Gamechain Reshaped Games

From General-Purpose to Specialized: How Game Chain Reshaped the Web3 Gaming | Gate Research

Foreword

In the early narratives of the Web3 industry, GameFi emerged as the second standalone sector to achieve industry-wide consensus and logical validation, trailing only DeFi. Initially, dedicated gaming blockchains were not a distinct concept, and blockchain game development was predominantly driven by game distribution platforms. Prior to 2020, most Web3 games relied on Ethereum smart contracts to facilitate the purchase and sale of NFT-based in-game assets. Play-to-Earn (P2E) served as the primary incentive for most players, often relegating gameplay experience to a secondary priority.

In the Web2 gaming realm, advancements in game performance drive upgrades to personal hardware. For instance, PlayerUnknown's Battlegrounds (2017) prompted gamers to upgrade their GPUs to RTX 1050 or higher, while Cyberpunk 2077 (2021) pushed players toward RTX 3060-tier graphics cards. In contrast, the Web3 gaming industry faces a reverse dynamic: surges in active players compel game developers to enhance blockchain performance. The explosive growth of Axie Infinity in late 2021 attracted massive player engagement in Play-to-Earn activities. However, Ethereum’s limitations in processing parallel transactions resulted in poor NFT trading experiences. This bottleneck motivated the Sky Mavis team to develop the Ronin sidechain, which not only significantly improved user experience but also laid the groundwork for a self-sustaining gaming ecosystem.

Unlike DeFi, where projects can rapidly clone open-source code (e.g., PancakeSwap replicating UniSwap), GameFi struggles to expedite the development of gameplay-rich products. The GameFi ecosystem involves a longer chain of dependencies—from game studios and blockchain selection to platform marketing and player communities—each requiring meticulous coordination. DeFi innovations, by comparison, often build upon existing product frameworks, enabling easier code reuse. For general-purpose blockchains, building a DeFi ecosystem is almost a mandatory step, whereas cultivating a GameFi ecosystem remains optional. Dedicated gaming blockchains address the resource gaps of general-purpose chains by prioritizing player experience and aligning incentives among studios, distribution channels, and stakeholders. These chains are typically spearheaded by industry veterans with deep ties to game studios, ensuring both technical excellence and equitable value distribution.

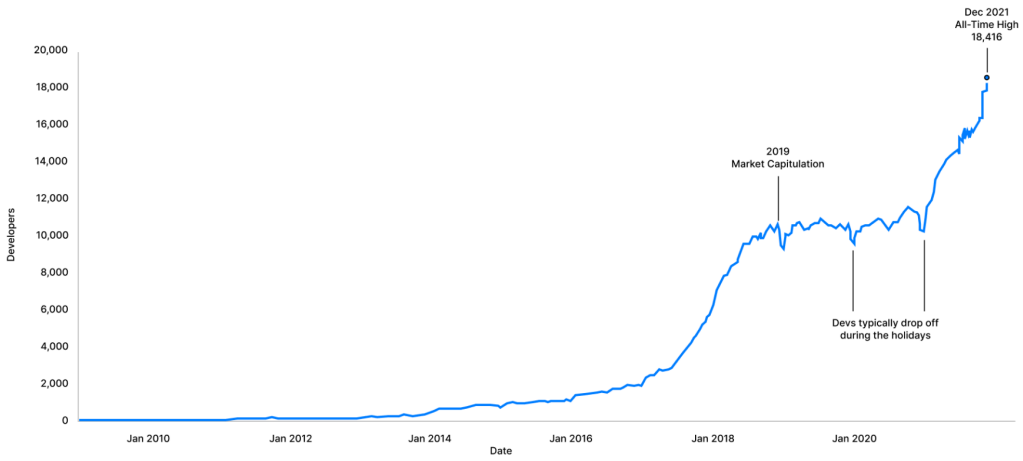
1. Game Chain Chronicle

2017-2019: Technical Validation and Conceptual Exploration

Prior to 2020, the blockchain application landscape remained largely barren. While entrepreneurs envisioned groundbreaking concepts, user adoption was limited, and commercially viable applications were scarce. In 2017, Gamechain System, initiated by veteran game developer Ling Lianwei, emerged as the earliest dedicated gaming blockchain on record. It proposed a decentralized framework for gaming asset circulation, pioneering the use of NFT standards (before the term "NFT" was formalized) and a DPoS consensus

mechanism to establish technical protocols for digital ownership. In 2018, Candy Shooter, the first game on the Gamechain System, launched. Despite its visionary approach, the project faded like a meteor in the gaming blockchain space. The Web3 ecosystem at the time lacked critical mass—fewer than 4,000 active developers globally—making sustainable community growth impossible.【1】

Figure 1:The number of active developers in the Web3 industry from 2009 to 2020



Gate Research, Data from: Crypto Council for Innovation

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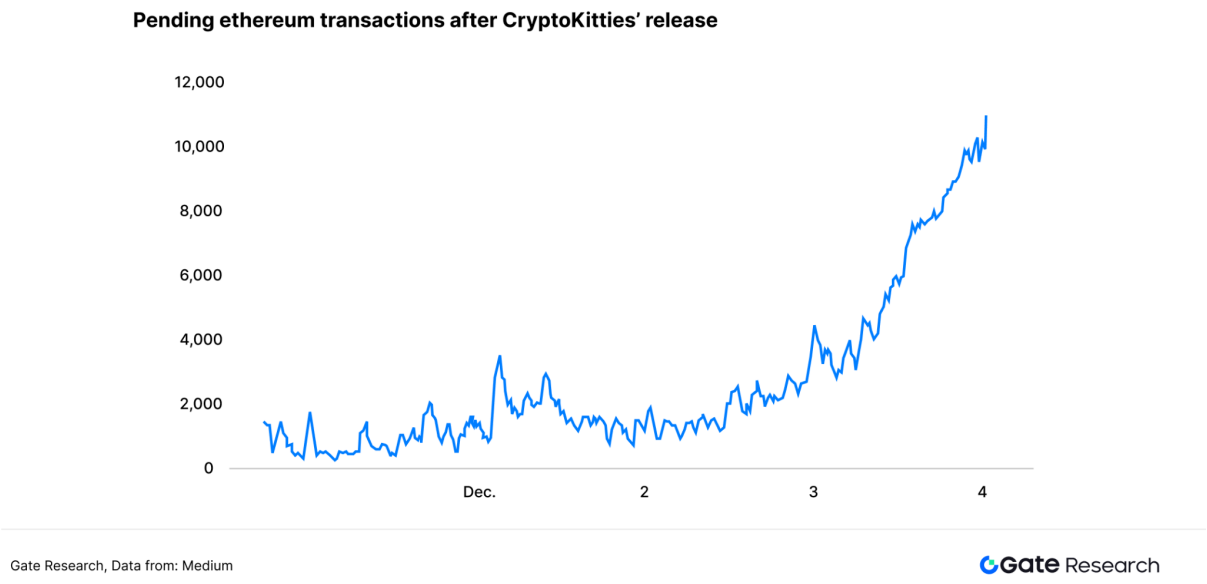
Notably, the WAX blockchain, another gaming/NFT-focused chain founded in 2017, launched its mainnet in June 2019, later than Gamechain System. Meanwhile, ImmutableX, designed to solve NFT scaling challenges, began development in 2018.

During this period, CryptoKitties (2017), developed by Canadian studio Dapper Labs on Ethereum, became the first Web3 game to achieve mainstream recognition. In this virtual pet game, each cat was a unique on-chain asset (retroactively recognized as an early NFT prototype). Players could breed two "CryptoKitties" to generate new NFTs and trade them on secondary markets. Its viral success overwhelmed Ethereum’s network, spiking pending transactions in the mempool to 12,000 at its peak.【2】

Figure 2: Ethereum network transaction volume after the release of CryptoKitties



Axie Infinity, later a breakout Web3 phenomenon, commenced development in 2018 under Sky Mavis. Blending Pokémon-inspired creature battles with CryptoKitties' NFT breeding mechanics, it allowed players to breed, battle, and trade Axie creatures.

The 2017-2019 era marked blockchain gaming's embryonic phase. Most Web3 games were formulaic, prioritizing financialization over gameplay, resulting in short-lived product cycles. Demand for dedicated gaming chains remained muted, as the industry's infrastructure required years to mature.

2020-2021: Formation of Technical Frameworks and the Rise of Vertical Blockchains

The period from 2020 to 2021 witnessed the popularization of blockchain gaming and the emergence of vertical blockchains. With the further adoption of the Play-to-Earn model, more game studios began developing blockchain games, leading to explosive growth in user numbers.

