

2024 **Crypto Wallet** Sector Overview and Trend Outlook

Crypto Wallet



Abstract

- Wallets serve as the gateway for users into the blockchain world, yet they are not receiving the capital attention that matches their strategic importance;
- The financing in the wallet sector has been declining year-on-year, which adds to the industry's challenges;
- Given the mix of opportunities and challenges, it's crucial to analyze the current state and future trends of crypto wallets;
- This report will explore the driving factors and potential changes in the sector through comprehensive market research.

Keywords:

Research, Wallets, Macroeconomics, Blockchain, Payments



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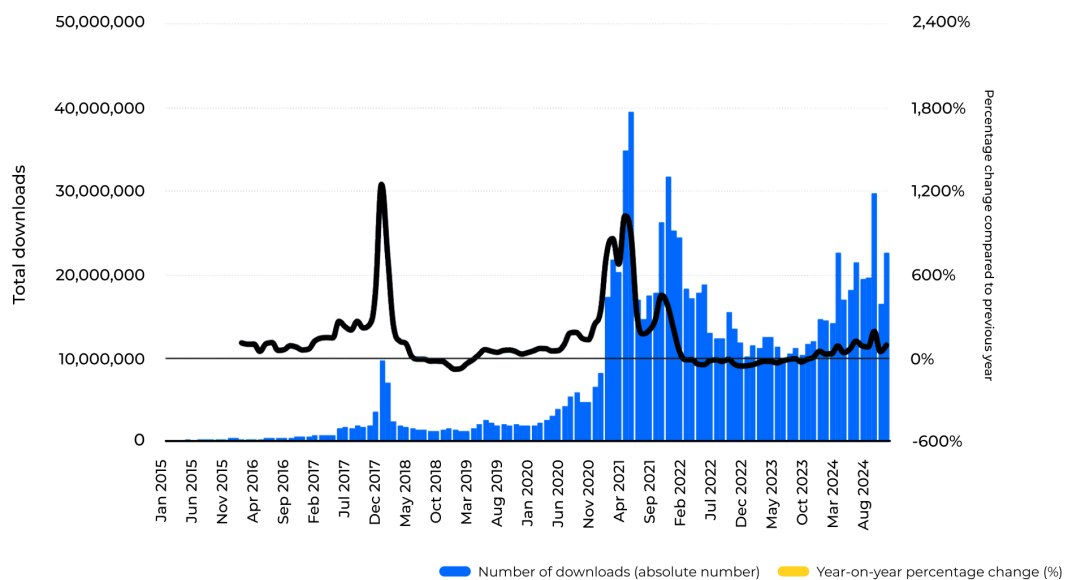
1 Market Overview: Balancing Market Potential and Challenges

1.1 Market Potential

The year 2024 is seen as the beginning of the first cryptocurrency bull market in the post-pandemic era. The global crypto market has surged to \$3.11 trillion¹, an impressive 220% increase compared to the previous year, breaking the previous record of \$2.86 trillion set in 2021. Wallets, as essential tools for managing and utilizing crypto assets, have gained significant importance. According to Statista, the peak monthly downloads of crypto wallets reached 40 million in May 2021, and even during the downturn in 2023, total downloads approached 114² million for the year. The wallet market size increased from \$6.75 billion in 2019 to an estimated \$8.42 billion in 2023, showing a strong growth potential with a compound annual growth rate (CAGR) of 24.8% and a market share of 0.3%.

Figure 1: Crypto Wallet Downloads

Crypto Wallet Downloads



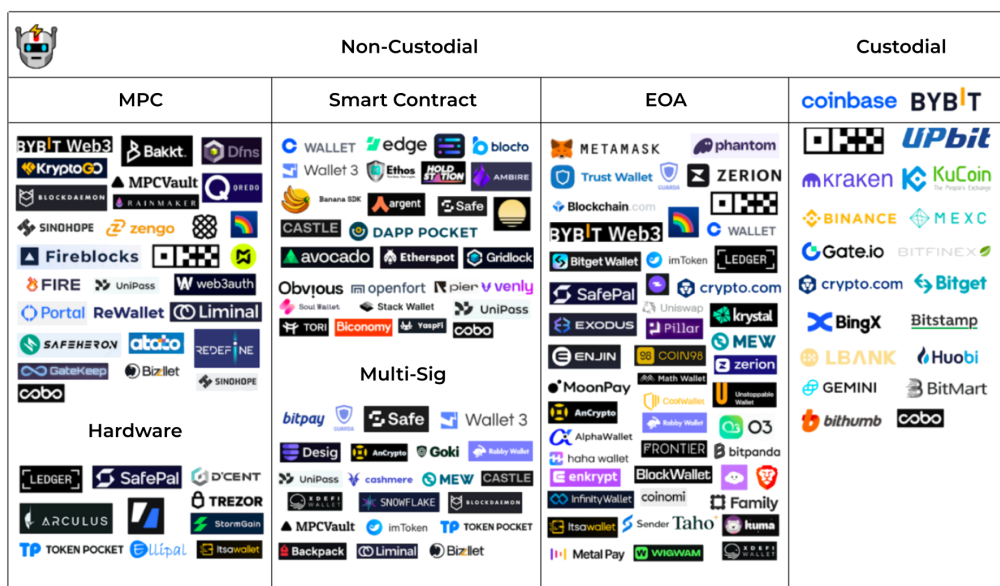
Gate Research, Data from : Statista (Statista 2024)

Gate Research

This rapid growth in market value and downloads indicates a thriving wallet sector. Current estimates suggest there are hundreds of wallet applications³ in use today. While some wallets cater to specific projects (like GameFi) or niche ecosystems, most support major blockchain platforms like Ethereum and Bitcoin. By looking at the Ethereum wallet ecosystem (Figure 2), we can identify the leading wallets available and further understand the diversity and technological trends in the wallet sector based on aspects like custody types, technology, and token issuance.

Figure 2: Ethereum Wallet Ecosystem (Source: Flashbots)⁴

Ethereum Wallet Ecosystem



Gate Research, Data from : Flashbots

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1.1.1 Custodial Wallets

Custodial wallets, also known as centralized wallets, are those where user assets are managed by centralized institutions. They are mainly divided into two types:

1. Exchange wallets (like Coinbase, Binance, OKX, Gate, etc.).
2. Telegram trading bot wallets (like Unibot, Banana Gun, Bonk Bot, etc.).

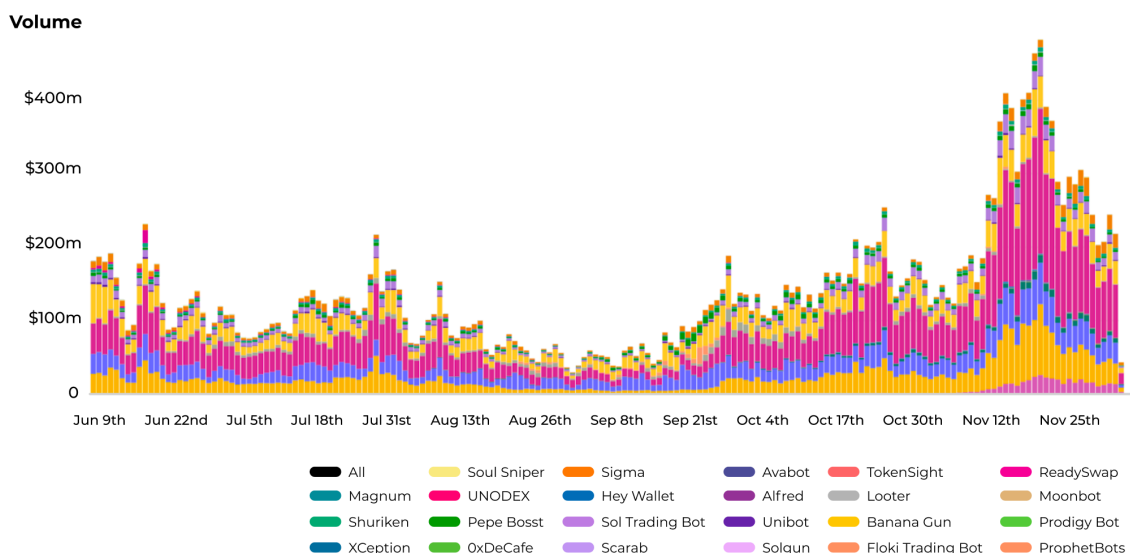
These wallets improve the user experience by allowing the service provider to manage user assets. For instance, exchange wallets use centralized servers for transactions, which reduces friction and delays; Telegram trading bot wallets offer a user-friendly interface along with featu-

res like transaction acceleration and sniper functions, making it easy to track market changes quickly—especially useful for high-frequency trading of meme tokens. However, custodial wallets come with security risks primarily related to hacking and service provider insolvency, so users should select providers with a solid track record and strong financial backing.

Interestingly, since 2022, there has been explosive growth in Telegram trading bots. According to CoinMarketCap⁵, 61 Telegram bots have issued tokens, with a total market value nearing \$2.8 billion. In 2023, the Unibot token surged from \$3 to \$200 in just three months, highlighting significant market interest in Telegram bots. This growth has further fueled the meme market during the current bull cycle (Figure 3).

Figure 3: Performance Data of Notable Telegram Bots⁶

Data Performance of Telegram Bots



Gate Research, Data from: Dune

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1.1.2 Non-Custodial Wallets

Non-custodial wallets (or decentralized wallets) allow users to have full control over their private keys, ensuring the security of their assets. Technically, non-custodial wallets can be categorized into software wallets and hardware wallets; by account type, they can be divided into traditional EOA wallets (Externally Owned Accounts, such as MetaMask, Phantom, imToken, Trust Wallet, etc.) and Smart Contract wallets (like Agent); from a security technology standpoint, they also include multi-signature wallets (like Safe) and wallets based on MPC technology (like Zengo).

