Digital Services

Data Mesh

A guide for companies

orange™ Business

Editorial

There is tremendous enthusiasm for Data Mesh. And for good reason: we finally have a complete framework for valuing data at company level.
Data Mesh thus embraces organisational issues but also those relating to methodology, governance, architecture and skills to help organisations adopt analytical practices. In short, Data Mesh is the modus operandi of data-driven companies.
It breaks with the data centralisation dogma that has been applied for decades and proposes an innovative approach that truly empowers businesses. It is sometimes said that it merely constitutes decentralised organisation. This is false and reductive: it is in fact both a distributed and federated model.
With such an ambition, the debate is raging... Is Data Mesh applicable in our companies or is it in fact a utopia? So I'll tell you straight away: yes, it's a utopia! But this is the kind of utopia that creates value every time you get close to it. The idea is not so much to apply all the principles of Data Mesh to the letter but rather to deploy them in an iterative and pragmatic way.

For companies, Data Mesh is therefore a crucial approach that should be followed without necessarily trying to reach it. And we're giving you the compass so you can head in the right direction!
This white paper offers you a deep dive into the concept of Data Mesh to understand the ins and outs and get the keys to apply it to your organisation. Written collaboratively by our experts, it responds to our mission of sharing knowledge to enable you to get full value from your data. Because as we say at Orange Business: 'Expertise is good, sharing it is better!'.

Mick Levy
Innovation Business Director

Contents

Data Mesh: the ultimate model for data-driven companies?

In contrast to the traditional data centralization models that have dominated the field for the past three decades, Data Mesh represents a groundbreaking approach. Built upon the pillars of federated decentralization and redistributed responsibility, Data Mesh empowers organizations with a strong commitment to embrace a new era of data management.

The European Commission estimates that the value of the data-driven economy will reach

€829 billion

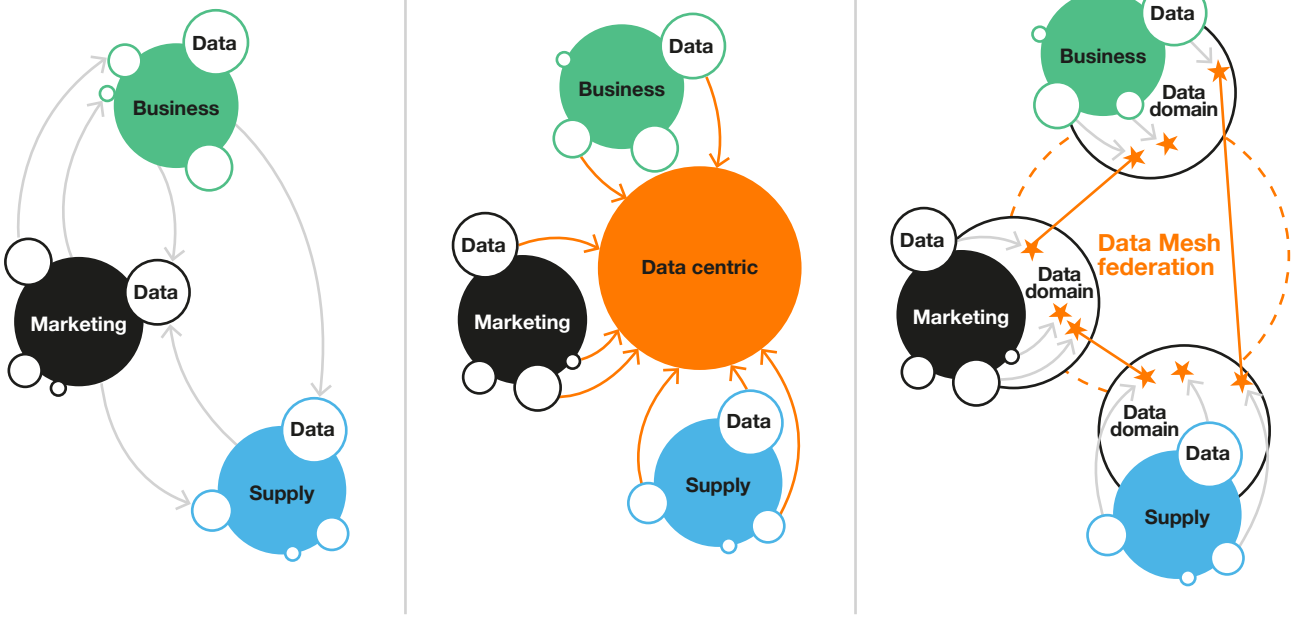
by 2025

Within a few decades, the world of data management has seen the emergence of multiple concepts, including 'infocentre', data warehouses and, about 10 years ago, data lakes.
All the data architecture concepts adopted so far have in common a high degree of centralisation of skills, but also of data and its processing. They also share an ambition: to create value.
The European Commission estimates that the value of the data-driven economy will reach €829 billion by 2025, up from €301 billion in 2018.

Data Mesh to harness data and create company-wide value

Data optimisation also includes internal practices to improve operational efficiency and better decision-making. According to a study by Opendatasoft [1], these challenges are the primary benefits sought from implementing a data optimisation project.
However, in practice, observing the difficulties faced by organisations in evolving Data Management solutions and frameworks to meet ambitious data aspirations challenges assumptions about how they can extract value from data. Why is there such a gap between the aspirations and the objectives achieved? There are a number of reasons. These include a lack of maturity and skills, as well as inefficiencies in the execution of data strategies.
In companies where the culture and organisation make it difficult to scale data initiatives, centralising data on a monolithic platform (such as a data warehouse, data hub or data lake) and centralising data optimisation and governance actually constitutes a bottleneck.
What if Data Mesh could fill these gaps? In fact, it represents a genuine turnaround, as it is based on a distributed model and a global response at company level. This is also a breakthrough. Data Mesh is not a technological solution. Data Mesh brings together architecture, organisation, methodology and governance, all with the same objective: to

Data management evolution



Data mess **Data centric** **Data Mesh**

involve the entire company in the challenges of optimising data as a strategic asset. Data Mesh is therefore a perfect model for the data-driven company.

From Data Mess to Data Mesh: on the road to the data-driven company

The emergence of the Data Mesh philosophy may be seen as a reaction. But to what? To a problem widely shared by organisations - the tragedy of silos (yes, just that! An actual tragedy!). It is to this tragedy that we owe much of the effort (and failure) devoted to data governance and the scaling up of analytical uses within the company.
Companies are historically organised in silos. Management, departments and services are thus structured by functions, products or sales channels. Through a mirror effect, this organisational model leads almost mechanically to the creation of data silos. These silos make it very difficult to exploit data for analytical purposes across the company. To escape the tragedy of silos and the Data Chaos they create, the answer to date has always been to seek to centralise data, for example through data warehouse, data lake or data hub solutions. Whatever the name of the solution, the ambition remains the same: centralise data for better processing!
Data Mesh therefore represents a real breakthrough. This model is based on the founding idea of no longer fighting the tragedy of silos, but taking advantage of it, literally playing with it. It is therefore a total change of paradigm... And far from returning to the totally decentralised approach of Data Chaos, Data Mesh proposes a federated approach to maintain the best possible control of data assets and uses.

1 Putting Data to Work: Challenges & Perspectives https://www.opendatasoft.com/en/blog/putting-data-to-work-challenges-and-perspective

What is Data Mesh?

Data Mesh is a powerful transformation tool, it is a decentralised, sociotechnical approach designed to federate data management and access at scale.

1 **Decentralise**

2 **Distribute**

3 **Federate**

Decentralise, distribute and federate.

The Data Mesh concept is based on these three key principles. And to achieve this, it requires a strong dose of agility and autonomy in the management of Data.
One creator: Zhamak Dehghani.[2] We owe the creation of Data Mesh in 2018 to her, through a founding article.[3] The contours have since continued to take shape. In April 2022 it was the subject of a book entitled “Data Mesh: Delivering Data-Driven Value at Scale”.[4]

Data Mesh: a decentralised socio-technical approach to managing and accessing data for analytical purposes and, more importantly, at scale.

Zhamak Dehghani, inventor of the Data Mesh concept

Optimising data at scale through analytics

However, Data Mesh is still alive. Its operational implementation is still being developed. Large companies are thus seeking to deploy it in an iterative way.
Zhamak Dehghani describes Data Mesh as a decentralised socio-technical approach to managing and accessing data for analytical purposes and, more importantly, at scale. Every word is important. Decentralisation underlines the break with the pursuit of extreme centralisation applied until now.
Data Mesh is therefore not just a technical concept. Data Mesh is not the sum of technological bricks, nor is it limited to architecture and infrastructure issues. It covers all aspects of: organisation, skills, methodologies, governance, architecture, etc.
Data Mesh aims to provide a framework for the company and its users in the management and creation of new products (Data). The notion of scaling up analytics is at the heart of the concept, and a response to the obstacles faced by organisations. With its global approach, Data Mesh is a relevant model for the data-driven company.
Data Mesh is based on the principle that value is intrinsic to each data product, to its level of interoperability and to the outcome of its correlation with other data products. It therefore tends to bring together two schools of thought, the first advocating the centralisation of data immediately independent of the identification of business use cases, the second imposing the availability of all the use cases to be covered as a prerequisite for data modelling.

