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Oracle Analytics for Enterprise Governance

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Agenda

- Addressing the needs of both Business and IT
- Securing All Layers of Your Enterprise
- Governed and secure enterprise semantic layer
  - Physical
  - Logical
  - Presentation
- Components of a semantic model
  - Dimensional Hierarchies, Level Keys, and Content Levels
- How Does a Semantic Model Query Data?
- Enterprise Semantic Layers for Securing your data
- What sets us apart

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Business problems Oracle Analytics can solve

Problems	Solution	Capabilities
 **Consumers** struggle to get answers	Empower users to **make data-driven decisions**	• GenAI powered data stories, newscasts and podcasts • Interact with data using natural language • One-click contextual insights • Automatically generate podcasts from data stories
 **Analysts** take too long to build analyses	**Improve productivity** of analysts	• AI/ML derived insights reveal new business opportunity • No code AI and ML accelerates time to insight • Develop projects faster through natural language • Explainability of metrics and attributes
 **Architects** are concerned about data chaos	Help architects **deliver trusted data**	• Governed enterprise semantic data model • AI powered data profiling, prep and enrichment • Repeatable and auditable data transformations • Clear data lineage

Addressing the needs of both business and IT

FOR BUSINESS GROUPS

SELF-SERVICE ANALYTICS

- Visualization & Storytelling
- Data Preparation
- Mobile app
- Collaboration

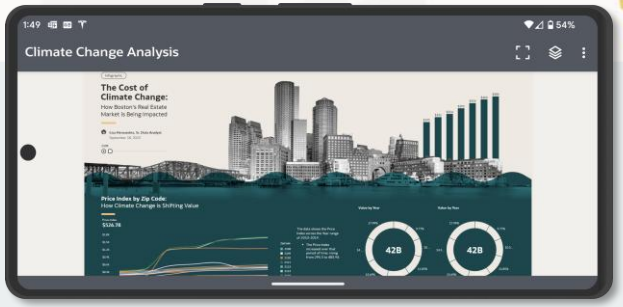
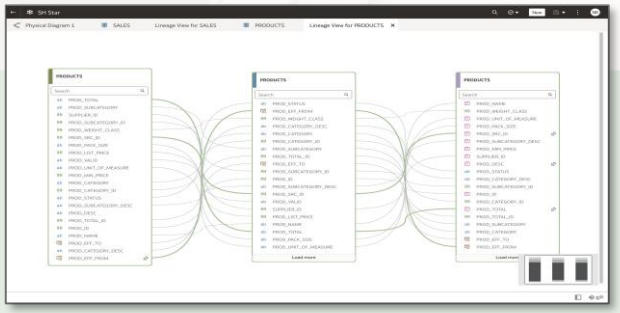
AUGMENTED/ADVANCED ANALYTICS

- Voice and Chatbot
- Natural Language
- Auto-generated Podcasts
- Generative AI
- Automated Insights
- Machine Learning

FOR THE ENTERPRISE

GOVERNED ANALYTICS

- Parameterized Dashboards
- Standard Reports
- Semantic Model
- Query Federation

Consumers		Mobile podcasts
Analysts		Recommended insights
Architects		Enterprise data modeling

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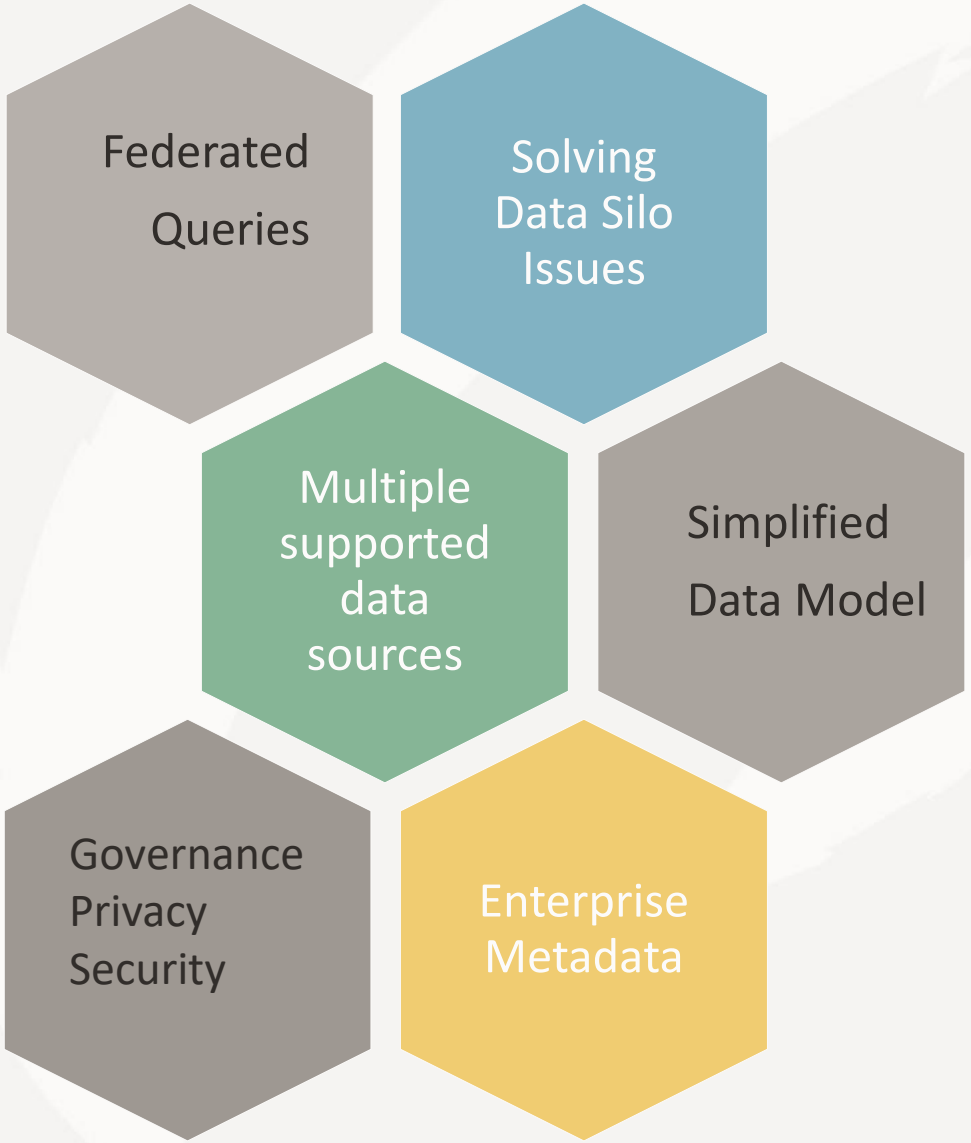
Data Federation



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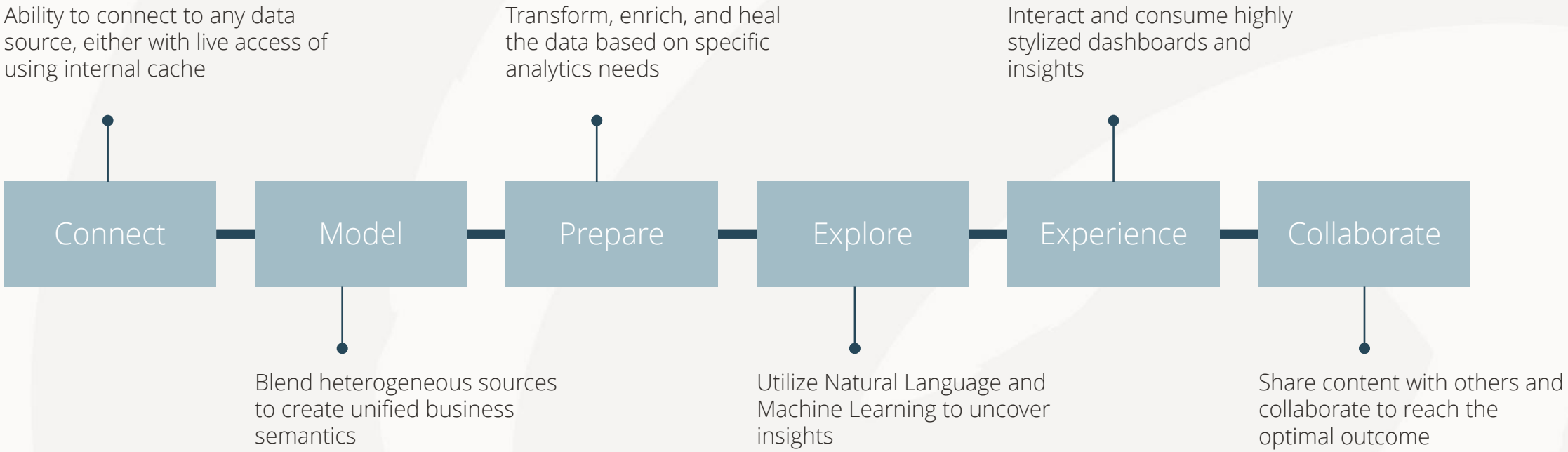
Delivering at Every Stage of the Analytics Journey



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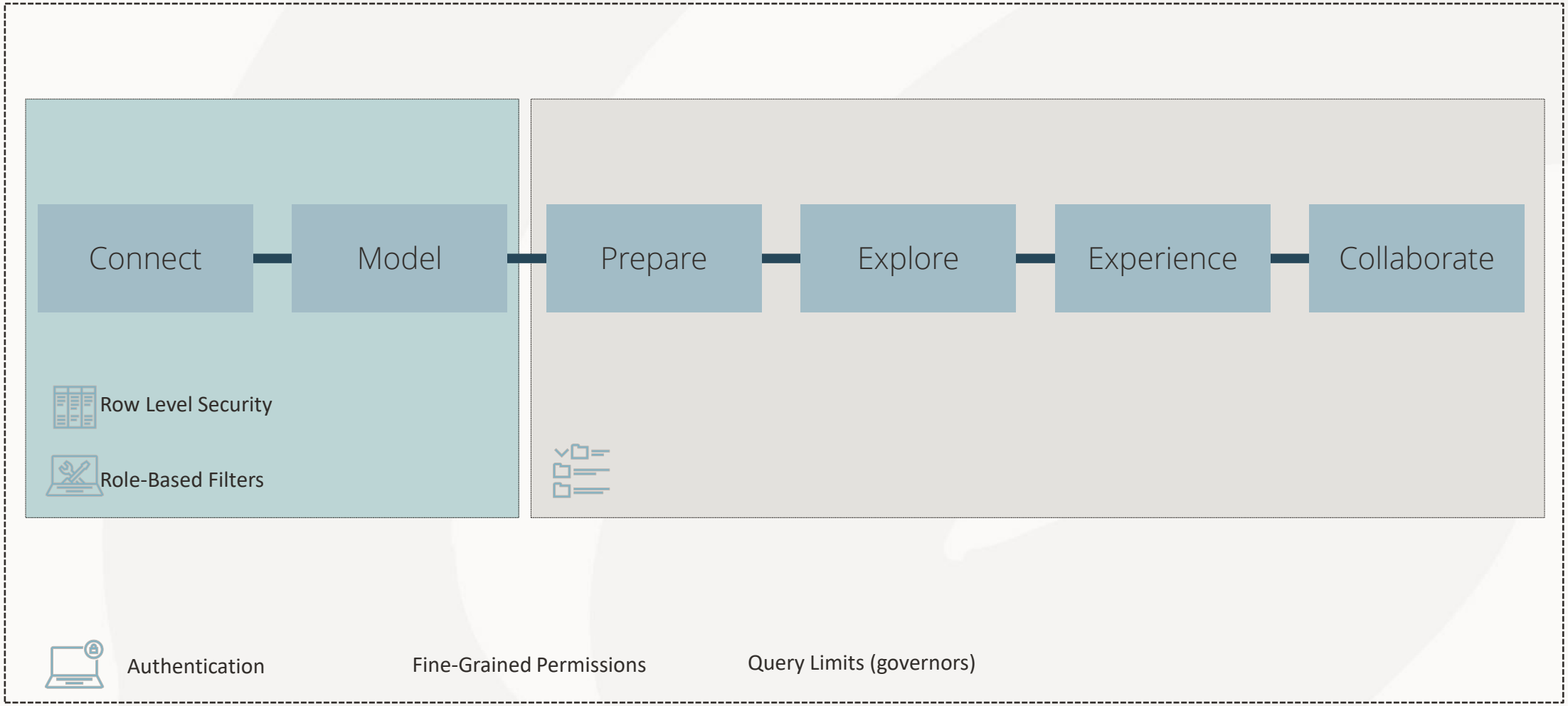
Delivering Security at Every Stage of the Analytics Journey