The main advantage of non-custodial wallets is their security, which drives their development focus on lowering user entry barriers and enhancing security. For example, hardware wallets (like Ledger and Trezor) offer top-tier security through offline storage, while MPC technology mitigates the risk of single points of failure by splitting private keys.

More custodial wallets are now expanding into the non-custodial space. Major exchanges like Coinbase, Binance, OKX, Gate, and Bitget have launched non-custodial Web3 wallets. This indicates that non-custodial wallets are not only a crucial part of the wallet sector but will also play an essential role in future developments. The subsequent sections of this article will focus on the trends and technological advancements in decentralized wallets.

It's important to note that, according to CoinMarketCap⁷, there are currently 43 wallet projects that have issued tokens, with none in the top 100 by market value, 5 in the top 200, and 10 in the top 500. The wallet project with the highest token market value is Safe (SAFE). This suggests there is significant growth potential in the wallet sector.

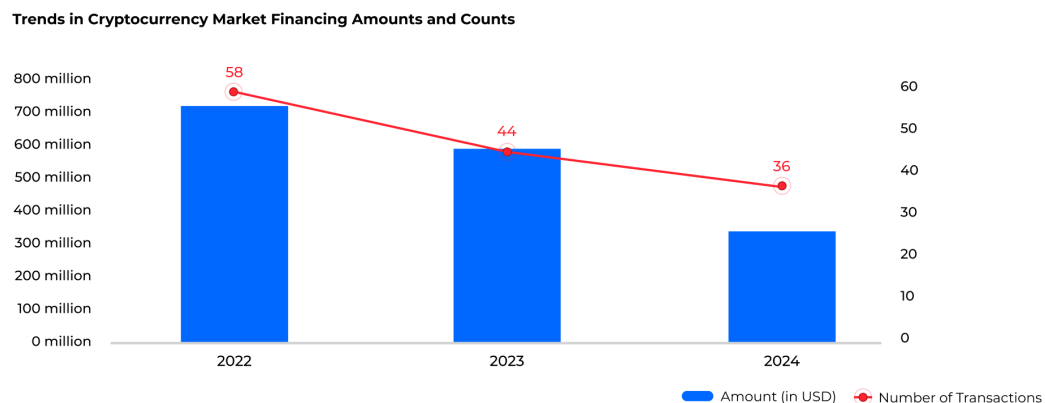
1.2 Challenges in the Sector

From a capital perspective, the total funding for the global crypto market over the past three years (2022 to the end of 2024) is approximately \$47.687 billion (Figure 4), with the wallet sector accounting for only \$2.7 billion, or 5.7%⁸. While this percentage is not low among the many subfields in Web3, the wallet sector still lacks adequate capital attention, especially given its role as a bridge for users entering the blockchain world and as a core entry point for interactions⁹ between people and chains. Additionally, the funding scale and number of projects in the wallet sector have been declining year-on-year, further intensifying the challenges faced by the industry.

In this context of both opportunities and challenges, a thorough analysis of the current state and future trends of the crypto wallet sector is warranted. The following sections will explore this area's driving factors and potential transformations through market research.

Figure 4: Funding Amount in the Wallet Sector from 2022 to 2024 (excluding AA, MPC, and hardware wallets)

Funding Amount in the Wallet Sector



Gate Research, Data from: rootdata

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2 Wallet Sector's Dilemma: High Competition and Low ROI

2.1 High Competition: Low Technical Barriers and Complex Public Chain Ecosystems

The wallet sector is highly competitive, with nearly all participants in the blockchain ecosystem developing wallet products, whether they are on-chain native projects, exchanges, public chains, or traditional internet giants. Here are a few notable examples:

- In April 2023, Uniswap launched a mobile wallet application to encourage the widespread adoption of DeFi wallets and facilitate easy mobile transactions.
- In March 2023, Microsoft integrated an Ethereum-based cryptocurrency wallet into the beta version of the Edge browser.
- In January 2022, Opera released a beta version of its Web3 crypto browser, which includes a built-in crypto wallet that supports cryptocurrency/NFT transactions and decentralized applications (dApps), along with other Web3 features.

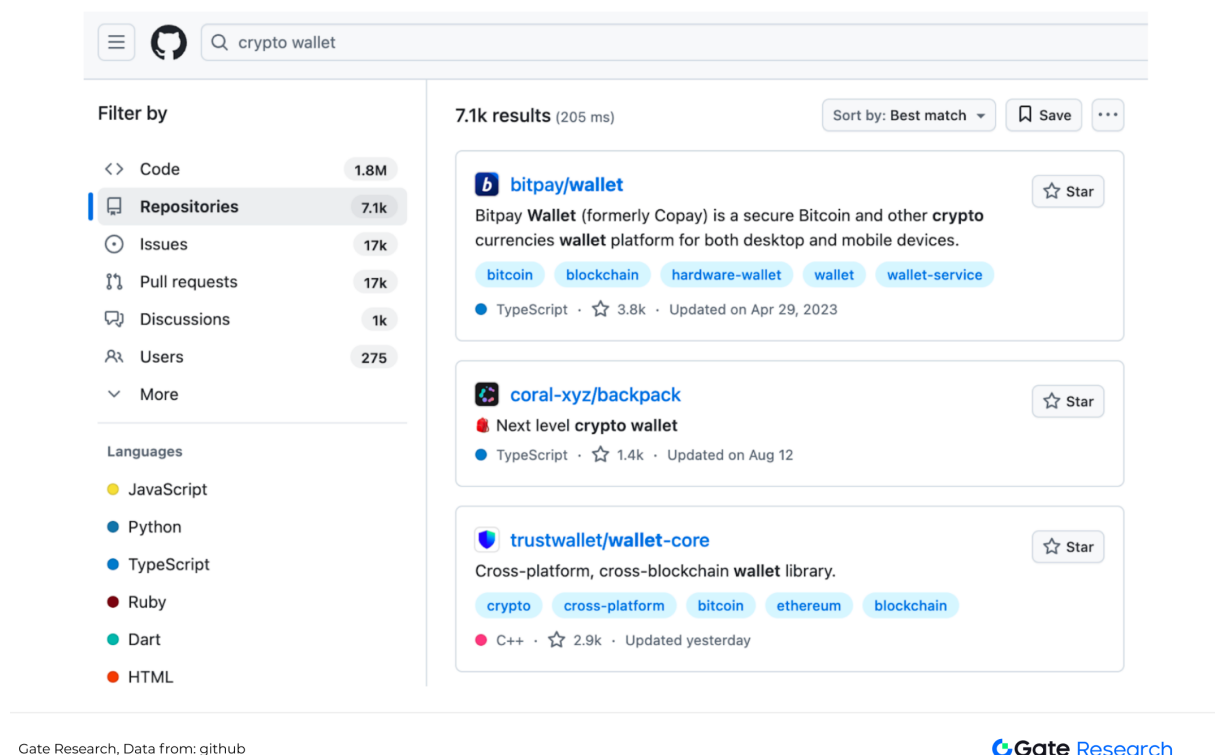
This apparent prosperity reflects market activity but conceals two significant contradictions: the low barrier to wallet development and the diversity and complexity of the blockchain ecosystem.

2.1.1 Low Barriers to Wallet Development

The essence of a crypto wallet is based on cryptographic public and private key technology, resulting in relatively low development barriers. Statistics indicate that there are over 7,000 open-source projects related to “Crypto Wallet” on GitHub, with more than 1.7 million code snippets and about 265¹⁰ user organizations (developers) involved. Additionally, blockchain infrastructure services are becoming increasingly sophisticated, with tools like APIs, RPC nodes, and token information services further lowering the technical barriers to wallet development. For instance, the Arweave ecosystem wallet ArConnect was developed by two high school students, Marton and Tate, which is not an uncommon occurrence.

Figure 5: Search results on GitHub for the term "Crypto wallet"

Search Results for Keyword "Crypto Wallet"



2.1.2 Diversity and Complexity of the Ecosystem

The blockchain ecosystem is highly diverse and segmented. As of 2024, incomplete statistics show that over 1,000 public blockchains have been documented¹¹. By the end of 2025. Different public chains exhibit significant differences in encryption algorithms, address generation rules,

token standards, and RPC services. This diversity presents considerable design and technical challenges for multi-chain wallet development.

Figure 6: Technical Characteristics and Differences of Various Public Blockchains

Technical Features and Differences of Public Blockchains

Public Blockchains	Cryptographic Algorithms	Address Generation Rules	Token Standards	Remote Procedure Call (RPC)	Wallet Support
Bitcoin (BTC)	ECDSA (Elliptic Curve Digital Signature Algorithm) using the secp256k1 elliptic curve	Addresses starting with '1' are generated from a public key hash (SHA-256 + RIPEMD-160)	There is no unified standard; standards like Ordinals or Taproot are used	Basic functionality includes transaction broadcasting and block data querying	Hardware wallets like Ledger and Trezor, as well as Electrum and UniSafe
Ethereum (ETH)	ECDSA with secp256k1 elliptic curve	Addresses starting with '0x' are generated from a public key hash (Keccak-256)	ERC-20, ERC-721, ERC-1155 standards	Advanced features such as smart contract interaction and transaction signing are supported	Wallets such as MetaMask, Ledger, imToken, etc.
Solana (SOL)	Ed25519 elliptic curve	The public key can be used directly as a wallet address without any additional hashing or compression	SPL Token standard	High-performance processing allows for concurrent requests, though it relies on a less decentralized network of nodes	Phantom, Solflare, Ledger, etc. for Solana
TRON	Using ECDSA with the secp256k1 elliptic curve	Addresses generated from Keccak-256 hashing are prefixed with 'T'	TRC-10, TRC-20, TRC-721 standards	APIs are available for direct interaction with smart contracts	TronLink, Ledger, imToken, etc. for TRON
NEAR	Ed25519 elliptic curve	Public keys can be directly used to create human-readable account names	NEP-141, NEP-171 standards	Supports cross-shard queries, state queries, and advanced contract functionalities	NEAR Wallet, Ledger, Sender Wallet, etc. for NEAR

As a result, various public chains and project teams are launching their own wallets to cater to specific scenarios. Uniswap has introduced a DeFi-specific wallet that supports Layer 2 networks like Polygon and Arbitrum. Solana users prefer the Phantom wallet, while Ethereum users often choose MetaMask. The emerging Move ecosystem, such as Sui, has also launched its own Sui Wallet. This diversity certainly enriches the available options but also leads to a fragmented market, lacking a single wallet that can meet all needs, while increasing competition among wallets.

