Covalent

Infinite Games

How Axie Infinity and P2E is Transforming Gaming

Foreword by Sandeep Nailwal,
Co-founder of Polygon

“We believe in a future where games are built and owned by the communities that play them. Ronin was built to expedite this transformation by acting as the technical foundation for the next generation of NFT games. Games will facilitate the onboarding of the masses into Web 3 and by doing so, ensure that the future of the internet is open and owned by its users.”

Axie Infinity (Ronin)

"Senspark has developed one of the top 3 NFT games called BombCrypto, to provide fun and finance for billions of users. Ultimately we are building a decentralized metaverse gateway via NFT games."

Hoa Vo, Bomb Crypto

“GameFi is still in the early phases of incubation. With the soon-to-be-released cross-platform Battle Game, Crabada looks to remove the friction of accessibility to the everyday person and infuse a daily dose of fun and enjoyment, while pushing the boundaries of designing a sustainable financial layer to add to an all-encompassing gaming experience that is unique to Crabada.”

Shinigummy, Crabada

“In the U.S., gaming is bigger than Hollywood, the NBA and the NHL combined. Play-to-own gaming economies are going to disrupt the gaming industries business models. This is why Polygon has created ‘Polygon Studios’ and pledged $100M to help accelerate the adoption of GameFi. We have seen awesome games deploy on Polygon already, but we anticipate the rate of deployment from game developers to increase exponentially.”

Polygon

“Avalanche's unique subnet architecture allows game developers to operate their own private chain on top of the network, creating their own L1 blockchain experience (like Flow or Ronin), fully customized to the wants of the player. The Avalanche Foundation's $220M Blizzard fund will help accelerate the adoption of NFTs and Gaming economies on Avalanche's subnets. We are extremely excited about the future of GameFi as it sits at the intersection of community and innovation. The future of gaming is here!”

Avalanche

“At 1kx we believe a fundamental understanding of GameFi is the biggest factor holding the space back. *Infinite Games* is the signal amongst the noise enabling people to gain this fundamental understanding. It's by far the best resource on Gamefi in the market today.”

Peter, 1kx Network

"There is a lot of innovation that needs to take place and Pegaxy is proud to be one of the leaders dedicated to innovation and growth. With that being said, our ethos also stands with bringing value to the GameFi space as a whole through data and experimentation. We are excited to be building in the public eye, with public documentation to help the industry succeed in the years to come."

Corey Wilton, Co-founder of Pegaxy

“Understanding a games’ reach, retention and revenue is paramount in assessing whether it’s a viable investment. *Infinite Games* is a perfect all-in-one report for understanding these metrics for the top P2E games.”

Woodstock

“Blockchain gaming economies present a very new and exciting research area. With Infinite Games, Covalent has established a strong starting point for other researchers to continue from”.

Dr. Alfred Lehar, University of Calgary

“I started out as a teacher and later moved onto youtube to educate people about crypto. I’m extremely passionate about the importance of quality education. It doesn’t matter if you are just starting out or have been in crypto from day one, read I*nfinite Games* cover to cover.”

Crypto Lark

“Covalent and CoinGecko share the same passion for lowering the educational barrier in crypto. *Infinite Games* is the go-to resource for understanding everything GameFi”

CoinGecko

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Foreword

GameFi, like DeFi in 2020, is confusing and ambiguous to investors, new entrants, and the general public as the market lacks the educational resources to on-ramp participants. Before GameFi can continue progressing and reach its full potential, market participants, especially builders and investors, should have a fundamental understanding of user behaviour, gaming economics, retention metrics and overall economic health. Though blockchain-based games purport all data to be public – deep, granular data on these chains is extremely difficult to find. The lack of information creates a barrier to entry for anyone trying to navigate this new and exciting genre of Web3.

Aside from Axie Infinity and the Ronin technology - Polygon is undoubtedly the leader in blockchain games. Through our focus on growing the developer ecosystem through investment, marketing and developer support - we're bridging the gap between Web2 and Web3. It's early innings - market participants need to understand **reach, retention and revenue** metrics to improve the gameplay further to bring the GameFi vision to fruition.

GameFi sits at the intersection of community and democratized financial services. It embodies the ethos of what we are trying to achieve in the space. By creating this e-book, our friends at Covalent are tearing down the educational barriers to entry. This is why I'm personally excited to support Covalent on their mission to progress the space through democratizing on-chain data for all. The e-book "Infinite Games" is the map that helps the reader navigate every aspect of GameFi.

Sandeep Nailwal
Co-founder of Polygon

Introduction

Introduction

Blockchain technology — and the cryptocurrencies they enable — are revamping the initial philosophy of the internet. Just as today's internet users don't need to understand TCP/IP or computer languages like Javascript, they don't need to know all the details of blockchain to benefit from it. One of blockchain's most significant applications is NFTs, which give creators irrefutable ownership over their creations - i.e. art, games, collectibles, books, etc. NFTs act as an open-sourced, censorship-resistant platform for creators to freely create and monetize, fully peer-to-peer, without the need for intermediaries like app stores and record labels.

The most exciting application for NFTs is their ability to transform traditional gaming. NFTs will enable games to be built and owned by the communities that play them. As stated by Yahoo Finance, the global gaming market has a $173B Total Addressable Market (TAM), with its expected market value to reach $314.4 billion by 2026 [link]. According to Jeff Zirlin - co-founder of Axie Infinity, which is the largest blockchain game to date - "it's evident that games will facilitate the onboarding of the masses into Web 3 and by doing so, ensure that the future of the internet is open and owned by its users." Part 1 of this eBook provides an overview of the history and the current state of GameFi and essential context for games, developers, and investors.

Using Covalent's unified blockchain API, we break down Reach, Retention, and Revenue for four of the most popular P2E blockchain games. These games have paid out billions of in-game rewards, and individual players are earning more than the top traditional ESports stars. Part 2 of the book provides a deep dive into this data for 4 of the most popular and successful blockchain games.

The State of GameFi

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Part 1: The State of GameFi - Investment Activity Explodes

Blockchain-based games date all the way back to late 2017 when Spells of Genesis was launched on Bitcoin, and CryptoKitties was launched on Ethereum. CryptoKitties was the first majorly popular game; it allowed players to collect and breed kitty NFTs. Along with the ability to collect and breed came the ability to buy and sell these NFTs as collectors had irrefutable ownership of the in-game asset for the first time. CryptoKitties saw 44k players in 2018 and significantly raised ethereum gas prices because of its popularity.

The rise in gas prices happened again in 2021 as Axie Infinity hit over 9M players, and the total Ethereum gas spent to bridge assets onto Axie Infinity's own Ronin Chain surpassed $72M. Axie Infinity brought blockchain-based P2E economies to the mainstream news, attracting some of the biggest gaming studios and venture capital firms in the world.

The P2E sector is definitely a sector you should get involved with. If you're a **gamer**, give some of these blockchain games a try - they aren't perfect yet, but they are rapidly improving, and they already offer more earning potential than traditional ESports events. If you're a **developer**, you can take advantage of the rapid growth in the sector to make an immediate impact. If you are an **investor**, it's just the beginning of this new sector, and the data in the following chapters show room for significant growth ahead. See the next page for some headline news to hit the sector in 2021.

Ubisoft launches Ubisoft Quartz platform for playable and energy-efficient NFTs.

Meta reportedly plans to integrate NFTs on Facebook and Instagram profiles.

Binance Smart Chain and Animoca Brands form

$200M

fund for GameFi projects.

Microsoft Adding 'Building Blocks' for Metaverse in Acquiring Activision Blizzard for

$68.7B

Axie Infinity developer secures

$152M

in Series B funding from investors.

MECHANISM CAPITAL

Mechanism Capital Launches

$100M

'Play-to-Earn' Gaming Fund.

Adidas enters the Metaverse with NFT partnerships.

GameFi Context

The following five pages give a brief history of video game business models, the relationships between GameFi and the broader blockchain ecosystem, and the new philosophy of the "play-to-earn" model. If you are already familiar with all of this, skip to Part 2 for the data-driven deep dive.

The "**pay-to-play**" video game business model rose to popularity in the 1970s, where it remained the most popular business model until the late 2000s. Under this model, developers make money from the initial game sales and any hardware needed to play the game. In an effort to further extract value from their players, traditional game developers could sell downloadable content (DLC) and in-game items like skins. The only way players could extract value from a game was in the form of enjoyment (and maybe resale of the physical game).

This changed in the late 2000s when the "**free-to-play**" model was introduced through the widespread use of the internet. Though the "pay-to-play" model still produces some popular games, the "free-to-play" model has taken over as players can interact online with no upfront cost. Monetization for the developers comes through in-game purchases, DLC packs and advertisements, while monetization for players comes through streaming and e-sports. A great "free-to-play" example is Fortnite, which launched in 2017 and saw over 80 million monthly players generate over $9 billion in revenue in 2018. Players can buy in-game assets such as weapons, skins, tokens and DLC packs like the Battle Pass - but they are impossible to sell or trade because game developers have ultimate control over every aspect of the game. This has caused instances of overreach by game developers and clashes between developers and players. The new, blockchain-based, 'play-to-earn' model intends to create a scenario where developers can monetize their games while distributing ownership of the blockchain-based economies to players.

The new, blockchain-based, '**play-to-earn**' model intends to create a scenario where developers can monetize their games while distributing ownership of the blockchain-based economies to players. The distribution of ownership, in the form of in-game tokens and NFTs, gives players the ability to govern the game's direction and monetize the time they spend playing. They can also purchase in-game assets (similar to the "free-to-play" model) to improve their experience, but players maintain ownership at all times because these assets are tracked on the blockchain. This means the game assets can be bought and sold on marketplaces and has also introduced a speculative element into the game economies. The most popular "pay-to-earn" game of 2021 was Axie Infinity which uses a similar breed-and-battle mechanism to the Pokemon card game - except the Pokemon-like characters (Axies) are non-fungible-tokens (NFTs) tracked on the Ronin blockchain.

Connections to the NFT Ecosystem

The launch of CryptoKitties as NFTs in 2017 opened the crypto market to blockchain-based games. To understand why let's do a quick recap on what it means to be fungible, and we can explore non-fungibility from there. A fungible asset is one that is easily replaced by something identical - typically, this is some sort of token or money. If someone lends you a $10 bill, you can pay them back with a different $10 bill (or even two $5 bills) because there is nothing unique about the different bills at a given face value. Now, if someone lends you a rare pokemon card and you don't return the exact same one, they would be justifiably displeased. Pokemon cards have different properties that make them distinguishable (and more valuable). That is the essence of non-fungibility. If we put every pokemon card on the blockchain and recorded its different attributes (set, condition, rarity, character, etc.), then we would have an NFT. These NFTs manifest as different characters, skins, weapons, and other in-game items in blockchain games. The ownership of each is recorded on the blockchain, and the history of every item can be tracked from inception.

This irrefutable ownership opens up avenues of composability and removes the ownership barrier faced in “free-to-play” games. It also means that non-players can get involved by speculating on different in-game items. If you think a certain character or skin will be valuable in the future, you can speculate on it without ever playing the game - this introduces speculative volatility and affects the “play-to-earn” economics.

Connections to the Decentralized Finance (DeFi) Ecosystem

GameFi is a portmanteau referring to the intersection between the “play-to-earn” gameplay model and the decentralized trading, lending, and staking characteristic of DeFi.

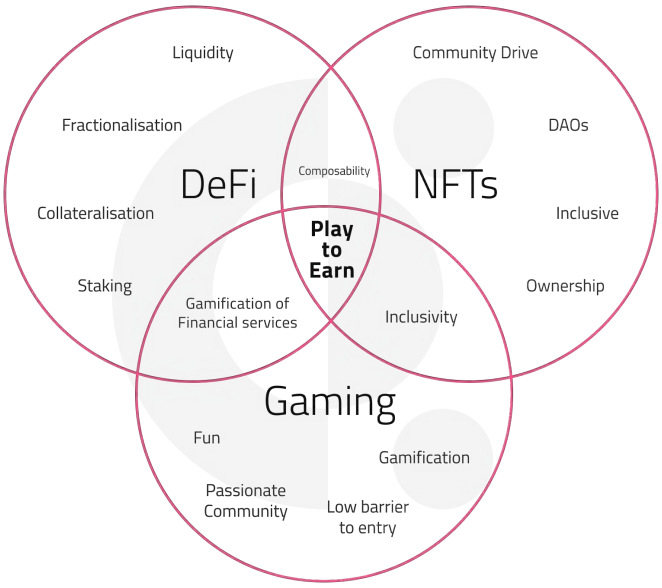
The “play-to-earn” model involves fungible reward tokens which can be traded, lent, and leveraged through various DeFi technologies. When gaming and DeFi are brought together, players can earn tokens by playing and then earn an additional yield by staking or lending those tokens. These DeFi concepts can also be applied to the NFT assets required to play the game. Axie Infinity’s popularity growth pushed the price of entry close to $1,000 at its peak, which prompted early players to lend their NFTs to new players in return for a piece of the earnings generated by playing the game. Many proponents of “play-to-earn” and DeFi claim that this intersection will finally free the players from the overreach of game developers and could even develop into a form of universal basic income (UBI).

As of this writing, the major DeFi elements incorporated into the “play-to-earn” space are mostly decentralized exchanges (DEXes), staking programs, and lending programs - though more integrations like NFT collateralization and fractionalization are certainly in development.

The Philosophy of GameFi

Up to this point, there has been no mention of enjoyment or the different fun elements of "play-to-earn" games. This is because the discussion of fun is primarily absent from the philosophy of GameFi. This is arguably because the basic economic elements of "play-to-earn" games need to be ironed out before the exciting and fun elements. Developers can focus on adding features and making it more enjoyable once a game has created a strong network and a sustainable economy. As such, this book will not be about the enjoyment garnered from "playing" each of the games in question, but rather it will discuss the economics for all of the involved parties. In fact, *fun* does not even factor into the analysis in most media pieces, and that will not change with this book.

That said, GameFi is all about ownership. The players own the assets and the different tokens used in the game. Developers typically hold tokens as well to keep their incentives aligned with the players. Eventually, the players will manage development treasuries via decentralized autonomous organizations (DAOs) and control the development and maintenance of the games as well. For developers, this means no middle man (app-stores) cutting into the profits, and for players, it means they can do whatever they please with their in-game assets and steer the game in the direction that they desire.



The Significance of GameFi

In the past year, GameFi has become a common term amongst crypto circles. This popularity has translated to on-chain significance as well. Almost 50% of the active wallets in the past two quarters have played a blockchain game, and over 20% of total NFT sales in 2021 came from game-related purchases.

