Web 3 Payment Acceptance Report 2025

Key Insights for Banks, Merchants, and PSPs

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Curiosity has always been the driving force behind innovation. Think about the first time you encountered a new technology – whether it was the internet, mobile payments, or even digital banking. At first, it seemed unfamiliar, perhaps even complex. Yet, over time, it became second nature, seamlessly integrating into your daily life. The same is happening today with Web 3 payments. While terms like stablecoins, DeFi, and tokenized assets may sound abstract now, they are poised to become as common as contactless payments or instant transfers. The key to staying ahead? A willingness to learn, adapt, and embrace change.

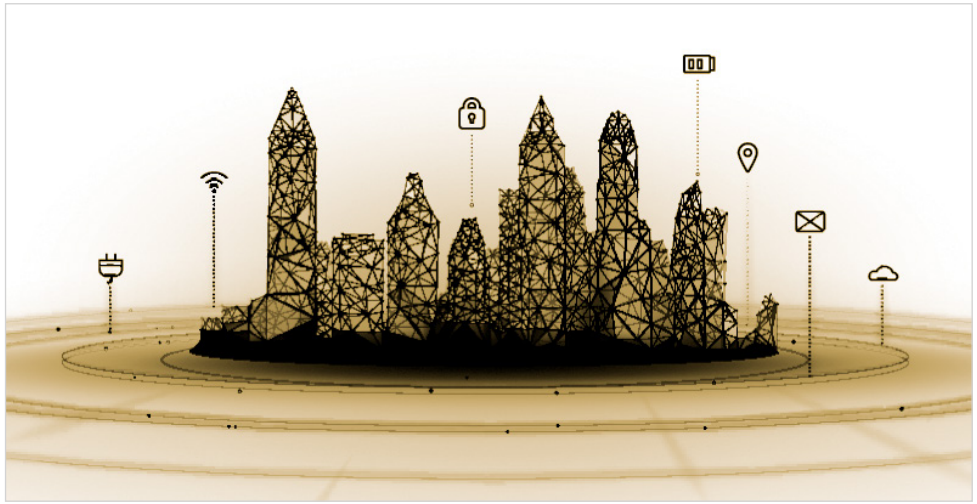
That is exactly why we created the ***Web 3 Payment Acceptance Report 2025 - Key Insights for Banks, Merchants, and PSPs***. In 2022, when we published our first edition, our goal was to provide a go-to payment resource of crypto terms and concepts for those interested in understanding the basics of crypto payments and their long-term impact; to share practical examples of cryptocurrency-enabled ecommerce and banking services; to present the latest developments in the regulatory landscape; and to reveal what are the most innovative companies in this space, that are building the next payment rails – the crypto rails. Now, in our second edition, we continue this mission, providing fresh insights into the latest trends, regulatory updates, and innovations shaping the future of Web 3 payments.

But we thought that this isn't enough, that these concepts don't exist in a vacuum, hence the second edition, designed to bridge the gap between traditional financial players and the rapidly evolving Web 3 landscape. It offers a bidirectional perspective – explaining Web 3 payments to banks, merchants, and PSPs while also demystifying traditional payment processes for Web 3 innovators. Our goal is simple: to foster a shared understanding of how these ecosystems can coexist and complement each other to create a more efficient and inclusive financial landscape.

Why this report matters

The payments industry is at a pivotal moment. Web 3 technologies – stablecoins, tokenized assets, and decentralised finance – are no longer just experimental concepts. They are gaining traction, promising lower costs, faster transactions, and fewer intermediaries. However, adoption isn't just about technology – it's about education, collaboration, and trust. ➔

> *“ Web 3 technologies – stablecoins, tokenized assets, and decentralised finance – are no longer just experimental concepts.*



Much like the telecom industry's transition from analog to digital (remember VoIP in the early 2000s?), payments are undergoing a transformation that may not be immediately visible to end users but will significantly impact costs, efficiency, and accessibility. Over time, regulated stablecoins and digital assets will likely integrate into mainstream financial services, bringing greater transparency and reducing risks associated with human error and inefficiencies.

Challenges remain. Many traditional financial institutions are still cautious about Web 3 due to regulatory uncertainty, security concerns, slow adoption by other players, and lingering perceptions of digital assets as volatile or risky. Additionally, a lack of knowledge on these topics – often seen as too technical – creates further hesitation. On the other hand, Web 3 innovators often view traditional payments as slow, outdated, and overly complex. The reality lies somewhere in between – there is immense value in merging the strengths of both worlds.

“ Our goal is simple: to foster a shared understanding of how these ecosystems can coexist and complement each other to create a more efficient and inclusive financial landscape.

What you'll find inside

This report is structured to provide clarity, practical insights, and expert perspectives on Web 3 payment acceptance. Here's what you can expect:

Web 3 payments 101: understanding traditional systems

Before diving into Web 3, it's crucial to understand the foundations of traditional payments. This chapter offers a primer on payment ecosystems, covering key processes like authorisation, clearance, and settlement.

Bridging the gap: Web 3 for traditional payment players

What exactly is DeFi? How do CeFi, CeDeFi, and TradFi fit into the financial ecosystem? This section deciphers these concepts, helping traditional players navigate the evolving digital asset landscape. →

Web 3 payments in action: adoption and use cases
Real-world applications of Web 3 payments, from stablecoin-powered merchant transactions to best practices for integrating crypto payments into business models.

The Web 3 payments ecosystem: key players and innovators
A closer look at the major players shaping the digital asset industry, from payment service providers to blockchain pioneers.

Regulation and the future of Web 3 payments
Navigating regulatory landscapes is one of the biggest hurdles for Web 3 adoption. This chapter explores current challenges and future trends, with expert insights on compliance, AI-driven risk management, and evolving legislation.

> *While terms like stablecoins, DeFi, and tokenized assets may sound abstract now, they are poised to become as common as contactless payments or instant transfers.*

The road ahead

The evolution of payments won't happen overnight. History has shown that we often overestimate the short-term impact of emerging trends while underestimating their long-term influence. Just as personal computing, the internet, and mobile technology revolutionised industries over decades, Web 3 payments will gradually reshape finance as we know it.

Whether you're a bank exploring stablecoin settlements, a merchant considering crypto payment options or a fintech innovator looking to integrate with traditional rails, this report provides the knowledge you need to navigate the changing landscape.

We invite you to download the full report, explore the insights within, and stay connected with **The Paypers** for ongoing coverage of Web 3 payments, fintech trends, and regulatory updates. The conversation around Web 3 payments is just beginning – let's shape the future of payments together.

Enjoy your read!

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Web 3 Payments 101: Understanding Traditional Systems

From Legacy Systems to Decentralised Frontiers: Redefining Payment Ecosystems for the Modern Era

Neira Jones

Advisor, Keynote Speaker, and Author

With 25+ years in financial services and tech, Neira Jones is a renowned expert in payments, fintech, and cybersecurity. A board advisor and speaker, she guides firms on innovation and compliance. An Amazon best-selling author, she's recognised in top influencer rankings and serves on the UK Payment Systems Regulator panel. Fellow of the British Computer Society.

Traditional payment ecosystems: a primer for fintech enthusiasts

To understand blockchain's disruptive potential, we must first examine the centralised payment rails it seeks to reinvent. Traditional systems like card networks and bank transfers rely on trusted intermediaries to orchestrate complex processes, a stark contrast to decentralised models. Let's dissect how these well-established systems operate.

The four-party model: a centralised choreography

Centralised payment ecosystems pivot on three core mechanisms: authorisation, clearing, and settlement. While bank and card transactions share this foundation, card systems amplify complexity through their four-party framework where cardholders, merchants, issuers (cardholder PSPs), and acquirers (merchant PSPs) interact under the orchestration of central entities (schemes) like Visa and Mastercard. These intermediaries synchronise transactions through a tightly choreographed sequence, blending institutional oversight with operational precision to ensure trust and finality at each step.

Step 1: authorisation

The authorisation process begins when a cardholder initiates a transaction, triggering a meticulously orchestrated dialogue: the merchant's acquirer dispatches a request through the card scheme (e.g., Visa, Mastercard) to the issuer, scrutinising the card's validity and probing for red flags like atypical spending patterns. →

The issuer then cross-examines the request against the cardholder's balance, credit limits, and risk thresholds, rendering a verdict (approval or decline) echoing the same digital pathway. If approved, the issuer temporarily reserves the transaction amount, a financial placeholder ensuring liquidity without immediate fund transfer, blending real-time vigilance with procedural precision.

Step 2: clearing – the reconciliation dance

Post-authorisation, transactions enter the clearing phase. Here, the card scheme aggregates batched transactions from acquirers and issuers, reconciling discrepancies and calculating net positions. This process ensures all parties agree on the amounts owed, but no actual money moves yet.

> *Decentralised rails aren't displacing legacy systems but creating interoperable networks where TradFi liquidity meets DeFi innovation.*

Step 3: settlement – moving the money

Settlement finalises transactions on card networks through two phases: interbank settlement, where funds transfer between issuers and acquirers via a commercial bank (the settlement agent) to balance institutional ledgers, followed by merchant settlement, where the acquirer deposits the net amount (less fees) into the merchant's account according to their contractual terms.

Unlike card systems, bank payment settlements bypass the acquirer-issuer model, consolidating these steps into a single transfer.

The cost of centralisation

This system relies on **centralised trust**: card schemes, banks, and settlement agents act as arbiters of truth. While effective, this introduces friction:

- **Latency**: multi-day settlement delays tie up capital.
- **Fees**: each intermediary takes a cut (e.g., interchange, scheme, acquirer fees).
- **Opacity**: participants depend on closed-loop reporting with limited transparency.
- **Single points of failure**: outages at central entities (e.g., Visa's 2021 European downtime) disrupt entire networks.

These inefficiencies created fertile ground for blockchain's emergence, a system aiming to replace centralised trust with cryptographic verification and distributed consensus.

Transacting in a decentralised world: modern pathways for value exchange

The evolution from physical cash to blockchain-powered ecosystems has redefined transactional frameworks, blending traditional finance with decentralised innovations. Unlike centralised systems that rely on institutional intermediaries, blockchain transactions operate through cryptographic proofs and distributed consensus, creating a paradigm where code governs value transfer. ➔

For payment professionals navigating this hybrid landscape, understanding custodial models, smart contract risks, and regulatory nuances is critical. Below, we explore the infrastructure enabling this paradigm shift.

Authorisation, clearing, and settlement: the decentralised version

In **Understanding Payments**, I detailed the foundational trio of payment processing in traditional finance: authorisation, clearing, and settlement. Yet these pillars persist in blockchain ecosystems, albeit reimagined through a decentralised lens. Here, transactions undergo validation, where nodes scrutinise integrity (preventing double-spending or fraud), followed by consensus, the algorithmic choreography that orders validated transactions into the blockchain's immutable ledger. Validation mirrors the checks of authorisation and clearing, while consensus, achieved via mining (Proof of Work) or staking (Proof of Stake), seals transactions into unalterable blocks, akin to settlement's finality. This dance of code and cryptography, explored in depth in **Beyond Payments**, underpins blockchain's promise: trustless efficiency.

Now, as we pivot to digital wallets, those popular facilitators of modern payment transactions, let's revisit their evolution, where centralised convenience converges with decentralised sovereignty to redefine value exchange.

Traditional wallets: centralised convenience

Four primary models dominate fiat transactions:

Closed loop systems

Ecosystem-specific platforms like Starbucks Rewards lock users into branded networks while monetising breakage, unspent balances totalling USD 210 million for Starbucks in 2023. These platforms foster loyalty but limit merchant reach beyond their walls.

Pass-through architectures

Tokenized card wrappers (Apple Pay, Google Wallet) prioritise security via dynamic tokenization. While reliant on Visa/Mastercard rails, they monetise data partnerships rather than transaction fees.

Stored value powerhouses

Alipay and WeChat Pay exemplify Asia's USD 5.5 trillion e-money market, offering cross-currency flexibility. Providers profit from float interest and ancillary services like microloans.

Hybrid models

PayPal and Cash App blend stored value with card-linked functionalities, though fragmented fee structures complicate merchant forecasting. →

The blurring of lines: bridging crypto and fiat

Traditional payment platforms like PayPal, Revolut, and Square are increasingly integrating crypto trading into their services, offering users a familiar gateway to digital assets. These platforms leverage existing infrastructure to enable seamless buying, selling, and holding of major cryptocurrencies like Bitcoin and Ethereum, often alongside stablecoins and fiat conversions. By centralising custody, they simplify entry for newcomers, blending crypto into conventional financial dashboards with user-friendly interfaces. However, convenience comes with trade-offs: limited asset diversity (prioritising regulatory compliance over niche tokens), reliance on platform security (exposing users to breaches like PayPal's 2022 credential leaks), and heightened regulatory vulnerability (e.g., Revolut halting US crypto services in 2023 post-SEC scrutiny).
While these services demystify crypto for mainstream audiences, they exemplify the tension between accessibility and decentralisation, a cautionary tale of TradFi's cautious embrace of blockchain's disruptive potential.
And then we have the crypto wallet, which is an altogether different beast.

Crypto wallets: self-sovereign frontiers

Unlike traditional counterparts, crypto wallets manage private keys rather than assets (i.e. they don't store your crypto, just the proof that you own it). Every transaction begins with a **crypto wallet**, a digital interface managing public-private key pairs. Public keys act as pseudonymous addresses (like bank account numbers), while private keys cryptographically sign transactions to prove ownership. There will be distinctions between crypto wallets depending on who has custody of the keys, and whether they are online or offline.

Custodial wallets

Custodial wallets act as digital vaults managed by third-party providers. Think of them as crypto banks: platforms like Coinbase or Binance store users' private keys on their behalf, handling security, backups, and transaction execution. This model prioritises convenience – users recover accounts via email if they lose passwords – but introduces centralised risk. For instance, when FTX collapsed in 2022, users lost USD 8 billion in commingled funds, illustrating the perils of trusting third parties with custody.

> *Centralised payment ecosystems pivot on three core mechanisms: authorisation, clearing, and settlement.*

Non-custodial wallets

Non-custodial wallets, like MetaMask or Trust Wallet, flip this dynamic. Users retain full control of private keys, embodying the crypto mantra 'Not your keys, not your crypto'. This self-sovereignty eliminates reliance on intermediaries but demands technical vigilance: losing credentials means irreversible asset loss. While non-custodial wallets enable direct DeFi interactions, they require users to manage phishing risks and smart contract vulnerabilities independently. →

Neira Jones

Users are also faced with achieving a balance between accessibility and security when considering online and offline capabilities.

Hot wallets

Hot wallets (e.g., Trust Wallet, MetaMask) are always connected to the internet, enabling seamless trading and DeFi participation. However, their online nature makes them prime targets. The 2023 Atomic Wallet hack, which drained USD 100 million from 5,500 users, underscores the risks of frequent hot wallet use.

> *Blockchain transactions operate through cryptographic proofs and distributed consensus, creating a paradigm where code governs value transfer.*

Cold wallets

Cold wallets (e.g., Ledger, Trezor) store keys offline on hardware devices, creating an 'air-gapped' barrier against remote attacks. While this method safeguards long-term holdings, like a digital safety deposit box, it isn't foolproof. Ledger's 2020 data breach exposed 270,000 emails, proving even cold storage faces supply-chain risks.

