Lawrence National Centre for Policy and Management
Harsheen Anand, Lakshay Kumar, Dr. Diane-Laure Arjaliès

Blockchains, Cryptocurrencies, & NFT's in the Gaming Industry

A TALE OF TWO WORLDS

Ivey 100

Scotiabank
Digital Banking Lab

Lawrence National Centre
for Policy and Management

Research Brief
June 2023

Table of Contents

Land Acknowledgment

The Ivey Business School, Western University (Ontario, Canada) is located on the traditional lands of the Anishinaabek (Ah-nish-in-a-bek), Haudenosaunee (Ho-den-no-show-nee), Lunaapéewak (Len-ah-pay-wuk), and Attawandaron (Add a-won-da-run) peoples, on lands connected with the London Township and Sombra Treaties of 1796 and the Dish with One Spoon Covenant Wampum.

With this, we respect Indigenous nations' longstanding relationships with this land, as they are the original caretakers. We acknowledge historical and ongoing injustices that Indigenous Peoples (e.g., First Nations, Métis, and Inuit) endure in Canada, and we accept responsibility as a public institution to contribute towards revealing and correcting miseducation as well as renewing respectful relationships with Indigenous communities through our teaching, research, and community service.

About The Authors

Harsheen Anand

is a graduate student at the Ivey Business School, Western University. She is pursuing her MSc in Management (International Business) and has previous experience with research and management consulting.

Dr. Diane-Laure Arjaliès

is an Associate Professor (with tenure) at the Ivey Business School, Western University, where she leads the Sustainable Finance Lab. She explores the potential role of blockchains in building financial instruments for social and environmental good. Previously, she studied the role of utopias in the workings of cryptocurrencies, from Bitcoin to alternative time monies. She is now investigating the impact of Web 3.0 (e.g., cryptos, NFTs) on society.

Lakshay Kumar

is a graduate student at the Ivey Business School, Western University. He is pursuing his MSc in Management (International Business) and has previously worked across management consulting and FinTech.

Lawrence National Centre
For Policy and Management

Established in 2002, the Lawrence National Centre has been at the forefront of national policy dialogue in Canada, bridging the gap between academia, business and government to enhance Canada's global competitiveness. It is an independent public policy centre that contributes to policy dialogue and development by producing evidence-based research, providing a convening platform to engage and inform businesses and policymakers, and developing leading educational programs in policy and strategy.

The Scotiabank Digital Banking Lab

The Scotiabank Digital Banking Lab was established in April 2016, supported by a $3 million gift over ten years from Scotiabank. As the first university research centre focused on financial technologies ("Fintech"), the Lab's mandate is to study and understand the implications of digital disruption for banking and financial services and to prepare students to operate in an environment of changing technology and innovation. The Lab promotes student engagement, publishes targeted research, and reaches out to stakeholders in Canada and abroad.

The Ivey Business School, Western University

Ivey Business School at Western University is Canada's leading real-world, case-based business education provider. Drawing on extensive research and business experience, Ivey faculty provide the best classroom experience, equipping students, through Case-Method Learning, with the skills and capabilities they need to tackle today's leadership challenges. Beyond the classroom, Ivey students gain a global perspective on business issues through international study trips, exchanges, and practicums.

Contact

Ivey Business School, Research Team Lead
Dr. Diane-Laure Arjaliès: darjalies@ivey.ca

An academic version of those findings is available at:
Arjaliès D-L. and Compain-Eglin S. (2023), Trying to sell the Crow Queen in Web 3.0: On the resistance of video gamers to cryptocurrencies, NFTs and their financial logic, cryptocarnival, https://cryptocarnival.wtf/index, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4398443

To cite this report:
Anand H., Kumar L., and Arjaliès D-L., (2023). Blockchain, Cryptos and NFTs in the gaming industry: A tale of two worlds, Western University, London, Canada, DOI: 10.5206/iveypub.64.2023, available at https://ir.lib.uwo.ca/iveypub/64/
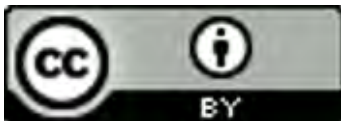
Executive Summary

The gaming industry is at a crossroads with Web 3.0.

The ever-growing gaming industry is at a tipping point of mass blockchain adoption. Based on public and secondary data analysis, we show that the gaming industry is shifting toward Web 3.0, which could significantly affect its practices and business models. Aligned with this change, big gaming companies have launched new technologies associated with Web 3.0, such as NFTs and cryptocurrencies. The sector's reaction could indicate the society's response to including cryptocurrencies and NFTs in an increasing number of industries.

Reluctant North American players.

North American players have been unwilling to include cryptocurrencies and NFTs in their games. They felt this integration was threatening the "gaming" logic of the industry and creating some ecological issues.

Welcoming Asian and Latin American players.

In sharp contrast, Asian and Latin American countries such as China and the Philippines have seen a more significant intake from gamers, who perceived cryptocurrencies and NFTs as an opportunity to generate more revenues.

A tale of two worlds.

Our study argues that consumers associated cryptocurrencies and NFTs with a financial logic, and would prefer not to use those technologies if their primary goal was to play. This prevented the mass adoption of those technologies in North America, where most gamers associated gaming with something other than revenue-generating (i.e., playing, escaping in a virtual world). Instead, Asia-Pacific gamers saw the opportunities in these technologies to generate additional revenues and create new markets. This led to a strong divide between both parts of the world regarding Web 3.0. The report outlines some implications for the future of the industry and the rest of society.

1 | The gaming industry: A giant player

In the past few years, the gaming industry has prospered and grown into a giant industry that ripples its influence on a global scale, creating jobs and products and organizing competitive events that generate tremendous cash flows. It is valued at over CAD$15 billion and is Canada's largest entertainment industry segment.[i] Video games are present in 75% of North American households, and it is estimated that 39% of the global population actively plays video games.[ii,iii] The global gaming industry will be worth $321 billion by 2026.[iv] Social and casual gaming is expected to generate the highest revenue of US$242.7 billion, followed by PC games with US$42.2 billion, console games (US$31.5 billion), and integrated video game advertising (US$4.7 billion).[v] China already has a colossal market share in the gaming industry, and emerging countries have tremendous growth prospects as their market is nascent.

The major drivers behind gaming growth are profound: processors are getting faster, and graphics and the overall gaming experience are improving. Console makers are also launching new hardware with better capabilities and offering more exclusive game titles. Global internet availability will continue to rise, enabling more people to play online games. Multiplayer games, mobile games and the population of casual gamers all are expected to continue to expand. 95% of North American Gen Z and Millennials play video games in some capacity; the most frequent gamers spend an average of five to seven hours a week.[vi] Gaming has also been regarded as a highly social activity owing to the pandemic. During Covid-19, more young people engaged in video gameplay for entertainment and as an avenue for social connection.[vii] Morgan Stanley's recent survey of more than a quarter of under 35 surveyed gamers shows that gaming is a better social connection platform than social media platforms.[viii] As a result, the industry became bigger than movies and sports combined.

The gaming industry is essential to the economy and society. The gamers' reaction to the inclusion of new technologies, such as NFTs or cryptocurrencies, could provide us with critical insights into how consumers could react to the shift of the overall economy to Web 3.0.

This report discusses the adoption of NFTs and cryptocurrencies in gaming across different geographies, focusing on North America. External secondary research data was used from published market reports and web articles. Additionally, the references section for each piece was searched for further information.

