

Oracle Cloud Infrastructure

Understanding the data mesh architecture



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Oracle Engagement on Data Mesh

Improve business outcomes



The screenshot shows a YouTube channel page for 'Data Mesh'. The channel has 5 videos with a total of 1,452 views, last updated on Nov 16, 2020. The videos are:

- 1. Data Mesh Part 1: Spark (Watched 60:14)
- 2. Data Mesh Part 2: oraclegoldengate (Watched 41:11)
- 3. Data Mesh Part 3: oraclegoldengate (Watched 46:59)
- 4. Data Mesh Part 4: oraclegoldengate (Watched 59:03)
- 5. Data Mesh Part 5: oraclegoldengate (Watched 59:11)

Below the videos, there is a description: "Data Mesh is a data-tier architecture to integrate and govern enterprise data assets across distributed multi-cloud environments – two defining characteristics are: (1) De-centralized data processing; no ETL/Hub/Lake monoliths (2) Event driven, real-time where possible, batch only when necessary".

At the bottom, there is a 'SUBSCRIBED' button.



The screenshot shows a LinkedIn article titled "DATA MESH 2021 & BEYOND" by Jeffrey T. Pollock, Vice President Product Development. The article was published on February 22, 2021. It features a green background with a forest illustration and the title "DATA MESH 2021 & BEYOND" in large white letters. Below the title is a sub-section "Data Mesh: 2021 and Bey".

The main content discusses the next installments of the series, which will focus on Oracle technical papers and a YouTube playlist on Dynamic Data Fabric and Mesh. The "What Next?" section lists the following topics:

- Data Product Thinking and Data Product Managers
- Decentralized, Modular Data Mesh
- Enterprise Data Ledgers for Data Integration
- Trusted, Polyglot Data Streams
- Trust, Transactions and ACID Properties
- Continuous Transformation and Loading (CTL) vs. ETL and E-LT
- Data Product Factories
- DevOps, CI/CD and DataOps
- Data Governance and Security in a Mesh

At the bottom, it says: "This is the first of a multi-part series that I plan to cover here on the platform. I am basing this series of posts on content I developed and [Oracle technical paper about Dynamic Data Fabric](#)".



The screenshot shows an Oracle Technology Brief titled "Technology Brief: Dynamic Data Fabric and Trusted Data Mesh using the Oracle GoldenGate Platform". The brief is dated January 2021, Version 2.2. It includes a "Core Principles and Attributes for a Trusted, Ledger-based, Low-latency Streaming Enterprise Data Architecture" section and a "Copyright © 2021, Oracle and/or its affiliates. All rights reserved." notice.

Oracle Engagement on Data Mesh

Thought Leadership



Tools for data products

Decentralized event-driven architectures

Streaming patterns

Data as Capital, and Liquidity of Data



Gartner

Selecting an Information Valuation Method

FOUNDATIONAL MEASURES

How correct, complete and verifiable is this data?
Intrinsic Value of Information (IVI)

How good and relevant is this data for specific purposes?
Business Value of Information (BVI)

How does this data affect key business drivers?
Performance Value of Information (PVI)

LEADING INDICATOR

Focused on improving information management discipline

What is your objective for valuing information?

TRAILING INDICATOR

What would it cost us if we lost this data?
Cost Value of Information (CVI)

What good could we get from selling or trading this data?
Market Value of Information (MVI)

How does this data contribute to our bottom line?
Economic Value of Information (EVI)

gartner.com/SmarterWithGartner

Source: Why and How to Measure the Value of Your Information Assets, August 2015
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Gartner

Accelerate Business Transformation Goals

Scope of Data Mesh Concepts

Organizational/Systems



Strategy: Data Product Thinking



Data Architecture

- Anti-monolith/pro-decentralization
- Business domain oriented – catalog, graph, metadata, etc.
- Event-driven, real-time, and streaming

