LTI
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Digital Asset

Whitepaper

Reimagine Reference Data Curation and Consumption

A solution for buy-side managers that eliminates silos and business process latencies.

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Abstract

Reference data, which comprises between 40% and 70% of the data utilized in financial transactions, enables the identification of significant actors. A business will suffer financial and reputational damage as a result of erroneous reference data. Additionally, as financial instruments proliferate, market processes evolve, regulatory pressure increases, and the role of third-party data providers expands, buy side firms will need to engage in reinventing reference data curation and consumption at speed. This article examines the difficulties inherent in reference data curation and the benefits of developing a ledger agnostic, DamI-driven solution.

Introduction

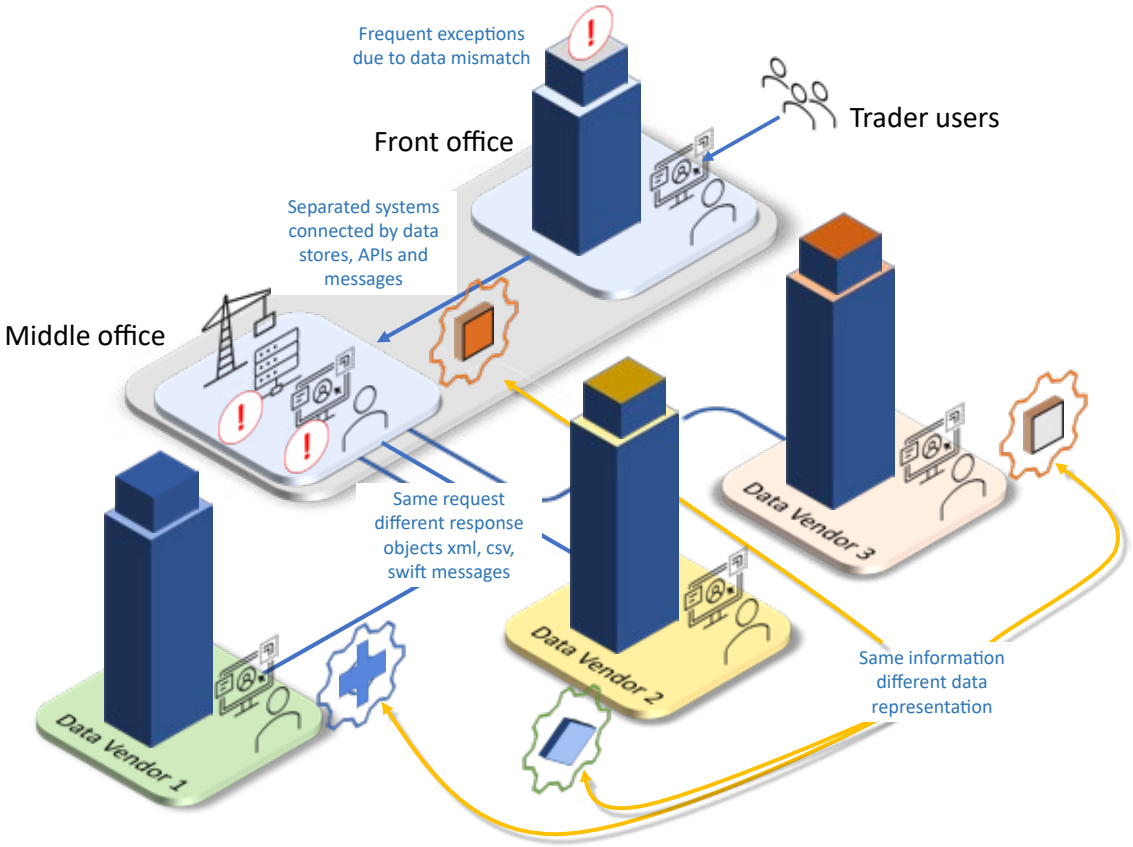
Buy-side investment managers process a variety of data in partnership with their data vendors and intermediaries. In the enterprise data journey, reference data has played a pivotal and central role. Failures due to inaccurate, inadequate, inconsistent, and untimely reference data contribute significantly to a financial institution's operational risk.

Reference data, which accounts for 40% to 70% of data used in financial transactions, aids in identifying key participants and can include the following:

1. Counterparty information
2. Product specifications
3. Securities across various asset classes
4. Issuer details, currencies market information
5. Corporate actions, prices and more.