2 | An industry at the crossroads

2.1. The entrance into Web 3.0.

Video games followed the Internet's development phases, known as Web 1.0., Web 2.0. and Web 3.0. (See Appendix 1 for further information about the history of video games.) The industry of Web 3.0. is mainly known as blockchain gaming and comprises devices such as blockchains, non-fungible tokens (NFTs) and cryptocurrencies (see Exhibit 1).

Since each NFT is one-of-a-kind, blockchain technology has encapsulated the concept of digital asset ownership. In the past, digital artwork, such as an image, could be reproduced and used by thousands of individuals without attribution to the original creator. Now, if the artwork is stored on the blockchain as an NFT, the owner can claim their right to keep or sell it to anyone they wish. Play-to-earn is one facet of blockchain gaming in which a gamer makes their own unique NFT(s) or cryptocurrency through merit-based advancements in the game, which they may then convert to actual money.

Even if players pay real money for their digital assets in traditional games, they will lose access if the server is ever turned down. Both the money and the game assets would remain the property of the publisher or developer. Meanwhile, players in blockchain games retain total ownership of their digital assets, allowing them to freely trade them with other players, sell them for real money, and potentially use them across numerous game universes.

The APAC region has the highest ownership rate, with 22.6 million gamers holding cryptocurrencies, followed by Europe (5.9 million), Middle East & Africa (5.8 million), Latin America (4.3 million), and North America (3.3 million). Crypto gamers in the Asia-Pacific region generated the highest revenue of US$157.3 million (49%), followed by North Americans with US$80.3 million (25%), Europe, Latin America, the Middle East, and Africa.[xi]

Exhibit 1
Web 3.0., blockchain, NFTs and cryptocurrencies

WEB 3.0.[ix]	Web 3.0. is the third generation of the internet currently being built, where websites and apps will be able to process information in a smart human-like way through technologies like artificial intelligence (AI), machine learning (ML), Big Data, decentralized ledger technology (DLT), and more.
BLOCKCHAIN	A blockchain is a decentralized, distributed, and public digital ledger that is used to record transactions across many computers so that the record cannot be altered retroactively without the alteration of all subsequent blocks and the consensus of the network.
NFTs	NFTs are unique assets that are stored on a blockchain, such as Ethereum, Polygon or Solana. They serve as verifiable deeds to property that only exists in the virtual world. Their storage on a public blockchain provides security and authenticity and enables NFT mobility across applications.
CRYPTOCURRENCIES[x]	A cryptocurrency is a medium of exchange that is digital, encrypted and decentralized. Unlike the Canadian Dollar or the Euro, there is no central authority that manages and maintains the value of a cryptocurrency. Instead, these tasks are broadly distributed among a cryptocurrency's users via the internet.

2.2.   Business models of blockchain gaming

Play-to-earn.[xii]

One of the most widely used forms of monetization in blockchain games, the play-to-earn model compensates users for playing games and allows users to buy and sell in-game items. This model, unlike traditional game models, gives users complete control over digital assets within the game, such as weaponry and skins.

In most blockchain games, the play-to-earn paradigm is applied, compensating players for playing games and participating in in-game economies, allowing users to buy and sell game-related commodities. As a result of the system's virtuous circle, players receive rewards such as weaponry, skins, and gaming items. Unlike traditional game models, such as free-to-play with in-game purchases or pay-to-play, blockchain-based games give players complete control over their digital assets.

Pay-to-earn.

Users must make an initial, up-front purchase of an in-game asset, often an NFT, under the pay-to-earn technique, which is like play-to-earn. Like the play-to-learn strategy, the item can develop value with time, with the promise of profits as an incentive for stickiness.

GameFi.

Both play-to-earn and pay-to-earn models are commonly referred to as GameFi, a term that emphasizes the earning potential of gaming. A successful blockchain game requires a robust blockchain foundation with high transaction rates and minimal fees. Consumers will not (and should not) pay huge transaction costs when purchasing or selling things because they are unusable without them.

Asset ownership in-game.

One of the biggest worries to gamers is paying for in-game assets that are not tangible or governed by the developer since this implies that when a game goes down, gamers lose all they have put into it. Blockchain games use tokenization, establishing NFTs to fully allow developers to own assets, thus alleviating gamers' concerns.[xiii]

Exhibit 2
Differences between Web 1.0., Web 2.0. and Web 3.0.

FEATURE	WEB 1.0.	WEB 2.0.	WEB 3.0.
PURPOSE	Provide information	Interactivity and user-generated content	Decentralization and trust through blockchain
BUSINESS MODEL	Advertising	In-game purchases and advertising	NFT sales, token appreciation, royalty sales and subscriptions
GAMING EXPERIENCE	Limited gaming options with physical locations and high fixed costs	Different gaming modes (console, PC, mobile) with multiple monetization techniques	Decentralized gaming experience with NFTs and blockchain-based transactions
CONTROVERSIES	Few	Debates around gaming's negative impacts on kids' social skills and health	Controversies surrounding the use of NFTs and blockchain in gaming
DOMINANT TECHNOLOGY	Static HTML pages	Dynamic HTML and server-side scripting	Decentralized blockchain technology

2.3. The potential benefits of Web 3.0.

Gaming companies are entering a new development phase, no longer bound by place, time or physical reality. In addition, the rollout of 5G communication networks will significantly accelerate the uptake of mobile and cloud-based game delivery. Faster network speeds and reduced latency allow game developers more freedom in producing games because the limitations of hardware platforms do not confine them. This provides players with several new and exciting possibilities for gameplay that will not tether them to existing devices. In addition to driving cloud gaming, 5G will allow consumers to use virtual reality (VR) and augmented reality (AR) gear on the go, providing a far richer mobile experience.

Although Web 3.0. gaming is still a tiny market; it could facilitate more interactive and flexible means for people to interact with their favourite gamers, teams, and brands. There are several potential benefits to entering Web 3.0. that we list below.

• **Earn a living.** Historically, the ownership aspect has been missing from gaming (in-game assets, collectibles etc.), but with Web 3.0., players could earn money.[xv] In the Web 3.0. era, the gaming industry has the potential to benefit from NFT sales, token appreciation, royalty sales, and subscriptions.

• **Avoid institutional constraints.** In online gaming, cryptocurrency removes bureaucracy and intermediaries, allowing players a seamless experience. It also enables players to play internationally without security or exchange rate issues.

• **Support collective governance.**
The gaming industry has always been haunted by controversies, whether the debate around its impact on children's health or social skills. Despite this, the industry has not only survived but thrived, and Decentralized Autonomous Organizations (DAOs) could prove to be a lifebuoy for crypto gaming initiatives to establish a sustainable footprint. A DAO is a structure with no central governing body in which members pursue a common goal - to act in the entity's best interest.[xvi] Based on democratic principles, DAOs allow users to express their opinions and influence the ecosystem through consensus among holders of governance tokens.

• **Adding security.** Blockchain increases player control by enabling ownership of Non-Fungible Tokens (NFTs), trading of NFTs, and using NFTs across numerous platforms. NFTs allow blockchains to issue one-of-a-kind digital assets with unique attributes. This means that players can acquire in-game purchases that are stored securely. Blockchain technology in online games prevents the illegal trading of digital assets. It also terminates the hacking and stealing of keys by creating an immutable ledger and eliminating the keys' duplication. This differs from Web 2.0. because Web 2.0. games contain constraints on who can own game assets, unlike Web 3.0. games, where players can have full ownership.