Design Thinking



Jobs to be Done Theory



Scope of Data Mesh Concepts

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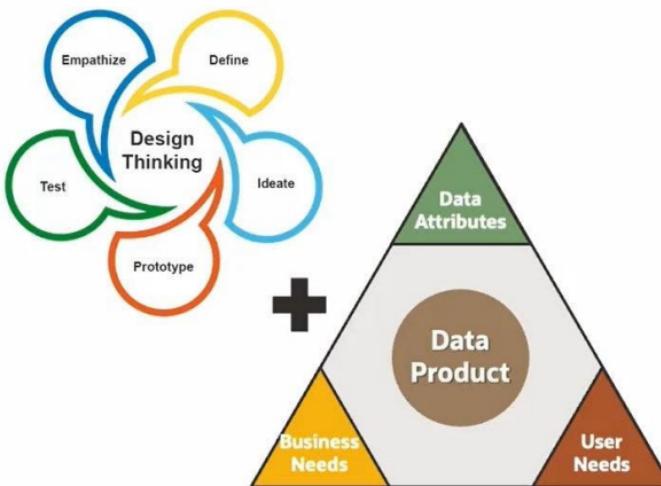
Jobs to Be Done Theory

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Digital Capital and Superstar Firms¹

25%

of a firm's value is digital capital.

"Digital capital" refers to factors of production that are

- 1) complementary to IT assets, but
- 2) are not otherwise recorded on the balance sheet

Total clarity

Digital capital is more concentrated than any other asset class.

Operational data availability

The most value is concentrated in the top decile of firms by market value.

Faster innovation cycles

Digital capital accumulation predicts firm productivity three years out.

