

Transforming Asset Servicing With AI, Oracles, and Blockchains

Major market participants collaborate to structure and distribute corporate actions data via industry-wide, unified golden records

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Executive Summary

As the industry leader in securely bringing data onchain and enabling interoperability between blockchains and traditional systems, [Chainlink](#) is uniquely positioned to support the fundamental change in how data is originated and distributed in financial markets. Chainlink, together with nine of the world's largest financial market infrastructures and institutions, has launched an industry initiative to combine advancements in AI, oracles, and blockchains to solve a long-standing problem in corporate actions—the lack of real-time standardized data in fragmented markets like Europe. Corporate actions processing is deemed one of the most complex areas of post-trade and is one of the most complex unstructured data problems in the financial world.

This multi-phase initiative goes beyond previous corporate action initiatives in its aim to establish a new system architecture focused on sourcing and distributing corporate actions information by employing three large language models (LLMs) and Chainlink decentralized oracle networks to autonomously extract and standardize unstructured data from issuers and publish it onchain, thereby enhancing data availability and distribution. Additionally, the initiative uses a blockchain-agnostic strategy to create [interoperable and unified golden records](#) around this critical data as it moves across different environments.

To shape the technical foundation of this initiative, we convened a consortium of major participants from across the industry, including a Central Securities Depository (CSD), a market infrastructure, and multiple asset managers and global custodians. This initiative brings together financial and market infrastructures Euroclear and Swift, as well as major financial institutions

including Citi, UBS, Franklin Templeton, Wellington Management, Caceis, Vontobel, and Sygnum Bank.

Key Takeaways

Corporate actions present one of the most complex unstructured data problems in the financial world. Initially presented in human-readable formats like PDFs and press releases, this critical information—covering mergers, dividends, and stock splits—undergoes a complex journey through custodians, brokers, fund managers, exchanges, and ultimately investors. As it travels, the data often emerges in varying formats and states, leading to a fragmented ecosystem characterized by poor data timelines, duplicative sources, and extensive data cleaning efforts. This results in increased costs and heightened risk due to potential errors.

Along with market participants and three blockchain ecosystem partners—Hyperledger Besu, Avalanche, and ZKsync—we found that by using data oracles paired with multiple LLMs, we were able to source unverifiable, unstructured, and often unreachable offchain data and convert it autonomously into digital data that is available in near real-time and into predefined standards of specific corporate action types, modeled on the ISO 20022 framework and aligned with the Securities Market Practice Group (SMPG) guidelines, ensuring consistency and adherence to globally recognized industry best practices. This approach not only reduces uncertainty around using novel LLM models but also distributes data nearly instantaneously on shared infrastructure to provide a unified golden record for asset managers, CSDs, and custodian service providers. The first phase of the initiative focused on the initial announcement stage of different mandatory corporate action events across equity and fixed income within six European countries.

Specifically, this initiative demonstrated the following:

- **Established autonomous conversion** of unstructured data into structured data using established ISO standards, such as the Securities Market Practice Group (SMPG).
- **Facilitated a shared, near real-time view of data** via interoperability across public and private blockchain networks, as well as compatibility with existing financial systems.
- **Validated a novel architecture** for multiple corporate actions between sourcing and distributing critical financial data.

| Overview | Goal |
|---|---|
| This initiative leverages cutting-edge AI models and institutional-grade oracle infrastructure to create unified golden records of corporate action data that work across multiple blockchains. | Evaluate the feasibility and industry value of an AI, oracle, and blockchain-based solution for corporate actions data coordination across diverse market participants and geographically different sets of inputs. |

Conducted by



Financial and Market Infrastructures



Asset Managers



Banks and Custodians



Blockchains



Business Context

The Challenges With Corporate Actions Today

According to research conducted by [ValueExchange and ISSA](#), today's inefficient corporate action processes cost regional investor, broker, and custodian businesses approximately \$3-5 million each annually, with 75% of firms re-validating custodian and exchange data manually. Globally, around 70% of business units have been paying over [\\$2 million](#) each due to corporate action errors, with some paying as much as \$43 million. Data was the root cause of 56% of these errors.

Current Corporate Actions Workflow

- The issuer of an asset (typically a company) announces mandatory events (e.g., dividends, stock splits) publicly. This is the starting point where the information is first generated.
- The information is then passed to various intermediaries downstream, such as custodians, news wires, and brokers. Each intermediary must accurately receive, interpret, and validate the accuracy of the data before passing on the information.
- Once the information reaches the asset managers, they must act on it on behalf of their clients.

