	Bronze Layer	Silver Layer	Gold Layer
Definition	Raw, unprocessed data as-is from sources	Clean & standardized data	Business-Ready data
Objective	Traceability & Debugging	(Intermediate Layer) Prepare Data for Analysis	Provide data to be consumed for reporting & Analytics
Object Type	Tables	Tables	Views
Load Method	Full Load (Truncate & Insert)	Full Load (Truncate & Insert)	None
Data Transformation	None (as-is)	- Data **Cleaning** - Data **Standardization** - Data **Normalization** - **Derived Columns** - Data **Enrichment**	- Data **Integration** - Data **Aggregation** - **Business Logic & Rules**
Data Modeling	None (as-is)	None (as-is)	- Start Schema - Aggregated Objects - Flat Tables
Target Audience	- Data Engineers	- Data Analysts - Data Engineers	- Data Analysts - Business Users

Sources

Object Type: CSV Files

Interface: Files in Folder

Microsoft SQL Server

Data Warehouse

Bronze Layer

Stored Procedure

RAW DATA

Object Type: Table

Load:

- Batch Processing
- Full Load
- Truncate & Insert

No **Transformation**
Data Model: None (as-is)

Silver Layer

Stored Procedure

Cleaned,
Standardize Sata

Object Type: Table

Load:

- Batch Processing
- Full Load
- Truncate & Insert

Tranformations:

- Data Cleaning
- Data Standardization
- Data Normalization
- Derived Columns
- Date Enrichment

Date Model: None (as-is)

Gold Layer

Business Ready Data

Object Type: Views

No **Load**

Transformations:

- Data Integrations
- Aggregations
- Business Logics

Data Model:

- Star schema
- Flat Table
- Aggregated table

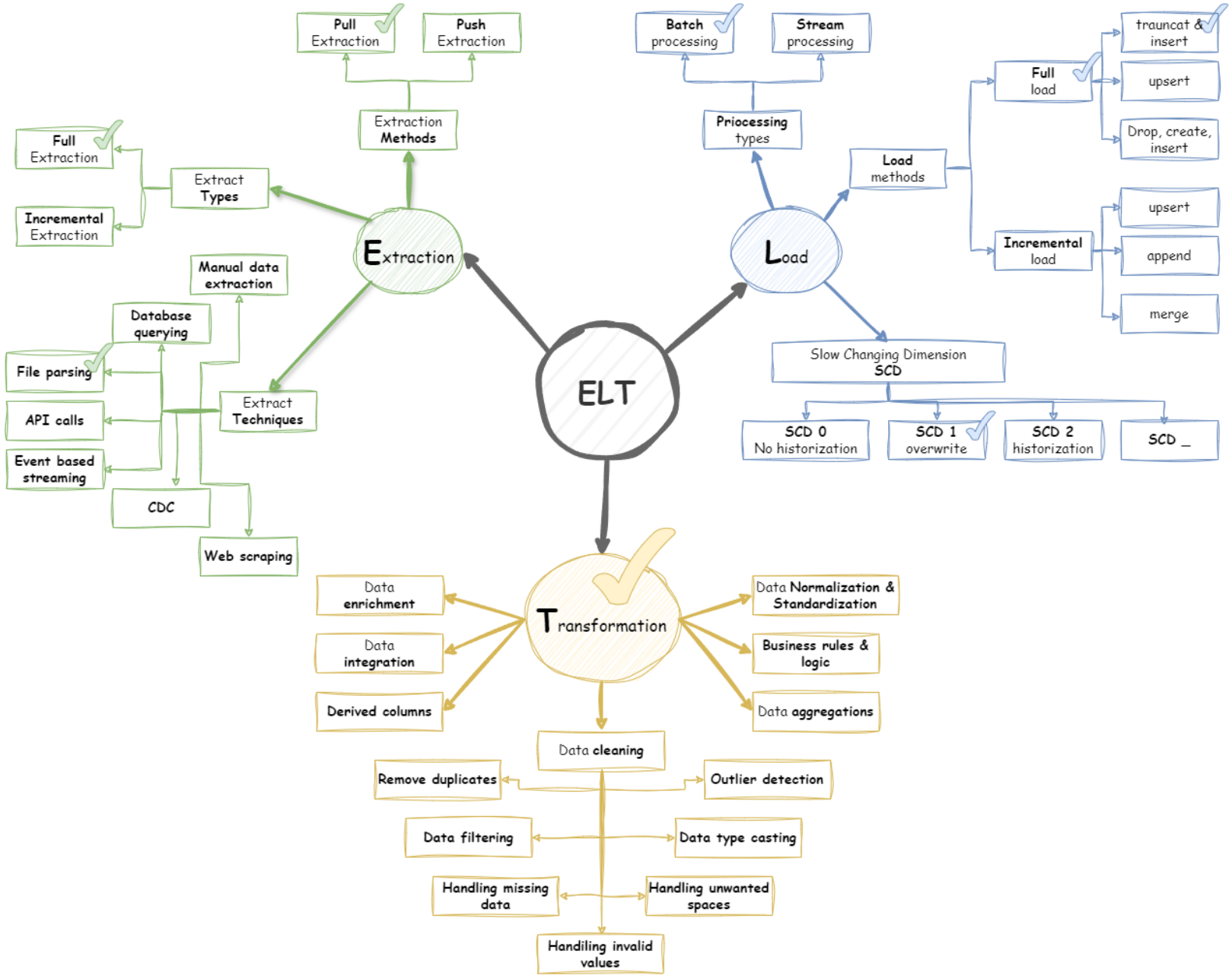
Consume

BI & Reporting

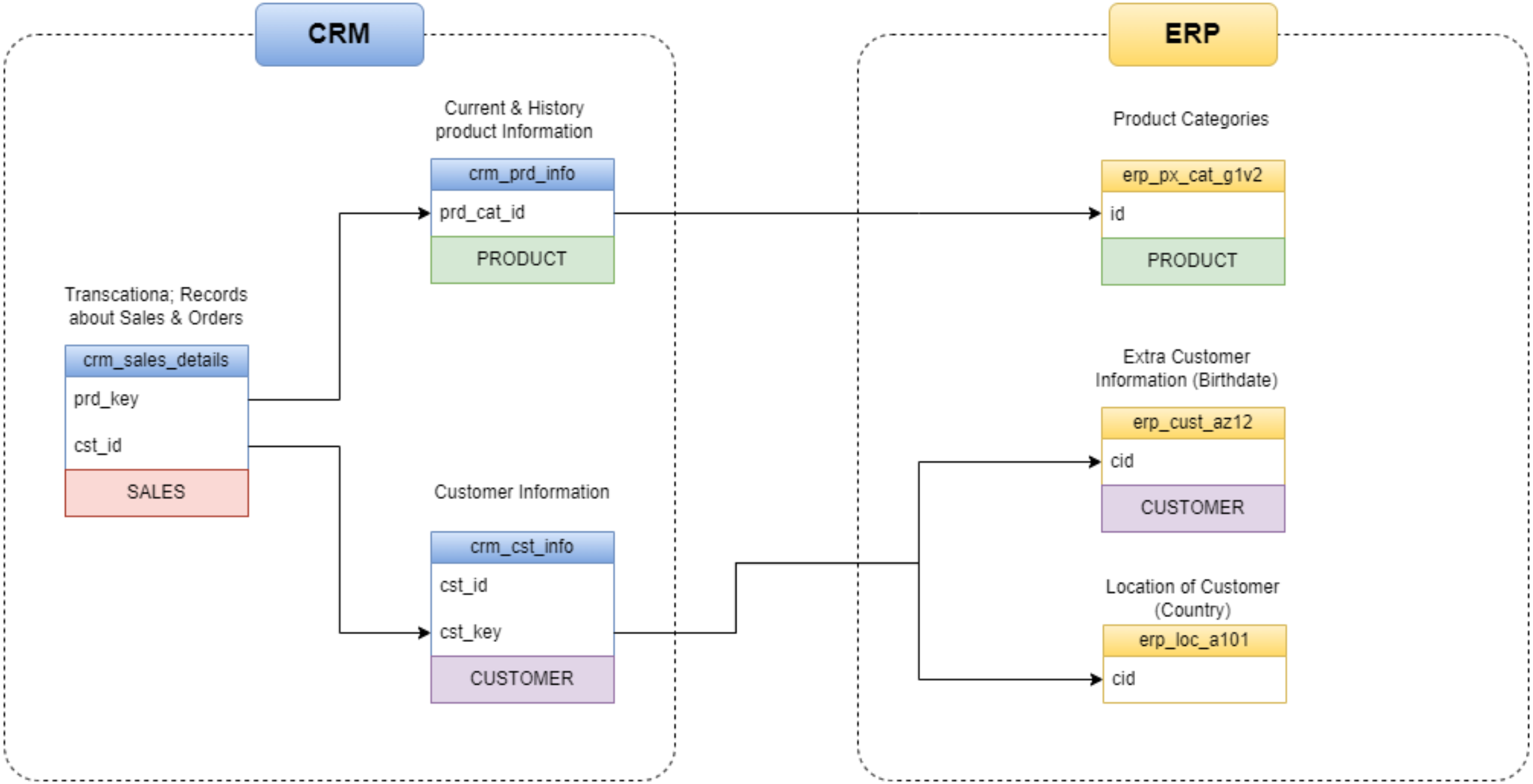
Ad-Hoc SQL Queries

Machine Learning

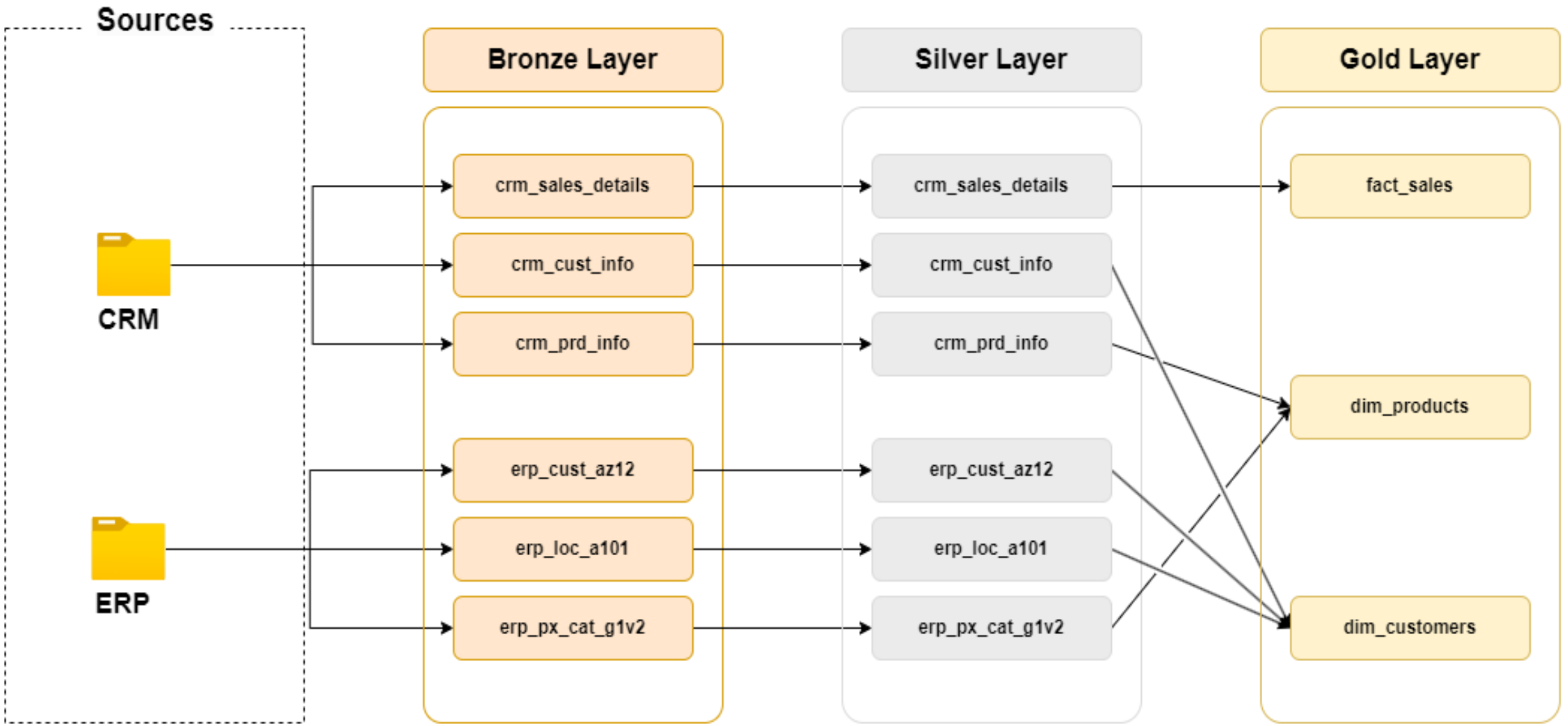
ELT Operations



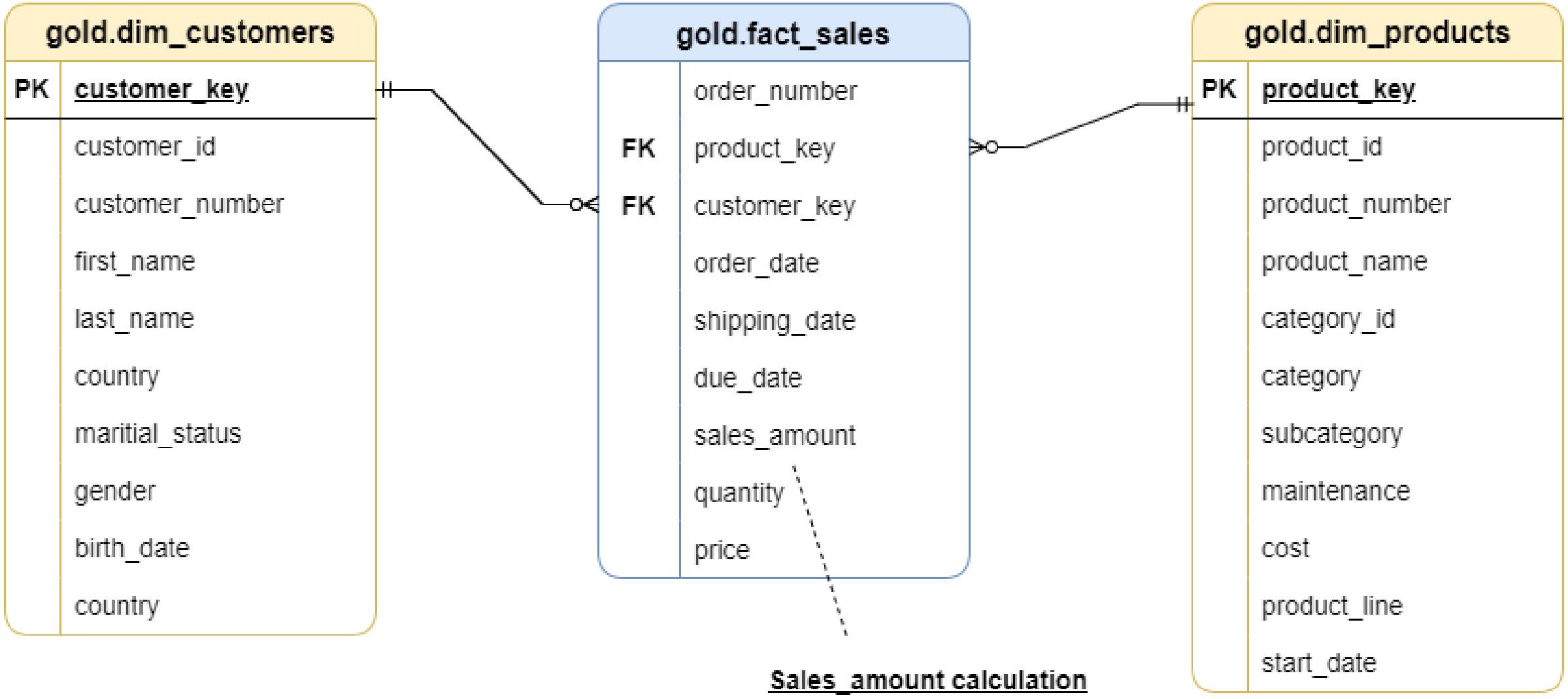
Integration of Model



Data Flow

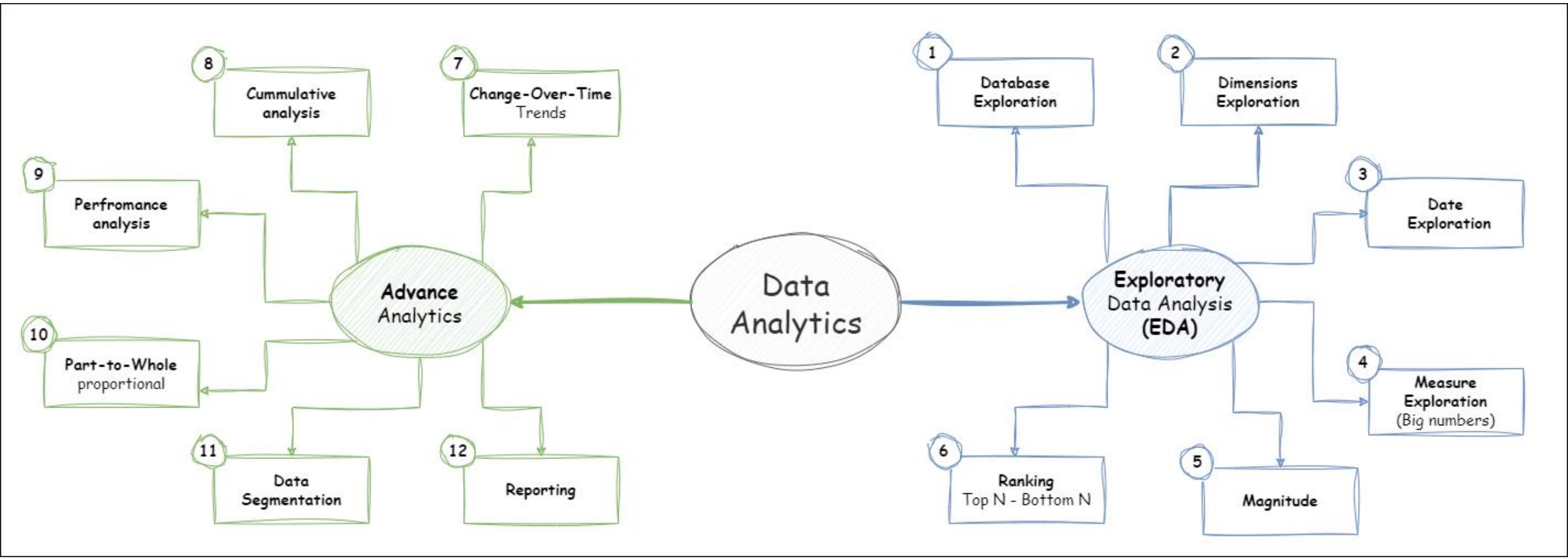

Sources
CRM
ERP
Bronze Layer
crm_sales_details
crm_cust_info
crm_prd_info
erp_cust_az12
erp_loc_a101
erp_px_cat_g1v2
Silver Layer
crm_sales_details
crm_cust_info
crm_prd_info
erp_cust_az12
erp_loc_a101
erp_px_cat_g1v2
Gold Layer
fact_sales
dim_products
dim_customers

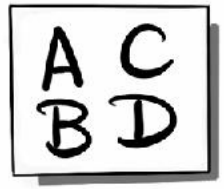
Sales Data Model(Start Schema)