Reduction in data engineering

Hidden Data Economy

Wide variety of shapes and structures

Applications

Sensors

Devices

Demand side

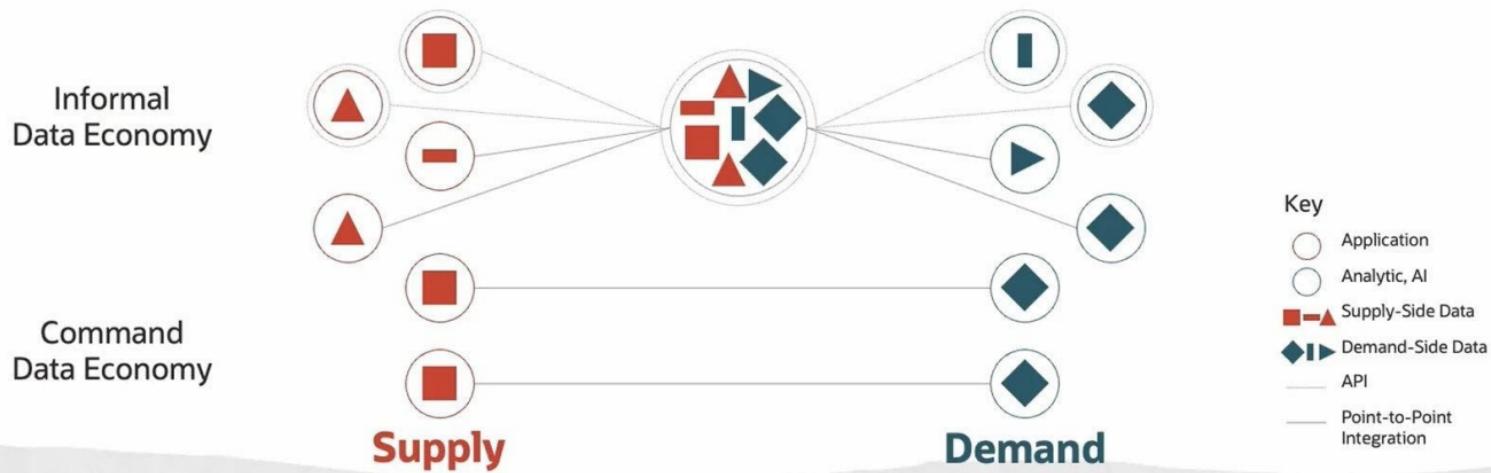
Analytics

AI

Hidden Data Economy

Websites

Mobile Applications



Hidden Data Economy

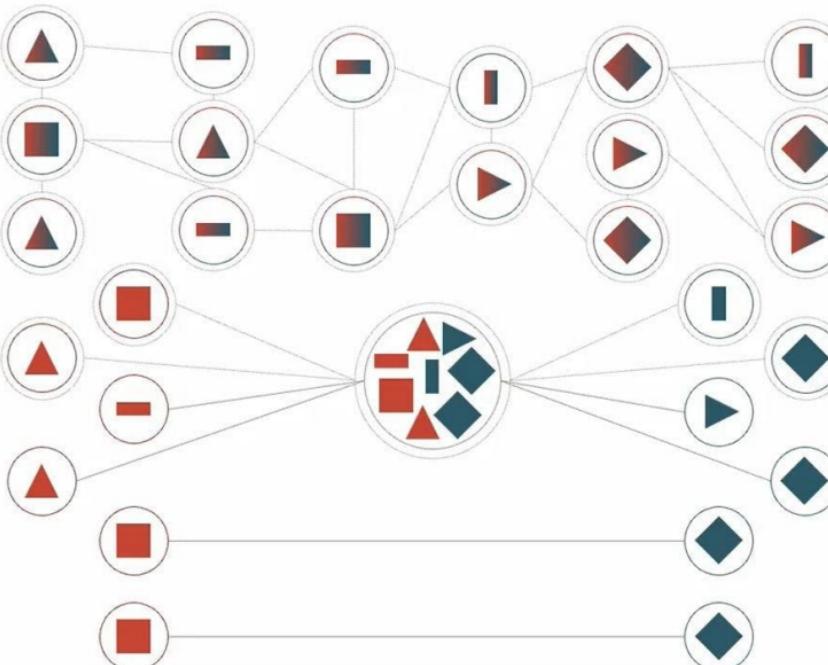
Market
Data Economy

Informal
Data Economy

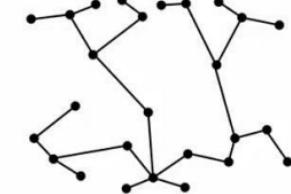
Command
Data Economy

Supply

Demand



Decentralize



Key

- Application
- Analytic, AI
- ▲ Supply-Side Data
- ◆ ▶ Demand-Side Data
- API
- Point-to-Point Integration

What does the hidden data economy lead to?

DEAD DATA CAPITAL

Trapped in silos

Labor intensive to repurpose

Undiscoverable

Allowed uses unclear

Twin Threats of Digital Transformation

Loss of
competitive
advantage



Legal and
reputational
damage

Data Strategy That Reinforces Competitive Strategy

Yes!