Context-driven choices

Custodial wallets, managed by regulated entities like Coinbase, offer beginners streamlined access with features like automated compliance checks and fraud detection, but charge fees (0.1-2% per transaction) and expose users to exchange risks. Non-custodial wallets (e.g., MetaMask) eliminate intermediary fees but require users to absorb network costs (e.g., Ethereum gas fees) and shoulder full security duties. In addition, it is generally recommended to use hot wallets for small, frequent transactions (e.g., <5% of holdings) and cold storage for bulk assets. Regulatory frameworks further shape user trade-offs: the EU's MiCA mandates custodial platforms to enforce stringent AML/KYC checks, linking all transactions to verified identities and insuring holdings up to EUR 150,000, enhancing fraud protection but eroding financial privacy. Meanwhile, Japan's licencing regime requires providers to maintain strict capital reserves and store 95% of user funds in cold storage, prioritising platform stability but limiting accessible cryptocurrencies and imposing withdrawal delays. These rules force users to balance convenience against privacy loss (EU) or innovation against institutional-grade security (Japan), reshaping how individuals and businesses interact with digital assets. →

Trading venues: from CEX to atomic swaps

Centralised exchanges (CEX): the convenient gatekeepers

Centralised exchanges act as crypto 'stock markets', where third parties like Binance or Coinbase manage transactions and hold user funds. These platforms dominate trading volume (68% of 2024's USD 14 trillion crypto trades) by offering high liquidity, user-friendly interfaces, and tools like futures contracts. However, centralisation creates systemic risks: the 2014 Mt. Gox collapse (850,000 BTC stolen), the 2022 FTX implosion (USD 8 billion customer shortfall), and the February 2025 Bybit record-breaking USD 1.4b billion hack highlight vulnerabilities in custodial models. While ideal for beginners, users trade control for convenience, a gamble where trust in the platform is paramount.

Decentralised exchanges (DEX): cutting out the middleman

Decentralised exchanges like Uniswap let users trade peer-to-peer via smart contracts, eliminating intermediaries. These platforms rely on automated market makers (AMMs), where liquidity providers pool funds to enable trades. While empowering self-custody, DEXs face challenges: liquidity fragmentation, impermanent loss (value erosion for providers), and smart contract exploits like KyberSwap's 2023 USD 56 million hack. Despite risks, DEXs drive DeFi innovation, offering censorship resistance and direct blockchain integration.

Hybrid exchanges

Hybrid crypto exchanges blend the liquidity and user-friendly interfaces of CEX with the security and self-custody of DEX, offering traders a versatile middle ground. By decentralising order matching (via Automated Market Makers or order books) while centralising functions like deposits and withdrawals, they aim to marry convenience with control. Users can choose between holding funds on the exchange for ease or retaining private keys for autonomy, trading cryptocurrencies and stablecoins across both centralised and decentralised protocols. Though promising, hybrids face hurdles: balancing regulatory compliance with decentralised governance, mitigating inherited risks like smart contract vulnerabilities, and bridging liquidity gaps between systems. While platforms like Raydium and Kyber Network showcase innovation, challenges around complexity and partial centralisation remind us that in the quest for equilibrium, trade-offs remain inevitable.

Atomic swaps and P2P trading: trustless but tricky

Atomic swaps enable cross-chain crypto trades without intermediaries, while P2P platforms like Bisq facilitate direct user transactions. Atomic swaps use 'all-or-nothing' smart contracts to eliminate counterparty risk, ideal for privacy-focused traders (e.g., Komodo AtomicDEX). However, adoption remains below 0.5% due to technical complexity and limited coin compatibility. P2P trading thrives in regions with banking restrictions, like Nigeria during its 2023 naira crisis, where citizens →

used Bisq to trade BTC for stablecoins, but demands vigilance against scams, such as fake escrow services stealing 2,300 ETH on LocalBitcoins in 2022. Both models exemplify crypto's decentralised ethos but face uphill battles for mainstream traction.

Bridging trust and innovation: the next chapter in decentralised finance

The crypto trading landscape is a high-stakes dance between centralised efficiency and decentralised innovation. Centralised exchanges (CEXs), like Binance, remain the industry's backbone and dominate liquidity but carry legacy risks, demanding rigorous due diligence. DEXs and atomic swaps offer alternatives for tech-savvy users but demand deeper blockchain literacy. Decentralised exchanges (DEXs), like Uniswap, empower self-custody but expose users to smart contract exploits and impermanent loss. Meanwhile, atomic swaps and P2P platforms offer censorship-resistant trading at the cost of technical complexity and scam risks. For professionals, the future lies not in choosing sides but in hybrid strategies: leveraging CEX liquidity, auditing DEX protocols, and piloting cross-chain tools while advocating for resilient, user-centric frameworks. As Visa and JP Morgan blur TradFi-DeFi lines, adaptability, not ideology, will define success in this volatile frontier where innovation and risk walk hand in hand.

Specialised asset marketplaces

NFT marketplaces

NFT marketplaces revolutionise how digital art and collectibles are traded, enabling creators and collectors to buy, sell, and auction unique tokens representing ownership of digital assets. Platforms like OpenSea and Blur allow users to connect crypto wallets directly, maintaining custody of their NFTs while leveraging blockchain transparency for provenance tracking. These marketplaces empower artists to monetise work and collectors to discover rare items, but face volatility, risking financial losses. Intellectual property disputes and evolving regulations add complexity, as lawmakers grapple with copyright enforcement and fraud prevention. Security remains a concern, with scams targeting wallets and personal data. Blur overtook OpenSea in 2024 with USD 4.3 billion gaming NFT sales, yet 23% faced IP disputes. Bored Ape floor prices swung 380% amid speculative volatility, while Sotheby's metaverse auctions legitimised digital art provenance tracking. Despite these challenges, NFT platforms continue to drive innovation in digital ownership, blending creativity with decentralised technology, while navigating a landscape where regulatory clarity and market stability remain works in progress. →

Neira Jones

Metaverse economies

Gaming and metaverse marketplaces revolutionise virtual economies by enabling users to trade in-game assets, NFTs, and virtual real estate through blockchain-powered platforms like Decentraland and The Sandbox. These decentralised hubs empower gamers and creators to buy, sell, and showcase digital goods, from rare skins to virtual land, using non-custodial wallets, ensuring true ownership via transparent blockchain records. While fostering immersive communities and monetisation opportunities for developers, they must navigate risks like speculative price swings, copyright disputes, and evolving regulations. Decentraland's virtual real estate market hit USD 700 million despite Axie Infinity's 2022 token crash, and interoperable assets across The Sandbox signal maturing ecosystems, though sustainability concerns linger around play-to-earn models. As jurisdictions grapple with applying gambling laws and tax frameworks to virtual economies, users must balance innovation with vigilance against scams, underscoring the blend of promise and peril in this new frontier of digital interaction.

Other specialised marketplaces

Over-the-Counter (OTC) trading desks like Cumberland and Galaxy Digital cater to institutional investors and crypto 'whales', enabling discreet, large-volume trades to avoid market disruption, a stark contrast to public exchanges. These platforms negotiate bespoke deals under rigorous AML/KYC frameworks, balancing privacy with regulatory compliance, though counterparty risks linger. Meanwhile, Security Token Exchanges (STOs), such as tZERO and Securitize, tokenize real-world assets (e.g., real estate, stocks, bonds) into blockchain-based securities, blending fractional ownership with blockchain transparency. While these markets promise enhanced liquidity and global access, challenges like valuation complexity, custodial risks, and evolving regulations temper their growth. The collapse of FTX, once a titan in derivatives and tokenized stocks, underscores the fragility of opaque practices: its 2022 implosion (fuelled by commingled funds, Alameda Research's risky leverage, and regulatory gaps) erased billions, triggering global scrutiny and a USD 12.7 billion restitution order. The IMF's subsequent warnings highlight crypto's systemic risks, urging tighter oversight to curb volatility and protect investors. Yet, from OTC's shadowy liquidity pools to tokenized Wall Street, these niches persist as double-edged innovations, bridging traditional finance's rigor with crypto's disruptive potential, if tempered by accountability. The lesson? Even in decentralised realms, trust hinges on transparency, and progress demands learning from scars like FTX. ➔

Neira Jones

Regulatory tightropes

The regulatory landscape for crypto trading demands agility, as centralised exchanges and decentralised platforms navigate divergent pressures. CEXs like Binance and Coinbase face stringent AML/KYC mandates, licencing hurdles, and consumer protections. Decentralised platforms, while resisting traditional oversight through pseudonymous, non-custodial models, increasingly contend with regulatory scrutiny. Professionals must prioritise platforms with robust compliance frameworks (e.g., proof-of-reserves audits, segregated customer funds, transparent governance) while leveraging decentralised services for niche assets with full awareness of their regulatory ambiguity. Jurisdictional shifts, like the EU's Markets in Crypto-Assets Regulation (MiCA), aim to standardise rules but risk burdening smaller players with compliance costs. The collapse of FTX, rooted in unregulated commingling of funds and lax oversight, underscores the perils of unchecked innovation, yet overregulation risks stifling progress or driving activity to less supervised markets. Success lies in balancing pragmatism with principle: treating compliance as a competitive advantage, advocating for clear frameworks that foster accountability without hampering decentralisation's potential, and selecting platforms that transparently bridge innovation with real-world governance.

A balanced horizon

Decentralised rails aren't displacing legacy systems but creating interoperable networks where TradFi liquidity meets DeFi innovation. Payment professionals must master cross-chain bridges, custody models, and regulatory sandboxes to navigate this blended future. As Thanos might say, convergence is inevitable and those harmonising security, compliance, and UX will lead the next transactional era. But unlike fiction, this future demands pragmatic adaptation over ideological purity.

> *"Convergence is inevitable and those harmonising security, compliance, and UX will lead the next transactional era.*

Bridging the Gap: Web 3 for Traditional Payment Players

From Banks to Blockchain: Decoding TradFi, CeFi, CeDeFi, and DeFi

Neira Jones

Advisor, Keynote Speaker, and Author

With 25+ years in financial services and tech, Neira Jones is a renowned expert in payments, fintech, and cybersecurity. A board advisor and speaker, she guides firms on innovation and compliance. An Amazon best-selling author, she's recognised in top influencer rankings and serves on the UK Payment Systems Regulator panel. Fellow of the British Computer Society.

Let's dive into the wild world of financial models, starting with the good old TradFi and working our way to what would some term as cutting edge!

TradFi: the Grandfather of finance

TradFi, or Traditional Finance, is like that reliable old car in your garage. It's been around forever, and you know exactly what you're getting:

- Centralised control (because someone has to be the boss);
- Regulated up to its eyeballs;
- Familiar services like loans, savings accounts, and investments;
- Slow to change (why fix what ain't broke, right?).

I won't elaborate on the characteristics of TradFi as you use it every day, and this is also covered extensively in my first book **Understanding Payments**. But just like that old car, TradFi can be a bit... well, traditional. It may not always be the most efficient or innovative, but just like a nice cuppa – comforting, familiar, and a bit old-fashioned – it still gets the job done.

As blockchain technology became more interesting for specific use cases, the traditional financial services industry saw new ways of using blockchain characteristics and properties. This is how the term 'CeFi' was coined. →

Neira Jones

CeFi: blockchain's first date with finance

CeFi (Centralised Finance) is like TradFi's cooler cousin who discovered blockchain and decided to give it a whirl.

CeFi is enabled by financial services applications where participants are financial services institutions who want to leverage the potential of blockchain technology to offer familiar financial services within a centralised framework.

It's got some new characteristics:

- Centralised control (old habits die hard);
- Beefed-up security thanks to tamper-proof records (immutability);
- Improved transparency via shared ledgers;
- Streamlined processes through automation;
- Still plays nice with regulators (as exemplified by centralised crypto exchanges).

But here's the catch: CeFi's transaction speed can be a bit sluggish, which can hinder its ability to match the speed required for applications requiring high transaction volumes and fast transaction speeds such as consumer payments. It's like trying to teach your grandpa to use a smartphone – there's potential, but it takes time.

DeFi: finance goes rogue

DeFi is the rebellious teenager of the financial world, building an alternative ecosystem on blockchain. It's all about peer-to-peer transactions without those meddling intermediaries.

DeFi is a generic term for decentralised financial services with an open infrastructure operating on a permissionless basis using a blockchain settlement layer where users control their assets. Services may include investments, insurance, asset management, payments, lending, and trading.

> *"DeFi is the rebellious teenager of the financial world, building an alternative ecosystem on blockchain.*

Key features include:

- Decentralised control (power to the people!);
- Cryptography-powered security;
- Transparency through public ledgers;
- Smart contracts doing the heavy lifting;
- Limited compliance (regulators, eat your heart out).

But beware, this wild west of finance comes with its own set of challenges, like smart contract vulnerabilities and a lack of regulatory oversight. →

Spotting DeFi in the wild

To identify a true DeFi service, ask yourself these questions:

1. Does it involve asset transfers?

2. Is it trustless?

3. Do users control their assets?

4. Does it operate on an open infrastructure?

If you're nodding yes to all of these, congratulations! You've got yourself some bona fide DeFi.

DeFi: not just another pretty face

DeFi isn't just about looking cool; it offers some interesting opportunities:

- **Yield farming**: imagine your crypto working overtime to earn you more crypto. That's yield farming in a nutshell. Users stake their assets in DeFi protocols to generate returns, often in the form of native tokens. It's like planting crypto seeds and watching them grow into a bountiful harvest of digital coins. But remember, high rewards come with high risks. Impermanent loss and smart contract vulnerabilities are lurking in the shadows, ready to rain on your yield farming parade.
- **Flash loans**: picture borrowing a massive amount of crypto without collateral, executing a complex financial manoeuvre, and returning it all in a single transaction. That's the magic of flash loans. They're powerful tools for arbitrage but can be as volatile as a cat in a room full of rocking chairs if not handled properly.

GameFi: when gaming meets DeFi

GameFi is where the worlds of gaming and DeFi collide, creating a new universe where players can earn crypto while having fun. It's like turning your gaming addiction into a potential side hustle!

- **Play-to-Earn (P2E)**: P2E games are the bread and butter of GameFi. Players earn coins or tokens for their in-game efforts, which can be used within the game or traded for real-world value. It's like getting paid to slay dragons or build virtual empires!
- **Beyond P2E**: GameFi isn't just about earning while playing. It often incorporates other DeFi elements:
  - NFT-based in-game assets (because who doesn't want to own a one-of-a-kind digital sword?);
  - Decentralised marketplaces for trading these assets;
  - Yield farming opportunities within games (your virtual farm can now grow real profits).

CeDeFi: the best of both worlds?

CeDeFi is the lovechild of CeFi and DeFi, offering DeFi functionalities within a centralised framework. It's like having your cake and eating it too, but maybe with a slightly smaller fork. →

CeDeFi bridges the gap between CeFi and DeFi. Built by financial institutions, CeDeFi applications may leverage a blend of blockchain applications and centralised systems. They offer functionalities typically associated with DeFi within a centralised framework, allowing for a familiar and more accessible user experience by combining DeFi functionalities with a familiar CeFi user experience.

Key characteristics include:

- **Centralised control**: institutions manage core functions, enhancing trust and efficiency.
- **Enhanced security**: blockchain immutability and institutional oversight improve security.
- **Transparency**: shared ledgers increase transparency, though limited by centralisation.
- **Streamlined processes**: blockchain automation speeds up tasks and transactions.
- **Regulatory compliance**: operates within regulations, ensuring user protection.

CeDeFi applications leverage the security and transparency benefits of blockchain technology, but their performance is often limited by the blockchain's integration with traditional centralised infrastructure. Whilst CeDeFi offers a blend of benefits from both CeFi and DeFi, it's important to note that it may not offer the same level of decentralisation, transparency, or user control over assets as pure DeFi platforms.

