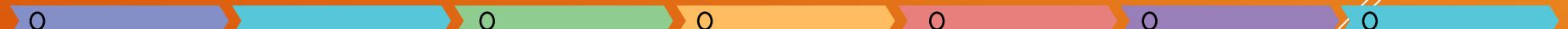


Business Analytics



SATYAJIT PATTNAIK

Agenda

- ❑ What is Power BI?
- ❑ Components
- ❑ Architecture
- ❑ Product Portfolio
- ❑ Life Hack: Small guide to install Pro
- ❑ Desktop Features: Get, Analyze, Visualize, Publish
- ❑ Power BI Services
- ❑ Integration with various Apps
- ❑ Power Query Editor: The heart of Power BI
- ❑ Understanding on DAX
- ❑ Live connectivity & datasources
- ❑ On-premises data gateway
- ❑ Dashboard Implementation



Power BI



Power BI is **business analytics solution** that lets you visualize the data and share the insights to the concern stakeholders and the business owners.

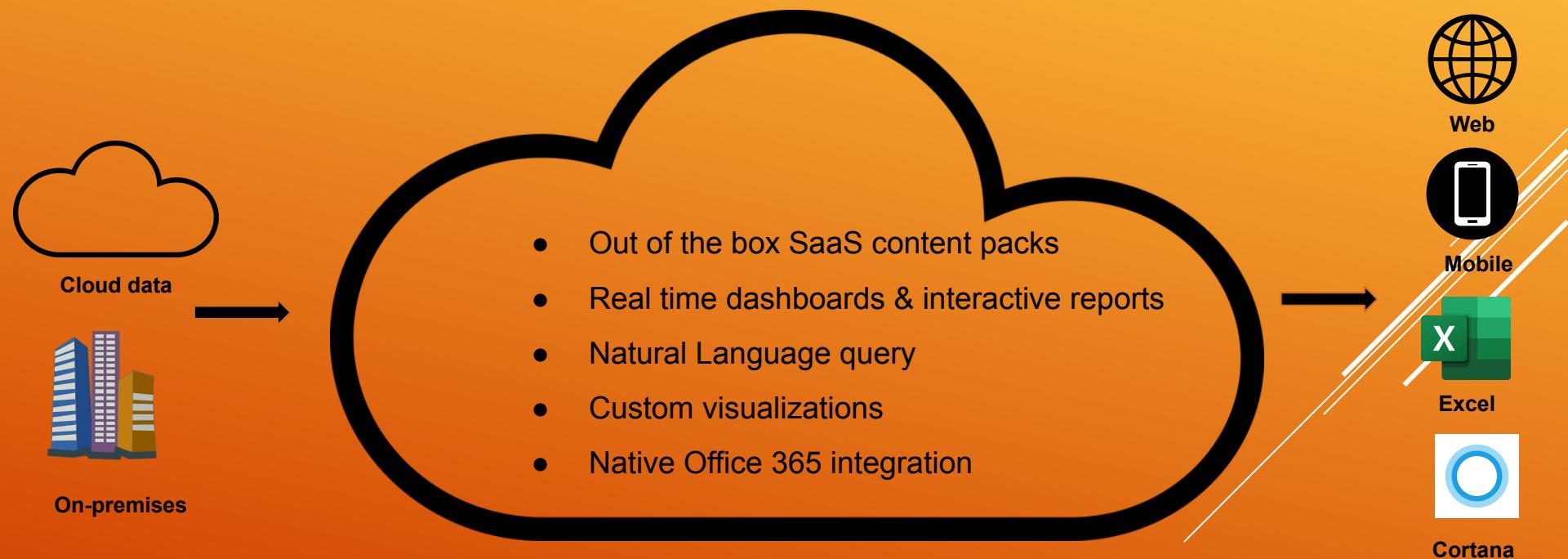
Power BI Components:

- Power BI Desktop
- Power BI service (*SaaS –Software as a Service*)
- Power BI Mobile Apps



Power BI begins by connecting to data sources and building a report in Power BI Desktop. You then publish that report from **Power BI Desktop** to the Power BI service, and share it so end users in the **Power BI Service** and **Mobile Devices** can view and interact with the report. This workflow is common and shows how the three main Power BI elements complement one another.

Power BI Architecture



Power BI Product Portfolio



Author



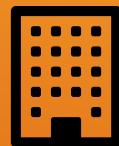
**Power BI
Desktop**

Share & Collaborate



**Power BI
Service**

Large scale deployments



**Power BI
Premium**

Share & Collaborate



**Power BI
Report Server**

App dev



**Power BI
Embedded**

Free data analysis
and reporting
authoring tool

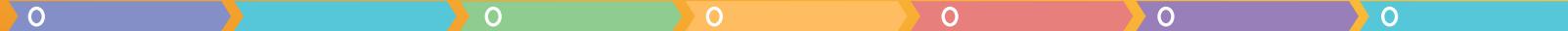
Cloud based modern
business analytics
solution

Dedicated capacity
for increased
performance

On-premises report
server

Visual analytics
embedded in your
applications

Power BI Pro - Life Hack



Download Power BI Desktop :

<https://powerbi.microsoft.com/en-us/downloads/>



How to sign up for Power BI without a work email

Incognito:

Log in to office.com → Enterprise → Plans & Pricing

→ E3 or E5 account

Try for free

Power BI Desktop



Get Data

Easily connect, clean, and mashup data



Analyze

Build powerful models and flexible measures



Visualize

Create stunning interactive reports



Publish

Share insights with others



Collaborate

Empower your organization with self-service analytics



Power BI Desktop



Get Data

Easily connect, clean, and mashup data

1. Connect to 80+ data sources, both on-premises and cloud
2. Shape, transform, and clean data for analysis
3. Live connectivity to on-premises and cloud data sources
4. Extend with custom data connectors for any data source
5. Prep your data using the familiar Power Query experience on the web
6. Get started quickly with a common data model
7. Extend self-service prep to Azure Data Lake Storage



Power BI Desktop



Analyze

Build powerful models and flexible measures

1. Automatically created model when connecting to data
2. High performance, in-memory engine
3. Point and click analysis with Quick measures, clustering & binning
4. Create powerful measures with familiar DAX (Data Analysis Expressions) formulas



Power BI Desktop



Visualize

Create stunning interactive reports

1. Author reports using 150+ visuals via a drag-drop canvas
2. Explore data across multiple interactive visualizations
3. Provide insights in the context of the business with Customer Visuals
4. Visualize data story with bookmarks and customer navigation



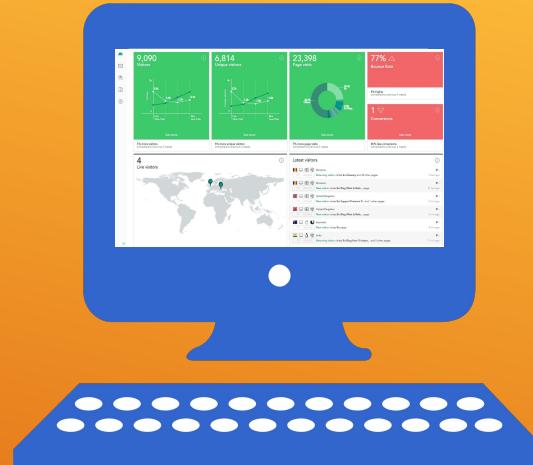
Power BI Desktop



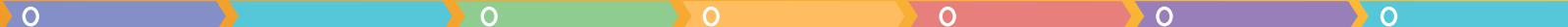
Publish

Share insights with others

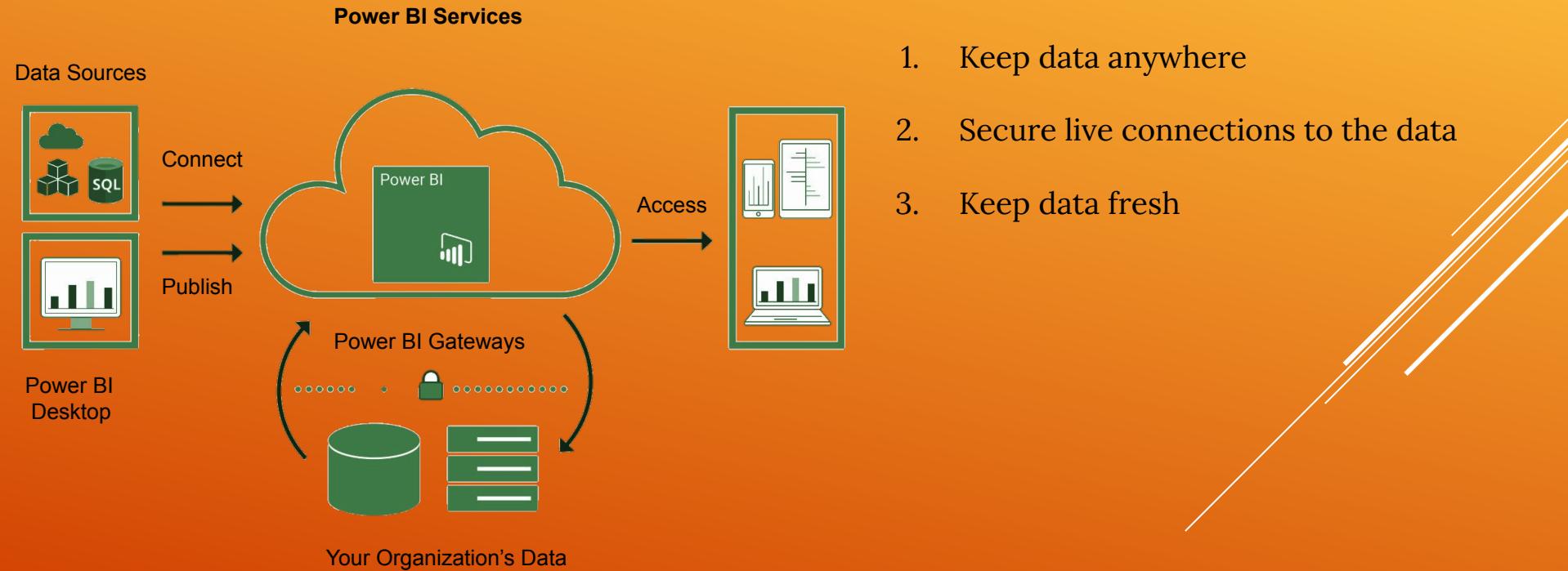
1. Publish directly to the cloud or on-premises
2. Automatic data refresh, so the reports are always up to date
3. Package your reports in apps for easy consumption and control
4. Manage analytics content with admin and governance tools



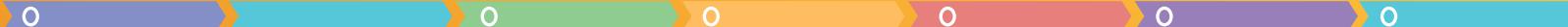
Power BI Services



**Secure, live connection to the data sources
on-premises and in the cloud**



Integration with Power BI



Deliver insights through other services

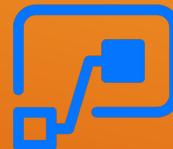
1. Collaborate and share insights with teams

in your organization using existing
services.

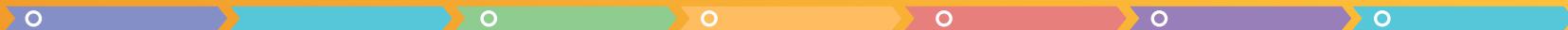


2. Fully interactive reports integrated into the

service



Excel & Power BI



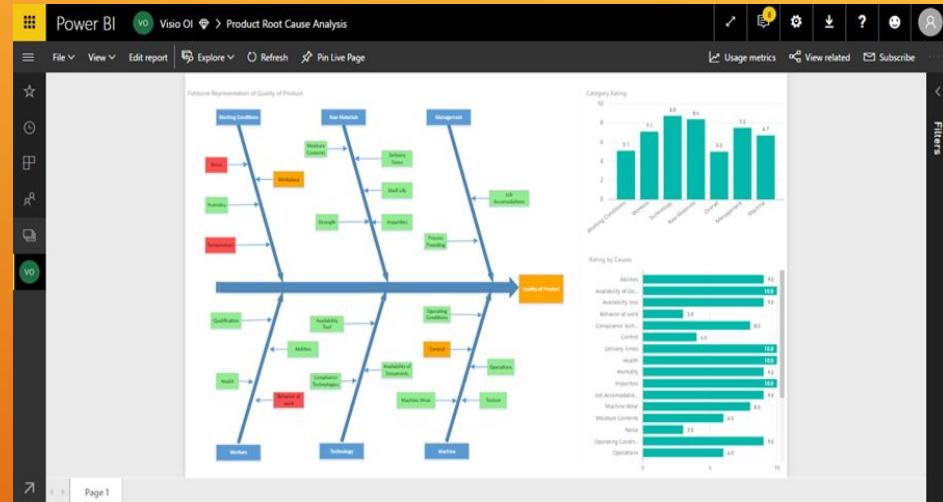
Easily aggregate objects from multiple Excel files on the same dashboard in Power BI

Analyze in Excel

Use Excel to view and interact
with a dataset you have in Power BI

Import Excel data into Power BI

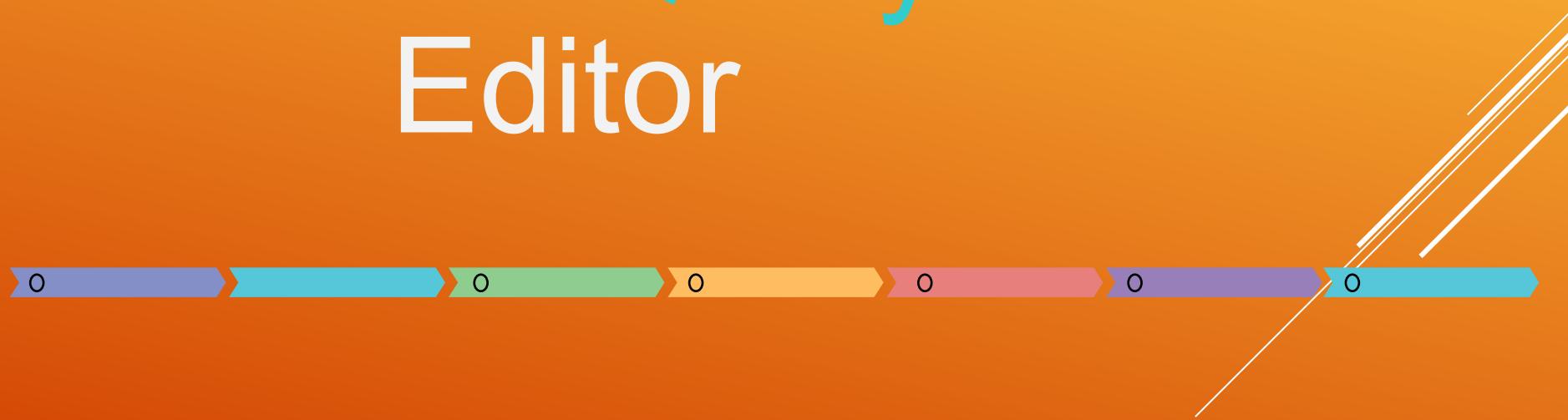
Connect to the data in your workbook so you can
create Power BI report and dashboards



Upload your Excel file to Power BI

Bring your Excel file into Power BI to view and
interact with it just as you would in Excel Online.
Pin ranges to Dashboards

Power Query Editor



User Experience

The Power Query editor represents the Power Query user interface, where you can add or modify queries, manage queries by grouping or adding descriptions to query steps, or visualize your queries and their structure with different views.

