed above, Axie was limited to in-browser play because it didn't have access to traditional gaming platforms — when Axie launched in March 2018, web3 infrastructure was still in its infancy. Further, consider if Axie's economy would have been better off if it:

- had a stable, non-fluctuating US dollar based currency (*e.g.,* USDC / PYUSD / USDT) and/or
- allowed users to hedge its in-game assets, SLP and AXS

When Axie launched, Tether's (USDT) market cap was only $2 billion and USDC didn't exist, so using a fiat based stablecoin wasn't a viable option. Further, just like a farmer hedges risk associated with her crops using futures and options, gamers who are "laborers" in virtual economies may desire to hedge risk associated

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[138] *Au, James. The Making of Second Life: Notes from the Virtual Revolution. New York: Basic Books, 2009.*

[139] Inspired by a conversation with Neil Young, founder of N3TWORK Studios.

[140] In Axie's case, the value of the in-game asset that players earned from playing the game – SLP (Smooth Love Potion) – was dependent on new entrants playing the game. Axie's DAUs hit a peak of ~2.6 million players in November 2021 and by March 2023, DAUs had fallen to under 1.5 million. SLP peaked at ~$0.40 in July 2021 and by March 2023 SLP was trading at ~$0.02 (SLP currently trades at a fraction of $0.01).

with volatile in-economy crypto assets like SLP and AXS.[141] Not only was Axie building in a technically constrained environment (web browser) with a limited audience and pioneering much of the core infrastructure it needed to build a web3 game (Ronin and its marketplace), but it was also limited in terms of assets and financial tools that could have helped protect gamers from asset volatility. Finally, Axie is / was far from a failure. At its height, Axie had 2.6 million DAUs[142] and, to date, has conducted $3.3 billion in secondary marketplace transactions[143]. I believe we'll look back at when Axie went viral as the point in time that the imaginations of web2 game developers were excited by the potential of web3 and many elected to start testing out this new technology.

[141] For example, let's assume that a worker in the Axie economy would like to earn $100 worth of SLP each month to pay expenses. The worker could use options to "collar" her SLP and buy SLP puts and sell SLP calls. This allows the worker (or a guild on behalf of the worker) to effectively lock-in an SLP price in return for the "work" she puts into playing Axie that month. There could be a simple interface which says, "*what level of income would you like to earn this month*" and the worker would then insert the desired amount of income. The worker would then be notified of the appropriate amount of crypto collateral needed to establish the hedge, deposit that collateral (plus a fee to execute the trade), and then an option collar would be executed on behalf of the worker. In a sense this "gamifies" derivatives by describing and presenting them in a way that provides real utility for users. This could help P2E games like Axie retain users because if workers are able to protect their income, then they may not want to leave the game if / when the price of the in-game fluctuating currency (*e.g.,* SLP) drops. It's not clear to me yet how derivatives markets like these will work; infrastructure could include option vaults and/ or use of centralized platforms. Big caveat: there are considerable legal/regulatory matters to navigate when attempting to bring derivatives to global, retail users. Given the complexities associated with hedging, it may make the most sense to use a non-fluctuating stablecoin as an in-game currency to address volatility issues.

[142] See November 29, 2021

[143] https://axieinfinity.com

Chapter 5: Okay, so maybe web3 enhanced games and NFTs aren't dead! …but why should we care?

We should care about web3 enhanced games for at least seven reasons, each of which I describe below. The tldr as you read through each of these is that games today are constrained by the business models under which they operate. Web3 offers new, albeit yet to-be-proven, business models that can be layered into games. The net new monetization opportunities that web3 offers games are exciting partly due to the potential for game developers and gamers to *monetize together*.

1. Ownership of Assets
2. Gaming Assets are Programmable & Composable
3. Web3 Community & Bringing Non-Spenders into Game Economies
   - Community is Great!
   - Until it isn't
4. Royalties for Game Developers… and Gamers!
5. Democratization; UGC on Steroids
6. Ownership of the Game
7. The Convergence of Mobile and web3

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[144] This drawing is based on my Bored Ape Yacht Club NFT #9063.

5.1 Ownership of Assets

I believe in the long-term inevitability of digital ownership and that gamers will come to expect, and demand, ownership of digital goods just as they do with physical goods. Physical and digital experiences are blending; this is already the case for Gen Z and Gen Alpha and will become true for older generations, especially as spatial computing attains mass adoption.[145] If ownership of goods is valued in the physical world, then, as physical and digital converge, it seems inevitable that ownership of goods will likewise be valued in the digital world. Further, if a gamer pays $15 for a skin in Fortnite and has a choice between owning it or not owning it, which option will she choose? It seems evident that the gamer will choose the web3 version over the web2 version. Even if the price of the skin goes down, the gamer still owns the item and can choose whether to hold it or recoup a portion of the purchase price in a secondary sale (or lend the item out or add it to an NFT AMM liquidity pool). This isn't dissimilar from the old days when gamers would buy a new game at GameStop and when they were tired of playing it, sell it (usually for less than the purchase price), and buy a new game.[146] In fact, at the end of its fiscal year 2011, GameStop sold $5.6 billion in *new* games and hardware compared to $2.6 billion in *used* games and hardware (with zero resale royalties accruing to the relevant game developers).[147] Finally, I fundamentally believe that gamers should own the time they spend in games, *e.g.,* if a gamer spends her valuable time progressing her hero, she should own that hero.

In gaming today, whoever owns the centralized servers owns the virtual items. Enhancing games with web3 allows players to own the assets in the games they play and transform purchases of in-game virtual items from pure expenditures to assets owned by gamers. There are also in-game and third-party marketplaces that provide a source of liquidity for these virtual items. If there is a liquid market for the virtual item, it can be resold potentially at a profit for the gamer and accrue a royalty for the game developer and/or the gamer. We all know that many games have significant "side economies," where assets are traded in violation of the game's or the platform's rules; these economies could be brought directly and lawfully into the game economy itself.[148] This is not to say that having an open game economy is

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[145] Andrew Dworschak, Co-Founder and CEO of Yakoa, puts it best:
"The rise of spatial computing and augmented reality is offering a paradigm shift in how we view the world around us. We're stepping into an era where reality isn't just defined by the things we can physically touch. Instead, we're blending our physical reality with virtual augmentations that bring their own form of value and ownership." Brevan Howard Digital is an investor in Yakoa. Spatial computing is a technology that enables computers to blend in with the physical world in a natural way. Apple's Vision Pro is a spatial computer.

[146] https://www.gamestop.com/trade/?cgid=video-games&tileView=list

[147] https://www.gamestop.com/trade/?cgid=video-games&tileView=list

[148] According to one report, black market sales of gaming accounts amounts to $1 billion annually.

easy – it's not! [149] It's like running a small country of gamer citizens (or large, if a game like Fortnite). But this isn't new. Games like Second Life and EVE Online (discussed in Chapter 8: *But Isn't Everything Old, Just New Again*) have had in-game economies for nearly two decades where complete monetary systems, taxes, royalties, inflation, rewards, and property rights are determined. One key difference with web3 is that economy rules can be encoded in smart contracts so they can't be changed without gamer consent and the players can verifiably own all assets. For example, if a gamer creates a killer mod, the gamer can be paid for her work via smart contract. Finally, ownership — whether through earned virtual goods, virtual goods given away for free, or virtual goods that are paid for — creates a sense of agency and potentially turns gamers into even more prominent advocates for the games they love, which should lead to increased UA, engagement, retention, and monetization.[150] We're obviously early in this process, but we're starting to see this thesis play out. Game studio, Boomland, developed a web3 game called Hunters On-Chain that is identical to a web2 game called Hunt Royale except that Hunters On-Chain uses NFTs and tokens in place of in-game characters and currency. The web3 game currently has 4.5x higher Day 30 retention, 7.2x higher average revenue per user, and increased spending from whales compared to the web2 version.[151]

In these early days of web3, it's important to ensure that gamers have proper disclosure as to what type of ownership they have. Even on public, permissionless blockchains, virtual assets can be subject to additional control because they're not

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[149] While this has worked well in some web2 open economies like Second Life, it has arguably failed in others like Diablo III's auction house. Or did Diablo III's real money auction house really fail (which is the mainstream narrative)? Game economist Philip Black has a different view than most. Black notes: *"And while Blizzard did remove both the real and virtual money auction houses from Diablo III, they were far from a failure. Conversely, they were a smashing success. 50% of players regularly engaged with the auction house (!), with some players bringing in enough to supplement full-time incomes. Sound familiar? Jay Wilson, Diablo's game director, further conceded the auction house performed as intended to combat account fraud."*

[150] I cover aspects of Second Life later in this essay and also encourage examination of Diablo III's Auction House, specifically what led to Blizzard shutting it down in 2014, two years after it launched (to the extent it actually failed, I believe it had more to do with the specific nature of gameplay in Diablo, the type of items available in the store, and a failure to design the marketplace with as much thought as the gameplay itself). While EVE Online has a robust 20-year-old economy, it's not necessarily "open" because gamers can't convert in-game virtual currencies or items to fiat (see *But Isn't Everything Old, Just New Again?... and what about money transmission* for a discussion on the U.S. regulatory considerations when converting virtual currencies to fiat and/or to an asset that is considered a "convertible virtual currency"). Nonetheless, an interesting turn of events occurred at GDC 2023 when CCP Games, the creator of EVE Online, announced that it raised $40 million to make a new blockchain based AAA game set in the EVE universe. EVE is estimated to have ~9.5 million players and ~270,000 active players and is a niche game with an entrenched 20-year, older community. In 2003, when EVE launched, the mean player age was 26. As the player base expanded, the mean age also increased – to age 33 by 2014. I couldn't find any data on what the average age of an EVE player is today, but I would guess early 40s. It will be interesting to see if the new web3 EVE game is able to pull existing users over and/or attract a new, younger generation of gamers.

[151] https://venturebeat.com/games/new-player-centric-web3-tools-prioritize-gamers-while-streamlining-development/

"native" assets but, rather, assets managed by a smart contract that may have a privileged administrator. An example here are certain stablecoins, where from time to time an issuer like Tether or Circle freezes or seizes funds in response to theft and/or to comply with sanctions or law enforcement requests.[152] It's likewise possible for a game developer to have some degree of control to intervene in legitimate cases of loss or theft, but of course once this capability exists, a game developer could use this control for arbitrary purposes. Further, even if the virtual item exists on-chain and under the control of the gamer who purchased or earned the asset, there is no guarantee that the virtual item will exist in-game (until the game state / game logic itself moves fully on-chain). In instances where the game environment is rendered by proprietary software under the control of the game developer, the developer could choose to disregard the on-chain state of the virtual item owned by the gamer.[153] Games with web3 elements will be developed across a spectrum from fractionally on-chain to fully on-chain and no matter where a game sits on that spectrum, it's important that game developers provide full and accurate disclosures so gamers understand what they own (or don't own) and the potential risks, fragilities, and the like associated with that ownership.[154]

[152] https://tether.to/en/following-investigations-by-tether-okx-and-the-us-department-of-justice-tether-voluntarily-freezes-225m-in-stolen-usdt-linked-to-international-crime-syndicate/

[153] For more information, I suggest reading this, an essay called "My First Impression of web3" by Moxie Marlinspike, creator of the messaging app Signal as well as some counterpoints to Moxie's essay detailed here.

[154] Thank you to Cem Paya for his feedback in this paragraph.

5.2 Gaming Assets are Programmable and Composable

Virtual gaming goods are now *programmable* and *composable*. Most people believe that trading and stablecoins are the "killer apps" of web3. Today, that's undeniably true; however, I believe the real "killer app" of web3 will be programmable virtual gaming assets (which may intersect with trading and stablecoins). These gaming items are digital bearer assets, which can exist anywhere the internet exists, have a security model around them that doesn't require centralized servers, and anyone, anywhere in the world with an internet connection can write code / add logic to them. Imagine that when a gamer logs into a game with a wallet — which serves as that gamer's reputation/identity — the game will recognize and rank the crypto assets (including NFTs) already owned by the user and provide the user with in-game assets commensurate with the type and quality of assets in the wallet. For example, if a gamer has a rare RTFKT CloneX in her wallet, she will programmatically be issued/rewarded with a similarly ranked asset for the game she connected to that she can now use to level up her gameplay (but see discussion on attestation/delegation / spam in Chapter 6: *web3 Wallets: the thing that gets you to the thing*). Over time, web3 item matching will expand to more generalized customer segmentation based on wallet holdings (*e.g.,* is the gamer a whale, degen, or newcomer) and port status across games (like how frequent travel programs sometimes recognize status from other brands… but permissionless!).

Note that while granting "free" NFTs and/or fungible crypto assets to gamers is a great source of UA, it inevitably comes at a cost, *e.g.,* inflating supply; a rare NFT game item is granted to a new player — who may have otherwise purchased it — to entice her to engage with the game and spend on other items; and potentially covering blockchain transaction costs associated with minting and storage of the crypto assets to abstract away those fees for gamers. It's too early to tell what type of impact this method of UA will have on LTV:CAC. Hopefully, over time, we see lowering CAC and increasing LTV in games enhanced with web3 versus web2 games with no web3 enhancements. The great thing about blockchains is that these metrics are *transparent* for anyone to examine so learning and adjusting based on real-time, raw on-chain data will be accelerated for everyone using web3 technologies in games.[155]

For mobile games, in a post- App Tracking Transparency (ATT) world (see discussion in Chapter 5.7.C: *Apple Nerfs F2P Monetization with ATT*) and given the historical problems with game discovery in the Apple App Store, new, novel methods of UA and discovery are critical, and wallets provide rich, unique repositories of valuable and differentiated data. For example, developers adding

[155] For example, Jon Jordan does a nice job examining raw data on the Mythical blockchain to understand how Mythical Games' web3 enhanced games, NFL Rivals and Nitro Nation, are performing and scaling.

web3 to games can look across wallets to see which wallets hold assets associated with existing games and launch a "UA attack" on that game's open social graph.[156]

This also means that gaming assets become composable and, depending on the type of game and who it's intended for, can plug into an open, web3 financial system. We have seen numerous examples of gaming, creator, and social economies integrating DeFi. For example, one of the reasons Axie Infinity went viral was because users created liquidity pools on Uniswap for Axie's in-game fungible asset, SLP, which allowed gamers to off-ramp into ETH, USDC, and eventually fiat.[157] In addition to secondary liquidity, composability opens borrow / lend / rental markets for gaming assets. I've read a lot of commentary about the dangers of "GameFi" and having speculators within crypto games, but I would encourage people to keep an open mind on GameFi. While the name "GameFi" may be unique to web3, the concept of playing games for financial gain is far from new[158] — see discussion on Second Life in Chapter 8: *But Isn't Everything Old, Just New Again* and see the comment above regarding the significant market for CS:GO skins on DMarket. Indeed, one could make the case that Nintendo invented GameFi in 1889 when it started manufacturing special trading cards purpose built for gambling, which led to the Yakuza becoming Nintendo's biggest customer.[159] Keep in mind also that GameFi can present in atypical forms. One of my former interns played Fortnite competitively in high school and his earnings helped cover a portion of his college tuition. He's also currently captain of his college varsity Valorant eSports team, which further reduces a portion of his tuition expense. My former intern loves games, but I would guess that part of the reason he competes is for a form of financial gain.

Yuga Labs[160], a web3 native entertainment company, launched a simple endless runner game called Dookey Dash in early 2023, which, over its three week

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[156] https://twitter.com/IndiGG_DAO/status/1534550308616957957?s=20

[157] We're seeing similar innovation with semi-fungible NFT AMMs like Sequence Marketplace, created by the Horizon Blockchain Games. Brevan Howard Digital is an investor in Horizon Blockchain Games.

[158] In FIFA Ultimate Team, players spend fiat money on FIFA Points, which can be used to buy packs of players, which contain a random selection of players with varying rarity. Players earn FIFA Coins by selling players on the transfer market and by participating in tournaments and challenges. While there is no official off-ramp from FIFA Points or FIFA Coins to fiat, many would consider FUT a form of "GameFi" due to the speculative nature of the game — poor speculation leads to additional money spent in the game (instead of grinding) in the form of a credit card to virtual in-game currencies or points.

[159] https://www.cbr.com/nintendo-japanese-yakuza-history/?utm_source=pocket_saves

[160] Yuga Labs is best known for its collection of 10,000 cartoon ape avatars that unlock membership to the Bored Ape Yacht Club (BAYC). Members who got in early paid less than $250 for their apes in April 2021. The current "floor price" for a bored ape is 30.85 ETH or ~$55,200 as of the date of this essay. Reportedly, Yuga earned $100 million in profits during its first year. Bored Ape holders own the art underlying their ape and Yuga earns 2.5% royalties on all secondary sales of the apes. Yuga has called itself "web3 Disney" and is attempting to create iconic IP and monetize it *along with BAYC members* across games, books, movies, and shows. Former Activision Blizzard COO, Daniel

course, was played by 25,000 gamers for 706,000 hours and generated 37,000 ETH in Sewer Pass trading volume (a Sewer Pass was required to play the game).[161] Additionally, 1/3 of the game's players (~9,000 players) used Yuga's native token, ApeCoin, to purchase boosts to help them achieve a higher score.[162] The winner of Dookey Dash was Kyle Jackson, aka Mongraal, an 18 year-old champion Fortnite player who has earned ~$700,000 over nearly five years playing competitive Fortnite on various pro teams.[163] Jackson was awarded an NFT one-of-one Golden Key for earning the highest score in Dookey Dash and promptly sold it for $1.6 million. In my opinion, Dookey Dash is a solid example of GameFi working:

- A player doubles the earnings it took him five years to achieve in Fortnite in three weeks.

- The game developer, Yuga Labs, earns 5% royalties, $80,000[164], on the sale of the Golden Key (not to mention all the royalties Yuga earned on secondary trading of Sewer Passes).

- Yuga Labs grows its ecosystem by 40% because of the game.[165]

While GameFi / P2E has had its challenges, it's far from dead and will take years of experimentation and iteration to see which business models stick.

Alegre, recently joined Yuga as CEO. Prior to joining Yuga, Alegre oversaw franchises like Call of Duty, World of Warcraft, and Candy Crush.

[161] https://nftnow.com/features/exclusive-yuga-labs-executive-talks-dookey-dash-hacks-and-whats-next/

[162] Id.

[163] https://escharts.com/players/mongraal

[164] https://dknetwork.draftkings.com/nft-crypto-marketplace-what-is-it/23617612/nft-news-yuga-labs-golden-key-sells-for-1000-eth-lucky-trader

[165] https://nftnow.com/features/exclusive-yuga-labs-executive-talks-dookey-dash-hacks-and-whats-next/

5.3 Web3 Community & Bringing Non-Spenders into Game Economies

Community is Great!

I live in Chicago and drive an old, used Ford Explorer. Chicago has the second largest police force after New York City and all Chicago police cars, including undercover cars, are Ford Explorers. Even though my car has dents in it and frequently breaks down, I drive it because Chicago has become increasingly violent and in my warped logic, I tend to think the likelihood of getting carjacked or robbed while driving is lower[166] because, upon initial impression, people may think I'm an undercover cop. But, in 2021, I had a choice:

- Do I finally buy myself a new car that looks nice, has CarPlay, and runs — especially now that my kids are teenagers and no longer spill cheerios, apple sauce, and pirate booty all over the backseat — *or*

- Do I buy a Bored Ape NFT?

Obviously, I bought an Ape. Some people may stop reading this essay because that seems like such a stupid decision. But let me explain why I did this. I wanted to experience firsthand what it felt like to be part of a passionate NFT *community*. I felt like I'd be buying an entry ticket in the form of a digital monkey into a web3 native community that had countless novel opportunities and experiences ahead for me and it all started with digital asset *ownership* rights. This is a unique, critical factor in building web3 community: the web3 community members own the digital assets.[167] Yuga didn't exist before April 2021 and because it built its brand in collaboration with its passionate community of owners, it created a $4 billion company from nothing in less than two years. For example, when Yuga launched Dookey Dash, as a Bored Ape owner, I had the right to:

- participate in an exclusive game and earn rewards *or*

- I could delegate my right to play the game to someone else *or*

- I could sell the Sewer Pass I minted for 6 ETH (at the time).

Accordingly, the value created by Yuga accrued not only to Yuga but to the *entire BAYC community*, which has, and continues to, share repeatedly in the network effects the BAYC community helped to create for itself. This is

[166] If you come to Chicago, most definitely avoid driving a Kia.
[167] In fact, I've used my ape as an illustration in this essay because I own it! With image assets that I don't own, I need to (i) identify the copyright holder; (ii) obtain permission from the copyright holder to use the image; (iii) pay a licensing fee, if applicable; and (iv) credit the copyright holder.

fundamentally different than participating on most web2 platforms, where all value accrues to the platform.[168]

Community is Great!
…Until it isn't

To be fair, web3 communities aren't all sunshine and rainbows. While it can be hard to leave a physical community (*e.g.,* sell your house, pack up your kids, move to a different community), it's comparatively easy to leave a digital community. And, if the market for the fungible and/or non-fungible token of a particular web3 community is liquid, it's *very* easy to exit the community with a one second, "sell" click. In these very early days of web3 — replete with scams, rug pulls, and the like — community building, maintaining, and retaining is not for the faint of heart. As noted above, certain aspects of web3 come with a pesky set of speculative "extractors." On this topic, Bobby Hundreds, co-founder of the iconic Hundreds streetwear brand, says[169]:

> *"Building an NFT collection is like building a company in reverse. You collect all the money upfront and then you spend the rest of your life proving your worth to your customers. The way it's designed now, it's an unpleasant process, if not a doomed model. Founder energy is finite, yet consumer avarice is infinite. If the collector's expectation is to make money from the NFT, no amount of return will ever be satisfactory - which spirals into FUD. Furthermore, floor prices spend most of their time descending or flatlining, punctuated with spikes of bull runs. So, if the sole purpose of buying the NFT is investment, the majority of the holder's experience monitoring markets will be consumed by worrying about money and wondering when the line will move up again."*

While I don't necessarily think the correct way to judge the health of a web3 community is by the "floor price"[170] of its NFT collection, plenty of other people do! In recognition of that, below are floor prices for a few prominent NFT collections from around the time I started and ended this essay:

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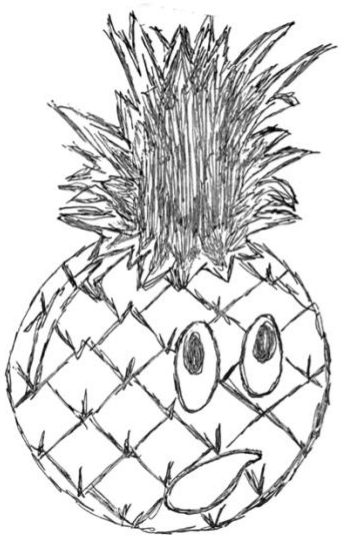
[168] I use "mostly" because there are some game developers like Fortnite and Roblox that do share value with creators. See *Democratization; UGC on Steroids* below.
[169] Hundreds, Bobby. *NFTs are a Scam / NFTs are the Future: The Early Days*. 1st Ed. New York, NY: MCD, 2023. (Bobby Hundreds legal name is Bobby Kim)
[170] Floor Price is the lowest price for an NFT collection on the secondary market.



	Floor Price 3/31/22	Floor Price 10/31/23	Volumes 3/31/22 – 10/31/23
BAYC	109.7 ETH	30.85 ETH	$1,225,233,508
Azuki	19.5 ETH	5.23 ETH	$548,551,455
CloneX	3.3 ETH	1.39 ETH	$340,787,590
CryptoPunks	69.7 ETH	46.87 ETH	$452,294,250
Pudgy Penguins	1.3 ETH	5.11 ETH	$109,625,403
Meebits	5.1 ETH	1.12 ETH	$109,001,086
Doodles	14 ETH	1.48 ETH	$256,713,198
ON1 Force	.45 ETH	0.8 ETH	$27,600,468

171

Most of these collections / communities have faced floor price reductions, but all have continued to host vibrant communities and healthy volumes despite these price drops. Pudgy Penguins[172] and ON1 Force[173] have even seen modest growth. (Interestingly, NFTs are perhaps the one place where a crypto asset – ETH – is the genuine currency of account. This is quite significant because even folks who are "down bad" on their NFTs determine their value in ETH, not USD, terms (which is why I have listed ETH in the chart instead of the corresponding USD values)).[174] As Hundreds notes, some NFT holders aren't really "community members"; they are there for speculative proposes and ruthlessly trade in / out of NFTs. This is why fun games with solid core game loops are essential to keep gaming economies balanced with true community members who love the game first and foremost. Further, it's important to note that speculative extractors aren't exactly unique to web3. In November 2022, scalpers used bots to purchase a significant number of tickets to Taylor Swift's Eras Tour. Scalpers, who consequently held a material supply of tickets, then listed them on ticket resale websites for exorbitant prices, which the scalpers profited handsomely on. Taylor Swift, the creator, did not share in any of

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[171] This NFT is based on my Adam Bomb Squad NFT #19436. The story behind this NFT, Pineapple Adam, is that for several years, the company that Bobby Hundreds co-founded, The Hundreds, compiled a collection exclusively for Hawaiian retail partners, The Hundreds Hawaii. Pineapple Adam was part of that collection.

[172] Pudgy penguins made an interesting transition from solely digital to creating "phygitals" – Pudgy Penguin animals linked to NFTs. According to Pudgy Penguin CEO Luca Netz, Pudgy Penguins saw over $500,000 in purchases over the first two days after going live, surpassing 20,000 individual toys sold on Amazon. I discuss the concept of "phygitals" in depth below in *The Institutions are Coming, Just Not the Ones you Expected*.

[173] Beginning in February 2023, On1 Force changed its leadership and presented a new roadmap to its community, which has likely contributed to the floor price increase.

[174] While I would like to take credit for this astute observation, I cannot — full credit to my friend and colleague, Lewis Cohen, co-founder of DLx Law.

these profits and her fans certainly suffered by paying higher prices for their tickets. At least in web3 when NFT holders sell and negatively impact the market and community, value still accrues to the creator through royalty fees. Note however, that creator royalties are currently under pressure with major third party NFT exchanges no longer enforcing them. Given the critical importance of creators in web3, I am confident the industry will come up with a solution to compensate creators for their work with royalties, whether through on-chain enforcement, use of internal versus third party marketplaces, and/or through licensing structures embedded in smart contracts. Generally, it's going to take a few years to figure out how to best harness the superpower of *community owners* while mitigating the unpleasantness of *community extractors*.

Bringing Non-Spenders into Game Economies

Enhancing games with web3 is a significant opportunity for game developers who understand that web3 communities have the potential to be very different than traditional gaming communities, which are also passionate but not *owners*. When gamers are given the ability to mint free[175] NFTs, earn them, or buy them, they become *owners* in that gaming community and are aligned with each other and the game developer. This applies equally to "non-spenders" or most F2P gamers who typically do not spend in games.

- In 2022, there were ~299 million gamers on console and ~458 million on PC who played but did not spend money.[176]

- The data is murky on the percentage of gamers who make in-game purchases, but the number 5% is often cited.[177]

Whatever the actual number is, monetization from in-game purchases in F2P games is exceptionally low, which means that most F2P gamers are not participants in these game economies. This changes in web3 when non-spenders are given the opportunity to mint free NFTs or earn NFTs that they now *own*, which brings them — for the first time — directly into the game economy and community. As noted above, giving away NFTs comes at a cost to the game developer. One risk is that these new owners become extractors only, but I think granting ownership is like a sprinkle of magic that sparks the desire to invest further in the game and to eventually spend. This is commonly referred to as the "endowment effect"[178] and my thesis is that ownership will cause some portion of the 95% of gamers who don't

[175] Blockchain transaction costs will apply – to both the minting transaction and storage of the NFT itself, which could happen on another blockchain such as Arweave or on plain web2 server, both of which have ongoing expenses associated.
[176] Newzoo Global Games Market Report 2022,
[177] https://martech.org/app-purchases-dominate-ads-app-store-lifetime-revenue-hits-71-billion/
[178] https://en.wikipedia.org/wiki/Endowment_effect

spend to start spending. Consider the difference in behavior when you have a fender bender in a rental car versus a car you own. If you rent, you will likely go to the nearest Home Depot, get some Krazy Glue, and do the bare minimum to get the bumper looking okay enough that the rental company doesn't notice when you return it. If you own the car, you will probably find the best mechanic available and spend whatever it takes to make that bumper look even better than before it was hit. *Ownership is a fundamentally different feeling.* (Note that the preceding applies equally to using fungible tokens in games, which I discuss below in *Ownership of the Game*.) Not only do crypto rails bring non-spenders into game economies through NFTs and fungible tokens, but they also expand the aperture of *who* can spend. As noted above, there are ~1.7 billion underbanked people globally. Accordingly, if a game developer links its games to crypto payment rails, 1.2 billion adults who are unable to spend via traditional means in games today, may be able to spend by using crypto assets like stablecoins.

5.4 Royalties for Game Developers …and gamers![179]

As noted above:

- Yuga Labs generated $107.8 million in royalties in 2022; and
- NFT creators have earned more than $1.9 billion in royalty revenues.[180]

While I think the above figures are compelling, the significant potential for net new monetization opportunities provided through royalties is best illustrated through my favorite mobile game, Pokémon Go, which I have been playing daily since 2016. One of my favorite Pokémon in my Pokédex is a shiny Gyarados. It took me about four years of Pokémon Go play to finally catch a shiny Magikarp with a strong enough appraisal that I wanted to evolve it into a shiny Gyarados.[181]

[182]

[179] Creator royalties are currently under fire due to a lack of viable on-chain enforcement. Given how critical creators are to web3, I have confidence that the industry will get to a place where royalties are enforced on-chain and/or open source type licensing standards are coded into NFTs (see a16z's "Can't Be Evil NFT Licenses"), including royalty terms. In this particular case, given that the Pokémon IP is perhaps the most valuable of all time, Niantic would likely have success with an internal NFT marketplace, where Niantic could incentivize most trading to take place (versus trading on external NFT marketplaces like Open Sea, Blur, and/or Magic Eden, where there is less certainty on enforcement of royalties).

[180] A16z 2023 State of Crypto and I also provide numerous examples of secondary royalties earned by brands in *"The Institutions Are Here, Just Not the Ones We Expected"* section.

[181] Evolving Magikarp to Gyarados requires 400 Magikarp candies, which (generally) requires catching 101 Magikarp.

[182] This is not an NFT. It's a drawing of my shiny Gyarados. What makes a *shiny* Gyarados unique from a non-shiny Gyarados is that it's red instead of blue.

Because of what I do for a living, I often admire my shiny Gyarados, a clear standout in my collection of 355 shinys, and ponder three things:

- What type of value would a shiny NFT-based Gyarados have on a web3 secondary marketplace?

- Wouldn't Niantic like to earn royalties on any secondary sale of my shiny Gyarados (and other Pokémon!)?

- Wouldn't it be great if I had the option to sell my shiny Gyarados on a secondary marketplace? Wouldn't be even more awesome if I could *also* earn royalties each time my shiny Gyarados trades?

Let's dive in and answer these questions Trainers[183]!