2 https://www.linkedin.com/in/zhamak-dehghani/
3 How to Move Beyond a Monolithic Data Lake to a Distributed Data Mesh (martinfowler.com) https://martinfowler.com/articles/data-monolith-to-mesh.html
4 “Data Mesh: Delivering Data-Driven Value at Scale” https://www.oreilly.com/library/viewdata-mesh/9781492092384/

Domains, products, platform, governance:

The 4 pillars of Data Mesh

As a global approach, the implementation of Data Mesh is based on four pillars:

1 Data Domains

Inspired by Domain-Driven-Design (DDD), this part of Data Mesh consists of a business breakdown of data and uses. The businesses, which are responsible for the domains, naturally become autonomous and responsible for the conduct of all their data initiatives.

2 Data as a product

With Data Mesh, data becomes the product, in line with other product-oriented digital areas. Data Mesh builds on and goes beyond these concepts. It is up to each data domain to make available products that include their consumers, their key features and a development road map. Products are delivered in a standardised format for use throughout the organisation.

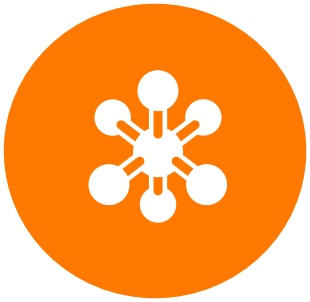
3 Self-service Data Infrastructure as a Platform

As the title suggests, this area concerns the technical and application infrastructure. Data Mesh requires the availability of an interoperable platform for all data domains. This pooling is intended to allow the different domains to provide technical resources on demand for the design and operation of their products. The platform can be based on any type of technological solution and is based on standardised architectures and exchange modes. The purpose of this pillar remains that of rationalising the base and the technologies used through the organisation.

4 Federated data governance

In the Data Mesh model, data governance raises several issues, including the interoperability of domains. It is through this pillar that data protection and the data dictionary are defined and implemented through unified governance rules and standards. Domains also play a critical role here. They are responsible for documenting the data and products made available on the basis of the standards defined at federated level. Governance is therefore driven in a hybrid way with distributed and federated responsibilities.

Decentralise Distribute



Data Domains

- Independent and responsible for the data in their area
- As close as possible to businesses
- Create and distribute their data products
- Govern the data in their area
- Coordination with other domains

Data as a product

- Data is a product in its own right
- Standardised distribution via API or Data Marketplace
- Agile methodology throughout the development and operational cycle
- Product promotion
- Evolutions with consumer needs

Federate

Self-service Data Infrastructure as a Platforms

- Standardised, interoperable and federated
- Construction on all types of technology (techno-agnostic)
- Self-service resource allocation for domains
- Catalogue of application services
- Management of IT Department as a product

Federated data governance

- Governance extended to data and data products
- Single data catalogue
- Common practices, formats, rules and standards
- The CDO and the Data Office lead and federate
- Operational governance activities in the domains

Data Mesh redistributes roles and responsibilities

Data Mesh is therefore based on a data management organisation that is both distributed and federated. In fact, its implementation requires the involvement of the entire organisation. This is therefore only possible with the sponsorship of the Management and the business and functional departments (including IT). The aim is to support the reconciliation of strategic challenges, functional needs and capacity to deliver. This approach requires a redefinition of responsibilities and therefore a move away from a model based solely on a centralised team, which all too often is a bottleneck.

Data Mesh will redefine the roles and responsibilities of business lines, Data (Data Office) teams and the IT Department.

It pushes back boundaries to engage the organisation in a genuine transformation towards the data-driven company.
The most important change undoubtedly concerns business lines. Data Mesh is about gaining autonomy, agility and responsibility in the creation of data products, in the management of their life cycle and in data governance. To achieve this, some of the Data skills should be directly attached to different roles, or the role of Data Stewards should be clarified and strengthened. They then gain independence and can advance their projects according to their own priorities and those shared within the company. As a result, the business departments will be able to activate the power of data for themselves.
The IT Department will see its role evolve while retaining a major role. It designs and manages a modular platform providing on-demand IT services while also ensuring an interoperable framework. This unified platform, which is managed centrally, thus ensures the provision of

common assets. To this end, the cloud and data virtualisation are particularly suitable architectural approaches for Data Mesh. The role of the IT Department is therefore focused on infrastructure and application architecture. It ensures consistency and technological rationalisation. IT leads the modernisation and agility of IT services, as well as the innovations generated by the Cloud.
Finally, the Data Office, led by the Chief Data Officer, takes on a role of leadership, acculturation and federation of data initiatives. It promotes the pooling of data, the coordination of actions, in particular governance, and prevents the creation of new silos. The Data Office acts as a veritable conductor of the organisation's transverse data function.
This transformation is also supported by a corporate strategy and change management. It is gradual and often starts with the businesses that are driving the Data, with the aim of demonstrating the value and encouraging initiatives among the other functions of the company. The less mature will adopt Data Mesh principles gradually. In addition, they will be able to benefit from the support of central skills.

Data Mesh: giving power back to the business

Data Mesh allows organisations to resolve previously insoluble problems.

For example, the lack of data quality is a widespread issue. It is still too often delegated to IT, which does not have the means to resolve it alone. It is above all the business, with its detailed knowledge of management processes and rules, that is really able to improve the quality of data in the long term. It is also up to the business to rethink certain processes if necessary in order to improve the quality of the data as soon as it is created, even before it is collected in an analytical database. By bringing data issues closer to the business and giving it responsibility for all data assets, both analytical and operational, Data Mesh is able to solve this problem at its root. More broadly, Data Mesh has many advantages over centralised approaches:

- Autonomous and empowered, businesses “naturally” regain control of their data, their ambitions and their business priorities. They are free from the limitations imposed or experienced by a central Data team. This freedom, accompanied by common technological means and in self-service mode, can also help reduce shadow IT while improving the pooling and interoperability of data.
- General improvement of data quality by bringing both the production and exploitation of data closer to the business.
- Increased agility for businesses with rapidly changing activities and needs. Data Mesh, through its decentralisation and its immediate proximity to the business, contributes to greater reactivity and therefore better time-to-market.
- Rationalisation of costs and pooling of the technology platform. Businesses primarily consume data services, regardless of the underlying solutions.
- Reduced data exploitation costs for the company, in particular through optimised management of data movement and modelling operations.
- Federated governance and metadata pooling.
- Distributed approach to give the power of data to the business and federated approach to keep the best control of data assets and technological consistency.

Data Mesh is both radical and unifying

There is no doubt that Data Mesh represents a real break with all those years dominated by data-centric dogma, whose limits in terms of value creation and scaling are obstacles to the Data transformation of organisations.

In our opinion, Data Mesh is emerging as the first truly global concept at the service of the data-driven company. Unlike approaches that are essentially technological or too disconnected from the reality on the ground, it combines all the components that are useful in constructing and implementing effective Data strategies.

In addition, Data Mesh provides opportunities and methodologies for businesses to regain power and autonomy in the production, governance and exploitation of data.

This agility in the creation of Data products and their sharing is an opportunity for the business to shorten the time-to-market in order to adapt more quickly to market changes, whether in terms of usage or competition.
In short, Data Mesh has all the characteristics required to help companies that want to put data at the heart of their decision-making to move towards becoming data driven.

Things to remember

- A complete approach (technology, methodology, architecture, etc.) for data strategies
- Distributed data skills
- Autonomous business lines responsible for data management and optimisation
- 4 pillars:
  - Organisation in data domains as close as possible to business lines
  - A framework for creating Data products
  - A federated technology platform
  - Distributed and federated data governance

Data domains: Data Mesh gives business domains powers

The Data Mesh concept is based on four main pillars, the first of which is an organisation divided into data domains. To be effective, this structure must reflect the commercial reality of the company and the interactions between its various entities. It therefore presupposes a high degree of proximity to businesses.

Data domains: Instructions for use

The use of data in business processes and decision-making is a real vector of change for creating value at all levels of the company. And in this respect, Data Mesh is an opportunity for business domains to drive their own transformation and improve all their decision-making through analytics.
Structuring data into domains that are as close as possible to the company's organisation and processes has two advantages. Data Mesh helps to democratise data beyond circles of experts such as Data Scientists, Data Engineers, Data Architects, etc. This approach also seeks to ensure that data is fully appropriated by operational staff, as close as possible to their needs. However, this is precisely what organisations are looking to achieve in their quest for data-driven maturity.
With Data Mesh, responsibility for data, knowledge of it and its uses are fully in the hands of the businesses, which are the key players in optimising data. This is the principle of 'Domain Ownership', which is motivated by:

- The ability to evolve data sharing in line with organisational growth (number of data sources, number of consumers, etc.),
- Rapid and continuous data change cycles,
- The agility to reduce cross-team synchronisation and remove the bottlenecks of centralised governance,
- Improving data quality and resilience of analysis (BI, AI) by bringing producers closer to consumers (removing the complexity of intermediate data pipelines).