Below is a generalized pipeline of corporate actions data and current challenges at each step:

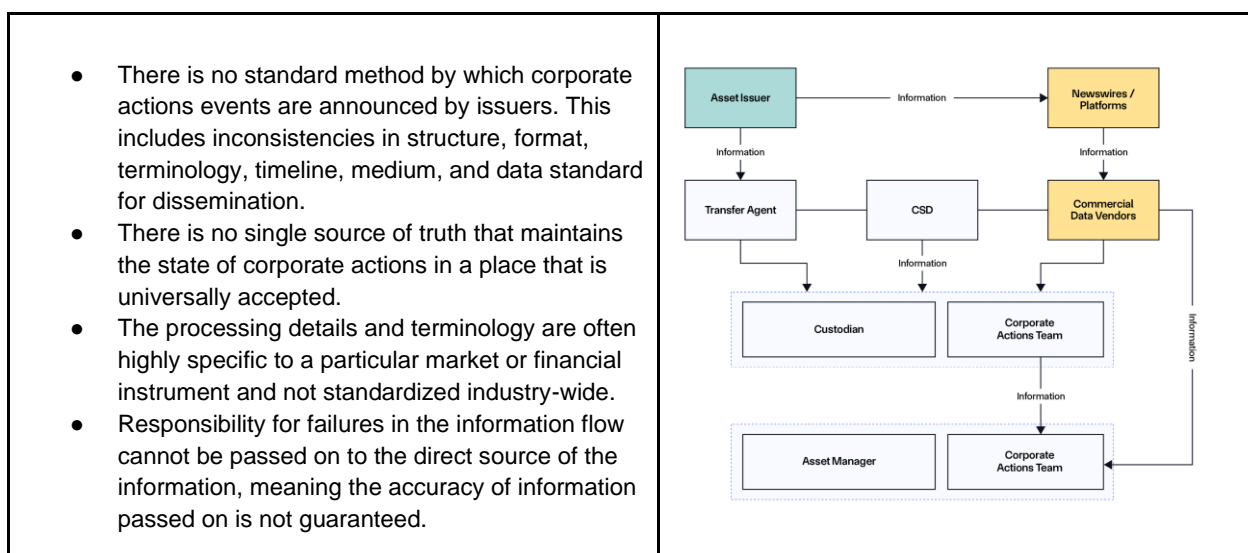


Figure 1: Generalized pipeline of how corporate actions data is distributed today.

“No one has a reliable golden source of data today—it’s all relative.”

—[The ValueExchange](#)

Our Approach

A Novel Architecture Combining AI, Oracles, and Blockchains

Combining AI, oracles, and blockchains, the following initiative takes unstructured corporate actions at the origination point—which are public statements like press releases or prospectuses—and autonomously processes them into a predefined standardized data output. The goal is to create a dynamic data container on shared infrastructure that all participants can

leverage to streamline internal processes—and all with minimal changes to how upstream asset issuers announce corporate actions.

Scope of Initial Phase

The initiative was designed to foster a collaborative environment where participants could exchange insights and learnings. In the first phase of the industry initiative, the goals included:

- Develop an innovative approach for combining AI, oracles, and blockchains to address the lack of structured data in corporate actions processing and establish a shared source of truth that is available onchain.
- Create a working prototype and engage with early adopters to collect feedback to help define the requirements for a potential production-grade solution.
- Gather inputs on the industry requirements for creating a unified golden record that can be addressed in future phases, such as challenges around LLM usage, liability, data confirmation, and more.

The Importance of a Unified Golden Record

Many of the inefficiencies in the current financial infrastructure arise from a lack of accurate and entirely machine-readable data, or difficulties to maintain its integrity as it travels along existing firm-to-firm infrastructure. The \$3-5 million individual annual cost of corporate actions processes for businesses, along with errors that can cost firms tens of millions, is the result of a highly fragmented and unstructured data landscape. Corporate actions lifecycle management has long been ripe for reinvention and needs a harmonized model around data origination and distribution—now afforded by the computational capabilities of AI and shared infrastructure like oracle networks and blockchains.

A [unified golden record](#) is a verifiable, persistent, updatable, and interoperable data container that is successfully synchronized across blockchains and is embedded with data, typically financial data. It serves as a single source of truth, which can be simultaneously referenced by all market participants, including issuers, banks, FMs, asset managers, and investors. Oracles and blockchains provide institutions with the infrastructure for a unified golden record that is verifiable and traceable by any market participant, removing the need for duplicated work around corporate action events and unlocking straight-through processing (STP). While blockchains can store a golden record, oracles bring real utility and unity by ensuring a data record is updated and synchronized with inputs from offchain systems, as well as interoperable across different public and private blockchains.

Solution Design

In this initiative, the process for sourcing and distributing mandatory corporate actions is enhanced by a cutting-edge digital tracking system:

Unstructured Input

- The process starts with an unstructured document (e.g., a PDF) announcing a mandatory corporate action, which may include details about dividends, share splits, or other financial events.
- The unstructured document is converted into a machine-readable text format.