The Power Query user interface has five distinct components.

The screenshot shows the Microsoft Power Query Editor interface with several numbered callouts:

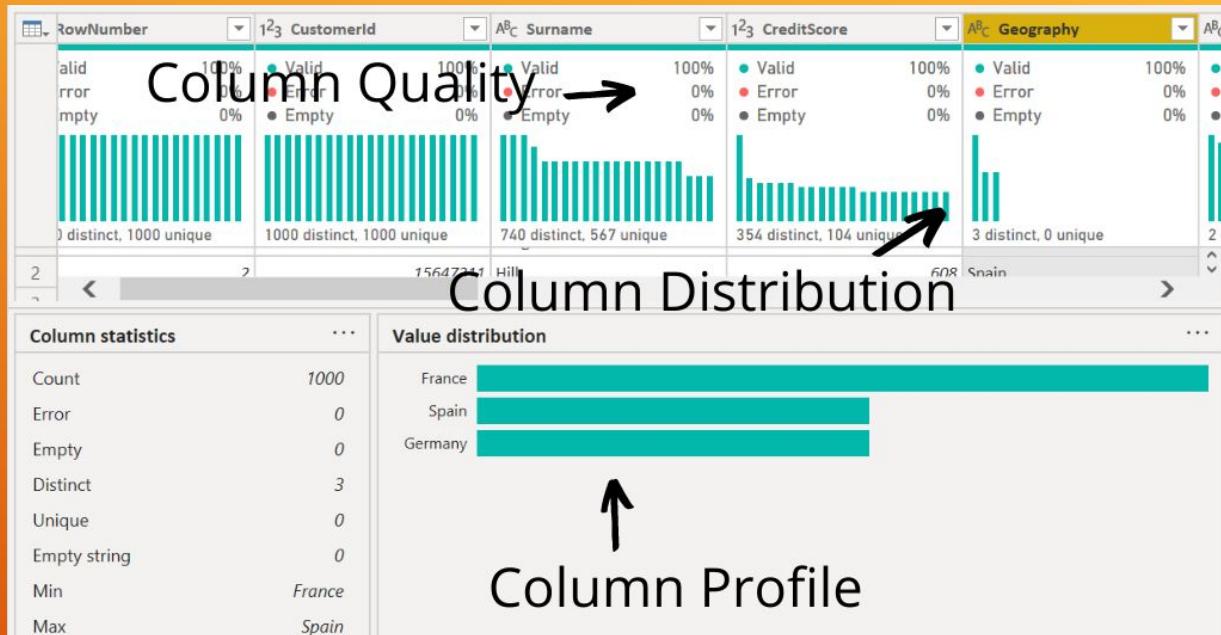
- 1: The top ribbon bar containing Home, Transform, Add column, View, Help, and various query management tools like Get data, Enter data, Options, Refresh, Advanced editor, Properties, Manage parameters, and a large set of transformation icons.
- 2: The Queries [1] list on the left side, which contains a single item named "Customers".
- 3: The main data grid area displaying a table of customer data with columns: CustomerID, CompanyName, ContactName, ContactTitle, Address, City, Region, and a dropdown menu for each row.
- 4: The Query settings pane on the right side, which includes sections for Properties (set to "Customers"), Entity type (set to "Custom"), Applied steps, and a Source section.
- 5: The status bar at the bottom showing "1 warning", "Completed (1.57 s)", "Columns: 13", "Rows: 91", and buttons for Step, Cancel, and Save & close.

CustomerID	CompanyName	ContactName	ContactTitle	Address	City	Region
1	ALFKI	Alfreds Futterkiste	Maria Anders	Sales Representative	Obere Str. 57	Berlin
2	ANATR	Ana Trujillo Emparedados y helados	Ana Trujillo	Sales Representative	Avda. de la Constitución 2222	México D.F.
3	ANTON	Antonio Moreno Taquería	Antonio Moreno	Manager	Matsäderos 2312	México D.F.
4	AROUT	Around the Horn	Thomas Hardy	Sales Representative	120 Hanover Sq.	London
5	BERGS	Berglunds snabbköp	Christina Berglund	Order Administrator	Berguvsgatan 8	Luleå
6	BLAUS	Blauer See Delikatessen	Hanna Moos	Sales Representative	Forsterstr. 57	Mannheim
7	BLONP	Blondesdís Íþrði og flíði	Frédérique Citeaux	Marketing Manager	24, place Kléber	Strasbourg
8	BOLID	Bólido Comidas preparadas	Martin Sommer	Owner	C/ Aragó, 67	Madrid
9	BONAP	Bon app'	Laurence Lebihan	Owner	12, rue des Bouchers	Marseille
10	BOTTM	Bottom-Dollar Markets	Elizabeth Lincoln	Accounting Manager	23 Tsawassen Blvd.	Tsawassen
11	BSBEV	B's Beverages	Victoria Ashworth	Sales Representative	Fauntleroy Circus	London
12	CACTU	Cactus Comidas para llevar	Patricia Simpson	Sales Agent	Cerrito 333	Buenos Aires
13	CENTC	Centro comercial Móvil	Francisco Chang	Marketing Manager	Sierras de Granada 9993	México D.F.
14	CHOPS	Chop-suey Chinese	Yang Wang	Owner	Hauptstr. 29	Bern
15	COMMI	Comércio Mineiro	Pedro Afonso	Sales Associate	Av. dos Lusíadas, 23	Sao Paulo
16	CONSH	Consolidated Holdings	Elizabeth Brown	Sales Representative	Berkley Gardens 12 Brewery	London
17	DRCRD	Drachenblut Delikatessen	Sven Ottlieb	Order Administrator	Waisenweg 21	Aachen
18	DUMON	Du monde entier	Janine Labrune	Owner	67, rue des Cinquante Otages	Nantes
19						

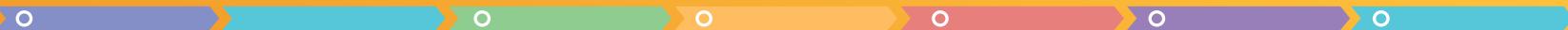
Data Profiling Tools

The data profiling tools provide new and intuitive ways to clean, transform, and understand data in Power Query Editor. They include:

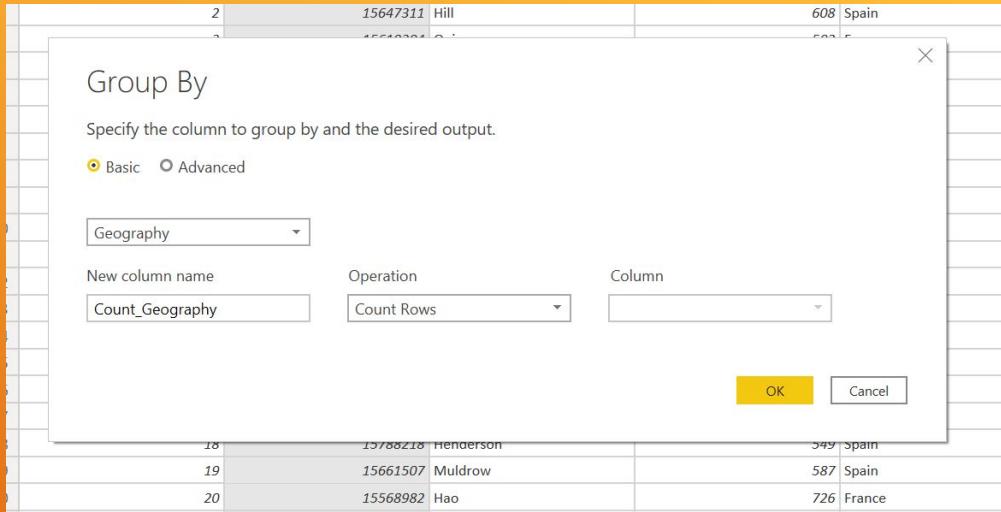
- Column quality
- Column distribution
- Column profile



Group By Dialog



In the Group by dialog, set the Group by operation to group by the Geography and count the number of supplier rows per Geography.



	A ^B C Geography	1 ² 3 Count_Geography
1	France	5014
2	Spain	2477
3	Germany	2509

Applied Steps



Any steps performed in Power BI is logged under the Applied Steps, which can be deleted or added anytime during the process

APPLIED STEPS

Source	⚙️
Promoted Headers	⚙️
Changed Type	⚙️
Replaced Value	⚙️
Replaced Value1	⚙️
X Replaced Value2	⚙️

Appending vs Merging



When you have one or more columns that you'd like to add to another query, you merge the queries. When you have additional rows of data that you'd like to add to an existing query, you append the query.

Merge

Select a table and matching columns to create a merged table.

Salary

Customer_ID	Salary
15634602	10000
15701354	20000
15767821	30000
15600882	40000

Churn_Modelling

RowNumber	CustomerId	Surname	CreditScore	Geography	Gender	Age	Tenure	Balance
1	15634602	Hargrave	619	France	Female	42	2	0
2	15647311	Hill	608	Spain	Female	41	1	83807.86
3	15619304	Onio	502	France	Female	42	8	159660.8
4	15701354	Boni	699	France	Female	39	1	0

Join Kind

Inner (only matching rows)

Use fuzzy matching to perform the merge

▷ Fuzzy matching options

✓ The selection matches 4 of 4 rows from the first table, and 4 of 10000 row...

OK Cancel

Welcome to DAX



Power BI - DAX



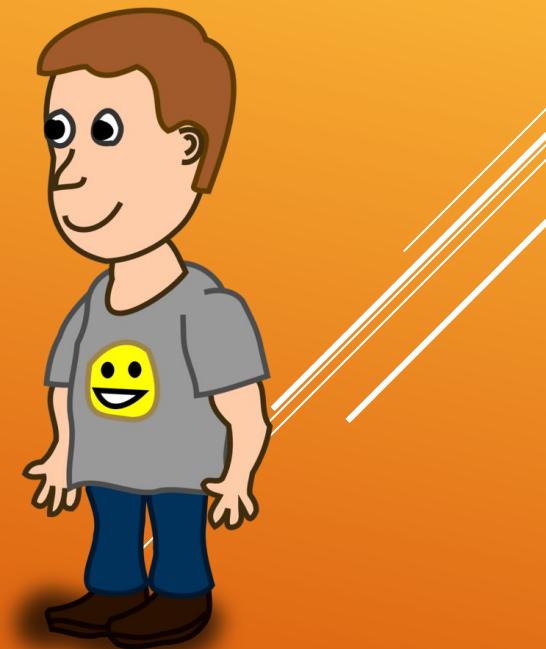
In order to say that you know DAX, you need:

You need to know these functions

SUM, AVERAGE, MIN, MAX, COUNT, COUNTROWS,
CALCULATE, FILTER etc.

Contexts: Row Context & Filter Context

Other things: Formatting, Best practices, X vs non X
functions, Time Intelligence Functions



First DAX Expression



- DAX: Data Analysis Expression
- Two business logics:
Measures & Calculated Columns
- As per google, Measures and calculated columns both use DAX expressions. The difference is the context of evaluation. A measure is evaluated in the context of the cell evaluated in a report or in a DAX query, whereas a calculated column is computed at the row level within the table it belongs to.

Calculated Columns



- Represents a single value per row
- Computed at compile time
- Results are dynamic, based on filters
- This is called the row context

Tenure_Months := Churn[Tenure]*12

Measures



- Represents a single value per data model
- Computed at run time
- Results are dynamic, based on filters
- This is called the filter context
- Not attached to any specific table

TotalQuantity := SUM(Sales[Quantity])

Implicit Measures



- If we use a calculated column as a value/result, it creates an implicit measure.
- For example:
- If we have columns such as Tenure in years, Monthly average usage, and let say we want to create the overall average usage for that particular customer.
- $\text{Churn}[\text{Tenure_Months}] = \text{Churn}[\text{Tenure}] * 12$
- Total usage for that customer will be,
- $\text{Churn}[\text{Total Usage}] = \text{Churn}[\text{Tenure_Months}] * \text{Churn}[\text{Monthly_Average_Usage}]$
- Which means, a change in the primitive column i.e. tenure, will impact the change in the Total Usage column



DAX is good at two things



- Aggregations
- Filtering

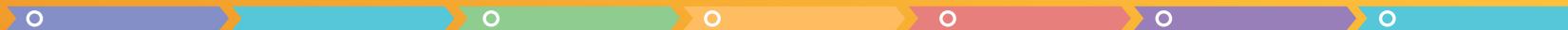
Aggregations:

Agg is combining a group of values into one value.

Examples:

- Sum
- Average
- Min
- Max
- Distinctcount

Power BI



Let's do a **SUM(Column)**

How to check whether it's correct?

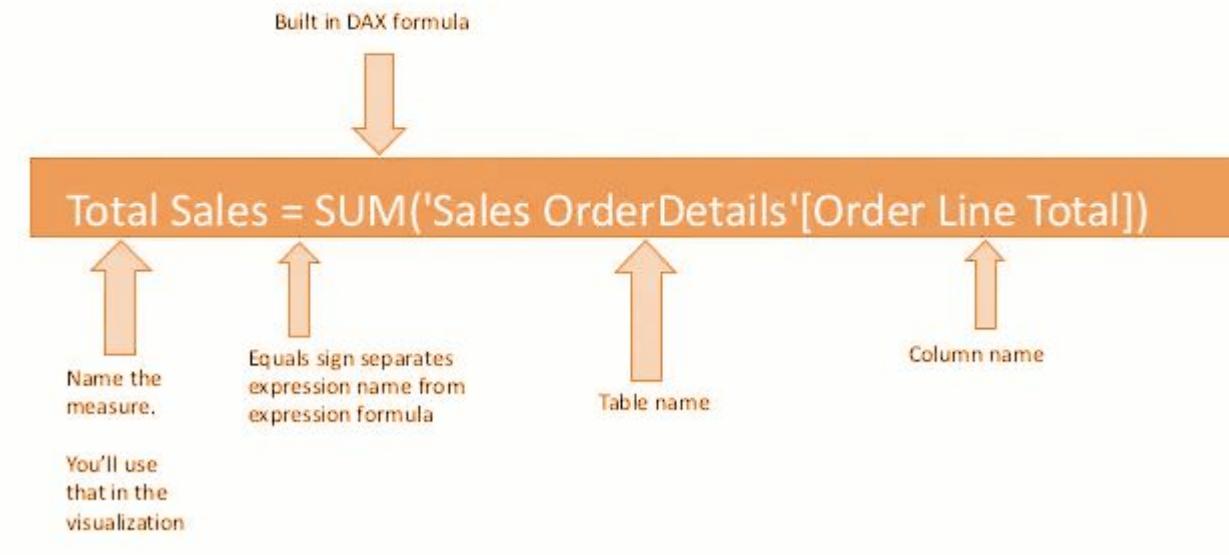
If you are using **select
SUM(quantity) from tablename;**

Power BI



DAX Breakdown

DAX Expression Breakdown



Power BI



Easy Peasy

- **SUM**
- **AVERAGE**
- **MIN**
- **MAX**
- **COUNT**
- **COUNTROWS**
- **DATEDIFF**
- **DATEADD**

Power BI

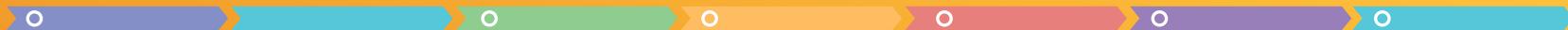


AVERAGE & DATEDIFF

Probation Period = DATEDIFF(column1,
column2, DAY)

Average = AVERAGE(column)

Power BI



Calculated Table

Dates = CALENDAR(range)

- Creates a dates table with a date per day between the specified range
- Also creates a Date Hierarchy

Power BI



Now on to Contexts!!

