Gartner Data & Analytics Summit
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Data Hubs, Lakes and Warehouses: Choosing the Core of Your Data and Analytics Platform

Rick Greenwald

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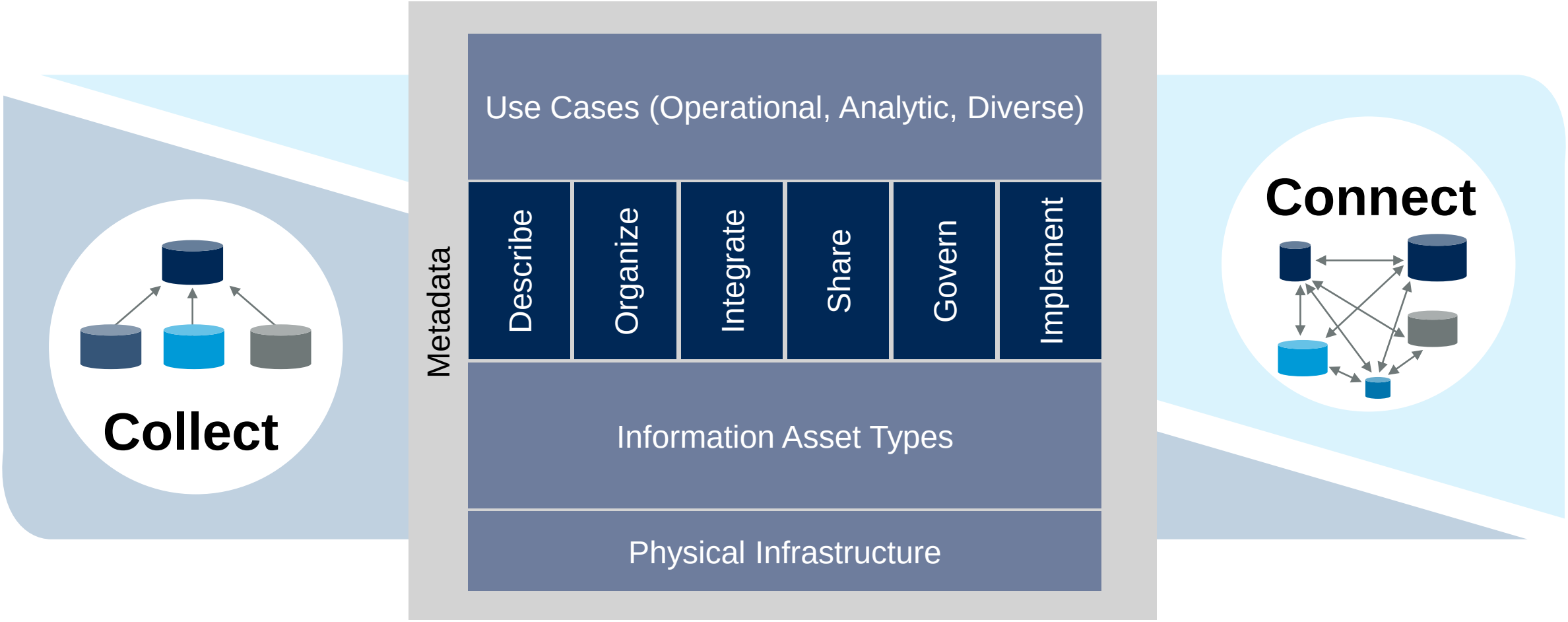
When to Collect — And Where? When to Connect — And How?



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Key Issues

1. What are the differences between hubs, lakes and warehouses?
2. How do you balance the trade-offs between these options?
3. What are the technology options and how are they integrated?

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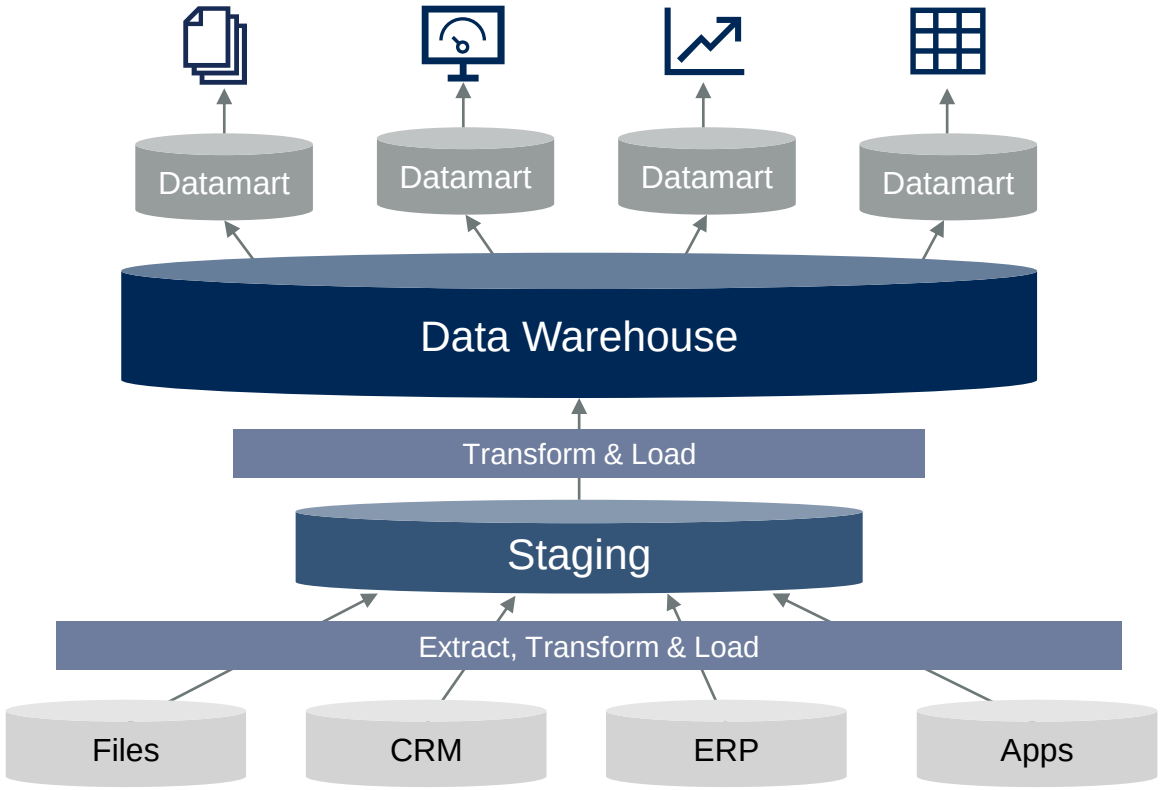
The Data Warehouse, Circa 1995