What next?

This is a very high-level introduction to these models, but the following table gives you some examples in real life:

FEATURE	TradFi (traditional finance)	CeFi (centralised finance)	CeDeFi (centralised decentralised finance)	DeFi (decentralised finance)
CONTROL	**Centralised**	**Centralised** (Financial institutions with blockchain integration)	**Hybrid** (Centralised control for user management, potentially decentralised for specific functions)	**Decentralised** (No central authority, governed by code and community)
EXAMPLES	Banks, regulated payment institutions, investment firms, payment schemes.	Custodial crypto exchanges offering fiat deposits or withdrawals (CEX), security token offerings (STO) on a blockchain.	Platforms offering some DeFi features but with centralised control over user assets.	Self-custodial wallets, decentralised exchanges (DEXs), trading, yield farming, peer-to-peer lending /borrowing protocols.

Source: Neira Jones

A complete version of this comparative table can be found in my book **Beyond Payments**.

As these financial models continue to evolve, we can expect even more innovative ways for users to interact with digital economies. Whether you're a TradFi traditionalist, a CeFi explorer, a DeFi rebel, or a GameFi enthusiast, there's something for everyone in this brave new world of finance.

The Evolution of Digital Ledgers: from Siloes to Seamlessly Interconnected Ledgers

Anurag Arjun
Co-Founder
Avail

Anurag Arjun is Co-Founder of Avail, and previously Polygon, where he spent five years building Ethereum scaling solutions. An expert in distributed systems, cryptography, and fintech, he leads Avail's mission to unify blockchain infrastructure and enable seamless cross-chain interaction, validation, and liquidity interoperability.

Financial technology has come a long way from the days of isolated mainframe systems and proprietary ledgers. The world runs on ledgers – from banking systems to government records, from ecommerce platforms to supply chains, ledgers form the backbone of how we track and transfer value. Traditional banks use ledgers to manage accounts, central banks use them for inter-bank settlements, and payment processors like Visa maintain complex ledger systems for transactions. Beyond finance, ecommerce platforms maintain ledgers for commerce data, shipping companies for logistics, and governments for everything from land records to identity management.

Before the advent of blockchain technology, these digital ledgers were primarily maintained in databases controlled by central authorities – companies and governments that owned the ledgers and controlled write access based on predefined rules and logic. While APIs enabled communication between these systems, the fundamental challenges of trust, transparency, and interoperability remained.

The blockchain revolution: beyond central control

The breakthrough innovation of blockchain technology lies in its ability to maintain ledgers without central control. Through Byzantine Fault Tolerance (BFT), blockchains enable multiple validators – sometimes hundreds or thousands – to maintain and cross-verify the same ledger. This first generation of blockchain technology demonstrated that secure, transparent ledger systems could operate without centralised authority. →

The technology has evolved significantly beyond this initial approach. Modern solutions like zero-knowledge rollups enable single parties to maintain ledgers while providing mathematical proof of correct operation. These advances, though not widely known outside the blockchain industry, represent fundamental improvements in how we can structure and scale digital ledger systems.

> *The breakthrough innovation of blockchain technology lies in its ability to maintain ledgers without central control.*

The rise of modular architecture

The blockchain landscape has evolved through distinct generations. The first generation consisted of monolithic blockchains like Bitcoin, Ethereum, and Solana – each operating as an independent Layer 1 network with its own validator sets and crypto-economic security. The second generation introduced a more modular approach, with specialised 'rollup' chains (Layer 2s) building on base layers like Ethereum or Avail.

This architectural shift mirrors the evolution of cloud computing, where complex operations are broken into specialised components that can scale independently. Just as Amazon Web Services enables auto-scaling of specific services during peak events like Black Friday, modular blockchain architecture allows different aspects of the system – execution, settlement, and data availability – to scale as needed.

Instead of hundreds of independent Layer 1 networks, each requiring its own validator set and security infrastructure, the modular approach enables thousands or even millions of Layer 2 chains to 'roll up' to a secure base layer. This dramatically improves scalability while maintaining security.

The challenge of fragmentation

While the modular approach solves scaling challenges, it introduces new complexities around system coordination. Users must navigate multiple networks, understand bridging mechanisms, and manage assets across different systems. This fragmentation creates friction, not just for developers but for everyday users, becoming a fundamental barrier to mainstream adoption through convoluted user journeys.

Traditional solutions like APIs, while useful, are limited by one-to-one communication contracts and complex governance requirements. This has led to the proliferation of purpose-built systems that struggle to interact – for instance, the challenge of enabling mutual fund trading on stock trading platforms. →

Building the unification layer

The solution sounds simple – we need a **unified layer** to coordinate between different blockchain systems and ledgers. However, such a unification layer must maintain the independence and security guarantees created in the first place by this constellation of very different blockchains. Any solution must address three core requirements:

1. **Data availability**: as blockchain networks scale, ensuring that transaction data remains accessible and verifiable becomes increasingly critical. This requires advanced data sampling techniques and efficient proof systems that can handle growing volumes while maintaining decentralisation.
2. **Proof verification**: different blockchain systems use various approaches to verify transactions – from simple signatures to complex zero-knowledge proofs. A unified system must handle these different proof types while maintaining security guarantees.
3. **Coordination mechanisms**: perhaps the most challenging is enabling communication between different blockchain systems without compromising their sovereignty or security models. This requires careful cryptographic design and consensus mechanisms that can bridge different security assumptions.

Real-world applications

The transformation of traditional ledger systems through tokenization and seamless interconnectivity is revolutionising how businesses operate.
In finance and commerce, where isolated ledger systems have long created friction, the impact is particularly significant. Consider cross-border payments, traditionally managed through a complex network of separate ledger systems at multiple intermediary banks. JP Morgan's **pilot programmes** with the Monetary Authority of Singapore and Banque de France demonstrate how interconnected digital ledgers can transform this process, reducing settlement times from 3-5 days to near-instant completion while maintaining the security and auditability that businesses require.

> *"The transformation of traditional ledger systems through tokenization and seamless interconnectivity is revolutionising how businesses operate.*

The evolution of supply chain ledgers shows a similar transformation. **Walmart's implementation of interconnected ledger systems through Hyperledger Fabric** has fundamentally changed its ability to track products. Their legacy system, which required reconciliation across multiple isolated databases, took 7 days to trace mangoes from farm to store. Their new interconnected ledger system accomplishes this in 2.2 seconds. The system now seamlessly tracks over 25 products from 5 different suppliers, with plans to expand across their fresh produce supply chain. →

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Ecommerce platforms are discovering new efficiencies through tokenized assets and interconnected ledgers. Traditional ecommerce relies on isolated databases that can't easily share information or value. Through tokenization, online marketplaces can now operate seamlessly across platforms. A customer's digital wallet becomes a portable store of value and identity, enabling purchases across any connected marketplace while the underlying ledger systems handle data verification and settlement automatically.

> *A unification layer must maintain the independence and security guarantees created in the first place by this constellation of very different blockchains.*

Supply chain management demonstrates the power of tokenized assets in interconnected ledger systems. Instead of managing separate databases for each partner or region, companies can now track products through tokenized representations across interconnected networks. A manufacturer can issue digital tokens representing physical goods, enabling efficient trading and tracking while maintaining a single, verifiable record of ownership and provenance across all participating systems.

Healthcare providers are leveraging interconnected ledger systems to solve longstanding challenges in patient data management. The Estonian E-Health Foundation's implementation for 1.3 million residents shows how sensitive data can be shared securely across different healthcare providers while maintaining strict privacy controls. Rather than storing medical records directly, their system maintains an immutable audit trail across interconnected ledgers, ensuring data integrity and appropriate access control while meeting regulatory requirements.

Traditional banking operations are being transformed through tokenization and interconnected ledgers. Trade finance, which typically involves coordinating separate ledger systems across multiple banks, insurers, and shipping companies, becomes streamlined when these various parties can interact through interconnected ledger systems. This infrastructure resolves traditional friction points – from asset type discrepancies to conflicting banking hours – through automated coordination between different institutional ledgers.

The evolution extends to merchant services, where interconnected ledger systems enable new possibilities for payment processing and settlement. Merchants can now accept any tokenized form of value while receiving settlement in their preferred currency, with the underlying ledger systems handling conversions and settlement automatically. This builds upon traditional payment processing systems but adds the benefits of programmable assets and transparent, interconnected ledgers. →

By enabling seamless interaction between different ledger systems while maintaining security and privacy, this technology allows businesses to achieve new levels of operational efficiency without sacrificing the reliability they expect from traditional systems. The key lies not in creating new unified systems, but in enabling existing ledgers to interact seamlessly through tokenization and sophisticated interconnection protocols.

The power of tokenization

The true potential of unified blockchain infrastructure extends far beyond traditional financial applications. At its core, tokenization represents a fundamental shift in how we represent and transfer value in digital systems. Tokens aren't merely financial instruments; they serve as digital representations of any form of value, including data, identity, assets, and even user attention. This broad applicability makes tokenization a powerful tool for breaking down traditional silos between different systems and enabling new forms of value exchange.

Consider how ecommerce data currently exists in isolated databases. A customer's shopping history on Amazon, for instance, remains locked within Amazon's proprietary systems. Through tokenization, this shopping data could be transformed into a portable digital asset that the customer controls. Combined with tokenized identity credentials, such as a digitised driver's license, customers could securely present their shopping history to competing platforms to unlock personalised discounts or services, all while maintaining privacy through zero-knowledge proof technology.

The financial sector demonstrates another powerful application of tokenization. Traditional mutual funds, which often lack efficient trading infrastructure in many markets, could be tokenized to instantly leverage existing blockchain trading systems. This enables immediate trading capability without building purpose-specific infrastructure, dramatically reducing time to market and operational costs.
The same applies to various financial instruments, each becoming programmable and interoperable through tokenization.

> *"The goal is to make unified blockchain services as easy to use as traditional digital services while maintaining the benefits of decentralisation.*

Tokenization also transforms how we handle identity and personal data. Rather than storing multiple copies of identity information across different services, individuals could maintain tokenized identity credentials that can be selectively shared with service providers. This approach not only enhances privacy but also reduces the risk of identity theft and fraud. Users could prove their age for →

restricted services without revealing their entire birth date or verify their credit-worthiness without exposing detailed financial records.

Regulatory considerations and compliance

The intersection of unified blockchain infrastructure with existing regulatory frameworks presents both challenges and opportunities. Rather than viewing regulations as obstacles, forward-thinking jurisdictions are creating frameworks that enable innovation while maintaining necessary oversight. Successful implementations demonstrate how this can be achieved while maintaining compliance. The European Union's regulations around blockchain technology, particularly MiCA (Markets in Crypto-Assets), provide a framework for how unified systems can operate within regulatory bounds. For example, the European Blockchain Services Infrastructure (EBSI) shows how a unified blockchain network can facilitate cross-border services while adhering to GDPR and other EU regulations.

In the financial sector, Singapore's Project Guardian offers an instructive example of regulatory-compliant blockchain unification. The Monetary Authority of Singapore (MAS) has created a controlled environment where financial institutions can test blockchain-based asset tokenization and DeFi protocols while maintaining compliance with existing securities laws. This demonstrates how regulatory bodies can work proactively with blockchain technology rather than against it.

Japan's Financial Services Agency (FSA) has also taken significant steps in creating clear regulatory frameworks for blockchain-based financial services. Their approach to stablecoin regulation, implemented in 2023, shows how traditional banking regulations can be adapted for blockchain technology while maintaining security and stability.

The future of blockchain regulation is likely to move towards harmonised international standards, similar to existing financial regulations. Organisations implementing unified blockchain infrastructure today should build with this evolution in mind, creating systems that can adapt to changing regulatory requirements while maintaining their core efficiency and transparency benefits. The goal is to create an infrastructure that not only meets current regulatory requirements but is positioned to evolve alongside the regulatory landscape, ensuring long-term viability and compliance.

Looking ahead

As we move toward 2025, the market is increasingly rewarding the value of infrastructure-focused solutions that seamlessly interconnected ledger systems and tokenized assets. The future of blockchain infrastructure isn't about building walled gardens but creating services that communicate seamlessly behind the scenes – much like how microservices power modern web applications, plus the immense benefits unlocked by highly efficient, transparent, and permissionless infrastructure. →

Avail

Traditional financial institutions are increasingly moving beyond pilot programs to full implementation of blockchain-based systems. By 2025, we expect to see major banks operating interconnected ledger networks for cross-border payments and settlements. This transition will likely be accelerated by the development of Central Bank Digital Currencies (CBDCs) in addition to stablecoins and other tokenized assets under custody.

The focus is shifting from building individual blockchain networks to the need to have seamless connections between them. There has been a growing demand for cross-chain applications and the need for unified user experiences. The development of standardised protocols for cross-chain communication will be crucial for this evolution.

As interconnected blockchain systems handle more valuable transactions and sensitive data, security models are evolving to meet these challenges. The trend toward multi-asset staking and shared security, as demonstrated by **Avail's Fusion's partnership with Symbiotic**, indicates how security models will become more sophisticated and interconnected.

Looking forward, organisations should focus on building or adopting scalable infrastructure that can handle increasing transaction volumes while maintaining security. This includes implementing robust data availability solutions and developing efficient proof verification systems.

Focus should be placed on abstracting complex blockchain interactions behind easy-to-use interfaces. The goal is to make unified blockchain services as easy to use as traditional digital services while maintaining the benefits of decentralisation.

As we move toward 2025, the success of interconnected blockchain infrastructure will depend on how well these trends are understood and incorporated. Organisations that can balance innovation with compliance while maintaining focus on user experience will be best positioned to leverage these developing technologies.

This requires ongoing collaboration between technology providers, businesses, and regulators to ensure that interconnected blockchain infrastructure continues to meet the needs of all stakeholders while enabling new forms of value.

From Crypto-Remote to Crypto-Inside: How PSPs Are Adopting Stablecoins

Ran Goldi
SVP of Payments and Network
Fireblocks

Ran Goldi is the SVP of Payment and Network at Fireblocks, the leading digital asset infrastructure provider. Previously, he was CEO of First Digital, a stablecoin and CBDC payment firm acquired by Fireblocks. Fireblocks empowers over 2,000 organisations with secure, scalable blockchain solutions, securing USD 10+ trillion in transactions. Learn more at **fireblocks.com**.

What if you could go from 'we don't touch crypto' to 'we settle on-chain in production'—in just six months?

That's not a hypothetical. It's the actual journey we've gone through with more than 300 payment service providers, fintechs, and banks—helping them level up from early-stage exploration to full production. In our latest **State of Stablecoins** research, 90% of institutions say they're live, implementing, or planning stablecoin payment flows. That's not just growing interest—it's a complete reset of payment infrastructure already underway.

