Immutable

A Pioneer of Web3 Gaming

a research report by Arrington Capital
June 2024

arrington
C A P I T A L

Table of Contents

Executive Summary

Most people are not aware of how large the video gaming business has grown. From humble beginnings in 1972 with Pong, gaming has grown into a massive industry generating at least $280 billion dollars in 2023.[1] That is larger than movies and music combined, which together account for about $94 billion per year.[2]

We believe Web3 will revolutionize the gaming industry, and we further believe Immutable could be instrumental in driving that shift. This report lays out our arguments for this proposition. However, as mentioned in the disclaimers, we are not unbiased. We first invested in Immutable in 2021 and have subsequently invested in other financing rounds, including both tokens and equity.[3] We have also invested in a number of games that are built on the Immutable platform.

As mentioned, the gaming industry is larger (much larger) than music and movies *combined*, and we believe it will be transformed and modernized by blockchain technology. Web3 should make games more fun to play - the games still need to be compelling, but Web3 can make a great game exceptional from a player perspective.

This report discusses the reasons for this shift and highlights Immutable, an all inclusive infrastructure and middleware solution for game developers and players. In this report, we discuss why Arrington Capital believes Immutable could become the market leader in Web3 gaming infrastructure and build an ecosystem with the potential to attract the best games in the world.

Immutable's beginnings date back to 2018 when the digital trading card game Gods Unchained was released. The cards were minted on Ethereum as NFTs, but the game became a victim of its own success. The Ethereum blockchain couldn't handle the volume well, and the team had to build workarounds to make the cards accessible to players. The founders realized that a new kind of

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[1] https://www.fortunebusinessinsights.com/gaming-market-105730
[2] https://www.zionmarketresearch.com/report/global-movies-entertainment-market
[3] https://www.arringtoncapital.com/blog/the-unstoppable-immutable/

infrastructure was needed for games and created one of the first Ethereum Layer-2s, Immutable X, to facilitate the minting and trading of in-game NFTs. Today, Immutable has just launched their second rollup using zkEVM (Zero-Knowledge Ethereum Virtual Machine) technology in partnership with Polygon. The result is a high performance gaming focused layer-2 solution with significantly reduced gas fees, increased transaction throughput, and necessary built-in products:.

Passport	Allows for web2 style sign in, with an email or social account, to facilitate the mass onboarding of gamers not yet familiar with Web3.
Checkout	Gives developers an SDK to take multiple forms of crypto or fiat payment for in-game purchases, with support for 100+ countries' local payment methods.
Open Orderbook	Facilitates transparent and efficient trading of NFTs across various platforms while enforcing royalties and aligning incentives between creators and consumers.

Immutable also offers the creation of hyperchains, allowing game developers to maintain control over their infrastructure while leveraging Immutable's scaling solutions if they need their own chain.

Gaming is one of the most compelling use cases for Web3. There are over 3 billion gamers worldwide,[4] representing a massive untapped user base for crypto. A single hit game like Fortnite can reach $20B in annual revenue with traditional monetization methods.[5] Gaming monetization models have historically followed technological developments; just as the internet enabled the gaming industry to move from disk sales to in-game purchases, Web3 will make these in-game purchases more attractive to spend on and turn them into recurring revenue from royalties. Users will also benefit from a shift towards a true ownership economy, and perhaps feel more comfortable investing more time and money into their favorite games.

We believe Immutable is well poised in the Web3 gaming market due to its strong treasury, existing ecosystem of games, and approach of building a vertically complete platform which serves as a one-stop-shop for game developers. Immutable's focus on creating engaging, accessible gaming experiences for a mass-market audience sets it apart from competitors and we believe is a better way to focus on long term value capture in Web3 gaming.

The IMX token is designed to offer utility through multiple avenues, including serving as a native gas token, platform fees from the Open Orderbook, and commissions on primary sales. A portion of these fees is automatically converted to IMX and allocated to the staking rewards pool, which token holders can benefit from. A significant portion of the token supply is allocated for ecosystem development, giving the team another tool to attract game developers.

The Immutable ecosystem already features high-profile titles such as Gods Unchained, Guild of Guardians, Illuvium, and numerous upcoming games.[6] Immutable's technology, funding, and experienced leadership team position it well in the Web3 gaming market. As the gaming industry continues to evolve, we believe Immutable will emerge as a leader in developing solutions that unlock new possibilities for players and developers worldwide.

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[4] https://whatsthebigdata.com/number-of-gamers/
[5] https://www.statista.com/statistics/1440682/fortnite-revenue/
[6] Games like Illuvium are still in Beta. However, they minted NFTs and launched a native token in 2021 which will have in-game utility.

Why Web3 Gaming Represents a Superior Evolution in the Gaming Industry

The gaming industry is ripe for disruption, and Web3 technology offers a number of meaningful benefits to games. Leveraging blockchain technology enhances player experience, engagement, and economic opportunities for developers and studios. This section explores these benefits and the ways in which technology drives advantages for all parties involved in the gaming ecosystem

Technology Drives Innovation in Gaming
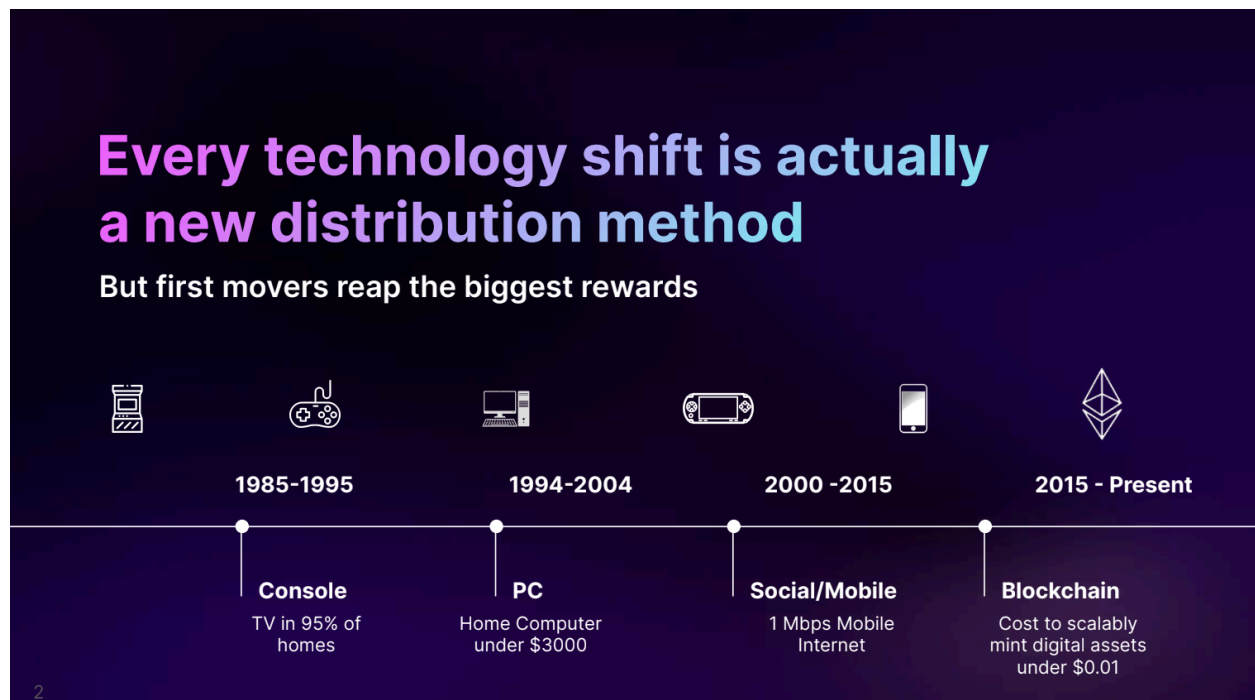
Source: Immutable pitch deck

New technology has always driven changes in the gaming industry, affecting both the gaming experience for users and business model for the developers. In the early days of gaming, companies like Atari focused primarily on selling hardware and game cartridges. This included games like Pong, Space Invaders, and Asteroids. The business model was simple: create a console, develop games, and sell them as physical products. Players would purchase the hardware and then buy individual games to play on their console. In the case of Pong, which was released in a home version in 1975, the game was built into the console.

As the industry shifted towards the PlayStation and Xbox era, the business model began to change. With the introduction of CD-ROMs and later DVDs, games could be larger and more complex. Third-party game developers thrived and created versions of games for multiple platforms. Game developers also began to focus on licensing deals, where they would pay others to create games and then distribute them across various platforms. This shift allowed for a greater variety of games

and opened up new revenue streams for developers. Better internet connectivity allowed for multiplayer games and streaming updates to users. This allowed some gaming platforms to move to more of a subscription model, like Xbox Live.

