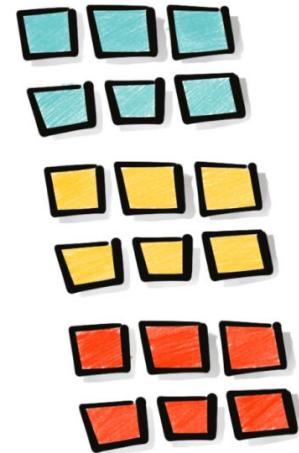




# VARIETY

## STRUCTURED



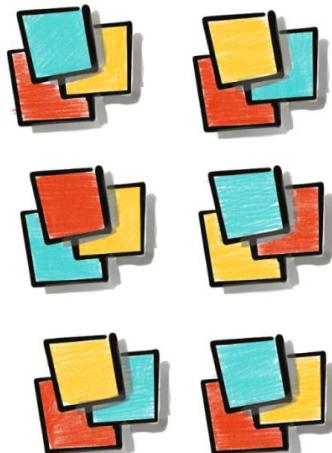
EXCEL



DATABASE



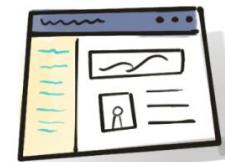
## SEMI-STRUCTURED



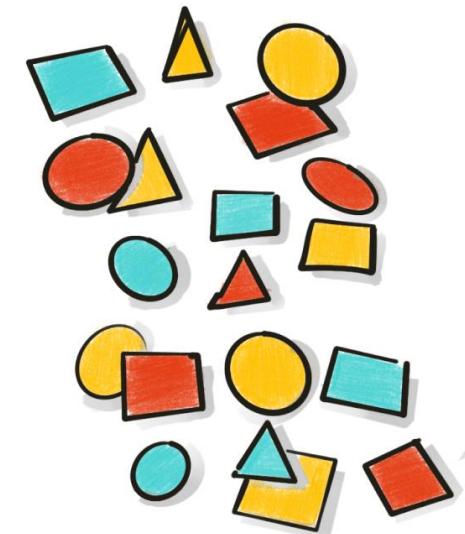
LOGs



WEBSITE



## UNSTRUCTURED



VIDEO



IMAGE

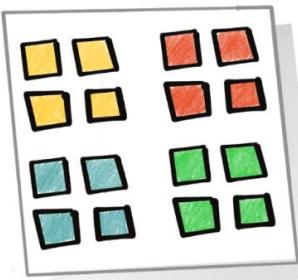




# VELOCITY



## BATCH

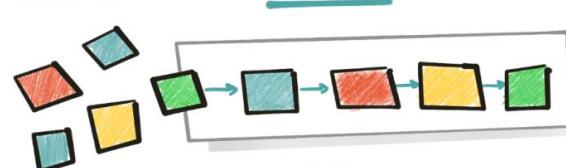


once a day

Hours → Mins



## STREAM



24

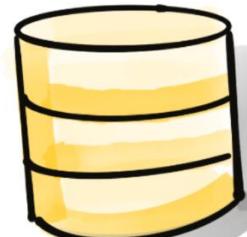
SEC → MSEC



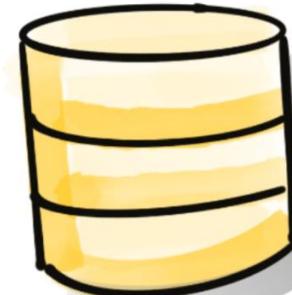
# VOLUME



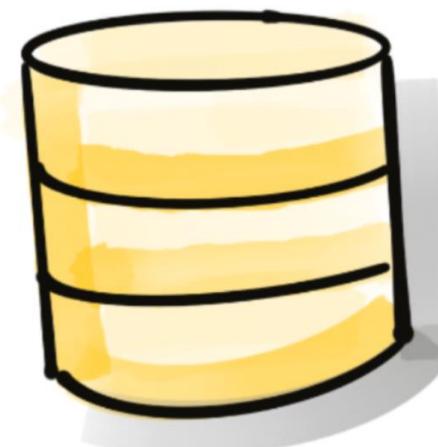
MB



GB



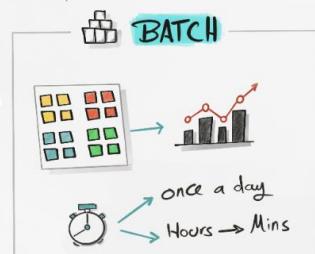
TB



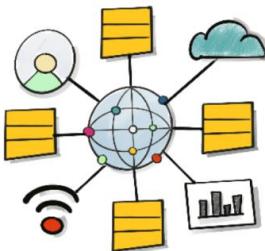
PB



# VELOCITY

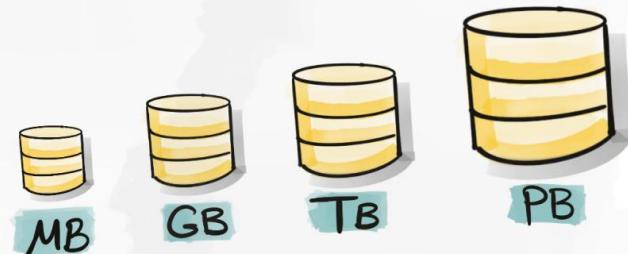


once a day  
Hours → Mins



# BIG DATA

# VOLUME



MB

GB

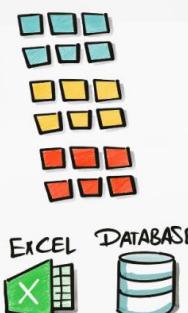
TB



PB

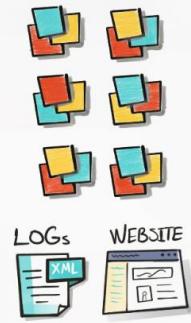
# VARIETY

## STRUCTURED



EXCEL DATABASE

## SEMI-STRUCTURED



LOGS WEBSITE

## UNSTRUCTURED



VIDEO IMAGE



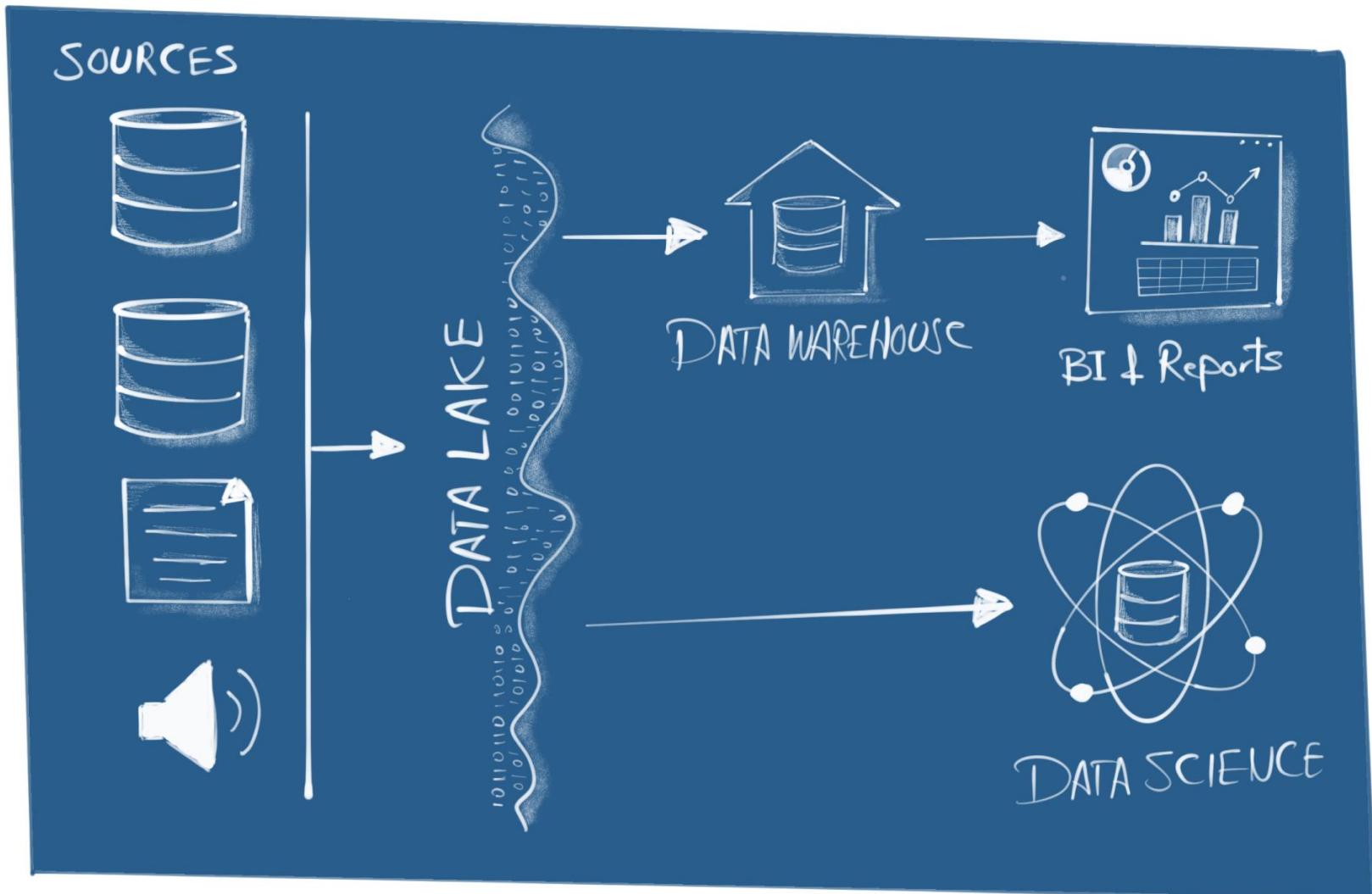
+ a b | e a u

# DATA ARCHITECTURE

DATA WITH BARAA



Blueprint

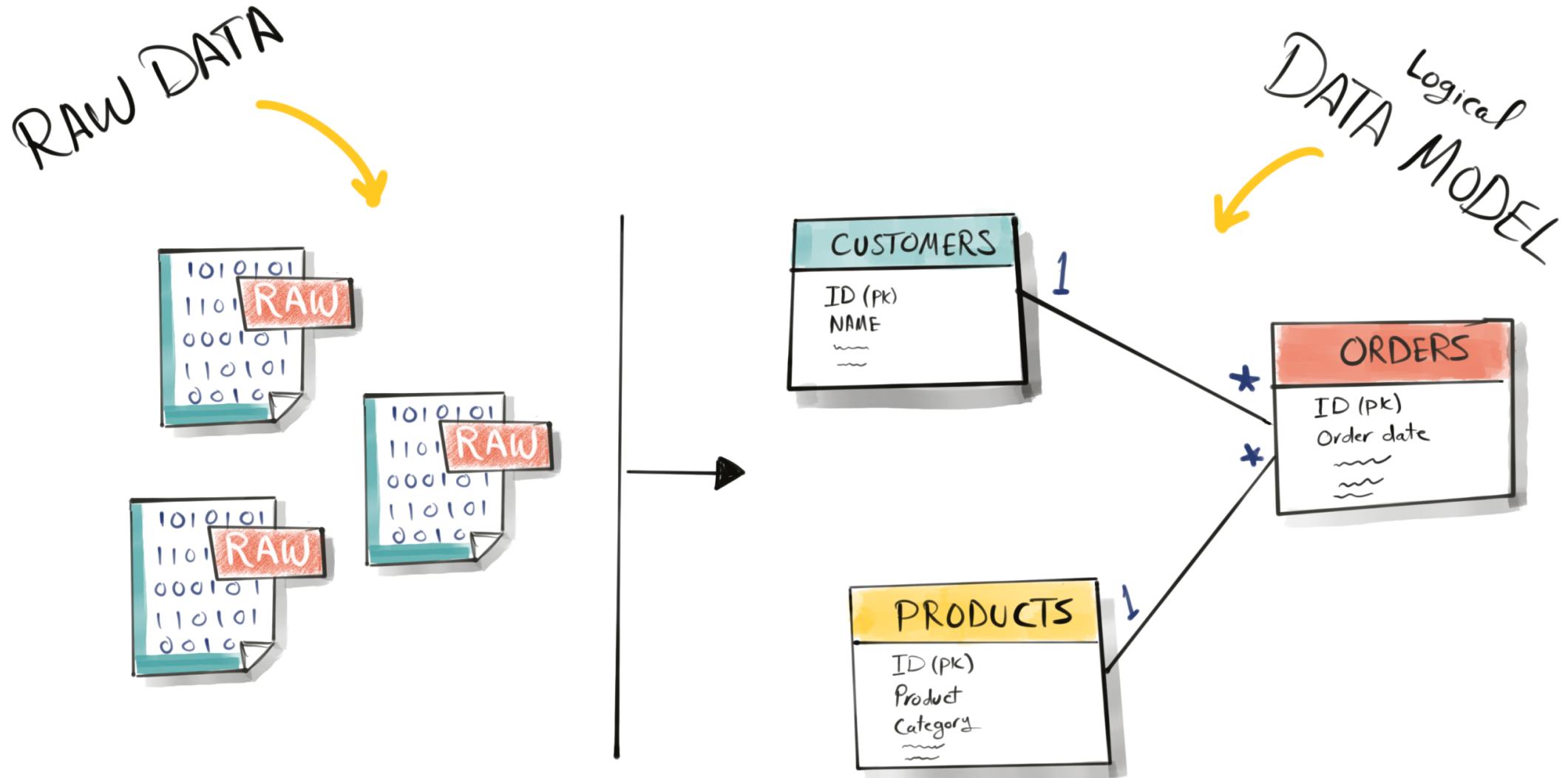




+ a b | eau

# DATA MODELING

DATA WITH BARAA

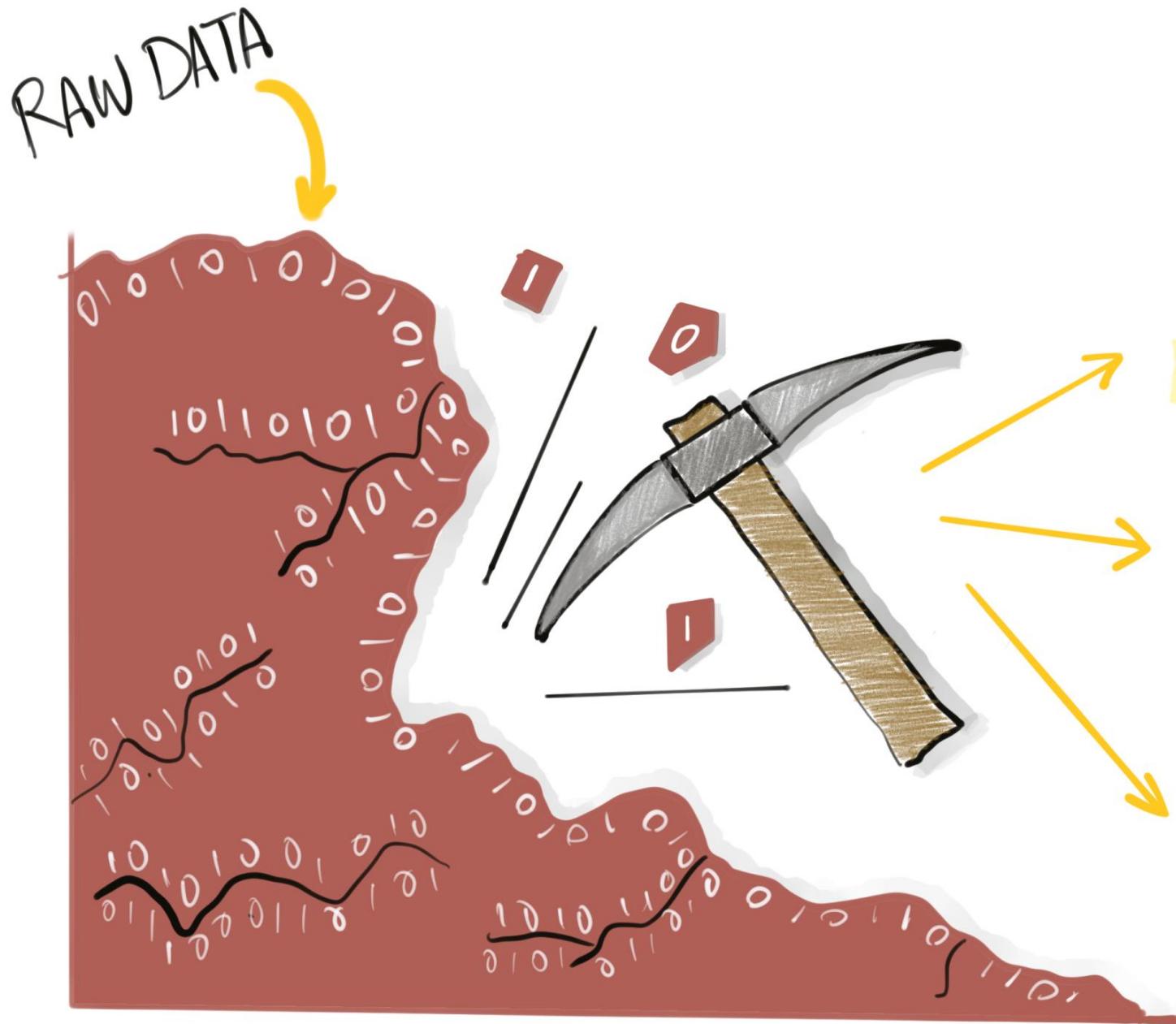




+ a b | e a u

# DATA MINING

DATA WITH BARAA





+ a b | e a u

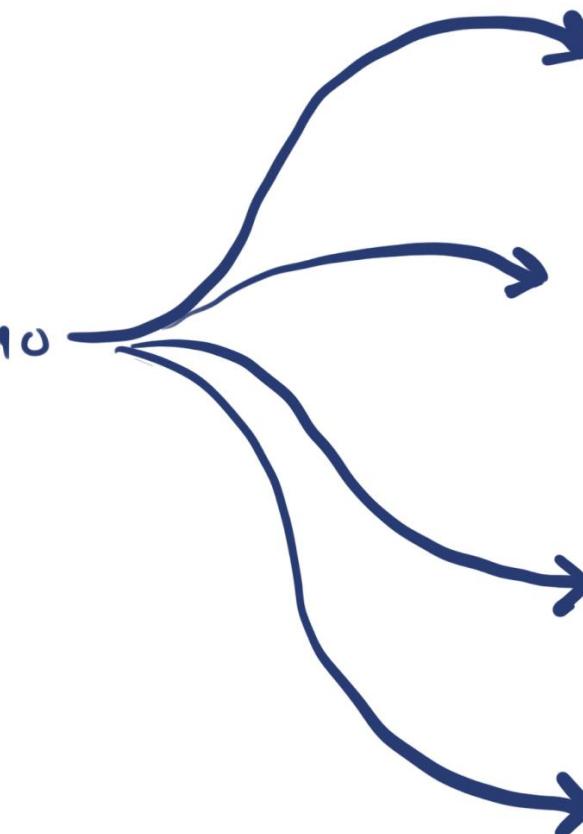
# DATA VISUALIZATION

DATA WITH BARAA

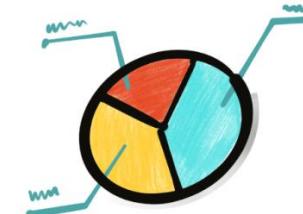


RAW DATA

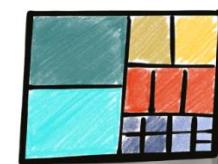
101101010010101010



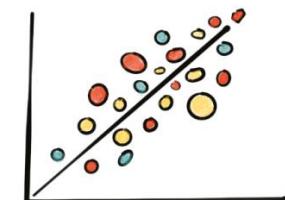
BARS



PIE



TREE



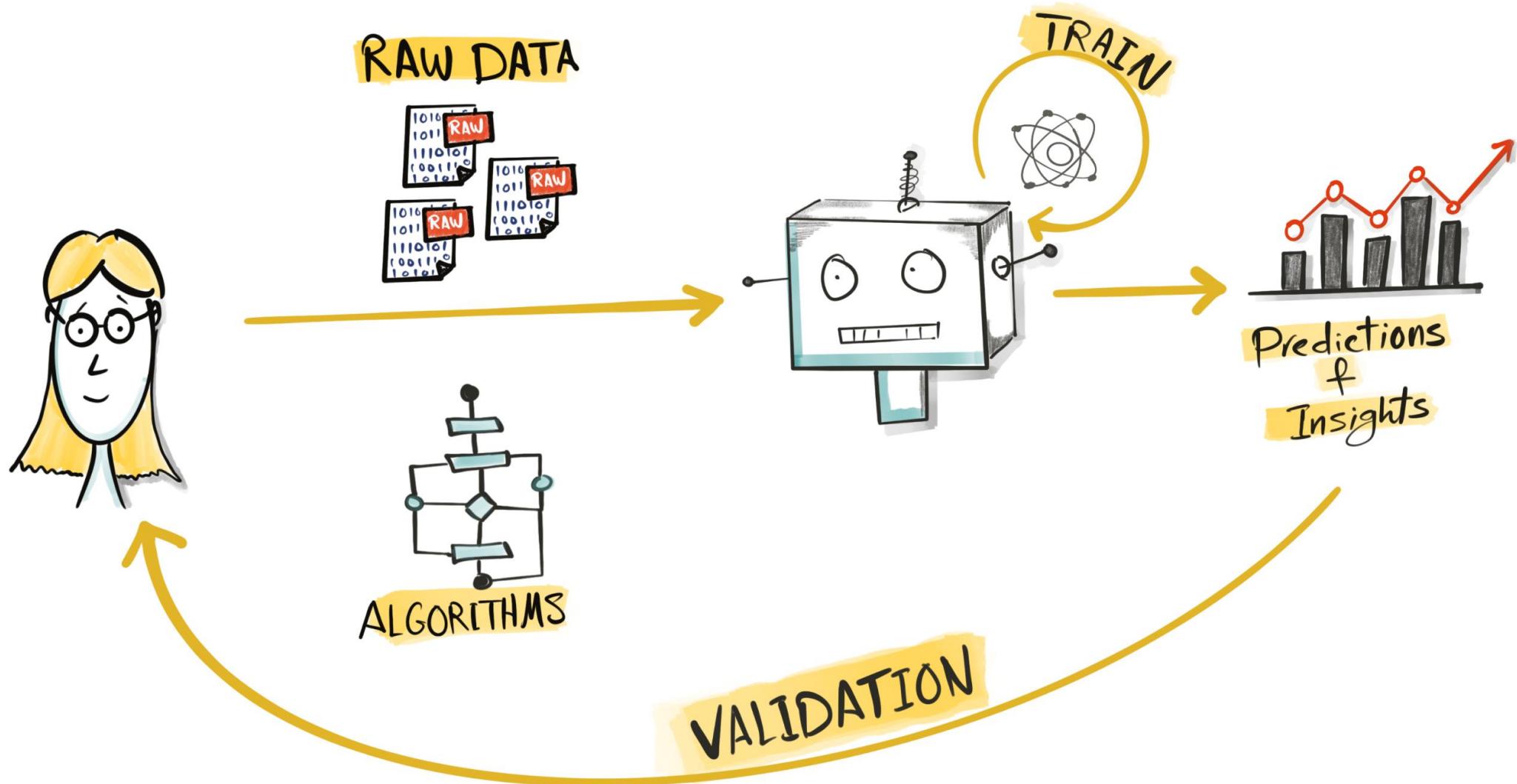
PLOTS



+ a b | e a u

# MACHINE LEARNING

DATA WITH BARAA





+ a b | e a u

# DATA ENGINEERING

DATA WITH BARAA



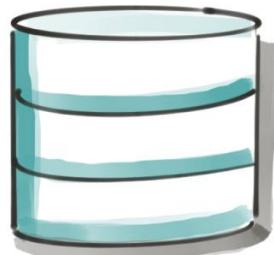
## DATA STORAGE



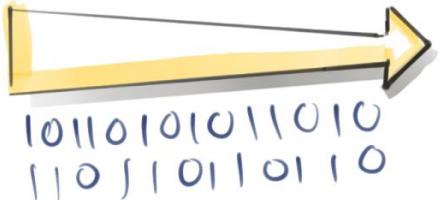
## DATA PIPELINE



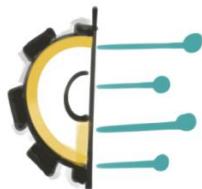
## SOURCE



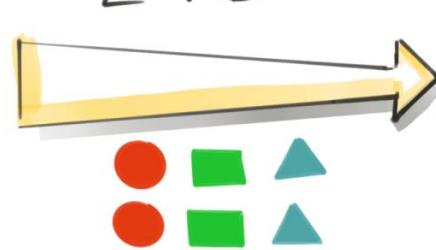
## EXTRACT



## TRANSFORM



## LOAD



## TARGET

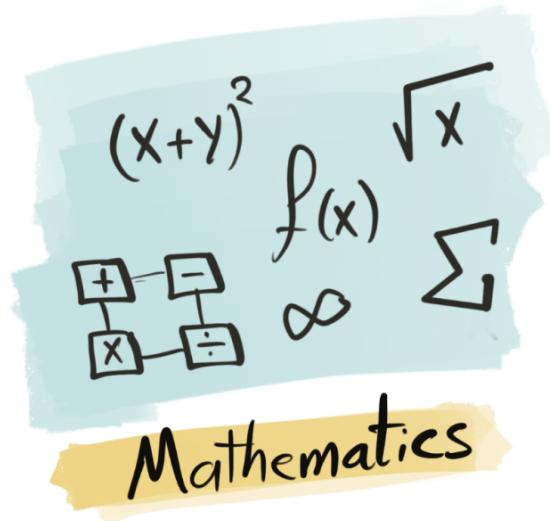




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# DATA SCIENCE

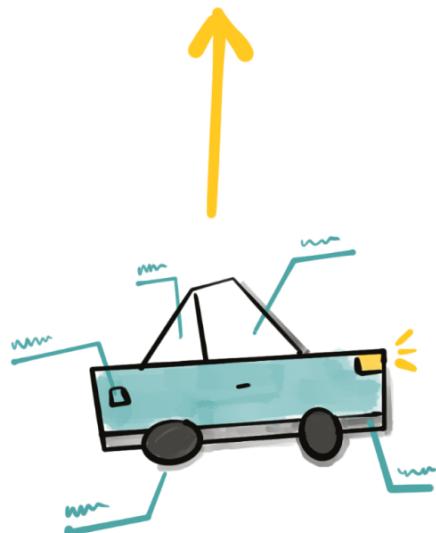
DATA WITH BARAA



# Knowledge



# Programming Languages



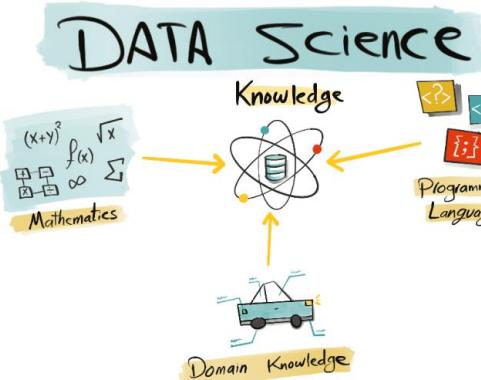
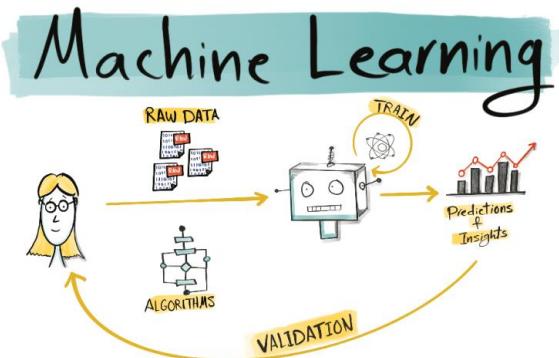
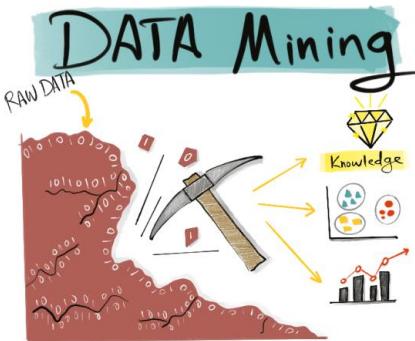
# Domain Knowledge



+ a b l e a u

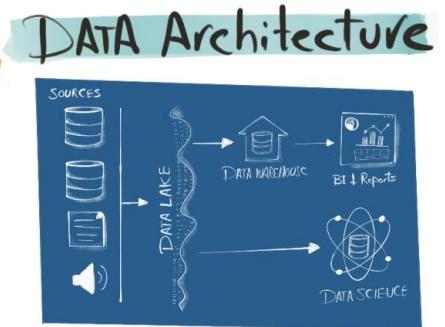
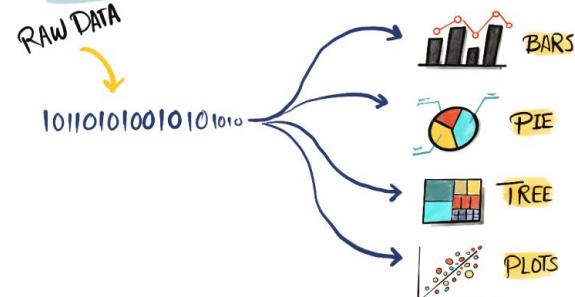
# DATA BUZZWORDS

