swish

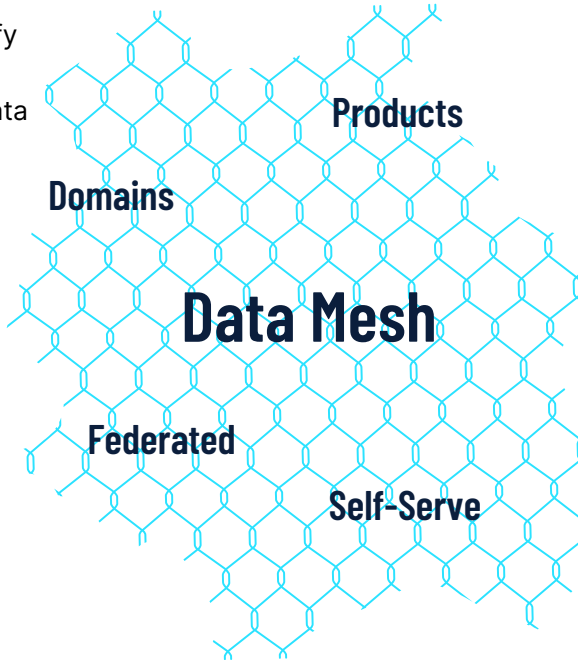
Solution Brief

Data Mesh

Introduction

Many government agencies are at an inflection point, where their data management approach no longer matches the complexity of the organization or its mission. The proliferation of data sources, fragile integrations, slow synchronization, and lack of effective governance are stifling collaboration and innovation. Different systems have inconsistent security and access policies, out-of-sync data sets, different formatting standards, and other incompatibilities that make the organization, as a whole, less agile and efficient. Furthermore, data formats aren't readily available for use in modern analytics and artificial intelligence workloads.

The *Federal Data Strategy*, OMB M-19-18, the *DoD Data Strategy*, and numerous other policies call for improved data-driven decision making. To operate at the speed of relevance, agencies must flatten and simplify data architectures, streamline data product creation, enable a high-velocity edge-based workforce, leverage real-time data, and ensure data is secure and well governed.



Gone are the days of centralized databases and data warehouses. Welcome to the decentralized and distributed world of the data mesh.

Data Mesh Principles

Data meshes provide distributed multidimensional architectures that deliver simple, scalable approaches for sourcing, managing, and accessing data at scale in real-time. Four simple principles capture the underpinnings of a data mesh:

- Domain Ownership
- Data as a Product
- Self-Serve Data Platform
- Federated Computational Governance

Domain Ownership

"Domain Ownership" involves assigning responsibility for data management and governance to the teams that are closest to the data's source and most knowledgeable about its context - the domain teams. This approach decentralizes data ownership, ensuring that it is accurate, reliable, and accessible for others across the organization. This also improves data quality, reduces bottlenecks associated with centralized data teams, and fosters a culture of accountability and collaboration around the organization's data.

Data as a Product

The principle of "Data as a Product" is based on treating data as a valuable, consumable asset that is curated, maintained, and made accessible with the same rigor and care as any other product. This entails ensuring data is high-quality, well-documented, discoverable, and easily accessible to users across the organization. Domain teams are responsible for managing their data products which can include:

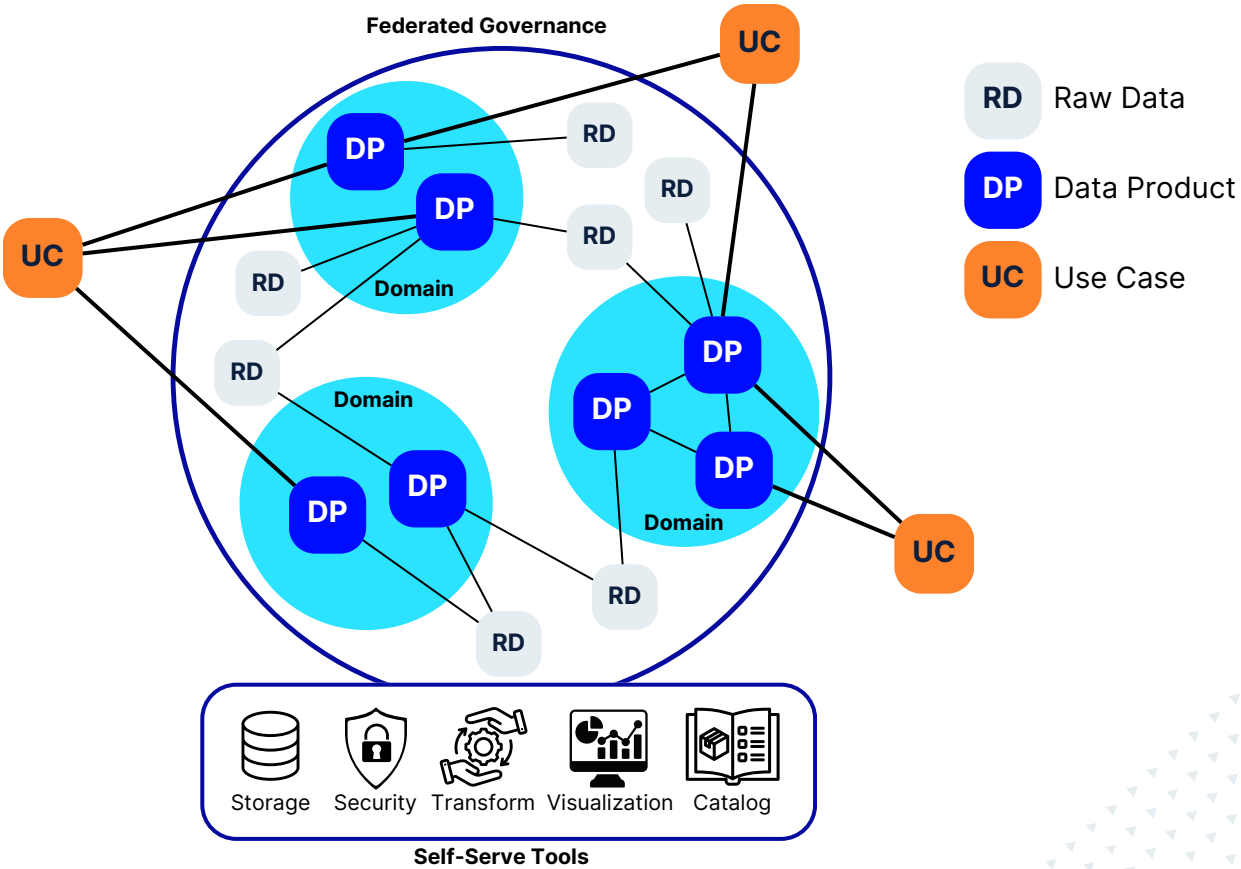
- Database tables
- Raw unstructured files
- Streaming transactions or telemetry
- Change event logs
- REST API
- Features for Machine Learning models
- Visualizations and dashboards

Self-Serve Data Platform

The Data Mesh concept of a "Self-Serve Data Platform" focuses on creating a set of tools, infrastructure, and capabilities that enable domain teams to autonomously manage, process, and serve their data products without needing deep technical expertise or being dependent on a centralized data team. This platform provides standardized, scalable solutions for data ingestion, storage, transformation, and access, along with robust governance and security capabilities. By empowering teams with a "Self-Serve Data Platform," organizations can enhance agility, reduce time-to-insight, and foster innovation by allowing teams to focus on deriving value from data rather than being bogged down by the complexities of data engineering and infrastructure management.

Federated Computational Governance

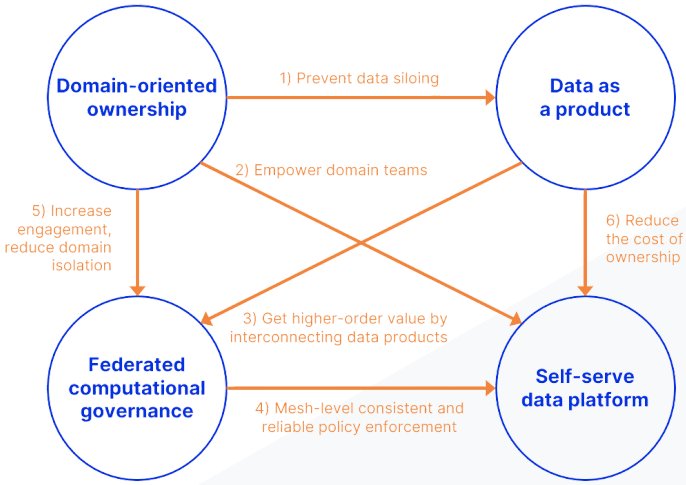
"Federated Computational Governance" is a decentralized approach to data governance that balances autonomy and standardization across domain teams. It involves establishing governance policies and standards that are enforced through automated, computational means, ensuring consistency, security, and compliance across the organization while allowing domain teams the flexibility to manage their data according to specific needs. By federating governance, organizations can maintain control and oversight without hindering the agility and innovation of individual domain teams.