- Provides 80% of analytics using the same 20% of available data
- Optimized for repeatable processes
- Supports hundreds of enterprise consumers



How can we ask enterprisewide questions requiring historical perspective?

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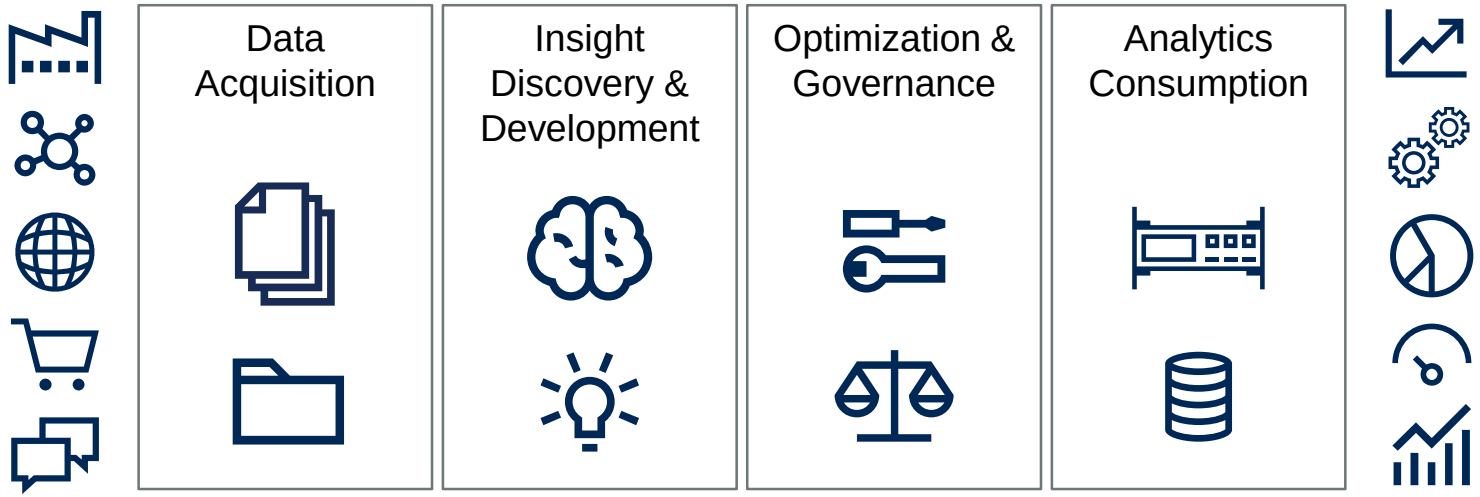
Data Lakes for Analytics Discovery

- Outgrowth of the DW staging area
- Stores raw data for exploration, analysis
- Not for everyone and every use case



How can we figure out what we don't know?

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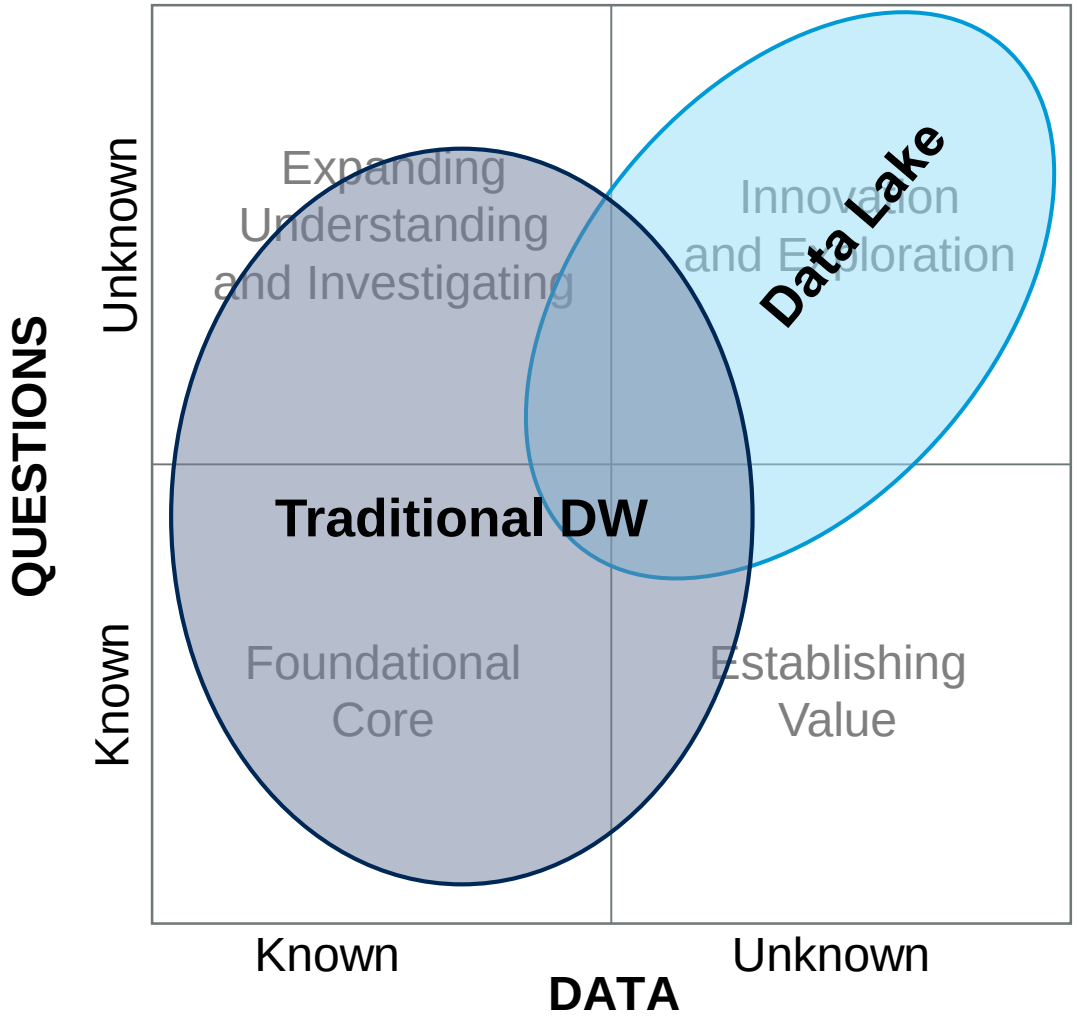
How Do Lakes and Warehouses Relate?



