

Abstraction Without Compromise: A Hard-Money Foundation for a Unified Web3

Co-authored by Aztec Amaya and Alexander Shipp

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II. Abstract

This paper is written in three parts. The first identifies the adoption bottleneck that continues to plague decentralized systems, despite rapidly advancing innovation and improvements in infrastructure and performance. Pointing to an ever-fragmentating decentralized landscape, part one recognizes that as chains, execution environments, and assets have multiplied, the broader Web3 ecosystem has imposed heavy demands on users. Noting that incremental innovation can no longer move the needle on adoption barriers, part one directs efforts toward simplifying user experience by eliminating complexity from Web3 frontends.

The second part introduces the recently announced Ethereum Interoperability Layer (EIL) proposal, which formalizes a wallet-native, streamlined experience for users in Ethereum's vast multichain ecosystem. To complement this vision, part two highlights the importance of upholding decentralization and other critical design principles, and emphasizes that no such compromises can be permitted in the process of enhancing user experience.

Finally, part three presents Litecoin as the foremost hard-money foundation for a unified Web3 interface that stands to uphold the highest level of decentralization across an interoperable network of EVM chains. This section presents proprietary, empirical research analysis that provably demonstrates Litecoin's globally distributed, retail-driven network based on LTC distribution and network activity. To extend Litecoin's programmability, part three introduces LitVM, a Layer-2 Litecoin virtual machine that enables EVM-compatible smart contracts while upholding Litecoin's hard-money principles at the base layer. In conclusion, the paper submits LitVM as a viable chain prepared to play a foundational role preserving Web3's hard-money roots within Ethereum's unified, wallet-native, and adoption-ready future.

III. Introduction

In spite of a landmark institutional entry and the approval of numerous spot Cryptocurrency Exchange-Traded Funds (ETFs), Web3's latest growth cycle struck disappointment into both onchain enthusiasts anticipating grassroots movements and token investors seeking returns. Without a major influx of new users to drive it forward, 2025's lackluster growth wave turned out to be propelled mainly by institutional demand — much to the disappointment of the many that had anxiously anticipated a potent and colorful alt season. Nonetheless, Web3 development marched onward: non-custodial perpetuals proved capable of sustaining major trading volume, agentic execution began automating routing and risk management directly onchain, and infrastructure improvements and superior data availability lowered latency in DeFi. Without exception, Web3's technical ceiling rose yet again in 2025 — it is only unfortunate that the usability floor did as well.

Simply put, it is not a lack of technical capability that is stalling adoption, but a lack of ecosystem cohesion. While Web3 continues to improve and advance, the decentralized nature of its competitive dynamics is overwhelming and deterring new users. Without a singular controller guiding and directing innovation, Web3 innovation is accelerating at the breakneck speed of a truly free market; but innovation is driving ecosystems in many different directions, as escalating fragmentation across Layer-1 networks, Layer-2 scaling systems, bridges, and myriad synthetic asset models has introduced cognitive overhead, additional trust assumptions, and ever-steepening user onboarding processes. As the number of active blockchains and scaling layers continues to grow, the industry faces a decisive inflection point where innovative features, capital management tools, and throughput performance no longer compose the primary adoption bottleneck.

Unless and until abstraction and interoperability become paramount in Web3, decentralized technologies — however profound and revolutionary — will remain both unpalatable and inaccessible to the mass market, whose preferences place user experience above all else.

1. The Path to Adoption is Paved with Abstraction

From the very origins of machine-based computation, abstraction has played an instrumental role in advancing digital technologies towards adoption. In simple terms, an abstraction portrays digital information in a format that humans can naturally understand and interface with. Abstractions do not change information per se; they simply transform, repackage, and reorganize it. Desktop monitors and touch-screen displays are rudimentary abstractions of computing hardware that modern internet users take for granted; without them, attempting to interact with the digital world would be futile. Thus, building every subsequent, digital-native technical component — from hardware to software, internet platforms, financial applications, and beyond — requires myriad layers of abstraction to offer a comfortable, intuitive experience for human users, who prefer to select outcomes rather than engineer processes.