The Size of GameFi

The blockchain gaming sector has grown exponentially in all regards throughout 2021. The top 10 games by total value locked (TVL) account for over $6.5B and 1.4M unique daily active wallets at the time of writing. The top game of the year, Axie Infinity, has grown to a peak of 2.5 million daily players at its peak. The game has seen more than 9.7M unique wallets, 1.5M unique NFT buyers and over 6.5M unique wallets claiming SLP in 2021. Axie Infinity NFT sales topped $4B in 2021 and made up a whopping 20% of all NFT sales over the course of the year. The Ronin bridge (Ronin is Axie Infinity's chain) is the #3 bridge from Ethereum in terms of net value flows with more than $3.7B locked in the contract and over $14B having flowed through the contract in 2021. Roughly 882k unique wallets used the bridge in 2021, and they spent over $72M in gas doing so. All of that is just one game - in this book, we will look deeper into Axie Infinity and some other top games.

One thing is extremely clear - GameFi made a splash in 2021 and is worthy of the attention that it garnered. The next page gives some high-level statistics covering the GameFi space and an indication of the research to follow in Part 2.

Top 10 games account for

1.4M

daily active wallets and

$6.5B

in total value locked

Axie Infinity alone topped

$4B

in NFT sales across

1.4M

wallets in 2021

Over

$3.1B

was “earned” by

6.4M

wallets through Axie Infinity in 2021

Splinterlands hit over

350k

daily active wallets in 2021

The Ronin bridge moved over

$14B

in assets in 2021.

The Top Blockchain Games

Part 2: Data Behind the Top Blockchain Games

So far, we have talked about the history and philosophy of blockchain games; now, it's time to dig into the data and put facts into ideas. This part of the book focuses on each game's *Reach*, *Retention*, and *Revenue*. This triad defines the competitive characteristics of the game and gives insight into its ability to grow and monetize a loyal group of players. Successful games will see positive player growth, high retention, and increased revenue growth (for both players and developers).

We have chosen a collection of the 4 top games across four significant blockchains. These represent the top games from the largest ethereum-virtual-machine (EVM) blockchains. These games are:

PEGAXY ON polygon

AXIE INFINITY ON Ronin

BOMB CRYPTO ON BINANCE SMART CHAIN

CRABADA ON AVALANCHE

10M

Active Players - All-Time

6.7M

Players that have claimed $SLP

1.1M

Players that have sold an Axie on marketplace

1.7M

Players that have bought an Axie on marketplace

450K

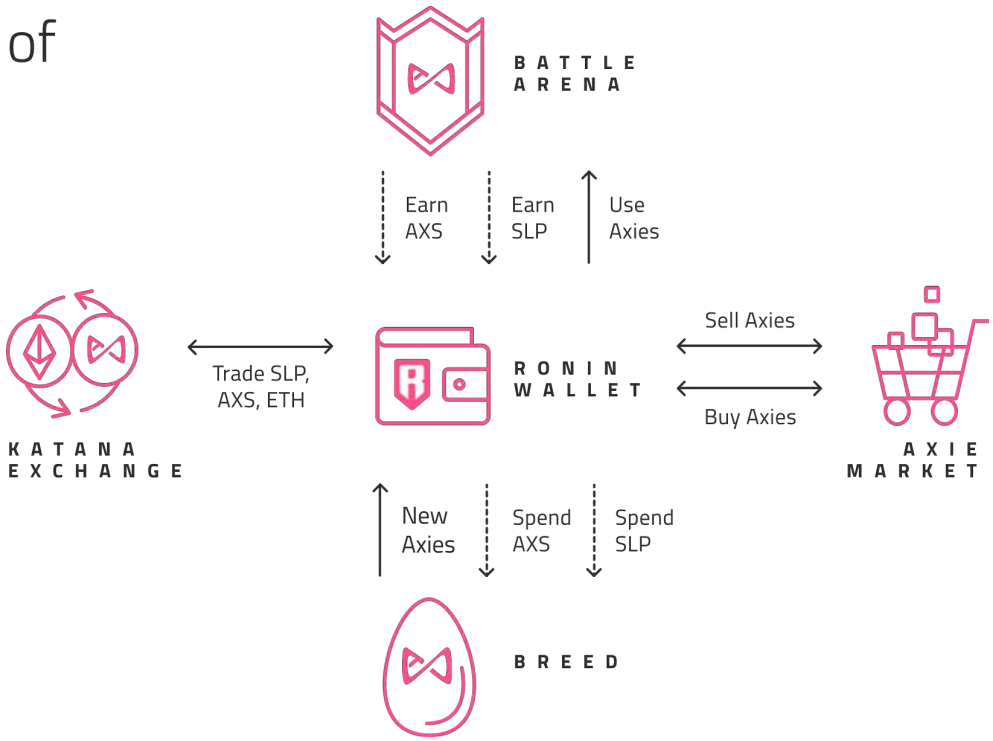
Players that have bred an Axie

Axie Infinity (Ronin) - Introduction to the Game

Axie Infinity is by far the most popular blockchain game of recent history, with more than 10M players all-time and over 2.5M daily active players at its peak. The game began on the Ethereum blockchain and has since moved to a gas-free chain made specifically for the game, called Ronin. This analysis is focused on the recent history and the game's explosive growth fueled by the Ronin chain since May 2021.

This analysis will center around the players and the ways in which they interact with the game (earning, breeding, buying, and selling). We will look at the acceleration of growth (reach), compare new and existing users, and examine month-over-month player retention in each category. We will also dig into the revenue mechanisms for both players and developers.

The Economics of Axie Infinity



The visual above gives a high-level breakdown of how Axie infinity keeps value cycling around the ecosystem. First, though, the value must flow into a Ronin Wallet (center in the diagram above) and happens in three ways:

- Bridge from Ethereum to Ronin.
- Binance integration with Ronin.
- Ramp Network allows users to deposit directly into their Ronin Wallet.

After a user has funded their wallet, they can buy and sell on the Axie NFT marketplace. If a user is looking to battle in the arena, they'll need to buy at least 3 Axies. They can also trade or provide liquidity for SLP, AXS, and WETH on the Katana DEX.

Once a player starts battling, they begin earning SLP rewards which can only be redeemed every two weeks. Within this time, if a player shows exceptional skill, they can be ranked on a global leaderboard to earn AXS as an additional prize.

As seen in the preceding diagram, these rewards (both SLP and AXS) are meant to flow into the breeding of more Axies. The SLP (which is generated when claimed) is burned upon the breeding of Axies. The AXS used in breeding is sent to the Axie Treasury and distributed as future rewards.

Retention comes from players wanting to play more to earn more, earn more to spend more, spend more to level up their team, and level up their team to earn more. Then the cycle starts over, theoretically capturing the value that enters the ecosystem. If SLP and AXS tokens leave the ecosystem and consequently aren't used for breeding more Axies, they can't be recycled back to pay the current players in the battle arena. For the Axie Infinity economy to remain sustainable in the long term, the SLP burnt from breeding needs to exceed, or equal, the amount of SLP minted through in-game rewards. If players redeem more SLP in the arena than what is burnt from breeding, then the supply of SLP increases, putting downward pressure on the price of SLP. If token prices fall, the earning potential drastically decreases, and players lose the financial incentive to play the game.

Axie Infinity

Player retention was extremely high from May to October with over

60%

of players returning month over month through that period.

Over

66%

of players have claimed rewards from the game.

Only

15%

of players have ever bought an Axie and

10%

have sold one.

Less than

5%

of players have ever bred Axies.

Less than

5%

of those that do breed, continue breeding in consecutive months.

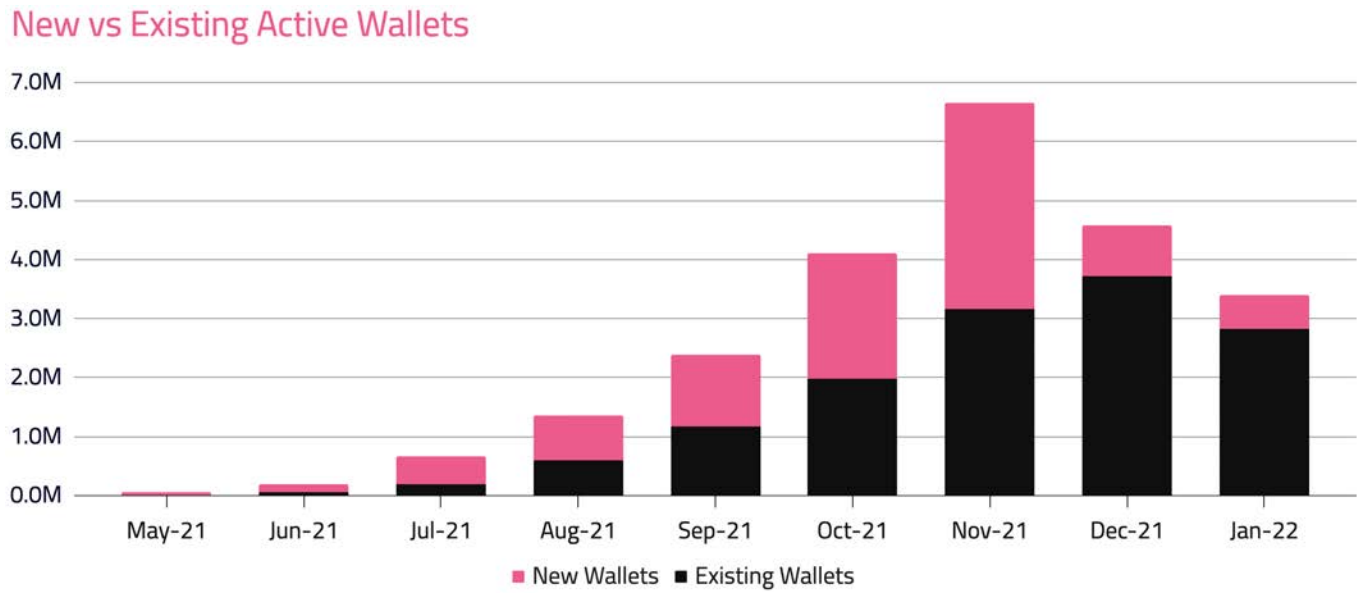
Axie Infinity (Ronin) - Reach

The reach of a game can be defined as the number of players that it attracts to different in-game elements. This is an extremely important indicator for growth and popularity as it is directly correlated with retention and revenue. Ronin - the blockchain that tracks all of the Axie transactions - surpassed 1M daily active wallets for the first time on November 13, 2021, and surpassed the 5M monthly active wallets mark.

January 2022 closed out with 3.4M active wallets - a mark that pushes it back to September 2021 in terms of active wallets and roughly half of its November peak. The table below shows both total and new wallet counts and their respective growth rates since the launch of the Ronin chain.

Month	New Wallets	Growth	Existing Wallets	Growth	Total Wallets	Growth
May-21	61,942		3,066		65,008	
Jun-21	138,799	124%	56,921	1757%	195,720	201%
Jul-21	475,254	242%	190,993	236%	666,247	240%
Aug-21	767,941	62%	594,610	211%	1,362,551	105%
Sep-21	1,223,896	59%	1,165,380	96%	2,389,276	75%
Oct-21	2,126,580	74%	1,983,663	70%	4,110,243	72%
Nov-21	3,503,516	65%	3,155,173	59%	6,658,689	62%
Dec-21	860,125	-75%	3,715,191	18%	4,575,316	-31%
Jan-22	576,654	-33%	2,826,254	-24%	3,402,908	-26%

The average new wallet growth rate of the past three months was -14%, and the total wallet growth rate over the past three months was 1.6%. These are low growth rates brought on by the decline in $SLP and $AXS token prices (more on that in the conclusions section). The Axie Infinity team is actively working to fix the issues by reducing the circulating supply of $SLP and reducing the amount earned in-game to reduce downward price pressure on the token.



The chart above gives a visual representation of the exponential growth that the game underwent from May-November 2021. Over 50% of the wallets each month in this period were new, and the existing wallets continued to grow month over month through this period as well.

Interestingly, December saw a steep decline in new wallets but showed growth in the retention of existing players. This is a very important point because it shows the stickiness of the game and the committed user base that it has grown. Even amidst a 50% decline in token price, the game attracted over 4.5M active wallets.

Now that the baseline is established let's look at some of the players' actions within the game. To play the game, you need to buy (or borrow) 3 Axies. Buying can be a financial strain for some people, so it has been popular to borrow Axies in a scholarship program where you split the earnings with the manager (or guild, see Appendix 2) who loaned you the Axie. The table below shows a low number of total buyers and an unsteady (sometimes negative) growth rate. It is obvious that a low buyer to player ratio is a sign of friction when it comes to growth. This could have been an early indicator of the economic troubles that Axie Infinity ran into and will be a key metric to watch as the game starts to swing back into popularity.

Month	New Buyers	Growth	Existing Buyers	Growth	Total Buyers	Growth
May-21	16,375		928		17,303	
Jun-21	51,206	213%	9,927	183%	61,133	253%
Jul-21	178,001	248%	36,611	269%	214,612	251%
Aug-21	200,533	13%	104,452	185%	304,985	42%
Sep-21	178,323	-11%	142,436	36%	320,759	5%
Oct-21	214,541	20%	176,710	24%	391,251	22%
Nov-21	286,189	33%	233,514	32%	519,703	33%
Dec-21	234,274	-18%	192,075	-18%	426,349	-18%
Jan-22	146,478	-37%	168,158	-12%	314,636	-26%

Of note in the above table is the negative growth in new Axie buyers in September. This is in stark contrast to the 1M+ new players in the game in September and an early indicator for the financial troubles that lead to the negative player and buyer growth in subsequent months.

New vs Existing Active Axie NFT Buyers

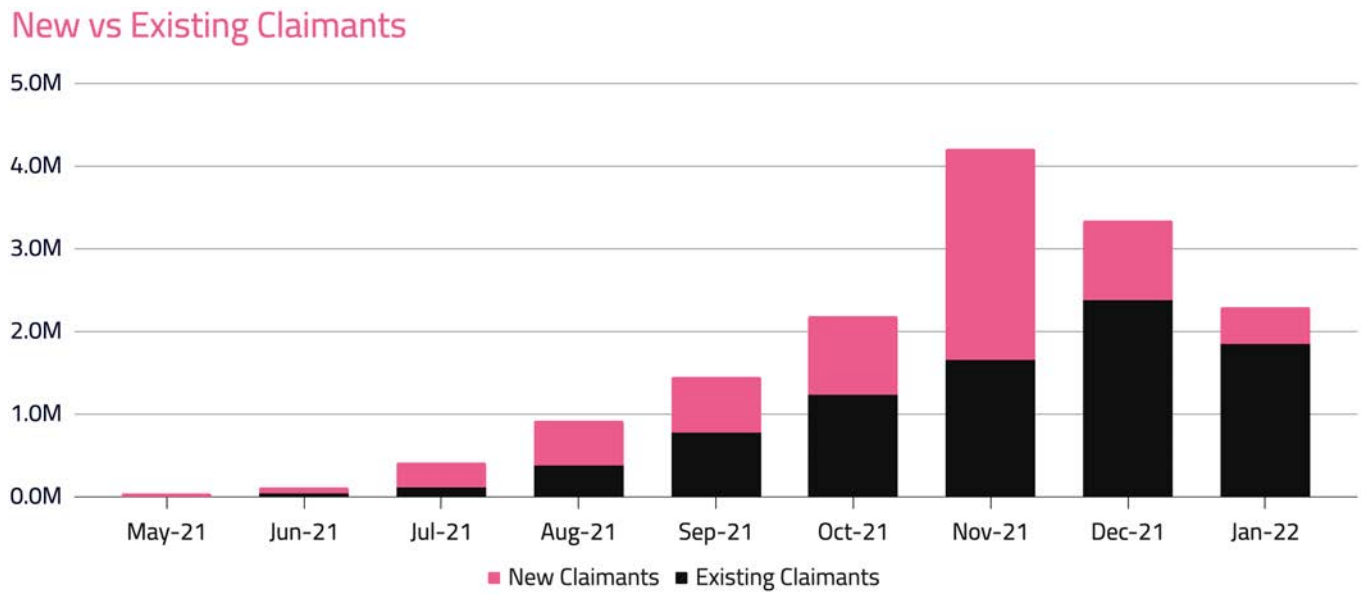
However, about 50% of traffic in November was from previous buyers each month since September. This also implies a high churn rate for new users. We will dig into the buyer retention analysis in the next section.