Data Strategy That Reinforces Competitive Strategy

→ Competitive Strategy

**Create unique value
in a unique way**

Value your customer can only get from you

Through activities your rivals cannot easily copy

Data Strategy

Create unique data assets

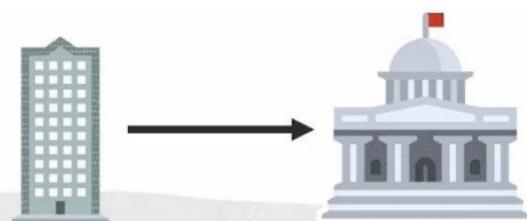
Observations only you possess

Use them to enhance uniqueness

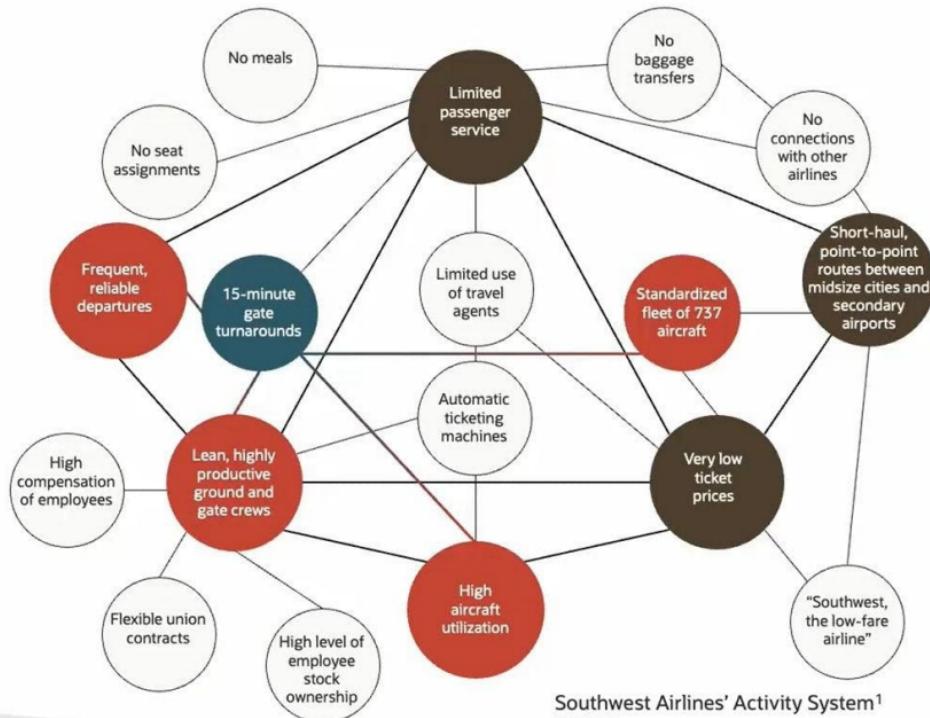
Differentiation, cost position, or both

Protect observer and observed

Safeguards for all data stakeholders



Activity Systems Tie Data Strategy to Competitive Strategy

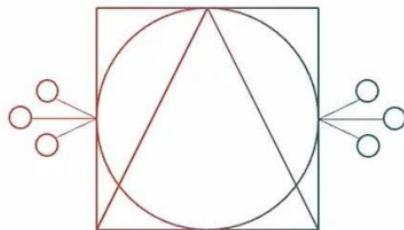


Can we use predictive maintenance to get to 10-minute turnarounds?

Sensor data
Engines, subsystems
Record data
Aircraft utilization,
repair and
maintenance, arrivals
and departures

Anonymize, mask
employee records
Monitor model for
performance as
planes age

Data Products, the Building Blocks of Data Strategy



A data product is a discrete set of observations and its complementary code designed to fulfil one or more jobs to be done.