What exactly does organisation into data domains mean?

The data domain approach of Data Mesh is directly inspired by the Domain Driven Design (DDD) concept, which is also applied to the design of software solutions. This axis of Data Mesh therefore consists of breaking down data (and its use) according to segmentation by domain. This is a fundamental notion, at the heart of the Data Mesh concept. Great care must also be taken when dividing and distributing data domains. In some companies, this choice will be obvious and will be based on the main

It is essential that the breakdown by data domain reflectsthe business reality of the company.

functions of the organisation chart (HR, operations, marketing, etc.). In other contexts, the breakdown may be by business line, by distribution channel or according to the specific needs of each entity. The domains of a single organisation may combine narrow scopes or broad, cross-cutting ones.
Whatever form it takes, special care must be taken with this breakdown. The granularity of the domains and their structure require an in-depth examination for each company to take into account their specific needs and the level of maturity of the various departments. In all cases, it is essential that the breakdown by data domain reflects the business reality of the company. It should never be the result of a purely technical approach or one that is too far removed from the reality on the ground. The methodological approach is to map and describe the different types of data domain:

- Source-aligned data domains, which concentrate analytical data reflecting the business facts generated by operational systems and known as native data products.
- Aggregate data domains, which concentrate analytical data resulting from correlation and enrichment operations involving data originally from several source-aligned data domains (e.g. 360° vision construction).
- Consumer-aligned data domains, which concentrate analytical data transformed to meet the needs of one or more business use cases.

Once established, the domains drive the distribution and optimisation of data. They play a greater role in giving power (if not superpowers) back to the business domains, which can become fully autonomous in the use of data. To achieve this, domains are responsible for ALL data within their scope. This of course includes operational data (ERP, process tools, etc.), but also analytical data.
To this end, the domains conform to a set of roles and responsibilities:

- Data producers and managers of all data assets (analytical and operational),
- Co-pilots of data governance, through the application of common rules and standards defined at organisational level.
- Designers of data products according to common principles to enable exposure (e.g. via APIs) and consumption by the different domains.
- Participants in sharing data with other domains. The value generated is increased by scaling up, for example through the creation of a data exchange or data marketplace. This is a fundamental aspect of Data Mesh to which we will return in more detail.

Autonomous, agile domains

Data Mesh undoubtedly represents a paradigm shift, both in the distribution of skills and in responsibilities. With organisation by domain, data know-how is no longer centralised (within IT or in a data factory), but rather distributed. There are many advantages of this approach:

- Overcome the bottleneck of a centralised team and develop data products that immediately address business priorities.
- Drastically improve data quality by bringing both the production and use of data closer to the business. These are also better able to document the data in a unified catalogue. The key to this is economies of scale. Gartner[5] estimates that poor data quality costs companies an average of $12.9 million per year.
- Encourage cross-domain data exchange to break down silos and create company-wide value.
- Encourage a culture of internal collaboration and the development of skills in data.

Data Mesh and Data Domains: the right recipe to finally involve the business?

Moving from a world where data is driven centrally by the Data Office and IT, to a world where roles are distributed and shared with the domains, requires an in-depth review of the organisation and therefore very high-level sponsorship.
Data Mesh implies assigning expert data skills in the domains, as close as possible to the business, to create multidisciplinary teams compatible with an agile delivery method.
This coverage in terms of skills is also essential to deal with the various subjects related to the end-to-end management of data and data products. This will require a review of job descriptions to incorporate these new activities.
The deployment of organisation by data domains is carried out iteratively, starting as a minimum with a producer domain (aligned with the source) and a consumer domain (aligned with the consumer). This initiation is based on an enabling, motivated and mature business.
Less mature businesses can be supported and advised by the Data Office, which will provide methodology and resources. The data domains can then be rolled out with a gradual transfer of activity and responsibility. Decentralisation will then be accelerated as maturity progresses.

Economies of scales: Gartner estimates that poor data quality costs companies an average of $12.9 million per year.

Use Case

Michelin & Data Mesh: from platform to data domains

Joris Nurit, chief data and analytics architect at Michelin, discovered the concept of Data Mesh[6] in 2019. At that point, he was heading up the company's data lake strategy. At the same time, Michelin had already been deploying a distributed architecture for five years. And this was not the only part of its IT to which the company had applied a distributed approach.
Michelin thus implemented one of the main principles of Data Mesh by setting the following objective: a single mesh to govern all data domains. The tyre manufacturer also looked at the other pillars. One of the CDO's priorities was therefore to set up a global governance system covering and connecting all domains. This federated governance is based on different roles such as the Data Owner, Data Steward and Data Administrator. The Data Owners of the domains are responsible for ensuring the proper management of the source and aggregate products.

Data domains that are independent and yet communicative

Companies very often come up against obstacles, in particular the difficulty of identifying relevant use cases that create value. This can often be explained by the low level of interest or acculturation of business entities with regard to data. With Data Mesh, the businesses, or rather the data domains, more than ever become players in the data strategy implemented in the company. Moreover, this appropriation is carried out on a federated basis. Each domain thus participates in the management and optimisation of the global data assets at company level, thanks to standardised data sharing between the domains and common governance.
The vision of the roles and responsibilities of the businesses in the end-to-end processing of data and the creation of data products as conceptualised by Data Mesh therefore implies a rupture. To date, businesses have not managed to take control of data. For them, this asset is technology and therefore for IT. The IT Department, for its part, has a defensive attitude towards the redistribution of roles and responsibilities, which is perceived as a source of risk in terms of cybersecurity and governance. These respective positions and the prevailing culture are holding back organisations from wanting to open up data more widely, to make access to it easier and to encourage people to use it. A realistic assessment of the situation involves the introduction of a few nuances, however. Levels of maturity vary greatly from one business to another. Some, such as those in marketing or logistics, are often cited as precursors in terms of use.

Data Mesh is about breaking with these practices. Through its global approach, it promotes the exchange of data between silos. Its solution: the creation of data domains that are both independent and interacting. The intrinsic value of the data products (another pillar of Data Mesh) exposed and shared by the source-aligned domains is intended to be leveraged through the uses that will be implemented by the consumer-aligned domains.

Things to remember

- A necessary overhaul of the organisation thanks to a very high level of sponsorship
- A data domain structure as close as possible to the business
- Expert data skills required in the domains
- A Data Office facilitator and driving force behind Data Mesh

5 Gartner – How to improve your data quality https://www.gartner.com/smarterwithgartner/how-to-improve-your-data-quality

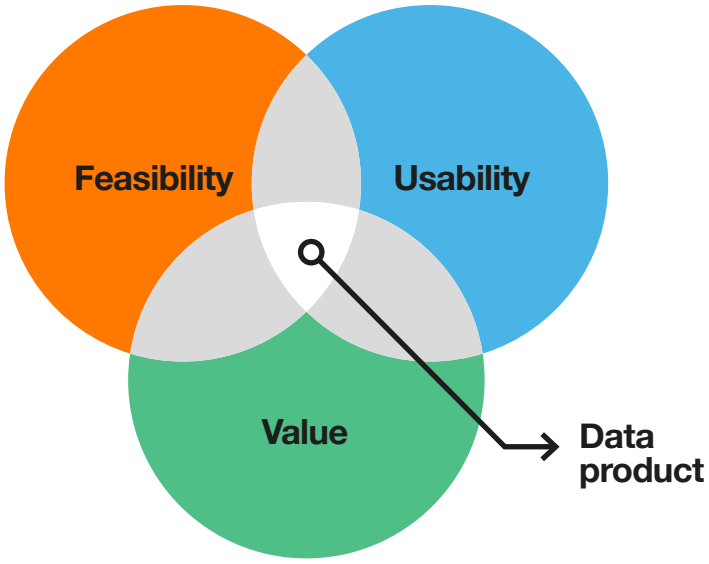
6 Michelin, discovered the concept of Data Mesh https://blogit.michelin.io/3-years-after-data-mesh-lessons-learnt-from-early-believers-of-the-mesh

Data Mesh: data is a product

Oil, digital black gold, strategic asset… With Data Mesh, data is regarded as a product. Data domains are responsible for managing the life cycle of these products and for sharing and promoting them throughout the organisation. This structuring into data products is the second of the four pillars of Data Mesh.

With Data Mesh, the data literally becomes the product, usually to be consumed in the form of a dataset.

Today, the most advanced companies are working on the concept of data products. They task entities such as their Data Factory, Data Office or their IT Department with building them. Data Mesh goes further in generalising this concept, not only by distributing the creation of products across domains, but also by considering the data itself as a product and not only as a component of a larger digital product. By exposing only data products and providing the interfaces to access them, Data Mesh gives consumer domains the responsibility and freedom to analyse and render the data through application services that are best suited to their needs, taking into account the tools at their disposal.