The key feature of Axie Infinity is its Play-to-Earn nature so let's explore how many players are earning. We will explore how many people are earning, how many of those are earning for the first time, and how many earners continue earning months down the line.

Month	New Claimant	Growth	Existing Claimant	Growth	Total Claimants	Growth
May-21	41,356				41,356	
Jun-21	76,778	86%	36,179		112,957	173%
Jul-21	308,128	301%	110,799	206%	418,927	271%
Aug-21	545,949	77%	377,657	241%	923,606	120%
Sep-21	676,472	24%	775,926	105%	1,452,398	57%
Oct-21	943,828	40%	1,237,611	60%	2,181,439	50%
Nov-21	2,557,880	171%	1,654,892	34%	4,212,772	93%
Dec-21	963,651	-62%	2,380,079	44%	3,343,730	-21%
Jan-22	449,265	-53%	1,845,423	-22%	2,294,688	-31%

The growth of players claiming SLP has been slowing since July - until November broke that trend in astonishing fashion, and December sharply corrected. The initial decrease was another troubling indicator because the growth in the number of players remained more or less steady while the growth of SLP claimants declined. This meant that the number of players increased, but the number of players claiming SLP was not increasing at a proportional rate - so each month, a smaller percentage of the total players were claiming rewards. November flipped that trend and saw 171% growth in players claiming SLP.

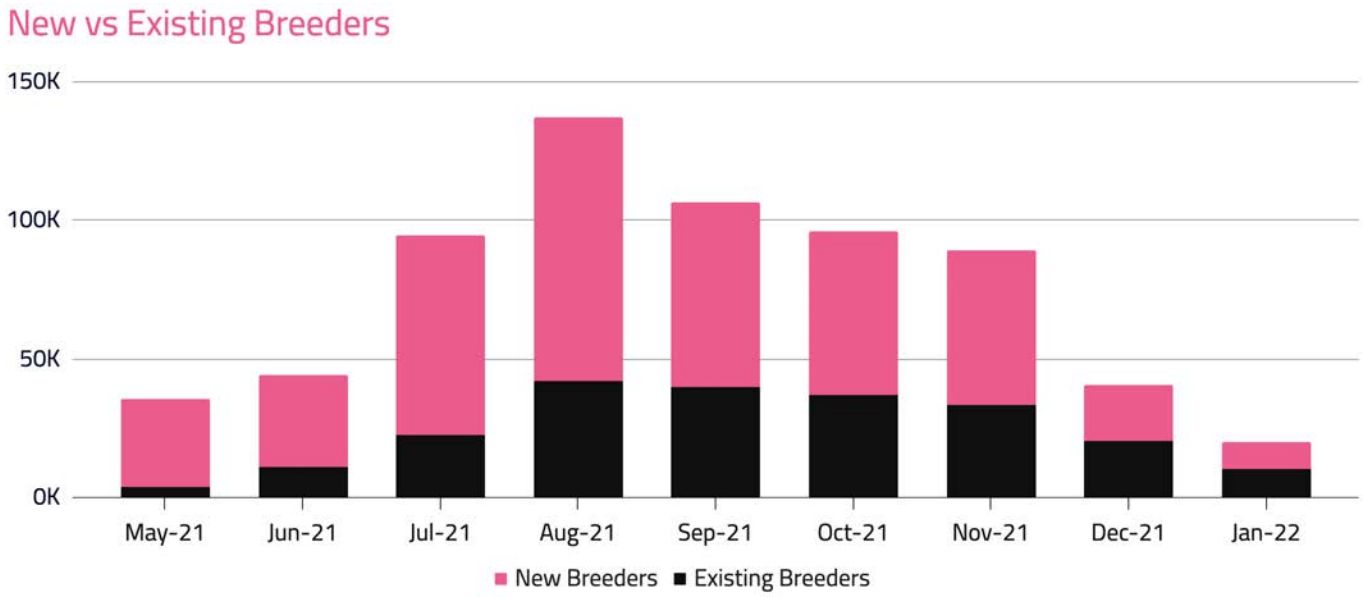
The visual below shows that the growth in returning claimants still continued into December despite the drop-off in new players and the token price correction. This is more support for the stickiness of the game. Players still found it valuable to claim, even during the volatility.



The in-game mechanism to spend your claimed SLP is through breeding. This requires two Axies and costs SLP in increasing amounts depending on how many times each Axie has been bred previously. It also requires AXS tokens (the amount of which depends on the current developer set configuration). The benefits of breeding would be maximized when the price of SLP and AXS are low, and the price of Axies are high. Currently, the price of Axies are low, SLP is low, and AXS is low. This is reflected in the decline of breeders since August and the negative growth rates shown in the table below.

Month	New Breeders	Growth	Existing Breeders	Growth	Total Breeders	Growth
May-21	31,622		3,911		35,533	
Jun-21	33,151	5%	11,075	183%	44,226	24%
Jul-21	72,207	118%	22,473	103%	94,680	114%
Aug-21	94,982	32%	42,062	87%	137,044	45%
Sep-21	66,532	-30%	39,842	-5%	106,374	-22%
Oct-21	58,706	-12%	37,128	-7%	95,834	-10%
Nov-21	55,693	-5%	33,407	-10%	89,100	-7%
Dec-21	20,065	-64%	20,442	-39%	40,507	-55%
Jan-22	9,716	-52%	10,254	-50%	19,970	-51%

Not only is the total number of breeders shrinking month over month, but the number of existing breeders is also shrinking - this means breeding is not consistently profitable for anyone regardless of their experience level. With decreasing growth rates and a decline in existing breeders, the retention rates shown in the next section are bound to be low.



Axie Infinity (Ronin) - Retention

Explosive growth is not sustainable without equally high player retention. The table below groups new users into cohorts based on when they first joined the game and tracks their cohorts throughout the months since they started playing.

The table below shows extremely high player retention from May until November. The lowest retention comes in the month of December as the September, October, and November cohorts all had significant attrition. Only 23% of the September cohort, 32% of the October cohort and 47% of the new November cohort were active in December. Interestingly though, the older cohorts seem to have mostly stuck around through December and January, with more than 50% of the May, June, and July cohorts sticking around all the way until January. This is great to see for the longevity of the game, and it seems the December cohort is bucking the downward trend of declining retention as 63% of them returned in January.

Cohort	New Addresses	Month							
		1	2	3	4	5	6	7	8
May-21	61,942	87%	92%	85%	79%	78%	74%	62%	56%
Jun-21	138,799	95%	89%	81%	79%	74%	63%	56%	
Jul-21	475,254	87%	78%	76%	72%	58%	50%		
Aug-21	767,941	82%	73%	68%	54%	46%			
Sep-21	1,223,896	74%	63%	23%	41%				
Oct-21	2,126,580	65%	32%	24%					
Nov-21	3,503,516	47%	17%						
Dec-21	860,125	63%							
Jan-22	576,654								

Now, let's switch gears to look at the retention of Axie NFT buyers. For context, we would not expect these retention numbers to be as high as simply playing the game. There is no need to purchase Axies beyond the first month - you can breed and grow your team in other ways - so low buyer retention is not overly concerning. It is still very interesting to see the NFT buyer patterns over the course of the game.

Interestingly, the first cohort consistently has the highest retention of Axie buyers, meaning that a higher proportion of those wallets which bought Axie NFTs in May continue to buy month over month compared to buyers who entered after May. Again, this speaks to the stickiness of the game and gives hope for a popularity upswing if the token price recovers.

The increasing number of players and a small number of buyers shows that the demand for Axies might be stagnant because of the number available through the scholarship programs. This suggests that the early cohort may have bought a significant number of Axies, and they are now loaning them to new players in order to earn SLP. If there are more Axies available for loan than there are on the marketplace, then it would push marketplace prices up and incentivize any new players to join through a guild.

Cohort	New Claimants	Month							
		1	2	3	4	5	6	7	8
May-21	41,356	87%	91%	81%	73%	72%	67%	54%	47%
Jun-21	76,778	95%	89%	79%	76%	69%	59%	52%	
Jul-21	308,128	89%	78%	76%	69%	56%	47%		
Aug-21	545,949	81%	77%	69%	55%	45%			
Sep-21	676,472	73%	66%	53%	44%				
Oct-21	943,828	57%	44%	35%					
Nov-21	2,557,880	42%	16%						
Dec-21	963,651	37%							
Jan-22	449,265								

The breeders have the lowest retention of all activities. Only 4% of players that were breeders in the May cohort bred Axies in October despite the fact that 78% of the players from this cohort were still playing in October. The number of new breeders is significantly decreasing month over month, along with the retention of those who do choose to breed. This is alarming because it shows the main SLP burn mechanism is not being used. The implications here are that the SLP is either being saved with the intention to breed in the future when conditions improve or the SLP is being sold on the open market. The second option is likely, given the sharp decrease in SLP price through December. Nearly all of the SLP minted by the game was flowing onto the open market through this period (and even well before December), so it is understandable that the price crashed.

Interestingly, over 51% of the new players in May were also breeders. This percentage has steadily fallen to the point where only 1.5% of new users in the December cohort were also breeding.

Watch for these retention numbers to improve in the future as the Axie development team attempts to ease the selling pressure on SLP and increase the profitability of breeding.

Cohort	New Breeders	Month							
		1	2	3	4	5	6	7	8
May-21	31,622	23%	15%	11%	6%	4%	3%	7%	8%
Jun-21	33,151	44%	27%	13%	9%	6%	3%	1%	
Jul-21	72,207	38%	15%	9%	6%	3%	1%		
Aug-21	94,982	22%	11%	7%	3%	1%			
Sep-21	66,532	22%	11%	4%	2%				
Oct-21	58,706	18%	6%	3%					
Nov-21	55,693	12%	4%						
Dec-21	20,065	11%							
Jan-22	9,716								

Axie Infinity (Ronin)- Revenue

Again, to play Axie Infinity, you need to purchase at least 3 Axies from the marketplace (or borrow them from a guild). To date, over 14M Axies have been bought/sold for a total of over $4B. There have been 1.5M wallets that bought an Axie and 1M wallets that sold an Axie. The most valuable Axie sale to date was for 300ETH ($120k at the time, $950k now).

Let's dig into how much you can earn by actually playing the game. In the last eight months, $3.1B of SLP has been claimed across 6.7M wallets. This breaks out to about $60 per wallet per month. We can look at the median marketplace spend on Axie NFTs per wallet as a measure of how much the typical wallet has spent on Axies throughout the game. This breaks out to a median of $867 per wallet, which makes the typical break-even time frame about 14 months.

It is important to note that the number of wallets is not necessarily proportional to the number of players because one Ronin wallet can be linked to multiple Axie gameplay accounts, and thus one Ronin wallet can back multiple players (this is how the scholarship program works). That being said, we can still see the total amount of SLP claimed each month and thus the full picture of revenue generated for players (even if

we don't know exactly how many players there are). As seen in the table below, the peak was $622M claimed in November, followed by a sharp 54% drop-off in December coinciding with the price drop of the token. January saw record low SLP claims and the first month under $150M since June 2021.

Month	Total SLP Claimed (USD)	Growth
May-21	$54,689,229	
Jun-21	$62,182,302	14%
Jul-21	$407,565,930	555%
Aug-21	$602,657,199	48%
Sep-21	$423,120,929	-30%
Oct-21	$546,063,175	29%
Nov-21	$622,159,785	14%
Dec-21	$289,300,681	-54%
Jan-22	$137,914,748	-52%

The final pieces of the puzzle here are the revenues generated for the games' treasury and for the developers at Sky Mavis. The treasury earns AXS for each breeding event and 0.05% of trades on Ronins DEX (Katana). This amounts to $1.1B all time and $62M in the month of December. The December value is 68% lower than the $196M that the treasury made at the peak in November. This decline in December is expected - it is not indicative of a 68% drop in breeding. The breeding fees were adjusted on December 7th, and the AXS fee (which made up about 80% of the fee) was cut in half. The SLP fee was tripled, but due to the low price, still has not grown significantly in dollar terms.

The Sky Mavis team takes 4.25% of NFT sales on the marketplace. This marketplace fee equals over $170M in all-time revenue and $13.5M in December revenue. However, these revenues are extremely volatile and dependent on how many players there are. As mentioned above, the new user growth is down significantly and the NFT revenues along with it. Sky Mavis saw a 59% drop in revenue in December when compared to the $35M in November revenue from the NFT marketplace.

Month	Marketplace Volume ($)	Growth
May-21	$30,752,237	828%
Jun-21	$124,955,538	306%
Jul-21	$695,015,529	456%
Aug-21	$870,888,615	25%
Sep-21	$526,132,778	-40%
Oct-21	$554,951,988	5%
Nov-21	$772,125,766	39%
Dec-21	$316,272,386	-59%
Jan-22	$132,896,370	-58%

Axie Infinity Conclusions and Implications

Players were joining Axie infinity at staggering rates throughout 2021 until economic collapse slowed the growth of the game. Over the growth period, monthly new wallet growth exceeded 60%, and roughly 81% of those wallets continued on to a second month. This growth stalled in December as the earning potential slid along with the token price. December saw negative growth rates across the board and pushed the game back to June 2021 in terms of player revenues.

Digging deeper, we see that not many players are buying or breeding Axies. This means that the new players are likely joining through scholarship programs that are controlled by existing players. Without ownership, churn rates start to rise, and the price of Axies decreases as a result.