The next shift in the gaming industry's business model came with the rise of mobile and social gaming. With the proliferation of smartphones and social media platforms, a new type of gamer emerged: the casual player. These players weren't interested in purchasing expensive hardware or paying for individual games, since they already have their phone, tablet or other device. Instead, they wanted free, easily accessible games that they could play on their phones or social media accounts. Game developers responded by creating free-to-play games that generated revenue through ads and in-app purchases. Players could download a game for free but would need to pay for extra lives, power-ups, or cosmetic items. This model proved to be incredibly lucrative, with games like Candy Crush and Clash of Clans generating billions of dollars in revenue.[7]

This freemium model even proved to be lucrative for console and PC based games. It is estimated that in-game spending is on track to reach $125.7 billion in 2023,[8] allowing games to be free to download and increasing virality while maximizing revenue from high value players.

As we mention in the next section, items purchased in game are usually not allowed to be sold or transferred to other players, and elaborate, multi-currency systems have evolved to deal with the complexity of mixing free-to-play and paid elements to a single game. Once the player stops playing, all of those items become valueless. Black market systems have also evolved over time, giving players the flexibility to sell certain items or currency to others; however, the terms and conditions generally prohibit this behavior, and players are sometimes banned when caught. This also leads to a total loss of all real-world funds and time put into the game.

Web3 technology presents a new opportunity to change the gaming industry's business model once again. With the use of blockchain and non-fungible tokens (NFTs), players can now truly own their in-game purchases and assets. This means that instead of simply buying a license to use an in-game item, players can actually own the item and trade it with other players on open marketplaces. This new model has the potential to create entirely new economies within games, where players can earn income by playing and trading their in-game assets. There's no lock-in to a single ecosystem, and games can collaborate with each other to share these in-game collectibles to cross-pollinate their userbases. Instead of prohibiting what were previous black market transactions, these games actually encourage these activities, and game developers generate revenue from each transfer via built in royalty payments.

Initial iterations of Web3 gaming centered around this player economy by creating the "Play to Earn" model. Players formed guilds and even paid others to play on their behalf to level up characters and in-game assets. This quickly became extremely popular with games such as Axie Infitity, which reached a peak market cap of over 9.5 billion[9] in 2021. Their average monthly player count peaked at over 2.7 million[10] in January 2022 with meaningful adoption in developing nations.

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[7] https://www.businessofapps.com/data/clash-of-clans-statistics
[8] https://www.gamesindustry.biz/midia-research-video-games-to-pass-300bn-revenue-38-billion-players-by-2030
[9] https://coinmarketcap.com/currencies/axie-infinity/
[10] https://activeplayer.io/axie-infinity/

Players can battle their Axies (sort of like Pokemon that can breed) against each other, as well as buy, sell and trade Axies and other in-game assets on a dedicated marketplace.

Web3 for Players

GameStop famously ran a campaign called "Power to the Players" - an ad campaign and rewards program. Catchy slogan, but it didn't mean much. Now, though, with the advent of Web3, tools are being developed that can actually fulfill that promise. Blockchain technology brings key elements to gaming that players love: Ownership and Transparency.

Ownership

The concept of ownership in Web3 gaming offers numerous benefits to players. Having provenance over an in-game asset offers a huge appeal to gamers because in the web2 gaming world those assets could be lost at any point, and are usually non-transferrable. Even before in-game items could be represented as NFTs, gamers have been trying to exchange ownership with each other. Black markets to attempt to trade in-game purchases or earnings have popped up for all kinds of games. For example, the popularity of Counter-Strike: Global Offensive (CS:GO), an online first-person shooter game, has led to the emergence of black markets for trading virtual in-game items, particularly weapon skins. An estimate by Delphi Digital in 2023 estimated there had been 32 billion dollars of cumulative trading volume, which at the time was 660% higher than the top five NFT collections combined.[11] The developers were not able to capture royalties on the transactions, and users were often victims of frauds that came out of these black markets.

Web3 gaming addresses these issues by allowing players to have true ownership of their in-game assets, such as characters, weapons, and virtual real estate, as unique digital assets or non-fungible tokens (NFTs). Players have complete control over their assets, which they can trade, sell, or use across different games and platforms. This ownership fosters a sense of pride, accomplishment, and emotional attachment to in-game items.

Moreover, Web3 gaming enables players to monetize their gaming experiences and assets. Players can earn real value by participating in play-to-earn models, where they accumulate tokens or NFTs through gameplay, which can be sold or exchanged for other cryptocurrencies or fiat money. This already exists in traditional gaming models, like grinding for gold in World of Warcraft. For people in developing nations, this can amount to a meaningful source of income, but most of it is done on the black market and subject to account bans. The introduction of NFTs and financial primitives like lending markets allows for these kinds of players to create value and sell to players who prefer to pay, while the game developers still take royalties on each transfer.

Owning Web3 in-game assets also leverages the security features of blockchain technology to protect player assets and prevent fraud. Decentralized storage and cryptographic mechanisms ensure the integrity and immutability of ownership records, while smart contracts automate processes and eliminate the need for intermediaries, reducing the risk of fraudulent activities.

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[11] https://x.com/Delphi_Digital/status/1665058264508424192

As Web3 gaming ecosystems grow and gain popularity, the value of in-game assets may appreciate over time. Rare, unique, or highly sought-after NFTs can become valuable collectibles, providing players with potential long-term investment opportunities, or at least a chance to recoup some of that they originally spent on the item. The scarcity and demand for certain assets can drive up their value, benefiting players who own them.

Transparency

Transparency in Web3 gaming is another benefit for players. In traditional gaming, players often lack visibility into the inner workings of the game, including the mechanics, algorithms, and decision-making processes. This lack of transparency can lead to mistrust, unfairness, and a sense of disconnect between players and developers. Web3 gaming, built on blockchain technology, addresses these issues by providing unprecedented levels of transparency across various aspects of the gaming experience.

Transparency is especially important for in-game assets. In Web3 gaming, players have actual ownership of their virtual items, characters, and other game elements through non-fungible tokens (NFTs). The ownership and transfer of these assets are recorded on the blockchain, providing a transparent and auditable trail. Players can easily verify the provenance and scarcity of their assets, enhancing trust and confidence in the gaming ecosystem. People currently rely on games being honest, for example trusting about how rare a certain item is. With crypto, all of that is verifiable, including things like randomness. A player can know the rarity of their weapon or skin, which can contribute to its value in the market.

Web3 further empowers players to actively participate in governance decisions. Through decentralized autonomous organizations (DAOs) and token-based voting mechanisms, players can have a say in the direction and development of the game. Proposals, voting records, and outcomes are transparently recorded on the blockchain, ensuring that community involvement is provable and cannot be manipulated. This level of transparency fosters a sense of ownership and empowerment among players, as they can directly influence the future of the game.

Web3 for Developers

Web3 gaming not only benefits players but also offers significant advantages to game developers. Despite the industry's size and historic profitability, user acquisition, retention, and monetization are becoming increasingly challenging. The cost to bring a game to market has skyrocketed in recent years, both in terms of time to market as well as dollars invested.[12] Web3 technology provides innovative solutions to overcome these hurdles and create more sustainable and profitable gaming experiences.

User Acquisition

One of the primary struggles faced by game developers is user acquisition. With the increasing cost of advertising and the recent changes in privacy policies, such as Apple's tracking restrictions, the effectiveness of traditional user acquisition methods has diminished. The return on advertising

