FUJITSU

Emerging Technologies

Data Mesh in Azure

Q. Is your organisation considering a shift from centralised Data Management?

Q. Are you trying to give your teams the freedom to act, adapt, and change?

If so, maybe you are considering the concept of 'Data Mesh' as a model your organisation can adopt.

Reaping the rewards of such a cultural shift comes with opportunities, as well as risks and challenges. Navigating the risks and challenges requires a trusted partner.

Fujitsu can help your organisation face these challenges and help you:

- **Evaluate your data strategy**

- **Understand if data mesh is the right fit**

- **Provide you with options and co-create a strategy fit for your organisation**

- **Implement this transformation from ideation to delivery**

Fujitsu Decision Intelligence Practice consists of Consultants, Data Architects, Data Engineers, Data Scientists and BI experts. The team is enhanced by MSc and PhD researchers with speciality in algorithmic and quantitative research skills.

What is Data Mesh?

At Fujitsu, we understand that becoming a truly data-driven organisation, is not a one-size-fits-all solution. Whilst the traditional approach promotes centralisation of data governance and infrastructure, we also understand that this isn't for everyone. Which is why we can help those who embrace decentralisation and grant their teams the freedom to act, adapt, and change.

Data Mesh changes the paradigm of data architecture

- Domain driven distributed architecture
- A self-serve platform for data
- Encourage teams to engage in product thinking about data

- Governance of the ecosystem
- By embracing Data Mesh, organisations empower their teams to take ownership of data products, fuel innovation, and make data-driven decisions

Our team of experts can help you enable understand Data Mesh and whether it's a fit for your business; more than that, we can help all the way to implementation, using Azure Cloud's scalable and flexible service and unlock the full potential of your data.

Data Mesh is not only about technology. It's, first and foremost, a cultural shift towards decentralised data ownership and domain expertise. It fosters collaboration, autonomy, and a product mindset. Fujitsu UK Decision Intelligence Practice consists of Data Architects, Data Engineers, Data Scientists, BI experts, and Analytical Consultants.

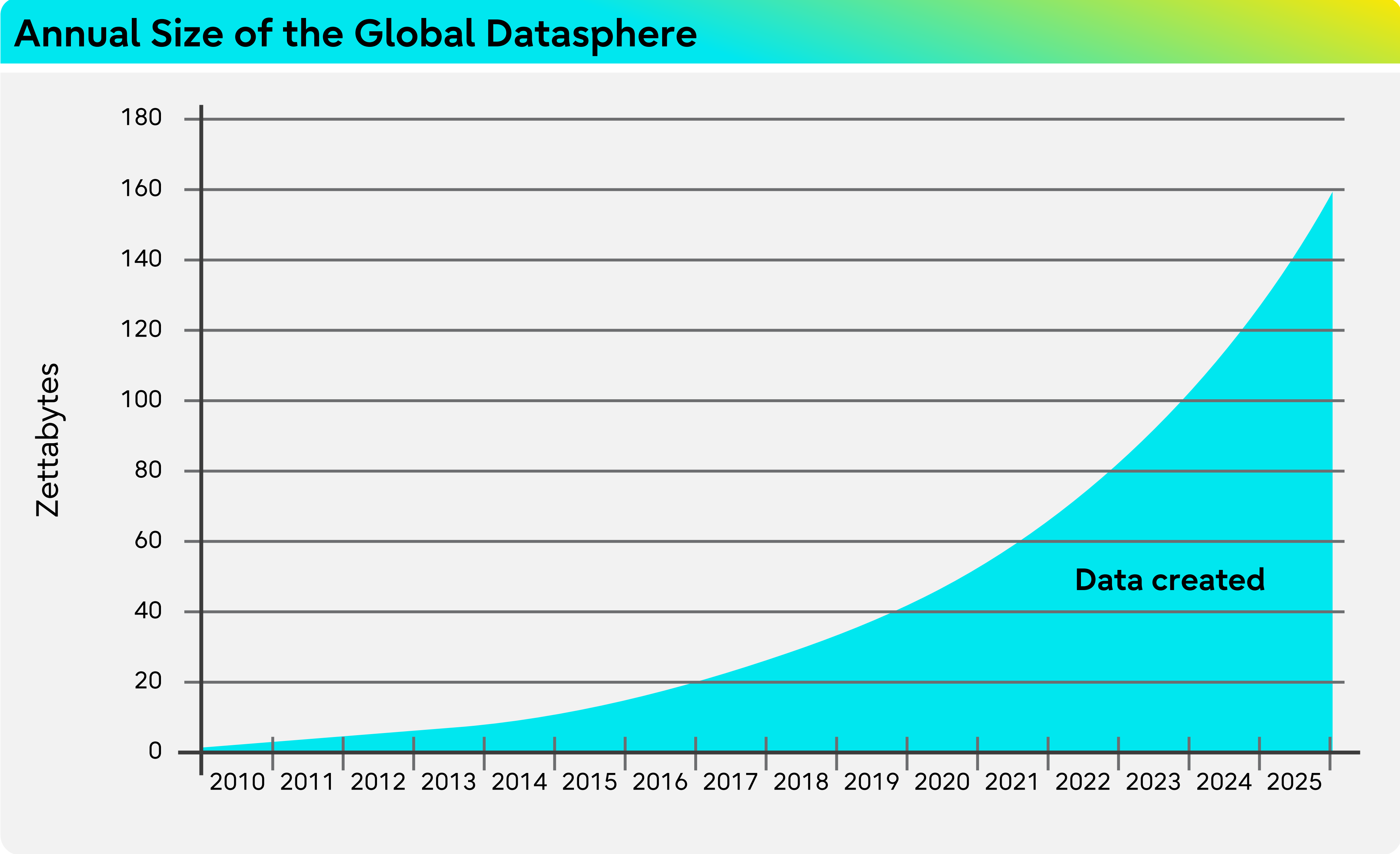## We can help you through every step of the process

