

**TABLEAU**



# Introduction to Tableau

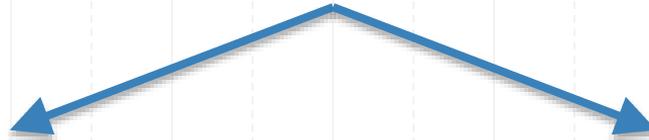
Let's start with the first concepts!

1

# WHAT IS TABLEAU?



We have to answer **two** important **questions**:



**WHAT IS DATA VISUALIZATION?**

**WHY IS DATA VISUALIZATION IMPORTANT?**



## WHAT IS DATA VISUALIZATION?

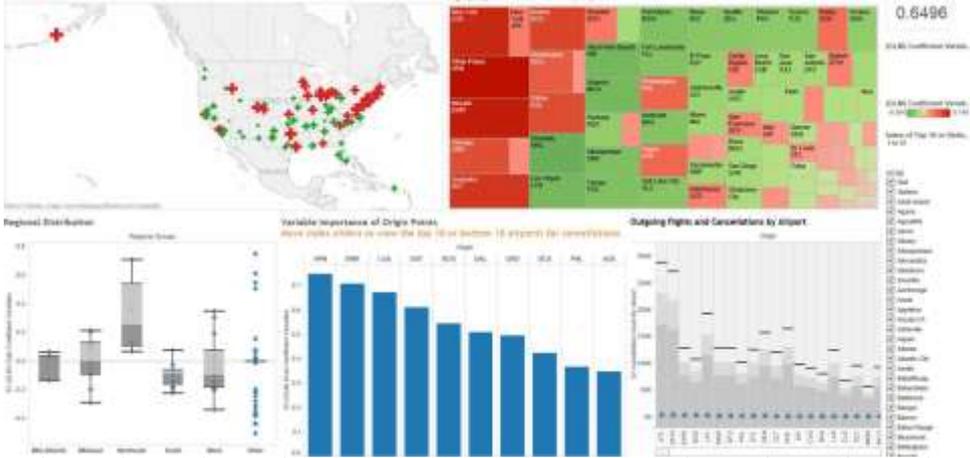
Data visualization is the **process** of describing information through **visual rendering**.



# WHAT IS DATA VISUALIZATION?



Flight Number	Origin	Destination	Other Data
AA101	DFW	LAX	...
AA102	DFW	LAX	...
AA103	DFW	LAX	...
AA104	DFW	LAX	...
AA105	DFW	LAX	...
AA106	DFW	LAX	...
AA107	DFW	LAX	...
AA108	DFW	LAX	...
AA109	DFW	LAX	...
AA110	DFW	LAX	...
AA111	DFW	LAX	...
AA112	DFW	LAX	...
AA113	DFW	LAX	...
AA114	DFW	LAX	...
AA115	DFW	LAX	...
AA116	DFW	LAX	...
AA117	DFW	LAX	...
AA118	DFW	LAX	...
AA119	DFW	LAX	...
AA120	DFW	LAX	...
AA121	DFW	LAX	...
AA122	DFW	LAX	...
AA123	DFW	LAX	...
AA124	DFW	LAX	...
AA125	DFW	LAX	...
AA126	DFW	LAX	...
AA127	DFW	LAX	...
AA128	DFW	LAX	...
AA129	DFW	LAX	...
AA130	DFW	LAX	...
AA131	DFW	LAX	...
AA132	DFW	LAX	...
AA133	DFW	LAX	...
AA134	DFW	LAX	...
AA135	DFW	LAX	...
AA136	DFW	LAX	...
AA137	DFW	LAX	...
AA138	DFW	LAX	...
AA139	DFW	LAX	...
AA140	DFW	LAX	...
AA141	DFW	LAX	...
AA142	DFW	LAX	...
AA143	DFW	LAX	...
AA144	DFW	LAX	...
AA145	DFW	LAX	...
AA146	DFW	LAX	...
AA147	DFW	LAX	...
AA148	DFW	LAX	...
AA149	DFW	LAX	...
AA150	DFW	LAX	...