With Data Mesh, data is the product

Note: Data Mesh distinguishes between the notions of data product and data as a product. A data product is defined as ‘a product that facilitates an end goal through the use of data’, i.e. the use of data in a digital product. The principle of data as a product, introduced by Data Mesh, is a subset of data products in which the data itself becomes the product. It therefore becomes the end and not just the means. In what follows, for the sake of simplicity, we will use the term ‘data product’ to refer to ‘data as a product’.
With Data Mesh, the data literally becomes the product, usually to be consumed in the form of a dataset. To be effective, data products must conform to a set of characteristics that place them at the intersection of usability, feasibility and value (Marty Cagan’s diagram).

Data Product

What if the data was water?

The analogy with a bottle of water helps to further clarify the nature of this data as a product. In this metaphor, data is water. To be consumed, water requires a container, the bottle. For data, this will generally be a dataset.
However, it also mobilises marketing, compositional information, instructions for use, a display or sales area such as a supermarket shelf or an online retailer's product page.

In the Data Mesh theory, a product must meet six fundamental criteria:

1 **Discoverable:** the product is referenced in a data catalogue or marketplace and accompanied by a set of metadata to facilitate its exploration and identification by consumers at all stages of its life cycle.

2 **Addressable:** to ensure productivity, each data product is located at a permanent and unique address, which guarantees the continuity of its use by the consumer domains irrespective of its evolution over time and in accordance with the access policy.

3 **Documented:** the data is defined and documented by the domain within a federated catalogue to ensure clear and unambiguous understanding and interpretation by consumers (provenance, location, freshness of data, semantics, life cycle, data model, etc.).

4 **Reliable:** the quality of the data is continuously measured and monitored by the producing domains (communication of quality indicators) to make the products reliable and to ensure a high level of user confidence.

5 **Interoperable:** products are based on common standards, thereby facilitating their availability, reuse and cross-referencing, etc.

6 **Secure:** as a strategic asset, the data is protected according to its level of sensitivity and authorisation (access rights, authentication, encryption, etc.).

5 main types of data product:

Raw data, directly from a data source. Only a few basic processing or cleaning operations are carried out. The consumer domains are then entirely responsible for optimising the data provided.

Derived data, which can be assimilated to raw data, enriched with complementary data on the basis of assembly and preparation work, carried out by the owner domain. The consumer domains are then entirely responsible for optimising the data provided.

Data resulting from the processing of source data (raw or derived) by an algorithm (recommendation, scoring, classification or other algorithm) designed and implemented by the owner domain. Consumer domains remain in charge of its interpretation and final use.

Decision support data, which is actionable analytical data resulting from potentially advanced processing. While the owner domain is responsible for the analysis of the data, the consumer domains remain in charge of its interpretation and end use.

Automated decision support data is a similar type to the previous one, except that all intelligence, including interpretation and actionability, is placed under the responsibility of the owner domain, the consumer domains being, in this context, limited to the role of operator.

But to be completely accurate, a data product is the combination of a dataset, the associated governance, the means (process) necessary for its construction, its destination (analysis, communication, etc.) and its distribution packaging. It can also take the form of a data science algorithm, which, when made available as an API, can be queried by the domains. Inspired by the DevOps philosophy, a data product brings together the necessary data, code and infrastructure. A product can also exploit other data products; indeed, this is recommended. A customer scoring algorithm provided by the e-commerce domain will, for example, exploit the ‘customer data’ product provided by marketing. Moreover, in order to be consumable on a self-service basis, products need to be made available in standardised ways, primarily via APIs. Other forms of provision are also possible for specific needs (connectors, data visualisation tool, Data Science studio, etc.). The advantage of these channels is that they allow the use of authorisation management to control access to data. Product management also requires the establishment of governance and standardisation rules and processes to promote its use throughout the company.

Building a data product: instructions and advantages

Beyond the six essential characteristics of the data product, the design of these products is based on operational activities. It is therefore necessary to choose the data sources, to document them, to detail the technical chain for making the data available (tools and methodologies, refresh rate, etc.) and its distribution methods.

The design and life cycle of products are supported by a key function, the Data Product Manager.

Weather data, for example, can be disseminated in a wide variety of ways: time series, trend curves, algorithmic calculations, and so on. Each method of dissemination can be matched to different products. The same data can be disseminated in a variety of ways depending on its uses and users.
This approach has a number of advantages, including the standardisation of distribution methods, which allows domains to monitor consumption in detail and assess priority needs.

How do you implement the data product approach?

This pillar of Data Mesh can be demanding in terms of its implementation, as can division by domains. It implies a transformation of the organisation with a strong orientation towards agility at scale, whether in a Spotify[7] - or SAFe-type variation[8]. The implementation of such organisations, based on tribes or squads, requires a high level of employee involvement and a radical change in working methods.
While the digital and IT departments have learned to deploy these methodologies, businesses are not very familiar with them. However, adoption is intended to be gradual. Businesses can also rely on agile teams located in competence centres or dedicated departments.
The design and life cycle of products are supported by a key function, the Data Product Manager. Attached to a domain, his/her role will be to coordinate all the necessary activities for the product(s) for which he/she is responsible.
The design of a first product is the key initiation stage. It contributes to the transformation by introducing the principles of product road map and MVP (Minimum Viable Product), while promoting agility and its benefits. It

encourages producers to prioritise and therefore identify those functions and products that create the most value.
The pilot product will ideally focus on a relevant use case, which will require access to multiple data sources, close to the business and considered complex to access in the company.
The creation of the product is an opportunity to acquire methodological and organisational skills. But to pursue agility, domains also need an IT platform and services that make it possible. This is the challenge of the third pillar of Data Mesh: the Self-Service Data Infrastructure as a Platform.

Things to remember

- Six characteristics for data products: discoverable, addressable, documented, reliable, interoperable and secure
- Availability standards (API, marketplace, etc.)
- Gradual adoption of agility at scale
- A key initiation approach: the design of the first product
- Development and consumption facilitated by the platform

7 Learn more about the Spotify Squad Framework – Part 1 https://medium.com/pm101/spotify-squad-framework-part-i-8f74bcfcd761
8 https://en.wikipedia.org/wiki/Scaled_agile_framework

Use case

Amadeus & Data Mesh: hundreds of data products

As a provider of solutions for the travel industry (airlines and railway companies, airports, hotels, agencies, tour operators, etc.), Amadeus is committed to a Data Mesh approach. Yan Morvan (Cloud Data Platform principal engineer) and Damien Claveau (Data Platforms Operations lead engineer) gave an update on the progress of this approach at the Big Data & AI 2022 exhibition.
Amadeus therefore works in parallel on the four pillars: federated governance, automation of the data platform in the cloud, organisation into data domains, but also deployment of data products. The company thus offers its internal customers and partners hundreds of directly consumable data products. For example, BI reports on a company's reservation lists aggregated according to multiple indicators.
To deliver the data products, Amadeus has implemented independent 'application workspaces' that are attached to an application or a development team. The workspaces contain the analytics services needed to transform the data. The applications in these spaces are connected to the various data stores in Data Mesh.

Data infrastructure self-service as the technological driving force behind Data Mesh

Data Mesh is not strictly speaking a technological approach, but data domains need powerful technical resources to develop their products. The data platform and its infrastructure are a facilitator for unifying initiatives and rationalizing the technologies used. This requires essential characteristics in terms of agility and automation for on-demand or self-service resource consumption. The Self-Service Data Infrastructure as a Platform is the third of the four pillars of Data Mesh.

A platform that is federated, interoperable and provisionable on demand

The Self-Service Data Infrastructure as a Platform is the technical pillar of Data Mesh. It aims to equip the data domains and to host the data products developed by them. To enable the autonomy of the domains and the distribution of data, it is essential, in the context of Data Mesh, to provide a federated, interoperable platform or infrastructure whose resources are addressed in self-service mode.
As a technological pillar, the Self-Service Data Infrastructure as a Platform therefore aims to position IT as a facilitator of the Data Mesh approach. It also aims to prevent an explosion in the technologies used for data-related projects.
Data Mesh is nonetheless based on a consolidation of infrastructure and data services. The efforts made in recent years in terms of rationalisation should not risk being swept away by, for example, multiplying the number of data storage solutions within the organisation. As Spiderman said: 'With great power comes great responsibility'. More than ever, therefore, the IT Department safeguards the consistency of technological choices.