- Engaging with your stakeholders and assess your readiness through our Data Maturity Assessment
- Understand your business strategy and requirements

- Incorporate your long-term vision and strategy in our architecture and solution designs
- Execute and deliver from MVP to scaling out your solution

Culture and Governance

The major transformative driver when adopting Data Mesh is not technology driven. Instead, it's a cultural shift. Traditional data architecture is built around the idea of a Data Warehouse managing a centralised, authoritative team within a business. The exponential increase of data produced and consumed over the last few decades, however, has challenged this paradigm.

Annual Size of the Global Datasphere

Data created

Zettabytes

180 — 160 — 140 — 120 — 100 — 80 — 60 — 40 — 20 — 0

2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025

Globally, we were producing less than 5 zettabytes of data before 2010. This 2017 IDC forecast was predicting more than 60zb by 2022. The pandemic accelerated this pace.

Source: Seagate-WP-DataAge2025-March-2017.pdf

In many cases, this increase has posed challenges for the centralised model and in some, it has rendered it insufficient. In a Data Mesh, domains take ownership of their data. They become responsible for its governance, ensuring accuracy, completeness, consistency, and timeliness. Trust is decentralised, and each domain establishes its own data management practices.

This creates opportunities as well as challenges. On one hand, it allows organisations to distribute decision-making authority and promote a culture of data ownership and accountability. Ultimately, it can foster agility and innovation.

Challenges, however, can arise in balancing something that, on its face, is contradictory. The flexibility and decentralisation that data mesh provides with its need for standardisation of governance, to enable common best practice and interoperability. That's why it's important to note that data mesh is not just a technology strategy but a broader cultural shift.

It is underpinned by a Governance layer, that looks like this:

Global Governance

Policies and Standards	Data Catalogue	Access and Authorisation	Quality	Security	Governance	Data Lifecycle	Monitoring	Ethics and Privacy

Let's explore each term

Policies and Standards: Policies and standards that define how data should be managed. This would include data quality guidelines, privacy and security measures, retention policies, compliance requirements as well as workflows and processes on incidents like Data Breaches.

Data Catalogue and Metadata Management: A data catalogue serves as a repository of information about available data assets. It gives you information about where they're held, who owns them, how they're used and what transformations they go through.

Access Controls: This domain includes defining roles, permissions and authentication protocols and processes to ensure data is only accessed by authorised individuals.

Quality Management: Implementing processes and tools to monitor, assess, and improve the quality of data. This includes data profiling, data cleansing, data validation, and establishing data quality metrics and thresholds.

Security and Compliance: Ensure data is protected from unauthorized access. Compliance with relevant data protection legislation and industry standards.

Governance Roles and Responsibilities: Defining clear roles and responsibilities within the organization for data governance, such as data stewards, data owners, and data custodians. These roles ensure accountability and ownership for data management activities.