• **Development of eSport.** NFTs are high-opportunity assets that bring fans, gamers, and brands closer to eSports teams and competitors. NFTs have a wide range of used cases. For example, a utility NFT can grant fans tickets to a tournament through special Twitch emotes or Discord channels.[xvii]

What is the Metaverse?

A shared, persistent, three-dimensional (3D) virtual realm where users interact with objects, the environment and each other through digital representations of themselves or avatars.[xiv]

In future iterations of the metaverse, a player's digital avatar will not always have an obvious purpose as it moves through various digital realms. The avatar could seek multiple experiences - from entertainment to social connection to work, education, commerce, etc. Gaming companies will be challenged to utilize a growing collection of internal and external data to understand better what their customers do in both the gaming and real worlds.

• **New partnerships.** With gaming at the forefront of Web 3.0. adoption, NFTs can drive higher customer satisfaction and margins and improve the visibility of products and services, enhancing collaboration with non-traditional gaming partners and attracting new customers as a perfect used case for Web 3.0. adoption in different industries. Some examples of recent partnerships include Nike partnering with RTFKT Studios to create NFT-based collectibles that allow fans to trade, buy, and sell virtual sneakers on the Ethereum blockchain.[xviii] NBA teamed up with blockchain developer Dapper Labs to launch NBA Top Shot, a platform that allows fans to trade, buy, and sell NFT-based digital collectibles featuring NBA players.[xix]

Web 3.0. startups raised $7.1B in funding during 2022, with gaming accounting for 62%.[xx] The investment activity suggests that despite the uncertain and challenging economic conditions in the digital asset markets, investment entities remain bullish on the GameFi industry.[xxi] For instance, Web 3.0. gaming firm Immutable and layer-2 blockchain Polygon's strategic alliance aims to make Web 3.0. games faster, easier, and less risky for larger gaming studios and independent game developers. Immutable's Ethereum Virtual Machine (zkEVM), a virtual machine that compresses data to improve scaling and security on the blockchain, will be powered by Polygon technology and supported on its platform. Polygon's zkEVM scaling technology aims to lower transaction costs while remaining compatible and secure with the layer-1 blockchain Ethereum, which is critical for the long-term growth of the blockchain and its ecosystem.[xxii]

3 | The mixed success of Web 3.0. so far: A geographical divide

The gaming industry has been rapidly evolving with technology and Web development growth. Starting from the arcade gaming model in the Web 1.0. era, the industry has moved towards console gaming, PC gaming, and mobile gaming in the Web 2.0. era (See Appendix 1). The introduction of Web 3.0. has disrupted the traditional gaming models by allowing for innovative monetization techniques and unlocking new growth opportunities for new customer acquisitions. However, the success of NFTs, blockchains, and cryptos in the gaming industry remains geographically divided. Players' reactions are primarily influenced by country-specific economic tensions where players from developing nations perceive financial opportunities associated with crypto games. At the same time, North American gamers have not felt the impetus to earn more income through playing.

3.1.   North American Players: Web 3.0. as a threat to the gaming spirit

The first archetype of players, traditional gamers, display attributes of hardcore gamers, as they are far more likely to play competitively, personalize their avatars, and engage with collectibles. Hardcore gamers have expressed their dislike for this growing trend of Web 3.0. gaming through tweets on social media. "I just hate that they keep finding ways to nickel-and-dime us in whatever way they can," said Matt Kee, 22, a gamer who took to Twitter in anger after Square Enix, which produces one of his favourite games, Kingdom Hearts, said it

was pushing into NFTs. "I don't see anywhere mentioning how that benefits the gamer and improves gameplay. It's always about, 'How can I make money off this?'" [xxiii]

The defining feature of Web 3.0. games is the financialization of in-game items - all of which can now be sold on primary and secondary marketplaces and therefore have a financial value assigned to them. Studios that publish Web 3.0. games can monetize through older methods: selling a premium game and incorporating microtransactions. They also typically develop their blockchain marketplace platforms through which they can monetize through transaction fees. An example is Axie Infinity, which recorded a massive USD 1.3 billion in revenue throughout 2021.[xxiv]

One use case Web 3.0. is purported to have been the decentralized ownership of an in-game asset, meaning if someone acquires or purchases an item in-game, they own it even in potential use cases beyond just that game. One quick example of this is the ability to sell assets earned in a contest through an external exchange - for example, trading Axie's currency, $AXS, directly to real fiat currency, allowing players to now earn money through playing a game. Axie Infinity saw mass adoption once it was known that estimated earning minimum wage. Despite this, Axie Infinity's popularity has decreased over time, leading the sustainability of this earning potential to be significantly questioned.[xxvi]

In 2022, North American gamers who hold cryptocurrencies only represented 15% of the global crypto gamers.[xxvii] They play for leisure and view crypto gaming as the financialization of gaming and a source of ecological issues. They also believe that in order to earn a sustainable livelihood, one requires additional earnings than that from crypto.
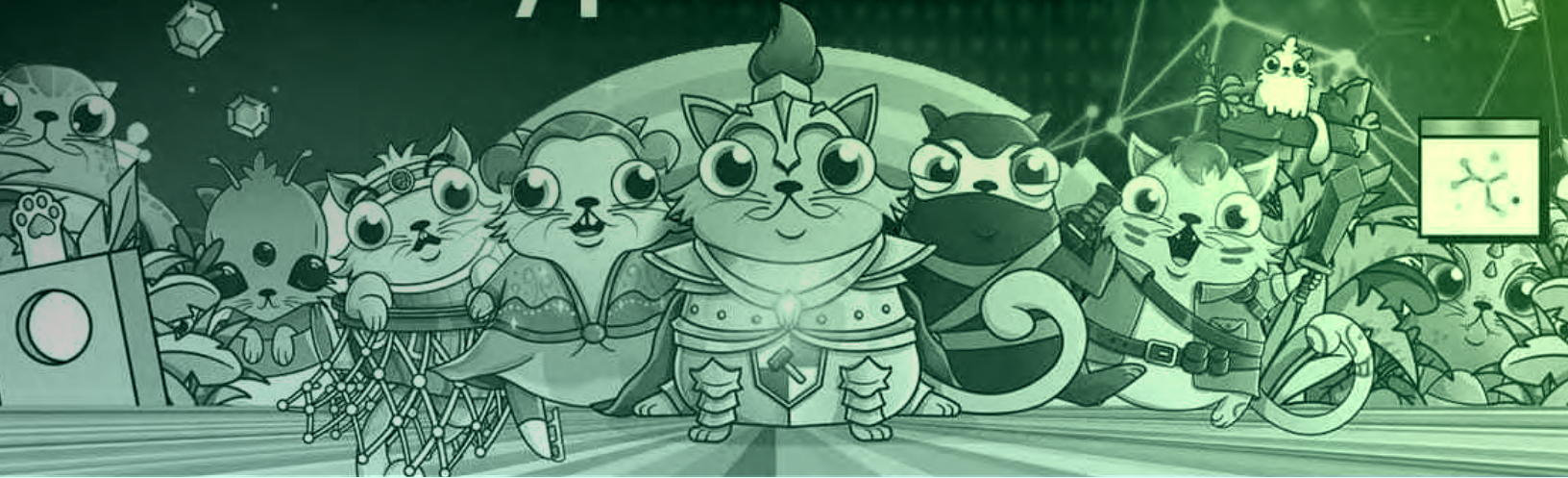
Crypto Kitties: The rise and fall of the first crypto game

Launched by Vancouver-based venture studio Axiom Zen, Crypto Kitties rose to popularity. The game was the first reimagination of both gaming as well as collectibles. The CryptoKitty NFT was one-of-a-kind collectible which was unique and stored on the blockchain. Collectors could breed their NFTs together and each new NFT created from this process had a unique combination of traits derived from its lineage. It employed a supply-and-demand form of monetization. The limited supply of kitties led to intense demand; the volume of transactions overloaded the Ethereum network (another form of monetization is digital assets). The game also fell due to a need for more exciting gameplay and an ecosystem of new players interested in crypto gaming.