Data Mesh: federated infrastructure and data platform for greater efficiency

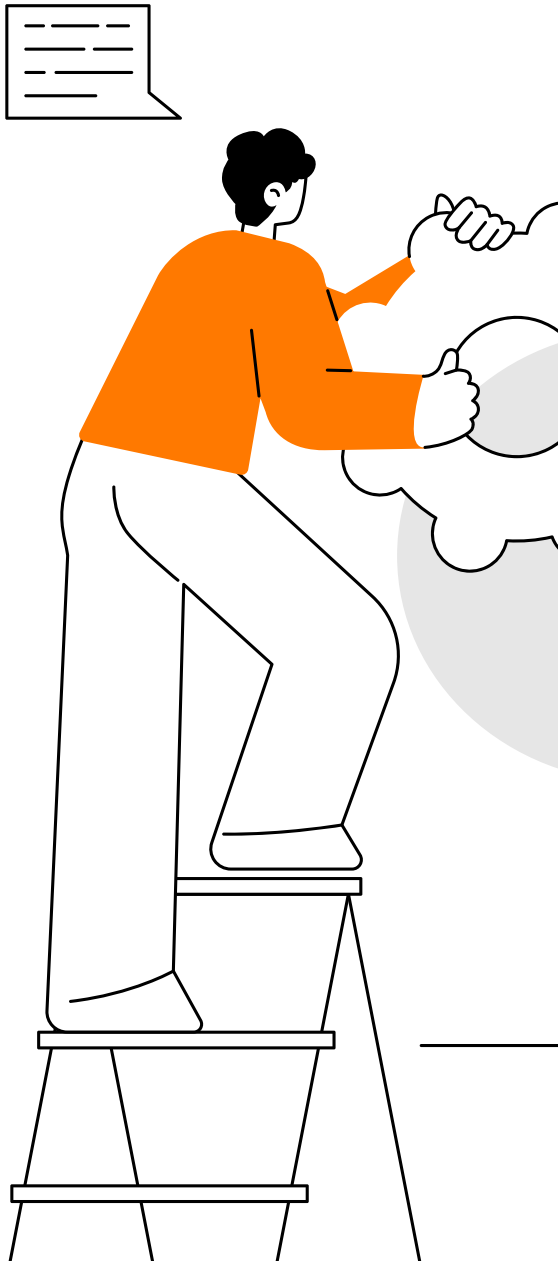
One of the key points of Data Mesh is that it is technology-agnostic. It can therefore be implemented with any type of tool or database. With an ETL tool or with specific development, with SQL or NoSQL databases, with traditional reporting or data visualisation tools or even with Data Science studios or programming languages… everything is possible! The key is that data exchange and access can be standardised across the organisation for effective interaction between domains. Independently of the bricks from which it is built, the infrastructure must therefore be federated and available in the form of a platform whose services can be consumed on demand by the various domains.
The platform encompasses services, grouped together in an application catalogue, which can be activated by the domains according to their needs and those of their products. It also includes a set of infrastructure resources, which will be allocated, again according to the needs of the domains.
This vision of a unified platform has several advantages, notably in terms of rationalisation, but also in terms of supervision, operated from a single point and by individual teams. The data platform must also be managed as a shared resource, whose development is controlled and operated within the scope of a road map organised according to the needs of its users (the domains).

Data Mesh: reaffirming the IT department's role in the data platform

Through its role in providing a catalogue of application and infrastructure services, the organisation's IT Department consolidates its function, whilst also developing it. It is less involved in the 'project' aspect (the development of data products is the responsibility of the domains) and instead focuses on the deployment, maintenance and technical support of infrastructure and application services.

In this context, the mission of the IT Department is therefore crucial. Through its operations and its expertise in the underlying technologies, it enables and facilitates all data initiatives undertaken by the domains. And to this end, the IT Department defines the rules for the technological pillar.
In operational terms, IT is therefore involved in three areas:

- Infrastructure (resource provisioning capabilities, computing, storage, orchestration, etc.)
- Supervision of infrastructure and expenditure (via FinOps), and its governance.
- Development of the platform as a product for the benefit of the domains.



Which technologies for Data Mesh?

The IT Department organises the provision of self-service technical resources. This aspect can be confusing in the world of data. Self-service often applies to access to business data via data visualisation tools (dataviz). When applied to Data Mesh, self-service characterises the ability to provide and allocate the hardware and application resources of the data platform at the request of the data domains.
In addition, two technological approaches make it much easier to implement Data Mesh: the cloud and data virtualisation.

What these two technological trends have in common is that they allow for flexible allocation and strong control of hardware resources. They can also be based on different underlying technological building blocks while offering a high level of standardisation of data access. In addition, their elasticity and scalability will make it possible to manage the increases and decreases in load related to the evolution of data products.
With this critical level of agility in mind, the DevOps and DataOps approaches are at the heart of the IT Department's strategy. Data Mesh relies on modern data engineering practices such as continuous integration and deployment (CI/CD), without which it will be difficult to imagine a level of industrialisation at company level. For maximum flexibility, preference could also be given to Infrastructure as Code.
Let us remember that Data Mesh remains agnostic in terms of the technologies used. The concept does not favour the use of public cloud infrastructure over private or on-premise cloud infrastructure. It is therefore possible to understand it within the context of a hybrid IT architecture or from a traditional data warehouse, data lake or data hub of the 'data-centric era'. However, this will have to be adapted to make it more agile and ensure standardised access to data.

Two technological approaches make it much easier to implement Data Mesh: the cloud and data virtualisation.

Use Case
Leboncoin & Data Mesh: the data platform as a springboard

Leboncoin has gone through various cycles. For Leboncoin, the transition to Data Mesh has been gradual at data platform level, and is still ongoing. The company testified to this at the Salon de la Data. Since 2018, Leboncoin has had a cloud platform that meets its requirements in terms of scalability, elasticity and resilience. For its management, the IT team has defined a service offer covering all needs from the management of data pipelines to their dataviz operation and governance.

To develop more advanced uses of data, in particular AI, Leboncoin has rethought its organisation by setting up feature teams, which have taken over part of the data management by integrating data engineering skills. Easy-to-use platform data infrastructures have also been provided. Finally, developers can access the catalogue of all existing data sources and data products via a unified catalogue.

Cloud and FinOps approach to Data Mesh

With the emergence of the cloud, the world of IT infrastructure has undergone a major technological revolution in recent years. Companies understand this and are investing heavily in agile environments to support their transformation efforts. This trend is reflected in a constant increase in spending. The 'Worldwide Quarterly Enterprise Infrastructure Tracker: Buyer and Cloud Deployment'[9] report estimates that spending on cloud infrastructure will exceed $90 billion globally by 2022. IDC Tracker also expects cloud infrastructure spending to displace on-premise infrastructure budgets.
There are a number of reasons why companies are adopting the cloud, and one of them is the challenge of data. The cloud is seen as a way to break down silos and accelerate projects involving the use of data and artificial intelligence. Thus, Cloud Data Platforms are now emerging as the new El Dorado for companies.
These platforms, but also the underlying infrastructure, are undoubtedly also an asset when implementing a Data Mesh approach. In the way they work, these technologies support the rise of the Self-Service Data Infrastructure as a Platform pillar.
However, the use of the cloud as part of a Data Mesh approach requires the application of good practices for monitoring expenses. Thus, in terms of cost management, the deployment of the platform must be consistent with the implementation of a FinOps approach. This is essential, as the consumption and therefore the associated expenditure are carried out in a distributed way, by the data domains. It is therefore vital to have the means to maintain a federated vision and ensure good control of overall expenditure.

As such, each domain can monitor its consumption and potentially integrate these costs (in euros and CO2 emissions) into its own budget. Expenditure can therefore be broken down to a precise degree to allow supervision by domain, by project, by application brick or by product.

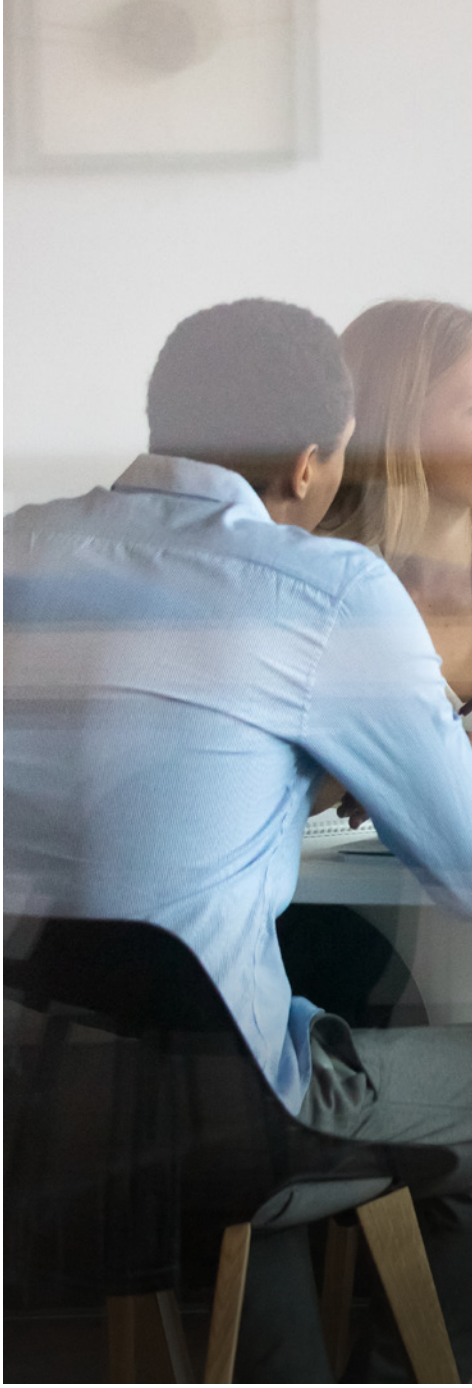
Things to remember

Self-Service Data Infrastructure as a Platform

- Federated, interoperable and self-service infrastructure/platform
- Application and infrastructure resources catalogue
- Catalogue of APIs (standardisation of access to data products)
- DevOps culture (already well) established
- The IT Department guarantees the consistency of technological choices
- Data Mesh is technology-agnostic
- 'Obvious Data Mesh' technologies: the cloud and data virtualisation

9 IDC - Worldwide Quarterly Enterprise Infrastructure Tracker: Buyer and Cloud Deployment' https://www.idc.com/getdoc.jsp?containerId=IDC_P31615

Data Mesh: federated governance to guarantee efficiency



Data governance is an essential part of any data strategy. Nevertheless, it remains complex to deploy in a traditional organisation, but through its federated approach, Data Mesh is able to remove obstacles. In this article, we explore the fourth and final pillar of Data Mesh, known as Federated Data Governance.