Two different contexts:

- Row context
- Filter context

Power BI



We already know how it works!

We've been using it for all our calculated columns so far, let's revisit our first DAX

Tenure in Years = ROUND(Churn_Modelling[Tenure]/12,2)

- Notice we expect a value per row in a table
- This runs at import and gets stored
- Might increase file size

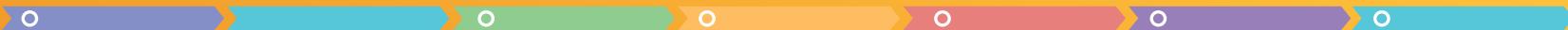
Power BI



Filter Context

Easy to show with measures

Power BI



CALCULATE: Breaking out of the filter context

```
Total Sales - Beverages = CALCULATE  
(  
    sum('Sales OrderDetails'[Order Line Total])  
    , 'Production Categories'[categoryname] = "Beverages"  
)
```

Year	Total Sales	Total Sales - Beverages
2006	\$2,26,298.5	\$53,879.2
2007	\$6,58,388.75	\$1,10,424
2008	\$4,69,771.34	\$1,22,223.75
Total	\$13,54,458.59	\$2,86,526.95

Year	categoryname	Meat/Poultry		Produce		Seafood		Total		
		Sales	Total Sales - Beverages	Total Sales	Total Sales - Beverages	Total Sales	Total Sales - Beverages	Total Sales	Total Sales - Beverages	Total Sales - Beverages
2006	Meat/Poultry	2,292.2	\$53,879.2	\$15,134.2	\$53,879.2	\$21,589.6	\$53,879.2	\$2,26,298.5	\$53,879.2	
2007	Produce	621.03	\$1,10,424	\$57,718.55	\$1,10,424	\$71,320.65	\$1,10,424	\$6,58,388.75	\$1,10,424	
2008	Seafood	275.57	\$1,22,223.75	\$32,415.85	\$1,22,223.75	\$48,712.84	\$1,22,223.75	\$4,69,771.34	\$1,22,223.75	
Total		1,188.8	\$2,86,526.95	\$1,05,268.6	\$2,86,526.95	\$1,41,623.09	\$2,86,526.95	\$13,54,458.59	\$2,86,526.95	

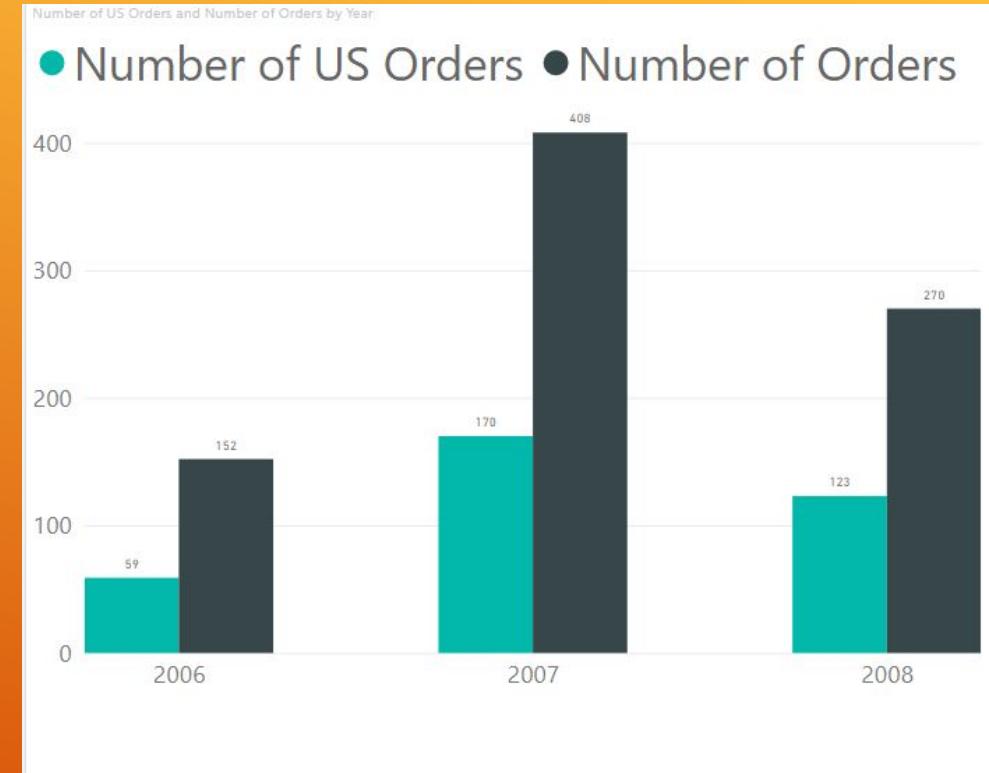
Power BI



Filter

```
Number of US Orders = CALCULATE  
( COUNT  
( 'Sales OrderDetails'[orderid])  
, FILTER (  
'Sales Customers' , 'Sales Customers'[country] = "USA" ))
```

```
Number of Orders = COUNT('Sales  
Orders'[orderid])
```



Power BI



Variables

VAR myVar=1



Data Type

Variable
Name

variable value

RETURN myVar + 25

Power BI



IF-ELSE & NESTED IF BLOCKS

Similar concepts like other programming languages.

```
Age_Bins = IF(Churn_Modelling[Age]>=60, "Above 60", "Below 60")
```

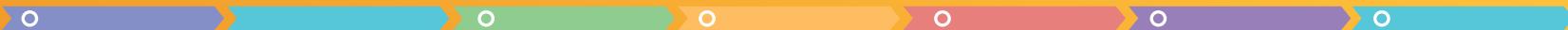
Power BI



Time Intelligence Functions

Time intelligence functions enable you to manipulate data using time periods such as years, quarters, months, and days and creating calculations over those time periods. The most common time periods that we encounter in business scenarios are usually Year-to-Date, Quarter-to-Date, Month-to-Date, Last Year Full Year, and Rolling 12 Months. There are many other time intelligence functions in DAX.

Power BI



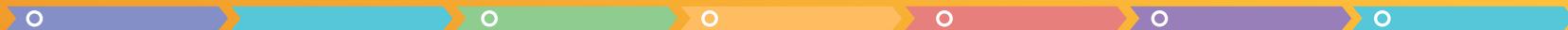
Time Intelligence: TOTALYTD

Month	2006	2007	2008	Total
January		\$66,692.8	\$1,00,854.72	
February		\$1,07,900	\$2,05,416.67	
March		\$1,47,879.9	\$3,15,242.12	
April		\$2,03,579.29	\$4,49,872.68	
May		\$2,60,402.99	\$4,69,771.34	
June		\$2,99,490.99	\$4,69,771.34	
July	\$30,192.1	\$3,54,955.92	\$4,69,771.34	
August	\$56,801.5	\$4,04,937.61	\$4,69,771.34	
September	\$84,437.5	\$4,64,670.63	\$4,69,771.34	
October	\$1,25,641.1	\$5,34,999.13	\$4,69,771.34	
November	\$1,75,345.1	\$5,80,912.49	\$4,69,771.34	
December	\$2,26,298.5	\$6,58,388.75	\$4,69,771.34	
Total	\$2,26,298.5	\$6,58,388.75	\$4,69,771.34	

YTD Total Sales = TOTALYTD

```
(  
    SUM('Sales OrderDetails'[Order Line Total])  
    , Dates[Date].[Date]  
)
```

Power BI



How to find the YTD for last year?

How to find the passengers in last year but same month

Power BI



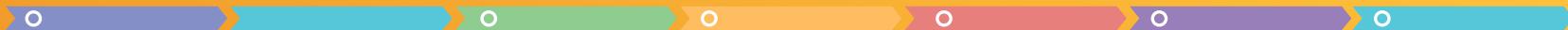
Time Intelligence: PREVIOUSMONTH

Total Sales Previous Month = CALCULATE

```
(  
    sum('Sales OrderDetails'[Order Line Total])  
    , PREVIOUSMONTH(Dates[Date])  
)
```

Year Month	2006		2007		2008		Total		
	Total Sales	Total Sales Previous Month	Total Sales	Total Sales Previous Month	Total Sales	Total Sales Previous Month	Total Sales	Total Sales Previous Month	Total Sales Previous Month
December	\$50,953.4	\$49,704	\$77,476.26	\$45,913.36				\$1,28,429.66	
November	\$49,704	\$41,203.6	\$45,913.36	\$70,328.5				\$95,617.36	
October	\$41,203.6	\$27,636	\$70,328.5	\$59,733.02				\$1,11,532.1	
September	\$27,636	\$26,609.4	\$59,733.02	\$49,981.69				\$87,369.02	
August	\$26,609.4	\$30,192.1	\$49,981.69	\$55,464.93				\$76,591.09	
July	\$30,192.1		\$55,464.93	\$39,088				\$85,657.03	
June			\$39,088	\$56,823.7			\$19,898.66	\$39,088	
May			\$56,823.7	\$55,699.39	\$19,898.66		\$1,34,630.56	\$76,722.36	
April			\$55,699.39	\$39,979.9	\$1,34,630.56		\$1,09,825.45	\$1,90,329.95	
March			\$39,979.9	\$41,207.2	\$1,09,825.45		\$1,04,561.95	\$1,49,805.35	
February			\$41,207.2	\$66,692.8	\$1,04,561.95		\$1,00,854.72	\$1,45,769.15	
January			\$66,692.8	\$50,953.4	\$1,00,854.72		\$77,476.26	\$1,67,547.52	
Total	\$2,26,298.5	\$6,58,388.75	\$50,953.4	\$4,69,771.34	\$77,476.26	\$13,54,458.59			

Power BI

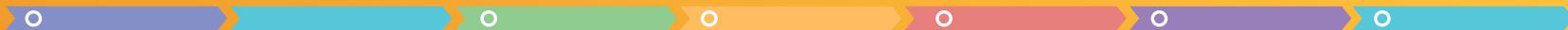


X vs nonX functions(SUM vs SUMX)

- SUM is an aggregator function. It works like a measure, calculating based on the current filter context.

SUMX is an in-memory iterator function. It works row by row. SUMX has awareness of rows in a table, hence can reference the intersection of each row with any columns in the table.

Power BI



SUM VS SUMX: EXAMPLE

Total Sales SUMX = SUMX(

'Sales OrderDetails'

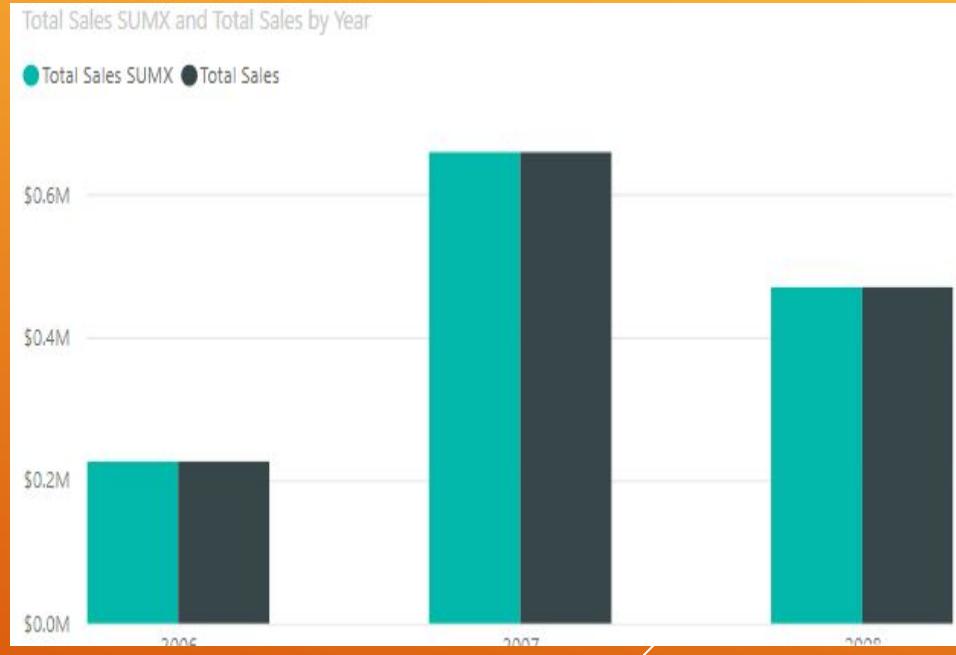
, 'Sales OrderDetails'[qty]

* 'Sales OrderDetails'[unitprice]

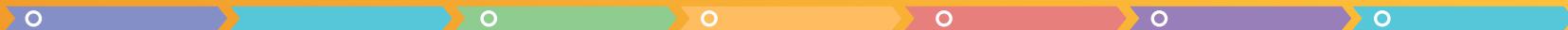
)

Total Sales =

sum('Sales OrderDetails'[Order Line Total])



Power BI

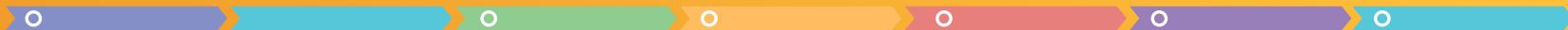


AVERAGE, AVERAGEA, AVERAGEX

- AVERAGE → Averages out the data
- AVERAGEA → Considers non integer values as null
- AVERAGEX → Creates In memory measure

AVERAGEX is also an iterator function. It works row by row. AVERAGEX has awareness of rows in a table, hence can reference the intersection of each row with any columns in the table.