The breakthrough in economic models served as the core driver during this phase. In 2021, Axie Infinity, with its dual-token mechanism (AXS governance token and SLP utility token), sparked a wave of enthusiasm in Southeast Asian markets. At its peak, its daily revenue even surpassed that of traditional mobile games, as token incentives created a positive growth flywheel effect. This model not only attracted millions of users but also fostered gold-farming communities on Discord, gradually shifting the user base from speculators to genuine players. By November 2021, Axie Infinity reached its zenith, boasting 5.59 million monthly active users and a total transaction volume of 64.86 million. While these figures still paled in comparison to Web2 classics like Dota, CS:GO, and World of Warcraft, no Web3 game has yet matched Axie Infinity's 2021 user and transaction volumes.【3】

Figure 3: Ronin Mainnet Launch

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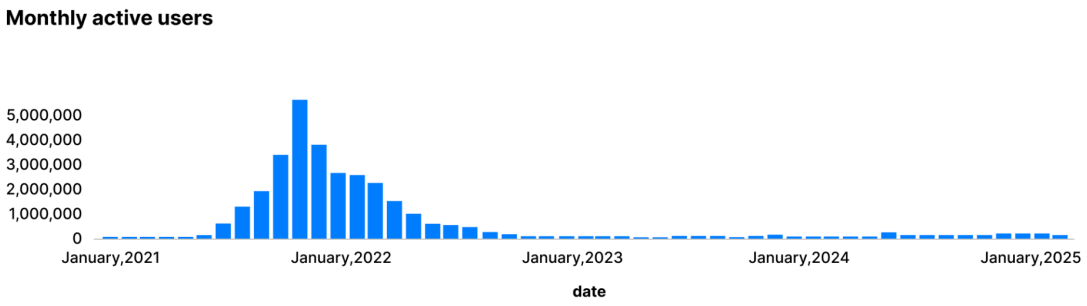
Figure 4: Axie Infinity Monthly active users



Gate Research, Data from: Footprint Analytics

Gate Research

However, as players and guilds engaged in continuous gold-farming transactions, the performance bottlenecks of the Ethereum mainnet became apparent. To optimize the gaming experience, Sky Mavis developed the Ronin sidechain, significantly improving the blockchain's TPS and setting a benchmark for vertical blockchains in terms of performance and scenario adaptation. The Ronin Network mainnet officially launched in February 2021.

Meanwhile, ImmutableX also made significant strides during this period, completing the construction of its gaming ecosystem and providing technical support for the development of subsequent AAA blockchain games. For example, the open-world RPG blockchain game Illuvium chose ImmutableX as its underlying architecture during its early development phase to achieve seamless integration of complex game logic and on-chain assets.

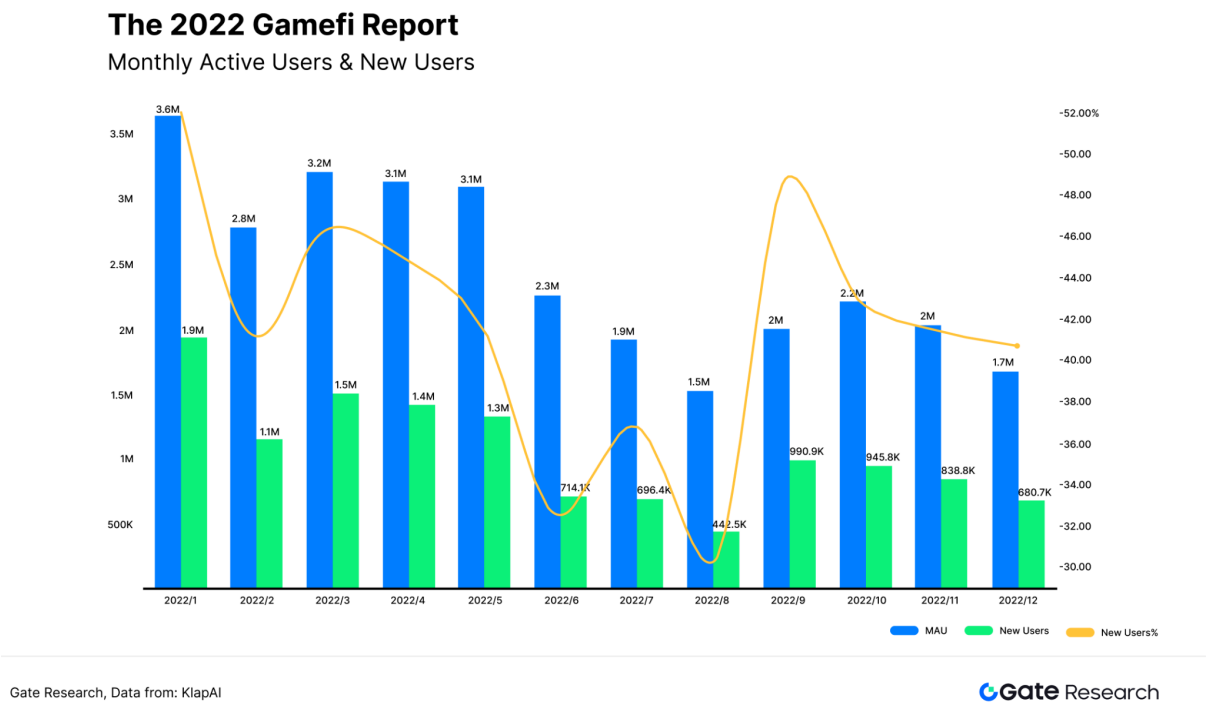
In summary, the technological breakthroughs and model innovations of this phase laid two critical foundations for the industry: First, vertical blockchains like Ronin addressed performance and scenario adaptation challenges through customized architectures. Second,

vertical blockchains such as ImmutableX ventured into the realm of AAA game development—a domain previously untouched by blockchain games—expanding the boundaries of blockchain gaming and setting the stage for ecosystem restructuring and technological convergence post-2022.

2022-2023: Market Adjustment and Ecosystem Restructuring

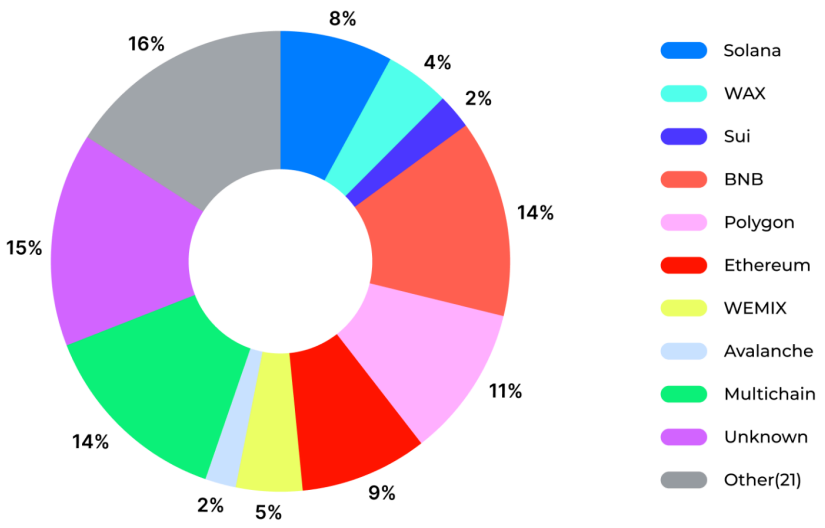
Beginning in 2022, the entire cryptocurrency industry entered an adjustment period, with the significant decline in total cryptocurrency market capitalization severely impacting the Web3 gaming sector. The rapid depreciation of token assets (both FT and NFT) made it impossible for many gold-farming studios to maintain financial balance. Notable games including Axie Infinity, Big Time, and CryptoBlades experienced significant user attrition during this phase. The disruption in gaming ecosystems further affected gaming blockchains, leading to a sharp decline in gas fee revenue.【4】

Figure 5: 2022 GameFi active users and new users



According to data from Big Blockchain Game List, over 30% of blockchain games announced in 2023 have been reported as discontinued or canceled. As of January 2024, the list includes 911 games, with 334 currently operational and 577 still in development. Since the initiative began in 2021, among the 1,318 blockchain games cumulatively listed, 407 have now been classified as discontinued or abandoned.【5】

Figure 6: Blockchain games classified as discontinued or abandoned in 2023



Gate Research, Data from: Blockchain Gamer

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On the positive side, after this industry consolidation, the landscape of Web3 gaming blockchains has become clearly defined. ImmutableX, WAX, and Ronin have gradually emerged as the top tier of specialized gaming blockchains. Their established ecosystems have created strong moats for these vertical gaming chains, making it increasingly difficult for general-purpose blockchains to rebuild competing ecosystems. Gaming-specific blockchains have thus become a dominant paradigm in the GameFi space.