1. What value would my shiny NFT-based Gyarados have on a web3 secondary marketplace?

There is no secondary liquidity for *virtual* Pokémon in Pokémon Go, but there is a very robust secondary market for Pokémon *physical* trading cards that may be instructive for our analysis. While there are many physical and online places[184] to buy and sell physical Pokémon cards, the largest venue is eBay, where Pokémon cards are the most popular category of trading cards on the site.[185] Some facts:

- There are > 1 million Pokémon cards listed on eBay, ranging from a few cents to $4 million per card.[186]

- During the first half of 2021, eBay reported a 536% rise in gross merchandise value for Pokémon cards[187] and, more generally, saw $2 billion in trading card transactions.[188]

- From 2019 to 2020, Pokémon trading card sales on eBay increased by 574%.[189]

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[183] In Pokémon Go, a "Trainer" is the player who controls the Pokémon. They can catch Pokémon, battle other Trainers, and complete challenges. Trainers can also customize their avatar and choose their team (Mystic, Valor, or Instinct). The term "trainer" is also used to refer to a group of players who are working together. For example, a group of trainers might team up to take down a powerful gym or to complete a raid.

[184] https://wellkeptwallet.com/sell-pokemon-cards-for-cash/

[185]https://www.ebayinc.com/stories/news/ebays-2021-state-of-trading-cards-report-spotlights-collecting-trends-and-industry-predictions/

[186] The Pikachu Illustrator PSA 9 Mint is listed for $4 million on eBay

[187] https://www.ebayinc.com/stories/news/ebay-launches-authentication-for-trading-cards/

[188] https://techcrunch.com/2022/08/22/ebay-acquiring-trading-card-marketplace-tcgplayer-295m/

[189] https://www.denofgeek.com/games/pokemon-tcg-card-values-sales-boom/

- Ebay takes a minimum ~13.35% commission on all sales of Pokémon cards.[190] While most common Pokémon cards are worth a few cents,[191] rare Pokémon cards sell for much, much more.[192]

    - In October 2020, the rapper Logic bought a rare Charizard for $183,812 and, more recently, the Pikachu Illustrator card sold for over $5 million to influencer Logan Paul (which he has now apparently turned into an NFT[193]).

- In terms of sales in the primary market, The Pokémon Company sold 9.7 billion Pokémon cards worldwide during its 2022 / 2023 fiscal year ended March 2023.[194]

- Of note, in mid-2022, eBay acquired an NFT marketplace[195] and its closest rival in the trading card collectible platform space.[196]

Regarding my shiny Gyarados:

- eBay currently lists a variety of editions and qualities of shiny Gyarados physical cards ranging from $3 - $14,000

    - Accordingly, if my shiny Gyarados were a physical trading card, I could potentially earn between $3 - $14,000 selling it on eBay; and

    - The eBay pricing for physical shiny Gyarados cards helps inform the price I may set for my Gyarados if it were an NFT and I wanted to sell it on:

        - Existing secondary marketplaces like OpenSea, Magic Eden, or Blur;

        - eBay's recently acquired NFT secondary marketplace if / when it launches;

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[190] https://www.ebay.com/sellercenter/selling/seller-fees
[191] https://www.polygon.com/pokemon/23190366/pokemon-card-shortage-production-numbers
[192] https://gamerant.com/most-expensive-pokemon-cards-ever-sold/
[193] https://kotaku.com/logan-paul-pokemon-pikachu-illustrator-nft-blockchain-1849158886
[194] https://www.pokeguardian.com/1335443_nearly-10-billion-pokemon-cards-sold-in-fiscal-year-2022-2023#:~:text=The%20Pokemon%20Company%20has%20released,in%20the%20last%207%20years
[195]https://techcrunch.com/2022/06/22/ebay-acquires-nft-marketplace-knownorigin/#:~:text=KnownOrigin%20was%20founded%20in%202018,create%2C%20buy%20and%20resell%20NFTs
[196] https://www.builtinsf.com/2022/08/22/ebay-tcgplayer-acquisition-295m

- a new NFT secondary marketplace within the existing Pokémon Go game, which will require sharing 30% of Niantic's royalty fees with Apple and Google (for a robust discussion on Apple's and Google's 30% fees see Chapter 5.7: *The Convergence of Mobile and web3)*; or

- optimal for Niantic, a web-based Pokémon Go marketplace, which could be newly created or added to Niantic's existing Pokémon Go Web Store[197] that's powered by Xsolla.[198] I think this final option makes the most sense for Niantic because it gives Niantic better control over enforcement of its royalties and Niantic can incentivize Pokémon Go players to trade on this marketplace (similar to how it incentivizes players to make purchases in the Web Store today).

    - Because of blockchains and their use of public shared standards, it's now technically easy for games to create internal marketplaces. Now all games, large or small, can have marketplaces, not just massive companies like Steam and Roblox. Through using a tool like Sequence's no-code Builder[199], an in-game NFT marketplace that automatically enforces royalties — is very simple to customize, brand, and add to a game.

I discuss Web Stores in Chapter 5.7.H: W*eb Stores and PWA, While a Step in the Right Direction, Don't Solve the Problem*, but here is generally how they work:

- If I spend $9.99 via IAP within the Pokémon Go mobile game, I get 1,200 PokeCoins, but if I spend $9.99 at the Pokémon Go Web Store, I get 1,300 PokeCoins — 100 more coins for the same amount of money!

    - This is because when I make a purchase in the Web Store instead of by IAP, Niantic gets the full $9.99. If I make that same purchase within the game, Niantic only gets $6.99 because Apple and Google take 30% fees on all IAPs.

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[197] https://store.pokemongolive.com

[198] Xsolla creates white label digital stores for game companies where gamers can purchase in-game items and in-game currencies. I personally purchase my Pokémon Go PokeCoins on Niantic's Pokémon Go Web Store because I get more coins for the same price when I do so. This is because when I purchase PokeCoins from the browser-based Web Store, instead of in-app as an IAP, Niantic doesn't have to share 30% of my purchase price with Apple / Google. This is great! More money for Niantic and more PokeCoins for me. Xsolla is also looking to make Web Stores more of a "hub" by adding blog posts, upcoming events, and the like. As an aside, it's a little curious that Niantic is comfortable cutting Google out of its 30% IAP fees given that Niantic was spun out of Google and Google remains a material shareholder (thank you to Florian Mueller (@FOSSpatents) for pointing this out)).

[199] Brevan Howard Digital is an investor in Horizon Blockchain Games, the creator of Sequence. See: https://sequence.build/landing

2. Wouldn't Niantic, Pokémon Go's developer, like to earn fees on any secondary sale of my shiny Gyarados?

I would think so! Let's run through some rough back-of-the-envelope math:

- In mid-2022, eBay said its trading card category was growing "significantly faster" than its total marketplace, and that trading cards saw $2 billion in transactions in the first half of 2021.[200] Assuming (i) a steady state of transactions during the second half of 2021 for a total of $4 billion in trading card transactions and (ii) eBay charging 13.25% commissions on trading card sales, that equals ballpark annual revenues of $530 million for eBay on trading cards alone.[201]

- Niantic has made as much as ~$1 billion annually in Pokémon Go revenues, primarily from IAPs[202], although revenues fell to ~$703 million in 2022.[203]

    - By allowing some / all Pokémon Go players to mint some / all of their Pokémon as NFTs and allowing secondary trading, Niantic — similar to eBay — could charge a 13.25% royalty fee on every sale.

    - It's hard to estimate how much revenue Niantic could make from royalty fees on secondary trading of Pokémon NFTs, but let's try!

        - There are 71 million Pokémon Go players[204] and if my Pokémon Go account is any indicator, there would be *a lot* of virtual Pokémon NFTs listed on secondary markets.

        - I've been playing Pokémon Go for seven years and I've caught 51,284 Pokémon.[205]

            - Let's assume that most players aren't like me and cut this by ~95%, meaning each player has caught 2,500

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[200] https://techcrunch.com/2022/08/22/ebay-acquiring-trading-card-marketplace-tcgplayer-295m/
[201] While Pokémon is the most popular category of trading cards on eBay, this figure also includes categories like baseball, basketball, football, and Magic the Gathering cards.
[202] Keep in mind that Apple and Google take 30% of all IAPs of virtual items so the $1 billion is *after* the 30% tax (although some (small) fraction of revenue is generated from Niantic's Pokémon Go Web Store, where the 30% fee does not apply)).
[203] https://www.dexerto.com/opinion/pokemon-go-devs-need-to-reconsider-their-vision-following-2022-revenue-tank-2046378/
[204] https://www.businessofapps.com/data/pokemon-go-statistics/. Note that I've seen this figure as high as 80 million in certain months but decided to use the lower number for purposes of this example.
[205] Mark Yusko, founder of Morgan Creek Digital, is two levels higher than me in Pokémon Go and has caught > 80,000 Pokémon.

Pokémon. If all 71 million players are allowed to mint their Pokémon as NFTs, that gets us to 177.5 billion Pokémon NFTs.

- Let's also assume secondary liquidity is good and each Pokémon Go NFT can be sold for $0.10[206] with Niantic taking 13.25% commissions.[207]
    - That's ~$2.352 billion in revenue for Niantic![208]

I'm not sure how solid these assumptions are because Niantic isn't publicly traded and I can't find any transparency on Pokémon caught / held per Pokémon Go account. Further, it's of course not realistic that every Pokémon will be sold on the secondary market, which is why I used a conservative number of Pokémon caught and a low $0.10 price. What I do know from my own collection is that many NFT based Pokémon would likely sell for much more than $0.10. Out of my ~51,000 Pokémon, 860 are rare:

- 448 Legendary,
- 355 Shiny, and
- 57 "hundos" with perfect 4-star appraisals

Given the rarity of these Pokémon, I believe they would trade significantly higher than $0.10 on an NFT secondary marketplace. As established above, we can look at the prices that physical Pokémon cards trade on eBay to help determine pricing for Pokémon NFTs. On eBay, shiny Gyarados physical cards trade between $3 - $14,000 – well in excess of the $0.10 used in my example — so I think the revenue numbers I've used in this example are relatively conservative.

Indeed, *I predict that at some point over the next 5-10 years, secondary marketplace revenues related to NFT based gaming items will exceed traditional gaming IAP revenue.* In my (admittedly rough!) example, Niantic makes $2.352 billion revenue / year from secondary sales assuming no IAP fees *or* $1.65 billion / year assuming full 30% IAP fees, both of which exceed Niantic's estimated $703 million - $1 billion in traditional Pokémon Go revenue. It's also important to note that just as Niantic sells virtual goods in-app today, Niantic will likewise make revenue from *primary* sales of NFT based goods (*e.g.,* Gucci T-shirts, hats, and

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[206] Note that blockchain transaction costs need to be free to fractions of a cent for .10 sales to make sense.

[207] For context, Mythical Games currently takes a 14% royalty on secondary NFT transactions for its NFT Rivals mobile game.

[208] If all those secondary transactions happen in-app, then Niantic would have to give 30% — ~$705.6 million — to Apple / Google, leaving Niantic with $1.65 billion in revenue. However, the Pokémon IP is so popular (the Pokémon Company made $11.6 billion in licensed goods in 2022!) that it's likely most Pokémon NFTs would trade out-of-app, avoiding Apple's / Google's 30% tax.

backpacks for Pokémon Go Trainer avatars).[209] These primary NFTs sales will also contribute to Niantic's revenue (as they do today, albeit in non-NFT format) and will be available to trade on Niantic's Pokémon Go secondary marketplace, where Niantic will have a brand new source of revenue in royalty fees.

3. Wouldn't it be great if I had the option sell my shiny Gyarados on a secondary marketplace? Wouldn't be even more awesome if I could also earn royalties each time my shiny Gyarados trades?

Yes and yes! Let's assume that my Pokémon NFT collection is worth $50,000 (as noted, I have 860 rare Pokémon). I get old, can't walk around as much to catch Pokémon, and my kids don't want to take over my account. Or maybe Niantic keeps nerfing remote raids, decreasing incense effectiveness, and trying to monetize my sleep data and I decide that Niantic is no longer worthy of my valuable time and money.[210] Well, now I can sell the Pokémon NFTs I own! And for super rare Pokémon that took years of grinding to obtain, maybe Niantic will share a portion of its royalty fee with me every time one of my ultra rare Pokémon trades (*e.g.,* 13.25% royalty, of which 11.25% goes to Niantic and 2% to me). Gamer royalty terms would be embedded in smart contracts and Niantic could add any parameters it would like to enhance engagement and retention, *e.g.,* a gamer only qualifies for an ongoing royalty if a particular ultra-rare Pokémon has been held by the gamer for two years. Gamer royalties could easily be paid instantly through use of stablecoins like PYUSD, USDC, and/or USDT.

In June 2022, Pokémon Go surpassed $6 billion in lifetime revenues in just under six years, but Pokémon Go generated 45% less revenue in Q1 2022[211] than in 2021 despite having 21% more active players. This shows that the number of active players doesn't necessarily translate into revenue generated. In June 2023, Niantic laid off 230 staff, which CEO John Hanke attributed to the mobile market being crowded and changes in the mobile advertising landscape which make it challenging to launch new mobile games at scale. Specifically, Hanke said:

> *"today's highly competitive mobile gaming market requires dazzling quality and innovation. It also requires strong monetization and a social core which can drive viral growth and long-term engagement."*[212]

It's incredibly difficult to innovate within a mature company like Niantic, which is partly why Pokémon Go looks much like it did when it launched seven years ago. Ironically, in 2016, you would have been hard-pressed to find a *more innovative* team than Niantic, but that's also when F2P was early and teams like

[209] https://pokemongolive.com/post/gucci-northface-collection/?hl=en
[210] I'm one of the 5% of gamers who spends.
[211] https://venturebeat.com/games/pokemon-go-passes-6b-in-lifetime-player-spending/
[212] https://nianticlabs.com/news/organizational-update?hl=en

Niantic were free to take risk and innovate. Pokémon Go was a massive hit during the summer of 2016 because its use of AR was so innovative. At that time, Pokémon Go was the game closest to a "metaverse" like experience because it was the first to bring AR gaming to the masses.[213] Maybe that's because Niantic has always been a technology company first[214] and a gaming company second, which is another reason I think Niantic is so well suited to enhance Pokémon Go with web3 technologies.

All growth comes from innovation and, as a dedicated Pokémon Go gamer, I would love to see Niantic heed Sid Meier's 33-33-33 Rule and figure out how to bring "33% New" to Pokémon Go. Hanke seems to believe the "New" will be AI and maybe he's right.[215] But I think Niantic should start testing what happens to the game economy if some / all players are able to earn NFTs, and/or convert some / all existing Pokémon into NFTs, all of which can then be traded on secondary marketplaces. I believe that enhancing the existing Pokémon Go game with NFTs will lead to increased monetization for Niantic *and Pokémon Go players*. I also believe this will be a boon to retention, especially as hardcore gamers are at or nearing Level 50[216] and need something new to keep them in the game. My suggestion is that Niantic begin with adding web3 enhancements for multi-year grinders like me. One of my biggest fears is that while my Pokémon are held captive on Niantic's servers, Niantic will nerf, dilute, or otherwise take away the Pokémon that I've spent so much time catching and evolving. After spending ~2,500 hours playing Pokémon Go and material sums of money on IAPs, don't I — not Niantic — deserve to own my Pokémon?

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[213] As revolutionary as the AR feature was in 2016, most Pokémon Go players don't use it to catch Pokémon because it can be glitchy, make phones run hot, and drain the battery. I use it sometimes if I'm in a cool location and want to take picture with a Pokémon in it or if I want to put a Pokémon beside a friend when I take their picture (unbeknownst to them!).

[214] Hanke previously founded a mapping company called Keyhole, which Google acquired in 2004 (Keyhole's technology was wrapped into Google Maps). Niantic was then spun out of Google in October 2015.

[215] https://www.theguardian.com/games/2023/apr/06/from-google-maps-to-pokemon-go-john-hanke-mapping-niantic

[216] Note rumors of another 10 levels up to 60 coming soon. Even if this happens, point remains that the game needs new innovation.

5.5 Democratization; UGC on Steroids

Blockchains are the perfect bones for the metaverse — they're public goods with public datasets all using the same standards for anyone with an internet connection, anywhere in the world to connect to and create on. Blockchains also give creators the ability to establish provenance and have digital property rights over the virtual goods they create. These virtual goods can potentially be sold with incredible profit margins (*i.e.,* no physical materials or shipping), to any other person globally because we now have open economies riding on crypto rails with secondary liquidity and no geographical boundaries. In short, web3 enables UGC on steroids.[217] In the US, 72% of the time spent engaging with video games is *active* and 69% of Gen Z consumers create digital content.[218] Of course, many of these Gen Z gamers aren't making a living off creating video content today, but it does suggest that there is an opportunity to bring these gamers into web3 where they have an opportunity to own and sell what they create.

Consider:

- 83% of TikTok users create videos.[219]

- Prior to TikTok, in social media: 90% of users just lurked, 9% contributed a little, and 1% accounted for nearly all content.[220]

TikTok has normalized UGC for the (mostly younger) masses; you don't need to be perfect or beautiful or even that talented to create because *everyone* puts videos up on TikTok. Most Gen Z TikTok "For You" feeds are made up of everyday,

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[217] Peter Kieltyka, CEO and co-founder of Horizon Blockchain Games, which has been building the web3 game Skyweaver for 5.5 years always says "Ethereum is the Metaverse." He explains: "*Imagine for example a game like GTA6 had an open modding system, and a natural resource to acquire through play, and creators were able to create and deploy mods into the GTA6 world by crafting the resource into items for GTA6, and were also free to monetize their creations inside of GTA6. The studio behind GTA6 no longer has to hire designers or developers, the users and the infinite creative potential of people around the world are now their developers, and the game in the kind of world it is, is ever evolving and expanding on its own. Just like our real world. The net of it, is games will be cheaper and faster to make, and more composable. Just like how the Internet is made up of open source software everywhere. There isn't a developer in the world that doesn't turn to open source to help build all of its creations — why are game items / components any different in the context of the metaverse?* In connection with Peter's thoughts, creators can be incentivized with tokens (which could be stablecoins) to curate content to keep it non-offensive. That's why I made the comment in an earlier footnote about my excitement that a brand like Lego is building metaverse content. To protect its brand and consumers, it is likely that Lego will build tools to ensure content is suitable for its audience and hopefully these tools can be utilized by other metaverse builders.

[218] https://newzoo.com/resources/blog/over-80-of-us-consumers-play-video-games-how-can-brands-accelerate-engagement-with-this-big-audience-of-game-enthusiasts

[219] https://wallaroomedia.com/blog/social-media/tiktok-statistics/

[220] https://digitalnative.substack.com/p/a-guide-to-gen-z-through-tiktok-trends

ordinary people — not celebrities — doing fun and cool things. Further, Gen Z isn't interested in giving their time away for free; nearly 2/3 of Gen Z plans to use social media to make money in 2023.[221] How does this apply to games? TikTok has turned Gen Z and Gen Alpha into creators and anywhere those generations create — including in games — there will increasingly be a desire to get paid and own content, both of which are more efficiently enabled through web3 technologies.

Further:

- As more games move to live services models, developers are more likely to embrace UGC, where contributions from people all over the world will help keep content fresh and drive network effects.
    - Through use of blockchains, creators can now establish provenance and have digital property rights over their UGC assets and economies can be created around those rights.
    - Game developers can incentivize users to create and curate content through granting / rewarding gamers with fungible and/or non-fungible tokens.
    - Because gaming assets are now programmable, royalties can be built into UGC assets so that when they change hands, royalties automatically accrue and are instantly paid to creators.

It's true that gamers can currently monetize some of what they create in games. In 2021 and 2022, Roblox's creator community earned $538 million and $624 million, respectively[222] and Roblox estimates that this figure will be $800 million in 2023[223]. However, only 81 Roblox developers netted over $1 million in 2021 and only seven earned more than $10 million. Very importantly, Roblox is not an open database that anyone can write to[224] and creators do not *own* the assets they create. Further, depending on the payment method, it can take up to 14 *business days* to process developer payments on Roblox[225], versus using blockchain based stablecoin payments that settle *instantly*. Epic Games similarly commenced a creator program in March 2023, which pays 40% of net revenue of Fortnite to all creators who publish islands in Fortnite, including Epic's own Fortnite development team. According to figures released in April 2023, Epic expects 43 creators to earn $1 million annualized and five to earn over $10 million annualized. Payouts in

[221] https://about.instagram.com/en-us/file/1276350079639305/TRENDREPORT_2022_fin-2.pdf/
[222] https://create.roblox.com/docs/production/earning-on-roblox
[223] Id.
[224] Ball, Matthew. "The Metaverse: And How It Will Revolutionize Everything." Medium, 2022. See page 191, Payment Rails, Constrained Virtual World Platform Margins.
[225] https://en.help.roblox.com/hc/en-us/articles/203314100-Developer-Exchange-DevEx-FAQs

Epic's creator program are made *30 days after the end of the month in which they were earned*[226] versus *instant settlement* using stablecoin based payments. Further, both Roblox and Fortnite have creator earnings minimums of $105[227] and $100[228], respectively. Presumably these minimums exist because it's too costly and time consuming to manage payouts below those levels. $100 may seem like a small sum, but that's not the case for many folks in emerging markets. Because blockchain based payments can settle instantly for free or fractions of a cent, micropayments to creators can easily be handled. Finally, many creators would like to earn in US dollars instead of in their local fiat currencies, which is yet another reason using US dollar backed stablecoins like USDC and PYUSD for creator payouts is beneficial.[229]

It's notable that Epic uses Hyperwallet, a division of PayPal, to facilitate creator payouts. It will be interesting to see if Hyperwallet eventually incorporates the use of PYUSD[230], which would enable what I've described above: instantly settled creator payouts in US dollars, creator payouts in denominations significantly lower than $100[231], and the ability to pay creators who don't have access to the traditional financial system but do have smartphones / Internet and, therefore, can access blockchain based payment systems — all of which I discuss in greater detail below in Chapter 5.7.F: *The Blockchain is the IAP System*.

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[226] https://create.fortnite.com/island-creator/overview

[227] https://en.help.roblox.com/hc/en-us/articles/13061189551124-Developer-Exchange-Help-and-Information-Page

[228] In Epic's case, if a creator doesn't exceed the $100 minimum threshold in a 12-month period, at month 13, it resets to zero and the $100 is gone.

[229] Note that Krafton, the South Korean game developer of PUBG (over 130 million users) recently announced the launch of Settlus, which will integrate USDC as the primary currency for handling creator payments on its platform.

[230] PYUSD is PayPal's newly announced stablecoin, which I discuss below in *The Blockchain is the IAP System*.

[231] That said, currently PYUSD is only issued on Ethereum, where blockchain transaction fees are generally too expensive for microtransactions. As/when PYUSD is also issued on L2s or an alternative, less expensive L1 like Solana, microtransactions will be possible.

5.6 Ownership of the Game

I described ownership of virtual game *items* (*e.g.,* NFT-based Pokémon above), but there is a second component to ownership, which is *player ownership of the game itself*. Again, it is best to illustrate this through example. Let's compare / contrast existing Fortnite ("Fortnite") versus fictional web3 Fortnite ("web3 Fortnite").

- Fortnite and web3 Fortnite have the same basic business model, they are F2P games that charge for purchases of digital cosmetics, but the incentive systems are very different.
    - In the Fortnite model, an early gamer ("FNITE Gamer") never receives any form of compensation for being one of the first people to play or contribute to Fortnite nor will that FNITE Gamer receive any equity or otherwise benefit when Fortnite's parent company, Epic Games, eventually goes public even though the FNITE Gamer was one of the early gamers who helped Fortnite go viral and achieve mass scale.
    - The option to own Epic Games prior to its IPO will not be available to a FNITE Gamer because she is not an Epic Games employee or venture capitalist with access to an Epic Games private capital fundraising round.
        - Even if a FNITE Gamer had an opportunity to invest, she may be unable to do so in the United States because she probably isn't an "accredited investor."
    - Based on its most recent valuation, Epic Games is worth ~$31.5 billion, all of which has accrued to Epic Games' "accredited investor" shareholders (and Sweeney as well as Epic Games employees) and none of which is shared with the early players who helped make all that value accrual possible (except in the form of Creator Economy 2.0 payments described above, which first commenced in March 2023).
    - If / when Epic Games finally goes public, non-accredited retail gamers will *finally* be able to access Epic Games shares in traditional public markets presumably starting at a valuation of at least $31.5 billion.

Roblox presents an even better example of this given that the company is already public and creates none of its own content, which is all UGC. Roblox went public in March 2021 at a valuation of over $41 billion, which was the first opportunity for Roblox creators to own equity in the company they made valuable. As noted above, very few creators make money for what they create on Roblox, and,

in any case, getting paid a small percentage of creator fees is quite different from being an *owner and having the opportunity to generate wealth*. It doesn't seem fair that the FNITE Gamers in my example or the real-life Roblox creators who helped make Epic Games and Roblox valuable in the first place and understand the ins / outs of Epic Games and Roblox better than most sophisticated, "accredited investors", aren't invited to the wealth generation party until the valuation of the games they love, understand deeply, and contribute so significantly to are in the 10s of billions.

So, why is crypto a fundamentally more fair and inclusive system? Let's say that FNITE Gamer was similarly an early user or UGC contributor to web3 Fortnite.

- Under web3 Fortnite's incentive mechanism, FNITE Gamer will receive FNITE tokens proportional to the time FNITE Gamer spent playing the game versus others and/or is rewarded FNITE tokens for early gameplay, UGC contributions (including based on other gamers engaging with FNITE Gamer's UGC assets), and/or curation.

- FNITE Gamer is allocated these tokens to reward her for the time she spent making web3 Fortnite valuable in its infancy, which helped drive the network effects necessary to make a social game like web3 Fortnite go viral.

- Owning FNITE tokens will entitle FNITE Gamer to participate in the direction of certain aspects of the game and FNITE Gamer may also share in a portion of any NFT and/or UGC fees collected by the web3 Fortnite treasury.

- Additionally, with web3 Fortnite, FNITE Gamer owns all skins and emotes that she purchases in the game and is free to sell them on any secondary marketplace.

- Receiving all these incentives from web3 Fortnite certainly motivates FNITE Gamer to keep playing and contributing to the game; most likely FNITE Gamer feels a sense of loyalty, community, and economic alignment.

With the above being the ideal state, there are many game design / economy, security / identity, and legal / regulatory / tax issues that need to be sorted out to make this more inclusive web3 state a reality.[232] As noted, crypto is trying very hard to change this system of "only the wealthy participate" and gamers should be

[232] And, as noted above, game companies sharing economics with gamers for UGC and other activities related to the game comes at a cost / is not free. It is therefore important to design game economies so that the gaming company is still making at least the same amount of money – and ideally more – due to achieving greater scale through sharing ownership with gamers.

beneficiaries of this change. While we're still in the early stages of figuring out web3 game token economies, allowing gamers to have *ownership* in games they're spending their most valuable asset — time — on is simply the better path forward that will inevitably come to be over time. Given the current regulatory environment, especially in the United States, it's important to note that "ownership" doesn't necessarily need to come through fungible tokens and may instead come through ownership of in-game assets[233], which I've described above. If United States regulators and policymakers fail to provide clarity as to proper classification of cryptoassets (among other matters), there is a significant opportunity for other jurisdictions to step in and do so, which will perhaps provide a path to ownership of games through fungible tokens for the 93%+ of gamers who do not reside in the United States.[234]

[233] Which isn't free from regulatory risk in the United States either, although some regulators have a more sensible view. The SEC just announced another NFT enforcement action with SEC Commissioners, Hester M. Peirce and Mark T. Uyeda, dissenting. I intend to write more about this later, but I do think it's interesting to note that Roblox recently added a scarcity mechanism called "Limiteds" to its Creator Marketplace. Creators receive a 10% royalty each time an item is resold and 80% of resold items sell for more than their original cost. It should be noted also that Roblox creators have the ability to "cash out" their earnings in Robux to fiat. From a legal standpoint, it's not clear to me how Limiteds differ from NFTs except that one is issued on a centralized database (not a security?) and the other on a blockchain (a security?). For example, does this sound like a web3 or web2 experience: *3D artist Youri Hoek is popular for creating exquisitely detailed items and he has found even more success with Limiteds. As of late June, Youri's rare golden helmet was reselling at 7.4 times its original price. Many other creators are seeing similar results and nearly 80% of resold items sell for more than their original cost. By giving creators the ability to specify the quantity of their items and allowing them to be resold, we've introduced market dynamics that are benefitting creators, buyers, and sellers alike.* It's directly from Roblox's July 2023 "Vision for the Roblox Economy."

[234] 7% of gamers reside in North America and some unknown percentage of them are our gaming friends in Canada, which means that US gamers make up less than 7% of total global gamers.

5.7 The Convergence of Mobile and web3

Here is what we'll cover in this chapter:

- *The Gatekeepers in Mobile Games …are not Benevolent*
- *Mobile Gaming: A Sea of Red*
- *Apple Nerfs F2P Monetization with ATT*
- *The Grind: Why aren't digital payments embedded into the Internet?*
- *Crypto vs. All the Money in the World*
    - *…. which makes Apple and Google seem small… if you play by their rules, they'll never let you win*
- *The Blockchain is the IAP System*
- *A Deeper Dive into the 30% Abyss*
    - *… & while Web Stores and PWAs are a step in the right direction, neither solve the problem*
- *The rise of gaming at Netflix and TikTok*
        - *Netflix: the way to ultimately win the "Streaming Wars"*[235] *is through games*
        - *TikTok: UGC for the (younger) masses*

[235] https://time.com/6253697/streaming-wars-disney-chaos-era/

The Convergence of Mobile and web3

Let's look at the current state of mobile and mobile gaming:

- There are 6.92 billion smartphone users globally, that's a staggering 86.29%[236] of the world's population and some predict that by 2025, 72% of all internet users will solely use smartphones to access the web.[237]

- Users spend an average of 5 hours a day on their mobile phones.[238]

- $318,000 / minute or $167 billion was spent in app stores in 2022, of this $110 billion was spent on mobile games, where 90 billion games were downloaded.[239]

    - This means that more than 50% of gaming revenues come from mobile!

- ARPU (average revenue per user) is higher on mobile than PC or console.[240]

    - In 2022, ARPU in the US mobile gaming market was $277.6, which is 4-5x the revenue from a boxed game on PC or console.[241]

Mobile has historically been the fastest-growing segment of gaming, partly driven by advances in the technical capabilities of mobile devices — microprocessors equivalent to those used in past video game consoles are increasingly becoming more powerful and incorporated into phones. While much of what I've written in other areas of this essay applies equally to mobile games, there are two important factors that we need to cover that are *unique* to mobile: (i) there are two large gatekeepers to mobile games, Apple and Google, and (ii) those two gatekeepers present unique challenges to the mobile game industry.

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[236] https://www.bankmycell.com/blog/how-many-phones-are-in-the-world
[237] https://www.cnbc.com/2019/01/24/smartphones-72percent-of-people-will-use-only-mobile-for-internet-by-2025.html#:~:text=Marketing.Media.Money-,Nearly%20three%20quarters%20of%20the%20world%20will%20use%20just%20their,access%20the%20internet%20by%202025&text=Almost%20three%20quarters%20(72.6%20percent,to%20nearly%203.7%20billion%20people.
[238] https://www.data.ai/en/go/state-of-mobile-2023/
[239] https://www.data.ai/en/go/state-of-mobile-2023/
[240] Naavik: Bringing PC & Console Games to Mobile – 7 Reasons Why AAA Brand Extensions Are so Popular (click on "read the full essay" and you'll get a .pdf)
[241] Id.

