



# Federated Computational Data Governance in Practice

How to maintain consistent governance standards while allowing domain teams the flexibility they need?

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# Agenda

1

## Hard Truths

How misconceptions built the understanding of Data Governance

2

## Data Teams & Models

Building the right data teams and structures.

3

## Data Governance

The Future of Data Governance.

# What Does It Mean to Treat Data as an Asset?

## The Asset Perspective

Data is a strategic business asset that drives value.

Requires investment, maintenance, and governance.

## The Service Paradigm

Organizations often treat data through IT service frameworks.

Ticket-based systems disconnect data from business outcomes.

## The Organizational Gap

Team structures remain misaligned with data's value.

Data teams typically mimics IT structures, limiting potential.

# The Operational Reality: Challenges in Data Management



## Build-centric mindset

Organizations prioritize system development over lifecycle management, treating data as project-based initiatives rather than ongoing assets.



## Reactive governance

Data governance becomes reactive when separated from business strategy, undermining long-term value creation.



## Failed enterprise initiatives

Large-scale data projects often collapse because they lack domain-specific understanding and ownership.



## Operational vs. analytical divide

The separation between operational and analytical data creates governance blind spots.



## "Democratization" misconception

True data empowerment requires clear accountability, not just equal access in non-democratic organizational structures.

# The Executive Reporting Game

## 1 Board-Level Matter

Data governance requires attention at the highest organizational level. Strategic decisions about data affect enterprise value creation.

## 2 Business Disengagement Risk

When business leaders abdicate data decisions, technical teams make business choices by default. This creates strategic misalignment.

## 3 Reporting Structure Confusion

Competing reporting lines between CIO, CFO, and CDO blur accountability. Clear authority channels are essential.

## 4 Governance's Unique Position

Data governance requires distinct organizational representation. It bridges technical implementation with business strategy.

# Data Governance as Negotiator

## Regulatory Downward Pressure

Compliance requirements cascade from regulators to all teams.

## Organizational Upward Pressure

Business units demand data to cater their operational needs.

## External Inward Pressure

Partners, competitors, and market forces shape data needs.

## Technological preconditions

Technological landscapes grow organically and rarely change due to a certain need.