2.2 Low Return on Investment (ROI)

Although the low technical barriers for wallets have led to a rapid influx of competitors, their return on investment (ROI) remains low, particularly in the realm of decentralized hot wallets.

This low ROI is primarily evident in several areas:

2.2.1 High Operating and Maintenance Costs

Decentralized hot wallets (like MetaMask, imToken, etc.) must support multi-chain interactions, be compatible with various public chain APIs and infrastructure services, and cover functions like RPC nodes, token information, and transaction acceleration. This raises development demands while significantly increasing maintenance burdens. For instance, when managing cross-chain interactions, wallet service providers must ensure the stable operation of nodes across chains and real-time synchronization of on-chain data, all of which require substantial technical resources and costs.

2.2.2 Challenges in User Education and Services

Decentralized wallets require users to manage their private keys independently. However, due to varying levels of blockchain knowledge and security awareness among users, incidents of lost or stolen private keys are common, often leading to irreversible asset losses. According to the OKLink “2022 Global Blockchain Ecosystem Security Situation Report,” private key leaks and losses are the leading causes of security incidents in the blockchain ecosystem, with related losses reaching \$930 million, accounting for about 40%¹² of total losses.

Moreover, the misalignment of responsibility for these issues often places blame on wallet service providers, severely damaging their brand reputation. For example, when users lose assets due to poor management of their private keys, many incorrectly attribute security issues to the wallet service provider, creating a long-term challenge for these providers in maintaining their image.

2.2.3 Limited Profit Models

The core principle of decentralized wallets is that users have full control over their assets. This distributed model effectively mitigates asset management risks, but also constraints profit margins for service providers:

- **Challenges in Monetizing Transaction Fees:** Users pay transfer fees to network miners instead of wallet service providers. Additionally, costs incurred while using dApps go directly to the respective service providers, meaning wallets function merely as entry points and cannot generate revenue from these transactions.
- **Limited Value-Added Services:** Some wallets try to earn small fees by offering additional servi-

ces like energy leasing or transaction acceleration, but these earnings are insufficient to cover their development and operational expenses.

- **Lack of Diversification in Revenue Exploration:** Recently, some wallet providers have attempted to broaden their revenue streams by integrating decentralized exchanges (DEXs) or issuing prepaid cards. However, these efforts typically focus on adding new features rather than enhancing the core wallet services.

2.2.4 Low Migration Costs for Users

The essential function of a crypto wallet revolves around a pair of public and private keys, which makes switching wallets a quick and straightforward process—users can import and transfer their private keys in just seconds. While low migration costs are beneficial for users, they create several challenges for service providers:

- **High Risk of User Attrition:** As competition increases, users can quickly switch to wallets that offer better features and experiences. If a wallet fails to meet market demands, it risks losing users, negatively impacting the service provider's retention rate.
- **Increased Security Risks:** The process of migrating wallets requires users to expose their private keys, and multiple transfers can raise the risk of asset theft. Reports indicate that losses from private key leaks are the most common security incidents, which heightens users' concerns about wallet security.

Low migration costs enhance user freedom of choice and push wallet providers to continuously improve their features and services to attract and retain users.

Thus, while decentralized wallets are crucial in the Web3 ecosystem, their business models face significant challenges, including high operational costs, difficulties in educating users, and a narrow profit model that limits growth potential. These structural issues contribute to a steady decline in return on investment (ROI) within the decentralized wallet sector, prompting providers to seek more efficient business strategies and sustainable operating models.

3 Breakthroughs in the Wallet Sector: Focusing on Core User Needs

An analysis of the current state and challenges in the wallet sector shows that opportunities and challenges can drive each other's development. The key to overcoming existing barriers lies in re-evaluating users' core needs and designing innovative solutions around them. Here are the

four primary demands users have regarding wallets:

3.1 Secure and Convenient Account Management

As the crypto market grows in value and user base, security has become the most pressing concern for both the industry and users. According to SlowMist's Q3¹³ 2024 report, private key leaks are the leading cause of asset theft. Since 2010, losses from improper private key management have exceeded \$100 billion¹⁴ in BTC.

Most current wallets rely on the Externally Owned Account (EOA) model, which uses a single private key or mnemonic phrase for account management. This approach presents significant risks during network attacks, device loss, or damage, as private key leaks or losses pose the greatest threat to asset security.

For wallet providers, ensuring the security of user assets is a fundamental product requirement and essential for building brand trust. For example, a recent theft incident involving a DEX wallet resulted in over \$100 million in user losses, severely damaging trust and putting the project team in a precarious position. Moving forward, wallets need to balance security and convenience, potentially by introducing safer multi-signature accounts, Multi-Party Computation (MPC) solutions, or implementing smart account management through Account Abstraction (AA).

3.2 Low-Friction Ecosystem Switching

In every bull market, standout wallets have emerged alongside significant market narratives. Figure 7 illustrates the wallet products that have gained prominence in each bull market since 2016, along with potential reasons for their success:

Figure 7: Most Likely Popular Wallets in Different Periods from 2016 to 2024

Wallets in Different Periods

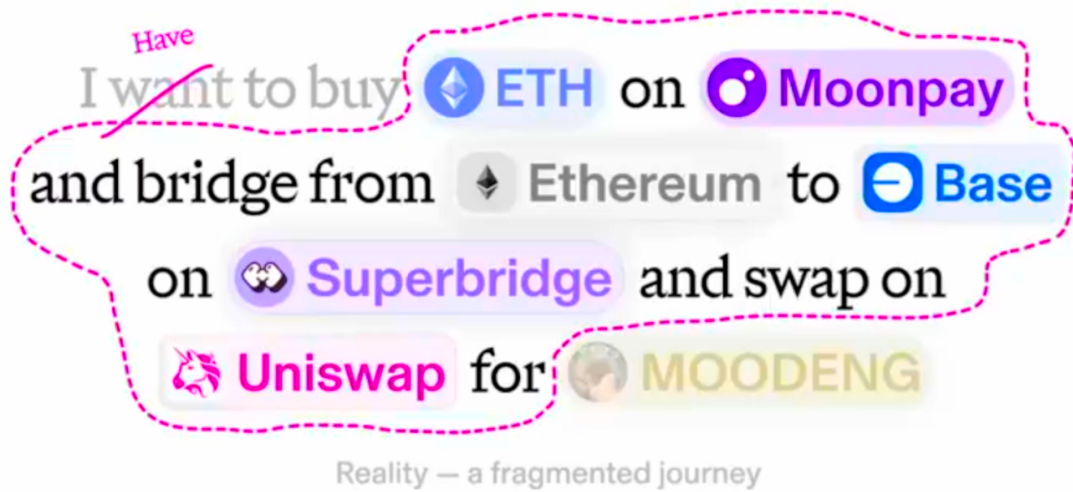
Time Periods	Wallet Names	Types	Active Users (AU)	Key Highlights
2016-2018	imToken	Mobile	4 million monthly active users (MAU)	- The Ethereum ICO boom - Widespread issuance of ERC20 tokens
2019-2021	TokenPocket	Mobile + Plugin	3.5 million MAU	The DeFi Summer significantly increasing user demand
2022	Metamask	Mobile + Plugin	31.7 million MAU	- A surge in EVM multi-chain DApps - The NFT market gaining widespread popularity - Compatibility with Hardware Wallets
2023	Okx Wallet	Mobile + Plugin	4.6 million weekly active users (WAU)	Optimizing user experience (UX) has become a key selling point
Feb. 2024	Metamask	Mobile + Plugin	30 million MAU	Strengthened market position through support for multi-chain DApps
Feb. 2024	Phantom	Mobile + Plugin	2.7 million MAU	- User growth fueled by the meme trend in the Solana ecosystem - Earning yields by staking SOL tokens
Apr. 2024	UniSat	Mobile + Plugin	1 million WAU	Innovations like BRC20 in the Bitcoin ecosystem attracting users
Aug. 2024	Bitget wallet	Mobile + Plugin	12 million MAU	User acquisition through airdrops of SBWB tokens

Market trends often dictate user behavior, and wallets must adapt quickly to the industry's rapidly changing demands. Whether it was the DeFi Summer in 2020, the rise of GameFi in 2022, or the meme coin surge in 2024, the wealth effects of each phase continuously rotate among different ecosystems. This trend reflects a deeper logic in industry development: multi-chain integration is now irreversible.

For wallets, reducing the friction of switching between multiple chains (as shown in Figure 8) and providing a seamless user experience has become a core challenge for future development. Users want to switch chains without worrying about the differences between underlying chains, aiming for a consistent and smooth experience in asset management and DApp interactions.

Figure 8: Interoperability Uniswap Labs Products

Interoperability of Uniswap



Gate Research, Data from: Fragments of Reality

Gate Research

3.3 High-Quality User Experience

3.3.1 Providing Intuitive and Practical Information

Users must see asset data and transaction information clearly to avoid complex operational hurdles. Traditional wallet interfaces often feature complicated hash information, which is not user-friendly. This design not only hampers the user experience but also increases the risk of mistakes or asset losses, particularly during complex smart contract interactions. Future wallet development should focus on "event" visualization, employing smart contract decoding and user-friendly designs to clarify transaction details.