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[12]https://www.midiaresearch.com/blog/single-player-game-budgets-and-scopes-have-spiralled-out-of-control-its-time-to-shrink-the-scope
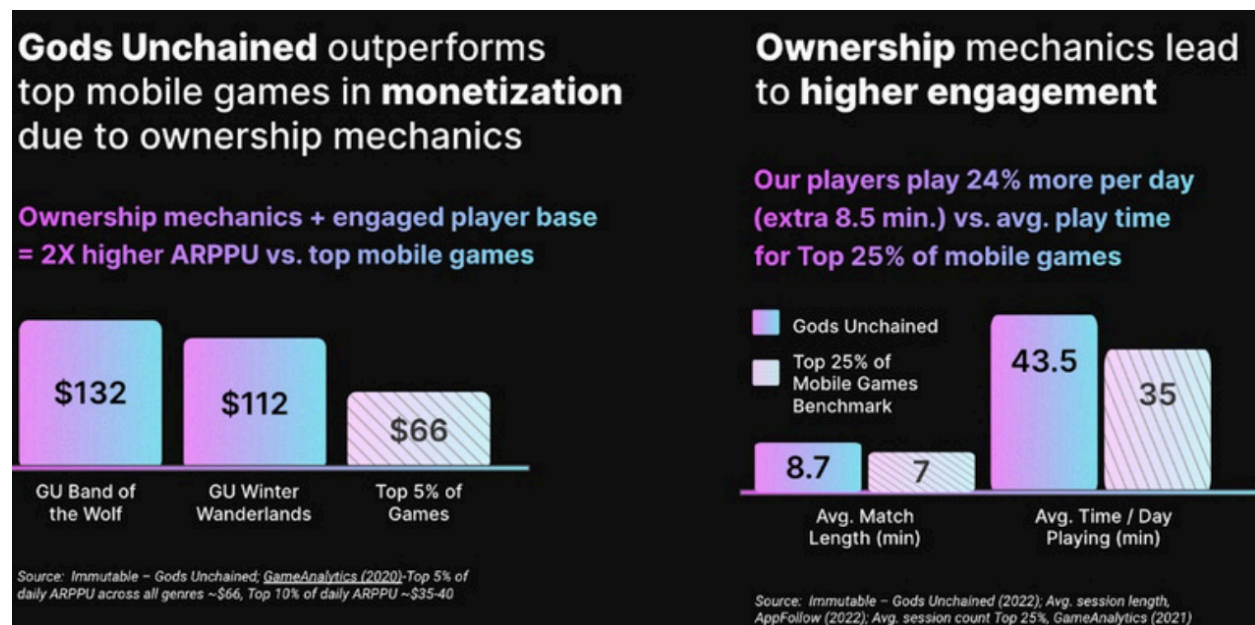
spend (ROAS) has decreased, making it harder for developers to attract new players. Web3 gaming offers a solution by leveraging the power of community and ownership. By offering players ownership of in-game assets through NFTs, developers can create a sense of investment and belonging among players. This, in turn, encourages players to become advocates for the game, organically spreading the word and attracting new users.

User Retention

User retention is another critical challenge for game developers. In traditional (Web2) gaming, only about 5% of players make in-game purchases, and over 60% of those players often regret their spending decisions.[13] This leads to high churn rates and a constant need to acquire new players. Web3 gaming addresses this issue by introducing assets with real market value. When players own their in-game items and can trade or sell them, we believe they may become more passionate and invested in the game. As the gaming industry moves to integrate Web3, we predict this increased engagement and sense of ownership will translate into better retention rates.

Monetization

Monetization is a crucial aspect of any gaming business, and Web3 gaming offers new and innovative monetization strategies. Traditional gaming heavily relies on in-game purchases and advertising revenue, which can often lead to a compromised player experience. In Web3 gaming, the focus shifts towards creating a player-driven economy and opens up new monetization strategies. By allowing players to earn, trade, and sell in-game assets, developers can create new revenue streams. They can earn royalties on secondary market transactions, implement play-and-earn mechanics with a native token, and potentially earn more on primary sales as players become more comfortable spending knowing they can resell. An example of innovative monetization has been shown with the first Immutable game, Gods Unchained:

Gods Unchained outperforms top mobile games in **monetization** due to ownership mechanics

Ownership mechanics + engaged player base = 2X higher ARPPU vs. top mobile games

$132 — GU Band of the Wolf
$112 — GU Winter Wanderlands
$66 — Top 5% of Games

Source: Immutable – Gods Unchained; GameAnalytics (2020)-Top 5% of daily ARPPU across all genres ~$66, Top 10% of daily ARPPU ~$35-40

Ownership mechanics lead to **higher engagement**

Our players play 24% more per day (extra 8.5 min.) vs. avg. play time for Top 25% of mobile games

Gods Unchained
Top 25% of Mobile Games Benchmark

Avg. Match Length (min): 8.7 / 7
Avg. Time / Day Playing (min): 43.5 / 35

Source: Immutable – Gods Unchained (2022); Avg. session length, AppFollow (2022); Avg. session count Top 25%, GameAnalytics (2021)

Source: Immutable - AppFollow (2022); GameAnalytics (2021)

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[13] Immutable internal user research

Players were more engaged, played for longer, and spent more when they were incentivized with real ownership of in game assets, according to the company.

Interoperable Experiences

Further enhancing user retention but also increasing value per player, Web3 gaming allows developers to build expansive ecosystems with interoperability and extended gameplay possibilities. By leveraging blockchain technology, developers can create games that interact with each other, allowing players to use their owned assets across multiple titles. This interoperability enhances the value proposition for players, as their investments and progress can be carried over to different games within the ecosystem. For developers, this opens up opportunities for collaboration, cross-promotion, and the creation of immersive and interconnected gaming experiences.

What is Immutable?

Immutable is a platform for game developers to build Web3 integrated games, specifically designed to address the unique needs of the gaming industry. The creation of Immutable was driven by the need to overcome the limitations associated with Ethereum's scalability, such as high gas fees and slow transaction times, which significantly hindered the user experience in blockchain-based games and NFT transactions. Since then, Immutable has built an internal game studio and suite of middleware tools to empower game developers to integrate the promise of Web3 into their games.

Origins and Launch

Immutable's origin story begins with the creation of Etherbots, a decentralized robot wars game built on Ethereum. It was developed by two brothers, Robbie and James Ferguson, and Alex Connolly. It was one of the first blockchain games, where each part of the robot was represented by an NFT following the ERC 721 standard. The next game they created was a digital trading cards game called Gods Unchained. The digital trading cards were also represented as NFTs on the Ethereum blockchain, meaning that trading them was censorship resistant and owners had true provenance over their purchases. The in-game NFTs were a success, with one of them auctioning for 146 ETH, or over $60,000 dollars at the time of the genesis collection.[14]

However, the launch of Gods Unchained was not without challenges. Ethereum proved to be a significant challenge to distributing the trading cards because of the low throughput and high gas fees. During the Gods Unchained genesis sale, a "receipt" of the NFT was published on chain which was cheaper than minting the actual NFT. This receipt would give users a right to the NFT in the future, but they avoided needing to pay the upfront gas costs of minting them. The idea was that the expensive action of minting the NFT could be done later, once everybody was ready to trade. However, when the set sold out, the cost of minting all the NFTs was incredibly high, and something needed to be done. The process took about 10% of ethereum's capacity for a week according to internal Immutable estimates. After this experience, it was clear that for game developers to succeed with Web3 technology, a new infrastructure solution was badly needed. This gave birth to Immutable X, the first infrastructure solution developed by Immutable.

Immutable X

Immutable X is an Ethereum layer-2 built in partnership with StarkWare. The rollup facilitates NFT minting and trading, with an open order book that any game developer can tap into. Immutable claims its throughput is 600 times higher than Ethereum, which game developers find critical for smooth gameplay.[15] Transactions on Immutable X are aggregated and published to Ethereum using STARKs (Scalable Transparent Argument of Knowledge) which have a number of benefits.

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[14] https://www.blockchaingamer.biz/news/5374/gods-unchained-sells-the-second-most-valuable-card-in-the-world/
[15] https://www.immutable.com/products/immutable-x

STARK proving and verification times increase only slightly as the size of the proof increases, which allows Immutable X to scale transactions. There are no gas fees on Immutable X that developers or users need to pay. However there are drawbacks: There is a limited amount of logic that developers can build on top of the chain that doesn't revolve around NFT minting and trading, and contracts must be coded in Cairo which fewer developers are familiar with. Immutable X has attracted a meaningful number of users and game developers, but the Immutable team wanted to bring full EVM equivalence to game developers. This led to the creation of their second rollup, Immutable zkEVM.

Immutable zkEVM

Immutable's zkEVM came to life with a strategic partnership between Polygon and Immutable.[16] Through the use of Polygon's zkEVM technology and Immutable's gaming infrastructure, Immutable zkEVM is a one stop shop for everything a developer could need to build a Web3 native game. Both Immutable X and Immutable zkEVM will continue operating in parallel.

Key features of Immutable zkEVM include:
- Full Type-1 EVM equivalence, allowing developers to deploy existing Ethereum contracts and leverage familiar tooling
- A suite of APIs, SDKs, and other tools to enable seamless building and launching of games
- Ability to mint and trade NFTs with high scalability and low fees
- Shared liquidity and users across all games and projects deployed on Immutable zkEVM

Key benefits of using Immutable's zkEVM stack include:
- Low fees: By batching transactions together and only submitting proofs to Ethereum, Immutable zkEVM offers significantly lower transaction fees than Ethereum mainnet.
- Fast finality: Within the zkEVM rollup, transactions can be finalized in a trusted state within 2 seconds. When published to ETH mainnet, there is no optimistic window that users must wait for because the proof can be verified immediately by L1.
- Ethereum security: Immutable zkEVM inherits the security of Ethereum by publishing validity proofs to the mainnet. Even if Immutable zkEVM goes down, funds are safe and withdrawable on Ethereum.

With Immutable zkEVM powered by Polygon, game developers get the full programmability and tooling of Ethereum combined with the scalability and low fees of ZK-rollups. This opens up new possibilities for blockchain gaming, with flexible and complicated logic that game developers can implement and an environment Web3 developers are already comfortable with. We believe this move is smart given the current state of virtual machine adoption in Web3 – EVM is the clear favorite, followed by SVM and Cairo (and almost all of the Cairo games have been driven by adoption of Immutable X). See below for some numbers via Game7's research.