Today's most successful digital-native products — from mass market hardware devices like the Apple iPhone and Samsung Galaxy to mass market social media applications like TikTok, X, and Instagram — all balance sophisticated backends with simple, intuitive frontends, providing an array of in-demand features within a seamless user interface.

Today's leading Web3 applications, on the other hand, tend to provide user experiences that mirror the complexity and sophistication inherent in their underlying protocols. For all but the most enthusiastic users and technologists, such complex system design acts as a major barrier to new user onboarding and broad adoption. Nonetheless, Web3 would be foolish to fret; for the mission to implement frontend abstractions and reduce technical complexity is not a novel challenge for the industry — nor is it one that onchain technologies have not previously conquered.

2. Web3's Biggest Success Stories

Contrary to the common wisdom that shaped early crypto discourse, crypto's most principled and resilient hard-money networks did not scale and generate network effects on innovative cryptography alone. In reality, their paths to prominence were paved with crucial abstractions that reduced onboarding friction, simplified user experience, and streamlined adoption initiatives.

Long-time hard-money networks Bitcoin and Litecoin formed grassroots communities and robust user bases with the help of abstractions that translated highly technical, protocol-level mechanics into familiar concepts and tooling. Taken for granted today, each abstraction obscures a specific form of complexity without altering the system's core operating parameters. With raw state transitions and scripts for developers on the backend, and balances, payments, and contacts for users on the frontend, 5 key abstractions made all the difference for Bitcoin and Litecoin in the early days. Notably, each abstraction was produced not by modifying the base-layer protocol, but by augmenting state-aggregation and execution clients — or as they are commonly called today, wallets.

Wallet applications contributed a number of powerful abstractions that continue to drive the adoption of the Bitcoin and Litecoin networks at their present day scale.

- **Account Balances:** Wallets translate fragmented onchain state into a single spendable balance by aggregating all unspent transaction outputs (UTXOs), allowing users to interact with Bitcoin and Litecoin as they would a bank account despite the absence of native balances at the protocol level.
- **Possession:** Wallets transform raw private key control into persistent, recoverable ownership through deterministic key derivation and seed phrases, enabling users to maintain possession across devices without directly managing cryptographic material.
- **Simple Payments:** Wallets collapse script-based transaction execution into simple “send” and “receive” actions, so users can initiate payments without understanding underlying spending conditions or validation logic.

- **Payment Destination:** Wallets route payments directly to people and services they know by presenting addresses as reusable identifiers, QR codes, and saved contacts.
- **Settlement Confidence:** Wallets present transactions as either “pending” or “confirmed,” enabling users and merchants to gauge settlement timing and counterparty risk without examining backend verification processes.

Via the abstractions provided by wallet applications, Bitcoin and Litecoin were able to onboard users and efficiently scale their networks without changing their core code.

Thus, usability — and therefore, adoption potential — is not an innate property of a base layer, but the end-product of the layered abstractions constructed atop it.

IV. A Unified World Ledger Of The Future

Recent developments within the Ethereum ecosystem point to the broader direction Web3 must take in order to get back on track for its mass market future. While its countless rollups, Layer-2 chains, and bridging frameworks have played instrumental roles improving performance and driving growth for its ecosystem, the Ethereum Foundation has finally acknowledged that overall usability has borne the cost of growth. Even as Ethereum expands, fragmentation at the protocol level is introducing new complexity that incoming users cannot be realistically expected to manage.

