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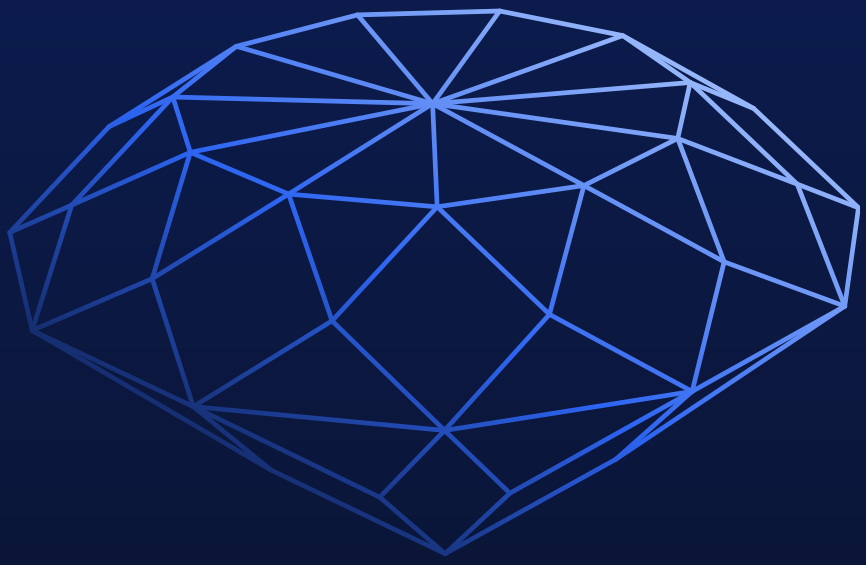

Case Study

Building an Audit-First Smart Contract – Powered Platform that Brings Traditional Financial Instruments On-Chain

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Unlocking the Potential of Digital Assets

In a world where digital transformation is reshaping every industry, the financial sector stands at a critical juncture. Traditionally, private markets have been defined by limited access, operational friction, and complex, opaque processes. However, the emergence of decentralized finance (DeFi) and blockchain technologies is creating a path to a more efficient and transparent future. This shift is not about replacing traditional finance but rather about upgrading its core infrastructure. By bringing traditional financial instruments on-chain, these innovations promise to create deeper, more liquid markets with enhanced transparency and controlled risk.

This bold vision requires the foresight and commitment of seasoned asset managers willing to lead the charge. This is the pivotal role of entities like Coinbase Asset Management. Their mission is to accelerate this market evolution by building secure, transparent, and auditable financial instruments that eliminate the need for traditional intermediaries. This was the visionary goal of Shaun Martinak and his team for Project Diamond — a platform we at Lime Institutional were privileged to help bring to life.

Our shared vision was to build a new type of financial platform that would enable businesses to access efficient financial instruments in a secure, auditable, and transparent manner, realizing the promise of a more open and accessible global financial system.

Project Diamond: A Compliant and Auditable On-Chain Solution

The truth is, traditional private markets have always had some significant problems. They often struggle with things like complicated paperwork, limited access for investors, and slow processes that can be frustrating and costly. It's a system that can be a real hurdle for asset managers trying to meet a growing demand for new investment opportunities.

Project Diamond was conceived as the direct antidote to these challenges. It is a compliant, interoperable system, meticulously designed for institutional investors to manage digitally native assets with enhanced transparency and efficiency. From the outset, the platform was built with an "audit-first" approach, ensuring every transaction is traceable and secure. This design philosophy aligns DeFi innovation with the stringent oversight required by global financial institutions, making Project Diamond a system built on trust and designed to bring practical and efficient financial instruments to businesses that need them.

Lime Institutional's Role: An Architectural and Development Partnership

Project Scope and Strategic Collaboration

As the main blockchain consulting and development partner, Lime Institutional collaborated closely with Coinbase Asset Management to define and build the platform. Our role spanned the entire development lifecycle, from initial consulting and discovery to the implementation of the secure digital signature system and the automation of token and network additions. Key elements of the project's scope included:

- **Platform Creation:** We built a secure, blockchain-based platform enabling institutions to create, buy, and sell digitally native financial assets.
- **Significant R&D:** The project involved extensive research and development to ensure the platform provided a clear return on investment and practical utility within an easy-to-navigate environment.

- **Regulatory Clarity:** A strategic priority was launching the platform with regulatory clarity, and it successfully received in-principle approval from the Financial Services Regulated Activity (FSRA) of Abu Dhabi Global Market (ADGM), entering the agency's RegLab sandbox.