Sales_amount calculation

sales_amount = quantity * price

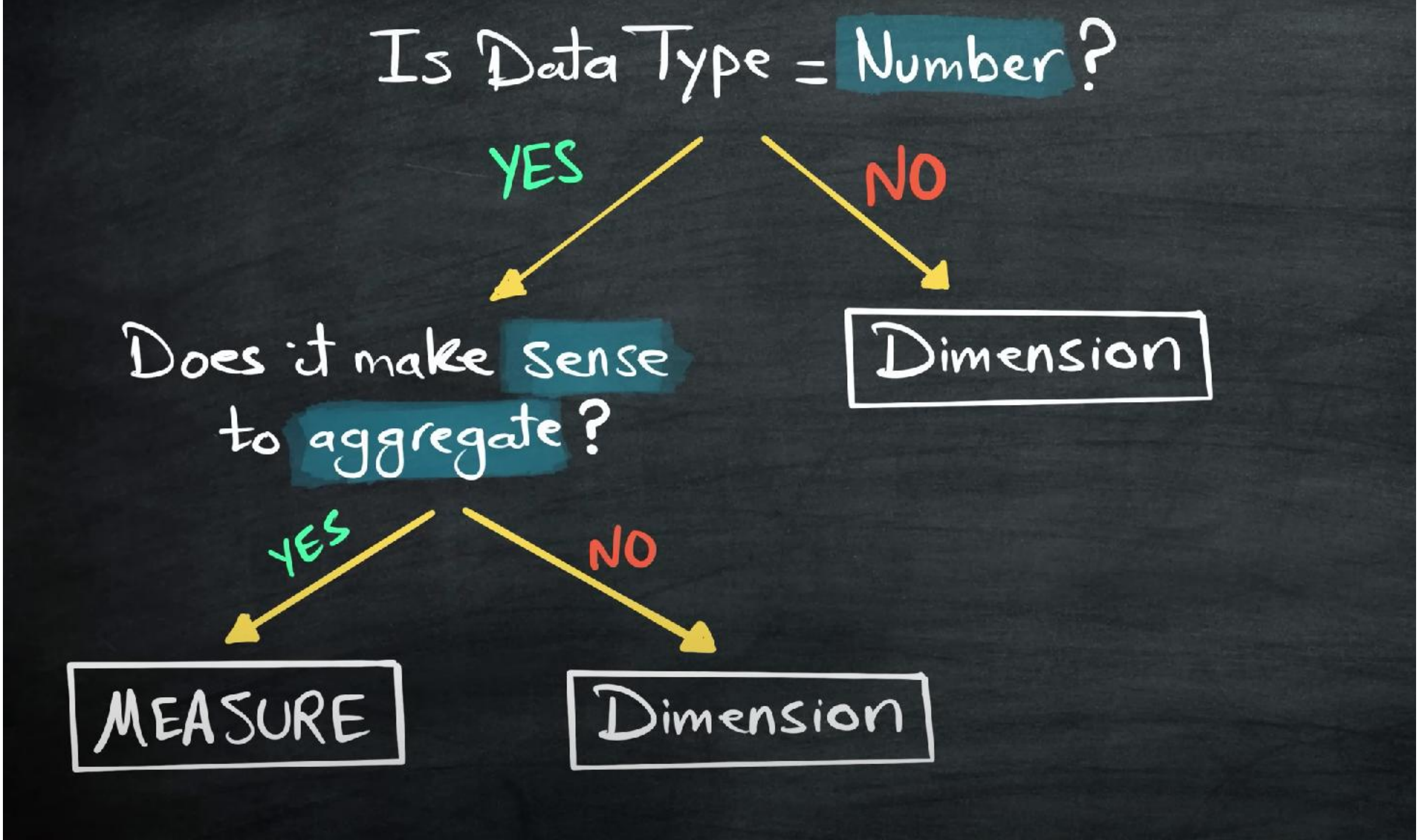

Data Analytics
Advance Analytics
8
Cummulative analysis
7
Change-Over-Time Trends
9
Perfromance analysis
10
Part-to-Whole proportional
11
Data Segmentation
12
Reporting
Exploratory Data Analysis (EDA)
1
Database Exploration
2
Dimensions Exploration
3
Date Exploration
4
Measure Exploration (Big numbers)
6
Ranking Top N - Bottom N
5
Magnitude