Games like Lumiterra, Dark Seraphim, and Shrapnel stood out as rare bright spots during the crypto bear market. These games share common characteristics: prioritizing player experience, featuring relatively well-designed game mechanics, and avoiding rapid descent into death spirals.

2024-2025: Ecosystem Competition and Technological Evolution

As of Q1 2025, gaming projects have yet to recover to their Q3 2021 levels in terms of active addresses and transaction volume. From a broader market perspective, Ethereum's ecosystem performance in 2024 significantly lagged behind Solana's. Most Ethereum-based gaming projects underperformed, while previously popular blockchain games like Axie Infinity, Big Time, and Lumiterra primarily conducted transactions on Ethereum scaling solutions such as opBNB, Polygon, Ronin, and ImmutableX.

Among Ethereum's main competitors, Solana originally had a relatively weak gaming ecosystem with limited game studio resources. However, the launch of Sonic SVM, a dedicated Solana Layer 2 for gaming, marked a turning point. Moving forward, Solana's gaming ecosystem is poised to directly compete with Ethereum's. Meanwhile, the TON blockchain emerged as a dark horse in the "Tap-to-Earn" mini-game category. Although

similar games exist on Ethereum, TON's integration with Telegram—boasting over 1 billion monthly active users—attracted a surge of developers. By Q3 2024, the number of games on TON grew by more than 320% year-over-year.【6】

On the technological front, an increasing number of gaming-specific blockchains adopted zero-knowledge proof (ZK) technology. For instance, Immutable X implemented its Validium solution to enhance transaction speed, reduce fees, and improve security. Ronin Network upgraded to a DPoS consensus mechanism, expanding its validator nodes from 9 to 22, significantly improving decentralization and attracting multiple game studios to revive its ecosystem. Emerging chains like Xai (an Arbitrum-based Layer 3) and Oasys (an Optimistic Rollup-powered Ethereum sidechain) further lowered player entry barriers by optimizing gas fees and transaction speeds.

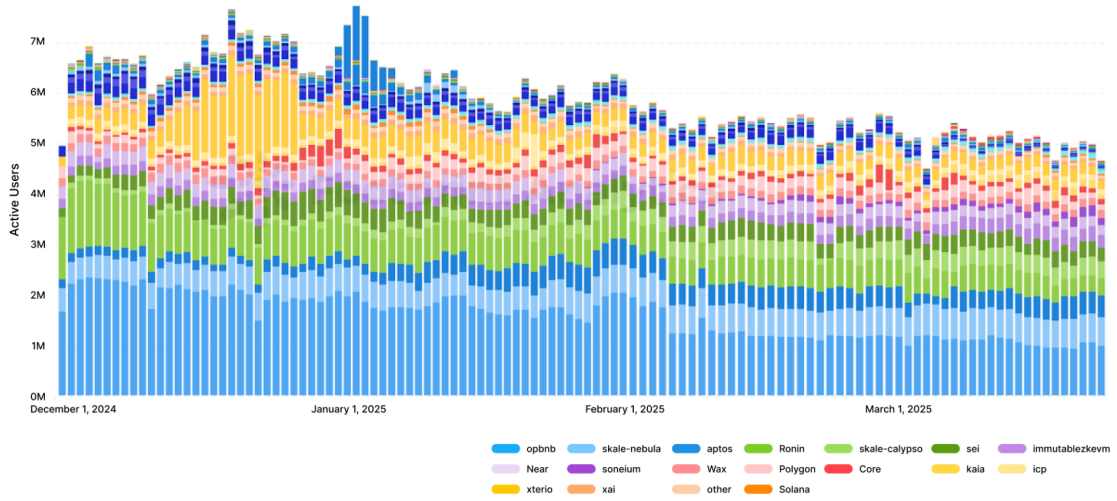
In terms of games, World of Dypians, a metaverse sandbox game launched in November 2024, achieved 1 million UAW (Unique Active Wallets) within just two months, making it the most popular GameFi project of this period.

2. Game Chain Competition

The current major gaming blockchains include WAX, Ronin, ImmutableX, Immutable zkEVM, and Xterio. This chapter will analyze the competitive landscape of Game Chains from multiple dimensions: active addresses, transaction volume, and transaction value.

First, in terms of daily active addresses, Ronin leads all dedicated gaming blockchains. As of March 2025, it maintains approximately 500,000 daily active addresses. Both Immutable zkEVM and WAX fluctuate around 200,000 active addresses. Xterio Chain, co-developed by gaming platform Xterio and AltLayer, shows the most volatile data among specialized gaming chains. Following a large-scale $XTER reward campaign launched in December 2024, Xterio's active addresses briefly surpassed 1.6 million but subsequently dropped to around 100,000 by March 2025 after the campaign concluded.【7】

Figure 7: Daily Active Address Data for Games Across Major Public Blockchains



Gate Research, Data from: Footprint Analytics

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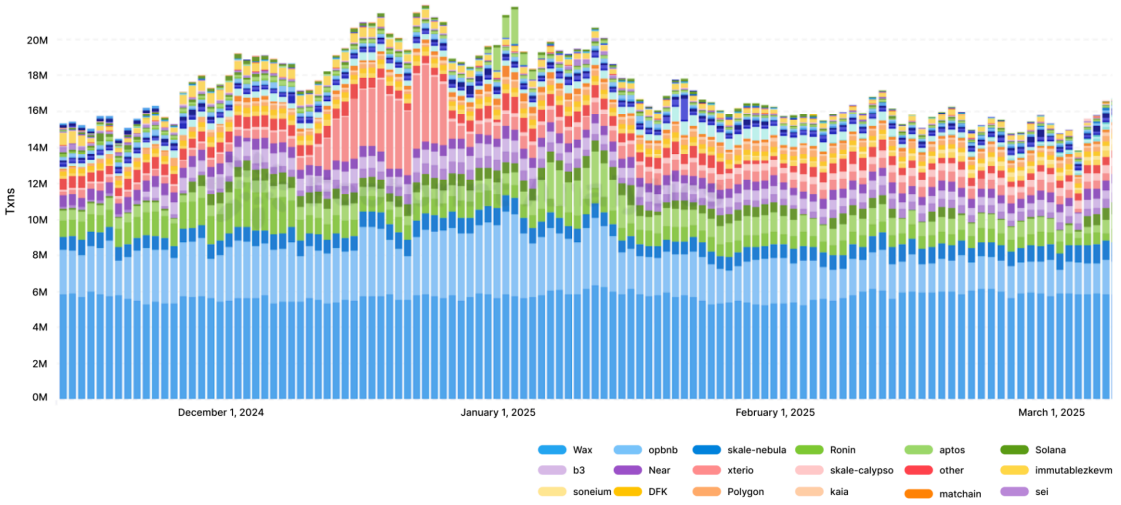
Second, regarding transaction count, WAX has maintained the top position (including among general-purpose blockchains) over the past three months with a stable daily transaction volume of about 5 million. Ronin ranks second with more fluctuating transaction numbers, currently processing approximately 500,000 daily transactions. Its peak occurred in December 2024 with over 2 million daily transactions. Immutable zkEVM maintains relatively lower transaction volume at around 200,000 daily transactions.【8】