Power BI



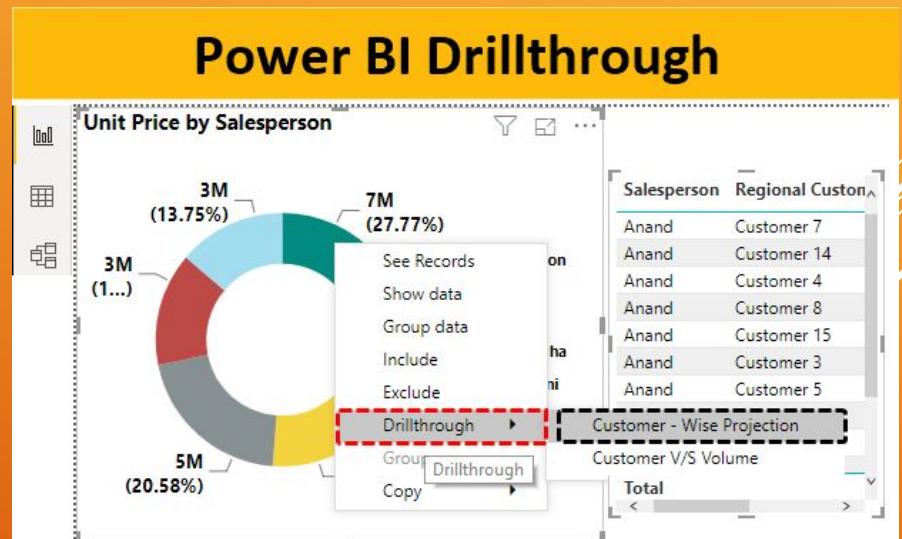
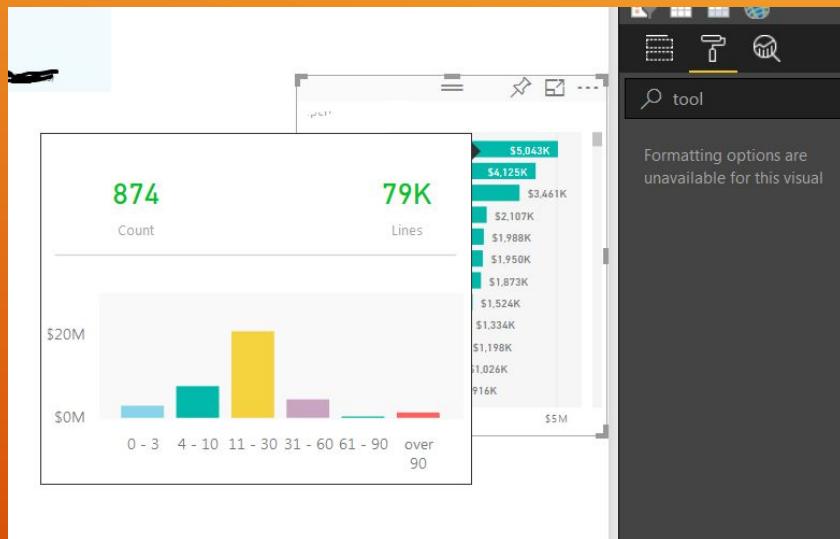
Best Practice: Organize your code

- Create a separate table for measures
- Limit Visuals: As visuals interact with each other, if we have more visuals, it might take a lot of time to refresh. Tool tips & Drill through can be used.
- Process as much data as required in the original source
- Certified Visuals are recommended
- Use a lighter background

Power BI



Tool tips & Drill Throughs



Power BI



Page Navigation

The screenshot shows the Power BI ribbon interface. The **Insert** tab is selected, indicated by a yellow underline. Below the tabs, there are several groups of icons:

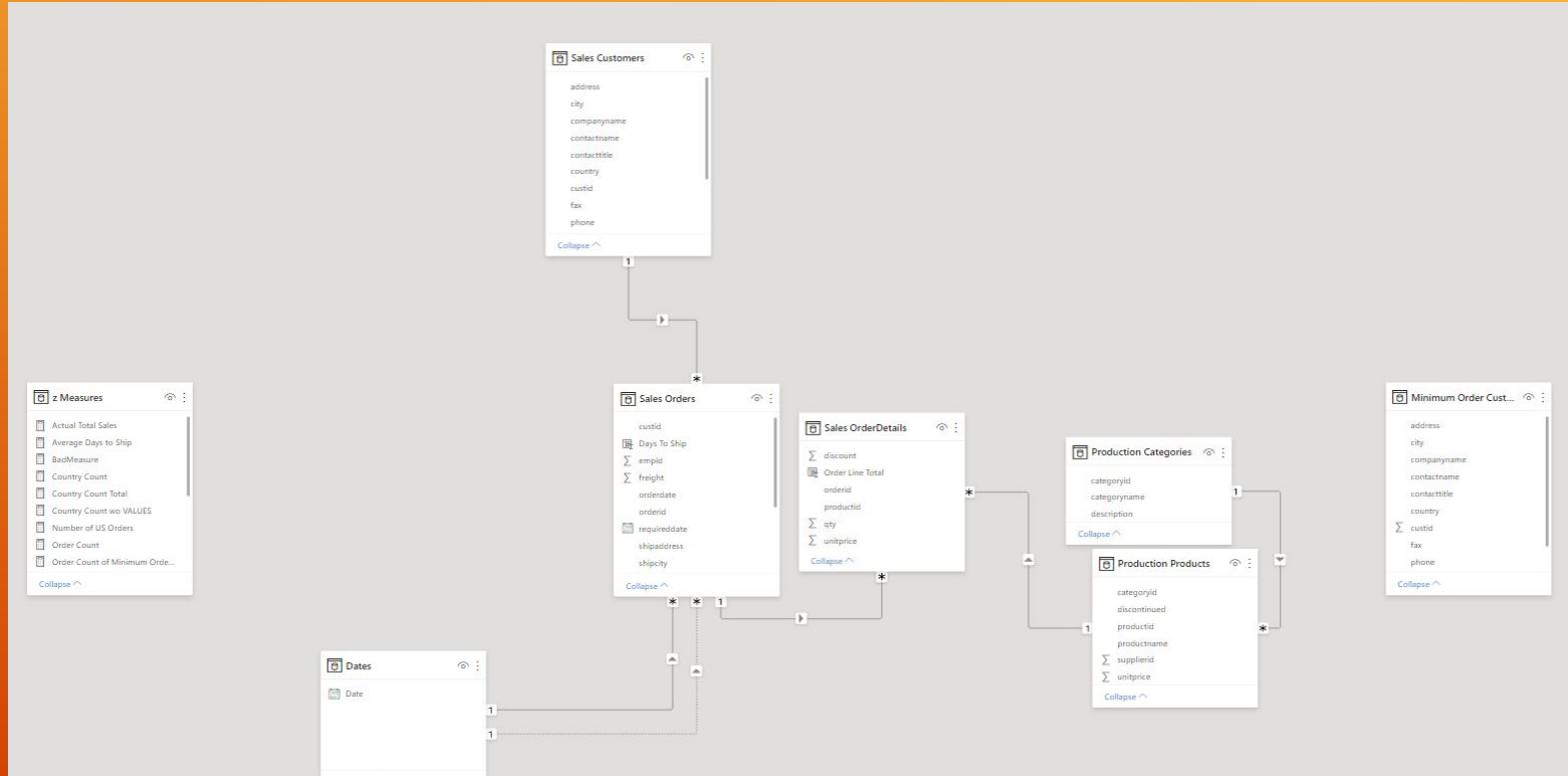
- Pages**: Includes **New page** (with a dropdown menu), **Visuals**, and a separator line.
- Visuals**: Includes **New visual** (with a dropdown menu), **More visuals** (with a dropdown menu), and a separator line.
- AI visuals**: Includes **Q&A**, **Key influencers**, and **Decomposition tree**.
- Power Platform**: Includes **Power Apps** and **Power Platform**.
- Elements**: Includes **Text box**, **Buttons** (with a dropdown menu), **Shapes** (with a dropdown menu), and **Image** (with a dropdown menu).

A red box highlights the **Buttons**, **Shapes**, and **Image** buttons in the **Elements** section. A white line points from the bottom right towards this red box.

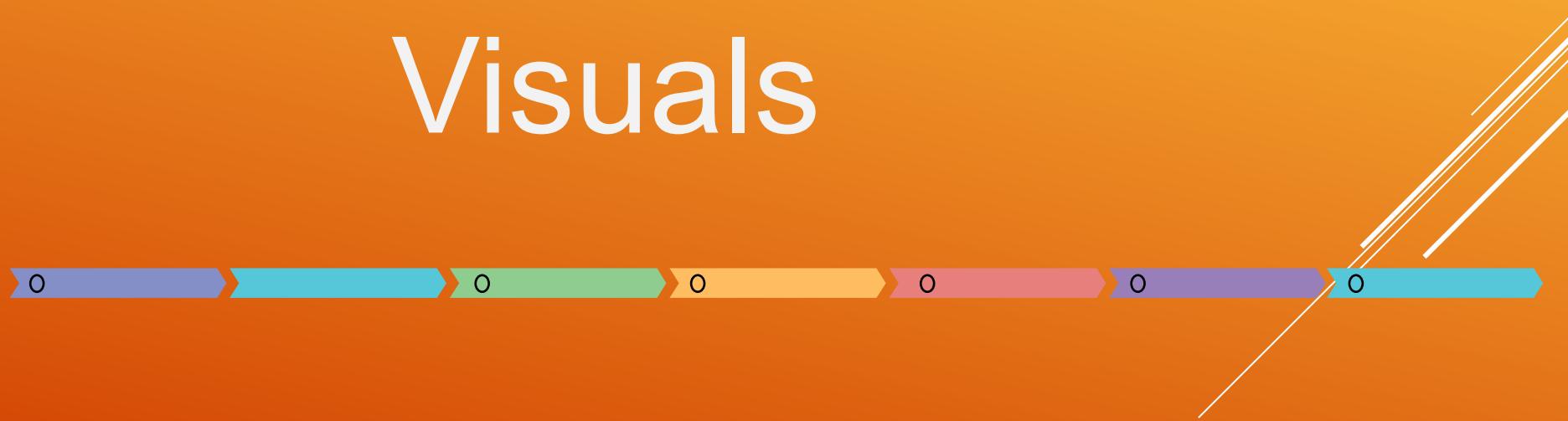
Power BI



RELATIONSHIP



Power BI Visuals



Building Blocks of Power BI



Building Blocks of Power BI



Visualizations

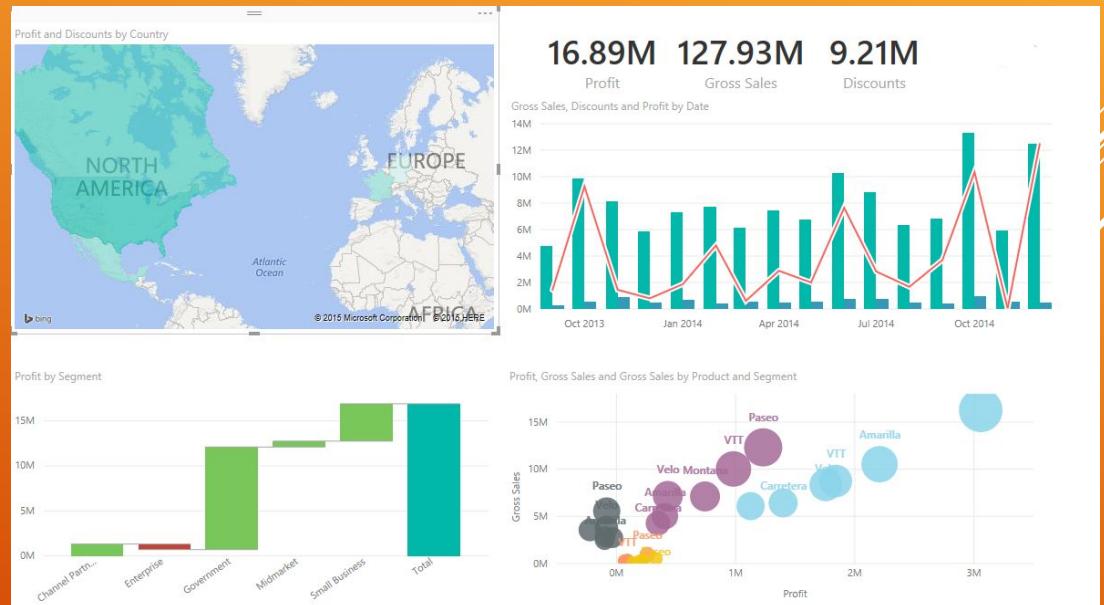
A visual representation of data is called visualization. For example, a chart, or a graph can be used to represent data visually.

Datasets

Reports

Dashboards

Tiles



Building Blocks of Power BI



Visualizations

Datasets

Reports

Dashboards

Tiles

A dataset is a collection of data or information

RowNumber	CustomerID	Surname	CreditScore	Geography	Gender	Age	Tenure	Balance
1	15634602	Hargrave	619	France	Female	42	2	0
2	15647311	Hill	608	Spain	Female	41	1	83807.86
3	15619304	Onio	502	France	Female	42	8	159660.8
4	15702354	Boni	699	France	Female	39	1	0
5	15737888	Mitchell	850	Spain	Female	43	2	125510.82
6	15574012	Chu	645	Spain	Male	44	8	113755.78
7	15592531	Bartlett	822	France	Male	50	7	0
8	15656148	Obinna	376	Germany	Female	29	4	115046.74
9	15792365	He	501	France	Male	44	4	142051.07
10	15592389	H?	684	France	Male	27	2	134603.88
11	15767821	Bearce	528	France	Male	31	6	102016.72
12	15737173	Andrews	497	Spain	Male	24	3	0
13	15632264	Kay	476	France	Female	34	10	0
14	15691483	Chin	549	France	Female	25	5	0
15	15600882	Scott	635	Spain	Female	35	7	0
16	15643968	Goforth	616	Germany	Male	45	3	143129.41
17	15737452	Romeiro	651	Germany	Male	58	1	132602.88
18	15788218	Henderson	549	Spain	Female	24	9	0
19	15661507	Mulrrow	587	Spain	Male	45	6	0
20	15568982	He	726	France	Female	24	6	0
21	15577857	McDonald	732	France	Male	41	8	0
22	15597945	Delucci	636	Spain	Female	32	8	0
23	15699309	Gerazimov	510	Spain	Female	38	4	0
24	15725737	Mosman	669	France	Male	46	3	0
25	15625047	Yen	846	France	Female	38	5	0
26	15738191	Maclean	577	France	Male	25	3	0
27	15736816	Young	756	Germany	Male	36	2	136815.64
28	15700772	Nebechi	571	France	Male	44	9	0
29	15728693	McWilliams	574	Germany	Female	43	3	141349.43
30	15656300	Lucciano	411	France	Male	29	0	59697.17
31	15584745	Azikiwe	591	Spain	Female	39	3	0
32	15706552	Odinakachukwu	533	France	Male	36	7	85311.7
33	15750181	Sanderson	551	Germany	Male	41	9	110112.54
34	15659428	Maggard	520	Spain	Female	42	6	0

Building Blocks of Power BI



Visualizations

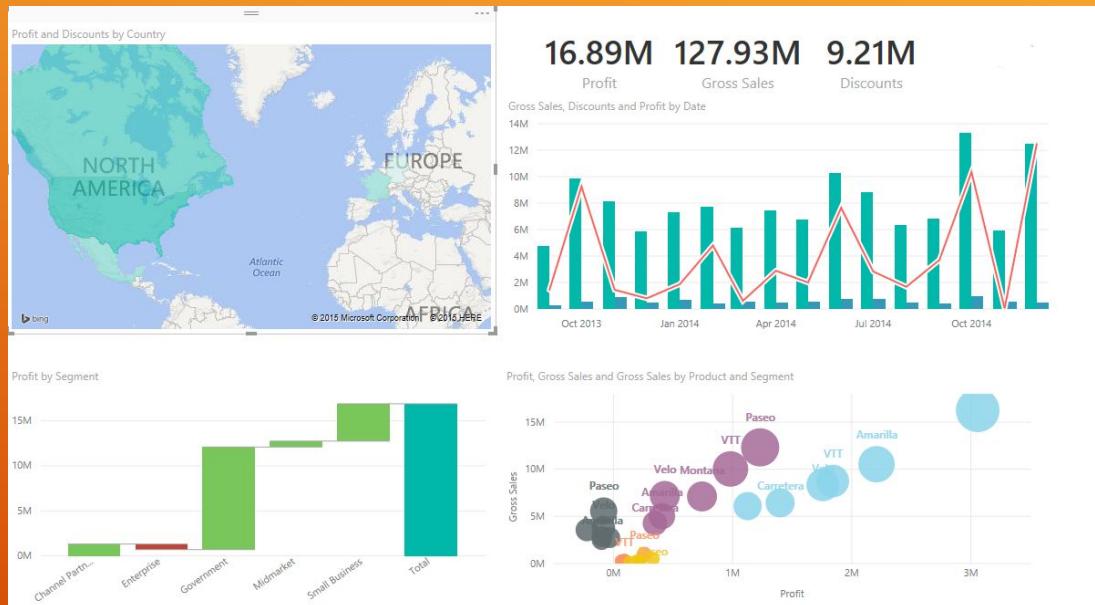
Datasets

Reports

Dashboards

Tiles

A collection of visualizations that appear together on one or more pages is a report in Power BI. It is a collection of items that have common motive.