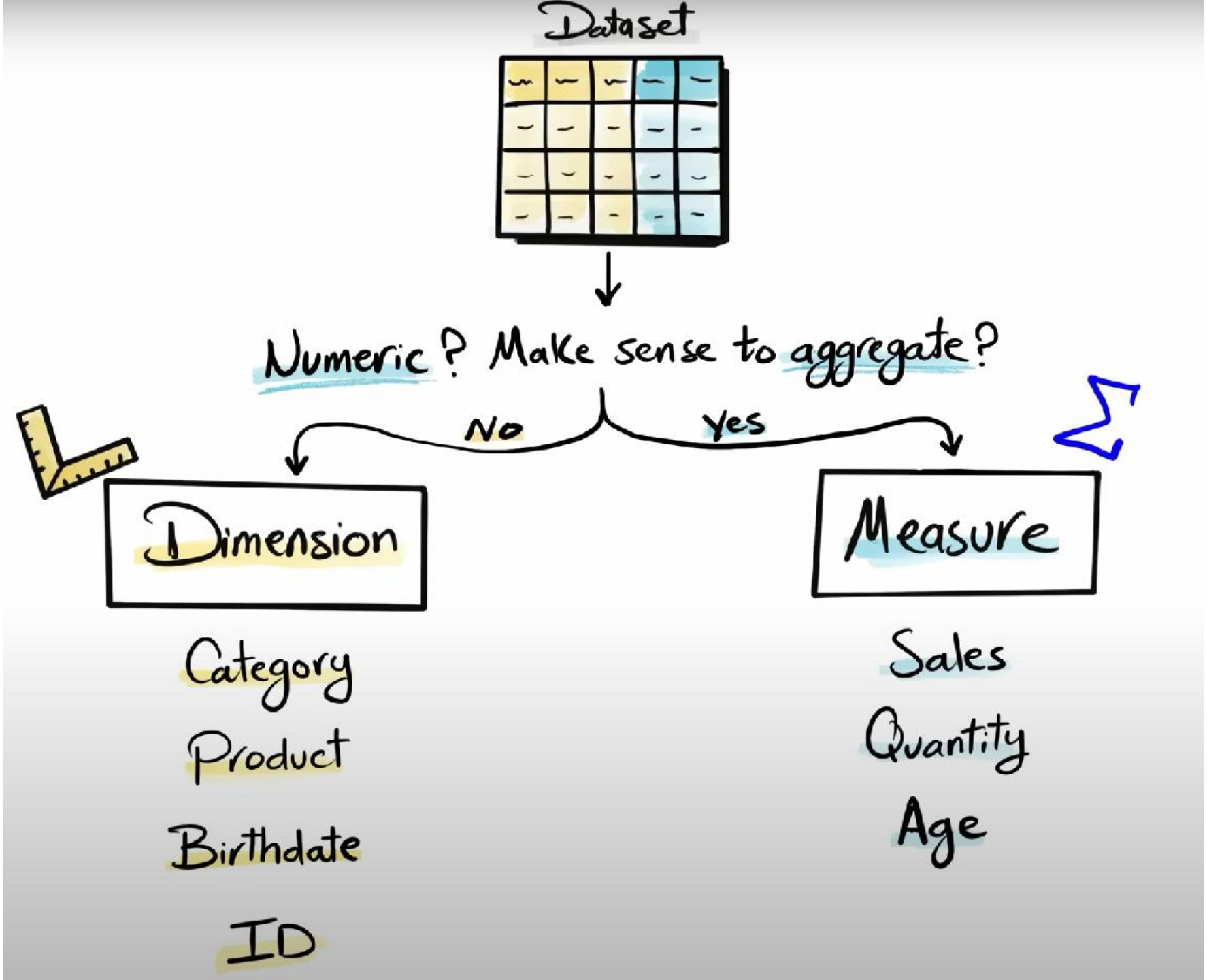


Dimensions Exploration

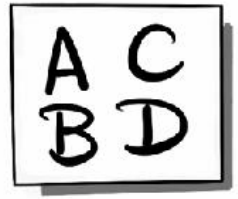
Identifying the unique values (or categories) in each dimension.

Recognizing how data might be grouped or segmented,
which is useful for later analysis.


Is Data Type = Number?
YES
NO
Dimension
Does it make sense to aggregate?
YES
NO
MEASURE
Dimension


Dataset
Numeric? Make sense to aggregate?
No
Yes
Dimension
Measure
Category
Product
Birthdate
ID
Sales
Quantity
Age

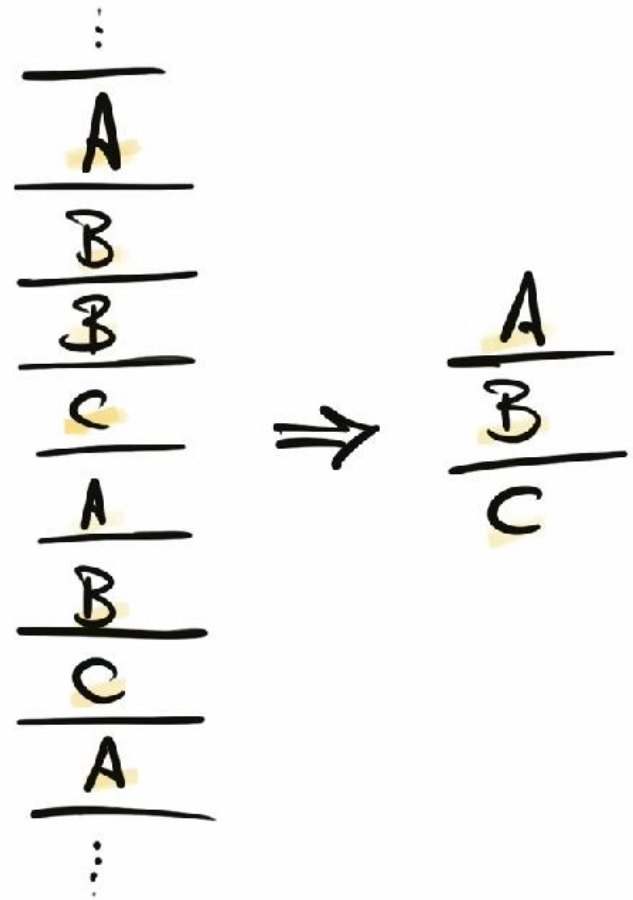
Bikes
500
Clothing
350
Components
100
Measures
400
350
200
Dimensions
USA
Germany
France

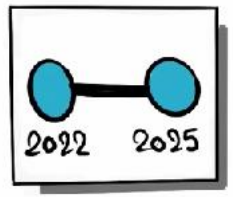


Dimensions Exploration

DISTINCT [Dimension]

DISTINCT Country
DISTINCT Category
DISTINCT Product

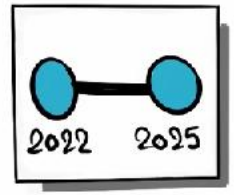




Date Exploration

Identify the earliest and latest dates (boundaries).

Understand the scope of data and the timespan.



Date Exploration

MIN/MAX [Date Dimension]

MIN Order_date

MAX Create_date

MIN Birthdate

2019

2020

2018

2018

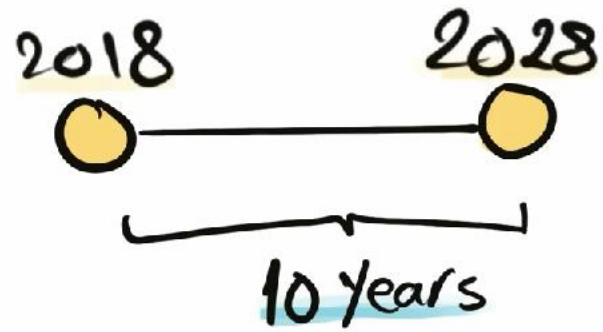
2022

2023

2023

2028

2022



DATEDIFF

Calculate the key metric of the business (Big Numbers)