5.7.A The Gatekeepers in Mobile Games …are not Benevolent

There are 1.8 billion active Apple devices (let's assume this represents ~1.5 billion users) and 3.3 billion Android mobile users. Apple and Google are the sole gatekeepers to accessing these ~4.8 billion users. This means that gamers and game developers, depending on whether they have an Android or Apple iOS device, must go through a single store controlled by Google, the Google Play Store, or Apple, the App Store. In the App Store and the Google Play Store, the sales of digital in-app content — like virtual gaming items — must be conducted through Google's and Apple's own IAP payment processing solutions, where each transaction is generally taxed at 30%.[242] Apple's and Google's 30% take-rate is ~10x other TradFi electronic payment solutions (*e.g.,* credit card processing at 3%) and, up to *30x higher than the price of blockchain-enabled payment solutions where transactions may be free or fractions of a cent, depending on the blockchain ecosystem*.[243]

To put in context just how important the revenue stream generated from the 30% fee is to Apple, in 2021, Apple was the third-ranked public company in terms of game revenues – after Tencent and Sony – *even though Apple doesn't make any games*![244] Please see Chapter 5.7.G: *A Deeper Dive into the 30% Abyss* — for more detail on the 30% fees.

[242] Some transactions are taxed at 15%. Developers can apply for the App Store Small Business Program and under that program, if a developer's business makes $1 million or less per year, the developer should qualify for a reduction of the fee to 15%.

[243] By inserting themselves as intermediaries in this process, Google and Apple also collect material personal information about gamers, which help make their internal advertising services more lucrative.

[244] https://newzoo.com/resources/blog/the-top-10-public-game-companies-generated-126-billion-in-2021-as-subscriptions-and-ma-shake-up-the-market

5.7.B Mobile Gaming: A Sea of Red

Due to privacy and other changes recently introduced by Apple (with Google expected to follow soon[245]), it's more challenging to target "whales" and monetize through IAPs. These changes are turning the historical "blue ocean" of mobile games into a sea of red.[246] I provided some encouraging mobile stats above, however, akin to the classic iceberg analogy, those metrics conceal some big problems below:

- For the first time ever, consumer spend in mobile gaming declined year over year — down 5% from 2021 to 2022[247] and is expected to be down 1.6% from 2022 to 2023.[248]

- Since Apple enacted App Tracking Transparency (ATT) in April 2021, 68% of mobile game developers find marketing more difficult and 75% of mobile game developers say their businesses are at risk.[249]

You may now be curious how this happened. See the immediately following Chapter: *Apple Nerfs F2P Monetization with ATT*!

[245] Google's Privacy Sandbox is expected to launch in 2024
[246] I'm pretty sure it was Matt Ricchetti, President of N3twork Studios, who said that mobile gaming is a "sea of red" and that introducing web3 to mobile games may lead to "bluer oceans." I believe it was also Matt who said that "blockchain is the IAP" system in that same podcast with Alexandra Takei on Naavik.
[247] https://www.data.ai/en/go/state-of-mobile-2023/
[248] https://newzoo.com/resources/trend-reports/newzoo-global-games-market-report-2023-free-version
[249] https://www.pocketgamer.biz/news/78922/68-percent-mobile-games-devs-marketing-challenge-apple-att/

5.7.C Apple Nerfs F2P Monetization with ATT

Most mobile games have F2P models where gamers download the game for free and game developers monetize via in-game ads and IAPs. Both revenue models are suffering post deprecation of IDFA (identifier for advertisers) by Apple. IDFA is a unique identifier for mobile devices used to target and measure the effectiveness of advertising on a user level across mobile devices. At Apple's annual developer's conference in 2020, Apple announced that it would be deprecating IDFA through its ATT privacy policy, which reached distribution on most iOS devices in July 2021. Under ATT, users must opt-into having their IDFAs tracked, which very few do. Google android mobile devices have an equivalent to IDFA, the Google Advertising ID (GAID). Google has not yet deprecated use of GAID but is expected to do so in 2024.[250] As a work-around to IDFA, mobile game developers have used "fingerprinting," which generally identifies a user's device without the actual IDFA, creating a digital signature that allows for targeted advertising. In June 2023, Apple announced that by the end of 2023, it will start rejecting apps, including games, that use fingerprinting devices. What this means practically is that the days of highly effective "whale hunting" in mobile games are likely over. Getting into the nuance of ATT, IDFA and GAID deprecation, fingerprinting, and potential solutions (other than web3!) is beyond the scope of this essay, but I have linked to some outstanding resources in this footnote.[251]

The aggregate effect of these privacy changes for mobile games is that it is:

- harder to acquire users
- harder to identify users likely to participate in IAPs
- harder for advertisers to assess whether their ads are working, which means less in-game advertising revenue for game companies
- harder for small game companies to financially compete due to the amount of money it takes to build the systems needed to track and find users

While it's great to have a potential audience of ~1.5 billion iPhone users for your game, it doesn't do a game developer much good if most of those users don't know about your game and are nearly unattainable due to Apple's privacy changes.

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[250] https://asoworld.com/blog/google-s-privacy-sandbox-gaid-what-it-means-for-android-app-promotion-works-2023/

[251] I highly recommend reading anything and everything by Eric Seufert on these topics. Start here. I also recommend Eric's interviews with Ben Thompson on Stratchery and recommend giving Eric a follow on Twitter. Jen Donahoe, co-host of Deconstructor of Fun and founder of JadeInferno Consulting, provides an outstanding overview of fingerprinting here.

In fact, Meta estimated that ATT cut $10 billion off its ad revenue in 2022 (8% of total revenues).[252] Rex Woodbury notes, albeit in the context of consumer apps[253]:

> *"A direct-to-consumer brand used to be able to scale to $20 million, $30 million, or even $40 million in revenue on Facebook ads alone. Despite its poor reputation, Facebook's ad engine is actually quite egalitarian for small businesses and fledgling companies; using Facebook, those smaller players could reach customers just as efficiently as multi-billion-dollar companies. In the mid-2010s, we saw a proliferation of DTC brands built on the back of Facebook—they offered us mattresses and meal kits, cosmetics and underwear, shoes and suitcases. This playbook is monumentally more difficult in 2023: Apple's ATT changes have made it much more difficult to scale and measure digital advertising spend."*[254]

Apple and Google's push for privacy is materially harming ROAS (return on ad spend). Blockchains are the *opposite* of private.[255] This could be an incentive enough for mobile games studios to build portions of their games on-chain for more effective targeting of users. As discussed in Chapter 6: *web3 Wallets: the "thing that gets you to the thing"*, the modality of targeting right now — being dropped scammy NFTs in your wallet — is primitive and often ineffective, but that doesn't mean it always will be. Among other things, blockchains provide a form of identity, reputation, transaction history, and messaging. Tying those characteristics together should lead to more effective targeting in a post ATT world — even if most of a game remains web2.

So, one may ask, what does it take to break through the noise and reach mobile users in this post ATT environment?

- A sh*t ton of money!

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[252] https://www.forbes.com/sites/danielnewman/2022/02/10/apple-meta-and-the-ten-billion-dollar-impact-of-privacy-changes/?sh=7bfc53d572ae

[253] https://digitalnative.substack.com/p/viral-growth-how-to-keep-lightning

[254] To hammer his point home, Woodbury states that of today's top twenty apps, 10 are owned by just three companies – Bytedance (TikTok and Capcut); Meta (Instagram, Facebook, WhatsApp, and Messenger); and Google (Google, YouTube, Gmail, and Maps). The remainder in the top 20 are decidedly not start-ups, including: Amazon, SHEIN, Snapchat, Cash App, and Roblox.

[255] Note that many web3 developers are working on zero-knowledge proofs (ZKPs), which are cryptographic techniques that allow one party to prove to another party that they know something without revealing any other information about what they know. ZKPs can be used to protect privacy in blockchain transactions, for example, by allowing users to prove they have the funds to make a transaction without revealing the amount of funds they have or the destination of the transaction. ZKPs are still under development and to achieve widespread adoption of ZKPs there are security, scalability, and complexity issues that still need to be addressed. I raise ZKPs because I believe users should have privacy in web3 and eventual use of ZKPs could impact use of wallets for attribution. It's also important to note that gamers may have many wallets (including those obtained by a variety of games using WaaS (wallets-as-a-service)), which also may make wallet attribution challenging. More in Chapter 6: *web3 Wallets, the Thing that Gets You to the Thing*.

- A strong IP that users love and recognize (*e.g.,* Pokémon Go, Marvel Snap[256]). Big spenders (>$25 / month) and average spenders ($5-$25/ month) are more likely to download a game if it's based on an existing franchise or IP they like)).[257]

- AAA games that also launch on mobile because these gamers are already in love with these games and now they can play them anywhere —on the train, waiting for the school bus — on their phone (*e.g.,* PUBG and Call of Duty (thanks to the MSFT v ATVI case, we now know that 50% of Call of Duty's MAUs (150 million MAUs) are on mobile[258])).

- Games with broad, inclusive audiences versus niche audiences that are harder to reach.

- Innovative use of social media for UA (*e.g.,* TikTok – see Chapter 5.7.J: *TikTok: UGC for the (younger) masses*).

- Use of UGC and AI tools to scale creative output.

- Web3 for potential enhanced UA, engagement, retention, and monetization through transparent and easily accessible wallet and blockchain analytics.

- Ownership of, or partnerships with, significant pre-existing distribution channels.

Regarding existing distribution channels, when we invest in start-ups building in web3, we always consider who their target market is — web3 natives, web2 natives, or both? The web3 native userbase — people who own crypto — is small, ~425 million people globally[259] and ~50 million Americans.[260] Circle's Jeremy Allaire recently estimated that while there are 80 million web3 wallets, there are 3 billion existing web2 digital wallets, which means that crypto has *less than 3%*

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[256] Note, however, that even an awesome IP and loved game doesn't guarantee success, Marvel Snap - which won Best Mobile Game of the Year for 2022 at the Game Awards – has seen its revenues decline 40% over a 6 month period from its peak in December 2022. Further, when Niantic announced its layoffs in June 2023, it also announced that it was sunsetting NBA All-World and stopping production on Marvel: World of Heroes. So, even a big developer like Niantic with excellent IP like the NBA and Marvel - doesn't always equate to a successful outcome.

[257] https://newzoo.com/resources/blog/over-80-of-us-consumers-play-video-games-how-can-brands-accelerate-engagement-with-this-big-audience-of-game-enthusiasts

[258] See the United States District Court Northern District of California's ruling embedded here.

[259] https://crypto.com/research/2022-crypto-market-sizing-report

[260] https://www.coinbase.com/blog/new-national-survey-of-2-000-american-adults-suggests-20-of-americans-own

penetration.[261] The sweet spot tends to be game studios that already have, or partner with, web2 distribution channels while also leveraging the unique attributes of web3. Here are some numbers that highlight the current size differential between web2 and web3 for purposes of distribution:

- Facebook: 2.96 billion MAUs[262]
- Instagram: 2 billion MAUs[263]
- YouTube: 2.6 billion active users[264]
- Apple: 1.8 billion active devices[265]
- Android mobile phone users: 3.3 billion [266]
- PayPal: 400 million active consumer user accounts, 6.1 billion transactions, and 35 million active merchant accounts[267]
- Reddit: 52 million DAUs and 430 million MAUs[268]
- Nike: 30% of the global market share of athletic footwear[269]
- Starbucks: 27.4 million loyalty members[270]
- Netflix: 238.39 million subscribers[271]
- Telegram: 55.2 million DAUs, 700 million MAUs[272]
- Twitter: 450 million MAUs[273]
- TikTok: 1 billion MAUs[274]
- Amazon 310 million active customer accounts[275]
- Web2 gaming industry: 3.38 billion gamers

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[261] https://twitter.com/jerallaire/status/1690027692408840192?s=20
[262] https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/
[263] https://www.statista.com/statistics/253577/number-of-monthly-active-instagram-users/. Although note that Meta and Instagram shut down its NFT project in March 2023. But Instagram doesn't appear to be done with NFTs! At Instagram's Creator Summit on October 4, 2023, Head of Instagram, Adam Mosseri, said he's still bullish on NFTs.
[264] https://www.demandsage.com/youtube-stats/
[265] https://www.theverge.com/2022/1/28/22906071/apple-1-8-billion-active-devices-stats
[266] https://www.demandsage.com/android-statistics/
[267] https://www.pymnts.com/earnings/2023/paypal-transactions-per-active-user-grow-to-54-7/
[268] https://www.businessofapps.com/data/reddit-statistics/
[269] https://www.cascade.app/strategy-factory/studies/how-nike-runs-the-sportswear-game#:~:text=Nike's%20market%20share%20is%20nearly,billion%20as%20of%20Feb%202023
[270] https://seekingalpha.com/article/4528887-starbucks-corporation-sbux-ceo-howard-schultz-on-q3-2022-results-earnings-call-transcript
[271] https://www.statista.com/statistics/250934/quarterly-number-of-netflix-streaming-subscribers-worldwide/.
[272] https://worldpopulationreview.com/country-rankings/telegram-users-by-country
[273] https://www.bankmycell.com/blog/how-many-users-does-twitter-have
[274] https://www.demandsage.com/tiktok-user-statistics/#:~:text=How%20Many%20TikTok%20Users%20are,billion%20are%20monthly%20active%20users.
[275] https://sell.amazon.com/blog/amazon-stats#:~:text=Amazon%20has%20over%20300%20million,1.9%20million%20selling%20partners%20worldwide.

Every single one of the above companies either has / had an active web3 strategy or is currently experimenting with web3 in some way. Many of these companies also have active gaming strategies (*e.g.,* TikTok's game advertising platform, Netflix's move into mobile and cloud-based game development, Nike's .SWOOSH partnership with EA, PayPal's expectation that PYUSD will see material adoption in games, all discussed below) or are gamifying an aspect of their business (*e.g.,* Starbucks is gamifying loyalty, also discussed below). So, even though the existing web3 userbase is currently small, games using web3 may reach mainstream adoption by effectively leveraging large social networks / platforms / studios.

It is in the context of the unique roles Apple and Google play in mobile games — the onerous 30% tax and the outsized impact their policy decisions have — that I believe adding web3 elements to mobile games could potentially lead to bluer oceans. The next portion of the essay will focus on why blockchain networks will become mobile IAP systems. However, to properly delve into this, we need to go back in time and grind through why the Internet uses archaic, cranky, analog based payment systems in the first place!

5.7.D The Grind: Why aren't Digital Payments Embedded into the Internet?

Because of the Internet, in the next few seconds, I can FaceTime a friend in Singapore, I can stream Too Hot to Handle on Netflix onto my iPhone or Mac, and I can jump into a Fortnite game with 99 other people while millions of other players are also playing Fortnite in their separate instances of the game.

But I still can't click on a button in my browser to instantly buy a New York Times article for $0.05 or move more than a nominal amount of money outside of PayPal, Venmo, CashApp, and Zelle with instant settlement. Domestic wires take up to 24 hours and international wires take up to 5 days with hefty fees.[276] Did you ever wonder why? Money is just data so why can't it move like data? Well, part of the problem is that we don't want money to be copied like any other form of data. An example may help:

- If I send Peter a .pdf, a photo, or any other document, I retain a copy of it and Peter can cut / paste it and send it to anyone, anywhere in the world.

- If I send Peter 100 digital dollars, it's critical that

    - I don't retain a copy of that same 100 digital dollars and

    - Peter can't cut / paste and send that same 100 digital dollars to more than one person.

That's the "double spend" problem that we didn't have a solution to when the Internet was being constructed. One of the reasons the inherently decentralized Internet became so centralized, relying on monetization of user data, is because we couldn't figure out a way to build economics directly into it. The breakthrough of the peer-to-peer Bitcoin system[277] is that it solved the "double spend" problem and gave us a trustless way to exchange money over an untrusted network like the Internet.

A few years ago, I read a book called "The Road Ahead,"[278] which Bill Gates wrote in 1995 detailing his vision for how an exciting new technology — the "information highway" — would develop. While many of the Internet use cases that Gates imagines were remarkably prescient, I was surprised by one item that Gates

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[276] It's too early to tell what type of impact FedNow may have on instant payments, but it's important to note that it's built on legacy infrastructure, only accessible via US banks. and it doesn't make money *programmable*. A brief overview of FedNow.
[277] Please read the Bitcoin whitepaper! *Bitcoin: A Peer-to-Peer Electronic Cash System* by Satoshi Nakamoto is only 8 pages, and it is the foundation that all of web3 is built on.
[278] Gates, Bill. The Road Ahead. New York: Viking, 1995.

got wrong. Gates anticipated that there would be a form of "wallet PC" that would hold digital currency as well as the formation of an "Internet billing system." Stated differently: Gates *expected money to be built into the open protocols that define the Internet,* which never happened. It wasn't due to a lack of effort; Netscape partnered with Visa and Microsoft partnered with MasterCard, both with the intent to build payments directly into the browser. These efforts failed — which Marc Andreessen refers to as the "original sin"[279] of the Internet — due to many factors including an unclear regulatory environment, the inability to cost-effectively process microtransactions, and no solution for the "double spend" problem.

This opened the door for companies like PayPal, Stripe, Plaid, and Shopify to provide "bridges" from TradFi into the Internet to create the rich and robust Internet e-commerce ecosystem that we enjoy today. While advances in FinTech have been significant and positive, PayPal, Stripe, Plaid, Shopify, and their ilk are closed systems built on TradFi banking and payments rails. Because these systems are closed, there has been little ability for developers to openly build on top of them and innovate. Any innovation in Internet native digital money that may have occurred at the advent of the Internet was effectively stalled until the Bitcoin whitepaper was published in October 2008. Fast forward 28 years from Gates' book and we are presented with a "do-over" opportunity to re-decentralize the Internet through the development of open-source infrastructure built outside of TradFi payment and banking rails. Critically, this infrastructure includes internet native digital currency as its cornerstone.

[279] https://soundcloud.com/a16z/nternet-past-crypto-future-crypto-regulatory-summit (~16 minutes in).

5.7.E Crypto vs. All the Money in the World ...which makes Apple and Google seem small

...if you play by their rules, they'll never let you win[280]

Taking another step back, at its core, crypto provides the opportunity to democratize access to money itself as well as to financial products and services and even consumer applications like games. For nearly 15 years, the crypto community has been hard at work building *a parallel system next to — and not on top of —* the traditional system with the hope that this system will be open to everyone and owned by no-one. As the wealth gap in the United States and globally increasingly widened over time, there was a lot of frustration from people who — rightfully — wanted better and more fair access to the traditional system. As and when that didn't happen, and especially given the events leading up to the Great Financial Crisis of 2008, the people created their own system, starting with Bitcoin. It's very important to keep in mind that crypto grew from the retail bottom up and not the other way around; crypto truly is the "(young) peoples' financial system." Like any new, innovative, transformative technology, crypto can be used for good and for bad. In 2022, crypto suffered multiple self-inflicted wounds from its very own bad guys, which devastatingly harmed many of crypto's working-class good guys. While we absolutely need regulatory guardrails, including a bespoke disclosure regime, it is frustrating to see some regulators and policymakers attempt to solve the ills of 2022 by attempting to place crypto in the same category of investment opportunities available only for "accredited investors." In fact, it defies logic to claim that the very non-accredited folks who built this new system somehow are "not suitable" to invest in it.

Why do I share this background in a gaming essay? Because *it's all a game*![281] And in that context, it's critical to understand that on January 3, 2009, the day the first bitcoin was birthed, crypto began its long battle with The Final Boss. The Final Boss is none other than the separation of money and state[282], the most formidable of all foes, especially given that the way many governments control their people is by

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[280] Quote from: Hundreds, Bobby. This is Not a T-Shirt: A Brand, A Culture, a Community - a Life in Streetwear (1st ed. MCD 2019).

[281] Even the original Bitcoin source code included online poker and marketplace sketches!

[282] To be very clear on my views, I do not want bitcoin or any other cryptocurrency to become the global reserve currency. I am a proud citizen of the United States and I do not wish that the US dollar ever cede its position as the global reserve currency, which I think would be devastating to my country. In fact, part of the reason I have engaged in regulatory / policy discussions over all these years is precisely because I feel so strongly about innovation in web3 staying in the United States, where it can be overseen by the best regulators in the world. My friend and colleague, Andrew Nelson, made a good point when he reviewed this essay — crypto is unlikely to defeat the Final Boss and *it doesn't need to in order to be successful*. Although regulators and policymakers can't kill crypto (that would require killing the Internet), they can materially chill its adoption in a coordinated, effective way. Accordingly — and this may be an unpopular view with some crypto folks — the way crypto "wins" is not by defeating the Final Boss but by collaborating and cooperating with global regulators and policymakers.

controlling the money. Although the tiny ~$1.48 trillion crypto industry taking on $4.49 trillion Apple and Google may seem lofty, it's really not for an industry that is battle-hardened from years of duking it out with every single government in the world and the $90 trillion "all the fiat money in the world system."

5.7.F The Blockchain is the IAP System

In my opinion, Apple and Google tapped out of their fight with crypto on October 24, 2022[283] and July 12, 2023[284], respectively. Those are the days when Apple and Google announced their NFT / crypto policies for the Apple App Store and the Google Play Store. Despite the policies being far from perfect and, frankly, confusing, most crypto folks were absolutely thrilled that games with web3 would now have access to billions of people through App Store and Google Play Store[285] distribution. I was happy simply because I knew this meant *we won* — obviously not today, but eventually. I don't believe that Apple nor Google necessarily support or like crypto, but I do believe they understand that once they're forced to compete against blockchain-based payment systems, their 30% fees will significantly decrease. Given this future state, there is no downside to letting games with crypto enhancements in and taking 30% fees… while they still can.

I note *"while they still can"* because there is increasing pressure on Apple and Google that may soon force them to compete fairly, including:

- The global regulatory, policy, and litigation heat on Apple and Google continues to intensify.[286]

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[283] https://developer.apple.com/news/?id=xk8d7p8c.

[284] https://android-developers.googleblog.com/2023/07/new-blockchain-based-content-opportunities-google-play.html

[285] Google updated its "Cryptocurrencies and Related Products Policy" in August 2023 to clarify that in September 2023, advertisers *"offering NFT games that do not promote gambling-related content may advertise those products and services."* Google provided the following example: *"NFT games that allow players to purchase in-game items, like virtual apparel for a player's characters, weaponry, or armor with better stats, consumed or used in a game to enhance a user's experience or aid users in advancing the game."*

[286] The Epic Games versus Apple and Google lawsuits, originally filed in August 2020, which challenge App Store and Google Play Store policies / practices, are moving their way through the legal system.

- Epic v Apple: In 2021, District Court Judge Yvonne Gonzalez Rogers decided nine counts in favor of Apple and one count in favor of Epic Games. Gonzalez Rodgers' ruling was upheld by the 9th Circuit Court of Appeals in April 2023. Although many have framed the ruling as a win for Apple, the portion of the case that Epic won (allowing developers to provide links and buttons that direct consumers to payment options outside the App Store and therefore avoid paying commissions to Apple) is very significant — so significant to Apple that on July 3, 2023, Apple filed a petition with the 9th Circuit Court of Appeals seeking a stay of the order pending resolution of a petition for a writ of certiorari that Apple intends to file in the Supreme Court. On July 27, 2023, Epic asked the Supreme Court to allow the lower court's "outlinking" ruling from 2021 to take effect. Specifically, the District Court found, and the 9th Circuit upheld, that Apple's anti-steering provision, which prevents apps from linking to a website that includes an alternative means of payment, was a violation of California's Unfair Competition Law's prohibition on "unfair conduct". Supreme Court Justice Elena Kagan declined Epic's request to lift the 9th Circuit's stay in August 2023. As of September 27th and 28th, 2023, both Epic and Apple have asked the Supreme Court to weigh in.

- In the November 2022 appeal hearing, the U.S. Department of Justice and the State of California argued that the lower court too narrowly interpreted parts of U.S. antitrust law. It has long been rumored that Justice Department's antitrust division will sue Apple.

- Epic v Google: Epic Games is also suing Google over Google Play Store terms and practices related to the 30% commission and control over Android app distribution. The case commenced with a jury trial on November 6, 2023 and is currently ongoing. Match and attorneys general in 36 states and Washington, D.C. were also part of the Epic v Google suit, but they reached a settlement with Google just before the trial started. Tim Sweeney was not happy and here is why.
  - The Justice Department is already litigating a case against Google over its search business and in June 2023 filed another antitrust suit against Google related to monopoly power over its "ad tech stack."
- The EU Digital Markets Act (DMA) is a new piece of antitrust regulation in the EU that is currently in force. The DMA applies only to certain, defined "gatekeepers" of which there are currently six - Meta, Amazon, Google, Microsoft, Apple, and Bytedance (TikTok's parent company). The intent of the DMA is to "reign in" the power/dominance of these digital platforms. (Interesting that none of the "gatekeepers" are European - they're all US companies except for Bytedance, which is Chinese.) Certain platform services are "in scope": search engines, browsers, operating systems, and social networks and include "online intermediaries" or where these gatekeepers have platforms with buyers/sellers and the gatekeeper intermediates transactions. Although currently in effect, true compliance with the DMA begins in March 2024. Prior to the DMA, antitrust in Europe in the digital space was challenging to enforce - if a company wanted to bring a case, the company had to argue in court that the opposing company was in a position of dominance and was abusing that dominance - it was hard to define and prove "abuse." Under the DMA, there is a long list of specific gate keeper obligations, including: (i) type of data you can collect and what you can do with it; (ii) can't use data you learn from operating the platform to compete with sellers on the platform; (iii) rules on fairness of terms - how people get in / out - similar to the European Consumer Protection Law; and (iv) rules about having to let your competitors do their own thing in your platform/in your ecosystem. (iv) is the important one for purposes of this essay. It means that gatekeepers must allow alternative app stores, *e.g.*, if the DMA is implemented as intended, Epic Games will be free to launch the Epic Games Store within the Apple App Store and Google Play Store in Europe in March 2024. Importantly, in this example, Epic can use whatever payment system it wants for purchases of games in the Epic Games Store and it can charge whatever commission it wants on those purchases. Further, games can "steer" gamers to alternate places to purchase digital items. *E.g.*, every in-app purchase in Pokémon Go is taxed 30% by Apple / Google. As detailed above, Xsolla powers the Pokémon Go Web Store, where gamers can purchase Pokémon Go virtual goods and Apple / Google don't earn any fees on those purchases. However, Niantic isn't permitted to "steer" gamers to its Web Store from within the Pokémon Go game. Under the DMA, in Europe, games will be permitted to "steer" gamers to Web Stores like Pokémon Go's from within the game. *E.g.,* I go to purchase virtual goods in Pokémon Go and a "pop-up" automatically appears saying something like: *"hey go buy these PokeCoins on the Web Store (with a link to the Web Store) where you'll get more coins for the same amount of money!"* Under the DMA, Web Shops can also be directly integrated to mobile games in-app versus being standalone on the web.
- Dutch, South Korean, Japanese, and Indian governments have forced Apple to support third party payment services (sometimes category by category).
- In July 2023, United States Representatives Gus Bilirakis and Jan Schakowsky, Chairman and Ranking Member, respectively, of the Subcommittee on Innovation, Data, and Commerce, wrote a letter to Apple CEO Tim Cook requesting "information and documents from Apple regarding policies in place governing Apple's iOS App Store and how these policies are impacting American leadership in emerging technologies including blockchains, NFTs, and other distributed ledger technologies."

- Successful, long-standing, publicly traded companies like PayPal are now entering the stablecoin market.

- Web Stores that allow game developers to sell virtual goods via web / outside Apple's / Google's walled gardens

I believe the above will, in aggregate, eventually lead to:

- IAPs being conducted through more efficient, cheaper competing blockchain network-based payment systems; and

- Game developers being allowed to offer competing app stores that come with their own payment systems, specifically, payment systems built on blockchain networks.

The road to get there will be bumpy because Apple and Google will attempt to block these efforts in every way possible.[287] Private sector developments like Web Stores and stablecoins may be the primary forcing functions for degradation of the 30% fees given that the wheels of justice turn extraordinarily slow and, like the outdated laws the crypto industry is grappling with, existing antitrust and competition rules and regulations never imagined fully digital, borderless worlds.[288] As Matthew Ball points out:

> *"governments do not have an effective framework or set of precedents for today's tech platforms. Antitrust is concerned with clearly defined products and markets, not ecosystems or APKs. … still regulators are starting to scrutinize and act upon the bundles of hardware + operating system + first-party software + third-party software + identity + payments + standards + browsers and so on, which increasingly define our modern economy."*

All that said, the wheels of justice eventually *do turn* and I believe that regulators, policymakers, and the courts are trying to get to a place where competition is not stifled, consumers have choices, and innovation can flourish.[289]

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[287]See Matthew Ball's post-script to his excellent essay "Big Tech's Biggest Bets (Or What It Takes to Build a Billion-User Platform." See also, Cravath's letter re: Pillar 3 – Preventing Circumvention of the Above Remedies" related to any attorneys general settlement with Google.

[288] Specifically, the antitrust and competition legal frameworks in the United States were established from 1890 – 1914 to address concerns related to the oil, tobacco, and railroad markets.

[289] That said, here is where I typically give my "Uber example." When Uber ran into regulatory difficulties, regulators and policymakers did not practically have the option of materially limiting or harming Uber because consumers loved and demanded Uber. Unfortunately, we're not there yet with web3. When a significant number of consumers vocally demand web3 products and services because they're making consumers' lives better in some way, then the wheels of justice will start to spin rapidly.

Given the foregoing, while I'm unable to say *when* blockchain-based payment systems will eventually win, I can tell you *why* they will win:

- Wires: $25 - $50 (sender $25 - $50) and recipient ($15) and limited to banking hours
- Credit Card: 1.5% - 3.5% merchant fees, late payments customer fees up to 20%
- Next-Day ACH: up to $10, could be free, $5, 1% for slower 1-3 days
- PayPal, Venmo, Cash App: 2% - 4% for payments to businesses, 1% to move money to a bank account, limited by geography and closed garden peer-to-peer
- Remittances: 6.8%
- Google / Apple: 30%
- Blockchain Network Payments: $0 up to fractions of $0.01

290 291

The reason it's so cheap to transact using blockchain networks is that they're entirely new payment rails *embedded into the Internet itself that completely bypass centralized, fee-taking intermediaries like banks*.[292] Crypto is referred to as "web3" because it's widely considered the third generation of the Internet itself.[293] Contrast

[290] But note that transaction / gas fees vary depending on the chain.
[291] This is based on my 0N1 Force NFT #2864. The 0N1 Force are 7,777 generative side-profile characters with over 100 hand drawn features.
[292] To be fair, banks also face high compliance costs that are passed through to users. Additionally, non-blockchain based payment systems offer features that blockchain based payment systems do not, e.g., (i) credit cards allow spending money that consumers do not yet have and arguably, a portion of the high fees charged by credit card issuers are there to cover the risk of default; (ii) ACH and credit card payments can be disputed while no such consumer protection exists with blockchain based payments; (iii) credit cards may share revenue with customers in the form of rewards programs. Further, *debit* card payments enjoy much lower transaction costs than credit cards due to the 2011 Durbin Amendment, which caps fees at 0.05% plus 21 cents. Finally, a colleague pointed out that a less charitable interpretation of "*completely bypass centralized, fee-taking intermediaries like banks"* is that miners, validators, MEV-builders and the like are the new crypto native intermediaries. While that's reasonable in terms of collecting fees, at least these crypto native intermediaries are less centralized, have limited power, and generally can't censor transactions or seize funds the way their TradFi counterparts can.
[293] I could insert tons of links here, but just google "Chris Dixon," "a16z," and "web3" and you'll find lots of materials to read and podcasts to listen to. Chris also has a new book coming out on January 30, 2024 called Read, Write, Own: Building the Next Era of the Internet. A fantastic overall resource is the a16z Crypto Canon and start with "Key Concepts."

that with PayPal (excluding PYUSD), Venmo, Cash App, and Zelle which are simply nice interfaces sitting *on top of* existing legacy financial system payment rails that then interact with the Internet. When a gamer purchases a virtual gaming item via IAP, Apple / Google are typically running a gamer's debit or credit card or processing the transaction through PayPal, all of which, in turn, interface with the traditional banking system. On the other hand, when a gamer purchases a virtual gaming item through a crypto wallet, it's the equivalent of the gamer connecting directly to her own personal digital bank that's open 24/7/365 and can process transactions at internet speed. Moreover, blockchain-based payment networks are not only cheaper, but they are also borderless, faster, always available, and they make money *programmable.*

Specifically, blockchain-based payment systems have the following characteristics that generally differ from the TradFi payments system, including IAPs:

1. Available 24/7/ 365, not confined to 9am-5pm, Monday - Friday, closed on holidays banking hours.[294]
    - For example, a user can send $2 million worth of USDC[295] to someone on another continent at 4am on a Saturday, with near instant settlement, and both parties can verify the transaction on the blockchain in real time.
        - No bank or other third-party is required to do anything to process the transaction.
            - Importantly, in the context of fiat backed stablecoins like USDC and USDT, the issuer generally has the ability to block individual wallet addresses from sending / receiving stablecoins in connection with illegal activity.[296]

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[294] Does not apply to debit card, credit card, and IAP transactions, which are also 24/7, but do not have the same finality of settlement as blockchain based payments because credit, debit, and IAP transactions can be disputed/reversed.