# Disentangling Governance from Operations

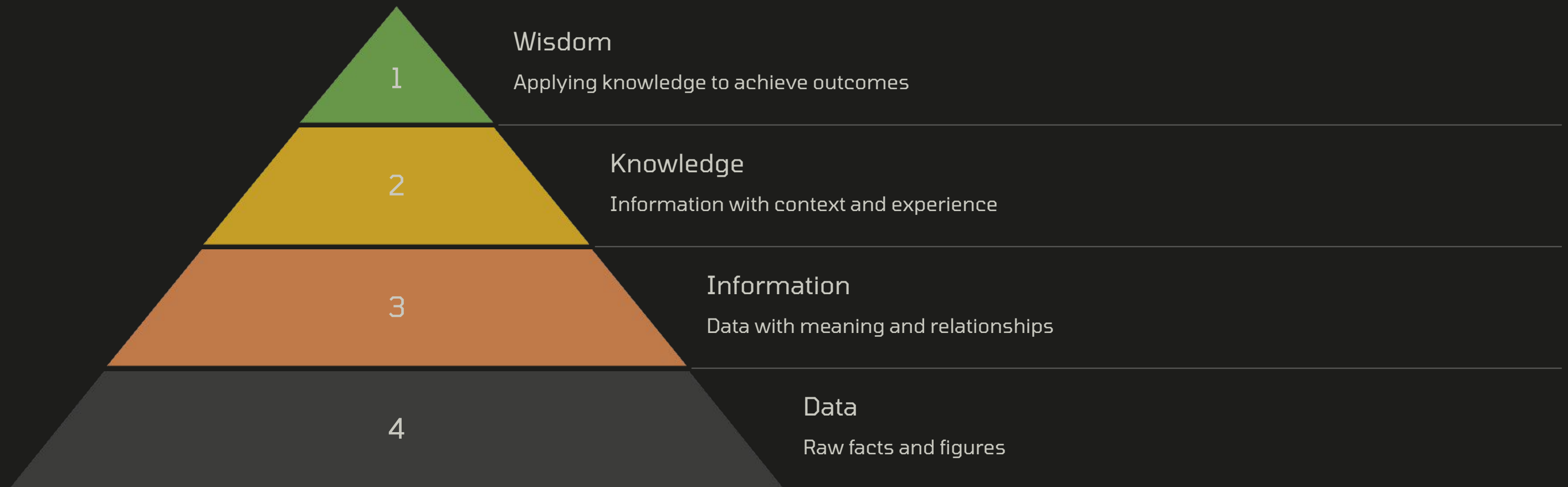


The term "Federated Computational Data Governance Operating Model" confuses distinct organizational functions.

Governance establishes the rules. Operations executes within those boundaries.

# A Holistic Approach to Data Information Knowledge and Wisdom

Effective governance must span the entire knowledge spectrum, not just raw data.



Each layer depends on the quality of what's beneath it. Governance must encompass all levels to create business value, not just technical compliance.

Computational governance enforces rules across this hierarchy, ensuring integrity at each transformation point.



# Evolution of Data Governance

1

## Compliance Focus

Early emphasis on meeting regulatory requirements.

2

## Enabling Innovation

Shift towards aligning governance with business value.

3

## Automation Motor

Now, there is a drive for Data Governance automation in complex, distributed landscapes.

# What Does It Mean to Treat Data as an Asset?

## Discoverable

Data must be easily findable through comprehensive catalogs and metadata. Teams across the organization should be able to locate the data they need without excessive searching or departmental barriers.

## Accessible

Once discovered, data should be readily accessible to authorized users through standardized interfaces and protocols. Proper access controls ensure data is available to those who need it while remaining protected.

## Trustworthy

Data quality, lineage, and provenance must be documented and maintained. Users should have confidence in the reliability of the data they're using for business decisions and analytics.

## Valuable

Data must contribute measurable value to business outcomes. This requires understanding data's context, business relevance, and potential applications across the organization.

# What is Data Governance?

## Traditional Definition

The exercise of authority, control, and shared decision-making (planning, monitoring, and enforcement) over the management of data assets.

## Alternative Perspective

Data Governance is a human-based system by which data assets in a socio-technical system are directed, overseen, and by which the organization is held accountable for achieving their defined purpose.



# "Roles" of Data Governance

## Data Negotiator

Translating business and regulatory requirements into actionable data policies.