With the gaming industry transitioning from Web 1.0., Web 2.0. to Web 3.0., monetization methods evolved from the traditional "buy-to-play" model to the "play-to-earn" model. Microtransactions received negative feedback from gamers. In 2017, EA released "Star Wars Battlefront II," which included a system of loot boxes that players could purchase with real money to earn in-game advantages such as more potent weapons and skills. Players were outraged, believing the method gave an unfair edge to those prepared to spend more money on the game. This scandal resulted in a massive backlash against EA, with fans boycotting the game and demanding government regulation of gaming microtransactions.

At this early stage of Web 3.0 development, many projects adopted models that could be more controversial than the old monetization models, thereby presenting significant barriers to adoption. An example is Axie Infinity, which has no free method to play. A prospective player must first own three Axie Infinity NFTs ("Axies") to be able to play, representing an initial investment of potentially over US$ 1,000 back in August 2021 to purchase via the marketplace during the game's peak popularity.[xxviii] This created sub-economies where lenders would provide Axies to prospective players in exchange for a cut of their earnings. Axies have differing gameplay values and can be bought and sold via a marketplace. Therefore, Axies with higher gameplay value can naturally sell for higher prices. Though this introduced pathways

for individuals to unlock significant amounts of personal wealth solely through earning Axies via gameplay, a more cynical view would be that this presented a prominent pay-to-win aspect.

Given the adverse reactions vis-à-vis previous financial approaches to gaming, a poor initial response to implementing cryptocurrencies and NFTs is unsurprising, especially in its current stage. There has been significant controversy surrounding discussions from existing studios such as Square Enix and Ubisoft around its usage. Ubisoft became the first game developer to include NFTs in a title, launching limited edition NFTs inside the military shooter game Ghost Recon Breakpoint. What was supposed to be a monumental shift turned out to be a blunder as players complained about 600 hours of playing time needed to earn one free item - a cosmetic helmet for in-game avatars. Attempts to drive revenue could have been better since only 15 NFTs were purchased for US$400. The key to success with NFTs in games is fully integrating them into a game's native economy so the users have a stake in it. [xxx] The shaky reputation blockchain technology has already accumulated with many - given concerns regarding environmental impact and commonality of fraud - also increases the difficulty of implementation and helps to understand the poor initial reaction from various demographics within the gaming community in North America.

3.2. Asia-Pacific and Latin American Players: Web. 3.0. to earn a living

On the other hand, many gamers from the Asia-Pacific and Latin American regions had entirely different opinions. The shift in monetization strategies altered the incentive structure for gamers and led to the exponential growth of Web 3.0. games, particularly in the Asia-Pacific region. Despite low margins, the high difference in exchange rates made it a stable source of income. In Asian countries, such as Vietnam, Indonesia, and the Philippines, meagre revenues in Bitcoin and Ethereum can generate significant purchasing power in local currencies.

While overall sentiment towards cryptocurrencies and NFTs remains lukewarm, with only 6% of regular gamers owning an NFT globally [xxxi], cryptocurrencies earnings remain the biggest common motivation for gamers and non-gamers to play Web 3.0. games. In countries such as the Philippines, new actors have emerged due to the rising play-to-earn economy considering rising inflation and unemployment. Crypto gamers between the ages of 25-34 represent 37% of crypto gamers who have started playing P2E (Play to Earning) games to make money to support their families in times of job loss and poor pay.[xxxii] Franco Villaflor, a 28-year-old DJ from Latin America, plays poker in the metaverse on behalf of an American man for three hours a day, allowing him to make as much as $1,500 a month, the equivalent of what he makes as a DJ. "That's after giving 40% of the proceeds to the owner of the NFT. My mother doesn't understand how I can spend my time playing games instead of doing something fruitful," Espeche, 34, said. "But what's the point of working hard if I can earn more like this?" [xxxiii]

Recently, players formed gaming guilds in blockchain-based games that incorporate NFTs. Gaming guilds act as facilitators to remove entry barriers for these new player groups into the crypto gaming world by giving them money to start playing crypto games. Additionally, these guilds provide a sense of community, social interaction, and a forum for sharing tips and strategies. Crypto gaming is an alternative source of income; player reactions have been more positive than in North America.

4 | The future of the gaming industry vis-à-vis Web 3.0.

4.1.   Industry leaders' hesitation

The gaming industry is divided regarding adopting cryptocurrencies and NFTs in gaming. Companies and games like Fortnite, Roblox, and Activision Blizzard lead the charge in incorporating cryptocurrencies and NFTs into their gaming experiences, positioning themselves at the forefront of the trend. On the other hand, companies like Nintendo and Electronic Arts are taking a more cautious approach, choosing to focus on traditional gaming experiences and wait to see how the cryptocurrencies and NFT space develop. American video game publishers like Google and Microsoft are actively exploring the potential of cryptocurrencies and NFTs in gaming, positioning themselves as potential power players in the future. On the other hand, Tencent, a Chinese conglomerate that publishes video games, has already made inroads into Web 3.0. by launching a "digital collectibles" platform. Huanhe has made significant investments to support the active deployment of the Web 3 ecosystem. Overall, the gaming industry is split, with some companies embracing the new technology, some waiting and observing, and others actively exploring the potential for integration.

Traditional gaming companies' attempts at Web 3.0.

Web 3.0. gamers, based primarily in developing nations, followed the trend quickly. Traditional gaming companies, mainly concentrated in North America, must rapidly adapt to Web 3.0. Below are several initiatives.

1. Nintendo, a Japanese multinational which develops video games and consoles, has expressed interest in the potential of the metaverse and non-fungible tokens (NFTs) to introduce blockchain technology into their video games.[xxxv]

2. Valve, an American video game developer, has blocked cryptocurrency and NFT games on its Steam digital distribution network due to concerns of it being considered an illegal gambling operation in Washington, where Valve is based.[xxxvi]

3. Electronic Arts: The CEO called NFT and "play-to-earn" games the "the future of our industry," but added that "it's still early to figure out how that's going to work; yet to enter officially into the space.[xxxvii]

4. Sony's esports betting patent accepts both physical and digital currencies for in-game betting, which means accepting bitcoin payments that would allow for live esports betting in-game.[xxxviii]

5. Ubisoft, jumped into blockchain gaming with new playable NFTs (Quartz) but ended support within three months. Ubisoft's recent move to launch Tezos-powered in-game NFT items in its games might have been met with pushback from gamers - like many current gaming-centric NFT projects - but that isn't stopping the publisher from making more moves in the crypto industry.[xxxix]

4.2.   The gaming industry's future in the Web 3.0 era: A takeover from the Asia-Pacific region?

Triple A's demographic analysis highlights that the ideal customer base for video game publishers incorporating blockchain technology into their games under Web 3.0. is a millennial (born between 1981 and 1996). This age group grew up with video games as a popular form of entertainment, which was instrumental in driving the growth of the gaming industry in recent years. Millennials are a natural fit for the cryptocurrencies and NFT gaming industry since they are more likely to be tech-savvy and comfortable with digital currencies. Lastly, millennial gamers are often interested in exploring new gaming experiences and finding new ways to engage with the games they love. And so consequently, the reaction of those gamers to the launch of GameFi using cryptocurrencies and NFTs has significantly impacted the market's perception of blockchain adoption.