In a November 2025 research and design initiative led by the Ethereum Foundation's Account Abstraction and Interoperability teams, researcher Yoav Weiss and collaborators articulated a formal vision for reducing the network's fragmentation [1]. Aptly titled, Making Ethereum Feel Like One Chain Again, the paper concedes that Ethereum's scaling achievements have also forced users to manage multiple chains, track an array of different balances, and vet for reliable bridges and relayers to move value effectively and securely. In order to prioritize simplicity for users, Weiss and co. propose a wallet-native interoperability abstraction called the Ethereum Interop Layer (EIL), which is built on ERC-4337 account abstraction principles [1]. EIL is presented as the key technical component that allows users to initiate and settle multi-chain operations with a single signed action from their wallets, automatically handling routing, execution, and cross-chain state coordination without introducing new trust assumptions or intermediaries [1]. Per the authors' analogy, EIL effectively does for Ethereum what HTTP did for the early internet: it allows users to seamlessly navigate otherwise isolated networks [1].

Most importantly, the EIL is to be guided by The Trustless Manifesto — a document Weiss co-authored with Vitalik Buterin and published a week before releasing the EIL vision [2]. The Trustless Manifesto explicitly anatomizes the goal of preserving Ethereum's core principles — self-custody, censorship resistance, disintermediation, privacy, and verifiable onchain execution — even and especially in the face of rising challenges [2]. Together, The Trustless Manifesto, Making Ethereum Feel Like One Chain Again, and the EIL lay out the right path for Web3: one which recognizes that usability is achieved through interface unification, and prioritizes both cogent abstractions and base-layer integrity as key components of a comprehensive, systems-level solution.

V. Upholding Decentralization: The Full Picture

The introduction of EIL offers a necessary reminder that — like for any other onchain convenience — usability must not come at the expense of decentralization. However, decentralization is not only an emergent property of an onchain network, but an attribute of the asset(s) it supports. While abstractions can support self-custody and sovereign execution as they unify disparate networks into a single interface, they retroactively imbue assets with hard-money attributes. Presented in The Trustless Manifesto as non-negotiable principles, self-custody, censorship resistance, disintermediation, and verifiable execution can be enforced through interface design and execution routing, but they originate with the chains whose consensus rules, validator sets, and governance constraints lay the foundation for decentralization, and the assets whose issuance rules, supply constraints, and settlement finality carry that decentralization into economic activity.

On this accord, EIL's vision is realized if it successfully unifies Ethereum into simplified interfaces, and:

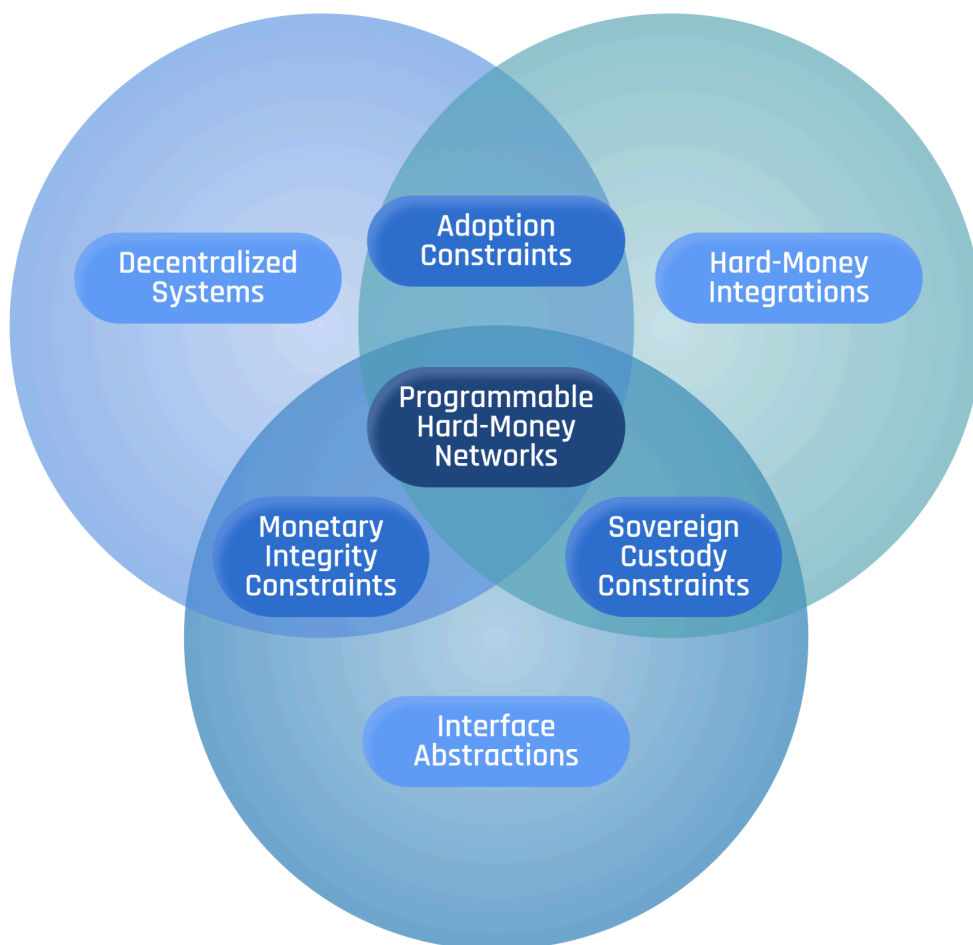
- (1) Does not introduce new intermediaries or vectors for trust;
- (2) Integrates Ethereum-native chains that operate in a decentralized, trustless manner;
- (3) Integrates crypto's most principled, hard-money assets from non-Ethereum chains.