LLM Processing

- After the text is extracted, LLM models identify the specific type of corporate action (e.g., dividend, share split) described in the document. The LLM models used by the Chainlink DON in this approach included OpenAI ChatGPT 4o, Google Gemini 1.5 Pro, and Anthropic Claude 3.5 Sonnet, but the design is agnostic to any LLM model.
- Custom prompts are used to extract key details from the text based on the type of corporate action identified. Standardizing these prompts for each corporate action type ensures consistent output across different document formats. Although LLMs may interpret text slightly differently, the approach is designed to prioritize uniformity in outputs across all models.

Oracle-Based LLM Processing

- A Chainlink decentralized oracle network (DON) running a verifiable compute service fetches the structured corporate actions event data from the LLMs.
- Each node in the Chainlink DON requests each LLM to process the document independently and extract data into a structured, machine-readable JSON format following SMPG guidelines, ensuring compatibility with ISO 15022 and ISO 20022. This predefined schema includes issuer, security identifiers, and action details, guaranteeing uniform output and seamless interoperability across financial institutions.

Structured Output With Two Levels of Consensus

- The prototype uses two levels of consensus to compare the LLM-generated outputs based on an identical input, which in this case is the initial public announcement of a corporate action event.
 1. During the node-level consensus process, each node in the Chainlink DON compares outputs for consistency, flagging discrepancies. At this stage, consensus is defined as all LLM outputs fully matching to emphasize accuracy over liveness, though this condition is configurable and can evolve in future phases.

2. Then, at the DON level, node outputs are aggregated. If the nodes reach consensus, a report is cryptographically signed and published onchain. This cryptographic report can be verified by anyone with access to the blockchain's ledger. This process helps ensure the integrity of data outputs while also mitigating risks of relying on a single source of truth.

Unified Golden Record Distribution

- Chainlink CCIP disseminates this structured data across private and public blockchain networks, which store all responses along with their timestamp in a tamper-proof, fully traceable, and immutable manner. This establishes a unified golden record around corporate actions data that various entities, such as exchanges, can confirm so custodian banks and asset managers can consume this verified data across different chains.
- CCIP is also interoperable with Swift's messaging protocol to enable downstream data consumers to access the unified golden record via their existing systems in the future.