[295] As noted earlier, the volatility of in-game fungible currencies like Axie's SLP can be mitigated with the use of stablecoins, of which there are currently ~$125 billion in circulation:

- USDT, a USD backed stablecoin developed by Tether in 2014, currently has $89 billion in circulation.

- USDC, a USD backed stablecoin developed by Circle, which is based in the United States, has $26 billion in circulation, 1.7 million holders, $4 billion in daily trading volume, $11.87 trillion in total on-chain transactions, and 190+ countries that support it.

- In August 2023, PayPal announced its own stablecoin, PYUSD, which will compete head-to-head with USDT and USDC. PYUSD currently has a market capitalization of $155 million. It's notable that Apple already accepts PayPal as a form of payment for IAPs. Maybe PYUSD will become the first accepted stablecoin IAP.

[296] For example, in August 2022, Circle froze over 75,000 USDC linked to 44 Tornado Cash addresses sanctioned by the U.S. Office of Foreign Assets Control's Specially Designated Nationals and Blocked Persons list.

2. Global peer-to-peer transfers, not confined by geography or closed garden networks, *e.g.,* I can send USDC to anyone with a crypto wallet[297] contrasted with I can send money over Venmo only to other people in the Venmo network.

3. Global, near-instant to instant settlement that due to scalable blockchains take seconds to settle, not up to three days like ACH.

4. Microtransactions at $0 – fractions of $0.01, which are possible because there is no need to run through cost-prohibitive existing credit / debit and banking systems.

    - As noted below, until recently, developers were restricted to fewer than 100 possible price points in the App Store, which previously started at a minimum of $0.49. As of late 2022, Apple increased this to 900 price points starting at $0.29.[298]

        i. Because some blockchain payment rails are free or fractions of $0.01, even tinier in-game purchase prices — *e.g.,* $0.05 — can be implemented. It will be interesting to see if these ultra low price points entice more gamers to spend.

5. Use of Crypto wallets, not bank accounts, which potentially brings ~1.2 billion more people into the financial system.

    - It takes ~30 seconds for a user to create a crypto wallet, which is much faster than opening a bank account and the only pre-requisite is internet connectivity.

    - For people who live in parts of the world where access to banking is limited or not viable because the official system is untrustworthy: internet access *plus* a phone *equals* a bank account.

        - There are 1.7 billion globally underbanked adults[299], but 2/3 of them own a smartphone (~1.2 billion people).[300]

        - It's also important to note that if a mobile gamer doesn't have access to the traditional financial system, then that gamer has no ability to pay via IAPs.

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[297] Note, this comes with risk, *e.g.,* you don't want to send or receive crypto from an address on this list.
[298] https://developer.apple.com/news/?id=dbrszv62
[299] https://www.worldbank.org/en/topic/financialinclusion/overview
[300] https://www.worldbank.org/en/news/press-release/2018/04/19/financial-inclusion-on-the-rise-but-gaps-remain-global-findex-database-shows

- Given the underbanked stats above, it should be clear that there are a lot of folks out there who do not have access to payment systems that are supported by the Apple App Store or Google Play. Adding blockchain-based payments as a form of IAP will allow more gamers to spend. In fact, in big gaming jurisdictions like Japan and Brazil, many gamers use alternative forms of payment that aren't necessarily supported by the Apple App Store and Google Play.[301]

6. Net new "programmable money", which has never existed in the traditional financial system.

   - Automated streaming payments to UGC creators located anywhere in the world for creation, initial sale, and secondary sales.[302]

   - Jose Fernandez da Ponte, PayPal's crypto SVP, recently said that he expects to see NPCs in games attached to crypto wallets with value where those NPCs can buy/sell items in the game with stablecoins.[303]

7. Battle-hardened blockchains like Bitcoin and Ethereum[304] have been tested for 14.5 and 8 years, respectively.

   - The Bitcoin and Ethereum blockchains are probably the most attacked computer software systems in history and, to date, they have withstood those attacks and continue to produce blocks every 10 minutes and 12 seconds, respectively.

   - Importantly, stablecoins like USDC and PYUSD are issued on the Ethereum blockchain.[305]

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[301] Chris Hewish from Xsolla discusses this with Ethan Levy on the Deconstructor of Fun podcast.
[302] In 2022, USDC facilitated ~$4.5 trillion worth of transactions on the Ethereum blockchain alone. Among these transactions, $2.7 trillion, or around 60% of the transactions, were related to smart contracts. The high percentage of smart contract-enabled transactions highlights the importance of USDC in not only facilitating faster and cheaper payments, but also in enabling the programmability of money. The design space related to programmable money in gaming is vast and yet to be explored.
[303] https://podcasts.apple.com/us/podcast/unchained/id1123922160?i=1000624146404
[304] The majority of USDC is issued as Ethereum USDC in the form of ERC-20 tokens, which is why I note that this chain is battle-tested. Specifically, when U.S. dollars are deposited into a Circle account, Circle issues the equivalent amount of USDC in the form of ERC-20 tokens. Note that USDC can also be minted on other blockchains and is transferable across blockchains.
[305] USDC is currently issued on nine different blockchains: Algorand, Arbitrum, Avalanche, Ethereum, Flow, Hedera, Solona, Stellar, and Tron with most of the activity occurring on the Ethereum blockchain. Circle recently announced the addition of USDC to six more blockchains: Base, Cosmos, Near, Optimism, Polkadot, and Polygon PoS.

- Game developers also use the Bitcoin lightning network to stream sats (analogous to "bitcoin pennies") within games.[306]

8. Ability to transact in significant sums of money cheaply and instantly.

- Until recently, developers were restricted to fewer than 100 possible price points in the App Store, which previously started at a minimum of $0.49 and a maximum price of $999.99.[307] Those types of limits don't exist with blockchain based payment systems. This is important for games that want to include high-end / luxury digital goods, including NFTs!

It's important to note that in March 2024, under the EU Digital Markets Act ("DMA"), Apple will be required to permit developers in Europe to either "sideload" or launch their own "third-party app stores" within the Apple App Store.[308] Importantly, in either case, the developer will be permitted to *use its own payment system* (and not incur Apple's 30% fee) and I believe developers will consider crypto / stablecoin integrations as preferred payment methods for the reasons I've stated above. When that portion of the DMA goes into effect next year, Meta is planning to allow people in the EU to directly download apps through Facebook ads bypassing the Apple App Store and Google Play Store.[309] Meta currently has no plans to tax in-app revenue and developers are free to use whatever billing system they would like. Microsoft similarly plans to launch its own app store for games for residents of Europe.[310] My bet is that Meta — which is already familiar with the benefits of stablecoins from its Libra stablecoin initiative — and Microsoft will integrate stablecoin payment rails. (As an aside, this is also a great opportunity for a web3 games launcher to start a competing app store in Europe!) I also believe that in the near-ish term, Apple and Google are likely to integrate PYUSD as a form of IAP due to their existing integrations with PayPal for the reasons set out above.

All that said, the 30% fees are so critical to Apple / Google that I think it will take a longer time to chip away at them because Apple / Google will do everything in their power to prevent, fight back against, and circumvent those efforts. This practically means that we won't go from where we are today to fully on-chain payments (where the true innovation resides) in the short-term. Rather, the journey to on-chain payments may be slow and develop on a spectrum, with a likely web2.5

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[306] https://blog.zebedee.io/which-games-can-i-play-for-bitcoin/

[307] In December 2022, Apple amended these so the lowest possible price in the US starts at $0.29 and the maximum is $10,000 (but on request only). Apple didn't do this out of the goodness of its heart - these changes were driven by Apple's $100 million settlement in a class-action lawsuit brought by 67,000 iOS developers earning more than $0 but less than $1 million from transactions annually in the App Store.

[308] https://www.ft.com/content/0c2d56f7-a402-45ea-8aa6-0e05e6260b68

[309] https://www.theverge.com/2023/6/29/23778928/meta-eu-facebook-plans-app-install-android-ads

[310] https://arstechnica.com/gaming/2023/03/microsoft-plans-mobile-games-app-store-to-rival-apple-and-google/

ecosystem developing along the way to acclimatize users to blockchain based payments.

5.7.G A Deeper Dive into the 30% Abyss

> *I do have one last thing.…What about developers? …We've come up with a very sweet solution.…We've got an innovative new way to create applications for mobile devices. Really innovative.…The full Safari engine is inside of iPhone. It gives us tremendous capability.…You can write amazing Web 2.0 and AJAX apps that look exactly and behave exactly like apps on the iPhone. And these apps can integrate perfectly with iPhone services.*
>
> Steve Jobs, June 11, 2007[311]

> *"The truth is Steve Jobs doesn't care about games. This is going to be one of those things that I say something in an interview and it gets fed back to him and I'm on his s***head list for a while on that, until he needs me to do something else there. But I think that that's my general opinion. He's not a gamer. …It's difficult to ask somebody to get behind something they don't really believe in. I mean obviously he believes in the music and the iTunes and that whole side of things, and the media side of things, and he gets it and he pushes it and they do wonderful things with that, but he's not a gamer. That's just the bottom line about it."*
>
> John Carmack, August 4, 2008[312]

> *"We don't expect this to be a big profit generator."*
>
> Steve Jobs on the App Store in August 2008, 3 months following its launch[313]

In trying to understand how we got to this place with Apple, I went back and read some interviews from the early days of the iPhone and the App Store. It's hard to believe that the iPhone launched without the ability for developers to build native apps and that Steve Jobs actually suggested that web apps were a "sweet solution" for third party apps on the iPhone. With the benefit of hindsight, it's also remarkable that Jobs didn't expect the App Store to generate much revenue and that Jobs' focus was more on music than games, which legendary game developer John Carmack infamously said Jobs hated. Fast forward to present times — Apple is estimated to have made $86.8 billion in App Store revenue in 2022, $50 billion of which was attributable to games.[314] (In fairness to Jobs, I don't think he hated

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[311] https://mjtsai.com/blog/2007/06/13/a-very-sweet-solution/
[312] https://www.eurogamer.net/steve-jobs-doesnt-care-about-games
[313] https://www.wsj.com/articles/the-mobile-industrys-never-seen-anything-like-this-an-interview-with-steve-jobs-at-the-app-stores-launch-1532527201?utm_source=Memberful&utm_campaign=5ed0c8b80c-daily_update_2018_08_23&utm_medium=email&utm_term=0_d4c7fece27-5ed0c8b80c-110908273
[314] https://www.businessofapps.com/data/apple-app-store-statistics/

games — when Jobs dropped out of college, he took his first job at Atari (employee #40) as a video game designer)).[315]

It's also notable that while Apple always took its 30% cut on purchases made in apps, until 2011, companies were allowed to direct users to buy content in a web browser to bypass the 30% fee instead of in-app.[316] In a sense, Epic Games has expended a tremendous amount of money and time over the last 3.5 years in hopes that the judicial system will restore the App Store of 12 years ago, when developers were permitted to link to alternate payment systems for in-app purchases.

If you haven't read United States District Court Judge Yvonne Gonzalez Rogers' September 10, 2021 opinion in the Epic Games, Inc. v. Apple Inc. case[317], I strongly recommend you do so! Although a bit dated, it offers a solid background on how games are disproportionately impacted by App Store fees. To wit, Judge Gonzalez Rogers writes:

> *"…the evidence demonstrates that most App Store revenue is generated by mobile gaming apps, not all apps"; "…generally speaking, on a revenue basis, gaming apps account for approximately 70% of all App Store revenue. This 70% of revenues is generated by less than 10% of App Store Consumers"; "… by contrast, over 80% of all consumer accounts generate virtually no revenue, as 80% of all apps on the App Store are free."*

In his book, The Metaverse, Matthew Ball spends a significant amount of time going over payment systems, including the origins of the Apple / Google 30% fee structure. I also highly recommend everyone read Chapter 10, Payment Rails (as well as the entire book – it's awesome!), where Ball runs through the circumstances in which Apple's 30% fee applies / does not apply and the strange economic (dis)incentives that result. A mix of Ball's comments and mine here:

- Purchases of gaming virtual goods
    - 30% fee applies, *e.g.,* skins, emotes, battle passes, loot boxes

- Purchases of take-out food or groceries
    - no 30% fee, *e.g.,* DoorDash, Instacart

- Purchases of physical goods
    - no 30% fee, *e.g.,* sneakers on Nike, treadmill on Amazon

- Purchases / sales of NFTs in-app / internal marketplace and/or secondary marketplace

[315] https://www.gamedeveloper.com/business/steve-jobs-atari-employee-number-40#close-modal
[316] https://www.nytimes.com/2011/02/01/technology/01apple.html
[317] https://cand.uscourts.gov/cases-e-filing/cases-of-interest/epic-games-inc-v-apple-inc/

    - 30% fee applies, *e.g.,* purchase of virtual sneakers on Nike's .SWOOSH app (note, however, that .SWOOSH is available via web only and this is probably why!)

- Sales of digital twin / phygital NFTs connected to physical goods
    - probably 30% fee applies, but unclear

- Purchases of fungible cryptocurrencies, *e.g.,* bitcoin, Ethereum
    - no 30% fee

- User watches $10 worth of ads in-game
    - no 30% fee

- User subscribes to the NY Times, Netflix, or Spotify in-app through link that takes subscriber directly to the provider's sign-up website
    - no 30% fee due to the "reader exemption"[318]

- User subscribes to a dating app, 30% fees generally apply, but this category is complicated based on jurisdiction[319] (and likely to get more complicated as result of the recent Match / Google settlement[320])

The tldr is that Apple treats games — and now NFT-based virtual goods — differently from nearly all other experiences. To be fair, it's not just Apple that charges 30%. Game console platform marketplaces (Nintendo eShop on Switch, Sony PlayStation Store, and Microsoft Xbox Games Store), PC game marketplaces like Valve's Steam, and Samsung and Google Play stores all also charge 30% fees on in-game purchases.[321] Apple's 30% tax is *uniquely egregious* because:

- Most of the overall gaming revenue comes from mobile gaming and Apple has a greater market share in mobile gaming monetization than both Google and Samsung. A recent report notes that an iPhone customer is 7.4 times more valuable than an Android customer.[322]

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[318] https://www.theverge.com/2021/9/1/22653264/apple-reader-app-exception-anti-steering-signup-page

[319] https://www.theverge.com/2021/12/24/22852966/apple-netherlands-dating-apps-match-tinder-app-store-competition

[320] https://www.theverge.com/2023/10/31/23941071/google-play-match-group-antitrust-settlement-epic-games

[321] For a fantastic history of the origins of the 30% fee standard (and overall history of the business of games), check out Game Craft, a phenomenal podcast series by Mitch Lasky and Blake Robbins, both legends in their own right and wonderful storytellers.

[322] http://www.asymco.com/2023/09/05/the-value-of-a-customer/?utm_source=substack&utm_medium=email

- Most of the mobile gaming revenue is derived from the F2P model which relies on IAPs and ads whereas PC, console, and cloud have more diversified revenue streams.

- The App Store is closed garden and competing app stores are not (yet!) permitted within the App Store (*e.g.,* Epic Games can't launch the Epic Games Store within the App Store) whereas Google Play is open and side loading is possible, albeit filled with friction.

- It makes some sense for console providers to charge 30% fees because they're generally selling console hardware below cost, which brings more gamers into the ecosystem — versus Apple, which sells its hardware at a premium.

This unfair treatment of apps / games with NFTs is further complicated by Apple's pricing tiers. The average IAP purchase per user for iOS is $1.08 and for Android is $0.43[323], whereas, the average price of an NFT in Q3 2022 was $150.[324] If, for example, OpenSea decided to sell NFTs via the App Store (which it does not) and sold an Autoglyph for 200 ETH ($360,000), that would mean that seller receives only 140 ETH ($252,000) while Apple receives 30% or 60 ETH ($108,000). Even though OpenSea is permitted to sell NFTs via the App Store, it has elected to keep its mobile apps as "showcase only" with no trading support precisely for this reason.[325] Is there any reasonable case to be made for Apple "earning" $108,000 on that NFT sale? Of course not!

[323] https://www.businessofapps.com/guide/in-app-purchases/

[324] https://20137703.fs1.hubspotusercontent-na1.net/hubfs/20137703/REPORTS/2022/NonFungible_NFT%20Market%20Report%20_Q32022.pdf?utm_medium=email&_hsmi=228481357&_hsenc=p2ANqtz--lYrCgRAiHtdZO3o2yF0bqGd_faPGqJThkcySzx-KzVLYGadn4KE4UCgmAokCicH9WGyRYB8DaSu2nuJig-zEeO4DE1A&utm_content=228481357&utm_source=hs_automation

[325] Unfortunately, this means that OpenSea loses purchasing potential from Apple's and Google's 4.8 billion users via their mobile devices — or does it? See Chapter 6: *web3 Wallets: the "thing that gets you to the thing" … or maybe not, at least not today*

5.7.H Web Stores and PWAs, while a step in the right direction, don't solve the problem

I also mentioned Web Stores above because they are starting to break out of Apple / Google's walled gardens. Specifically, major web2 game developers like Supercell[326], Niantic[327], and Scopely[328] — which have enormous player bases and distribution channels — incentivize players through discounts to purchase virtual goods via the web through external Web Stores versus in-app (primarily) to circumvent Apple's / Google's 30% fees. That's obviously great because Web Stores save both the game developer and gamers money.[329] Web Stores also allow game developers to establish a direct relationship with gamers and collect first party data. That said, Web Stores are only a viable option for major game developers with millions of gamers in their ecosystems because:

- Game developers need to make gamers aware of the Web Store while complying with Apple's and Google's restrictions. Generally, game developers can't let their players know a Web Store exists through in-app links or other in-app advertising directing gamers to the store so they need to do that via email (which requires first party data) or socials[330])).

- Game developers need to set up the Web Store, which takes time and money.

- Game developers need to implement an account system so Web Store purchases are credited to the iOS or Android account (which can be complicated given that Apple forces app developers to support "sign-in with Apple" versus registering an email address and/or Apple asks if the gamer would like to "hide" her email address from the game developer).[331][332]

Another challenge with Web Stores – even for large game developers – is that Web Stores don't solve the "I need an extra life or boost *now*" problem. While it may

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[326] https://store.supercell.com
[327] https://store.pokemongolive.com
[328] https://home.startrekfleetcommand.com
[329] https://www.pocketgamer.biz/news/80992/supercell-to-bring-clash-royale-to-web-store/ and https://www.dexerto.com/pokemon/pokemon-go-web-store-rolling-out-with-special-pokecoin-deals-2111917/ and http://www.fosspatents.com/2022/10/bypassing-apples-and-googles-app-tax.html
[330] Depending on how the 9th Circuit Court of Appeals and eventually the Supreme Court rule, Apple may not be able to prevent developers in the United States from out-linking to websites that include alternative forms of payment.
[331] http://www.fosspatents.com/2022/10/bypassing-apples-and-googles-app-tax.html
[332] Note that Xsolla provides back-end services for 60 company Web Shops that support 120 games, including for Niantic / Pokémon Go. See Xsolla President Chris Hewish's fireside chat at Gamesbeat in May 2023.

be fine for gamers to leave the app and go to a Web Store to purchase additional in-game coins or purely cosmetic items, that doesn't work when a player is mid-game and needs to buy an item immediately to extend gameplay or for competitive reasons. This is why it's essential for developers to be able to integrate payment processing directly into the app instead of sending gamers to a Web Store to process transactions. In sum, while Web Stores help circumvent Apple / Google's 30% fees for some game developers, they aren't as helpful for small game studios and they aren't helpful at all for "I need it now" purchases. More generally, Web Stores interrupt immersive gaming experiences, moving gamers out of their *flow* state when they exit a game to enter a Web Store. What's interesting about Web Stores to me is that they're a private sector partial workaround to the 30% problem and, unsurprisingly, big Web Store providers like Xsolla have started to integrate crypto payment solutions precisely for the reasons I stated above — integrating crypto payment options like stablecoins allows gamers to spend in games when they are otherwise unable to because they don't have access to the traditional banking system or credit / debit cards to spend.[333] Web3 has the potential to open even more monetization opportunities than Web Stores for game developers and gamers alike via secondary liquidity and royalties (which can of course be added to Web Stores as described in my Pokémon Go example earlier in the essay).

Progressive Web Apps (PWA)[334] also come up from time to time as a good work-around to the 30% fees assessed to App Store / Google Play Store gaming native apps.[335] And it's true that mobile games can be PWAs[336], although the most well-known example of a PWA is Starbucks[337], which is not a game (at least for now, see below). My favorite web3 game, Skyweaver[338] is a PWA and has native mobile versions on the Apple App Store and Google Play Store as well as browser. While PWAs may mitigate the "I need it now" purchase problem, they suffer from the same distribution / discoverability issues that Web Stores do as well as lack of access to Apple APIs and an inability to match the performance and speed of a native app. PWAs also require a new user behavior. Most mobile gamers have no idea what PWA is and wouldn't think to access a game via mobile browser and then add it to their home screen. For this reason, it's not surprising that ~95% of gamers who play Skyweaver on mobile do so via native mobile versions and not PWA. It was suggested in the Epic v. Apple case that Fortnite could be developed as a PWA

[333] https://xsolla.com/blog/game-payments-with-crypto-dot-com
[334] Good overview of PWAs here. PWAs are an area of discussion in web3 presently because Friend.Tech is a PWA.
[335] https://cand.uscourts.gov/wp-content/uploads/cases-of-interest/epic-games-v-apple/Epic-Games-20-cv-05640-YGR-Dkt-407-Epic-Games-Proposed-Findings-of-Facts-and-Conclusions-of-Law.pdf
[336] https://www.konvoy.vc/newsletter/pwas-will-shape-the-future
[337] https://business.adobe.com/blog/basics/progressive-web-app-examples
[338] https://www.skyweaver.net. Skyweaver is also available via native mobile and on desktop. As noted above, Brevan Howard Digital is an investor in Horizon Blockchain Games, which developed Skyweaver.

and therefore accessible to mobile gamers.[339] Tim Sweeney rebutted that assertion and not so subtly explained why PWA is not an option for games like Fortnite[340]:

> *Apple's "Just use PWAs" angle is disingenuous. These APIs are TERRIBLY limited on iOS and always have been. Independent developers aren't allowed to fix this, because Apple bans all competing web browser engines on iOS, and bans substantive improvements on their engine.*
>
> *The whole iOS platform - the app store, the guidelines, the PWA limitations, everything - is built as an intermediation trap. All of the pieces carefully fit together to obstruct developers from competing with Apple.*

I've mentioned Netflix and TikTok a few times in this essay and I'm going to delve into their mobile game activities next. Note that the following two sections are a bit less "crypto-y" so feel free to skip them. I included them because I think they're helpful for folks who are not generally immersed in gaming / who may not appreciate the magnitude of what Netflix and TikTok are doing in gaming. I also think it makes good sense for web3 developers to consider how to work with Netflix (primarily from a potential partner and/or acquisition standpoint) and TikTok (primarily from a UA standpoint).

[339] https://www.theverge.com/2021/5/6/22421912/iphone-web-app-pwa-cloud-gaming-epic-v-apple-safari

[340] https://twitter.com/TimSweeneyEpic/status/1382565456893054980?s=20

5.7.I Netflix: the way to ultimately win the "Streaming Wars"[341] is through games

A recent entrant to mobile games, Netflix, has:

- A tremendous catalogue of owned and popular IP.
- Distribution: Netflix has 238.39 million subscribers - but as Matthew Ball points out, the actual number of users, with 3.5 – 4 people per subscription, *is closer to 1 billion.*[342]
- A sh*t ton of money, ~$7.7 billion of cash on hand.[343]
- Many people around the world enjoy watching Netflix on their phones; in fact, the most searched AppStore keyword in 2022 in Brazil, Canada, France, Germany, India, Mexico, Saudi Arabia, Thailand, Turkey, South Korea, and the United States was "Netflix".[344]
- Netflix has no (current) intent to monetize its games via IAPs and ads.

Overall, while ATT presents significant challenges for most game developers, it's a clear opportunity for Netflix to carve out a place for itself in mobile gaming (and gaming overall[345]). Netflix's push into gaming is very intentional. Netflix had a rocky 2022; its stock ended the year down 50%[346] and at one point, was down ~71%. Netflix also experienced its first decline in subscribers in Q1 2022. This is partly due to competing against the likes of Disney+, HBO Max, and Apple TV, but Netflix is also competing for the younger generation, which (as we all know by now!) is spending a significant majority of their time in games. In fact, in a recent report, Deloitte & Touche stated:

> *"If the Generation Z preferences for gaming, music, and social media persist over time, the dominant position that video entertainment has held could be challenged. If this is the case, media companies [Netflix!] should be prepared to evolve and take a diversified approach, starting with gaming."*[347]

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[341] https://time.com/6253697/streaming-wars-disney-chaos-era/
[342] https://www.theringer.com/video-games/2023/7/14/23793669/netflix-video-games-oxenfree-ii-streaming-cloud-gaming
[343] https://www.konvoy.vc/content/gaming-industry-report-q3-2023
[344] https://www.data.ai/en/go/state-of-mobile-2023/
[345] Netflix is also pushing into cloud gaming
[346] Although, note that NFLX is up ~45% YTD in 2023
[347] Deloitte & Touche: Digital Media Trends, 15th Edition: Courting the Consumer in a World of Choice

Netflix Co-Founder and former CEO Reed Hastings did an interview with Andrew Ross Sorkin in November 2022 and repeatedly said that Netflix's mission is to build the most exciting entertainment on earth in shows, films, *and games*. Hastings also reiterated that one of Netflix's primary competitors is Fortnite, which is something Netflix has been saying since January 2019, when the following statement appeared in Netflix's annual letter *"We compete with (and lose to Fortnite) more than HBO"*. When Sorkin asked Hastings about competing with "sports", Hastings said *"Talk to us after we're a big leader in games. We have a lot of investment to do in games."*[348] So, you may wonder — has Netflix been executing on this? Yes! Netflix has:

- Acquired four gaming studios.
- Established two in-house studios.
- 67 games in the Netflix library, playable through its iOS and Android apps and 86 additional games in development, with 16 of these being made by its in-house studios.
- Developed a cloud gaming platform and believes it will do better than Google Stadia — which recently shut down — because Netflix's mobile gaming initiative is a "value add" to its existing streaming model.
- Partnered with Ubisoft and is issuing three mobile games with them, including Mighty Quest: Rogue Palace, which launched in April 2023.
- Netflix Games currently has *450 employees*.

It's also important to note that Netflix has been experimenting with web3. In mid-2022, Netflix's Emmy winning animated series "Love, Death, and Robots" included a digital scavenger hunt for nine QR codes tied to NFTs hidden across social media accounts, physical billboards, and within the show. The NFTs represented artwork from each of the season's nine episodes and 131,690 Love, Death, and Robots NFTs were ultimately minted across 32,300 unique holders and 682,000 users. Aside from gas fees, the NFTs were free to mint. Netflix didn't generate revenues from this initiative so what did Netflix gain? Unique data — a new way to gauge episode popularity could be through which episode NFT had the most mints, secondary market volume, and/or maintained the highest floor price. One of the key issues in the Hollywood strikes relates to streaming providers not providing viewership data transparency to creators so they can be properly

[348] It seems like Netflix has made a decision to also prioritize sports since the time of Hastings' interview.

compensated for their current and future work.[349] The Love, Death, and Robots NFT data — easily accessible on-chain by streaming services, actors, and writers alike — could be a compoent in understanding the overall audience for streaming. Overall, Netflix seems to embrace Matt Ridley's concept of "ideas having sex" — the combination, exchange, and recombination of different ideas, knowledge, and inventions from various sources, which leads to the creation of new ideas, technologies, and solutions. In this case, Netflix is using a combination of its traditional streaming business *plus* mobile gaming *plus* web3 to reach the next generation of Netflix subscribers. As I discuss below, Gen Z and Gen Alpha are participatory generations who expect to be owners (*e.g.,* UGC in mobile games, physical scavenger hunts, ownership of favorite episodes via NFTs). In 2022, Netflix was the fourth-ranked mobile app for Gen Z. Is this entirely due to Netflix content geared towards that generation? Probably. But it could also be early evidence that Netflix's new initiatives in gaming and web3 are paying off with the younger generation.

[349] https://journalnow.com/why-the-war-over-streaming-data-is-at-the-heart-of-hollywood-s-strikes/article_e82a193c-58a9-11ee-949f-1b335a912e43.html

5.7.J TikTok: UGC for the (younger) masses

As discussed above in *Democratization; UGC on Steroids*, the vast majority of TikTok users create content. While some Gen Zs post content solely for fun, many others create with the goal of making money. What does this have to do with web3? *Ownership*! Older generations were lurkers, not creators, and therefore, ownership wasn't much of a concern. TikTok has turned Gen Z and Gen Alpha into creators and I believe that with creation, there will increasingly be a desire to own. Of course, web3 provides the ability to own the content you create as NFTs and/or getting paid more efficiently and effectively via blockchain rails.[350]

Not surprising to those who have been paying attention, TikTok has also become a juggernaut in gaming. Before we jump into gaming, some quick TikTok general stats:

- TikTok is available in 150 countries, has 1 billion users[351], and — much to the chagrin of US policymakers[352] — has 150 million US active users – or 50% of the entire United States.[353]

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[350] I think it's interesting that Meta intends for Threads to enable access to ActivityPub, an open protocol for decentralized social networking established by the World Wide Web Consortium (W3C), the body responsible for the open standards that power the modern web. Unlike Twitter (or X or whatever Elon is calling it by the time this essay is published), where I can't take my followers or content with me when I go, with Threads, I will be able to. I believe Meta thought they would gain a competitive advantage over Twitter by building Threads on an open protocol instead of in a centralized silo. I also believe that Meta has an abundance of data indicating that Gen Z and younger will expect to *own* their social graphs and content. That said, while Threads got off to a very fast start, that is no longer so. While the idea of decentralization is appealing to many, the stickiness of today's centralized, massive web2 social networks like X and Instagram is undeniable. While web3 has so many things going for it – decentralization, global accessibility, transparency, etc. – we need products that users demand because they make their lives better in some way. It's at that point that web3 will seriously start to go mainstream. And this is a real challenge: if Meta with its billions to spend can't take on X with a decentralized framework, how is a web3 start up expected to? (This example is a little unfair because Meta didn't exactly market Threads becoming decentralized as a selling point. It was more the case that folks in my industry picked up on the ActivityPub aspect of it.)