According to SlowMist's Q3¹⁵ 2024 report, phishing attacks are the second most common cause of asset theft, with many users falling victim to unclear transactions. Wallets that incorporate intuitive signature features can help users recognize potential phishing attempts, thereby enhancing asset security. For instance, Rabby provides a feature that decodes smart contracts to show transaction details, allowing users to understand the transaction's subject, amount, and potential implications clearly. This design improves users' comprehension of transactions and reduces the risk of blind signing (unauthorized signing) leading to asset loss.

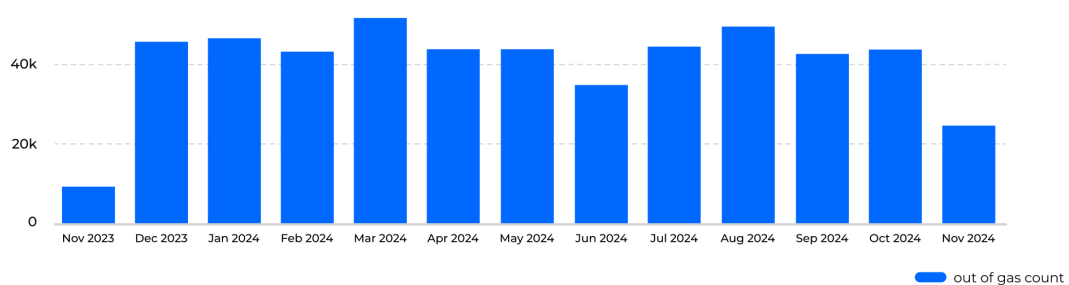
3.3.2 Imperceptible Gas Fees

Currently, most blockchain ecosystems require users to pay gas fees using native tokens (like ETH or SOL). This system is particularly challenging for novice users, especially those unfamiliar with gas mechanics, as insufficient native tokens can result in transaction failures, creating a significant pain point in user experience.

Data from Dune indicates that in 2024, over 526,000 transactions in the Ethereum ecosystem failed due to insufficient gas (see Figure 9). Although some wallets (like Rabby and OKX Wallet) have improved gas fee estimation features and perform better during periods of high volatility, the issue of "insufficient native tokens" continues to be a problem for users.

Figure 9: Monthly Distribution of Ethereum Out of Gas Incidents in the Past Year

Distribution of Ethereum "Out of Gas" Incidents



Gate Research, Data from: dune

Gate Research

3.3.3 Efficient Transaction Processes

Blockchain transactions are not just about "success" or "failure"; they also include complex pending states that can cause users to miss trading opportunities, especially during volatile market conditions. For instance, during the Meme coin surge in 2024, many users paid high fees to prioritize their transactions, hoping to capitalize on fleeting market changes.

As a result, improving transaction success rates and efficiency has become a key competitive factor for wallet service providers. Wallets like OKX Wallet, Rabby, and imToken have adopted various innovative strategies to boost transaction efficiency. For example, Rabby offers real-time transaction simulations to help users predict potential failures, reducing wasted time and costs. Meanwhile, OKX Wallet has integrated efficient gas management and optimized trans-

fer processes to enhance transaction confirmation success rates. These improvements directly enhance user experience and asset utilization.

Transaction efficiency is also evident in user demand for decentralized exchanges (DEXs). Wallets act as "safes" for assets and often lack core liquidity support. By incorporating built-in swap features, wallets can serve as transaction bridges, minimizing the switching costs between DEXs and wallets, thus improving asset liquidity. Analysis of transaction volume and active user trends (see Figures 10 and 11) shows that wallets with built-in DEXs experience significant increases in active users during market hotspots, such as the meme coin narrative.

Figure 10: Weekly Active Users of Built-in Swap in Ethereum Wallets

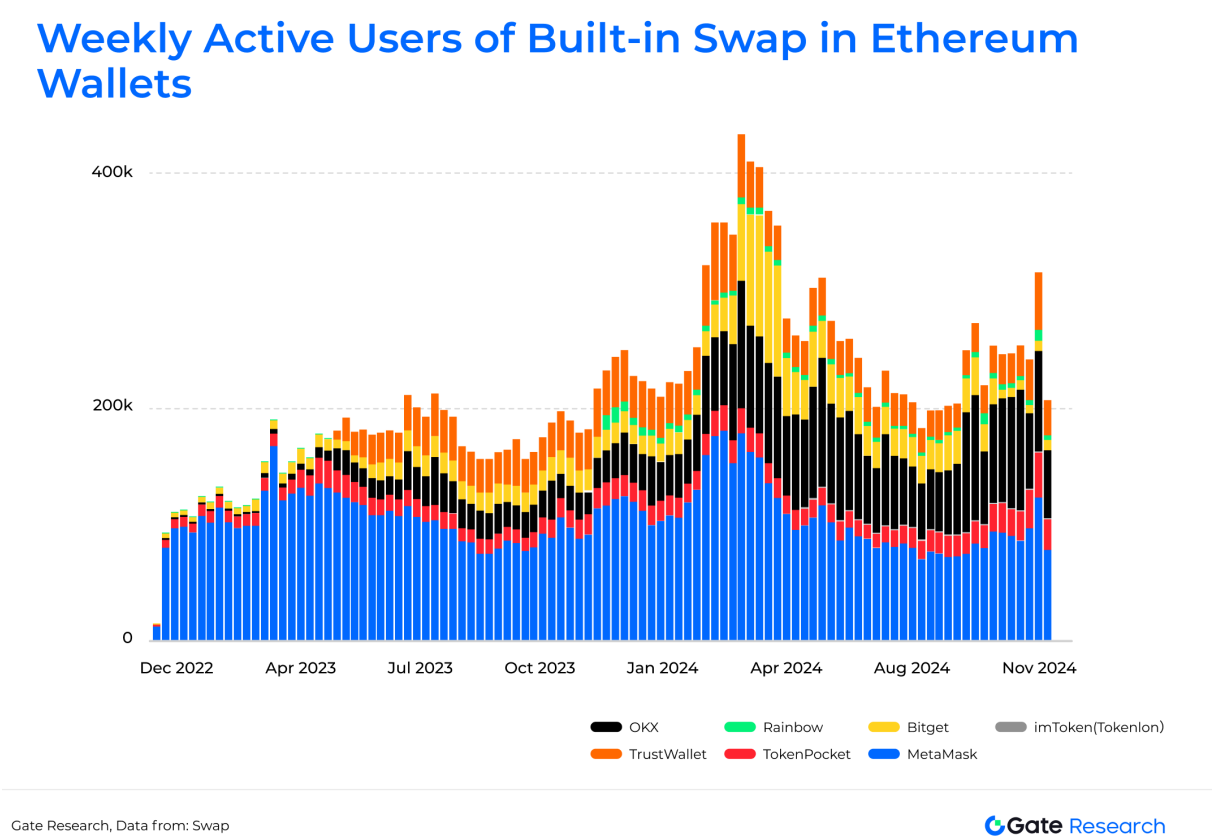
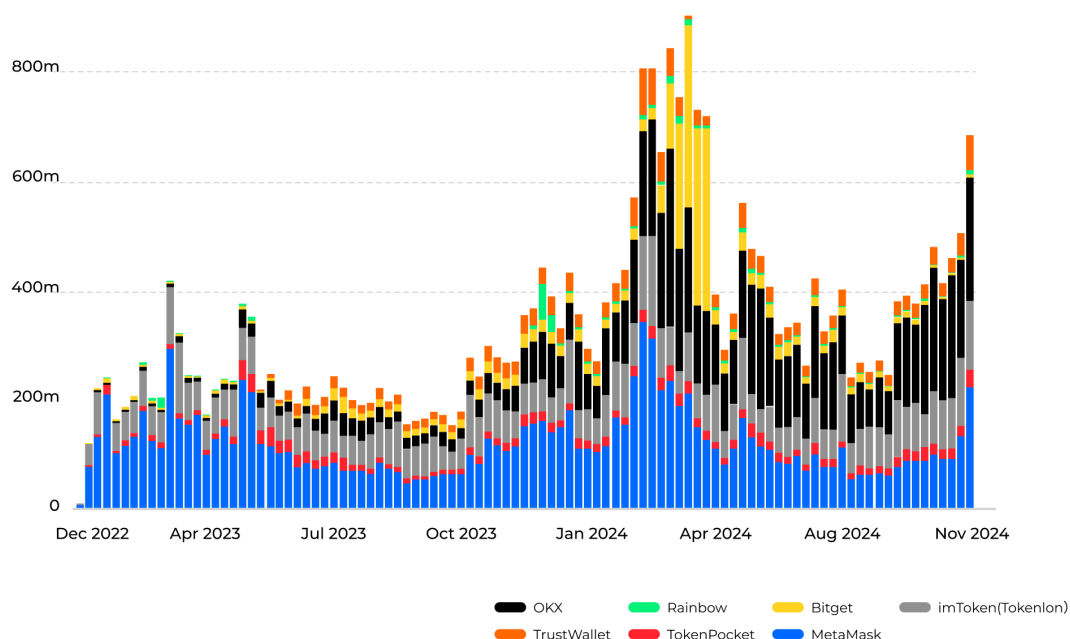