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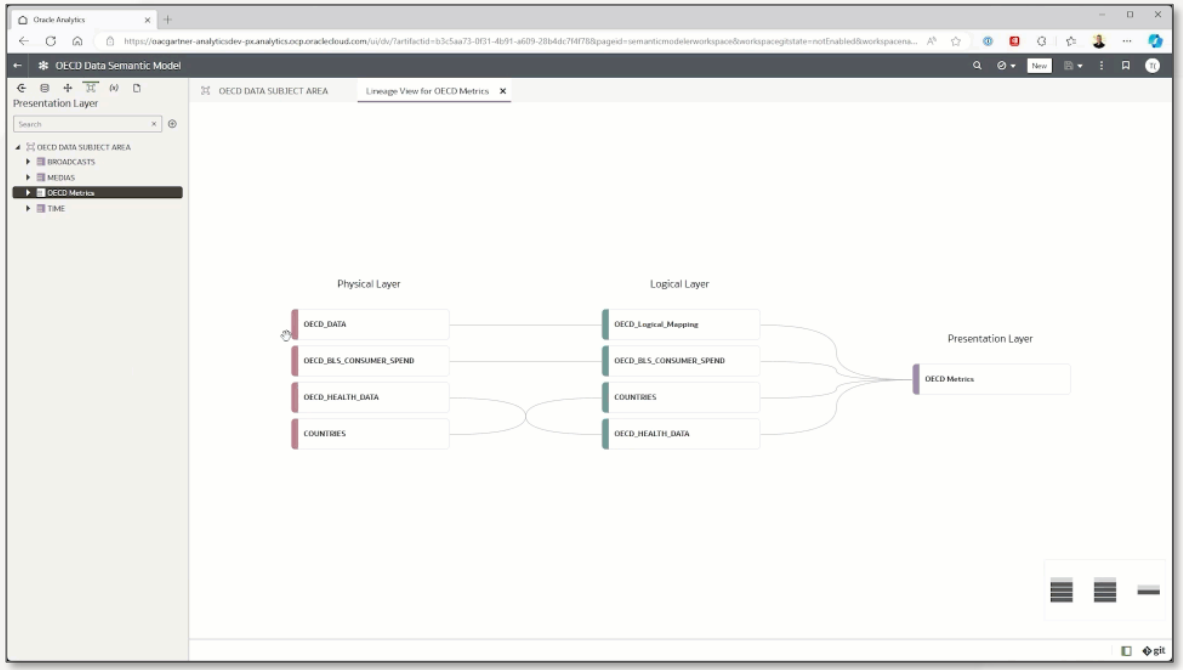
Governed and secure enterprise semantic layer

- A single representation of the enterprise data estate for consistent reporting
- Provide business a view they understand and hides the complexity of the physical data estate
- Visual data lineage helps explain numbers
- Semantic markup language (SMML) helps developers build and modify the data layer programmatically
- Git repository support built-in for multi-user development (MUD)



Data lineage to better understand metric definitions

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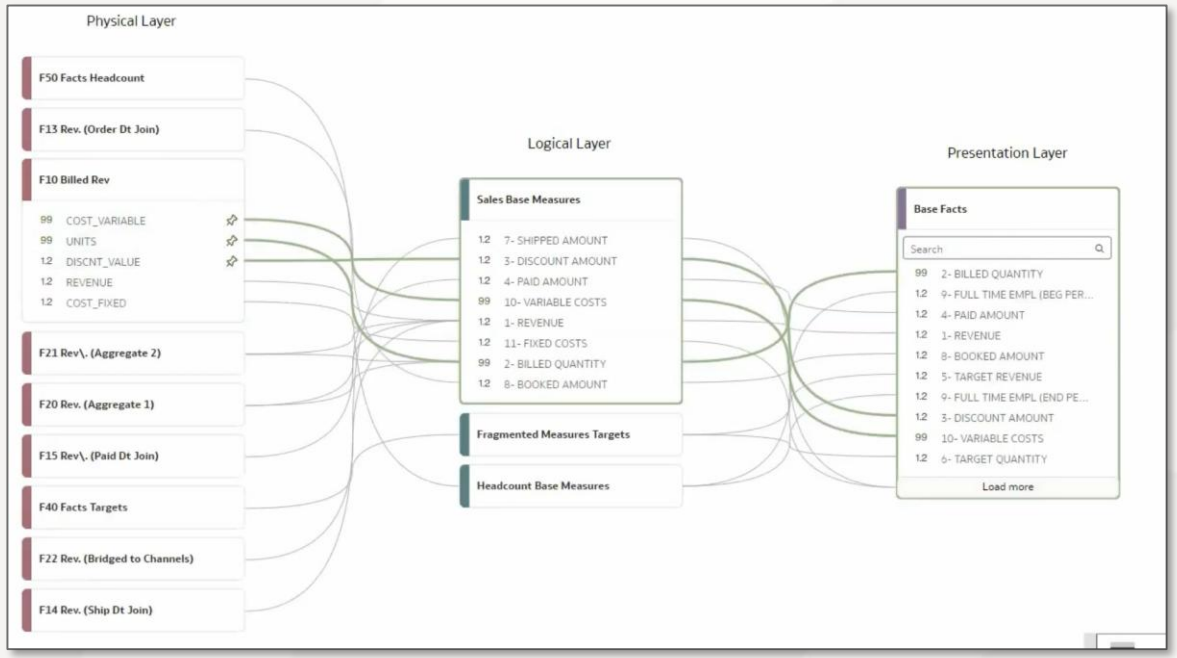
Governed and secure enterprise semantic layer

Physical Layer

- Physical data model for the enterprise
- Includes all relevant sources in the data estate
- Execute native queries to each data source
- Process functions at the the data sources



Logical Layer

- Logical representation of the data estate as business subject areas
- Centrally managed for governance and consistency
- Accurate blending of disparate data sources
- Shared data hierarchies and dimensions

Presentation Layer

- Consumption layer abstracts data complexity from users
- Powers reporting, dashboards, ad hoc analyses and story telling
- Consistent and trusted results regardless of consumption method
- Support additional data visualization tools, eg Power BI

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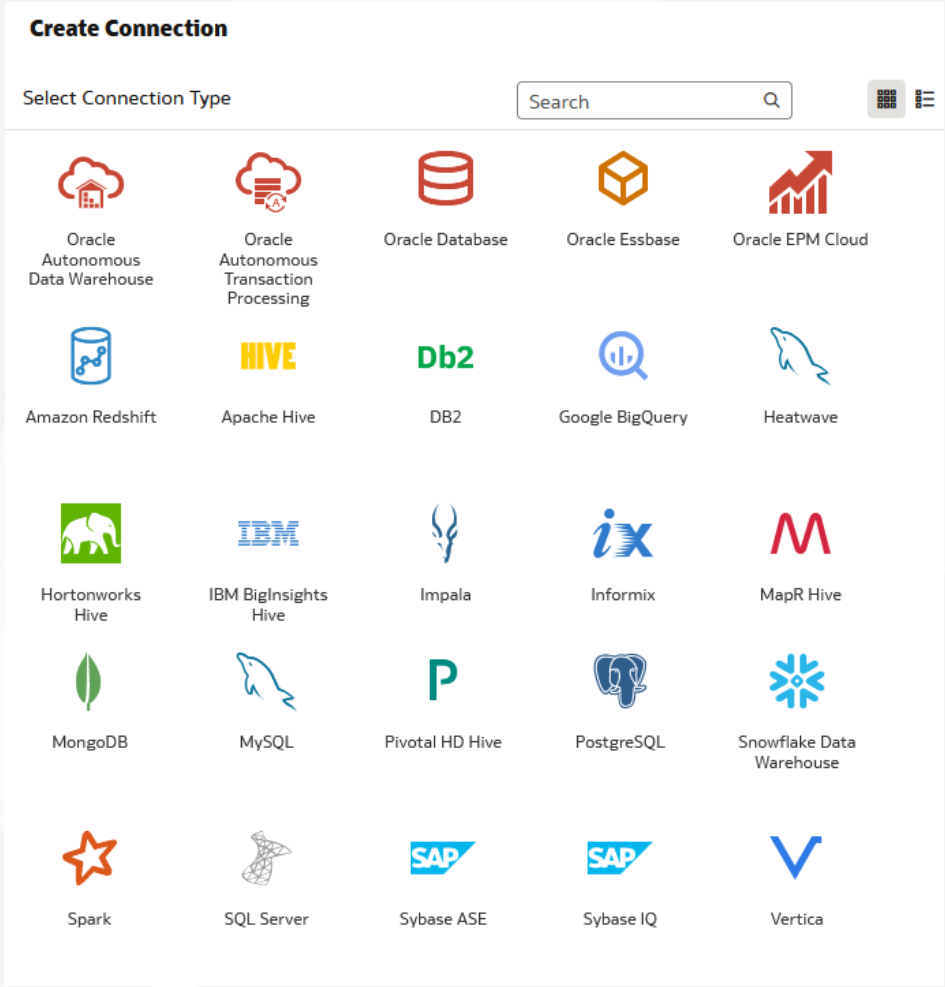
Governed and secure enterprise semantic layer: Physical

Physical Layer

- Physical data model for the enterprise
- Includes all relevant sources in the data estate
- Execute native queries to each data source
- Process functions (eg AI/ML) at the the data sources