Figure 8: Daily Transaction Count Data for Games Across Major Public Blockchains



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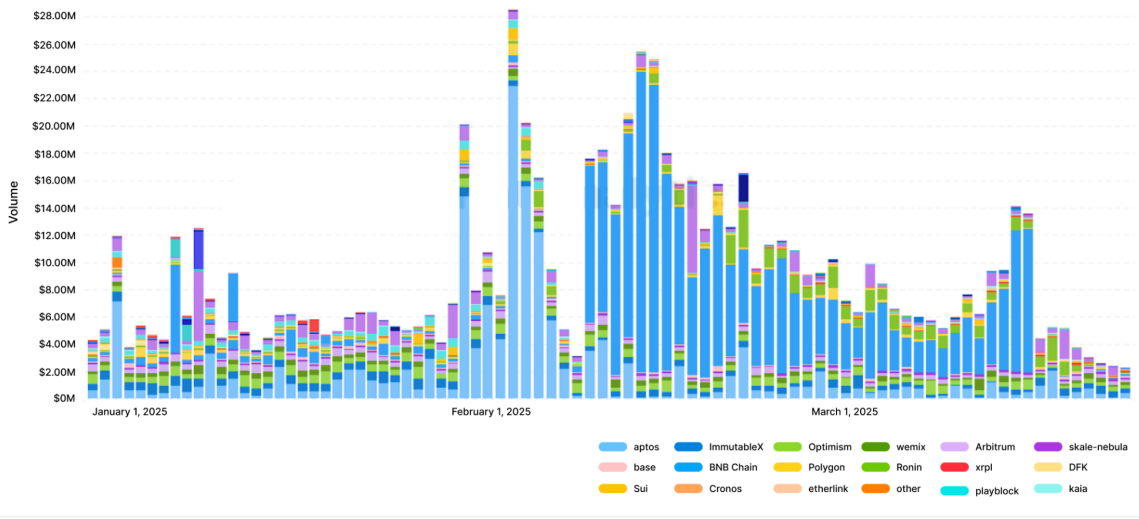
Finally, in transaction value, Ronin currently leads all dedicated gaming chains with daily transaction values consistently between 800,000 and 800,000and1.5 million. ImmutableX

follows with transaction values ranging from 300,000 to 1 million. Despite WAX's dominance in transaction quantity, its average daily transaction value rarely exceeds $100,000.【9】

Figure 9: Transaction Volume Data of Gaming Projects Across Major Public Blockchains



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Overall, gaming-specific blockchains haven't demonstrated clear advantages over general-purpose chains in current competition. In active addresses, Aptos and opBNB maintain significant leads. Regarding transaction value, both BNB and Aptos outperform dedicated gaming chains by multiples. For gaming blockchains to truly dominate the GameFi market, more exclusive hit games will need to emerge.

3. Game Chain Typical Studies

3.1 WAX

Founded in 2017 by cryptocurrency pioneer William Quigley (co-founder of Tether), the WAX blockchain is often called the "King of NFTs" for successfully facilitating NFT sales for major partners including Major League Baseball, Street Fighter, Atari, and others. Built as an adaptation of EOS, WAX inherits its Delegated Proof-of-Stake (DPoS) consensus mechanism to support the high throughput required for gaming applications.

3.1.1 Core Mechanisms of the WAX Blockchain

WAX employs a DPoS consensus mechanism, an evolution of the mainstream PoS model, originally pioneered by Dan Larimer (former CTO of EOS). In simple terms, while PoS follows a one-validator-one-vote system (requiring 32 ETH staked to become an eligible node), DPoS implements an "electoral college" model where token holders vote for 21 guilds

(GUILD) responsible for block production. The advantage of DPoS lies in its speed, achieving over 3,000 TPS; however, its drawback is lower decentralization, as guilds may form oligopolies.【10】

The WAX blockchain produces a block every 0.5 seconds, with only one authorized guild node permitted to generate blocks per time slot. If a node fails to produce a block within its allotted time, the slot is skipped, creating a gap of 0.5 seconds or more. To deter negligence, WAX penalizes guild nodes with ≤50% block production rates by slashing their rewards. As an independent blockchain, WAX lacks modular components like a dedicated Rollup layer or DA layer.

WAX achieves Byzantine Fault Tolerance (BFT) through a rule that strictly prohibits guild nodes from signing two different blocks at the same block height or timestamp. This BFT mechanism safeguards against critical failures and mitigates malicious actors. Any guild node attempting to double-sign will be voted out by token holders. Block finality requires signatures from 15 guild nodes—once confirmed, blocks become immutable and permanently recorded.

3.1.2 WAX Blockchain Economic Model

WAXP serves as the governance token of the WAX blockchain. Token holders can earn rewards through staking, with the network allocating a fixed daily amount of tokens as staking rewards. Individual daily rewards are calculated as: (Individual staking weight / Total network staking weight) × Daily reward pool. As a blockchain emphasizing community governance, staking rewards are also tied to voting participation. The individual staking weight equals: Number of WAX tokens currently staked × Voting intensity. Voting intensity is a coefficient between 0 and 1 - holders who consistently vote on weekly community proposals maintain higher voting intensity, while inactive voters see reduced intensity.

The 21 guilds elected by token holders earn WAX guild rewards through block production, with rewards directly proportional to the actual number of blocks each guild produces. Additionally, Standby Guilds serve as "backup operators" and receive proportional rewards when randomly selected to successfully process blocks.

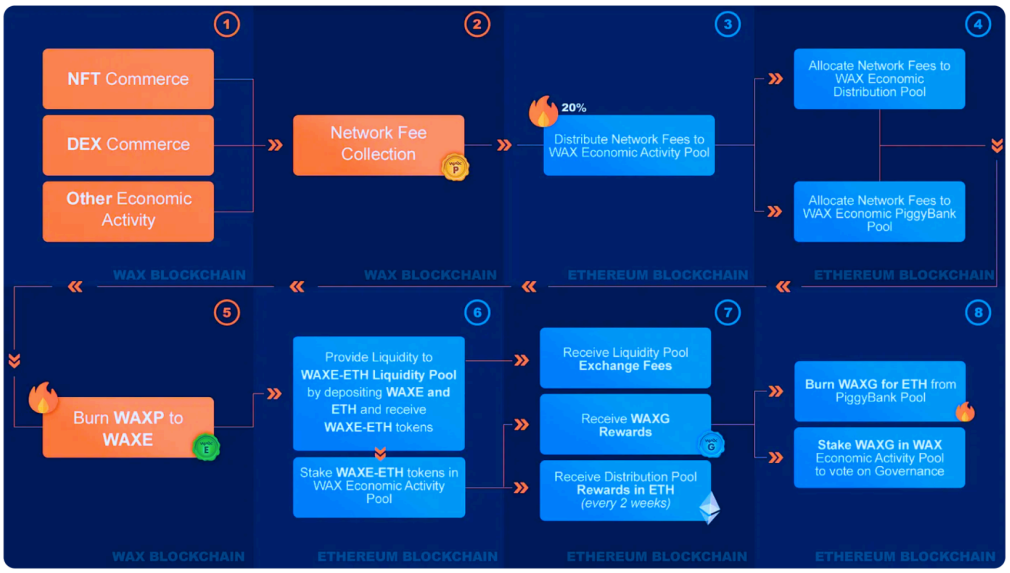
To improve Ethereum compatibility, WAX introduced three specialized tokens:

WAXE: An ERC-20 token with a 1000:1 peg to WAXP (redeeming WAXE burns the equivalent WAXP). In addition to conversion from WAXP, 80% of on-chain NFT transaction fees are distributed as WAXE rewards into the WAX Economic Activity Pool (WEAP).

WAXE-ETH: Liquidity provider tokens awarded to those who contribute to WAXE-ETH liquidity pools.

WAXG: Earned by staking WAXE-ETH in WEAP, these tokens grant additional governance rights and benefits within the ecosystem. The WAXG mechanism further incentivizes participation while deepening the connection between WAX's native chain and Ethereum-based DeFi activities.【11】

Figure 10: WAX Economic Model



Gate Research, Data from: Medium

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3.1.3 WAX gaming ecosystem

As one of the earliest established gaming-specific blockchains, WAX has developed an ecosystem spanning over five years that now hosts more than 5,000 games, making it one of the chains with the highest number of gaming projects. Within the WAX gaming ecosystem, Alien Worlds stands out with significantly superior metrics - its Unique Active Wallets (UAW) exceed 110,000 (last 24 hours), while the second-ranked Taco Studios records only 16,000 UAW. Additionally, Alien Worlds generates over 5 million daily transactions, accounting for more than 80% of WAX's total transaction volume.【12】【13】