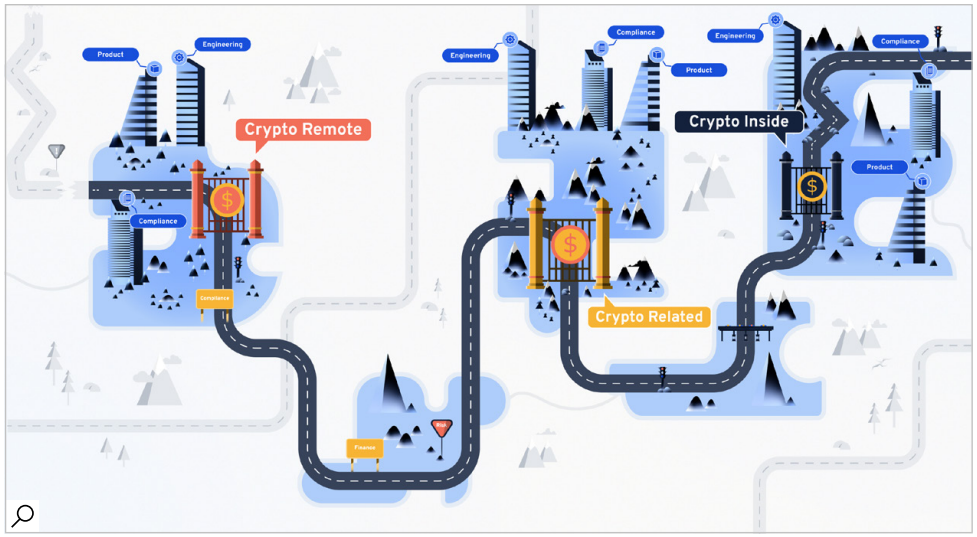
To make sense of that journey, we use a simple framework: a map with three gates. *Crypto-Remote → Crypto-Related → Crypto-Inside*. Each gate gets you closer to tighter control, better margins, and a more seamless customer experience.

Think of it like playing Super Mario. You dodge roadblocks, pick up power-ups, and unlock boss-level capabilities. The further you go, the more your business levels up (Figure 1). →

> *90% of institutions say they're live, implementing, or planning stablecoin payment flows.*

Fireblocks

Figure 1



Source: Fireblocks

The crypto posture journey: from *Crypto-Remote* to *Crypto-Inside*

We've seen hundreds of PSPs follow the same adoption curve—with three distinct phases that shape their posture, priorities, and potential.

Crypto-Remote: 'We'll play, but keep our distance'

This is where most payment service providers begin. They offer stablecoin-based services to customers but keep all crypto operations at arm's length: no wallets, no keys, and no digital assets on the books.

Why? Compliance teams may be unsure of licensing requirements.
Finance departments may resist the accounting implications of holding crypto.
Legal and risk leaders may still be weighing operational exposure. Meanwhile, engineering and product teams may be focused elsewhere.

How it works:

You partner with a licensed third-party to handle digital asset components.
Your rails stay fiat and theirs handle the crypto. For example, if a merchant wants to send a stablecoin payout, the PSP processes fiat through its usual rails, while the third party handles on-ramping, conversion, and settlement. The PSP never touches the assets.

Why PSPs like it:

- **Fast go-to-market**: Minimal lift required from internal teams.
- **Minimal risk**: *Crypto-Related* activity is externalised.
- **Proof of concept**: Teams gain insight into workflows and user needs. →

Fireblocks

What it limits:

- **Control**: Third parties mediate the user experience and flow.
- **Margin opportunity**: PSPs forgo revenue otherwise captured from settlement and spread.
- **Strategic depth**: Without internal crypto capabilities, the PSP remains reliant on external infrastructure.

Example:

Shift4 illustrates this model. They enable stablecoin payouts without handling assets directly, using Bridge to orchestrate on-chain flows—while Bridge itself runs on Fireblocks.

Crypto-Related: 'One foot in, one foot out'

After initial traction, PSPs want more control—but not the full stack. They've validated demand. They've proven the use case. Now they want to manage more of the flow, without fully taking on the responsibility of infrastructure.
This is where licensing talks start. Treasury starts thinking about float. Engineering starts diagramming wallet management. Legal frameworks are reviewed. This is the 'maybe we should actually own this thing' moment.

How it works:

The PSP owns accounts at a licensed exchange or custodian. They now have stablecoins on the balance sheet, but they still rely on partners to manage keys and wallets. The PSP is no longer removed from crypto—they're in the ecosystem, with visible exposure and increasing internal touchpoints.

Why this posture appeals:

- **More margin**: PSPs can now participate directly in conversion and settlement.
- **Tighter control**: Access to real-time funds movement and reporting.
- **Operational maturity**: Teams develop the compliance, treasury, and product muscle to support digital assets at scale.

What this posture requires:

- **Risk muscle**: Regulatory, financial, and reputational exposure increases as market volatility, fraud, and counterparty concerns now sit closer to home.
- **Cross-team coordination**: Treasury, legal, compliance, and engineering must align.
- **Policy infrastructure**: Enforcement of transaction limits, wallet whitelisting, and audit trails becomes essential as reporting obligations and internal governance expectations increase.

Example:

Checkout.com exemplifies this middle posture. They bridge fiat and crypto, with stablecoin flows touching their balance sheet—while continuing to rely on trusted partners for digital asset management. They're building muscle without taking on the full lift. →

Fireblocks

Crypto-Inside: 'We know Kung Fu'

This is the final gate—and the most transformative. At this stage, stablecoin payments are no longer an add-on; they are embedded in the PSP's core infrastructure. The business doesn't just enable digital asset flows—it architects them. Operations, compliance, product, and engineering work in lockstep, because crypto is no longer a parallel experiment. It's part of the company's operating system.

> *Eventually, every PSP will hit the same realisation: you don't just want to offer stablecoin payments. You want to own them.*

How it works:

You run wallets, hold private keys, manage on-chain liquidity, and set policy internally. Compliance, product, engineering—they're all synced. This requires substantial investment in infrastructure, licensing, and talent, but it also unlocks full control over margin, margin, and user experience.

Why they do it:

- **Full margin capture**: PSPs eliminate intermediaries and stop paying rent to third parties.
- **Competitive defensibility**: Owning more of the stack makes it harder for others to replicate the offering.
- **Speed and differentiation**: Real-time settlement and custom UX become standard, not aspirational.

What this posture requires:

- **Licensing**: The ability to issue, transmit, or custody digital assets—often across jurisdictions.
- **Infrastructure**: A stack that is secure, extensible, and enterprise-grade.
- **Org-wide alignment**: Success depends on coordination across product, risk, treasury, compliance, and engineering.
- **Balance sheet exposure**: Stablecoins become part of working capital, subject to liquidity, hedging, and accounting strategy.

Example:

When **Conduit** launched, they didn't take an incremental approach—they built for *Crypto-Inside* from day one. Their infrastructure gave them full control over on-chain settlement, and their integration with the Circle Payments Network allowed them to deliver real-time payments across global corridors. Fireblocks provides the security backbone, but Conduit owns the experience end-to-end.

Crypto-Remote works—until it doesn't

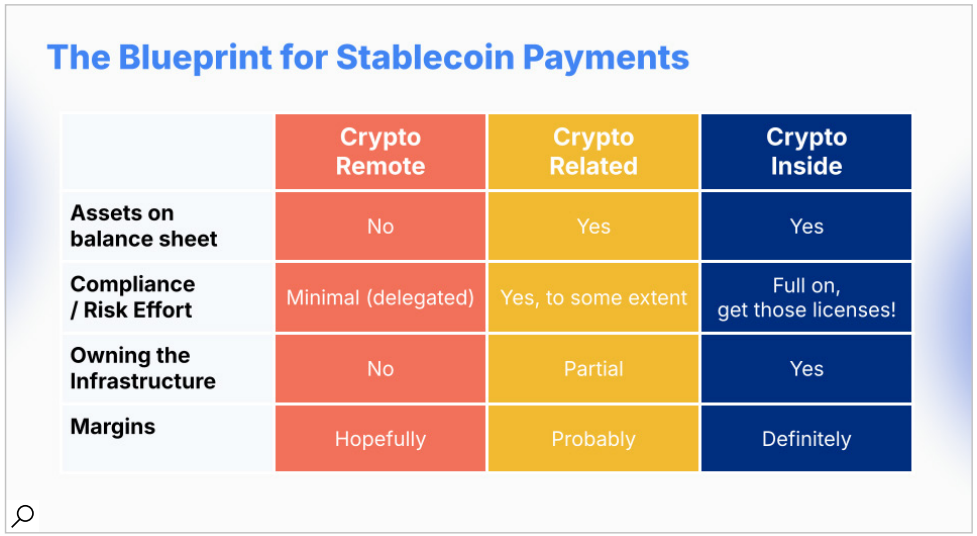
For many PSPs, starting out *Crypto-Remote* isn't just easier—it's smarter. It gets you to market quickly, with lower risk and minimal investment. It's how you learn, build internal buy-in, and meet immediate client demand. →

But eventually, it starts holding you back.

Because the PSPs moving through the gates aren't standing still. They're compounding their lead: more expertise, more policy muscle, more defensibility.

What used to be a moat becomes a gap.

Figure 2



The Blueprint for Stablecoin Payments

	Crypto Remote	Crypto Related	Crypto Inside
Assets on balance sheet	No	Yes	Yes
Compliance / Risk Effort	Minimal (delegated)	Yes, to some extent	Full on, get those licenses!
Owning the Infrastructure	No	Partial	Yes
Margins	Hopefully	Probably	Definitely

Source: Fireblocks

Final word: you can't outsource forever

Stablecoins are not just a new way to move money. They're becoming the standard for modern payment infrastructure—faster, cheaper, programmable, and global by default.

You don't have to build everything on day one. But you do need to start moving. Because eventually, every PSP will hit the same realisation: you don't just want to offer stablecoin payments. You want to own them.

You don't have to know Kung Fu today. But you should probably start stretching.

> *"Stablecoins are not just a new way to move money. They're becoming the standard for modern payment infrastructure—faster, cheaper, programmable, and global by default.*

Web 3 Payments in Action: Adoption and Use Cases

How to Integrate Crypto Payments into Your Business

Eric Barbier
CEO
Triple-A

Eric Barbier, CEO of Triple-A, is a fintech entrepreneur with 17+ years in global payments, having founded Mobile 365 (acquired by SAP) and TransferTo (now Thunes and DT One). At Triple-A, a licenced payment institution in the US, Europe, and Singapore, he helps businesses like Razer and Grab tap into 560+ million digital currency users via secure crypto and stablecoin payments.

For merchants and traditional payment providers, navigating the payment ecosystem can be complex, especially when it comes to adopting digital currencies. However, expanding payment capabilities to include crypto can unlock new opportunities, helping to reach more customers, generate revenue, and stay ahead in an evolving market.

The concept of digital currencies first emerged in the late 1980s, with the idea of 'cryptographic money'. Today, **thousands of cryptocurrencies** have been circulated globally, with Bitcoin's launch in 2009 marking a turning point. Stablecoins have become an enticing proposition for cross-border transactions, offering a reliable payment solution – especially for businesses serving customers in developing countries and emerging markets that lack cost-effective access to traditional banking rails.

The uptake of crypto payment solutions

Consumer demand for crypto payment options continues to grow, and businesses aiming to attract higher-spending customers are adopting digital currencies.

Digital currency payouts are an ideal solution for cross-border payments, saving on costs due to lower transaction fees and instant payouts. With no banking intermediaries involved and no chargebacks, the risk of payment disputes and fraud is eliminated. They also streamline transactions for global merchants, enabling them to reach wider markets by accepting USDT. Merchant adoption of crypto payments has been steadily rising, driven largely by market demand. Key users include those in the tourism and gaming industries, B2B vendors and sellers, freelancers, and businesses using digital wallets. →

Triple-A

“Digital currency payments help businesses reach new customers and increase revenue while offering a cost-effective cross-border solution with lower fees and instant transfers.

“Sending and receiving digital payments can be done in several ways, but the most efficient method is through a licenced payment institution.

In a recent interview, Managing Director of **Alternative Airlines**, Sam Argyle shared that **52% of their bookings** came from the US – a market where 30% of travellers prefer paying with cryptocurrencies. The 2024 surge in Bitcoin, which saw a 71% increase in value, coincided with the **Average Order Value (AOV) from crypto users rising by 23%**.

Grab, often referred to as the **‘Uber of Southeast Asia’** and one of the region’s leading superapps, has introduced cryptocurrency as an option for everyday spending. This is made possible through crypto top-ups on its digital wallet, enabling Grab users to easily off-ramp their crypto holdings. Meanwhile, luxury retailer **Farfetch** started accepting crypto in 2022 and found that crypto-paying customers spend, on average, 30% more in Average Order Value (AOV) than those using traditional payment methods.

How to send and receive payments in crypto

Sending and receiving digital payments can be done in several ways, but the most efficient method is through a licensed payment institution, like **Triple-A**. Their solutions bridge the gap between local and digital currencies and provide businesses with a secure and customisable payment process. With a crypto payment gateway, merchants can ensure compliance, security, and smooth settlement – all without the need to handle cryptocurrencies directly.

To send payments, the process is straightforward: deposit funds in fiat currency, wait for the payee’s request for a digital currency payout, and confirm the transaction.

To receive payments, merchants can enjoy faster and more cost-effective transactions with a white-label solution that is compatible with all wallets, with locked-in exchange rates. The process integrates smoothly into their existing payment gateway, enabling customers to select their preferred digital currency, confirm the payment, and complete the transaction in minutes. →

Triple-A

“For businesses looking to integrate crypto into their operations, selecting the right payment gateway is crucial.

“As businesses seek new ways to grow, adopting crypto as a payment option – a fast, borderless and secure solution – positions them ahead of the competition.

How to choose the right partner

For businesses looking to integrate crypto into their operations, selecting the right payment gateway is crucial. Start by identifying the primary needs of your business, as this will help define the key considerations for choosing the ideal partner. Here are some of the most important considerations:

1. Compliance and licencing

- Ensure robust security measures and legal compliance to protect your business and customers.
- Safeguard against illicit activities like money laundering and terrorism financing.
- Look for comprehensive screening, real-time monitoring, and instant fraud mitigation.

2. Volatility management

- Opt for instant crypto-to-fiat conversion to minimise exposure to price fluctuations.
- Support for major stablecoins (e.g., USDT, USDC, PayPal USD).
- Settlement in your preferred local currencies.

3. Integration flexibility

- Full control and flexibility with API integration.
- Customisable payment flows tailored to your business’s unique needs.
- No-code solutions, such as invoicing tools, for ease of use.

4. User experience

- White-label, customisable payment experiences.
- Compatibility with all crypto wallets.
- Support for a wide range of popular and stable cryptocurrencies.
- Instant payment confirmations.

As businesses seek new ways to grow, adopting cryptocurrency as a payment option – a fast, borderless, and secure solution – positions them ahead of the competition. Learn more: **https://www.triple-a.io/**

Stablecoins: Fuelling Everyday Crypto Commerce for Merchants

Massimiliano Silenzi
CEO
Cryptorefills

As CEO of Cryptorefills, Massimiliano Silenzi merges everyday commerce with stablecoin and crypto payments, offering flights, hotels, and gift cards to a global audience. Cryptorefills is a leading Web 3 commerce platform enabling millions of crypto-savvy users to shop worldwide.

Recent research from **Triple-A** indicates that overall crypto ownership in 2024 surged to an estimated 560 million users worldwide, creating fresh opportunities for both consumers and merchants. At the same time, **Cryptorefills research** and transaction data show a growing subset of these users actively spending crypto on everyday goods and services. Within this expanding landscape, stablecoins are emerging as a preferred choice for everyday commerce. By maintaining a steady exchange rate tied to traditional currencies (e.g., USD, EUR), they combine the core benefits of cryptocurrencies – speed, global reach, and lower transaction fees – with a degree of price stability that reduces the volatility risk for both consumers and merchants.

Our **surveys** conducted on thousands of crypto shoppers over the past years reveal two broad but overlapping motivations to use cryptocurrency as a means of payment. On one hand, necessity and inclusion fuel adoption among those living in regions with limited or costly banking infrastructure. For these users – freelancers paid in digital currencies, families sending cross-border remittances, or communities grappling with high inflation – crypto is a lifeline. It offers low fees, seamless global transfers, and a way to maintain purchasing power when local currencies are in flux.