Adding a new connection



Full list of supported data sources is available here

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Governed and secure enterprise semantic layer: Physical

Physical Layer

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Physical tables

Alias tables

Full list of supported data sources is available here

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Governed and secure enterprise semantic layer: Physical

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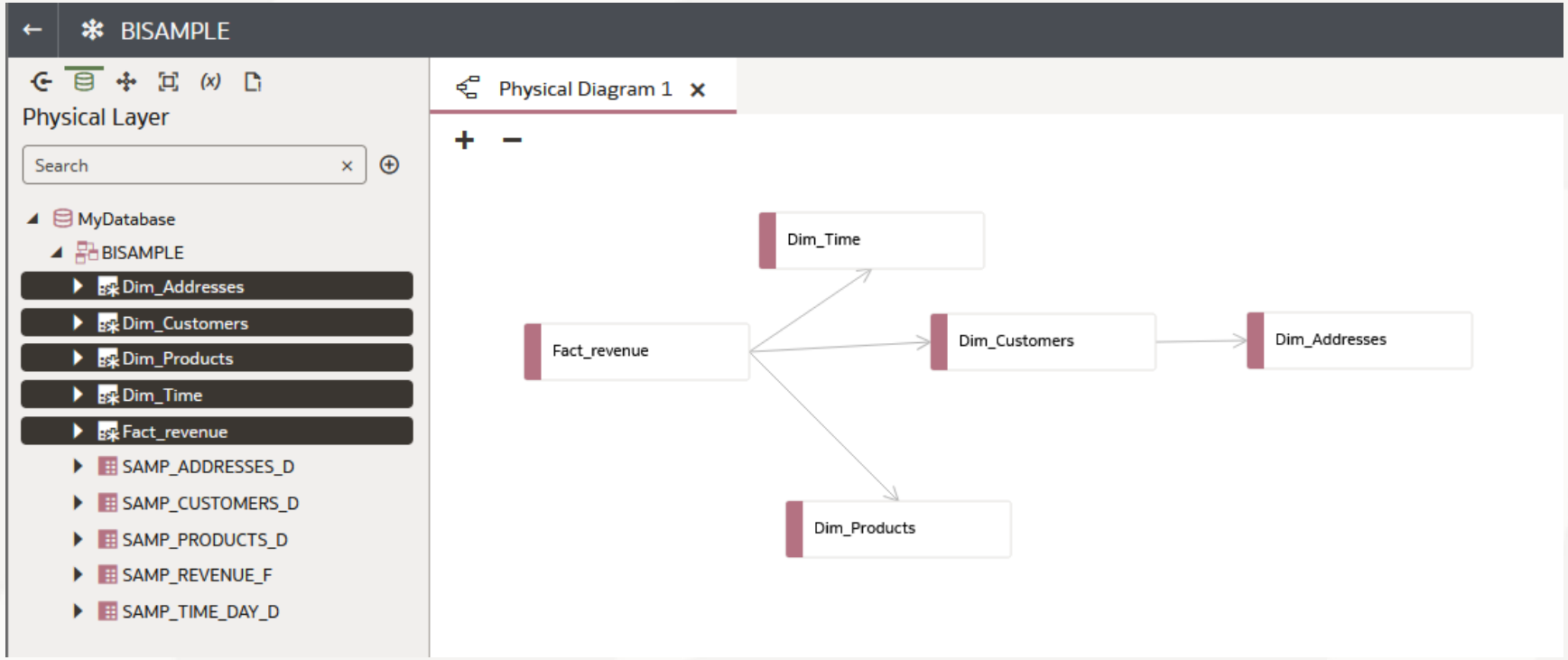

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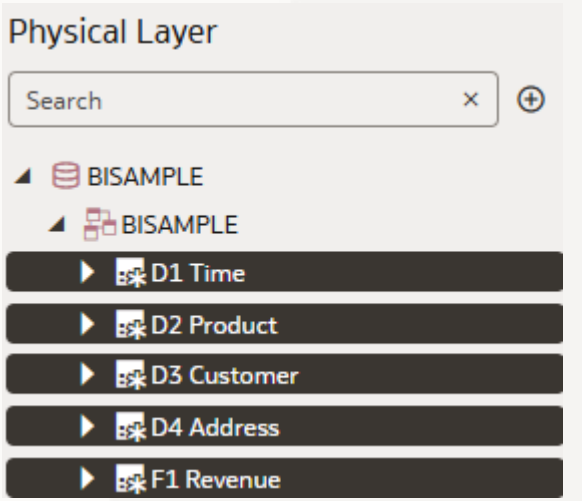
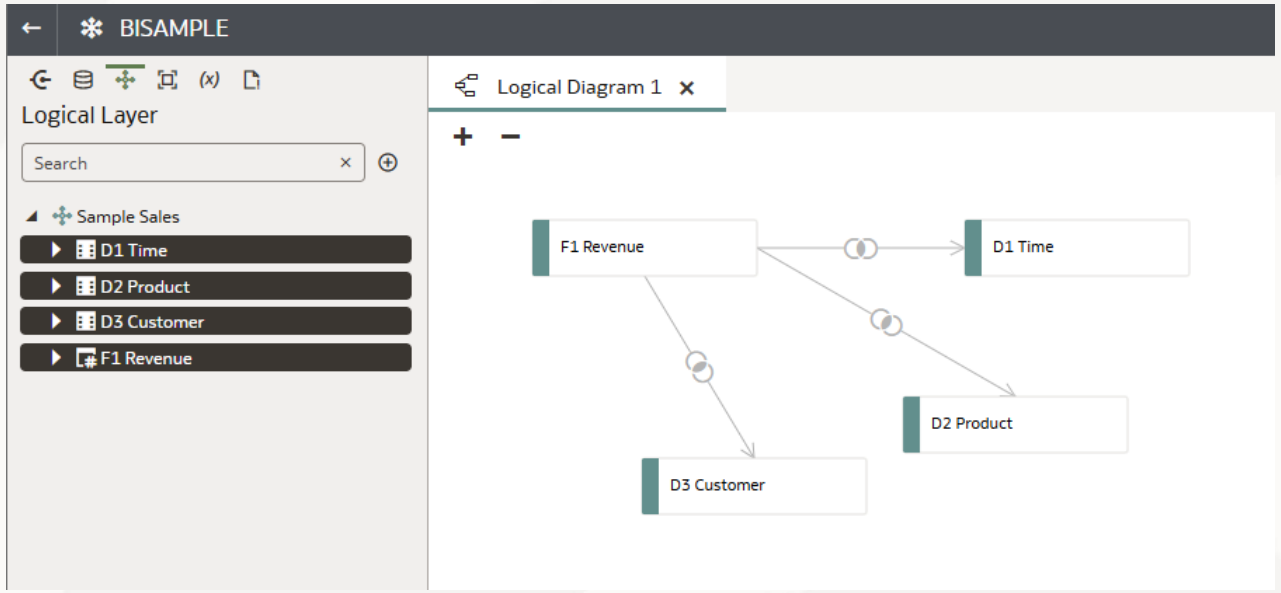
Governed and secure enterprise semantic layer: Logical

Physical Layer





Logical Layer

- Logical representation of the data estate as business subject areas
- Centrally managed for governance and consistency
- Accurate blending of disparate data sources
- Shared data hierarchies and dimensions

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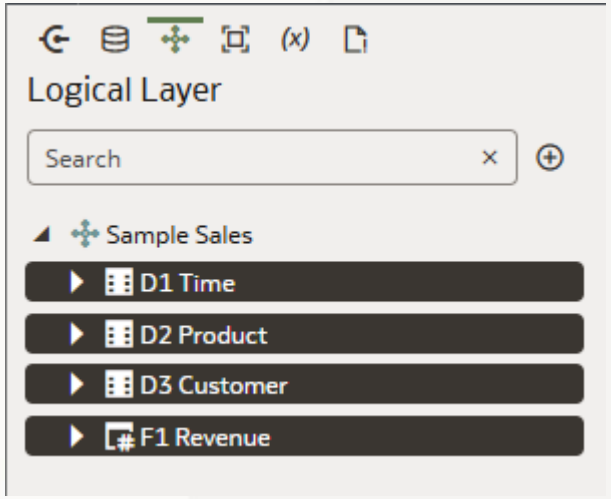
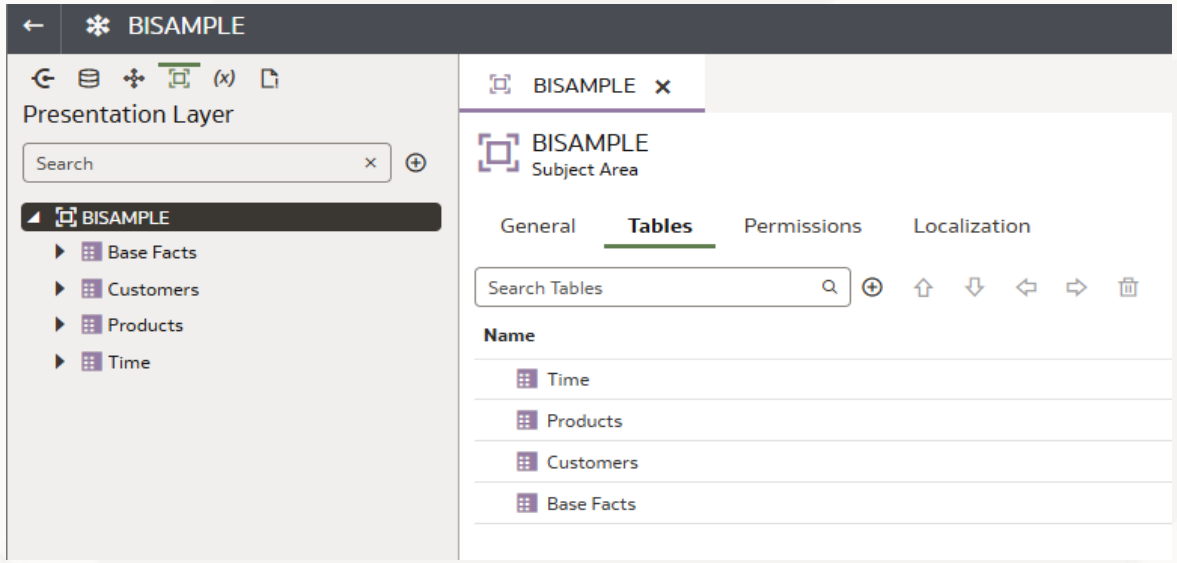
Governed and secure enterprise semantic layer: Presentation

Logical Layer



Presentation Layer

- Consumption layer abstracts data complexity from users
- Powers reporting, dashboards, ad hoc analyses and story telling
- Consistent and trusted results regardless of consumption method
- Support additional data visualization tools, eg Power BI