- Highest Level of Aggregation | Lowest Level of Details -

999

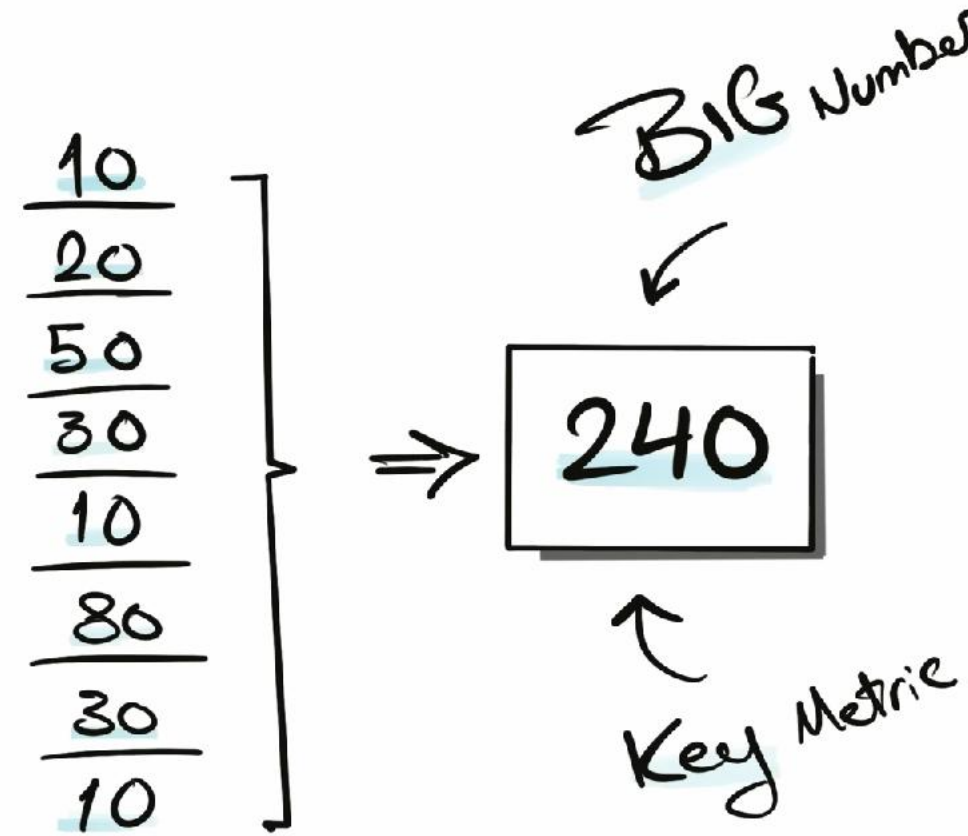
Measures Exploration

$\sum$ [Measure]

SUM (Sales)

AVG (Price)

SUM (Quantity)



Magnitude

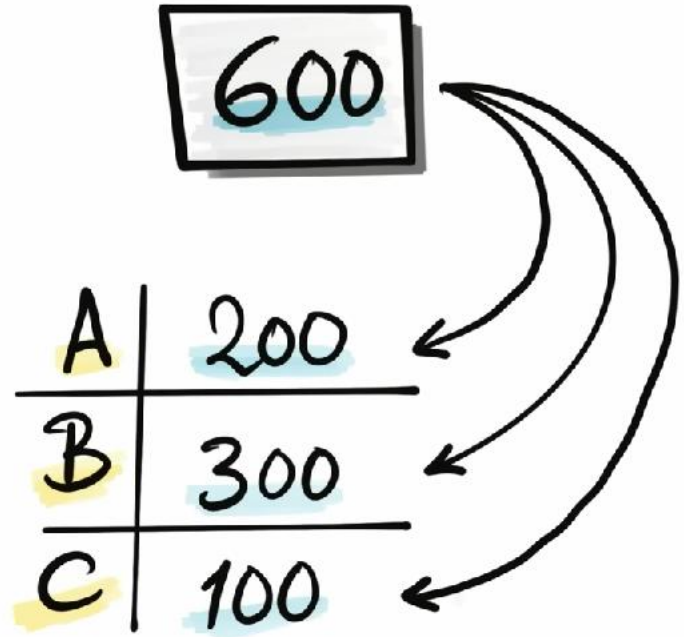
Compare the measure values by categries.

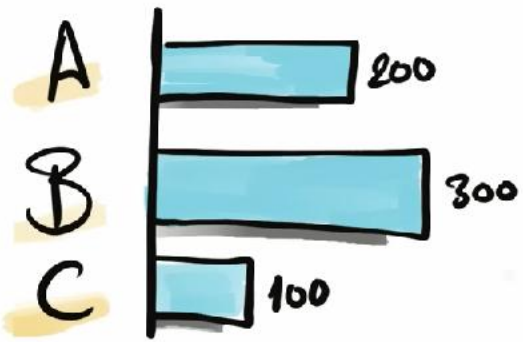
It helps us understand the importance of different categories.

Magnitude

$\sum$ [Measure] By [Dimension]

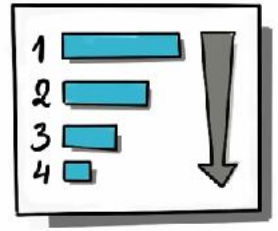
- Total Sales By Country
- Total Quantity By Category
- Average Price By Product
- Total Orders By Customer





Order the values of dimensions by measure.

Top N performers | Bottom N Performers



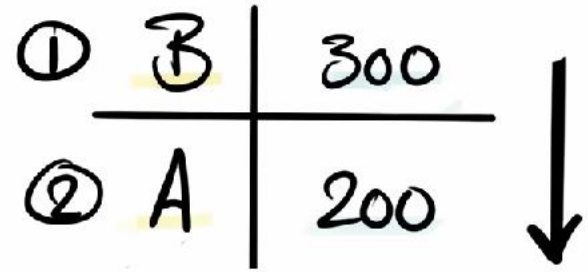
Ranking

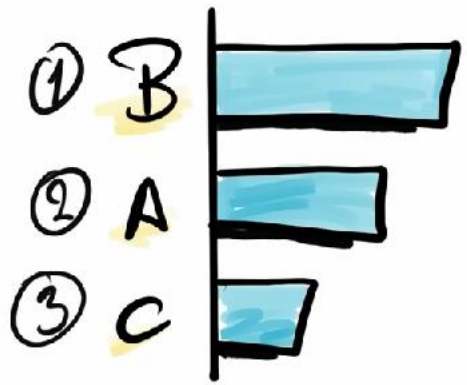
Rank [Dimension] By $\sum$ [Measure]

Rank Countries By Total Sales

Top 5 Products By Quantity

Bottom 3 Customers By Total Orders





Top RANK() DENSE_RANK()

ROW_NUMBER()

Change-Over-Time Trends

Analyze how a measure evolves over time.

Helps track trends and identify seasonality in your data.

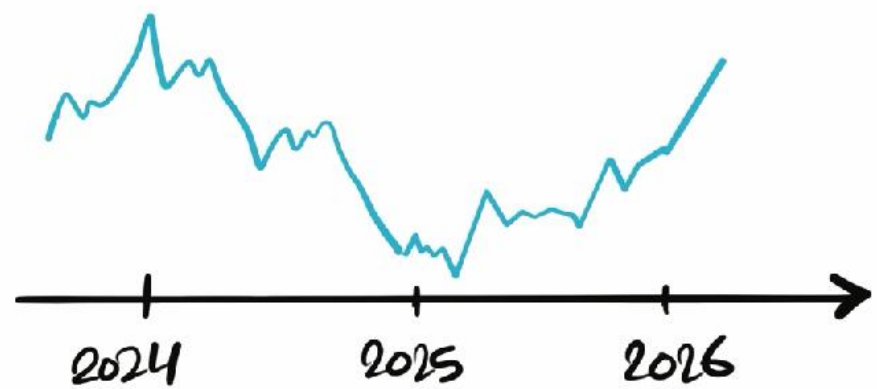
Change-Over-Time "Trends"

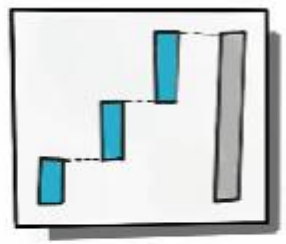
$\sum$ [Measure] By [Date Dimension]

Total Sales By Year

Average Cost By Month

2024	300
2025	100
2026	200

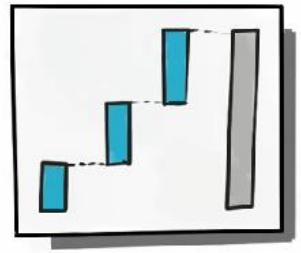




Cumulative Analysis

Aggregate the data progressively over time.