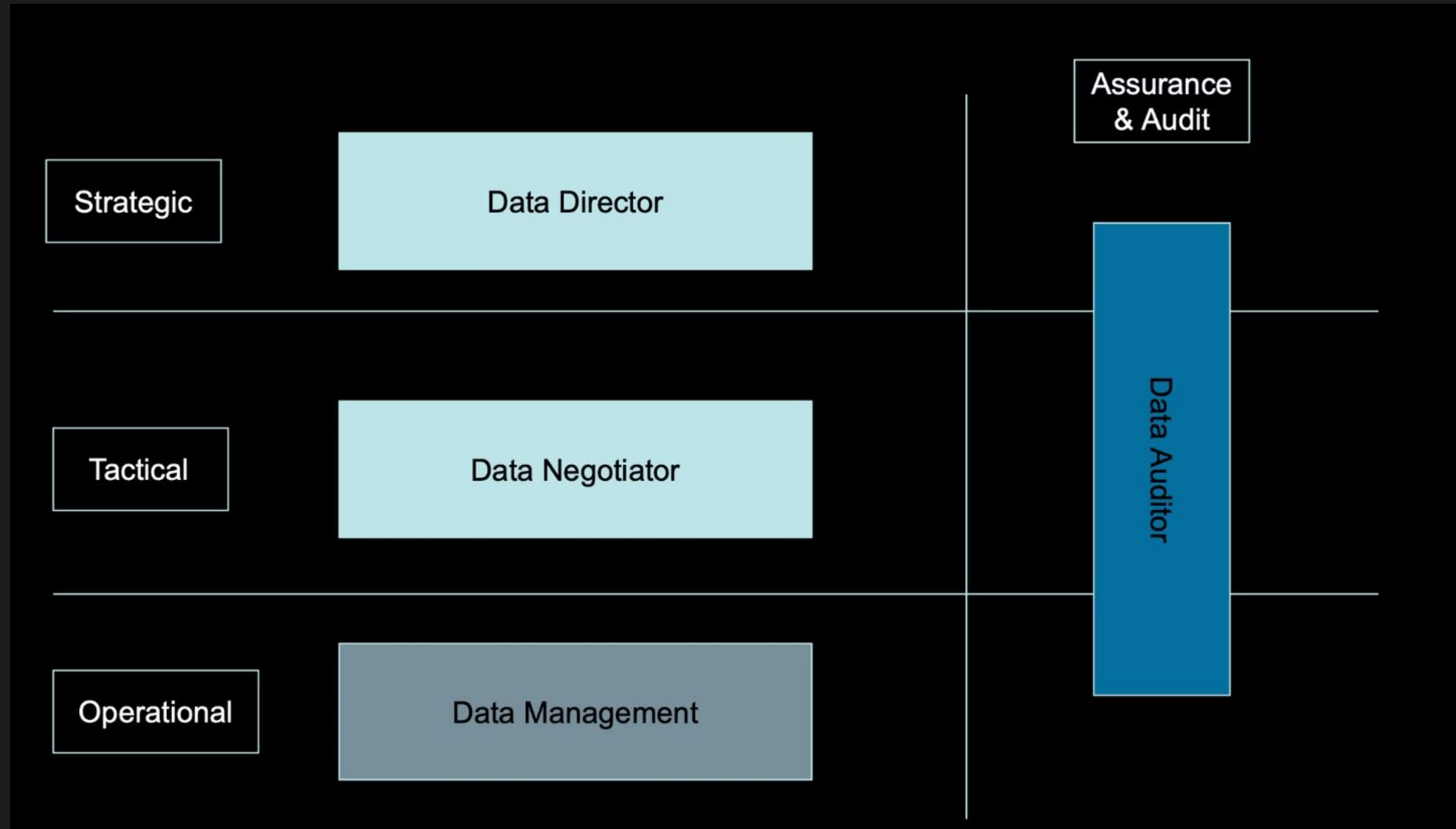
## Data Director

Shaping focus and priorities in Data & AI-driven initiatives.

## Data Auditor

Overseeing and ensuring the accountability for data.

# "Roles" of Data Governance





# Data Operating Models: Central vs. Distributed vs. Federated

1

Centralized

Single point of control.

2

Distributed

Data dispersed across units.

3

Federated

Balancing control and autonomy.

# What is Federated Data Governance?

**Federated Data Governance** balances local autonomy in data handling with overarching organizational policies to achieve cohesive, secure, and compliant data practices within a socio-technical system.

1

## Central Oversight

Core policies, standards, and frameworks set by a central authority.

2

## Domain Autonomy

Business units manage domain-specific requirements and implementations.

3

## Shared Accountability

Clear ownership at each level with transparent responsibility models.