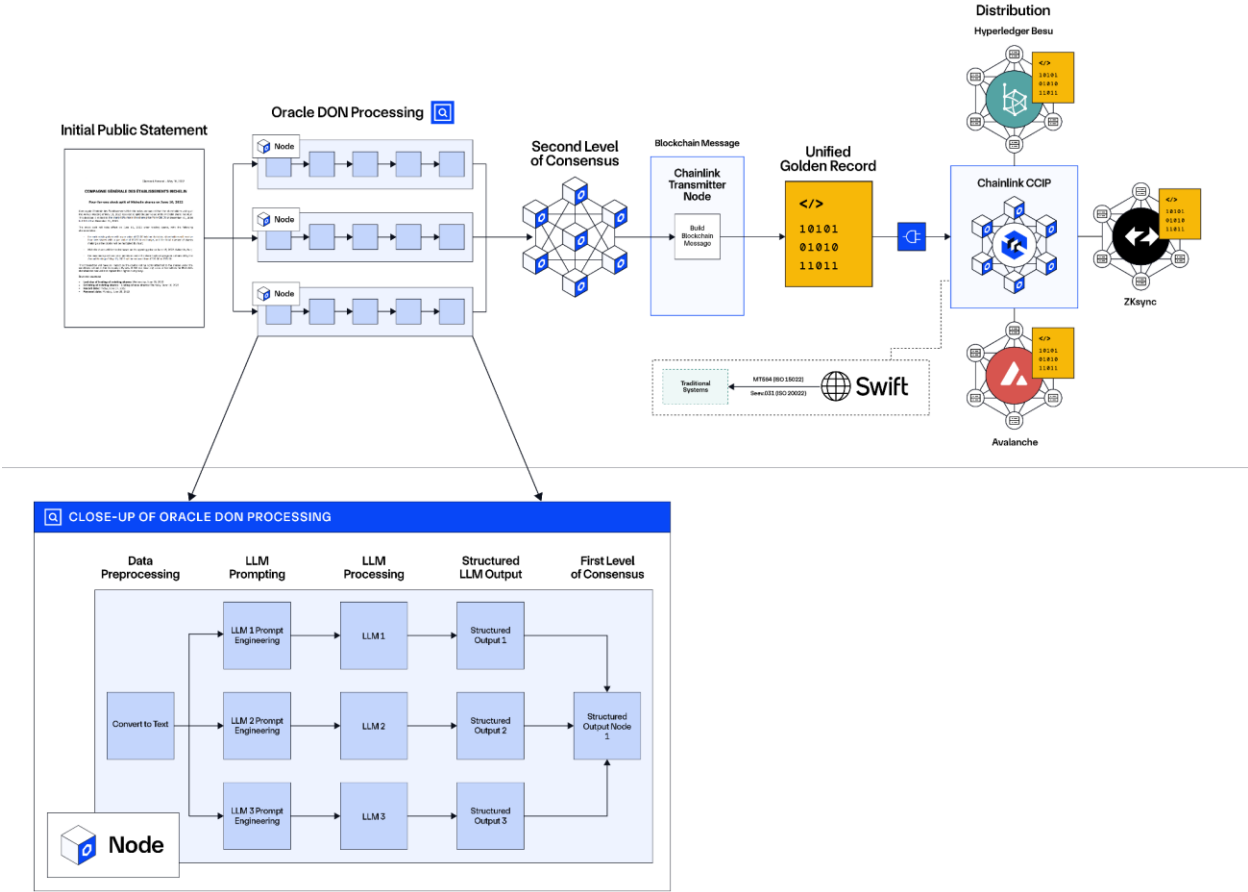


Figure 3: An enhanced onchain corporate actions workflow with the LLM oracle in detail.

Standards and Controls

The initiative leveraged the blueprint for establishing an industry-wide digital asset ecosystem to drive acceptance of tokenized assets developed by DTCC, Clearstream, and Euroclear in collaboration with Boston Consulting Group (BCG). The paper [Building the Digital Asset Securities Ecosystem](#) defines principles to promote the successful adoption of tokenization and digital asset securities and details a comprehensive set of risk management controls to underpin the future of digital markets. For the initial phase, we demonstrated how the following key Control Principles were addressed:

| Control Principle | Description | Our Solution |
|--|--|---|
| C21-S Interoperability between DLT networks | Adhere to industry-accepted cross-network communication protocols specifically designed for blockchain interoperability. This includes standardized protocols for asset representation, transaction formats, and data exchange between different blockchain networks, ensuring seamless and secure interactions across diverse blockchain platforms. | Chainlink CCIP serves as a cross-chain messaging protocol for transferring data and value across public and private blockchains. Chainlink CCIP is powered by Chainlink’s industry-standard oracle networks and is the only interoperability protocol with level-5 cross-chain security. |
| C-3L Network and Oracle Vetting | Conduct thorough checks on network and oracle alignment with DLT standards and governance structures before integrating third-party tools. Validate reliability and security SLAs for all networks and oracles rigorously | Chainlink DONs are decentralized networks of nodes that perform a service for smart contracts. These networks can exclusively allow KYC/AML-vetted node operators to meet specific regulatory requirements. |
| C52-N Compliance and Policy Management | Implement and enforce transaction policies consistently across all networks. Include mechanisms to verify and record compliance for each transaction. | Through CCIP’s Risk Management Network, institutions can apply predefined controls and limits across transactional activity, including policies around identity, AML/KYC, legal requirements, token pools, on/off ramps, organizational restrictions, and various forms of cross-chain security mechanisms. |

Results

The initiative achieved a significant architecture milestone in the journey to improve the management and dissemination of corporate actions data. By integrating cutting-edge technologies, we were able to:

- **Establish a novel data extraction and structuring process:** By leveraging unstructured offchain data from public company sources, we autonomously converted this information into structured digital data, ensuring that it adheres to predefined standards for specific corporate action types modeled on the SMPG framework.
- **Success in LLM consensus framework for financial data:** We achieved success in our initial framework that compares the outputs of three large language models (LLMs) in assessing unstructured financial data, enhancing the reliability of LLM-generated information. In the Results Matrix section below, we highlight how a Chainlink DON was used to come to consensus or flag any discrepancies around the LLMs' outputs.
- **Near real-time data distribution:** We demonstrated the capability to propagate data immediately across three blockchain ecosystems and store it as unified golden records in smart contracts, providing accessibility and composability for market participants.

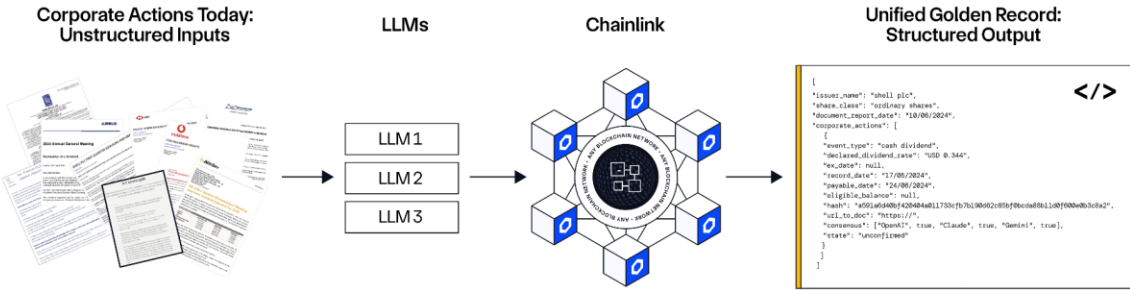


Figure 4: Chainlink in combination with LLMs enables a structured, onchain, unified golden record around corporate actions data.