Building Blocks of Power BI



Visualizations

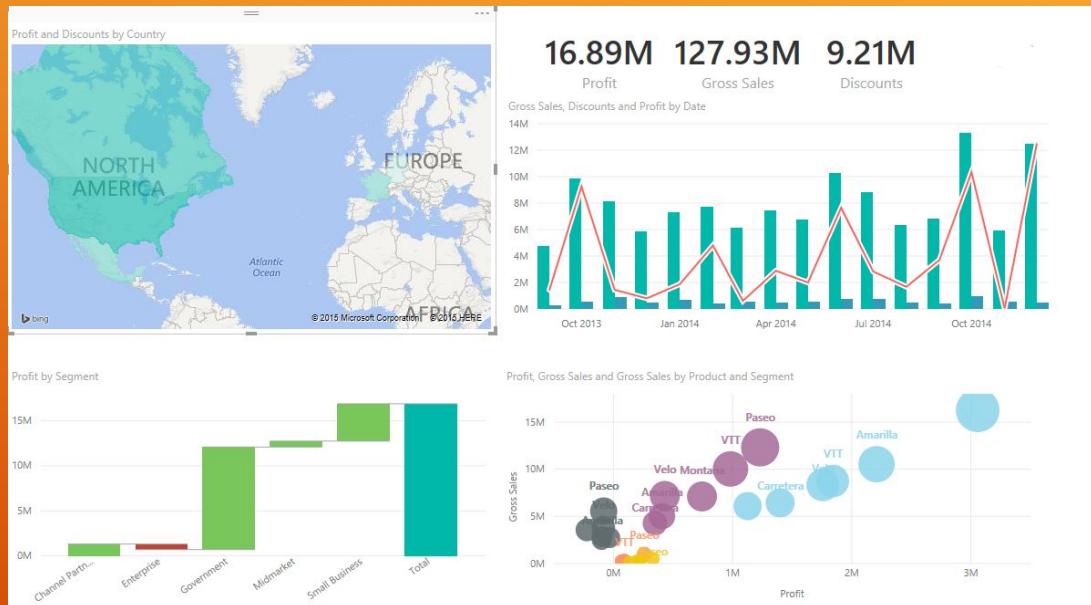
Datasets

Reports

Dashboards

Tiles

A Power BI dashboard is a single page interface that uses the most important elements of a report to tell a story.



Building Blocks of Power BI



Visualizations

Datasets

Reports

Dashboards

Tiles

In Power BI, a tile is a single visualization found in a report or on a dashboard



Pin to dashboard

Select an existing dashboard or create a new one.

Where would you like to pin to?

Existing dashboard

New dashboard

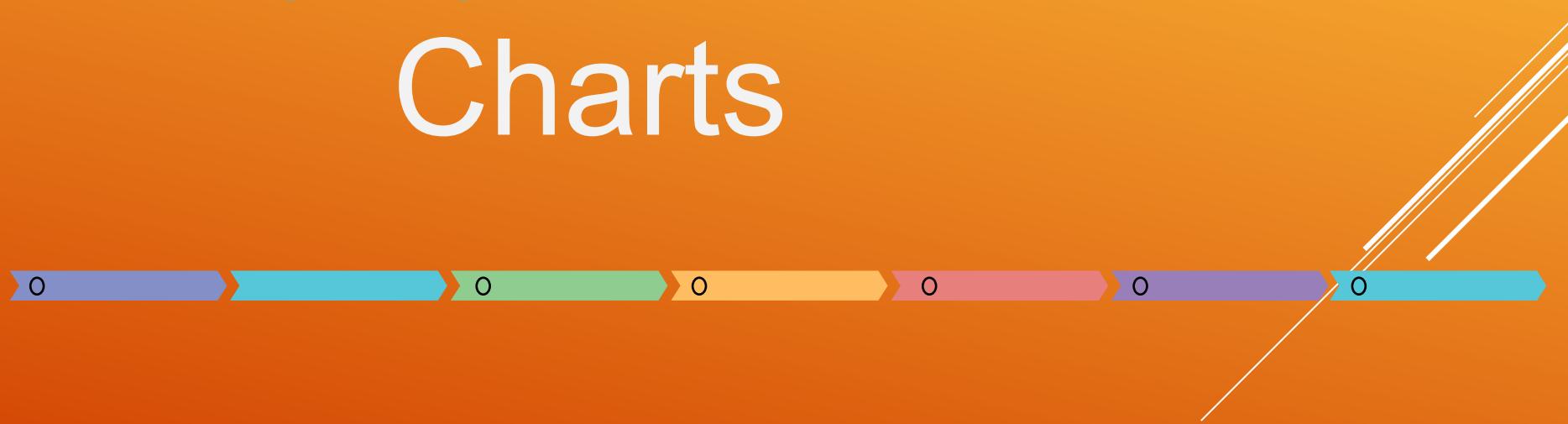
Select existing dashboard

Hate Crime - Dashboard

Pin

Cancel

Power BI Charts



Different Charts in Power BI



Bar, Column, Line & Area Charts

Combination Charts

Pie-Charts, Doughnut charts

Maps, Funnel Charts

5

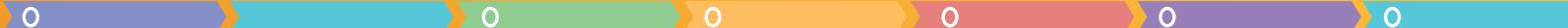
Gauge, Cards, Tables & Matrices



Power BI KPIs



Topics to be covered.



What is KPI ?

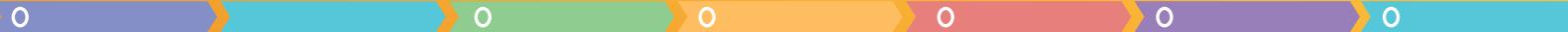
When to use KPI ?

What do you require for KPI ?

How to use KPI visualizations ?



When to use KPI?



1

What is KPI ?

2

When to use?

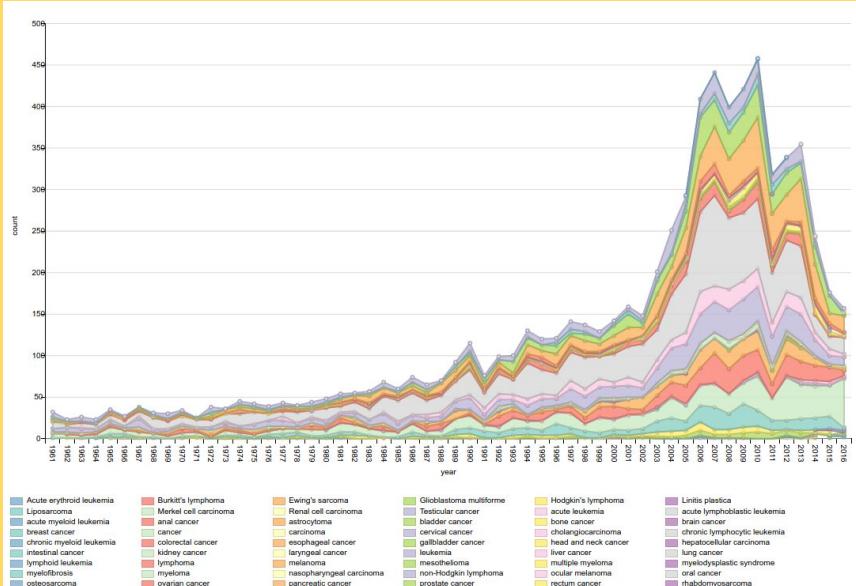
3

Requirements for KPI

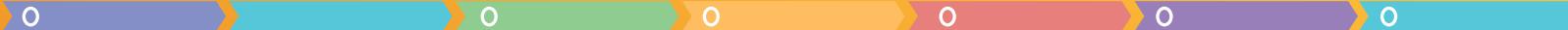
4

KPI
Visualizations

A key performance indicator (KPI) is a visual cue that communicates the amount of progress made toward a target.



When to use KPI?



What is KPI ?



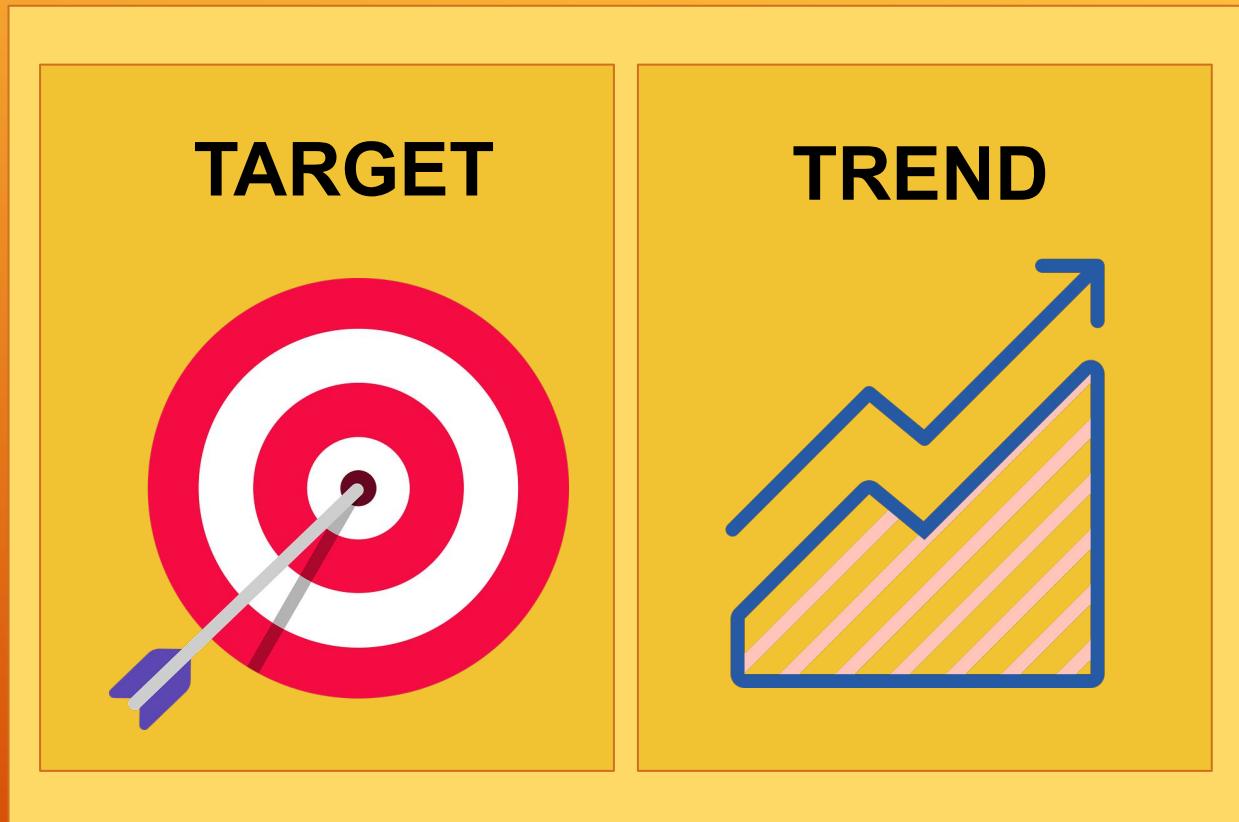
When to use?



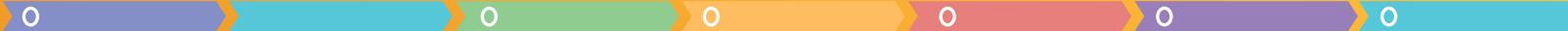
Requirements for KPI



KPI
Visualizations



When to use KPI?



What is KPI ?



When to use?



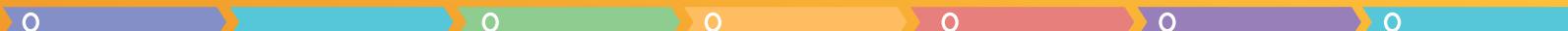
Requirements for KPI



KPI
Visualizations



When to use KPI?



What is KPI ?



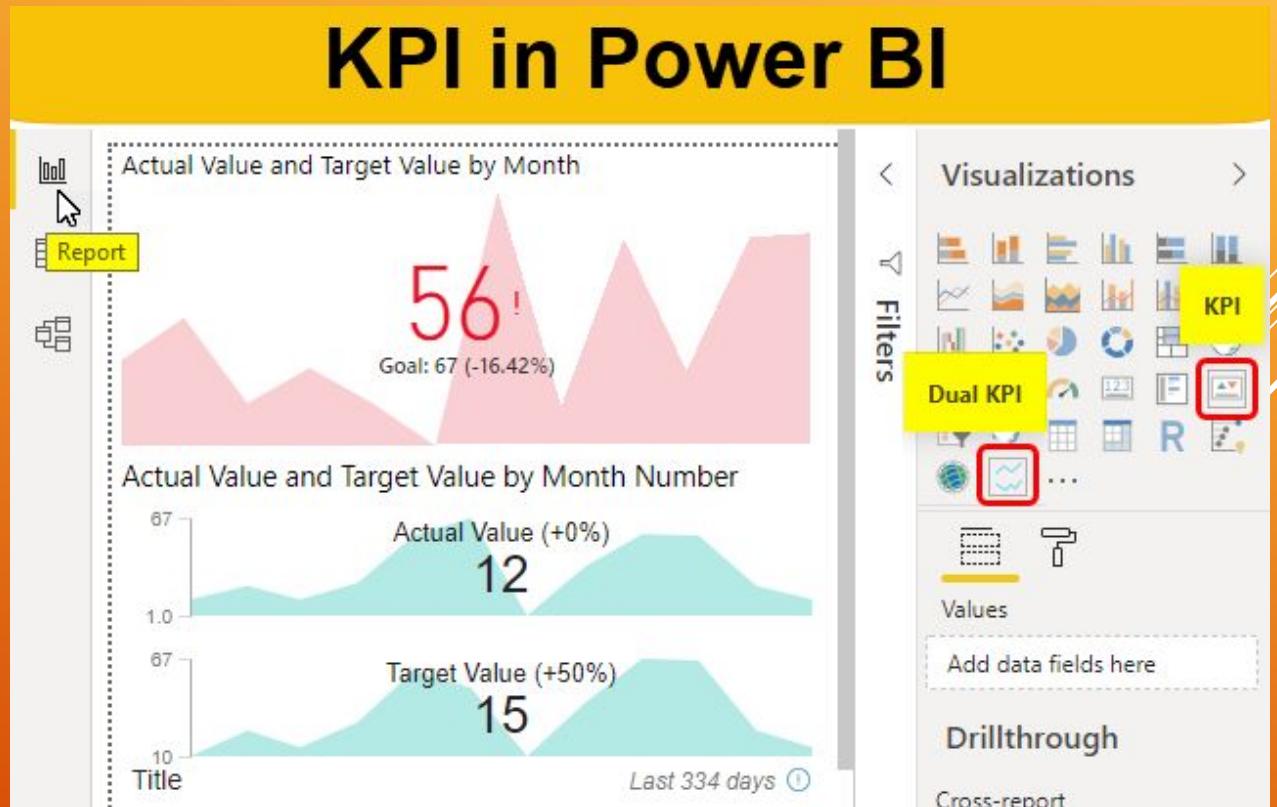
When to use?