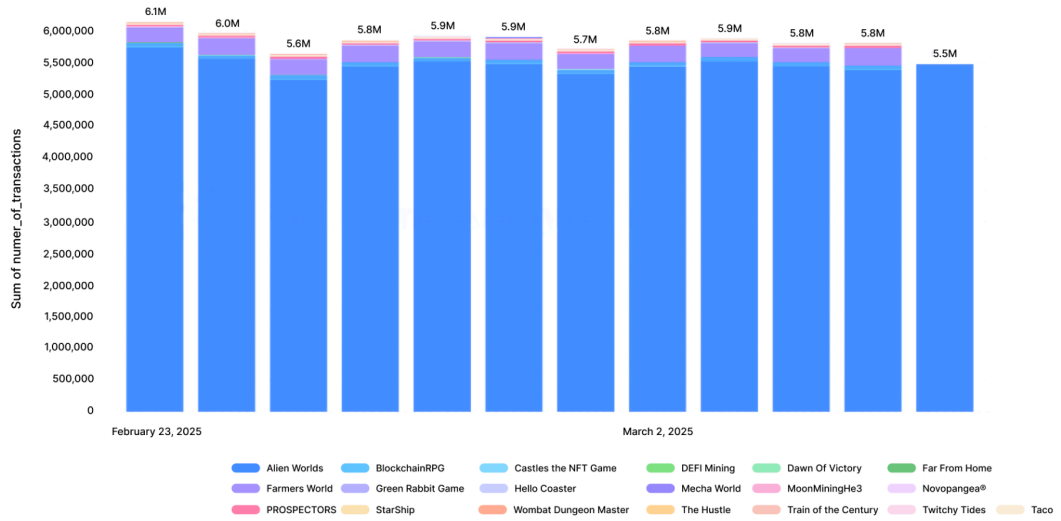
Figure 11: Top 10 Games on WAX Blockchain as Displayed on DappRadar

#	Name	Balance	UAW	%UAW	Volume	%Volume
1	Alien Worlds	$71.76	110.2k	-3.72%	$315.06	-95.41%
2	Taco Studios	$32.11k	16.6k	+0.19%	$3.34k	+56.39%
3	Farmers World	$2.03k	9.34k	-2.89%	$0	0%
4	Wombat Dungeon Master	$688.83	6.9k	+0.409%	$0.02	+1.83%
5	PROSPECTORS	$0.08	2.72k	+7.89%	$51.67	-61.75%
6	Thrive on Mars	$1.79k	2.65k	-6.42%	$12.71	-91.22%
7	Warsaken	$15.53k	402	-2.19%	$15.48	+277.89%
8	Dawn Of Victory	$37.61	324	+3.18%	$221.79	-22.01%
9	Twitchy Tides	$40.22	217	+7.43%	$0	0%
10	Nanotopia - GR Game	$42.87	178	-7.29%	$1	+163.41%

Gate Research, Data from: DappRadar

Gate Research

Figure 12: Transaction Counts of Games on the WAX Blockchain



Gate Research, Data from: Footprint Analytics

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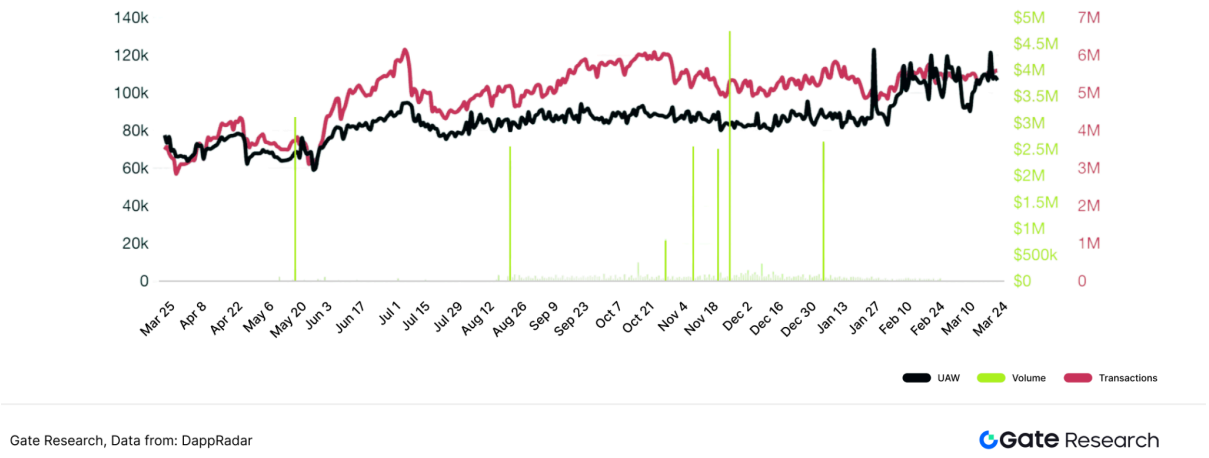
Developed by Dacoco GmbH on the WAX blockchain, Alien Worlds is a space exploration game that offers players land ownership, deployable tools, soldiers and weapons, along with customizable game characters. Since its launch in late 2022, the game has maintained stable performance thanks to its well-designed gameplay mechanics. The land-building gameplay represents one of the more successful Play-to-Earn models, where players purchase land NFTs to mine various resources and earn substantial economic returns. 【14】

Figure 13: Core Metrics of Alien Worlds Over the Past Year



Gate Research, Data from: DappRadar

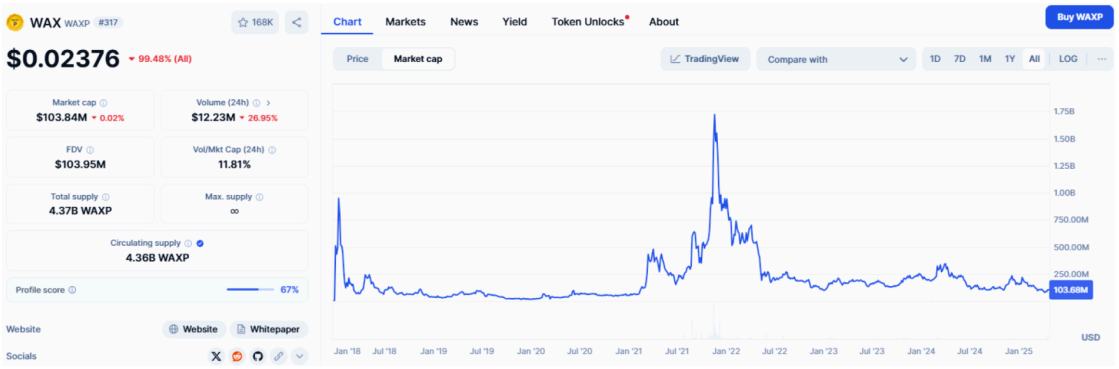
Gate Research

Beyond Alien Worlds, other notable games on WAX including TACO Studios, Farmers World, and Thrive on Mars similarly follow the land-building game model with fundamentally similar underlying mechanics. This demonstrates that WAX's primary gaming offerings are strongly finance-oriented games built around NFT-based economies. The chain has particularly excelled in fostering this specific genre of gameplay that combines digital asset ownership with earning potential.

3.1.4 Strategic Review and Development of WAX Blockchain

From the perspective of WAXP market capitalization, the core team of the WAX public chain has not taken any actions in market cap management. WAXP's market cap has been declining steadily from $1.7 billion in November 2021 to below $100 million by March 2025 (the lowest point since March 2021). During the cryptocurrency bull market in 2024, its market cap still fell by over 32%, underperforming the broader market. If market capitalization is used as a measure of a project's success, the strategic decisions of the WAX public chain over the past three years can be considered a failure.【15】

Figure 14: Market Cap Fluctuations of WAX After Its TGE



Gate Research, Data from: Coinmarketcap

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From the perspective of WAXP's holder address distribution, data from Coincarp and Arkham indicates an extremely high degree of token centralization, with over 96% of WAXP tokens held by a single address (0x6dcc). This highly centralized distribution suggests that the decline in WAXP's value is not due to token unlocking and selling by the project team. Instead, the core reason lies in the WAX public chain team's failure to view WAXP as a reflection of the chain's value, neglecting market cap management.【16】

Figure 15: WAX Top5 Contract Addresses

#	地址	持币数量	持币占比%	7日变化
1	0x6dcc725d2cb337ed5da8ae183870f3f02dd6c707	3,736,919,910	96.69%	-240,757
2	0x2a79324c19ef2b89ea98b23bc669b7e7c9f8a517	43,439,166	1.12%	--
3	0xe61cedeb1593e2d9f06af1e212842c8b5e289863	14,080,296	0.36%	720,857
4	0x611f7bf868a6212f871e89f7e44684045ddfb09d	6,466,880	0.17%	152,370
5	0x0d0707963952f2fba59dd06f2b425ace40b492fe 芝麻开门	5,725,050	0.15%	-5,149