Results Matrix

We used static artifacts as the primary data source such as official corporate action announcements in the form of press releases or earnings reports. Our methodology for selecting corporate actions involved targeting a diverse range of companies and asset classes within Europe:

1. Large companies in the FTSE 100 and STOXX Europe 600

2. Diverse range of European countries
3. Coverage across equity and fixed income asset classes
4. Most popular corporate actions by volume

By comparing the three LLM models, we improved the accuracy of the extraction and interpretation of the outputs. In our analysis of numerous different corporate actions across equity and fixed-income securities, we observed consensus around 100% of fixed income events. For equities, LLM outputs deviated for 7.2% of events, specifically around Vodafone's dividend event, where LLMs did not reach consensus. In this case, a data object was recorded onchain that flagged further manual review would be required. This discrepancy occurred around a [51-page earnings report](#), which added increased complexity for the LLM model (standard corporate actions announcements typically range from one to a few pages depending on the complexity of the action). Earnings reports also include complex formatting such as tables and images that are more difficult for LLMs to process. This situation could be addressed in the future through additional LLM training on earning reports for corporate actions data, the use of more advanced LLMs, or the configuration of alternative consensus methods.

Corporate Actions: Equities











| Company | Announcement | Type | Country |
|-------------------------|------------------------|---------------------------|--|
| SHELL | SOURCE | Dividend |  United Kingdom |
| HSBC | SOURCE | Dividend |  United Kingdom |
| VODAFONE | SOURCE | Dividend |  United Kingdom |
| AIRBUS | SOURCE | Dividend x 2 |  France |
| ANHEUSER-BUSCH INBEV | SOURCE | Dividend |  Belgium |
| BLACKSTONE FUND | SOURCE | Dividend |  United Kingdom |
| AIR FRANCE | SOURCE | Share Split |  France |
| SAAB | SOURCE | Share Split, Dividend x 2 |  Sweden |
| FINNAIR | SOURCE | Share Split |  Finland |
| MICHELIN | SOURCE | Share Split |  France |

Figure 5: Corporate actions events sources for equities.

Corporate Actions: Fixed Income








| Company | Announcement | Type | Country |
|-------------|------------------------|--------------|--|
| ASTRAZENECA | SOURCE | Interest PMT |  United Kingdom |
| ROLLS-ROYCE | SOURCE | Interest PMT |  United Kingdom |
| FERRARI | SOURCE | Interest PMT |  Ireland |
| L'OREAL | SOURCE | Interest PMT |  France |
| ASTRAZENECA | SOURCE | Maturity |  United Kingdom |
| ROLLS-ROYCE | SOURCE | Maturity |  United Kingdom |
| FERRARI | SOURCE | Maturity |  Ireland |
| L'OREAL | SOURCE | Maturity |  France |

Figure 6: Corporate actions events sources for fixed-income securities.

Key Outcomes

The outcomes of our initiative not only validate our approach but also pave the way for future advancements in financial data management:

- **Unified golden record:** Using unstructured data sources about corporate actions in Europe, we created a structured data source that can be confirmed and consumed by downstream asset managers, CSDs, and custodians.
- **Cross-chain connectivity about key data:** We enabled a unified golden record that successfully creates a single source of truth across multiple blockchains
- **Cross-industry collaboration:** The project exemplified successful collaboration across public and private blockchain ecosystems, showcasing the potential for broader industry

coordination aimed at enhancing data integrity and operational efficiency in capital markets.

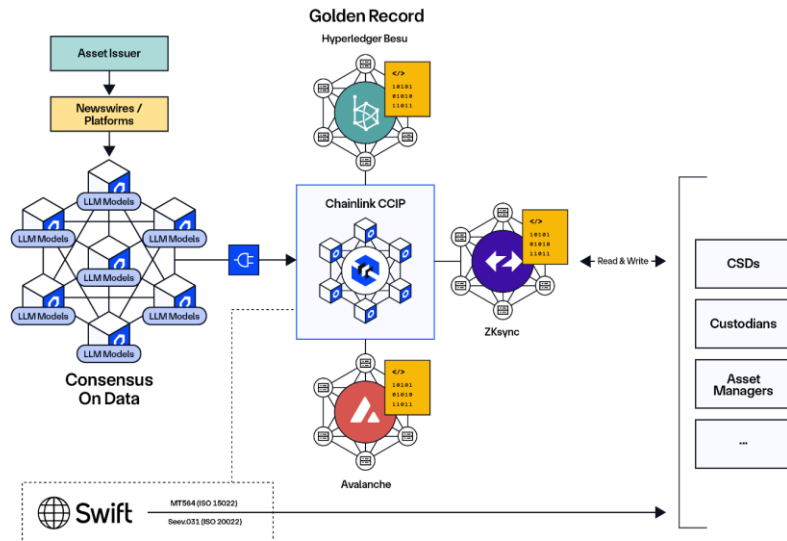


Figure 7: CCIP's interoperability with Swift's messaging standards and protocol enables financial institutions to interact with onchain data directly from their existing systems.