An enterprise will incur a financial and reputational loss because of incorrect reference data. For example, transaction failures attributable to delayed processing can cause significant risk to trades and their respective risk assessments. Furthermore, with the proliferation of financial instruments, evolving market mechanisms, increasing regulatory pressure, and the growing role of third-party data vendors, buy-side firms will need to invest in reimagining reference data curation and consumption.

What Are We Solving?



Understanding the Complexity

Traders invest in different and complex asset classes across domestic and global markets. The timely availability of reference data for trade execution and assessment has a wide-ranging impact on trade settlements, market valuation, risk assessment and compliance. The transaction flow complicates the trading journey, which includes updates from traders' desks, executing brokers, verification from exchanges, clearinghouses, custodians, and the confirmation round trip back to the firm's back office, middle office, and front desk.

A complex set of processing and referencing systems that work in federation with inconsistent data models is responsible for updates, verification, and confirmation of the trades journey. This inconsistent data often causes discrete data silos, which cause trade delays, increase the operational expense associated with reconciliation and asset servicing while also increasing the overall asset risk.

Key Elements of the Problem Statement

The timely and accurate availability of a trade and its related reference data are critical components of a successful trade and depend heavily on the communication technology adopted by the firm. The necessary information, or reference data, is classified as static or dynamic:

- **Static data applies to data elements that do not change, such as brokers, dealers, money managers, exchanges, as well as details about counterparties and other intermediary partners**
- **Dynamic reference data changes over time, such as securities, issuers, corporate actions, prices, and thus market values**

Reference data is stored and used by a buy-side enterprises' front office, middle office, back office, and other supporting functions such as finance and human resource systems. Throughout the lifecycle of a trade transaction, reference data is incrementally attached when dealing with different internal consumers and their relevant systems. When conducting a trade transaction, systems that access reference data can be proprietary systems with their own collection of reference data maps. As these proprietary systems communicate, data mismatches can occur because each of these systems uses a unique data structure to handle reference data.

How Do We Solve These Pain Points?

The challenges understood so far mandate developing a system that will construct reference data from various data sources via an automated system. This system will also be expected to consistently distribute the information in a timely manner to various data consumers in the right format. Buy-side firms have solved, or are trying to solve this problem with multi-point solutions such as data management products, SaaS providers, and custom application development. However, most of the solutions have yet to solve this problem, as many businesses are still experiencing significant delays in receiving timely reference data.

To resolve this open and persistent problem impacting business satisfaction, our recommendation is to use distributed ledger technology coupled with Distributed Asset Modeling Language (Daml) at the application layer. Daml is a programming language well-suited for businesses seeking to rapidly develop & scale multi-party/multi-stakeholder processes both internally and externally. Daml ensures that businesses can interoperate across any distributed ledger (or database) with a consistent and timely