Web3's most robust, hard-money assets are those which originate from hard-money networks, and which derive their attributes from immutable monetary rules, permissionless validation, and robust settlement. These systems minimize trust not by abstracting it away, but by refusing to introduce it in the first place. Their limitations — restricted programmability, conservative upgrade paths, and rigid consensus mechanisms — are the very mechanisms that have historically made them reliable monetary bases. It is for this reason that a hard-money foundation is the missing component in EIL and many similar technologies: interfaces and execution can be abstracted, but monetary attributes cannot be manufactured.

If EIL is to represent a genuinely trustless interface layer for Web3, it must not only abstract Ethereum's internal fragmentation, but also accommodate assets whose decentralization exceeds that of Ethereum's own execution environment. A wallet-native future that meaningfully serves users cannot confine itself to assets native to a single computation layer. To the contrary, EIL must integrate Web3's truest, hard-money assets without forcing them through wrappers or other custodial compromises.

Above all, EIL and other interoperability solutions confirm that Web3 technologies are converging on a core principle: decentralization must be preserved beneath abstraction — not traded away for it. The next step is ensuring that this principle applies not only to execution and routing, but to money itself. Without hard money at the foundation, all innovation will become a trivial exercise in providing convenience. It is for this reason that Litecoin’s most fundamental role is to serve as the unwavering base layer for Web3 innovation.

We must not forget the real endgame: a unified world ledger with hard money at its core.



VI. Litecoin: The Right Hard-Money Asset For A Unified Web3 Experience

In the realm of hard money, Litecoin occupies a unique position. Often overlooked, Litecoin was not designed to compete with EVM execution environments, nor to displace Bitcoin's role as a primary store of value. Rather, it was designed intentionally as a payments-first hard-money network that specializes in reliable settlement, low transaction costs, and a resilient operating capacity.

With 14 years of consecutive uptime and counting, Litecoin's modern user demographic reflects its original design intent. In contrast to many prominent ecosystems where supply concentration is heavily weighted toward venture funds, foundations, and institutional allocators, the Litecoin network remains predominantly retail-driven, with more than 8.7 million holders worldwide and retail participants controlling over half of the circulating supply [3]. Litecoin's ownership profile has emerged organically through mining operations, healthy market activity, and robust payments utility, producing a base composed largely of individual users, long-term holders, miners, merchants, and commercial customers. While institutional involvement is expected to increase over the coming years as regulatory clarity improves and Litecoin's longevity attracts more traditional capital, the network's current structure remains fundamentally retail-native [4].