Data Lifecycle Management: Establish processes to manage the entire lifecycle of data, from its creation or acquisition to its archival or deletion. This can include data retention policies, archival, purging, and data disposal procedures.

Monitoring and Auditing: Implementing monitoring and auditing mechanisms to track data usage, access patterns, changes, and overall compliance with governance policies. You can identify issues, detect anomalies, and ensure adherence to established practices.

Data Ethics and Privacy: Incorporating ethical considerations and privacy principles into the governance layer. This includes addressing data bias, ensuring informed consent, and protecting personally identifiable information (PII) in compliance with privacy regulations.

Next, we're going to look at an example of two organisations. One that adopts a centralised model, and one that adopts data mesh.

Example

Your Customer Service team analyses data to enable a tailored approach per age group. At the same time, your Marketing team uses automation to increase retention. All that whilst Finance colleagues are studying customer lifecycle value. The results of this analysis can be used for a new product recommendation service on your website. They all need to act on these initiatives that can improve operations and revenue. They need to use data and produce 'data products' that will drive this improvement. A centralised business unit and data warehouse might find it difficult to do all three.

You might have worked for or worked with businesses with a 'Data team'. A team responsible for maintaining and develop the technology components around data. They provide a service to the rest of the business. They are also tasked with providing insights to the rest of the business. Some of these job titles might sound familiar. Data Engineers, Integration Developers, Business Intelligence Developers, Data Analysts, and Data Scientists.

Teams and business units are reliant on the 'Data team's' availability, in this scenario. By association, so are the decisions and actions they need to take. Also, the data infrastructure, reports, integrations, and transformations produced are a single unit. As a result, it is difficult to incorporate different perspectives, objectives, and priorities.

Data mesh separates responsibility between two sides.

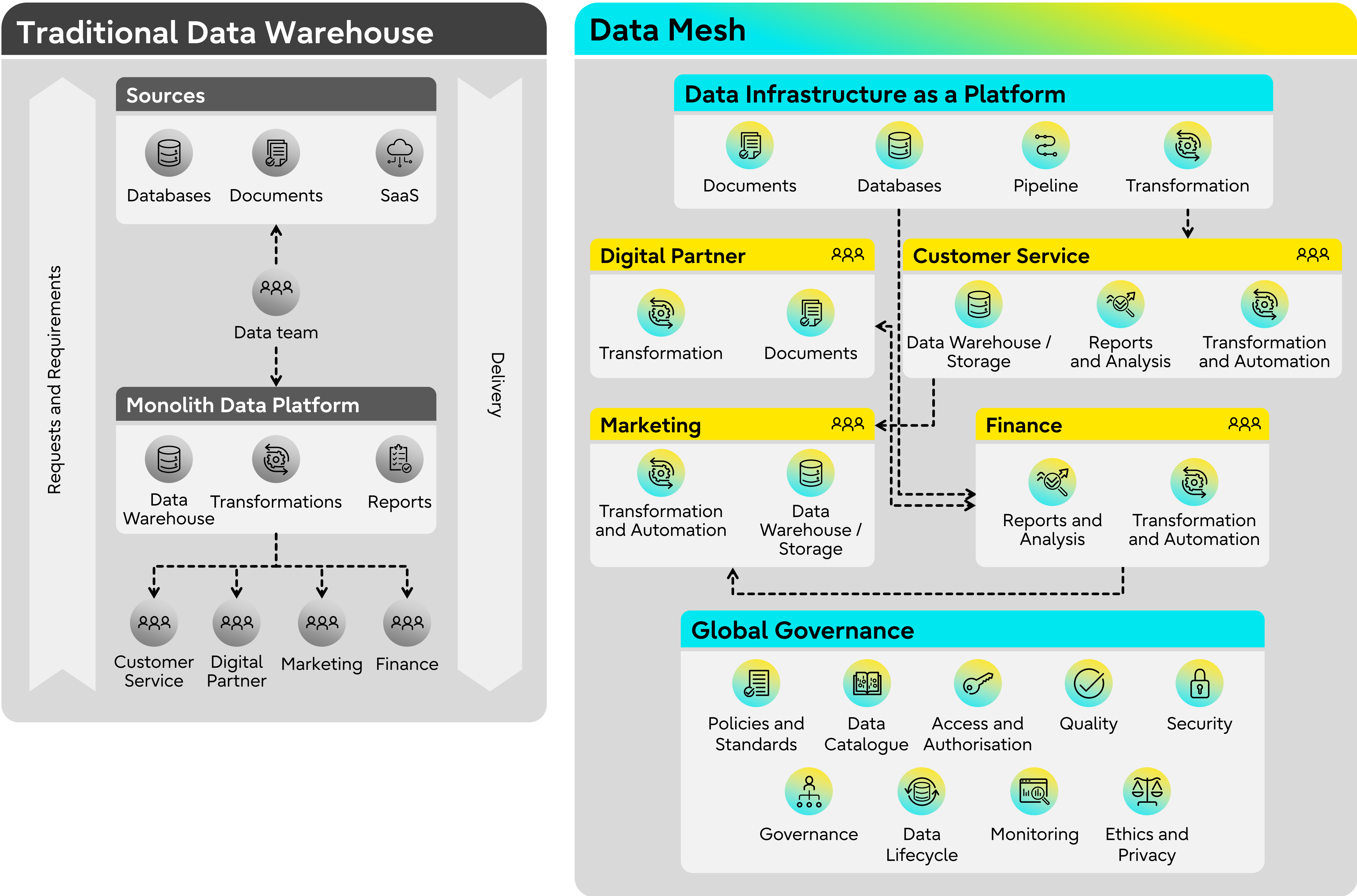**1** **Business domains that focus on creating data products**