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[16] https://www.theblock.co/post/221420/polygon-to-help-develop-immutable-zkevm-secured-by-matic-stakers

Virtual Machine Adoption for Web3 Games and Networks

EVM remains the leading execution environment for smart contracts in the gaming space.

Source: Game7 Research https://research.game7.io/state-of-web3-gaming-2023
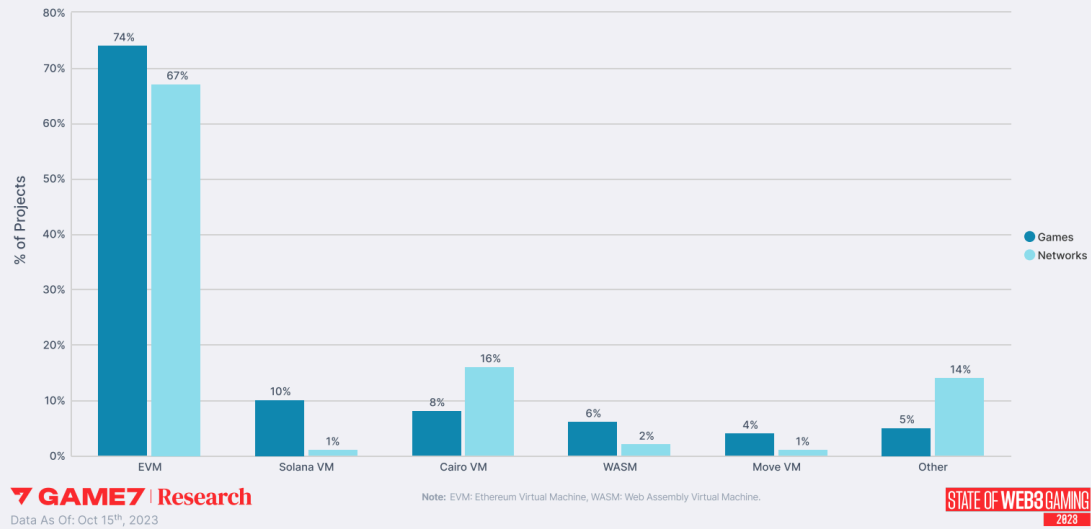
Some of the initial gaming partners planning to deploy on Immutable include Illuvium, Guild of Guardians, Metalcore, Treeverse, Embersword and Pixelmon. The following graphic shows just a sample of the games deploying on zkEVM, with hundreds more in the pipeline according to Immutable.
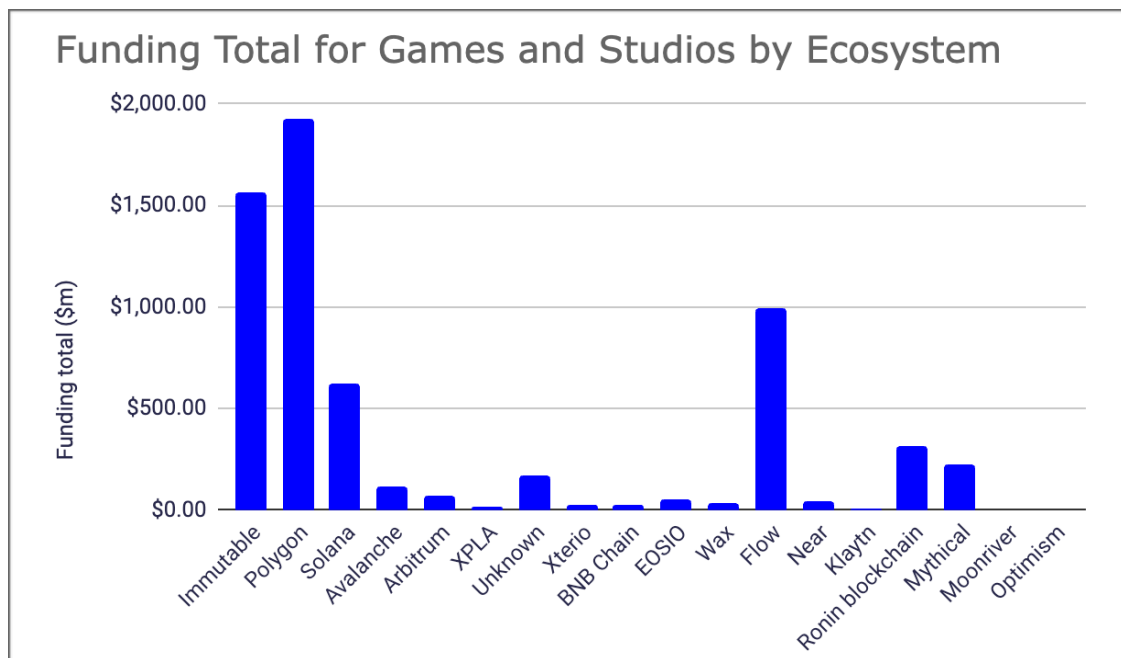

Source: Immutable

We believe that this funding advantage may compound with time, as the Immutable user base grows and gives evidence of the market opportunity building in the Immutable ecosystem. By capturing 70% market share of new Web3 games in development, Immutable has cultivated an interconnected gaming ecosystem that fosters symbiotic relationships among its participants.[18] We expect this extensive network of games to potentially create a virtuous cycle of growth and engagement, allowing players to discover and explore new titles within the platform, driving user acquisition and retention. The cross-pollination of users among games within the Immutable ecosystem has the potential to fuel a network effect, enhancing the value proposition for both developers and players.

Moreover, Immutable's warchest, primarily composed of its native IMX token, allows the Digital Worlds Foundation to offer a grants program that directly supports game developers. Immutable and the Digital Worlds Foundation, the nonprofit foundation established to support the Immutable ecosystem and Web3 gaming, hold over $2.6B in $IMX[19] and over $200M[20] in USD combined, as of May 2024. The Digital Worlds Foundation's grants and venture investment program[21] provides IMX tokens and/or fiat to game developers to encourage them to build on the Immutable platform. These grants are tranched and released upon completion of various milestones, which could include metrics such as user signups, transaction numbers, or trading volume. Competitors offer similar programs, and it has become a popular model for chains trying to attract games to their platform. The largest announced to date comes from Arbitrum, which recently launched a $400 million gaming fund.[22] Some other chains, like Sui, have generous grants programs but have not disclosed the total amount earmarked. These competitive programs typically only offer financial and marketing support. In addition to these value adds, Immutable's in-house consulting team helps studios design their game economies and tokenization strategies.

Some games launching tokens and NFTs have already found success leveraging Immutable's infrastructure. These games include Iluvium, GOG and Gods unchained, which have fully diluted market caps of $687m, $176m and $118m respectively, as of June 2, 2024. We believe that when a developer is looking to choose an ecosystem, they will look for a place where there are existing users and an evidenced path to success. Already having a community and well funded builders in the Immutable ecosystem could be perceived by these developers as positive signaling.

Vertically Complete Solutions for Game Developers

To our knowledge, Immutable is currently the only gaming infrastructure solution that provides a complete suite of products for game developers. Building with Immutable means access to cheap blockspace, a low dropoff sign in module, immediate liquidity for assets on existing marketplaces, SDKs to handle payments, minting and trading. By offering an end-to-end solution that caters specifically to the needs of game developers and players, Immutable allows developers to focus on creating engaging gameplay while leveraging the benefits of decentralized assets and economies. Game developers can integrate these Web3 elements into their games, often with just a few lines of