How Project Diamond Works: A Walkthrough

Project Diamond streamlines complex financial processes into a secure and transparent on-chain flow. Its primary goal is to simplify the user experience, especially for participants new to web3, by eliminating unnecessary steps and reducing complexity. To achieve this, the platform uses Account Abstraction (ERC-4337). The mechanism is straightforward: the system automatically provisions a dedicated smart wallet for every Externally Owned Account (EOA) wallet, which then acts on its behalf. This smart wallet can take multiple signed instructions, called userOps, and bundle them together, allowing the user to approve a complex operation with just a single transaction.

We are also working on implementing EIP-7702, an upgraded account abstraction protocol that will further simplify the user experience by allowing EOAs to temporarily delegate execution to smart contracts, unlocking powerful programmability and advanced features.

Project Diamond defines key roles for participants to ensure a controlled and auditable environment: "lender," "borrower," and "admin," all of whom participate directly in the clear transaction flow outlined below.

The Transaction Flow

1. **The borrower initiates a debt instrument, created both on and off chain, and signs it using their web3 wallet.**
2. **The lender accesses the marketplace, selects the loan, and places a bid, also signing the transaction with their web3 wallet.**
3. **Auction is run, finalizing the loan agreement, and distributing funds to all sides of the deal.**

4. **The borrower settles the loan, which is confirmed by signing a transaction with their web3 wallet.**

5. **When the loan is repaid, the admin joins and closes the repayment transaction, thus concluding the loan.**

So, why build this on-chain? The answer lies in the fundamental value proposition of blockchain technology: transparency, immutability, and efficiency. Every transaction is a permanent, verifiable record on the blockchain, eliminating disputes and providing real-time auditability. This level of data integrity is a powerful upgrade from the fragmented, paper-based processes of traditional finance.

Platform Capabilities at a Glance

Derived from a competitive analysis of the institutional DeFi landscape, Project Diamond's capabilities are deliberately scoped to align with regulated finance:

- **Funding Asset**: Regulated USD Stablecoin
- **Collateralization Level**: Uncollateralized
- **Credit Evaluation**: Handled by the Lender
- **Debt Structure**: Individual Borrowers
- **Default/Recovery**: Offchain Legal Process
- **AML/KYC**: All Users
- **Secondary Trading**: All Platform Assets
- **Offchain Legal Agreements**: Yes
- **Clear Regulatory Alignment**: Yes
- **Audit & Regulatory Reporting**: Yes

Project Diamond: Technical Architecture and Innovation

The decision to build Project Diamond on-chain is driven by the fundamental value proposition of blockchain technology: transparency, immutability, and efficiency. The technical architecture is engineered for institutional use, abstracting blockchain complexity to provide a secure, scalable, and intuitive platform for financial asset management.

Primary Functionality: Asset Creation and Lifecycle

The core of Project Diamond centers on defining and managing the financial asset lifecycle through robust smart contracts.

1. Creation of Financial Instruments (Diamond Standard)

The platform utilizes the Diamond Standard (EIP-2535), a smart contract pattern that ensures a modular and upgradeable architecture. This design allows each new financial instrument to create its own "Diamond" on the blockchain. Although this represents a detailed setup, it results in massive long-term savings — preventing hundreds of thousands of dollars in costs compared to traditional, manual processes.

2. Supporting Mechanisms

The system further leverages Loan Vaults (EIP-4626) for asset standardization and management. Crucially, to maintain cost efficiency, the Dutch auction logic is embedded and executed off-chain to significantly reduce gas fees. Only the final, determined logic is then sent to the blockchain for contract finalization.

Additional Innovation: Web 3 Document Management System (W3DMS)

The Web 3 Document Management System (W3DMS) represents an innovative framework developed by Lime Institutional for advanced blockchain asset management. W3DMS was designed to handle the creation, storage, validation, and signing of all necessary legal documents.

Although this system is complete and functional, its final integration with traditional legal services and the full signing flow is currently a planned feature on the product roadmap, not yet used in live production. Nevertheless, W3DMS provides verifiable history and traceability for all off-chain agreements, establishing the necessary infrastructure to bridge traditional legal processes with on-chain immutability in the future.

Strong Focus on UX/UI

The overall architecture is a testament to careful planning and execution, emphasizing security and performance. The UI/UX was designed to be intuitive and accessible, abstracting the technical complexities of the blockchain to create a seamless experience for institutional users. This design was guided by Coinbase design system patterns, utilizing the color palette and styles for a consistent look. The plan is to adopt the internal Coinbase design system in the future.

> *Project Diamond is the tangible expression of more than a decade of on-chain innovation, bridging the chasm between blockchain's promise and its enterprise implementation.*
>
> — Dimitar Ivanov, Chief Delivery Officer of Lime Institutional

A New Era for Private Markets

Project Diamond is more than just a platform; it is a proof of concept for the future of finance. This initial phase was only the beginning of a larger mission to tokenize and bring a vast range of assets on-chain. By successfully demonstrating that complex financial instruments can be managed in a secure, compliant, and transparent on-chain environment, Project Diamond has paved the way for more liquid and accessible private markets. It represents a powerful upgrade to operational efficiency and a significant step toward unlocking institutional participation in the global cryptoeconomy.