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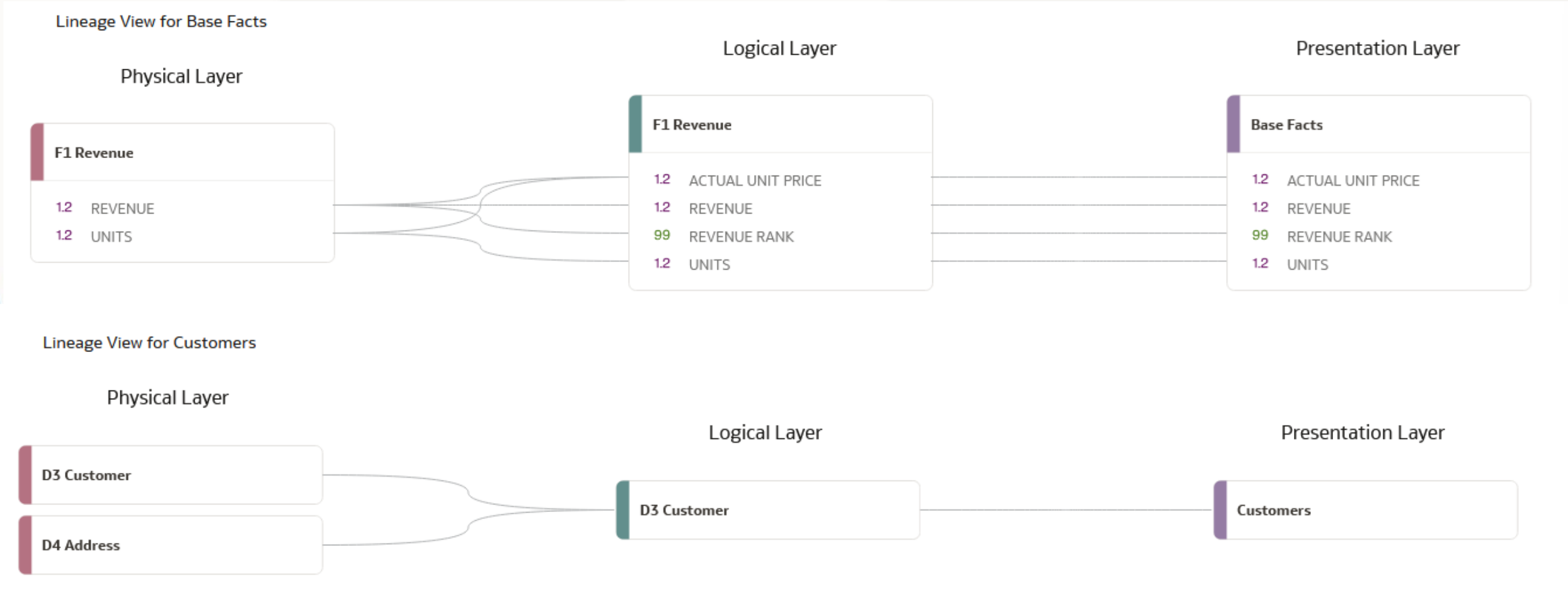
Governed and secure enterprise semantic layer

Lineage view & Lineage export



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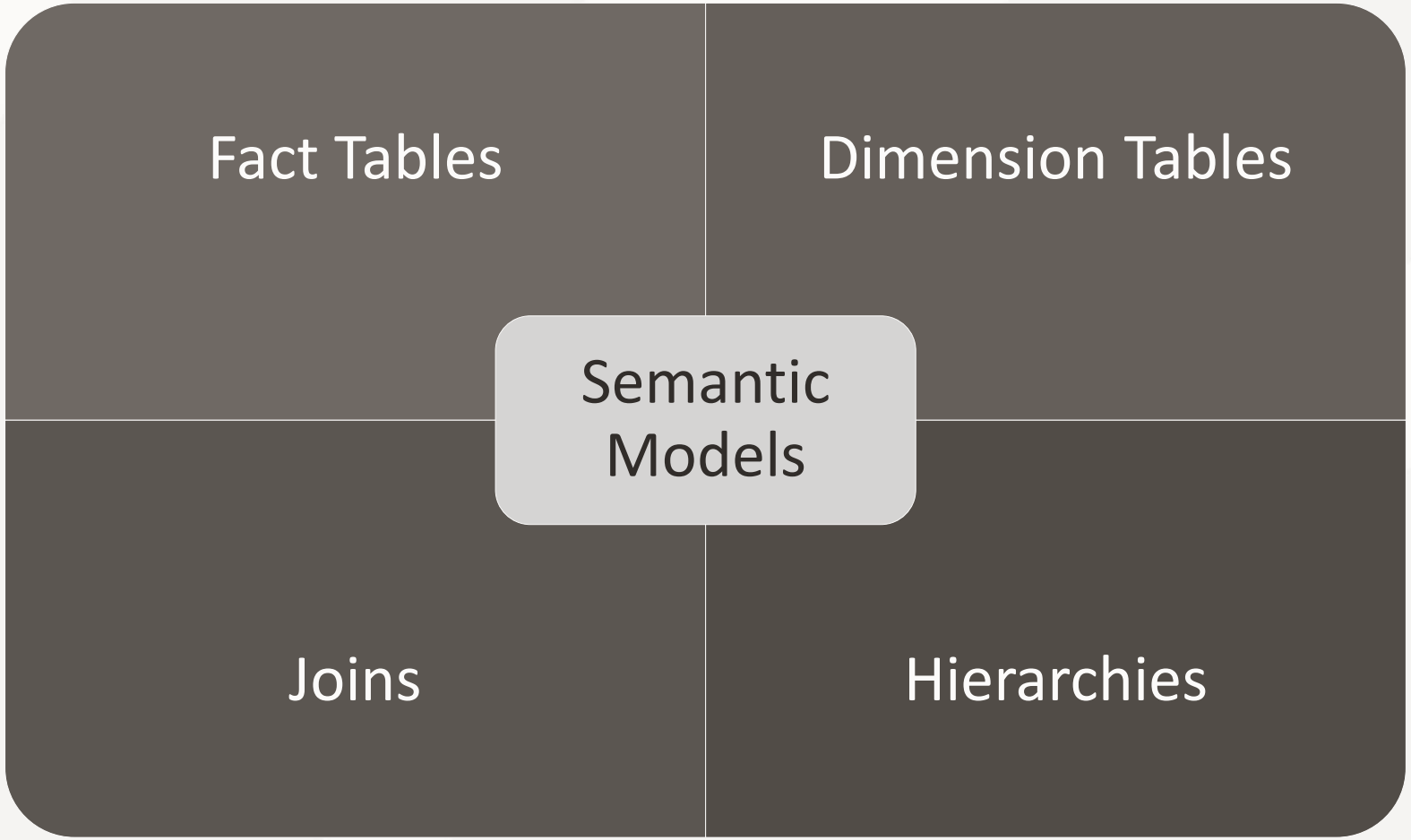
Components of a semantic model



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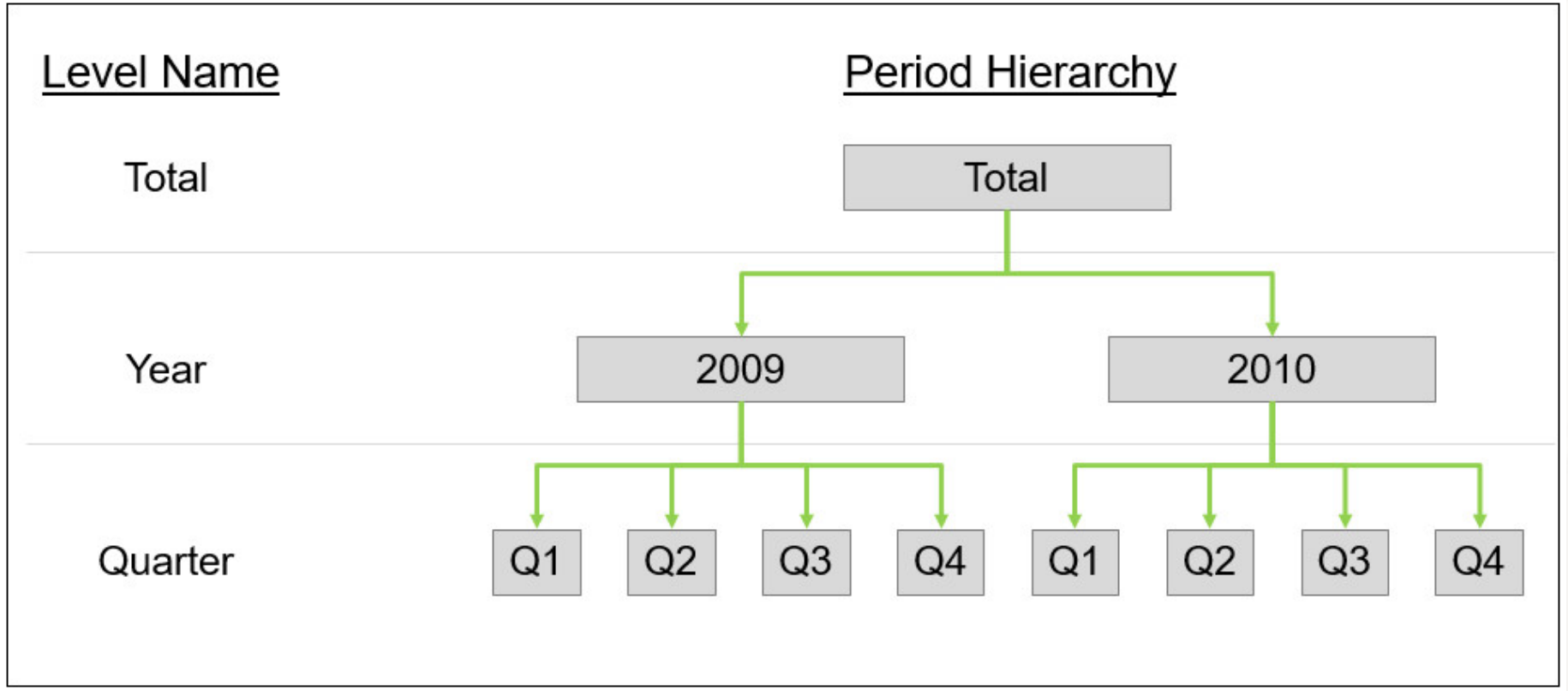
Dimensional Hierarchies, Level Keys, and Content Levels

A balanced level-based hierarchy is the most common type of hierarchy used in Oracle Analytics. In all level-based hierarchies, the detail levels roll up into higher levels. In a balanced level-based hierarchy, all members of the hierarchy have ancestors at all levels as shown here.