## WHY IS DATA VISUALIZATION IMPORTANT?

- Technological advances have made **data visualization** more **prevalent** and **powerful** than ever before.
- Businesses **purpose**.



## WHAT IS TABLEAU?

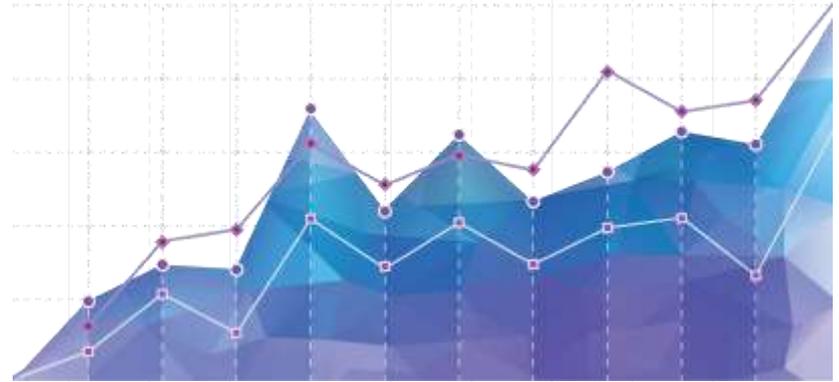
- Tableau is groundbreaking **data visualization software** created by Tableau Software.
- Tableau connects easily to nearly **any data source**
- Tableau allows for **instantaneous** insight by transforming data into **interactive visualizations** called *dashboards*.