Over the boom, more than 75% of players collected earnings every month since joining the game, which means that if a player reached the point of collecting SLP, they were very likely to continue playing and continue earning. Earning through breeding and selling Axies appears to be unprofitable now, given the negative growth and high churn rates of those activities. Earning retention significantly dropped across all activities as earning potential dropped throughout December; however, with the right

improvements, the Sky Mavis team may be able to recreate the growth of the past. We have looked at the GameFi ecosystem through the lens of the largest blockchain game from 2021 - Axie Infinity - and analyzed over 700M rows of on-chain Ronin data. Axie Infinity has seen over 6.7M wallets claim over $3.1B in SLP from the game. The NFT marketplace facilitated more than $4B in sales for over 1.5M different wallets. And the bridge has brought more than $5B into the Ronin ecosystem. The median wallet can break even after 14 months of gameplay with revenue of $60 per month and a total median cost of $862 to build a team.

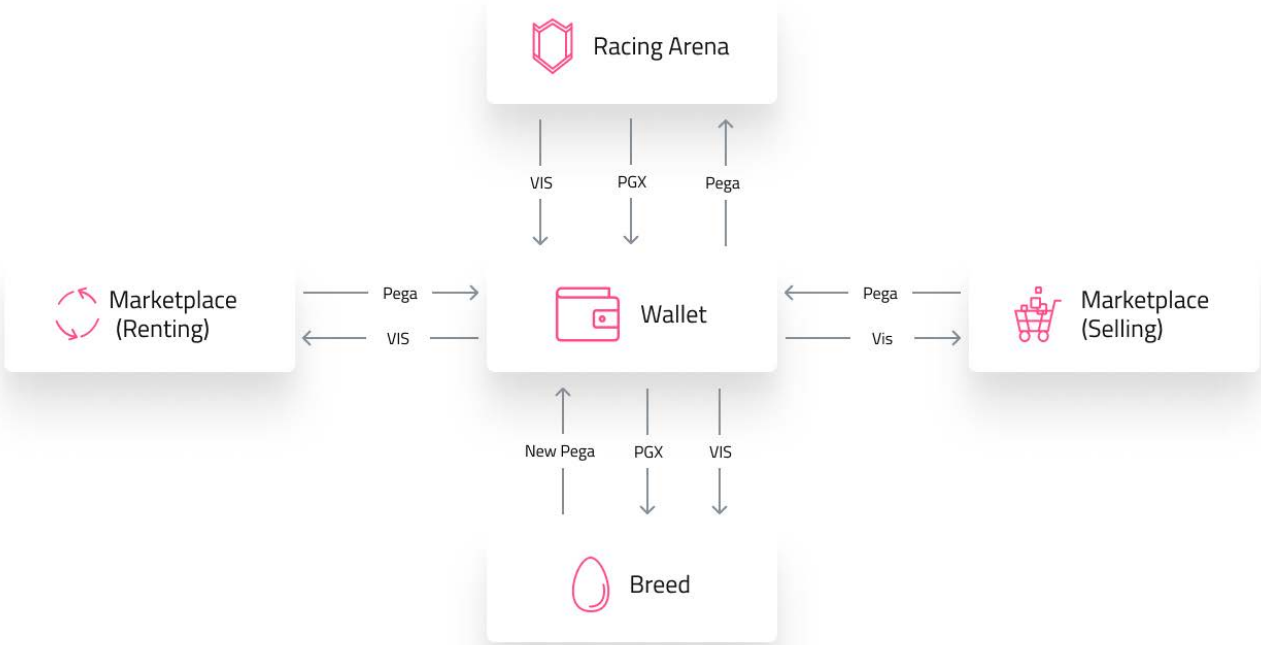
While the summary numbers are staggering, the monthly numbers have sharply declined since November on all fronts. SLP claims have decreased by 54% since November, NFT marketplace sales are down 59%, and bridge traffic has decreased by 62%.

The Axie Infinity Economy - like any economy - will go through growth and contraction cycles, so short bursts of negative growth are understandable. The $3.1B in community earned revenue should surpass $4B by the end of March 2022 as long as the ecosystem can recover from the slow months of December and January. Axie demand is low, and Axie prices are correspondingly low, so now is a great time to start a team and learn what the game is all about.

Pegaxy (Polygon) - Introduction

Pegaxy is a play-to-earn PVP-style horse racing game built on Polygon, where players compete for top 3 placement against 11 other racers simultaneously. The attractive graphics, innovative trustless rental system, and Axie Infinity-inspired economic model has made Pegaxy one of the most exciting games in the entire GameFi ecosystem. Within the game, players are able to breed, rent, sell, and of course, race their Pega (horse NFT) to earn rewards (VIS tokens). This economic system enables teams to build large guilds scholarship programs and provides solo players with the opportunity to earn in-game tokens through daily racing.

Once a player has either bought or rented a Pega, they can start competing in the arena to earn VIS tokens. The game's governance token (PGX) can also be won through ranking on global leaderboards and placing in the Grand Dash Tournament. The Grand Dash Tournament takes the top 12 racers with the highest statistics in each class, each month! There are 11 qualification months, with the Grand Dash Final held in December of each year. With their in-game rewards, a player can then rent, buy, or breed more Pega's or cash out by swapping to a different token.



Renting a Pega from the marketplace is completely automated and trustless (unlike in Axie Infinity). Pegaxy enables two options for people to rent Pegas - upfront payment or profit share:

- **Upfront Payment** - The upfront payment allows renters the chance to pay a single upfront fee (denominated in PGX) to rent a horse for a set amount of time.

- **Profit Share** - Profit sharing is a popular renting system seen by gaming guilds like YGG. It's where players share in-game rewards with the owner of the playable NFT - like a Pega.

Breeding requires both PGX (governance token) and VIS as well as two Pegas - one male and one female. Similar to Axie Infinity, the VIS from breeding is burnt from the circulating supply, and the PGX goes into a community treasury. All Pegas can be bred seven times, with each following breed costing more. You can reference the current rates through the game's extremely detailed documentation.

Pegaxy (Polygon) - Reach

Month	New Wallets	Growth	Existing Wallets	Growth	Total Wallets	Growth
Nov-21	7,168				7,168	
Dec-21	35,607	397%	5,308		40,915	471%
Jan-22	69,832	96%	20,715	290%	90,547	121%

The game launched in mid-November and has pretty scarce statistics and adoption as a result, but the numbers are very promising. In the face of a struggling GameFi ecosystem, with many in-game tokens experiencing significant drawdowns, Pegaxy has spun a narrative of strong growth. The game more than doubled its active users by growing 121% over the month of January. The economy of Pegaxy is very complex so let's dig into the reach of some other in-game aspects as well.

Month	New Buyers	Growth	Existing Buyers	Total Breeder	Growth
Dec-21	2,276			2,276	
Jan-22	9,571	321%	1,753	11,324	398%

To play the game, you need to either purchase or rent a Pega. In December, 2,276 distinct wallets purchased Pega's, which more than tripled in January, with over 11,324 unique wallets purchasing at least one Pega. This purchasing growth is an extremely strong sign for the game. If we look at the other mechanism to acquire a Pega for gameplay (rental), we can see the full picture of how users are joining the game.

Month	New Renters	Growth	Existing Renters	Total Renters	Growth
Dec-21	23,263			23,263	
Jan-22	71,899	209%	15,110	87,009	274%

In December there were 23,263 unique renters which grew by 274% to 87,009 in January. This makes up 96% of the total user count of the game for the month of January! That means 96% of players were also renters at one point during the month - this is likely due to the ease and trustless nature with which you can rent Pegas. More than 65% of those who rented a Pega in December also rented one in January. The downside to renting is that you are only able to earn VIS, and you are not able to breed. This means we would expect a much lower proportion of players to be breeders.

Month	New Breeders	Growth	Existing Breeders	Growth	Total Breeder	Growth
Nov-21	1,563				1,563	
Dec-21	1,412	-10%	1,298		2,710	73%
Jan-22	3,810	170%	2,338	80%	6,148	127%

In total, there were 6,148 breeders in January, representing just over 6% of the total wallets and 54% of the total buyers. These numbers will be crucial to watch as the game grows because breeding is the main VIS burning mechanism in the game. If breeding slows down, then VIS burning slows, and the new user growth will put downward pressure on the price of VIS. It is essential to keep breeding profitable and incentivize the burning of reward tokens, so Pegaxy doesn't fall into the growth traps that Axie Infinity experienced.

Pegaxy (Polygon) - Retention

Cohort	New Wallet	Month	
		1	2
Nov-21	7,168	74%	58%
Dec-21	35,607	47%	
Jan-22	69,832		

Pegaxy is still very new, so it isn't surprising that the retention rate is high. The early supporters are prospering financially, and the game is adding new features almost weekly. 74% of the new players in November returned to play again in December, and a further 58% continued playing into January as well. The new players in December are not as committed, but still, 47% of them returned to play the game again in January. These numbers should stay around the 50% mark to remain sustainable - Axie Infinity showed that going below 50% retention is a leading indicator of economic troubles.

Pegaxy (Polygon) - Revenue

Month	Total Claims (USD)	Claim Transactions	USD/Claim	Total Claimants	USD/ Claimant
Nov-21	$3,226,014	1,174	$2,748	1,174	$2,748
Dec-21	$67,210,342	22,333	$3,009	17,472	$3,847
Jan-22	$315,364,425	67,481	$4,673	46,051	$6,848

The strong player growth and retention is backed up by extremely lucrative earning potential. Unlike in Axie Infinity, each player is responsible for their own earnings regardless of their position as a scholar or a manager. The rewards distributed to managers would partially go back into breeding more Pegas and partially go to profit for the manager. In the case of scholars, they will take the rewards as profit and potentially save to purchase a Pega of their own. However, you can only purchase Pegas with USDT and PGX, meaning the scholars will need to swap their rewards (VIS) regardless of their plans to take profit or reinvest.

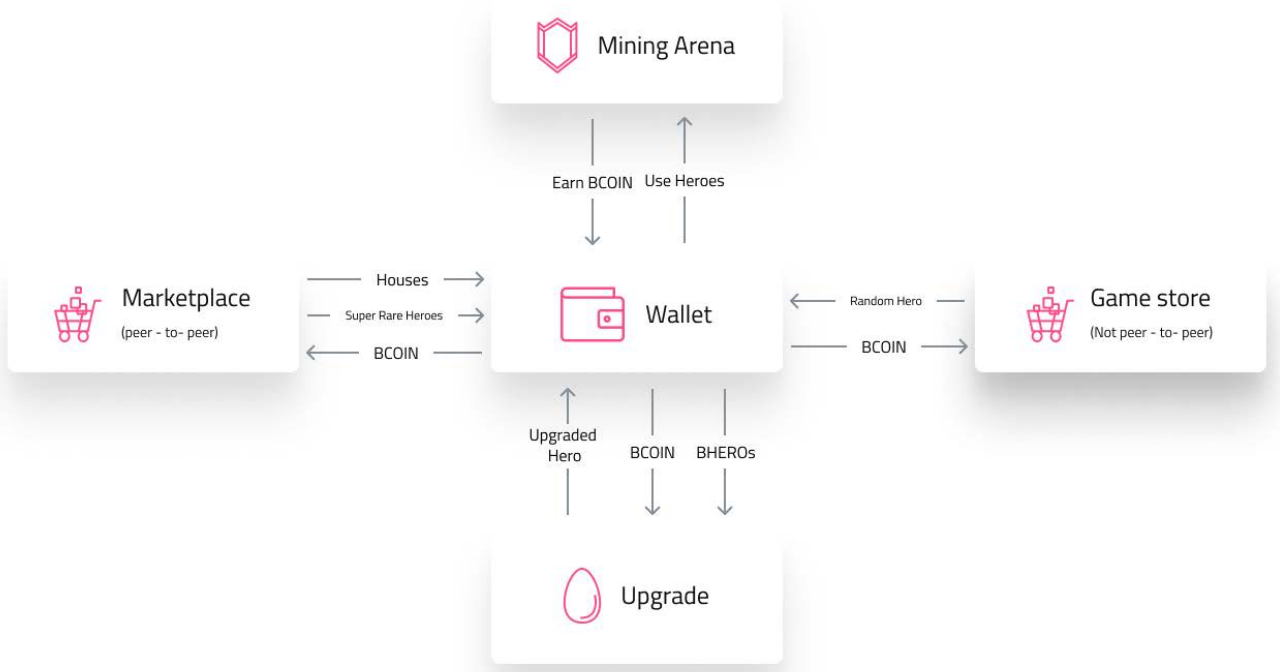
The fact that there is no way for scholars to reinvest their rewards without putting downward pressure on the price of VIS is concerning, but the game has an extremely high VIS burn rate nonetheless. This is because the rewards are heavily skewed towards managers right now. Typical profit sharing gives 70%-80% of the rewards to the managers and only 20%-30% to the scholars. Thus far in the game, over 90% of the minted rewards have been burned in breeding events which is keeping runaway reward inflation under control.

From the table on the previous page, the average claimant made $4,481 in rewards per month across three months from November to January. The average renter made about $850 per month throughout this period with no initial investment. With the current floor price of a Pega at $1,300, it would only take about 1.5 months for a scholar to earn enough to purchase their own Pega. The average manager has about 4 Pega's, and thus, it also takes about 1.5 months to break even on the purchase of a Pega through rewards alone.

Pegaxy (Polygon) - Conclusions & Implications

Playing Pegaxy can be extremely rewarding financially, and as a result, we should see it grow in popularity rapidly. This will likely push volatility into the VIS token and the price of Pegas, but the game has held up under steady growth thus far and looks poised to continue.

Bomb Crypto (BSC) - Introduction



Bomb Crypto is currently one of the largest games in the space with over 30k daily active wallets and 135K daily transactions. The simple, pixelated graphics combined with the low gas fees on BSC are a recipe for success. The broader NFT market might be able to get away with high Ethereum gas fees but the success of Bomb Crypto is a testament to gamers intolerance of slow and expensive transaction fees. Bomb Crypto has not experienced the explosive growth trajectory like Axie Infinity did but has been steadily growing ever since its inception on September 30th, 2021.

A player starts by purchasing 10 BCOIN to mint a Hero (utility NFT for the game) with random rarity traits (common, rare, super rare, etc.) from the in-game store. The money spent on heroes should be considered a cost because any Hero outside of a Super Legend can't be sold on the marketplace, and the cost is therefore not recoverable at this time.

A player can take any number of their Hero's to the mining arena, where they start randomly placing bombs to blow up chests containing BCOIN. All Hero's have different Power, Speed, Stamina, Bomb Number and Bomb Range. These five traits determine how quickly a Hero accumulates BCOIN in the arena. Running around the arena drains a Hero's stamina to zero, which stops them from accumulating BCOIN. This means you must rest your Hero to regenerate their stamina. To speed this up, a player can buy a house for their character's while they rest - improving the rate at which they recover means they can accumulate more BCOIN over time. There are six houses, each of which charges a Hero at different rates (e.g. a Super Villa allows 14 characters that recharge 17 stamina per minute). If all the houses are sold out from the in-game store - which they regularly are - a player can acquire one from the secondary P2P marketplace.