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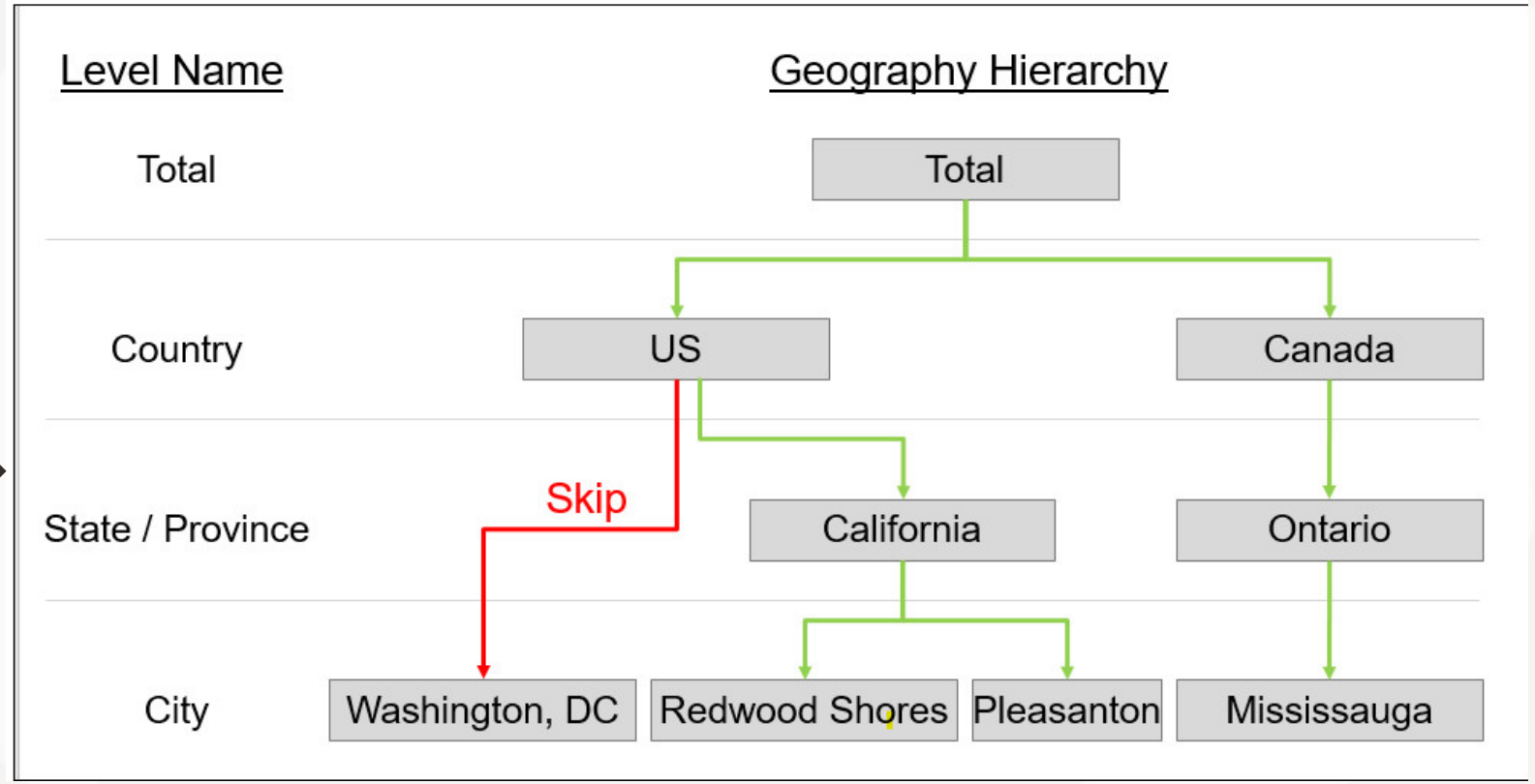
Dimensional Hierarchies, Level Keys, and Content Levels

A skipped-level hierarchy is a special level-based hierarchy where not all members of the hierarchy have ancestors at all levels. To define a skipped-level hierarchy, you select Skipped Levels in the properties of the hierarchy.

This example shows a skipped-level hierarchy where Washington DC doesn't belong to a state, so the state/province level is skipped.



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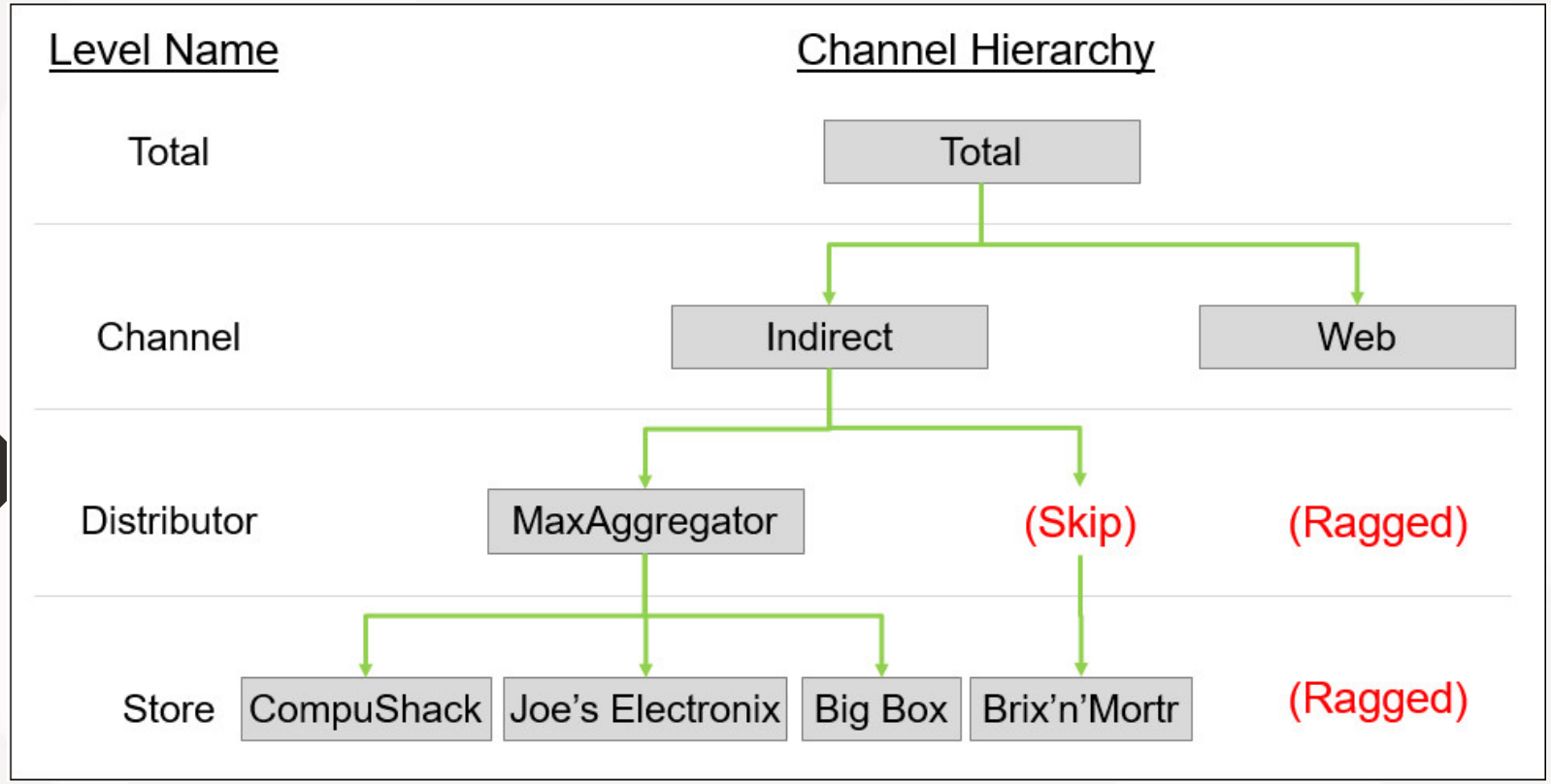
Dimensional Hierarchies, Level Keys, and Content Levels

A ragged or unbalanced hierarchy is another special level-based hierarchy where not all the data is present at all levels of the hierarchy. To define a ragged hierarchy, you select Ragged in the properties of the hierarchy

This example shows a ragged and skipped-level hierarchy where the Distributor and Store levels are missing from the Web branch of the hierarchy.



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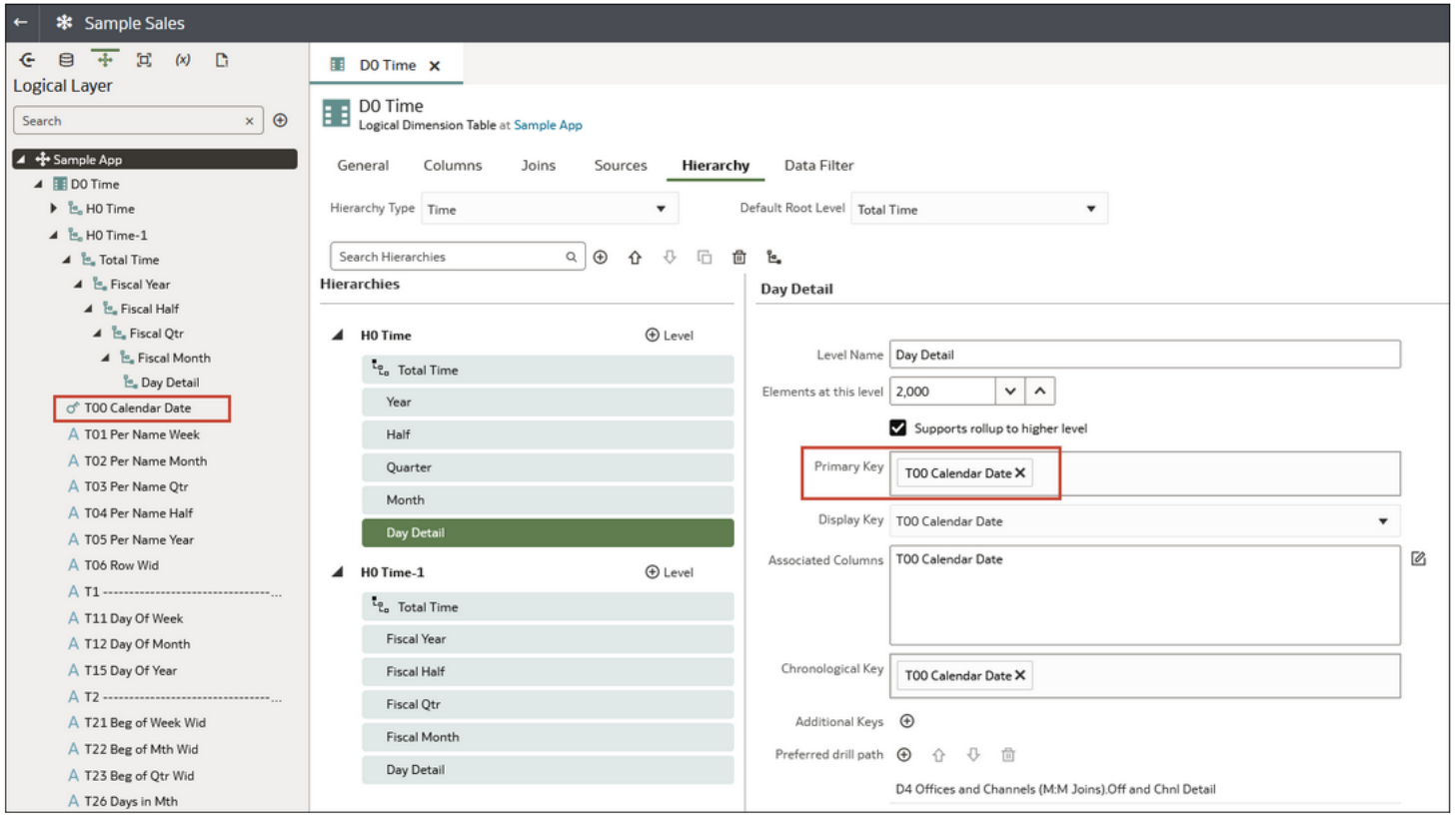
Dimensional Hierarchies, Level Keys, and Content Levels

Content Levels

You use content levels to define the level of aggregation of a logical table source in both facts and dimensions.