On the other hand, many embrace crypto for innovation and opportunity. Tech-savvy enthusiasts and digital nomads view it as the future of finance, drawn by its speed, and decentralised features. They value the freedom to earn, save, and spend in a single, borderless currency.

Across both groups, there is a common desire for a secure, user-friendly, and globally accessible payment method. This is precisely where stablecoins begin to stand out, tackling concerns over volatility and paving the way for widespread crypto-based commerce. ➔

Cryptorefills

“Roughly 80% of people purchasing with crypto now prefer stablecoins, citing price stability as a key factor.

“Many embrace crypto for innovation and opportunity. Digital nomads view it as the future of finance, drawn by its speed, and decentralised features.

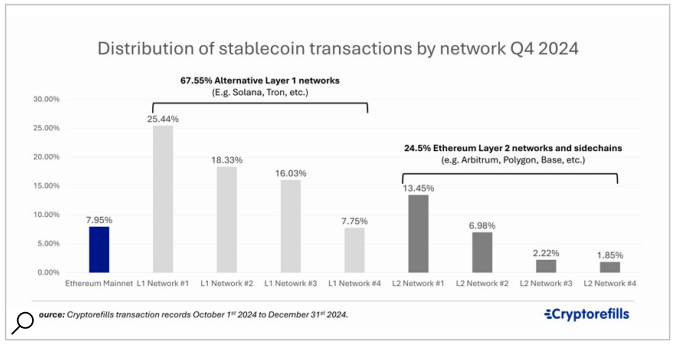
A 2024 **study** by Cryptorefills shows that roughly 80% of people purchasing with crypto, now prefer stablecoins over more volatile cryptocurrencies like Bitcoin or Ether. In fact, these users explicitly cite price stability as a key motivator, allowing them to spend digital assets without worrying about significant value drops or missed gains. Moreover, the research shows a slight, but statistically significant correlation ($r \approx 0.185$, $p < 0.001$) between stablecoin usage and higher shopping frequency, suggesting that stability drives more frequent transactions. Further findings show that two-thirds of people paying for purchases with crypto say they would shop even more if their favourite merchants offered stablecoin payment options.

Equally important is the matter of cost and speed. Cryptorefills internal transaction records indicate that in Q4 2024, only 8% of stablecoin transactions occurred on the Ethereum mainnet, (down from 15% in Q4 2023). The remaining 92% of the transactions take place on alternative blockchains or Layer 2 solutions, where fees are minimal, and confirmations are near instant. This trend resonates with the needs of many global crypto shoppers who either need to maximise every dollar’s purchasing power or expect frictionless user experiences.

These different data points lead to the same conclusion: by addressing concerns about volatility, fees, and transaction times, stablecoins are removing many of the barriers that once held back everyday crypto commerce. →

Cryptorefills

Figure 1



Implementing stablecoin payments may seem straightforward – after all, any merchant can technically integrate a compatible blockchain network and start accepting transactions without third-party contracts or approvals. However, the road from theory to practice is far more complex. Beyond meeting regulatory and financial requirements, businesses must handle the intricacies of blockchain transaction processing and ensure a user-friendly payment flow. Moreover, considering Cryptorefills transaction data, 92% of stablecoin transactions happen off Ethereum's mainnet, but the volume is fragmented across multiple Layer 2s and alternative Layer 1s – each with its own technical standards and quite 'tribal' user community.

Until a clear winner emerges, merchants looking to capture the widest audience must support a broad range of networks, adding significant complexity in terms of technology, accounting, and compliance. These challenges encompass everything from managing multiple networks and fee structures to dealing with the steep learning curve of crypto user experience, crypto custody, and security.

Since 2018, Cryptorefills has operated as a direct-to-consumer online crypto store for gift cards, mobile credit top-ups and more recently offering also flights and hotel bookings – developing its own blockchain payment infrastructure in the process. This in-house expertise has led to being the first ecommerce to accept Ethereum Layer 2 payments for stablecoins and today offering the widest plethora of layer-2 and scalable layer 1 stablecoin payment networks. For merchants who see crypto as a core part of their strategy and audience, building internal capabilities might be worthwhile. However, for most businesses, partnering with trusted, licensed payment processors that can handle the top stablecoins across multiple networks is a way more efficient route by consolidating processing, settlement, and risk management under one umbrella. Instead, for those still unsure about offering crypto payments, listing products through an established crypto commerce platform like Cryptorefills offers a simple way to tap into a ready-made audience of active crypto spenders – without having to build or maintain complex blockchain integrations.

BVNK

Best Practices for Stablecoin Payouts: What We've Learned

Chris Harmse
Co-Founder and Chief Business Officer
BVNK

Chris Harmse is Co-Founder and Chief Business Officer at BVNK, the leading global infrastructure provider for stablecoin payments. A Chartered Financial Analyst, Chris brings over a decade of expertise in finance and banking to Web 3 payments. Chris is passionate about helping businesses transform their payments with new technology.

Stablecoins started as a tool for crypto traders, but it didn't take long for fintech builders to see their significance: a tokenized dollar that travels the world in an instant, is accessible 24/7, and is viewable on an immutable public ledger. Today, stablecoins have emerged as a fast lane for global payments, a modern alternative to correspondent banking. At BVNK, we help financial institutions integrate stablecoins into their products, giving us a unique view of how stablecoins are being used today. Here's what we've found.

Payouts: the fastest growing use case

Stablecoins payouts make up one-third of our volumes at BVNK and it's the fastest growing use case we serve. We see demand in three areas:

Freelancer payroll (live)

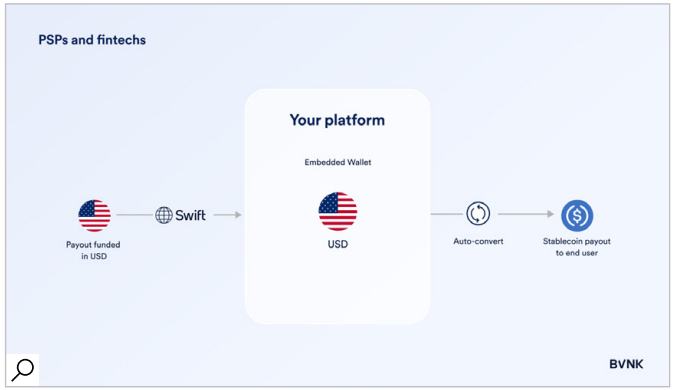
HR and gig economy platforms enable freelance workers to withdraw wages nearly instantly in stablecoins. Many of these workers are based in the Global South, where there is a demand to hold stablecoins as a hedge against local currency inflation. Global HR platform Deel, for example, uses BVNK to pay out contractors in 100+ countries.

Marketplace payouts (pilot/ testing)

Ecommerce and travel marketplaces are looking at stablecoins as a way to pay sellers and hosts in emerging markets, while tech platforms are looking at creator payouts. For marketplaces, stablecoins reduce costs and complexity associated with regular cross-border bank payouts. With crypto regulation now **taking shape in the US**, where many global marketplaces are based, I anticipate a flurry of activity in this space in 2025. →

Figure 1

With BVNK's embedded wallets, PSPs and fintechs can enable instant stablecoin payouts for their customers.



Source: BVNK

Salary payments (opportunity)

To pay out salaried employees in stablecoins, you'll first need to pay them in their local currency (to comply with payroll laws), before converting. At BVNK, we're seeing demand for stablecoin salary payments, especially in the Web 3 sector, where tech-savvy employees are already moving a portion of earnings into digital assets every month. I predict we'll see the first major implementation here by the end of the year.

Key considerations for launching stablecoin payouts

At BVNK we process USD 12 billion in annualised stablecoin payment volumes. Through this, we've learned several practical lessons.

1. You don't have to handle crypto yourself.

Many of our partners prefer not to handle stablecoins, because they're not licenced to, or they want to ringfence digital assets from their treasury. The good news is you don't have to touch crypto. Choose a partner you can fund in your preferred fiat currency, and who can auto-convert to stablecoins for you on payout (or convert stablecoin pay-ins into your preferred fiat currency).

2. Consider your KYB/C model.

If you're using a partner to pay out stablecoins on behalf of your customers, your partner will need to KYB/C the customer. Let's say you're a PSP using BVNK to enable your customer to pay a supplier in stablecoins. BVNK would KYB/C your customers once they set up stablecoin payments in your platform. Your customer simply accepts BVNK's T&Cs, and you pass BVNK the relevant KYB/C data by API.

3. Don't force a specific stablecoin on your user.

We've found distinct geographic preferences for stablecoins. In Latin America for example, it's often USDC; in Africa and Asia, it's USDT. This usually comes down to market conditions, e.g. local liquidity and spending options. If you only offer one stablecoin, you'll likely limit your global takeup. →

“ Stablecoins have emerged as a fast lane for global payments, a modern alternative to correspondent banking.

4. Go multi-chain for maximum flexibility.

Stablecoins can travel on different blockchains – and different chains are suited to different payment types. Low-cost chains like Solana, for example, work well for micropayments. We’ve found it’s better to give your users the option but incentivise the use of certain blockchains as needed.

5. Consider your fee structure.

If you’re enabling contractor payouts you might choose to pass on network fees to users. If it’s a salary payment, the employer or fintech will likely pay those fees. Choose a payments partner that gives you flexibility on how you charge for stablecoin transactions. The good news is that either way, the base cost of sending money via stablecoins is usually cheaper than the banking alternative.

6. Offer wallets to boost adoption.

To receive a stablecoin payout, a user must connect their blockchain wallet. This works well for crypto-native users but if you’re looking to grow adoption, consider enabling wallet creation at the point of payout. So, if a user doesn’t yet hold stablecoins, they can receive their payout in a newly-created wallet. BVNK **enables this** for our partners.

Stablecoin and fiat interoperability is critical

Stablecoins are the biggest infrastructure upgrade to payments in decades – but they’re not always easy to integrate and scale. At BVNK, we’re unifying stablecoin and traditional payments to help our customers add stablecoins to their payment stack. You can find out more about how we do that **here**.

Ushering in the Future of Crypto Payments with Stablecoins

Cassie Craddock
Managing Director, UK & Europe
Ripple

Ripple is the leading provider of digital asset infrastructure for financial institutions – delivering simple, compliant, reliable software that unlocks efficiencies, reduces friction, and enhances innovation in global finance. Cassie is Managing Director, UK & Europe at Ripple. She is a seasoned fintech leader who specialises in working with global financial services companies to enable them to drive growth through new technologies.

Stablecoins have quickly emerged as a pivotal innovation in the financial landscape, bridging the gap between cryptocurrencies and traditional fiat currencies. By maintaining a consistent value, stablecoins can be used to facilitate seamless transactions, making them indispensable for a multitude of traditional financial applications.

Beyond institutional applications, stablecoins are also revolutionising global payments, remittances, and decentralised finance (DeFi). In fact, our recent research found that 58% of finance leaders in Europe see cross-border payments as a top use case for stablecoins. Their ability to facilitate near-instant cross-border transactions at lower costs makes them a game-changer for financial institutions and corporates alike. As regulatory frameworks continue to evolve and adoption grows, stablecoins are beginning to play a critical role in the mainstream financial ecosystem, bridging traditional and digital economies while driving the future of crypto payments forward.

Growth in fiat-backed stablecoins

Fiat-backed stablecoins, which are underpinned by reserves of traditional fiat currencies and typically subject to regulatory oversight, are considered among the most reliable and trusted in the market today. They combine blockchain's security, speed, and scalability with the stability of traditional currencies, making crypto transactions more accessible.

By mitigating the volatility inherent in other types of crypto assets, stablecoins have also become a viable gateway for new users to more confidently embrace crypto and blockchain solutions. Last year, the **annual stablecoin transfer volume reached USD 27.6 trillion** surpassing volumes passing through Visa and Mastercard's global networks. →

Ripple

“Stablecoins are increasingly playing a crucial role in payments, remittances, decentralised finance (DeFi), and cross-border payment solutions.

“Stablecoins provide access to financial services for the unbanked populations, allowing them to participate in the global economy.

In response to the growing demand for USD-denominated stablecoins, prominent global businesses are increasingly investigating the opportunities presented by launching stablecoins, especially in regions like APAC, the EU, and Australia. Several stablecoins have been launched on the XRPL including EURCV, BBRL/BUSD, and RLUSD. With the supply of stablecoins on the rise – and **global market cap exceeding USD 200 billion** in early 2025 – it’s clear that stablecoins are becoming a fundamental component of the global financial system.

Why stablecoins matter

Stablecoins offer several advantages that make them integral to the modern financial system:

1. **Fast, low-cost transactions**: stablecoins enable instant transfers with minimal fees, making them ideal for everyday transactions.
2. **Cross-border payments and remittances**: their stable value and digital nature make stablecoins suitable for global transactions, reducing the time and cost associated with traditional cross-border payments.
3. **Financial inclusion**: many economies across the globe experience local currency volatility, making life difficult for businesses and individuals due to the resulting unpredictable business environment, increased costs, and challenges in financial planning. Stablecoins provide access to financial services for the unbanked and underbanked populations, allowing them to participate in the global economy.
4. **Institutional use cases**: businesses can use stablecoins for treasury management, settlements, and corporate payments, benefiting from their stability and efficiency. Stablecoins also offer a compelling solution for banks and fund managers seeking efficient trade settlement assets. When it comes to real-world assets (RWAs), these markets are best served by stablecoins to ensure that RWAs are properly priced and to facilitate efficient market operations worldwide by using a stable medium of exchange.
5. **On-ramps and off-ramps for crypto**: stablecoins facilitate the conversion between digital and fiat assets, serving as a bridge for users entering or exiting the cryptocurrency market. Given their ease-of-use and ubiquity across protocols, stablecoins often provide a simple and easy method to onboard more customers. ➔

Ripple

“The success of any stablecoin hinges on two critical factors: regulatory clarity and stability.

“Stability remains the primary reason businesses and individuals rely on stablecoins, making trust and transparency critical.

Keys to stablecoin success

The success of any stablecoin hinges on two critical factors: regulatory clarity and stability. Smart, clear regulations are essential for fostering institutional adoption of digital assets and are key to driving continued innovation.
A prime example is the Markets in Digital Assets (MiCA) regulation which establishes a comprehensive framework for stablecoin issuers in the European Union. It requires issuers to maintain full transparency by undergoing regular audits that verify their reserves. It also limits stablecoin issuance to regulated financial institutions, ensuring that only entities meeting strict standards can participate in the market. In addition, it establishes clear consumer protection rules, outlining investor rights and redemption policies to prevent misuse. However, regulatory clarity is only part of the puzzle. Stability remains the primary reason businesses and individuals rely on stablecoins, making trust and transparency critical. Stablecoins that are backed 1:1 by fiat currency and fully supported by segregated fiat currency reserves provide businesses with the confidence to fully lean in.

The future of payments

Stablecoins are increasingly playing a crucial role in payments, remittances, decentralised finance (DeFi), and cross-border payment solutions. Their stable value ensures seamless fund transfers without value fluctuations during the transaction, making them a reliable choice for both consumers and businesses.
As blockchain technology advances, stablecoins are addressing the challenges currently facing our global, traditional, real-world payment systems by providing a secure and efficient alternative. By combining the stability of a fiat-backed asset with enhanced liquidity, financial institutions can improve transaction speed, reduce costs, and increase transparency, all whilst embracing a digital-first approach.