## WHAT IS TABLEAU? - Cont'd



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# TABLEAU FEATURES

**SPEED TO MARKET**



**TABLEAU IS EASY TO USE**



**TABLEAU DOES BIG DATA**



**TABLEAU DOES ANY DATA**

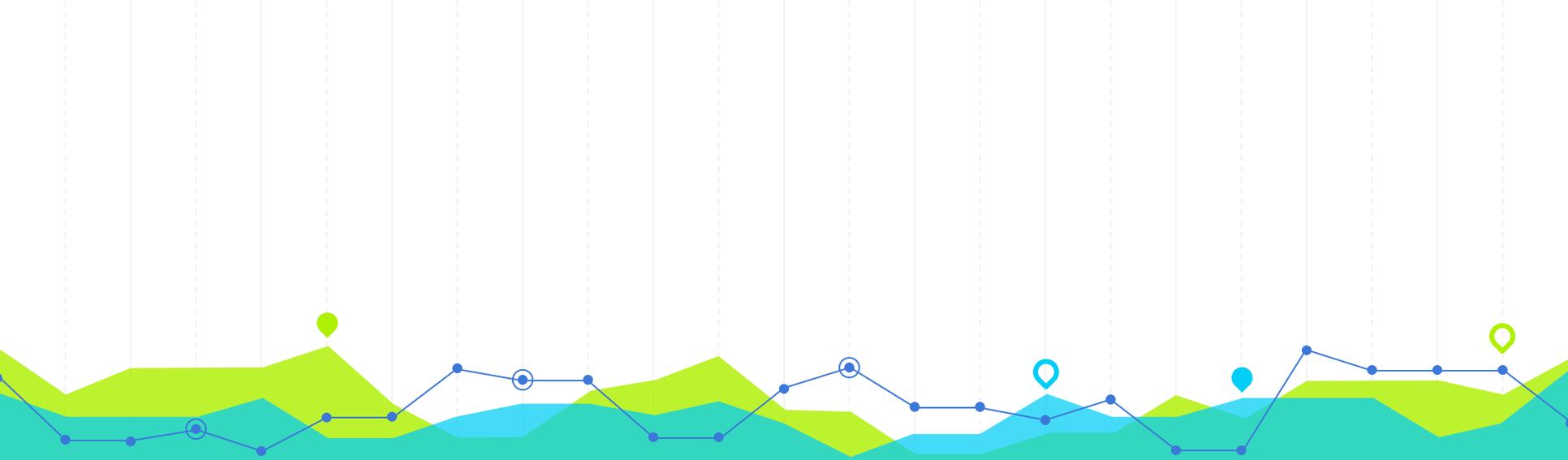


**STUNNING & INTERACTIVE PLOTS**



**TABLEAU IS AN INDUSTRY LEADER**



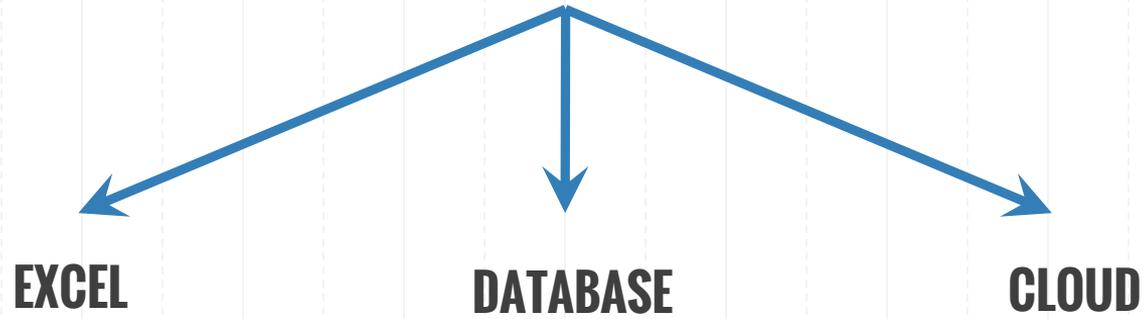


# Connecting to data

Let's connect Tableau to the data!

# 2

# CONNECTING TO DATA



## ADDING ANOTHER DATA SOURCE

A *workbook* can have **multiple** data source. We can connect to a locally saved extract or to a data source which is published to Tableau Online or Tableau Server.



**LIVE VS EXTRACT**



## DATA PREP WITH TEXT AND EXCEL FILES

<b>DATA INTERPRETER</b>	With no columns names and a lot of nulls, <b>Data Interpreter</b> strips out them and the columns are properly identified.
<b>PIVOT</b>	The <b>Pivot</b> merges the information from the original columns and rows into two new columns.
<b>METADATA GRID</b>	It's can be a useful view with a large number of files and when tables have been joined.
<b>SPLIT</b>	We can <b>split</b> the columns based on the shared delimiter of that hyphen.
<b>CUSTOM SPLIT</b>	We can choose our delimiter and use a hyphen.



# USING DATA INTERPRETER

**Connections** Add

- little\_crime1\_excel  
Excel
- little\_crime2\_excel  
Excel

**Sheets** 🔍

Use Data Interpreter

Data Interpreter might be able to clean your Excel workbook.

- little\_crime2\_excel



Click on  
[Review the results](#)

**Sheets** 🔍

Cleaned with Data Interpreter

[Review the results.](#) (To undo changes, clear the check box.)