DATA WITH BARAA

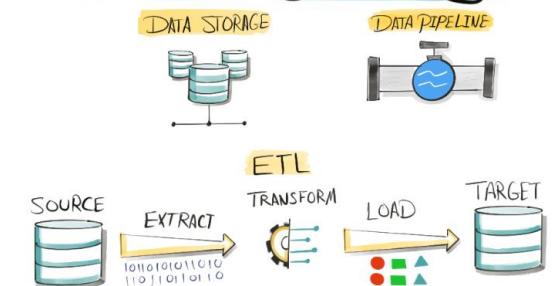


0101010001100101  
RAW DATA

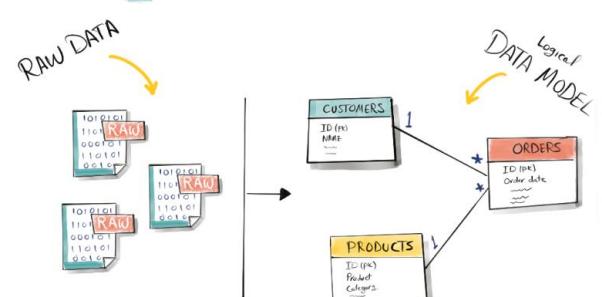
DATA Visualization

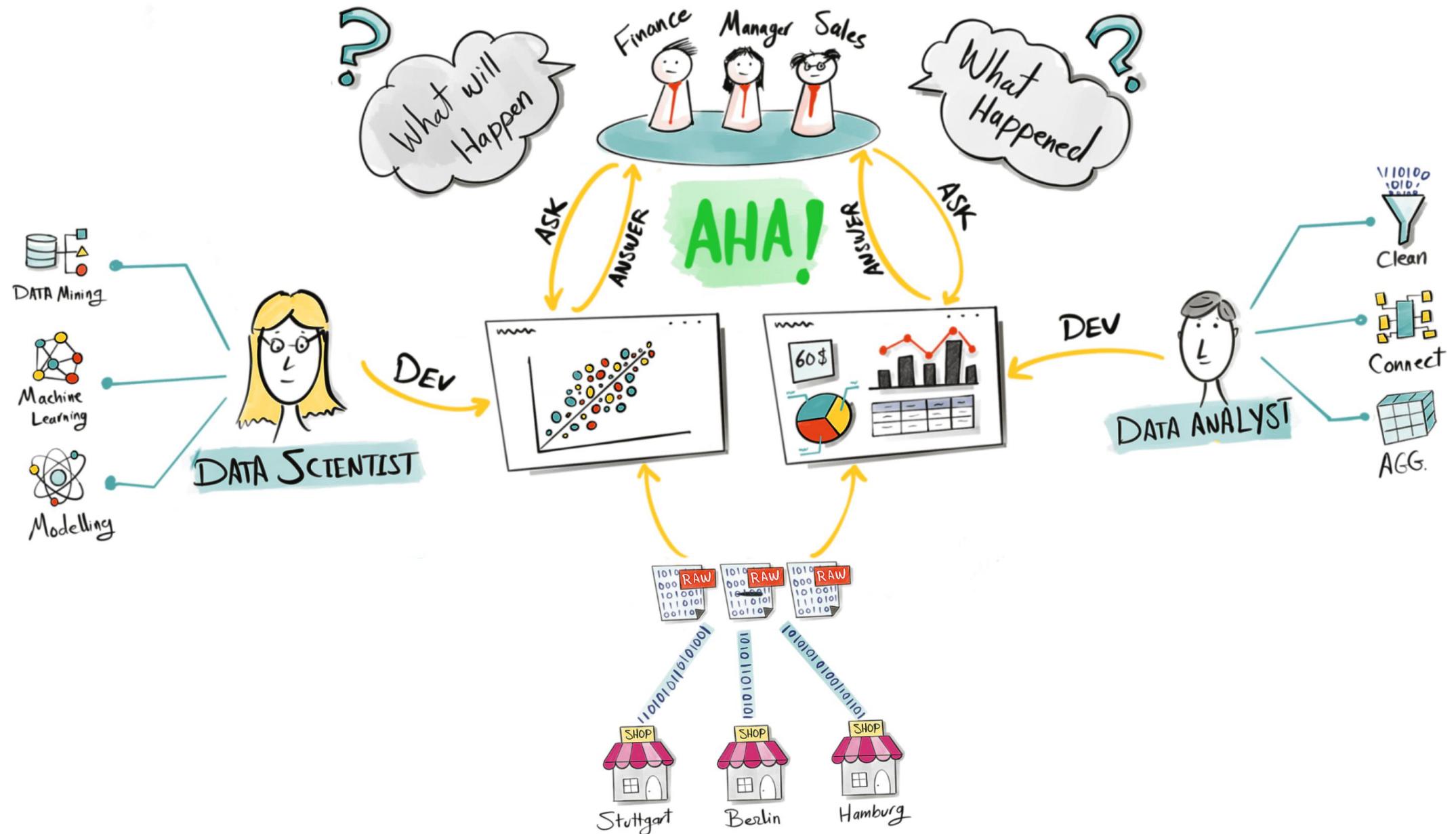


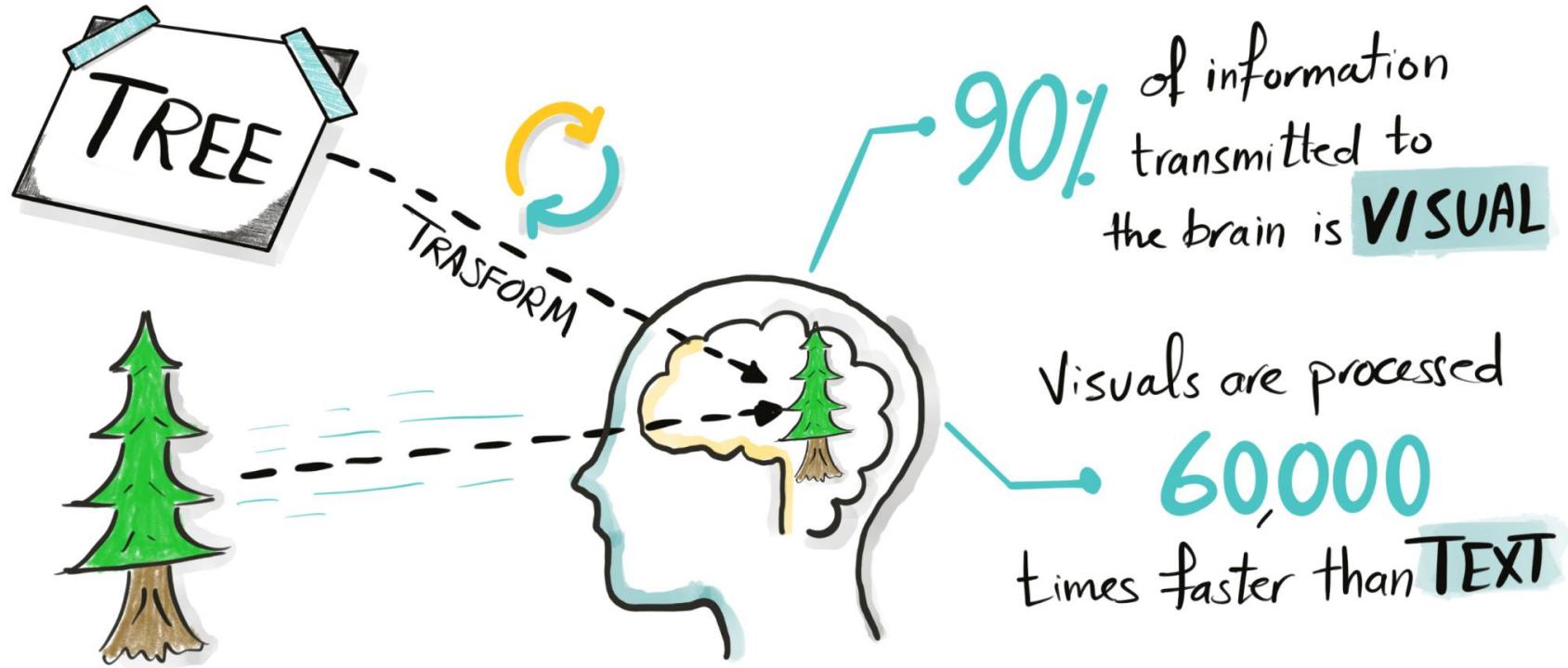
DATA Engineering



DATA Modeling









Increase Engagement

Discover Unknown Facts

Faster & Smarter Decisions

Telling a Story

Seeing Big Picture

Tracking Trends

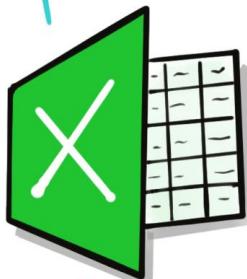




~1 Billion users

People ❤️ EXCEL

Planning Tool  
DATA Entry  
DATA Analysis  
DATA Visualization

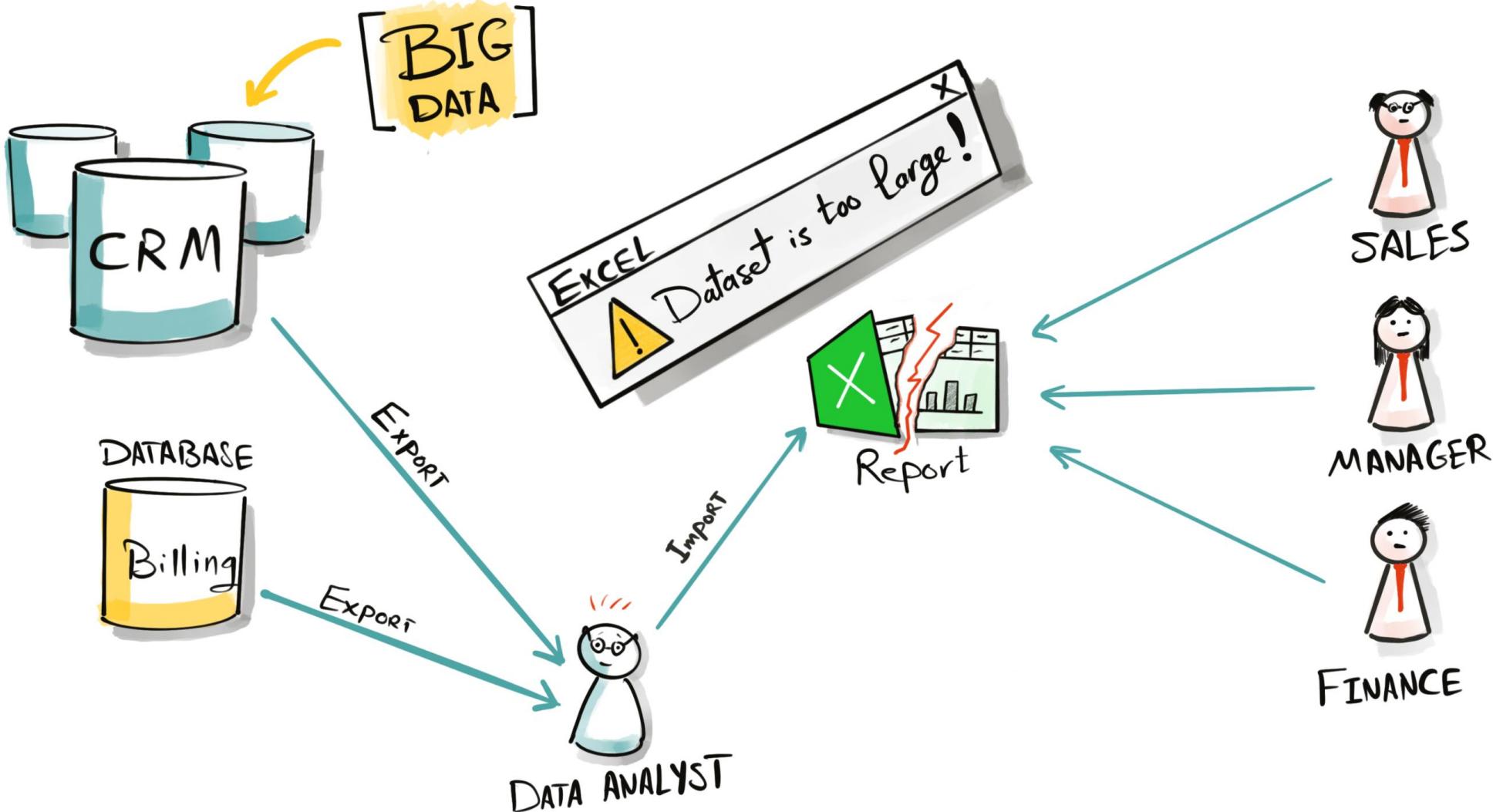


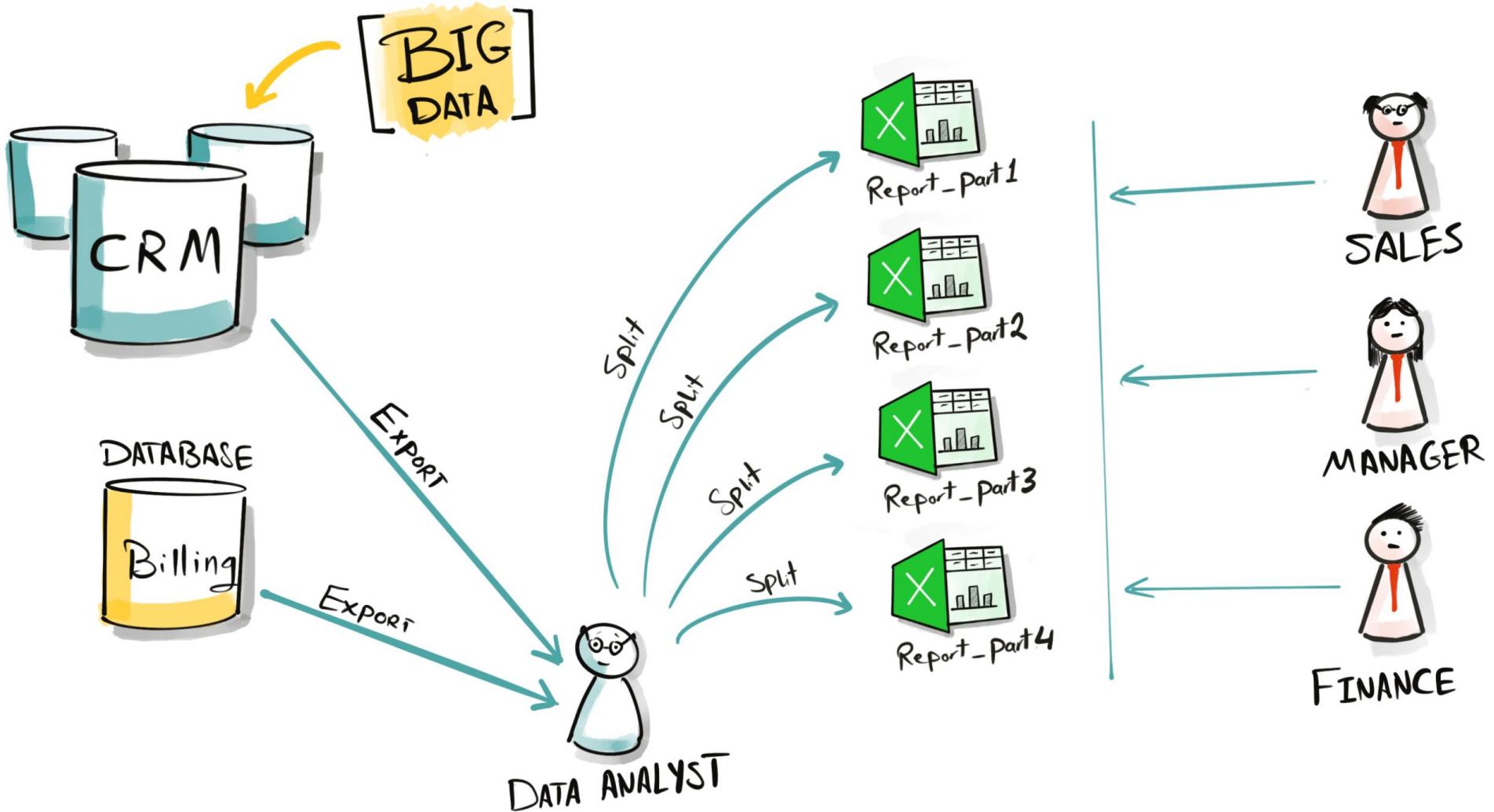
DATA  
VIZ

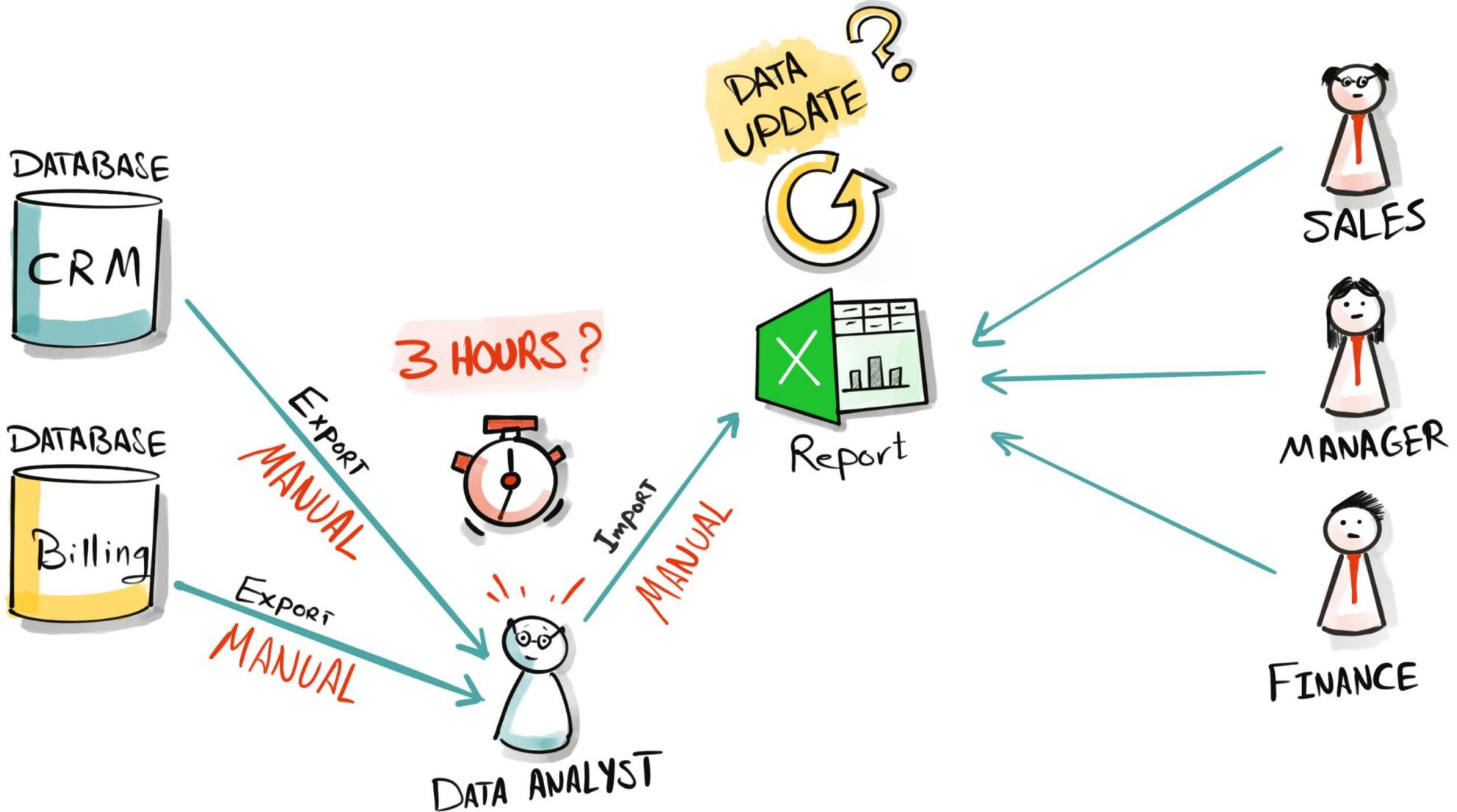
tableau

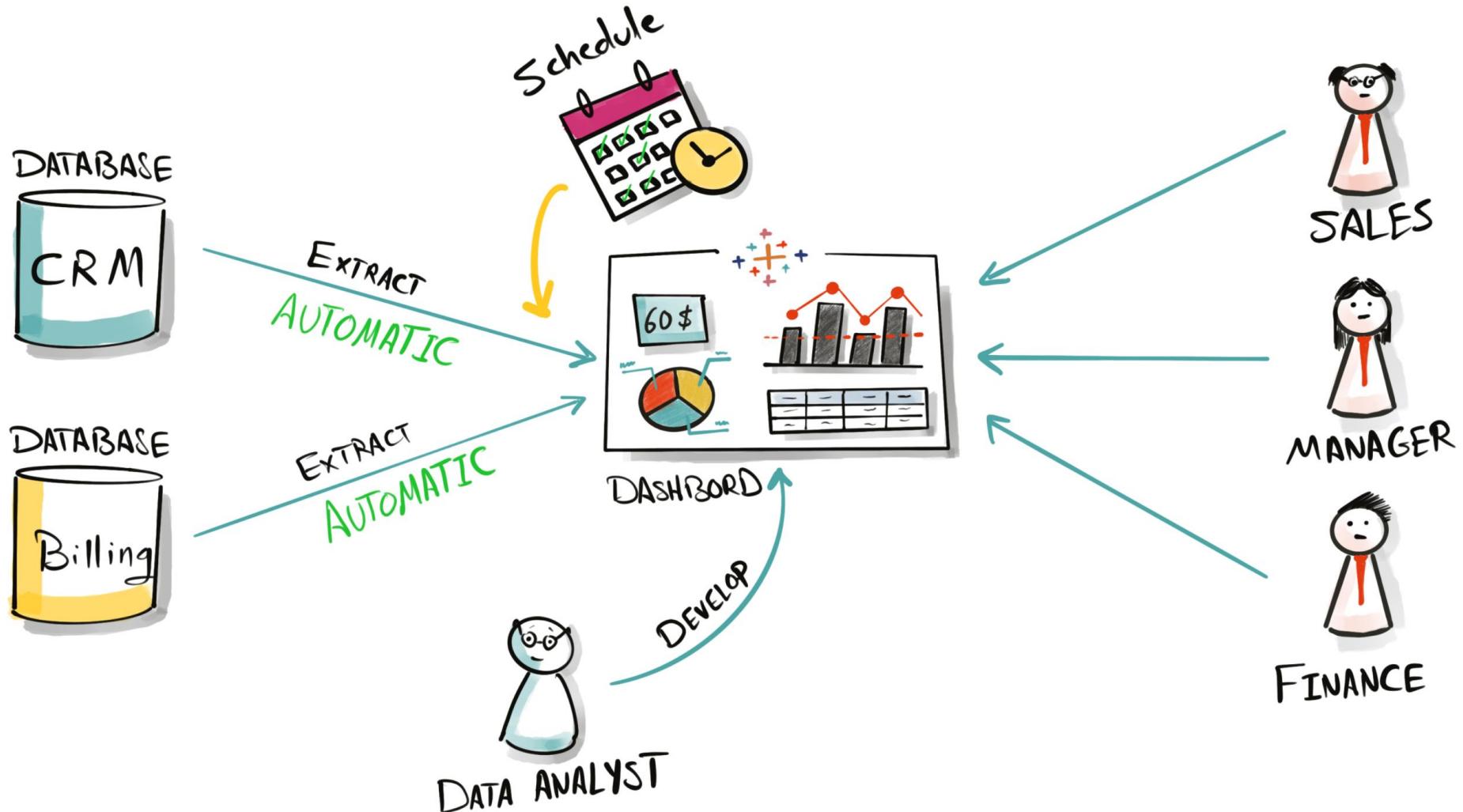
Power BI

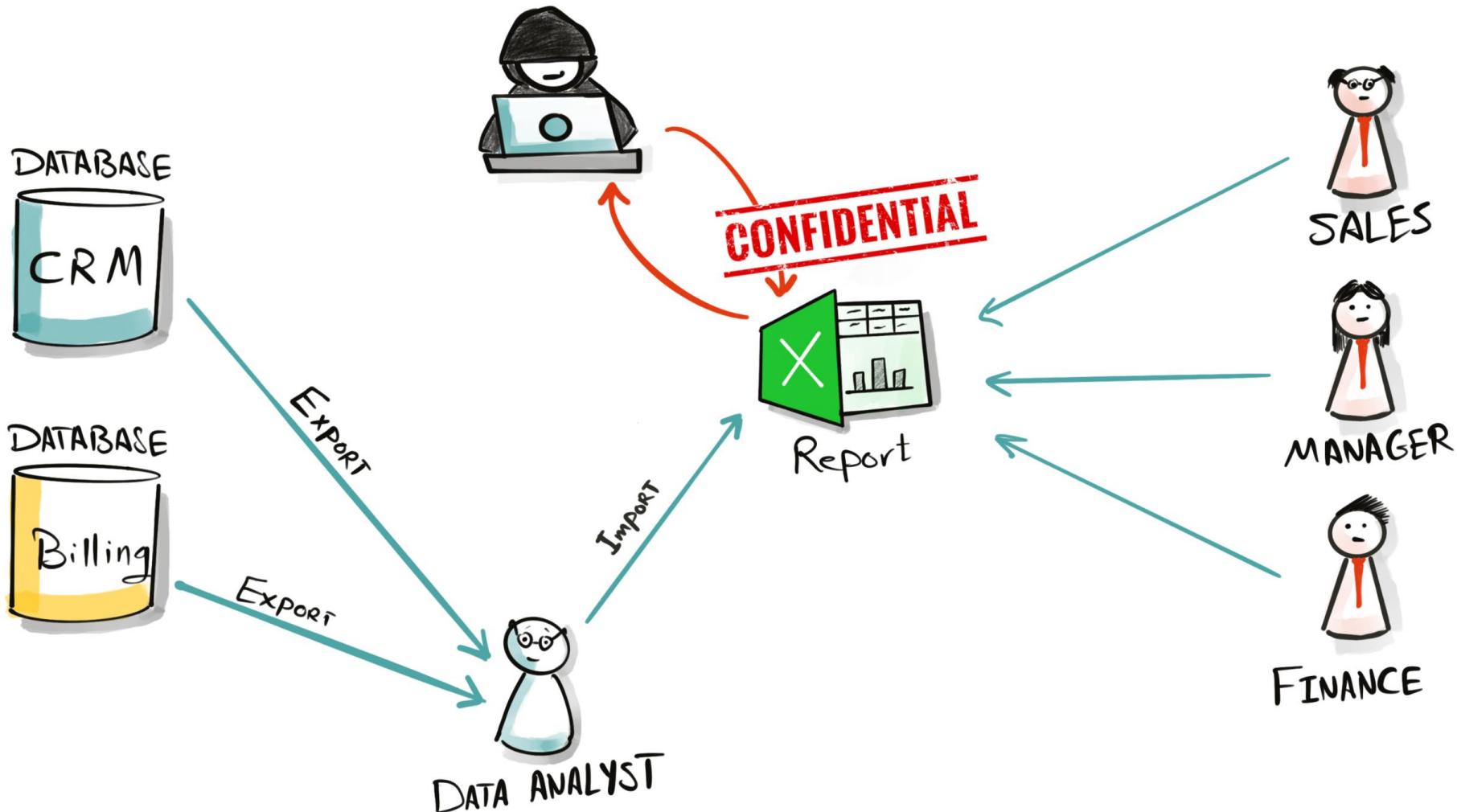
Qlik









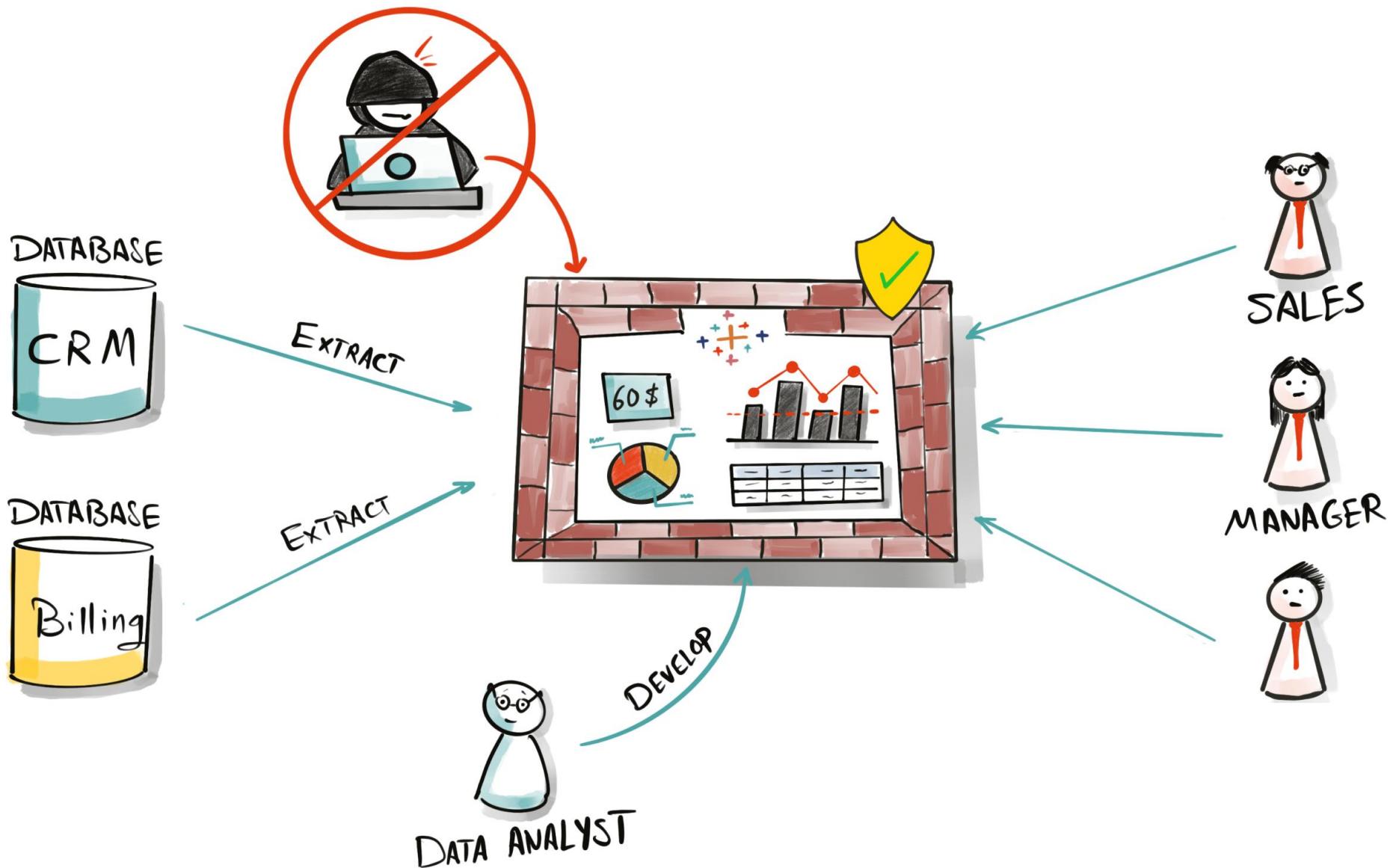




+ a b | e a u

# BI with Excel | Security

DATA WITH BARAA





# Row-Level-Security (RLS)



UserName	Country	Sales
Baraa	USA	9000
Baraa	Germany	8000
Maria	USA	6500
John	France	10000
John	USA	7500
Peter	Spain	5900

All Rows in Sales

UserName	Country	Sales
Baraa	USA	9000
Baraa	Germany	8000

Baraa's View

UserName	Country	Sales
John	France	10000
John	USA	7500

John's View

**CONFIDENTIAL****[NEED-TO-KNOW]****DATA ANALYST**

Export

Export

Import

Import

Import



Sales\_Report

Manager\_Report

Employee\_Report



SALES

MANAGER

**CONFIDENTIAL**

DATABASE



[NEED-TO-KNOW]

EXTRACT

DATABASE



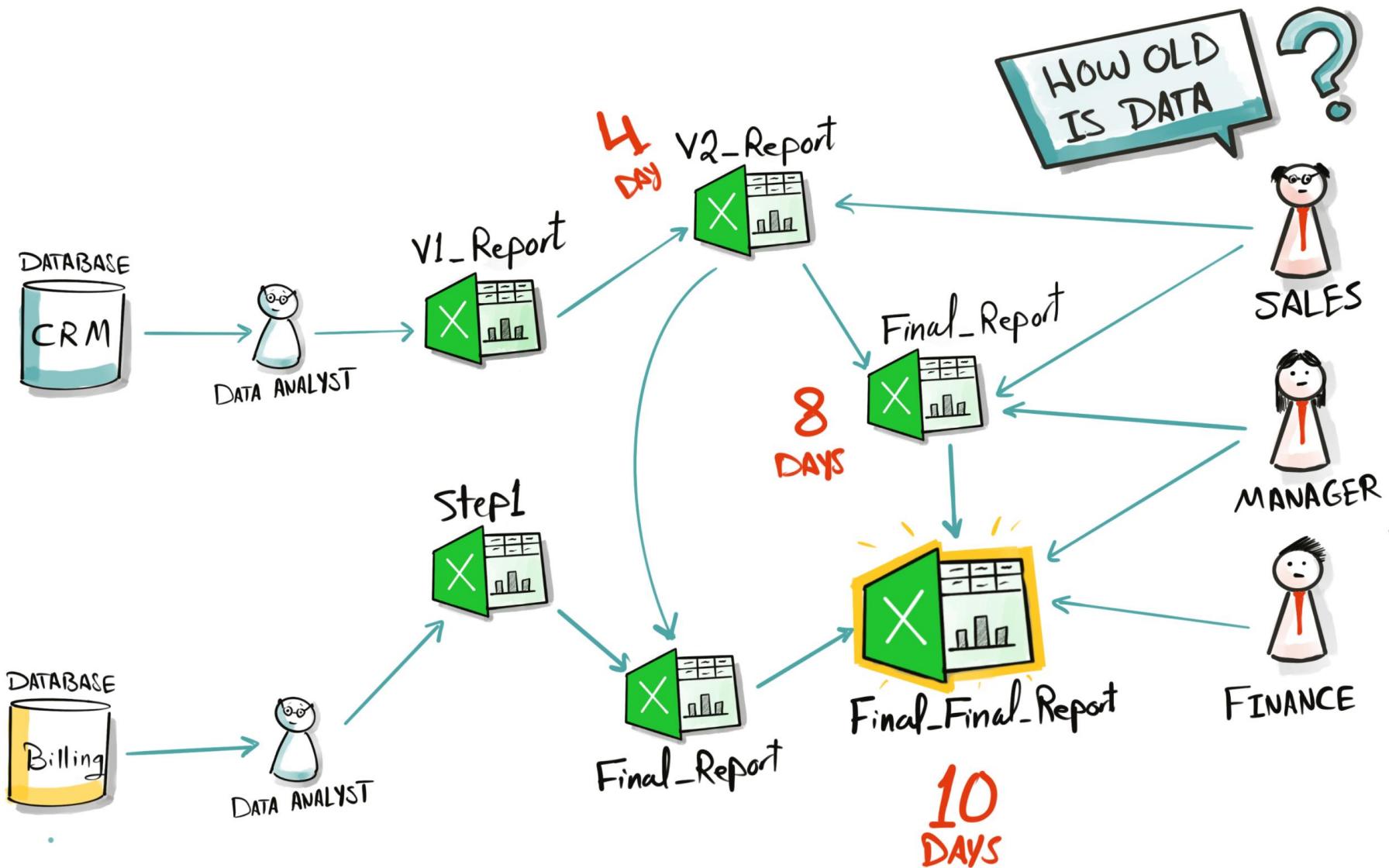
EXTRACT

DATA ANALYST

DASHBOARD

DEVELOP



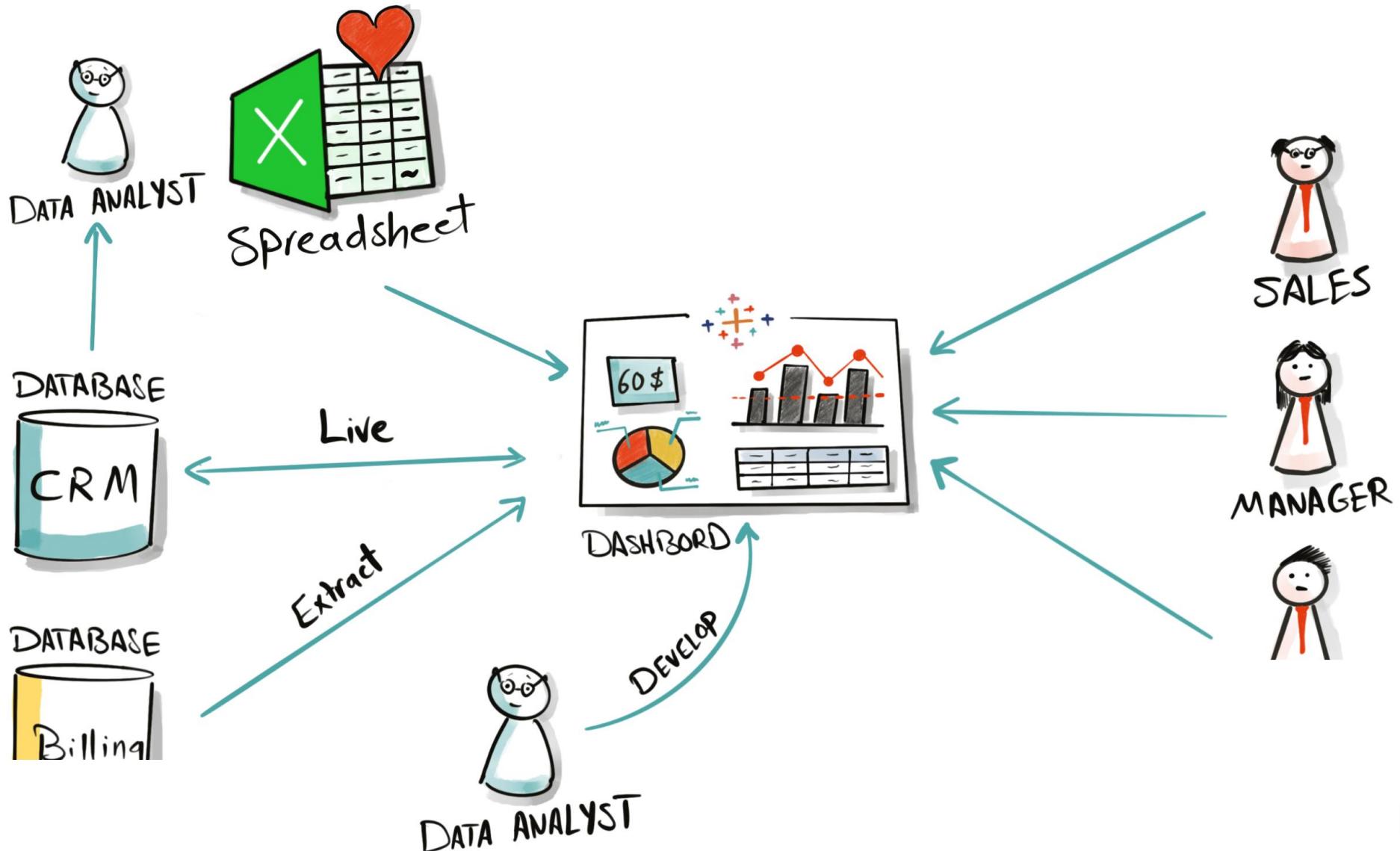




+ a b | e a u

# BI with Tableau & Excel

DATA WITH BARAA





# Benifits of Tableau vs Excel



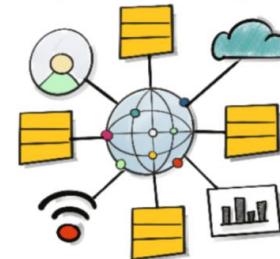
Automation ✓



Security ✓



BIG DATA ✓



Interactive ✓

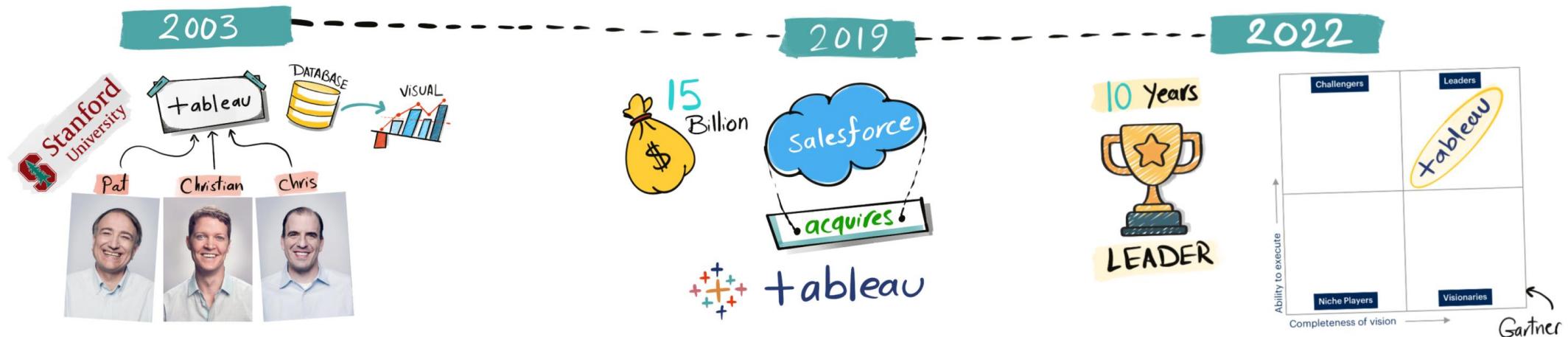




+ a b | e a u

# Tableau History

DATA WITH BARAA



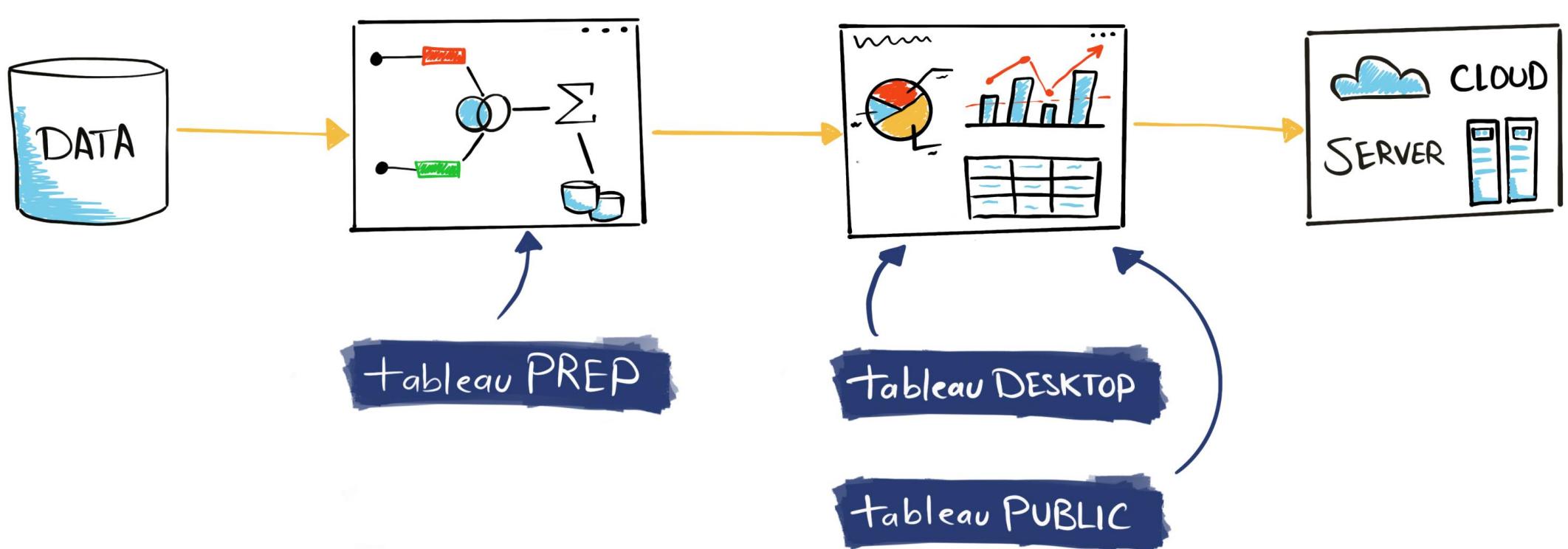


1  
CONNECT

2  
PREPARE

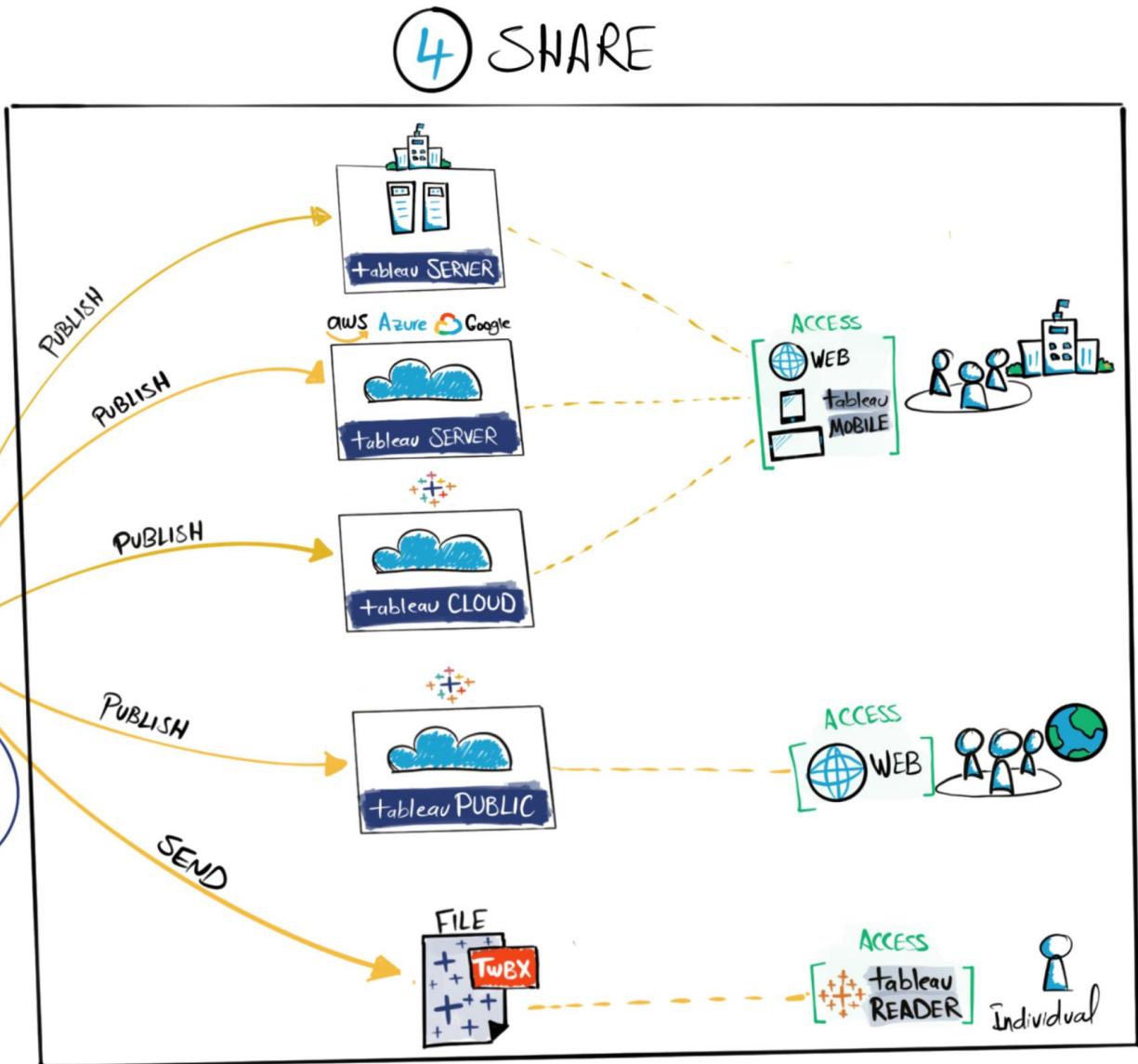
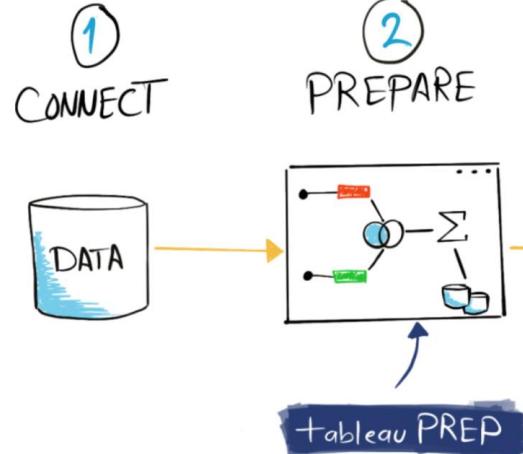
3  
BUILD VIZ