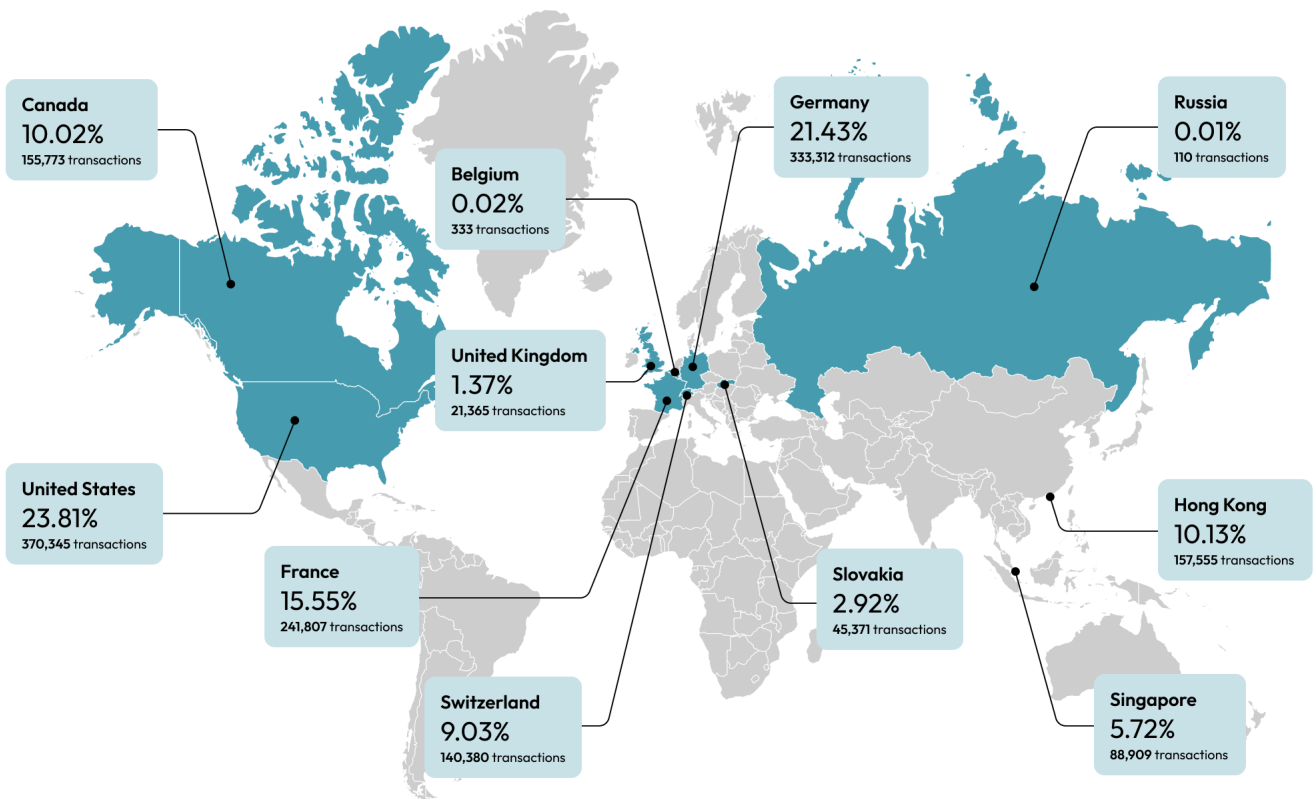
Litecoin's orientation toward retail is not only a matter of LTC ownership distribution, either; the same pattern is also reflected in network activity. Litecoin's weekly active users metric consistently hovers around 1.3 million, and in 2024 alone the network processed nearly 93 million transactions [5]. These figures indicate an engaged user base of substantial size that interacts with Litecoin as a functional payments network independent of speculative dynamics. Much of Litecoin's payments activity is driven by users in both emerging and developed markets who rely on Litecoin for low-cost, near-instant peer-to-peer payments, cross-border transfers, and merchant settlement, particularly where banking infrastructure is unreliable or fees are prohibitive. Faster block times and lower fees relative to Bitcoin continue to elevate Litecoin as a practical medium of exchange that rigorously upholds hard-money principles [4].