Considering a Ledger Agnostic Solution

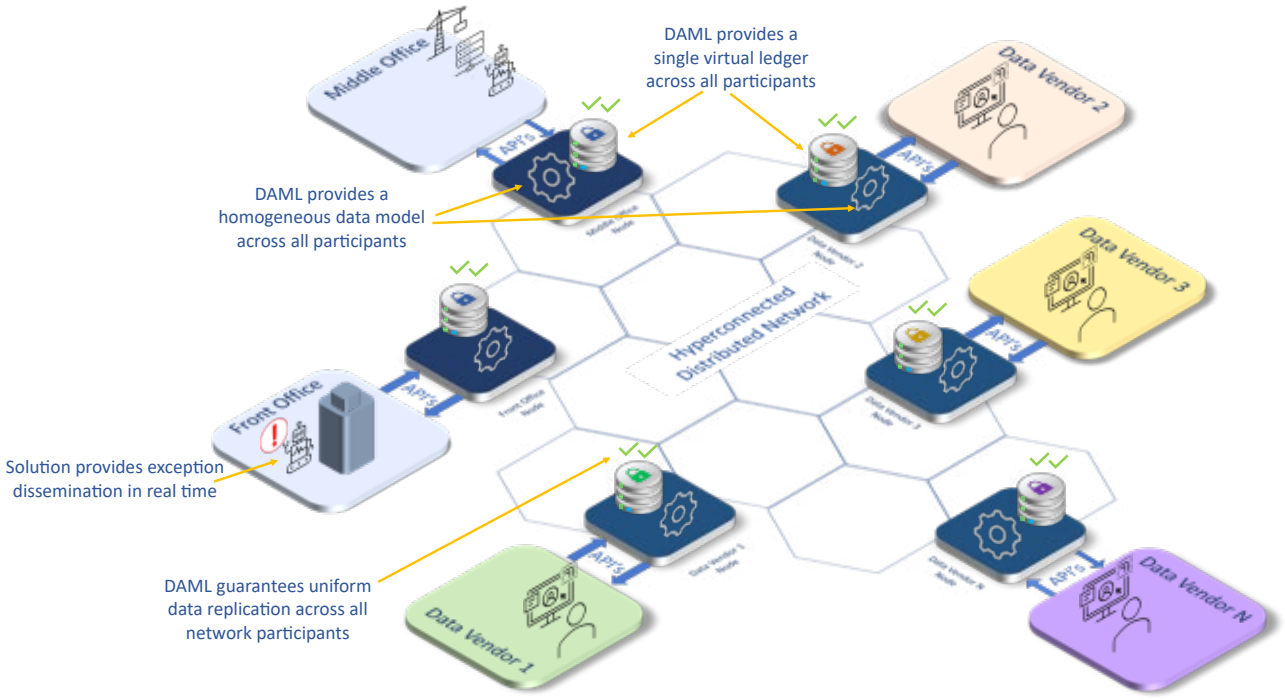
Daml can serve as an application development platform for building systems of record that transform disparate data silos into synchronized networks, eradicating latency and data inconsistency across complex business processes and workflows. also preserves data privacy and ensures data integrity with features including a built-in audit trail, along with data modeling, authorizations, data visibility rights, and transactional guarantees available directly in the platform.

Incorporating this type of structure across data jurisdictions and external systems enables buy-side firms and other financial service entities to construct intricate economic networks. Additionally, Daml replaces a physical blockchain with a virtual shared ledger, enabling true platform interoperability with internal and external systems. This is done via Daml's interoperability protocol that abstracts away the infrastructure layer so companies can send and receive reference data in real-time

without necessitating reconciliation between disparate systems. Daml is the layer that connects each entity in a network and provides a node for each business entity to transact with common data made available to other desks immediately.

In the context of reference data management, Daml aims to provide accuracy guarantees on distributed systems of record through a virtual shared ledger. Daml controls permissions to update specific fields, data validation checks, and exception workflows/triggers. Daml eliminates single point of failure by creating a hyperconnected point-to-point network that allows participants to share distributed value and maintain stricter privacy between transactions. This application framework can realize several features and advantages that blockchain and distributed ledger systems don't supply on their own.

A Daml-driven Approach to Reference Data Management



The proof of concept outlined above incorporates Daml nodes into the front office, middle office, and data vendor applications. The nodes exchange information about the front office reference data status. The front office node inserts relevant securities' shell records, in which, trade defaults due to erroneous data can be sensed. Once the inserted shell records have been validated, the middle office node will send a data request to the data vendors to obtain the underlying securities data. Both the static and dynamic data requests are received and processed in the data vendor nodes with uniquely curated referral data fields.

To fulfill a data demand, each data vendor follows its own data format. The solution also uses a data vendor bot to map the corresponding data of a vendor to be used for a proof of concept, with a homogeneous data model. The middle office master bot collects uniform data from several data vendors and presents the information to the existing mastering algorithms. The mastered security data from the external mastering system are received by the mastering bot and made visible to the front office as security reference data.

This solution's reference data construction flow is automated and triggered from the front office depending on exception events in the data. The system also aims to maintain data quality with crisply updated vendor data in real-time, while improving the resiliency of information sources by allowing the data vendor network to be expanded in real-time.

Deployment Methodology for Businesses

You can deploy a Daml-driven reference data management application on your current network (any infrastructure) if privacy is not a concern and workflows are internal by nature. If your organization must function across data domicile boundaries, then using a distributed ledger with Daml will also enable privacy and data integrity. Daml allows your organization to continue to follow the standard deployment strategies to production environments (it becomes important to understand ways one can tune the deployment strategy as per the requirements of the business).