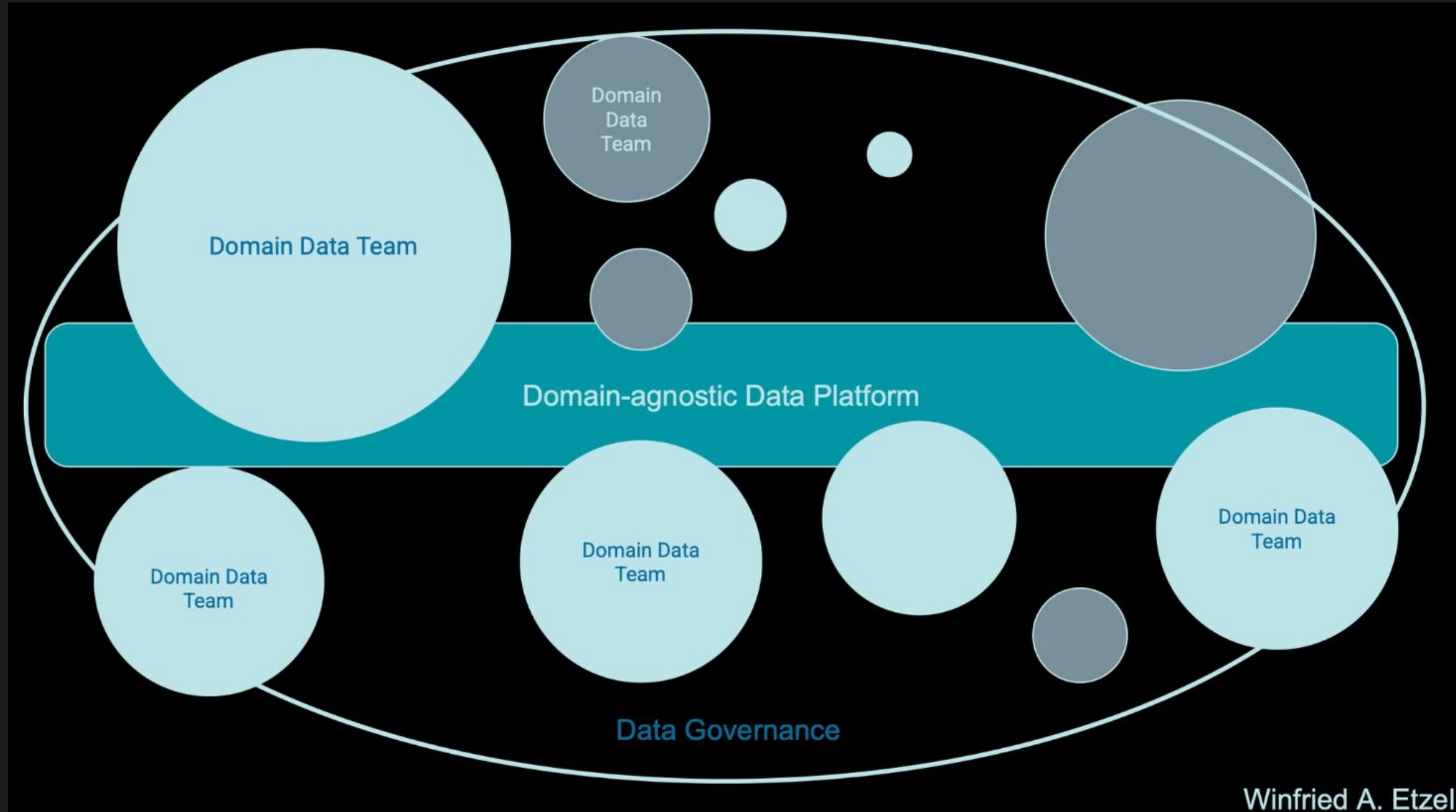




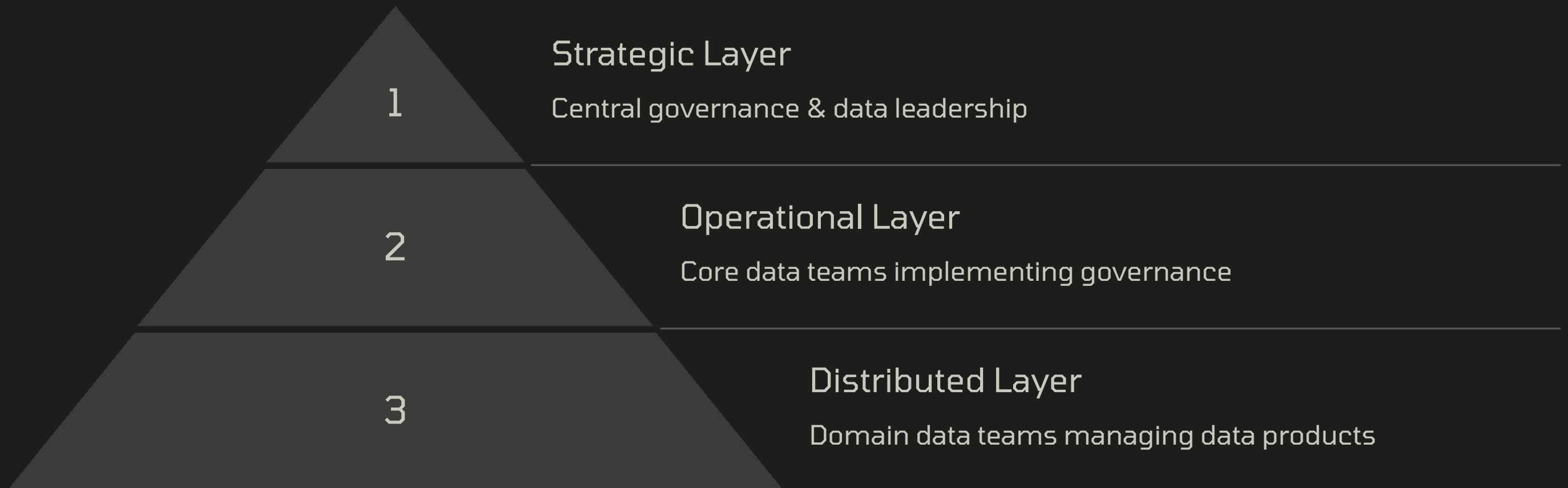
영화 「스타쉽 트루퍼스(Starship Troopers, 1997)」의 한 장면

Data Teams for Maximum Impact

# Data Mesh Holacracy



# Structuring Data Teams for Agility & Impact



# Data Teams for Maximum Impact

■ Data Governance  
Establish data policies, standards, and controls to enable trusted, ethical, and compliant data use.

■ Data Strategy  
Navigate uncertainty in data towards overall business objectives and priorities.

■ Data Scientists  
Leverage advanced analytics and machine learning to uncover insights from data.

■ Data Engineering  
Build and maintain the data infrastructure, pipelines, and platforms to support data-driven initiatives.