To better gauge the global character of Litecoin network activity, proprietary research was conducted on Litecoin's geographic distribution with the assistance of [Taha Dhailey](#), a proof-of-work developer recognized for operating the Txcity blockchain explorer and contributing to Litecoin-adjacent infrastructure. Using direct Litecoin node peer-announcement tracking, Dhailey analyzed a probabilistic sample of over 1.55 million transactions to identify statistically significant geographic patterns in network propagation. While the methodology is subject to the inherent uncertainty of IP-based inference, it provides one of the most detailed global views of Litecoin's active user distribution to date.

The results demonstrate that the Litecoin network is both globally distributed and exceptionally balanced relative to other prominent blockchain networks. Europe accounts for just over half of observed transaction propagation, with Germany, France, Switzerland, Slovakia, the United Kingdom, and Belgium collectively representing approximately 50.3% of total activity. North America follows with roughly 33.8%, driven primarily by the United States and Canada, while Asia — represented in the sample by Hong Kong and Singapore — accounts for approximately 15.9%. No single region exercises overwhelming dominance, and activity is well dispersed across major jurisdictions and economies. Notably, earlier analyses based on smaller samples suggested a significantly higher U.S. concentration near 30%, but as the dataset expanded beyond 1.5 million transactions, the U.S. share normalized downward to roughly 23.8%, indicating a more distributed global footprint than initially assumed.

Additional insights from the dataset reinforce Litecoin's network decentralization, as over 30 distinct IP ranges were confidently mapped to specific countries, with major peers each handling over 100,000 transactions, suggesting stable, long-running nodes. As data collection continued, observed peer diversity increased from 11 peers across 8 countries to 33 peers across 11 countries, further indicating broad geographic coverage and resilient network topology. At large, these research findings depict a monetary network whose activity is neither regionally concentrated nor institutionally bottlenecked, and one which is sustained by a diverse set of long-term participants across varied and diverse jurisdictions.

Litecoin's geographic network topology demonstrates that decentralization is a distinct, measurable property of a network — namely, how it is used, who controls its assets, and where its economic activity occurs. Litecoin's global, retail-driven usage profile also stands in direct alignment with the key principles designated in The Trustless Manifesto. The Litecoin network minimizes discretion, resists capture, and treats monetary rules as fixed parameters. Its proof-of-work consensus mechanism and immutable ledger have remained stable across more than 14 years of operation, multiple market cycles, and shifting regulatory environments — the truest prerequisite for trustless abstraction [4].



Region	Share of Transactions (%)	Transactions Observed
Europe	50.32%	782,868
North America	33.83%	526,118
Asia	15.86%	246,574
Other	0.01%	110

VII. LitVM: Programmability Without Compromise

In the modern Web3 space, operating from a single base layer without EVM-compatibility places natural limits on Litecoin-native innovation — in particular, those that stem from a lack of native programmability. For much of Litecoin’s lifespan, this tradeoff has been accepted as the price of hard money, as any attempt to move LTC into other environments — especially EVM chains — would have required wrapping, centralized intermediaries, and other custodial solutions. Unwilling to sacrifice any degree of decentralization for programmability, Litecoin stayed true to its principles, waiting patiently for a solution that could realize the best of both worlds without imposing tradeoffs.