For the first time, the Asia-Pacific region overtook North America in terms of revenue in the video gaming industry, standing at $157.3 million compared to $80.3 million as of 2020. The dominance of the Asia-Pacific region in the cryptocurrencies and NFT gaming industry could have several implications for North America. Here are a few possibilities:

• **Market share:** The rise of the Asia-Pacific region in the crypto and NFT gaming industry could result in a decline in North American market share, potentially leading to reduced revenue and investment opportunities.

• **Talent migration:** As the industry shifts towards Asia-Pacific, North American talent in the field may move to the region to take advantage of the growing opportunities.

• **Different gaming cultures:** The gaming cultures in Asia-Pacific and North America may differ, leading to the creation of different types of games and other market preferences.

• **Technological advancements:** The Asia-Pacific region may become a hub for technological advances in the cryptocurrencies and NFT gaming industry, potentially leaving North America behind.

To combat Asia-Pacific's dominance in the crypto and NFT gaming industry, North America could consider the following policy recommendations:

1. Invest in R&D and innovation:
North America could invest in research and development in the crypto and NFT gaming industry to drive innovation and competitiveness. This could be achieved through government funding, tax incentives, and startup grants.

2. Foster talent retention and attraction:
North America could implement policies to retain and attract top talent in the cryptocurrencies and NFT gaming industry. This could include tax breaks, education and training programs, and immigration policies that make it easier for skilled workers to work in the region.

3. Promote entrepreneurship:
North America could support entrepreneurship in the cryptocurrencies and NFT gaming industry by providing access to funding, mentorship, and resources to help startups succeed.

4. Collaborate with the industry:
North America could collaborate with industry leaders and organizations to understand their needs and create policies that support growth and competitiveness in the region.

5. Regulate the industry:
North America could regulate the cryptocurrencies and NFT gaming industry to ensure consumer protection, prevent fraud and money laundering, and foster a level playing field for market participants.

'State' of Play

There still needs clarity around the rules and regulations guiding blockchain gaming. Some entire blockchains require more electricity than specific countries, placing strain on the environment and premiums in the form of "gas fees," or the money it costs a user to tap the network.[xli] The play-to-earn model, where users gain and lose assets, raises the question of whether gambling laws should be applied. Further, using in-game tokens and currencies corresponding to real-world assets raises worries about market manipulation and other possible violations of securities regulations. While future iterations of Ethereum, or other more efficient blockchains, could offer a more environmentally friendly solution and cheaper fees, the regulatory concerns are more challenging. "Anytime you create systems where a specific behaviour can be incentivized, you risk creating an environment that encourages gambling-like activity." [xli] As for Canada, gaming and gambling are regulated as criminal law matters under the federal Criminal Code.[xlii] Generally, the Criminal Code prohibits games fundamentally premised on the payment of money and the possibility that the user can earn money from playing. However, provisions have not yet been interpreted by Canadian courts with respect to pay to earn NFT games.

5 | Conclusion

Over the past decades, technology and Web development growth have significantly changed the gaming industry. The introduction of Web 3.0. has disrupted traditional gaming models, offered innovative monetization techniques, and unlocked new growth opportunities. The success of NFTs, blockchains, and cryptos in the gaming industry varies, but their integration into mainstream games could prove crucial for their success. Using DAOs in the sector could help establish a sustainable footprint for crypto gaming initiatives.

The strong correlation between the growth of the gaming industry and technological innovation has been evident in the past. Advancements in technology, such as voice and facial recognition, augmented reality and virtual reality, and cloud technology, influenced by the gaming industry, have been implemented in various sectors, including healthcare, education, and real estate.

What happens in the gaming industry may indicate what could happen next in the rest of the economy. This may lead to a future where Asia-Pacific competes or even overtakes North America as the world's leading innovation hub for gaming.

Yet, the reluctance of North American gamers could also be seen as reassuring. Many people in today's fast-paced world utilize gaming to escape from their everyday concerns and reality. While some may argue that this is a waste of time and resources, it is crucial to understand that gaming can have various positive effects, including stress release, relaxation, and sociability.[xliii] Furthermore, only some things in life need to be monetized or marketed, as there is value in engaging in things that offer us joy and pleasure without necessarily creating monetary gain. It is ultimately up to everyone to decide how they want to spend their time and resources, and if gaming allows them to escape the stresses of the world, it can be a meaningful pastime, with potential to earn some income in the process.

Appendix 1
A comparison of Web 1.0., Web 2.0. and Web 3.0.

The gaming industry originated in the United States in the early 1970s with arcades. During this period, machines were accessible only in specific physical locations, such as bars, bowling, and arcades. They provided players with limited gaming options, primarily through coin-operated engines that created the concept of microtransactions, where players had to insert coins in exchange for time or lives in the game.

The first version of the Internet, launched around the 1990s and early 2000s, is known as the "read" Internet or Web 1.0. This iteration was aimed at replicating media sources such as magazines, newspapers and newsletters and mainly consisted of static web pages from which people could download information.[xliv] Crucially, the protocols it ran on were open source.

The second version of the Internet launched around 2004 is known as the "read and write" Internet or Web 2.0. This iteration allowed people to download and upload information on sites like Facebook and Youtube. Web 2.0. marks the evolution of the internet from a computerized version of existing media to a separate outlet primarily dominated by the social media era.

The Web 2.0. era was transformational for gaming, with multiple gaming modes becoming popular and game developers benefitting from in-game purchases and advertising. Games such as FarmVille and World of Warcraft enabled users to play games online with friends bringing the advent of social gaming.

Additionally, game developers developed new monetization models such as free-to-play, subscription, and in-game advertising, which further drove up revenues resulting in quicker updates within games that consequently drove up the user's gaming experience. This period coincided with the traditional model for home video games (i.e., excluding arcades) known as the "premium model" or "buy to play"- where a prospective player pays one total upfront price to own a game. The game's success can then be measured by the price multiplied by the quantity sold.

However, video game retail prices have not kept pace with inflation over time; particularly over the past fifteen years, as publishers have been reluctant to raise retail prices beyond the US$ 60 mark. Development costs for AAA-quality games have increased over that timeframe as well. Without raising retail prices, studios can only hope to sell to as many people as possible to turn a profit, which can be difficult to consistently do concerning the various types of video game genres and differing player preferences. This has naturally led to video game studios looking into alternative methods to continue growing revenues.

Nexon in South Korea first implemented the free-to-play business model. In 1997, Nexon was preparing to remove one of its subscription titles, QuizQuiz, because of a lack of players. The team decided to instead give the game away for free and sell some in-game items for real money as an experiment.[xlv] Shortly after, the user counts significantly increased. Over the early 2000s, Nexon and other publishers would implement this new model in other highly successful online games, such as MapleStory & RuneScape.

Free-to-play games have created new demographics of gamers, who normally would have been gatekept by the premium upfront model. Incorporating social mechanics into free-to-play games led to the viral adoption of games such as FarmVille, Game of War, and Candy Crush Saga, increasing the total addressable market, especially when combined with the growing access to gaming devices through the proliferation of smartphones.[xlvi, xlvii, xlviii]

The industry aimed to implement "microtransactions" - allowing users to purchase in-game items, currency, or additional content, typically for small sums. Microtransactions are often associated directly with the "free-to-play" business model. However, it can also be found in the traditional "premium" model, often called downloadable content ("DLC").

