

# Quick Answer: Are Data Fabric and Data Mesh the Same or Different?

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A data fabric is a technology-enabled implementation capable of many outputs, only one of which is data products. A data mesh is a solution architecture for the specific goal of building business-focused data products.

## Quick Answer

### Are data fabric and data mesh the same or different?

- A data fabric is the utilization of multiple existing technologies in combination to enable a metadata-driven implementation and augmented orchestration design. A data mesh is a solution architecture that can guide design within a technology-agnostic framework.
- A data fabric assumes substantial experience exists across multiple industries in the continuous use and reuse of data to discover, infer and propose data management infrastructure designs and to validate data objects. It also assumes support for separate contextual references for reusing those objects. A data mesh utilizes current business subject matter expertise to guide the resolution of data objects that are then developed into multiple context-based data product designs.
- A data fabric and a data mesh both recognize the distributed nature of data governance and authority. The design principles of each can be used in complementary fashion. A data fabric can be built without following data mesh practices. A data mesh must utilize the discovery and analysis principles that are intrinsic to a data fabric to support the validation of data objects and products to present them as part of the design process.
- A data fabric recognizes and tracks data use cases that can be authoritative, and it treats all subsequent reuse as potential contributors that can add to, refine and resolve data authority differently within context and by use case.
- A data mesh places emphasis on originating sources and use cases in which data assets are designed and captured to then produce differing combinatorial data products relative to

business context from those assets.

- A data fabric encourages augmented data management and cross-platform orchestration to minimize human design, deployment and maintenance efforts. A data mesh, at present, seems to promote the ongoing manual design and orchestration of existing systems with human intervention during maintenance.

## More Detail

Gartner clients — as well as technical press outlets, providers and system integrators — have been trying to determine if there is a difference between a data fabric and a data mesh. This begs the question, “What’s in a name?” Is this a question of hype, branding or go to market or is there a real similarity or difference?

The current market hype related to concepts for supporting data context specific to use cases as opposed to separating context from specific data management instances and the incumbent infrastructure is rising. The pattern is a return to previously attempted concepts that support distributed responsibility, the designation of authority to individual systems and use cases, and then publishing the resulting data outputs. Such an approach requires careful, often centralized governance to prevent the propagation of single-use-specific data assets.

Many IT practices proceed from the false assumption that centralized governance also means centralized data management. In IT, we have made it a practice to conflate governance with management; this results in the fallacy that a data management instance has its own authority. Authority is bestowed upon a data asset by the governance model. Any assumption that a data management system in one part of a complex business has authority simply because it captured the first instance of using that data is denial that data can and will be reused. This is a logical fallacy. And data, above all else, is logical and by nature follows the rules of mathematics.

More clearly, data is captured and then managed. Any managing system has a mandated responsibility to demonstrate it has met the authority contract it is adhering to. It is important to recognize that a system managing data is *not* authoritative unless validated as being responsible to the governance model.

**Governance > Authority > Responsibility > Management**

A data fabric begins as a metadata observer and analysis solution and is specifically *not* active in replacing or altering existing solutions. It follows the principle that data usage is defined by the metadata in the current systems, logs, optimizers, import/export and even the network traffic information. It then utilizes a broad base of existing technology and the metadata generated from those platforms for analysis, recommendation and even data management orchestration.

While practitioners of either are small in number, the level of interest in both data fabric and data mesh has created significant hype in the data management market. There are many other terms that implementers apply to the same commonly held architectural principles. However, those same implementers and platform and tool providers are inferring that design options and actual deployment preferences constitute competing architectural approaches. Simply put, these differing delivery approaches are fulfilling the same data management architectural requirements. But, any architecture requires implementation through design that leverages technology.

A data mesh is a solution architecture for the specific goal of building business-focused data products without preference or specification of the technology involved. A data fabric is a technology utilization and implementation design capable of multiple outputs and applied uses.

## Netting It Out and Keeping It Short

Data fabric versus data mesh:

- The total cost to deliver either one may ultimately be similar relative to design and deployment. However, the more augmented data management capabilities included in a data fabric improves the cost model for ongoing improvement and maintenance.
- Both can adapt to and utilize the practices of the other.
- Both emerge from a very mature data management practices timeline and both can leverage the capabilities afforded by more than 50 years of data management technology advances.

The data fabric relies heavily upon the efficiency and capabilities of tools and platforms as technology for investment (see Figure 1). It is reasonable to argue that a mesh, like so many solution architecture practices before, shifts the focus of cost toward services. In the cloud era, subscription flexibility should be considered a new part of your decision about spending on services versus technology. Organizations should consider their current patterns and any directional changes in their budget and allocation behavior.