With the launch of LitVM, the first trustless Litecoin Virtual Machine, Litecoin’s hard-money principles and EVM programmability will no longer be bound by mutual exclusivity. For the very first time, a Layer-2 programmable execution environment will preserve Litecoin’s monetary properties. Leaving Litecoin’s base layer untouched, LitVM operates as a Layer-2 virtual machine that settles back to the Litecoin network and Ethereum, leveraging its robust security and monetary integrity to secure transactions. Meanwhile, LitVM introduces trustless zero-knowledge capabilities for smart contracts, enabling the development of dApps and cross-chain interoperability solutions. Retail users — many of whom are already accustomed to Litecoin’s payments efficiency, but have been limited by its lack of programmability — will soon gain access to advanced applications and features like onchain lending, DEXs, Litecoin-backed stablecoins, Real World Assets (RWAs), and cutting-edge agentic tech, all of which unlock new ways to earn yields, automate transactions, and participate in Web3 culture.

Among these platforms and features, those which integrate agentic tech present a particularly novel arena that is ripe with disruptive potential. Having already established a strong presence in several on-chain ecosystems, AI agents are increasingly mediating how users interact with Web3, from executing transactions, to managing portfolios and coordinating activity across otherwise disparate ecosystems, platforms, and applications. Working with top-notch developer teams to ensure on-chain AI is designed for right purposes and use cases, LitVM stands as the critical infrastructure that will allow the Litecoin community to fully participate in the rising agentic economy. As personal agents operate atop shared, multi-chain interfaces, LitVM will extend Litecoin’s capabilities, allowing LTC to function seamlessly within AI-assisted workflows without reliance on custodial bridges, wrapped assets, or centralized execution layers.

At its core, LitVM aligns directly with the vision introduced by both the EIL and The Trustless Manifesto. Where the EIL focuses on interface-level abstraction and execution routing across heterogeneous chains, LitVM ensures that one of the most powerful decentralized monetary networks in existence can participate in that future without compromising on its decentralized system architecture. In short, LitVM provides a trustless execution through which Litecoin can integrate into a unified, wallet-mediated Web3 experience such as the EIL or any other unified abstraction technology, while remaining sovereign as a global payments medium.

VIII. Conclusion: Hard-Money Web3, Unified.

Web3's adoption barriers are no longer rooted in innovation. The ever-inventive decentralized landscape has repeatedly demonstrated its capacity to scale, optimize execution, and engineer sophisticated onchain systems for the next-generation digital world well within the horizon. What it has struggled to do is present those systems as a coherent, intuitive whole to ordinary users. Fragmentation across chains, layers, assets, and interfaces has steadily raised the cognitive and operational cost of participation, even as technical capabilities have advanced. The solution does not lie in sacrificing decentralization for usability, nor in attempting to collapse money and computation into a single, overburdened base layer. Instead, the path forward for Web3 is one of deliberate, uncompromising abstraction that simplifies interfaces, unifies chains, and upholds trustless system design at every juncture.

As exemplified by the EIL, the industry's growing consensus around interface-level abstraction has rightfully identified frontend complexity as Web3's foremost adoption barrier. But in order to follow its own mandate to maintain decentralized system architecture, the EIL and other interface-unifying solutions must integrate hard money at their foundations. Otherwise, the entire Web3 ecosystem risks becoming efficient at the expense of producing meaningful change. As a globally distributed, retail-native, proof-of-work network with hardcoded issuance and 14 years of consecutive uptime, Litecoin provides a robust monetary foundation for a unified Web3 experience. By extending Litecoin with trustless programmability, zero-knowledge-enabled interoperability, and modern execution capabilities, LitVM reconciles two domains that have long been treated as mutually exclusive: hard money and EVM dApps. Most importantly, LitVM does so without compromising Litecoin's hard-money principles or inciting modifications to its base layer.

The future of Web3 is unified, inclusive, and permissionless; with Litecoin plugged in via LitVM, it can be decentralized, trustless, and grounded in hard money too. Our industry has been searching for its next big breakthrough, and many across the space remain disillusioned by the prevailing issues of degradation and exploitation. By fusing key technical components of Bitcoin, Litecoin, and Ethereum together, LitVM is forming an ecosystem where seamless capital flows bring Web3 technologies, applications, and users together in symbiosis. Now is the right moment to bring purpose and utility to Web3 by returning to its founding principles — that is, uniting hard money with Web3.

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