Figure 11: Weekly Transaction Volume of Built-in Swap in Ethereum Wallets

Weekly Transaction Volume of Built-in Swap in Ethereum Wallets



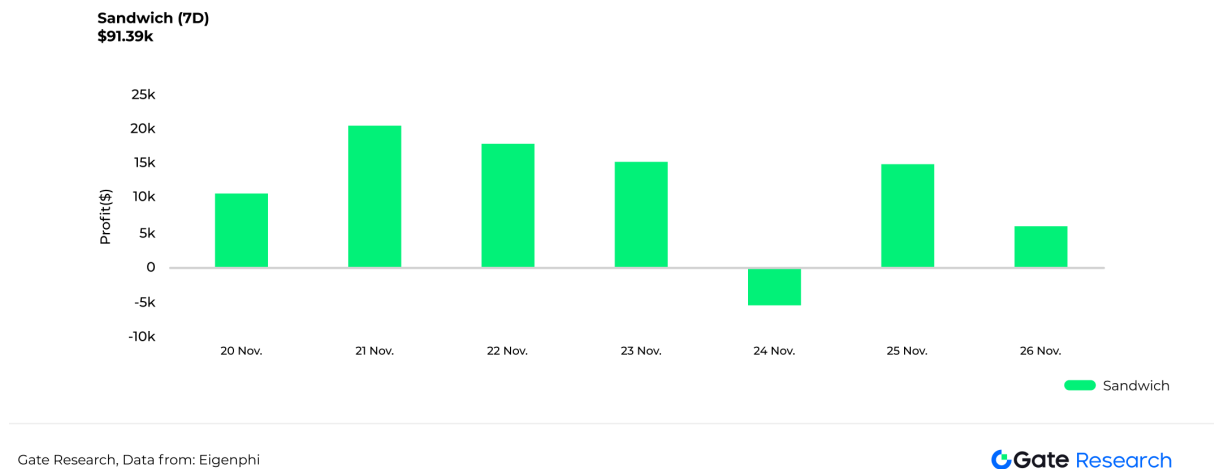
Gate Research, Data from: Swap

Gate Research

However, as users become more reliant on DEXs, the issue of MEV (Miner Extractable Value) has emerged as a significant challenge affecting user experience and asset security. MEV refers to the practice of block builders extracting additional value by manipulating transaction orders, which can be particularly harmful to regular users. In the common sandwich attack, attackers place high-priority transactions before and after a user's transaction, forcing the user to buy tokens at inflated prices, thus increasing transaction costs and causing asset losses. For everyday users, these hidden costs are hard to detect but can accumulate into substantial financial losses over frequent trades. While wallet users can implement solutions like Flashbots RPC for MEV protection, these options still present high barriers for average users, requiring manual RPC setup or an understanding of complex blockchain mechanics.

Figure 12: Profits from Sandwich Attacks in the Past Week(Eigenphi)

Profits from Sandwich Attacks



3.4 Stable Wealth Growth

3.4.1 Earning Through Staking

Staking is crucial for maintaining the security of Proof of Stake (PoS) networks and effectively enables users to achieve stable asset growth during bear markets. Many wallets enhance asset utilization through built-in staking services, such as imToken's ETH staking feature, which allows users to lock up ETH for consistent returns. Vertical chain wallets like Phantom and Sui Wallet support native token staking, enabling users to leverage idle assets for wealth growth during prosperous periods. This approach preserves asset value and offers users the potential for long-term appreciation, making it a key feature for increasing user engagement and asset management efficiency.

3.4.2 Investing in Stablecoins

Stablecoins are the most liquid and least volatile asset class in the crypto market due to their peg to fiat currencies. According to CoinMarket data, the total market capitalization of stablecoins is approaching \$200 billion¹⁶, accounting for 6.4% of the total cryptocurrency market cap. Their efficient liquidity allows users to quickly convert between crypto assets while also serving as a crucial tool for risk mitigation. However, decentralized wallets currently fail to provide robust stablecoin investment features; most can only offer related services through third-party DApps, lacking direct and convenient automated investment capabilities. This limitation restricts user

experience and the appreciation potential of stablecoins. In 2024, Coinbase Wallet launched a USDC investment service that does not require locking up funds, offering a 4.7% annual yield and distributing earnings monthly to Base chain wallets¹⁷. This model effectively balances returns and liquidity, providing a valuable reference for improving investment features in decentralized wallets and indicating a new direction for functional optimization in the industry.

3.4.3 Airdrop Incentives

Airdrops are a highly attractive marketing strategy in the Web3 ecosystem, boosting user engagement and providing project teams with excellent opportunities to educate users. For example, Bitget Wallet launched an airdrop program in March 2024, allowing users to earn points by storing assets or participating in transactions¹⁸, which rapidly grew its user base, reaching 12 million monthly active users by August—a remarkable surge. Similarly, Binance Web3 Wallet distributed airdrops by combining BNB staking, attracting a large user base and significantly increasing activity. These examples demonstrate that airdrops have become a vital entry point for users exploring the Web3 landscape, effectively strengthening the connection between users and projects while fostering the growth of wallet services.

4 Future Directions for Wallet Development: Addressing Core Needs through Technological Innovation

By summarizing the four core demands of wallet users—"secure and convenient account management," "low-friction ecosystem switching," "high-quality user experience," and "stable wealth growth"—we see that these needs are interconnected and form a complete loop of user experience. As Particle Network CEO Penyu stated in an interview with TechFlow: "Optimizing user experience must span the entire lifecycle; interactions at all levels are multiplicative rather than additive, and any weakness in one area can have a global impact on the overall experience."¹⁹ Thus, the future development of wallets must take a systematic approach, moving beyond traditional client-side UI/UX optimizations or mere feature additions, and instead addressing user needs through deeper technological transformations. Below, we will explore how to create the next generation of wallets that meet users' comprehensive needs from three core technological directions: "Account Abstraction," "Gas Abstraction," and "Chain Abstraction," along with their close interrelationships.

4.1 Account Abstraction

Ethereum founder Vitalik Buterin updated the ETH development roadmap at the end of 2023, maintaining the focus on Account Abstraction (AA)²⁰. This is not coincidental. In fact, Vitalik proposed the concept of account abstraction as early as 2015 (EIP-101, which is now stagnant) and has continued to advocate for its development (see Figure 13). Particularly, the promotion of EIP-7702 allows users to upgrade to an AA account without changing their Externally Owned Account (EOA) address. This indicates that account abstraction is seen as a core solution to address various issues in Ethereum's current account management.

Figure 13: Development Journey of AA

Development Journey of AA

Creation Timeline	EIP	Details
2015.11.15	101	Modify transaction parameters based on standards, allowing addresses to store code natively and integrate the native token ETH into the ERC20 standard.
2017.02.10	86	Introduce a new transaction type enabling contracts to initiate transactions, with gas fees treated as top-level accounts.
2018.01.30	859	Propose a functional specification for Account Abstraction (AA), currently in the discussion phase.
2020.06.13	2718	Outline the introduction of new transaction types by encapsulating necessary information to broaden the range of transaction types.
2020.09.04	2938	Enable contracts to handle gas payments and create top-level accounts for upgrades, establishing a framework for fields in advanced transactions.
2020.10.15	3074	Allow externally owned accounts (EOAs) to delegate control to contracts, giving existing EOAs smart contract capabilities.
2021.06.10	3607	Expand Ethereum addresses by an additional 160 bits to improve account privacy and security.
2021.09.29	4337	defining the optimal solution for AA without modifying the consensus layer, and facilitating transaction liquidity through UserOperation and Bundlers.
2022.03.26	5003	Before 3074, enable EOAs to integrate more advanced code to resolve security concerns associated with private key control.
2022.06.29	5189	Introduce the concept of "Endorser" within the 4337 mechanism, which will be implemented by Bundlers.

4.1.1 Enhanced Security: From Single Point Risks to Multiple Safeguards

AA significantly reduces the risk of single points of failure by supporting multi-signature, multi-party approval mechanisms, and tiered permission controls through smart contracts. For instance, users can delegate some account permissions to guardians (like friends or professional service providers) who can assist in recovering permissions if private keys are lost or accounts are compromised, thus preventing irreversible asset losses. Additionally, account abstraction allows users to set different permissions for various devices, such as limiting access to balance inquiries or requiring multi-party approval for initiating transactions, thus balancing flexibility and security. Furthermore, AA provides various account recovery options, including social, device-bound, and time-locked recovery, effectively mitigating asset risks due to lost private keys.

4.1.2 Greater Flexibility: Achieving Comprehensive Evolution in Asset Management

Flexibility is one of the core advantages of account abstraction, as it grants high programmability to asset management through smart contracts, providing users with richer customization options. For example, users can set daily or per-transaction limits; if a transaction exceeds the preset limit, the account will automatically reject the transaction or require additional authorization, similar to bank risk control mechanisms, effectively preventing large asset losses due to accidental or fraudulent activities.

Moreover, smart accounts support complex conditional execution rules, such as triggering transactions only when gas fees fall below a certain threshold or setting specific execution times for transactions, optimizing efficiency and reducing costs.

Account abstraction also enables automated trading. Users can set periodic operations (like regular payments or dividends) that the system executes automatically without manual intervention. Batch transaction functionality further simplifies operations, allowing users to sign multiple transactions simultaneously, such as bulk transfers or cross-chain asset migrations, thereby enhancing operational efficiency. Users can also set trigger conditions for transactions via on-chain timers, such as executing buy or sell operations automatically when market prices reach desired levels.

Introducing these flexible features not only optimizes user experience but also elevates the autonomy of asset management to a new level.

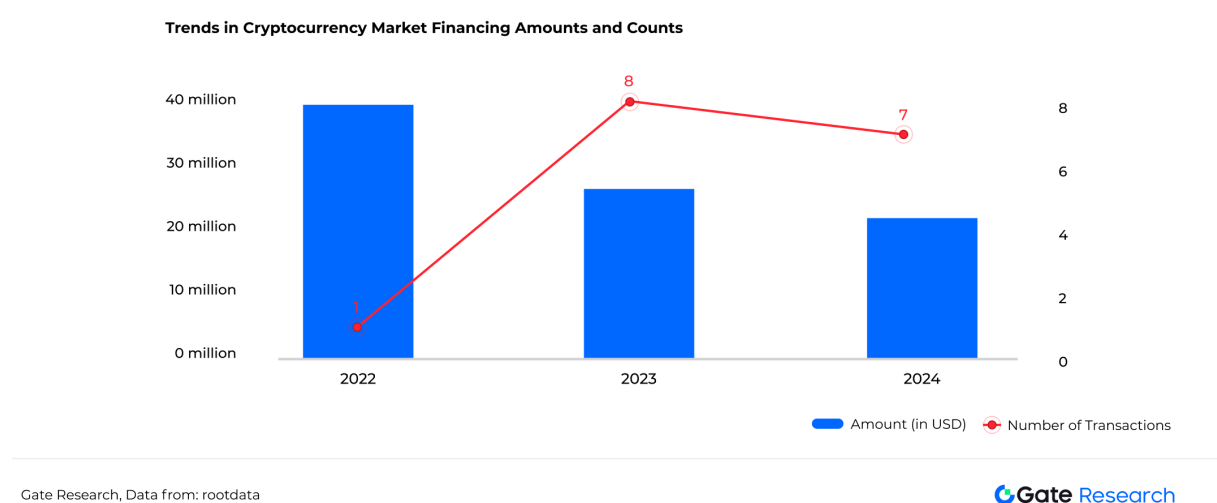
4.1.3 Synergistic Development of AA Technology and MPC Technology

AA technology is gradually transforming decentralized wallets, with its flexibility and security becoming crucial for enhancing user experience. Since 2022, 16 AA wallet projects have raised \$89.1 million, accounting for 3.29%²¹ of total funding in the wallet sector (see Figure 14).