**Figure 1. Comparing Data Fabric and Data Mesh Quick Reference**



## Comparing Data Fabric and Data Mesh Quick Reference

Trending and Architectural Functionality Held in Common					
Data Domain Basis	Usage Products Output	Use Case Has Authority	Data Discovery is Ongoing	Data Behavior Graph	Adoption < 1.5% Addressable Market
Mesh			Fabric		
<b>Business Proposal</b> <ul style="list-style-type: none"> <li>Business design data products</li> <li>Localized business metadata</li> <li>Registry or federated delivery of known assets</li> </ul>	<b>Centralization</b> <ul style="list-style-type: none"> <li>Diffidence to warehouses, lakes, etc.</li> <li>Deference to local data authority</li> <li>Can enroll new assets</li> </ul>	<b>Data Quality and Stewardship</b> <ul style="list-style-type: none"> <li>Data engineer performs analysis of ongoing changes in data patterns and recommends design and deployment changes</li> </ul>	<b>Business Proposal</b> <ul style="list-style-type: none"> <li>Data products derived from use</li> <li>Descriptive metadata layers</li> <li>Known assets or deploy new optimized assets</li> </ul>	<b>Centralization</b> <ul style="list-style-type: none"> <li>All existing assets are contributors or beneficiaries.</li> <li>Challenges, aligns and confirms local authority</li> <li>Deploys new assets</li> </ul>	<b>Data Quality and Stewardship</b> <ul style="list-style-type: none"> <li>AI/ML and content evaluation for trends and patterns of new data values, origins and integrity with existing use cases or in new use cases</li> </ul>
<b>Recognition and Fusion</b> <ul style="list-style-type: none"> <li>Manual review and redesign of data products</li> <li>Permits adding new assets to existing data products</li> </ul>	<b>Orchestration/Deployment</b> <ul style="list-style-type: none"> <li>Relies upon new implementation</li> <li>Between or overlays existing systems</li> <li>Relies on localized data authority</li> </ul>		<b>Recognition and Fusion</b> <ul style="list-style-type: none"> <li>Profiling &amp; content analysis</li> <li>Continuous analysis of Utilization, use-case &amp; user graph.</li> <li>Human engineer provides train-by-example</li> </ul>	<b>Orchestration/Deployment</b> <ul style="list-style-type: none"> <li>Evolves current infrastructure</li> <li>Between or overlay existing systems</li> <li>Tests local authority against each other</li> </ul>	

Source: Gartner  
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## Data Fabric and Data Mesh: What's in a Name?

There are multiple definitions for data fabric and data mesh in the market today:

- *Data fabric (semantic)* is promoted by some platform and tool providers as a completely semantic or virtualization solution. Most of these solutions actually include some form of caching of data and included optimization techniques.
- *Data fabric (AI-/machine-learning-augmented)*, as described by Gartner, begins initially with the accumulation of passive metadata, then progresses into an active metadata scenario. Examples are detailed in Gartner research in three case studies, as referenced in the next section.

- *Data fabric (archaic)* was initially proposed as a hardware and systems resource allocation model for determining the sizing and assignment of infrastructure components based on processing requirements — whether related to storage, networks, processors or memory requirements.
- *Data mesh network (dynamically overlaid data management and infrastructure)*, as proposed by Gartner in 2016, combines the capabilities of communications mesh networks with an AI-/machine-learning-augmented data fabric and a process-based data mesh.
- *Data mesh (data-product-based)* asserts that authority, governance and management of data resides in source systems. A data mesh further asserts that it can be leveraged to create domain-based and integrated solutions without specifically refactoring the physical data assets in an abstracted and semantic approach supported by use-case-specific processes for use-case context.
- *Data mesh (process-based)* is currently represented by the utilization of technologies such as Kubernetes and Linkerd to create a software-enabled, orchestrated process model for relaying data throughout a network of use cases. Such a network includes various performance tuning via resource asset allocation and utilization. *Note: This nomenclature predates the usage of “data mesh” provided above.*

## Recommended by the Authors

[Data and Analytics Essentials: Data Fabric](#)

[Top Trends in Data and Analytics for 2021: Data Fabric Is the Foundation](#)

[Enable an “Integration Always” Approach From the CDO Down](#)

[Top Strategic Technology Trends for 2022: Data Fabric](#)

[Innovation Insight: A Data Fabric Demands Continuous Data Inference](#)

[Data Integration Product Vendors Must Build Partnerships to Address 3 Emerging Trends](#)

## Evidence

The etymology of IT terminology is always confusing and frequently crosses over each other. Even in the current parlance, there are multiple definitions for data fabric and data mesh. Nomenclature aside, the histogram in Figure 2 demonstrates that the objectives of optimized, distinct and specific data management has been a long-held goal for data management. Multiple design options to achieve these consistent architectural goals have emerged from the days of early object-oriented programming through EIS Data Systems and now the nomenclature from Thoughtworks Chief

Scientist Martin Fowler that includes admonishment of “centralized” data collections (for example, lakes and warehouses).

Figure 2. Evolution of Dynamic Data Management Practices



Evolution of Dynamic Data Management Practices

Mix of Timeline Positions Approximated vs. Actual



Source: Gartner  
Note: Data mesh was not publicly available as a term from Gartner without a subscription to research services.  
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