As seen in the diagram above, BCOIN is minted into the ecosystem as players play in the arena. BCOIN earnings then theoretically flow back into the minting of more Hero's and Hero upgrades, which remove BCOIN from the ecosystem. This supply and demand dynamic directly correlates to the health and profitability of Bomb Crypto's economy. Economic destabilization happens if the minting of BCOIN drastically outweighs burning - which is yet to happen. Currently, the only way to cash out of the game is by selling the BCOIN that you mine. It is generally not possible to sell or transfer your Hero NFTs with the exception of the highest level Super Legends. If you do transfer your Hero's, you risk getting banned from using them to earn BCOIN.

This analysis will be structured similarly to those before it. First, we will dive into the game's reach and retention, and then we will take a look at some revenue metrics outlining the profitability of the game.

Bomb Crypto (BSC) - Reach

Cohort	New Buyers	Month			
		1	2	3	4
Sep-21	9,404	85%	78%	53%	42%
Oct-21	73,247	79%	53%	39%	
Nov-21	186,554	65%	43%		
Dec-21	332,911	54%			
Jan-22	372,085				

Bomb Crypto only launched in September 2021 but has already attracted nearly 1M unique wallets. This steady growth is on pace with what Axie Infinity experienced in the early days. Despite the 72% drop in the BCOIN token price over the course of December, the game still saw very positive new wallet growth as well as growth in returning wallets.

The game developers are working to stabilize the token price by tweaking the mint and burn rates through the in-game rewards and NFT purchases. This means the new wallet growth of recent history might reverse as the bumps in the game's economy are smoothed over.

The game has grown at an average rate of 113% per month in the past three months despite the economic troubles. This must mean players are still finding it profitable to play and keep returning as a result - let’s dig into retention next.

Bomb Crypto (BSC) - Retention

Month	New Wallets	Growth	Existing Wallets	Growth	Total Wallets	Growth
Sep-21	9,404				9,404	
Oct-21	73,247	679%	8,036		81,283	764%
Nov-21	186,554	155%	65,234	712%	251,788	210%
Dec-21	332,911	78%	164,353	152%	497,264	97%
Jan-22	372,085	12%	292,072	78%	664,157	34%

The retention metrics shown in the table above are very much in line with the strong growth numbers of the previous section. Over 54% of the new wallets in December returned again in January, and 42% of players who joined in September - 4 months prior - were still playing the game in January. It's concerning that the retention rates are decreasing, but this is expected as the game grows and especially as it grows through economic challenges. Let's take a look at what players have been earning each month.

Bomb Crypto (BSC) - Revenue

Month	Claimed Amount USD	Growth
Sep-21	$1,075	
Oct-21	$8,312,079	
Nov-21	$169,186,207	1935%
Dec-21	$262,935,013	55%
Jan-22	$177,724,098	-32%

The profitability of the game rapidly increased along with the token price over the period from September to early December until economic issues arose. The month of December saw almost $263M BCOIN claimed from the game. Across the total user base of 497,264 wallets, this amounts to an average of $529 per wallet in just the

month of December! Given that it only takes 10 BCOIN to get started, this is a great earning opportunity.

Bomb Crypto (BSC) - Conclusions & Implications

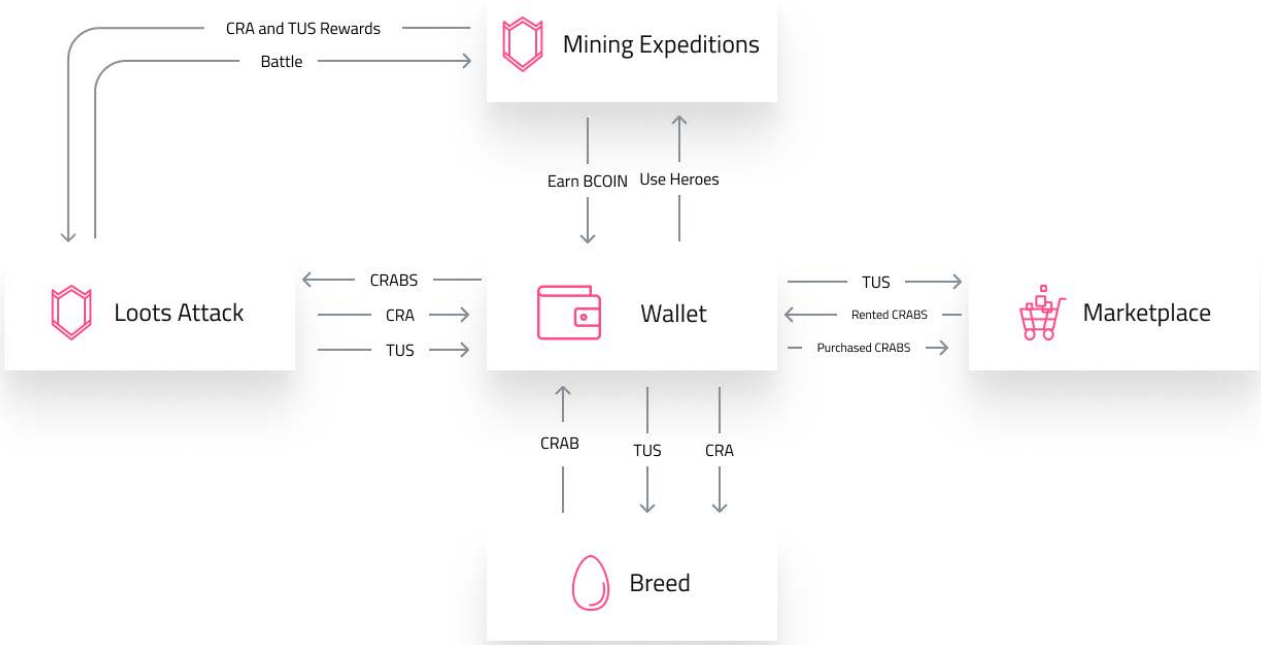
Bomb crypto is still very new and quickly gaining popularity for its simplicity and high earning potential. The flood of new players has seen a significant increase in BCOIN being generated through the game and thus downward pressure on the BCOIN price as burn rates are not able to keep up. This has caused economic troubles for the game, and the developers are working to decrease emission rates while increasing burn rates which likely means earnings will be squeezed for the next few months. The earnings squeeze will cause higher attrition rates and lower growth rates but should be considered positive for the game long term. After all, new wallets were still entering the game at a growing pace despite the 72% token drop in December.

Crabada (Avalanche) - Introduction

Crabada is by far the most popular P2E game on Avalanche. It is a multi-token ecosystem with four major ways to earn:

- Mining expeditions
- Looting
- Renting
- Staking

The main avenue for earning tokens is through mining expeditions. To start mining, a player must acquire three crabs from the marketplace. Once your team of 3 has been assembled, you can start a mining expedition. If unbothered by looters, each mining expedition takes 4 hours, which can be shortened by a maximum of 30 mins, depending on the speed attribute of your crabs. Once the mining expedition is complete, a player gets rewarded 3.75 CRA and 303.75 TUS. However, if an enemy team loots a player successfully, they will only make 1.3125 CRA and 106.3 TUS - more on looting below.



Looting is the act of attacking someone else's mining expedition with your own team of 3 crabs. When you initiate this looting attack, it turns into a 3v3 which is completely hands-off for the user. A looting party will always earn a small bounty of 0.3CRA and 24.3 TUS for each looting mission they participate in. A successful looting mission would result in stealing 65% of the mining party's rewards for a sum of 2.4375CRA and 197.4375 TUS. The figure below gives a breakdown of earning scenarios (which will be important in the Revenue Analysis below).

#	Description	CRA Reward	TUS Reward
1	Miners were not disrupted by looters or they overcame the looters	3.75	303.75
2	Miners were disrupted by looters and got looted	1.3125	106.3125
3	Looters successfully looted a mining expedition	2.7375	221.7375
4	Looters unsuccessfully looted a mining expedition	0.3	24.3
5	Miners were not disrupted by looters or they overcame the looters and they had at least one Prime Crab on the expedition	1.6875	136.6875
6	Miners were disrupted by looters and got looted and they had at least one Prime Crab on the expedition	334.125	4.125

There is a reserve called the Tavern which allows players to list any crabs - not on an expedition - for rent. Although miner vs looter is a hands-off battle, each side is able to reinforce their attack or defence with crabs from the Tavern by paying a fee to the owner of that crab. This creates a constant demand for rentable crabs, giving less wealthy players the chance to participate.

Players can take their CRA earnings and stake it on the platform. Staking rewards are distributed once per week in amulet tokens (CRAM). For every 50 CRA staked, the player will get 1 CRAM per week. A staker, however, can only hold a maximum amount of CRAM:

$$(\text{Staked CRA}/50) * 4$$

For example, if a player has 100 CRA staked, they will be earning 8 CRAM tokens per week. After four weeks, the player would have reached their maximum amount of CRAM - 32 - meaning they need to either sell it or use it. CRAM has two principal utilities:

1. **Buying another team slot** - Each player is limited to a maximum of 3 teams by default. Players can spend 250 CRAM to permanently increase the total teams they have by 1. With three teams (the default), you can play up to 3 games concurrently using 9 Crabada. By spending 250 CRAM to increase to 4 teams, you can play up to 4 games concurrently using 12 Crabada. With five teams, you can play up to 5 games concurrently with 15 Crabada
2. **Lucky Draw** - The Lucky draw is a raffle with a prize pool of 3 Genesis and 7 Pure Crabada. One ticket costs one CRAM, and there's no limit to the number of tickets a player can purchase.

Outside of CRAM, CRA and TUS have a similar mint and burnt mechanism to Axie Infinity. Both CRA and TUS are minted through game rewards and burnt through breeding fees. To create more demand for the TUS token, both in-game peer-to-peer marketplaces are denominated in TUS.

Crabada (Avalanche) - Reach

Month	New Wallets	Growth	Existing Wallets	Growth	Total Wallets	Growth
Nov-21	2,167				2,167	
Dec-21	804	-63%	1,334		2,138	-1%
Jan-22	1,591	98%	1,838	38%	3,429	60%

Crabada has only been around roughly 3-months but is already the largest game deployed on the Avalanche C-Chain. There are less than 3,500 active wallets that have played the game thus far, but this number is rapidly growing as players discover its profitability.

There may only be 3,500 active wallets, but they have submitted over 6M transactions. That is an average of over 1,700 transactions per wallet. This is because there are multiple transactions submitted per game (sometimes up to 5 or 6 for a single game). This is fine since gas costs on Avalanche are typically below $1 per transaction, and the players' revenue can top nearly $70 per game.

The low reach may also be due to the extremely high financial entry barriers. The cheapest entry-level crab on the market right now is over $2700 USD. To play the game, you need to own at least three crabs. This means the upfront cost of playing is at least $8100 USD. There are also not many scholarships or renting opportunities available so the only option is purchasing.

Crabada (Avalanche) - Retention

Cohort	New Wallets	Month	
		1	2
Nov-21	2,167	62%	53%
Dec-21	804	86%	
Jan-22	1,591		

Since Crabada is a relatively new game and has a fairly low reach, we expect retention to be high as the initial players benefit from the new player growth and continue to play the game. Crabada has high retention similar to that experienced by Axie Infinity early on. From the inaugural November cohort, 62% of players returned in December, and 53% returned in January. The game's second cohort - those that joined in December - is the stickiest yet, with over 86% of new December players returning in January. It is exciting to see growing retention and continued interest from existing players. Now, let's dig into the profitability that these players are sticking around for.

Crabada (Avalanche) - Revenue

Month	Transaction Count	CRA Reward (USD)	TUS Reward (USD)	Total Reward (USD)
Nov-22	127,396	$440,655	$3,208,839	$3,649,495
Dec-22	426,619	$764,164	$6,162,039	$6,926,202
Jan-22	925,102	$2,219,853	$43,808,930	$46,028,783
All Scenarios Total	**1,479,117**	**$3,424,672**	**$53,179,808**	**$56,604,480**

More than $56M in rewards have been distributed to the 3,500 players active in the game through January 2022. The rewards significantly increased in January, catalyzed by the growth in the TUS token price (over 300% gain in January) and the increase in Crabada NFT prices. The token price has since stabilized, and the rewards appear to be sustained through February thus far as well.

When we break out the earning scenarios discussed in the figure from the Introduction section above, we can see how players are adapting over time and tending towards one earning mechanism or the other.

The first scenario, where Miners are not disrupted by looters, or they overcome the looters, accounts for 18% of rewards by transaction count but over 35% of rewards by USD value. This is the most profitable scenario yielding about $71 per transaction across the three months.

Month	Transaction Count	CRA Reward (USD)	TUS Reward (USD)	Total Reward (USD)
Nov-22	3,840	$20,724	$163,773	$184,497
Dec-22	36,379	$112,913	$959,916	$1,072,829
Jan-22	233,248	$871,015	$17,490,530	$18,361,545
Scenario 1 Total	**273,467**	**$1,004,652**	**$18,614,219**	**$19,618,871**
Scenario 1 % of All	**18%**	**29%**	**35%**	**35%**

The second scenario, where miners are disrupted by looters and get looted, makes up 18% of the rewards by transaction count but only 9% of the rewards by total USD. This is the worst-case scenario for a mining expedition and still yields an average of $18 per transaction (which amounts to about $4.5 per hour).

Month	Transaction Count	CRA Reward (USD)	TUS Reward (USD)	Total Reward (USD)
Nov-22	36,557	$79,359	$575,983	$655,342
Dec-22	93,918	$102,678	$809,370	$912,048
Jan-22	135,854	$169,963	$3,295,951	$3,465,913
Scenario 2 Total	**266,329**	**$351,999**	**$4,681,303**	**$5,033,302**
Scenario 2 % of All	**18%**	**10%**	**9%**	**9%**

The third scenario is one in which the looters are successful. This scenario makes up 34% of the rewards by transaction count and over 36% of the total USD rewards. Looting is a high risk endeavor because it has a lower payoff than mining in both winning and losing scenarios,

but the timeframes are shorter (you don't need to wait the full 4 hours for looting).

Month	Transaction Count	CRA Reward (USD)	TUS Reward (USD)	Total Reward (USD)
Nov-22	58,786	$266,003	$1,927,878	$2,193,881
Dec-22	163,530	$372,463	$2,962,715	$3,335,179
Jan-22	280,775	$736,591	$14,358,732	$15,095,323
Scenario 3 Total	**503,091**	**$1,375,057**	**$19,249,325**	**$20,624,383**
Scenario 3 % of All	**34%**	**40%**	**36%**	**36%**

The fourth scenario, where the looters lose, is the least profitable scenario. This makes up 9% of the total reward transactions and only 1% of the reward value. It is meant as a reward to guarantee some payoff for those engaging in risky behavior.