Gate Research, Data from: Coincarp

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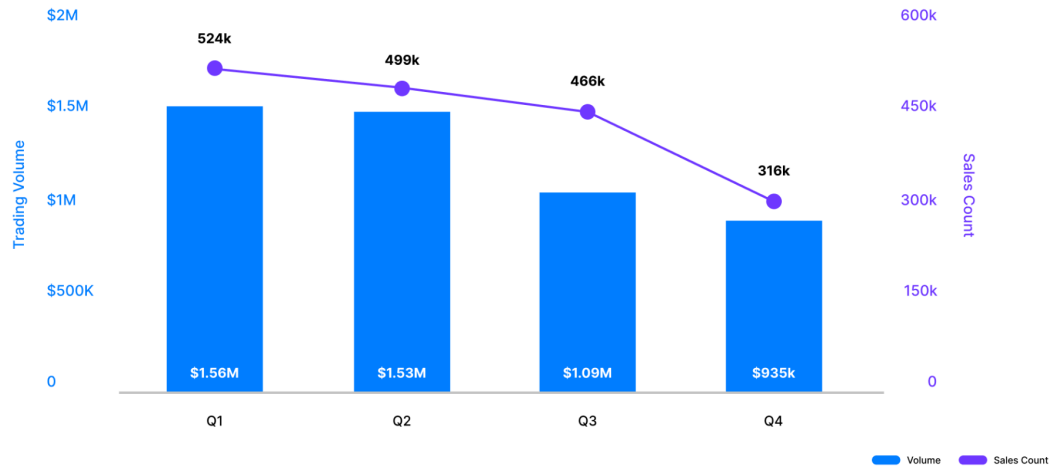
Overall, WAX's current situation mirrors that of many older application-oriented public chains (e.g., EOS, ICP, Conflux). After experiencing significant token price drops, these chains have fallen into a state of declining trading volume and low-price consolidation. On the gaming ecosystem front, there have been few new game releases. Early projects like Alien Worlds and Farmer Worlds account for the majority of WAX's on-chain transaction volume. Land-based NFTs, which have strong financial attributes, do not require high development barriers. The lack of new games indicates an ecosystem starved of fresh blood.

In terms of resource endowment, William Quigley, a veteran in the crypto industry, has given WAX a significant advantage in issuing NFTs for classic IPs. Major brands like DC, Marvel, and Street Fighter have chosen to collaborate with WAX.

By the end of 2022, the total NFT sales on the WAX chain had surpassed $400 million, primarily through the WAX-owned Atomic Hub platform, which charges a 2% fee on NFT transactions. During the 2021-2022 NFT boom, the WAX core team reaped substantial profits. However, from an operational perspective, the team has shown clear signs of "coasting" over the past three years, with NFT sales in 2024 amounting to just $5 million. 【17】

Figure 16: NFT Sales Volume on the WAX Blockchain in 2024



Gate Research, Data from: DappRadar

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3.2 Immutable

Immutable was officially founded in 2018 by brothers Robbie Ferguson (CEO) and James Ferguson (CTO), both seasoned experts in the blockchain and gaming industries. ImmutableX Layer 2 (based on StarkEx) launched in 2021, focusing on high-performance scaling for NFTs and gaming. Immutable zkEVM (based on the Polygon tech stack) went live on the mainnet in January 2024, further optimizing Ethereum compatibility and scalability.

3.2.1 Core Mechanisms of ImmutableX and Immutable zkEVM Public Chains

Both ImmutableX and Immutable zkEVM utilize ZK-Rollup for batch processing. The difference lies in ImmutableX using the ZK-Stark proof system developed by Starkware, optimized for NFT trading experiences, while Immutable zkEVM employs Polygon's ZK-SNARK proof system, fully supporting smart contracts. Regarding consensus

mechanisms, both ImmutableX and Immutable zkEVM adopt the widely used Proof-of-Stake (PoS) mechanism.

ImmutableX Consensus Mechanism

ImmutableX employs a Vault Merkle Tree to manage asset states, where each leaf node represents an asset vault, and non-leaf nodes are hashes of their child nodes. Its operational mechanism includes two core components:

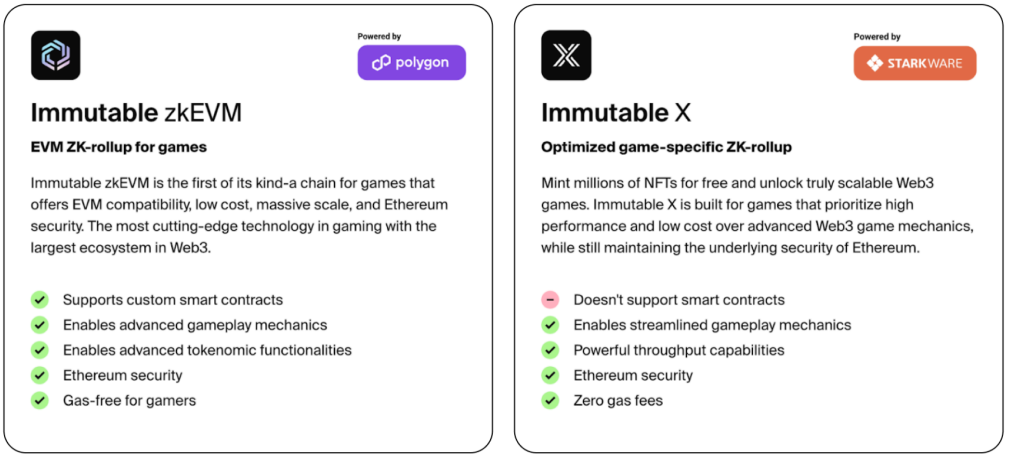
- **On-chain Smart Contract Validator**: Ensures state security by storing the root hash and only allowing updates with valid proofs. It currently uses a time-locked upgradable design but plans to become immutable in the future.
- **L2 Proof Logic Written in Cairo**: Handles the verification of state transitions, such as asset transfers, for legitimacy.

This dual-verification architecture ensures asset security while retaining flexibility for system upgrades. ImmutableX uses STARK proof technology instead of the more common SNARK proofs. As a next-generation zero-knowledge proof technology, STARK addresses three core flaws of SNARKs: the need for a trusted setup ceremony, lack of post-quantum security, and reliance on overly complex cryptographic implementations prone to errors. Although STARK proofs are larger and incur higher on-chain publishing costs, the team believes this is a reasonable trade-off for stronger user security guarantees.【18】

Regarding Data Availability (DA), ImmutableX supports both Rollup and Validium modes. In Rollup mode, every batch of state changes is published to L1, maintaining L1 security while adding minimal linear costs per transaction. In Validium mode, a Data Availability Committee (DAC) signs each batch of data, and as long as one honest member exists in the committee, users can successfully withdraw assets. The current DAC includes eight institutions, such as Immutable and StarkWare.

Immutable zkEVM Consensus Mechanism
Developed in collaboration with Polygon, Immutable zkEVM shares a similar settlement layer and data availability (DA) layer with ImmutableX. The key difference is that Immutable zkEVM employs the ZK-SNARK proof system, which fully supports smart contracts and is compatible with Ethereum development toolchains (e.g., Hardhat, Truffle), reducing migration costs for games.

Figure 17: Comparison between ImmutableX and Immutable zkevm



Gate Research, Data from: Immutable

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3.2.2 Immutable Economic Model

Although ImmutableX and Immutable zkEVM are two distinct public blockchains, they share the same governance token, IMX, and operate under a unified economic system. IMX is an ERC-20 token with core functionalities including voting, staking, and payments.

For payments, 20% of Immutable protocol fees must be settled in IMX. These fees can be paid directly in IMX or automatically converted from the actual payment currency (e.g., ETH) into IMX by Immutable on the open market. This means users do not need to hold IMX tokens specifically to conduct transactions on the protocol.

Regarding staking, gas fees paid by gamers on both Immutable chains are pooled into a rewards pool. Token holders who stake IMX can earn IMX tokens from this gas fee reward pool. Each user's reward is proportional to their staked IMX amount relative to the total staked amount across the network that month. Similar to WAX's mechanism, Immutable also imposes requirements for staking participation in community governance—only those who have voted on governance proposals within the last 30 days qualify as eligible stakers. Additionally, Immutable requires stakers to complete at least one transaction or hold an NFT within 30 days to be eligible. The author believes that IMX's staking model provides an effective deflationary mechanism for the entire system, as stakers locking up their tokens reduces sell-side pressure in the market, preventing high inflation rates in the economic ecosystem.

Figure 18: IMX token staking mechanism

Gate Research, Data from: Immutable

Gate Research

In terms of community governance, token holders will be able to vote on token-related proposals through a decentralized governance mechanism. The scope of proposals includes: (1) Token reserve allocation plans; (2) Developer grant program approvals; (3) Activation of daily reward mechanisms; (4) Adjustments to token supply.