[351] https://wallaroomedia.com/blog/social-media/tiktok-statistics/

[352] I'm not going to get into TikTok politics / policy in this essay, but it's important to note that some US policymakers would like to ban TikTok for national security (concern that ByteDance, TikTok's owner, will share U.S. user data with the Chinese government) and other reasons (kids are addicted, lots of misinformation, mental health concerns). The United States already bans TikTok on federal and public sector employees' phones. TikTok is also banned on state employee phones in 32 out of 50 states. The State of Montana banned TikTok effective January 1, 2024, although Montana's decision was just blocked by a Federal judge. I personally doubt that either political party in the United States will attempt to ban TikTok during the 2024 election year given that would likely alienate young voters.

[353] https://www.reuters.com/technology/tiktok-tell-congress-it-has-150-million-monthly-active-us-users-2023-03-20/

- An estimated 60% of users on TikTok are Gen Z.[354]

- Nearly 40% of Gen Z uses TikTok and Instagram for search instead of Google.[355]

- More time is now spent on TikTok than on Facebook and Instagram combined.[356]

- TikTok will generate more in ad revenue than Twitter and Snap combined.[357]

- TikTok users in the United States averaged more than 80 minutes a day scrolling through videos.[358]

Remember above when I noted that one of the ways for mobile apps to survive in a post-ATT world is by having sh*t tons of money? Well, TikTok didn't grow to 1 billion users by accident; it spent *$3 million / day* on acquisition marketing in the United States alone and is said to have spent ~$1 billion on advertising over the course of 2018 (Snapchat inadvertently fueled TikTok's rise by allowing it to become its largest advertiser in 2018, which ultimately led to TikTok siphoning off Snapchat's user base through its advertising efforts).[359] But, back to TikTok and gaming! Like Netflix, TikTok also sees tremendous opportunity post ATT and is aggressively recruiting "gaming brands" to advertise on TikTok as a "gateway to future growth".[360] Indeed, TikTok is becoming a critical new GTM for mobile games and here's why[361][362]:

- 82% of TikTok users game at least once a week.

- 75% of TikTok gamers discovered new gaming content on TikTok.

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[354] https://wallaroomedia.com/blog/social-media/tiktok-statistics/#:~:text=Gen%20Z%20–%2060%25%20of%20TikTok%20users%20are%20Gen%20Zers.
[355] https://www.nytimes.com/2022/09/16/technology/gen-z-tiktok-search-engine.html
[356] https://sensortower.com/blog/tiktok-power-user-curve#
[357] https://www.reuters.com/technology/tiktoks-ad-revenue-surpass-twitter-snapchat-combined-2022-report-2022-04-11/#:~:text=Twitter%20and%20Snapchat%20are%20expected,%2411%20billion%20projected%20for%20TikTok.&text=Our%20Standards%3A%20The%20Thomson%20Reuters%20Trust%20Principles.
[358] https://sensortower.com/blog/tiktok-power-user-curve
[359] https://mobiledevmemo.com/tiktoks-billion-dollar-secret-that-wasnt/?utm_source=substack&utm_medium=email#:~:text=The%20fact%20that%20ByteDance%20spent,over%20the%20course%20of%202018
[360] https://www.tiktok.com/business/en-US/blog/gaming-marketers-ultimate-guide-tiktok-content
[361] https://www.tiktok.com/business/en-US/blog/tiktok-made-me-play-it-supercharging-game-discovery?redirected=1
[362] https://venturebeat.com/games/tiktok-is-turning-games-into-cultural-phenomena-3t-views-in-2022/

- 500 million TikTok users watch game content!

- In 2022, there were 3 *trillion* views of game content on TikTok.

- 41% of TikTok gamers co-created on TikTok, which "supercharges discovery via co-creating / sharing.

- TikTok mobile gamers are 70% more likely to talk about games on social media.

- Game publishers who employed TikTok as a component of their marketing strategy saw high conversion rates:

    - 41% of users downloaded the game
    - 26% purchased to play
    - 61% of TikTok users see brands more favorably if they create or participate in a trend on TikTok
    - TikTok followers are 191% more likely to like or comment than non-followers

Game discovery on TikTok isn't a boring, typical pop-up ad; rather, TikTok gaming ads consist of unique content that the gaming community wants to engage with, including in-feed playable games, mini-clips, and UGC video collages. Two mobile gaming companies that have found tremendous discovery success on TikTok are:

- Finland's Kitka Games, developer of Stumble Guys, which was acquired by Scopely in 2022, and

- Denmark's Sybo Games', developer of Subway Surfers, which was acquired by Miniclip in 2022.

Subway Surfers is an old game — it launched 11 years ago — but it has had a massive resurgence over the last year thanks to UGC on TikTok. Specifically, creators on TikTok use Subway Surfers in video collages to catch users' attention, which led to Subway Surfers being the most downloaded mobile game of 2022 and hitting 4 billion downloads.[363] Similarly, Stumble Guys, a mobile clone of Fall Guys, was one of the first mobile games to incorporate TikTok into its UA strategy early – before TikTok even had a global gaming division – and, as of February 2023, the Stumble Guys hashtag had 40 billion views on TikTok.[364] Interestingly, when you go to Stumble Guys TikTok page, the first link under 1.9 million followers and

[363] https://venturebeat.com/games/subway-surfers-reaches-4b-lifetime-downloads/
[364] https://mobilegamer.biz/tiktok-isnt-launching-a-games-tab-but-it-is-doubling-down-on-discovery/

6.9 million likes is a link to the Stumble Guys Web Store, which of course, allows Scopely to bypass the Apple and Google 30% IAP fees.[365]

My discussion of Netflix and TikTok may seem removed from web3 and gaming, but I included them for a few reasons:

- I'm surprised how many folks I speak with are generally unaware of the extent to which these two companies have pushed into (mobile) gaming. While TikTok's parent company, ByteDance, is apparently exiting the game making business[366], I can't imagine TikTok exiting the games advertising business any time soon.

- I'm also surprised that more game developers aren't using TikTok for UA purposes — free (start putting up videos!) and/or paid (through TikTok itself or working with paid influencers).

- The very rise of these two massive superpowers in gaming – both of which are relatively new entrants to the space – tells me that there is a real opportunity for others to also break into mobile gaming in novel ways, especially now that Apple and Google have started to clarify their respective stances on web3 enhancements to games.

Just how significantly mobile F2P games have suffered due to ATT shows the fragility of the mobile gaming industry and demonstrates why *now* is the time for new entrants with new models, including web3, to step up to the plate and take a big swing.

[365] https://www.tiktok.com/@stumbleguystt?lang=en

[366] https://www.gamesindustry.biz/bytedance-reportedly-pulling-out-of-games-following-nuverse-restructure?mc_cid=9a6af86d89&mc_eid=51ad266bef

Chapter 6: web3 Wallets: the "thing that gets you to the thing" … or maybe not, at least not today

Wallet Utopia

My favorite show is "Halt and Catch Fire," which is about the early days of the internet, where the four protagonists start a series of companies in the areas of computing, gaming, and search. There are two sentences from that show that have really stuck with me: *"Computers aren't the thing." "They're the thing that gets you to the thing."* Of course, the "thing" is the Internet, which in the context of the show meant the nascent stages of the web1.0 "internet of information." What is the "thing" that will bring non-crypto native users to web3? I believe it's clearly gaming, but to get to the gaming "thing", it's critical to have beautifully designed and safe portals to the blockchains that make this possible. The wallet (in whatever form it may ultimately take, including being invisible[367]) is the gateway to web3, like how we think of web2 browsers today, except that, crucially, the wallet is also a user's identity (or more likely, identities) and because of this, wallets must be beautifully designed, consumer friendly, and fundamentally secure. The wallet is also crucially important not just for *user acquisition and onboarding*, but also for user *engagement* and *retention*.

Web3 wallets do more than just manage on-chain assets. Here is one mental framework for how web3 wallets may evolve: at the advent of the Internet, there were lots of websites popping up all around the world and Google solved the problem of how to structure search queries so that when looking at all that unstructured Internet data, a useful search result could be provided to users. Similarly, wallets include infrastructure to look at unstructured web3 datasets, filter them, and provide search results that make sense, and are tailored to, the wallet owner.[368] In addition to general search, from a web3 wallet, users will have an app store like experience where they can select from different web3 verticals that are pre-populated, *e.g.,* gaming, DeFi, social, fashion, creator, work, banking, which, in turn, will have sub-verticals / categories for further exploration, *e.g.*, under gaming, I'll be able to select from FPS, TPS, RTS, RPG, MMORPG, board, puzzle, card, racing, educational, etc. As I discussed above, it's possible that as/when the Apple App Store and Google Play Store are forced to allow other app stores to operate within their current closed garden ecosystems, wallets become app stores that serve as portals to dapps built on blockchains using crypto rails as their payment systems instead of IAPs.

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[367] https://mirror.xyz/sylve.eth/A8VnNvBVbc0aXmW2FlG58ysI8oZUnH0HGwwjIsQGHUk

[368] In this future state of web3 wallets, it won't matter to me at the wallet level which chain web3 projects are built on because all chains will eventually flow into web3 wallets.

That said, whether Apple fully realizes it or not, in a sense, Apple is already allowing crypto wallets to act as app stores within the App Store. This is because Apple *does* allow crypto mobile wallets to include in-app browsers, from which consumers can go to NFT marketplaces like OpenSea and easily purchase NFTs presumably without paying Apple's 30% fees.[369] The NFTs that are purchased via the in-app mobile browser are then held in the consumer's mobile wallet. It's interesting that Apple permits this type of activity, but effectively *does not* permit crypto mobile wallet users to *transfer* NFTs (transfers are obviously different from buying/selling NFTs in-app (not via browser), where the 30% fee clearly applies)). This is because Apple wants blockchain transaction fees associated with NFT *transfers* to be processed as IAPs, which is impossible given blockchain transaction fees are crypto based and crypto isn't (currently) an accepted form of IAP.[370] In any case, the way to get around the mobile wallet NFT transfer problem is to simply use the desktop browser version of your crypto wallet and transfer the NFT you purchased via mobile from desktop (e.g., the Coinbase mobile wallet doesn't have a "send" button for NFTs, but the Coinbase Wallet extension on Chrome does).

Back to wallet utopia! I may also be able to choose which social or professional identity I want to use for the experience I'm going into and spin up different wallet addresses and avatars across these ecosystems. Web3 wallets may allow me to be anyone I want to be; I can flex whatever asset I want to flex, I can select what I want that experience and the people in it to know about me, I can spend and earn effortlessly, and, importantly, experiences can be created for me. For example, when I enter a virtual Gucci fashion show at NYFW, I may want to enter with my identity that holds my Bored Ape so Gucci can create a custom blue NFT digital purse to match my Bored Ape's dress and then offer to sell me the physical version with an embedded NFC chip. Or, when I enter a new DeFi app, I may want to enter with my identity that shows me sending ETH to the original DAO so I can impress the community as a serious DeFi-er. This will all be seamless — and eventually, safer — with the click of a button so every time I enter web3, I have a "choose my own adventure (and identity!)" experience.

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[369] This seems to potentially violate Section 3.1.1 of Apple's App Store Review Guidelines, specifically: "*… Apps may allow users to browse NFT collections owned by others,* ***provided that the apps may not include buttons, external links, or other calls to action that direct customers to purchasing mechanisms other than in-app purchase****."* On the other hand, perhaps in-app browsers in crypto mobile wallets are acceptable to Apple because the way in-app browsers are implemented today is not a "call to action" or "directing" consumers to make NFT purchases on NFT marketplaces like OpenSea. Instead of being explicitly shown OpenSea (or any other NFT marketplace) or guided towards it, the customer must discover on her own initiative that she can buy NFTs on OpenSea by directly entering "opensea.io" in the in-app browser and attempting a purchase.

[370] https://www.theverge.com/2022/12/1/23488448/coinbase-ios-wallet-app-apple-nft-fees-in-app-purchase-store

Wallet Reality

It is equally possible that wallets won't evolve at all as I have described above! While I have no doubt that the incredible developers in web3 will cure many of the problems plaguing wallets today, the wallet user experience for non-crypto native users is challenging in its current state and it's important that we're honest about that. Among others, three issues are tormenting wallets today:

- 1. web3 wallets are confusing, full of friction, hard to use, transactions fail frequently (if you can even figure out how to on-ramp funds), and even the most crypto-native users continually fall victim to scams resulting in assets being drained from their wallets.

- 2. No ability to filter spam and prioritize wallet in-boxes or for senders to effectively target highly desired users via wallets. For airdrop recipients, it's nearly impossible to distinguish between airdrops that may have value and ones that are junk; therefore, by default, wallets quickly turn into depositories of spam. Additionally, even crypto natives are scared to log into dapps with hot wallets that contain valuable assets for fear of them being stolen due to a hack. These problems for airdrop recipients are clearly also problems for legitimate airdrop distributors.

- 3. Potential solutions like Wallets as a Service (WaaS) — where a game abstracts away wallets altogether and creates a wallet for every gamer behind the scenes — are like temporary Band-Aids. WaaS may help with initial onboarding, but could very well lead to problems down the road.

I'll elaborate on problems 2 and 3, both of which contribute to problem 1. 2 is a problem that developers are working on so either the wallet itself or an app that is linked to the wallet provides for strong spam filtering and prioritization. As / when these products come to market, wallet holders will receive opportunities to interact with communities and projects they care about while also building out an on-chain profile so senders can more easily target specific wallets in the future. Likewise, senders will be better able to search, send, and follow-up with wallets (or specific NFTs themselves![371]) based on their network profiles and activity. For example, if a game developer wants to attract all BAYC holders to her game[372] by airdropping a hero NFT from her game to them, the recipient's wallet will automatically scan the hero NFT and verify with some probability that it's not associated with a scam / fraud and send the recipient an alert that a valuable, and safe to interact with, hero

[371] https://www.coinbase.com/blog/unlocking-the-future-of-nfts-exploring-erc-6551-token-bound-accounts

[372] Which she can do by making a query with an indexer.

NFT has been airdropped to the wallet. This type of system will be incredibly valuable for web3 native user acquisition and retention, especially for games.

Today, I can easily see assets in my wallet, but I'm usually too afraid of attacks and scams to interact with unknown assets that came in through airdrops. Further, I'm generally terrified to log into / connect a hot wallet containing any valuable assets to any dapp — including games. Instead, I log into web3 games with an empty, burner wallet, which doesn't help the game developer in identifying me / segmenting me. The good news is that like in-box filtering and prioritization and the ability for senders to engage in highly specific targeting, web3 infrastructure developers are also hard at work on solving attestation issues. For example, in the game Dookey Dash, Yuga suggested that users set up delegate.cash or warm.xyz for their Sewer Passes. Through using these systems, I could leave my ape in a cold wallet and delegate it to a hot wallet (so I didn't have to transfer my ape from a cold wallet to a hot wallet) and still mint a Sewer Pass. Through using these attestation models, I could log into a game with a burner / hot wallet, but the game developer could still see all the assets that I have "delegated" or "attested" to the hot wallet from the assets sitting safely in a cold wallet. This allows the game developer to effectively segment / profile me and, for example, immediately drop me an NFT from the game commensurate with the assets in my wallet to entice me to play.

Regarding problem 3, imagine that:

- Big web2 gaming company #1 (Web2 Game #1) wants to enhance a game with web3 by allowing users to own their heroes as NFTs, but Web2 Game #1 is worried that forcing gamers to download / log-in with a wallet may prevent non-crypto natives from playing the game.

- To mitigate this, Web2 Game #1 decides to use WaaS so a gamer ("Gamer #1") enters the game through a standard, familiar onboarding flow, while a crypto wallet is created for Gamer #1 behind the scenes.[373]

- Having seen the success of Web2 Game #1, Big web2 gaming companies #2, #3, and #4 (collectively, Other web2 Games), want to add web3 to some of their games too! They also decide to use WaaS architecture to streamline onboarding.

- Gamer #1, who is super interested in web3 enhanced games now, decides to play Other web2 Games and now has four crypto wallets that have been created for her.

[373] Gamer may not even realize that a wallet has been created for her until if / when she "graduates" to web3 and desires to trade any of the fungible or non-fungible assets she has purchased or earned while playing the game.

- Gamer #1 wants to use USDC from her Web2 Game #1 to purchase assets in Other web2 Games and realizes that none of her four wallets are connected!

This is the current problem with WaaS architecture; the wallets become siloed app / game wallets and can't be "reused" or linked to other app / game specific wallets. This is challenging because existing web3 gamers then show up to your game with zero crypto purchasing power. This is analogous to needing a separate bank account for Target, Walmart, and the BP gas station.[374] Gamers having multiple unlinked wallets also makes attribution difficult. The flipside is that web2 gaming companies may like this "walled garden" element of WaaS because it's closer to what they're accustomed to.

In any case, the good news is that developers are also hard at work solving the above problems[375] and once they do, wallets will be easier to manage and safer to interact with. Wallet senders will be able to more efficiently and effectively target users with airdrops and other campaigns through the rich and unique data provided from wallets, including: assets and values, volume and frequency of transactions, average transaction value, current purchasing power, social graph, gaming graph, level of web3 experience, level of gaming experience, and favorite types of games. That said, please be mindful of my comments above regarding ZKPs and gamers having hundreds of unlinked wallets, both of which may make wallet attribution challenging (among many other things).

[374] Inspired by a conversation with Peter Kieltyka, CEO and co-founder of Horizon Blockchain Games.

[375] See: EIP-7212 helps improve security for wallet users. EIP-4337 and other "account abstraction" / "smart contract wallets" which are programmable will also help link application-specific wallets and provide a standard way for these wallets to interact with each other. This would make it easier for users to transfer cryptocurrency between different applications. Some of benefits of linking application-specific wallets that use WaaS infrastructure:

- Increased convenience: Users would be able to transfer cryptocurrency between different applications more easily.
- Improved security: Users would have more control over their cryptocurrency, as they would not have to rely on a single application to store their assets.
- Enhanced interoperability: Application-specific wallets would be able to interact with each other more easily, which would make it easier for users to use their cryptocurrency across different platforms.

Overall, EIP-7212 could have a positive impact on the way that application-specific wallets are used. It could make it easier for users to transfer cryptocurrency between different applications, improve security, and enhance interoperability.

Chapter 7: The Institutions are Coming …just not the ones we expected

There are videos of me out there in 2014, 2015, 2016, and 2017 saying that the "institutions are coming" and that a "wall of institutional capital will soon flow into crypto." While we have absolutely seen strong institutional uptake in crypto[376], we haven't seen the level of engagement I would have expected by this point. Some of that can certainly be laid at the feet of regulators; we are still seeking clarity in foundational matters like asset classification, custody, accounting, and tax (among other areas). But the good news is that I wasn't entirely wrong. The institutions are here, just not the ones I anticipated. While financial institutions have been dipping their toes into the crypto waters slowly, big brands have jumped right in. This is a bit tongue-in-cheek, especially when the largest asset manager in the world files for a bitcoin ETF, which Blackrock did in June 2023. That said, I do think there is much for TradFi to learn from brands willing to experiment with, and embrace, innovative technologies like web3. In this section, I'll cover:

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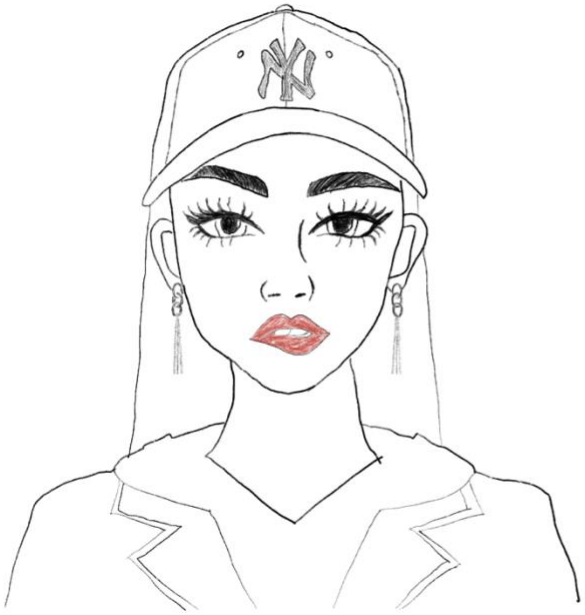

- Brand collaborations with games
- Existing & digital native brands in web3 & "net new" monetization opportunities
- Nike in web3
- Do brands still care about web3 after the crypto events of 2022

[376] Sean Judge, General Partner at Castle Island Ventures gives some great examples of institutional involvement in crypto here. Blackrock, the world's largest asset manager with $8.59 trillion under management as of the end of 2022, filed for a bitcoin ETF.

[377] This drawing is based on my Crypto.Chick #4770 NFT. Crypto.Chicks are a collection of 10,000 "gorgeous, proud, independent, and empowered girls." Crypto.Chicks has had its share of controversy.

7.1 Brand / Game Collabs

In hindsight, given my love of games, I'm unsure why I thought financial institutions would embrace web3 before brands. Brands have been collaborating with games for quite some time. Gucci alone has partnered with Roblox, Pokémon Go, Animal Crossing, The Sims, Genies, and League of Legends. Brands like Louis Vuitton, Tommy Hilfiger, Valentino, Marc Jacobs, Balenciaga, Ralph Lauren, and Burberry have also done game collaborations. Why? They understand that the next generation is hanging out in games. A recent poll by Deloitte found that whereas previous generations of Americans picked TV and film as their favorite home entertainment, Gen Z ranked gaming first.[378] Did you ever wonder why Gucci built the Gucci Garden experience in Roblox to sell your kids $5 virtual purses? It's because Gucci wants to get in front of Gen Z and Gen Alpha now with $5 digital bags[379] so they eventually purchase $2,000 - $5,000 Gucci jackets and purses (and phygitals!) when the grow up[380]. Indeed, during the first two weeks of Gucci's Gucci Garden collab with Roblox, *90m kids visited the experience*.[381] Gucci's strategy is working! In a recent Business of Fashion survey, Gucci — despite its products generally being too expensive for Gen Z — was ranked as Gen Z's favorite fashion brand after Nike.[382]

Gucci also understands that while House of Gucci may be on the top now, House of Fortnite and House of Roblox aren't far behind. Matthew Ball notes that Fortnite is already one of the largest apparel companies in the world with its ~$20 billion in revenues over the last four years — nearly all related to the sale of purely cosmetic virtual outfits.[383] Fortnite's revenues exceed those of Prada, Dolce & Gabbana, and many more.[384] Another non-obvious competitor is Roblox, which made $2.2 billion in 2022, much of that generated from the sale of its virtual

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[378] https://www.economist.com/special-report/2023/03/20/ready-player-four-billion-the-rise-of-video-games

[379] Note that not all luxury brands are going to sell lower-priced goods to kids. As Bernard Arnault infamously said: *"…it's not our objective to sell virtual sneakers for 10 euros. We're not into that."*

[380] In fact, a Gucci Queen Bee Dionysus bag that originally sold for 475 Robux (~$5) later sold for $4,115! That's more than the physical IRL Dionysus bag that sells for $3,400.

[381] Robert Triefus, former CEO of Gucci Vault, in the context of games being the entry point to the younger generation, noted that the Grammys have 12 million viewers while Riot has 50 million for its esports championships.

[382] https://www.businessoffashion.com/articles/retail/bof-insights-nike-and-gucci-top-gen-zs-favourite-fashion-brands/

[383] https://www.voguebusiness.com/technology/the-fashion-execs-guide-to-the-metaverse

[384] Ball's observation isn't just theoretical: Epic Games invested in CLO Virtual Fashion, which already integrates with Epic's Unreal Engine, and provides 3D fashion design software, a digital CMS and collaboration platform, and marketplace where thousands of true-to-life garment designs are bought, sold, and showcased.

currency, which is then used by gamers to purchase virtual goods, including digital fashion. As noted above, according to a study by Roblox and Parsons School of Design[385], in 2022, more than 11.5 million creators designed over 62 million virtual clothing and accessory items on Roblox. That's 200x as many creators as the estimated number of fashion designers creating physical collections in the United States and six times as many creators as the estimated 1.8 million people employed in the U.S. fashion industry across manufacturing, textiles, and other fashion items. In that same study, 75% of Gen Z said they spend money on digital fashion.

The general rule with brands is that they're cool, until they aren't. We see this time and time again; the next generation comes up, there's a cultural shift, and the brand no longer represents the interests of that generation. So how have the brands listed below stayed "cool" for such a long time and, in some cases, survived 100+ years of cultural shifts, lots of internal strife[386], and world altering events like world wars?

[387]

One simple answer is that these brands aren't afraid to experiment, innovate, and meet the next generation wherever they are. Gucci isn't in games for giggles and to hang out with pre-teens; they're there because they know that to get to the next 100 years, the biggest risk is taking no risk. The pandemic also left its mark; over the last three years, many brands' physical locations were closed or became unsafe,[388] forcing brands to rethink old business models and pull the digital future

[385] Metaverse Fashion Trends 2022 by Roblox and Parsons School of Design
[386] House of Gucci, Lady Gaga, anyone?
[387] This isn't an NFT. It's an illustration of "Forever Brands" active in web3 and the years that each of them were founded in.
[388] https://www.washingtonpost.com/opinions/2022/04/27/chicago-magnificentmile-michiganavenue-retail-shopping-malls-lorilightfo ot/

forward. Brands understand that games are the third “place” (after home and school) for many Gen Z and Gen Alpha kids and these kids will be their most important customers in the coming decades. As Gen Z and Gen Alpha move deeper into web3 experiences, including games, innovative brands will follow. From web2 game collaborations, brands already understand that the experiences they will eventually build in web3 enabled games must be authentic to the environment they’re operating in. Brands know they need to understand the language, the culture, and the community of a specific game, *e.g.*, gamers in Roblox, the Sandbox, and Fortnite have very different communities and capabilities.

7.2 Existing and digital native brands in web3 and "net new" monetization opportunities

The depth of what top-tier brands are doing in web3 is meaningful. Many accept cryptocurrency payments: Gucci[389], Ralph Lauren, Off-White, Tag Heuer, Ferrari, and Balenciaga. Further, leading brands have generated more than $280 million in NFT revenues, including[390]:

NFT Revenues

- Nike: $203m NFT revenue; $108m in royalties. $1.4b in secondary vol
- Dolce & Gabbana: $26m NFT revenue; $2.9m in royalties. $14.5m in secondary vol
- Tiffany & Co.: $12.6m in NFT revenue
- Gucci: $12.2m in NFT revenue; $2.2m in royalties. $40.6m in secondary vol
- Adidas: $25.2m in NFT revenue; $19m in royalties. $155m in secondary vol
- Starbucks: $1.38m in NFT revenue; $204k in royalties. $2.79m in secondary vol

Traditional Revenues

- Nike: $51.2 billion
- Starbucks $26.58 billion
- Adidas: $22.6 billion
- Gucci: $11.07 billion

391

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389 Gucci is widely credited with being the first luxury brand in web3, starting with its May 2021 auction of an NFT film inspired by its Aria collection (with all proceeds being donated to UNICEF). Gucci has even formed an internal group called "Dream Big" to focus on gaming / web3 opportunities and recently entered a multi-year partnership with Yuga Labs. Not surprisingly, Gucci's first collaboration with Yuga relates to a game. Specifically, Gucci released the "KodaPendant," an NFT representing both a physical piece of jewelry and an NFT expected to unlock perks in the game. Kodas, little avatar monsters in the Otherside game, flex their virtual Gucci chains. Michael Figgee, Chief Creative Officer of Yuga says the aim of the collab with Gucci is to: *"put culture on the blockchain"*.
More generally, Gucci's work in gaming and web3 includes, among other initiatives: Gucci Town in Roblox; Gucci Vault; Gucci Gaming Academy developed in partnership with FaceIt and focused on CS:GO; purchasing real estate in The Sandbox; partnerships with Fnatic on dive watches and 100 Thieves on a backpack; 10KTF NFT project that includes a virtual floating "New Tokyo" world; a 500 NFT collector series with SuperPlastic; joining the Superrare DAO with a $25,000 investment; and adding ApeCoin (BAYC token) as a payment option

390 https://dune.com/kingjames23/nft-project-possible-data-to-use

391 This is a drawing of my Sad Girl #7704 NFT. Glam Beckett, creator of the Sad Girls Bar NFT collection, is an independent artist based in London. She is best known for her bold, sensitive, and evocative monochrome artworks. Here is more about Beckett's work.

Of course, the above NFT revenues pale in comparison with 2022 "traditional revenues" of Gucci: $11.07 billion, Nike: $51.2 billion [392], Adidas: $22.6 billion, and Starbucks $26.58 billion. However, these brands understand at a fundamental level that sometimes building culture, community, and stories — which all lead to *loyalty* — must come before product and revenues. That said, the web3 revenue potential for brands is real because web3 offers "net new" commerce / monetization opportunities.

Blockchains are like factories for digital goods and because digital goods can easily and cheaply be produced on blockchains, brands now have the same creation and monetization abilities as video games. The ownership and tradeability aspects of web3 are critical for brand's virtual goods — just as those attributes are critical for the physical goods those brands produce. web3 enhanced monetization for brands can take a few different forms, separate or commingled (all of which provide revenue from primary and secondary sales):

- NFT sales or airdrops of digital goods, including fashion, art, access passes, and more (*e.g.,* Gucci Vault Art Space collaboration with Super Rare[393], Nike's .SWOOSH). This includes direct to avatar commerce (*e.g.,* buying Balenciaga cosmetics for your Fortnite avatar[394], except the cosmetics are NFTs).

- "Digital twins" / "phygitals" (unclear which of these terms will win out, if either) – the linking of physical goods (and experiences) and NFTs, which enable brands to embed more value into a physical product and create direct customer connections.

- Royalties on secondary sales. As noted, NFT creators have earned over $1.9 billion in royalties.[395]

As discussed in more detail below, Nike is currently the best example of this:

- Old monetization: Consumers can buy physical Nike goods at physical stores that sell Nike products, on Nike.com, and on the Nike mobile app store.

- New monetization: In December 2022, Nike launched its web3 platform https://www.swoosh.nike, which is currently for members but will eventually be open to the public. On .SWOOSH, members can purchase digital, NFT based shoes that will ultimately be worn by avatars or used in other yet-to-

[392] Note that this revenue figure is for Nike's fiscal 2023 fourth quarter and full year ended May 31, 2023.
[393] https://vaultartspace.gucci.com/gallery/grid
[394] https://www.vogue.com/article/balenciaga-fortnite-partnership
[395] A16z 2023 State of Crypto: https://a16zcrypto.com/content/article/state-of-crypto-report-2023/

be-determined ways. Members are also eligible to participate in phygital drops of shoes[396] and clothing.[397] Additionally, through its subsidiary, RTFKT, Nike sells phygital sneakers[398], hoodies[399], and luggage[400] collections as well as NFTs.[401]

I firmly believe that Nike is just the start and that *every streetwear and luxury brand will sell NFT goods and phygitals alongside their existing physical goods*. More on this below in *Nike and web3*.