Month	Transaction Count	CRA Reward (USD)	TUS Reward (USD)	Total Reward (USD)
Nov-22	5,115	$2,377	$18,284	$20,661
Dec-22	43,188	$10,629	$86,305	$96,934
Jan-22	84,278	$24,108	$471,098	$495,206
Scenario 4 Total	**132,581**	**$37,114**	**$575,687**	**$612,801**
Scenario 4 % of All	**9%**	**1%**	**1%**	**1%**

The fifth scenario involves Prime Crabs. These are special rare crabs that increase rewards by 10% over the regular scenarios for mining expeditions. Scenario five represents a mining expedition containing a Prime Crab that looters did not disrupt. Because of the Prime Crab rarity, these transactions only make up 16% of the total, and the rewards make up 11%. There are only about 3,800 Prime Crabs, and there are over 34,000 regular crabs which means the Prime Crabs make up about 11% of the total population, so, understandably, they would make up the same percentage of rewards.

Month	Transaction Count	CRA Reward (USD)	TUS Reward (USD)	Total Reward (USD)
Nov-22	21,116	$59,974	$428,907	$488,881
Dec-22	69,354	$97,433	$783,168	$880,601
Jan-22	144,747	$235,294	$4,609,096	$4,844,389
Scenario 5 Total	**235,217**	**$392,700**	**$5,821,171**	**$6,213,871**
Scenario 5 % of All	**16%**	**11%**	**11%**	**11%**

The sixth and final scenario occurs when a mining expedition containing a Prime Crab is successfully looted. This only makes up 5% of the transaction and 8% of the rewards. The success rate of Prime Teams is over 77% because of the additional strengths that the Prime Crabs have - they are not likely to lose.

Month	Transaction Count	CRA Reward (USD)	TUS Reward (USD)	Total Reward (USD)
Nov-22	1,982	$12,219	$94,014	$106,233
Dec-22	20,250	$68,048	$560,565	$628,612
Jan-22	46,200	$182,882	$3,583,524	$3,766,406
Scenario 6 Total	**68,432**	**$263,148**	**$4,238,103**	**$4,501,251**
Scenario 6 % of All	**5%**	**8%**	**8%**	**8%**

Now that we have an understanding of the different scenarios and their probabilities, we can calculate the expected reward of both mining and looting. Mining rewards pay roughly $71 per successful expedition and $18 per unsuccessful expedition (of non-Prime Crabs). If we consider the probabilities of each - 51% chance of success and 49% chance of looting - the expected revenue per mining expedition is $45. Each expedition takes roughly 4 hours to complete and thus yields an expected revenue of $11.25 per hour for a single team.

Similarly, looting activities pay $41 when successful and only $4.5 when unsuccessful. The probability of being successful when looting is over 79%, so the expected revenue per looting mission is $33. However, looting can take anywhere between 1 to 3 hours, with a mandatory cooldown after each looting mission. This means the minimum number of looting missions per 24 hour period is eight, and the maximum is 24. Depending on the strength of your team, this means you can expect revenue between $11 per hour and $33 per hour. There is also the downside that looting takes more input on the side of the player when compared to mining.

Crabada (Avalanche) - Wallet Level Revenue

Avalanche Wallet Address	Total Reward (USD)	Rolling % of Total Rewards	Rolling % of Users	Rolling % of Transactions
0x6bad4881ef149fa2deab68209cda712202b02402	$863,112	0.82%	0.02%	0.50%
0x2d8719cf0fe19782140ae16eec03938a96f5228b	$699,034	1.48%	0.04%	0.89%
0x4ae04bdb0c084b507fb5740bbd6eb6c37f6b7778	$479,201	1.93%	0.06%	1.15%
0x150d739c9ff986c4177ba22a6b54dfbf2e967ae0	$456,905	2.37%	0.08%	1.39%
0x856e7872e5ae60d51c85727d16c1b3dc8d72070a	$447,961	2.79%	0.10%	1.73%
0x02c7bdfd23b8b7922e64e9c9689c7cd74e7e9bd6	$433,152	3.20%	0.12%	2.22%
0xdcfcac2e42b0612f22985fe31b2a5aabd224b959	$429,014	3.61%	0.14%	2.47%
0xac0628764ca6dabc12530f1fb86b040d4a274d7c	$379,295	3.97%	0.16%	2.67%
0x68be4e97c0ecd7b2b69a712b57bc917af8b5dc6b	$376,553	4.33%	0.18%	3.05%
0x1fe4ffa70f92f8b57d4d4eac407d2dce876a28f9	$367,019	4.67%	0.20%	3.23%
0xd673e252f22c6d0d01ae9a4a22d9ea587bb6cf4e	$357,774	5.01%	0.22%	3.42%

There are two players that have earned over $500k to date since the launch of the game. It is important to note that these are revenue numbers and not necessarily profits. The top player owns 71 Crabs, and at the floor of $2,700, that collection is worth almost $192K. The player bought an initial supply of Crabs and has been reinvesting the earnings to breed more.

Crabada (Avalanche) - Conclusions & Implications

Through the past few pages, we have covered reach, retention and revenue for Crabada. The game's reach is minimal due to its high entry barriers - only about 3,500 wallets have interacted with the game up to Feb 1. These entry barriers also mean that the players are extremely loyal, however. More than 53% of the November cohort was still playing two months later in January, and 86% of the December cohort also played in January. Because of the low reach and high retention, we dug deeper into the revenue flows of the game. Of the two earning mechanisms (mining and looting), mining had expected revenue of $11.25 per hour, whereas looting (which requires more user input and better Crabs) had an expected revenue between $11 and $33 per hour, depending on the team. With high retention and high revenue potential, Crabaded looks poised to continue steady growth and dominance of the Avalanche gaming scene.

Closing Remarks

05

Closing Remarks

In the above sections, we have covered everything from the history of gaming and the philosophy of the growing P2E sector to deep granular statistics on the top blockchain games. The gaming sector, in general, has a TAM of over $173B worldwide and is forecasted to continue growing well into the future. Blockchain games offer different business models for both gamers and developers through NFT ownership and composability, which are expected to increase the growth potential of gaming. These business models allow developers to create entire economies within their games and allow players to trade their in-game assets with whomever they please.

Part 2 of the book was a deep dive into the top blockchain games where we discovered the rebounding growth of Axie Infinity on the Ronin chain, the wide reach of BombCrypto on Binance Smart Chain, and the high earning potential of Pegaxy on the Polygon chain and Crabada on Avalanche C-Chain. Axie infinity has distributed over $3.1B in rewards to the community and experienced a growth spurt late in 2021. Pegaxy offers an advanced user experience where players can trustlessly rent NFTs and race to earn rewards with minimal upfront costs. These renters can make an average of $845 per month just by playing the game for free. BombCrypto has seen strong retention rates above 50% even amidst a 70% token price decline, proving that players are in the game for the long term despite its volatility. Finally, Crabada has bootstrapped an extremely high-earning game with the top 11 players earning more than $5M collectively in the past three months. These earnings come at the cost of an $8000 barrier to entry as players need three expensive NFTs to play the game.

Overall, the sector has shown far-reaching and fast-paced growth throughout the past six months. These games also have retention rates in the 80% range when token prices are stable proving that the majority of players are able to earn consistently by playing the game. When growth is induced too quickly, it brings token volatility along with it,

and retention rates suffer but still hold around the 50% mark as players ride out the volatility. This is a great sign for the longevity of the games and their ability to persist through economic challenges. The sector has also been exceptionally profitable for all involved. The top players have earned more than $800k, and the developer valuations continue to grow as the games increase in popularity. Like any developing economy, the P2E GameFi space has felt strong bull and bear cycles and will likely continue to do so until growth slows and the sector becomes more mainstream.

The research provided in this book came entirely from the data powering Covalent's unified blockchain API. This data is free to access, and you can replicate the analyses above for your own personal research. This book only covers a sliver of the GameFi space and an even smaller proportion of analytics the opportunities available across the 28 blockchains that Covalent supports. There are billions of rows, terabytes of information, and more than one-billion possibilities at your fingertips through the Covalent API.

Thank you for making it through the book, and I look forward to hearing any feedback or questions from you through my Twitter @BrandonRochon_ .

Further Reading

06

Recommendations for Further Reading

https://www.decentralised.co/understanding-ronin/

https://www.ar.ca/blog/debunking-more-overreactions-to-macro-a-ronin-case-study

https://www.covalenthq.com/static/documents/Covalent%20Whitepaper%20Apr%202021%20v1%20Branded.pdf

https://ethereum.org/en/developers/docs/web2-vs-web3/

https://medium.com/@VitalikButerin/the-meaning-of-decentralization-a0c92b76a274

https://medium.com/@synesisone/web3-and-gaming-9c1c2c7fe2fe

https://dappradar.com/blog/2021-dapp-industry-report/#games

https://www.bloomberg.com/news/articles/2022-01-15/gamefi-is-a-new-crypto-craze-what-s-it-all-about-quicktake

https://whitepaper.axieinfinity.com/axs

https://medium.com/@synesisone/web3-and-gaming-9c1c2c7fe2fe

https://www.bloomberg.com/news/features/2021-10-30/what-is-the-metaverse-where-crypto-nft-capitalism-collide-in-games-like-axie

https://www.forbes.com/sites/robertfarrington/2021/12/13/play-to-earn-gaming-is-driving-nft-and-crypto-growth/?sh=4ecc5d44c2dc

https://www.playtoearn.online/whats-the-play-to-earn-business-model/

https://decrypt.co/resources/what-are-play-to-earn-games-how-players-are-making-a-living-with-nfts

https://www.weforum.org/agenda/2021/11/what-play-to-earn-games-mean-for-the-economy-and-metaverse/

https://www.coindesk.com/layer2/2022/01/18/is-crypto-a-ponzi-define-ponzi/

https://cointelegraph.com/news/blockchain-and-the-evolution-of-business-models-in-the-game-industry

https://cointelegraph.com/news/5-reasons-why-blockchain-based-gaming-economies-are-the-future

Appendix 1: The importance of data sovereignty to GameFi & Crypto

This is a study of blockchain-based games - the intent of using blockchain technology in game development is to give players ownership of their in-game assets (i.e. buy, sell and use as they please), and to protect players from the overreach of traditional game developers. Put another way, the goal is to "democratize the different aspects of gaming" [1] and utilize "mechanisms to ensure that they stay neutral as they grow, preventing the bait-and-switch of centralized platforms" [2].

Simply deploying on a blockchain does not achieve these goals. Blockchains are purported to be public, but deep, granular and historical data remains prohibitively difficult to access. This means most players are unable to access the data that relates to their gameplay.

This book is a step in the direction of truly democratizing this data and passing the privilege of data-driven decision-making onto the reader. The different aspects of gaming can be effectively democratized and the mechanisms which protect players can be understood only once players, investors, and developers are in control of their data.

For **developers**, this means simple data streams which you can build on as you improve the player experience.

For **players**, this means tracking your ownership, gameplay metrics, and progress without depending on a UI built out by the game developers.

For **investors**, this means tracking aggregate metrics across the entire game without depending on analytics built out by the game developers or the news sites.

For **everyone else**, this is the freedom to break away from the media hype and own your decision about how you interact with the future of blockchain games.

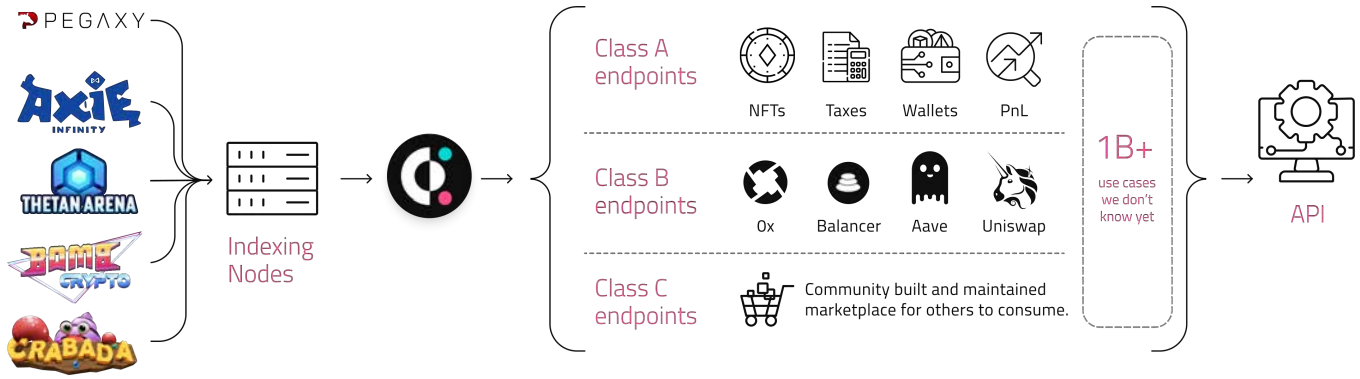


Figure 1: How to access blockchain game data with Covalent

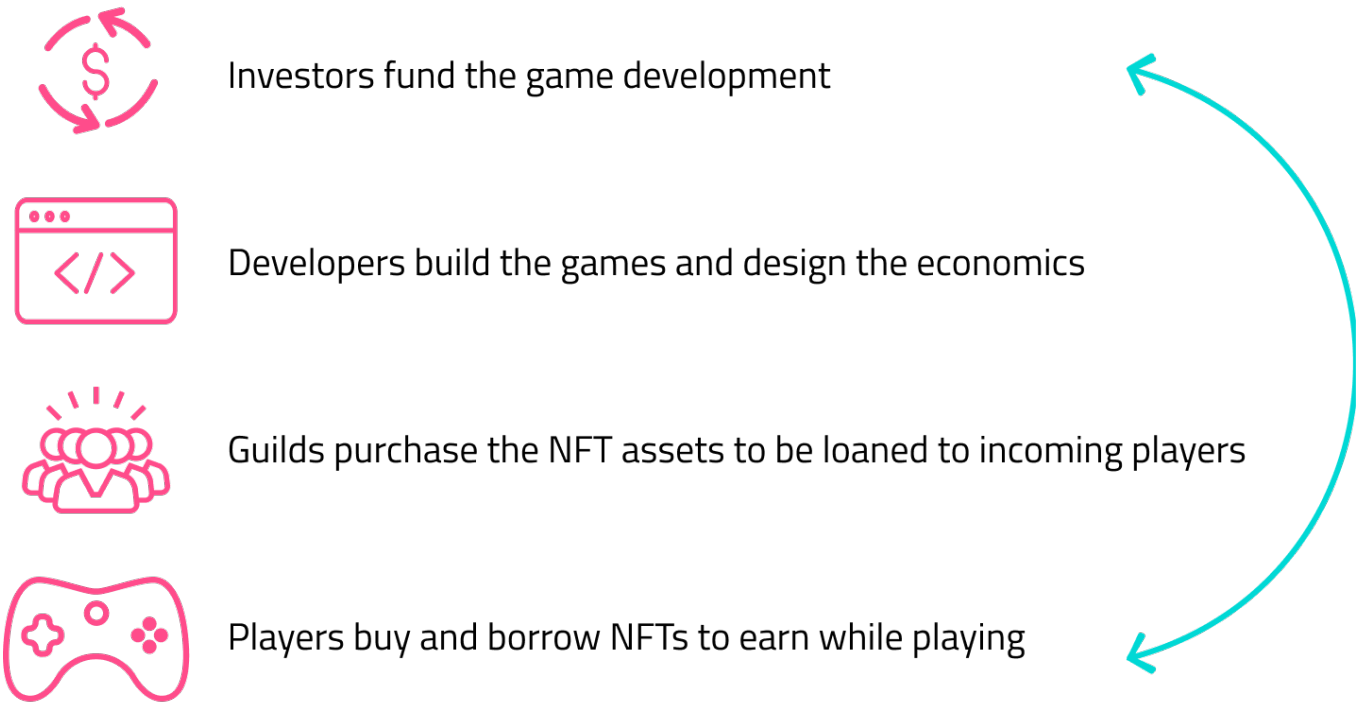
Covalent's mission is to bring transparency to all blockchain-based assets via one Unified API. For free, developers can use the Covalent API to build better products, players can set up spreadsheets to track their own metrics, investors can build historical analyses and track game performance, and everyone else can easily investigate any ecosystem they are curious about.