4  
SHARE





# SHARING PROCESS





# Tableau Desktop

*"Backbone Product of Tableau"*



Developer tool for data visualization

- Connect data
- Build views, dashboards, stories
- Publish workbooks & data sources

Requires a license

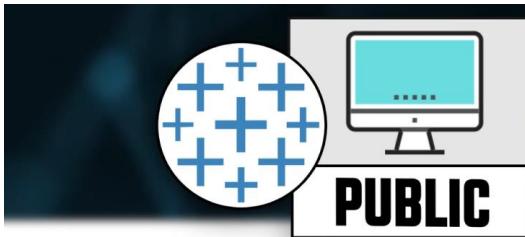
90 Data connectors

Publish

- Tableau Server
- Tableau Cloud
- Tableau Public (cloud)

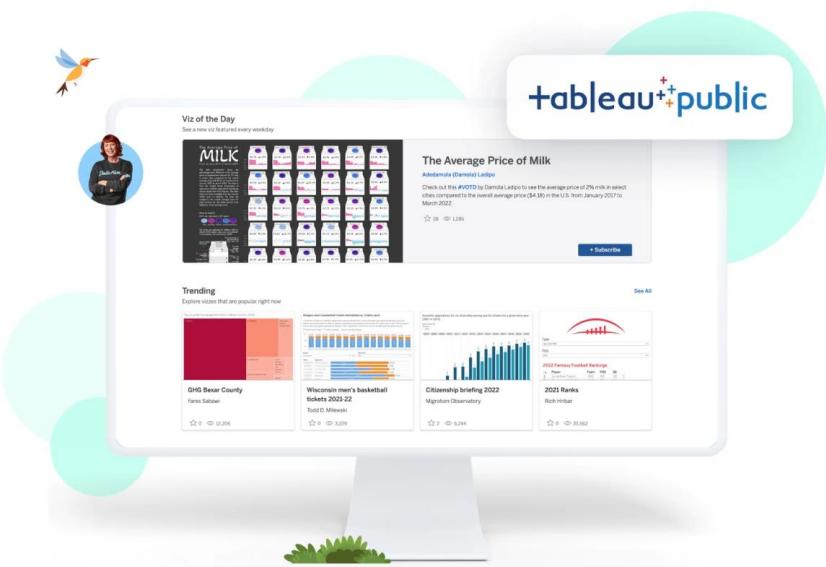
No Limitations

For Data scientists & Data analysts



# Tableau Public

*"Free Version of Tableau Desktop"*



Developer tool for data visualization

- Connect data
- Build views, dashboards, stories
- Publish workbooks & data sources

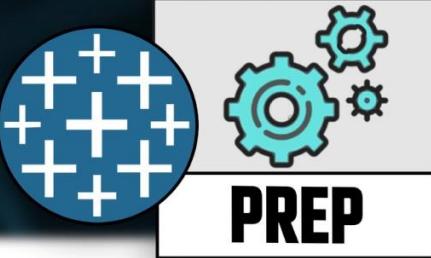
Free Tool

## 4 Main Limitations

- 10 Data connectors (only local files)
- Limited to 15 Million rows
- Publish to only Tableau Public (cloud)
- Can't save locally

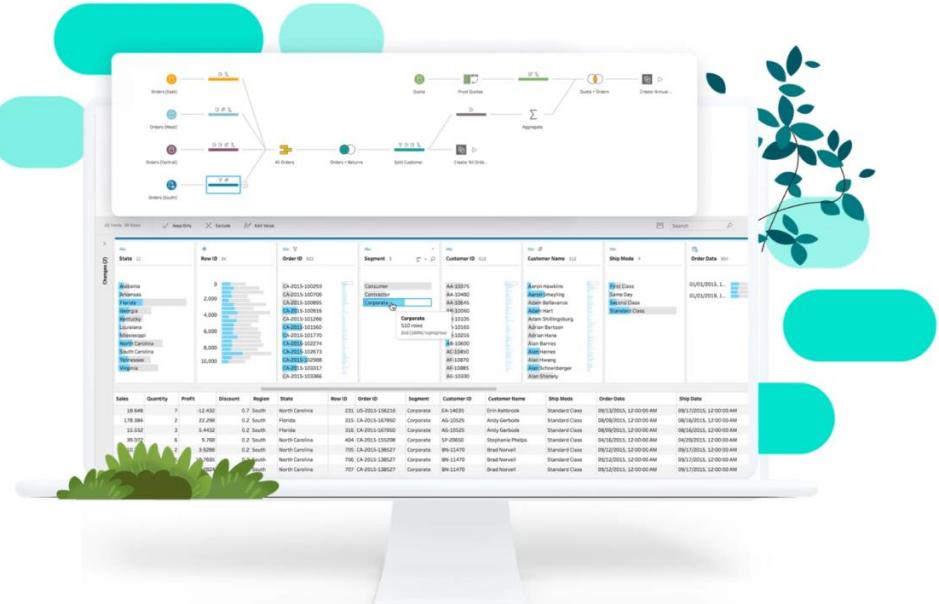
All tools & functions to build Viz are available!

For Everyone



# Tableau Prep

*"Data Engineering Tool"*



Developer tool for data engineering

- Connect data
- Build flows (clean, combine, aggregate ... etc)
- Publish flows & data sources

Requires a license

90 Data connectors

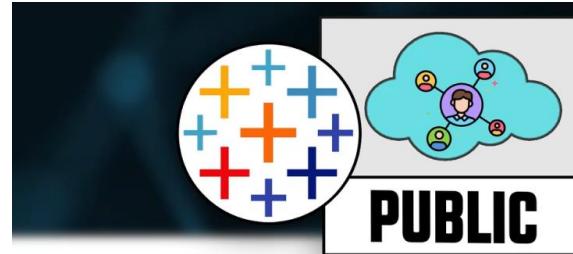
Output

- File
- Tableau Data Source
- Database Table

Publish

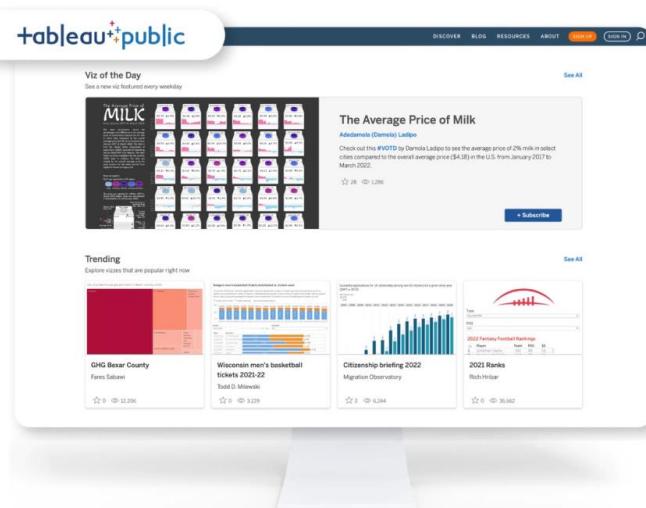
- Tableau Server
- Tableau Cloud

No public (free) version available.



# Tableau Public Cloud

*"Social Media of Tableau"*



Sharing tool for data visualization

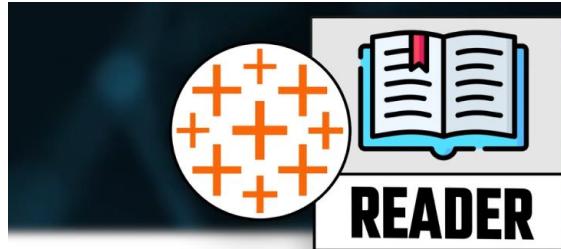
Free Cloud Service from Tableau

Platform

- Inspiring
- Connecting to other developers
- Sharing your skills

Main Limitations

- Limited to 10 GB for each account
- No connection to sources
- No Security features



# Tableau Reader

*"Free Tool to view Vizzes"*

Sharing tool for data visualization

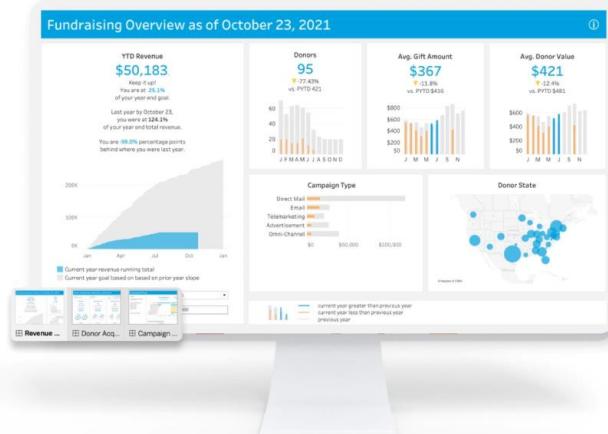
Free Tool

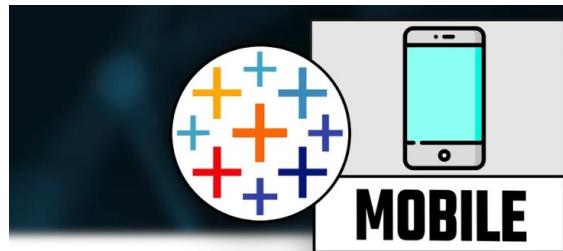
Only to view visualization

Main Limitations

- Can't build visualization
- Can't Refresh Data
- No Security features

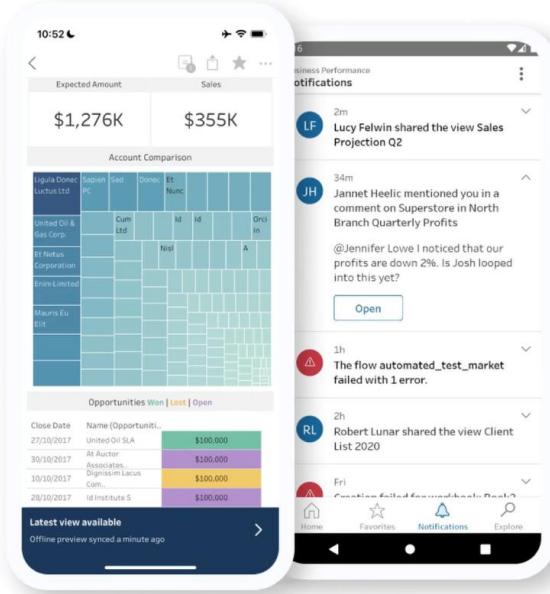
Don't recommend using it in organization





# Tableau Mobile

"Access Vizzes from anywhere"



Only to **view** visualization

Cant use it to **build** data visualization

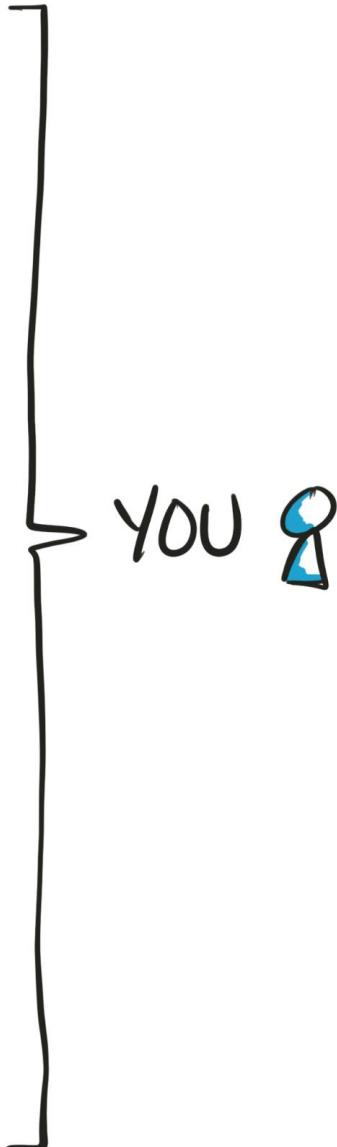
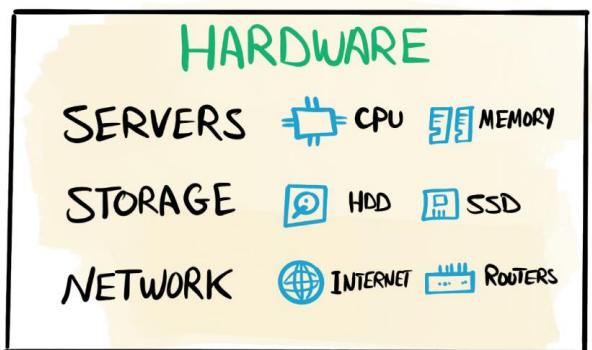
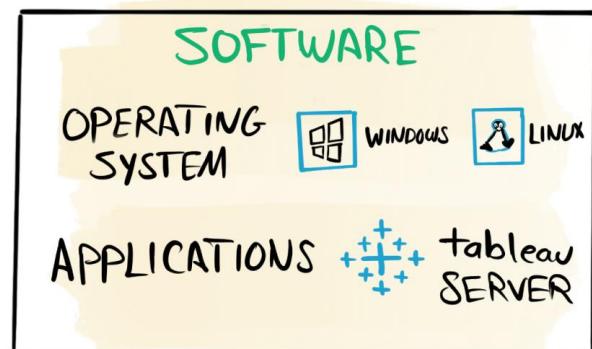
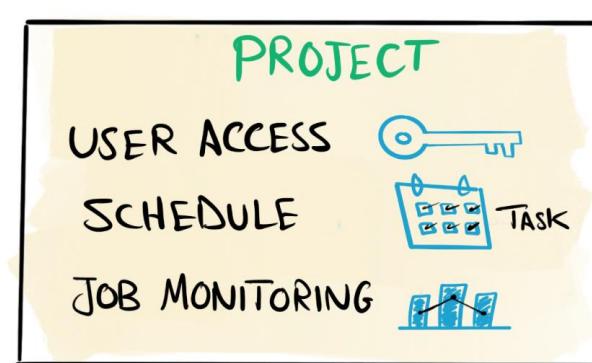
Free App to **download**

Require a **licence** to use

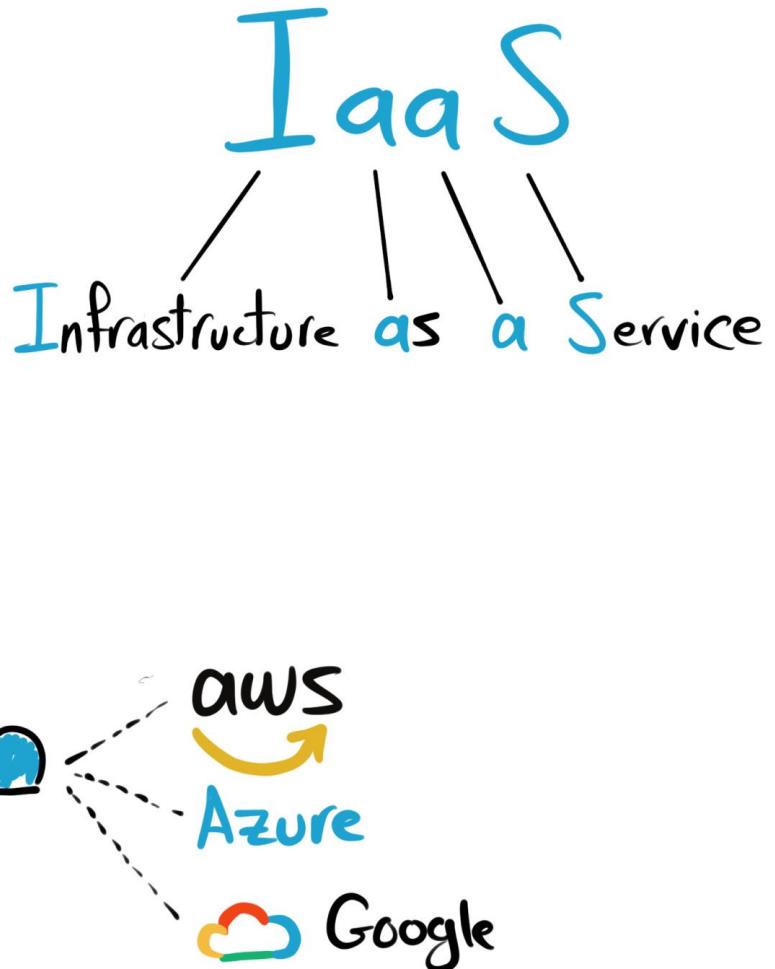
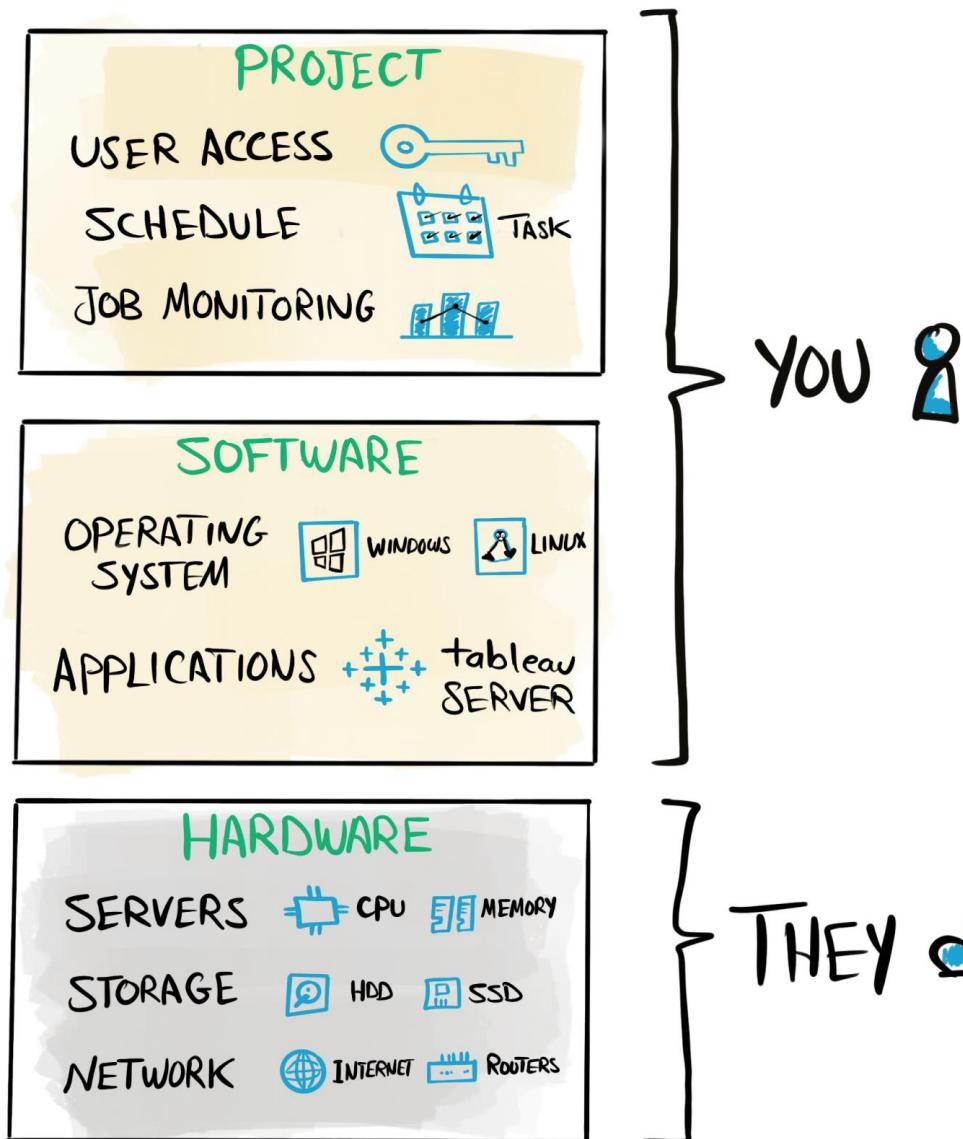
Connect to

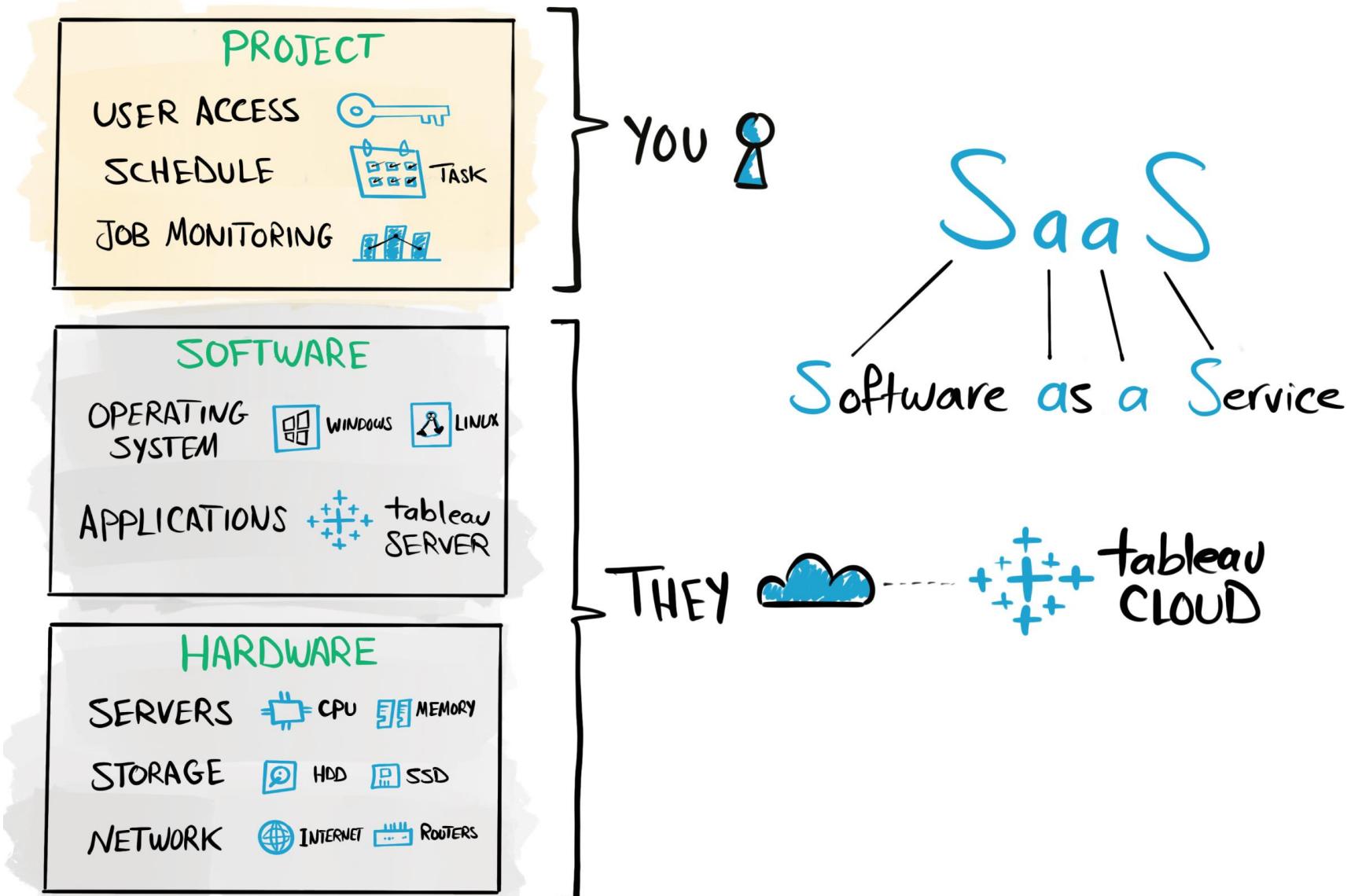
- Tableau **Server**
- Tableau **Cloud**

Cashing Dashboards for **offline** access



ON-PREM







On-Prem



Hosting



Hardware

YOU

THEY

THEY



Software

YOU

YOU

THEY



Project

YOU

YOU

YOU



PROS

Full Control

Flexibility

Focus on Core Business

Data behind Firewalls

No Upfront Costs

Always Up-To-Date



CONS

High Upfront Costs

Software Administration

Loss of Control

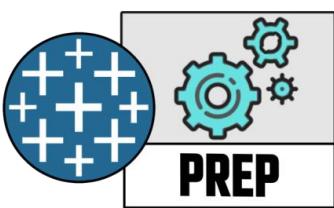
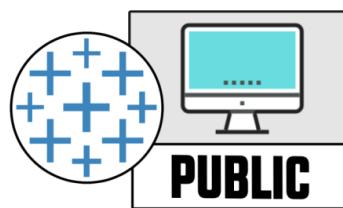
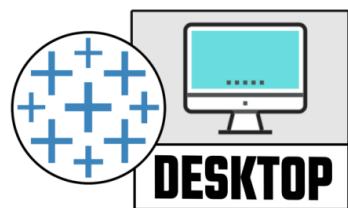
Inflexibility

Unexpected costs

Potential Networking Issue



# Dev Products Comparison



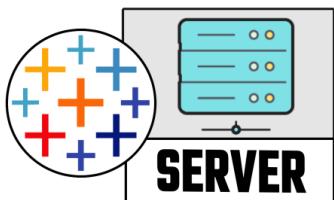
Purpose	Data Visualization	Data Visualization	Data Engineering
Costs			
Security			
Data Limit	No Limit	15 Million Rows	No Limit
Connectors			
Live Con.			
Store Locally			
Audience	Data Scientists & Analysts	Everyone	Data Engineers



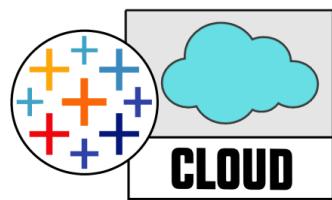
+ a b | e a u

# Sharing Products Comparison

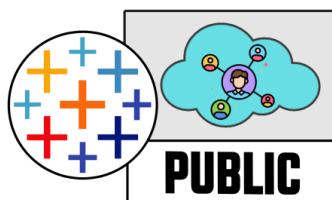
DATA WITH BARAA



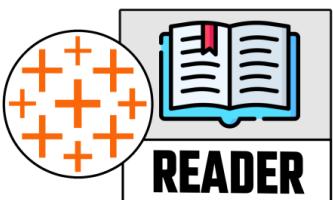
SERVER



CLOUD



PUBLIC



READER

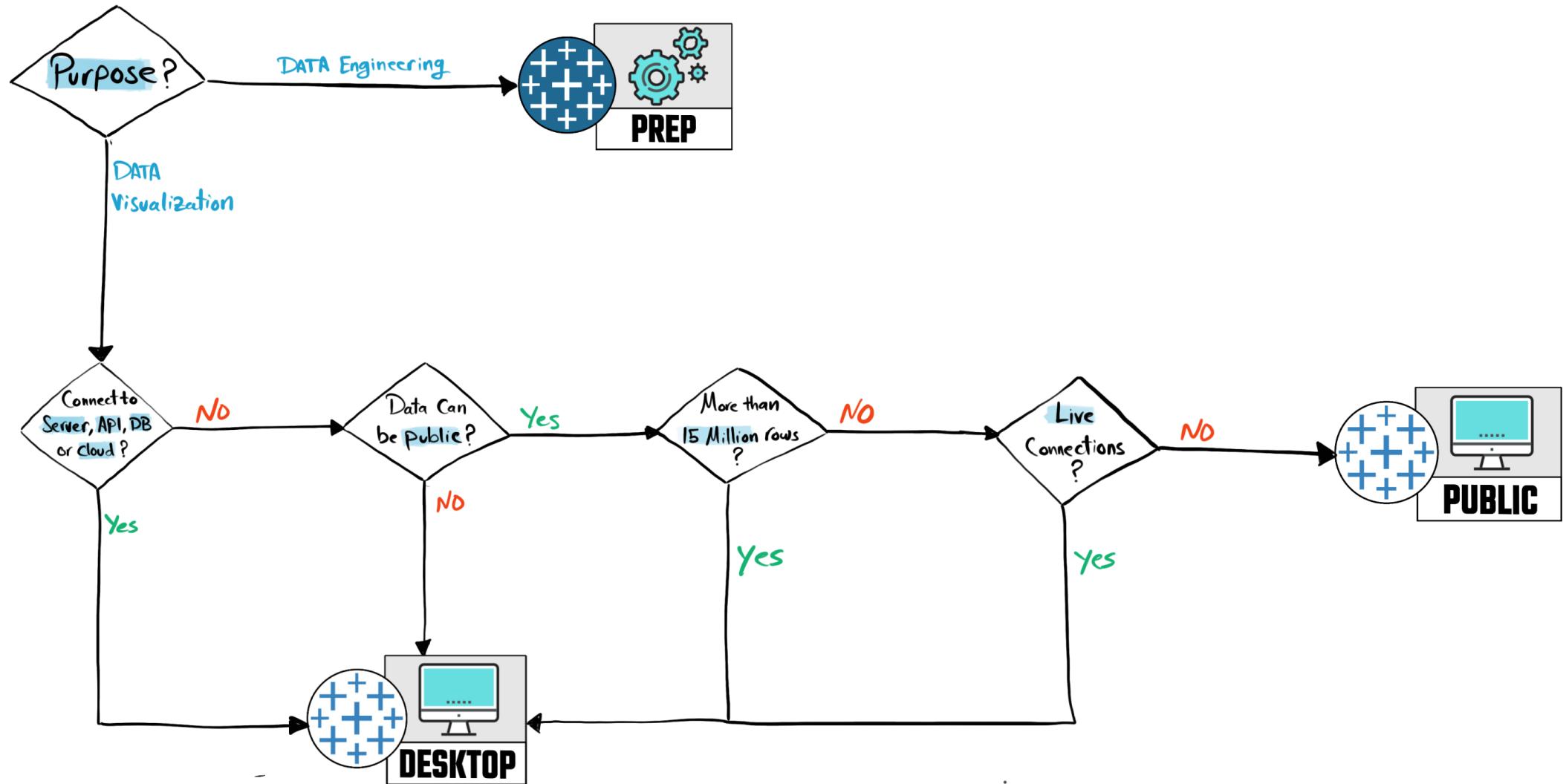
	Project				
	Software				
	Hardware				
	Storage Limit	Server Disk Space	No Limits	10 GB	No Limits
	Connectors				
	Automation				
	Mobile				
	Sharing				