Supply Side

Mostly passive: Data that **is** something

Data Sets

Sets of observations in different shapes, formats

Models

Domain objects, data models, ML features

Libraries

Inert algorithms, technical definitions of business semantics

Demand Side

Mostly active: Data that **does** something

Analytics

Reports and dashboards, real-time and historic

Algorithms

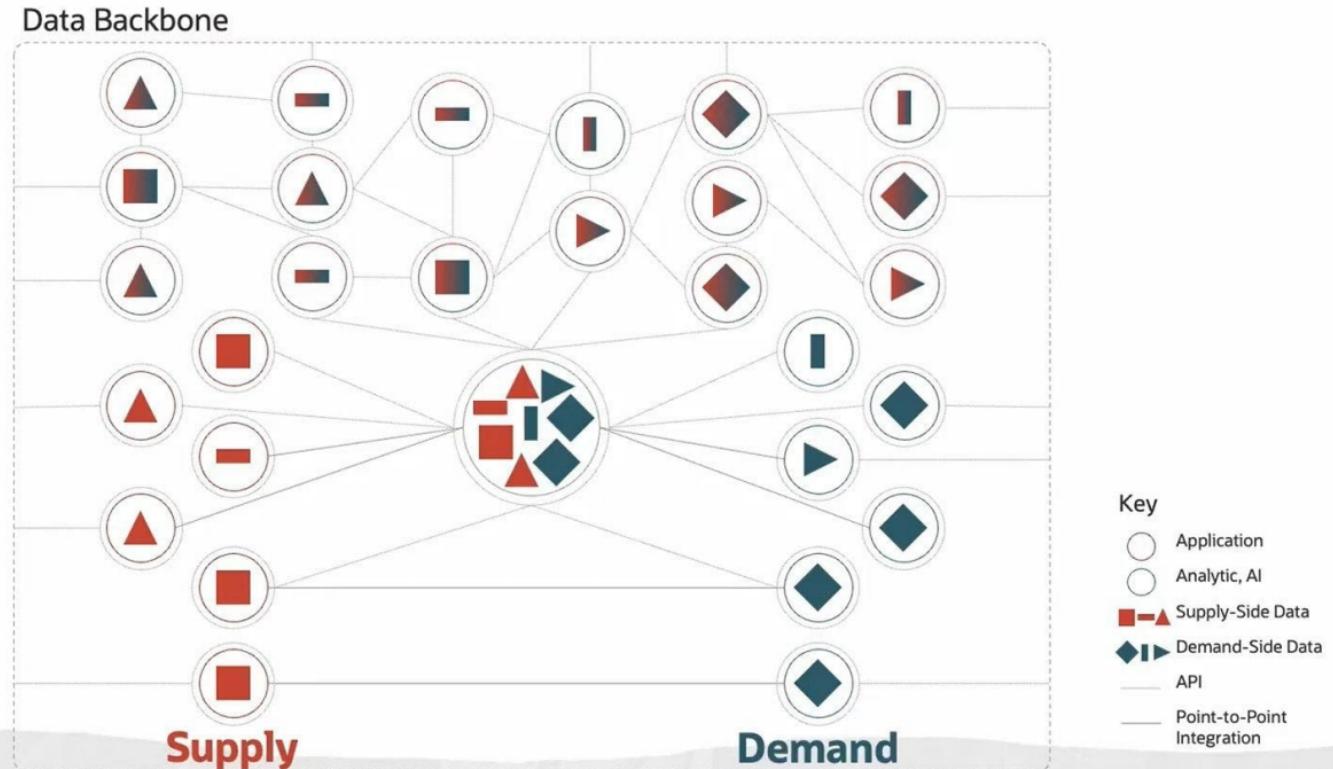
ML models, scoring, business rules

Data Services

Payloads, topics, authorization

A Unified Data Economy Requires a New Data Backbone

Unified
Data Economy



Principles for Translating Data Strategy into Data Architecture

Data Liquidity

Ease of data reuse and recombination¹

Data Productivity

Value created as a result of data usage per unit of work, dollar invested, or resource consumed

Data Security

Protections against external and internal threats

Data Governance

Assurances of data quality, compliance, ethics

A Data Mesh Is...

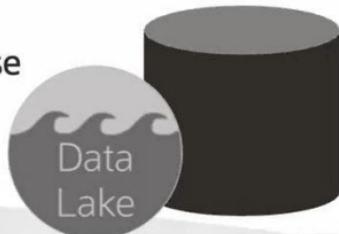
A data solution for enterprise-scale domains and/or event-driven data-centric cloud projects

A data architecture approach focused on outcomes (data products), IT agility (service mesh), and speed (streaming data)

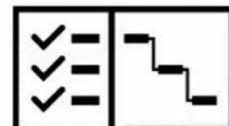


A Data Mesh Is Not...

An alternative point-solution for data warehouse or data lakes



A finite project that can be run by a LoB Departmental IT org in isolation



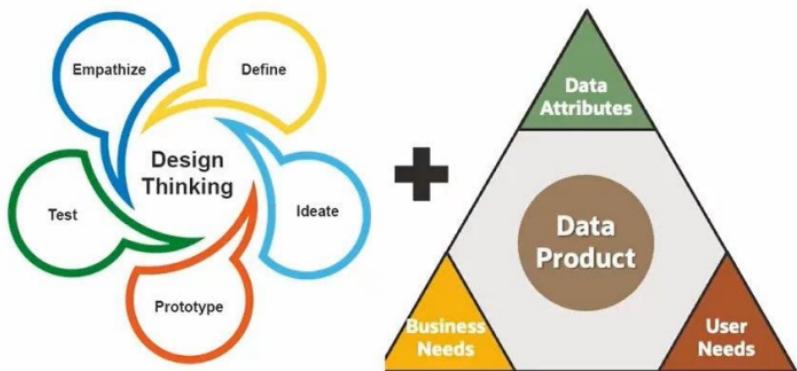
A single tool or single cloud service that you can buy