The platform's commitment to compliance was firmly established by securing in-principle approval from the Financial Services Regulatory Authority (FSRA) of the Abu Dhabi Global Market (ADGM), allowing it entry into the agency's RegLab sandbox.

This significant milestone serves as an important step toward unlocking broader institutional adoption and participation in the creation, tokenization, and trading of digitally native assets. As Shaun Martinak notes:

> *Project Diamond represents a foundational achievement in bringing traditional capital markets on-chain and delivering an internet-native upgrade to finance, allowing us to define ownership and create programmable financial relationships. Our commitment at Coinbase is to build the institutional-grade infrastructure to realize this vision, and the technical partnership with Lime was critical in architecting a platform that is compliant, auditable, and ready for global adoption.*
>
> — Shaun Martinak, Coinbase Asset Management

Frequently Asked Questions

Why was blockchain chosen over a traditional database for Project Diamond?

A traditional database can record transactions, but it cannot independently prove that those records have not been altered. Project Diamond required a system where every transaction is a permanent, verifiable record — one that investors, auditors, and regulators can read directly without relying on the platform operator's assertions. Blockchain provides that immutability and transparency natively, eliminating disputes and enabling real-time auditability that paper-based or centralized processes cannot match.

What is the "audit-first" approach, and how does it differ from standard blockchain projects?

Most blockchain projects optimize for speed or cost first and treat compliance as a layer added later. Project Diamond inverted that priority. Every architectural decision — from smart contract design to role-based access — was made with auditability and regulatory traceability as the primary constraint. The result is a platform where compliance is structural, not cosmetic: transactions are traceable end-to-end, roles are enforced on-chain, and the entire lifecycle of a financial instrument is visible to authorized parties.

What is the regulatory status of the platform?

Project Diamond received in-principle approval from the Financial Services Regulatory Authority (FSRA) of the Abu Dhabi Global Market (ADGM), entering the agency's RegLab sandbox. This is a significant milestone that validates the platform's compliance architecture and positions it for broader institutional adoption across jurisdictions.

How does Account Abstraction (ERC-4337) improve the experience for institutional users?

Institutional participants are not crypto-native users. Account Abstraction removes the friction of managing gas fees, signing multiple transactions, and understanding wallet mechanics. The system automatically provisions a smart wallet for each user that bundles multiple signed instructions into a single approval. Complex multi-step operations — loan initiation, bidding, settlement — become single-click actions. The planned upgrade to EIP-7702 will simplify this further by allowing standard wallets to temporarily delegate execution to smart contracts.

Why was the Diamond Standard (EIP-2535) selected for the smart contract architecture?

Financial instruments are not static. They evolve as regulations change, new asset classes are added, and operational requirements shift. The Diamond Standard provides a modular, upgradeable architecture where each financial instrument creates its own on-chain "Diamond" — a self-contained contract that can be extended without redeploying the entire system. This prevents the costly rebuild-from-scratch cycles that plague monolithic smart contract designs and delivers massive long-term savings compared to traditional manual processes.

What is the Web 3 Document Management System (W3DMS), and is it live?

W3DMS is an innovative framework developed by Lime Institutional for creating, storing, validating, and signing all legal documents associated with on-chain financial instruments. It provides verifiable history and traceability for off-chain agreements, bridging traditional legal processes with on-chain immutability. The system is complete and functional; its full integration with traditional legal services and the signing flow is on the product roadmap and not yet used in live production.

Can this architecture be applied to asset classes beyond debt instruments?

Yes. The platform was deliberately architected to be extensible. While the initial phase focused on debt instruments and invoice factoring, the modular Diamond Standard design, role-based access controls, and audit-first compliance framework are asset-class agnostic. The roadmap includes tokenization of a broader range of financial instruments — the infrastructure built in this phase is the foundation for that expansion.

About Lime Institutional

Lime Institutional is a strategic advisory and technology delivery firm built on the engineering foundation of more than nine years at the forefront of blockchain and digital assets development and over 300 projects delivered. We translate that deep engineering pedigree into clear, predictable, and fully executable solution paths for financial institutions and enterprises seeking to expand into the realm of digital assets safely and seamlessly.

From strategic advisory and enterprise architecture to tokenization infrastructure and full-scale implementation programs, we bring senior consultants, engineers, and architects into the room from day one — because strategy disconnected from technical reality is just another map that doesn't survive contact with the territory.

To discuss how Lime Institutional can design and deliver a blockchain solution for your financial infrastructure, visit limeinstitution.com or contact us.

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