+ a b l e a u

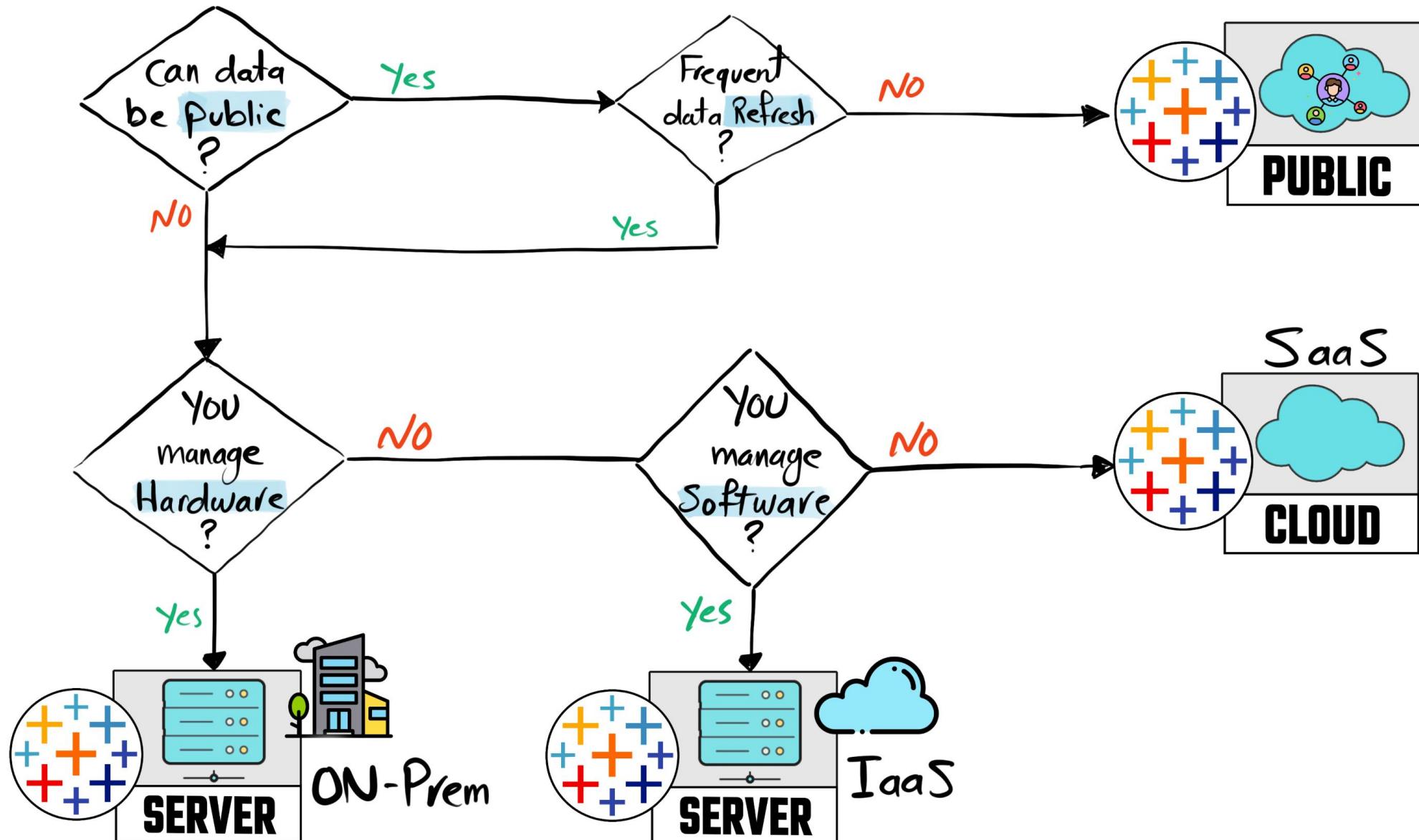
# Choose Right Dev Product

## DATA WITH BARAA



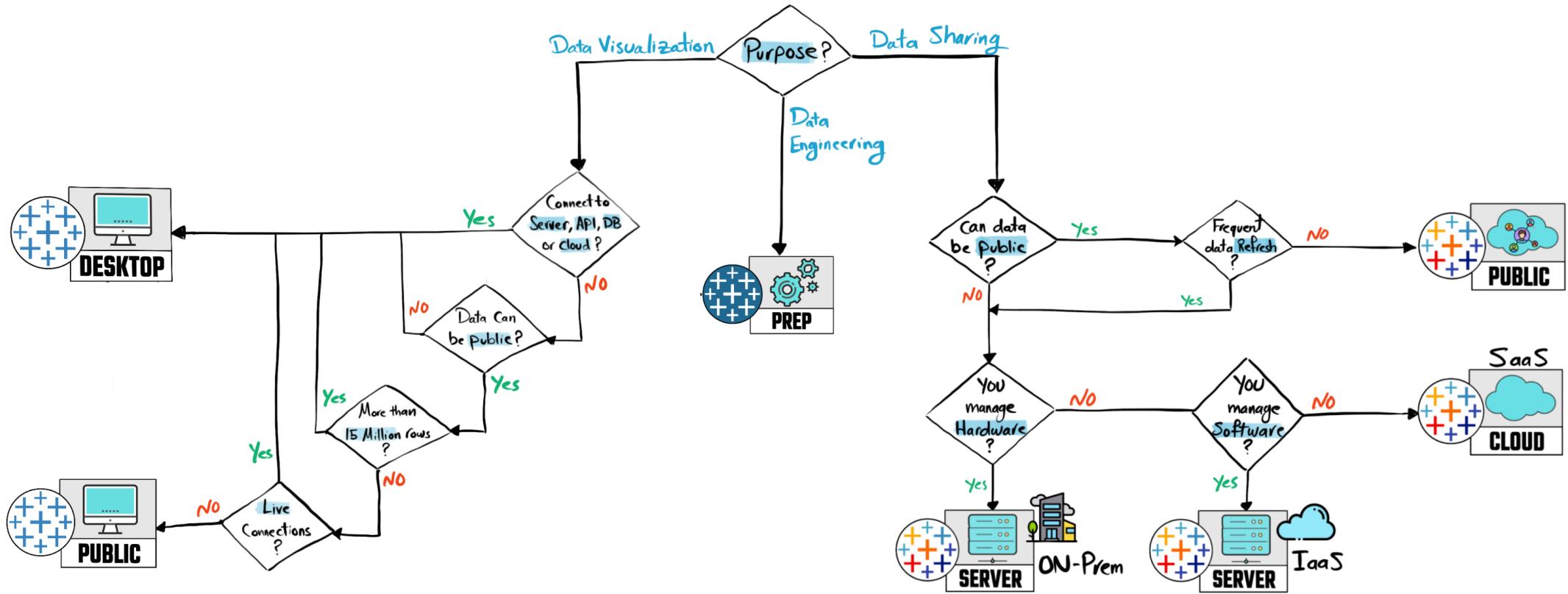


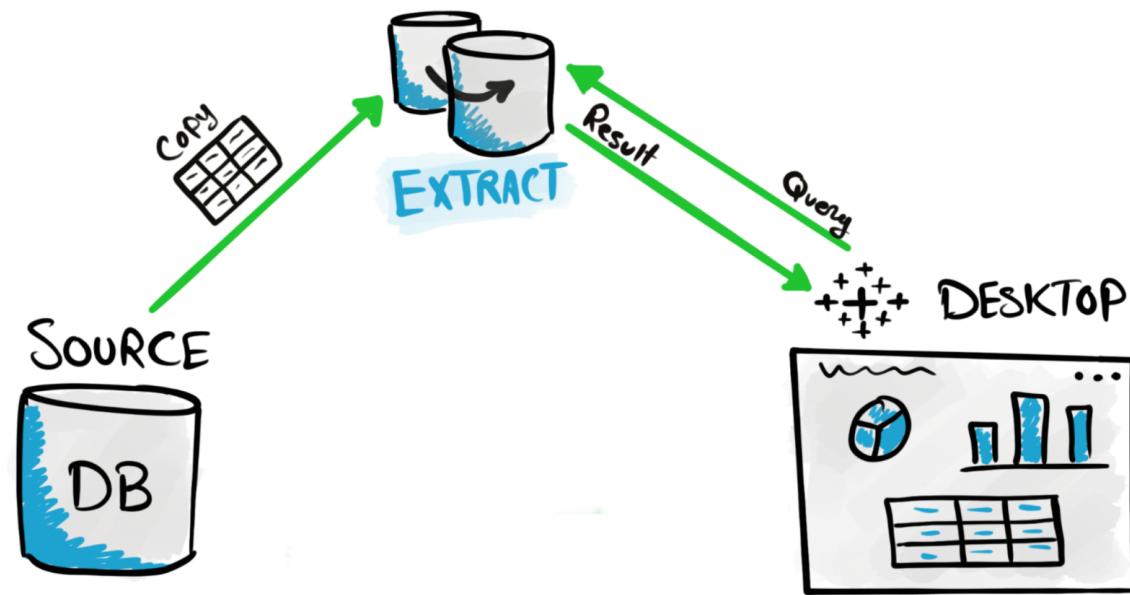
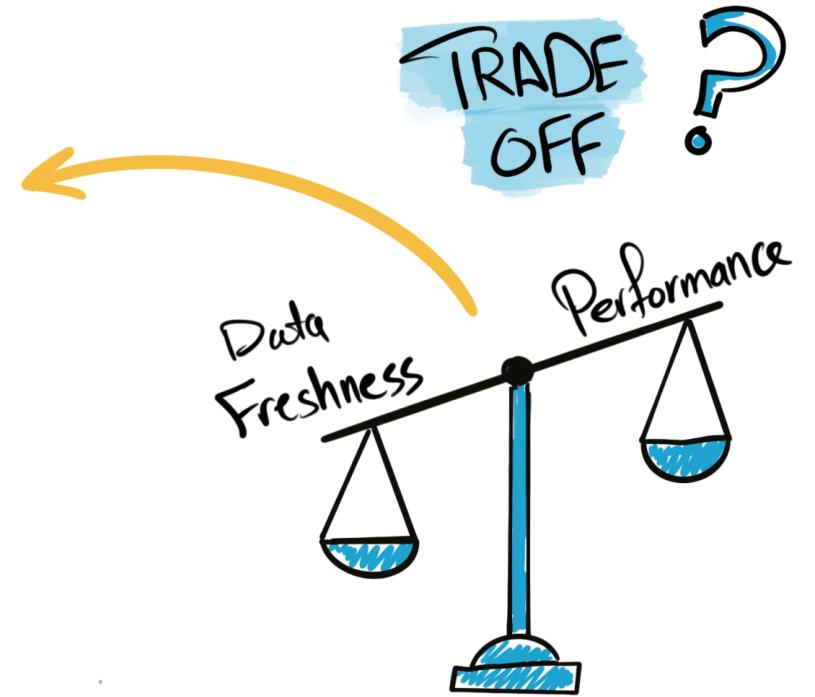
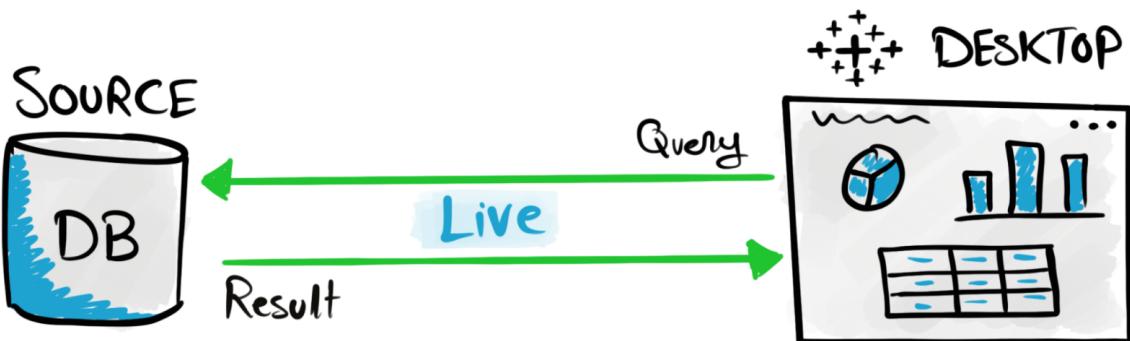
# Choose Right Sharing Product





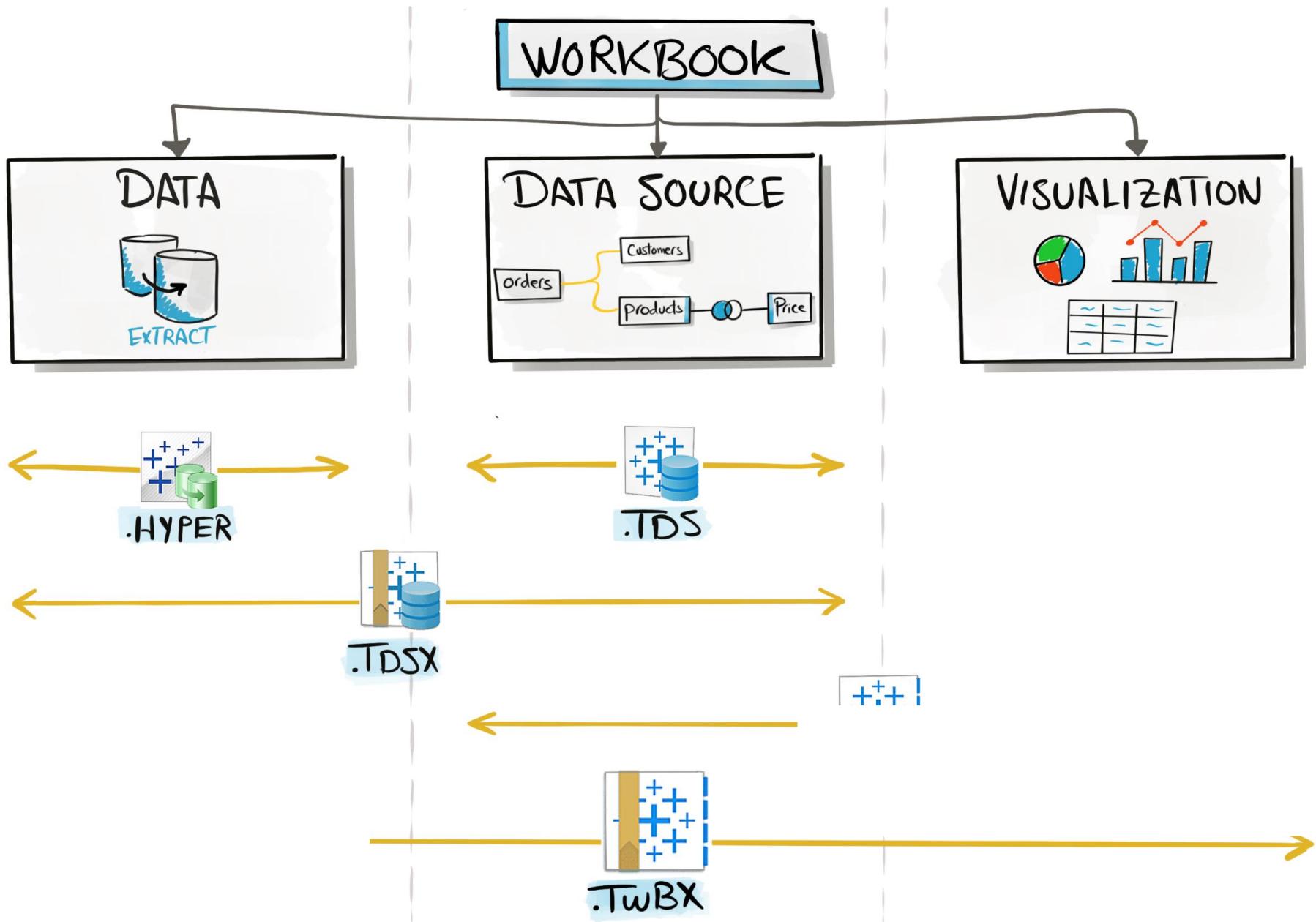
# Choose Right Tableau Product







# Tableau File Types



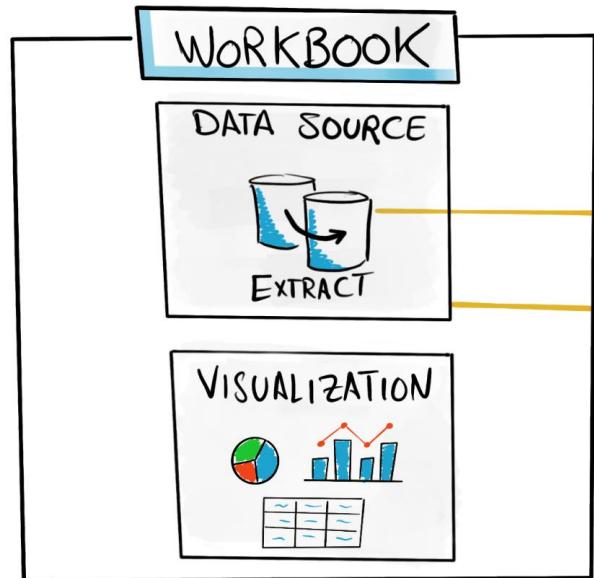
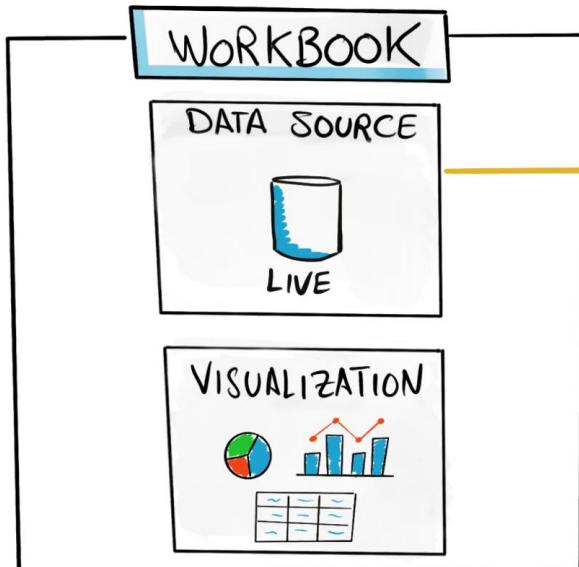


tableau Desktop	tableau Reader	tableau Public
✓	✗	✗
✓	✗	✗
✓	✓	✓



.TDS	✓	✗	✗
.TWB	✓	✗	✗



+ a b | e a u

# Tableau Data Source

DATA WITH BARAA

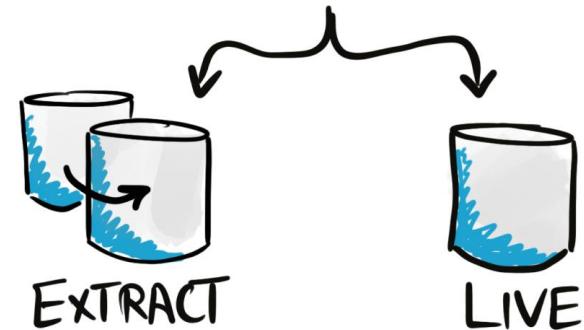


## DATA CONNECTORS



90 CONNECTORS

## CONNECTION TYPE



## ACCESS INFO

E:\User\Data\Tableau\sales.csv

DB location ↗

Server: localhost  
Database: myfirstwebsitedb

Access token ↘

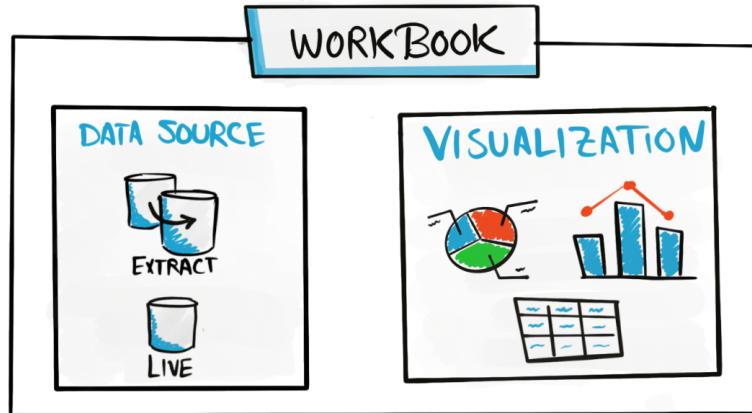
czZCaGRSa3F0MzpnjuUjk091qErXJW ↘

## DATA MODEL





# Tableau Workbook Files



DATA



ID
1
2
3
4

HYPER

Prod
A
D
F

Price
20.5
8.99



METADATA

```
<metadata class='column'>
  <name> Code </name>
  <type> Integer </type>
  <Count> 631 </Count>
</metadata>
```

SALES.TWB



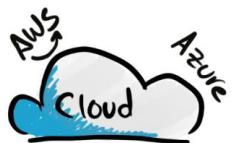
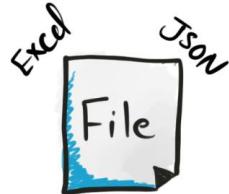
+ a b | e a u

# Tableau Desktop Architecture

DATA WITH BARAA



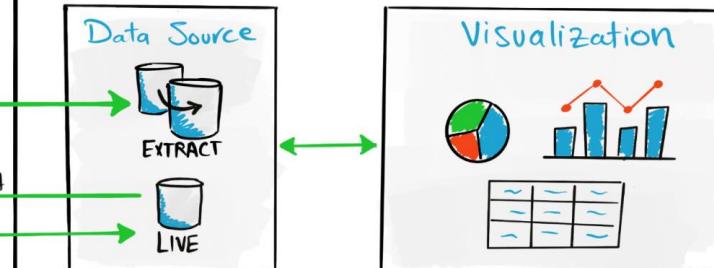
## SOURCE



[API]

## DESKTOP

### WORKBOOK



Publish Data Source

Publish Workbook

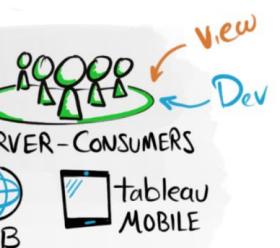


## SERVER

.TWBX

.HYPER .TDSX .TWBX  
.TDS .TWB

## CONSUMER





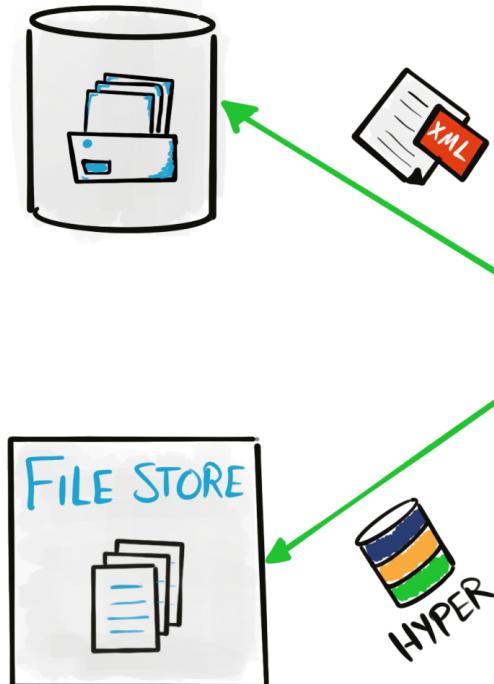
+ a b | e a u

# Publish Process

DATA WITH BARAA

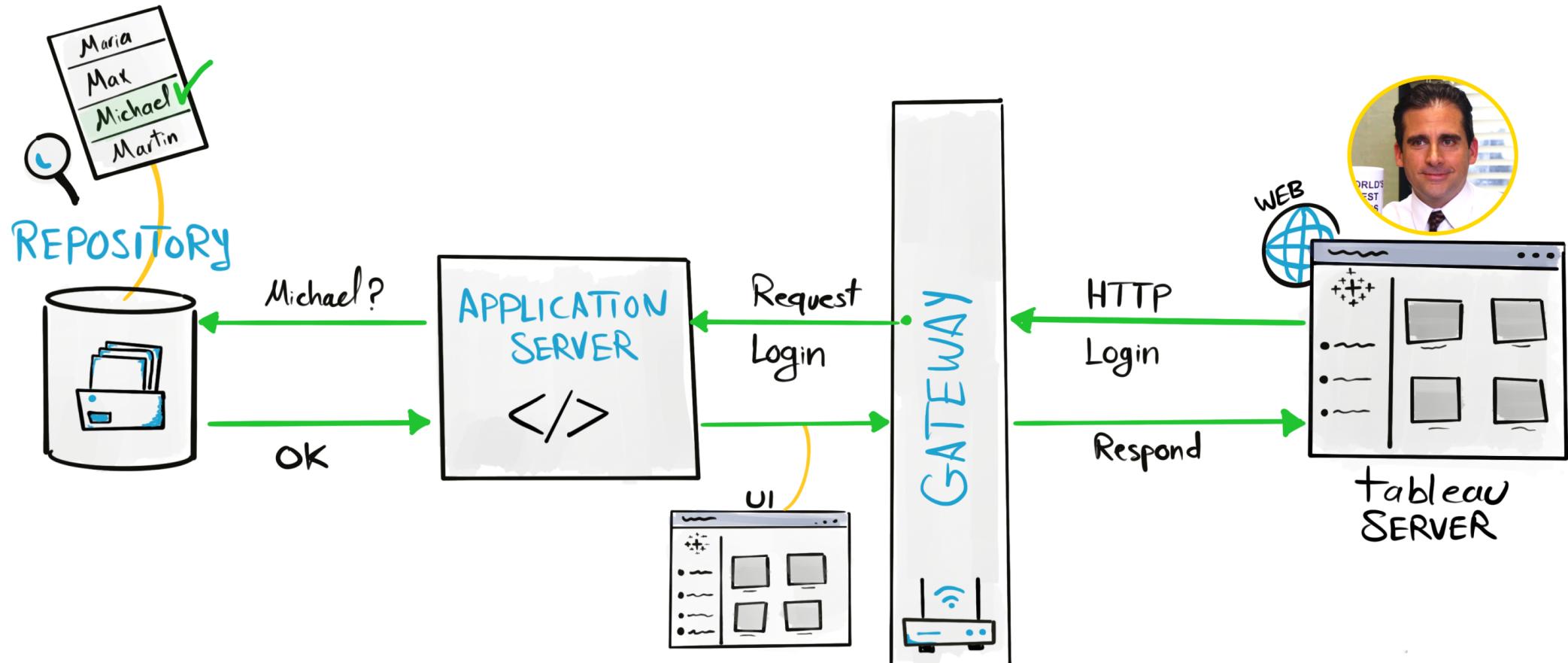


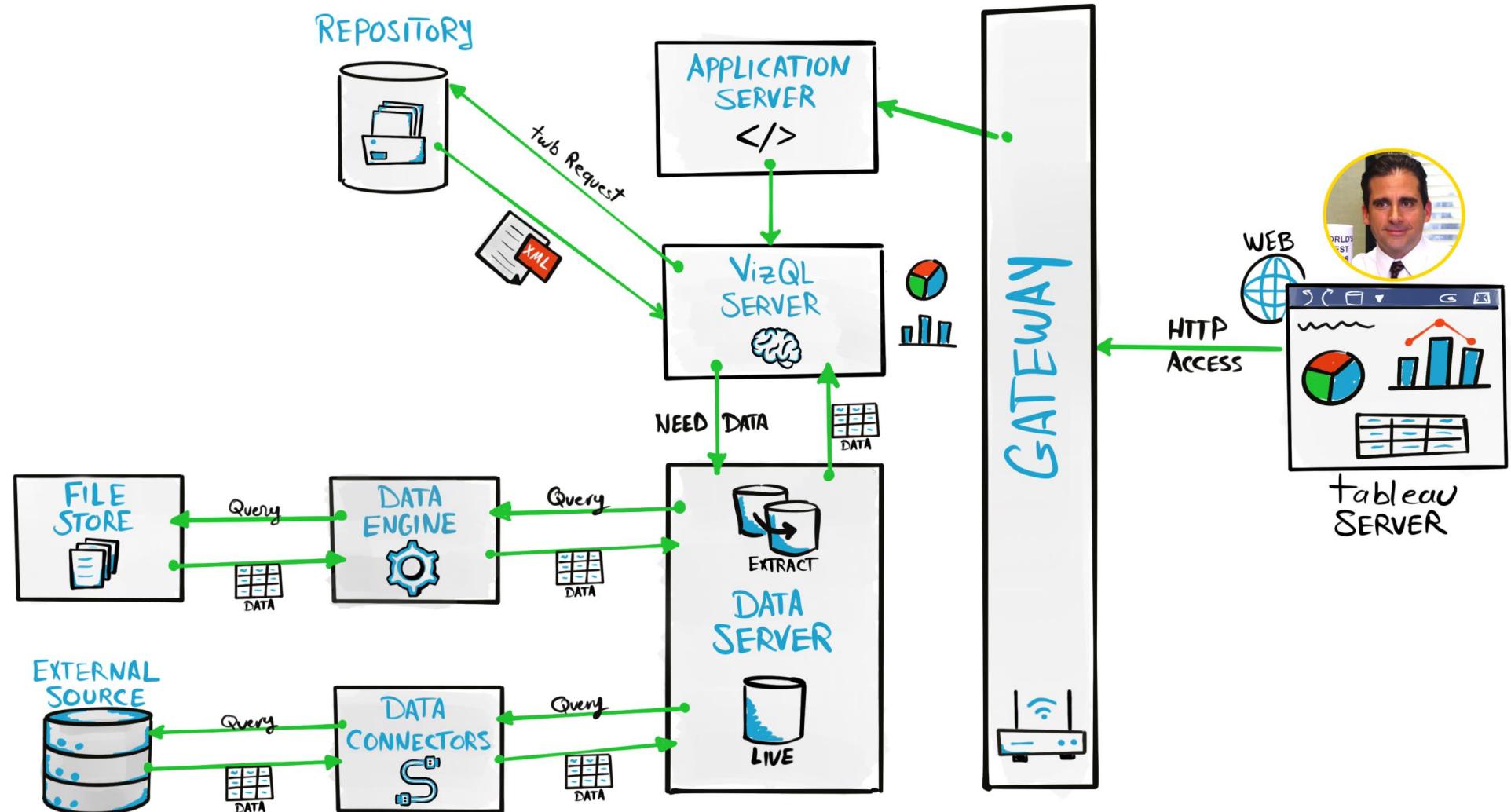
REPOSITORY

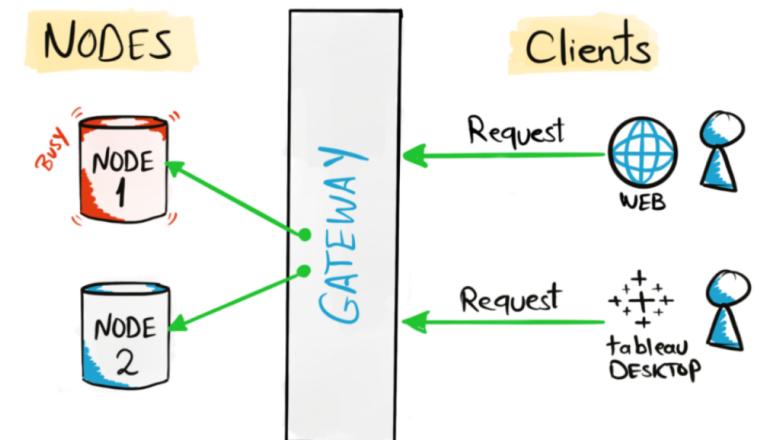
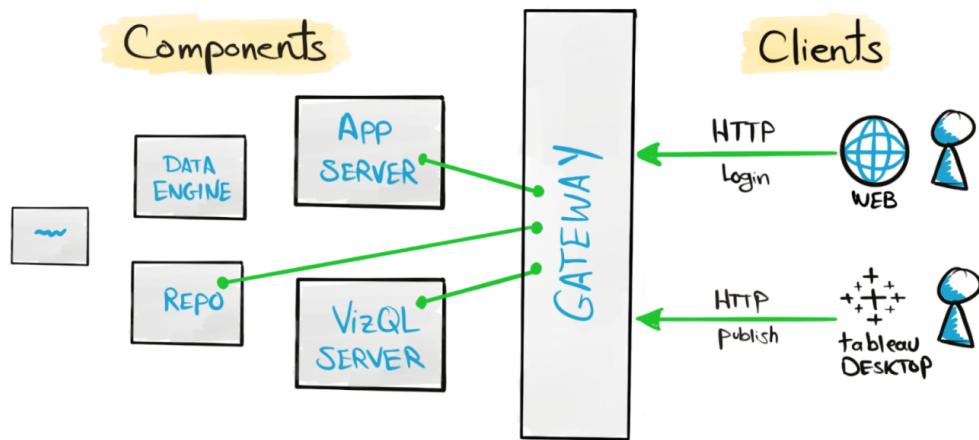
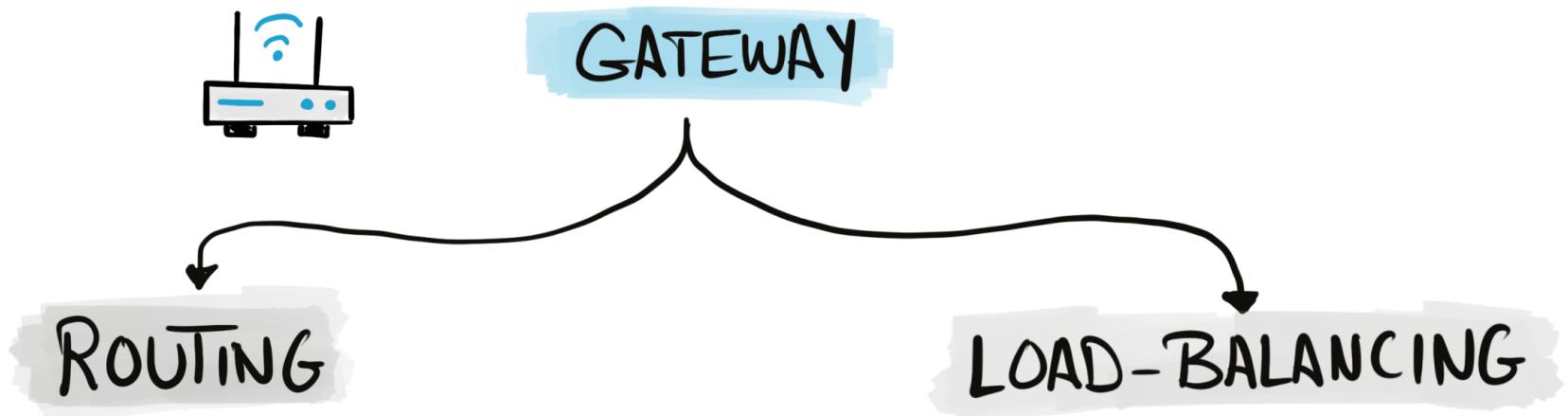




# Authenticate Process





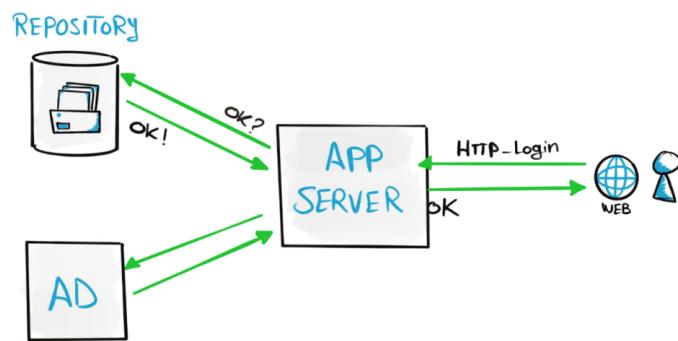




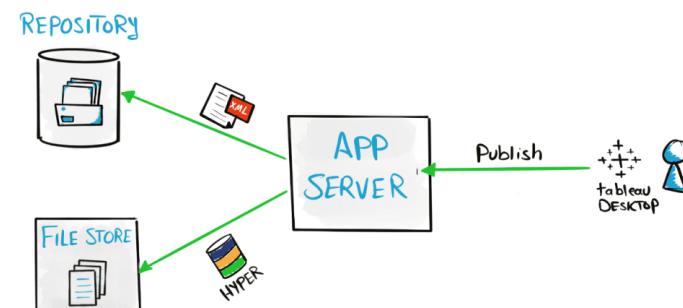
&lt;/&gt;