- little\_crime2\_excel
- little\_crime2...cel A1:G10000



	A	B	C	D	E	F	G
1	ID	Psa	Dc_Key	Location	UCR_Genr	Text_Genr	Police_Dis
2	0	1	2,02E+11	800 BLOC		600 Thefts	13
3	1	3	2,02E+11	1500 BLOC		600 Thefts	16
4	2	3	2,02E+11	1500 BLOC		600 Thefts	16
5	3 A		2,02E+11	GATE C-1E		600 Thefts	
6	61	1	2,02E+11	900 BLOC		600 Thefts	3
7	62	1	2,02E+11	100 BLOC		600 Thefts	20
8	63	2	2,02E+11	5200 BLOC		600 Thefts	20
9	64	1	2,02E+11	N 17TH ST		800 Other Assaults	
10	65 A		2,02E+11	PIA GATE		800 Other Assaults	
11	66	1	2,02E+11	100 BLOC		600 Thefts	20
12	67	4	2,02E+11	1400 BLOC		600 Thefts	16
13	68	2	2,02E+11	5900 BLOC		2600 All Other	15
14	69	2	2,02E+11	1100 BLOC		600 Theft fron	11
15	70 A		2,02E+11	PIA GATE		600 Thefts	
16	71 A		2,02E+11	GATE E-8		600 Thefts	
17	72 A		2,02E+11	PIA TERMI		600 Thefts	
18	73 A		2,02E+11	98 PIA WA		600 Thefts	22
19	74 A		2,02E+11	GATE A-7		600 Thefts	
20	75	2	2,02E+11	400 BLOC		200 Rape	4
21	76	2	2,02E+11	1200 BLOC		200 Rape	5
22	77	2	2,02E+11	3200 BLOC		1100 Fraud	7
23	78	2	2,02E+11	2800 BLOC		600 Thefts	16
24	79	2	2,02E+11	5200 BLOC		800 Other Ass	20
25	80	1	2,02E+11	N 410 N 6		300 Robbery No Firearm	

An Excel file is **generated** with the interpreted null values. Look the 'A's!

# SAVING AND PUBLISHING DATA SOURCES

**Saving** a data source makes it easily available in your copy of **Tableau Desktop...**

...or it can be **published** to **Tableau Online** or **Tableau Server.**

Saving data source as a **.tds**



*this is not the data itself!*



## A NOTE ON FILE TYPES

- **Workbook (.twb):** Workbooks hold worksheets, dashboards and stories.
- **Bookmark (.tbn):** Bookmarks contain a single sheet.
- **Packaged workbook (.twbx):** Archive containing a workbook along with all data sources and files.
- **Data extract (.tde):** Local copy of a subset or entire data source to share and improve the performance.
- **Data source(.tds):** Shortcut to oftenly used data sources, containing information and modifications.
- **Packaged data source (.tdsx):** Archive containing a data source file along with any related files.

# JOIN TYPES WITH UNION

**Joining tables** is a way of combining information from multiple tables based on a field they share.

**Joins** are always made on a specific field (or fields).

Name	# of Siblings
Taylor	2
Alex	3
Shannon	0
Tina	1

Name	Eye Color
Taylor	Blue
Alex	Brown
Hogan	Brown

+

**Inner Join**

Name	# of Siblings	Eye Color
Taylor	2	Blue
Alex	3	Brown

**Left Join**

Name	# of Siblings	Eye Color
Taylor	2	Blue
Alex	3	Brown
Shannon	0	null
Tina	1	null

**Right Join**

Name	Eye Color	# of Siblings
Taylor	Blue	2
Alex	Brown	3
Hogan	Brown	null

**Outer Join**

Name	# of Siblings	Eye Color
Taylor	2	Blue
Alex	3	Brown
Shannon	0	null
Tina	1	null
Hogan	null	Brown

**Union** follows the behavior “*Union all*” even if there are duplicate values for some rows.

**Union** appends new rows AND new columns if the shared field don't match across the *unioned* data sources

Q1		Q2	
Name	# of presentations	Name	# of presentations
Kai	10	Kai	10
Piper	3	Tori	7
Lien	4	Clair	4

**Union**

Name	# of presentations
Kai	10
Piper	3
Lien	4
Kai	10
Tori	7
Clair	4

Q1			Q2		
Name	# of presentations	Expenses	Name	# of presentations	Expense report
Kai	10	\$3,761	Kai	10	\$4,024
Piper	3	\$287	Tori	7	\$2,930
Lien	4	\$1,008	Clair	4	\$987