The controversy of microtransactions

The implementation of microtransactions has often been met with controversy. Ethical concerns have been raised about the nature of the business model, especially when implemented with gambling-like mechanics, as "loot boxes" are notorious for. Loot boxes function as a purchasable good with a random outcome - players spend real money for an in-game reward, with a chance to receive a range of potential items with differing in-game value. This is particularly concerning with children, who may unknowingly spend excessive money through a bank account connected to a parent's gaming device (such as an iPad). [xlix] The usage of microtransactions was contentious enough to result in significant legislative efforts to regulate the practice, such as attempting to limit access for minors or even forcibly removing microtransaction features entirely from games sold in Belgium. [li]

We see a disconnect between Eastern and Western markets regarding implementing microtransactions, especially in free-to-play online games. In some games, players willing to pay for certain in-game items/power-ups and additional content may gain an advantage over those playing for free, especially if access to these paid items/features is difficult to impossible through regular gameplay. The game is considered pay-to-win when a paying player can gain any advantage over their non-paying peers. [lii] Market research indicates that pay-to-win mechanics are considered much more acceptable by players in China and South Korea than in Western countries, possibly because players are more accustomed to recurring costs associated with gaming, such as gaming café fees. [liii] A recent example of this is Lost Ark - a South Korean game released in 2019. It performed highly successfully in its home market but required many monetization adjustments before being brought to Western markets in 2022. [liv] Free-to-play games that are highly successful in Western markets, such as League of Legends & Fortnite, tend to focus the bulk of their monetization efforts around cosmetics - in-game appearance alterations that can be highly appealing to players, with no true discernable effect on gameplay.

Additional Insights:

1. The move from play-to-earn to play-to-own to play-and-develop:

The gaming industry needs a paradigm shift where the power comes back to the people. In traditional gaming, gamers do not own what they are buying, and there are more and more things hidden behind a paywall necessitating buying. Games require game mechanics that are not just based on earning. The community's perception is that NFTs provide more ways to extract money from the consumer: a money grab. Education and game design become more critical, and gaming companies must ensure that tech is almost invisible in the games. There needs to be a "shift in the way NFTs and Web 3.0. concepts are communicated to gamers, in that the Web 3.0. parts should be hidden in the product," says the lifelong gamer. [lv]

2. Customer experience beyond the game:

Customers will expect the ability to move seamlessly between gameplay, socializing, and commerce, in physical and virtual worlds as the metaverse expands in reach and scale. Identity, wallet, and memory of lived experiences must move seamlessly with the consumer across devices and platforms. Every touchpoint must recognize the consumer and enable a seamless experience (e.g., one registration, one avatar). The individual customer journey will also need to be highly personalized. With various possible media and non-media experiences, companies must create a journey engaging consumers based on what they love. This journey only begins with consumer interactions with the company. With the rise of out-of-game communities like Discord and Reddit, user-created content on TikTok and Twitch, and gaming influencers like Valkyrae and Asmongold (66% of US teens follow influencers), companies need to establish a proactive approach to building community. [lvi]

3. Mobile will be the primary platform that facilitates blockchain gaming adoption:

Blockchain gaming is on the verge of a mobile revolution as Solana takes on mobile endeavours. Game studios centered around mobile devices are emerging. Mobile devices have a wider reach and accessibility, making it easier for a larger audience to participate in blockchain games. Advancements in mobile technology, including improved processing power and storage capabilities, have enabled the seamless running of blockchain games on mobile devices. As such, mobile devices' combination of reach, convenience, and technical feasibility makes it an ideal platform to spur the widespread adoption of blockchain gaming.

4. It will take longer for a new wave of high-quality blockchain games:

Given the complex, capital-intensive and time-consuming nature of fun, the industry has continued to pose slow progression. Currently, several games are under development that has been in the works for over a year. These games are expected to not only be released but will undergo further optimizations through various updates and patches in the coming years. By comparison, mobile gaming will likely see quicker adoption due to typically shorter development cycles for mobile games. [lvii]

5. Investors will keep pouring money into NFT gaming projects:

In 2022, there were many funding rounds related to spin-off type projects from traditional U.S. and Europe gaming businesses, which is supposed to continue in 2023. However, Asian firms are more public in their cryptocurrency push, while Western firms have just begun to swoop in while being cautious with their public relations. [lviii]

Endnotes

i.   Twgadmin. (2022b). Industry Data - Canadian Gaming Association. Canadian Gaming Association.
         https://canadiangaming.ca/industry-data/

ii.   Howarth, J. (2023b, January 18). How Many Gamers Are There? (New 2023 Statistics). Exploding Topics.
         https://explodingtopics.com/blog/number-of-gamers

iii.   Valentine, R. (2020b, July 15). Three-quarters of all US households include someone who plays video games. GamesIndustry.biz.
         https://www.gamesindustry.biz/three-quarters-of-all-us-households-include-someone-who-plays-video-
         games#:~:text=Three%2Dquarters%20of%20all%20US%20households%20include%20someone%20who%20plays%20
         video%20games,-ESA%3A%20Of%20214&text=More%20than%20214%20million%20people,person%20who%20plays%20
         video%20games.

iv.   TripleA crypto payment. (2023d, April 11). Crypto Ownership Data for Gaming Industry 2021 | TripleA. TripleA.
         https://triple-a.io/crypto-gaming-industry-2/

v.   Gaming is booming and is expected to keep growing. This chart tells you all you need to know. (2023, March 7). World Economic
         Forum.
         https://www.weforum.org/agenda/2022/07/gaming-pandemic-lockdowns-pwc-growth/

vi.   YPulse. (2022, December 19). Gen Z, Millennials, and Gen Alpha's Favorite Video Games of 2022 - YPulse.
         https://www.ypulse.com/article/2022/12/19/gen-z-millennials-and-gen-alphas-favorite-video-games-of-2022/

vii.   Blog, P. D. (2022b, March 20). How 2022 Will Impact the Future of Gaming Industry. PSN Deals Blog.
         https://psndeals.com/blog/how-2022-will-impact-the-future-of-gaming-industry/

viii.   Morgan Stanley. (n.d.-b). Into the Metaverse: Why Gaming Could Level Up in 2022 | Morgan Stanley.
         https://www.morganstanley.com/ideas/video-gaming-industry-2022

ix.   CoinMarketCap. (2023). What is Web 3.0? Decentralized Internet Explained. CoinMarketCap Alexandria.
         https://coinmarketcap.com/alexandria/article/what-is-web-3-0

x.   Ashford, K. (2022b, July 19). What Is Cryptocurrency? Forbes Advisor Canada.
         https://www.forbes.com/advisor/ca/investing/cryptocurrency/what-is-cryptocurrency/

xi.   TripleA crypto payment. (2023e, April 11). Crypto Ownership Data for Gaming Industry 2021 | TripleA. TripleA.
         https://triple-a.io/crypto-gaming-industry-2/

xii.   Zipmex. (2022b, June 30). Let the blockchain games begin - Zipmex. Zipmex.
         https://zipmex.com/th/en/learn/the-future-of-blockchain-gaming/

xiii.   Zipmex. (2022b, June 30). Let the blockchain games begin - Zipmex. Zipmex.
         https://zipmex.com/th/en/learn/the-future-of-blockchain-gaming/