# APPLICATION SERVER

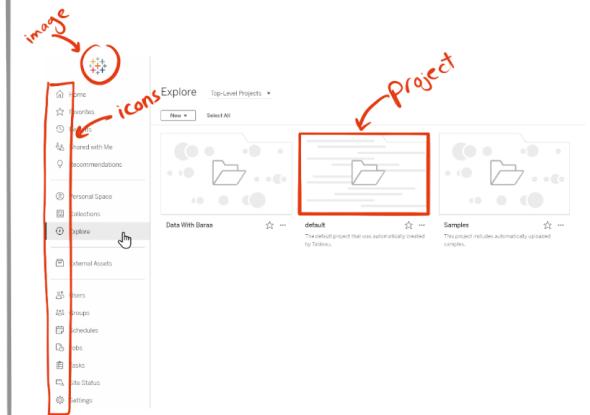
## Authentication & Authorisation



## Publishing

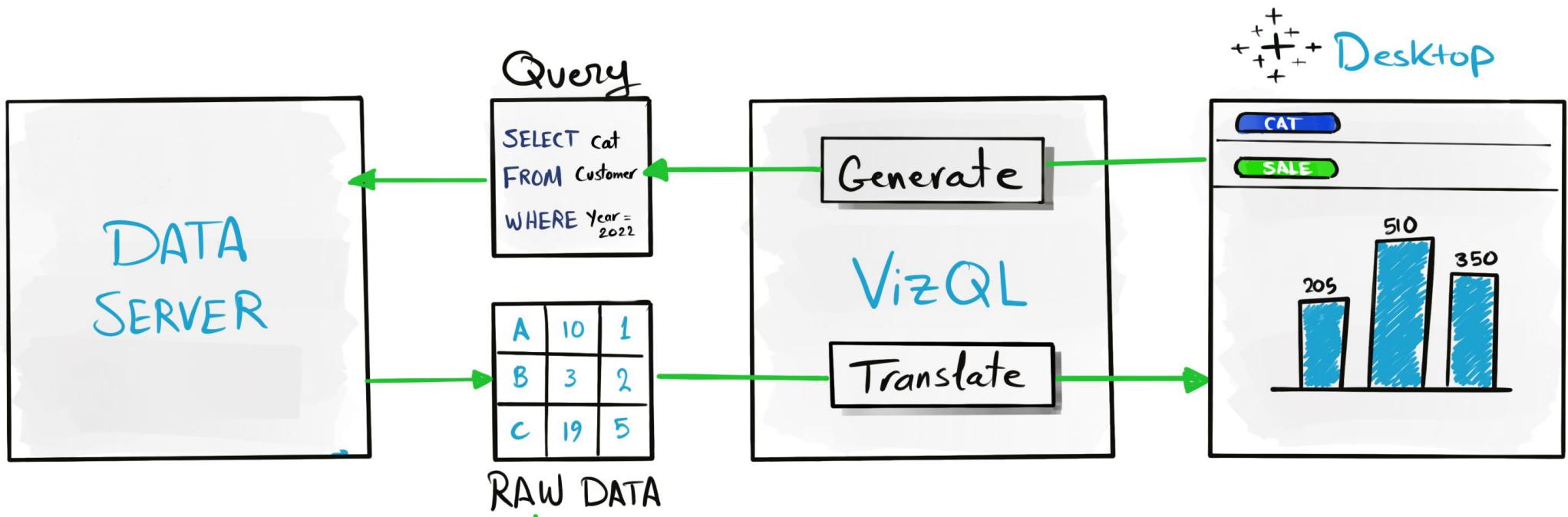


## UI Rendering



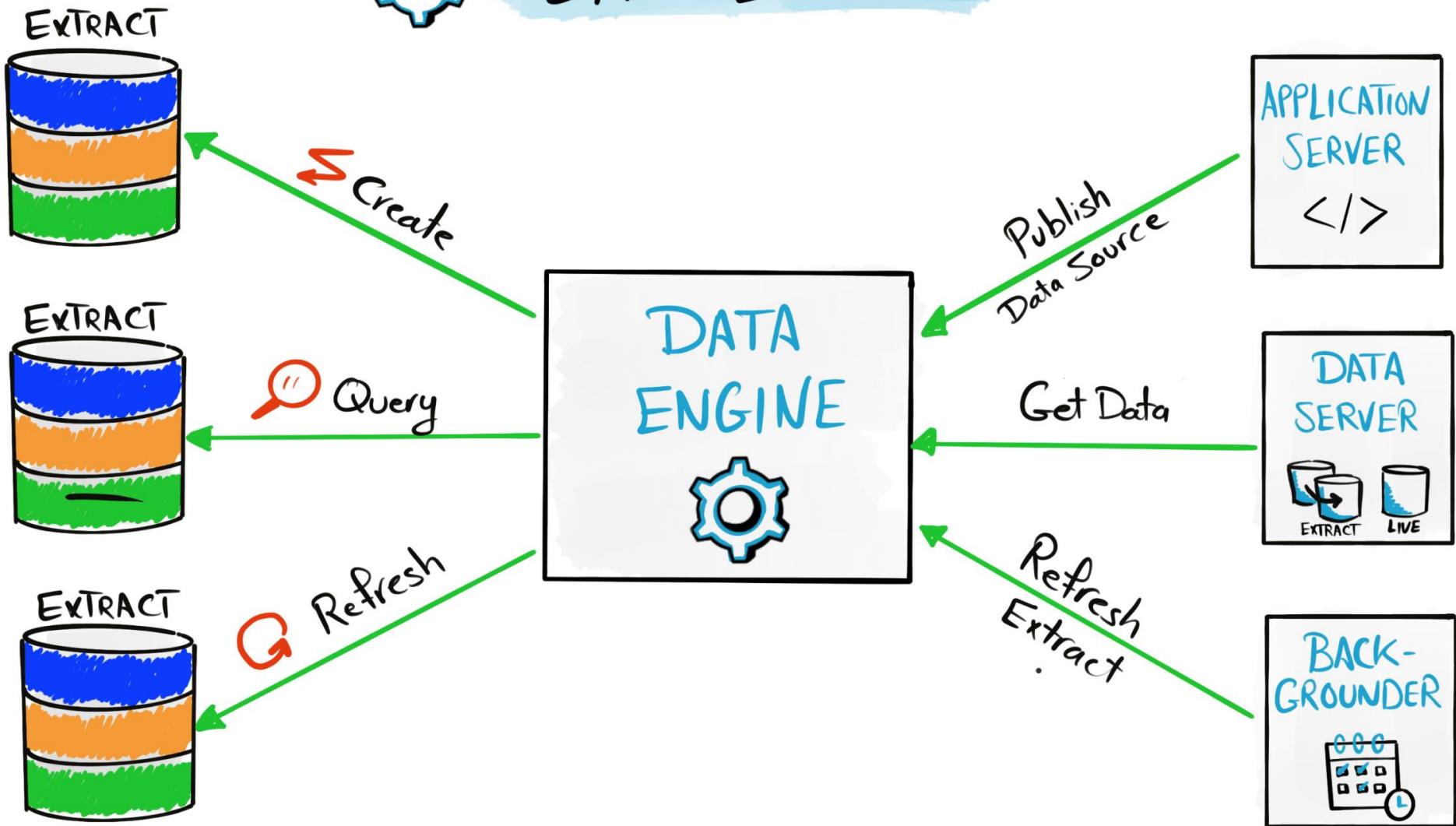


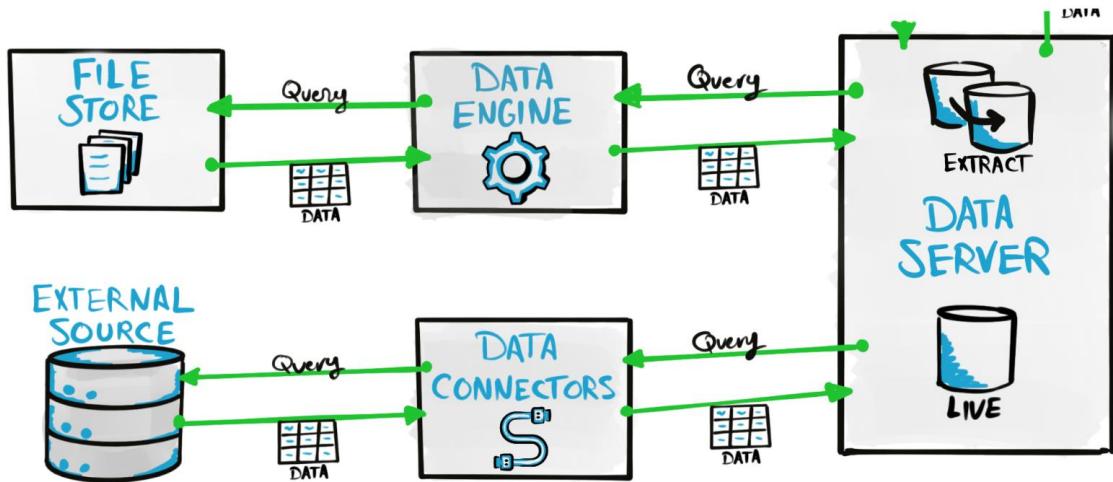
# VizQL SERVER





# DATA ENGINE





Manages EXTRACT & LIVE dataSources



Act as Proxy



Enforces data Security

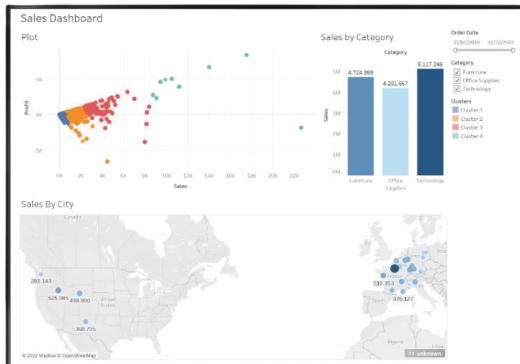


Driver deployment



# REPOSITORY

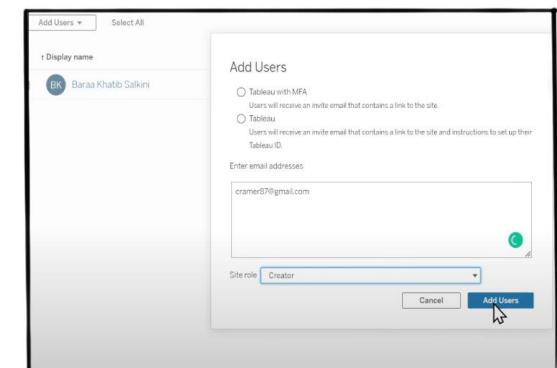
## WORKBOOK DATA



## USAGE DATA



## SECURITY DATA



```
<metadata class='column'>
  <name> Code </name>
  <type> Integer </type>
  <count> 631 </count>
</metadata>
```

SALES.TWB

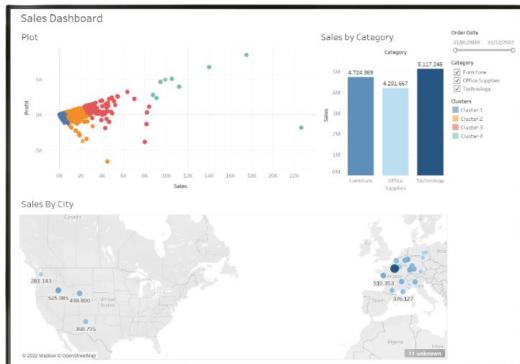
- Total active Users ?
- Total View Count ?
- Most used Data Sources

NAME	REPORT
John	Sales
Michael	Sales
Max	Finance



# REPOSITORY

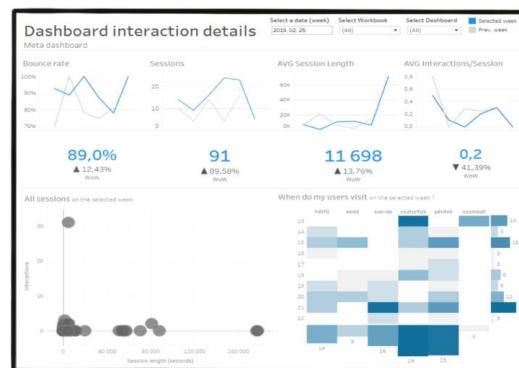
## WORKBOOK DATA



```
<metadata class='column'>
  <name> Code </name>
  <type> Integer </type>
  <count> 631 </count>
</metadata>
```

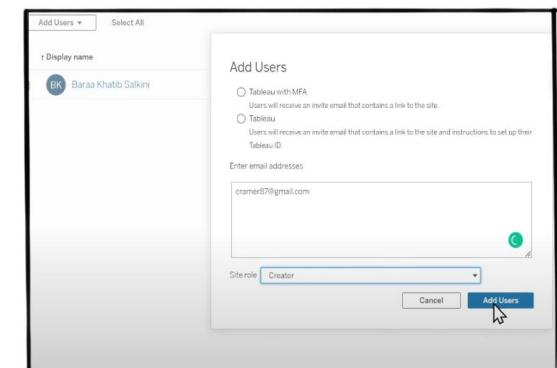
SALES.TWB

## USAGE DATA



- Total active Users ?
- Total View Count ?
- Most used Data Sources

## SECURITY DATA



NAME	REPORT
John	Sales
Michael	Sales
Max	Finance



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# Tableau Architecture

DATA WITH BARAA



SOURCE

MySQL Oracle

DB

Excel JSON  
File

AWS Azure  
Cloud

[API]

SERVER

REPOSITORY



SEARCH + BROWSE



APPLICATION SERVER



CACHE SERVER



BACK-GROUNDER



VizQL SERVER



FILE STORE



DATA ENGINE



DATA SERVER



GATEWAY



Copy

Query

Result

HTTP Publish

HTTP Access

CONSUMER

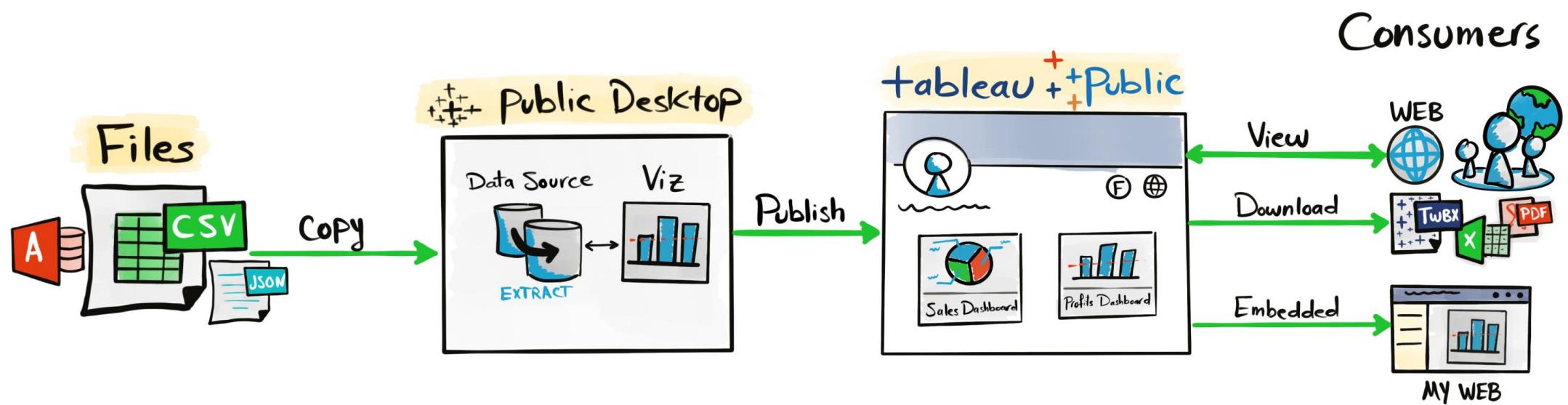
View  
Static - CONSUMERS  
WWW EXCEL PDF

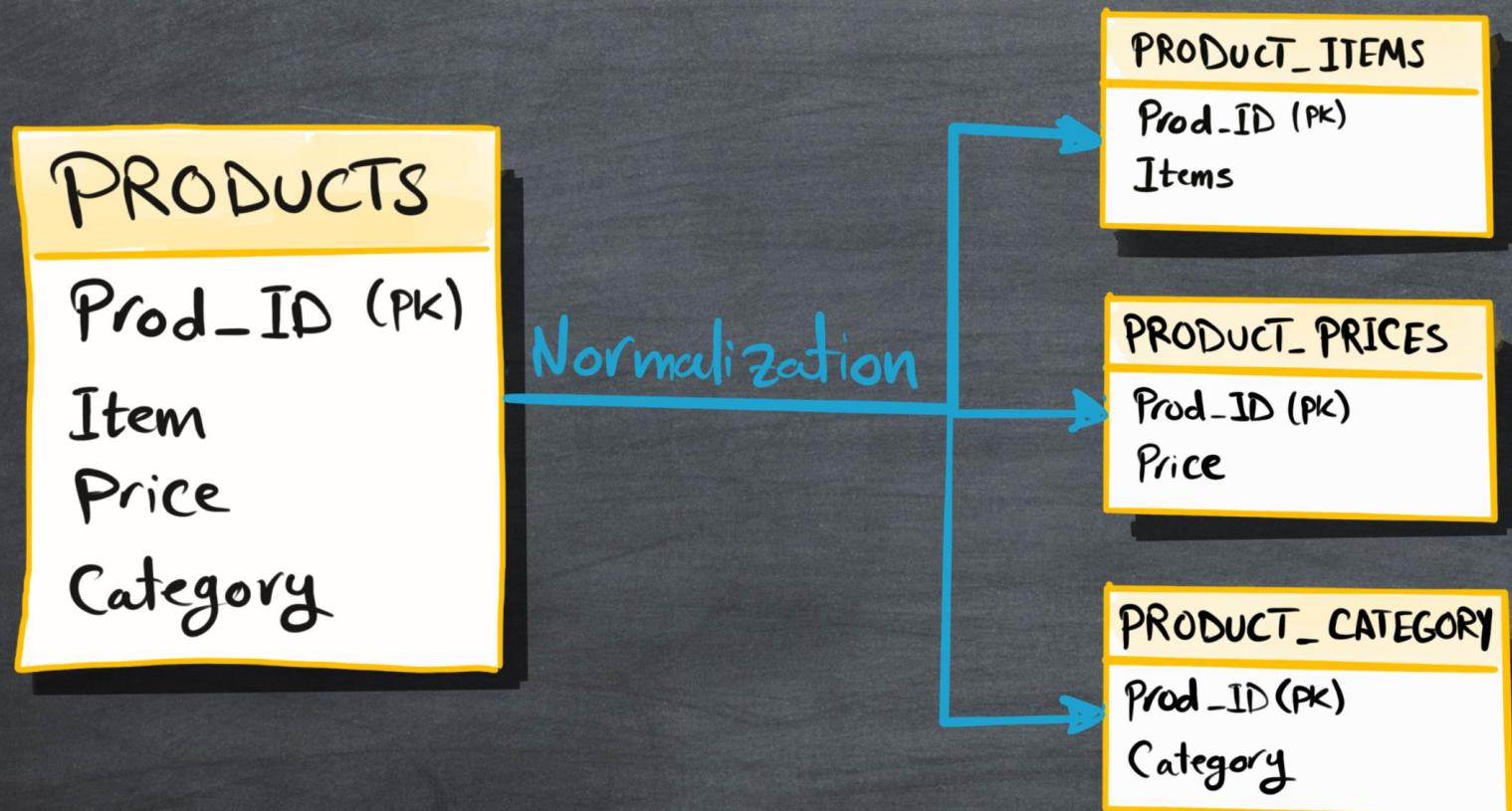
Dev  
Tableau DESKTOP

View  
Server - CONSUMERS  
WEB TABLEAU MOBILE



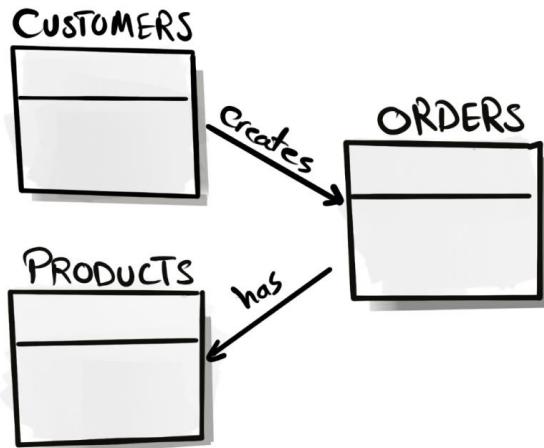
# Tableau Public Architecture



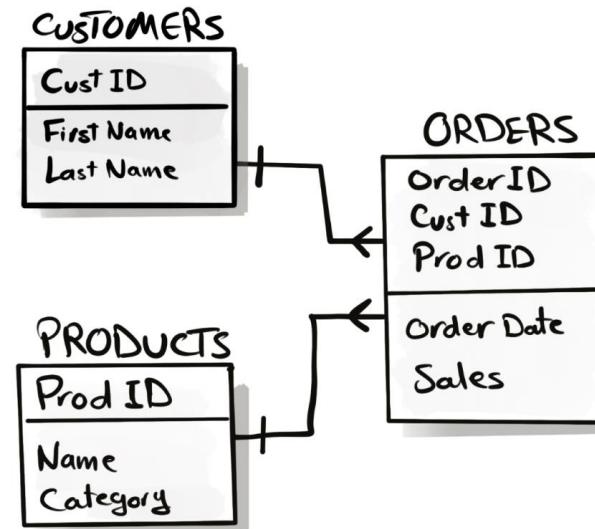




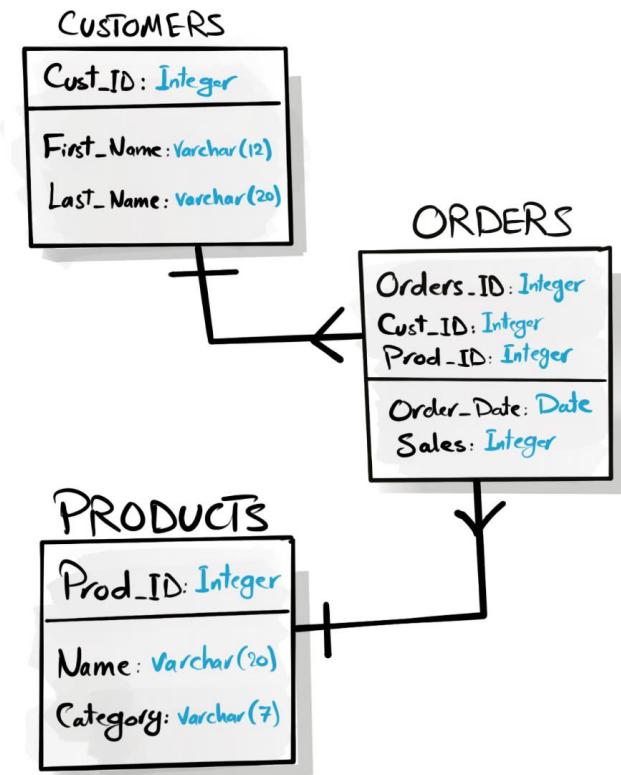
## Conceptual Data Model



## Logical Data Model

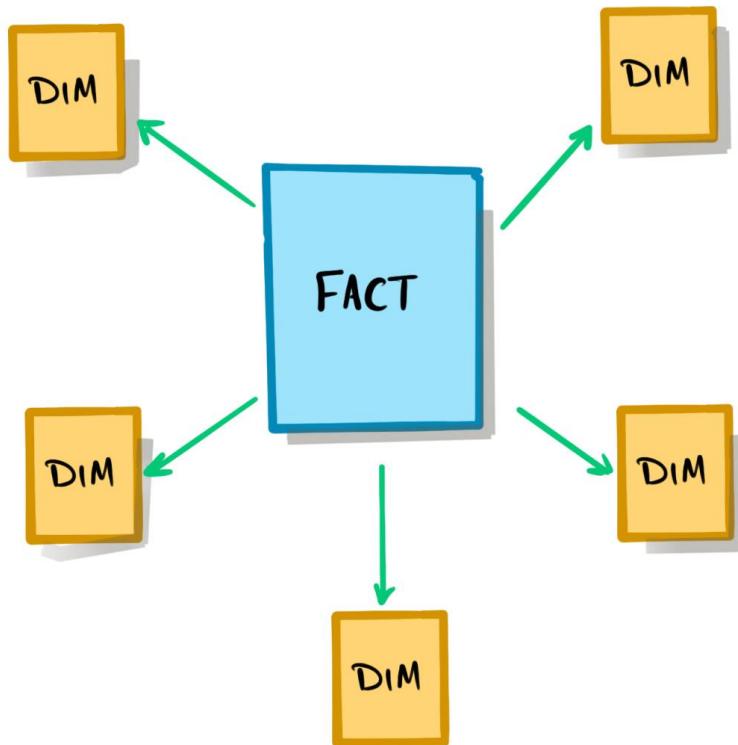


## Physical Data Model

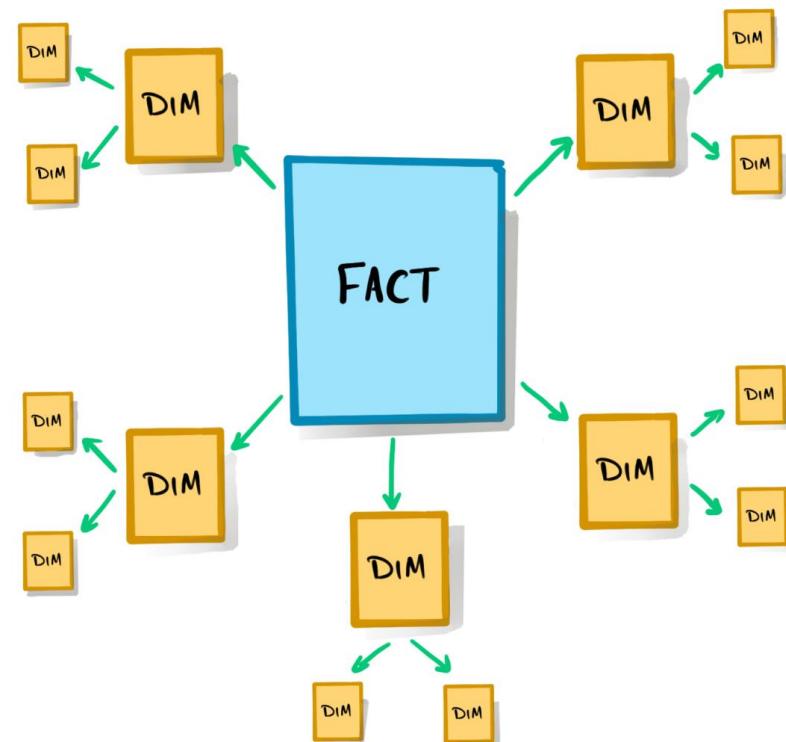




## STAR SCHEMA

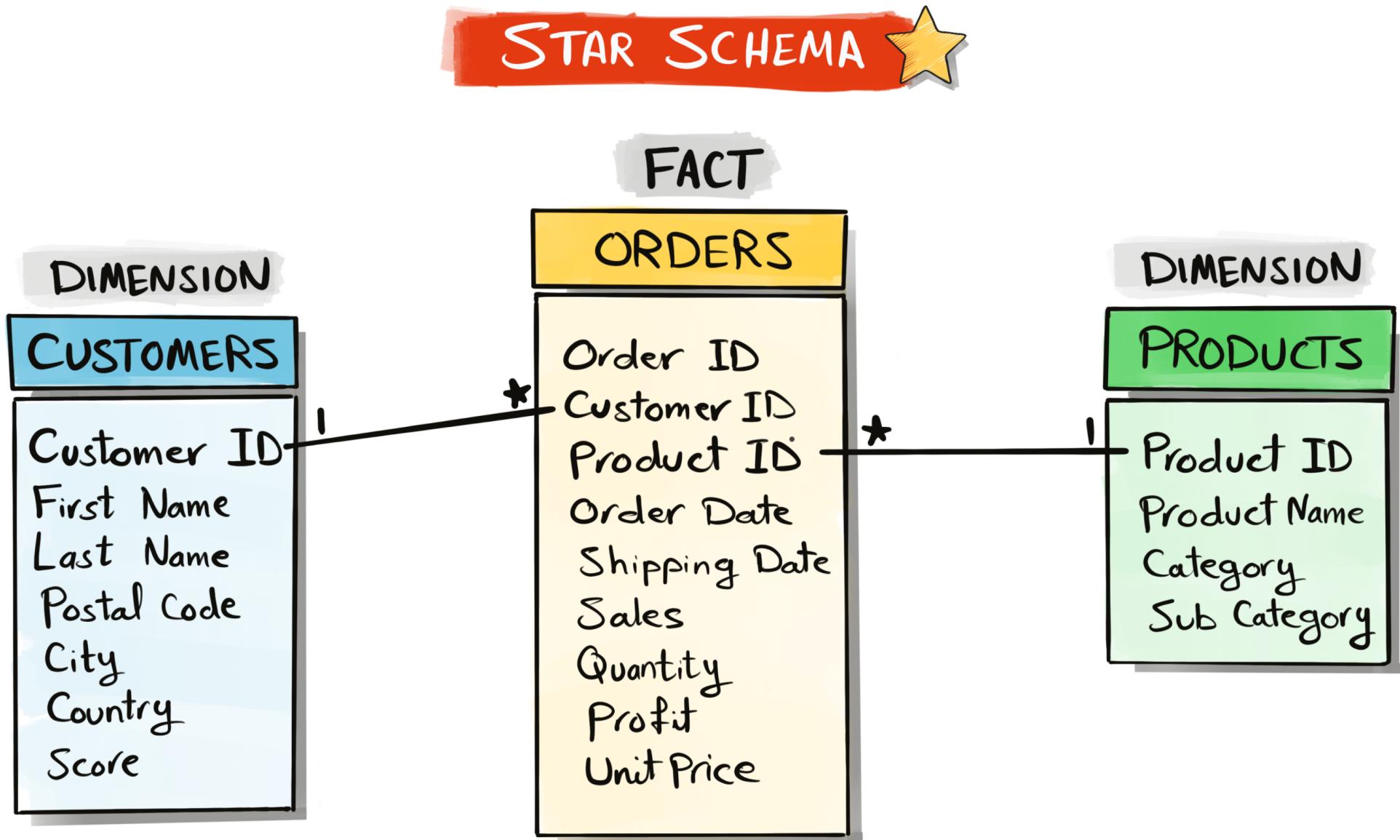


## SNOWFLAKE SCHEMA





## STAR SCHEMA





VIZ

DATA SOURCE

Physical Layer

Logical Table

Relationship

Logical Table

Physical Table

JOIN

Physical Table

JOIN

Physical Table

Physical Table

UNION

Physical Table

Logical Table

Logical Table

Logical Table

Physical Table

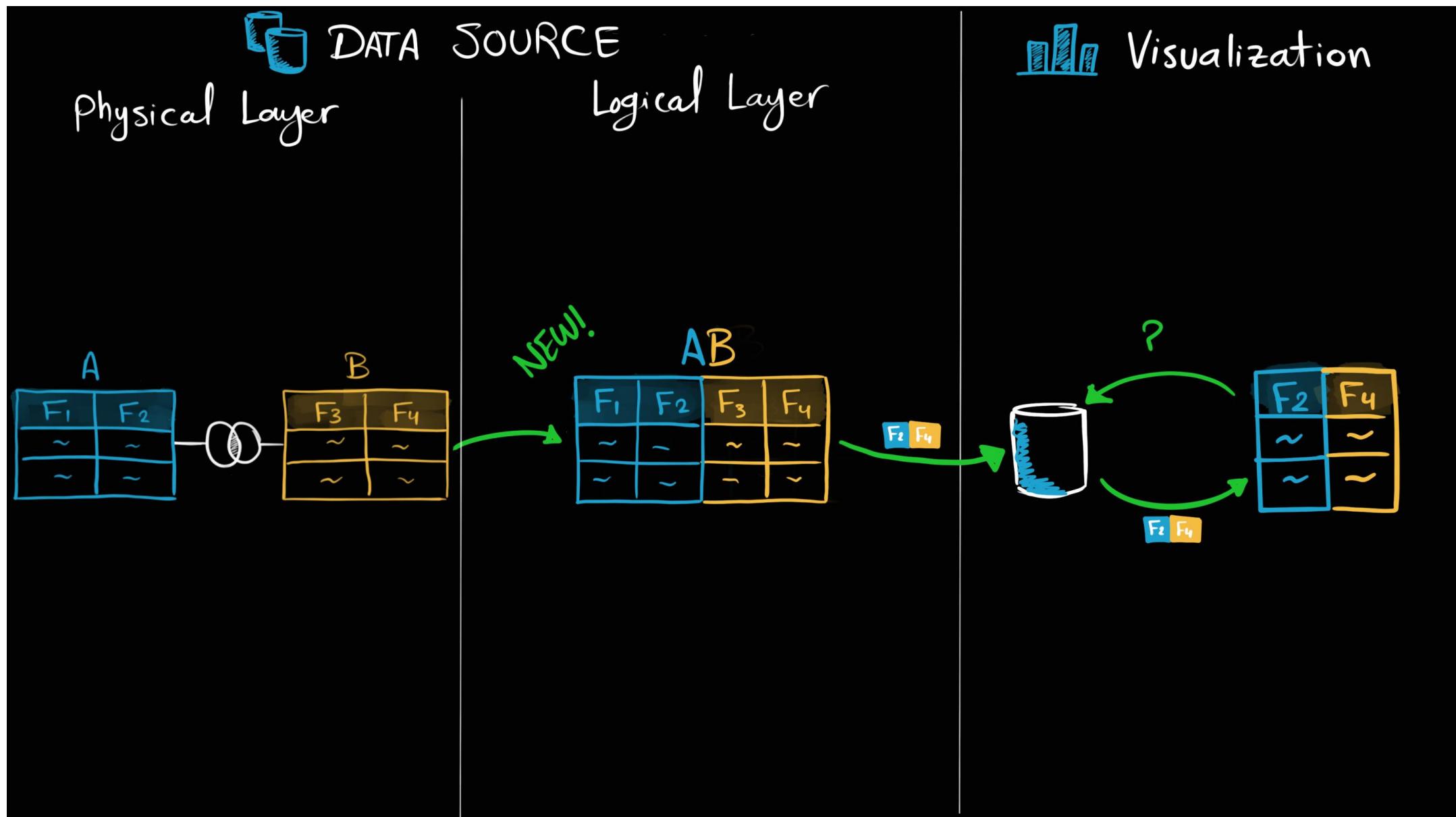
JOIN

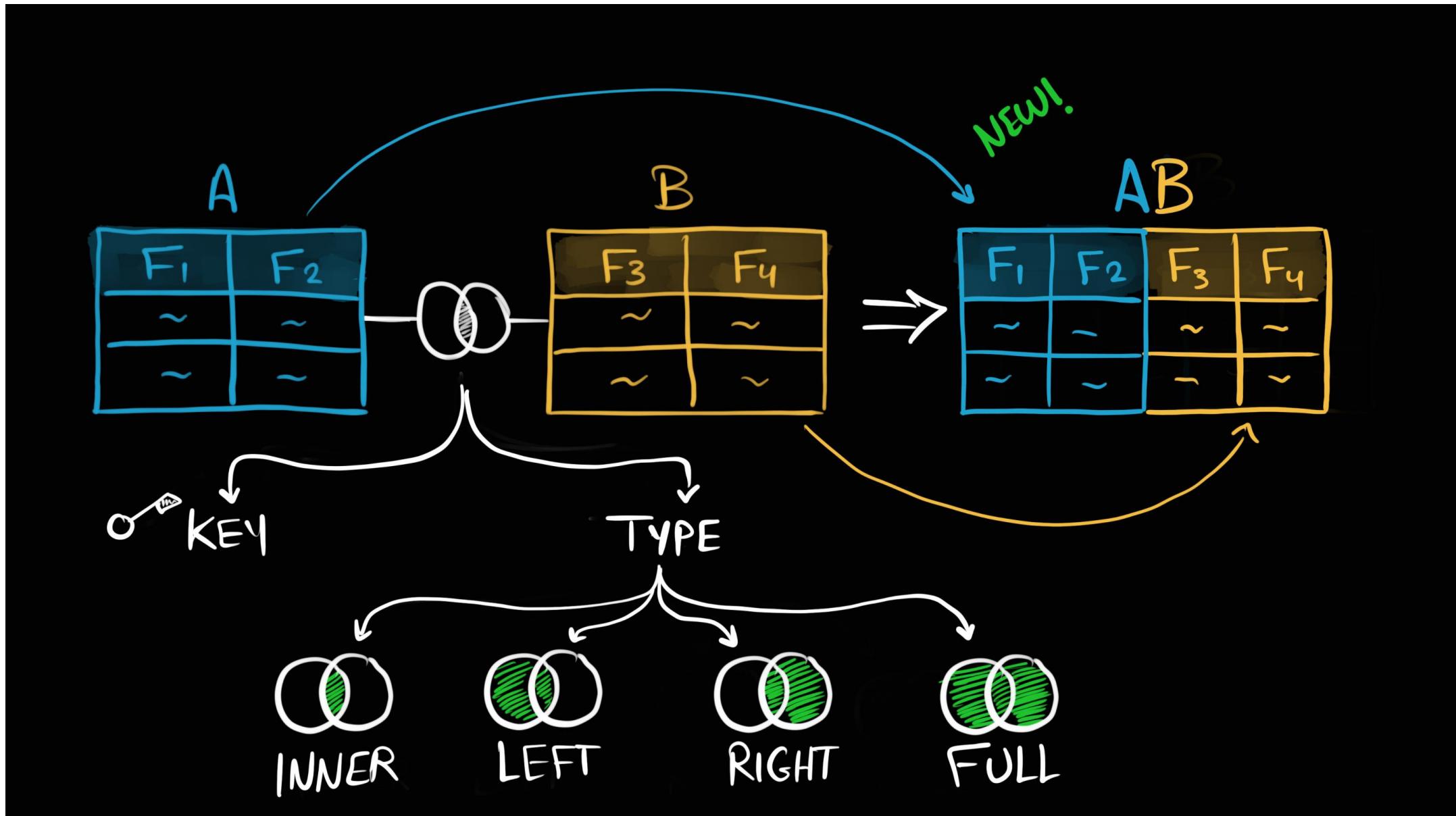
Physical Table

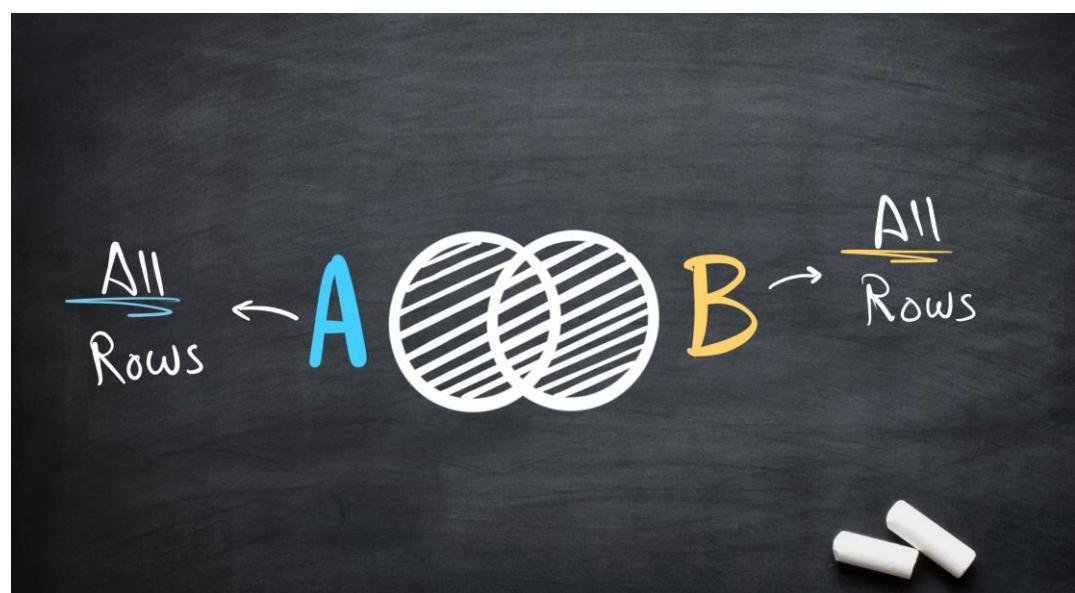
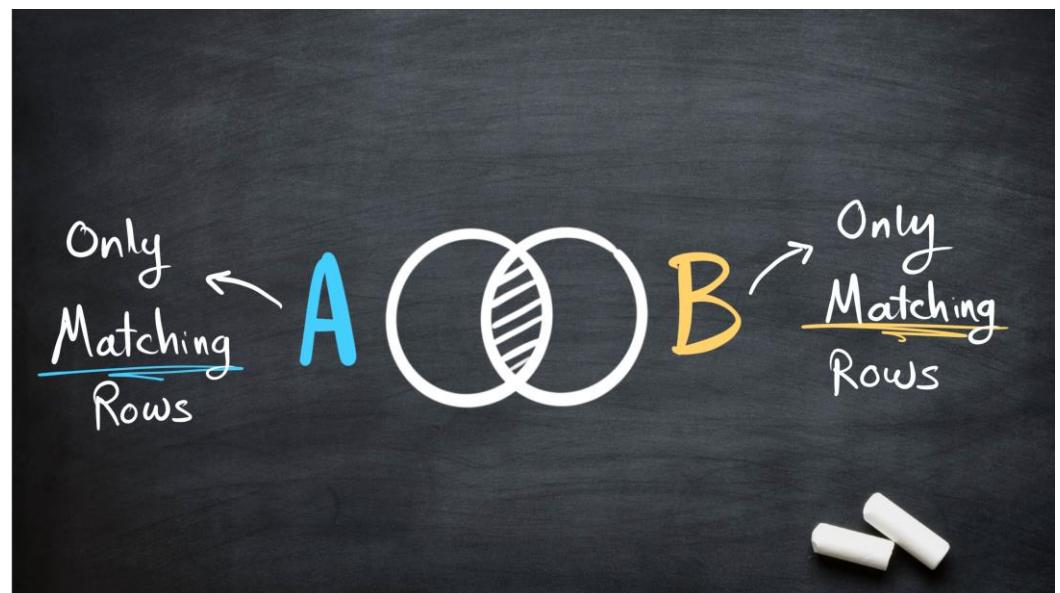
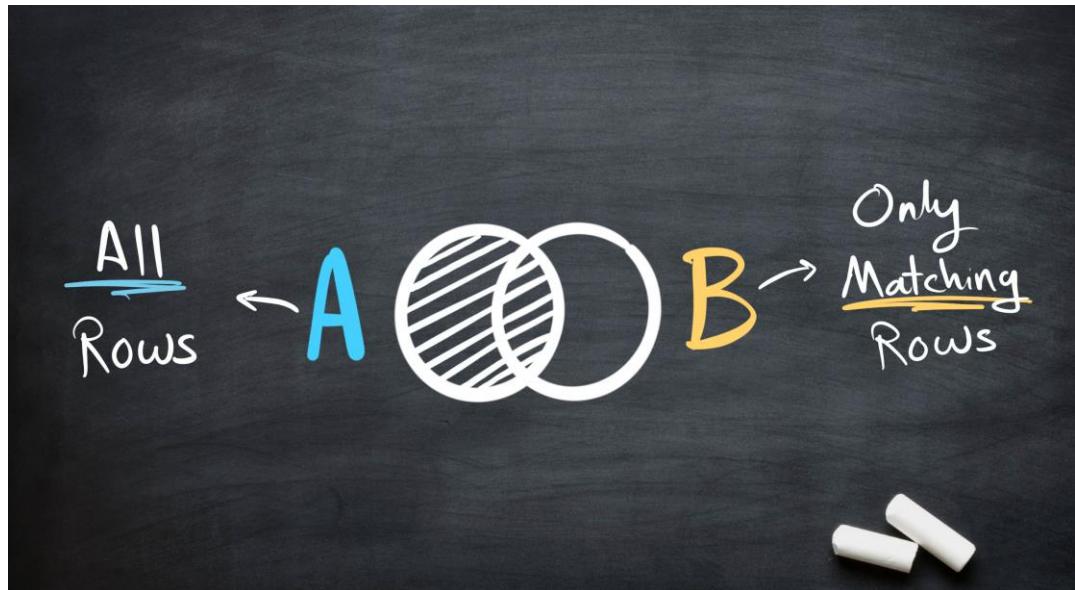
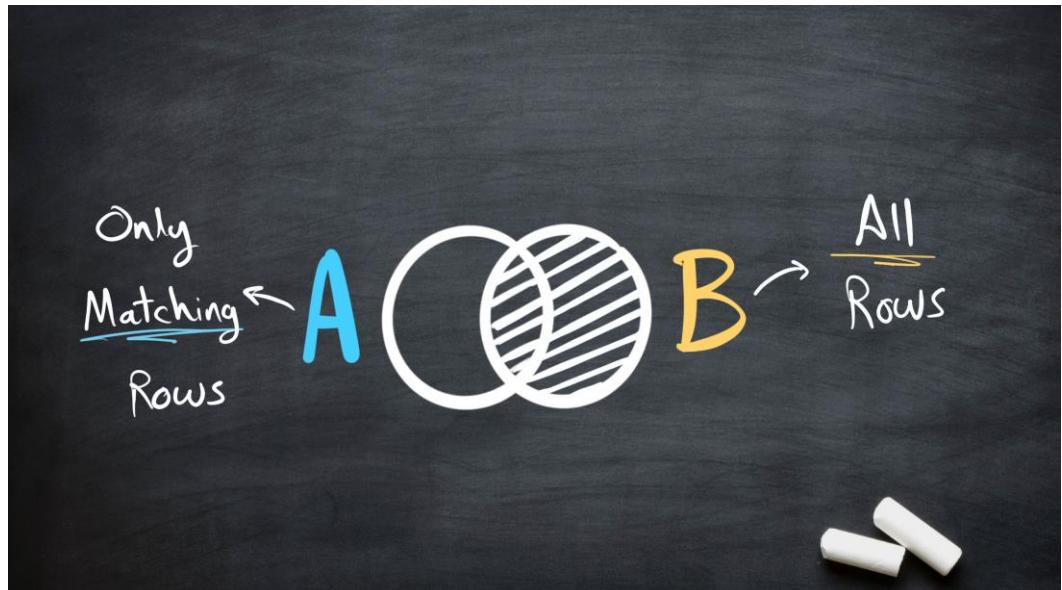