The Path Forward

This initiative is a significant industry milestone that successfully demonstrates how AI, oracles, and blockchains can be combined to convert unstructured, human-readable financial data into structured, machine-readable, easily distributable data. Using a consensus-based approach, a decentralized Chainlink oracle network connected to multiple independent LLM models helped to reduce the risk of hallucinations around LLM outputs. Chainlink CCIP then increased the accessibility of this data by publishing the outputs onto various private and public blockchain networks, while also synchronizing data across networks to maintain unified golden records.

With the next upcoming phase of our initiative, we aim to integrate established Swift ISO standards, along with Swift messaging and connectivity, to make onchain unified golden records interoperable with and consumable by existing mission-critical portfolio processing and management systems utilized by financial institutions. This model would provide market participants access to accurate and real-time corporate actions information and complete, end-to-end connectivity for corporate actions lifecycle management.

As we look further to the future, the market-defining opportunity is enabling dynamically updated unified golden records that are accessible by all market participants and incorporate existing security identifiers, real-time data modifications from issuers, and data confirmations from existing exchanges. To further industrialize the approach in this initiative, future solutions can include other sources of information from exchanges, issuing agents, issuing CSDs, and more. Our vision is to expand the scope of the unified golden record model by converting additional sources of unstructured data into structured data for financial assets, expanding the benefits of AI and Chainlink oracles to the wider financial industry.

| Goals of Initial Phase | Goals of Next Phase |
|--|--|
| <ul style="list-style-type: none"> → Evaluate the feasibility and industry value in an AI, oracle, and blockchain solution for corporate actions data coordination across market participants. → Achieve the technical milestone of building a working prototype with high-quality data. | <ul style="list-style-type: none"> → Integrate Swift messaging for seamless transmission of onchain unified golden records with standardized corporate actions data to offchain applications using Chainlink. → Achieve end-to-end connectivity of corporate action origination from source to user application. |

Future Considerations

Throughout the project, several key insights emerged, particularly concerning the interaction of LLMs with unstructured data, liability, handling of complex events, and updating the state of an unconfirmed corporate action to fully confirmed:

- **Ability to turn unstructured data into structured data:** There are billions of critical data points stuck in unstructured data formats, which requires entire departments of people to properly process. By combining AI and oracles to properly analyze this data in a highly reliable and consensus-based way, we have shown how unstructured data can now be made into structured and highly reliable data.
- **Importance of confirming corporate actions:** Confirming corporate actions from exchanges will play a pivotal role in the future of this initiative by ensuring data enrichment with additional key fields, particularly for critical events such as dividend declarations and share splits in regards to ex-date. Establishing reliable communication channels with exchanges is essential and valuable for all market participants.
- **Addressing hallucination issues:** We found that the most common source of data mismatch stemmed from hallucinations in very specific LLM model outputs. In contrast, certain LLM models demonstrated superior performance. Understanding these nuances allows for targeted improvements in LLM training and application. Much like our blockchain-agnostic design principles, we remain agnostic to the LLM technology.
- **Complex corporate actions handling:** With corporate actions data, a lot of the slow processing occurs around more complicated events, such as mandatory events with options and voluntary events. As we expand upon our LLM consensus framework for financial data, we will look to include these types of events for testing.
- **Interoperability with Swift messages:** The seamless integration and enrichment of Swift's widely adopted messaging standards with enhanced contextual data about specific events ensure that existing systems receive comprehensive, real-time information. This empowers financial institutions to make more informed decisions and improves operational efficiency in corporate actions processing.
- **Compliance with existing corporate action standards:** To facilitate broader industry adoption, future designs should favor compliance with established corporate actions standards, such as [CAJWG](#) and [SCoRE](#), to provide quicker and more secure key data elements through the custody chain, from the Issuer to the final beneficial owner.
- **Liability:** While outside the scope of the initial phase of this initiative, future considerations can be made into the evolving liability dynamics between parties involved in the corporate actions process when using AI models such as LLMs and decentralized infrastructure.
- **Security reference master data:** Integrating security reference master data is vital for creating a unified golden record, as it offers a standardized and authoritative source of information for all securities. Moving forward, effectively leveraging this data will be essential for accurately matching corporate actions with the legal identifiers of each security, ensuring enhanced clarity and consistency in financial reporting and analysis,

as well as supporting entitlement calculation and corporate action notification to the investor.

Participant Insights

[Quotes coming soon]

Euroclear is drafting

The complexity of corporate actions is a relevant and appropriate use case for the convergence of AI, oracles, and blockchain technology. By leveraging AI and Chainlink oracles to interpret, standardize, and deliver high-value unstructured data, we can dramatically reduce the manual processes required, enabling significant potential operational efficiency and cost reduction while ensuring that data flows through the system with the required levels of accuracy and transparency." — Mark Garabedian, Director, Digital Assets & Tokenization Strategy, Wellington Management.