Between 2020 and 2025, IDC estimates that the volume of data generated by businesses will increase from 6.7 to

16.1 ZB

Between 2020 and 2025, IDC estimates that the volume of data generated by businesses will increase from 6.7 to 16.1 ZB. This represents an increase of 10 ZB of data (or 140%) in just five years. This inflation presents a real challenge to organisations in their ambitions to optimise their data assets. And this is not the only challenge they face and to which governance must in principle provide solutions.

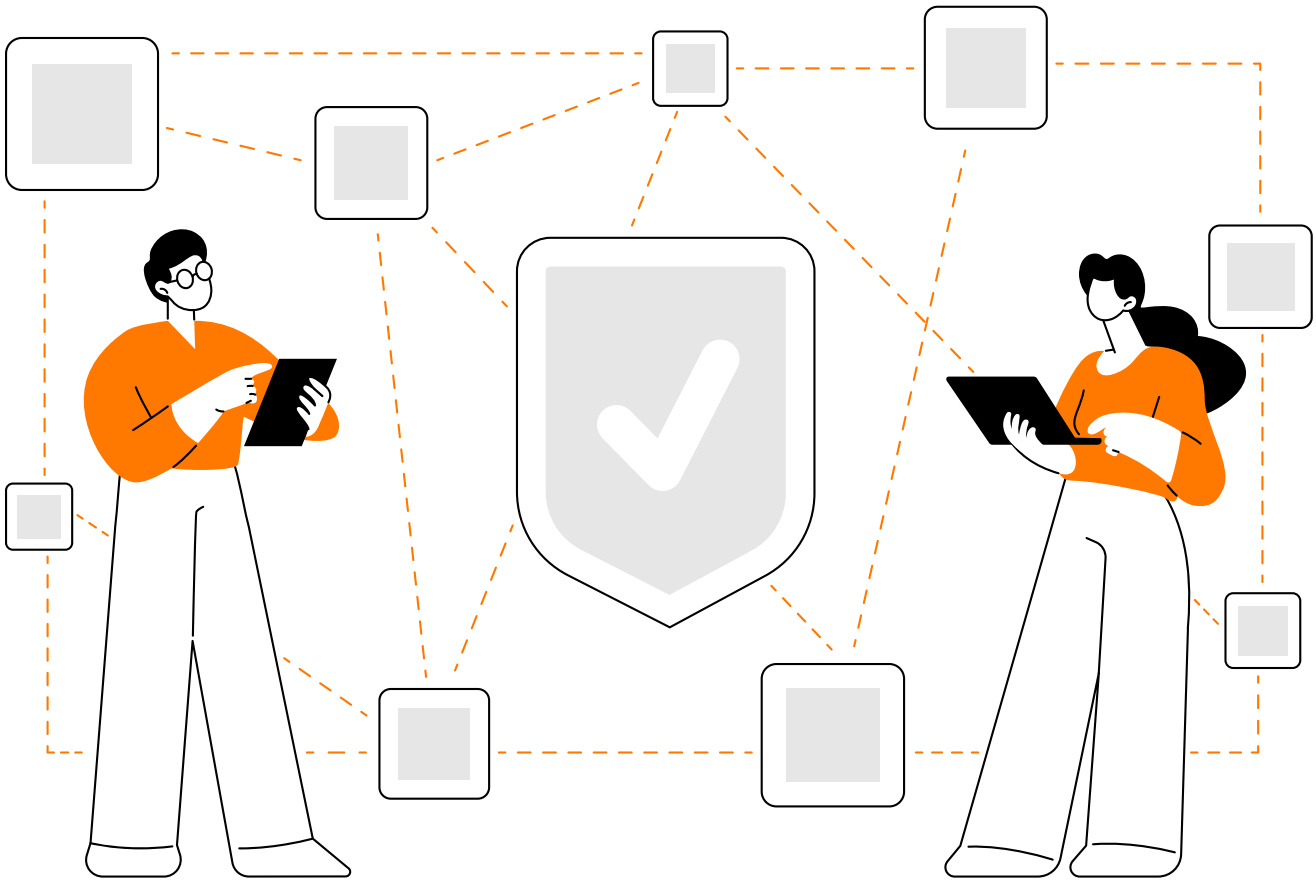
Data Mesh establishes federated governance of data and data products.

Governance is still too often perceived as a constraint, a cost item and a brake on the acceleration of data transformation. It is, however, strategic in more ways than one to maximise control and usability of the company's data assets. It is no coincidence that the Data Mesh concept dedicates a pillar to the importance of governance.
Data Mesh therefore promotes distributed and federated governance with various data domains in the organisa-

tion. This represents a redistribution of roles, since the domains are themselves responsible for the governance of their data perimeter.
This includes all operational data governance tasks: mapping, documentation, quality management, etc.
However, this control at ‘local’ level does not exclude facilitation, supervision and federation at company level.
This cross-functional layer ensures compliance with common practices and standards, which are essential, for example, to harmonise documentation and to enable the sharing and reuse of products and datasets.

Governance is strategic in more ways than one to maximise control and usability of the company’s data assets.

Federated governance, as prescribed by Data Mesh, therefore requires the use of shared tools. A minimum requirement is the use of a single data catalogue, shared by all domains.



A federating Data Office on governance

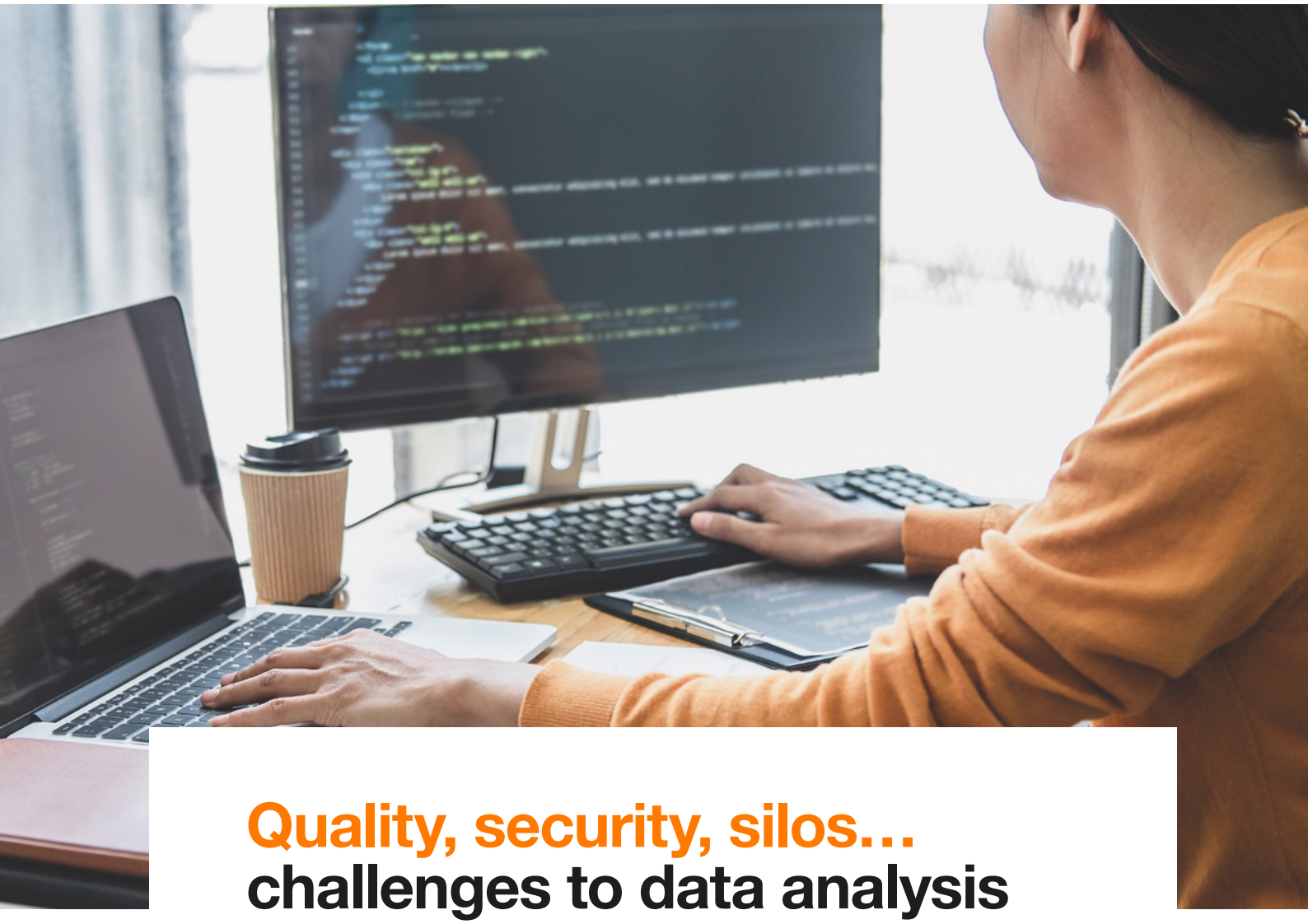
The federation of governance is based on unified solutions, but also on a team that centralises standards in terms of describing data. It will thus be able to propose templates, and provide its expertise and support to standardise governance between the different domains. The Data Office, as it exists today in many organisations, seems to be the perfect choice to perform this unifying role. Some Data Offices already perform this function. But in the context of Data Mesh, this role is extended. Federation does not only apply to 'traditional' data governance. It also includes products. This need will become more and more important as data products are developed by the domains, which could quickly result in several hundred products being made available throughout the company.