**Union**

Name	# of presentations	Expenses	Expense report
Kai	10	\$3,761	null
Piper	3	\$287	null
Lien	4	\$1,008	null
Kai	10	null	\$4,024
Tori	7	null	\$2,930
Clair	4	null	\$987

# CROSS-DATABASE JOIN

## Sales and Products

10,000 rows  Show aliases Copy

Category	Market	Order Date	Order ID	Product ID	Product Name	Row ID	Sub-Category	Number of Records	Sales
Furniture	Asia Pacific	01/01/2012	DN-2012-3H159857-40909	FUR-FU-4075	Eldon Light Bulb, Duo Pack	22255	Furnishings	1	113,67
Office Supplies	Africa	01/01/2012	AG-2012-TB112803-40909	OFF-ST-6261	Tenex Lockers, Blue	42433	Storage	1	408,30
Office Supplies	Asia Pacific	01/01/2012	DN-2012-3H159857-40909	OFF-PA-3990	Eaton Computer Printout Paper, 8.5 x 11	22254	Paper	1	35,24
Office Supplies	Asia Pacific	01/01/2012	DN-2012-3H159857-40909	OFF-GU-3002	Acme Trimmer, High Speed	22253	Supplies	1	120,37
Office Supplies	Europe	01/01/2012	IT-2012-EM14140124-40909	OFF-PA-4177	Emermax Note Cards, Premium	11731	Paper	1	44,87
Office Supplies	Europe	01/01/2012	HU-2012-4773557-40909	OFF-ST-6230	Tenex Box, Single Width	49883	Storage	1	66,12
Technology	USCA	02/01/2012	CA-2012-MH726023-40910	TEC-MA-5503	Okidata Inkjet, Wireless	49550	Machines	1	314,22
Furniture	Asia Pacific	03/01/2012	ID-2012-4L1664592-40911	FUR-CH-4684	Hon Rocking Chair, Set of Two	30451	Chairs	1	139,44
Furniture	Asia Pacific	03/01/2012	IZ-2012-LW699061-40911	FUR-CH-9414	Novimex Swivel Stool, Set of Two	46681	Chairs	1	666,84
Furniture	Asia Pacific	03/01/2012	ID-2012-4L1664592-40911	FUR-CH-5757	SAPCO Charmat, Black	30452	Chairs	1	68,87
Furniture	Asia Pacific	03/01/2012	DN-2012-LB16735102-40911	FUR-TA-3769	Chromcraft Round Table, Adjustable Height	26361	Tables	1	211,18
Furniture	Europe	03/01/2012	ES-2012-0013570139-40911	FUR-BO-3896	Danso Corner Shelving, Traditional	16385	Bookcases	1	854,49
Office Supplies	Africa	03/01/2012	TZ-2012-3G5115129-40911	OFF-GU-6174	Siletto Scissors, Serrated	45193	Supplies	1	81,24
Office Supplies	Asia Pacific	03/01/2012	IR-2012-JO528060-40911	OFF-AP-3566	Breville Coffee Grinder, Black	50042	Appliances	1	122,58

• DATA FROM DIFFERENT SOURCES

• CROSS DATABASE JOINS

• USING INTEGRATED DATA SOURCES

# WHAT IS DATA BLENDING?

Data **blending** is a way to combine data from multiple data sources into a single view.