3.2.3 ImmutableX and Immutable zkEVM Gaming Ecosystems

ImmutableX Gaming Ecosystem

The ImmutableX gaming ecosystem covers a wide range of game genres, including the card game Gods Unchained, pixel-style mini-games like Habbo X, and AAA titles such as Illuvium. However, ImmutableX has relatively low Unique Active Wallets (UAW). Currently, Gods Unchained is the most active game on ImmutableX, with only 560 UAW in 24 hours—far below the UAW of games on the WAX ecosystem. This suggests that while ImmutableX games prioritize player experience, their Play-to-Earn (P2E) mechanics are relatively weak, making them less attractive to yield-focused players. 【19】

Figure 19: Top 5 Games on ImmutableX Blockchain as Displayed on DappRadar

Name	Balance	UAW	%UAW	Volume	%Volume	24h UAW
Gods Unchained	-	560	+77.78%	$507.67k	+181.89%	
Habbo X	-	237	+50.96%	$8.24k	+189.12%	
IMVU powered by MetaJuice	-	220	+62.96%	$0	0%	
Cross The Ages	-	24	+200%	$1.84k	+685.09%	
Illuvium: Beyond	-	13	+116.67%	$315.61	+198.09%	

Gate Research, Data from: DappRadar

Gate Research

Immutable zkEVM Gaming Ecosystem
Developed in collaboration with Polygon, Immutable zkEVM enables games originally on Ethereum and Polygon to migrate to the Immutable ecosystem at a lower cost. Currently, Immortal Rising 2, an exclusive game on Immutable zkEVM, boasts an impressive 103,000 UAW, ranking first among exclusive titles. This MMORPG mobile game has significantly improved its maps and gameplay compared to its predecessor, Immortal Rising, gaining substantial popularity. Unlike its sibling chain ImmutableX, which struggles with low activity, Immutable zkEVM has successfully struck a balance between gaming experience and financial incentives.【20】

Figure 20: Top 5 Games on Immutable ZkEVM Blockchain as Displayed on DappRadar

Name	Balance	UAW	%UAW	Volume	%Volume	24h UAW
Overtake	$750.58	118.34k	-21.71%	$0	0%	
Immortal Rising 2	$0	103.09k	-1.67%	$0	0%	
RavenQuest	$0	11.88k	-1.44%	$0	0%	
Battle of Souls（NEW）	$0	3.12k	+100%	$0	0%	
Guild of Guardians	$111.93	1.84k	-2.43%	$0	0%	

Gate Research, Data from: DappRadar

Gate Research

3.2.4 Immutable Strategy and Development Overview

Since IMX was listed on multiple exchanges in late 2021, its token price and market capitalization have experienced a significant rollercoaster ride. Backed by prominent VC funds such as Naspers Ventures, Digital Galaxy, and SBF prior to its Token Generation Event (TGE), IMX achieved a valuation of $1 billion during its TGE in November 2021. By March 2024, IMX's token market cap surpassed $5 billion, reaching an all-time high. However, the market cap subsequently trended downward, dropping to $800 million by March 2025.【21】

Figure 21: Market Cap Fluctuations of IMX After Its TGE

Gate Research, Data from: Coinmarketcap

Gate Research

Following the TGE, the project team has consistently sold tokens to cash out at each unlocking milestone of their contract addresses. The IMX Foundation Treasury CA (0x237) has cumulatively sold over 1 billion tokens, while the IMX Dev Treasury CA (0x9cC) has sold more than 300 million tokens. To stabilize the token price, two other IMX contract addresses collectively repurchased 1.06 billion tokens during the selling periods. As of March 2025, these four addresses together hold 1.25 billion tokens, accounting for 62.5% of the total token supply.【22】【23】

Figure 22: IMX Top 4 Contract Addresses

#	Address	Quantity	Percentage	7d Change
1	0x971f723194796dbf04dcfe361ed584cae9bf94a0	785,785,500	39.29%	--
2	0x14650700fec5697c014e8332169f93734a6c5741	283,094,433	14.15%	--
3	0x9ccc2cfc1da5c2623b9ad74dcf01765eae273539	115,918,800	5.80%	--
4	0x237343c10705ae7605850977503e25a8c12851e6	66,729,215	3.34%	--

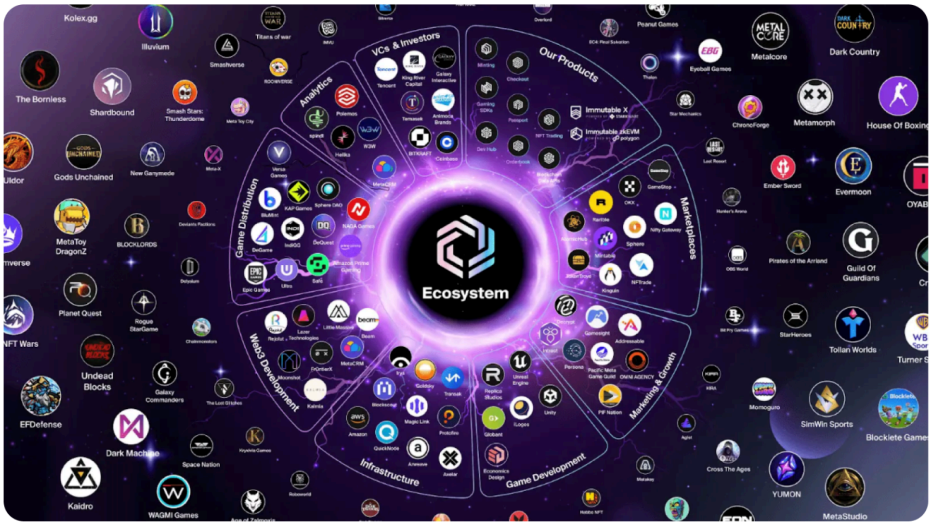
Gate Research, Data from: Coincarp

Gate Research

In terms of resource endowment, Immutable, as a star project, garnered favor from both capital and industry players during its early stages. Across the entire game development chain, Immutable has established strategic partnerships. On the game development front, top-tier studios such as Mineloader, Ubisoft Innovation Lab, and Planetarium Labs have chosen to deploy their games on the Immutable blockchain. To ensure real-time in-game item trading for players, Immutable has formed a strategic partnership with AWS, whose servers can handle 9,000 transactions per second.

In terms of distribution platforms, multiple Immutable games have been launched on the Epic Games Store, and Immutable has also partnered with the gaming retailer GameStop. Additionally, to engage players, Immutable has collaborated with gaming guilds such as YGG and Merit Circle, encouraging guild players to participate in games on the Immutable chain.【24】

Figure 23: Immutable's Core Gaming Ecosystem



Gate Research, Data from: Game3s

Gate Research

In summary, led by the seasoned gaming duo, the Ferguson brothers, the Immutable project has consistently adhered to a "high investment, high output" development strategy. Despite IMX's current market cap being at a historical low, the ecosystem maintains a steady pace of new game launches, and its global partnership network continues to expand. Facing the pressure of declining Unique Active Wallets (UAW) on the ImmutableX chain, the team swiftly initiated deep technical integration with Polygon, achieving Ethereum compatibility through Immutable zkEVM and successfully migrating 15 Polygon-based games to bolster its ecosystem. From the perspective of strategic execution, the team's agile response to market changes and efficient implementation of flagship IP adaptations on the chain underscore its pragmatic and effective operational DNA.

3.3 Ronin

As mentioned at the beginning of this article, Ronin is a highly representative gaming-specific public blockchain. Unlike other public chains that first build underlying infrastructure before establishing a gaming ecosystem, Ronin was developed by the Axie Infinity team after encountering transaction bottlenecks on Ethereum. It is a high-performance public chain created by this gaming studio. The Ronin mainnet launched in 2021, and in addition to its core game, Axie Infinity, Ronin has partnered with multiple gaming studios to expand its gaming ecosystem.

3.3.1 Core Mechanisms of the Ronin Public Chain

In terms of consensus mechanism, Ronin adopts the DPoS (Delegated Proof of Stake) mechanism used by EOS-based public chains like WAX, which enhances the speed of transaction processing by nodes. For settlement, Ronin employs a modular approach with ZkEVM, improving performance while ensuring the security of transactions on the public chain.

3.3.1.1 Ronin Consensus Mechanism

Ronin's DPoS mechanism consists of four core components: Governing Validators, Blockchain Block Production, Final Voting, and Delegators. Among these, Governing Validators are similar to the guilds in the WAX mechanism and are elected by the community.【25】

Governing Validators
The validator selection process through staking may introduce new attack risks. If an attacker controls over 51% of the tokens, they could potentially take over the entire blockchain. To mitigate such risks, the community-elected group of Governing Validators helps prevent these attacks. In addition to Governing Validators, any token holder can register as a Validator Candidate.