Looking ahead, stablecoins will play an increasingly vital role in global finance, DeFi, and tokenization. Built on trust, security, and regulatory compliance, they are redefining the global money movement and paving the way for a more inclusive and efficient financial future.

Tokenization of Assets: New Payment Opportunities

Jean-Marc Stenger
CEO
Societe Generale-FORGE

Societe Generale-FORGE (SG-FORGE) is a fully integrated subsidiary of Societe Generale providing end-to-end solutions for crypto assets issuance, trading, and custody, backed by bank-grade security and regulatory compliance. With Jean-Marc Stenger as the CEO of SG-FORGE, the company is the issuer of EUR CoinVertible (EURCV), a European MiCA-compliant stablecoin.

Jean-Marc Stenger, CEO of SG-FORGE, reflects on key lessons learned from the deployment of SG-FORGE's stablecoin, the EUR CoinVertible.

What are the key lessons learned from the EUR CoinVertible SG-FORGE initiative, and how do they shape the future of asset tokenization in payments?

Within SG-FORGE, we are always looking forward to further innovation, and 2024 was marked by an acceleration in the deployment of our stablecoin, the EUR CoinVertible. A strategy driven by a desire to offer next-generation, compliant crypto assets that promote transparency, security, and scalability. The Ethereum network was the first step, and in the recent months, we have announced several deployment plans:

- **Solana network**, with the aim of improving the user experience on various DeFi platforms and payment solutions, including a cross-border one and other decentralised applications. The Solana network stands out for its ability to handle tens of thousands of transactions per second (TPS), making it one of the fastest blockchains in the industry. This integration will allow users to send, receive, and trade the stablecoin with minimal costs and near-instant transaction finality, crucial attributes for fostering broader adoption of stablecoins in both retail and institutional markets.
- The secure and decentralised Layer 1 blockchain **XRP Ledger** (XRPL) enables the EURCV to benefit from the scalability, speed, and low cost of the XRPL but also its thriving community. An integration that once again meets our desire to leverage more institutional use cases, but also to offer new applications thanks to a credible asset to users and developers. →

Societe Generale-FORGE

“ Having a MiCA-compliant stablecoin that embraces regulatory evolutions is definitely a game changer.

“ The stablecoin market is growing rapidly, and we strongly believe that uses will continue to expand beyond pure crypto trading.

- And recently, the integration of the EURCV on **Stellar** represents a major step forward in the evolution of digital payments, offering users a more efficient way of storing and transferring value across borders while benefiting from an ultra-scalable network with advanced asset tokenization capabilities and minimal fees.

This multichain strategy is part of a global approach always aiming at bridging the gap between traditional finance and digital assets. The widespread adoption is also reinforced by an existing listing of the EURCV on platforms exchanges such as Bitstamp and Bitpanda, enabling institutional as well as retail investors to carry out a variety of trading operations while benefiting from the stability of a MiCA-compliant stablecoin. Having a MiCA-compliant stablecoin that embraces regulatory evolutions is definitely a game changer.

The stablecoin market is growing rapidly, and we strongly believe that uses will continue to expand notably beyond pure crypto trading. Cross-border payments are, for instance, likely to be one of the main growth drivers for euro stablecoins in the future. Many small and medium-sized businesses have already realised the benefits of using stablecoins. In fact, making international payments using traditional infrastructures can take a long time – between 1 and 2 days on average – whereas making them in stablecoins on the blockchain is instantaneous and inexpensive.

How can banks, merchants, and PSPs leverage tokenized assets to enhance payment efficiency and liquidity management?

The crypto market is entering a new dimension. We clearly see that the adoption is growing and in fact, many companies are already leveraging tokenized assets.

Awareness is also growing within banks. Banking competitors are moving fast to launch new offers on crypto assets following the entry into the application →

Societe Generale-FORGE

“ Cross-border payments are likely to be one of the main growth drivers for euro stablecoins in the future.

“ Positive initiatives demonstrate growing adoption with Societe Generale clients such as the recent issue of the first digital green bond registered on the blockchain.

of MiCA. For instance, positive initiatives demonstrate growing adoption with Societe Generale clients such as the recent issue of the first digital green bond registered on the blockchain. An inaugural transaction that paves the way for the development of future market standards. Or more recently, the successful completion of a collateralised market transaction (repo) fully executed on the blockchain with the Banque de France through the Swift messaging system in December 2024.

What challenges do financial institutions face when integrating tokenized assets into traditional payment systems, and how can they overcome them?

The development of blockchain and crypto assets is about to change the rails of the financial system, benefiting from enhanced automation, better services, and productivity gains linked to faster and cheaper transactions.

Standardisation is an important matter for financial institutions and the challenge also lies on ensuring enforceable KYC/AML on crypto transactions.

How do regulatory frameworks impact the adoption of tokenized assets in the EU, and what should FIs consider when exploring this space?

The entry into force of the MiCA regime reshapes the market in the EU and opens up a window of opportunity.

This is the first time that we have a clear, homogeneous, relatively broad, and ambitious framework that is directly applicable throughout the EU. Competitive pressure will increase due to ambitious development plans of the existing players but also because of new foreign entrants for whom Europe now represents one of the most attractive markets in the world. MiCA has an extraterritorial dimension, meaning that its effects will extend beyond Europe.

The Web 3 Payments Ecosystem: Key Players and Innovators

INNOPAY
A business of Oliver Wyman

Mastering the Evolved Blockchain Space – 2025 Update to INNOPAY's Digital Assets Ecosystem Scan

Douwe Lycklama
Vice President
INNOPAY

Jelmer Koster
Senior Consultant
INNOPAY

Maurits Mulder
Consultant
INNOPAY

Douwe Lycklama (Vice President), Jelmer Koster (Senior Consultant) and Maurits Mulder (Consultant) are part of INNOPAY's Digital Assets team. With years of dedicated exploration and practical experience in the digital assets space, they are committed to unlocking the vast potential of blockchain technology for a diverse range of stakeholders in the financial services industry.

INNOPAY launched its **Digital Assets Ecosystem Scan** in 2023. Designed to visualise the complex landscape of digital assets in a single, indicative overview, it serves as a compass for navigating this emerging space. In our **earlier article** reviewing last year's major events, we observed a rapid evolution of the sector. This underscored the need for us to update our original ecosystem overview.

In this article, we guide you through the significant industry changes we have observed since 2023 using the updated Digital Assets Ecosystem Scan*[1]. We identify three key trends: 1) exponential growth and maturation across all layers of the ecosystem, 2) increasing institutional adoption, and 3) initial emergence of synergies between digital assets and artificial intelligence (AI). →

> *"Institutional stablecoin issuers exemplify a broader trend of TradFi players embracing digital assets solutions.*

*1 Please note that the scan serves as an attempt to capture the complex digital assets space in a single, indicative overview and should by no means be interpreted as an exact, exhaustive representation.

Recap: what is the digital assets ecosystem scan?

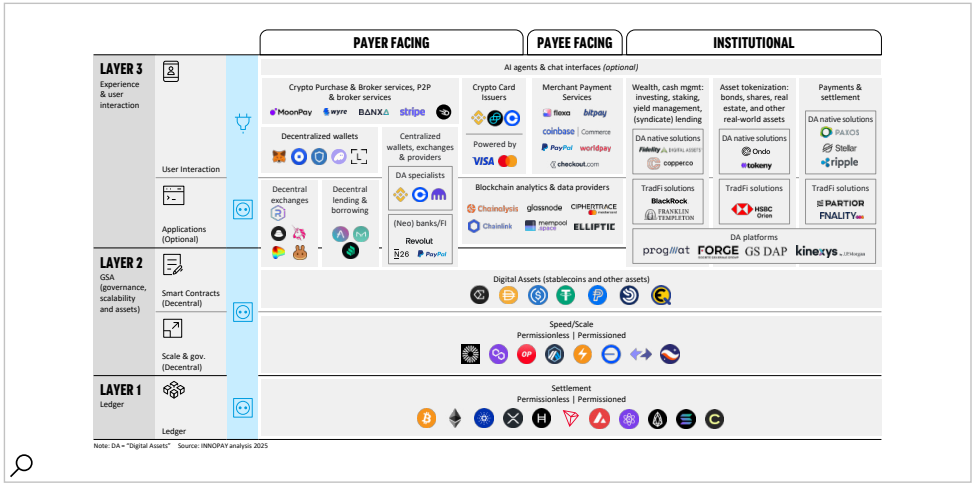
The Digital Assets Ecosystem Scan depicts the layered structure of today's digital assets landscape. Like the internet's TCP/IP model, the digital assets ecosystem consists of interconnected layers, each serving specific functions.

These are the three main layers:

- **Layer 1** is the 'ledger' layer that processes and finalises transactions, ensuring security and integrity. Since each blockchain has unique characteristics, Layer 1 targets various use cases. This usually means a trade-off between decentralisation, security, and scalability.
- **Layer 2** solutions – such as the Lightning Network for Bitcoin or Arbitrum for Ethereum – are built on Layer 1 to enable faster transactions and reduce costs. This layer also includes smart contracts, which automate processes and enable trustless interaction with decentralised services.
- **Layer 3** is where users interact with digital assets. It includes user interface (UI) and user experience (UX) components. Layer 3 plays a crucial role in driving adoption by simplifying user interactions. Decentralised finance (DeFi) applications flourish in this layer, offering user-friendly platforms for services such as asset custody, trading, and lending. While users can engage directly with the blockchain, this approach can be cumbersome, highlighting the need for effective services within Layer 3. This layer is also where traditional finance (TradFi) can offer compelling user propositions, obfuscating the complexity and usability risks of DeFi.

"An overall trend we observe is the increased activity across all layers – both in terms of usage volumes and number of offerings – and the maturation of solutions.

Figure 1



Source: INNOPAY

Key ecosystem changes since 2023

These are the three key changes compared to the 2023 ecosystem scan:

1. Exponential growth and maturation across all layers

2. Increasing institutional adoption

3. The initial emergence of synergies between digital assets and AI →

1. Exponential growth and maturation across all layers

An overall trend we observe is the increased activity across all layers – both in terms of usage volumes and number of offerings – and the maturation of solutions.

In terms of blockchain networks, we witness a rise of DeFi applications built within the ecosystem built on the Ethereum Layer 1 ledger. Ethereum is attractive due to its smart contract functionality, network size and security, combined with the lower costs and enhanced speed of Layer 2 solutions. From more of a 'retail' perspective, the ecosystem built on the Solana Layer 1 ledger is experiencing heightened activity.

The usage of decentralised services in Layer 3 such as the exchanges Raydium and Jupiter, along with wallets like Phantom, is growing significantly. This surge is largely driven by an interest in 'meme coins', which reached a peak with the **launch of US President Trump's TRUMP coin**. Solana's increasing popularity can be attributed to its user-friendly interface, performance, and accessibility, allowing users to participate within minutes by simply downloading an app and accessing services at very low fees. However, it remains uncertain whether a broader audience – especially institutional players, who are more sensitive to governance and compliance – will fully embrace Solana, as Ethereum continues to dominate the market with a **total value locked (TVL) nearly ten times greater than that of Solana**.

> *"In terms of blockchain networks, we witness a rise in DeFi applications built within the ecosystem developed on the Ethereum Layer 1 ledger.*

Furthermore, stablecoins – which can be issued on both Layer 1 and Layer 2 networks, depending on design choices and use case – are experiencing a remarkable surge with their market cap skyrocketing to over **USD 240 billion**. While the market remains dominated by blockchain-native USD powerhouses Tether and Circle, new institutional entrants such as **PayPal** and **Société Générale** are rapidly emerging, often targeting different, institutional use cases.

2. Increasing institutional adoption

Institutional stablecoin issuers exemplify a broader trend of TradFi players embracing digital assets solutions, as illustrated by the addition of a new quadrant in the top right corner of our scan. Inherent benefits of blockchain technology – such as speed, 24/7 availability, low cost, interoperability, global access, and automation – enable disruptive alternatives to traditional financial services. Initial reluctance to engage with digital assets has diminished due to technological maturity, rising client demand, political momentum, and regulatory clarity and legitimisation, e.g. through the introduction of crypto exchange-traded funds (ETFs) in the US and the Markets in Crypto-Assets Regulation in Europe. →

“ AI is a great fit with the blockchain ecosystem, which is entirely digital and offers opportunities for automation.

In the Digital Assets Ecosystem Scan, we have categorised activity in three key areas:

1. **Wealth and cash management** – optimising the management of financial assets through blockchain technology, encompassing investing, staking, yield management, and treasury services.
2. **Asset tokenization** – the digitisation of bonds, shares, trade documentation, real estate, and other so-called real-world assets, providing benefits like easier transferability, improved transparency, and atomic settlement through an on-chain cash leg (see ‘Payments and Settlement’).
3. **Payments and settlement** – executing financial transactions on a blockchain, often utilising stablecoins, which removes traditional frictions – particularly in cross-border transactions – through 24/7, cheaper, faster, and programmable payments to recipients anywhere in the world.

Within these three areas, we observe specific solutions offered by both blockchain-native and TradFi players. Meanwhile, large institutions like J.P. Morgan and Société Générale offer a comprehensive suite of services across all three areas through a single ‘digital assets platform’. This enables them to serve a broad range of clients such as corporates, other financial institutions, and public entities like central banks.

3. Initial emergence of synergies between digital assets and AI

AI is making waves across all markets, and the world of digital assets is no exception. AI is a great fit with the blockchain ecosystem, which is entirely digital and offers opportunities for automation. Although this development is still in the early stages, we are beginning to see promising solutions emerge, such as analytical tools and task automation services like **Trojan**, which assist in trade execution. Furthermore, AI agents serve as the perfect assistants to interact with digital assets. These are represented by an additional UI layer in our scan. While many applications are still experimental and primarily used by retail innovators, they possess the potential for rapid evolution, which we expect to unfold at an accelerating pace. We envision a future scenario where users can simply ‘talk’ or ‘chat’ with their AI assistant to manage on-chain tasks, such as gaining market insights, making payments, or overseeing their organisation’s operations.

Closing thoughts

As outlined in this article, the digital assets landscape has undergone significant evolution in the past two years, characterised by three key trends: growth and maturation across all layers, institutional adoption, and the emergence of AI within digital assets. At INNOPAY, in collaboration with our partners, we remain committed to closely monitoring this ongoing (r)evolution of financial services and its implications for the financial sector at large.