Requirements for KPI



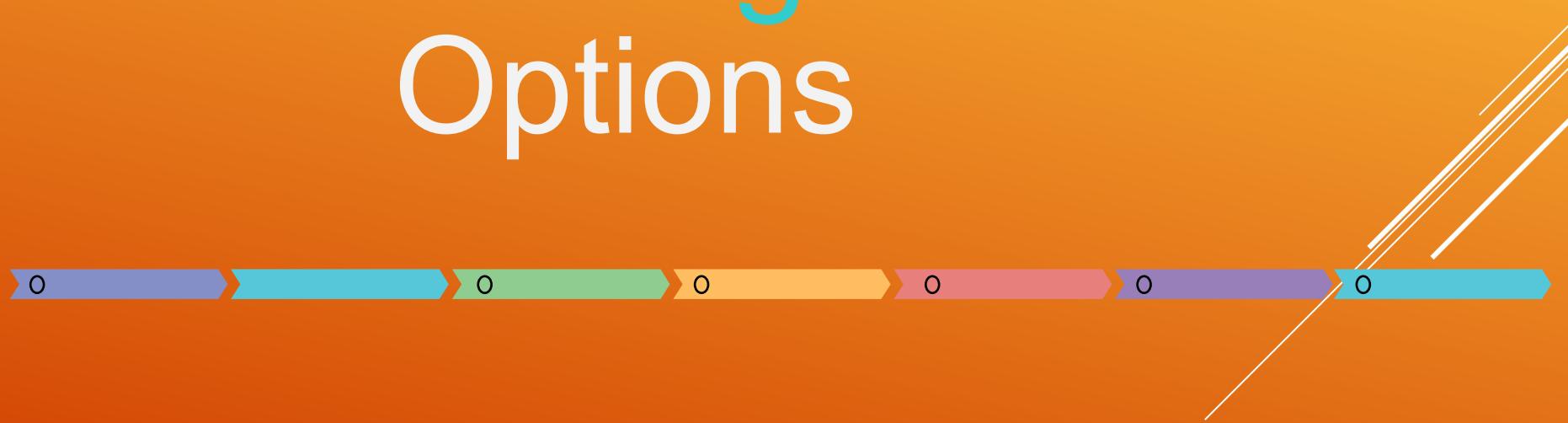
KPI
Visualizations



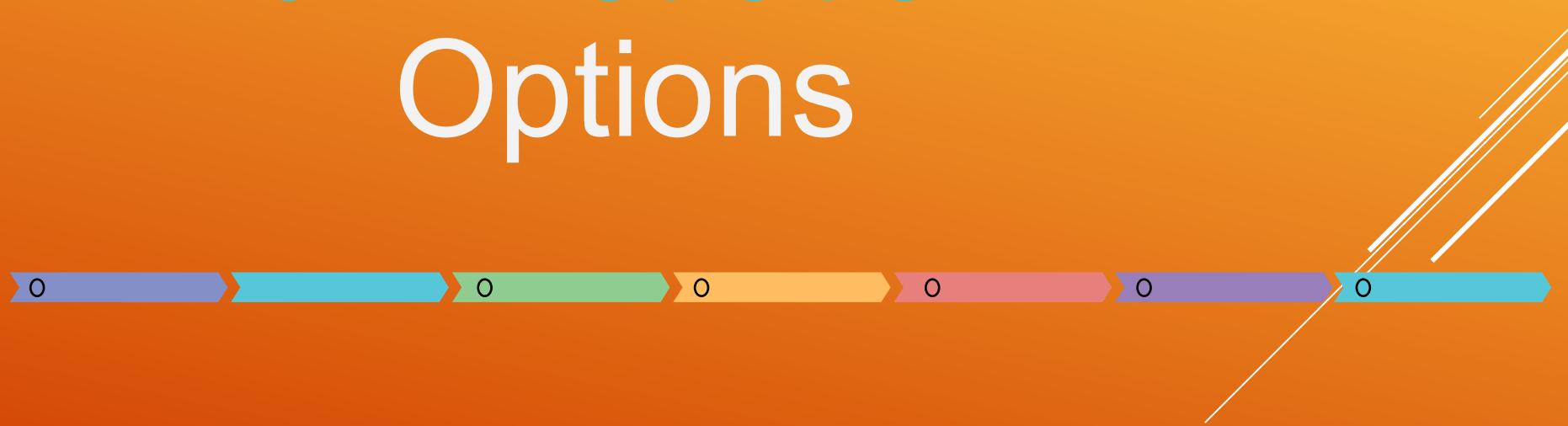
Edit Interactions



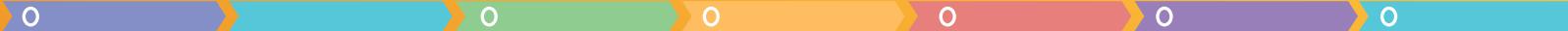
Formatting Options



Administration Options



Different Roles in Power BI Service



Admin

Member

Contributor

Viewer



Different Roles in Power BI Service



Link:

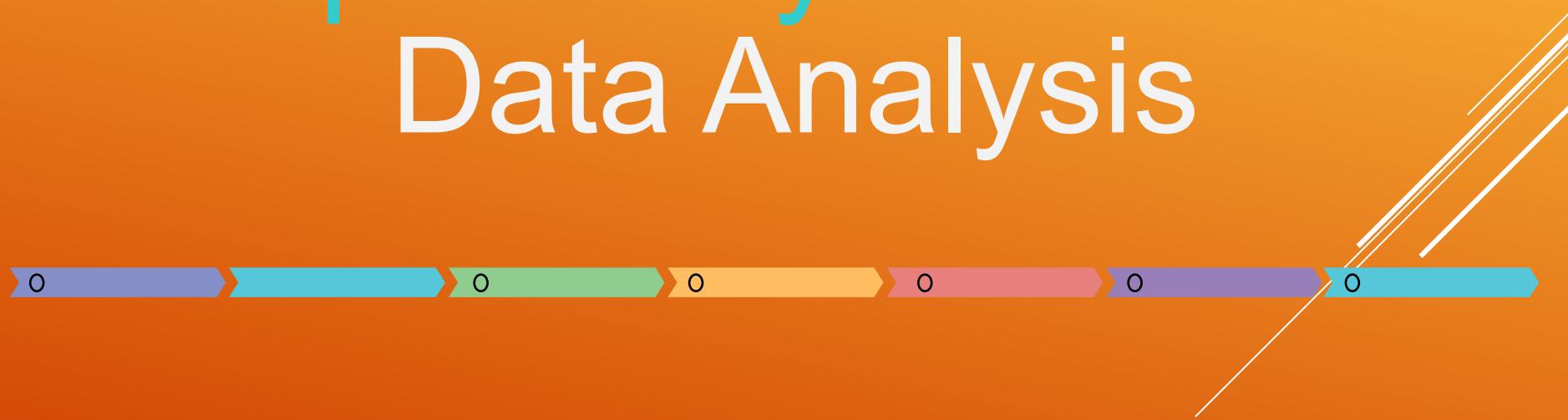
<https://docs.microsoft.com/en-us/power-bi/collaborate-share/service-roles-new-workspaces>

Capability	Admin	Member	Contributor	Viewer
Update and delete the workspace.	✓			
Add/remove people, including other admins.	✓			
Allow Contributors to update the app for the workspace	✓			
Add members or others with lower permissions.	✓	✓		
Publish, unpublish, and change permissions for an app	✓	✓		
Update an app.	✓	✓		If allowed ¹
Share an item or share an app. ²	✓	✓		
Allow others to reshare items. ²	✓	✓		
Feature apps on colleagues' Home	✓	✓		
Manage dataset permissions. ³	✓	✓		
Feature dashboards and reports on colleagues' Home	✓	✓	✓	
Create, edit, and delete content in the workspace.	✓	✓	✓	
Publish reports to the workspace, delete content.	✓	✓	✓	
Create a report in another workspace based on a dataset in this workspace. ³	✓	✓	✓	
Copy a report. ³	✓	✓	✓	
Create goals based on a dataset in the workspace. ³	✓	✓	✓	
Schedule data refreshes via the on-premises gateway. ⁴	✓	✓	✓	
Modify gateway connection settings. ⁴	✓	✓	✓	
View and interact with an item. ⁵	✓	✓	✓	✓
Read data stored in workspace dataflows	✓	✓	✓	✓

Security in Power BI



Exploratory Data Analysis



Visualization

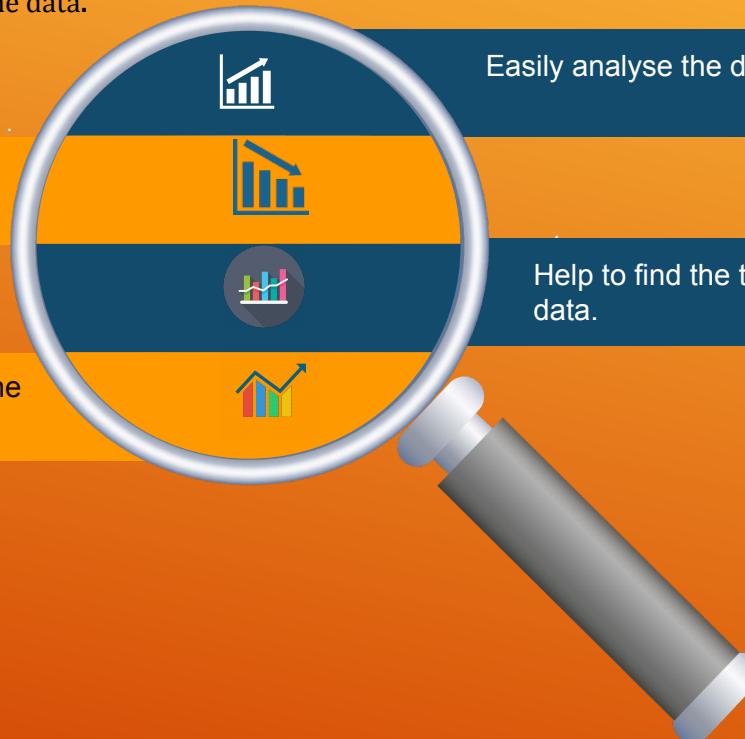
Visualisation is the presentation of the data in the graphical or visual form to understand the data more clearly. Visualisation is easy to understand the data.

Easily understand the features of the data.

Help to get meaningful insights from the data.

Easily analyse the data and summarize it.

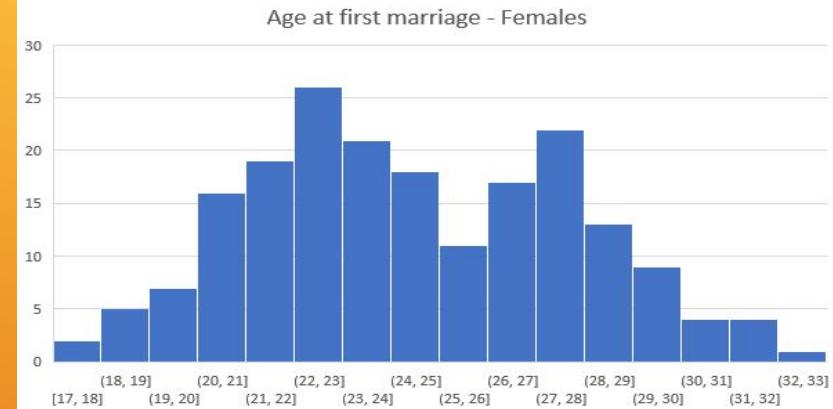
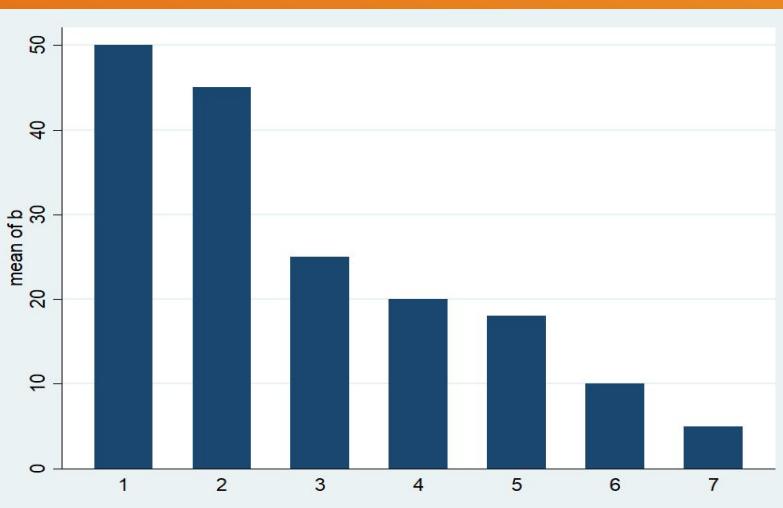
Help to find the trend or pattern of the data.



Important Charts for Visualisation

Histogram

Histogram represent the frequency distribution of the data

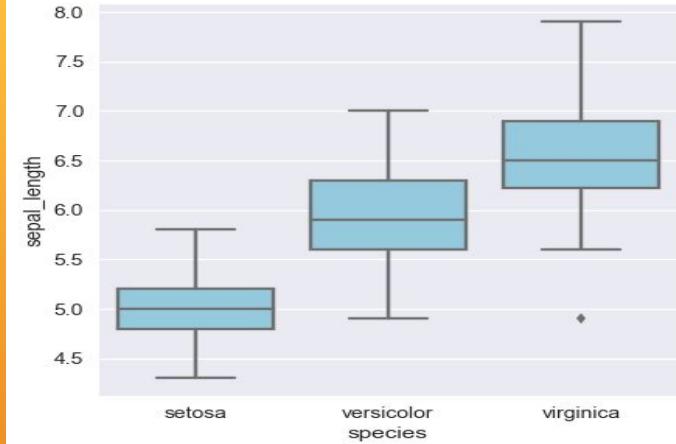


Bar Chart

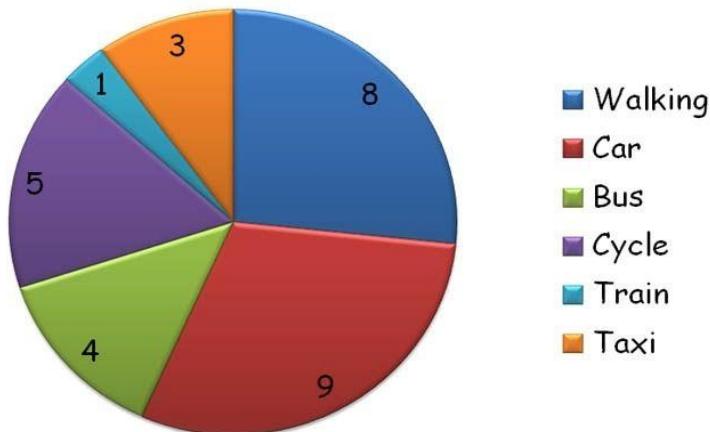
Bar graph represent the total observation in the data for a particular category.

