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FINANCIAL SERVICES

BLAZING A TRAIL WITH NEXT GENERATION DATA MANAGEMENT

Democratizing trusted data for greater
collaboration and deeper insights

TODAY'S DATA ARCHITECTURE CANNOT KEEP UP WITH DEMAND

For financial services companies, analytics and predictive models have become an important front-line tool to understand and serve customers and to identify market and competitor trends. The technology has become embedded in the business where it is key to helping companies stay responsive and agile in a changing world.

Today, the data that fuels these analytics systems is having a hard time keeping up. As data volumes grow, organizations struggle to manage, prepare, and deliver data to business stakeholders, who often have an urgent need to use it to develop insights. As a result, analyst reports show that speed to value with business analytics is declining as data estates grow. Data management is bogged down by a range of problems including unclear ownership, a lack of quality data, process

bottlenecks, and a disconnect between the people producing data in the organization and the business users who consume it.¹

The solution lies not just in technology, but in a new approach to managing data – one based on distributed data management principles. A distributed data management architecture reorders the way data flows from business operations to central data repositories and on to business analytics users. This ultimately creates a distributed data ecosystem that can cut time and costs out of the process and quickly arm the business with the data it needs to compete. At the same time, it improves collaboration across the enterprise ensuring data consumers get the right data at the right moment with clarity and quality.

The solution lies in a new approach to managing data



¹ <https://worldretailbankingreport.com/>

BOTTLENECKS, DELAYS, AND BAD DATA

As financial services companies have amassed growing amounts of data over the years, they have found new ways to manage it. To avoid data silos, growing volumes of data have been put into data warehouses and then into huge data lakes. Today, companies are using the cloud to scale up their data capabilities and create more flexible pipelines for accessing that data. Throughout all these changes, one key aspect of managing data for analytics has not changed – the linear nature of the process. One party produces data, another then

prepares data for consumption, and yet another then consumes that data.

In this model, data producers across the company feed data about operations – accounts, customer onboarding, insurance claims, etc. – into the central database. There, the data is put into a standard enterprise data model and managed by IT. When business stakeholders request data that they need for analysis, IT responds by preparing and delivering that data to the business for consumption.