But there's more: we're also seeing the rise of web3 native fashion designers. SYKY[402] recently launched an incubator for web3 native fashion designers, SYKY Collective, which is intended to give these designers the mentorship and tools to establish their own luxury fashion houses of the future.[403] Web3 brings with it a blank canvas for creative expression. Designers can create NFT goods for avatars that are not physically possible IRL, like Balmain's flame dress.[404] Web3 native designers often start with virtual fashion, which has meager marginal costs, especially compared to physical fashion. Importantly, what all these opportunities have in common is *ownership* enabled by web3. I love this quote from the founder of SYKY, Alice Delahunt[405] [406]:

[396] https://nftnow.com/runway/nike-dot-swoosh-debuts-air-force-one-tinaj/
[397] https://blog.swoosh.nike/everything-you-need-to-know-about-the-tinaj-tee-e69f99e8b2c2
[398] https://www.highsnobiety.com/p/rtfkt-cryptokicks-irl/
[399] https://www.voguebusiness.com/technology/why-nikes-next-web3-move-is-a-black-hoodie-rtfkts-founders-tell-all#intcid=_voguebusiness-uk-bottom-recirc_14448817-6a48-4a59-907e-9b704f83f999_text2vec1
[400] https://www.highsnobiety.com/p/rtfkt-rimowa-nft-suitcase/
[401] https://rtfkt.com/category
[402] Brevan Howard Digital is an investor in SYKY.
[403] https://www.prnewswire.com/news-releases/syky-debuts-luxury-fashion-incubator-for-digital-designers-301793993.html
[404] https://vogue.sg/balmain-nft/
[405] Before founding SYKY, Alice was global director of digital and social at Burberry and then transitioned to chief digital and content officer at Ralph Lauren. Alice is also a non-executive board member of Soho House and a former retail and creative council advisory member at Google and Snapchat.
[406] https://nftnow.com/culture/runway-exclusive-syky-debuts-luxury-fashion-incubator-for-digital-designers/

"What we are doing is important because the Renaissance is coming," Delahunt says. "We are about making the fashion industry more equitable, more diverse, and specifically, those that care about fashion are excited to discover the next Coco Chanel. The biggest luxury houses of the next 100 years will be built in the next five."

[407]

That's another reason why traditional luxury and streetwear brands are in web3. Their upstart competitors are here. Nike understood this and quickly acquired RTFKT, another web3 native fashion house that may have eventually become one of Nike's biggest competitors. In my opinion, Gucci, Nike, Prada, and Tiffany,[408] which collectively have *455 years* of operating experience, are currently in pole position to lead existing luxury and streetwear brands into web3.

[407] This drawing is based on my CloneX #634. It's one of 20,000 next-gen Avatars by RTFKT and Takashi Murakami.

[408] Or Tiffany was when I started this essay. It's now been well over a year since we've seen anything further from them – so we'll see if they keep up. For context, on July 31, 2022, Tiffany announced its NFT TFTiff launch of 250 NFTs for 3 ETH (~$50,000 at the time of sale). The admission ticket for the pendant was a punk NFT, which allowed a punk owner to purchase a TFTiff NFT in the image of the owner's punk. All 250 NFTs sold out, netting Tiffany ~$12.5 million in revenue.

7.3 Nike in web3

In December 2021, Nike acquired a web3 native fashion start-up called RTFKT for an undisclosed sum. At the time of the acquisition, Nike President and CEO, John Donahoe, said,

> *"This acquisition is another step that accelerates Nike's digital transformation at the intersection of sport, creativity, gaming, and culture."*

Prior to the acquisition, Nike launched Nikeland in Roblox and in December 2019, was granted a patent for "cryptokicks," which envisions "digital twins" (*e.g.*, a shoe NFT paired with a physical NFT with an NFC chip). Late last year, Nike launched .SWOOSH, a web3 experience. As one of the initial 330,000 beta members of .SWOOSH, I received an NFT based access pass, which gave me eligibility for a new "Our Force 1" NFT airdrop. Ron Faris, vice president and general manager of Nike Virtual Studios says:

> *"Our approach around our virtual creations is, above all else, to provide a sense of utility and benefit, and not to be any speculative asset. The underlying technology is what we find engaging to explain concepts like digital ownership, co-creation royalties — that's what we find exciting because it allows us to reframe our relationship with our members."*[409]

Indeed, Nike is incorporating game-like UGC elements into .SWOOSH and allowing community members to design virtual products and receive royalties.[410] As noted above, we expect all luxury and streetwear brands to have both physical and digital shopping experiences and .SWOOSH is Nike's virtual goods and phygital store.[411] On .SWOOSH, fully digital products are priced much cheaper than their physical counterparts, which makes sense because the margins for virtual versus physical goods are exponentially lower. In May 2023, Nike's .SWOOSH digital store launched with NFT versions of its iconic Air Force 1 shoes — called Our Force 1 — which cost $19.82, in reference to the year they launched (versus >$100 for physical Air Force 1s). Notably, Nike didn't kick off its .SWOOSH web3 strategy with a

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[409] https://www.businessoffashion.com/articles/technology/nike-has-a-plan-to-take-digital-goods-mainstream-just-dont-call-them-nfts/

[410] From Vogue Business: A key component will be co-creation, including the ability for people to weigh in on design elements and sell their own co-created products, including earning royalties on virtual goods. Those who win community challenges will be given the chance to co-create and earn a royalty for every virtual product they helped co-create.

[411] If you've made it this far in the essay, you understand why Nike launched .SWOOSH via browser instead of via a mobile app, where it would have had to give 30% of all NFT sales to Apple and Google.

fringe product: the Air Force 1s are Nike's *top selling shoe of all time*. [412] Nike sold more than 97,000 OF1s to 53,000 members of the .SWOOSH community (including me!) generating ~$2 million in revenue.[413] Immediately following the OF1 NFT sale, Nike announced two gaming partnerships:

- EA SPORTS[414], the division of Electronic Arts that publishes EA FC (formerly, FIFA) and Madden NFL (among many others), under which select .SWOOSH virtual creations are expected to be available in EA SPORTS titles.
    - EA has 200 million players engaged in its EA Sports games[415], who will soon be introduced to web3 via .SWOOSH.
- Fortnite, where .SWOOSH members were able to link their .SWOOSH accounts to their Fortnite account for a limited period and claim achievements, earn cosmetics, and gain preferred access to a future .SWOOSH Air Max Virtual Collection for playing a game called Airphoria, set up as a distinct Fortnite island.
    - Fortnite had 231 million active players over the last 30 days[416], who have now been introduced to web3 via .SWOOSH.

.SWOOSH abstracts away all of web3, including crypto jargon, and uses Bitgo's custodial wallet solution, which is invisible to the consumer. We have seen many brands move in this direction, especially after the events of 2022. The focus is now firmly on the *utility* web3 offers: digital goods (*e.g.,* OF1s), enhanced authentication, product-specific information/provenance, immersive and interactive digital environments, and access to digital and physical perks.[417] Remarkably, over

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[412] https://www.flexdog.com/magazine/air-force-1-the-best-selling-nike-silhouette

[413] https://www.businessoffashion.com/briefings/technology/if-nfts-are-passe-nobody-told-nike/

[414] https://about.nike.com/en/newsroom/releases/nike-virtual-studios-dot-swoosh-ea-sports-partnership?utm_source=substack&utm_medium=email

[415] https://www.fool.com/earnings/call-transcripts/2022/11/01/electronic-arts-ea-q2-2023-earnings-call-transcrip/#:~:text=With%20the%20launch%20of%20Madden,were%20well%20above%20our%20expectations. During EA's Q2 2023 earnings call, Andrew Wilson CEO said: *As we look ahead, our talent teams are focused on building extraordinary experiences that drive deep engagement to grow our communities and reach new audiences, particularly Gen Z and Gen Alpha, who are turning to games as their preferred choice for entertainment and social connection. Games continue to be one of the fastest-growing forms of entertainment and the social networks of the future. We're in the privileged position of creating what people love doing more than anything else with their friends and family.*

[416]https://activeplayer.io/fortnite/#:~:text=Right%20now%2C%20there%20are%201%2C584%2C420,played%20Fortnite%20this%20September%202023.

[417] "Fashion and beauty brands integrating NFTs today are doing so in a much more thoughtful manner, providing utility and added value to the consumer right away — versus the promise of potential future value," says Angelic Vendette, CEO and founder of Web3 advisory firm Ave Advisory (and former Alo CMO). "This feels more in-line with the clienteling and loyalty programmes that we expect from luxury brands and premium experiences."

the last two years, Nike's top three web3 collections generated approximately 1.45 billion social engagements, nearly as much as web2 Nike brand, and around 800,000 social mentions – *6.5x more than web2 Nike's brand in the same period*![418]

It's no surprise that Nike is early in embracing a technology that offers a superior way to pay and collaborate with creators – that is the very foundation of Nike's business. Until 1984, Nike was floundering against its primary competitor, Adidas[419], which, at that time was generating 50% more in revenues. In 1984, Nike signed a groundbreaking deal with Michael Jordan, under which Nike paid Jordan $2.5 million for a five-year contract, but also paid him 25% royalties on all sales.[420] That deal catapulted Nike into the top sportswear firm in the world. In Nike's 2023 fiscal year, which just ended, revenue exceeded $50 billion, twice as much as Adidas, and Jordan's division was the top revenue producer with $6.6 billion in revenues.[421] It's incredible that the Jordan brand continues to generate that type of revenue for Nike *39 years after the initial deal was inked*. I think Nike learned something very important from its experience with Jordan: paying royalties to creators leads to *everyone winning "the game" together.*[422] It seems that Nike, regarded by many as *the* most innovative and effective marketer and cultural influencer in the world — and the top fashion brand of Gen Z[423] — is taking a "Just Do It" approach to web3.

[418] I really enjoyed Marc Baumann's Nike web3 case study, which is where I found this statistic. I highly recommend subscribing to Marc's Dematerialzd.xyz substack if you're interested in the intersection of brands and web3.
[419] In 1984, Adidas had 50% more revenue than Nike.
[420] That royalty figure is now believed to be 5%
[421] Nike FY-2023 revenues.
[422] Of course, this is all now documented in the awesome movie, AIR.
[423] https://www.businessoffashion.com/articles/retail/bof-insights-nike-and-gucci-top-gen-zs-favourite-fashion-brands/

7.4 Do brands still care about web3 after the crypto events of 2022

Yes! Below is a list of "forever brand" web3 initiatives *following* the worst of the 2022 crypto events:

- Adidas X Moncler "Explorer" NFTs, October 2023
- Adidas X Bape phygital sneaker collection, August 2023
- Dior phygital sneaker collection, July 2023
- Louis Vuitton phygital Treasure Trunk, June 2023
- Gucci X Yuga phygital pendant, April 2023
- Puma X 10KTF phygital sneaker collection, April 2023
- Balmain phygital Unicorn sneaker collection, February 2023
- Nike launches .SWOOSH web3 platform, December 2022
- Starbucks launches Odyssey, December 2022
- Prada monthly Timecapsule with NFT drops

424 425 426 427 428 429 430 431 432 433

If the above isn't proof enough, in 2023, brands filed 14x more patents than in 2020, 7x more than in 2021, and almost double the number in 2022.[434] The luxury and streetwear brands I cover in this essay have been around for decades and some, for over a century. They didn't get to where they are by being afraid or losing

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[424] https://stories.starbucks.com/stories/2022/the-starbucks-odyssey-begins/
[425] https://blog.swoosh.nike/the-swoosh-id-process-step-by-step-6add002de8c3
[426] https://www.gucci.com/us/en/st/stories/article/otherside-relics-by-gucci
[427] https://www.voguebusiness.com/technology/louis-vuitton-to-sell-euro39000-nfts
[428] https://www.voguebusiness.com/technology/what-diors-nft-sneakers-say-about-luxurys-web3-future
[429] https://news.adidas.com/originals/adidas-originals-and-bape--present-the-limited-edition-triple-white-forum-84-low-dropping-through-a-/s/9db582b4-9c11-4d21-a307-b1f0ccb9609a
[430] https://www.puma-catchup.com/puma-partners-up-with-10ktf-as-its-largest-web3-collaboration-to-date/
[431] https://www.voguebusiness.com/technology/balmain-releases-first-phygital-unicorn-sneaker-collection
[432] https://www.prada.com/us/en/pradasphere/special-projects/2022/prada-timecapsule.html
[433] This is a drawing based on my .SWOOSH Our Force 1 NFT #75648 (based on Air Force 1 – LA).
[434] https://www.dematerialzd.xyz/p/exclusive-key-insights-from-3200

conviction when things get hard. Indeed, "forever brands" have an uncanny ability to not only see, but *feel*, what's coming around the corner and then lean in regardless of current sentiment. While 2022 will undoubtedly go down as one of the worst years in crypto history, the fact that we see these "forever brands" doubling down should be as solid of an indicator as any that crypto is here to stay. In 2023, we have seen web3 brand activations shift from NFT PFP drops with potential future value to more thoughtful provision of actual utility, experiences, and added value *now* to consumers.[435]

[435] From a loyalty perspective, brands understand that NFTs are programmable while points are not and brands are now starting to explore what that means, *e.g.,* through programmable NFTs, brands can, among many other things: (i) create personalized direct to consumer experiences tailored to a particular customer's purchasing history, interests, and preferences; (ii) create experiences that are interoperable with affiliate or partner loyalty programs; (iii) create gamified loyalty experiences where customers earn NFTs that can then be sold on secondary marketplaces; and/or (iv) create fully transparent loyalty programs. See also: *Today, Loyalty is Boring …tomorrow, it's a game*

7.5 The Tokenization of RWA is Really… Twinning!

We've been waiting for the tokenization of TradFi real world assets (RWA) since about 2014, but, yet again, culture and NFTs lead while TradFi lags. Instead of tokenization of real estate, stocks, bonds, we have digital twins/phygitals! Again, I'm being a bit tongue-in-cheek[436], but I would have expected the bulk of tokenization of RWA to be in financial assets rather than sneakers, hoodies, and hats. Providing NFTs to consumers that accompany purchases of physical items allows brands to start building out their own on-chain, first party data social graphs, which they can then query, segment, and reward based on who's engaging with their brand and products most. This is the first step in bringing real world items on-chain. Objects can now exist in the digital world and IRL, linked through NFTs, which are the bridge, functioning as an immutable representation of authenticity and ownership in both realms. NFTs empower physical items with new utilities, such as unlocking token-gated benefits and unique AR experiences.[437]

Prada[438] now adds NFC/RFID chips to all its physical goods and has been linking its physical Timecapsule pieces with NFTs[439], which provide exclusive

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[436] Tokenization of TradFi RWA is most definitely happening: Franklin Templeton has tokenized money market funds and other large TradFi firms like J.P. Morgan and Goldman Sachs are working on tokenization initiatives.

[437] For example, RTFKT released a Nike AR hoodie that CloneX avatars can wear and entitles CloneX owners to claim the same physical hoodie.

[438] Prada isn't the only luxury brand creating phygitals: In June 2023, Louis Vuitton launched phygital "Treasure Trunks" called VIA, which consist of physical luggage and a soul-bound NFT that will sell for $39,000 each with a supply of "several hundred." The NFT will offer traceability and serve as a "Key" to other products and experiences - both physical and digital. Louis Vuitton says the NFTs are "soul-bound collectibles" and cannot be sold or given to another person. Holders will be able to periodically buy bespoke "Keys" that unlock access to additional products and future items acquired through "Keys" can be sold. Louis Vuitton's strategy is like Tiffany's, which is also under the LVMH umbrella, and which sold 250 owners of cryptopunks the option to purchase custom-made cryptopunk pendants for $52,000 (at the time). Also, under the LVMH umbrella is Rimowa, which partnered with RTFKT for a custom luggage collection. Louis Vuitton's previous NFT experience was "Louis the Game" a F2P experience introduced in August 2021. The game educated players on Louis Vuitton's history and rewarded players with the opportunity to win one of 30 free digital NFT based postcards. Louis Vuitton is taking a markedly different approach than Nike - which sold its Our Force Ones for $19.72. LVMH CEO Bernard Arnault has said that high-value items may be the best approach to applying web3 to LVMH brands, specifically saying *"it's not our objective to see virtual sneakers at Euro 10. We're not interested in that."* Also in June 2023, Dior launched its first web3 initiative – a physical version of Kim Jones's B33 sneaker paired with an NFC chip and authentication NFT. Says a Dior spokesperson: *"We want to guarantee authenticity throughout the product lifecycle with more than just a physical card in a shoebox*." Like the Treasure Trunks, the NFT associated with the shoes is "soulbound" and can't be transferred from the wallet that mints it. Further, there is a "digital twin" that can be worn in Snapchat and allows early, exclusive perks starting with Dior's Spring 2024 collection.

[439] https://www.voguebusiness.com/technology/prada-expands-web3-offer-with-product-linked-nft-drop-and-discord-launchcollection.

benefits and experiences and are tradeable on secondary marketplaces.[440] But, RFID technology has been around since at least the early 1980s — so why is Prada adding chips to its goods now? Simply, because linking an embedded programmable chip in a physical good to a blockchain was not possible before. Through tethering physical goods to blockchains and/or creating phygitals (*e.g.,* sneakers, jackets, purses, etc.), brands like Prada create:

- Connectivity with consumers throughout the entire lifecycle of the product, which allows brands to push infinite ongoing digital and physical experiences to the customer and stay connected to the consumer *after* they buy something, which builds ongoing loyalty to the brand.

- A permanent immutable certificate of the physical good's authenticity. Counterfeit products are an issue in the fashion industry and plague the resale market. Through web3 technology, the origin of an item, its history, and previous owners can all be tracked, which allows a product's ownership to be easily transferred and products to be traced and resold.

Adding an NFT component to luxury / streetwear physical goods provides each item with an identity akin to a passport or drivers license, where through the NFT, purchasers can see what materials were used in a product, where those materials were sourced, and what factory the item was assembled in. *In many ways, we have privacy backwards: humans should have more of it and physical goods should have less of it* when it comes to accountability and sustainability. This type of transparency has become more and more important for Gen Z and Gen Alpha. I believe we will look back at this essay in a few years and find it strange that there was ever a time when luxury / lifestyle goods weren't linked to blockchains and/or paired with NFT based counterparts.

One more point that needs to be made is that Gen Z and Gen Alpha *really* care about sustainability. It matters for the younger generation that Ethereum's switch to proof-of-stake cut its energy use by 99.988% and carbon-dioxide emissions by 99.992%, which means the network now uses less carbon dioxide than a few hundred US households do during a full year of electricity use.[441] In fact, Ethereum now consumes .001% of the energy that YouTube consumes annually. According to Deloitte & Touche's 2022 Gen Z & Millennial Survey[442], 90% of Gen Zs and millennials are making some effort to reduce their own impact on the environment and 64% of Gen Zs would pay more to purchase an environmentally sustainable product. In fact, many brands are held accountable by their customers to "sustainability scores" and certain brands and businesses have come together to

[440] https://www.voguebusiness.com/technology/episode-1-pradas-rfid-investment
[441]https://www.coindesk.com/business/2022/09/15/vitalik-buterin-says-ethereum-merge-cut-global-energy-usage-by-02-one-of-biggest-decarbonization-events-ever/
[442] https://www.deloitte.com/global/en/issues/work/genzmillennialsurvey.html

create “Impact Labels”.[443] Initiatives are already underway to use blockchain technology to track and verify a product’s sustainability metrics (*e.g.,* materials, origin, manufacturing process.[444] On a more practical level, the Ethereum changeover to proof-of-stake also allows brands to issue NFTs on Ethereum or other EVM compatible chains, where most crypto liquidity, users, and infrastructure reside as well as battle-tested security, versus being forced to choose other chains, which are lacking in all those areas, solely to appease environmental concerns. The brands are likely to have more success on liquid and secure chains like Ethereum, which means success for *all* of us in the crypto ecosystem.

[443]https://www.voguebusiness.com/sustainability/fashion-has-a-new-product-label-to-mark-sustainability-metrics

[444] https://www.todsgroup.com/en/news/tods-passport

7.6 Today, Loyalty is Boring …tomorrow, it's a game

Every time I go to a physical Sephora store and make a purchase, the sales associate marvels at the number of points I have — 8,945[445] as of the writing of this essay — and asks if I want to use some of my points. My answer is always the same, "no, not until Sephora incorporates web3 and makes loyalty *fun*." And guess what? I had to update this essay before publication because now Sephora is trying to do exactly that! In September 2023, Sephora announced that it is adding "gamified loyalty experiences" to its loyalty program (albeit not web3 enabled (for now[446])):

> *"[Our customers] couldn't have been clearer when they told us they want gaming elements included in our loyalty program to create more ways to connect with Sephora. We also know that engaging loyalty benefits, exclusive access and perks are important to Gen Z."*
>
> Emeline Berline, SVP and GM of Loyalty at Sephora[447]

Loyalty is a big market; according to a recent Oracle report, 71% of U.S. consumers are active in at least one loyalty program per month, 56% have at least one loyalty rewards program app on their phone, and 62% of consumers are willing to choose one brand over another because of its loyalty program.[448] But customer expectations for loyalty programs are changing; Gen Z and Gen Alpha are participatory generations and they want to *contribute to* and *own* the brands they support. Current boring, static, one-way loyalty programs don't cut it.

Starbucks has one of the most successful loyalty programs in existence — ~31 million members, who drove 57% of US company-operated revenue in Q2 2023.[449] Yet, Starbucks understands that to meet the next generation of consumers where they are and maintain relevancy with them, Starbucks must infuse innovation into loyalty. This doesn't mean that Starbucks needs to replace its current, well regarded loyalty program; rather, Starbucks launched a web3 based interactive loyalty layer, Odyssey, on top of its existing loyalty program. I'm part of the Odyssey beta program and the most surprising aspect of it to me is that through web3, Starbucks has also *gamified* loyalty. If you go all the way back up to my definition of a "game," it includes loyalty experiences, and now I'll explain why! In

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[445] In my defense, my daughters also make purchases through my account.
[446] Sephora is owned by LVMH afterall — see footnote 438!
[447] https://www.glossy.co/beauty/sephora-adds-gamified-experience-to-beauty-insider-loyalty-program-in-appeal-to-gen-z/
[448] https://www.oracle.com/cx/marketing/customer-loyalty/retail-marketing/?utm_source=Evolok+PROD&utm_campaign=45bb612894-enterprise-briefing-dec-30&utm_medium=email&utm_term=0_9b49635b30-45bb612894-493994022&ct=t(enterprise-briefing-dec-30)
[449] https://www.pymnts.com/earnings/2023/starbucks-us-loyalty-membership-increases-15percent-despite-watered-down-rewards/

Odyssey, users complete a variety of tasks[450] and earn "stamps" (NFTs), which users can collect in their digital wallets or which can be listed for sale on secondary NFT marketplaces. A couple of months ago, I asked my husband to go to a physical Starbucks location and buy a bag of coffee, which totally confused him because we have a Nespresso machine that uses coffee capsules. But I was playing a game, and if I bought that bag of coffee, it would be my final task toward earning a "stamp". On the date I sent my husband on my Odyssey "journey," this particular stamp had a floor price of $100 and the bag of coffee was $13. When I explained that to my husband, he left immediately and bought the bag of coffee (which we then gifted to our neighbor). As you all know, I love Pokémon Go and as someone aptly said "Odyssey is like Pokémon Go for coffee."[451] It's a loyalty *game,* it's fun, and, importantly for Starbucks, it caused me to engage with Starbucks in a very different way and to spend more money than I otherwise would have. Going forward, Starbucks has an open portal to push new experiences directly to me through my NFT stamps.

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[450] For example, completing the holiday cheer journey requires: correctly answering a series of Starbucks trivia questions; matching Starbucks holiday cups with the year released; entering a challenge to win coffee for life; buying a Starbucks gift card to give to someone else.

[451] https://www.geekwire.com/2022/i-just-earned-and-sold-my-first-starbucks-nft-how-it-works-how-much-i-made-and-what-i-learned/?utm_source=pocket_saves

7.7 Community Commerce via Collabs = Multiplayer

Finally, the ability for brands to *collaborate* is second to none in web3. We've seen this play out in web2 gaming in a very significant way. Fortnite alone has done collabs with the likes of: Marvel, the NFL, Marshmello, Stranger Things, Air Jordan, DC Comics, Star Wars, Travis Scott, Rocket League, Street Fighter, Tomb Raider, Batman, the NBA, Superplastic, Ferrari, Balenciaga, Ariana Grande, Monopoly, League of Legends, the Matrix, Lego, Cobra Kai, X-Men, Wu-Tang Clan, Indiana Jones, Among Us, WWE, and Eminem. Think about what we've seen already in the NFT space[452] — an abbreviated list includes:

Nike x RTFKT (CloneX)
The Hundreds x Bored Ape Yacht Club
Adidas x gmoney x Punks Comic x Bored Ape Yacht Club
Gucci x Superplastic
Gucci x Yuga Labs
Tiffany & Co. x Cryptopunks
Adidas x Bape
Sandbox x Alo Yoga
American Eagle x Starcatchers
Wrangler x Deadfellaz
L'Oréal Group's Shu Uemura x RTFKT
Rimowa x RTFKT
NBA x Dapper Labs

Alex Danco, who runs blockchain for Shopify, best describes the power of web3 collaborations as follows:

> *Collabs are the lifeblood of creative work; ask anyone in music, streetwear, or any kind of scene. But online, how do you organize a collab merch drop that's exclusive for a superset of people: my fans plus your fans? There's no conventional way to do this that's both exclusive and not janky. But tokengated commerce makes this so easy. Connect your wallet, access drop with any of these NFTs. Bam. I let you in, and you let me in.*

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[452] Major shoutout for Vogue Business' NFT Tracker, which can be found here: https://www.voguebusiness.com/technology/the-vogue-business-nft-tracker. I can't say enough fantastic things about Maghan McDowell and her team at Vogue Business, including Madeleine Schultz. I ended my subscriptions with the Wall Street Journal, Forbes, Fortune, and a bunch of substacks so I could subscribe to Vogue Business, which is where I get the vast majority of my brands / web3 alpha. I highly, highly recommend subscribing!

What are tokengated collabs? When The Hundreds does a collab with Deadfellaz, and you can unlock limited edition merch with an NFT from either of their collections, that's a tokengated collab. When Superplastic does a collab with Gucci that's gated to holders of a secret SUPERGUCCI NFT, that's a tokengated collab.

Here's where the magic starts to happen: I belong to my community, you belong to your community, but when we do a collab together, I can invite you in; and you can invite me in. Tokengated collabs flip exclusivity into reciprocal inclusivity. A century-old brand like Gucci gets to endorse a really hot brand like Superplastic, in a way where their fans are both inviting each other into this shared experience, and this shared community they now have together.

But for now - when we look back ten years from now at 2022 and ask, "What was really obvious and in front of our faces that whole time?" I think one answer will be that collaborative gating will be the mechanic that dramatically simplifies how brands collaborate and endorse each other, and that simplification will mean that community commerce is about to get a lot more multiplayer.[453]

That last line — "*community commerce is about to get a lot more multiplayer*" — is such an incredibly insightful statement and one that I have highlighted throughout this essay: it's a key component of the lifeblood that allows 100+ year-old brands to stay culturally relevant. One of the upcoming collaborations that I'm most excited about was announced in July 2023. RTFKT is partnering with L'Oreal Group's Shu Uemura to develop physical stickers that will be worn around both human eyes and CloneX PFP avatar eyes. The stickers are inspired by Japanese calligraphy and will contain NFC chips that when scanned with a smartphone will activate a variety of AR lenses. This is a true *multiplayer collab* consisting of the L'Oreal Group, Shu Uemura, RTFKT (owned by Nike), and RTFKT's community, which will be invited to co-create stickers for their clones. The collab is also focused on reaching a Gen Z audience, which RTFKT brings to the 114-year-old L'Oreal Group. In an article about the collab, Vogue Business writes[454]:

"In RTFKT, the 114-year-old L'Oréal stands to gain the attention of a Web3 community that is accustomed to digital enhancements and new approaches to fashion and design. And, with Shu Uemura, RTFKT is able to continue to push into new areas beyond sneakers, and reward its loyal community with more perks and opportunities to monetise their creativity."

Further Benoit Pagotto, founder of RTFKT says:

[453] https://www.notboring.co/p/tokengated-commerce
[454] https://www.voguebusiness.com/technology/would-you-wear-face-stickers-embedded-with-nfcs

"Beauty is about self-expression and identity and an area that has a lot of innovation to do. I'm very interested in how Gen Z is using filters and different beauty codes, and it is a lot more diverse than what it was for a long time. The concept of beauty with younger generations is completely different and more transformative."

Finally, Asmita Dubey, Chief Digital and Marketing Officer at L'Oreal Group recognizes RTFKT's relevance in gaming and calls the approach:

"O plus O plus O", which stands for "offline, online and on-chain" and says: "We believe the future of beauty is physical, digital and virtual, and we know there will be new codes of beauty for new audiences," Dubey says. "RTFKT is very much at this intersection of physical and digital — they are into gaming, fashion and design, digital value — and that is a common ground for both of us."

Chapter 8: But isn't Everything Old, just New Again? …and what about money transmission?

This concept of open game economies, digital fashion, and brands collaborating with games isn't new. In fact, there is a 2006 article in the Economist called "Living a Second Life"[455], which reads as if it were from 2023 if you simply swap out web2 for web3 and put Linden Dollars, Second Life's in-game currency, on crypto rails. Second Life[456] has operated an open game economy for two decades along with Linden Dollar, which can be exchanged for USD. Brands like Adidas, Coca-Cola, Warner Music, Toyota, and American Apparel have all done collaborations or set up virtual shops in Second Life. Corporations like Amazon, Cisco, and IBM have used the platform to host conferences. Harvard taught classes in Second Life, the Department of Homeland Security did biochemical terrorist attack simulations in Second Life, and Suzanne Vega hosted a concert in the virtual world[457]. Second Life has a $650 million annual GDP[458], more than 2 billion user generated assets[459], 200,000 DAUs, 70 million historical user accounts, processes more than 345 million annual transactions, and pays its creators ~$80 million annually, with the top earner making $2.5 million / year[460]. Linden Lab, the creator of Second Life, was also early to "digital ownership" and allows creators to own (albeit on Second Life's servers) the intellectual property of their creations and determine whether to allow copying, modification, or transferability. In fact, Second Life has its very own "Second Life Patent and Trademark Office" to settle IP disputes[461]. Second Life even has undercover avatar cops to help maintain a civil society.[462] Further, one of the most significant businesses within Second Life is digital fashion. In fact, House of Blueberry, a digital fashion brand that has sold

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[455] https://www.economist.com/special-report/2006/09/28/living-a-second-life

[456] Second Life was backed by an all-star roster of investors: Benchmark, Mitch Kapor, founder of Lotus, eBay founder Pierre Omidyar, and Jeff Bezos.

[457] https://www.youtube.com/watch?v=BFCpsxb6m8s ← contrary to popular belief, the Marshmello / Fortnite concert was *not* the first concert in a game!