However, AA technology is still in its early stages and faces challenges such as high transaction fees, compatibility issues within existing ecosystems, and incomplete technical standards (like EIP-4337). As Layer 2 technology matures and the community gains a better understanding of AA technology, these challenges are expected to be overcome, paving the way for AA to become a significant milestone in decentralized wallets.

Figure 14: Funding Situation of the AA Sector Since 2022

Financing Situation of the AA Sector

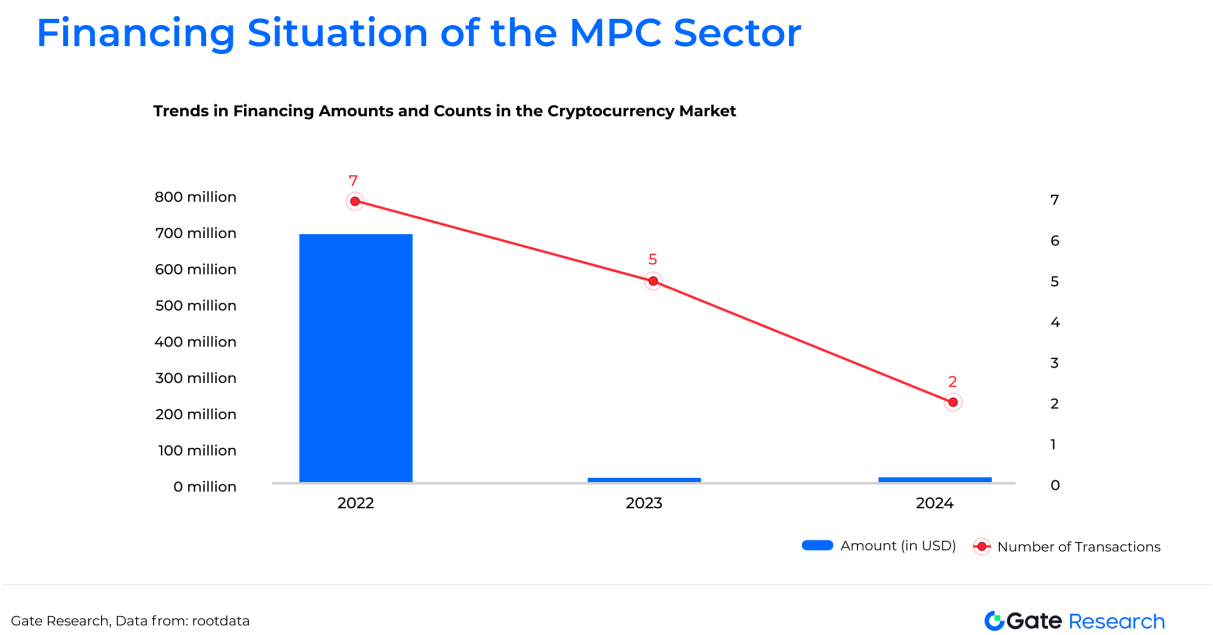


At the same time, in the realm of wallet security, MPC (Multi-Party Computation) technology is rapidly evolving and has gained widespread adoption among institutional users. For instance, the ZenGo wallet, which utilizes MPC, has provided asset management services to over 1 million users.²² Meanwhile, Fireblocks' MPC wallet has become the go-to tool for institutions, serving over 1,800 organizations and securing a cumulative transaction volume exceeding \$60 billion.

MPC technology is particularly well-suited for institutional users due to its robust multi-party security, whereas AA technology focuses more on enhancing security and flexibility for individual users.

Since 2022, 14 MPC wallet projects have secured \$730 million in funding, representing 27.03%²³ of total funding in the wallet sector (see Figure 15). Both technologies have distinct characteristics, and future applications may trend toward collaborative development; integrating AA and MPC technologies could create new opportunities in the decentralized wallet space.

Figure 15: Funding Situation of the MPC Sector Since 2022.



Although AA technology is still in its early stages, its potential is widely recognized. With further improvements in technical standards (like EIP-4337) and deeper integration with Layer 2, AA technology is poised to significantly enhance wallet security and user experience. Supported by various forces, AA technology will likely become a core driver for the future development of decentralized wallets, facilitating smarter, more convenient, and efficient asset management.

4.2 Gas Abstraction

4.2.1 Key Applications of Account Abstraction

Gas Abstraction is an innovative technology that separates gas fee management in blockchain transactions from the user side, aiming to lower barriers for users engaging with blockchain and significantly improve the user experience. With gas abstraction, users can pay gas fees using various assets (such as stablecoins, NFTs, or project tokens) and even allow third-party payments, thus avoiding transaction failures due to a lack of native tokens.

Gas abstraction is a significant aspect of account abstraction (AA). For example, Argent employs MetaTransaction technology and an intermediary layer known as the Gas Station Network (GSN) to offer users gas payment services. In the EIP-4337 proposal, the gas abstraction feature has been further enhanced by introducing a Bundler service that plays a central role in transaction packaging and gas management. The Bundler collects user transaction requests and pre-pays for gas, later deducting the corresponding fees from the user's account after completing the transaction. This mechanism simplifies user operations and opens up more possibilities for expanding wallet functionalities.

4.2.2 Other Solutions

4.2.2.1 Dynamic Exchange

In August 2024, the Solana ecosystem wallet Fuse Wallet launched a dynamic exchange feature²⁴ based on gas abstraction. This feature allows users' liquid staking tokens (LST) fuseSOL to be dynamically converted into SOL²⁵ for gas payments. This approach maximizes the value of users' assets and encourages other wallets to implement similar mechanisms to automatically convert user-selected assets into native tokens, resulting in a smoother trading experience.

4.2.2.2 Plugin Compatibility

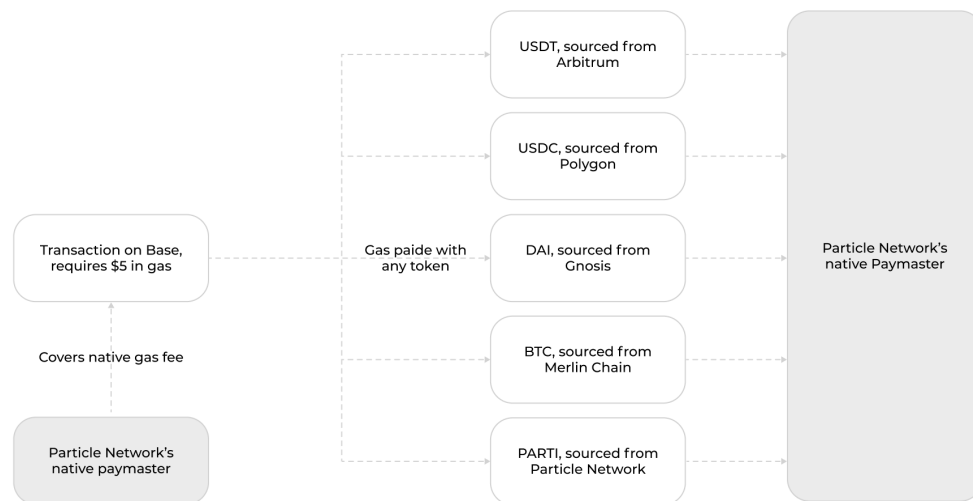
In September 2023, MetaMask introduced the Snaps feature, enabling developers to create plug-in applications on its platform. One such plug-in, Coinchoice Snap, allows users to pay gas fees using USDC. This enhances the wallet's compatibility with third-party applications, transforming it into a multifunctional platform that not only broadens the application scenarios for gas abstraction but also offers new ideas for the ecological development of decentralized wallets.

4.2.3 Universal Gas

The concept of Universal Gas proposed by Particle Network introduces cross-chain dimensions to gas abstraction applications. By integrating account abstraction and chain abstraction technologies, Universal Gas allows users to pay transaction gas with any token on any chain. For example, users can directly use USDC from the Base chain to pay for transaction gas on the Solana chain. This design fundamentally addresses the issue of dispersed gas fees in multi-chain ecosystems, making cross-chain operations smoother and more efficient.

Figure 16: Particle Network Universal Gas Solution

Universal Gas Solution



Gate Research, Data from: particle

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However, realizing the full potential of Universal Gas relies on the development and support of chain abstraction.

4.3 Chain Abstraction

Chain Abstraction is an innovative mechanism that hides the underlying technical differences between blockchains, enabling users and developers to perform cross-chain interactions as easily as if operating within a single system. Its goal is to simplify multi-chain operations so that users do not need to worry about which chain a specific transaction occurs on. For instance, with chain abstraction support, users can use ETH from Ethereum to participate in a meme launch

on Solana without needing to exchange for SOL through a decentralized exchange (DEX) or use a cross-chain bridge for asset transfers.