DATA ESTATE EVOLUTION

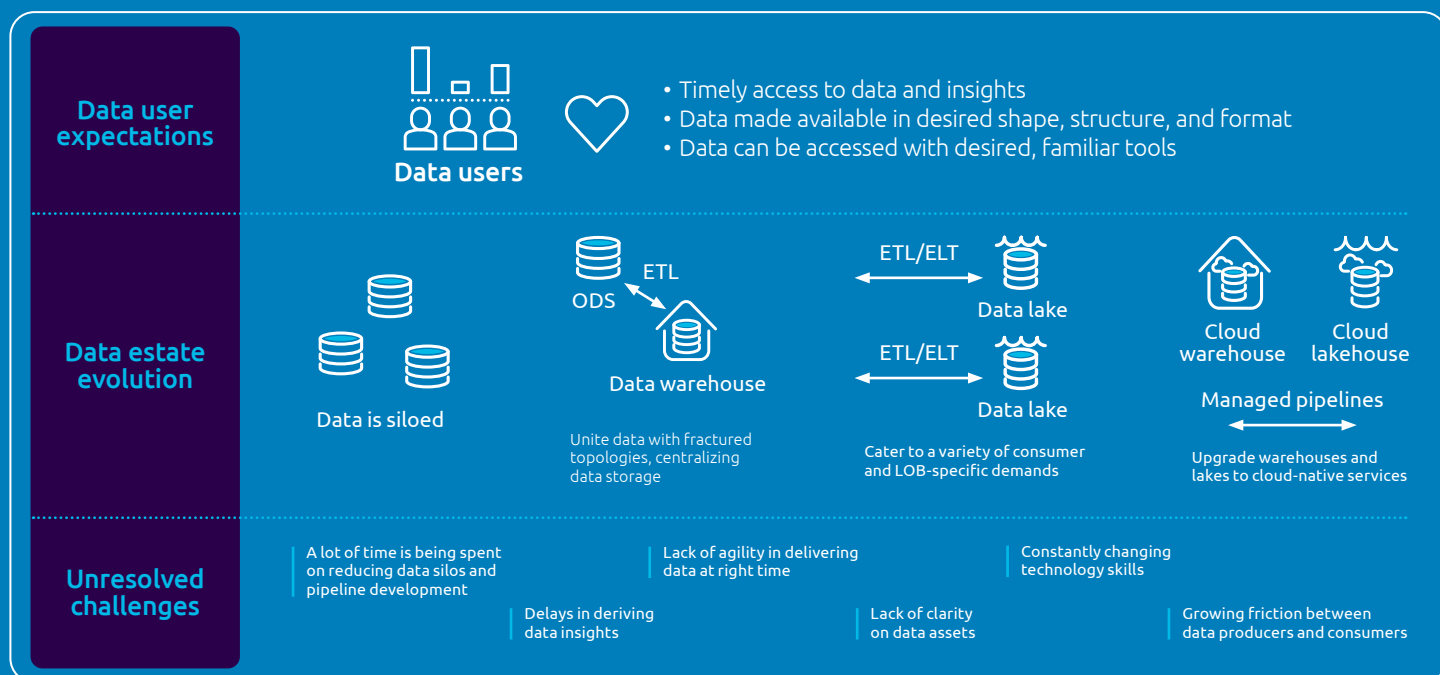


Figure 1: While data estates have evolved to better meet user expectations, unresolved challenges remain

With this approach, IT quickly becomes a bottleneck. Often working with constrained budgets, the central IT team must contend with a proliferation of data sources and data consumers with complex and varied demands. Different business units and consumers require different data organization strategies with which the data is expected to be provisioned. In many organizations, IT simply cannot keep up.

Just as important, this process can create problems with the data that is being delivered to the business stakeholders. With the large amounts of data involved, some data that may seem unimportant to IT may be left out even though it could be valuable to the business.

In addition, this traditional approach creates a disconnect between data producers and data consumers. A system of records produces data without really knowing how the business intends to use it, and the business does not really understand the

producers' intent for the data. The producers' intent and knowledge are lost in the translation conducted by IT, and data consumers do not have direct access to producers for clarification. There can even be uncertainty about who owns the data in the organization.

This approach often leads to delays in getting data through such a process, which can leave business stakeholders waiting for weeks and months to go live with new analytics solutions or develop new insights. In addition, this data may not be suited to the needs of the business, leading to erroneous analyses and faulty business decisions. These delays and errors quickly turn into critical issues in an era of relentless competition and constant, rapid changes in customer expectations. The business can lose trust in the data and the financial institution is not able to fully leverage the vast amount of data it has on hand.

A DIFFERENT APPROACH TO MANAGING DATA

To address these issues, financial services companies can adopt a new paradigm based on a distributed data management architecture. This alternative peer-to-peer approach decentralizes the management and ownership of data that is ultimately used by business stakeholders, enabling greater collaboration when serving and consuming data.²

The distributed data management architecture is built on four key principles:



DOMAIN-ORIENTED DECENTRALIZATION

Traditionally, data has been managed at the enterprise or line-of-business level. The distributed data management approach organizes data by domains, such as customer, accounts, policy, statements, or loans. Domain owners naturally have a deep understanding of the data they produce, and under the domain-centered model, they are given ownership of their data. Rather than relying on enterprise data management, this approach gives domain owners responsibility for managing their respective datasets. Each domain operates autonomously and manages its data independently of other domains, but all domains share a common data infrastructure for storage, cataloging, access control, and other infrastructure components.



SELF-SERVICE ENABLEMENT

With traditional data management, data producers are largely shielded from the technical complexities of preparing data because that aspect is handled by IT. In this new approach, data producers are expected to source, process, and publish data for consumers via the data products. To maintain the required level of sophistication, IT teams provide the required frameworks and solutions to process and publish the data products in a low-code/no-code manner. Data product owners can create data products on their own at scale by leveraging these standardized frameworks.



END-TO-END GOVERNANCE

Financial services companies should take a federated approach to governance to reduce risk and help ensure the delivery of business value. With data distributed across multiple data products, establishing distributed ownership, centralized monitoring, and a governance solution suite where catalog-of-catalogs and governance-driven principles are applied will be critical to a successful implementation. Governance should also include metrics for tracking the usage of platforms, data, and data products; innovation and value generated; the quality of the user experience; and service enhancements. FAIR principles should be incorporated where data and data products are findable, accessible, interoperable, and reusable.



DATA PRODUCTS

Instead of having users access data from one monolithic data warehouse or data lake, the new approach decomposes data into smaller units called data products. These data products are independent architectural components – essentially, modules of data that are discoverable, reusable, trusted, secure, auditable, and validated for compliance. They can be easily accessed and used in business solutions. Domain-driven decomposition of data objects are served via data products. Domain owners create and manage their respective data products.