Federated governance can therefore be seen as the application of a federal political system to the world of data. This means strong autonomy at State or regional level (here the domains), with responsibilities and obligations imposed at national level (here with federated governance by the Data Office).

How can federated governance be put into practice?

Federation can be implemented in various ways. Think, for example, of the definition of a policy and a choice of tools at Data Office level. The Data Office may, if necessary, delegate governance specialists within the business teams or domains according to the division made.

Having mastered the rules of governance and the functional aspects, those who can be referred to as Data Governance Officers will then be able to ensure coherence between central and local levels. They will also support governance principles specific to the reality of the domains to account for specifics on the ground and avoid overly rigid rules, particularly for products that are not intended to leave the perimeter of a domain.
To put governance into practice in the domains, Data Mesh can build on existing functions within the organisations: Data Owner and the Data Steward.
This conception of governance should, in particular, promote gains in terms of agility, a better match with needs and autonomy in the investments and efforts to be made. Finally, Data Mesh could result in the success of governance projects due to a transfer of responsibility to the domains.
The distribution of roles and the involvement of domains can be seen as a powerful lever for the deployment of efficient governance 'by design'. Autonomous and accountable, domains can benefit from improving data quality and documenting metadata.
Through federation, Data Mesh also ensures good coherence across domains. The intertwining of distributed and federated modes thus proves to be virtuous for the entire organisation and its ambition to optimise data. In this respect, federated governance therefore appears to be vital in a Data Mesh operation. It is the 'functional glue' that prevents a relapse into data chaos and ensures the autonomy of domains within a common and collaborative framework.
Data is truly becoming an asset for the company and a lever for creating value in the domains. As such, they have a vested interest in improving this asset and creating products to extract value from it, whether in terms of operational efficiency or new revenue generation.



Quality, security, silos… challenges to data analysis

In its ‘Data Monetization Survey’ (November 2020), the IDC notes a strong growth in the number of data sources utilised by organisations. In 2020, more than 50% of EMEA companies operated fewer than 10 sources. Over 70% plan to manage more than 10 sources in the future - with 40% aiming for 20 or more. This makes their data analysis projects, considered a priority or very high priority by 6 out of 10 companies, more complex (Source: IDC European Future Enterprise Resilience Survey, August 2021). These companies face multiple obstacles in developing their analytical skills and for 53% of them in western Europe, it is security. Also according to IDC (Source: European Future Enterprise Resilience Survey, June 2021), 44% are citing data quality, 36% financial constraints, 32% lack of business strategy and 31% inadequate infrastructure. The purpose of a data governance policy is precisely, in part, to respond to these challenges. Data governance is an integral part of an organisation’s data strategy. Although it is sometimes difficult to involve all the business domains in its implementation, governance is now fully taken into account. Many organisations have embarked on vast projects to overhaul their governance, in particular by introducing federated governance. And even if these approaches do not always claim to be linked to Data Mesh, they do follow the general principles and good practices.

Data analysis projects are considered as a priority or very high priority by 6 out of 10 companies.

Use Case Banque Postale & Data Mesh: federal governance

To become the preferred bank of the French people, the subsidiary of the La Poste group has defined a strategic plan, in which data is a central component. Although La Banque Postale does not explicitly claim to be a Data Mesh company, its principles do influence its initiatives, particularly in terms of governance.
In this organisation, the Data Office, headed by a Chief Data Officer, counts among its missions that of federating the company's data community (500 people). The CDO, Matthieu Olivier, detailed his approach at the Hubday Data & IA for Business. A new governance at scale is therefore being implemented. It is being presented as 'federal governance' or 'distributed organisation'.
In this model, the role of the Data Office is 'to set the framework, the playing field, and to set its boundaries and also the rules of the game' to orchestrate internal interactions and collaboration. Matthieu Olivier sees the optimisation of data and the management of data projects as a 'team sport'. And this also applies to the governance framework.

Things to remember

Federated Governance

- Federated governance
- Operational governance activities supported by the domains
- Common practices and standards
- A single data catalogue for the whole company
- A data office and a CDO as facilitators and federators
- Governance of data and products

Data Mesh: Practical examples and feedback

Mastering data and its uses to create value is an ambition that is increasingly shared. However, organisations continue to face obstacles that Data Mesh could help to overcome… provided the transformation is successful and the whole company is brought together. In this article, we give you some guidelines for getting started and some feedback from companies that are successfully implementing one or more pillars of Data Mesh.

The IDC estimates that within three years, the volume of data used will rise to

3.1 ZB

Data Mesh to scale up analytics

According to IDC (Source: European Future Enterprise Resilience Survey, August 2021), data analysis is a priority in terms of technological investment for 61% of European companies. This expenditure is aimed in particular at enabling them to cope with the data tsunami (180 ZB of data generated worldwide in 2025, 13.6 ZB of which was by organisations). However, only 0.8 ZB of data is being utilised by companies worldwide (source: IDC Worldwide Global DataSphere Forecast). And it is lower still for the most powerful practices based on AI or Machine Learning (ML).
To make effective use of this ever-growing asset, organisations must therefore be able to extricate themselves from the data chaos and the tragedy of silos. This is the purpose of Data Mesh, a concept that we have detailed in this document and for which we shed light here on practices through practical feedback.

Another figure: The IDC estimates that within three years, the volume of data used will rise to 3.1 ZB, 2.8 ZB of which will be unstructured data. This progression is a response to the desire of companies to accelerate their use of data and the process of scaling up. Data Mesh enables these ambitions to be realised through its approach structured around governance, organisation by domains, infrastructure and products. By providing multiple best practices and a global framework, Data Mesh can be compared to ITIL (the Information Tech-

nology Infrastructure Library). Moreover, it seems hard to envisage companies succeeding simultaneously on all pillars. They may initially address one or two of the fundamentals of Data Mesh, and then gradually expand its footprint. Every achievement on one of the pillars will enable the company to make a profit. It is not necessary to complete all four to create value through increased organisational maturity. Such transformations are complex.

Implementing a 100% data product logic is a real challenge. The same goes for the other main pillars. Data Mesh should therefore be understood above all as a trajectory, to be undertaken in stages, each of which will bring incremental benefits. Following the path of Data Mesh is like following the North Star. It is a direction. Reaching the destination is utopian, it is not the challenge of this concept, but each time you get close to it, you will have taken a step towards the data-driven company and created value.

Data Mesh should be understood above all as a trajectory, to be undertaken in stages, each of which will bring incremental benefits.

That said, where do you begin? How do you get started? What is the specific path to follow? There can be no single answer. It depends on the company's IT, digital and data priorities and road map.

Data Mesh's first steps focused on value

In the previous chapters, we have identified several relevant steps to weave the fabric of Data Mesh. A good starting point is to list the priority actions for each pillar. These include, for example:

- The organisation of a first data domain. To do this, you need to find a business that is mature in the management of data and seeking greater autonomy in its optimisation. Based on this motivated business, all the basics of how Data Mesh works can be put in place.

- The implementation of a data product pilot. This is a way of spreading the product culture within the teams and launching initiatives on the other three pillars. After creating the first products in a domain, it will then be possible to make it autonomous and apply the division into domains. Moreover, implementing data as a product is undoubtedly the most engaging project for businesses and the one that generates the most business value.

- The creation of a data platform. Independently of Data Mesh, many companies today are undertaking this large-scale modernisation project with a view to industrialisation. The challenge with Data Mesh is to design this platform to serve all needs and support self-service for data domains.

Implementing data as a product is undoubtedly the most engaging project for businesses and the one that generates the most business value.