Who Is Who in Crypto Payments and the Web 3 Ecosystem

Crypto Payment Infrastructure (Rails & PSPs)

Crypto Payment Rails

B2B Crypto Payment Rails

anchorage digital, Banking Circle, BOSONIC, BVNK, Calypso Pay, Conduit, Cryptostone, FINOA, Fireblocks, Galoy, LIGHTSPARK, MERGE, nilos, NYDIG, QREDO, rail, sFOX, striga, Triple-A, Unchained, UNICOIN, upvest, Yellow Card, ZeroHash

B2C Crypto Payment Rails

loopcrypto, Multivers, nebeus, sylq, SOLANA, VOLTAGE

Crypto Payment Service Providers (PSPs)

Crypto-Native PSPs

B2BINPAY, BANXA, Bitfinity NETWORK, bitpace, bitpay, Blockchain.com, Blockonomics, Calypso Pay, coinbase, Coincheck, coingate, CoinPayments Since 2013, CoinsBank, CoinsPaid, electrocoin, Fiat Republic, Flexa, GoCrypto, ikajo, kontigo, LIGHTSPARK, LUNU, MoonPay, nearpay, onramper, opennode, PDX, PLISIO, ramp, Ramp NETWORK, Request, SpectroCoin, SpicePay, STRIKE, Triple-A, Wert, ZeroHash

Traditional PSPs Integrating Crypto

ACI Worldwide, Aevi, Checkout.com, finXP, nuvei, PayPal, Skrill, stripe, Unlimit, WORLDLINE

Card Issuers *

BINANCE, bitpay, coinbase, CoinsBank, crypto.com, mercuryo, NAGA EVERYTHING MONEY, nebeus, NEXO, SpectroCoin, we weld, WIREX

** Via Visa and Mastercard partnerships*

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Wallets & Custody Solutions

Exchange-Based Wallets

1inch, AmberApp, argent, Atomic Wallet, B2BINPAY, BINANCE, BitBox, BitcoinCash, Bitfinity NETWORK, Blockchain.com, blue wallet, BRD, Breez, Chivo, CIRCLE, coinbase, Coincheck, CoinsBank, CoinsPaid, Cryptostone, CURVE, edge, ELECTRUM Bitcoin Wallet, EXODUS, HANDCASH, keep key, LEDGER, LEMON, muun, OPOLO, PLISIO, Portal, SpectroCoin, tangem, TREZOR, WASABI WALLET, WORLDLINE, XAPO BANK EST. 2013

Wallet-as-a-Service (WaaS)

anchorage digital, BASTION, CIRCLE, cobo, dynamic, Fireblocks, LEDGER, lirium, Portal, privy, ROCKWALLET

Self-Custodial Wallets

Bitkey, MetaMask, phantom, TRUST

Institutional Custody Providers

Strong Institutional Custody Providers

anchorage digital, BitGo, bitpanda Technology Solutions, cobo, coinbase, copper.co, CRYPTO FINANCE DEUTSCHE BÖRSE GROUP, DLT Finance, FINOA, First Digital, OREDO, FORGE SOCIETE GENERALE GROUP

Potentially Related But Not Pure Custody Providers

abra, B2BINPAY, crypto.com, PayPal, OREDO, ROCKWALLET, sFOX, ZeroHash

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Crypto Exchanges & Trading Platforms

Centralised Exchanges (CEXs)

AscendEX, AZA Finance, Binance, Bitfinex, Bitget, bithumb, bitpanda, Bitso, Bitstamp, BTSE, Bybit, coinbase, CoinEx, electrocoin, Gate.io, Gemini, HTX, kraken, KuCoin, LBank, Luno, MEXC, OKX, Paxos, Poloniex, UPbit, wazirx, XT, young platform, zondacrypto, SHAPESHIFT

Decentralised Exchanges (DEXs)

1inch, Balancer, Bancor, Curve, dYdX, GMX, KWENTA, PancakeSwap, Raydium, Sushi, THORCHAIN, UNISWAP

Hybrid Exchanges

Bullish, Injective, LOOPRING, OpenOcean, OREDO, rhino.fi, SHAPESHIFT, THORSWAP

DeFi Liquidity Aggregators

matcha, OpenOcean, paraswap

Liquidity Aggregators

AMBER, CUMBERLAND A DRW COMPANY, DWF LABS, FLOW TRADERS, GSR, jumptrading, KAIRON LABS, Keyrock, WINTERMUTE

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Fiat On/Off-Ramps & Liquidity Providers

Fiat On/Off-Ramps

Crypto Exchanges with Built-in On/Off-Ramps

BINANCE, coinbase, kraken, Bitstamp, GEMINI, OKX

Payment Processors & Fiat Gateways

Alchemy Pay, BANXA, mercuryo, MoonPay, NOWPayments, opennode, Paychant, Ramp Network, RATIO, ROCKWALLET, simplex by nuvei, Transak

Banking & Fintech Services Supporting Crypto

Cash App, NETELLER, PayPal, Revolut, sardine, STRIKE

Banking & Fintech Services Supporting Crypto - dedicated to stablecoins

DAKOTA, KAST

Institutional & Business-Focused Fiat Ramps

B2C2, CIRCLE, Fireblocks, tether

Institutional & Business-Focused Fiat Ramps - dedicated to stablecoins

BlindPay, CEDAR, Paygrid, rail

Crypto Ramp Aggregators

bitpay, mercuryo, MoonPay, onramper, Ramp Network, ROCKWALLET, StrikeX, Transak

P2P Trading Platforms

BINANCE

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Fiat On/Off-Ramps & Liquidity Providers

Stablecoin Issuers

Major Stablecoin Issuers

Issuer	Stablecoin
archblock	TUSD
CELO	CELO
CIRCLE	USD Coin
First Digital	
MONERIUM	
PAXOS	Global Dollar USDG, USDL, USDP, PYUSD, PAXG
Sky	
STASIS	
tether	tether, tether GOLD

Stablecoin Issuers

Regional & Emerging Stablecoin Issuers

Issuer	Stablecoin
ASC	cNGN
GMO-Z.com Trust Company, Inc.	GYEN Digital JPY, ZUSD Digital USD
novatti	AUDD
Num	nStables
straitsX	XSGD, XUSD, XIDR
Transfero	BRZ TOKEN

Algorithmic & Crypto-Collateralised Stablecoin Issuers

Issuer	Stablecoin
Frax Finance	
Liquity	

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DeFi (Decentralised Finance) & Lending/Borrowing Protocols

DeFi Lending & Borrowing

aave · ALCHEMIX · Compound · JustLend DAO · Liquity · MAPLE · RADIANT · Sky · truefi · VENUS

Yield Aggregators

Badger · Beefy · convex · enzyme · Harvest · idle · Reaper

Decentralised Derivatives & Options

dYdX · gTrade · GMX · Hyperliquid · Injective · KWENTA · SYNTHETIX · vertex

Decentralised Stablecoins

Decentralised Algorithmic Stablecoins

Decentralised Options

Derive · Hegic · opyn · premia · Stryke

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Institutional & Regulated Crypto Services

Regulated Financial Institutions Offering Crypto Services

Traditional Banks Entering Crypto

AMINA, ANZ, Galicia, Banking Circle, BNP Paribas, BNY, btg pactual, citi, Clear.Bank, customers bank, DBS, Goldman Sachs, itaú, JPMorganChase, LGT, mercado pago, Morgan Stanley, MUFG, OCBC, RBC, Santander, Shinhan Bank, FORGE Societe Generale Group, SoFi, Solaris, standard chartered, USAA

Crypto-Native Banks

anchorage digital, AMINA, Bank Frick, Bitcoin Suisse, cashaa, Dukascopy Swiss Banking Group, QUONTIC, Revolut, SoFi, SYGNUM, wirex

Crypto Custodians & Institutional Trading Desks

BitGo, coinbase, Fidelity Digital Assets, Fireblocks, GEMINI

Regulated Crypto Market Makers

Cumberland A DRW Company, empirica building markets, Flow Traders, GSR, Keyrock, LMAX Digital

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Compliance, Identity & Blockchain Security

Fraud Prevention

AUTOTIX · Blowfish · Cognyte · data zoo · Fortanix · nSure.ai · sardine · Web3 Builders

KYC, AML & Identity Verification Providers

3 · BLOCKPASS · Bloom · Blowfish · brightID · checkin.com · CIVIC · COMPLY ADVANTAGE · ComplyCube

Crypto-kyc · Fourthline · GBG IDology · haptrail · identity · jumio · KYC-CHAIN · KycHub · MERKLE SCIENCE · NOTABENE

onfido an Entrust Company · parallel MARKETS · PLAID · Prove · SANCTION SCANNER · SELFKEY · Shyft · SpruceID · sumsub · Web3 Builders

Blockchain Analytics for Fraud Prevention

Chainalysis · ciphertrace by · ELLIPTIC · Nansen · TRM

Smart Contract Auditing & Security

ANASTASIA LABS · CERTIK · Diligence · hashlock. · OpenZeppelin · Quantstamp · QuillAudits · SLOWMIST · Three Sigma · TRAIL OF BITS

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Web 3 Infrastructure & Middleware

Layer 1 Blockchain Networks

Algorand, avalanche, bitcoin, BNB CHAIN, CARDANO, COSMOS, cronos, fantom, Hedera, near, Polkadot, SOLANA, Tezos, TRON

Layer 2 Blockchain Networks

ARBITRUM, AURORA, BASE, BOBA NETWORK, Immutable, Lightning Network, LOOPRING, OPTIMISM, polygon, STARKNET, ZKsync

Interoperability & Cross-Chain Bridges

ARBITRUM, avalanche, OPTIMISM, polygon, PORTAL, stargate, Synapse, WBTC

Blockchain Oracles & Data Feeds

api3, BAND PROTOCOL, Chainlink, DIA, nest, PYTH, tellor, UMA

NFTs, Tokenization & Digital Assets

NFT Marketplaces (general & artwork)

ATOMICMARKET · BINANCE · BLUR · crypto.com · foundation.app · LooksRare · MAGIC EDEN · MINTABLE · Nifty Gateway · objkt.com · OpenSea · Rarible · Solanart · SuperRare · X2Y2 · ZORA

Gaming & Metaverse Platforms

AXIE INFINITY · Decentraland · GALA · Immutable · THE SANDBOX

Asset Tokenization & RWAs (Real-World Assets)

4K · BRICKKEN · Centrifuge · Courtyard.io · L.A.B.S. · MASTERWORKS · Ondo · PAXG · POLYMESH · PROPY · RealT · tether GOLD · VNX

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Emerging Sectors in Web 3 & Crypto

Decentralised Identity & Web 3 Social Networks

Bluesky, brightID, CIVIC, DeSo, ens, farcaster, Lens, orb.club, polygon, SELFKEY, SpruceID, world

Decentralised Cloud Storage & Computing

akash, arweave.org, Filecoin, Render Network®

AI x Blockchain

CORTEX, fetch.ai, NUMERAI, ocean, SingularityNET, VELAS

Researched by ©The Paypers, 2025

Infographic Glossary

To help you navigate the Web 3 Payment Acceptance landscape featured in our 2025 industry mapping infographic, we've created a comprehensive glossary. It breaks down the 10 main categories, each with its own subcategories, offering clear definitions and context for better understanding:

1. Crypto Payment Infrastructure (Rails & PSPs)
2. Wallets & Custody Solutions
3. Crypto Exchanges & Trading Platforms
4. Fiat On/Off-Ramps & Liquidity Providers
5. DeFi (Decentralised Finance) & Lending/Borrowing Protocols
6. Institutional & Regulated Crypto Services
7. Compliance, Identity & Blockchain Security
8. Web 3 Infrastructure & Middleware
9. NFTs, Tokenization & Digital Assets
10. Emerging Sectors in Web 3 & Crypto

1. Crypto Payment Infrastructure (Rails & PSPs)

- **Crypto Payment Rails** – Networks that facilitate the transfer of digital assets between users, businesses, and financial institutions. They enable faster and more cost-effective transactions compared to traditional banking systems.
- **Crypto Payment Service Providers (PSPs)** – Companies that allow merchants to accept cryptocurrency payments and settle them in fiat or stablecoins.
  - ***Crypto-Native PSPs*** – Payment processors built specifically for crypto payments.
  - ***Traditional PSPs Integrating Crypto*** – Legacy payment providers that have added crypto support.
- **Crypto Card Issuers** – Companies offering debit/credit cards linked to crypto wallets, enabling users to spend digital assets in the real world.

2. Wallets & Custody Solutions

- **Self-Custodial Wallets** – Digital wallets where users control their private keys, meaning they have full ownership of their crypto assets.
- **Wallet-as-a-Service (WaaS)** – Enterprise solutions that allow businesses to integrate crypto wallets into their services without developing the infrastructure themselves.
- **Institutional Custody Providers** – Companies offering secure storage for digital assets, often required by institutional investors and regulatory bodies.
  - ***Strong Institutional Custody Providers:*** These companies specialise in secure digital asset storage for institutional investors.
  - ***Potentially related but not pure Custody Providers:*** These companies offer custody as part of a broader financial service (e.g., trading, payments, infrastructure). →

Infographic Glossary

3. Crypto Exchanges & Trading Platforms

- **Centralised Exchanges (CEXs)** – Platforms that facilitate crypto trading, custody, and liquidity provision with a centralised entity managing transactions.
- **Decentralised Exchanges (DEXs)** – Peer-to-peer trading platforms that enable users to swap tokens without intermediaries, using smart contracts.
- **Hybrid Exchanges** – Platforms combining the liquidity of centralised exchanges with the security and transparency of decentralised models.
- **Liquidity Aggregators & Market Makers** – Firms that provide liquidity to trading platforms and help stabilise market prices.
  - ***Liquidity Aggregators*** - Platforms that source liquidity from multiple venues to optimise trading execution.
  - ***DeFi Liquidity Aggregators*** - Platforms sourcing liquidity from multiple DEXs to offer the best prices.

4. Fiat On/Off-Ramps & Liquidity Providers

- **Fiat On/Off-Ramps** – Services that allow users to convert fiat currency (USD, EUR) into cryptocurrencies and vice versa.
  - ***Crypto Exchanges with Built-in On/Off-Ramps*** – These centralised exchanges (CEXs) allow users to buy/sell crypto directly using credit cards, bank transfers, or other payment methods.
  - ***Payment Processors & Fiat Gateways*** – These companies integrate fiat-to-crypto conversions for businesses, wallets, and DeFi apps.
  - ***Banking & Fintech Services Supporting Crypto*** – Traditional finance platforms that offer direct fiat-crypto conversions.
  - ***Institutional & Business-Focused Fiat Ramps*** – These providers offer large-scale fiat-to-crypto services for enterprises and institutions (including stablecoins – meaning that they have a focus on **stablecoin-powered financial infrastructure**).
- **Stablecoin Issuers** facilitate seamless conversion between fiat and crypto, acting as key liquidity providers.
  - ***Major Stablecoin Issuers*** – These companies issue widely used stablecoins pegged to fiat currencies like USD, EUR, or other assets.
  - ***Regional & Emerging Stablecoin Issuers*** – These issuers focus on specific markets and use cases.
  - ***Algorithmic & Crypto-Collateralised Stablecoin Issuers*** – These issuers provide non-fiat-backed stablecoins that rely on algorithms or crypto reserves.
- **Crypto Ramp Aggregators** – Platforms that aggregate multiple on/off-ramp services to provide users with the best rates and liquidity options.
- **P2P Trading Platforms** – Marketplaces that connect buyers and sellers for direct cryptocurrency trading, often used in regions with restricted access to banking services. →

Infographic Glossary

5. DeFi (Decentralised Finance) & Lending/Borrowing Protocols

- **DeFi Lending & Borrowing** – Platforms allowing users to lend or borrow crypto assets without intermediaries, using smart contracts to enforce agreements.
- **Yield Aggregators** – Services that optimise yield farming strategies across multiple DeFi protocols to maximise returns.
- **Decentralised Stablecoins** (these stablecoins are backed by crypto assets or other reserves and operate on decentralised platforms) & **Algorithmic Stablecoins** (these stablecoins rely on algorithmic mechanisms to maintain their peg, rather than being backed 1:1 by collateral) – Cryptocurrencies pegged to fiat assets, either backed by reserves (e.g., USDC, DAI) or algorithmically managed.
- **Decentralised Derivatives** (these platforms offer futures, perpetual contracts, and other derivative instruments using smart contracts) & **Options** (these platforms allow users to trade crypto options in a non-custodial, on-chain manner) – Platforms offering financial instruments like futures, swaps, and options in a decentralised manner.