Helps to understand whether our business is growing or declining.



Cumulative Analysis

Cumulative

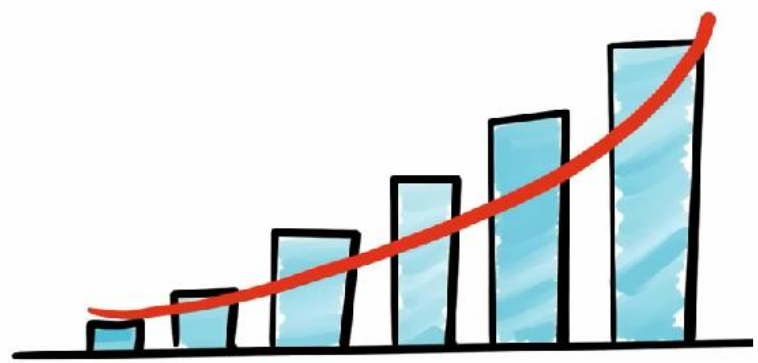
$\sum$ [Cumulative Measure] By [Date Dimension]

Running Total Sales By Year

Moving Average of Sales By Month

2024	300	300
2025	100	400
2026	200	600

WINDOW FUNCTIONS



Performance Analysis

Comparing the current value to a target value.

Helps measure success and compare performance.

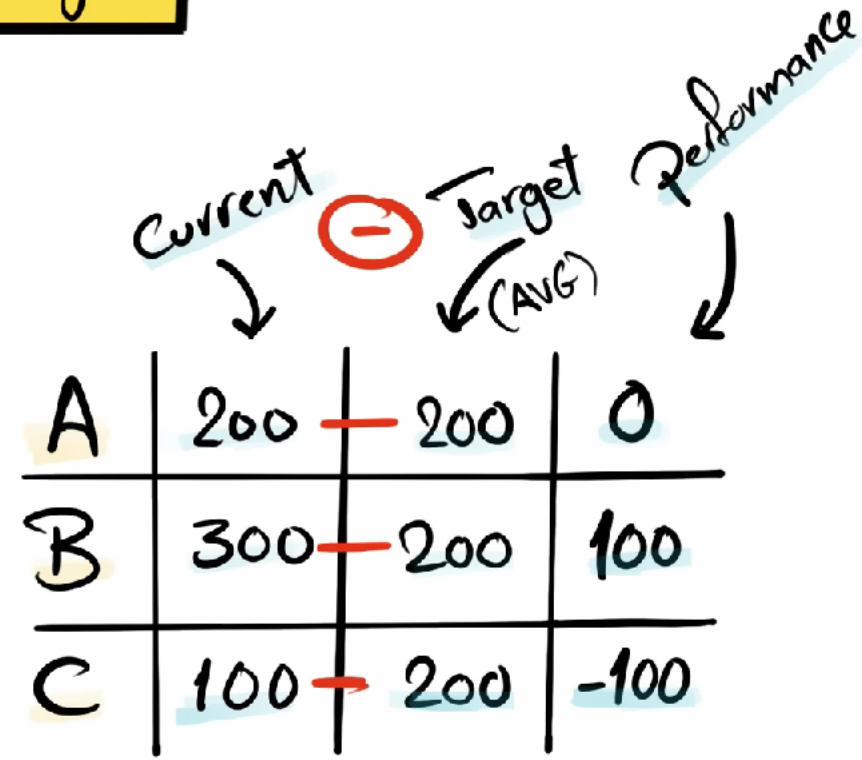
Performance Analysis

Current [Measure] – Target [Measure]

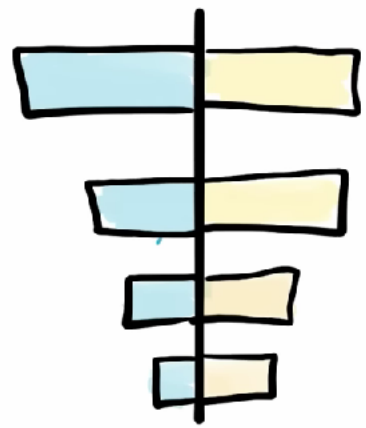
Current Sales – Average Sales

Current Year Sales – Previous Year Sales

Current Sales – lowest Sales



A	200 –	200	0
B	300 –	200	100
C	100 –	200	-100

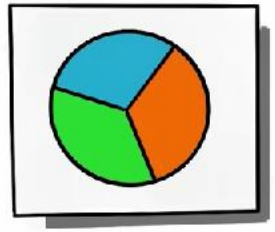


WINDOW FUNCTIONS

Part-to-Whole

Proportional Analysis

Analyze how an individual part is performing compared to the overall, allowing us to understand which category has the greatest impact on the business.



Part-to-Whole

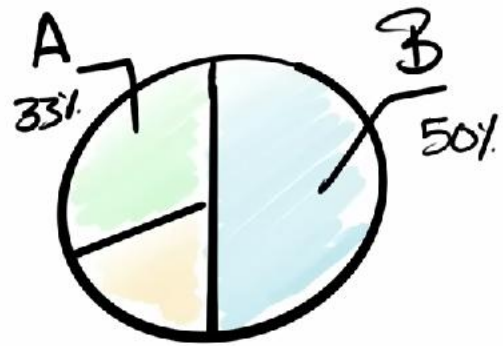
Proportional Analysis

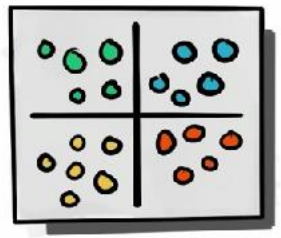
([Measure] / Total [Measure]) * 100 By [Dimension]

(Sales / Total Sales) * 100 By Category

(Quantity / Total Quantity) * 100 By Country

A	200	33%
B	300	50%
C	100	17%

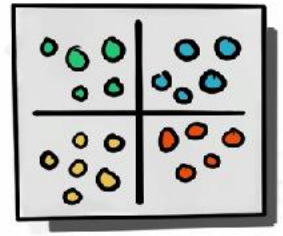




Data Segmentation

Group the data based on a specific range.

Helps understand the correlation between two measures.