Box Plot

Boxplot display the distribution of the data based on five number summary(minimum, first quartile, median, third quartile, maximum)



Methods of Travelling to School

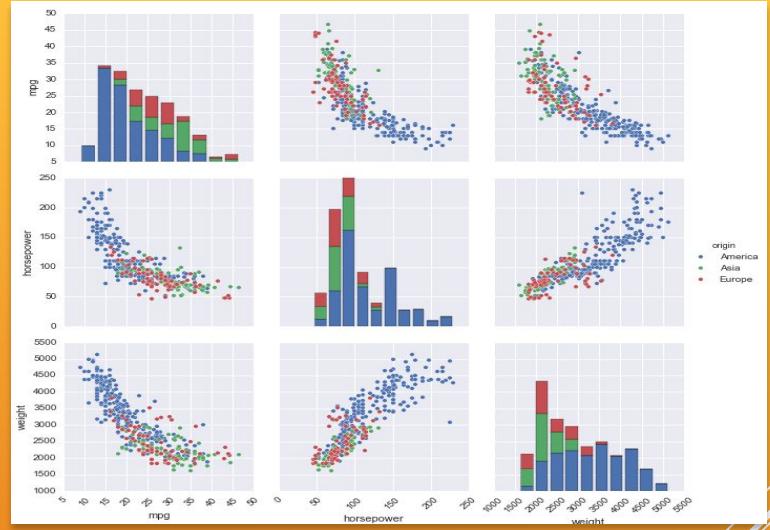
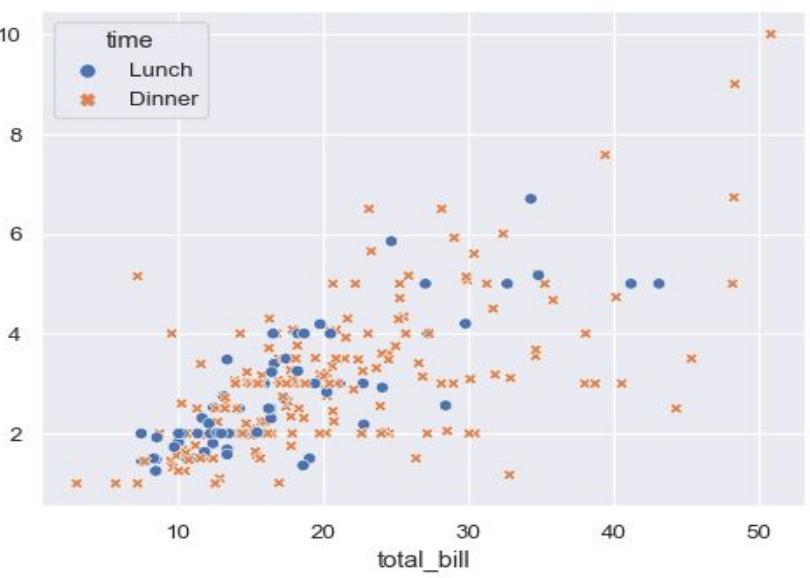


Pie Chart

Pie chart represent the percentage of the data by each category.

Pair-plot

Pair plot show the bivariate distribution of the datasets. It show the pairwise relationship between the variable



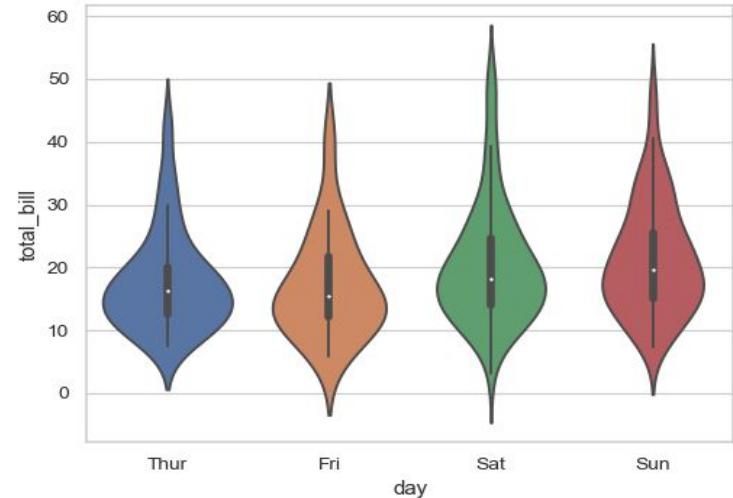
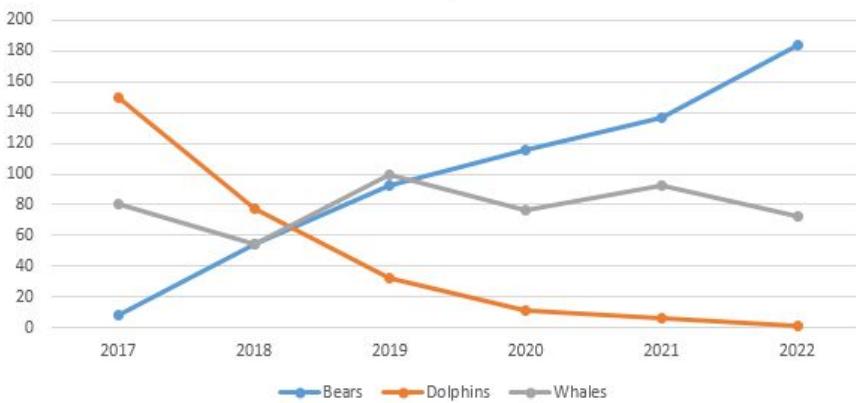
Scatter Plot

Scatter plot represent the relationship between two numerical variable. It show the correlation between two variable.

Violin Plot

Violin chart are used to plot numeric data

Wildlife Population



Line Chart

Line chart are used to track change over line and short period of time. Line chart are used in time series data.

Steps Involved in EDA

01

Data Sourcing



02

Data Cleaning

03

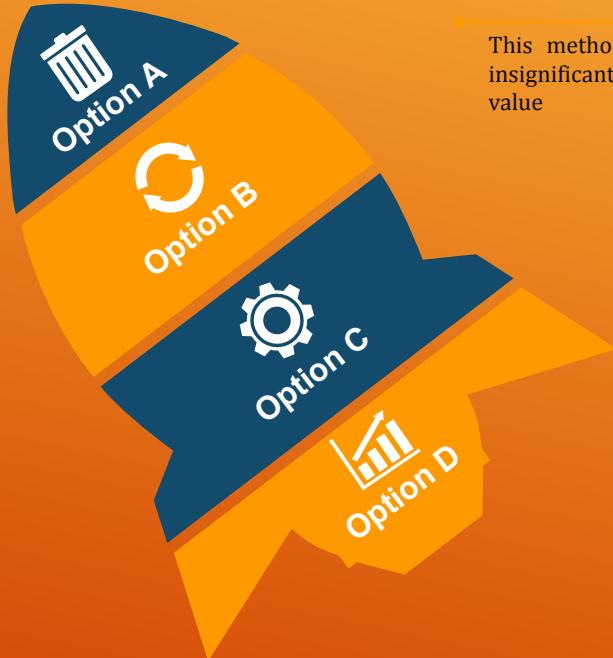
**Categorical Data Analysis:
Univariate/Bivariate/Multivariate Analysis with Visualisation**

04

Numerical Data Analysis

Derived Metrics

Handle Missing Value



Delete Rows/Columns



This method we commonly used to handle missing values. Rows can be deleted if it has insignificant number of missing value Columns can be delete if it has more than 75% of missing value

Replacing with mean/median/mode



This method can be used on independent variable when it has numerical variables. On categorical feature we apply **mode** method to fill the missing value.

Algorithm Imputation



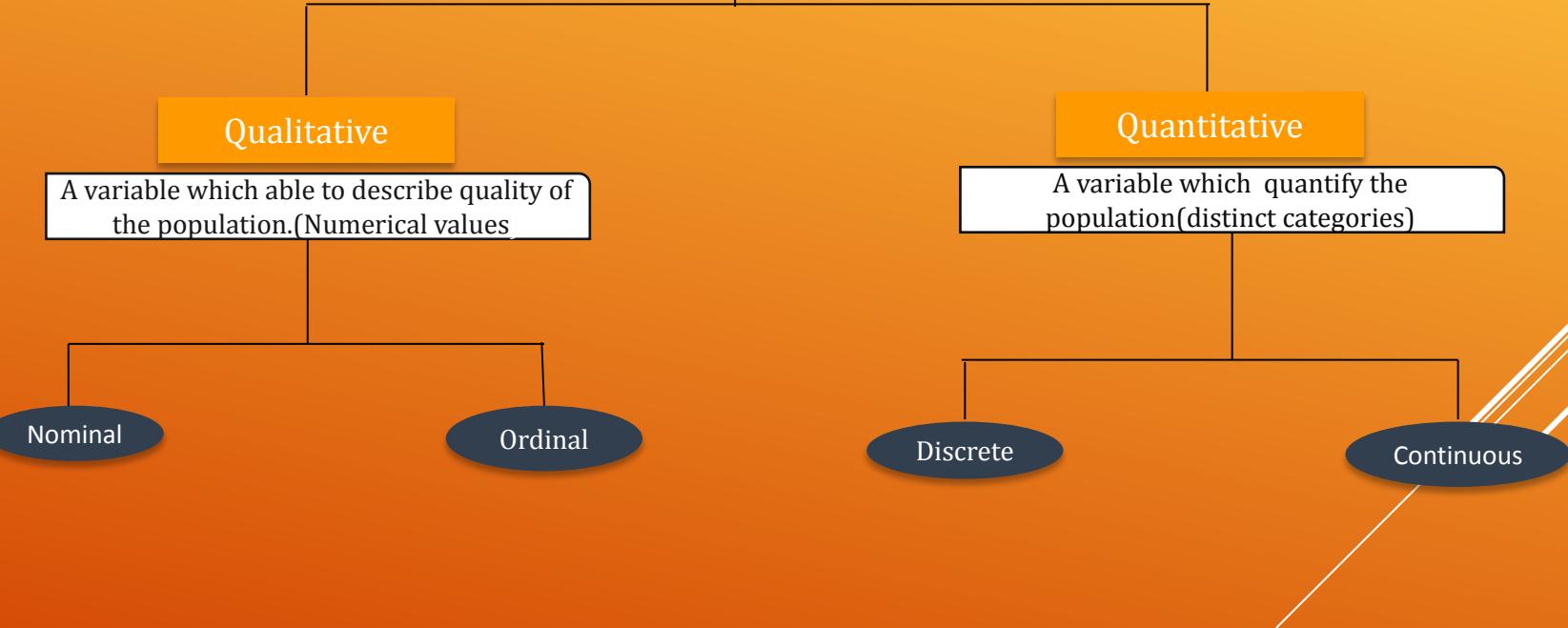
Some machine learning algorithm supports to handle missing value in the datasets. Like KNN, Naive Bayes, Random forest.

Predicting the missing values



Prediction model is one of the advanced method to handle missing values. In this method dataset with no missing value become training set and dataset with missing value become the test set and the missing values is treated as target variable.

Types of Data



Types of Data



Discrete

It has a discrete value that means it take only counted value not a decimal values. Like count of student in class



Continuous

A number within a range of a value is usually measured, such as height.



Nominal

It represent qualitative information without order. Value represent a discrete units.

Like Gender: Male/Female ,Eye colour.

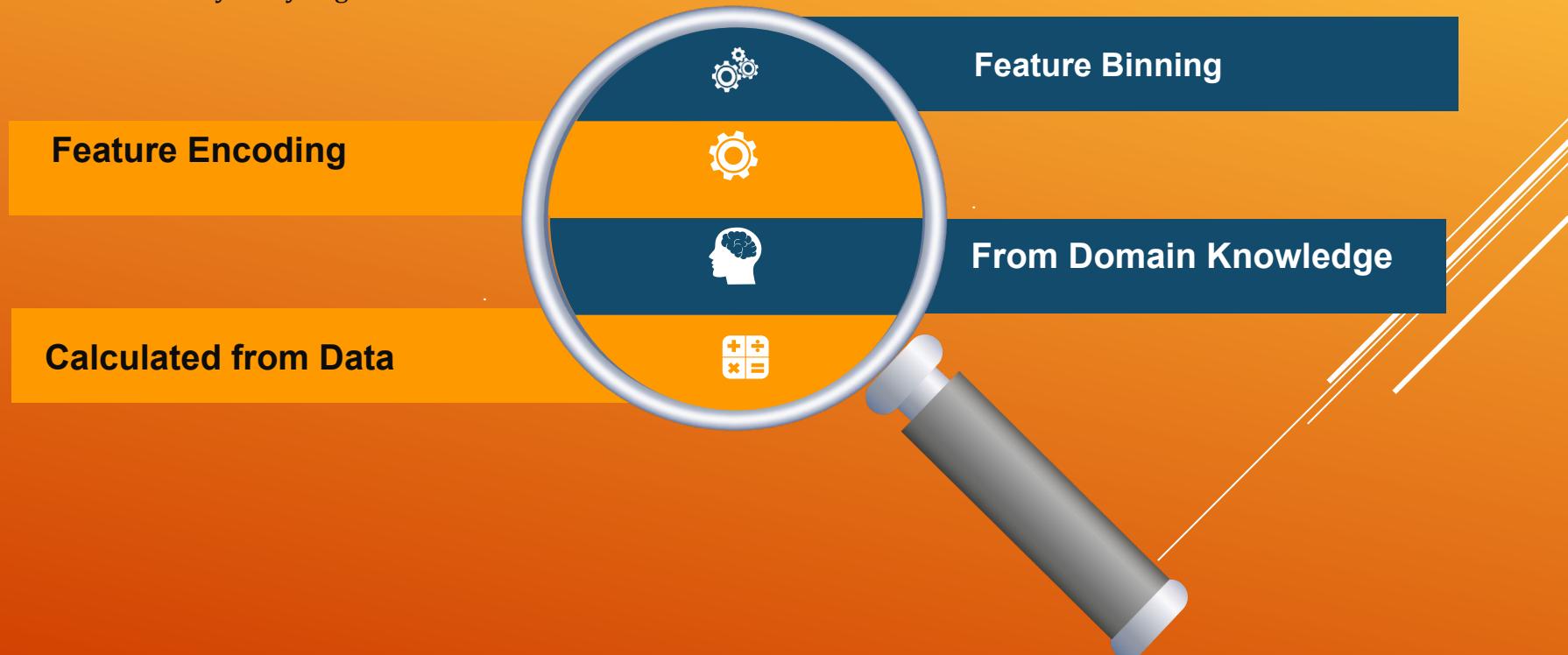


Ordinal

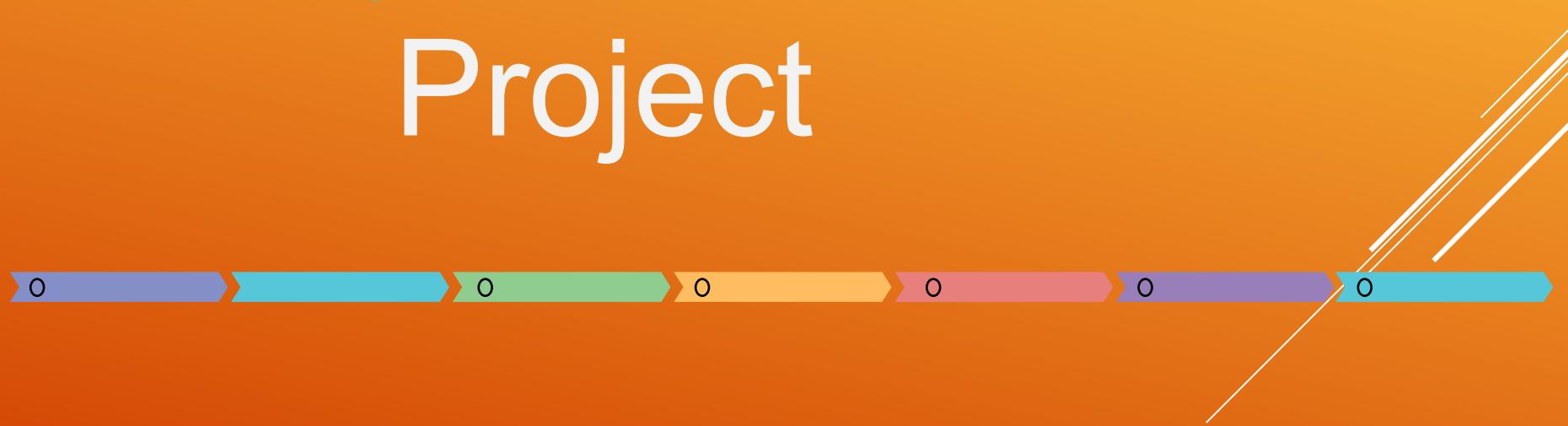
It represent qualitative information with order. It indicate the measurement classification are different and can be ranked. Lets say Economic status: high/medium/low which can ordered as low,medium,high.