Context-Independent
Data Warehouse

Logical data warehouse overlays the **whole** chart

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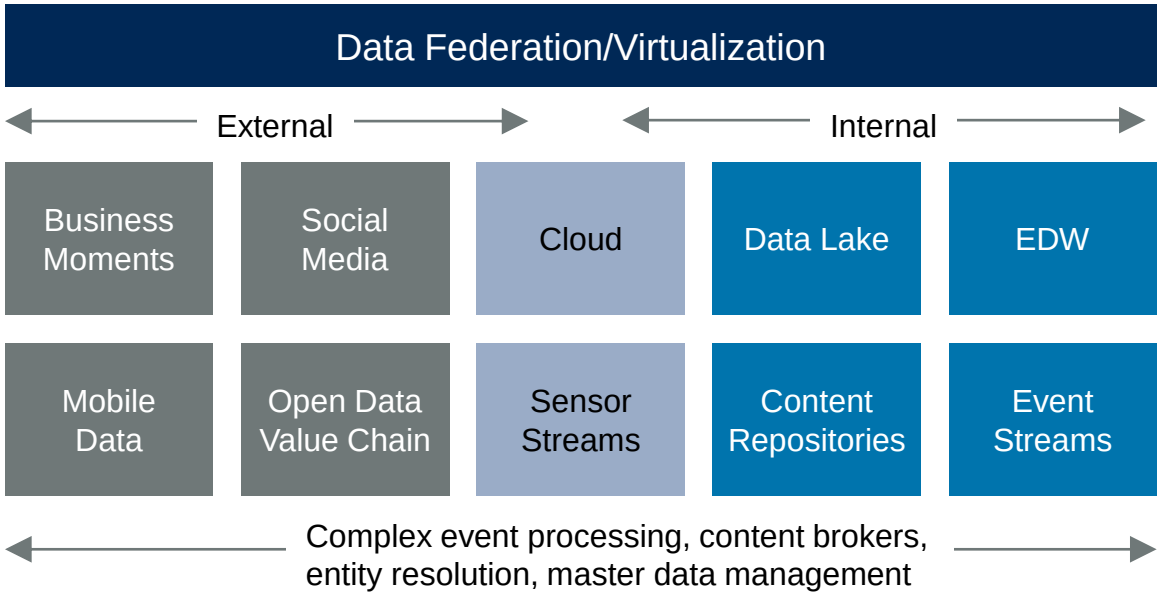
Workload and Data Expansion With the Logical Data Warehouse

- Need to support the remaining 20% of analytics
- Diverse users with diverse skills and tools



How can we expand our data management and analysis to more data types for different contexts?

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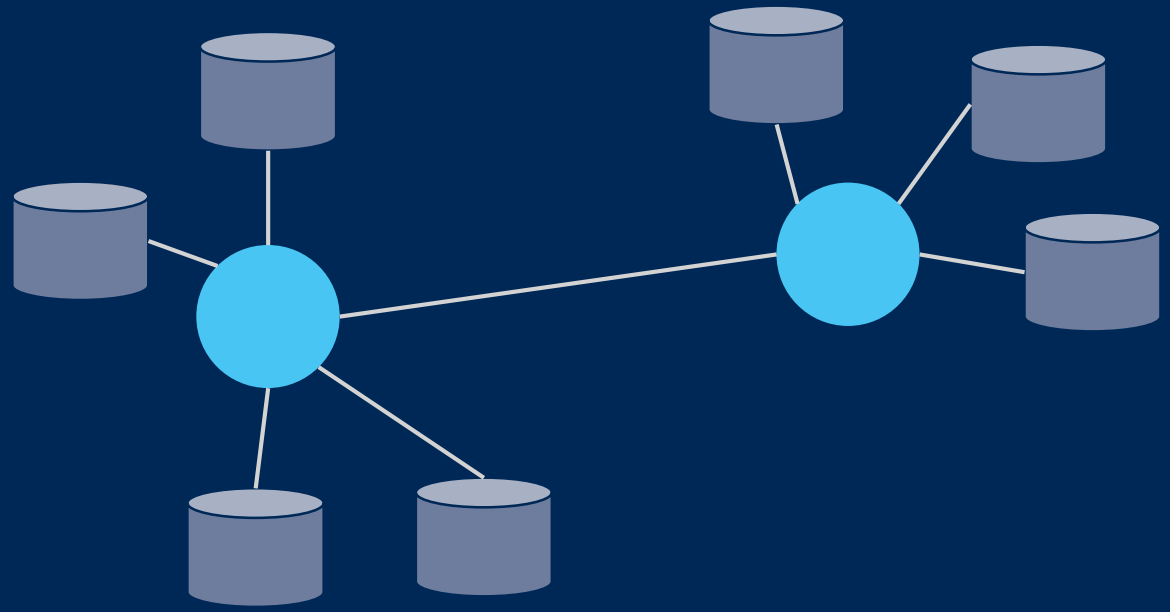
Data Hubs for Mediating Governance, Sharing and Integration