4.3.1 Particle Network

Particle Network is a leading project in the field of chain abstraction, offering users three core functionalities: universal accounts, universal liquidity, and universal gas through modular Layer 1 blockchains and innovative technologies, fundamentally simplifying the multi-chain interaction experience. By utilizing a single on-chain address and unified balance, Particle Network conceals the differences between multiple chains, providing a truly seamless on-chain experience. Particle Network's innovations also include dual staking through Babylon technology, enhancing the security of the crypto economy using BTC, while employing aggregated data availability technology to avoid single points of failure. These features bolster the network's security and reliability and lay the groundwork for the commercial application of chain abstraction technology. Since launching its public testnet in May 2024, Particle Network has attracted 1.3 million account registrations and distributed 6.71 billion PARTI²⁶ points through the Particle Pioneer reward program, showcasing strong potential for user growth.

4.3.2 Unichain

Unichain is another representative project in the field of chain abstraction, focusing on decentralized finance (DeFi) and multi-chain liquidity as an Ethereum Layer 2 solution. Its core features include instant transactions, low-cost scalability, and cross-chain liquidity support, significantly enhancing user experience through chain abstraction technology.

Unichain offers a 1-second block time (with plans to reduce it to 250 milliseconds in the future), which greatly reduces transaction delays while improving efficiency through a single sequencer, gradually achieving greater decentralization with a complete node validation mechanism. This architecture dramatically lowers transaction costs, saving about 95% compared to the Ethereum mainnet, providing a cost-effective solution for high-frequency trading and liquidity operations.

In terms of cross-chain liquidity support, Unichain has achieved seamless interoperability with dozens of blockchains, allowing users to easily access multi-chain asset liquidity pools and obtain native cross-chain functionality through the Superchain ecosystem, thus promoting standardized operational protocols in a multi-chain environment.

Figure 17: Development Roadmap of Uniswap²⁷

History of Uniswap

Era	Time	Version	Bottleneck	Solution	Significance
DEX	2018	Uniswap V1	Centralized Exchange (CEX) Problems	First Automated Market Maker (AMM) Model	Demonstrated the feasibility of a decentralized exchange (DEX)
	2020.03	Uniswap V2	V1 Only Supported ETH/ERC20 Pools	ERC20/ERC20 Pools	Enabled ERC20 swaps, increased flexibility, reduced fees
	2021.03	Uniswap V3	Low Capital Efficiency	Concentrated Liquidity	Increased efficiency, reduced slippage, customizable price ranges
	2023.06	Uniswap V4	Mandatory High Fees in V3	Hooks & Flash Accounting	Trade-off customization, reduced fees, clearer net transactions
Intent	2023.07	UniswapX	Fragmented Liquidity & Complex UX	Intent Model + Filler	Aggregated on/off-chain liquidity, simplified UX
	2024.04	Proposed a standard of cross-chain intent so that filler networks can be unified			
DeFi Chain	2024.10	Unichain	Fragmented Liquidity & Speed Bottlenecks	Rollup + Built-in Cross-chain	Cross-chain interoperability, fast blocks, decentralized validator

Gate Research, Data from: cycle network

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Unichain's chain abstraction technology is deeply integrated with wallets, significantly enhancing user experience and providing unprecedented convenience and efficiency for multi-chain operations. Thanks to Unichain's instant transaction capabilities, wallet users can achieve millisecond-level transaction confirmations, greatly reducing wait times and improving transaction success rates, especially in high-frequency trading and volatile market conditions.

Additionally, Unichain's collaboration with Flashbots provides comprehensive MEV protection through Rollup-Boost technology and Trusted Execution Environments (TEE). Before executing transactions, TEE simulates and eliminates failed transactions, preventing users from incurring extra costs due to transaction failures, while Flashbots' 250-millisecond pre-confirmation mechanism effectively reduces the risk of transaction rollbacks caused by block reorganizations, offering users a more stable trading environment. The prioritization mechanism ensures that transactions are executed according to transparent rules (such as priority fees), preventing block builders from abusing their sorting power and fundamentally reducing the hidden losses users

face due to MEV operations. Moreover, Unichain's MEV internalization mechanism returns part of the profits to users and liquidity providers, directly enhancing the user experience in a fair trading environment.

Unichain's low-cost transaction architecture further lowers the barriers to multi-chain interactions, allowing users to operate without holding native tokens from different blockchains. Its cross-chain liquidity support positions wallets as essential platforms for multi-chain asset management. Users can manage multi-chain assets, complete cross-chain transactions, or access liquidity pools through a single interface without frequently switching chains or relying on bridging tools. This seamless, multi-chain-compatible operational experience not only simplifies the complexity of multi-chain interactions but also provides developers with more efficient multi-chain technical support. Unichain's innovations are advancing wallet technology toward a smarter and more user-friendly future, offering DeFi users a safer and more efficient experience.

4.3.3 User Stories

Through the technologies of "Account Abstraction," "Gas Abstraction," and "Chain Abstraction," we can identify several key wallet use cases:

Scenario 1: Multi-Chain Asset Integration

User Need: Alice wants to quickly view all her ETH assets, but they are scattered across the Ethereum mainnet, various EVM chains, and Solana, making it cumbersome to check and manage.

Solution: The wallet uses account abstraction and chain abstraction technologies to automatically aggregate ETH from different chains into a total amount. When Alice opens her wallet, she sees "10 ETH" without knowing the specific distribution, and she can use ETH from any chain to pay gas fees when making transfers.

Scenario 2: Small Cross-Chain Payments

User Need: Bob wants to invest \$10 in a meme project on Solana, but all his funds are on Ethereum, and traditional cross-chain methods are costly and slow.

Solution: Using chain abstraction technology, the wallet enables Bob to complete a cross-chain operation in one transaction, paying gas with ETH from Ethereum and directly participating in the Solana project, making small investments more efficient with quick and low fees.

Scenario 3: Consolidating Fragmented Assets

User Need: Charlie has small amounts of assets on Base, Solana, Arbitrum, and Ethereum, which are difficult to use individually and cumbersome to manage.

Solution: The wallet offers a one-click consolidation feature that automatically converts Charlie's fragmented assets into USDT on TRON, making it easier for him to manage or invest his assets.

Scenario 4: Multi-Chain Smart Investment

User Need: David wants to invest in USDC on the Sui chain (20% APY), but all his funds are in USDT on Ethereum. He hopes to achieve cross-chain investment without affecting the liquidity of his existing assets.

Solution: The wallet integrates chain abstraction and investment tools to help David transfer USDT from Ethereum to Sui and automatically deposit it into an investment product. At the same time, the wallet supports staking ETH on Ethereum to use the staking rewards for investments on other chains, maintaining liquidity while maximizing returns.

4.4 Other Points of Interest

In addition to the three major trends in wallet development discussed earlier, there are other noteworthy areas in the wallet space that deserve attention.

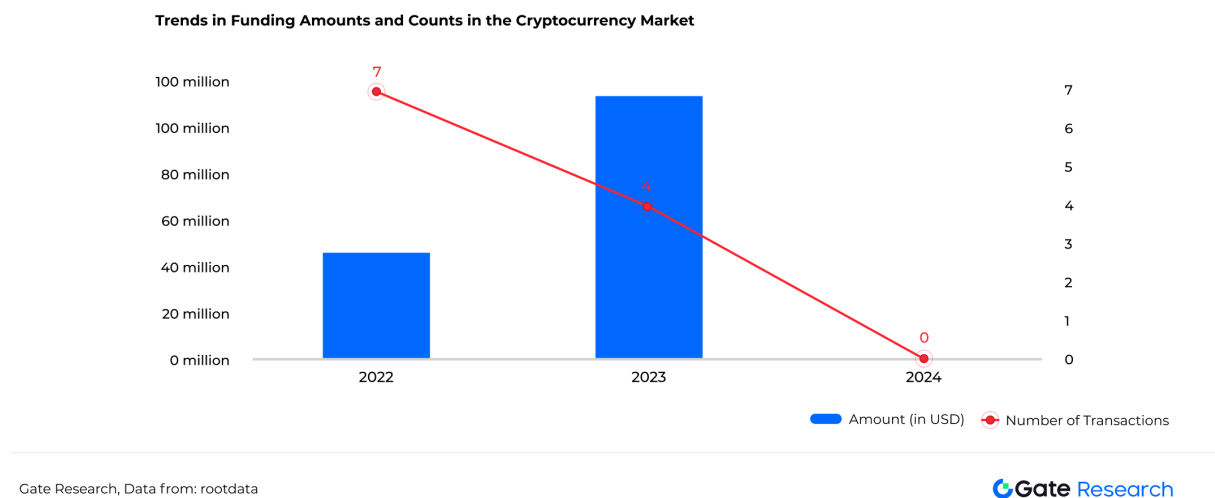
4.4.1 Integration of Hardware and Software

Hardware wallets are renowned for their high security due to the offline storage of private keys, and the trend towards integrating hardware with software is gaining momentum in wallet technology. Hardware wallets like Ledger provide security through offline signing and work alongside hot wallets like MetaMask to facilitate on-chain interactions. Furthermore, more hot wallet providers are launching their own hardware wallets to strengthen their ecosystems.

According to Mordor Intelligence, the hardware wallet market is projected to grow from \$470 million in 2024 to \$1.89 billion by 2029, reflecting a compound annual growth rate of 31.94%²⁸. This trend indicates that the increasing demand for asset security will drive the development of integrated hardware and software solutions.

Figure 18: Since 2022, 11 Hardware Wallets Have Raised \$165 Million, Accounting for 6.11% of the Total Financing in the Wallet Sector²⁹

Crypto Market Funding Amounts and Trends



4.4.2 Digital Identity

While digital identity is not yet a universal requirement for users globally, wallets are gradually evolving from mere asset management tools into carriers of digital identity in the Web3 space. Technologies such as WalletConnect, ENS, and Lens Protocol are enabling decentralized identity verification, transforming wallets into on-chain "business cards" and gateways to services. In the future, wallets will play a crucial role in areas like verifiable credentials (VC), privacy protection (ZKP), and cross-chain identity integration. For example, social wallets like Friend.tech are starting to combine asset management with interactive features, reshaping how users engage with the ecosystem.