Benefits

Data meshes revolutionize how organizations harness and utilize their data:

- Enable democratic data processing as domain experts take the reins, creating meaningful data products within a decentralized governance framework.
- Improve innovation velocity with empowered domain experts, reducing operational bottlenecks and strains on the system.
- Achieve cost efficiencies through distributed processing and improved visibility into resource allocation and storage costs, ensuring better budgeting and cost reduction.
- Enhance data discovery with a model that prevents data silos, lowering the risk of data assets getting locked within different mission domain systems.
- Strengthen security and governance with robust policies and monitoring.



Example Use Cases

Citizen Services	Integrated Citizen 360 View	Streaming Messaging	Sentiment Analysis	Systems of Scale for High Demand
Finance & Acquisitions	Cross-system Fraud Detection	Preventive Regulatory Scanning	Real-time What-if Analysis	High-quality Data for Insights and Analysis
Critical Infrastructure and C5 ISR Systems	Real-time Operational Data, Analytics and Alerts	Environmental Factor Processing	Preventive Maintenance	Threat Detection & Real-time Response

Swish Success Services

Swish brings decades of engineering experience, helping numerous public sector and DoD agencies navigate the complexities of operationalizing enterprise solutions. Our team of certified professionals objectively assess your environment, requirements, and long-term operational needs. We utilize a continuous improvement approach with Plan, Implement, Manage, and Optimize phases which focus on providing rapid value and long-term success. Swish values our client relationships and are here to provide support over the lifecycle of the solution. We can develop a customized Data Mesh solution that effectively safeguards your critical data while optimizing costs and maximizing efficiency.

Plan	Implement	Manage	Optimize
Assess	Installation	Remote Management	Health Checks & Tuning
Design	Integration	Upgrade Assistance	Customization
	Adoption	Ongoing Enablement	Maturity Assessments

The Swish Difference

Swish's expertise in data mesh solutions allows us to deliver distributed, multidimensional architectures for sourcing, managing and accessing data at scale in real-time. Additionally, our solutions meet federal security and compliance requirements, giving you peace of mind. Contact Swish today at info@swishdata.com to learn more about how we can enhance your data mesh architecture, while ensuring security and compliance.

Procurement Pathways

Swish has served the federal government since 2006, successfully managing complex GWACs and IDIQs. We have a deep understanding of the acquisition management process and bidding compliant best-value proposals. Swish solutions are available on our GSA contract (GS-35F-0563X), SEWP V contract (NNG15SC91B), and CIO-CS contract (HHSN316201500049W). Swish also has extensive subcontractor relationships for procurement via other contract vehicles. Additionally, Swish is an AWS Partner and can quote directly via the AWS Marketplace for ISV solutions and professional services.

Compliance and Certifications

Swish strictly adheres to a security-first mindset and carefully vets and selects solutions which meet our stringent Fed-ready and secure supply chain requirements.

FedRAMP

ADA VPAT 2.0 for Section 508 Compliance

Multiple DoD/IC ATOs

FIPS VALIDATED 140-2

FIPS 140-2

Partners

CONFLUENT aws databricks IBM

Get Started

Go to https://swishdata.com/solutions/data-mesh/ or email Swish at info@swishdata.com to learn more about our Data Mesh solutions. Go to https://swishdata.com/contact/ to schedule a meeting with our experts.

Swish is a provider of technology solutions and engineering services to the U.S. Public Sector with a focus on high-quality outcomes for customers. Since 2006, Swish has delivered high-performance solutions and services to the Public Sector market ensuring that customer's digital service capabilities, performance, and security exceed expectations and requirements. Swish is a Service-Disabled, Veteran-Owned and HUBZone certified Small Business.