Blending

DATA WITH BARAA









## JOIN | How it Works



CustomerNames

ID	Name
1	Maria
2	John



CustomerAges

ID	Age
1	20
3	35



ID	Name	ID	Age
1	Maria	1	20



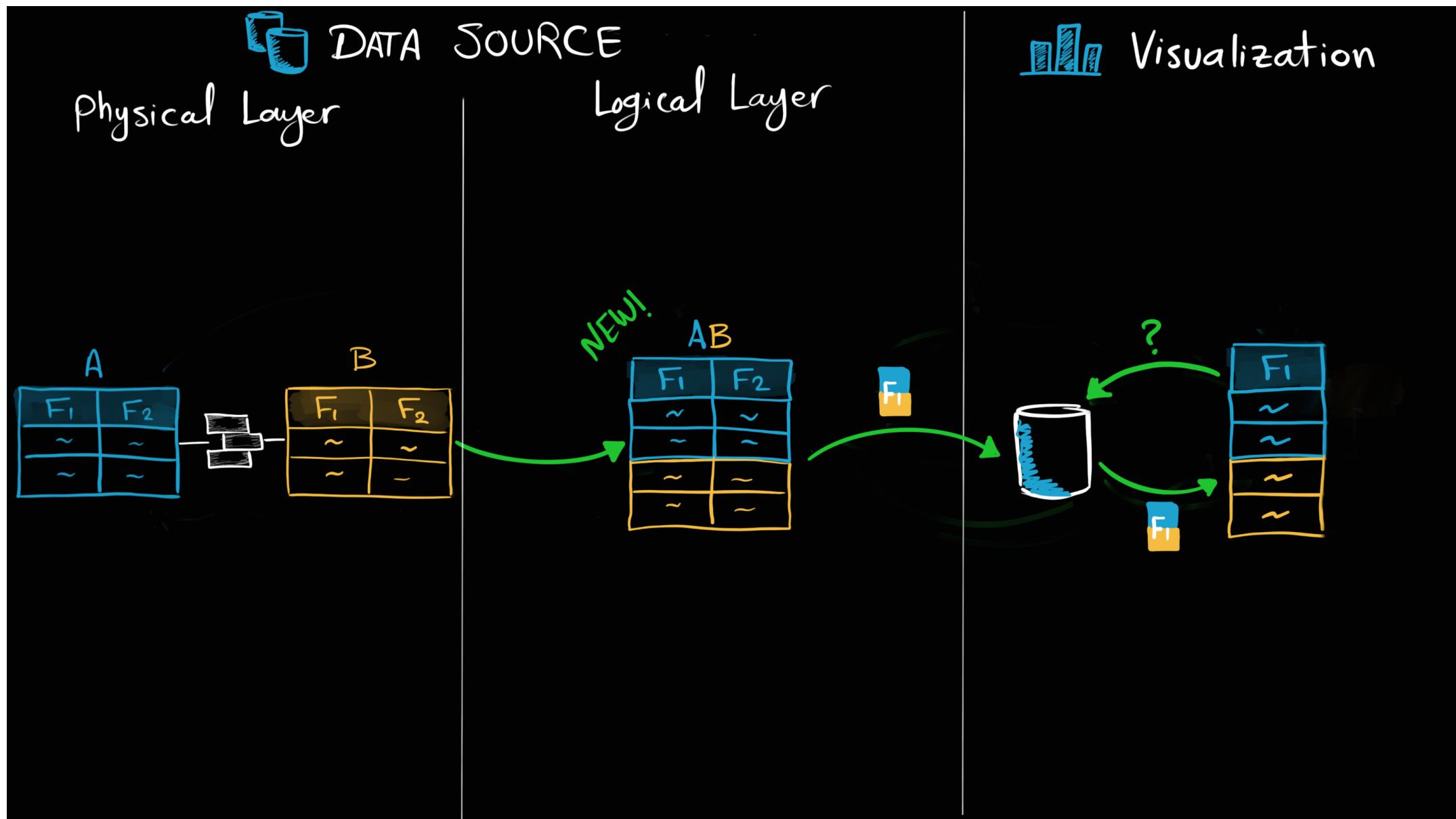
ID	Name	ID	Age
1	Maria	1	20
2	John	NULL	NULL



ID	Name	ID	Age
1	Maria	1	20
NULL	NULL	3	35

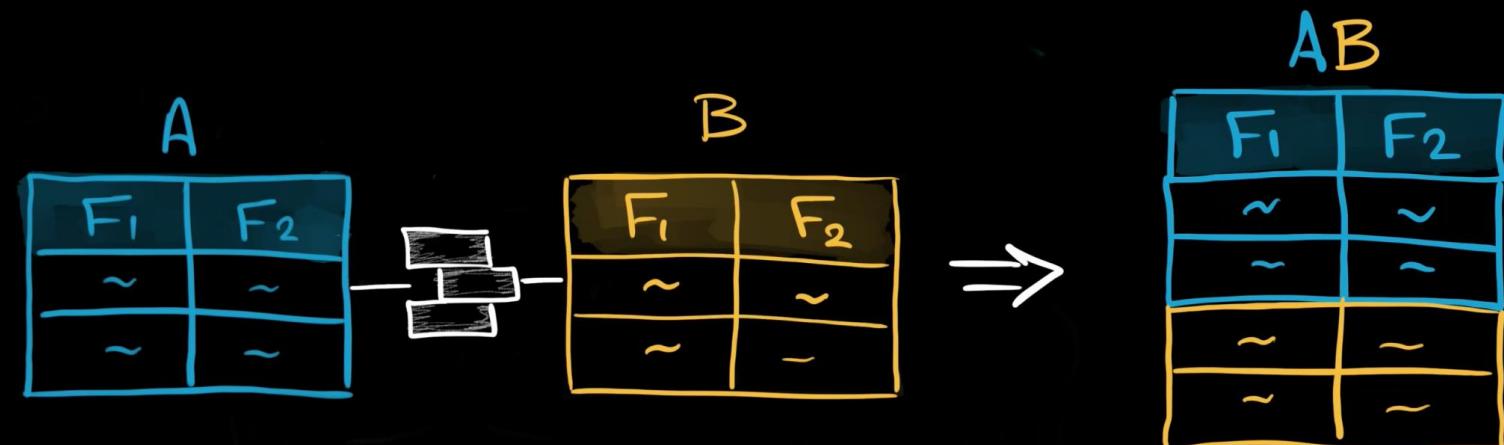
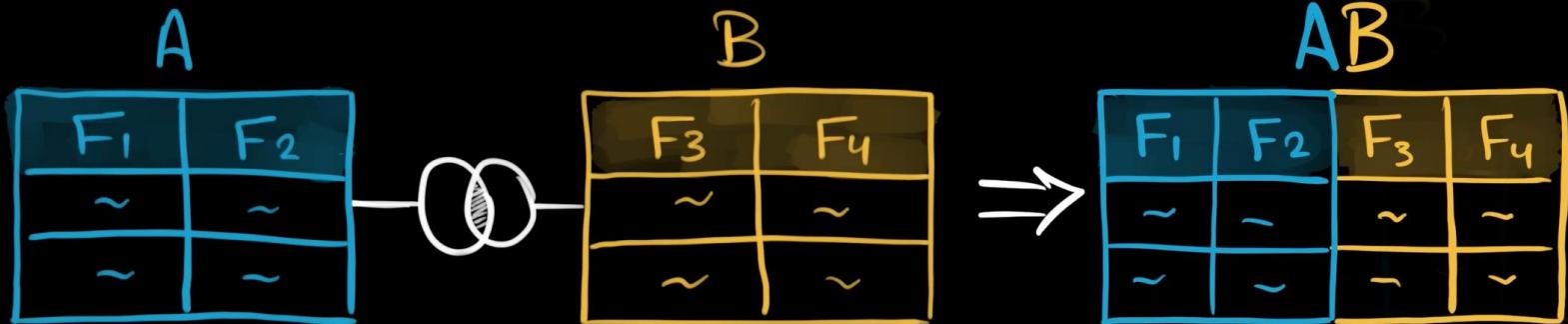


ID	Name	ID	Age
1	Maria	1	20
2	John	NULL	NULL
NULL	NULL	3	35





*JOIN Combine the FIELDS of two Tables*



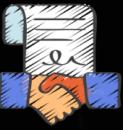
*UNION Combine the ROWS of two Tables*



DATA SOURCE  
Logical Layer

A

F <sub>1</sub>	F <sub>2</sub>
~	~
~	~

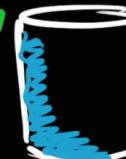


B

F <sub>3</sub>	F <sub>4</sub>
~	~
~	~

F<sub>4</sub>F<sub>1</sub>

Visualization



?

F<sub>1</sub> F<sub>4</sub>

F <sub>1</sub>	F <sub>4</sub>
~	~
~	~



## LEFT TABLE

Some Record Match

All Record Match

Some Record Match

All Record Match

## RIGHT TABLE

Some Record Match

Some Record Match

All Record Match

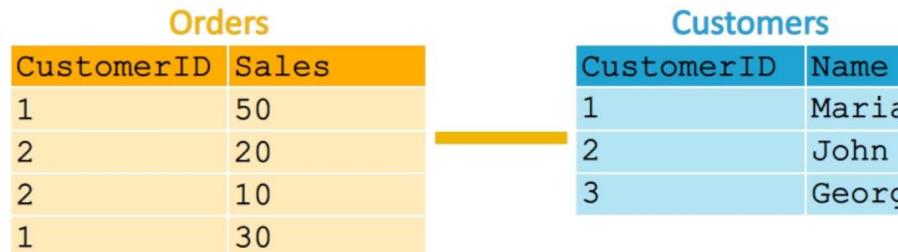
All Record Match

## JOIN TYPES





# Relationships | How it Works



MANY-MANY

CustomerID	Sum(Sales)	Name
1	80	Maria
2	30	John

MANY-ONE

CustomerID	Sum(Sales)	Name
1	80	Maria
2	30	John

ONE-MANY

CustomerID	Sum(Sales)	Name
1	50	Maria
2	20	John

ONE-ONE

CustomerID	Sum(Sales)	Name
1	50	Maria
2	20	John

## Correctness Performance

OK	NOK
----	-----

## Cardinality

MANY	MANY
------	------

OK	OK
----	----

MANY	ONE
------	-----

NOK	NOK
-----	-----

ONE	MANY
-----	------

NOK	OK
-----	----

ONE	ONE
-----	-----



DATA SOURCE  
Logical Layer

A

F <sub>1</sub>	F <sub>2</sub>
~	~
~	~
~	~

B

F <sub>3</sub>	F <sub>4</sub>
~	~
~	~
~	~

F<sub>1</sub>F<sub>4</sub>

Primary

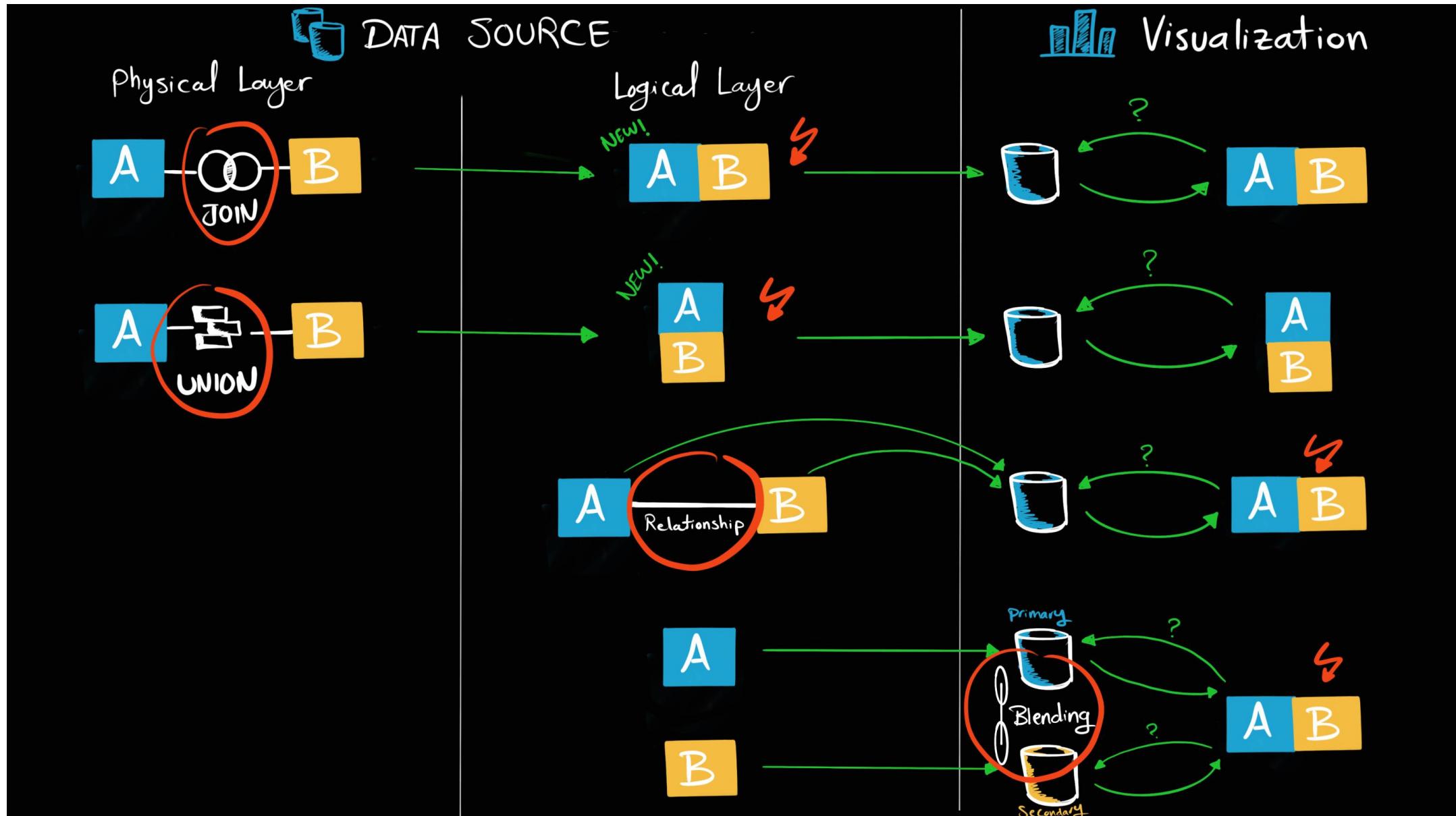
Secondary

Visualization

LEFT JOIN

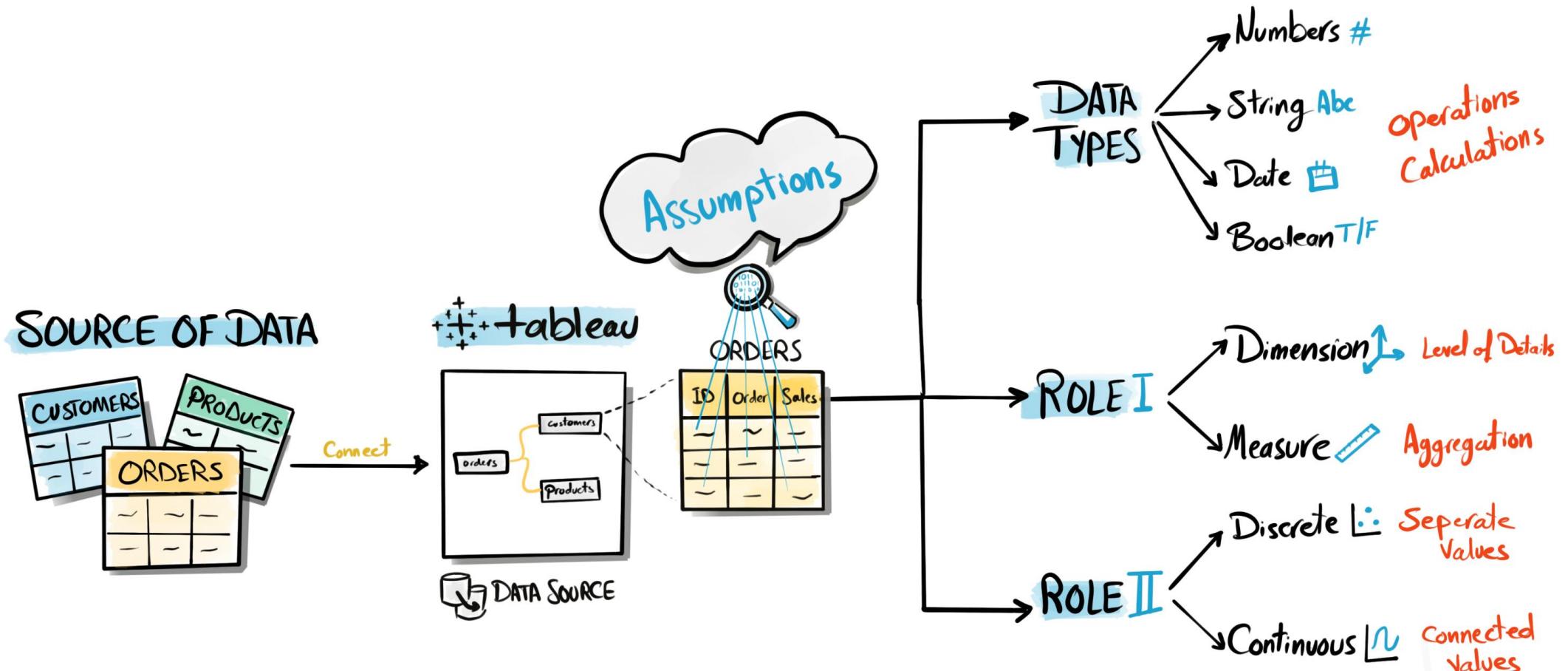
F <sub>1</sub>	F <sub>4</sub>
~	~
~	~
~	~

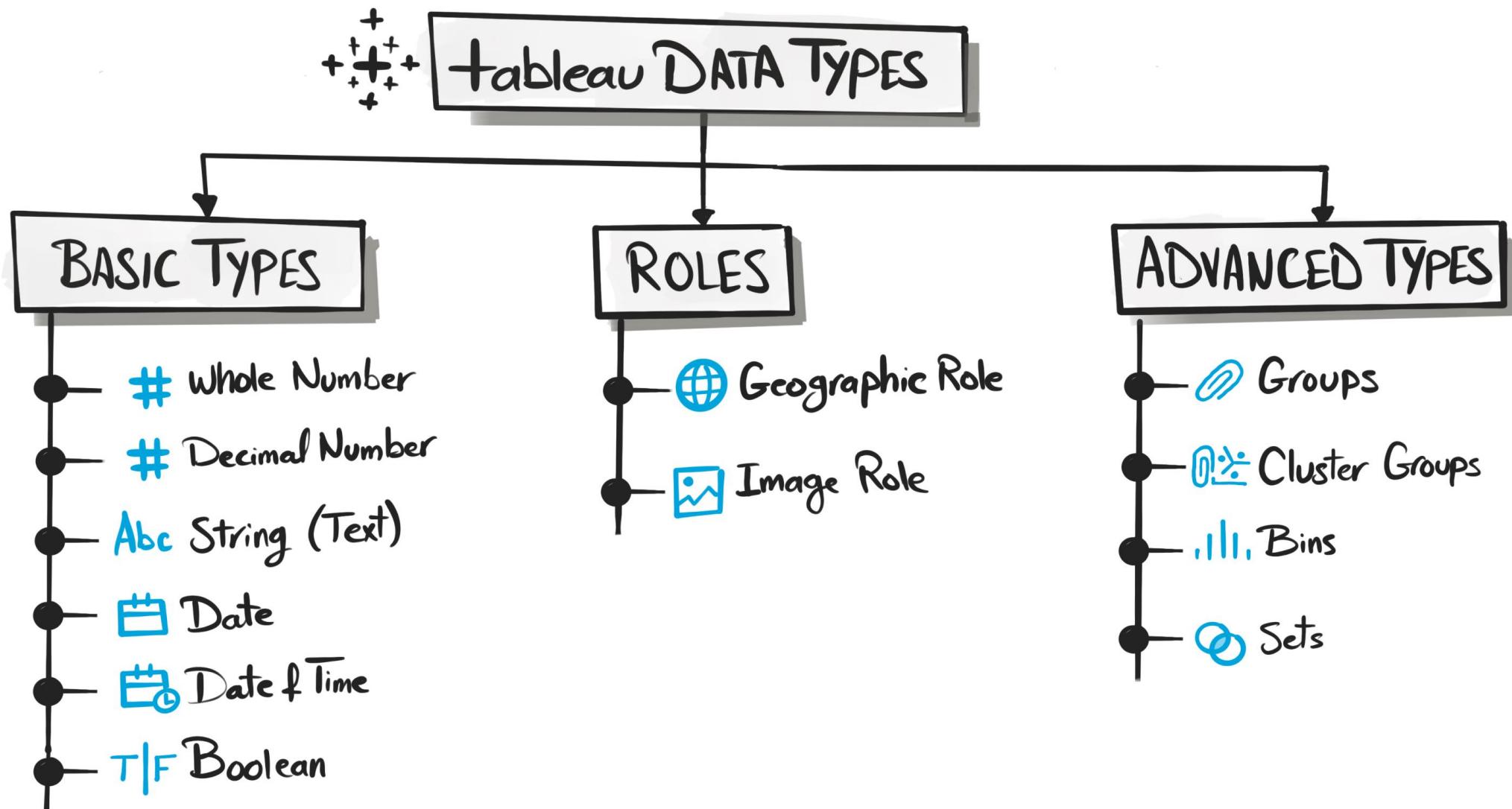
F<sub>1</sub>F<sub>4</sub>

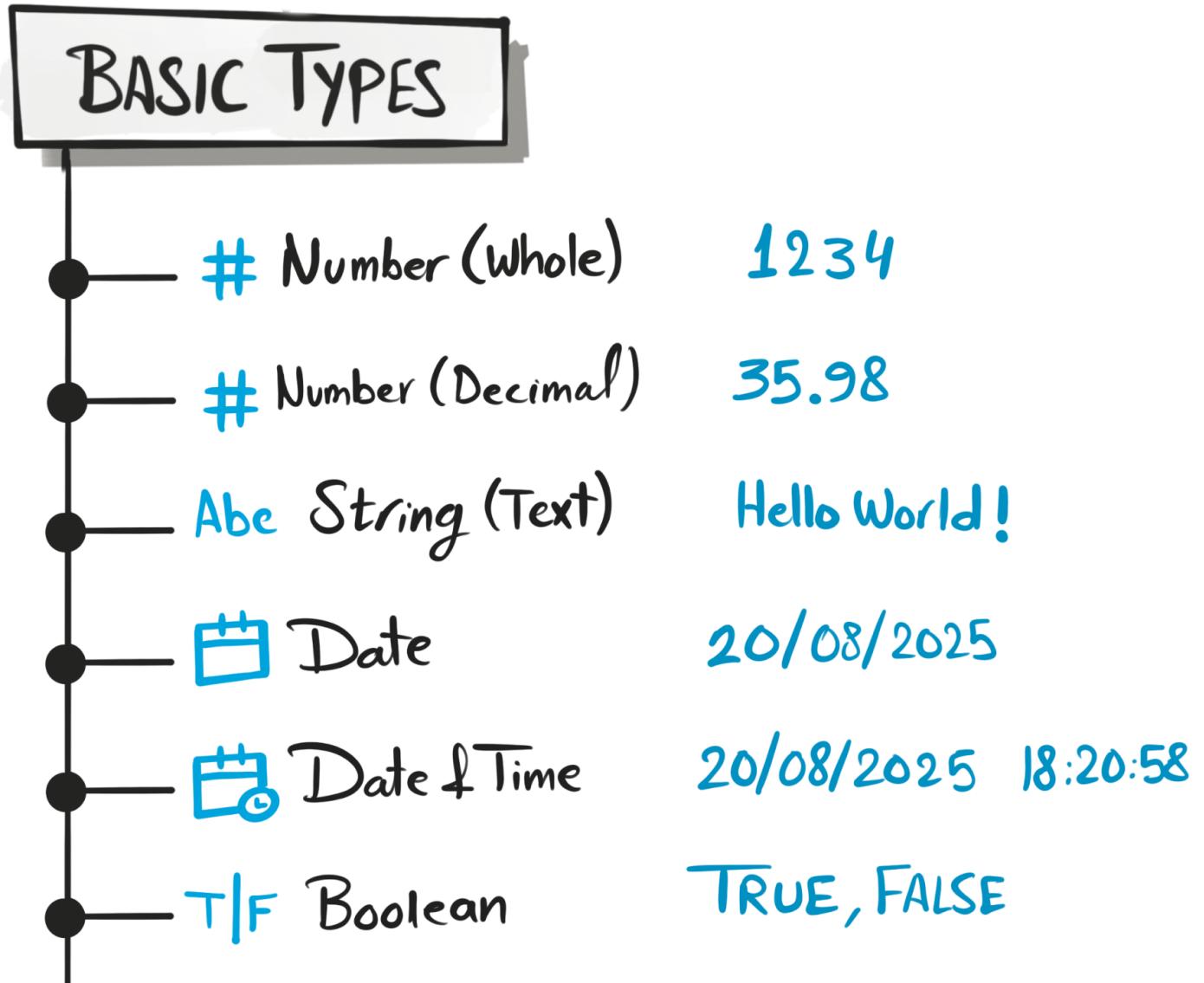


**UNION****JOINS****RELATIONSHIP****BLENDING**

Layer	Physical Layer	Physical Layer	Logical Layer	Visualization Level
	X	X	X	
			X	X
	Static	Static	Flexible	Very Flexible (Page by Page)
	n/a	Inner, Left, Right, Full	All	Left
	n/a	3	1 (Default)	2

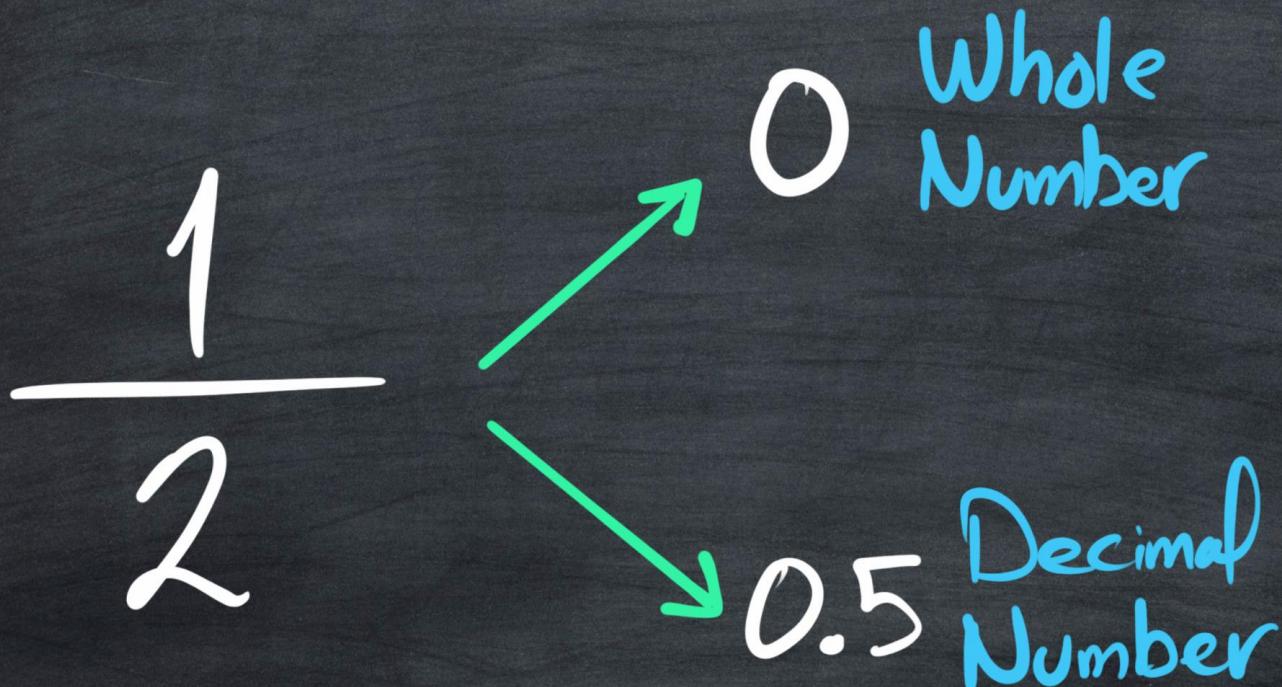








#





Abc

A B x ≤ 1 3 5 \$ ?

↑  
White  
Space



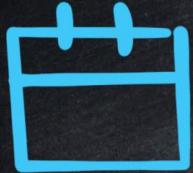


# Abc

A B x ≤ 1 3 5 \$ ?