4.4.3 Card Financial Services

Wallet providers need to explore new business models that create value for users and generate profits for themselves, thereby enhancing the industry's sustainability. Physical and virtual cards are essential tools for bridging fiat currencies and cryptocurrencies. For instance, Bitget and Okex Wallet have introduced crypto payment card services, allowing users to make online and offline payments directly with their crypto assets.

According to Statista, crypto payments accounted for over \$17.5 billion³⁰ in global e-commerce transaction volumes in 2023, highlighting the significant market potential in this area. More wal-

let providers are partnering with banks to issue debit cards based on the advancements in Layer 2 technology, aiming to provide more efficient and cost-effective payment solutions. This innovation not only meets users’ needs for convenient payments but also opens new avenues for profit growth for wallet providers.

Figure 19: Transaction Amount and Market Share of Payment Methods in Global E-commerce Total Transaction Volume in 2023

Transaction Volume and Market Share of Payment Methods in Global E-commerce Total Transaction Volume in 2023

Payment method used in e-commerce transactions worldwide	Estimated transaction value in U.S.dollars (2023)	Estimated share of transaction value in e-commerce (2023)	Estimated transaction value in U.S. dollars (2027)	Estimated share of transaction value in e-commerce (2027)	%CAGR (2023-2027)
Post-pay	\$11.00b	0.3%	n/a	n/a	n/a
Cryptocurrency	\$17.50b	0.2%	n/a	n/a	n/a
Pre-pay	\$20.00b	0.3%	n/a	n/a	n/a
Prepaid cards	\$64.00b	1%	\$73.00b	0.8%	3.3%

Gate Research, Data from: statista



Figure 20: Time of Card Issuance by Various Wallets

Card Issuance Timeline of Various Wallets

Wallet Name	Time	Description
Coinbase	2015	Bitcoin-Based Cryptocurrency Payment Card
Binance	2021	The Binance Card is a VISA debit card linked to a Binance account.
Gnosis Safe	2023	Gnosis Safe has introduced Gnosis Pay, a specialized network for cryptocurrency payments that also supports the issuance of Visa cards.
imToken	2023	The imToken Card is a co-branded credit card issued by DCS Card Centre Pte. Ltd.
Tokenpocket	2024	The TP Card (Visa) is a debit card created in partnership between TokenPocket and a Swiss compliant bank, operating on the Arbitrum network.
Bitget wallet	2024	Exclusively supporting Tether (USDT).

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5 Summary

As a vital entry point into the blockchain ecosystem, wallets serve the essential function of connecting users with blockchain technology. However, many issues persist in the current market, including fragmented asset management, complex cross-chain interactions, and high transaction costs. These challenges hinder improvements in user experience and limit further development in the sector. Future growth should be guided by user needs, leveraging technological innovations to drive change.

From our analysis, "Account Abstraction," "Gas Abstraction," and "Chain Abstraction" stand out as key technological directions for addressing user pain points. Account abstraction enhances security and flexibility by moving away from the traditional Externally Owned Account (EOA) model through smart contracts, enabling multi-signatures, hierarchical permissions, and automated operations for efficient asset management. Gas abstraction significantly reduces users' reliance on native tokens, making gas payments in multi-chain interactions more straightforward. Chain abstraction completely simplifies the complexities of underlying chains, allowing users to seamlessly integrate and manage assets across chains without worrying about which chain a transaction occurs on.

Additionally, features such as digital identity, payment cards, and hardware wallets further enrich the wallet ecosystem. Nevertheless, the core future direction for wallet development still revolves around abstraction technologies. By lowering the barriers for users to enter Web3, wallets can reshape asset management and cross-chain interaction experiences, evolving from simple tools into comprehensive platforms.

6 Reference

- ¹ Coinmarketcap. (n.d.).
- ² Statista. (2024). Estimate of the number of downloads of the 21 largest apps that allow for cryptocurrency storage worldwide from January 2015 to May 2024.
- ³ [https://github.com/search?q=crypto%20wallet & type=repositories](https://github.com/search?q=crypto%20wallet&type=repositories)
- ⁴ Tesa Ho, George Zhang, Reid Yager, Quintus Kilbourn, Fred, Danning Sui, Elaine Hu, Daniel Marzec & Ivo Georgiev, Joe Huang, Nic Lin, Tina He, Nico Csgy, Eric Siu, Allan Sapank, Brian Friel, Andre Geest, Daniel. (n.d.). State of Wallets 2024. Flashbots.
- ⁵ <https://coinmarketcap.com/view/telegram-bot/>
- ⁶ <https://dune.com/whale-hunter/dex-trading-bot-wars>
- ⁷ <https://coinmarketcap.com/view/wallet/>
- ⁸ rootdata. (n.d.). 加密市场融资金额与数量趋势.
- ⁹ 巴比特. (2019). 区块链十年: 看见怎样的未来 (巴比特, Ed.). 中国友谊出版公司.
- ¹⁰ <https://coinpaper.org/2977/how-many-blockchains-are-there-unveiling-the-ecosystem-s-diversity>
- ¹¹ <https://coinpaper.org/2977/how-many-blockchains-are-there-unveiling-the-ecosystem-s-diversity>
- ¹² DAOSquare. (n.d.). DAOSquare 加密情报 # 66: 2022 年由私钥导致的损失金额高达 9.3 亿美元. Foresight News. Retrieved November 22, 2024.
- ¹³ Slowmist. (n.d.). 慢雾: 2024 Q3 MistTrack 被盗表单分析. binance.
- ¹⁴ Royal, J. (2024, October 10). Are Your Lost Bitcoins Gone Forever? Here's How You Might Be Able To Recover Them. Bankrate. Retrieved November 22, 2024.
- ¹⁵ Slowmist. (n.d.). 慢雾: 2024 Q3 MistTrack 被盗表单分析.
- ¹⁶ <https://coinmarketcap.com/view/stablecoin/>
- ¹⁷ Pollak, J. (2024, November 20). Onchain rewards for everyone: Earn 4.7% APY in USDC rewards on Coinbase Wallet. Coinbase. Retrieved November 23, 2024.
- ¹⁸ JOE. (2024, 06 11). 交易所大战: Web3 钱包的爱恨情仇. Chaincatcher.
- ¹⁹ 深潮 TechFlow. (2024, 06 22). 专访 Particle Network: 链抽象是链爆炸背景下的必然产物, 我们致力于解决 Web3 UX 的终极问题. Chaincatcher.
- ²⁰ OXNATALUE. (2023, 08 17). EIP-7377: 全面实现账户抽象 (AA) 的加速器?. Foresight News.
- ²¹ <https://www.rootdata.com/>
- ²² <https://zengo.com/>
- ²³ <https://www.rootdata.com/>
- ²⁴ Tech Flow. (2024, 08 13). Fuse Wallet 推出 Solana gas 抽象功能, 允许使用 fuseSOL 支付 Gas.
- ²⁵ Paymaster: Bringing Gas Abstraction To Solana. (n.d.). Fuse wallet. Retrieved November 23, 2024.
- ²⁶ <https://messari.io/report/understanding-particle-network>

²⁷ Cycle Network. (2024, 10 23). Virtualization: Unichain' s Ultimate Chain Abstraction Solution. Medium.

²⁸ Mordor Intelligence. (n.d.). 硬件钱包市场规模和份额分析 - 增长趋势和预测 (2024-2029). Mordor Intelligence.

²⁹ <https://www.rootdata.com/zh/dashboard>

³⁰ de Best, R. (2024, September 25). E-commerce payment methods market share 2027. Statista. Retrieved November 22, 2024.

Scope of the Report

Figure 21: Scope of the Research Report

Research Report Scope

Attributes	Details
Main Data Coverage Period	Coverage Period: 2022 to 2024
Partial Data Coverage Period	Historical Data: 2016 to 2019
Key Areas Covered	Technologies Covered: Types, applications, industries, forecasts, account abstraction, gas abstraction, chain abstraction, etc.
Wallet Coverage	Metamask, imToken, Okx wallet, Zerion, Rainbow, Rabby, Argent, Bitget wallet, Friendtech, ZenGo, Gnosis Safe, Fireblocks, Fuse wallet, Particle Network, Unichain
Scope of the Report	Included Information: Market forecasts, funding data, analysis of driving factors, constraints, opportunities and challenges, market dynamics, and growth strategies.

FAQs

What are the driving factors behind the development of the crypto wallet market?

There is a growing preference for digital currencies and increasing demands for transparency in payment systems, which are both significant drivers of the crypto wallet market.

What are the main segments of the crypto wallet market?

Crypto wallets are primarily categorized into cold wallets and hot wallets. Cold wallets, like Ledger, provide high security through offline storage, making them suitable for long-term storage. Hot wallets, like MetaMask, allow for convenient online operations and are ideal for everyday use. Additionally, centralized wallets (like Binance) manage private keys for users, offering simplicity but requiring trust in the platform, while decentralized wallets (like MetaMask) allow users to manage their own private keys, providing greater security but necessitating more technical knowledge. Hardware wallets (like Trezor) offer the highest security through dedicated devices, while software wallets (like Trust Wallet) are more user-friendly as applications. There are also trading wallets, ecosystem wallets, institutional wallets, and social wallets, catering to various needs.

What is EIP-4337?

EIP-4337 is one of the Ethereum Improvement Proposals (EIPs), titled "Account Abstraction via Entry Point Contract Specification." It aims to achieve account abstraction (AA) through smart contracts without altering the underlying Ethereum protocol, providing more flexible account management capabilities for the Ethereum ecosystem. This proposal marks a significant step toward account abstraction in Ethereum, enhancing user experience and the security of account management by introducing flexibility in account logic through smart contracts. For wallet developers, this proposal offers numerous technical possibilities and will guide decentralized wallets toward more convenient, secure, and intelligent advancements.

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