- Use cases:
  - Mediation and sharing of datasets:
    - Metadata focused
  - Distributed governance/ policy enforcement
  - Operationally focused but can be a trusted analytical data source



Determines effective mediation of semantics, and efficient data integration strategies, across applications, IoT networks, enterprises and ecosystems

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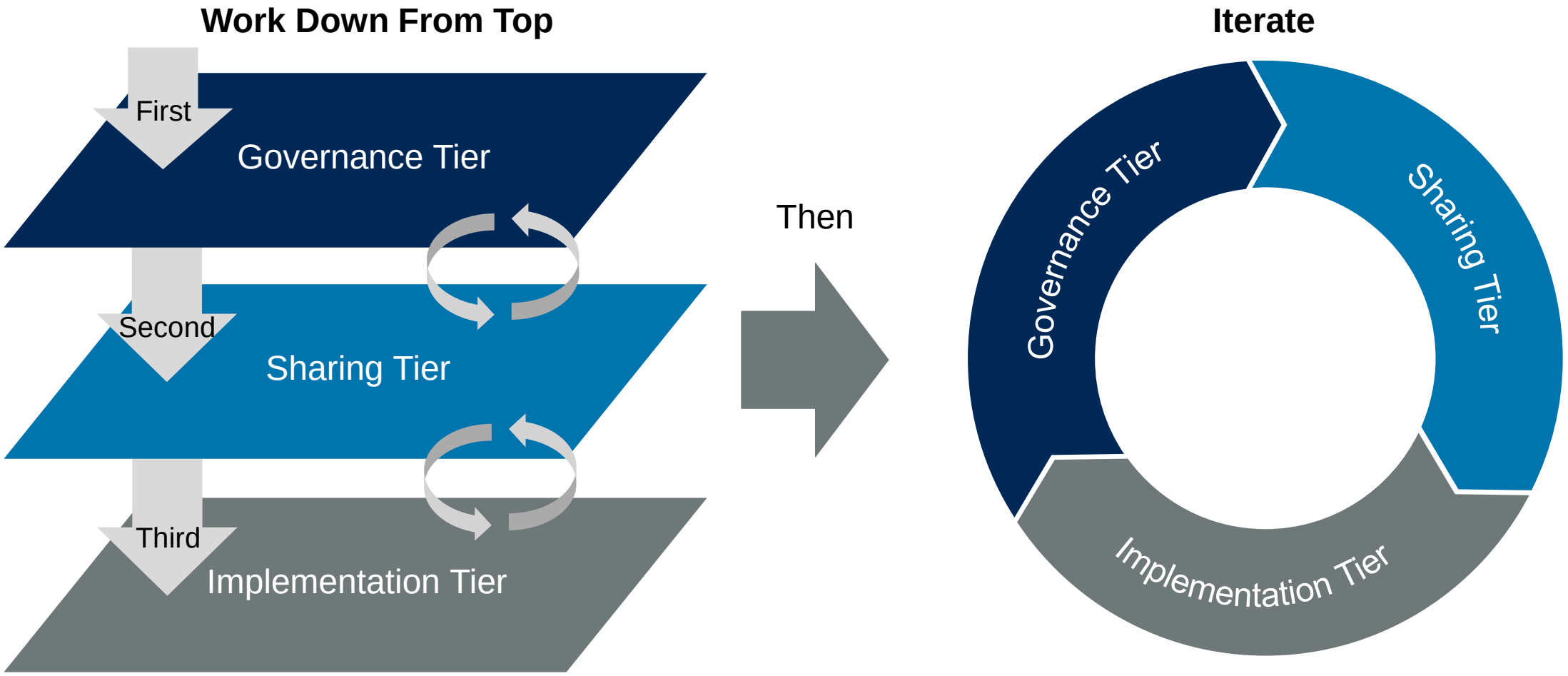
The Elements of a Data Hub Strategy



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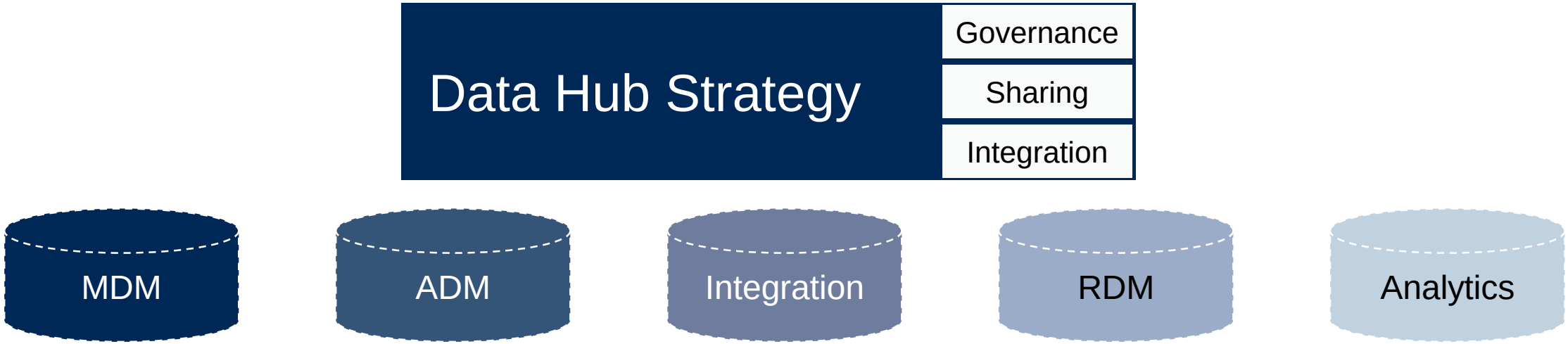
Types of Data Hubs



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How Do Hubs, Lakes and Warehouses Differ?