■ Data Operations  
Ensure reliable and efficient data processing, monitoring, and incident response.

■ Distributed Data Management  
Empower domain experts to manage data within their business units.

■ Central Data Management  
Provide centralized data enablement and support for the entire organization.

■ Strategic / Tactical Guidance

■ Data Teams

■ Distribution

**DATA GOVERNANCE "ASSIGNING" DATA OWNERS**



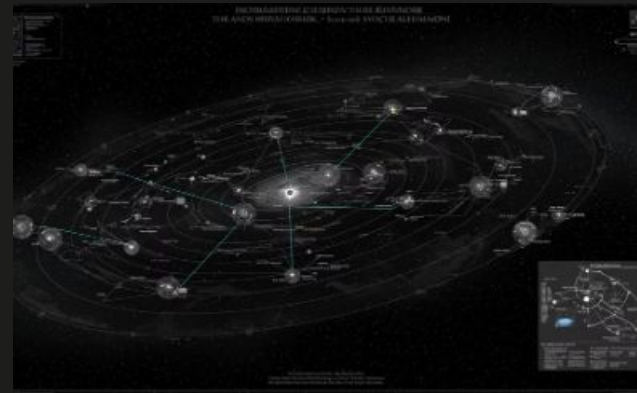
**EVERYONE**

# Automation in Data Governance



## From Incentives to Automation

Computational governance shifts from human compliance to machine-enforced standards.