Level Keys

You use level keys to identify a given level.



This example shows a logical dimension table and dimensional hierarchy with common primary keys.

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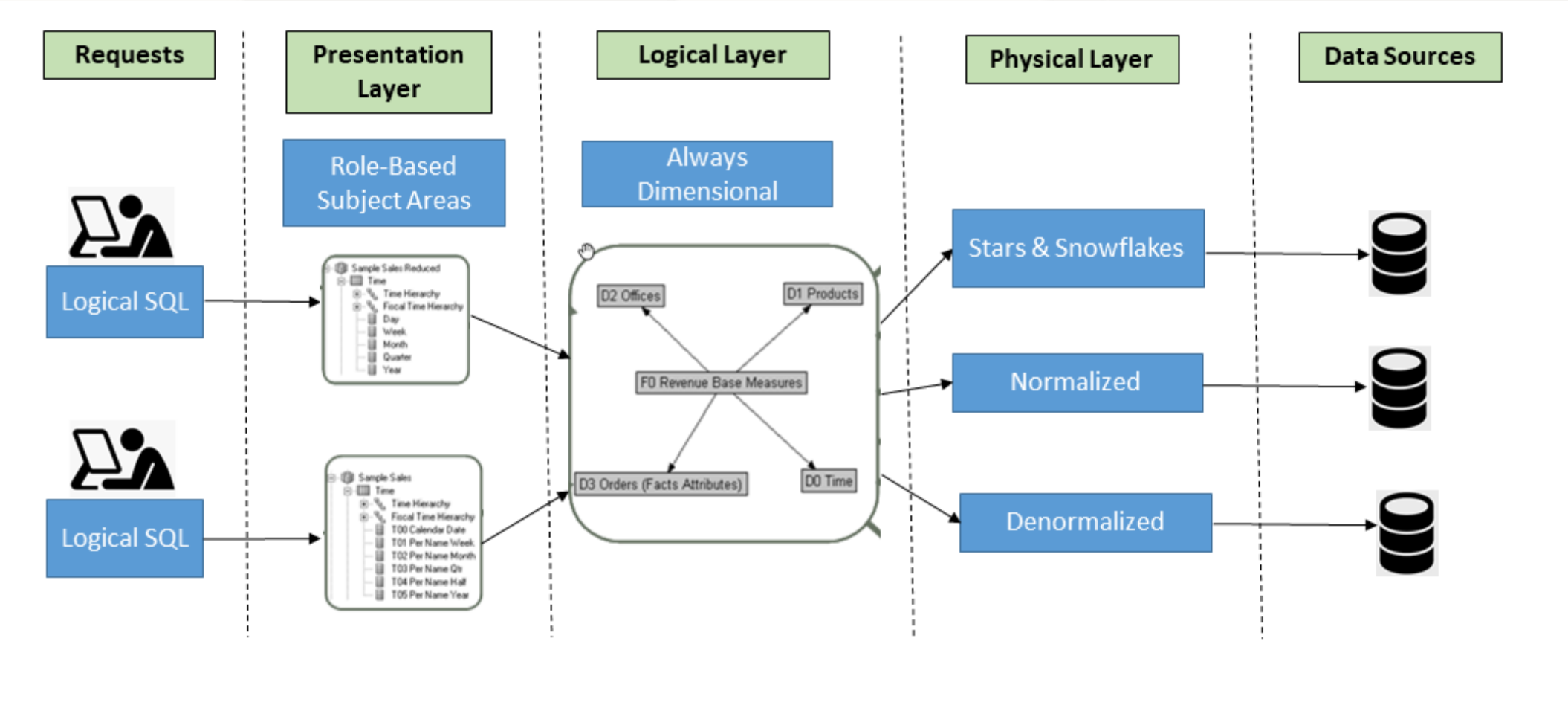
How Does a Semantic Model Query Data?



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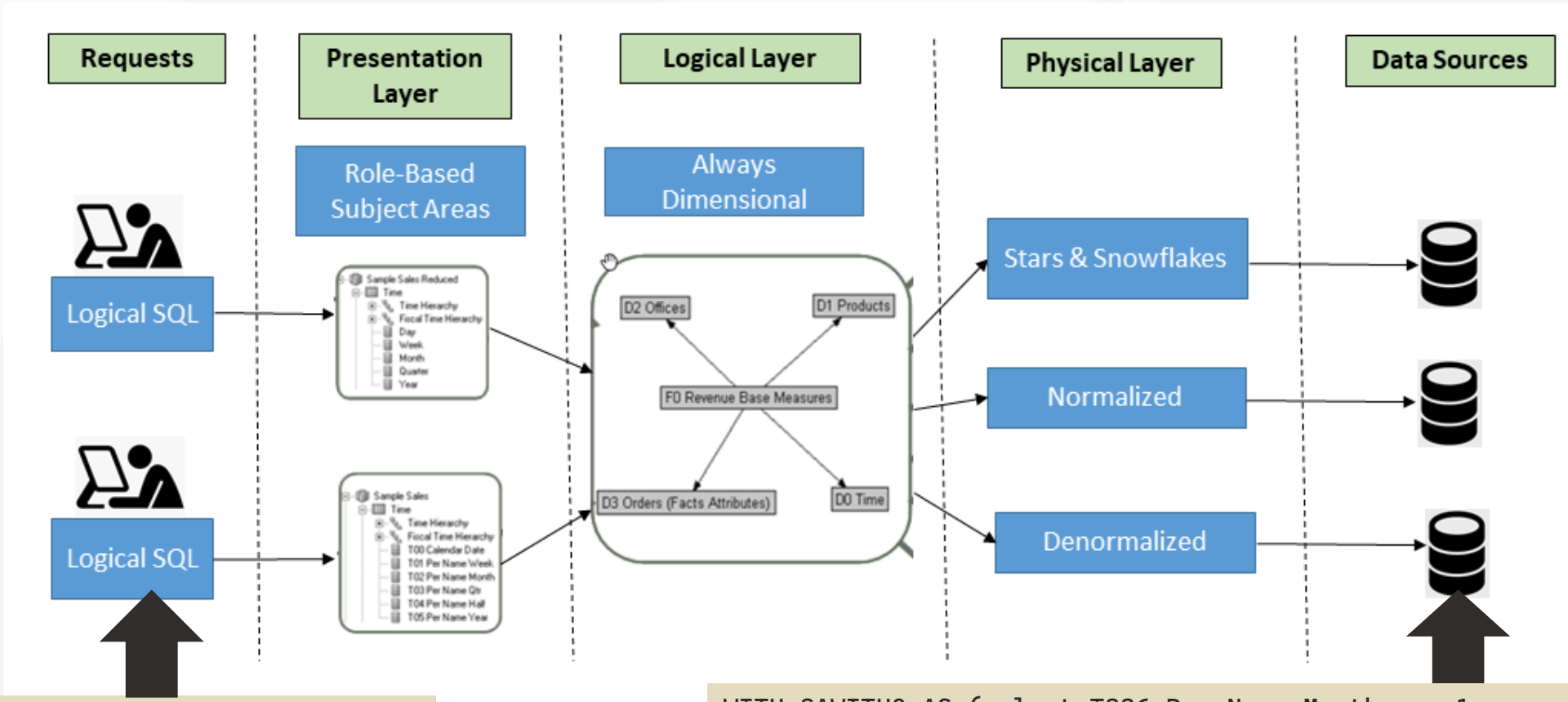
How Does a Semantic Model Query Data?




```
SELECT"D0 Time"."T02 Per Name
Month" saw_0,"D4 Product"."P01
Product" saw_1,"F2 Units"."2-01
Billed Qty (Sum All)" saw_2FROM
"Sample Sales"ORDER BY saw_0,
saw_1
```

```
WITH SAWITH0 AS (select T986.Per_Name_Month as c1,
T879.Prod_Dsc as c2,   sum(T835.Units) as c3, T879.Prod_Key
as c4from   Product T879 /* A05 Product */ ,   Time_Mth T986
/* A08 Time Mth */ ,   FactsRev T835 /* A11 Revenue (Billed
Time Join) */where ( T835.Prod_Key = T879.Prod_Key and
T835.Bill_Mth = T986.Row_Wid)group by T879.Prod_Dsc,
T879.Prod_Key, T986.Per_Name_Month)select SAWITH0.c1 as c1,
SAWITH0.c2 as c2, SAWITH0.c3 as c3from SAWITH0order by c1, c2
```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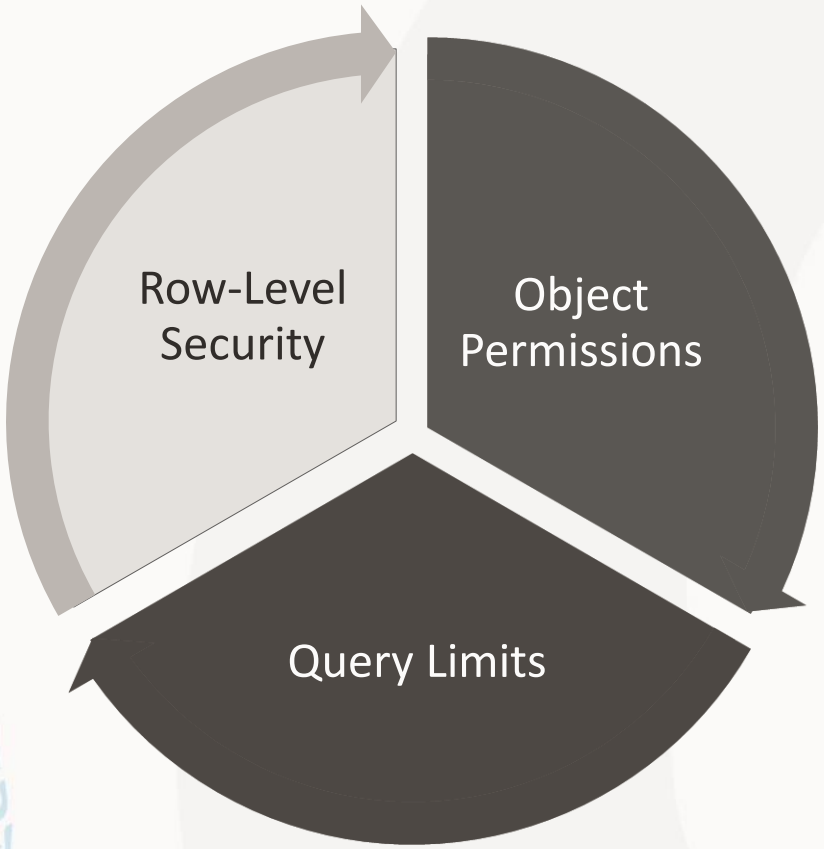
Enterprise Semantic Layers for Securing your data



Row-Level Security Benefits:

- All users share the same database connection pool for better performance.
- All users share cache for better performance.
- Security rules can be defined and maintained to apply across many federated data sources.