- What data processing options are available?
  - Flexible or optimized?
- What semantic capabilities are offered?
  - Variable or consistent?
- What types of use cases can I address?
  - Generic or specific?

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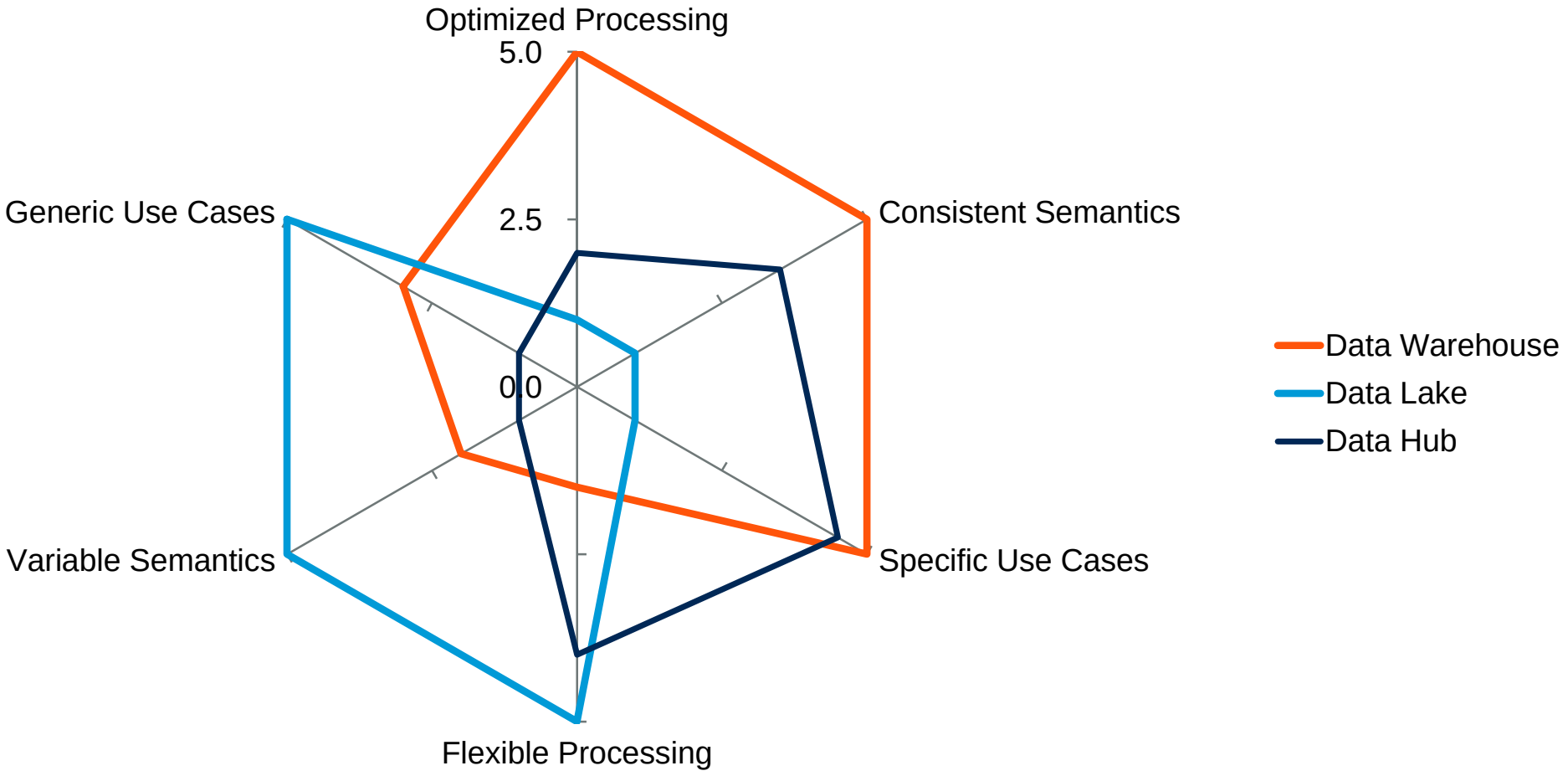
How Do Hubs, Lakes and Warehouses Differ?



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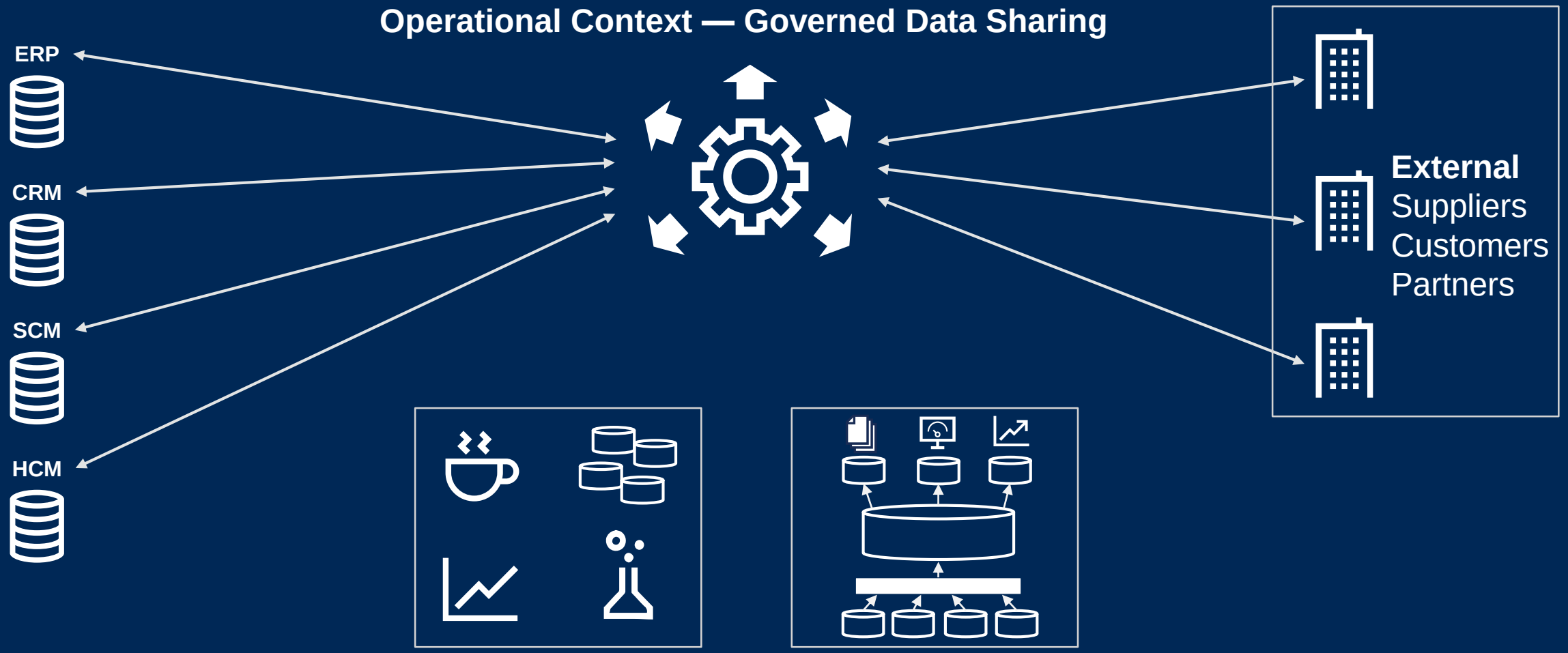
Hubs, Lakes and Warehouses Aren't Exclusive Choices