[458] https://venturebeat.com/games/tilia-spins-out-gets-minority-investment-from-jp-morgan-to-do-metaverse-payments/

[459]https://venturebeat.com/games/the-deanbeat-will-the-metaverse-bring-the-second-coming-of-second-life/

[460] https://venturebeat.com/games/tilia-spins-out-gets-minority-investment-from-jp-morgan-to-do-metaverse-payments/

[461] Ownership of gaming and fashion NFTs (as well as corresponding physical twins) recorded as immutable records on blockchains should be sufficient proof of rights and history related to those assets. As / when this data is integrated into gaming back-ends, it will prove powerful from an anti-cheat and intellectual property standpoint. Stated differently, while the Betterverses of tomorrow may still need virtual USPTOs, adjudicating ownership disputes with respect to virtual goods that are NFT based should be easier.

[462] Side note, Second Life even has a history with bitcoin, where from 2011 - 2013 there were BTC / Linden dollar trading pairs, which provided a gateway to get from BTC to Linden dollars to fiat and/or fiat to Linden dollars to BTC.

more than 20 million digital assets across platforms such as Roblox and the Sims[463], got its start in 2011 by creating and selling digital fashion in Second Life and, by 2016, was making $1 million / year selling digital clothing in Second Life.[464]

Second Life was arguably ahead of its time and it has been plagued by problems including: technology failures (DDos attacks, updates that took the game offline for long periods of time), copyright infringement, avatars behaving (very) poorly, management departures, community revolts, economic mistakes, needing to set up a money transmitter subsidiary in order to allow legal convertibility of the Linden Dollar to USD (see below), and a steep learning curve to understand the game[465]. Also, while I refer to Second Life as a "game" due to its virtual currency and UGC elements, one of the reasons I think Second Life never achieved its full potential is that it didn't encourage users to create games within its virtual world[466]. Ironically, Roblox was founded the year after Second Life and did exactly that, growing to the $24.9 billion business that it is today (down from $77.9 billion at its peak in November 2021). I recently heard Philip Rosedale, founder of Linden Lab, speak at an event and he addressed the issue of "why didn't Second Life scale" and he also made an interesting comment on how he views "metaverse experiences" as distinct from "games."[467]

On the first point, Rosedale says that the inability for avatars to display realistic non-verbal communication is partly why metaverse experiences like Second Life, which is intended for adults, have not grown as much as one would expect given advances in technology since Second Life launched. Rosedale says that avatars need to communicate as well as humans for experiences like attending concerts, school, and business meetings to work well in virtual worlds. Rosedale suggests that the Mark Zuckerberg/Lex Friedman interview[468] is the closest he's seen to acceptable face to face communication, but even that isn't good enough for two adults who don't know each other. Rosedale believes that kids, unlike adults, don't really care about these issues; they're happy to be "blocky avatars." This is something I had not considered before listening to Rosedale's talk and it's a subset of Second Life potentially *still* being ahead of its time – 20 years after the company's founding.

On the second point, Rosedale says that games and the metaverse are two very distinct and separate experiences. In the metaverse, you're always interacting with real people who you often don't know and these real people are the only reason

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[463] https://venturebeat.com/gaming-business/house-of-blueberry-launches-roblox-fashion-collection-inspired-by-clueless/
[464] https://observer.com/2022/10/house-of-blueberry-has-been-outfitting-digital-avatars-for-a-decade/
[465] Rosedale himself said it took the average user 40 hours just to learn how to interact with Second Life
[466] Although, during the Spring of 2004, a game called Tringo took off in Second Life!
[467] https://vimeo.com/venturebeat
[468] https://www.youtube.com/watch?v=MVYrJJNdrEg

you go to a virtual space. Rosedale says games, on the other hand, are themselves so delightful and fascinating that gamers don't care who else is in the game and/or, at most, the gamer is happy to play with her IRL friends. I have the utmost respect for Rosedale and consider him a true futurist, but I mostly disagree with him here. Research shows that younger gamers are primarily motivated to game for social and competitive reasons, which implies playing solo isn't ideal.[469] Where I potentially agree with Rosedale is that research indicates older generations may enjoy gaming as more of an escape or way to unwind[470], which possibly implies solo gaming (but equally possibly does not, "escaping" and "unwinding" are often more fun with IRL and/or virtual friends). Further muddying this, 71% of gamers age 65+ say they play games to help bond with friends and family, which implies a social motivation to game. [471] In any case, I continue to view the metaverse as a component of gaming and not as something separate.

I don't think Second Life will get a second life in web3 (nor do I think its residents want that). The platform isn't culturally relevant for Gen Z and Gen Alpha, many of whom already don't want to hang out IRL with their parents, let alone with avatars their parents' age. But that's okay! Second Life has a sticky, older *community* that is extremely *loyal.* Second Life didn't become a large, publicly traded company or score a big exit, but I still think there is a tremendous amount web3 game developers can learn from Rosedale and from studying Second Life's economy.[472] For example, in the early days of Second Life, the community revolted against the monthly subscription-based model then in place and the Second Life management team consulted with economists to help them figure out what to do:

> *"what makes a country successful and helps a third-world developing country grow? It's the ability of the people who live there to build something. In order to do that, they have to have access to land because land serves as both a place to build and also as collateral."*

Hernando De Soto, the Peruvian neoliberal economist opined:

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[469] Newzoo's Generations Report: How Different Generations Engage with Games

[470] Id.

[471] https://www.fandomspot.com/us-senior-gamers-study/

[472] Other prominent folks to study and learn from include: Eyjolfur Eyjo Gudmundsson (a.k.a. Dr. Eyjo), former lead economist for CCP, creator of EVE Online; Yanis Varoufakis, former economist in residence for Valve; and Edward Castronova, author of Virtual Worlds: A First-Hand Account of Market and Society on the Cyberian Frontier. I personally also enjoy listening to Phillip Black, Game Economist, on Deconstructor of Fun and reading the essays on his site, including the insightful and very applicable: What is a Game Economist and Why Now? I recommend checking out Phillip's latest essay "How to Solve THE web3 Problem: A Staircase Tax" in which he offers an interesting solution for the problem of inflating supply in games, which is particularly challenging for web3 economies given tradeability.

"They have to be able to reap the benefits of their labor, which means that they have to have both ownership and financial reward."

Based on these discussions, Second Life decided to scrap the subscription business model and instead sell virtual land and charge usage fees for its maintenance. Second Life also elected to allow Linden Dollars to be bought and sold on the open market for fiat and to allow residents to retain the IP rights of the designs and depictions of the 3-D objects and scripts they created in Second Life. These decisions around IP rights, ownership of virtual land, and virtual currency exchangeable for fiat currency then led to an economic boom in Second Life with the creation of virtual businesses including clothing design, engineering and architecture, and entertainment.

Overall, I think it's important for folks in web3 to ask and thoughtfully answer:

- Why will brands interacting with web3, including games enhanced with web3, succeed when they were ultimately unable to when interacting with Second Life?

- Why do we believe web3 experiences will sustain and scale while Second Life was able to sustain, but not to scale?

- Does web3 technology (and modern technology more generally) solve some of the problems Second Life experienced?

While I believe that I've provided food for thought for each of these questions throughout this essay, it's up to the creators / developers in web3 to determine how and why web3 brand and game integrations will lead to mass adoption and scale where other platforms like Second Life were unable to do so.

All that said, the primary reason I wanted to cover Second Life relates to US Federal and State money transmission regulation. So long as game economies are "closed loop", meaning that in-game virtual currencies can only be used for in-game activity (*e.g.*, PokeCoins, Vbucks, Rbux) and there is no ability to "cash out," Financial Crimes Enforcement Network (FinCEN), Money Service Business (MSB), and state money transmitter license (MTL) rules aren't triggered. However, generally, once a game platform allows users to directly "cash out" or convert from an in-game virtual currency to fiat *or* for an asset that is a "convertible virtual currency" like a stablecoin or bitcoin, these rules may be implicated. I won't bore everyone with all the problems with defining "convertible virtual currency," but there are many and I strongly advise talking with the lawyers I've dropped in the

footnotes if this is an issue you may need to grapple with.[473] Do note that while these rules clearly apply to cashing out fungible in-game assets into fiat and certain cryptocurrencies, different questions arise with respect to cashing out NFTs. Let's consider physical artwork — even though it can be exchanged for cash, it doesn't somehow turn the artwork itself into money. That's the line we're trying to apply to NFTs, but of course this gets blurry if you have a series of 10,000 NFTs distinct by serial number only that are trading at the same value. Kind of sounds like US dollars, right? Every US dollar has a unique serial number but trades at the same value and is treated as fungible. Second Life, which allows players to cash out Linden Dollars directly for a variety of different fiat currencies solved for these issues by setting up a subsidiary, Tilia Pay[474], which is a FinCEN registered MSB and has all its MTLs in the United States. In a model like Second Life / Tilia Pay, Tilia effectively conducts all regulated activity for Second Life's gaming platform, including compliance services like KYC / AML and monitoring in-game transactions for fraud and money laundering.

The foregoing is critical for web3 game developers to understand for at least two reasons:

- In an ideal gaming experience, *you don't want gamers to have to leave the gaming experience to cash out*, *e.g.,* force a gamer to move in-game currency to Metamask, send that in-game currency to Coinbase, and then convert to fiat or have to create a liquidity pool for that in-game asset on Uniswap, convert to USDC, and then cash out to fiat at Coinbase.

- Obtaining and maintaining money transmitter licenses and the New York BitLicense is cumbersome, time consuming and expensive.[475] For these reasons, web3 game developers who would like to enable conversion of in-game fungible assets to fiat will likely want to work with a company that has the appropriate regulatory licenses (*e.g.,* Tilia or Provenance Technologies, which was incubated by Forte).

[473] Dave Teitelbaum at Sidley Austin and Lewis Cohen and Angela Angelovska-Wilson at DLx Law are the best in the business with these issues and are substantively deep when it comes to the intersection of money transmission legal matters and web3. If you want to legal nerd out, you can also read a letter that I wrote to FinCEN in January 2021, which addresses some of these issues.
[474] Tilia recently spun out of Second Life and took strategic investments from JP Morgan and Dunamu, which owns South Korea's largest crypto exchange, Upbit.
[475] Aston Waldman, CFO of Linden Lab, said it took Tilia over three years and many millions of dollars to obtain the state licenses. Similarly, Forte CFO, Bela Pandya said it took a company that Forte incubated, Provenance Technologies, three years to obtain its MTLs as well as a NY BitLicense.

Chapter 9: It's all about the (Digital) Benjamins for Kids …and we have an "old people don't understand" problem

"Mom, all I want for my birthday is GTA dollars, V-bucks, or Rbux. Please tell Grandma to stop sending me that paper 20 money; I can't get it into my games."

My son, Mack, when he was 11 years old

[476]

That was my son Mack a few years ago. He's 17 now and still has no use for "paper 20 money." I think the older generation often misses that nearly all Gen Zs and Gen Alphas are already digital native and accustomed to virtual currency. In fact, most of them were introduced to virtual currency in games before they first encountered fiat money.

According to Deloitte & Touche, gaming is the favorite media and entertainment activity for Gen Z (followed by watching TV and movies, listening to music, browsing the internet, and engaging on social platforms) and 87% of Gen Zs are playing video games on smartphones, gaming consoles, and computers at least weekly if not daily.[477]

Also, as noted above, 75% of kids ages 9 - 12, all Gen Alphas, in the US, UK, Canada, New Zealand, and Australia use Roblox[478], where there are 70.2 million active DAUs[479]. It is critically important to understand that what is happening within games for Gen Z and Gen Alpha is "real"; it may not be happening in the

[476] This drawing is based on my Tigerbob NFT #244. This NFT is from the Tigerbob NFT Genesis Collection, a collection of 1,000 handmade pixel tiger heads created by Gossamer Rozen, a legendary tattoo artist. Gossamer began as a maker with an interest in game design, narrative illustration, comic books, and children's book illustrations. Their body of work explores a variety of media including tattoos, woodcarving, textile art, soft sculpture, digital media, and fashion design.
[477] https://fortune.com/2021/04/19/gen-z-gamers-video-games-media-entertainment-outlook-changes-future/
[478] https://conversationswithtyler.com/episodes/matthew-ball/
[479] https://ir.roblox.com/news/news-details/2023/Roblox-Reports-Third-Quarter-2023-Financial-Results/default.aspx.

physical world, but it is very "real" to them. The concept of IRL versus digital no longer applies. Craig Donato, Chief Business Officer at Roblox:

> *"Kids that grew up with interactive online gaming, based on our research, view reality differently than we do. I think of myself as a colonist of the metaverse, one of the old people. We see digital and physical reality as distinct from each other, and we see digital as less than physical. But this younger generation sees them as not only equal but as not separate. They live their lives both at the same time. They view it differently. They naturally socialize. They understand how to get around, and understand the social norms. They just see it differently."*

There is an excellent George Orwell quote: "To see what is in front of one's nose needs a constant struggle." I believe we are undergoing a cultural shift unlike any other in history and because of the technology gap between the younger generation and the older generation, many folks don't see or understand what is happening right in front of them. Gen Z and Gen Alpha are growing up faster than most generations before them. Due to the pandemic, they were cut off from critical social in-person interaction, increasing their dependence on technology — often games, which became their primary place for social engagement. Further, many Gen Zs witnessed the challenges their parents went through during the Great Financial Crisis and have thus understood from an early age that the way to wealth is through working for themselves and becoming *owners.* Because of technology, corporate America must compete with YouTube, Twitch, Roblox, Fortnite, Minecraft, Discord, and web3 – all places where Gen Z and Gen Alpha can be their own bosses, make their own schedules, and be owners.

Gen Zs - born between 1997 - 2012 are currently 25% of the global population[480] and make up 20% of the overall US population[481]. In the United States, Gen Z has $360 billion of purchasing power (as of 2021)).[482] Nearly 1/2 of Gen Z uses TikTok and Instagram for search instead of Google[483]. Gen Alphas are those born after 2012. Some estimates say that by 2025, there will be more than 2 billion Gen Alphas and they will be the largest generation ever.[484] 385,000 Gen Alphas are born each day, *fully digital native*[485] — Gen Alphas are *younger* than the iPhone. Many Gen Alphas will never use a landline telephone or a physical wallet,

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[480] https://www.oliverwymanforum.com/global-consumer-sentiment/a-gen-z.html#:~:text=We%27re%20talking%2C%20of%20course,of%20the%20workforce%20by%202025.
[481] https://www.statista.com/statistics/797321/us-population-by-generation/
[482] https://genzplanet.com/blog/gen-z-spending-power-reached-360-billion-just-imagine-the-opportunities/
[483] https://www.nytimes.com/2022/09/16/technology/gen-z-tiktok-search-engine.html
[484] https://www.britannica.com/topic/Generation-Alpha & https://mccrindle.com.au/article/topic/generation-alpha/generation-alpha-defined/#:~:text=More%20than%202.5%20million%20are,those%20born%20from%202010%2D2024.
[485] Subject to Internet access.

set an analog alarm clock, put film in a camera, or use a paper map. Gen Z and Gen Alpha are also set to inherit significant wealth: Baby Boomers control 70% of the United States' disposable income and will pass down $30 trillion over the next 20 years.[486]

As noted previously, Gen Z and Gen Alpha have new expectations based on their experiences with technology. They have been raised on responsive technologies like TikTok, Minecraft, and Roblox — they are used to being co-creators — they don't just consume. This is a cultural shift, which means that to reach Gen Z and Gen Alpha, brands need to make these generations creators, owners, and active participants. Indeed, because of early engagement in games, these generations are used to creating their own avatars and expect customization in all their digital interactions. 94% of Gen Z consumers who are active on Roblox say they have done customization to their avatars and over half say they've customized "a lot."[487] Simply, these two generations are unique.

Gen Alpha is the first generation to be fully born in the 21st century and live in a fully digitized economy. In the U.S. Department of Treasury report, "Crypto-Assets: Implications for Consumers, Investors, and Businesses," which was released on September 16, 2022, the following was stated:

> *"Recent studies have shown that children are being exposed to crypto-assets at an early age and are often more familiar with them than their parents. One such study noted that 57% of kids surveyed were familiar with crypto-assets (compared to 47% of their parents) and if given $100, 57% of kids said they would invest their money in crypto-assets (compared to 38% who said they would invest in stocks). Some high schools have begun to incorporate study of crypto-assets into their financial literacy efforts and there are crypto-focused kids camps that provide children with a laptop, cellphone, and a digital wallet."*

The report, which used statistics pulled from, a T. Rowe Price April 5, 2022 release called "Families' Excitement for Cryptocurrency Brings Risks and Opportunities," also states:

> *40% of kids agree with the statement "cryptocurrency is the future of investing." Among kids who are familiar with cryptocurrency, 51% agree with the statement.*[488]

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[486] https://www.forbes.com/sites/markhall/2019/11/11/the-greatest-wealth-transfer-in-history-whats-happening-and-what-are-the-implications/?sh=645151d74090

[487] https://blog.roblox.com/wp-content/uploads/2022/10/FINAL_2022-Metaverse-Fashion-Trends-report_Roblox-x-Parsons.pdf

[488] https://www.troweprice.com/content/dam/trowecorp/Press%20Release%20-%20PKM22_release_FINAL%2004052022.pdf

Yay kids! However, that's not the take-away that Treasury and T. Rowe Price want us to have. No, they are warning us that kid / crypto penetration is dangerous. What they seem to fail to understand is that just like "real" and "digital" are blurred for kids, the same holds true for "virtual money" (*e.g.,* Robux and Vbucks) and cryptocurrency and "virtual goods" (*e.g.,* skins and emotes) and NFTs. The only surprising thing about the T. Rowe Price study is how many kids *aren't* yet familiar with cryptocurrency.

At this point, I think it makes sense to take a quick detour from gaming and consider why some of our U.S. regulators and policymakers may not understand the cultural shift that has already occurred and the inevitable nature of web3 technology. I think it's in large part because of the significant age and diversity gaps that exist between some US policymakers and regulators, on the one hand, and the digital native generation that is building and using this technology, on the other.

- At the beginning of the current 118th Congress, the average age of members of the House was 57.9 years and of the Senate was 65.3 years.[489]

- These policymakers also stick around for a long time: the average length of service for members of the House was 8.9 years (4.5 House terms) and for Senators was 11.0 years (1.8 Senate terms).

- There isn't much diversity: out of a total of 540 voting and nonvoting members of Congress, only 153 are women[490]; 60 are African American; 54 are Hispanic or Latino; 18 are Asian American or Pacific Islander American; and 5 are Native American[491].

- Fewer than 5% of House members cited blue-collar or service jobs in their biographies and ~95% held bachelor's degrees (compared to ⅔ of Americans 25 and older who do not)[492].

- In terms of this generational divide, SEC Chairman Gary Gensler and Senator Elizabeth Warren, both of whom have powerful voices in the future of web3 technology, are 66 and 74 years old, respectively; Janet Yellen is 77 years old; and Jerome Powell is 70 years old.

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[489] https://www.pewresearch.org/short-reads/2023/01/30/house-gets-younger-senate-gets-older-a-look-at-the-age-and-generation-of-lawmakers-in-the-118th-congress/#:~:text=%E2%80%93%20just%20turned%2026%20in%20January,members%20in%20the%20prior%20Congress.

[490] https://www.pewresearch.org/short-reads/2023/01/03/118th-congress-has-a-record-number-of-women/

[491] https://thehill.com/changing-america/respect/diversity-inclusion/3805580-118th-congress-is-most-racially-diverse-to-date-research/

[492] https://www.nytimes.com/interactive/2019/01/26/opinion/sunday/paths-to-congress.html

Contrast the above with:

- More than half of the United States' total population are now members of the millennial generation or younger.[493]

- Millennials and younger generations are more racially diverse than those that preceded them, with nearly ½ identifying as a racial or ethnic minority.[494]

- At peak poverty rates in 2011 and 2012, almost 1 in 4 Gen Zs lived in poverty and in 2012, when Gen Zs were ages 0 – 15, 46% lived in low income families[495].

- Since Gen Alpha started in 2013, a greater percentage of this generation has lived in low-income families *than all other generations*.[496]

Projections show that by 2030, millennials and their juniors will make up more than half of not just the population, *but of all eligible voters*.[497] Gen Z will make up 13% of eligible voters in 2024[498] and 35% in 2036.[499] As touched on above, it's also important to keep in mind that older Gen Zs have experienced both the 2008 Great Financial Crisis and the impacts of the pandemic. There is a growing sense that the older policymakers and regulators have favored capital over people and specifically people who have not yet been able to accumulate assets.

The millennial generation and below has borne the brunt of the downsides of our existing financial system. Additionally, while the Biden administration may be progressive, the older participants in the democratic party may not have the lived experience to really put themselves in the younger generation's shoes (*e.g.,* diversity, socioeconomic status, digitally native, and losing an entire IRL social network as pre-teens, teens, and young adults during the pandemic) and of course, where you sit is generally where you stand on matters such as this.

Remember the jurisdictional gaming stats I referenced earlier:

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[493] https://www.brookings.edu/articles/now-more-than-half-of-americans-are-millennials-or-younger/
[494] Id.
[495] https://www.aecf.org/blog/generation-z-statistics: low-income families mean income less than 200% of the federal poverty level.
In 2021, 200% of the federal poverty level for a family of two adults and two children was $54,958.
[496] https://www.aecf.org/blog/generation-z-statistics#:~:text=Poverty%20rates%20for%20Gen%20Alpha,1%20million%20kids)%20in%202021.
[497] https://www.brookings.edu/articles/now-more-than-half-of-americans-are-millennials-or-younger/
[498] https://www.theatlantic.com/ideas/archive/2023/06/gen-z-millennials-vote-republican/674328/#
[499] https://www.washingtonpost.com/opinions/2023/07/25/voters-progressive-trump-harvard-youth-poll-gop/

- 53% of gamers are Asia-Pacific
- 17% Middle East & Africa
- 13% Europe
- 10% Latin America
- 7% North America

These figures are important because it's possible that US dollar-backed stablecoins become a form of in-game currency in web3 games. As gaming business models shift more and more towards monetization enhanced by web3, US dollar-backed stablecoins have the potential to reach 3.27 billion non-US people through web3 gaming alone.[500]

In my opinion, one of the most significant upside opportunities in crypto is building a more inclusive financial system. Coinbase recently conducted a survey[501] and found that 80% of Americans think the global financial system unfairly favors powerful interests and that 67% of Americans agree that the financial system needs major changes or a complete overhaul. 76% of the 50 million Americans who own crypto (20% of the population) believe cryptocurrency and blockchain are the future. Regardless of crypto ownership, 54% of Gen Z adults and 55% of Millennials agree that cryptocurrency and blockchain are the future.

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I'd like to leave those who were determined enough to make it through this entire essay with one concluding thought to display the power and beauty of games. I visited my mother-in-law at the end of October 2023 in Los Angeles, and she was very sick with late-stage cancer. When you're running out of time with someone you love so much, even though everything feels awful, you try to find some joy. So, do you know what we did? We put an unnecessary obstacle called Scrabble in front of us, which we all voluntarily tackled. For the next hour, we had so much fun. And while you'd assume the last thing a family would want to use precious, glaringly finite hours on is an escape, that's exactly what we did. And that's the power of a game. My mother-in-law passed away on November 4, 2023, and my final memory with her is the tremendous amount of happiness that a game gave us. I have the scoresheet from that game of Scrabble and I'm considering turning it into an NFT so the memory of the delight we had playing a game with her endures in the digital world for generations, and so that my kids' grandkids get to savor this meaningful moment in their family's lives.

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[500] J. Austin Campbell testified on April 19, 2023 on stablecoins' role in payments and the need for legislation in front of the Subcommittee on Digital Assets and I highly recommend reading the first six pages of his testimony to understand why US dollar backed stablecoins are so important.
[501] https://www.coinbase.com/blog/new-national-survey-of-2-000-american-adults-suggests-20-of-americans-own

Afterword by Peter Kieltyka, CEO and Co-Founder of Horizon Blockchain Games

Unlocking web3 gaming

Web3 presents a revolutionary layer atop existing Internet protocols, brimming with untapped potential. But what is the catalyst that will harness its true potential in the realm of video games? Unquestionably, it lies in the ability of developers and creatives to build delightful experiences for gamers.

Historically, transformative technologies such as computing, graphics cards, game engines, modems, the Internet, web browsers, cloud computing, social networks, mobile devices, and app stores have found their true essence and widespread application only when ingenious developers and creators have stepped in. Developers, armed with creativity and opportunities for experimentation, have consistently had their watershed moments, crafting solutions that not only tapped into the latent power of these platforms but also transformed entire industries. And many of these technologies took off or were driven forward by developers building games and attending to the wants of gamers.

Consider this: Computing was once the realm of enterprises and hobbyists, until visionaries like Steve Jobs imagined a world where every household boasted a PC. Graphics cards, originally designed for text rendering, paved the way for immersive video games. Game engines, in turn, revolutionized entertainment. Modems then bridged information exchange in the digital realm, while the Internet globalized and democratized data access. Web browsers provided a unified and instant medium to explore and publish data across disparate servers. Social networks tethered our lives and passions. Mobile devices empowered us with pocket-sized computing, and app stores opened avenues for developers to amplify the reach and functionality of these devices. Now, web3 stands poised to breathe life into digitally native goods, transform networks into economies, and open paths for collaborations and design that were once blocked by technology.

Video games, for years, have merged reality with the digital realm, creating worlds so captivating that billions have found solace and escape within their confines. That is the power of games.

Envisioning the role of web3 in video gaming reveals a spectrum of possibilities. It starts with foundational elements: an open format for virtual items owned by gamers and a shared public infrastructure where all virtual items coexist. This is not merely an addition; it’s a fundamental evolution of the DNA in virtual goods found in every video game. The roadmap to truly leveraging web3's potential in gaming will be charted through continual creativity, experimentation, innovation, and discovery by developers and creators of all kinds.

To unlock web3 gaming is to unblock the obstacles of creators and accelerate their ability to experiment, leading to a meaningful breakthrough for both game studios and players.

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Glossary

AMM: *Automated Market Maker* is a type of decentralized exchange (DEX) that uses algorithms to determine the prices of assets and facilitate trades. AMMs use liquidity pools, which are made up of tokens that are deposited by users. When a user wants to buy or sell an asset, the AMM algorithm will calculate the price based on the ratio of tokens in the liquidity pool. The trader will then be able to buy or sell the asset at that price. Example: Uniswap.

Android Operating System: Android is a mobile operating system based on a modified version of the Linux kernel and other open-source software, designed primarily for touchscreen mobile devices such as smartphones and tablets. Android is developed by a consortium of developers known as the Open Handset Alliance, though its most widely used version is primarily developed by Google. It was unveiled in November 2007, with the first commercial Android device, the HTC Dream, being launched in September 2008. Android has been the best-selling operating system worldwide on smartphones since 2011 and on tablets since 2013.

APECoin: APECoin is an ERC-20 governance and utility token within the Bored Ape Yacht Club / Yuga Labs ecosystem.

API: *Application Programming Interface* is a set of definitions and protocols for building and integrating application software. APIs specify how software components should interact, and they are used to connect different software systems.

Apple App Store: The Apple App Store is an app marketplace developed and maintained by Apple Inc., for mobile apps on its iOS and iPadOS operating systems. The store allows users to browse and download approved apps developed within Apple's iOS SDK. The App Store was launched on July 10, 2008, with the release of the iPhone 3G.

Apps on the App Store are subject to a number of requirements, including:

- They must be compatible with the iOS or iPadOS operating system.
- They must be submitted through Apple's App Review process.
- They must comply with Apple's App Store Review Guidelines.

Apps on the App Store are categorized into a variety of genres, including games, productivity, social networking, and entertainment. Users can search for apps by keyword or browse by category.

AR: *Augmented Reality* is a technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view. AR applications can overlay digital information on the physical world in real time. AR

is different from virtual reality (VR), which creates a completely artificial environment that users can interact with. In AR, the real world is still visible, and users can interact with both the real and virtual worlds. AR can be used to create games that are more immersive and engaging. For example, an AR game could allow players to battle in a virtual world that is overlaid on the real world. Pokémon Go is one of the most popular AR games.

ARPU: *Average Revenue Per User* is a metric used to measure the average amount of revenue that a company generates from each of its users. ARPU is calculated by dividing the total revenue by the number of active users.

ATT: *App Tracking Transparency* is a privacy framework introduced by Apple in iOS 14.5 and iPadOS 14.5. It requires apps to ask users for permission before they can track them across other companies' apps and websites. ATT works by giving users a choice about whether they want to be tracked by apps. When an app tries to track a user, the app will show a pop-up asking for the user's permission. The user can then choose to allow or deny tracking. If the user allows tracking, the app will be able to collect the user's Identifier for Advertisers (IDFA). The IDFA is a unique identifier that is assigned to each Apple device. It can be used to track users across different apps and websites. If the user denies tracking, the app will not be able to collect the user's IDFA and will not be able to track them across different apps and websites.

Axie Infinity: Axie Infinity is a blockchain-based game that allows players to collect, breed, and battle digital pets called Axies. The game is built on the Ethereum blockchain and uses the Smooth Love Potion (SLP) token as its in-game currency. Players can earn SLP by playing the game, which can then be used to breed new Axies or traded for other cryptocurrencies.

AXS: Axie Infinity Shards (AXS) are the governance tokens of the Axie Infinity game. They are used to vote on decisions about the future of the game, such as new features and changes to the economy. AXS tokens can also be used to breed Axies, participate in staking, and access exclusive content.

Matthew Ball: Matthew Ball is one of my favorite authors. Ball is the CEO of Epyllion, a diversified holding company that makes angel investments, provides advisory services, and produces television, films, and video games. Ball is also a Venture Partner at Makers Fund, Senior Advisor to KKR, Senior Advisor to McKinsey & Company, and sits on the board of numerous startups. I have read and re-read all of his essays and his excellent book, The Metaverse, multiple times. I have learned a lot from reading Ball's work and strongly encourage folks to read every single piece of content he puts out.

BAYC: Bored Ape Yacht Club (BAYC) is a collection of 10,000 Bored Ape NFTs—unique digital collectibles living on the Ethereum blockchain. The apes are generated from a variety of traits, including background, fur, clothing, and accessories. They are all unique and no two are alike. BAYC was created by Yuga Labs. The project was launched in April 2021 and quickly became one of the most popular NFT collections in the world.

BTC: Bitcoin. Please read the whitepaper! It's only eight pages long and is the foundation upon which all crypto stands.

CAC: *Customer Acquisition Cost* is the amount of money a company spends to acquire a new customer. It is calculated by dividing the total cost of acquiring customers by the number of new customers acquired. CAC is an important metric for businesses because it helps them to understand how much they are spending to bring in new customers. This information can be used to make decisions about marketing, pricing, and product development.

CCP Games: CCP Games is an Icelandic video game developer and publisher based in Reykjavík. It's best known for developing the massively multiplayer online role-playing game (MMORPG), EVE Online, which was released in 2003.
CCP Games was founded in 1997 and the company's name is an abbreviation of "Computer Control Productions." In September 2018, CCP Games was acquired by South Korean video game publisher Pearl Abyss for $425 million.

CFTC: *Commodity Futures Trading Commission* is an independent agency of the United States government that regulates the commodity derivatives markets – futures, options, and swaps. The CFTC was established in 1974.

CloneX: CloneX is a collection of 20,000 3D avatar NFTs created by RTFKT, an "undefined collective" that was co-founded by Benoit Pagotto, Chris Le, and Steven Vasiliev in January 2020. Each CloneX is unique and has its own DNA type, which determines its appearance.