Get Involved

If your organization is interested in participating in future phases of this industry-wide initiative, reach out via <https://chain.link/contact>.

Appendix

The Growth of LLMs in Financial Markets: Opportunities and Challenges

Large Language Models (LLMs)—an artificial intelligence (AI) model that can interpret and generate human language—have recently achieved a level of sophistication where they can

provide significant value within the financial domain. [Recent research surveying LLMs for financial applications](#) has highlighted how LLMs have demonstrated that they can rapidly process vast amounts of unstructured data from extensive financial documents, interpret the context and financial terminologies, extract key information, and produce machine-readable data outputs in a structured format.

Financial institutions have already started experimenting with incorporating LLMs into their business workflows. For example, Citi is [rolling out](#) Github CoPilot to all their developers, Goldman Sachs [developed](#) a tool that analyzes consumer data and provides personalized advice to its customers, and Bloomberg created [BloombergGPT](#).

LLMs are highly adaptable and can integrate domain-specific data and parameters. As a result, it's highly plausible that they can be trained on the complexities and nuances of corporate actions communications within various markets, regulatory regimes, and languages. The challenge is how to achieve results that meet the high standards of global financial markets.

However, a major concern of the financial industry in regards to incorporating LLMs is the black box nature in which they operate, as it is difficult to know how LLMs arrived at specific outputs. [Some research](#) has argued that LLM hallucinations—where models report false or misleading information that appears coherent and grammatically correct—are an innate limitation of these systems. Even the latest models trained on financial data have been proven to be inaccurate at times. Ingesting inaccurate data can have significant implications for financial institutions, particularly around automated actions, as well as inhibit organizations from maintaining strict legal and reliability standards.

Additionally, LLM-driven solutions may raise questions about liability dynamics, particularly for industry workflows such as corporate actions that involve processing and distributing data. Liability questions can pertain to several aspects of the data, such as accuracy, timeliness, completeness, and reliability. While human oversight can help validate LLM outputs in the case of discrepancies between different models, future solutions could incorporate cryptographic proofs or certifications around AI-generated outputs to potentially minimize liability concerns.

Structuring, Validating, and Propagating Corporate Actions Data With LLMs and Decentralized Oracle Networks

Ensemble learning and multi-LLM verification are emerging industry approaches that are being explored to help mitigate the risk of hallucinations around LLM outputs. Following Chainlink's oracle-based approach to aggregating and delivering price reference data onchain, this initiative used multiple LLMs to process the same corporate action communications and form a consensus-based response using decentralized oracle networks (DONs).

DONs are a novel technology consisting of a decentralized network of independent nodes, where each node fetches data from multiple different sources and then reaches consensus between nodes on the final output based on predefined criteria. For instance, a DON could be programmed to pull data from three different LLMs, wherein all three must unanimously agree in order for the data point to be considered valid. The DON can then relay the validated data point onchain for consumption by financial institutions. By leveraging an LLM-agnostic architecture, such a DON could be upgraded over time to leverage increasingly advanced LLM models less prone to hallucination, as well as even adopting entirely novel natural language processing technologies as they arise.

Chainlink Platform Overview

Chainlink is the leading technology platform for onchain data, cross-chain interoperability, and blockchain abstraction. The Chainlink platform enables financial institutions to develop customized, compliant, and future-proof blockchain applications and tokenized assets. Chainlink can power tokenized assets throughout their entire lifecycle, enriching them with real-world data (e.g., NAV, proof of reserves), providing secure interoperability between any private or public blockchain to increase liquidity, and synchronizing asset data between blockchains and existing systems to maintain a unified golden record.