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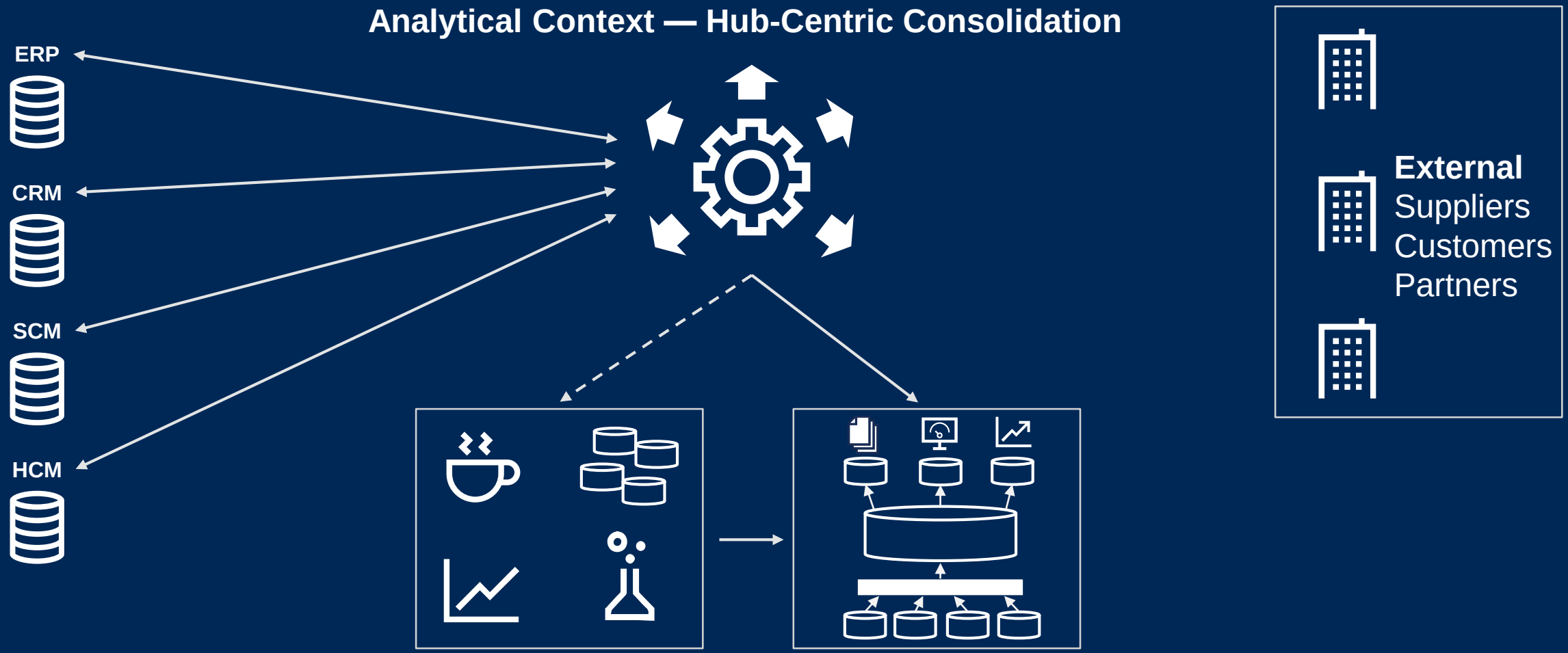