GOVERNED DATA MARKETPLACE

When data products are ready for consumers, it is imperative to have a well-governed data marketplace for effective collaboration. A data marketplace provides a platform to publish consumption-ready data products where consumers can easily search for them, understand details about the data product, identify access requirements, write peer reviews, and provide their own personal ratings. The marketplace also ensures trustworthiness of data consumption and promotes understanding of data assets, including ownership elements, which are key challenges in today's data platforms.

² Zhamak Dehghani, "Data Mesh - Delivering Data-Driven Value at Scale," March 2022.

FEDERATED DATA PRODUCTS GOVERNANCE

DATA TRUST ENABLED DECENTRALIZED GOVERNANCE

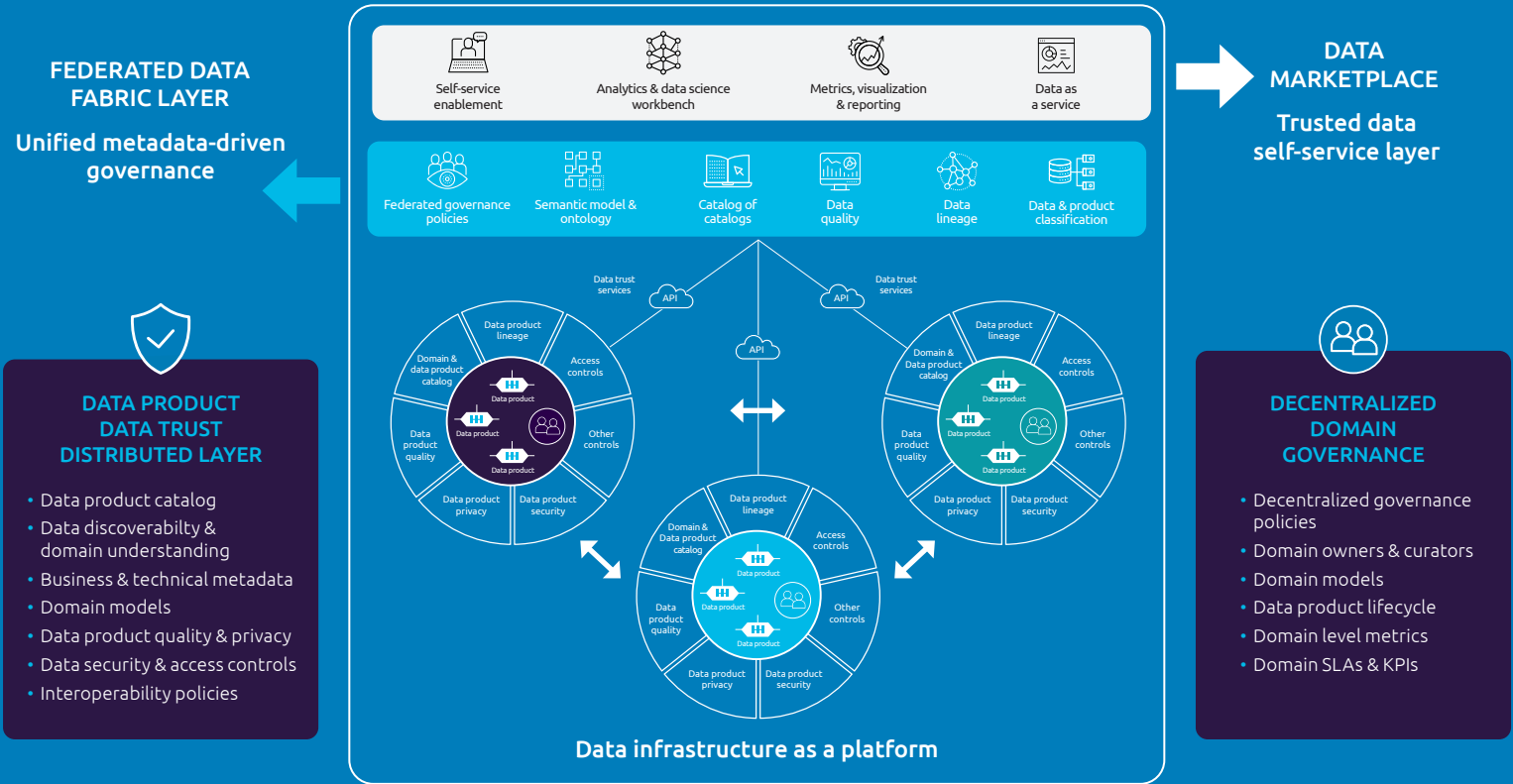


Figure 2: Overview of data-as-a-product architecture

The data-as-a-product architecture can dramatically shorten the process of sourcing, processing, and publishing data assets.