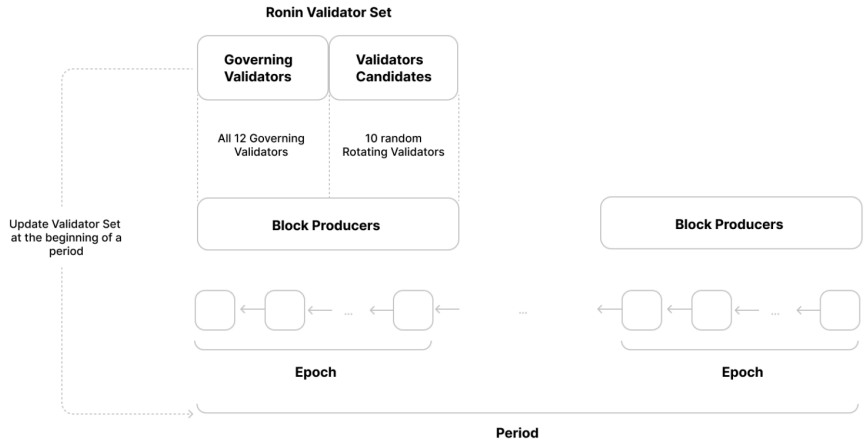
Blockchain Block Production
In each cycle (approximately every 10 minutes), a group of block producers is randomly selected to produce blocks. Out of the total, 12 block slots are reserved for Governing Validators. The remaining 10 block slots are allocated based on the staking amounts of Validator Candidates.

Final Voting
All validators can participate in finality voting. The voting weight of a validator is proportional to their staked amount.

Delegators

Delegators entrust their staked assets to validators of their choice, increasing the likelihood of those validators being selected as standard validators and gaining access to block production opportunities.

Figure 24: Ronin Consensus Mechanism



Gate Research, Data from: Ronin

Gate Research

3.3.1.2 Ronin Settlement Mechanism

To enhance the scalability of the public chain, Ronin adopts Zk Rollup, bundling and uploading transactions to achieve rapid settlement on the mainnet. The ZK Prover is seamlessly integrated into the Ronin protocol, enabling validators to establish their own ZK-EVM. Validators can initiate a ZK-EVM by submitting a transaction containing the necessary information for the new ZK-EVM chain. Once initiated, validators must maintain their state and cannot opt out of the validator set.

3.3.1.3 Ronin Cross-Chain Bridge

As Ronin is an EVM-compatible public chain, it interacts with the Ethereum mainnet by creating a cross-chain bridge. The Ronin Bridge suffered a hacking incident in March 2022, resulting in losses exceeding $600 million. To enhance the security of the cross-chain bridge, the bridge between Ronin and Ethereum is now managed by 22 bridge operators to ensure secure and reliable cross-chain transactions. For each transaction, every bridge operator is responsible for verifying its validity and voting to approve or reject it. To ensure a high level of security and consensus, a transaction can only be executed if at least 70% of the bridge operators approve it.

3.3.2 Ronin Public Chain Economic Model

RON is the governance token of the Ronin public chain, encompassing a range of functions including staking, payments, and governance:

Staking
Users can stake RON in the Delegated Proof of Stake (DPoS) consensus mechanism. Validators stake RON to operate validator nodes and validate blocks to earn rewards. Users delegate their RON to validators, further enhancing economic security and receiving a portion of the rewards.

Governance
In the future, holders will be able to participate in network governance decisions and influence the use of the Ronin Treasury, which collects fees from decentralized applications (such as DEXs and NFT marketplaces).

Payments
Games built on the Ronin public chain typically use RON as the primary currency for key revenue sources, such as in-game item purchases, NFT minting, and token trading.

Exclusive Opportunities
RON stakers and holders have gained access to airdrops, whitelist opportunities, and allocations on launchpads for token sales of projects built on Ronin.

3.3.3 Ronin Public Chain Gaming Ecosystem

From a data perspective, Ronin is currently the public chain with the most blockbuster games, with multiple titles—including Pixel, Axie Infinity, and The Machine Arena—each surpassing 50,000 Unique Active Wallets (UAW). In terms of game genres, Ronin's gaming ecosystem encompasses a diverse range, including MMORPGs, RTS, turn-based games, and simulation management games. The author believes that even when compared to general-purpose public chains with strong gaming ecosystems like BNB Chain and Polygon, Ronin stands out as one of the best public chains for gaming ecosystem development, thanks to its array of exclusive games with deep gameplay. 【26】

Figure 25: Top 5 Games on Ronin Blockchain as Displayed on DappRadar

Name	Balance	UAW	%UAW	Volume	%Volume	24h UAW
Pixels	$2.1k	198.78k	-1.22%	$0	0%	
Axie Infinity	$638.99M	115.49k	-0.38%	$537.18k	-48.14%	
The Machines Arena	$65.45	66.35k	-18.89%	$0	0%	
Tama Meme	$104.31k	4.89k	-8.8%	$787.59k	+60.5%	
Fishing Frenzy（NEW）	$0	4.8k	+269.18%	$0	0%	

Gate Research, Data from: DappRadar

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3.3.4 Ronin Strategy and Development Overview

From the perspective of token market capitalization, RON has experienced two periods of rapid market cap growth since 2024—in March 2024 and December 2024—its cycles of rise and fall largely aligning with the broader cryptocurrency market trends. Unlike other gaming-focused public chains that primarily raise funds through the chain itself, Ronin's development team, Sky Mavis, secures funding as a gaming studio entity. Following the breakout success of Axie Infinity, Sky Mavis attracted investments from top-tier funds such as a16z and Animoca Brands.【27】【28】

Figure 26: Market Cap Fluctuations of RON After Its TGE

Gate Research, Data from: Coingecko

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Figure 27: Sky Mavis Investors List

Date of funding	Funding Amount	Round Name	Post money valuation	Revenue multiple	Investors
Apr 06, 2022	$150M	Series B	-	-	Binance, al6z, Animoca Brands, Dialectic, Paradigm, Accel
Oct 05, 2021	$152M	Series B	$3B	-	al6z, Accel, Paradigm, Standard Crypto, Fabric Ventures, Samsung NEXT, FTX
May 11, 2021	$7.5M	Series A	-	-	Libertus Capital, Collab+Currency, BlockTower, Backed, Mark Cuban, Kevin Lin, Alexis Ohanian, Stephen McKeon, Konvoy Ventures
Nov 07, 2019	$1.5M	Seed	-	-	Animoca Brands, 500 Global, Hashed, Consensys, Pangea Blockchain

Note: Investors shown in bold are lead investors in that round

Gate Research, Data from: Binance

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Given that Sky Mavis is a game studio with extensive development experience, the Ronin Network boasts a wealth of exclusive game resources. In April 2024, the MOBA game *The Machines Arena* completed its public beta, with its Unique Active Wallets (UAW) data consistently ranking third within the Ronin ecosystem, trailing only Axie Infinity and Pixel. The year 2024 marked a transition period for Ronin's gaming ecosystem, with both new and established titles making an impact—*The Machines Arena*, *Lumiterra*, and *Apeiron* all launched on the Ronin chain that year, delivering impressive performance data and sustaining the ecosystem's momentum. If WAX excels in leveraging rich IP resources to issue NFTs, and Immutable stands out in integrating the entire gaming supply chain, Ronin's strength lies in game development itself. Continuously delivering high-quality exclusive gaming content remains Ronin's core competitive advantage.

4. Conclusion

The gaming industry is relatively young, with Web2 online games having just over 50 years of history. Looking at the development trajectory of Web2 gaming, high-quality game studios have the potential to grow into industry-dominating oligarchs (e.g., Blizzard Entertainment, Game Science), while internet giants with strong financial backing have also expanded into the gaming sector, becoming industry leaders (e.g., Tencent, NetEase). A similar trend is emerging in the Web3 space: Sky Mavis, leveraging the blockbuster success of Axie Infinity, has evolved from a game studio into a titan of the Ronin gaming ecosystem; meanwhile, Immutable, with its substantial financial resources, has released several influential AAA games.

Game Chains have become key entry points for capturing gaming traffic, with multiple game distribution platforms, including Xterio, transitioning to develop specialized gaming public chains. In the future, dedicated gaming public chains are poised to capture a larger share of

the gaming market, with more robust infrastructure and influential games serving as their core competitive advantages.

Data Source

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