xiv.   What's possible for the gaming industry in the next dimension? (n.d.-b). EY - US.
         https://www.ey.com/en_us/tmt/what-s-possible-for-the-gaming-industry-in-the-next-dimension

xv.   Team, N. (2022c, August 15). NEAR & Gaming: How Web3 is Disrupting Gaming - NEAR Protocol - Medium. Medium.
         https://medium.com/nearprotocol/near-gaming-how-web3-is-disrupting-gaming-47198d465ba6

xvi.   Reiff, N. (2022b). Decentralized Autonomous Organization (DAO): Definition, Purpose, and Example. Investopedia.
         https://www.investopedia.com/tech/what-dao/

xvii.   Team, N. (2022d, August 15). NEAR & Gaming: How Web3 is Disrupting Gaming - NEAR Protocol - Medium. Medium.
         https://medium.com/nearprotocol/near-gaming-how-web3-is-disrupting-gaming-47198d465ba6

xviii.   TechCrunch is part of the Yahoo family of brands. (2021, December 13).
         https://techcrunch.com/2021/12/13/nike-acquires-nft-collectibles-studio-rtfkt/

xix.   Friend, T. (2023, February 16). Dapper Labs launches NBA Top Shot app.
         https://www.sportsbusinessjournal.com/Daily.aspx.
         https://www.sportsbusinessjournal.com/Journal/Issues/2023/02/13/Technology/nba-top-shot.aspx

xx.   https://cryptoslate.com/web3-startups-raised-7b-funding-in-2022-with-gaming-accounting-for-62/

xxi.   https://cryptopotato.com/web3-games-and-metaverse-projects-raised-748-million-in-august-report/

xxii.   https://techcrunch.com/2023/03/20/polygon-and-immutable-partner-to-help-onboard-more-gamers-and-developers-into-
         web3/

xxiii. Isaac, M., & Browning, K. (2022, January 19). Cryptocurrency Enthusiasts Meet Their Match: Angry Gamers. The New York Times. https://www.nytimes.com/2022/01/15/technology/cryptocurrency-nft-gamers.html

xxiv. Yahoo is part of the Yahoo family of brands. (n.d.-c). https://finance.yahoo.com/news/top-nft-game-axie-infinity-140000481.html?guccounter=1

xxv. Asher, M. (2021b, July 15). To Infinity and Beyond: The Growth of Axie Infinity. ConsenSys. https://consensys.net/blog/metamask/to-infinity-and-beyond-the-growth-of-axie-infinity/

xxvi. Manoylov, M. (2022b). Axie Infinity earned less than $1 million for the first time since early 2021. The Block. https://www.theblock.co/linked/150320/pay-to-earn-game-axie-infinitys-revenue-continues-to-slide

xxvii. Doll, I. O. (2022b, March 22). Argentines Flock to Crypto Games as Economy Eats Up Salaries. Bloomberg.com. https://www.bloomberg.com/news/articles/2022-03-22/argentines-flock-to-crypto-games-as-economy-eats-up-salaries

xxviii. Mgoesdistance.Eth. (2022b, June 24). Axie Infinity—The biggest Ponzi in crypto? | Coinmonks. Medium. https://medium.com/coinmonks/axie-infinity-a-developing-worlds-messiah-or-the-biggest-ponzi-scheme-in-crypto-right-now-564ecfb62054

xxix. Orland, K. (2021b, December 8). Ubisoft's first NFT plans make no sense. Ars Technica. https://arstechnica.com/gaming/2021/12/ubisofts-first-nft-plans-make-no-sense/

xxx. Birnbaum, J. (2022b, January 6). Why Video Game Makers See Huge Potential In Blockchain—And Why Problems Loom For Their New NFTs. Forbes. https://www.forbes.com/sites/justinbirnbaum/2022/01/06/why-video-game-makers-see-huge-potential-in-blockchain-and-why-problems-loom-for-their-new-nfts/?sh=1b64edcb43d7

xxxi. The Global Web3 Gamer Study_Oct2022.pdf. (n.d.-b). Google Docs. https://drive.google.com/file/d/12U25Iguo7xttLVHUmncWNSdnNkXSn18_/view

xxxii. GOBankingRates. (n.d.). What Are Blockchain Games? Nasdaq. https://www.nasdaq.com/articles/what-are-blockchain-games

xxxiii. Doll, I. O. (2022c, March 22). Argentines Flock to Crypto Games as Economy Eats Up Salaries. Bloomberg.com. https://www.bloomberg.com/news/articles/2022-03-22/argentines-flock-to-crypto-games-as-economy-eats-up-salaries

xxxiv. Sun, Z. (2023, February 22). Tencent Cloud signs multiple collaboration agreements with blockchain firms. Cointelegraph. https://cointelegraph.com/news/tencent-cloud-signs-multiple-collaboration-agreements-with-blockchain-firms

xxxv. Scullion, C. (2022, February 4). Nintendo says it's interested in NFTs and the Metaverse: 'We feel the potential in this area' VGC. https://www.videogameschronicle.com/news/nintendo-nfts/

xxxvi. Takahashi, D. (2021, October 22). Steam reportedly blocks cryptocurrency and NFT games. VentureBeat. https://venturebeat.com/games/steam-reportedly-blocks-cryptocurrency-and-nft-games/

xxxvii. Colp, T. (2021, November 3). EA calls NFT and blockchain games "the future of our industry." Pcgamer. https://www.pcgamer.com/ea-calls-nft-and-blockchain-games-the-future-of-our-industry/

xxxviii. Murray, S. (2021). Sony Jumps On Crypto Bandwagon With Patent To Accept Bitcoin For In-Game Betting. TheGamer. https://www.thegamer.com/sony-espots-betting-patent-crypto-bitcoin/

xxxix. Hayward, A. (2022, April 6). Ubisoft Will Bring Tezos NFTs to Other Games as Ghost Recon Support Ends. Decrypt. https://decrypt.co/97090/ubisoft-tezos-nfts-other-games-ghost-recon-support-ends

xl. TripleA crypto payment. (2023f, April 11). Crypto Ownership Data for Gaming Industry 2021 | TripleA. TripleA. https://triple-a.io/crypto-gaming-industry-2/

xli. Birnbaum, J. (2022c, January 6). Why Video Game Makers See Huge Potential In Blockchain—And Why Problems Loom For Their New NFTs. Forbes. https://www.forbes.com/sites/justinbirnbaum/2022/01/06/why-video-game-makers-see-huge-potential-in-blockchain-and-why-problems-loom-for-their-new-nfts/?sh=1b64edcb43d7

xlii. When games become gambles – criminal law implications of 'pay to earn' NFT games. (n.d.-b). Osler, Hoskin & Harcourt LLP. https://www.osler.com/en/resources/regulations/2022/when-games-become-gambles-criminal-law-implications-of-pay-to-earn-nft-games

xliii. Shi, J., Renwick, R., Turner, N., & Kirsh, B. (2019). Understanding the lives of problem gamers: The meaning, purpose, and influences of video gaming. Computers in Human Behavior, 97, 291–303. https://doi.org/10.1016/j.chb.2019.03.023what-is-web3-the-confusing-term-explained/

xliv.   Van Boom, D. (2022c, April 28). What Is Web3? The Confusing Term, Explained. CNET.
         https://www.cnet.com/personal-finance/crypto/what-is-web3-the-confusing-term-explained/

xlv.   Vayne, A. (2015b, October 13). How Nexon accidentally invented microtransactions. VentureBeat.
         https://venturebeat.com/games/how-nexon-accidentally-invented-microtransactions/