The data-as-a-product architecture brings several important benefits. It helps increase operational efficiency and drives down total cost of IT ownership. It enables greater innovation in the business while helping to ensure regulatory compliance. It also frees IT from having to be an intermediary between those who are producing data and those who are consuming it, allowing it to take on a more consultative role. This helps IT focus on more strategic issues, while helping to eliminate

the traditional bottleneck that previously delayed the delivery of data to the business.

This approach enables business stakeholders to get the data they need quickly and use it to experiment, develop solutions, and gain insights at scale. At the same time, it enables them to interact directly with data product owners to explain their needs, rather than having to work through IT. Thus, domain owners have a better understanding of what the business plans to do with the data and business users have a better understanding of the quality and nature of the data that is available to them. This helps to strengthen their trust in the data and its ability to support accurate analyses and forecasts.

Overall, the data-as-a-product architecture can dramatically shorten the process of sourcing, processing, and publishing data assets. In turn, this can reduce the time to value for business groups using analytics to create new offerings, enhance the customer experience, and increase revenue.

CASE STUDY

U.S. RETAIL BANK EMBARKS ON DATA ARCHITECTURE TRANSFORMATION

A leading U.S. bank with more than 60 million customers embarked on a journey to transform their data architecture. In the current state, data persisted across multiple systems with no single version of truth. A legacy technology stack with limited analytics and self-service capabilities made it challenging to quickly gain usable insights from the data. Overall, new revenue opportunities were being missed due to an outdated data management architecture.

Based on the bank's enterprise product and platform strategy, the following objectives for a new domain-driven data architecture were defined:

- Deliver an improved, frictionless, and intuitive user experience for data producers and data consumers
- Incorporate supplemental data attributes and 3rd party data to improve insights
- Increase speed-to-market through self-service data access
- Embed advanced analytics, artificial intelligence (AI), and machine learning (ML) capabilities into the framework
- Reduce cost and effort to meet regulatory, compliance, and management reporting

After several months of careful planning, a new multi-tenant architecture was created spanning several hyperscalers and a private cloud that modernized the data management landscape by adopting domain-driven data products and distributed data management principles. New architectures and architectural patterns for data management, data movement and processing, data platforms, security, AI, and ML were fully defined. A single control plane for the data management framework provided a landscape view of data assets, data quality controls, data lineage, and a data catalog.

While the bank's data architecture transformation is still ongoing, they have made significant progress. Data products are gradually being created under a new operating model featuring data owners and stewards that control their domains. Data literacy is growing through data product descriptions, peer reviews, and sample datasets, driving improved enterprise collaboration. Business stakeholders are more engaged in the product architecture development lifecycle leading to greater adoption.

USE CASES FOR ALL AREAS OF FINANCIAL SERVICES

INSURANCE

Claims

Identify patterns in claims behavior with improved access to customer data

Risk management

Generate comprehensive risk profiles across all areas of the organization

Product development

Personalize offers by incorporating internal and external data sources

BANKING

Customer experience

Create a holistic view of customers by integrating data from multiple domains

Compliance

Connect data throughout an organization to quickly respond to regulatory inquiries

Fraud detection

Recognize anomalies in transaction data across multiple lines of business



THE DATA MANAGEMENT JOURNEY

The data-as-a-product architecture represents a significant change from past data management practices, and it will certainly require sophisticated technology solutions. Fortunately, these solutions are already available, including self-service capabilities that streamline and simplify the creation, hosting, and management of data products by data owners. These solutions support efficiency and collaboration around data, reference architectures, and operating models for domain-driven distributed data management.

At heart, this new approach is less about technology and more about changing the data management organization and culture. As a result, a robust change-management effort will need to be a key part of implementing the new architecture.³

While moving to a data-as-a-product architecture will entail change, that change can be implemented gradually. Financial services companies can begin with an assessment of their current data management landscapes and their future needs. This can provide a basis for creating an implementation plan that can be carried out incrementally. For example, the new architecture might be implemented in a single domain with a handful of data products and a limited number of business stakeholders. From there, the new approach can be rolled out to other domains and business groups over time. In addition, companies typically will be able to make the shift without changing much of their existing IT infrastructure, allowing them to protect that investment as they move ahead.

The advent of the data-as-a-product architecture represents an important step in the financial services industry's ongoing effort to manage growing volumes of data to generate actionable insights. It promises to help companies obtain data insights at speed and scale, ultimately enabling them to make better use of both analytics and their critical data assets to compete more effectively.

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³ <https://www.forrester.com/blogs/exposing-the-data-mesh-blind-side/>

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