## Governance by Design

Automated processes enforce policies without requiring constant human intervention.



## Operational Efficiency

Management processes become prime candidates for streamlined automation.



## Reduced Compliance Burden

Systems that self-govern eliminate the need for economic or social incentives.

# Automation in Data Governance



## Data Products

Well-defined, reusable data assets with clear ownership that encapsulate both the data and its governance.



## Data Contracts

Formal agreements between data producers and consumers that specify access rules, quality expectations, update frequencies, and usage limitations.



## Governance Scaling

The product-contract approach enables governance enforcement to scale by embedding controls and standards directly into data interfaces.

# Automation in Data Governance

## AI-powered Policy enforcement

Automating policy operationalization and enforcement across systems.

## AI-Enhanced Compliance

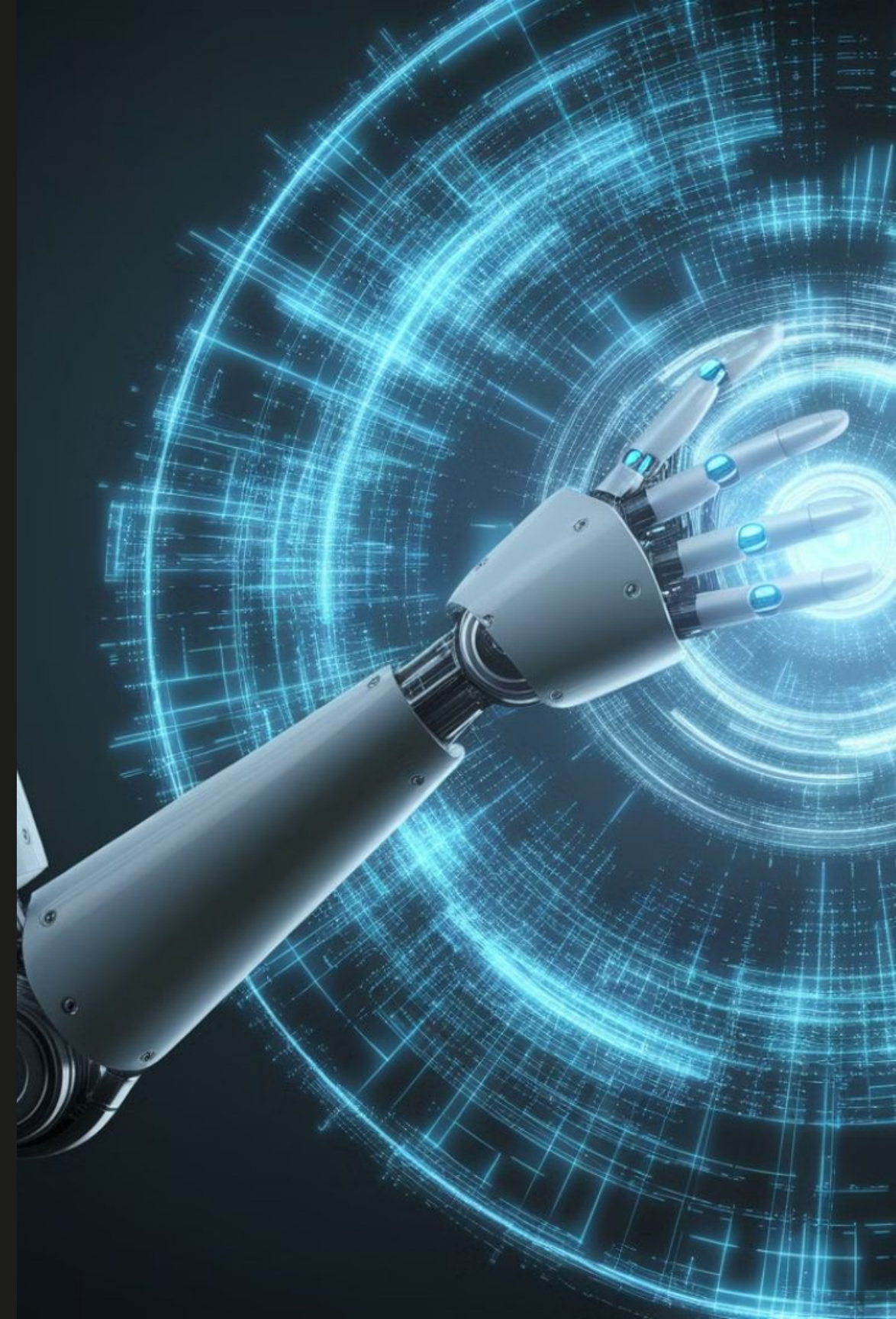
Leveraging e.g. natural language processing to review contracts, privacy policies, and regulatory changes for compliance gaps.