Derived Metrics

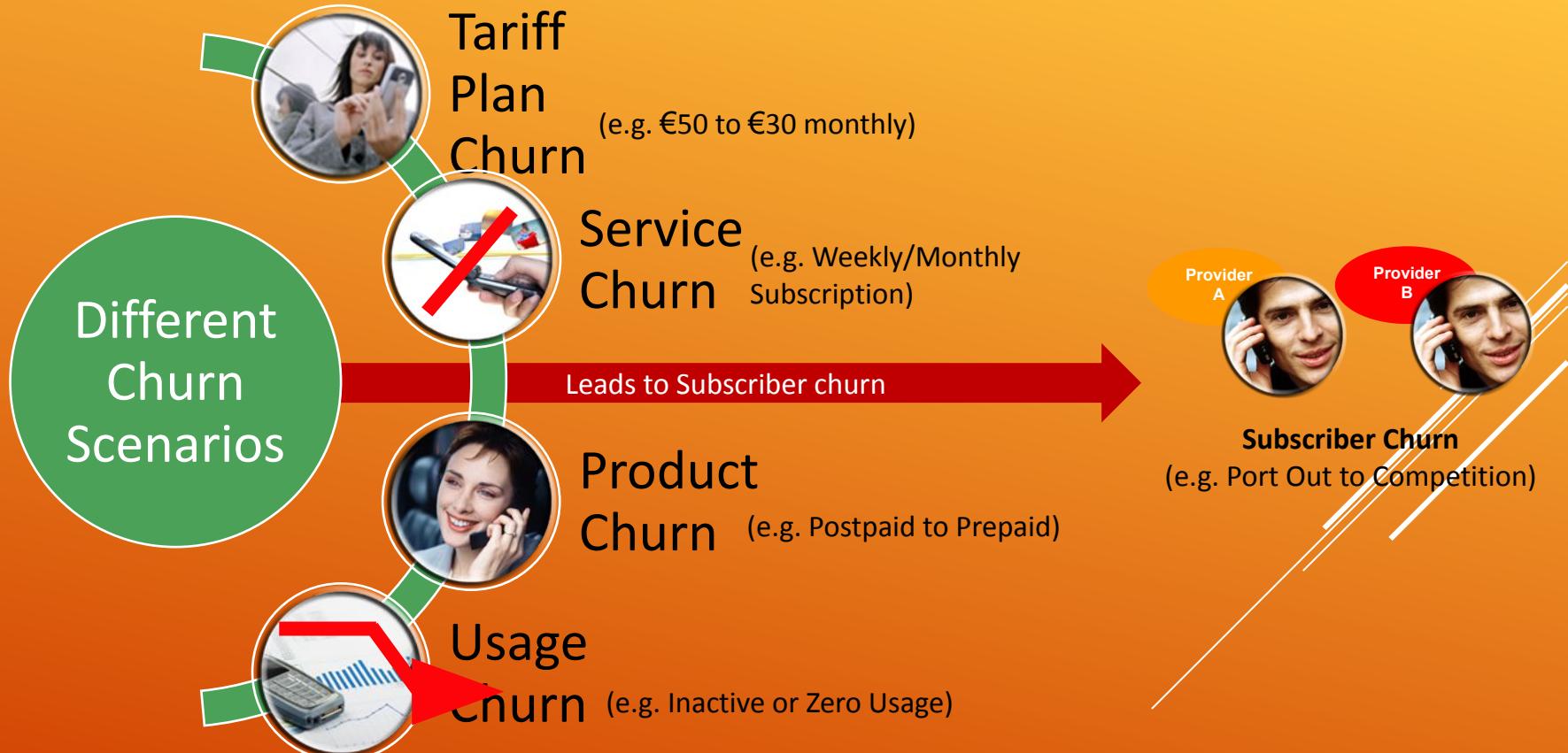
Derived metrics create a new variable from the existing variable to get a insightful information from the data by analysing the data.



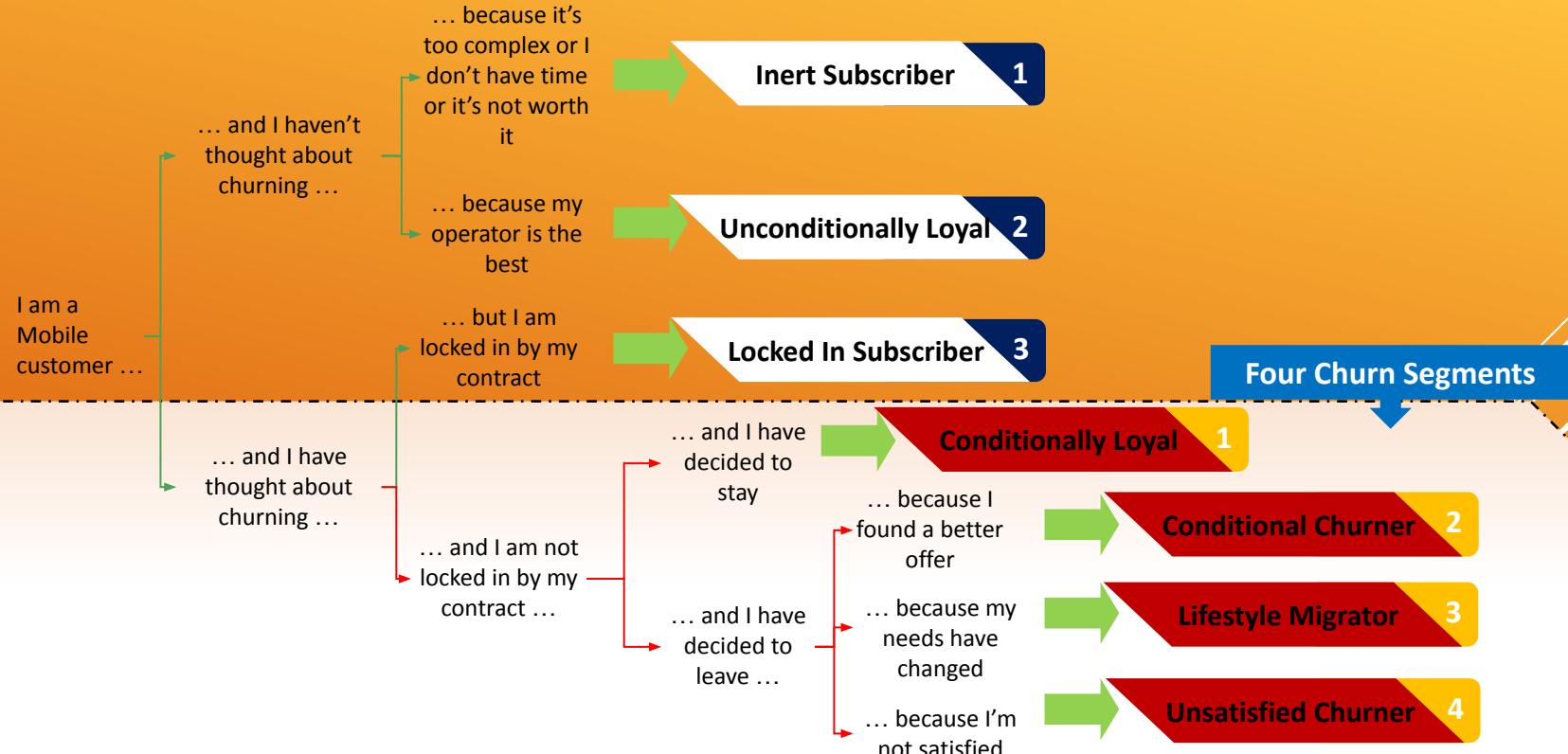
Live Project



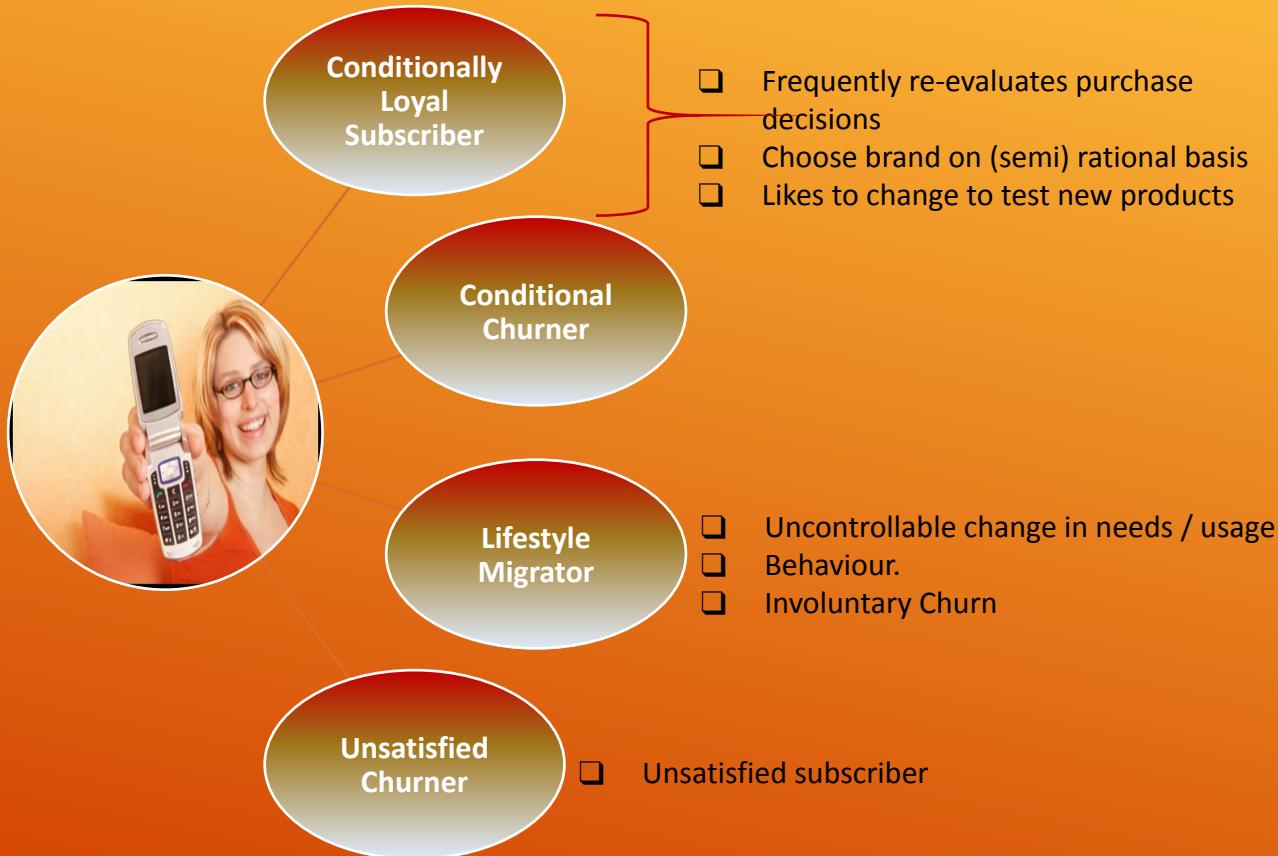
Subscriber Churn can be in different forms and not just exit from the base



Decision cycle of a subscriber: Changes as per needs and/or experiences



Four Churn Segments: Loyalty drivers for each segment

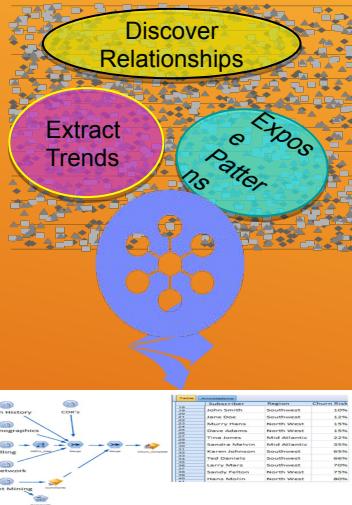


High level Overview of a Data Science led approach to manage churn

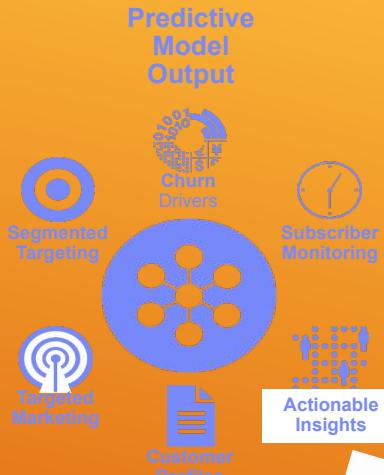
Capture & Analyze



Report & Predict



Engage & Act



- Business Understanding
- Identify data requirements and explore data availability
- Request and extract data required to build a model
- Aggregate, Clean and Standardize data in desired format for model

- Business Analysis of standardized data
- Predictive model design
- Development and Implementation of Predictive model

- List of churn drivers / KPI's for tracking and monitoring
- A generated list of recommended subscribers for targeted churn campaigns
- Recommendations on monthly churn initiatives

Project Link

Part I: <https://www.youtube.com/watch?v=Xu5x-vn8J6M>

Part II: <https://www.youtube.com/watch?v=HCpmbhS2kBs>

Part III: <https://www.youtube.com/watch?v=g2BXlb6E5cl>

Power BI



Resources

- Power BI Documentation
<https://docs.microsoft.com/en-us/power-bi/>
- Power BI Guided Learning
 - <https://docs.microsoft.com/en-us/power-bi/guided-learning/>
 - <https://www.youtube.com/playlist?list=PL1N57mwBHtNOJFoKSR0n-tBkJHeMP2cP>
- Power BI White Paper
<https://docs.microsoft.com/en-us/power-bi/guidance/withepapers>
- Power BI Blogs
<https://powerbi.microsoft.com/en-us/blog/>