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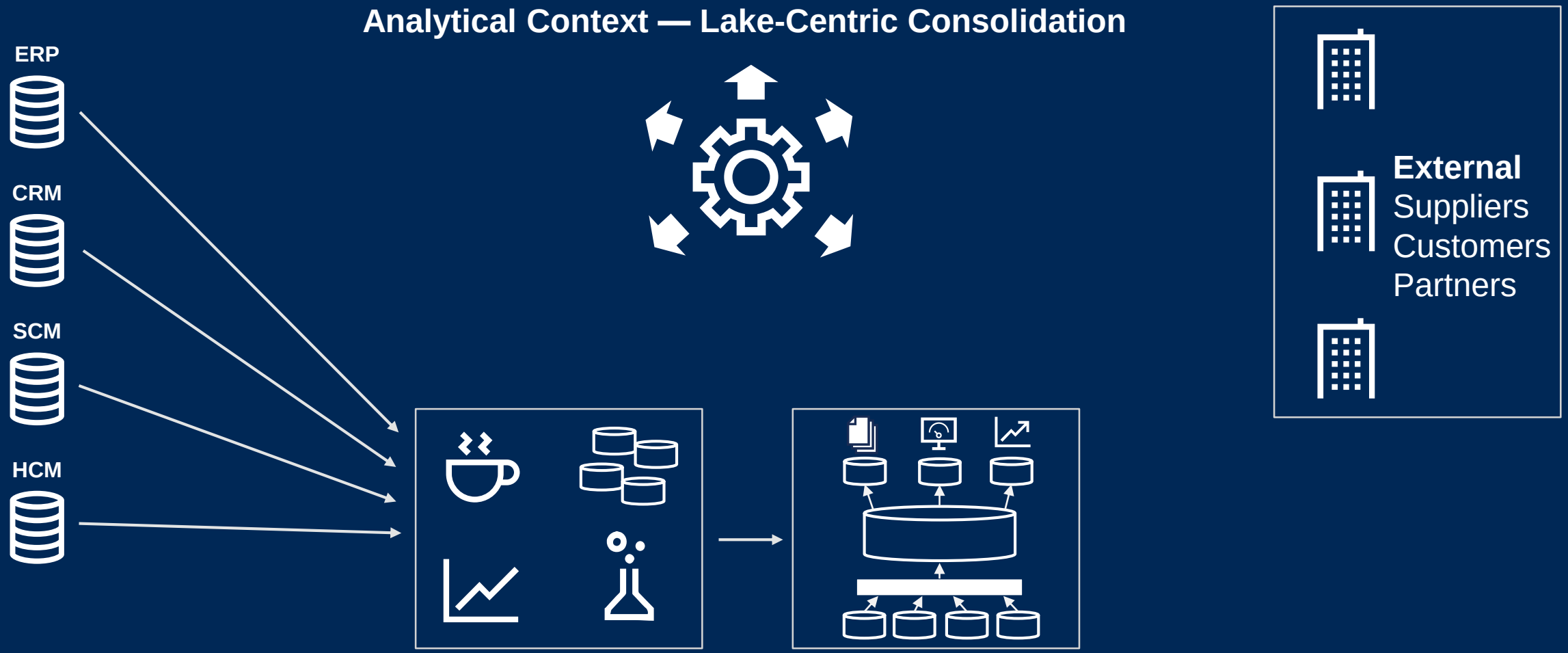

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Do You Need All of These Options?

Strategic Planning Assumption

By 2021, enterprises using a cohesive strategy incorporating data hubs, lakes and warehouses will support 30% more use cases than competitors.

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Data Warehousing Choices Proliferate

- Continued adoption of cloud offerings:
  - Alibaba Cloud, Amazon Web Services, Google Cloud Platform, IBM, Microsoft, Oracle, Qubole, Snowflake
- Hybrid data warehousing becoming viable as incumbents lead shift:
  - IBM, Micro Focus, Microsoft, Oracle, Teradata
- Insurgent vendors filling specialized roles:
  - Cloudera-Hortonworks, MapR Technologies, MarkLogic, MemSQL, Neo4j, Treasure Data

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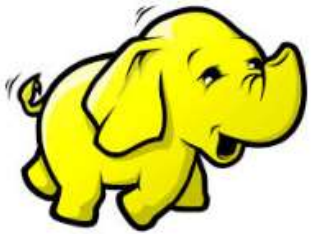
Data Lake Implementation Technologies

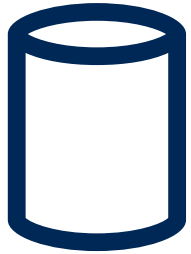


Apache Hadoop distributions:

- Simplified data ingestion and storage with several processing options
- Data lake management ecosystem emerging
- Complex deployment and management

Cloud-based block and object stores:

- Simplified data ingestion and storage
- Bring your own processing
- Nascent management and security ecosystem



Database management systems:

- Optimal for certain data types and formats
- Data processing options expanding beyond SQL
- Scaling and cost may be challenges

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Data Hub Technologies and Tools

- Data integration tools (ETL, replication, data virtualization).
- Application integration middleware (ESB, MOM, iPaaS, API management).
- Persistence technologies (DBMS, Hadoop, cloud-based data stores).
- Governance (data quality tools, data privacy technology, MDM solutions).
- Metadata management platforms.
- All the above, packaged as a “hub product”?