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[18] https://resources.messari.io/pdf/crypto-theses-for-2024.pdf
[19] Publicly marked wallets on Etherscan
[20] https://www.immutable.com/blog/immutable-raises-200-million-to-bring-blockchain-gaming-to-the-masses
[21] https://www.immutable.com/fund
[22] https://www.theblock.co/post/282651/arbitrum-eyes-400-million-crypto-gaming-fund-with-proposal-to-dao

code, effectively replicating a seamless web2 user experience while unlocking new features only possible with blockchain technology. The following graphic gives an overview of the tools available to developers building with Immutable:
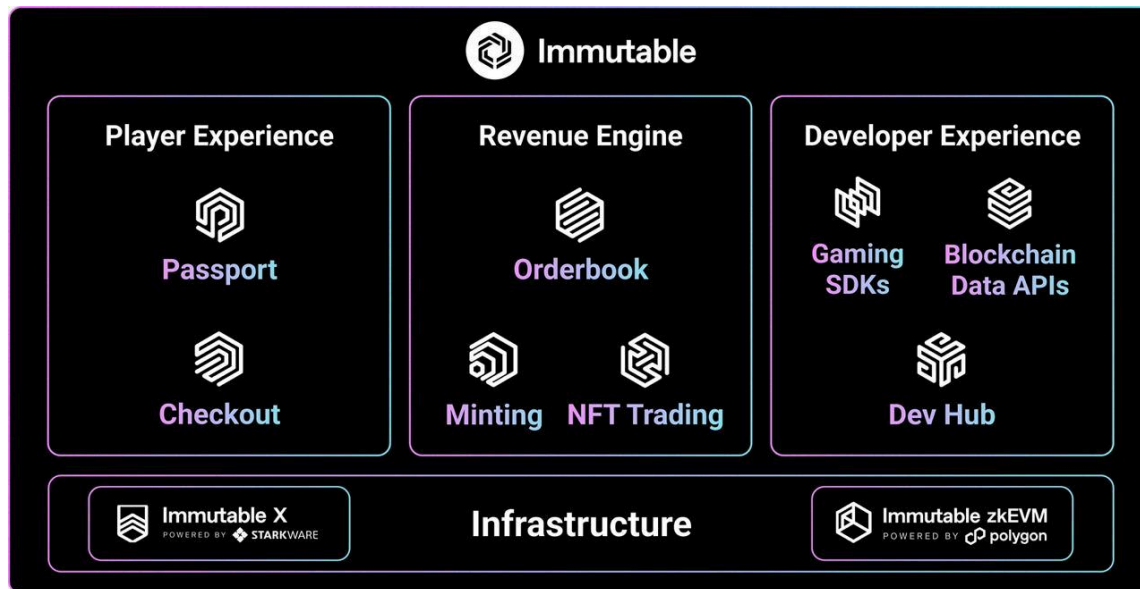
Source: Immutable Pitch Deck

We will now explore a few of these unique offerings in detail: Passport, Orderbook, Checkout, zkEVM, and gaming SDKs.

Solving for Onboarding: Immutable's Passport

The complexity of traditional crypto wallets often leads to confusion and skepticism among mainstream gamers, hindering widespread adoption of Web3 games. Even Web3-native players face friction by maintaining multiple wallets across different games, resulting in fragmented funds and in-game items. Immutable Passport solves these issues by providing a secure, user-friendly, and universal onboarding solution that enables players to access multiple games and marketplaces with a single login.

The Immutable Passport has integrations with familiar social logins, such as Google and Apple accounts, making Web3 onboarding accessible to all gamers. By eliminating the need for passwords and seed phrases, an Immutable case study showed that Passport users are more than twice as likely to complete sign-up and onboarding compared to traditional email and wallet setups.[23]

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[23] https://x.com/Immutable/status/1698056808433352864

Immutable Passport:
Redefining User Acquisition

Immutable Passport conversion			Email & wallet conversion		
Land on Page	3500	100%	3500	Land on Page	
Start Passport	525	15%	18%	630	Enter Email
Finish Passport	473	90%	33%	211	Create Wallet
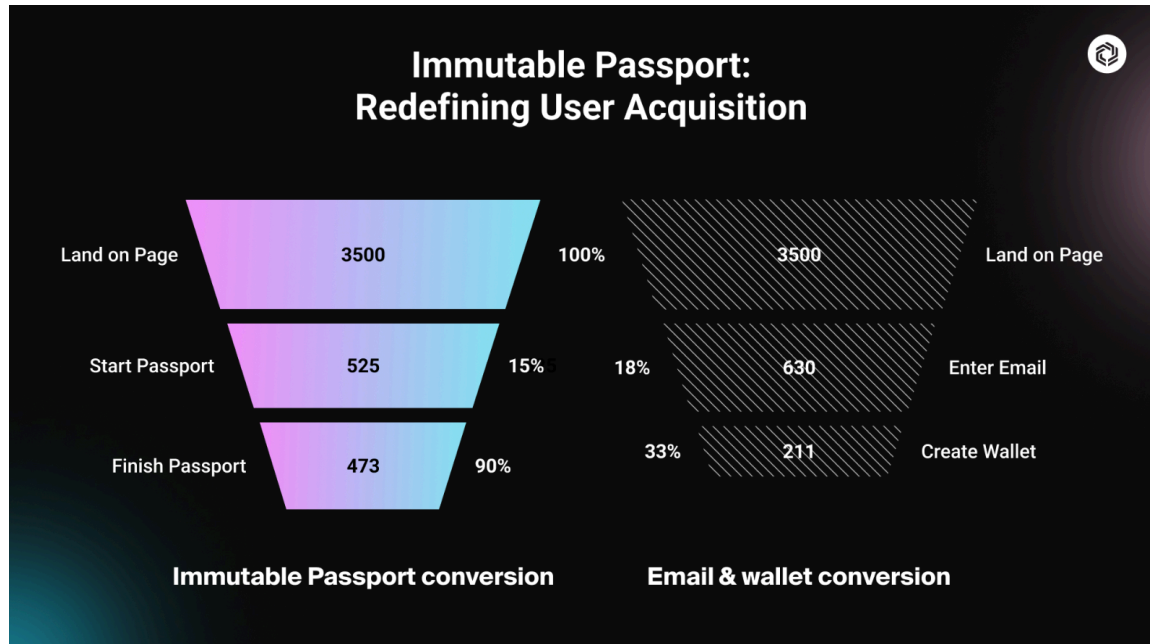
Source: Immutable Pitch Deck

The goal of Immutable Passport is to offer enterprise-grade security without compromising user experience or gameplay mechanics. The platform utilizes a non-custodial solution, meaning Immutable cannot revoke access to a user's assets. Through its partnership with Magic, a leading Web3 wallet service provider, Immutable Passport incorporates wallet technology and a Delegated Key Management System (DKMS) that encrypts and secures private keys.

In addition to its security features, Immutable Passport provides an ecosystem of tools, marketplaces, and infrastructure solutions that enable global scalability for game developers. With a single Passport login, developers gain immediate access to the entire Immutable gamer community and marketplace network.
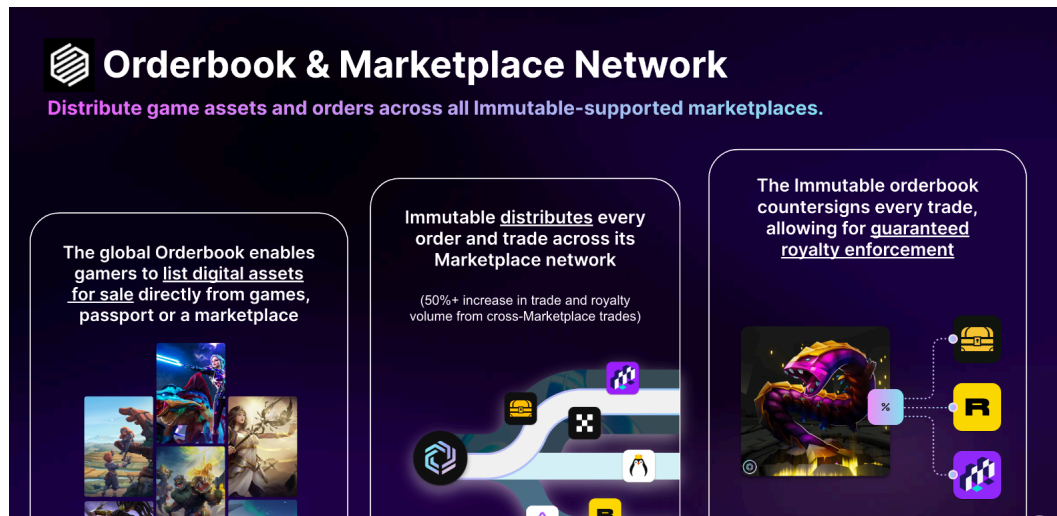
Immutable Passport has already been integrated into multiple Web3 games and marketplaces, including Gods Unchained, Illuvium, and Guild of Guardians, reaching a combined user base of over one million.[24] Early adopters, such as Gods Unchained, have reported a "drastic decline" in drop-outs during the sign-up process after implementing Passport.[25]

Compared to other wallet solutions in the market, such as MetaMask or Coinbase Wallet, Immutable Passport is specifically designed for gamers. While most wallets cater to decentralized finance (DeFi) or general use cases, Passport incorporates gaming-specific features like gamer profiles, early access to game features, and user-set limits. Moreover, Passport eliminates the need for users to hold network tokens to cover gas fees, and offers the developers to enable gas-free signing. In fact, developers can leverage invisible signing to facilitate in-game transactions without a pop up interrupting the flow of the game. When using Passport, the player in a game can be completely unaware that blockchain technology is behind the scenes.