To review what a blockchain is and how it works, check out the links provided in the recommended reading section above.

Figure 2: Main use cases of the Unified Covalent API

Appendix 2: The major entities in blockchain gaming

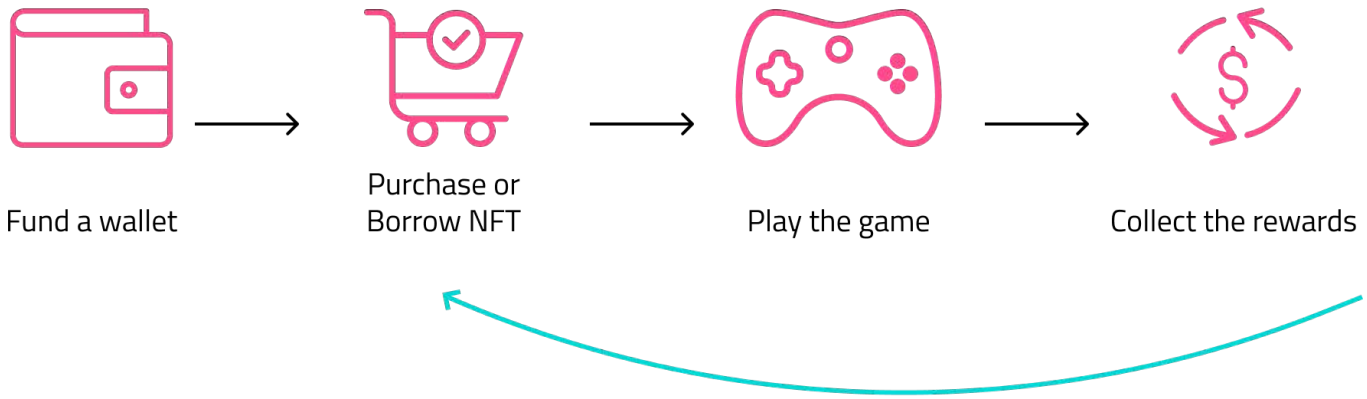
There are currently four major roles in the blockchain gaming industry - players, guilds, developers, and investors. The **players** are at the forefront, steering the direction of the industry, with their attention geared predominantly towards income potential. **Guilds** are growing in popularity as a method to attract players and reduce financial barriers to entry. Guild members pool funds together, buy assets and then loan those assets to incoming players in exchange for a percentage of the new players' "earnings". The GameFi **developers** are typically small, agile teams focussed on building visually attractive games with secure and sustainable economies. The large Web2 game developers are yet to meaningfully enter the space, but they have stated the intention to do so in the very near future. And finally, there are the **investors**. Focussed on growing the entire ecosystem, investors are typically broad-reaching across many blockchains and games. GameFi has attracted investment from some top-tier names, including Softbank, Andreeson Horowitz, Animoca Brands, Hashed, Mechanism Capital, and many more.



The Player Cycle

Players are the principal persona in the "play-to-earn" space. Where players choose to spend their time has typically been a function of how fun the game was and who else was playing it, but blockchain games have added an earnings element to the mix as well. Players in the blockchain space make their decisions primarily based on where they see the most earning potential. This is evident by the 48% decrease in player activity from November to December on the then-leading game Axie Infinity as the earning potential (token price) dropped by 75% in a single month.

Figure X below outlines the start to finish process of going from beginner to earning in-game tokens. Players typically start by funding a wallet on the blockchain which hosts their game of interest. This could mean using a bridge from one blockchain to another, using a centralized on-ramp like Binance or Coinbase, or doing an off-chain deal with their friends who already have assets on the specified chain. Next, the player would need to purchase one or multiple NFTs used to play the game. In the case of Axie Infinity, you can do so for about $30 on the Ronin marketplace right now. You need 3 Axies to play the game, so it would cost around $90 to begin playing the game at the time of writing. At the height of the Axie infinity frenzy, it cost $1000 to begin playing. There are options to get around these financial barriers to entry, though. The most common method is joining gaming guilds like Yield Guild Games (YGG). After you have purchased or borrowed an NFT, you are ready to play and earn.

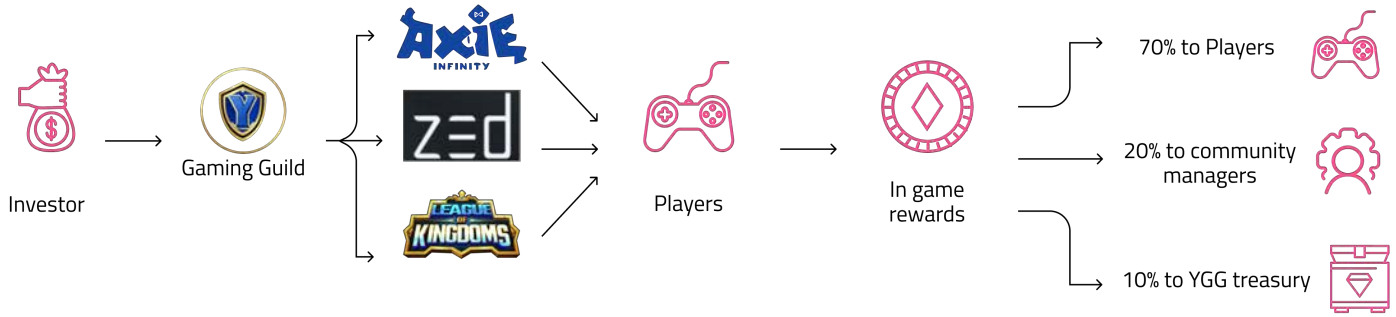


The Guild Cycle

The guilds are the enablers of GameFi. They remove barriers, build communities, and connect players with the materials needed to be successful in their chosen games. Guilds give members access to NFTs needed for the "play-to-earn" games as well as knowledge from experts in these games. They are basically modern-day labour unions - representing masses of players in the metaverse.

The largest gaming guild, Yield Guild Games (YGG), operates as a DAO with over 100k members. Its mission is to "build the biggest virtual economy" by "optimizing its community-owned assets for maximum utility and sharing its profits with its token holders" [link]. This mission is shared across many of the other prominent gaming guilds - they pool financial assets, buy in-game NFTs, and then loan them out to members in return for a portion of their earnings.

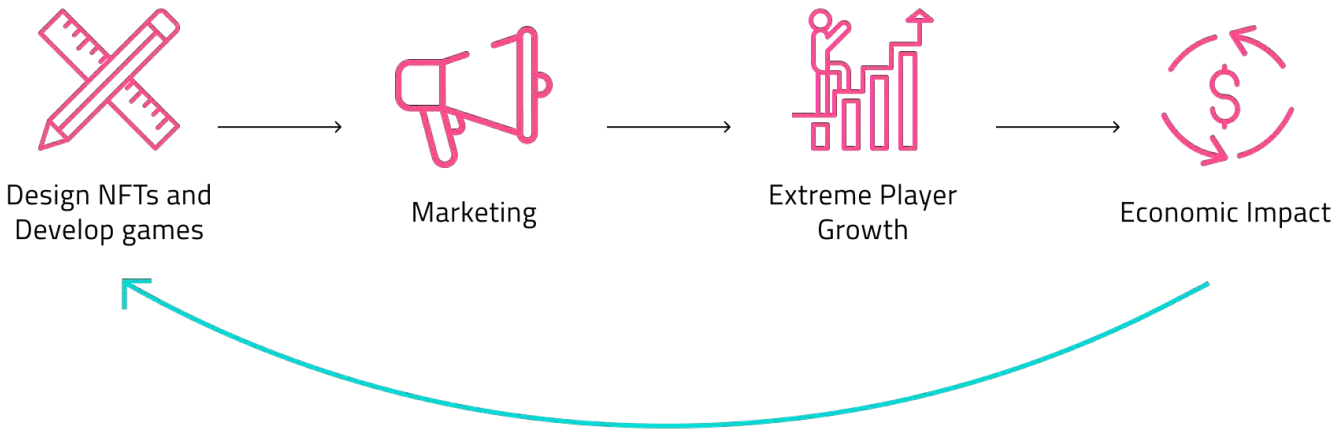
The diagram above shows YGG's powerful positive feedback loop that allows them to own large portions of P2E economies without ever playing the game. Capital flows into YGG to purchase in-game NFTs that then get deployed to skilled players (scholars) by community managers. The gaming guild then takes ownership of in-game rewards and gives 70% to the scholars, 20% to community managers, and keeps 10% for themself. This 10% fee gives the guild capital to reinvest in more NFTs to onboard more players which inflates the games economy. Then the loop continues. The feedback loop pushes the economy of the various games exceptionally hard, and in the case of Axie Infinity, it pushed it to collapse. The focus of these guilds is on optimizing returns for both players and token holders - hence the "yield" in Yield Guild Games. Once one economy falters, the guild and its players move their attention to the next highest yield possibility, and the cycle continues.



The Developer Cycle

In GameFi, developers are creative artists, blockchain programmers, macroeconomists, and marketing masters all in one. They are typically small, versatile teams that design and deploy visually attractive NFTs, integrate these NFTs into a game of some sort, tune the economics of the game to support a mass inflow of players, and then market the game effectively to attract as many players as possible. There aren't any major traditional game developers in the blockchain gaming space yet, so this cycle is still very much in flux. Right now, the blockchain game developers are typically relatively small crypto native teams with a strong vision to leverage the ownership economy that blockchain has enabled. That was the focus of the largest blockchain gaming company Sky Mavis (creator of Axie Infinity) - to leverage NFT property rights and incentivize players to act more like owners than traditional players. This ownership piece means that the developer incentives are perfectly in line with the players because developers are typically paid in the same tokens that players are paid in, and thus both have an incentive to improve the game and the economy. The developers are typically paid through fees in the game, which accrue to a treasury when players make purchases or complete certain activities.

The P2E game development cycle starts with an interesting NFT collection that can be incorporated into different types of games. Once the game and the NFT collection are launched, it is all about attracting and retaining players with a positive feedback loop. As the game grows, developers shift their focus to maintaining and stabilizing the economy by tweaking reward and burn mechanisms, adding new features to increase player earning potential, and creating new game elements. Increased player growth and retention mean increased revenue for game developers, allowing them to further improve and allowing the loop to continue. If the game grows too fast, the economy can overheat, token prices drop, players leave, and the cycle repeats until sustainable burn and reward mechanisms are discovered. In the case of Axie Infinity, the economy overheated, too many players reaped too many rewards, and the token price decreased over 70%.



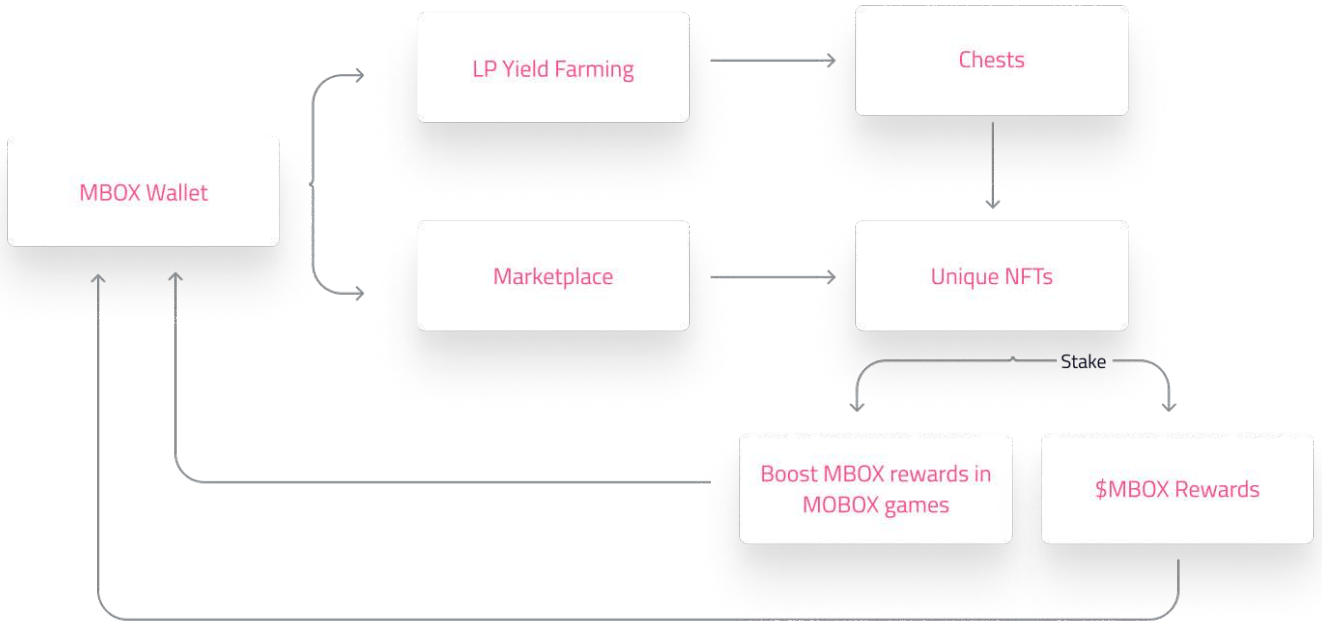
The Investor Cycle

The GameFi space raised over $4B from investors in 2021 alone and has raised more than $5.4B from the biggest names in the VC space, including Softbank, Andreeson Horowitz, Animoca Brands, Hashed, Mechanism Capital, and many more. These funds have poured into both developers and guilds as each is instrumental in bringing in players and building the financial groundwork to support multiple different games.