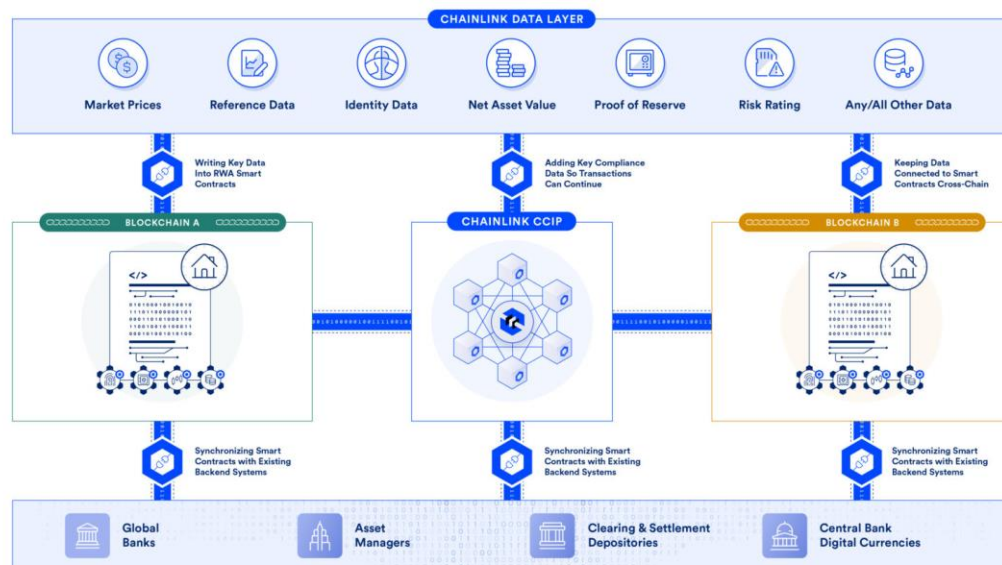


Figure 8: Chainlink is the only fully-featured platform that supports the creation of unified golden records for financial data and assets.

As the leading oracle network, Chainlink has securely enabled over \$16 trillion in transaction value and delivered more than 14 billion onchain data points across the blockchain ecosystem. Major market infrastructure providers and institutional banks have collaborated with Chainlink to successfully demonstrate how financial institutions can use existing infrastructure and messaging standards to interact with tokenized assets across any blockchain, and synchronize asset data between blockchains and existing systems to maintain a unified golden record.

Chainlink Cross-Chain Interoperability Protocol (CCIP)

Chainlink's Cross-Chain Interoperability Protocol (CCIP) is the industry standard for securely integrating existing systems across any blockchain. Using CCIP, financial institutions can transfer data and assets across any public or private blockchain in a single atomic transaction, as well as transact across the multi-chain ecosystem from their existing infrastructure through a single point of integration. Major market infrastructures and institutional banks have successfully used Chainlink to demonstrate that financial institutions can use existing infrastructure and messaging standards to interact with tokenized assets across blockchains through CCIP's blockchain abstraction layer.

Underpinned by Chainlink's proven decentralized oracle infrastructure, CCIP operates at the fifth and highest level of cross-chain security where multiple decentralized networks, including an independent risk management network, secures the validation and processing of every cross-chain transaction. CCIP is the only cross-chain protocol that offers defense-in-depth security and a way to manage various global policies through the Risk Management Network, which enables institutions to apply predefined controls around transactional activity to help ensure regulatory and organizational compliance.

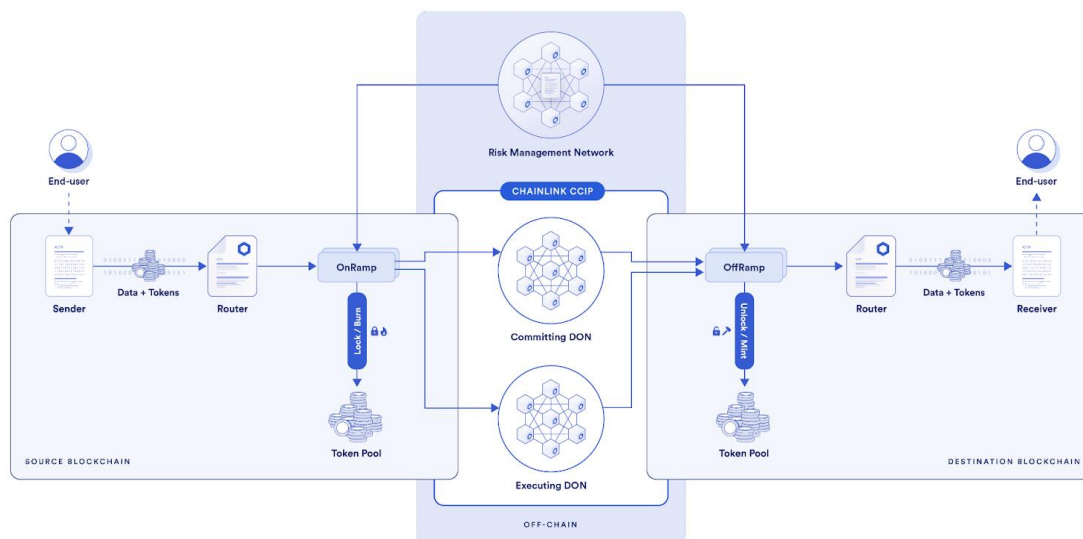


Figure 9: Chainlink CCIP enables secure interoperability between existing systems and blockchains.

Through [Programmable Token Transfers](#), CCIP enables the transfer of value (via tokens) cross-chain along with data instructions informing the receiving smart contract on what to do with those tokens once they arrive on the destination chain. Through this functionality, institutions can interact with smart contracts and tokenized assets on other blockchain networks without needing to integrate or directly interact with the destination blockchain. As a result, CCIP's Programmable Token Transfers can condense a complex set of actions involving multiple users, blockchains, and assets down to a single instruction.