## MLOps for Governance

Automating governance enforcement within ML pipelines ensures that models adhere to data policies, enhancing model integrity and trust.

## Audit and Monitoring with AI

AI-powered tools can monitor data usage and AI model performance in real time, identifying potential issues and anomalies, facilitating proactive risk management.



# The Data Governance Mindset

## From Prerequisite to Guardian

Shift the perception of data governance from a mere prerequisite to a guardian that empowers and protects the organization's data assets.

1

## From Excellence to Enablement

Refocus data governance efforts from striving for perfection to prioritizing the enablement of data-driven decision making across the organization.

3

## From Centralized to Federated

Shift from a centralized data governance structure to a federated model that empowers domain experts to manage data within their respective areas while maintaining overall alignment.

5

## From Governmental to Societal

Embrace a data governance mindset that considers the broader societal impact of data-driven initiatives, fostering responsible and ethical data management practices.

7

2

## From Enforcement to Support

Move away from a heavy-handed enforcement approach and instead position data governance as a supportive framework that enables teams to manage data effectively.

4

## From Universal to Adaptive

Recognize that a one-size-fits-all data governance model may not work for every domain, and embrace an adaptive approach that caters to the unique needs of each business area.

6

## From Descriptive to Prescriptive

Move beyond just describing data governance policies and instead focus on designing data governance frameworks that actively guide and shape data-related decision making.



*I'm doing my part!*

# Key Takeaways & Next Steps

## Treat Data as a Business Asset

Make data discoverable, accessible, and trustworthy through clear ownership and governance, managing it with the same rigor as financial assets.

## Structure Teams for Balanced Governance

Balance strategic, operational, and distributed teams. Centralize for security and compliance; federate where domain expertise matters.

## Implement Data Products & Contracts

Package data as consumable products with defined interfaces. Establish contracts that specify quality expectations and usage terms between producers and consumers.

## Automate for Sustainable Governance

Use AI and automation to monitor quality, enforce policies, and measure governance effectiveness, ensuring consistent standards at scale with minimal overhead.

# Future Vision of Data Governance

1

Agile

Adaptive to changing regulatory and business environments.

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2

Resilient

Withstanding disruptions in distributed systems.