White  
Space



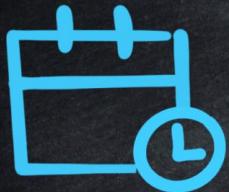


DATE

2025 - 08 - 20  
Y Y Y Y - M M - d d

DATE FORMAT





DATE

2025 - 08 - 20  
Y Y Y Y - M M - d d

DATE FORMAT

TIME

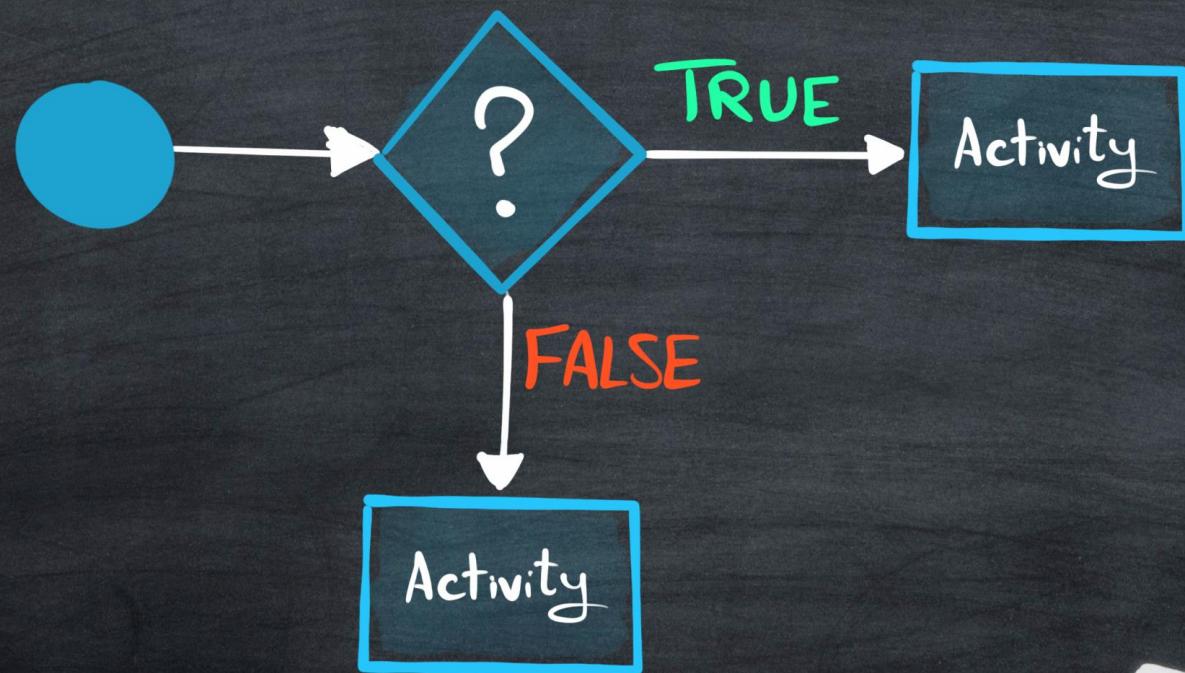
18 : 48 : 53  
H H : M M : S S

TIME FORMAT





T|F

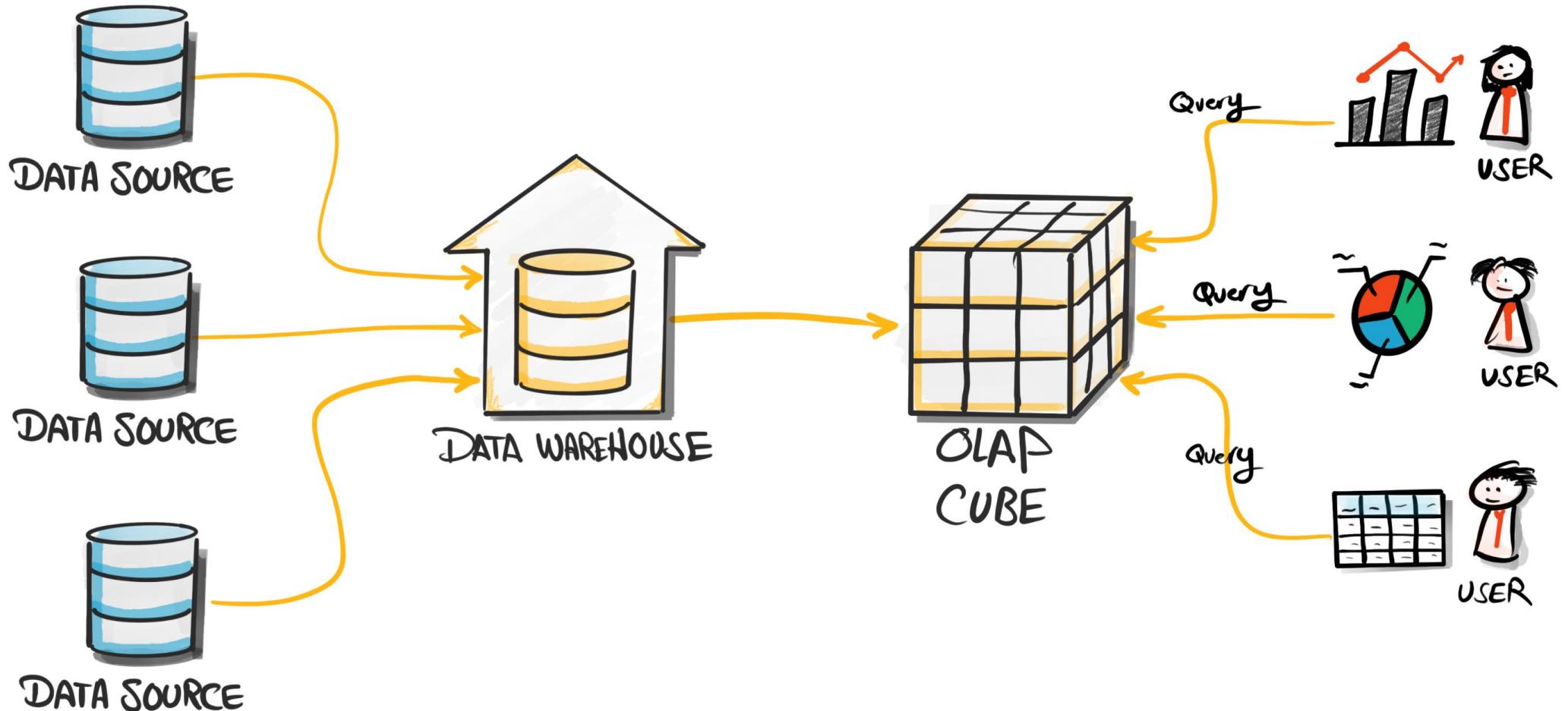


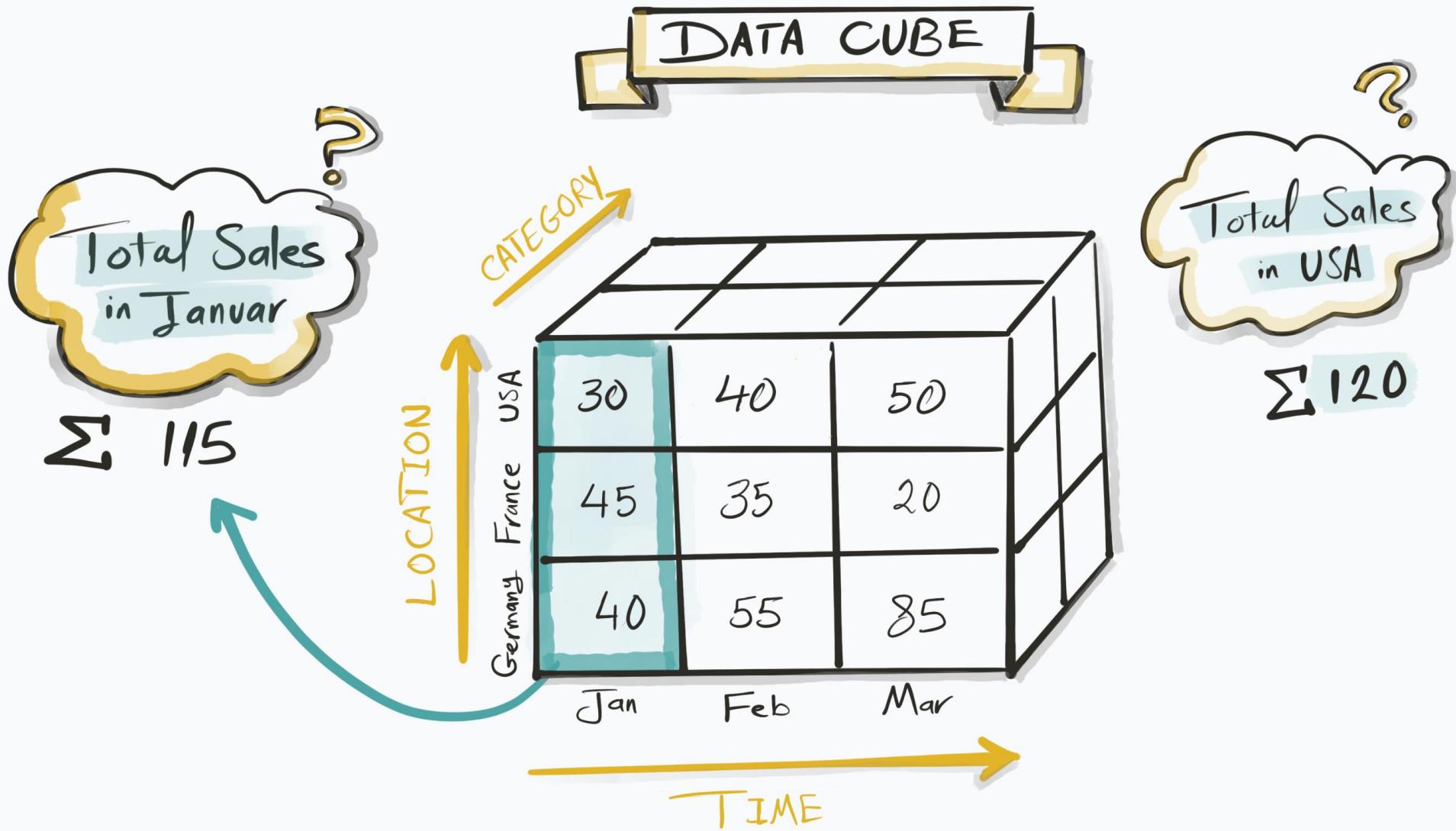


+ a b | e a u

# Online Analytical Processing (OLAP)

DATA WITH BARAA







Is Data Type = Number?

YES

NO

Does it make sense  
to aggregate?

Dimension

YES

NO

MEASURE

Dimension



tableau

Definition

Example

Aggregation

Data Types

Role of Analysis

Granularity

## Dimensions

Descriptive Values

Category, Country, ID

Can Not be aggregated

[String, Date, Boolean, Number]  
Abe □ TIF #

Filtering, Grouping, Organising Data

LOD: Level of Details

## Measures

Quantitative Values

Sales, Profit, Quantity

Aggregate [SUM, AVG, MIN, MAX]

[Number]  
#

Calculations & Numerical Analysis

Determine Quantity being Measured



## Discrete

11 Values

0
1
2
3
4
5
6
7
8
9
10

## Continous

$\infty$  Values

1
1.11
1.12
1.13
1.14
1.15
.
.
.
2





## Discrete

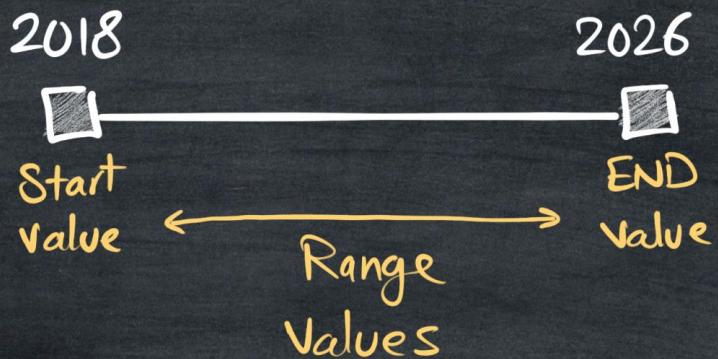
### Filter-Category

- All
- Art
- Copiers
- Storage
- Tables
- ...

Distinct  
Values

## Continuous

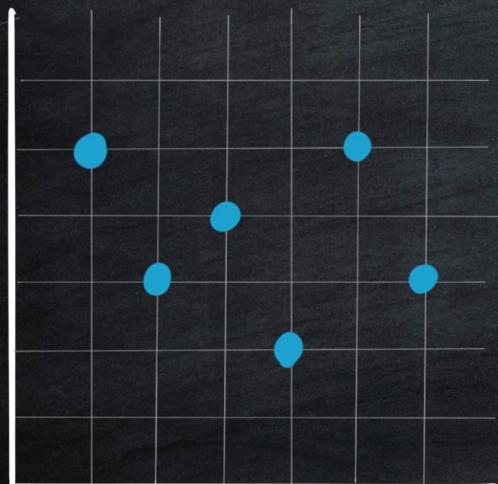
### Filter-Date





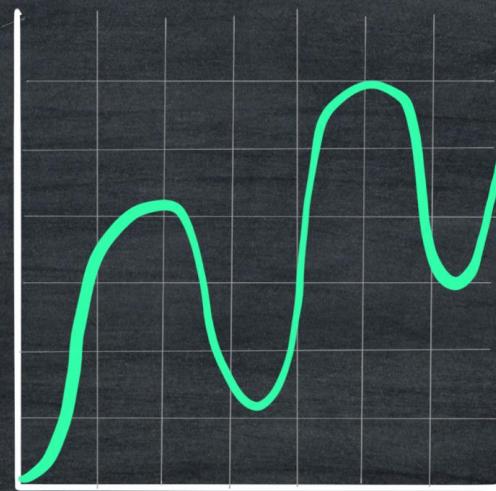
## Discrete

Disconnected & Separated  
Values



## Continuous

Connected & unbroken chain  
of Values





## Discrete

Many Sorting options

- Ascending
- Descending
- Data Source order
- Alphabetic
- Field
- Manual
- Nested

## Continous

Limited Sorting Options

- Ascending
- Descending





## Discrete

## Continuous

Purpose:

Deep Dive Analysis



Purpose:

Big Picture Analysis





tableau

Definition

Example

Colors

Filters

Views

Sorting

Purpose

Discrete

Disconnected values



[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]

Blue Pill



Distinct values



Header

Many sorting options

Specific Scenario | Deep Dive

Continuous

Connected values



Green Pill



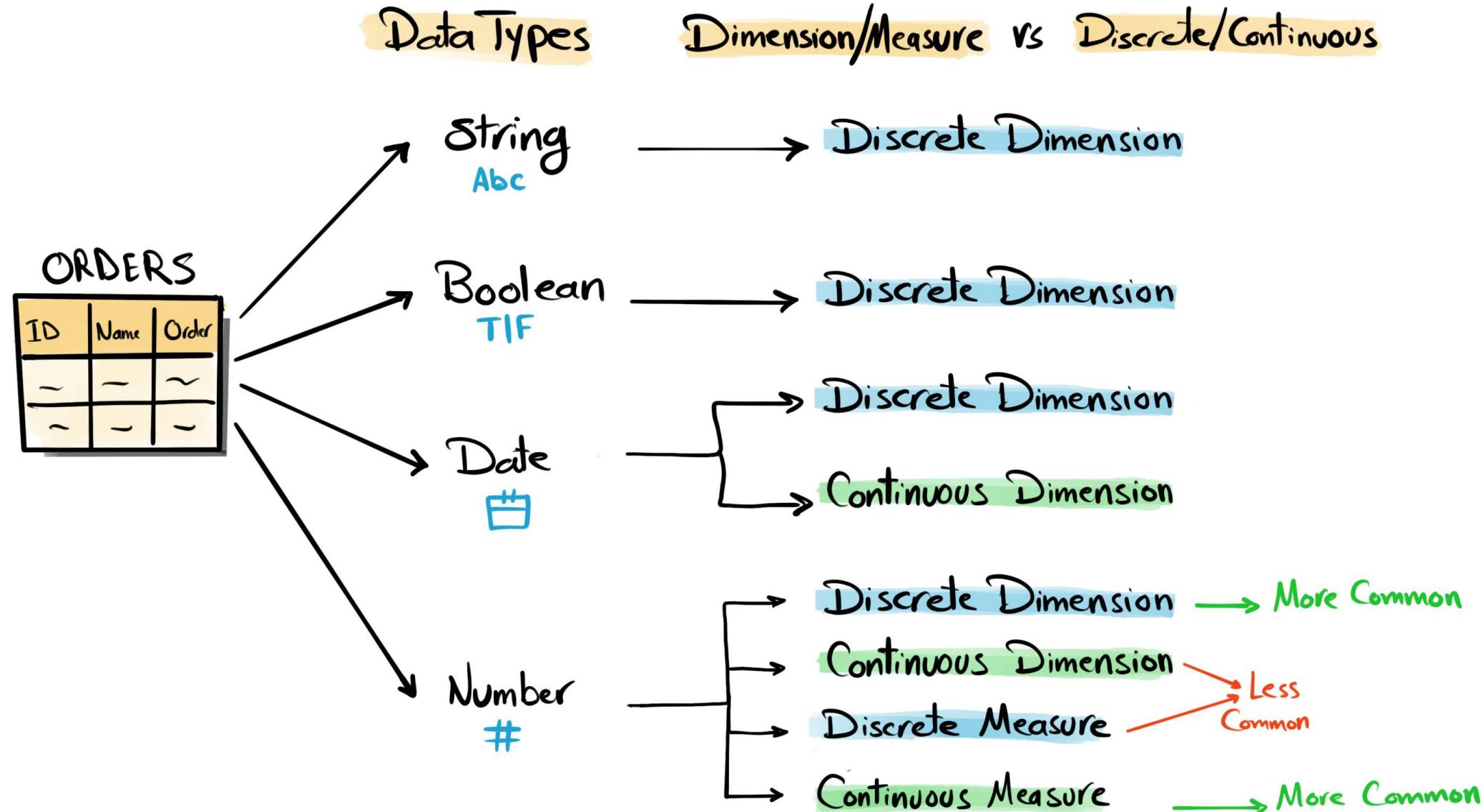
Range value



Axis

Limited Sorting Options

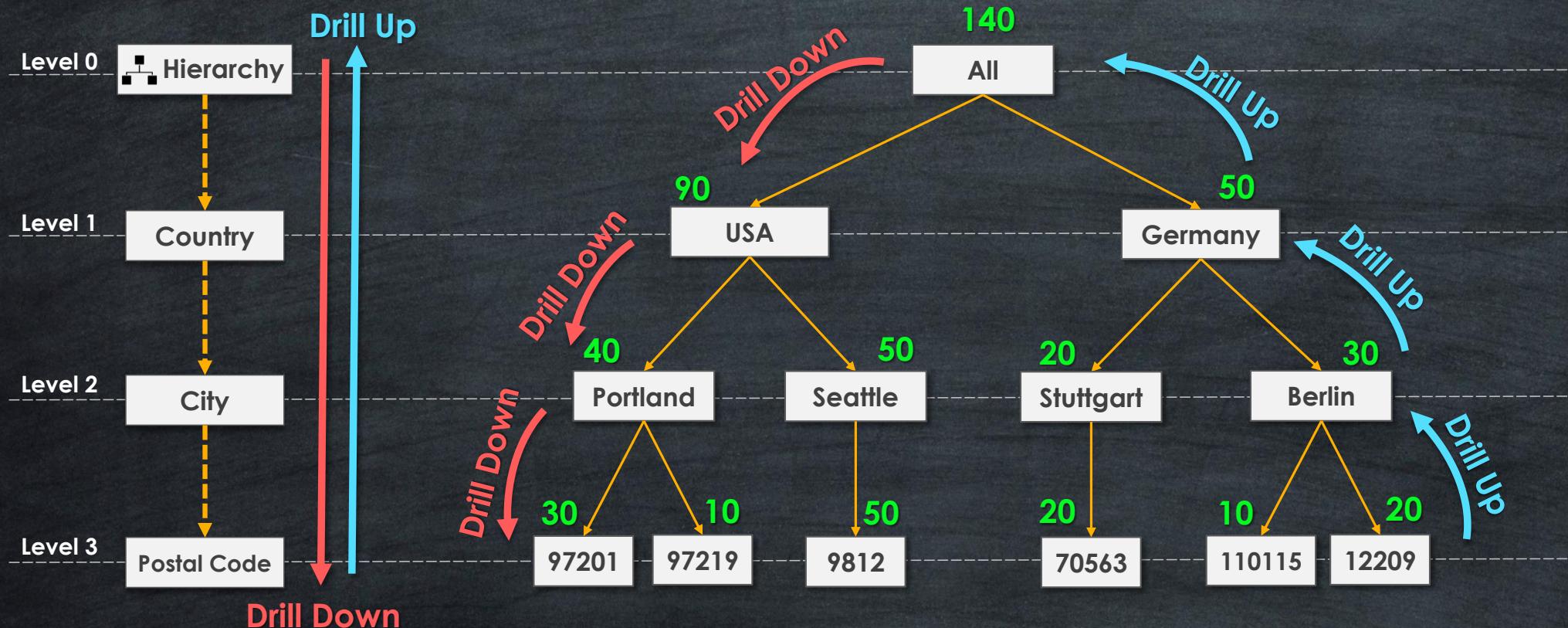
Big Picture | Trends Analysis

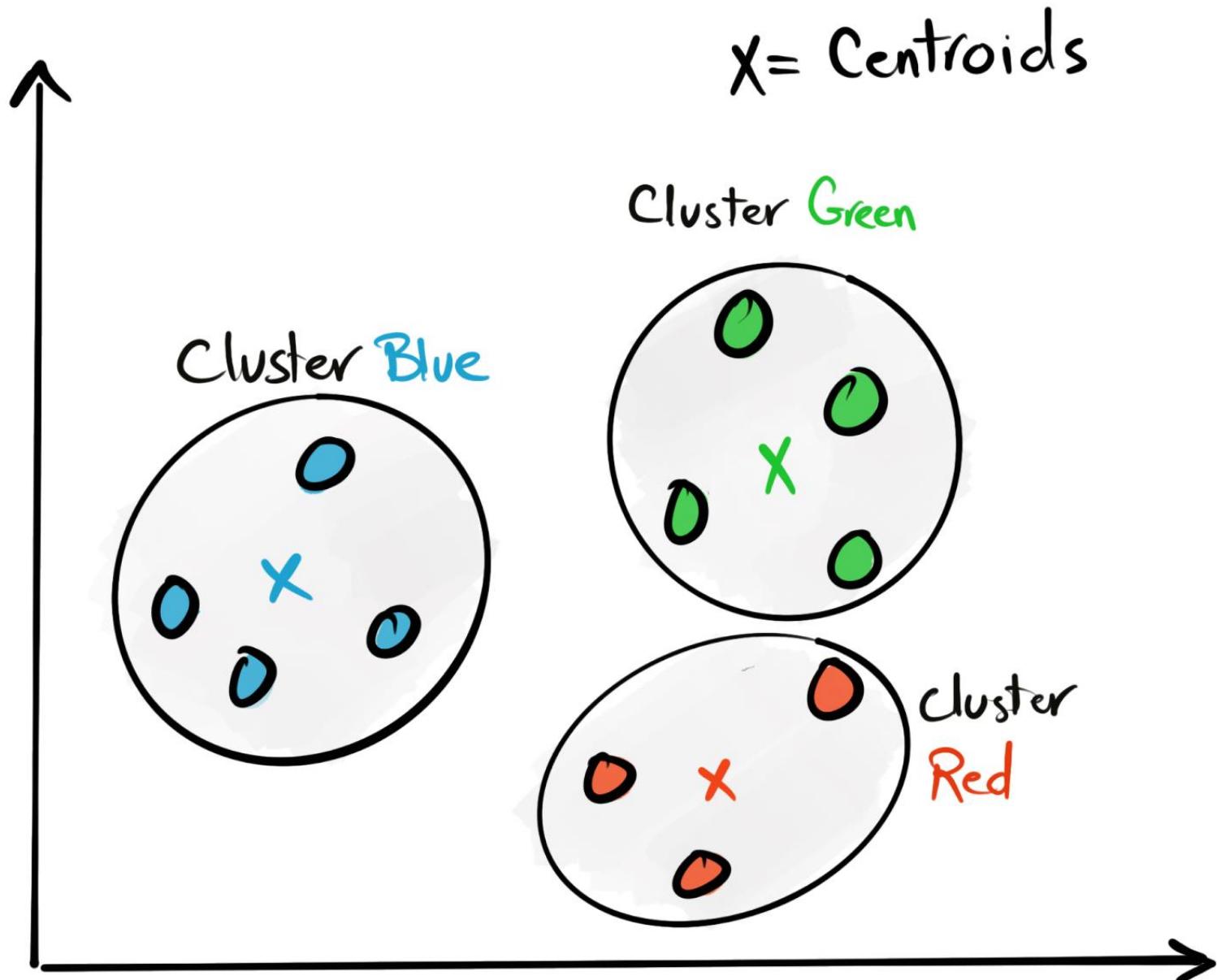


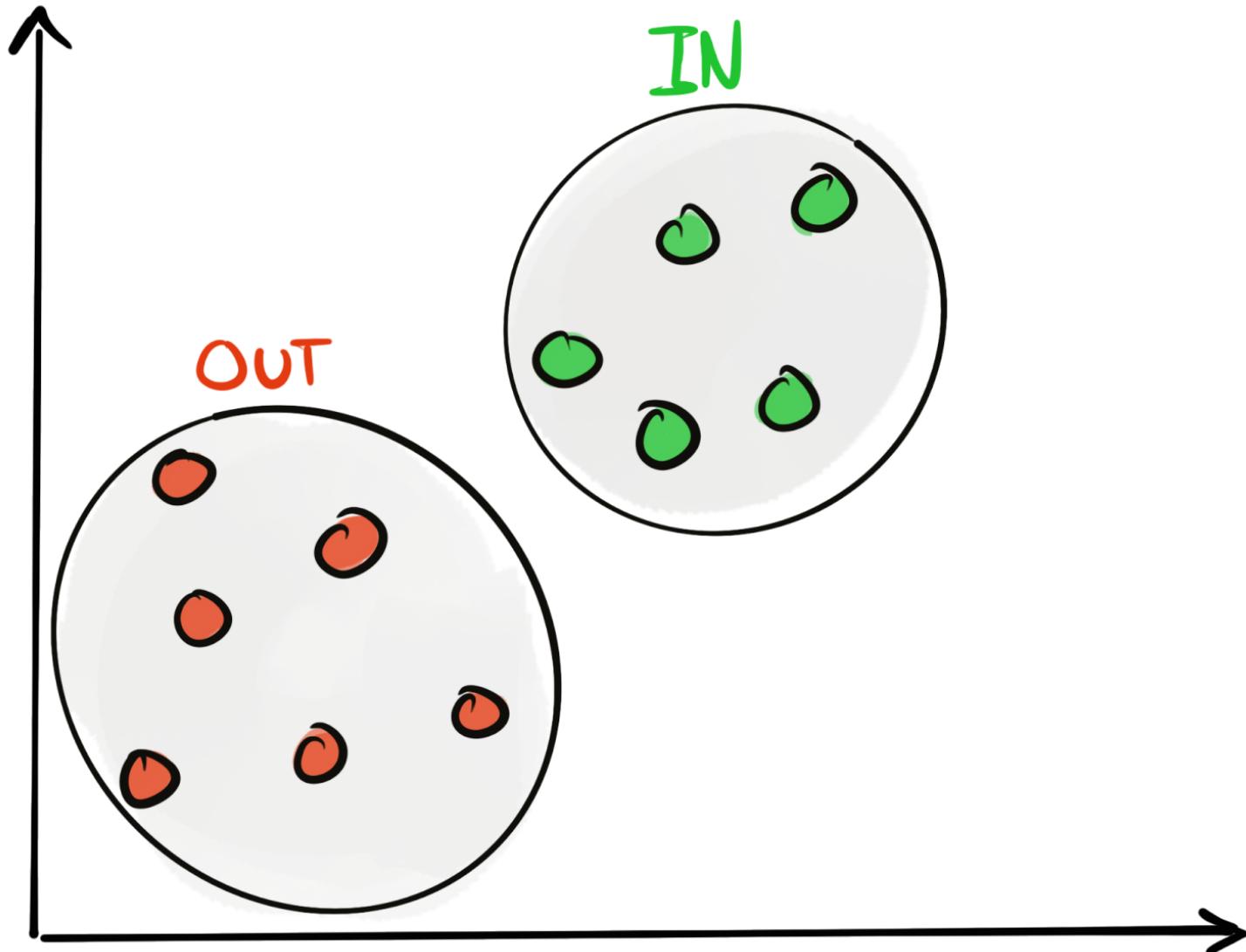


Example: CUSTOMER NAME

NAMING CONVENTIONS	EXAMPLE	Letter Case	Separation	APPLICATION
Snake Case	customer_name	lowered case	underscore "_"	Python, PHP, Ruby
Camel Case	customerName	1st is lower, Rest is Capitalized	No seperation	Java, JavaScript, TypeScript
Pascal Case	CustomerName	capitalized	No seperation	Java, C#
Kebab Case	customer-name	lowered case	Dash "-"	HTML, CSS
Title Case	Customer Name	capitalized	Space " "	Tableau
Your Convention	Customer_Name	capitalized	underscore "_"	

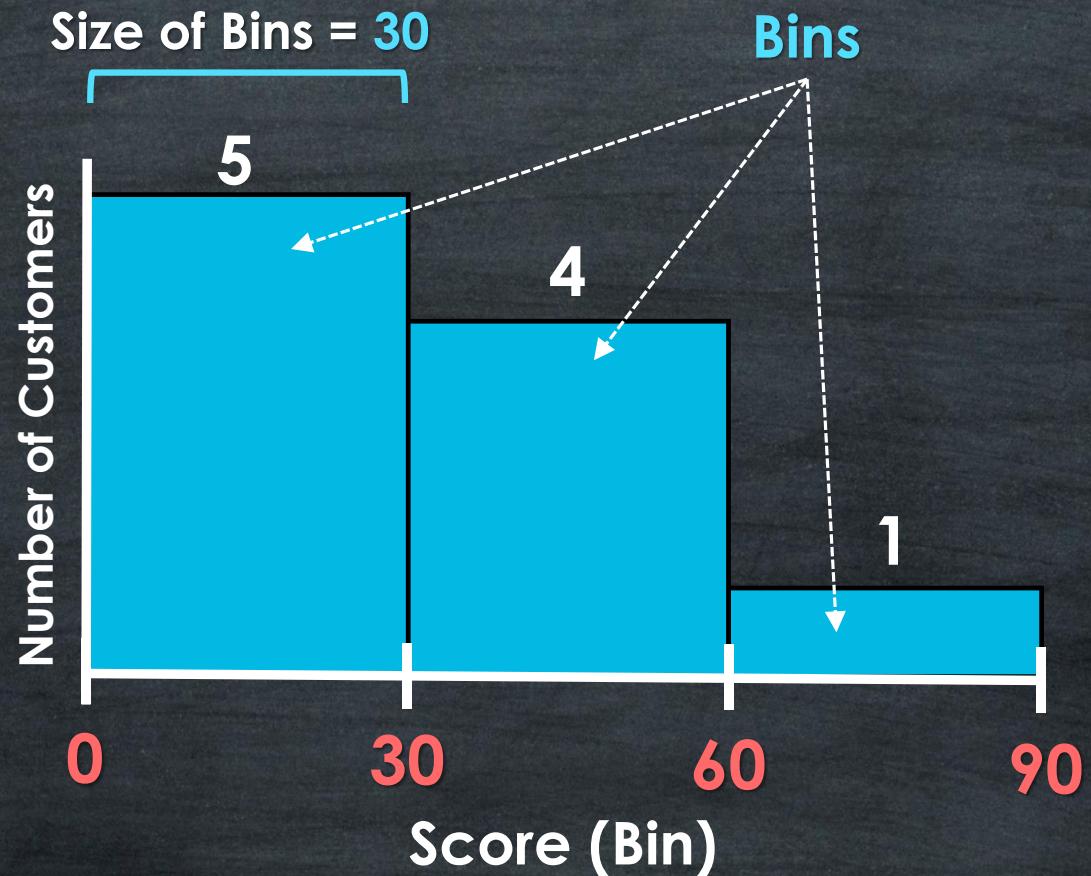






**Customers**

Customer_ID	First_Name	Score
1	Bill	63
2	Gerald	9
3	Harry	11
4	Dwight	25
5	Rutherford	57
6	Grover	35
7	Grover	24
8	Bill	44
9	Calvin	0
10	Dwight	55

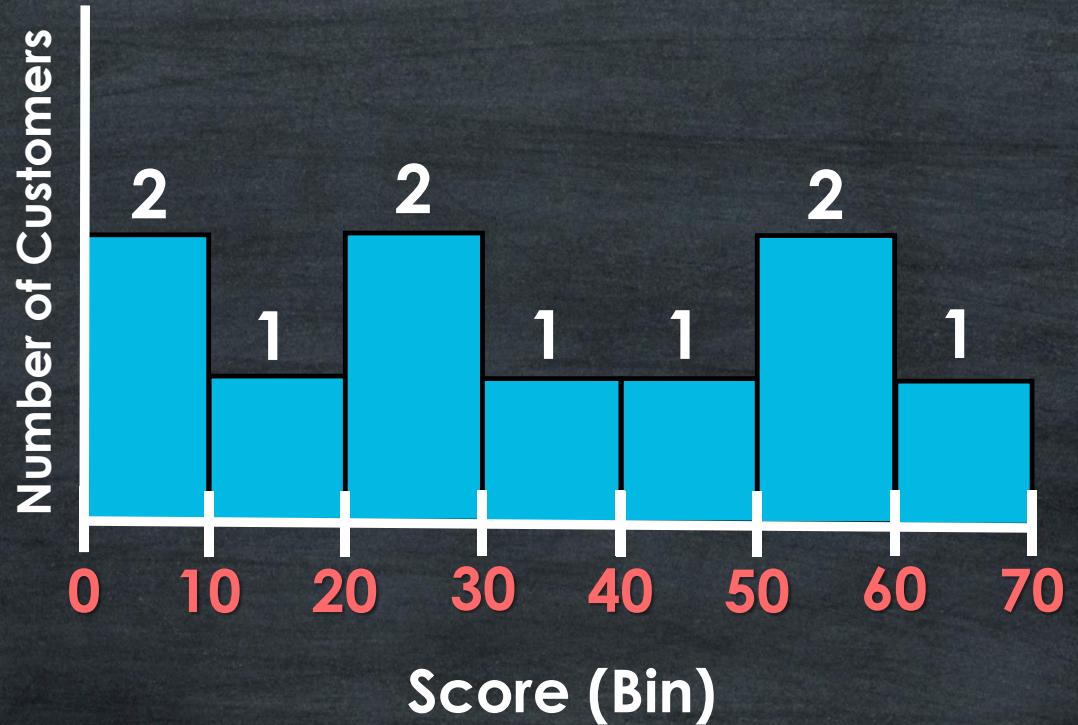
**Size of Bins = 30**

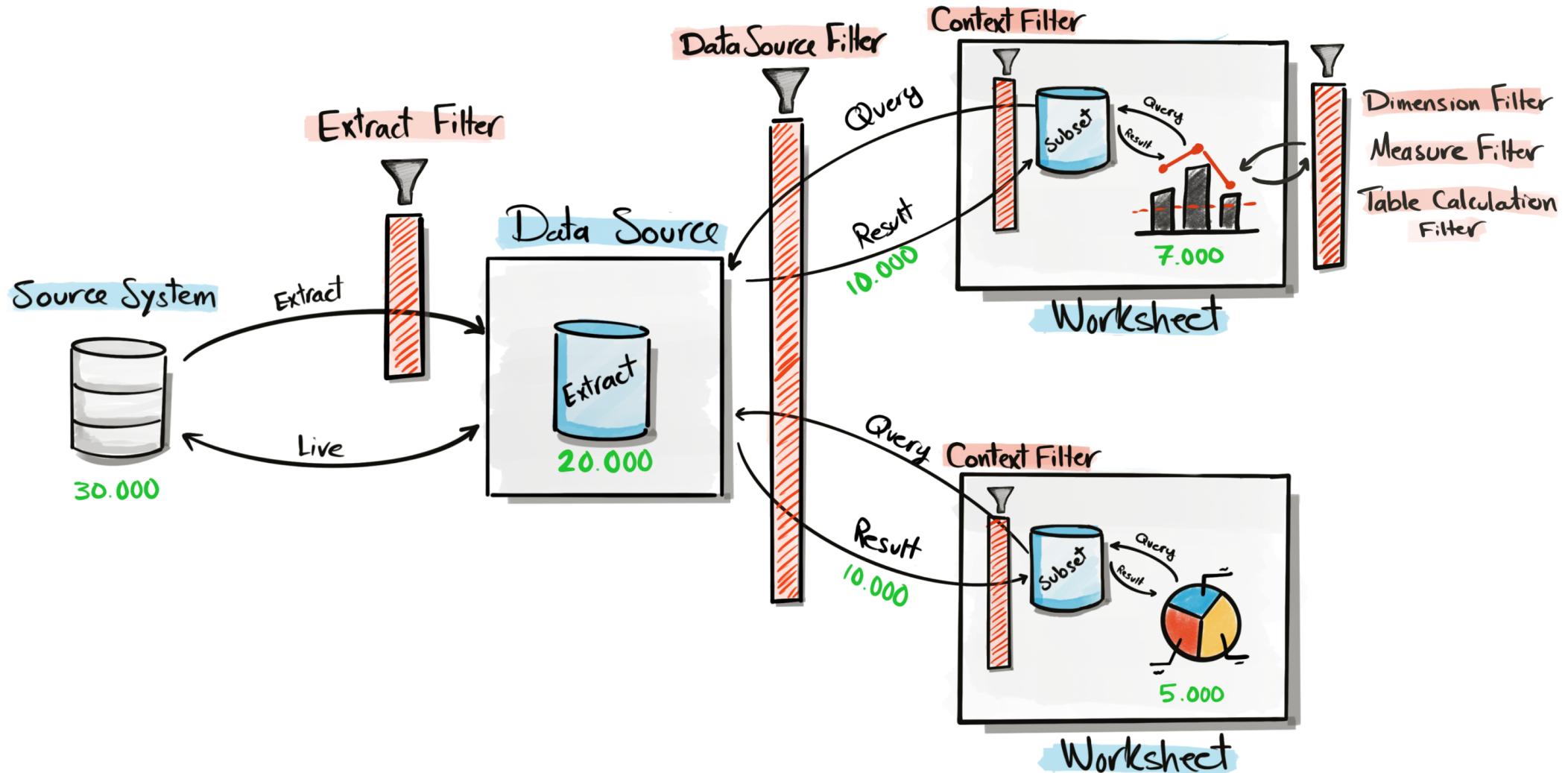


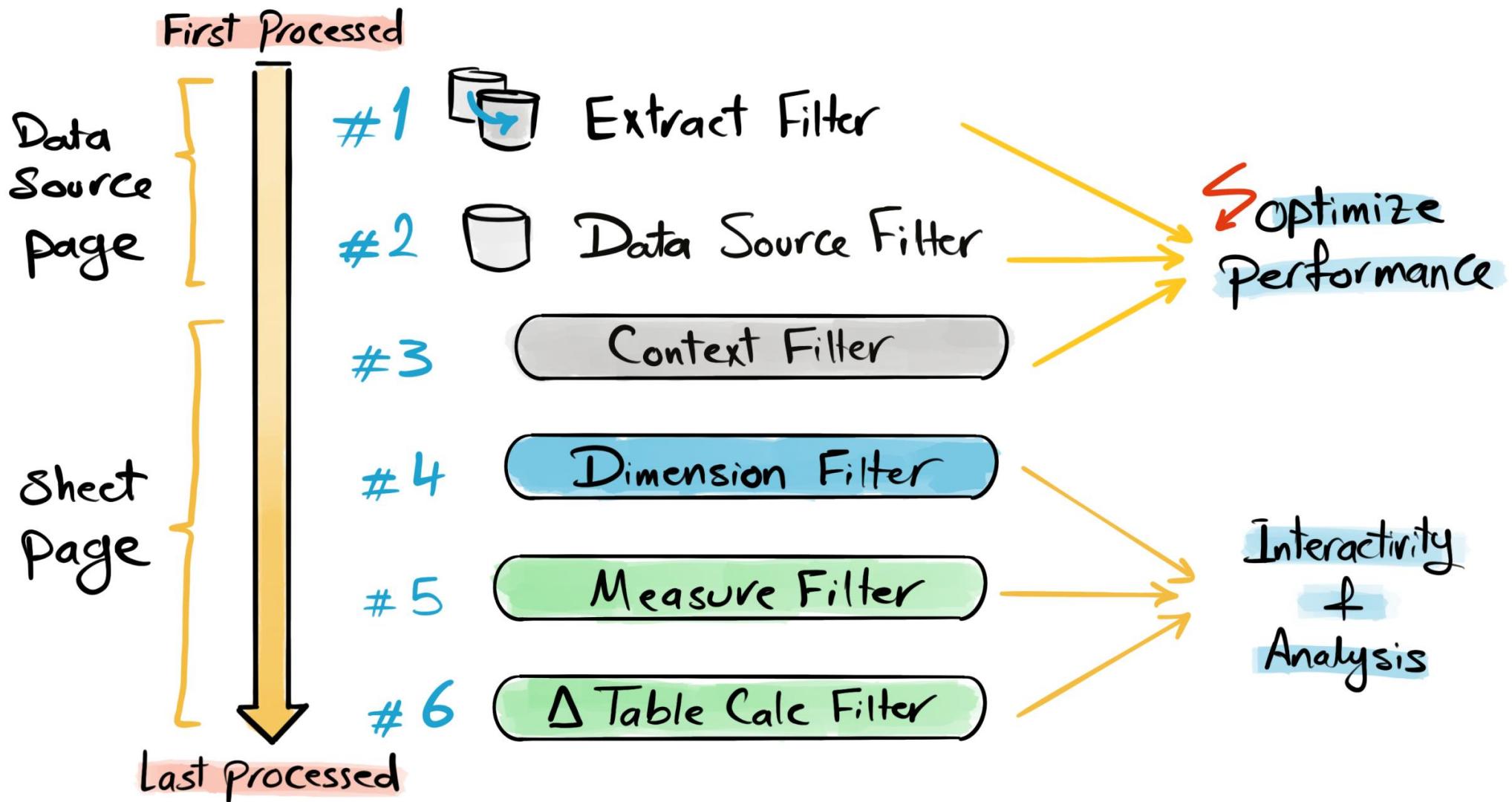
### Customers

Customer_ID	First_Name	Score
1	Bill	63
2	Gerald	9
3	Harry	11
4	Dwight	25
5	Rutherford	57
6	Grover	35
7	Grover	24
8	Bill	44
9	Calvin	0
10	Dwight	55