2 **A platform team that focuses on technical capabilities**

The platform and infrastructure reflect this separation. It helps you create an ecosystem based on:

- **Domain driven distributed architecture**
- **A self-serve platform for data**
- **Encourage teams to engage in product thinking about data**
- **Governance of the ecosystem**

This approach can help incorporate these different perspectives and allow different domains to own their data products.
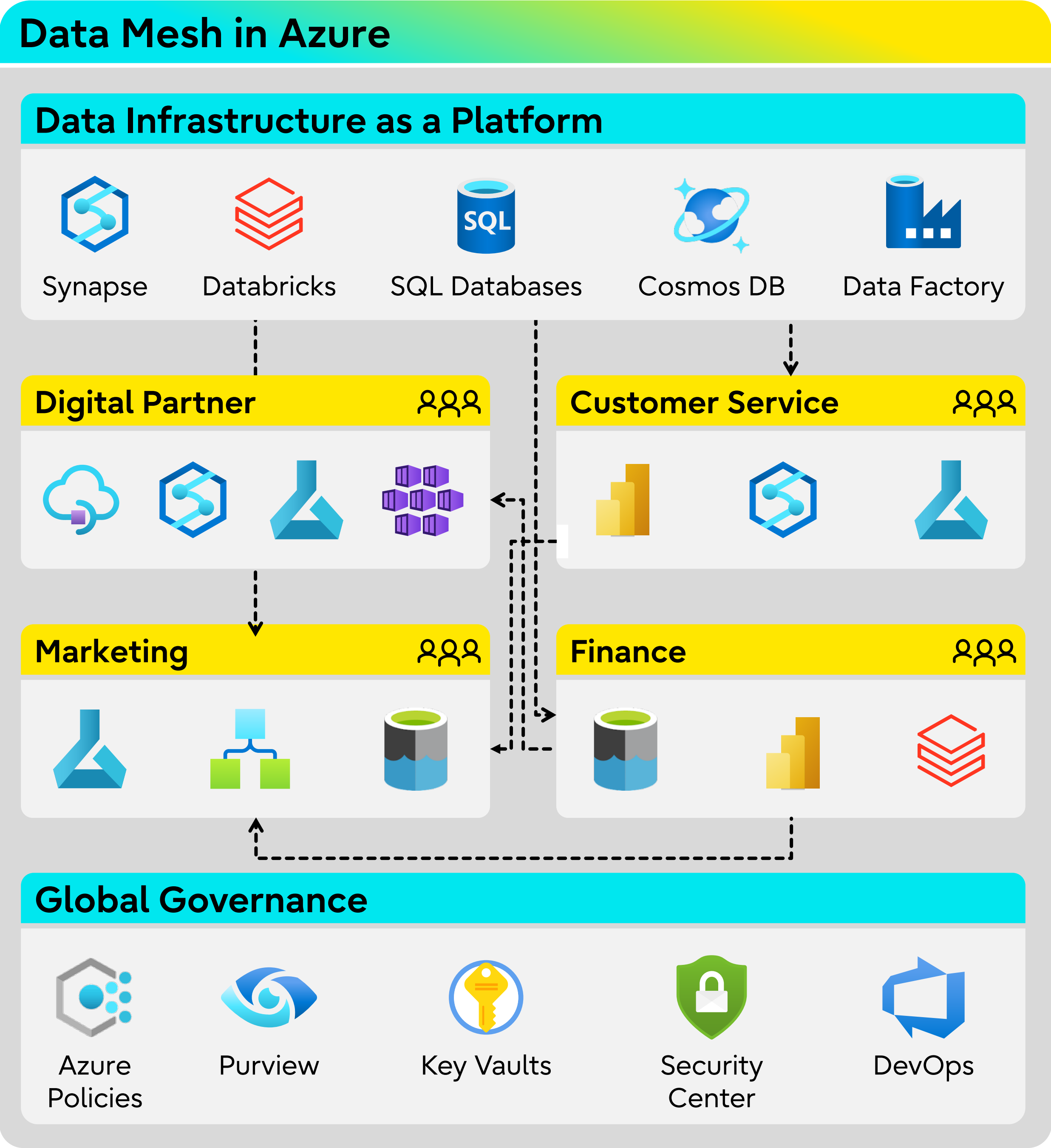
So, what does a 'side by side' comparison look like?