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3

Accountable

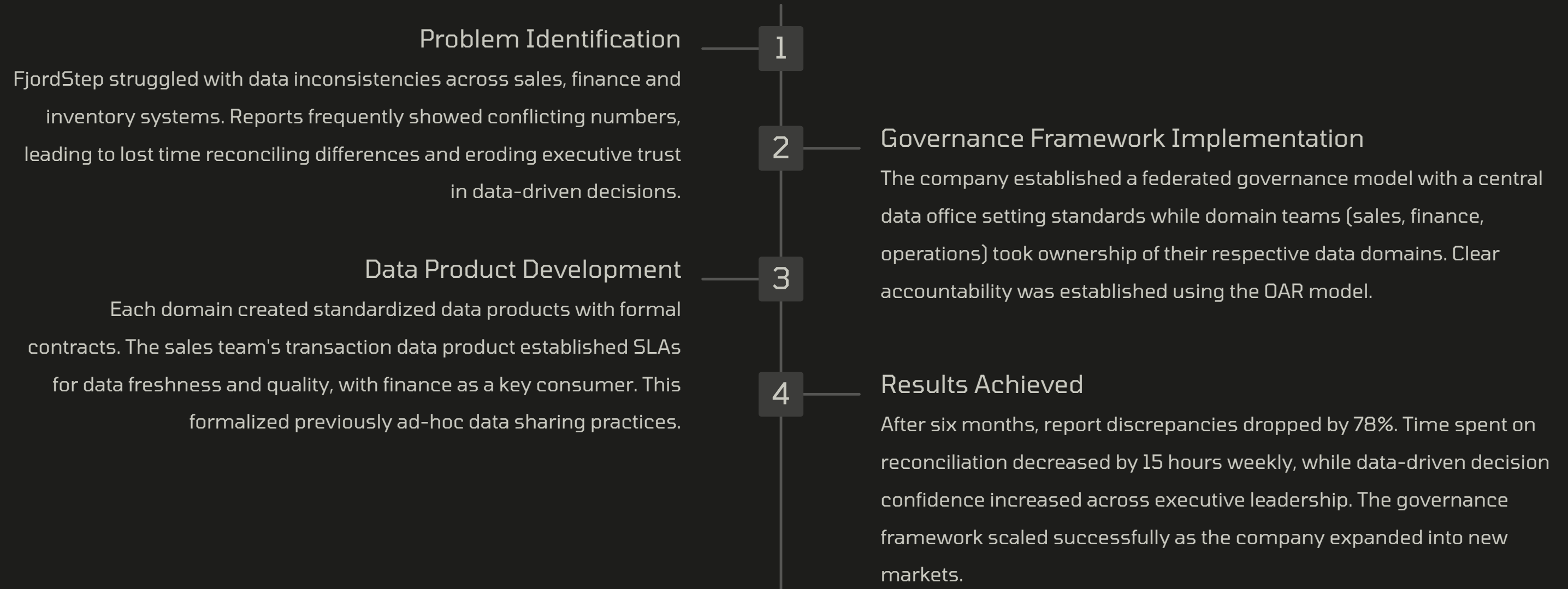
Ensuring clear accountability across federated models.



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# Case Study: FjordStep's Governance Transformation



FjordStep's experience demonstrates how federated governance can transform data practices even in organizations with established but problematic data systems. By clearly defining ownership and implementing product thinking, they achieved both technical improvements and business outcomes.

# Data Stewardship: Evolving Roles in Federated Organizations

Traditional stewardship models struggle in distributed environments where business domains maintain autonomy.

1

## From Control

Stewards once acted as gatekeepers enforcing standardized rules across the enterprise.

2

## To Domain Enablement

Modern stewards coach domain teams on governance within computational boundaries.

3

## To Value Acceleration

Today's stewards facilitate cross-domain data contracts that unlock business value.

4

## To Governance Automation

Future stewards implement computational guardrails that scale governance seamlessly.



# Long-Term Maintenance of Data Governance Practices



Sustaining data governance is a continuous process rather than a one-time project. Organizations must establish feedback loops that provide visibility into governance effectiveness while enabling adaptation to evolving business needs and regulatory requirements.

AI and automation play crucial roles in making governance sustainable at scale. AI-powered monitoring can detect anomalies in data quality or usage patterns, while automated policy enforcement reduces manual overhead and ensures consistent application of standards. Together, these capabilities allow governance to become embedded in daily operations rather than existing as a separate compliance activity.

# Ensuring Data Accountability with Clear Ownership

Role	Ownership	Accountability	Responsibility
Domain Lead	Decides domain data strategy	Reports on data quality KPIs	Reviews critical data elements
Business Function Leader	Approves data access policies	Ensures governance policy adherence	Allocates resources for data work
Data Engineer	Defines technical implementations	Documents data lineage	Executes data transformations
Data Steward	Owns metadata standards	Monitors data quality	Resolves data issues