CMT Digital: CMT Digital was founded by Colleen Sullivan, Scott Casto, and Jan-Dirk Lueders in 2013. CMT Digital is a subsidiary of the CMT Group, which was founded by Casto and Lueders in 1997. Since its inception, the CMT Group has incubated and operated proprietary businesses and traded in commodities and equities markets in the United States, Europe, South America, Asia, and Australia.

CS:GO: *Counter-Strike: Global Offensive* is a multiplayer first-person shooter developed by Valve and Hidden Path Entertainment. CS:GO was released in 2012.

Mihaly Csikszentmihalyi: *The Father of Flow*. A Hungarian-American psychologist and a professor of psychology and management at Claremont Graduate

University. He was best known for his work on the concept of flow, a state of complete absorption in an activity. Csikszentmihalyi's research focused on the psychology of happiness and optimal experience. He developed the concept of flow, which he defined as "a state in which people are so involved in an activity that nothing else seems to matter; the experience is so enjoyable that people will continue to do it even at great cost, for the sheer sake of doing it."

Dapp: *Decentralized Application.* A dapp is an application that runs on a blockchain network instead of on a centralized server. This means that dapps are not controlled by any one entity. Dapps are typically built using smart contracts. Dapps can be used for DeFi, NFTs, gaming, and social media and include Uniswap and Aave.

Dapper Labs: Dapper Labs is a Vancouver-based blockchain company that makes games and developed the Flow blockchain. Dapper is best known for CrpytoKitties and NBA Top Shot. Dapper's top-line sales (packs + 5% of marketplace + wallet fees) over the past three years: 2020: $5 million, 2021: $167 million, and 2022: $135 million.

DAO: *Decentralized Autonomous Organization* is a is a type of organization that is run by code and not by people. It is a community-owned and -operated entity that is governed by a set of rules that are written into smart contracts on a blockchain. DAOs are often used to manage collective assets, such as funds or real estate. They can also be used to coordinate the development of projects or to provide services.

DAU: *Daily Active User* is a metric used to measure the number of unique users who log in to a website or app on a daily basis.

DeFi: *Decentralized Finance* is a financial system that does not rely on central financial intermediaries such as banks or exchanges. Instead, it uses blockchain technology to enable peer-to-peer transactions. DeFi applications allow users to lend, borrow, trade, and earn interest on their cryptocurrencies without the need for a third party. They also offer a variety of other financial services, such as insurance and derivatives. DeFi is still in its early stages of development, but it has the potential to revolutionize the financial system. It could make financial services more accessible and affordable, and it could also reduce the risk of fraud and corruption.

Diablo III Auction House: The Diablo III auction house was a feature in the popular action role-playing game Diablo III. It allowed players to buy and sell items with other players using real money. The auction house was introduced in 2012, shortly after the release of Diablo III. It was met with mixed reactions from players. Some players praised the auction house for making it easier to find and purchase items, while others criticized it for devaluing the game's loot system.

In 2014, Blizzard Entertainment, the developer of Diablo III, announced that it would be shutting down the auction house. The company cited several reasons for the decision, including concerns about real-money trading and the negative impact it was having on the game's economy.

DMarket: DMarket is a marketplace to trade virtual items and esports digital assets, primarily CS:GO skins. DMarket was acquired by blockchain game developer, Mythical Labs in January 2023. All DMarket trades are recorded on the Mythical Chain, an EVM blockchain developed by Mythical Labs.

Dookey Dash: Was a skill-based, endless runner game developed by Yuga Labs that was open to 26,000 Sewer Pass NFT holders to play from January 19, 2023 – February 8, 2023.

Epic Games: Epic Games is an American video game and software developer and publisher based in Cary, North Carolina. It was founded in 1991 by Tim Sweeney. Epic Games develops Unreal Engine, which powers Epic's internally developed game, Fortnite.

ETH: *Ethereum*. Read the Ethereum whitepaper too! It was originally published by Ethereum's founder, Vitalik Buterin, in 2014.

EVE Online: EVE Online is a massively multiplayer online role-playing game (MMORPG) set in a science fiction universe. It is developed and published by CCP Games. The game was released in 2003 and has since become one of the most popular MMORPGs in the world.

EVM: *Ethereum Virtual Machine* is a Turing-complete virtual machine that runs on every Ethereum node. It is responsible for executing smart contracts, which are programs that run on the Ethereum blockchain.

FedNow: FedNow is a new instant payment system being developed by the Federal Reserve. It is designed to provide faster and more efficient payments than the current system, which can take several days to settle. FedNow payments, unlike blockchain based payments, are not programmable.

FinCEN: *Financial Crimes Enforcement Network* is a bureau within the United States Department of the Treasury that is responsible for enforcing financial regulations designed to combat money laundering, terrorist financing, and other financial crimes.

Fingerprinting: Device fingerprinting is a technique used to identify a device, such as a mobile phone, by collecting and analyzing its unique characteristics.

These characteristics can include the device's IP address, hardware information, software configuration, and usage patterns.

Floor Price: Floor Price is the lowest price for an NFT collection on the secondary market.

Fortnite: Fortnite is a free-to-play battle royale game developed by Epic Games. It was released in 2017 and has since become one of the most popular games in the world.

F2P: *Free to Play* is a business model in which a video game is available to play for free, but players can purchase additional items or features, such as virtual currency and virtual items, to enhance their experience. F2P games allow players to try out a game without having to commit any money.

FPS: *First Person Shooter* is a video game genre in which the player experiences the game world from the perspective of the character they control. The player typically views the game world through the eyes of the character and controls the character's actions by moving a mouse or joystick.

GAID: Google Advertising ID. It is a unique identifier assigned to each Android device by Google Play Services. GAIDs are used by advertisers to track user behavior across apps and websites.

GameFi: GameFi is a portmanteau of "game" and "finance".

GDC: The *Game Developers Conference* is an annual conference for game developers. It is held in San Francisco, California, and is one of the largest and most prestigious game development conferences in the world.

Gen Alpha: *Generation Alpha* is the demographic cohort succeeding Generation Z. Researchers and popular media use the mid- to late-2010s as starting birth years and the early 2020s as ending birth years. Gen Alpha is the first generation to be born entirely in the 21st century and the first to grow up with smartphones and tablets.

Gen Z: *Generation Z* is the demographic cohort succeeding Millennials and preceding Generation Alpha. Researchers and popular media use the mid- to late-1990s as starting birth years and the early 2010s as ending birth years.
Gen Z the most diverse generation in history, with people of color making up most of the population in many countries.

GFC: The *Great Financial Crisis* was a severe worldwide economic crisis that took place between 2007 and 2009. The GFC had a significant impact on the global

economy. It led to the loss of millions of jobs, and it caused a decline in economic growth. The GFC also led to several reforms in the financial industry, in an effort to prevent a similar crisis from happening again. The GFC resulted in, among other things, loss of jobs, decline in economic growth, and an increase in government debt.

GMV: *Gross Merchandise Value* is the total value of goods sold through a marketplace or by an eCommerce startup. It is calculated by adding up the total price of all items sold.

Golden Key: The prize for earning the highest score in Yuga Labs' game Dookey Dash was a one-of-one NFT called the Golden Key. Kyle Jackson, a.k.a. Mongraal sold his Golden Key for 1,000 ETH (~$1.6 million) in February 2023.

GRAC: *South Korea's Game Rating and Administrative Committee* is a governmental organization in South Korea that is responsible for rating video games. The GRAC assigns age ratings to video games based on their content. The GRAC's ratings are required for all video games that are sold or distributed in South Korea.

GTA*: Grand Theft Auto* is an action-adventure video game series created by David Jones and Mike Dailly. It is developed by Rockstar North (formerly DMA Design) and published by Rockstar Games. The series is set in open world environments that players can explore freely. The first game in the series, Grand Theft Auto, was released in 1997. The virtual currency in GTA is GTA$ or GTA money. It is used to purchase a variety of items in the game, such as vehicles, weapons, properties, and clothing. GTA$ can be earned by completing missions, activities, and races in the game, or it can be purchased with fiat money through the in-game store.

GTM: *go-to-market* strategy is a plan for how a business will introduce its product or service to the market. It includes the marketing, sales, and distribution strategies that will be used to reach the target audience and generate sales.

Gyarados: Gyarados is a very powerful Pokémon and is known for its destructive nature. It is said that Gyarados appears whenever there is world conflict, burning down any place it travels through. Once it appears, it goes on a rampage. It remains enraged until it demolishes everything around it. Despite its destructive nature, Gyarados can be loyal and obedient to its Trainer if it is properly trained.

IAP: *In App Purchases* allow users to buy consumable items, non-consumable items, and subscriptions within an app. These purchases are made through the relevant app store or another payment system, using real money (as opposed to in-app currency or rewards).With most apps now free to download, app owners rely on in-app purchases as a key revenue stream.

IDFA: *Identifier for Advertisers* is a unique identifier assigned to each Apple device by Apple. IDFAs are used by advertisers to track user behavior across apps and websites.

iOS: Apple's operating system is a mobile operating system developed by Apple exclusively for its hardware. It is the world's second-most popular mobile operating system after Android. iOS is a closed-source operating system, which means that its source code is not available to the public.

IP: *Intellectual Property*, which generally refers to copywrites, trademarks, and patents in gaming, *e.g.,* characters, level design, monsters, guns.

IRL: *In Real Life* (as opposed to virtual).

Konvoy Ventures: Is thesis driven venture capital firm founded by brothers Josh and Jason Chapman and Jackson Vaughan that focuses on investing in the platforms and technologies at the frontier of gaming. I highly recommend subscribing to Konvoy's weekly newsletter.

Linden Lab: Linden Lab is an American technology company that created and operates Second Life, a virtual world. It was founded in 1999 by Philip Rosedale and is headquartered in San Francisco, California. Linden Lab also founded Tilia, a registered money services business and licensed money transmitter that powers virtual economies.

LFG: *Lets Fuc*ing Go!*

LTV: *Lifetime Value* is a measure of the total revenue or profit a customer is expected to generate over their relationship with a business. It is calculated by taking the average customer value and multiplying it by the average customer lifespan (LTV = (Average Customer Value) * (Average Customer Lifespan)). LTV is a valuable metric for businesses because it can help them to understand how much they can spend to acquire and retain customers.

Magikarp: Magikarp is a fish Pokémon that is known for its weak and pathetic appearance. It is a small, orange fish with large, red fins and whiskers. It has a weak body and can only splash around. However, when it evolves into Gyarados, it becomes a powerful dragon-like Pokémon.

March Madness: March Madness is a single-elimination tournament that is played by 68 teams from the National Collegiate Athletic Association (NCAA) Division I men's basketball conference. The tournament is named after the month in which it is played, March. The tournament is held every year and is one of the most popular sporting events in the United States. The championship game is held

on the first Monday in April and is one of the most watched sporting events of the year.

MAU: *Monthly Active User* is a metric used to measure the number of unique users who have logged into a website or app within a given month. MAUs are a valuable metric for businesses because they can help to understand the level of engagement with their products or services. Businesses can use MAUs to track their growth over time and to compare their performance to their competitors. There are a few different ways to calculate MAUs.

Jane McGonigal: One of my favorite authors, Jane McGonigal, has a PhD from the University of California at Berkeley in performance studies and is the Director of Games Research & Development at the Institute for the Future and currently teaches a course at Stanford called "How to Think Like a Futurist." McGonigal is the author of Reality is Broken: Why Games Make Us Better and How They Can Change the World, SuperBetter: The Power of Living Gamefully, and Imaginable: How to See the Future Coming and Feed Ready for Anything – Even Things That Seem Impossible Today. McGonigal also created the game SuperBetter, initially to help her heal from a concussion, but which has now been downloaded by over 1 million people to help them overcome obstacles in their own lives.

MMO: *Massively Multiplayer Online* is a genre of video games that allows many players to interact with each other in a shared virtual world. MMOs typically feature persistent worlds, meaning that the game world continues to exist even when players are not logged in.

MMORPG: *Massively Multiplayer Online Role-Playing Game*. It is a genre of video game in which many players interact with each other in a virtual world. MMORPGs typically feature a persistent world that is always running, even when a player is not logged in. This allows players to explore the world, interact with other players, and take part in quests and activities. Some of the most popular MMORPGs include World of Warcraft, EVE Online, RuneScape, Final Fantasy XIV, MapleStory, and Elder Scrolls Online. These games have millions of players worldwide and offer a variety of features, such as character customization, crafting, and player-versus-player combat. The main difference between an MMO and an MMORPG is that an MMORPG is a specific type of MMO that includes role-playing elements. Popular MMOs that are not MMORPGs are Fortnite, League of Legends, Minecraft, and Grand Theft Auto.

Mod: A mod, or modification, is a change or addition to a video game made by someone other than the original developer. Mods can be anything from small changes to the game's appearance or gameplay to complete overhauls that turn the game into something entirely new. Mods are created for a variety of reasons. Some people create mods to fix bugs or improve the performance of the game. Others

create mods to add new content, such as new weapons, maps, or missions. And still others create mods to change the game's mechanics or gameplay in some way. Grand Theft Auto V has a large modding community. There are mods for GTA V that add everything from new cars and weapons to new missions and gameplay mechanics.

MSB: *Money Service Business* provide a range of financial services beyond money transmission. They may also offer currency exchange services, allowing customers to convert one currency into another. Additionally, MSBs often provide check cashing services. Some MSBs may offer prepaid cards or issue money orders, which are payment instruments similar to checks. Money transmitters are a subset of MSBs and primarily specialize in facilitating the transfer of funds. They may or may not offer additional services that fall within the scope of MSBs more broadly. MSBs are regulated by the FinCEN, a bureau of the US Department of the Treasury.

MTL: *Money Transmitter License*. Money transmitters engage in: funds transfer, international remittances, payment services, currency exchange, and financial services for the unbanked and underbanked. Money transmitters are subject to regulations and oversight to prevent money laundering, terrorist financing, and other illicit activities. Money transmitters must register with state-level regulatory authorities, maintain adequate capital reserves, and follow specific reporting and compliance procedures. The specific requirements for obtaining a money transmitter license can vary significantly depending on the state / jurisdiction.

NAIA: *National Association of Intercollegiate Athletics* is an American collegiate athletic association that serves the interests of small colleges. The NAIA includes 83,000 student-athletes across 250 schools.

NCAA: *National Collegiate Athletic Association* is a nonprofit organization that regulates student athletics among about 1,100 schools in the United States, Canada, and Puerto Rico. It also organizes the athletic programs of colleges and helps over 500,000 college student athletes who compete annually in college sports. The organization is headquartered in Indianapolis, Indiana.

Nerf: A nerf is a change to a game element that makes it less powerful or effective. This can be done to balance the game, make it more challenging, or to address any exploits or bugs. The term "nerf" is thought to have originated from the Nerf brand of foam toys, which are designed to be less harmful than traditional toys.

NFC: *Near Field Communication* is a set of standards for short-range wireless communication between two electronic devices. It works by enabling two devices to establish a connection when they are within about 4 centimeters (1.6 inches) of each other

NFT: *Non-Fungible Token* is a digital asset that is unique and cannot be replaced by another asset and is recorded on a blockchain. NFTs can be used to represent a variety of assets, including, among others: digital artworks, collectibles, in-game items, tickets, and real-world assets. NFTs are different than fungible assets like bitcoin. Any bitcoin can be traded for another bitcoin and you will have the exact same asset.

C. Thi Nguyen: C. Thi Nguyen is associate professor of philosophy at University of Utah. Nguyen is interested in the ways in which our rationality and agency are socially embedded – about how our ways of thinking and deciding are conditioned by features of social organization, community, technology, and art practices. Nguyen is also interested in the structures and nature of the interdependences we have with one another – and with our artifacts, practices, and institutions. For more, see here, and Nguyen's book: Games: Agency as Art.

Niantic Labs: Niantic is an American software development company based in San Francisco, California. It was founded in 2010 by John Hanke, who was also the co-founder of Keyhole, which was acquired by Google and became Google Earth. Niantic is best known for developing the augmented reality (AR) mobile games Ingress and Pokémon Go.

NPC: *Non-Playable Character*. In video games, an NPC is a character that is controlled by the game's computer program, rather than by a human player. NPCs can be found in all kinds of video games, from role-playing games to adventure games to first-person shooters. NPCs can serve a variety of purposes in video games. They can provide players with information, give them quests, or simply populate the game world and make it feel more alive. Some NPCs are also hostile and can attack players. The level of detail and complexity of NPCs can vary greatly from game to game. NPCs can help to create a sense of immersion and make the game world feel more alive. They can also provide players with challenges and rewards.

NYFW: *New York Fashion Week* is an annual fashion event that takes place in New York City. It is one of the four major fashion weeks in the world, along with London Fashion Week, Milan Fashion Week, and Paris Fashion Week. NYFW is held twice a year, in February and September. The February show features the collections for the following fall/winter season, while the September show features the collections for the following spring/summer season.

OFAC: *Office of Foreign Assets Control*. It is a bureau of the United States Department of the Treasury that is responsible for enforcing economic and trade sanctions against targeted foreign countries, terrorists, and other threats to the national security, foreign policy, or economy of the United States. OFAC

administers and enforces several different sanctions programs. These programs are designed to achieve a variety of foreign policy and national security objectives, such as: curtailing the flow of money to terrorist organizations, deterring the proliferation of weapons of mass destruction, promoting democracy and human rights, and countering corruption. OFAC sanctions can be imposed on, companies, and other entities. These sanctions can include: blocking assets, prohibiting financial transactions, and imposing travel restrictions.

OpenSea: OpenSea is an online marketplace for buying and selling NFTs. OpenSea was founded in 2017 by Devin Finzer and Alex Atallah. It is a peer-to-peer marketplace, which means that buyers and sellers can interact directly with each other. OpenSea charges a commission on all transactions.

P2E: *Play to Earn* games allow players to earn rewards with real-world value by, among other things, completing tasks, battling other players, and progressing through game levels. Axie Infinity is a P2E game.

Pokémon Go: Pokémon Go is a location-based augmented reality (AR) mobile game developed and published by Niantic in collaboration with Nintendo and The Pokémon Company for iOS and Android devices. The game was released in July 2016 and quickly became a worldwide phenomenon. In Pokémon Go, players use their smartphones to locate, capture, train, and battle Pokémon, which are virtual creatures that appear in the real world. Players can also interact with other players at PokéStops and Gyms, which are located at real-world landmarks.

PnL: Profit and loss.

PWA: *Progressive Web App* is a type of application delivered through the web, built using common web technologies including HTML, CSS, JavaScript, and WebAssembly. It is intended to work on any platform with a standards-compliant browser, including desktop and mobile devices. PWAs are designed to be reliable, fast, and engaging. They can be installed on the user's home screen, can work offline, and can access device features such as push notifications and geo-location.

PYUSD: PYUSD, called *"payUSD"* is a stablecoin designed to maintain a stable $1 USD value. It is backed by dollar deposits, US treasuries, and cash equivalents.

RFID: *Radio-Frequency Identification* is a wireless technology that uses radio waves to identify and track tags attached to objects. An RFID system consists of two main components: RFID tags (small electronic devices that can be attached to or embedded in objects) and RFID readers (devices that emit radio waves and receive signals back from RFID tags). Here are the key differences between RFID and NFC:

Feature	RFID	NFC
Range	Up to 100 meters	A few centimeters
Communication direction	One-way (from tag to reader)	Two-way
Applications	Asset tracking, access control, payment systems, product authentication, animal tracking	Contactless payments, mobile wallets, data sharing

ROAS: *Return on Ad Spend* is a marketing metric that measures the revenue generated for every dollar spent on advertising. It's calculated by dividing the total revenue generated by the total ad spend. For example, if you spend $100 on advertising and generate $500 in revenue, your ROAS is 5:1. For every dollar you spend, you generate $5 in revenue.

Roblox: Roblox is a massively multiplayer online game platform and game creation system developed by Roblox Corporation. Roblox was created in 2004 by David Baszucki and Erik Cassell and released in 2006. Roblox is F2P, with in-game purchases available through a virtual currency called Robux.

Robux: Robux allows players to buy various items and obtained by purchase with fiat currency, from a recurring stipend given to members with the Premium membership, and from other players by producing and selling virtual content in Roblox. Robux acquired through sale of user-generated content can be exchanged into fiat currency through Roblox's Developer Exchange System.

Ronin: Ronin is an Ethereum linked sidechain made specifically for Axie Infinity. Ronin was developed to process transactions more quickly than Ethereum. When Ronin was designed, it was intended to: provide fast and seamless transactions with near instant confirmation, drastically reduced gas fees, the ability to withdraw Axie assets back to Ethereum mainnet, simplified on-boarding for new users, and a block explorer for transparency and data accessibility. On March 23, 2022, Ronin was hacked for $620 million. In April 2022, the FBI announced that Lazarus Group and APT38, cyber actors associated with the Democratic People's Republic of Korea was responsible for the theft. As of the date of this essay, the Ronin hack remains the most significant hack in crypto history.

RPG: *Role Playing Game* is a genre video game in which the player controls a character or party of characters in a fictional setting. RPGs typically feature

character development, such as the ability to improve the character's stats, skills, and equipment. Popular RPGs include Pokémon, the Final Fantasy series, the Elder Scrolls series, and Elden Ring.

RTFKT: RTFKT was founded in 2020 by Benoit Pagotto, Chris Le, and Steven Vasilev to redefine the boundaries of physical and digital value. RTFKT leverages game engines, NFTs, blockchain authentication, and augmented reality to create one of a kind virtual and/or phygital products and experiences. Nike acquired RTKFT in December 2021.

RTS: *Real-Time Strategy* is a subgenre of strategy games that doesn't progress incrementally in turns but allows players to play simultaneously in real-time. Examples include Starcraft and Age of Empires.

RWA: *Real World Assets*. Real-world asset tokenization is the process of converting real-world assets into digital tokens that can be traded on a blockchain. USD backed stablecoins are an example of real-world assets being tokenized. Other real-world assets could include stocks, bonds, real-estate, gold, money market funds, and art.

SEC: *U.S. Securities and Exchange Commission* is an independent agency of the United States federal government responsible for enforcing the federal securities laws and regulating the securities markets. The SEC was created in 1934 because of the stock market crash of 1929, which led to the Great Depression.

Second Life: Second Life is an online multimedia platform that allows people to create an avatar for themselves and then interact with other users and user-created content within a multiplayer online virtual world. Second Life was developed and owned by Linden Lab and launched in June 2003.

Sewer Pass: To access Yuga Labs' game Dookey Dash, players needed to obtain a Sewer Pass, which was a digital token of admission available only to BAYC members but could be delegated to anyone.

Sid Meier: Sidney Meier is a Canadian-born Swiss-American programmer, designer, and producer of several strategy video games, including the Civilization series.

Skins: Skins are virtual items that gamers can accumulate in a video game to decorate weapons or characters. Most skins are cosmetic only and do not give players any gameplay advantage.

Sky Mavis: The developer of the game Axie Infinity.

Skyweaver: Alongside Pokémon Go and Fortnite, the best game ever made. A blockchain based TCG developed by Horizon Blockchain Games.

SLP: *Smooth Love Potion* can be earned by Axie trainers as rewards for winning battles against opponents in the game Axie Infinity.

Snow Crash: Snow Crash is a science fiction novel by American writer Neal Stephenson published in 1992. Stephenson coined the term "metaverse."

Steam: Steam is a digital distribution service for video games developed by Valve Corporation. It was launched in September 2003 as a software client to provide automatic updates for Valve's games and expanded to distributing third party titles in 2005.

SYKY: SYKY is an incubator, marketplace, and social community for the next generation of designers and consumers. SYKY was founded by Alice Delahunt, the former Chief Digital and Content officer at Ralph Lauren and Digital and Social Marketing Director at Burberry.

TAM: *Total Addressable Market* is the total revenue opportunity that exists for a product or service if it captured 100% of the market. It is calculated by multiplying the number of potential customers by the average revenue per customer.

Tether (USDT): Tether is a cryptocurrency stablecoin that is pegged to the US Dollar. Tether was founded in July 2014 by Brock Pierce, Reeve Collins, and Craig Sellars. Tether was one of the first stablecoins created and is the largest stablecoin by market capitalization at the time of this essay. Tether has been critized for its lack of transparency.

The Final Boss: The Final Boss in a video game is the final opponent that the player must defeat to complete the game. Final bosses are often the most challenging enemies in the game, and they often require the player to use all their skills and abilities to defeat them.

Tim Sweeney: Legend. Also, founder and CEO of Epic Games.

TPS: *Transactions Per Second* is a measure of the number of transactions that a system can process in one second. It is a metric that is used to evaluate the performance and scalability of systems that handle a high volume of transactions. TPS is calculated by dividing the number of transactions processed by the amount of time it took to process them, e.g., if a system processes 100 transactions in 10 seconds, then the TPS is 10. TPS is an important metric for a variety of systems including: payment processing systems, database systems, and blockchain networks. For context

- Visa has the capacity to execute more than 65,000 TPS
- Solana averages 400 user-generated TPS and surges to 2,000 user-generated TPS during times of peak demand
- Ethereum averages 12 TPS
- Bitcoin averages 7 TPS

TPS: *Third Person Shooter*. TPS also stands for Third Person Shooter, which is a video game in which the player character is visible on-screen and the gameplay consists primarily of shooting. TPS games are like FPS games, but the player sees the character from a third-person perspective, rather than a first-person perspective. Fortnite and Grand Theft Auto are two popular TPS games.

TradFi: *Traditional Finance* is the mainstream financial system and conventional institutions such as retail, investment, and commercial banks, insurance companies, brokerages, and other regulated entities that operate within it.

Trainer: A Pokémon trainer is a person who catches, trains, cares for, and battles with Pokémon.

Valve: Valve Corporation is a privately held video game developer, publisher, and digital distribution company headquartered in Bellevue, Washington. It is the developer of the software distribution platform Steam and the franchises Half-Life, Counter-Strike: Global Offensive, and Dota. Valve was founded in 1996 by former Microsoft employees Gabe Newell and Mike Harrington. Valve created Steam in 2003 to serve as a digital content distribution channel before app stores existed. When I drafted this definition, there were 18.8 million players on Steam and 4.9 million steam players currently in-game. In 2022, Valve released the Steam Deck, a handheld gaming PC.

Vbucks: Vbucks are an in-game virtual currency used in Fortnite that allow players to purchase a variety of in-game items and rewards. Vbucks can be acquired through various means including gameplay, challenges, and fiat money purchases.

VR: *Virtual Reality* is a simulated experience that employs pose tracking and 3D near-eye displays to give the user an immersive feel of a virtual world. Applications of virtual reality include entertainment (mostly video games), education, and business (virtual meetings). VR is created using a computer to generate a simulated environment.

Xsolla: Xsolla is a global video game commerce company that provides a suite of products and services to help game developers and publishers launch, monetize, and scale their games. Xsolla's products include digital tools that help with in-game payments and enable alternative payment systems to be used for digital transactions.

UA: *User Acquisition* is the process of gaining new users for an app, platform, or other service. In gaming, UA is the process of attracting new players to download and play a game. It is an essential part of any game's marketing strategy. There are many ways to acquire new players for a game, including paid advertising, organic marketing, and cross-collaborations.

UGC: *User Generated Content* is any type of content that is created by users, rather than by a brand or an organization. UGC can take many forms, including text, images, videos, and audio. UGC can be found on a variety of platforms, including social media, blogs, and forums.

Uniswap: The Uniswap Protocol is the largest decentralized exchange for swapping cryptocurrency tokens on Ethereum and other popular blockchains. Launched in 2018, it is the world's largest and most popular decentralized exchange, with over $1.5 trillion in trading volume and 250 million swaps. As of the date of this essay, the Uniswap Protocol is the fifth largest application on Ethereum with over $4 billion in total value locked (TVL). The protocol consistently does billions in weekly trading volume and is the most popular decentralized exchange by volume on Ethereum mainnet, Polygon, Arbitrum, and Optimism. Hayden Adams created the Uniswap Protocol in 2018 and later founded Uniswap Labs, which has built the largest marketplace for onchain digital assets such as cryptocurrency tokens and NFTs. No single entity or company controls the Uniswap Protocol. It is governed by UNI token holders and stewarded by the Uniswap Foundation. The Uniswap Protocol exists as a set of persistent, non-upgradable smart contracts. That means that no one controls the codebase. The Uniswap Protocol's code cannot be changed or modified and will run as long as the blockchain is functional, even if Uniswap Labs disappears tomorrow. Anyone can deploy the Uniswap Protocol contracts on any blockchain. The Uniswap Protocol is already on several blockchains, like Ethereum, Polygon, Arbitrum, Optimism, Binance Smart Chain, and Celo.

People use the Uniswap Protocol primarily for two reasons:

- Swapping. The Uniswap Protocol is a decentralized exchange (DEX). Unlike traditional exchanges, decentralized exchanges are unique because they allow users to swap tokens without third parties facilitating the transaction or taking control of funds. Swapping on the Uniswap is completely self-custodial, which means you always retain control of your assets — and no third party can take or misuse your funds.

- Providing Liquidity. Liquidity refers to how much of an asset is available to trade. The Uniswap Protocol relies on third parties to supply liquidity. These liquidity providers (LPs) are users who deposit tokens into a liquidity pool to provide liquidity for a particular token pair that swappers can trade with. In

return for providing liquidity, LPs earn trading fees generated by the pool. Anyone can become a liquidity provider, a transformative change to participating in financial markets.

The Uniswap Protocol is open-sourced, meaning that the code is publicly viewable for anyone to see.

Unreal Engine: Unreal Engine is a suite of creative tools and game engine developed by Epic Games. It is one of the most popular game engines in the world and is used to create a variety of games, from indie titles to AAA blockbusters. Epic released Unreal Engine 5 in April 2022. UE5 introduced a collection of features for rendering real-time worlds in incredibly high-fidelity detail, including Lumen, a fully dynamic global illumination solution. UE5 also introduced a new micropolygon geometry system, Nanite.

USDC: USDC is a digital stablecoin pegged to the US Dollar and designed to maintain a value of $1 per USDC. USDC was created in 2018 by a consortium called Centre, which was founded by Circle and Coinbase. In August 2023, Circle and Coinbase agreed that Centre was no longer needed and that Circle would remain as the issuer of USDC and bring Centre governance and operations under Circle.

WaaS: *Wallet as a Service* is a scalable and secure set of wallet infrastructure APIs that enable companies to create and deploy customizable onchain wallets to their end users. Companies can offer their users wallets directly in their apps with onboarding by username and password.

Wallet: There are two primary types of cryptocurrency wallets: custodial and non-custodial. Non-custodial or self-custodial wallets means that crypto is held directly by the user, e.g., Metamask. Custodial wallets mean that a third party, typically an exchange, takes custody of the assets on behalf of the user. A digital "wallet" represents anything in which crypto can be stored. Wallets hold a user's private keys that enable the user to access the funds on the blockchain. This allows the user to buy crypto, use crypto (e.g., staking). Wallets can be "hot" (internet-connected) or cold (offline). Crypto wallets don't hold funds, they store two keys:

- A public key that links to an address that lets the user send and receive transactions, similar to an email address
- A private key that proves the user owns the tokens associated with the public address, similar to an email password.

XP: XP means "experience points" and is a term commonly found in video games. XP is earned by completing tasks or objectives in a game like defeating enemies, completing quests, or exploring new areas. The accumulation of XP is used to represent a player's progress and level of expertise in the game.

Yuga Labs: Yuga Labs was founded in February 2021 and is the creator of Bored Ape Yacht Club. Yuga was last valued at $4 billion, ~2.5 years after it was founded.