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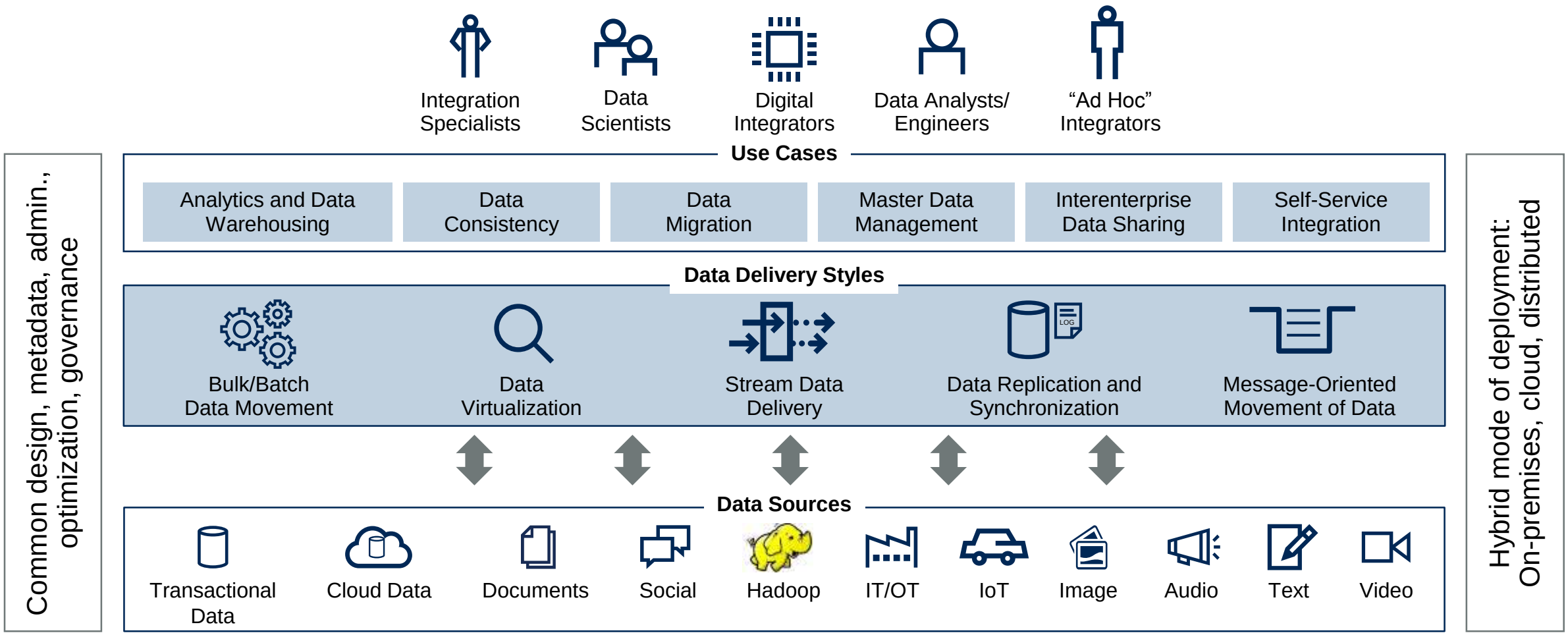
A Range of Integration Styles to Support a Range of Patterns and Connection Types



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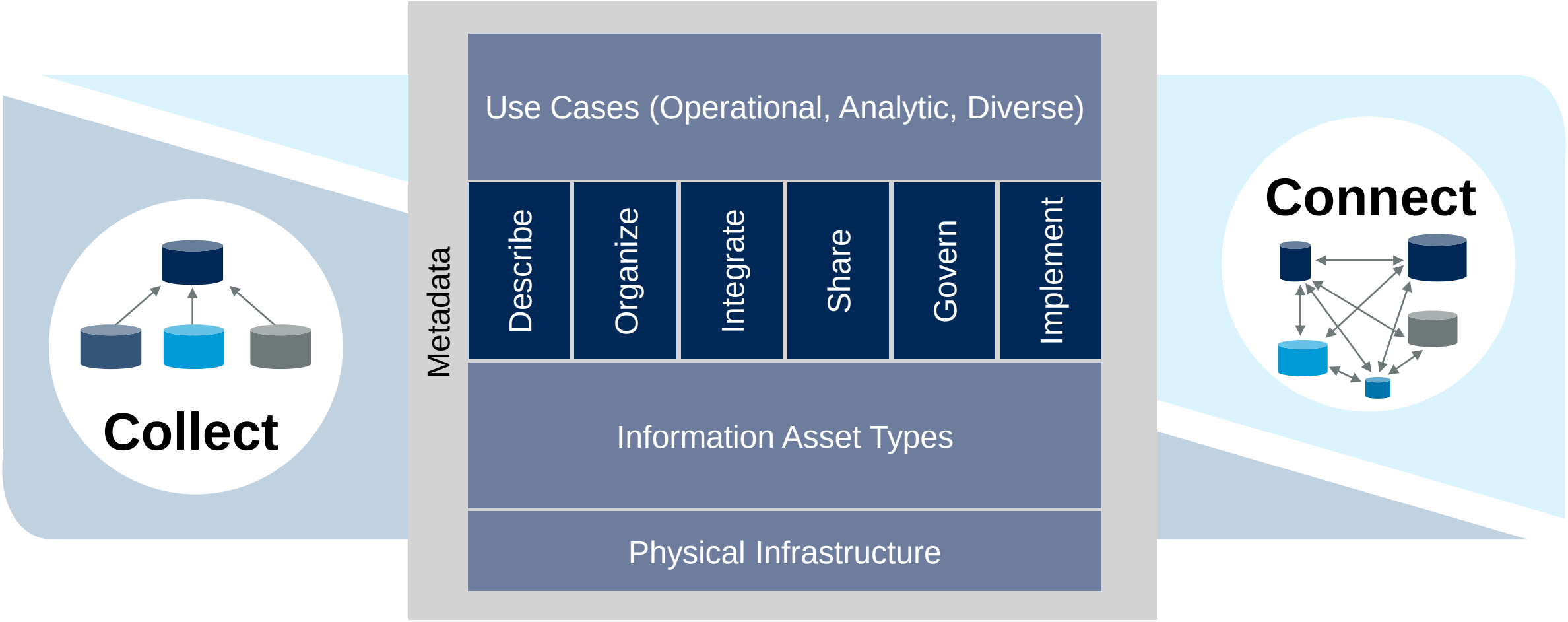
Apply the Right Combination of Lakes, Warehouses and Hubs to Best Enable Data Sharing and Analytics



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Recommendations

- ✓ Build the core of your digital platform based on the types of use cases, processing flexibility and semantic enablement your users require.
- ✓ Apply the data hub architecture to better balance the ability to collect data with connecting data producers and consumers as needed.
- ✓ Use data lakes for analytics exploration and data warehouses for optimization and broad consumption.
- ✓ Prepare for continuous platform evolution as business needs change.

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Recommended Gartner Research

- **Use a Data Hub Strategy to Meet Your Data and Analytics Governance and Sharing Requirements**
  Andrew White and Ted Friedman (G00295309)
- **Implementing the Data Hub: Architecture and Technology Choices**
  Ted Friedman and Andrew White (G00297674)
- **Best Practices for Designing Your Data Lake**
  Nick Heudecker (G00315546)
- **Data Management Solutions for Analytics: Current and Future States, 2017**
  Rick Greenwald and Adam Ronthal (G00336273)

For information, please contact your Gartner representative.

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