Azure implementation

Data Mesh in Azure

Data Infrastructure as a Platform

| Synapse | Databricks | SQL Databases | Cosmos DB | Data Factory |

Digital Partner

Customer Service

Marketing

Finance

Global Governance

| Azure Policies | Purview | Key Vaults | Security Center | DevOps |

Azure Cloud provides you with the tools to:

- Manage and secure your data platform
- Enforce policies and standards
- Provide enterprise-scale data catalogue
- Manage and distribute resources to all domains
- Allow self-service as well as collaboration between different domains

Azure cloud can provide different services for each domain. Azure Data Lake Storage, Databricks, Synapse Analytics are some of them. The selection of tools will depend on their needs and business objectives.

We can see the marketing team using Azure Machine Learning and Logic Apps for automation. The customer service team is also using Azure Machine Learning, as well as Power BI and Synapse Analytics for reporting, and with Microsoft Fabric now in general availability, it becomes easier for businesses to focus less on tooling and more on implementation and deliver value to end users and customers alike. Finally, the Finance team is studying the customer lifecycle by collaborating on Azure Databricks. The Digital Partner can reuse the results of their analysis. Then, they build a product recommendation algorithm used by the company's website. The service recommends products best suited to each stage of the customer lifecycle. The marketing team can reuse this data in their automations and targeted campaigns.

The Global Governance layer uses Azure Policy and Azure Purview. Active Directory and Key Vaults provide identity and access management. Azure Cloud also provides the platform team with tools.

- Managed or SaaS Analytics platforms such as Azure Databricks, Microsoft Fabric or Azure Synapse
- Globally distributed data stores such as Cosmos DB
- Orchestration and Integration through Azure Data Factory

Is Data Mesh a good fit for my organisation?

Data Mesh is a best fit for complex organisations with:

- large-scale data ecosystems
- multiple domains
- diverse data sources

These organisations need agility and autonomy in data management. As such, they find themselves embracing decentralised ownership, domain expertise and a product mindset for data. It starts with a cultural shift, followed by a technology one.

However, it may not be suitable for organisations with:

- simpler data architectures
- limited domain-specific data needs
- lack of domain and technical expertise in business areas

Organisations need to assess their readiness to embrace both the cultural and architectural shifts required for decentralised data management.

In conclusion, leveraging Azure Cloud for implementing Data Mesh brings several significant benefits. It provides you with scalable and flexible infrastructure that can empower decentralised data ownership, domain-oriented architectures, streamlined workflows, and secure data management, unlocking data's full potential.

Why Fujitsu?

Data Mesh is not just about technology. It's a cultural shift. Is your organisation ready for it? Is it a good fit?

Fujitsu can help your organisation answer these questions and help you implement this transformation from ideation to delivery. **Fujitsu UK Decision Intelligence Practice** consists of Consultants, Data Architects, Data Engineers, Data Scientists and BI experts. The team is enhanced by MSc and PhD researchers with speciality algorithmic and quantitative research skills.

Technology research is further supported by our **four centres of excellence**, researching Advanced Analytics, Artificial Intelligence, Quantum / Digital Annealer, and Blockchain.

Decision Intelligence teams adopt an agile way of working with a start small, think big approach. Resource augmentation and the ability to scale quickly is supported by our network of **European delivery centres**.

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