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[24] https://x.com/0xferg/status/1793040835933511855
[25] https://www.prnewswire.com/news-releases/immutable-passport-debuts-providing-seamless-sign-on-for-over-500-000-gamers-across-five-leading-web3-games-302019360.html

Cross Platform Marketplace: Immutable's Open Orderbook

Source: Immutable Pitch Deck

The Immutable Open Orderbook addresses the issue of order fragmentation in the NFT market, offering an improvement to the way buyers and sellers interact across multiple platforms. By providing a global, protocol-level orderbook accessible to all Immutable-integrated marketplaces, the Open Orderbook enables orders created on one marketplace to be immediately visible and fillable on any other marketplace within the network. This shared liquidity model enhances the NFT trading experience.

One of the advantages of the Open Orderbook is its ability to facilitate price discovery and market efficiency. With orders shared across the leading NFT marketplaces, buyers and sellers can access the best prices for their NFTs, regardless of the platform they are using. This global reach ensures that the true market value of an NFT is reflected, as it takes into account the demand and supply across the entire ecosystem.

The Open Orderbook also allows for in-game and context specific trading. Developers may want their users to trade in-game for higher conversion rates, rather than sending them to an external exchange to buy NFTs. We believe that allowing users to buy an NFT at the moment they need it has the potential to improve the conversion rates and transaction volume for a game's collection.

For emerging marketplaces, the Open Orderbook offers a solution to one of the largest challenges inherent with launching: bootstrapping liquidity. By leveraging a shared orderbook, new marketplaces can instantly showcase a wide array of NFTs to their users, even if those orders originated elsewhere. This feature is particularly beneficial for niche and context-specific marketplaces, such as GUDecks, a Gods Unchained deck builder that allows users to instantly copy and buy popular decks. The Open Orderbook's ability to surface relevant NFTs through advanced metadata filtering, powered by Immutable's protocol-wide NFT metadata indexer, further enhances the user experience and facilitates the discovery of unique assets.

According to Immutable's analysis of their marketplace network, more than half of all trades in Immutable's orderbook are created on one marketplace and filled on another.[26] This cross-platform trading activity has resulted in a doubling of NFT sales compared to a scenario where users are restricted to buying and selling NFTs within the same platform. As the number of games and marketplaces integrated with Immutable grows, the network effects of the Open Orderbook will become stronger, possibly leading to increased liquidity.

Immutable's Open Orderbook consists of four APIs that enable developers to submit, retrieve, and cancel orders, as well as create trades using one or more orders from the orderbook. This architecture allows developers to integrate their marketplaces with the Open Orderbook, regardless of whether they focus exclusively on Immutable assets or support assets from multiple chains. For marketplaces dedicated to Immutable, direct integration using the Immutable APIs offers the most efficient approach, while marketplaces supporting multiple chains can synchronize the Immutable orderbook with their own backend, enabling a seamless user experience across different blockchain ecosystems.

The Open Orderbook's architecture also addresses common pain points associated with NFT trading, such as front-running and price surprises. By controlling the cross-marketplace orderbook, Immutable can put a hold on price changes and prevent other buyers from sniping an NFT between the time of purchase and settlement.

Developer Enablement: Gaming SDKs

Immutable's gaming SDKs are a cornerstone of its Web3 gaming offering, providing developers with tools to create blockchain-powered games. These SDKs are designed to abstract away the complexities of blockchain development, allowing game studios to focus on creating immersive gameplay experiences via Unity, Unreal or other third party game development engines. In addition to the core SDK, Immutable offers specialized SDKs for these development engines. These SDKs enable developers to integrate smart contract logic, Immutable Passport, and the Open Orderbook without needing to learn a whole new development framework.

Immutable's SDKs are available in a number of popular programming languages, including TypeScript, Unity, and Unreal, allowing developers to work with tools and environments they are already familiar with. This approach lowers the barrier to entry for game studios looking to explore the potential of Web3 gaming, as they can leverage their existing expertise and resources to build on Immutable's platform.

The core SDK facilitates integration with the Immutable platform, providing developers with a set of APIs and smart contract templates that streamline the development process. These APIs enable developers to implement essential Web3 gaming features, such as minting and trading NFTs, without the need to write complex smart contract code from scratch.

While other platforms in the Web3 space often cater to a wide range of applications, such as DeFi and social apps, Immutable's focus on gaming allows it to provide a tailored, optimized solution for game developers and players.

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[26] https://www.immutable.com/products/orderbook

Current In-Market Product and Platform Comparison

As the Web3 gaming market continues to grow and evolve, several prominent players have emerged, each vying for a piece of the blockchain gaming pie. While competitors such as Saga, zkSync hyperchains, Avalanche subnets, Thirdweb, Stardust, Magic Eden, Sequence, Optimism rollups and Ronin offer their own unique solutions and value propositions, Immutable offers an infrastructure stack that we believe gives it certain advantages over these competitors.

On the middleware side of the market, Thirdweb is one of the largest competitors. However, they don't offer a native orderbook, marketplace, or their own general purpose rollup. On the other end of the spectrum you have blockchains like Ronin, which can offer cheap blockspace but do not currently have middleware solutions for services like minting, and checkout.

Platform Comparison Matrix

|	Immutable	Thirdweb	Stardust	Sequence	Magic Eden	Ronin
Wallet	🟢	🟢	🟢	🟢	🔴	🟢
Checkout	🟢	🟡	🔴	🟡	🔴	🔴
Orderbook	🟢	🔴	🔴	🔴	🟢	🔴
Marketpalce	🟡	🔴	🟡	🟡	🟢	🟢
Indexer	🟢	🟢	🟢	🟢	🔴	🔴
Mint	🟢	🟢	🟢	🟢	🔴	🔴
RPC	🟡	🟢	🔴	🟢	🔴	🟢

Source: Immutable Pitch Deck

The aforementioned competitors currently only address a limited number of pieces of the infrastructure stack required to build a game. If a game builds on a new layer-1 or layer-2, they may have access to cheap blockspace on par with an Immutable rollup. But the developer will have to learn a new development language, then seek out providers for user authentication, checkout, smart contract templates, data management, minting, trading, etc. Dealing with many vendors can lead to an inconsistent experience for players and longer development times. In housing everything also leads to longer development times and higher costs. Even if a game wants a sovereign chain, they can still do that with Immutable via the use of Immutable Nexus. We believe that the most competitive solution will be one that offers a fully integrated infrastructure stack, which to our knowledge, only Immutable currently offers.

Another factor that sets Immutable apart from some competitors is its native token, IMX. The use of a native token to offer grants and spur development can be important in winning high profile

deals. A token can also help with building a community around a project, which in turn increases attractiveness for builders who can tap into a larger cryptonative market of users. A middleware provider like Thirdweb that is only providing SDKs and tools for building games without bringing a community as well arguably offers less value to developers.