- The application of federated governance principles based on the Data Owner and Data Steward functions. It is an opportunity to make businesses responsible, and even to integrate measurable data objectives into their business challenges.

- Collaborative workshops bringing together members of IT, data and businesses, such as the Data Mesh Bootcamp that we organise, are also an opportunity to acculturate and federate. These meetings must also lead to the definition of an action plan and a road map that set the priorities and planning of actions on the four pillars of Data Mesh.

On the way to Data Mesh:

Some examples from our experience

01.

From Data Hub to Data Platform as a Service

A major French multinational in the digital sector is pursuing an operational project involving Data Mesh, planned to last several years.
As a first step, the company plans to review its data architecture, starting by identifying the components of its existing system that are compatible with Data Mesh. Taking advantage of the technological possibilities of the new tools, the company is redefining its governance and organisation. The platform was previously operated in Data Hub mode based on Hadoop Spark. It has been modernised and implemented with Infrastructure as Code and the Cloud.
In its journey towards Data Mesh, the IT teams want to be ahead of the curve and prepare everything for the transformation of the businesses. They plan to move from a data factory mode (where they do everything) to a data platform owner mode. In the latter case, the data platform is managed as a product by IT, which makes it evolve according to the needs expressed by the businesses. This mode also allows for a distribution of responsibilities, particularly as regards governance and data optimisation. Once the data domains are deployed, everything will be ready to move to the data platform as a service model promoted by Data Mesh.

02.

Data for one, data for all

For a pharmaceutical group, Data Mesh, explored through a Bootcamp, addresses the problems arising from centralisation, the outdated decision-making stack and a lack of communication between business domains. As a result, the same datasets were purchased several times by different domains, representing one of the company's largest expenses.
An inventory of the data was carried out and the data was made available in an internal data marketplace to allow it to be shared. For this distribution of data and its uses, the pharmaceutical sector player combined the deployment of a cloud platform (not yet self-service) and data virtualisation.

03.

Platform, governance, product… all paths to Data Mesh

A large company in the e-commerce sector took the modernisation of its data platform as the starting point for Data Mesh. The approach is primarily technological and aims to address the limitations of the existing data warehouse and data lake. These data platforms lack agility and are expensive to operate. In response, the company decided to migrate its entire data platform to the cloud. This project encourages the direct involvement of the business domains in the development of a data product logic and leads the IT Department to hand over the project aspect. This transition has been prepared for a long time by an increase in the maturity of the business domains in terms of agility and the product approach.
In another company in the same sector, data governance was developed as a priority following a request from the marketing department. The marketing department understood that control of its data assets was strategic in order to create value for the entire company. The organisation is therefore working on the deployment of a data catalogue, the appointment of data owners and the establishment of a federated community focused on governance and directly linked to the businesses. In this context, the structure has chosen to adopt the federated governance concepts of Data Mesh involving the Data Office, and eventually data domains.
Another context: a large bank that used the optimisation of stored data as its entry point. Getting to grips with Data Mesh: how to do and real-life testimonials in its data hub. Encountering multiple obstacles in this operation, the banking group decided to launch a data product pilot. With an emphasis on agile methods and the appointment of a Data Product Manager, the results were not long in coming. After this successful pilot, multiple initiatives have been launched on other data products.

Data Mesh roadmap and maturity KPIs

As we have emphasised several times, the Data Mesh approach is carried out in iterations through initiatives conducted on the different pillars. This requires a road map and a vision that includes objectives for the short term (three months) and others for the medium and long term (one to three or even five years).

First steps are therefore widely available on Data Mesh and can thus enable value to be added in the first few weeks. However, this concept implies a transformation and therefore requires a longer-term vision.
To verify the benefits generated by the Data Mesh initiatives and the alignment with the initial road map, it is naturally advisable to define and monitor indicators. The main KPI is undoubtedly usage, and first and foremost the rate of use of the data, i.e. the data products. Usage is measurable via, for example, the number of API requests, downloads from the data marketplace or ratings left by consumers on the marketplace, which can be used as an NPS (Net Promoter Score).
It is also consistent to measure the portion of the data assets shared between the domains. Existing methodologies for measuring the data maturity of companies also provide different metrics adapted to the challenges of Data Mesh and its deployment.
Data Mesh therefore defines a transformation path for companies that want to become data driven. Multiple routes are possible. You can use the ones presented in this article as a guide to determine which one will be most effective for your organisation.

Things to remember

How to use Data Mesh

- Collaborative workshops to acculturate and federate
- Not one, but several possible entry points and trajectories
- Identify the IT components that are compatible with Data Mesh
- Identify and share data via a marketplace
- Deploy a catalogue and appoint data owners
- A road map with a long-term vision
- KPIs to measure the value generated at each stage of maturity

Data Mesh, a total data-driven model

Through its four main pillars, Data Mesh truly moves away from the dogma of centralisation and all-technology in favor of a global approach based on federation. Data Mesh thus promises to be at the heart of company data strategies and organisations.

Data Mesh is based on a dual model of distribution and federation.

According to BCG[10], data is now like oxygen in most sectors. To take advantage of this, companies are striving to build up an indispensable foundation of capabilities, which also have a place in Data Mesh.
The ambition in the long term is to rise to the rank of 'data masters', to which the digital giants and a few multinationals seem to be able to aspire at the moment. While 'some have a proven benefit from data, many are still not achieving their goals, giving leaders a growing advantage,' notes BCG.

A federated data path and distributed responsibilities

The data maturity of companies as a whole is nevertheless progressing. But there are always obstacles in their way: the slow acculturation of businesses, the improvement of data quality, made more complex by an explosion of sources and volumes, and the hybridisation of IT systems.

Data Mesh is based on a dual model of distribution and federation. And it is clearly no coincidence that a growing number of professionals in the world of data are interested in this 'total' or global concept, which makes it possible to make companies data-driven 'by design'.
With its four pillars, it offers an approach that is convergent with many of the directions companies are currently taking to reach a higher level of maturity and increase the value generated by their data strategy.
Taking the Data Mesh route is not a blank slate for organisations already engaged in their transformation. For the less mature, this new paradigm is even an opportunity to define a coherent, state-of-the-art strategy involving all internal stakeholders.

10 BCG -Is Your Company Gaining Momentum in Data? https://www.bcg.com/fr-fr/publications/2021/companies-data-capabilities-progress

Data Mesh: revolution or evolution of data strategies?

A few examples illustrate the convergence between Data Mesh and the new data trends that aim to finally break free from the limits of centralisation and promote scaling up:

- Companies are striving to obtain the support and direct involvement of business likes so that they allocate resources to the identification of use cases and the implementation of data projects. Data Mesh advocates an orientation by data domains, which can be likened to a business division of data and uses. It gives power and autonomy back to operational staff so that they can finally control their own data destiny.
- The trend is towards the design of data products, which can be dashboards or machine learning algorithms. This product approach implies a different logic from that of simply delivering an application. Data Mesh conceives the data as a product and entrusts its development to the domains.
- The objective is to rationalise and consolidate groups around a single data platform (often taking advantage of a Cloud orientation). Data Mesh retains this concept of pooling, with emphasis on the agility and management aspects of the platform for self-service consumption.
- Organisations are trying to break away from top-down governance, which is decided and controlled entirely by a central team in top-down mode. Data Mesh goes beyond this by thinking of a governance (of data and products) that reconciles central and local, that is federated ‘by design’.

Data Mesh therefore does not break abruptly with the rising trends among data strategies. It draws on them to design what may appear to be the next generation of data policies. Data Mesh is therefore above all a trajectory, a path, iterative. It is interesting because it proposes a global framework applicable to all companies. It is therefore not really a revolution, but it does clarify & give coherence to the many directions taken by companies. In addition, organisation into data domains enables data to be placed at the heart of the business. In the end, it is this pillar that is the most revolutionary and also the most complex to implement.

Data Mesh is not a specification, but a compass

Data Mesh is not a collection of best practices that will naturally lead to success.
Nor is it a specification that should be followed to the letter. In many contexts, this would be impossible or counterproductive.

Utopia or reality, the breakthrough embodied by Data Mesh is in fact already under way.

However, its approach does contain a great many elements of response. And it is above all its implementation, the quality of its execution and its appropriation by all parties that will make it a lever for internal improvement and a springboard towards the status of data champion or data-driven company.
In many companies, the Data Mesh philosophy is already taking hold, even if it is under a different name or without explicit reference to it. This is particularly true with regard to the ambition of greater involvement of the businesses and the distribution of skills and responsibilities, as outlined above.
The desire to consolidate around a single platform, often in the cloud, and the development of product logic are also points of convergence. Utopia or reality, the breakthrough embodied by Data Mesh is in fact already under way.
If Data Mesh is not a set of specifications, then it should be seen as a compass. Or better still: as a North Star. Data Mesh provides direction, and the company will create value at scale with its data with every step it takes towards it.

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Do you have any further questions?

Or if you would like to know more about how to value data at your company level, do not hesitate to mail us your query.

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