Size of Bins = 10







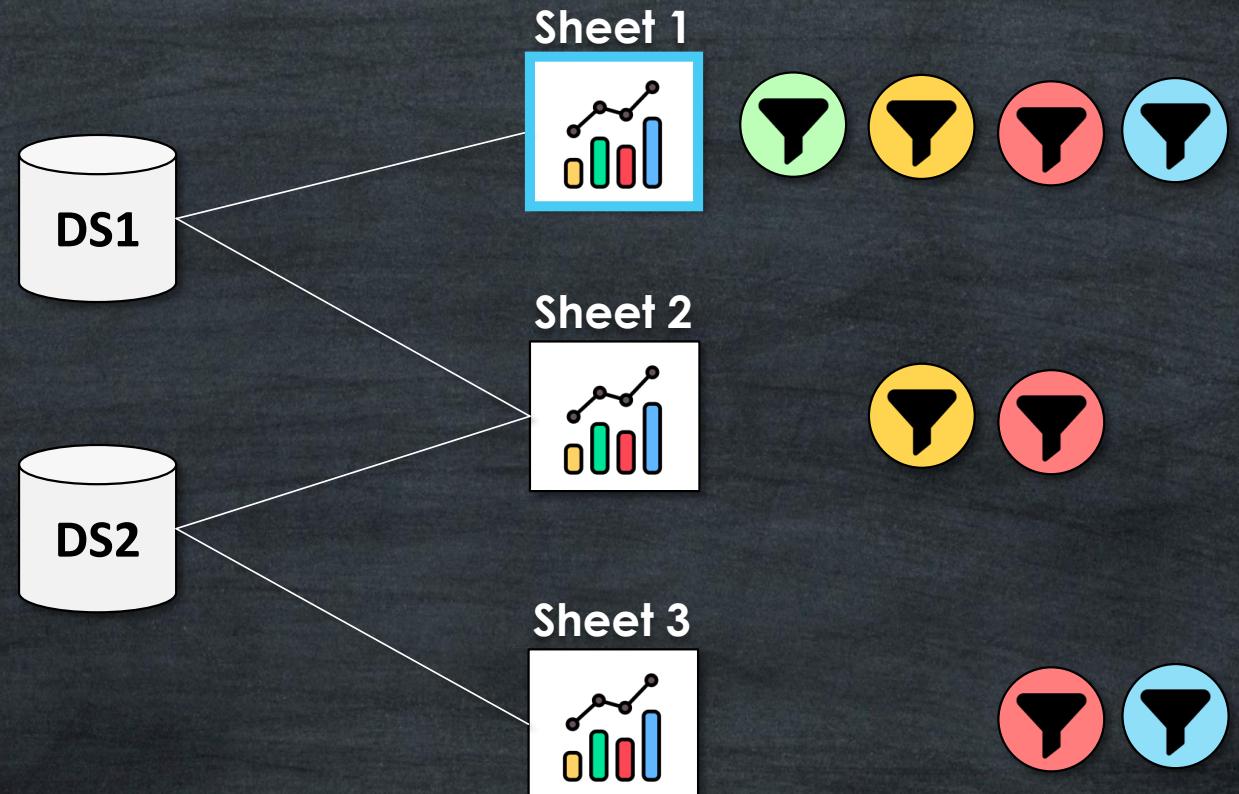


Only This Worksheet

All Using This Data Source

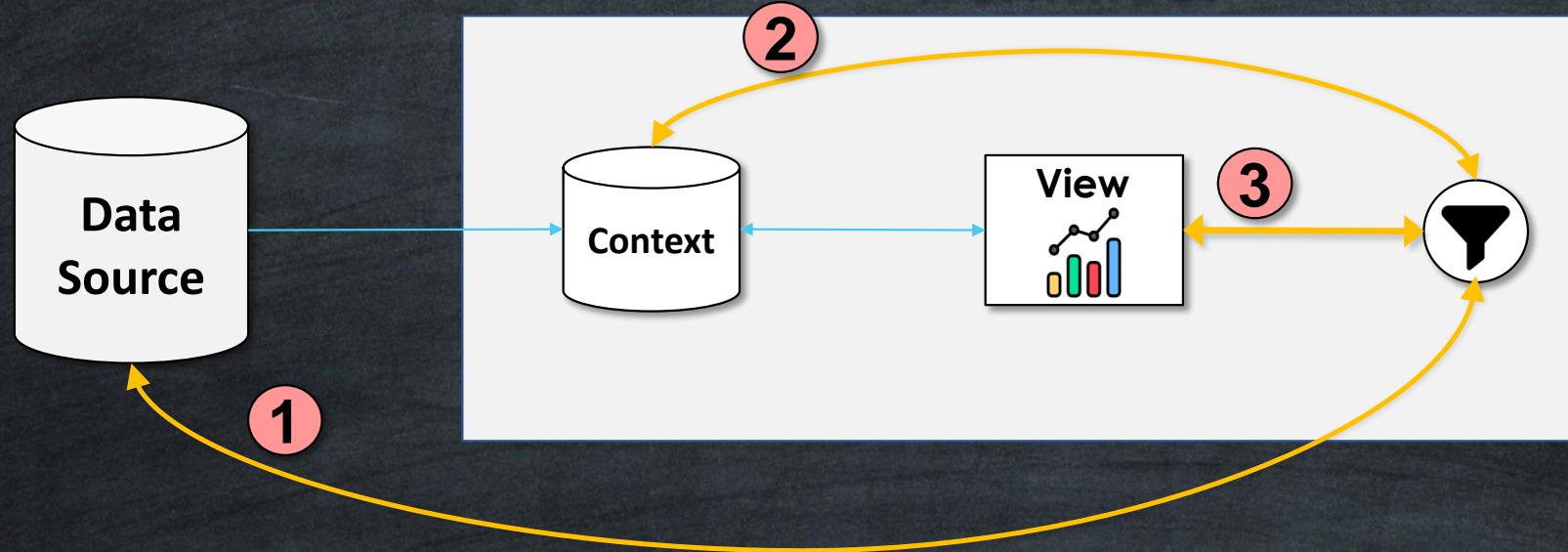
All Using Related Data Sources

Selected Worksheets





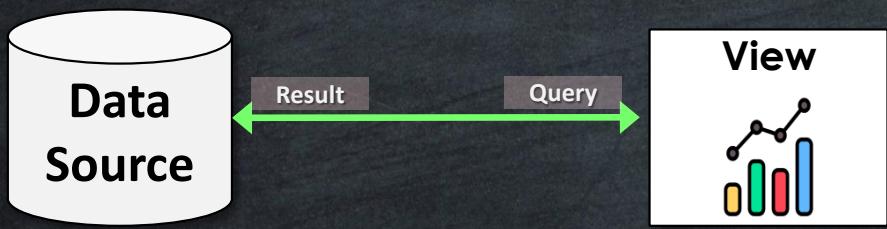
## Worksheet



- 1** All Values in Database
- 2** All Values in Context
- 3** Only Relevant Values

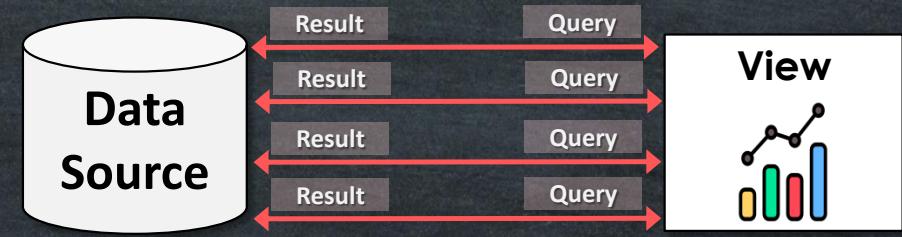


## All Values

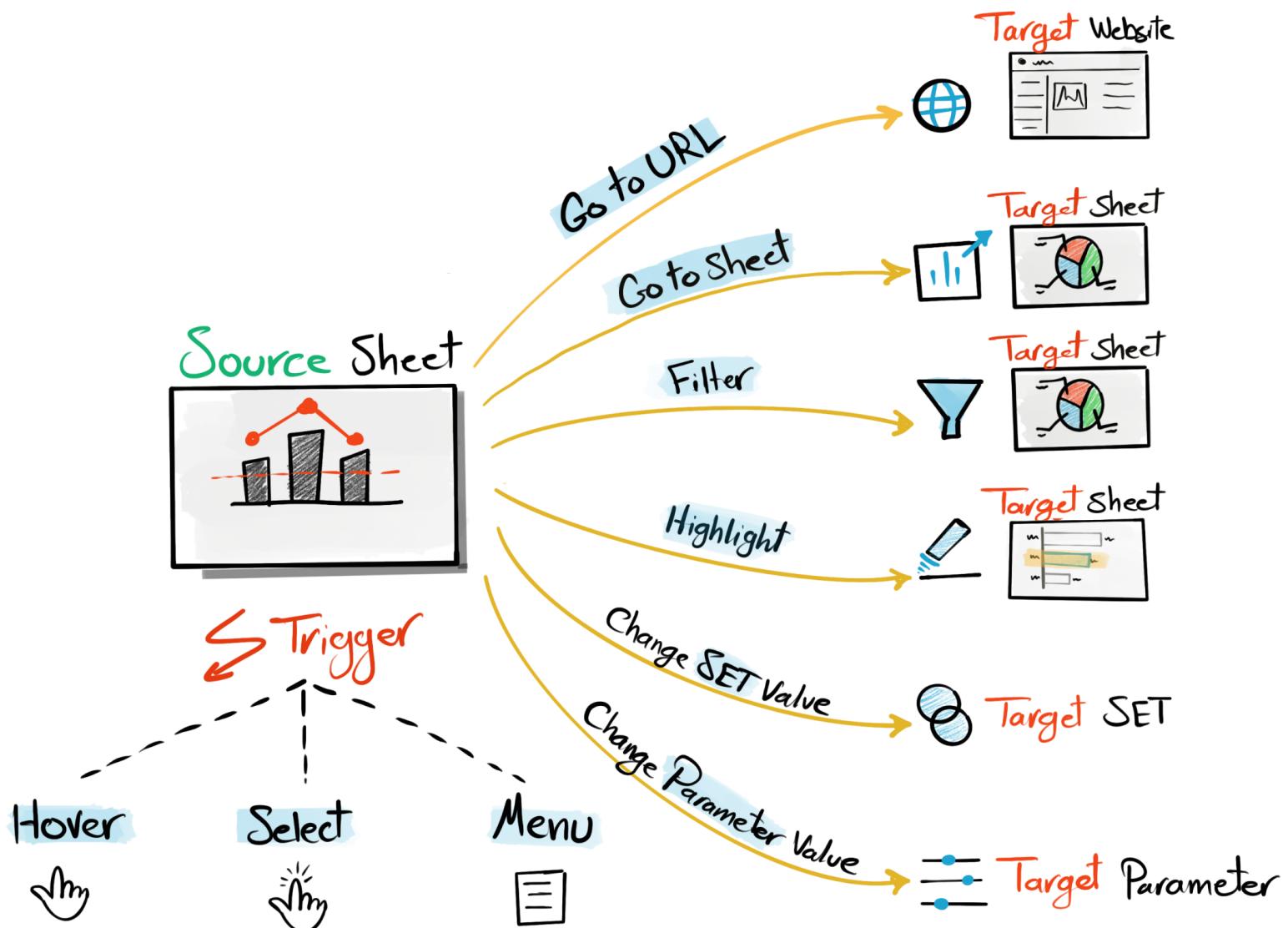


1 Initial Query as user starts View

## Only Relevant



Multiple Queries for each user Interaction







## Data Source

Row-Level Calc.

Price \* Quantity

Category	Product	Price	Quantity
A	P1	20	2
A	P1	30	3
A	P2	20	1
B	P3	10	4
B	P3	5	5
B	P3	15	1

Revenue
40
60
20
40
25
15

SUM(Revenue)

Product  
Controls LOD

P1	100
P2	20
P3	80

Aggregate calc.



## Visualization (VIZ)

Table Calc.

RANK(SUM(Revenue))

Products

P1	1
P2	3
P3	2

Product

A	P1	120
A	P2	120
B	P3	80

LOD Calc.

{FIXED Category : SUM(Revenue)}

Controls LOD



RANK(SUM([Quantity]\*[Price]))

1 Row-Level  
Calculation

2 Aggregate  
Calculation

3 Table  
Calculation



# Types of Calculations



Row-Level Calculation	Aggregate Calculation	LOD Calculation	Table Calculation
[Quantity] * [Price]	SUM([Revenue])	{FIXED [Category]:SUM([Revenue])}	RANK(SUM([Revenue]))
Do Not Aggregate Data	Aggregate Data	Aggregate Data	Aggregate Data
Row Level	VIZ Level Of Details	Specific Level Of Details	VIZ Level Of Details
Calculated using Data in Data Source	Calculated using Data in Data Source	Calculated using Data in Data Source	Calculated using Data in VIZ
Pre-Calculated	Calculated in the Fly	Calculated in the Fly	Calculated in the Fly
Simple Calculations	Simple Calculations	Complex Calculations	Complex Calculations



# Choose Right Calculation Type



**Q1:** Do you have to aggregate the data?

NO

**Row-Level**  
Calculation

YES

**Q2:** Is all the needed data already in the VIZ?

YES

**Table**  
Calculation

NO

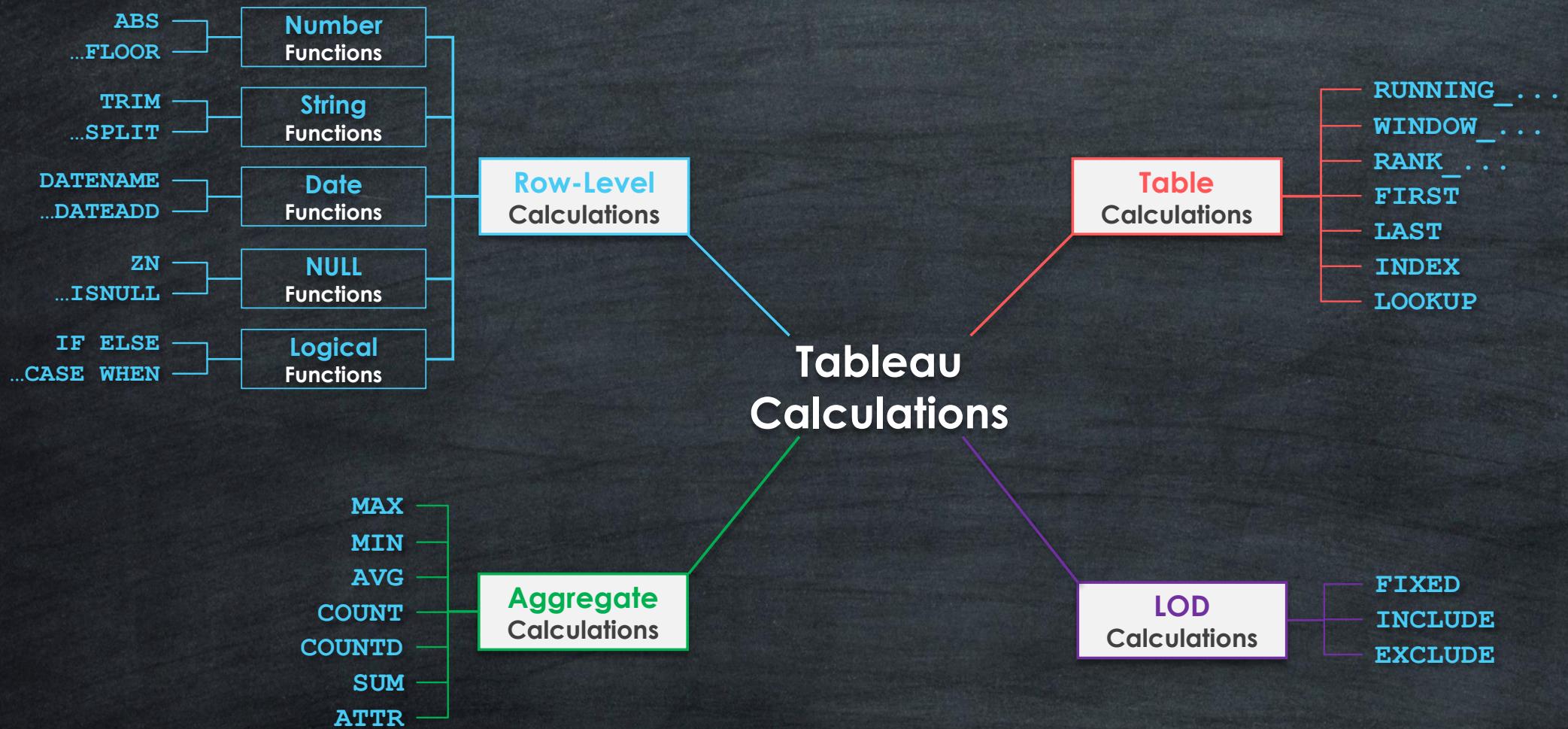
**Q3:** Is the Level of Details in VIZ matches the Question?

YES

**Aggregate**  
Calculation

NO

**LOD**  
Calculation





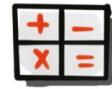
## LOD (VIZ)

View 1

Category	Country	Sales

View 2

Product	Category	Country	Sales



## LOD (Expression)

FIXED [Category] : SUM([Sales])

Category	Sales

Category	Sales



## LOD (VIZ)

View 1

Category	Country	Sales



View 2

Product	Category	Country	Sales



## LOD (Expression)

EXCLUDE [Category]: SUM([Sales])

-1 DIM

Category	Country	Sales

-1 DIM

Product	Category	Country	Sales



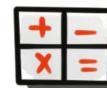
LOD (VIZ)

View1

Category	Country	Sales

View2

Product	Category	Country	Sales



LOD (Expression)

INCLUDE [Customer] : SUM([Sales])

+1 DIM

Customer

Category	Country	Sales

+1 DIM

Customer

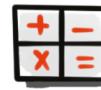
Product	Category	Country	Sales



## LOD (VIZ)

View 1

Category	Country	Sales



## LOD (Expression)

FIXED

Category	Sales

-1 DIM

Category	Country	Sales

EXCLUDE

+1 DIM

Customer

Category	Country	Sales



# Sales Performance

\$ 30K

Sales

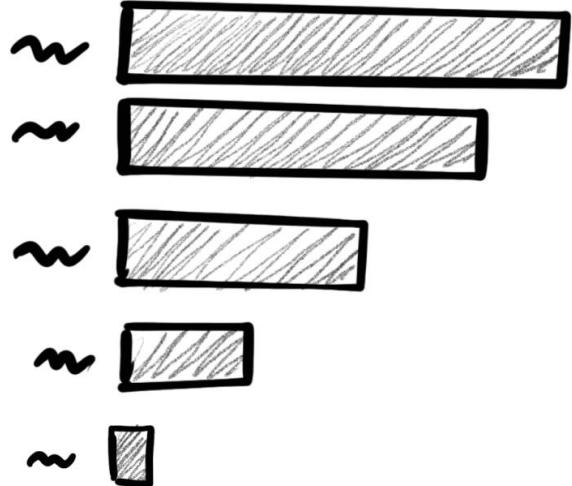
\$ 25K

Profit

60K

Quantity

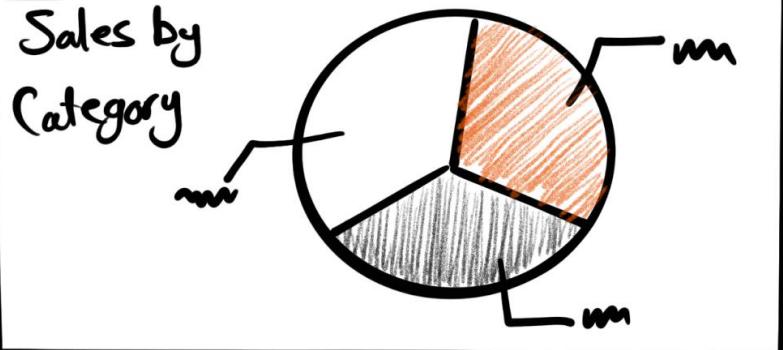
## Top Category



## Sales vs Profit

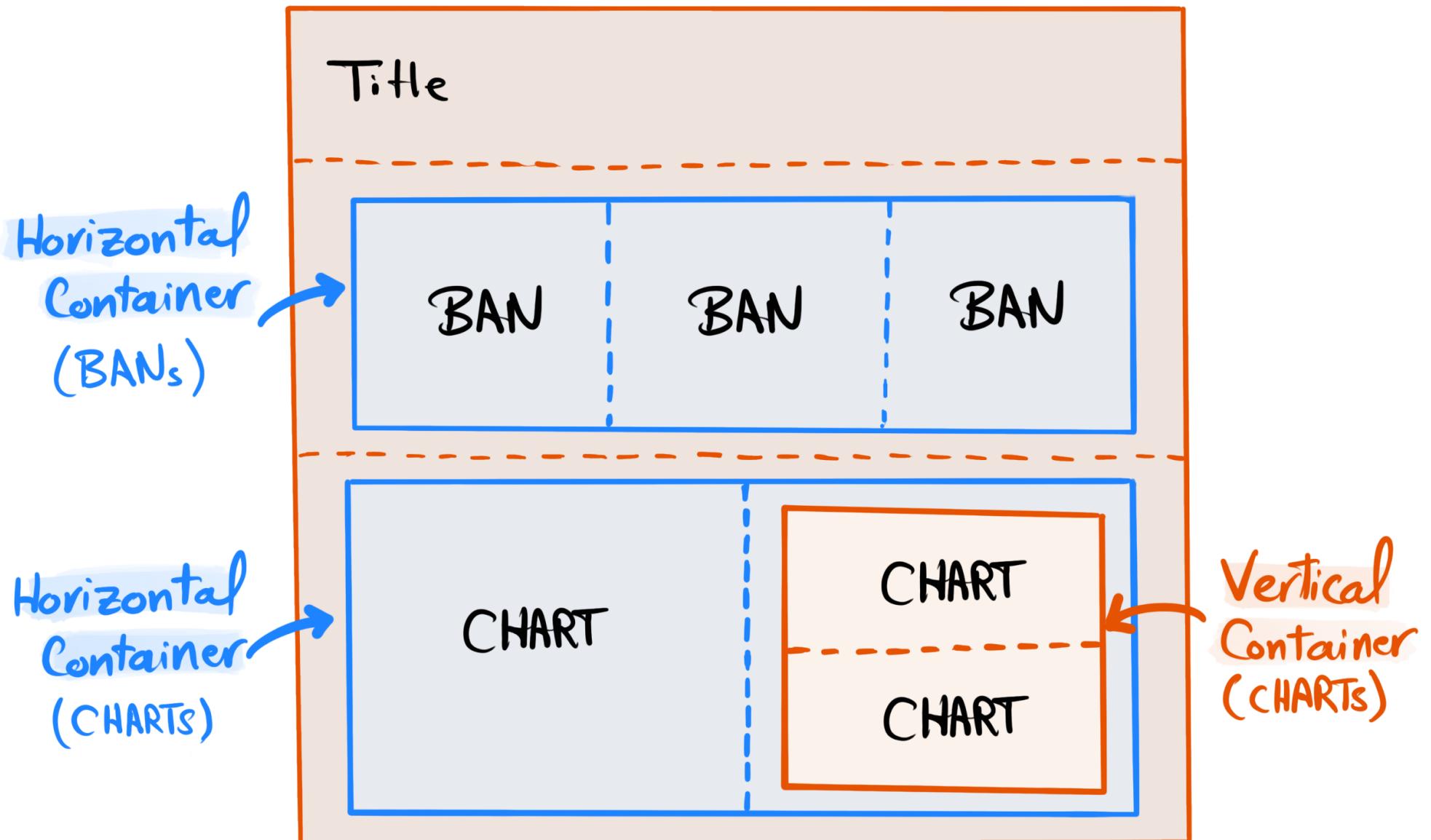


## Sales by Category





## Vertical Container (Main) ↴





# DASHBOARD DESIGN PROCESS

STEP1

ANALYSE REQUIREMENTS

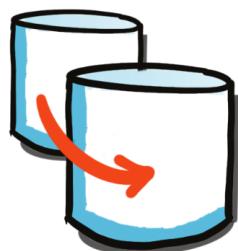


- Collect Requirements
- Choose Right Charts
- Draw Mockups
- Choose Colors



## DASHBOARD DESIGN PROCESS

### STEP 2 BUILD DATA SOURCE

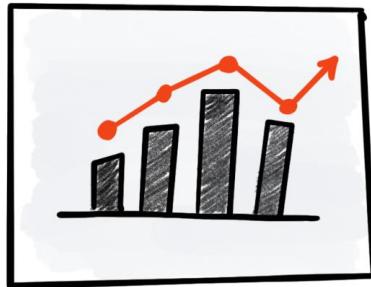


- Connect Data
- Create Data Model
- Rename Fields & Tables
- Check Data Types
- Understand Data



## DASHBOARD DESIGN PROCESS

### STEP 3 BUILD CHARTS

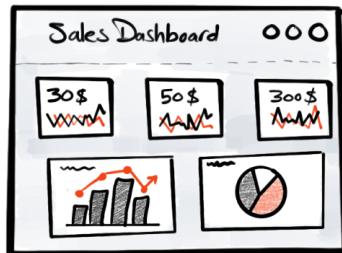


- Create Calculated Fields & Test
- Build Chart
- Format
  - Remove Lines & Grids
  - Clean up Axis & Headers
  - Coloring
  - Tooltips



# DASHBOARD DESIGN PROCESS

## STEP 4 BUILD DASHBOARD

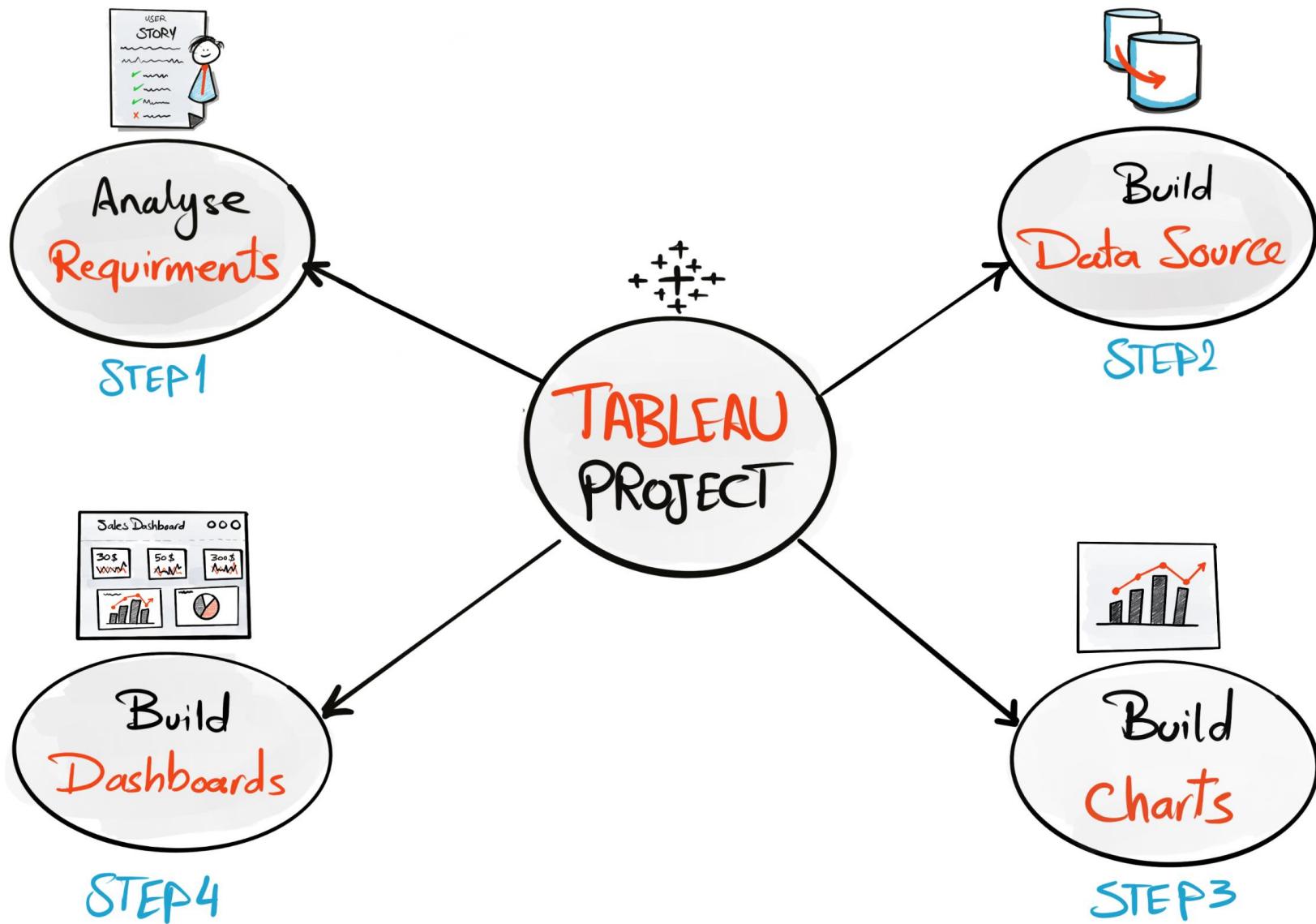


- Draw Mockup for Container
- Create Container Structure
- Put All Charts Together
- Format
  - Distribute Object Evenly
  - Format Colors, size ... etc
  - Fit "Entire View"
  - Add Legends
  - Add Spaces (inner/outer Padding)
- Add Filters & Dynamic
- Add Icons



+ a b | e a u

DATA WITH BARAA

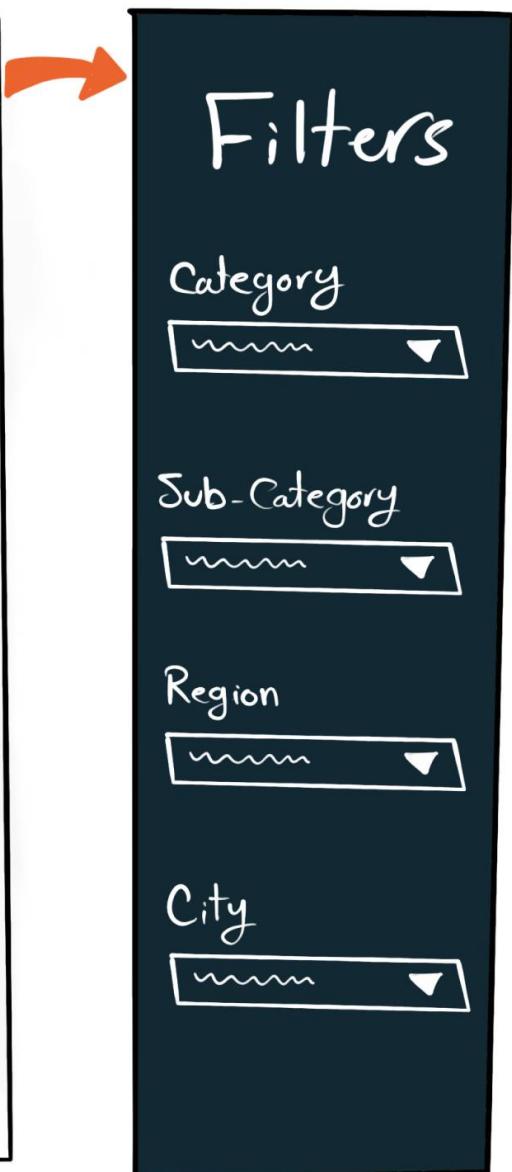
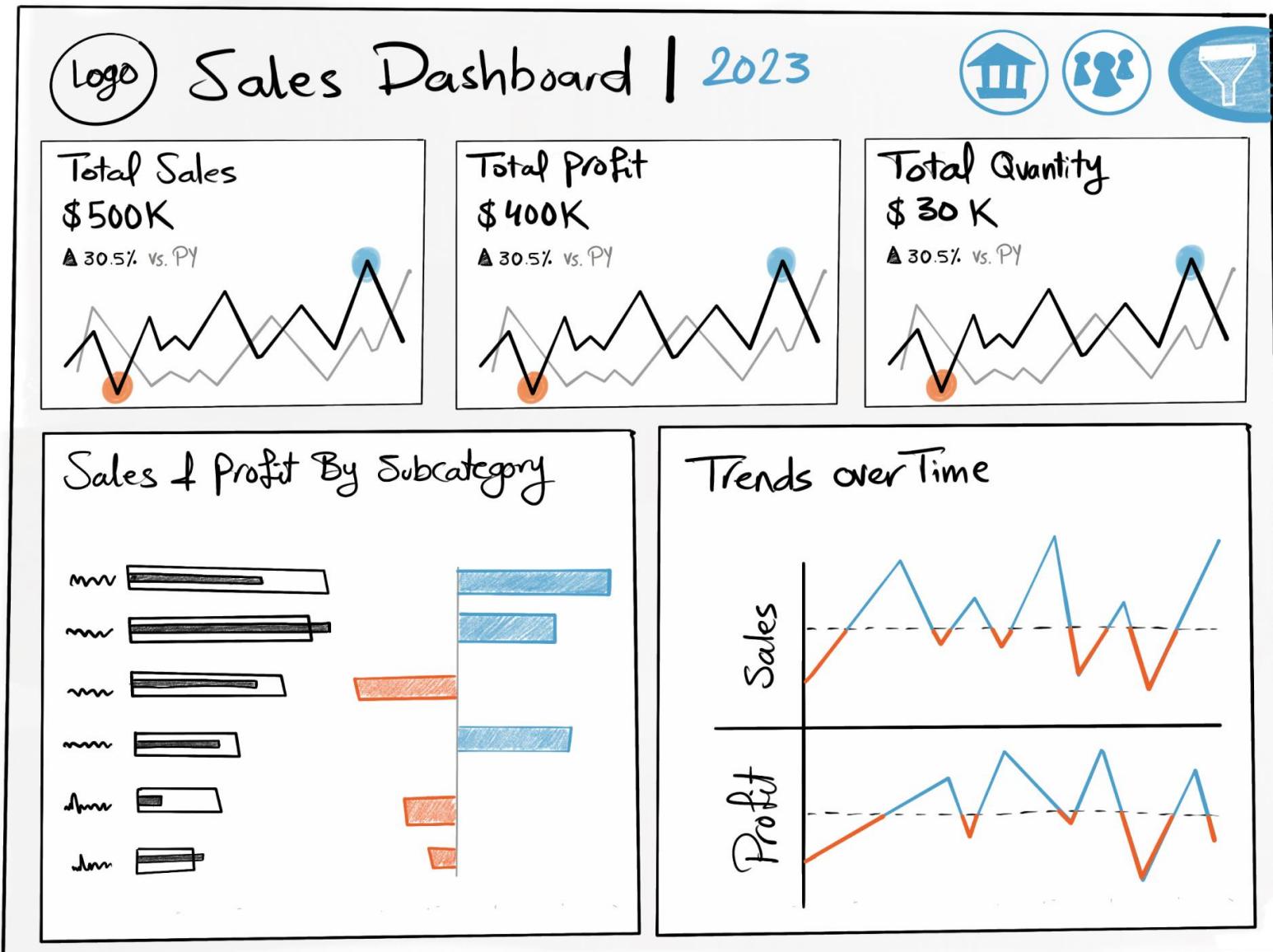




+ a b | e a u

# Dashboard Mockup

DATA WITH BARAA





+ a b | e a u

# Dashboard Mockup

DATA WITH BARAA