Web3 Integrated Gaming Ecosystem
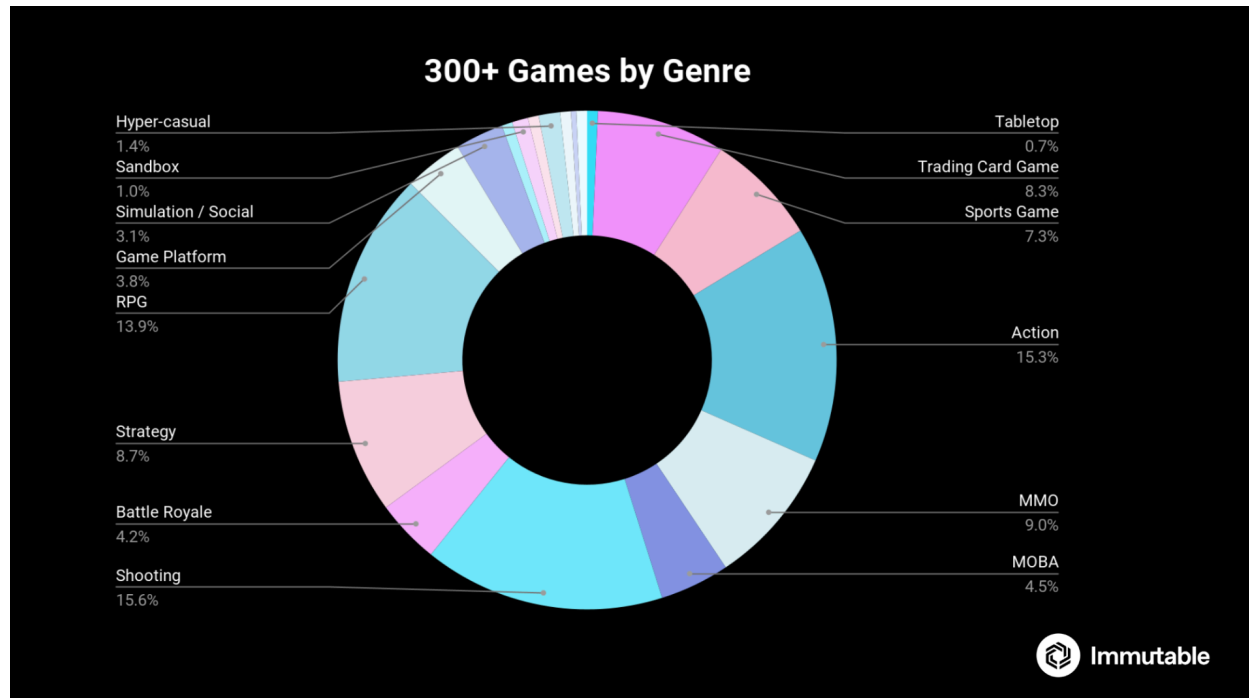
A robust and healthy ecosystem that welcomes new participations is paramount to any community - but especially critical for gaming. In addition to compelling graphics and attention grabbing gameplay narrative and mechanics, games offering Web3 integrations encourage additional levels of player participation and capture the imaginations of gamers.
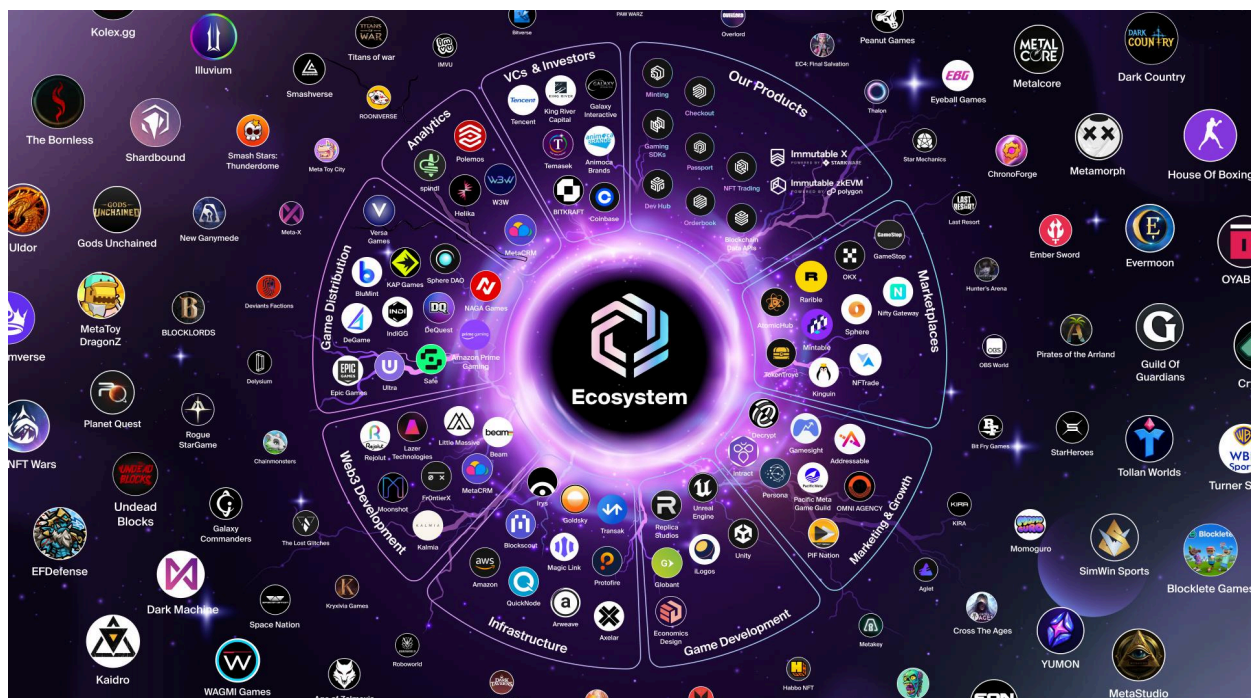
Source: Immutable Pitch Deck

There are currently over 300 games across various genres on Immutable.

300+ Games by Genre

| Genre	%
Hyper-casual	1.4%
Sandbox	1.0%
Simulation / Social	3.1%
Game Platform	3.8%
RPG	13.9%
Strategy	8.7%
Battle Royale	4.2%
Shooting	15.6%
Tabletop	0.7%
Trading Card Game	8.3%
Sports Game	7.3%
Action	15.3%
MMO	9.0%
MOBA	4.5%

Immutable internal data, consists of games that have signed at one point in time.

We will highlight a few of the most notable games in the ecosystem. Arrington Capital has financial stakes in the token of each of the games mentioned below.

Illuvium

Illuvium is a blockchain-based role-playing game (RPG) that combines open-world exploration, creature collecting, and auto-battler gameplay. Illuvium aims to deliver a high-quality gaming experience that leverages the benefits of Web3 to connect these playstyles with a common set of in-game assets.
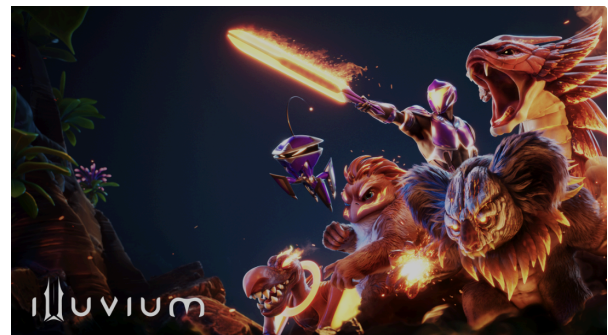
Gameplay and Setting
Set in an alien world filled with powerful creatures known as Illuvials, Illuvium offers players a variety of games based around a common set of NFTs and a native token. There are four games in the Illuvium universe, creating diverse offerings to a wide variety of participants in the ecosystem: Overworld, Arena, Illuvium Zero, Illuvium Beyond.

Web3 Integration

Illuvium has both in-game NFTs and a native token. Captured Illuvials and other items are represented as NFTs, which can be traded on the IlluviDEX, the game's decentralized marketplace, or on external NFT platforms like OpenSea.

The game's native token, ILV, serves as a governance token for the Illuvium DAO and is used to reward players for their in-game achievements and contributions to the ecosystem.

Because Illuvium has multiple games in its ecosystem, the composability Web3 brings to the game enables these games to be connected by a common set of NFTs to create a more unifying experience.

Community and Ecosystem

Illuvium has garnered a strong community following, with over 1 million registered users eagerly awaiting the game's full release.[27] The project's unique revenue-sharing model, which distributes 100% of in-game revenues to ILV token stakers, has resonated with the community.[28]

The Illuvium ecosystem continues to expand, with the development of new features like the IlluviDEX repository, which will provide detailed information on Illuvials and other in-game assets, and the introduction of Illuvitars, a customizable NFT collection that adds depth to the game's lore.[29]

Guild of Guardians

Guild of Guardians is a squad-based action RPG that combines high-quality gameplay, stunning graphics, and a player-centric rewards system. Developed by Stepico Games and published by Immutable, Guild of Guardians aims to revolutionize the mobile gaming experience by integrating blockchain technology and NFTs.

Gameplay and Setting

Set in a fantasy world on the brink of destruction, Guild of Guardians tasks players with assembling a team of heroes to embark on an epic adventure and conquer the darkness threatening the land. The game features strategic squad-based combat, challenging dungeons, and a variety of powerful bosses to overcome.

Players can collect and upgrade unique heroes, each with their own abilities and playstyles, and craft powerful equipment to enhance their performance in battle. The game also emphasizes social gameplay, with players able to join or create guilds, contribute to their community, and compete for top rewards.

[27] https://alexablockchain.com/illuvium-raises-12m/
[28] https://alexablockchain.com/illuvium-raises-12m/
[29] https://illuvium.io/news/illuvium-x-ethlizards-partnership

Web3 Integration

Heroes and equipment are represented as NFTs, which can be traded freely on the open market, allowing players to monetize their progress and creating a sustainable in-game economy. The game's native token, $GOG, serves as the primary currency for purchasing in-game items, participating in governance, and accessing exclusive content.