Considerations:

- Some data sources apply row-level security policies to determine what data can be queried by an individual user.
- Data security is described using various terms such as row-level security, data-level security, or Virtual Private Database (VPD) policies.
- You can set up row-level security in the semantic model or in the database.

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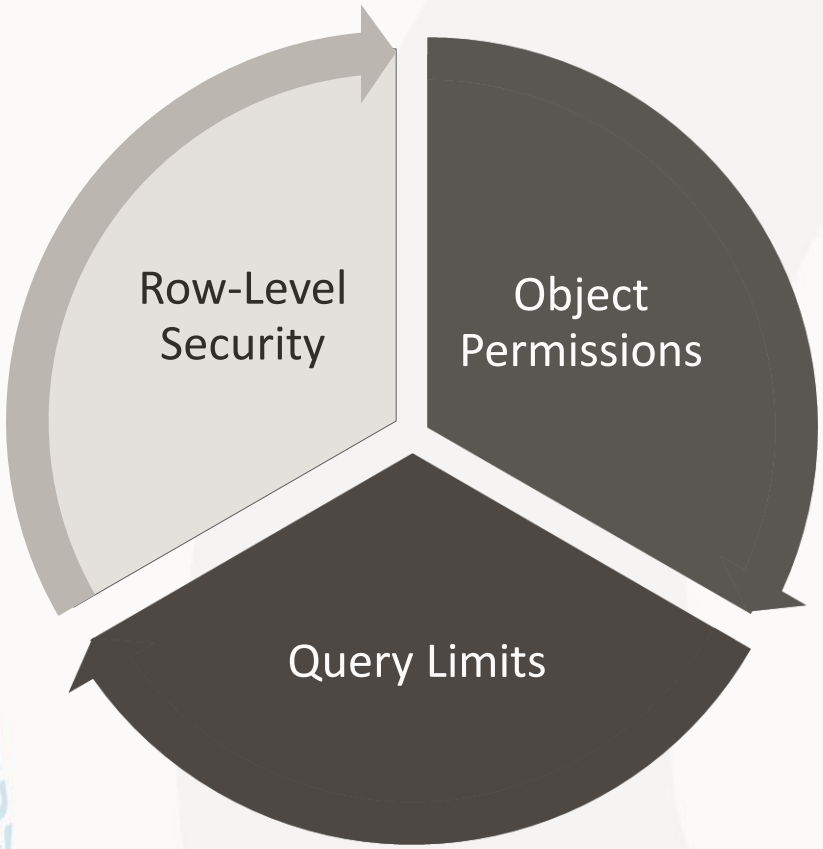
Enterprise Semantic Layers for Securing your data



Workbook Query

```
SELECT
 Employee.Name saw_0,
 Customer.Customer saw_1
FROM Sales
ORDER BY saw_0, saw_1
```

Enterprise Analytics Generated SQL Query

User= 'Administrator'

```
select distinct
  T122.SALESREP as c1,
  T122.NAME as c2
from
  D1_CUSTOMER2 T122
order by c1, c2
```

Result

User= 'Administrator'

Employee Name	Customer Name
Angela Richards	Ben Chin
	David Sunder
	Ethan Pappayliou
	Janette Dudley
	Kei Okuda
	Mark Stapley
Anne Green	Jean Mackenzie
	Walter Joachim
Aurelio Miranda	Ben Chin
	David Sunder
	Ethan Pappayliou
	Kei Okuda
	Mark Stapley
Bob Grant	Debbie Walls
Charles Brooks	Jeff K

User= 'Anne Green'

```
select distinct
 T122.SALESREP as c1,
 T122.NAME as c2
from
   D1_CUSTOMER2 T122
where
   ( T122.SALESREP = 'Anne Green' )
order by c1, c2
```

User= 'Anne Green'

Employee Name	Customer Name
Anne Green	Jean Mackenzie
	Walter Joachim

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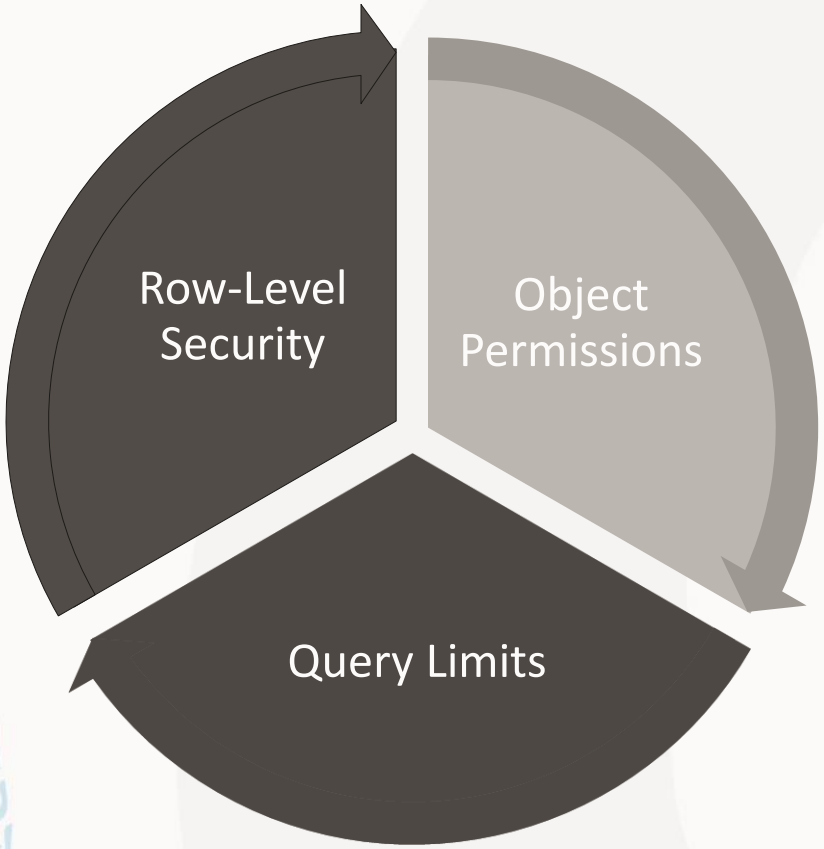
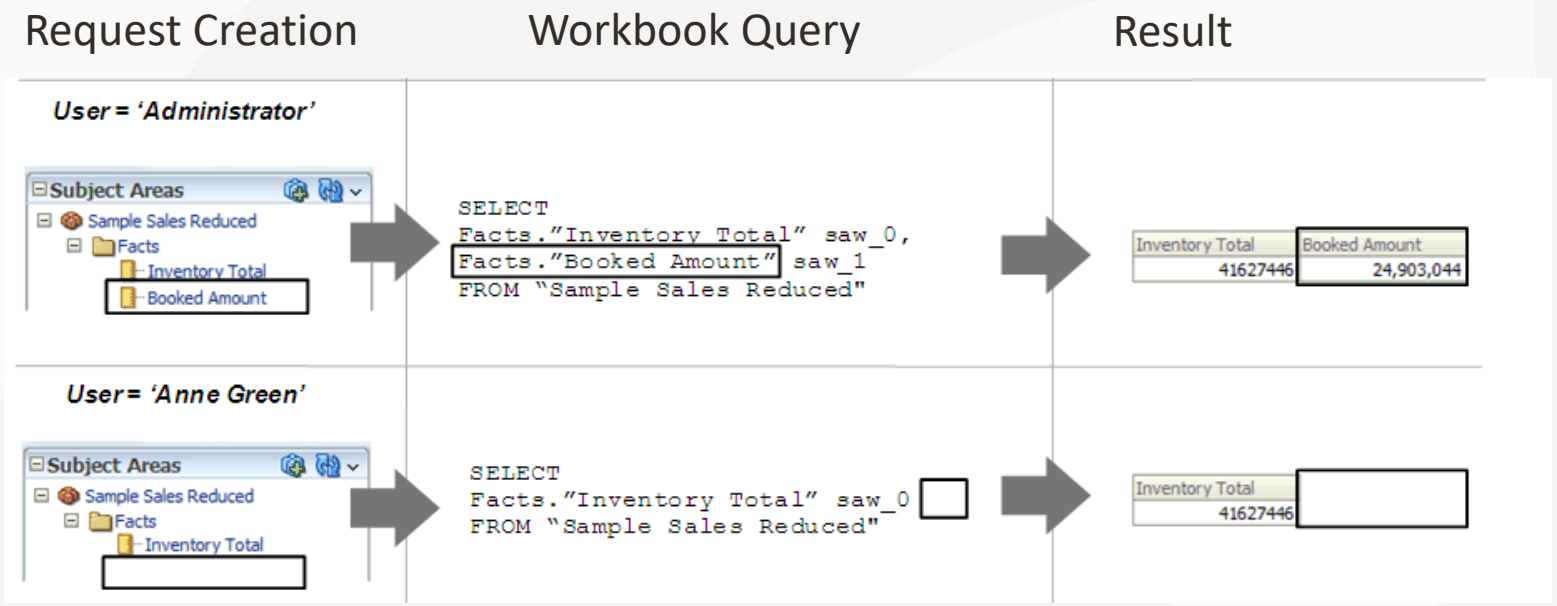
Enterprise Semantic Layers for Securing your data



You can use object permissions to configure data filters for objects in the logical layer by using functional groups for multiple application roles.