Attributes of a Trusted Data Mesh

Upgrade legacy enterprise data architecture, monolithic integration tools, and outmoded batch processes.

Value-Focused, Data Product Thinking



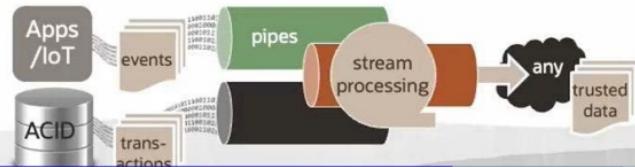
Decentralized, Multicloud Mesh



Enterprise Data Ledgers

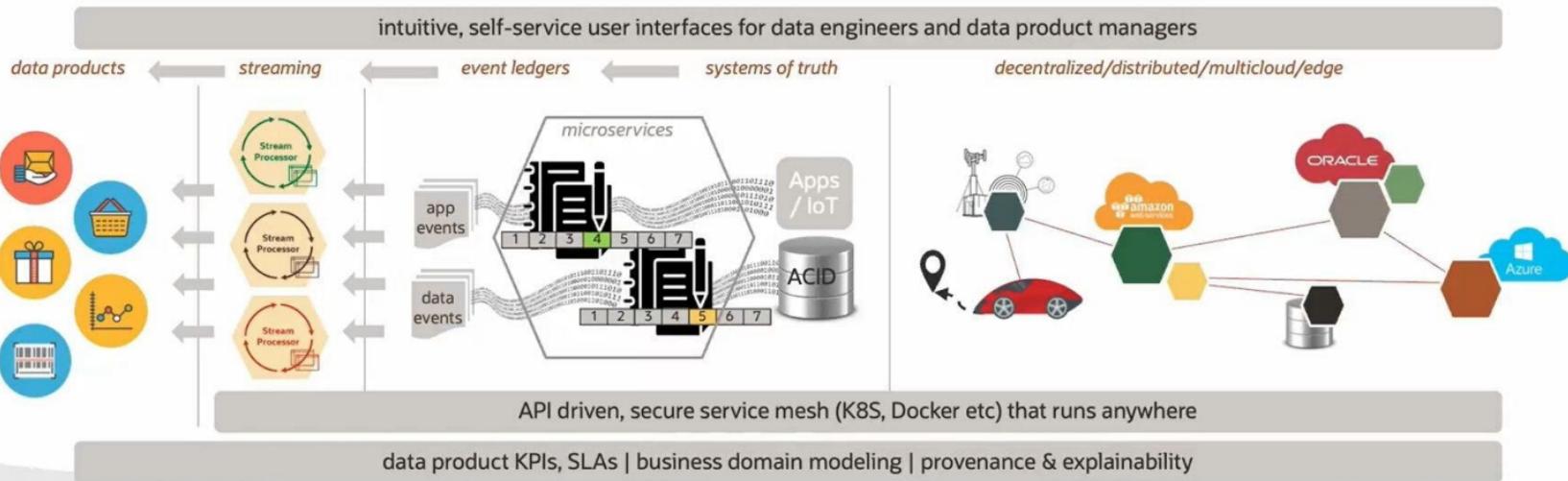


Trusted, Polyglot Streams



What is a Data Mesh?

A trusted Data Mesh is a data architecture approach focused on outcomes (data products), IT agility in a multicloud world (service mesh), trusted data of all kinds (polyglot data streams), and faster business innovation cycles (event-driven integration).



OCI-Based Data Mesh Blueprint