Development and Partnerships

Guild of Guardians is being developed by Stepico Games at the helm and Immutable providing expertise in blockchain technology and ecosystem development. The project has also secured partnerships with major players in the gaming and esports industries, including Ubisoft, Sandbox, Cloud9, NRG Esports, and more.[30] The game recently launched as of May 2024 with over 1 million sign ups.[31]

MetalCore

Metalcore is a free-to-play, first-person/third-person multiplayer mechanized combat game that is set to launch on Immutable zkEVM. It is being developed by a team with experience working on AAA titles such as Fortnite, Gears of War, and Mortal Kombat.
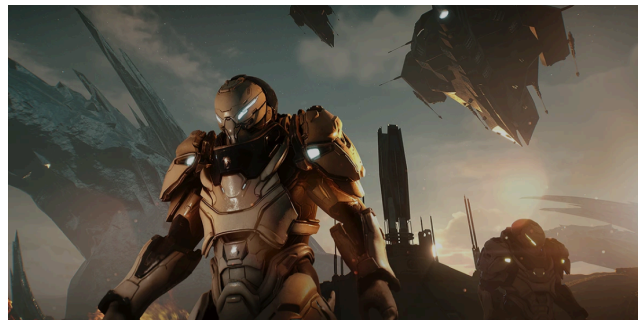
Gameplay and Setting

Set in the distant future on the war-torn planet Kerberos, Metalcore puts players in the role of soldiers fighting for dominance using powerful war machines. The game features a blend of first-person infantry combat and third-person vehicular gameplay, allowing players to switch between mechs, tanks, and aircraft.
Players can choose to fight for one of three warring factions - the Gearbreakers, Metal Punks, or Holy Corporation - or remain a lone mercenary as an Earther. The game offers both PvP and PvE content, including territorial battles, missions, boss fights, resource management, and crafting.

Web3 Integration

Metalcore has deep integrations with Web3 elements. Players have true ownership over their in-game assets, including vehicles, weapons, and cosmetic items, which are represented as NFTs. These assets can be freely traded on the open market, allowing players to monetize their progress and creating a player-driven economy.

The game also features a dual-token system, with the $MCG token serving as the primary in-game currency. $MCG empowers players to customize their gameplay experience by purchasing and upgrading items.

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[30] https://esportsinsider.com/2022/10/key-esports-sponsorships-and-partnerships-september-2022
[31] https://x.com/GuildOfGuardian

Development and Partnerships

Metalcore is being developed as a collaboration between Studio 369, which handles the game development on Unreal Engine, and Immutable, which brings expertise in blockchain technology and data management. The game boasts an impressive roster of talent, with concept art by Hugo award-winning artist Stephan Martiniere and music by Mick Gordon, known for his work on DOOM and Wolfenstein.

The game has also secured partnerships with major players in the Web3 gaming space, including Immutable and the Epic Games Store. Metalcore is set to be one of the first games to launch on Immutable's zkEVM blockchain.

Treeverse

Treeverse is an upcoming free-to-play, open-world MMORPG built for mobile with an emphasis on social features and cooperative gameplay. Developed by Endless Clouds, a studio led by well-known NFT collector and creator Loopify, Treeverse aims to bring the depth and immersion of classic MMORPGs to the world of Web3 gaming.

"The goal of Endless Clouds is to bring digital ownership to gamers. There are two parts to this: a good game, and seamless integration. A chain is a partner that helps solve the latter while our team can focus on production."—Loopify, a gaming influencer.

Gameplay and Setting

Set in the mystical city of Lorwick protected by the World Tree, Treeverse invites players to explore a vast, detailed world filled with quests, crafting, and combat. The game draws inspiration from titles like Genshin Impact, offering a top-down perspective and a vibrant, stylized art direction.

Players start their journey in Lorwick, where they can meet up with friends, form parties, battle monsters, gather resources, and craft powerful gear. The game world is divided into various regions, each with its own unique environments, challenges and boss encounters that encourage cooperation between players.

Web3 Integration

Treeverse incorporates Web3 elements through its integration with the Immutable zkEVM blockchain, allowing players to own their in-game assets as NFTs. This includes land plots, cosmetic items like skins, and potentially crafting materials and equipment.

The game also features its own $ROOT token, which serves as the basis for its player-driven economy. Players can earn $ROOT through gameplay activities like quests and trading, and use it to purchase items from other players. NFT landowners can also set their own prices for the resources their land generates, creating a dynamic marketplace.

Development and Partnerships

Treeverse began with a generative NFT collection called NFTrees in early 2021, which quickly sold out and provided the initial funding for the game's development. Since then, Endless Clouds has released additional NFT collections like land plots and avatar skins, generating nearly $100M in trading volume.

In January 2024, Endless Clouds announced a strategic partnership with Immutable to launch Treeverse on the Immutable zkEVM blockchain. On picking a chain, Loopify said *"The decision came down to many variables, from the final tech solution to how many things we can delegate to a partner, connections that help with production, and more. Rather than another chain being bad or good, we simplified it to what fits our needs the best."* Treeverse is targeting a Q4 2024 alpha release.

IMX Token Mechanics and Utility

The IMX token, which powers the Immutable protocol, is designed to bootstrap adoption, facilitate a combination of protocol revenue capture, platform fees, and ecosystem growth. In this section, we will explore the utility of the IMX token.

Protocol Revenue and Gas Fees

One of the primary use cases of the IMX token is the native gas token of the Immutable protocol. The transaction fee market uses EIP 1559, which means that the base fee paid is burned. Immutable offers developers the option to cover user gas costs on their zkEVM, which maintains the user experience of no gas fees but still generates demand for the IMX token.

Platform Fees and NFT Take Rates

In addition to gas fees, Immutable also generates revenue through platform fees, such as take rates on NFT transactions. Any time the Open Orderbook is used to trade an NFT on the secondary market, a piece of that sale will be collected by Immutable. The platform charges a 2% fee on all secondary trades, payable in IMX tokens. If the user would rather pay in a different currency, the swap is abstracted in the background for a seamless experience. Twenty percent of these protocol fees are automatically converted to IMX and allocated to the staking rewards pool.[32] This mechanism ensures a constant demand for IMX tokens, as a portion of the fees generated by the ecosystem is used to purchase IMX from the open market. If adoption of IMX increases and transaction volumes also increase, this would increase the number of IMX tokens distributed back to token holders via the staking pool.

Governance

IMX also serves as a governance token for the Immutable ecosystem. This means holders of IMX will be able to vote on proposals guiding the direction of the Immutable protocol. The topics of these votes include topics such as allocating token reserves, voting on developer grants, activating daily rewards, and changes in token supply. Voting is done proportionally, meaning that voting power per holder is determined by the number of tokens they hold. If a single holder accumulates enough IMX tokens, they will be able to sponsor a proposal and bring it to a vote.[33]

IMX Token Distribution

The total supply of IMX is capped at 2 billion tokens, with a significant portion allocated for ecosystem development, including user rewards and developer grants.

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[32] https://support.immutable.com/en/articles/6470640-immutable-whitepaper
[33] Ibid.

Notably, the majority of IMX tokens are subject to vesting schedules and unlock periods, which helps to ensure a stable and predictable supply. As of May 2024, 75% of IMX tokens have been unlocked.[34] There are remaining unlocks earmarked for ecosystem and product development. Many of these tokens are spent through grants given by the Digital Worlds Foundation. These grants are always tranched so that projects must meet agreed upon milestones in order to continue receiving tokens. Oftentimes, these milestones are related to usage and trading volume, which both drive revenue and recoup the value of those tokens for the community.

Conclusion

The gaming industry has experienced significant growth and evolution over the past few decades, with advancements in technology driving changes in both user experiences and business models. As the industry continues to mature, there is increasing interest in the potential of Web3 technologies, such as blockchain and non-fungible tokens (NFTs), to address some of the challenges and limitations of traditional gaming platforms.

Web3 gaming offers several potential benefits for both players and developers. For players, Web3 technologies enable true ownership of in-game assets, allowing them to trade, sell, and use their items across multiple games and platforms. This level of ownership and control has the potential to enhance player engagement and investment in the games they play. Additionally, Web3 gaming introduces new economic opportunities, such as play-to-earn models, where players can earn real-world value through their in-game activities.

For developers, Web3 gaming presents new avenues for monetization, user acquisition, and retention. By leveraging blockchain technology and NFTs, developers can create more sustainable and profitable gaming ecosystems, with the potential for cross-game interoperability and collaboration.

Immutable, a company focused on providing infrastructure and tools for Web3 gaming, has positioned itself as an important player in the market. Through its layer-2 scaling solutions, Immutable X and Immutable zkEVM, the company aims to address the scalability and user experience challenges associated with blockchain gaming. Immutable differs from its competitors by offering a complete solution for game developers, including solutions for user wallets, checkout, marketplaces, minting, and cheap blockspace settled back to Ethereum. We believe that this approach of being a "one stop shop" will benefit Immutable as they seek to win over the most promising crypto games looking for a home.

The Immutable gaming ecosystem has attracted several notable titles, such as Gods Unchained, Guild of Guardians, and Illuvium. These games showcase the potential of Web3 gaming and demonstrate the capabilities of Immutable's infrastructure in supporting diverse gaming experiences. Immutable's focus on providing the necessary infrastructure and tools for Web3 gaming has positioned the company as a notable player in this space, and we are excited to see what their future holds.

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[34] https://token.unlocks.app/immutable-x

Disclosure

Arrington Capital Investment Management. LLC and/or its affiliates (collectively "Arrington Capital") has a financial interest in the success of the Immutable Pty Ltd ("Immutable") initiatives and projects. Arrington Capital currently owns IMX tokens.

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