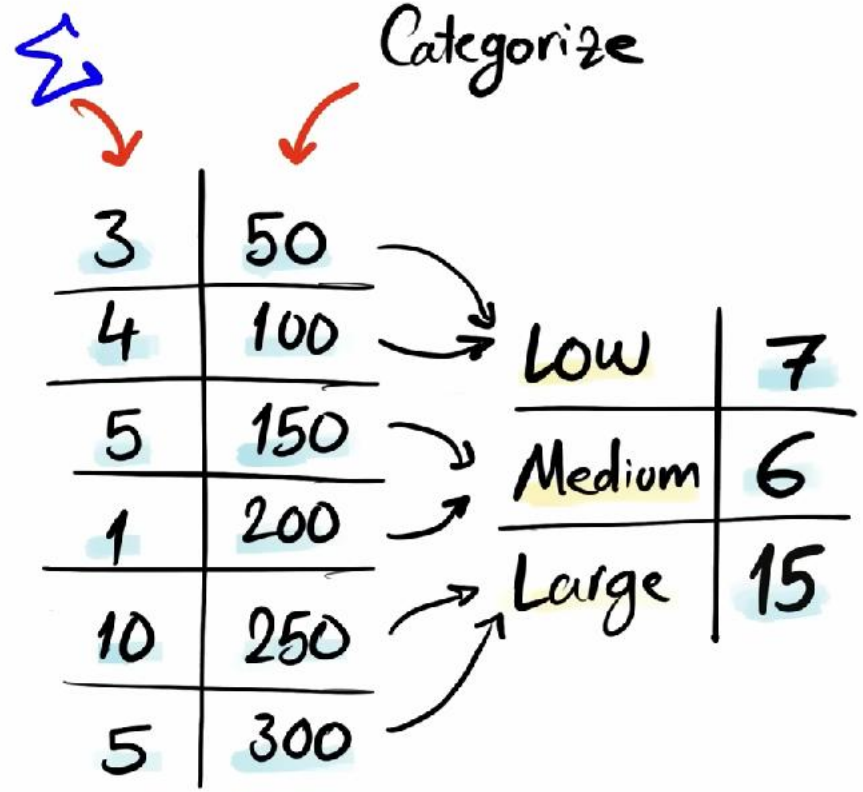


Data Segmentation

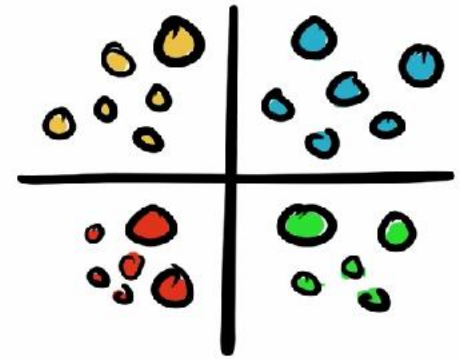
[Measure] By [Measure]

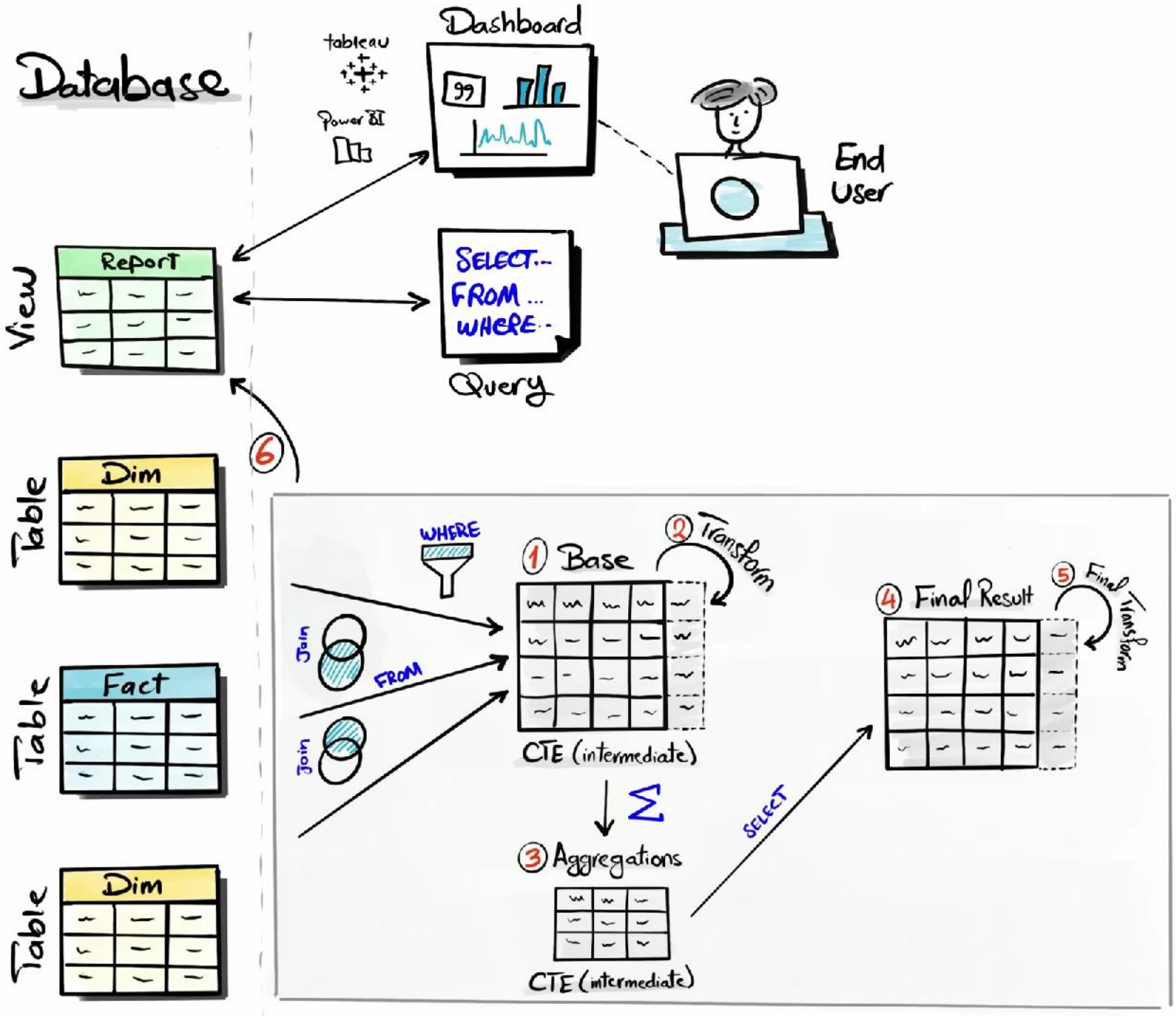
Total Products By Sales Range

Total Customers By Age



CASE WHEN STATEMENT




Database
tableau
Power BI
Dashboard
End User
View
Report
SELECT...
FROM ...
WHERE...
Query
6
Table
Dim
Table
Fact
Table
Dim
WHERE
1 Base
2 Transform
Join
FROM
Join
CTE (intermediate)
Σ
3 Aggregations
CTE (intermediate)
SELECT
4 Final Result
5 Final Transform