xlvi.   Takahashi, D. (2011b, January 3). Zynga's CityVille becomes the biggest-ever app on Facebook. VentureBeat.
         https://venturebeat.com/games/zyngas-cityville-becomes-the-biggest-ever-app-on-facebook/

xlvii.   Grubb, J. (2016b, April 4). Game of War's paying players spent an average of $550 on its in-app purchases in 2015. VentureBeat.
         https://venturebeat.com/games/game-of-wars-paying-players-spent-an-average-of-550-on-its-in-app-purchases-in-2015/

xlviii. Dredge, S. (2020b, April 16). Candy Crush Saga: "70% of the people on the last level haven't paid anything." The Guardian.
         https://www.theguardian.com/technology/appsblog/2013/sep/10/candy-crush-saga-king-interview

xlix.   Kleinman, B. Z. (2019b, July 8). "The kids emptied our bank account playing Fifa." BBC News.
         https://www.bbc.com/news/technology-48908766

l.   Good, O. S. (2018, February 13). Hawaii lawmakers introduce loot crate regulation bills. Polygon.
         https://www.polygon.com/2018/2/13/17007830/hawaii-loot-crate-laws-ea-star-wars-battlefront-2

li.   Yin-Poole, W. (2018, April 27). Now Belgium declares loot boxes gambling and therefore illegal. Eurogamer.net.
         https://www.eurogamer.net/now-belgium-declares-loot-boxes-gambling-and-therefore-illegal

lii.   Tampere University Dissertations. (2022). The Rise of Free-to-Play: How the revenue model changed games and playing. In Trepo.
         Tuni.Fi (No. 978-952-03-1774–4). Faculty of Information Technology and Communication Sciences of Tampere University. Retrieved
         May 1, 2023, from
         https://trepo.tuni.fi/bitstream/handle/10024/123848/978-952-03-1774-4.pdf

liii.   Huang, E. (2018b, June 1). Americans largely won't pay to win a video game — but Chinese gamers will. CNBC.
         https://www.cnbc.com/2018/05/30/pay-to-win-video-games-differences-between-us-and-chinese-gamers.html

liv.   Lost Ark Business Model. (2021b, October 25). Lost Ark - Free to Play MMO Action RPG.
         https://www.playlostark.com/en-us/news/articles/lost-ark-business-model

lv.   Parasol, M. (2023). 2023 is a make-or-break year for blockchain gaming: Play-to-own. Cointelegraph Magazine.
         https://cointelegraph.com/magazine/2023-is-a-make-or-break-year-for-blockchain-gaming-play-to-own/

lvi.   Level Up: The Future of Video Games Is Bright. (2022, December 7). Bain.
         https://www.bain.com/insights/level-up-the-future-of-video-games-is-bright/

lvii.   Everyrealm. (2023). State of Blockchain Gaming 2023. Everyrealm.
         https://everyrealm.com/blog/reports/state-of-blockchain-gaming-2023

lviii.   Reguerra, E. (2023, January 12). NFT gaming trends in 2023: Industry execs expect more big players to jump in. Cointelegraph.
         https://cointelegraph.com/news/nft-gaming-trends-in-2023-industry-execs-expect-more-big-players-to-jump-in
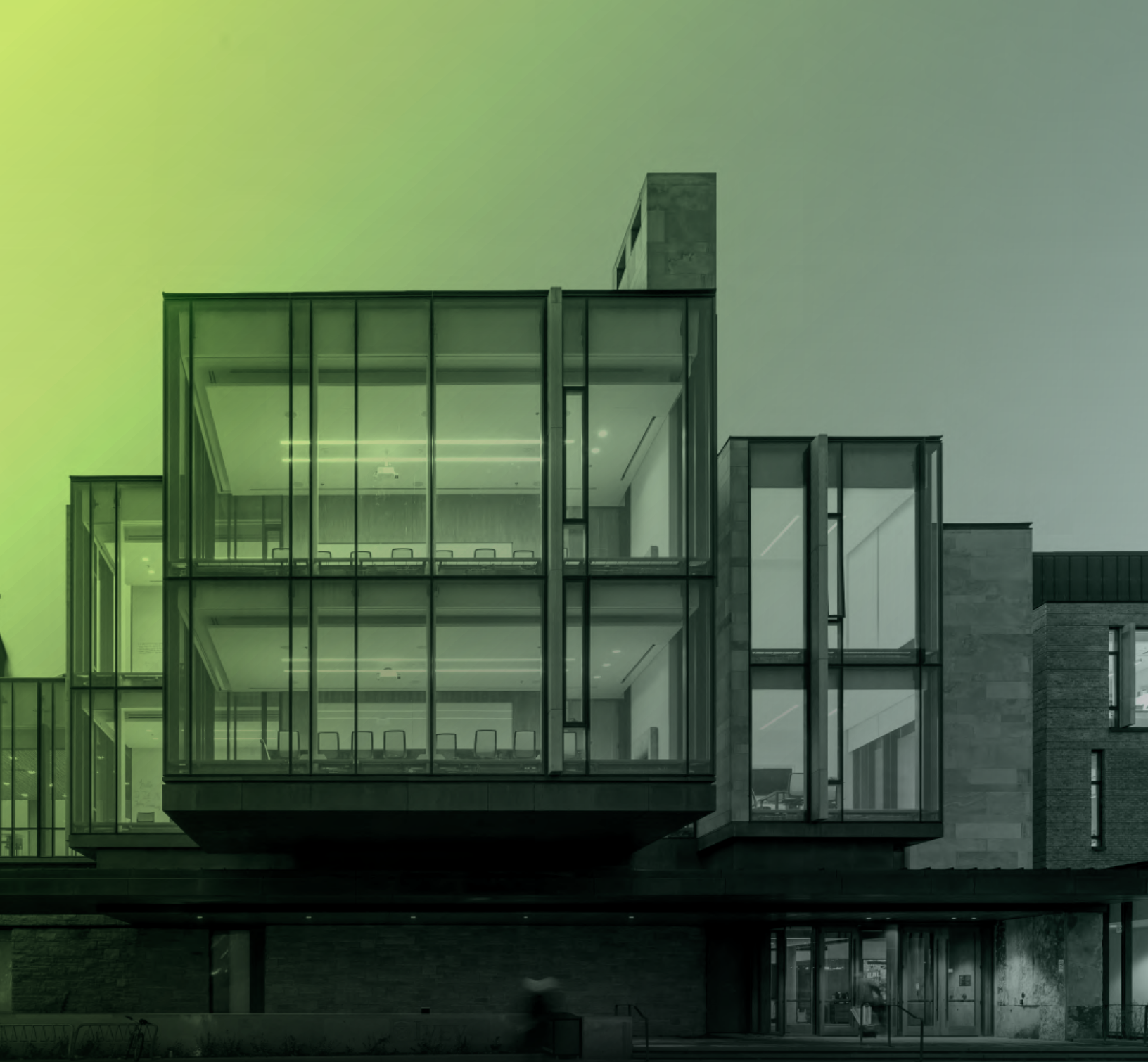
**Lawrence National Centre for
Policy and Management**

Scotiabank
Digital Banking Lab

Lawrence National Centre
for Policy and Management

Ivey Business School at Western University
1255 Western Road
London, Ontario N6G 0N1

Telephone: 519-661-2111 ext. 84253
Email: LNC@ivey.ca
www.ivey.uwo.ca/lawrencecentre