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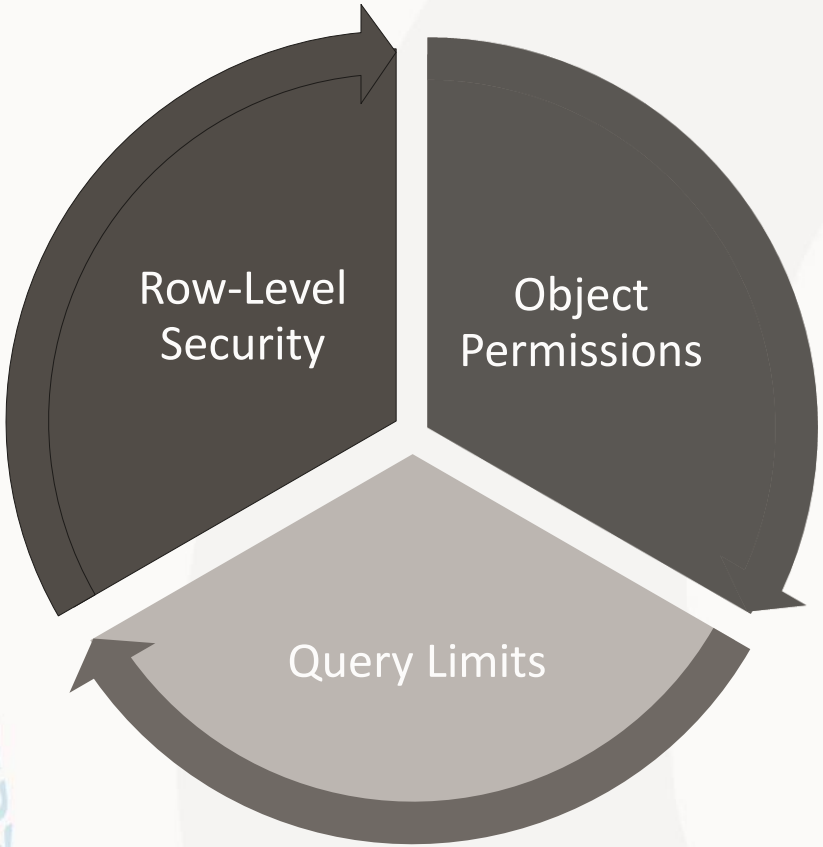
Enterprise Semantic Layers for Securing your data



You can control runaway queries for an application role assigned to a physical database by limiting queries to a specific number of rows:

- Limit the Number of Rows in a Database Query
- Limit Database Queries by Maximum Run Time
- Allow or Disallow Direct Database Requests
- Override an Application Role's Query Limits
- Pause an Application Role's Query Limits

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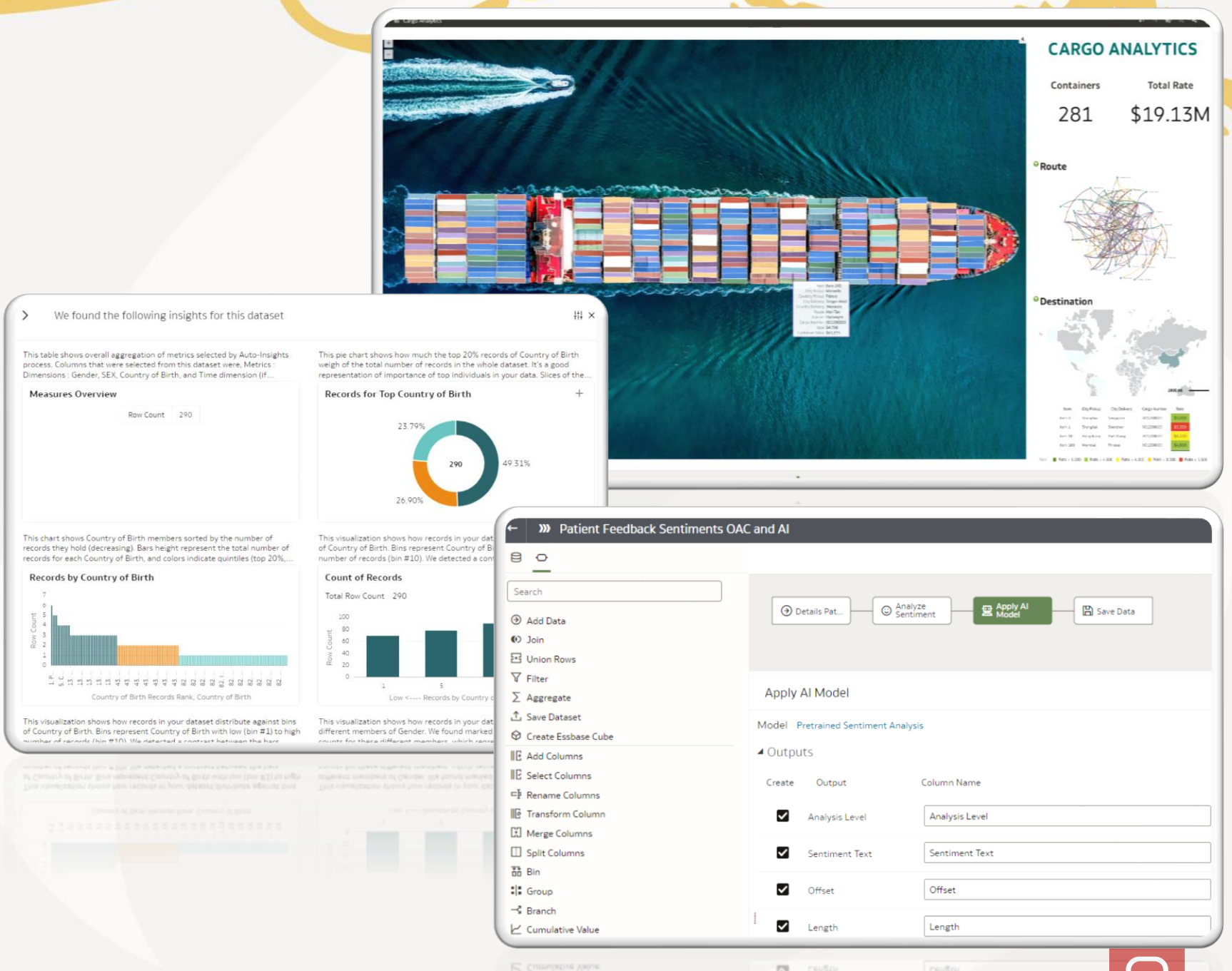
What sets us apart: True end-to-end coverage

- Data ingestion
- Data prep
- Data enrichment
- Data modeling and mashups
- Auto-insights, forecasts,…
- ML & AI
- Visualization
- NLP, NLG
- Actions



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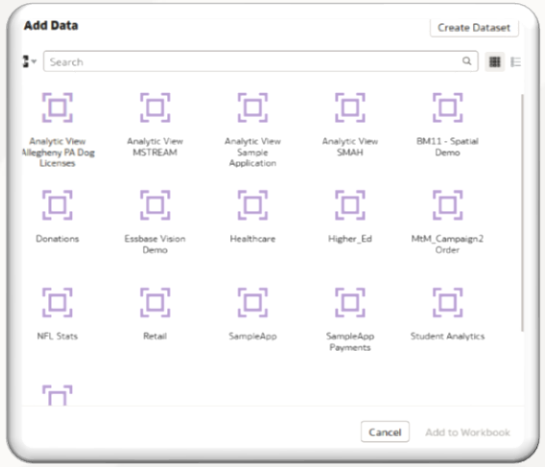
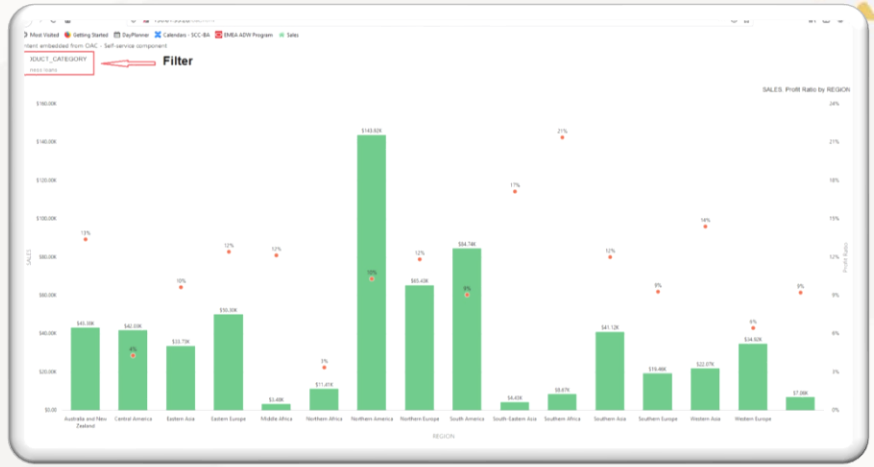
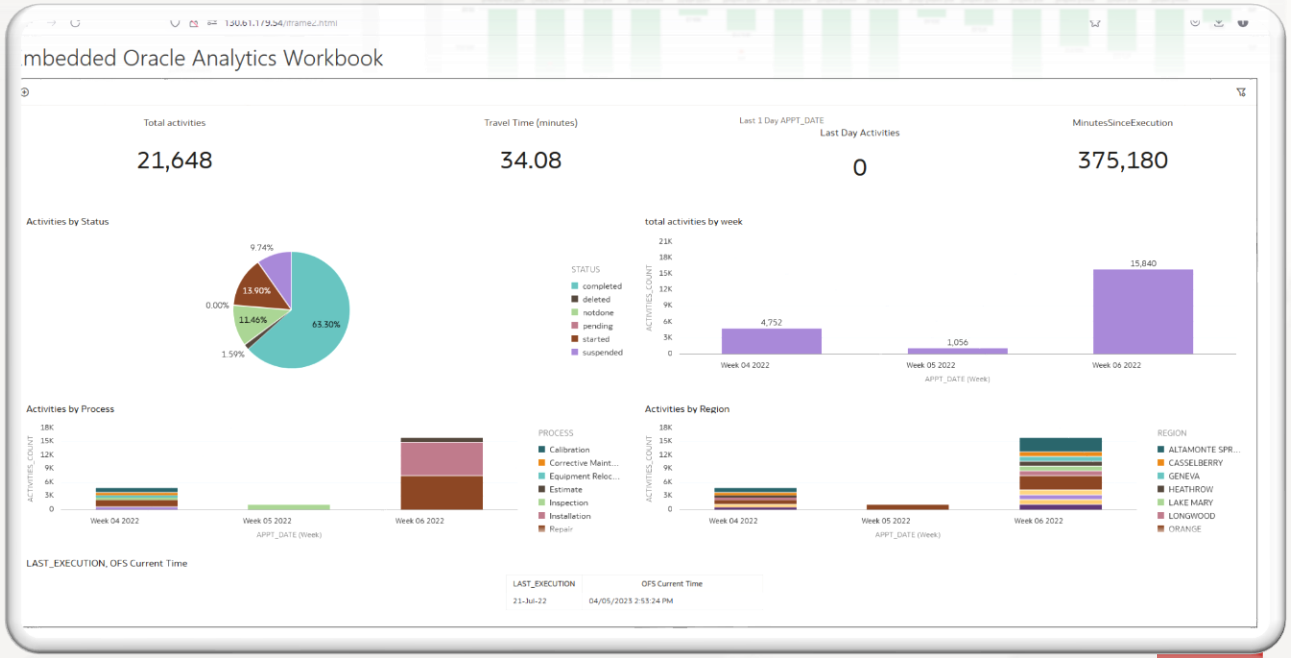
What sets us apart: Enterprise Solution

- Data Federation
- Semantic Models
- Enterprise Grade Security
- Snapshotting
- Embedded Analytics
- Usage tracking of user activities







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Resources

Live LABS:

- Model Your Data with the Semantic Modeler in Oracle Analytics Cloud: Part 1
- Model Your Data with the Semantic Modeler in Oracle Analytics Cloud: Part 2

Documentation:

- Building Semantic Models in Oracle Analytics Cloud

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