6. Institutional & Regulated Crypto Services

- **Regulated Financial Institutions Offering Crypto Services** – Traditional banks and fintech firms integrating crypto solutions, often under regulatory frameworks.

What Makes a Crypto-Native Bank Different?

  - Built with crypto in mind (not just integrating it later);
  - Offers crypto custody, trading, lending, and staking;
  - Provides crypto-friendly fiat banking (on/off-ramps, debit cards, business accounts);
  - Supports blockchain-based financial services.

- **Crypto Custodians & Institutional Trading Desks** – Services providing secure storage and execution for institutional crypto traders.
- **Regulated Crypto Market Makers** – Firms that ensure liquidity in digital asset markets while complying with financial regulations.

7. Compliance, Identity & Blockchain Security

- **KYC, AML & Identity Verification Providers** – Companies specialising in identity verification, anti-money laundering (AML) compliance, and fraud detection for crypto transactions.
- **Blockchain Analytics for Fraud Prevention** – Tools that analyse blockchain transactions to detect suspicious activity and prevent financial crime.
- **Smart Contract Auditing & Security** – Firms that review and audit blockchain smart contracts to identify vulnerabilities before deployment. →

Infographic Glossary

8. Web 3 Infrastructure & Middleware

- **Layer 1 & Layer 2 Blockchain Networks**
  - ***Layer 1*** refers to base blockchains like Ethereum and Solana, which operate independently.
  - ***Layer 2*** solutions like Polygon and Arbitrum enhance Layer 1 networks by improving scalability and reducing transaction costs.

  Many of these chains are optimistic rollups. An optimistic rollup is one of the layer-2 scaling constructions that help augment blockchain scalability.
  It computes and processes multiple transactions outside the base layer and submits them as a single transaction to the main blockchain.
- **Interoperability & Cross-Chain Bridges** – Technologies that connect multiple blockchains, enabling seamless asset transfers between ecosystems.
- **Blockchain Oracles & Data Feeds** – Services that bring real-world data onto the blockchain to enable smart contracts to interact with external information.

9. NFTs, Tokenization & Digital Assets

- **NFT Marketplaces** – Platforms where users can buy, sell, and trade non-fungible tokens (NFTs), which represent digital or real-world assets.
- **Gaming & Metaverse Platforms** – Virtual ecosystems that integrate blockchain-based assets, allowing users to buy land, trade items, and engage in play-to-earn mechanics.
- **Asset Tokenization & RWAs (Real-World Assets)** – The process of representing physical assets (real estate, commodities, equities) as digital tokens on the blockchain.

10. Emerging Sectors in Web 3 & Crypto

- **Decentralised Identity & Web 3 Social Networks** – Platforms enabling users to control their digital identities and interact with decentralised applications (DApps) without relying on traditional social media giants.
- **Decentralised Cloud Storage & Computing** – Blockchain-based storage and computing networks that offer censorship-resistant, secure, and cost-effective alternatives to centralised cloud providers.
- **AI × Blockchain** – Projects integrating artificial intelligence with blockchain technology to enhance data security, automation, and decentralised decision-making.

Whether you're a fintech innovator, developer, or crypto enthusiast, this glossary is your guide to understanding the evolving Web 3 payments ecosystem.

Regulation and the Future of Web 3 Payments

Navigating the Future of Digital Asset Regulation

Patrick Hansen

Senior Director of EU Strategy & Policy

Circle

Patrick Hansen is the Senior Director of EU Strategy & Policy at Circle, leading Circle's regulatory strategy and engagement across the European Union. Circle is a global fintech company at the forefront of digital financial infrastructure, issuing USDC and EURC stablecoins, and providing developer services that enable secure and efficient financial transactions.

Patrick Hansen, Senior Director of EU Strategy & Policy at Circle, shares insights on the evolving digital assets policy landscape and its impact on businesses and consumers.

Why is having a well-structured crypto policy essential for companies operating in the digital asset space?

A clear and well-defined crypto policy ensures consumer protection, financial stability, and rules-based innovation and competition. Without regulatory clarity, businesses face uncertainty, limiting their ability to scale or secure investments and institutional partnerships. Particularly in the European Union, having a harmonised crypto rulebook across the 27 EU member states allows crypto businesses to address a larger market. Sensible regulation also promotes trust among users and institutions, which is critical for mass adoption and long-term industry success.

What are the core principles that guide Circle's approach to crypto regulation and compliance?

At Circle, we pride ourselves on being a regulation-first actor that goes through the front door in every major jurisdiction in the world. We built our regulatory positioning on transparency, compliance, and financial integrity. This is how we have managed to become the only major global stablecoin issuer to adhere to stablecoin-specific rules, including in Canada and the MiCA framework in the EU.

What challenges has Circle faced in adapting its policies to evolving regulatory frameworks like MiCA?

Regulatory evolution inevitably requires some operational recalibration. However, at Circle, we see much of the oncoming legislation as aligning with Circle's existing business model rather than requiring fundamental change. While we've →

Circle

“ Startups should prioritise compliance early to avoid scalability bottlenecks later.

“ With more countries opting to adopt new regulations, regulatory reciprocity will become important to prevent national fragmentation of rules.

made some structural adjustments to ensure full regulatory alignment, our core framework for reserve management, licensing, and compliance reporting was already built for this level of oversight. One major challenge for both policymakers and operators in the stablecoin space alike is how to create compatibility and interoperability between stablecoin frameworks in various jurisdictions. With more and more countries opting to adopt new regulations, regulatory reciprocity, recognition and harmonisation will become increasingly important to prevent national fragmentation of rules.

MiCA has been a game-changer for regulatory clarity. How is it being implemented so far, and what challenges exist in its enforcement?

MiCA is a significant step forward in setting clear rules for crypto assets across the EU. Its implementation is a marathon, not a sprint. We started building out our MiCA operations and licence applications over two years ago, and with some of the implementing regulations and guidelines still to be adopted by the EU, this work has never stopped.

A major topic of ongoing discussion has been the dual categorisation of Electronic Money Tokens (EMTs) as crypto-assets and e-money. To achieve its goal of fostering regulated crypto-asset services in the EU, it is key that EU authorities avoid duplication of licensing and applicable rules here for actors providing stablecoin-related services in the EU.

Where does MiCA fall short, and what gaps still need to be addressed in the EU’s crypto regulatory landscape?

While MiCA is comprehensive, it is a product of its time, and some topics should be closely looked at in its upcoming EU Commission interim review 2025. As mentioned earlier, the EU should look into how to align its regime with other new frameworks being adopted in other jurisdictions. The EU should carefully evaluate the attractiveness of its stablecoin rules overall, addressing key concerns around duplication of requirements under MiCA and PSD. The EU will also consider gaps on other topics like decentralised finance (DeFi) or non-fungible tokens (NFTs), but at this stage, I believe both the industry and the EU →

Circle

“ MiCA is a foundation, but ongoing refinements will be needed for a fully matured framework.

“ Regulations evolve quickly, and understanding upcoming requirements early can prevent costly adjustments later.

institutions favour fully implementing and improving existing MiCA rules instead of creating additional ones.

How does MiCA compare to regulatory approaches in the US and Asia? Do you see it influencing global standards?

MiCA provides the most comprehensive framework for stablecoins and crypto assets to date, offering greater clarity than the currently fragmented regulatory landscape in the US at the state and federal level, where multiple agencies oversee different aspects. In Asia, regulatory approaches vary widely, from innovation-friendly frameworks in Singapore to more restrictive policies in China. MiCA’s unified approach is setting a precedent that could influence global standards, but much will depend on a pragmatic implementation in the upcoming 12-18 months.

What advice would you give to startups or enterprises navigating crypto regulations for the first time?

First, stay proactive — regulations evolve quickly, and understanding upcoming requirements early can prevent costly adjustments later. Also, if you can, engage with policymakers and industry groups to stay ahead of regulatory changes and contribute to shaping a strong crypto sector in your region.

Second, and I can’t stress this enough, start early. Adherence to frameworks like MiCA takes a lot of time.

Looking ahead, what’s next for EU crypto policy? Could we see further refinements or even a MiCA 2.0?

The EU will likely refine MiCA over time, but for now, it is all hands-on deck for implementation. Many crypto-asset service providers, like large exchanges, are yet to be authorised under MiCA. So, the focus should be on resolving current challenges and addressing existing regulatory uncertainty and bottlenecks first. Additionally, as global regulatory discussions progress, we may see greater harmonisation between MiCA and international standards, reducing fragmentation across jurisdictions.

Regulatory Challenges and Opportunities in the Web 3 Payment Landscape: How AI Shapes Crypto Compliance

Marina Khaustova
Chief Operating Officer
Crystal Intelligence

Marina Khaustova, with 12 years of experience in global SaaS businesses, became COO in February 2024 after over five years as CEO of Crystal Intelligence. She now drives Crystal's global growth in cryptocurrency compliance and investigation software. Crystal empowers financial institutions, law enforcement, and regulators with real-time blockchain analysis and compliance solutions, available as a free explorer, SaaS, or API.

The financial world is at a pivotal moment. Web 3 and blockchain-based payments are no longer just the domain of crypto enthusiasts – they are redefining how we think about money, transactions, and trust. But with rapid innovation comes an equally fast-evolving regulatory landscape, one that challenges even the most established financial institutions. The question isn't whether Web 3 payments will go mainstream, but how compliance will keep pace.

The AI-powered compliance revolution

Historically, regulatory hurdles have slowed the adoption of Web 3 payments. Compliance teams are navigating a patchwork of global regulations, from the EU's MiCA framework to the US' fragmented approach. But while traditional compliance methods struggle to keep up, AI is stepping in as a game-changer.

- **Efficiency gains**: financial institutions are **increasingly adopting AI** for compliance. A study by Moody's Analytics revealed that 51% of compliance and risk management professionals are utilising AI for fraud detection, underscoring its growing importance in the sector.
- **Market growth**: the **global market for AI** in fraud detection was valued at **USD 12.4 billion** in 2024 and is projected to reach **USD 65.35 billion** by 2034, reflecting the escalating investment in AI-driven compliance solutions.

These figures underscore a crucial reality: AI isn't just a tool – it's becoming the backbone of effective regulatory oversight in crypto payments. →

The global regulatory divide: who's leading the charge?

The European Union is setting the tone with its Markets in Crypto-Assets (MiCA) regulation, coming into effect in 2025. MiCA mandates licencing for crypto-asset service providers and enforces strict AML and KYC protocols. This provides long-awaited clarity, helping institutions integrate Web 3 payments into mainstream finance with greater confidence.

Meanwhile, the US remains a regulatory patchwork. While federal agencies such as FinCEN, the SEC, and CFTC impose strict compliance requirements, the lack of cohesive legislation creates uncertainty. New York's BitLicence provides a model for responsible oversight, but a national framework remains elusive. This regulatory gap slows institutional adoption and forces payment providers to navigate a shifting landscape.

> *"Regulatory compliance shouldn't be a roadblock to innovation. It should be a competitive advantage.*

Other jurisdictions are taking varied approaches. The UAE's Virtual Assets Regulatory Authority (VARA) is positioning Dubai as a hub for compliant crypto transactions, while Singapore's Payment Services Act has introduced a licencing framework that prioritises AML measures without stifling innovation. Countries that embrace balanced regulation will likely lead the Web 3 payments revolution.

Challenges for traditional payment providers

For legacy financial institutions, Web 3 payments present both an opportunity and a massive compliance headache. Consider PayPal's entry into the space with its PYUSD stablecoin. To comply with New York's strict BitLicence requirements, PayPal had to build compliance infrastructure from the ground up, adapting to crypto's real-time transaction landscape.

Banks and payment providers must rethink compliance at every level:

- **Real-time fraud detection**: unlike traditional transactions, blockchain payments are instantaneous and irreversible, making proactive fraud detection essential.
- **AML and KYC adaptations**: decentralised finance (DeFi) adds complexity, requiring AI-driven solutions to track suspicious activities across multiple chains.
- **Interoperability struggles**: legacy systems aren't designed for blockchain's transparency and immutability, making compliance integration a technical challenge.

A 2025 report by PwC highlights that **74% of financial institutions see regulatory uncertainty as the biggest barrier to Web 3 adoption**. Yet, those who adopt AI-powered compliance solutions are seeing significant advantages. ➔

Crystal Intelligence

AI's role in revolutionising crypto compliance

The key to navigating this complex regulatory environment? AI-driven compliance tools.

1. **Real-time blockchain monitoring:** AI improves **AML compliance** by detecting illicit transactions at scale. For instance, Crystal Intelligence's AI algorithms analyse blockchain data in real time, identifying high-risk wallets before they engage in illicit activity.
2. **Automated identity verification:** AI-powered KYC solutions streamline onboarding, verifying user identities against blockchain transaction histories. This significantly reduces onboarding fraud while enhancing regulatory adherence.
3. **Predictive risk analytics: AI** can forecast compliance risks before they escalate. By analysing historical patterns, machine learning models can flag suspicious transactions before they trigger regulatory red flags.
4. **Cross-border compliance harmonisation:** AI bridges gaps between different regulatory jurisdictions, ensuring that businesses can operate globally without violating local compliance laws.

> *"As blockchain adoption grows, institutions that leverage AI-driven compliance solutions will be best positioned to navigate regulatory complexities.*

AI agents: the future of compliance teams

We are witnessing the rise of AI-powered compliance 'agents' – digital assistants capable of autonomously managing regulatory tasks. A **MarketsandMarkets report** predicts that the AI agents market will surge from USD 5.1 billion in 2024 to USD 47.1 billion by 2030, reflecting enterprises' growing reliance on AI-driven automation. Additionally, McKinsey estimates that AI-powered automation could contribute up to USD 4.4 trillion annually to the global economy by 2030. These agents will act as extensions of compliance teams, adapting to regulatory changes in real-time and minimising human error.

Imagine an AI compliance officer that:

- Instantly flags risky crypto transactions before they are completed;
- Monitors global regulatory updates and adjusts compliance protocols accordingly;
- Provides audit-ready reports with full blockchain transparency.

For financial institutions, these capabilities could be the difference between thriving in the Web 3 era and falling behind competitors who embrace AI-driven compliance solutions. ➔

Crystal Intelligence

The future of Web 3 compliance: preparing for AI-driven regulation

As AI becomes more deeply embedded in compliance frameworks, we are moving toward a future where regulatory agencies themselves will rely on AI-driven monitoring. Government bodies in Europe, Singapore, and the UAE are already exploring AI's role in overseeing digital assets. In the US, the SEC has increased investments in AI analytics to monitor crypto transactions.

A McKinsey report predicts that by 2028, AI-powered compliance frameworks will reduce financial crime by 40% globally, saving institutions billions in penalties and fraud-related losses. This highlights a fundamental shift: compliance is no longer just a defensive measure but a strategic advantage.

Embracing Web 3 compliance with AI

Despite its challenges, Web 3 payments are an unavoidable evolution of global finance. AI is no longer a luxury – it's a necessity. As blockchain adoption grows, institutions that leverage AI-driven compliance solutions will be best positioned to navigate regulatory complexities while tapping into the full potential of decentralised finance.

For payment providers, the message is clear: regulatory compliance shouldn't be a roadblock to innovation. It should be a competitive advantage. The firms that integrate AI-driven compliance now will lead the charge in Web 3 payments, setting the stage for a future where security, trust, and transparency define the financial landscape.

> *"By 2028, AI-powered compliance frameworks will reduce financial crime by 40% globally, saving institutions billions in penalties and fraud-related losses.*

the paypers

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