With Daml, the solution will be multifaceted. There will be several teams working towards solving a problem set from their respective viewpoint. Such a dynamic evolution process demands a rolling deployment strategy that provides agility to the development teams for handling several updates simultaneously. Development teams can upload many versions concurrently using rolling updates; the number of active versions is referred to as the window side.

Here, development teams can upload a single instance at a time (by setting the window size to 1) or deploying apps in clusters in parallel updates. Developers use containers for faster and safer deployment. Docker and Kubernetes are prominent container application deployment solutions for isolating updated versions, activating, and stopping servers, and tracking changes.

A considerable amount of application downtime is reduced with this strategy, which is crucial for mission-critical systems. The deployment teams can choose the most efficient and visible window size. Additionally, diverting user traffic to the updated releases can eliminate security and performance issues.

Conclusion

The purpose of this proof of concept was to investigate and understand Daml's capabilities in developing a vendor-neutral distributed ledger pipeline for the construction of reference data. The specified use case was mapped by LTI's team of Daml professionals and domain specialists. Because of the development of business flows that utilize Daml, the solution will be future proof for multiple blockchain platforms, especially for the production rollout supporting continuous integration and deployment strategies. The team at LTI is working with its financial and banking services clients to articulate potential alterations to the use case for further applications in capital markets.

Author Profile

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Sushant is primarily responsible for solution design and architecture for applications that leverage Blockchain, which solves real-world business problems for our clients. Prior to LTI, he held a key position in Designing and Implementing the next-gen Matching Engine for National Stock Exchange, Mumbai. He has deep expertise in most prominent Blockchain platforms such as Daml, R3 Corda, Ethereum, Hyperledger Fabric, Monax, and more.

Pramit Joshi

Client Partner Capital Markets, LTI

Pramit is responsible for client relationships for multiple capital markets customers. At the same time, he advises customers to solve their high priority initiatives including transformation programs. He has consulted global firms such as Wealth Managers, Investment Managers, Insurance Money Managers and Index providers on data strategy to implementations. He also consults programs and projects as a Wealth Management and Buy Side domain consultant.

Appendix

Why distributed ledger technology?

- Security: Since it is built on distributed consensus, it removes single points of failure and eliminates the need for data intermediaries such as transfer agents, messaging system operators, and inefficient monopolistic utilities. Additionally, DLT-based smart contracts allow the creation of stable application code that is impenetrable to fraud and malicious third parties, rendering it almost impossible to hack or exploit.

- Transparency: It uses mutualized principles, protocols, and common procedures, serving as a centralized source of truth for network members of the front office, middle office, and back-office systems.

- Trust: Its static and distributed ledger enables various parties in a business network to collaborate, manage data, and conclude agreements. It enables the development and execution of smart contracts – tamper-resistant, deterministic software that automates business logic – thereby increasing confidence and performance.
  This significantly increases accountability, confidence, and productivity while also protecting individual privacy and confidentiality.

- High Performance: The networks are designed to handle hundreds of transactions per second and spikes in network traffic periodically.

- Scalability: It enables interoperability and easy onboarding of participants in real-time, extending the global scope while providing enormous resilience and high integrity of a distributed ledger network to each enterprise solution.

- Real-Time Data Construction: It enables the system to automate the aggregation of reference data in real-time and master the data records for ready-made consumption across all network participants.

As distributed ledger technology (DLT) becomes more widely adopted within enterprise organizations, securities service providers would have access to a broader range of storage options that incorporate enhanced security mechanisms to ensure data integrity and privacy. A private distributed ledger network, providing sub-transaction level privacy at the infrastructure level, is used in conjunction with a privacy-first smart contract solution that provides a secured API interface to sensitive applications.

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LTI (NSE: LTI) is a global technology consulting and digital solutions Company helping more than 460 clients succeed in a converging world. With operations in 33 countries, we go the extra mile for our clients and accelerate their digital transformation with LTI's Mosaic platform enabling their mobile, social, analytics, IoT and cloud journeys. Founded in 1997 as a subsidiary of Larsen & Toubro Limited, our unique heritage gives us unrivalled real-world expertise to solve the most complex challenges of enterprises across all industries. Each day, our team of more than 40,000 LTItes enable our clients to improve the effectiveness of their business and technology operations and deliver value to their customers, employees and shareholders. Find more at http://www.Lntinfotech.com or follow us at @LTI_Global.

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