A major theme in each VC firm's investment thesis is that many players will be earning their first cryptocurrency through these games, and it is a perfect mechanism to bring more mainstream adoption to the entire blockchain space. A further thesis revolves around the untapped emerging economies struggling in the past two years of COVID lockdowns. A sustainable virtual economic system would bring many emerging economies into the blockchain ecosystem and improve the standard of living for everyone involved. This already happened to an extent with Axie Infinity. The game was immensely popular in the Philippines as struggling workers joined the game for higher wages than traditional employment was offering at the time. If that can be scaled out to all emerging economies, it will be truly revolutionary.

Appendix 3: Honorable Game Mentions

Mobox (BSC)



Mobox is the second-largest game on our list. It is a multi-game ecosystem that shares a single reward and governance token. There are four major ways to earn on the platform:

- Participate in Yield Farming
- Participate in MOMO NFT mining
- Participate in Mystery BOX
- Participate in Games

The native NFTs on MOBOX are dubbed MOMOs and can be acquired through either purchasing one off the marketplace or staking various cryptocurrencies to unlock crates containing random MOMO. Users who receive these NFTs can trade them, stake the NFTs to farm MBOX tokens, or use them as collateral for other uses throughout the ecosystem's games. The number of tokens that you earn depends on the rarity of the MOMO NFTs that you stake. These MOMO NFTs can also be traded in the open market or used to play one of three NFT based games on the platform. Staking MOMO NFTs does not affect your ability to play any of the games, it is simply a mechanism to

multiply your earnings. You can also lend your NFTs to other players and earn a reward. The MOBOX games are titled Chain Z Arena, Block Brawler, and Token Master. Each game offers players different ways to earn. The games will be the main focus of this analysis since we are focused on the "play to earn" mechanisms and the utility of MOMO NFTs rather than NFT and token staking - though these elements can leverage the rewards from the games to increase total earnings.

In ChainZ Arena, players can attack and/or defend against attacks in order to accumulate leaderboard points. For each win or lose you will earn or lose arena points that go towards ranking you against other players. MBOX rewards will be distributed based on how high your ranking is. In addition to battling, players automatically mine MBOX passivey. It does not matter what you are doing, your account is mining all the time! If a player wants to accelerate their mining rewards they have the option of using a hammer. Hammers yield two rewards:

- Boost all mined resources
- Enable lucky chests which yield resources to upgrade your heroes

Block Brawler is an RPG game focusing on battle strategy. Blockchain Brawler has 6 hero classes that you can choose from:

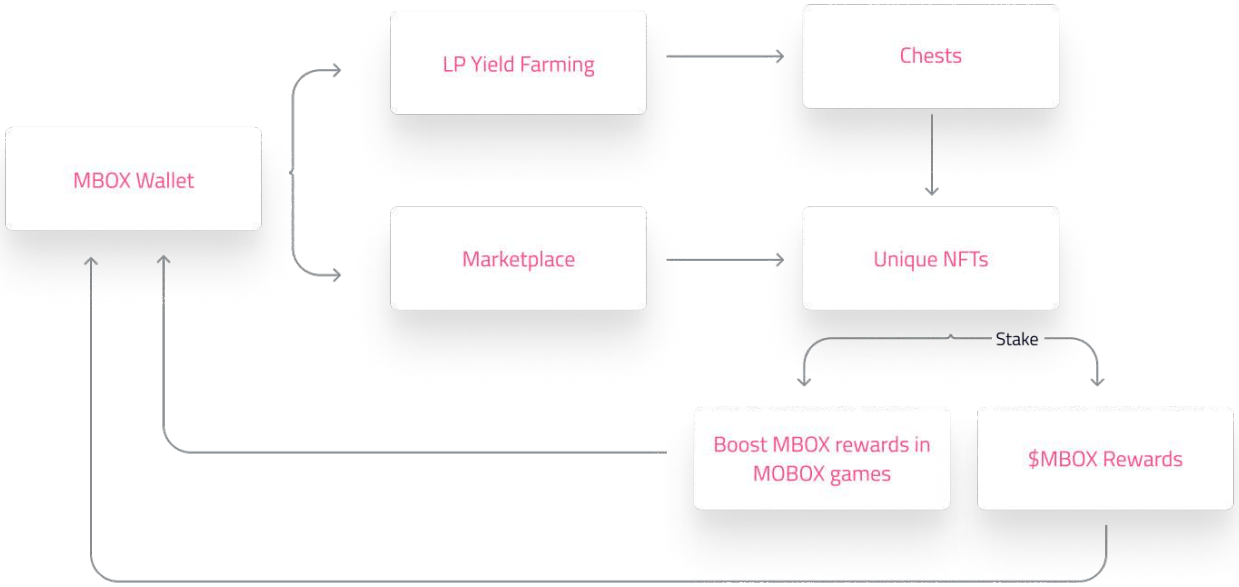
- Barbarian
- Duelist
- Monk
- Ranger
- Assassin
- Mage

The battlefield is divided into 4 battle zones: Bronze, Silver, Gold, King. Beginners start on bronze with all other battlefields closed with entry conditions. Players can only compete with players in the same battlefield. Season rewards are divided according to these battlefield rankings: Silver, Gold, and King. In addition, there are daily boss battles that reward users with MBOX according to damage dealt, total damage, and final blood.

In Token Master, players put their MOMO's into a casual turn-based idle game. MOMO's will automatically produce tokens at a certain rate allowing players to accumulate tokens automatically. If a player wants a more hands-on gaming experience, they Assemble a team of 3 MOMOs and send them to loot tokens from their friends. In each battle, a user will be rewarded a star for each MOMO defeated. The more stars they gain, the more tokens they loot. Each battle, whether win or lose, changes the player's rank on a leaderboard. The higher a user is on the leaderboard, the more MBOX they earn.

The MBOX tokens earned through these games would then theoretically flow back into MBOX liquidity pools or the marketplace. Players would be locking more of their MBOX tokens in liquidity pools to earn more NFTs to earn more MBOX tokens. MBOX then stays in this cycle to keep as much value in the ecosystem.

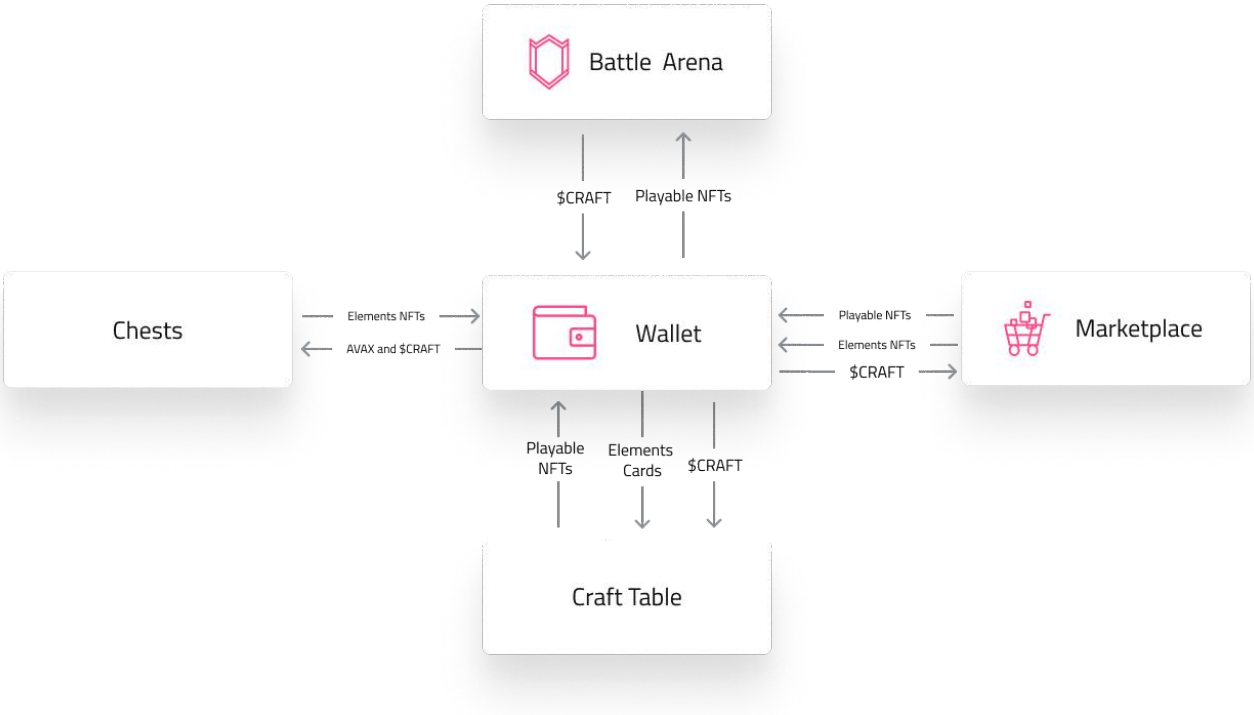
Crazy Defense Heros (Polygon)



Crazy Defense Heroes is a mobile game developed by Animoca Games with over 2 million downloads. Crazy Defense Heroes has a game style like Balloon Tower Defense where players place towers to defeat an onslaught of enemies. The Free-to-Play nature of Crazy Defense Heroes means players don't have to purchase any tokens or NFTs to start earning $TOWER. Players must complete levels to unlock an in-game chest. Once a player opens this chest, they head over to the Crazy Defense Heroes website to claim their $TOWER. A player must then wait 16 hours to redeem another chest.

What makes Crazy Defense Heroes interesting is that it's current game is just a way of distributing TOWER tokens to the community - a form of user acquisition. Animoca Brands is currently developing a new version of the game that will allow players to use NFTs and TOWER tokens to interact with a fully peer-to-peer P2E economy. Animoca Brands is paving the way for traditional gaming apps to make the transition to running on blockchain infrastructure.

Talecraft (Avalanche)



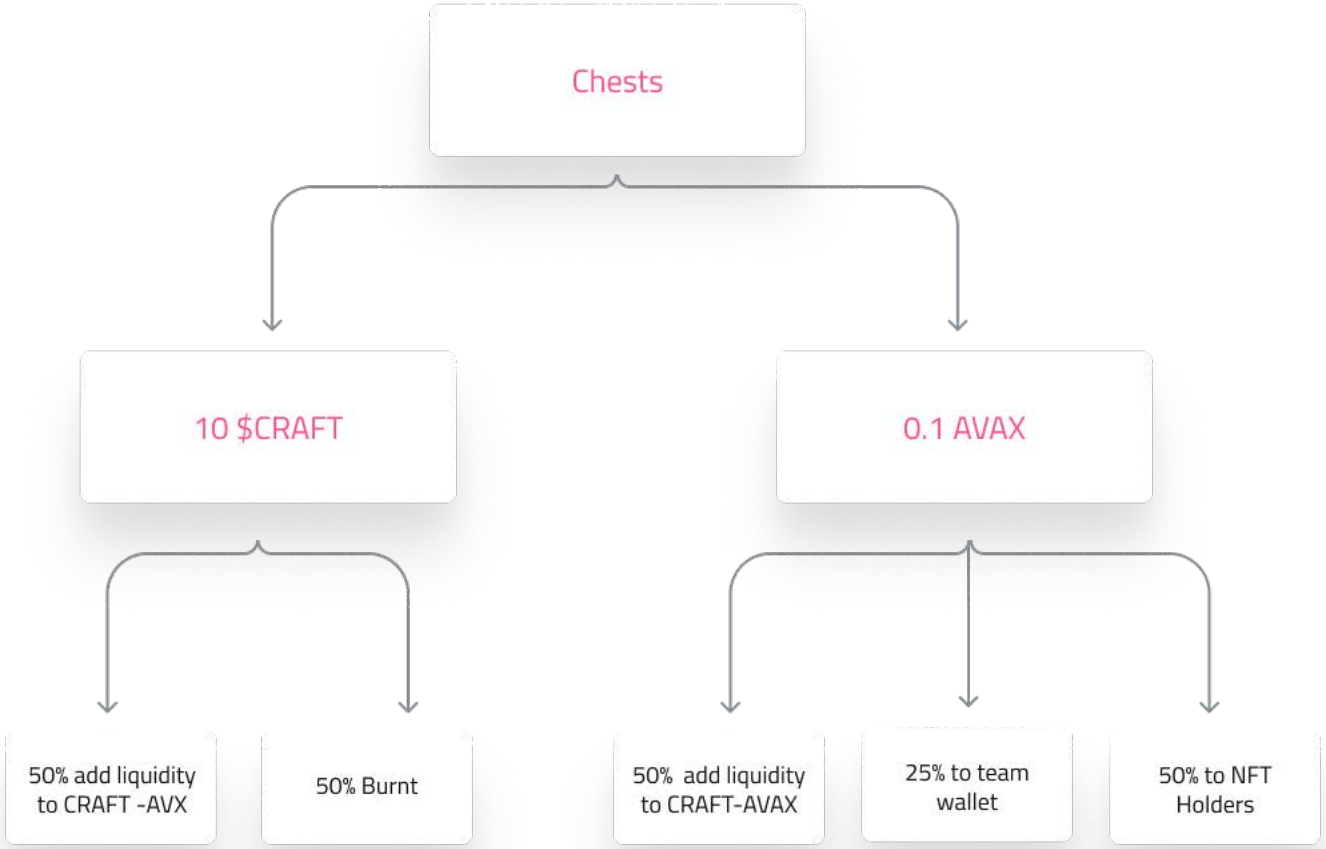
TaleCraft is a PVP card game. Talecraft's unique craft-to-earn game mechanics make it one of the most interesting card-based Play-to-Earn games in the space. It initially launched on Avalanche testnet, but with increased community demand and engagement, has now launched on the Avalanche C-Chain.

Talecraft is driven by a unique mint and craft mechanic, where players grow more powerful through gamified NFT alchemy. In order to play TaleCraft, a player must collect three playable NFTs. As seen in the diagram above, players can do this in two different ways:

1. Buy Playable NFTs off the marketplace
2. Acquire the elements (Fire, Water, Air and Earth) required to craft them from the marketplace or from chests.

A player must burn their newly acquired elements, along with some $CRAFT, to craft playable NFTs for PVP games. Once a player has acquired or crafted their three playable NFTs, they

can now battle in the PVP arena. Depending on the power of a player's NFTs, they can play in 3 different arenas - Junior, Senior and Master. Beginners will start in Junior as access to these arenas are based on your cards collective power. To put it simply, the more a player wins, the more $CRAFT they are rewarded. Players can then spend $CRAFT to open more chests and craft new playable NFTs to win more. Winning more, earns them more $CRAFT and the cycle continues.



Currently, 10,000 chests are put on sale every week for 10 CRAFT and 0.1 AVAX. The only way to mint new element NFTs for crafting is through opening one of these chests. The 10 $CRAFT spent on buying a chest is split in half, with 50% adding liquidity to the CRAFT-AVAX pool, while the other 50% is burnt. In addition, 25% of the 0.1 AVAX adds liquidity to this pool, 25% goes to a team wallet and the rest gets distributed to users that hold playable NFTs. Players now earn passive AVAX rewards from just holding these NFTs.

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