## Blend Relationship and How To Blend

**Blue:** Primary data source

**Orange:** Secondary data source

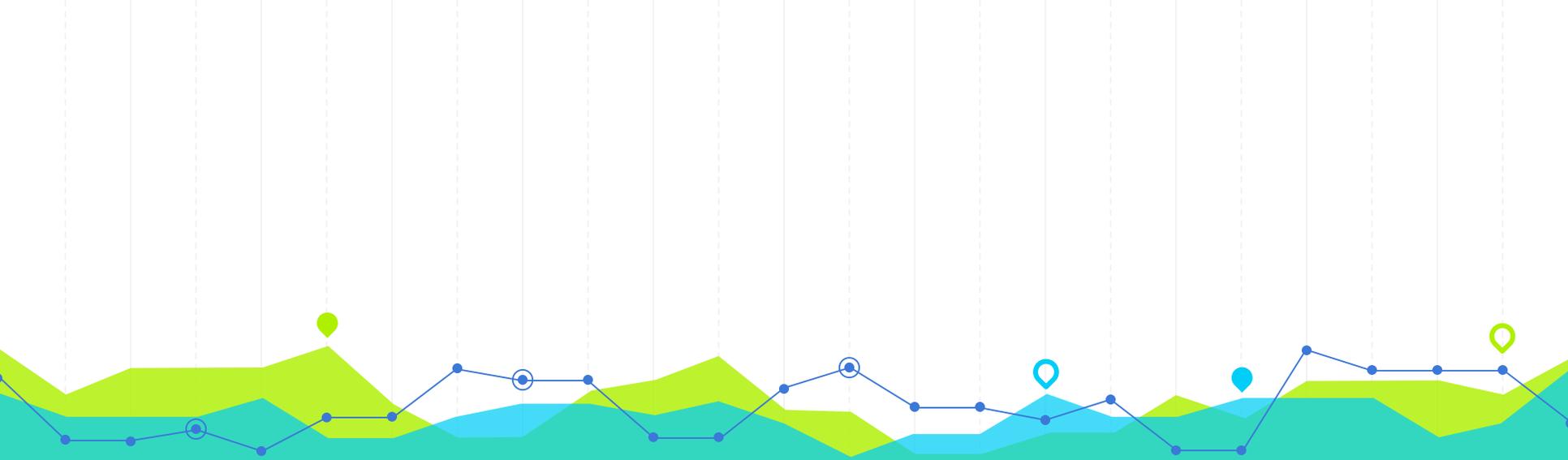
**Links:**

**Orange:** Use the common field for linking

**Gray:** Don't use the common field for linking

Data	Analytics
 Coffee Chain	
 Office City	
Dimensions	
 Area Code	
 Date	
Abc Product	
Abc Product Line	
Abc Product Type	
Abc Region	
 State	
Abc Territory Size	
Abc Type	
Abc Measure Names	

Data	Analytics
 Coffee Chain	
 Office City	
Dimensions	
 City	
# Client ID	
Abc Client Name	
Abc Goods Category	
Abc Goods Name	
Abc Goods Sub-Category	
# Order ID	
Abc Region	c/d
# Row ID	
 State	e/f
 Zip Code	
Abc Measure Names	



# Visual Analytics

Let's give some meaning to that data!

# 3

## WHAT IS VISUAL ANALYTICS?

Is a field in information visualization that focuses on **analytical reasoning** facilitated and supported by interactive **visual interfaces**.



# A PICTURE IS WORTH A THOUSAND WORDS

Humans are **very good**  
in solving complex  
problems...



Visual representations  
**enhances** the human  
cognitive process



## WHAT TABLEAU HAS TO OFFER? - PT1

Powerful ways to **select** and **aggregate** the data to consider:

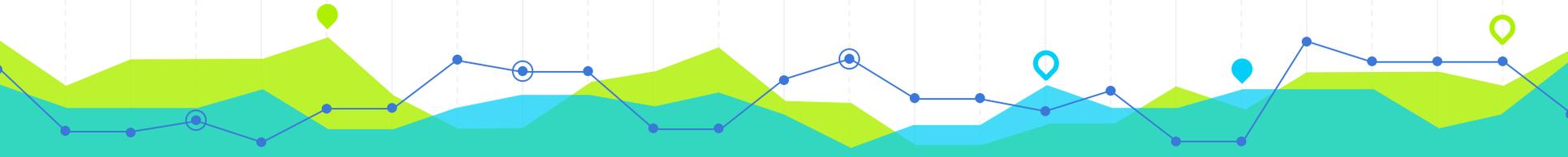
- Hierarchies
- Groups
- Sets
- Filters



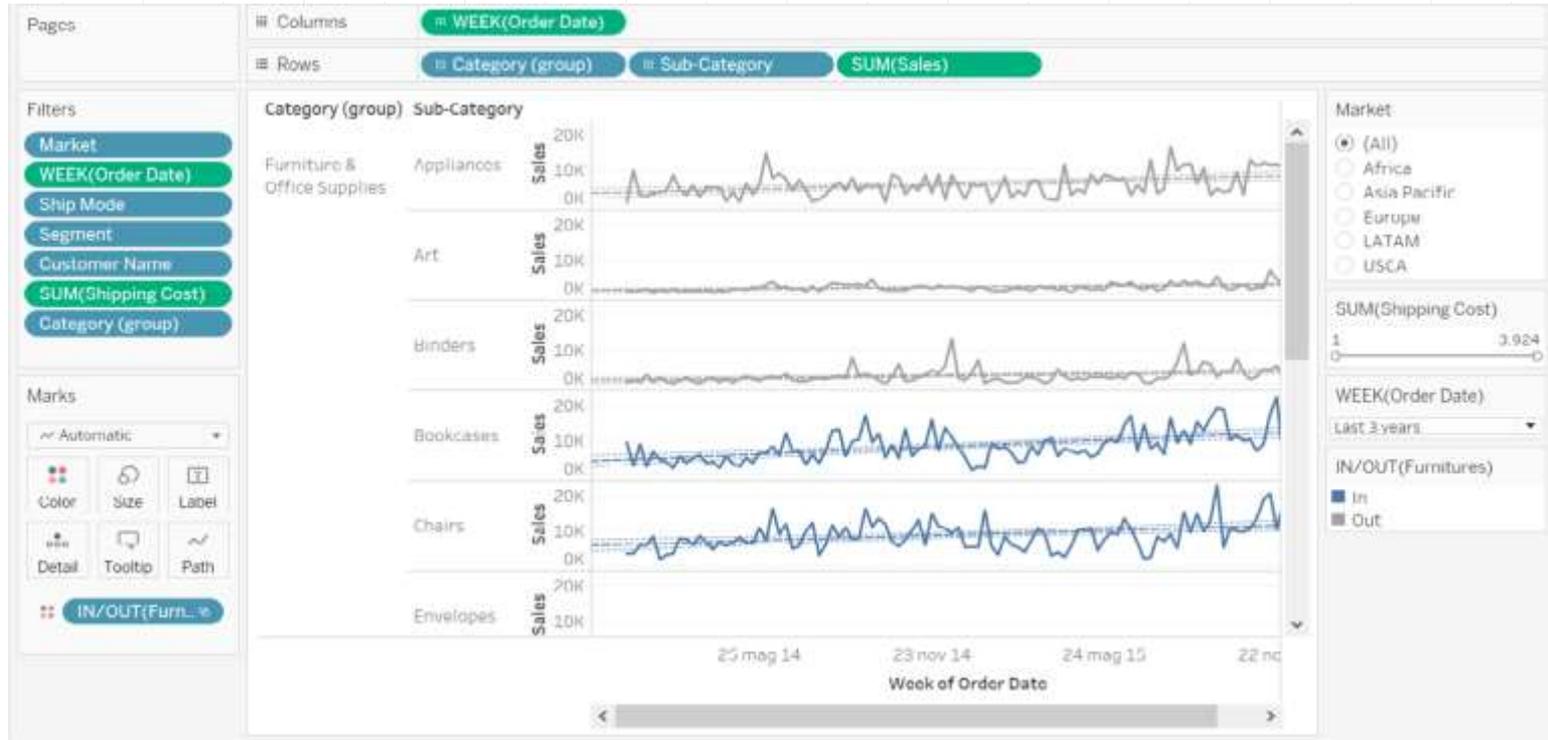
## WHAT TABLEAU HAS TO OFFER? - PT2

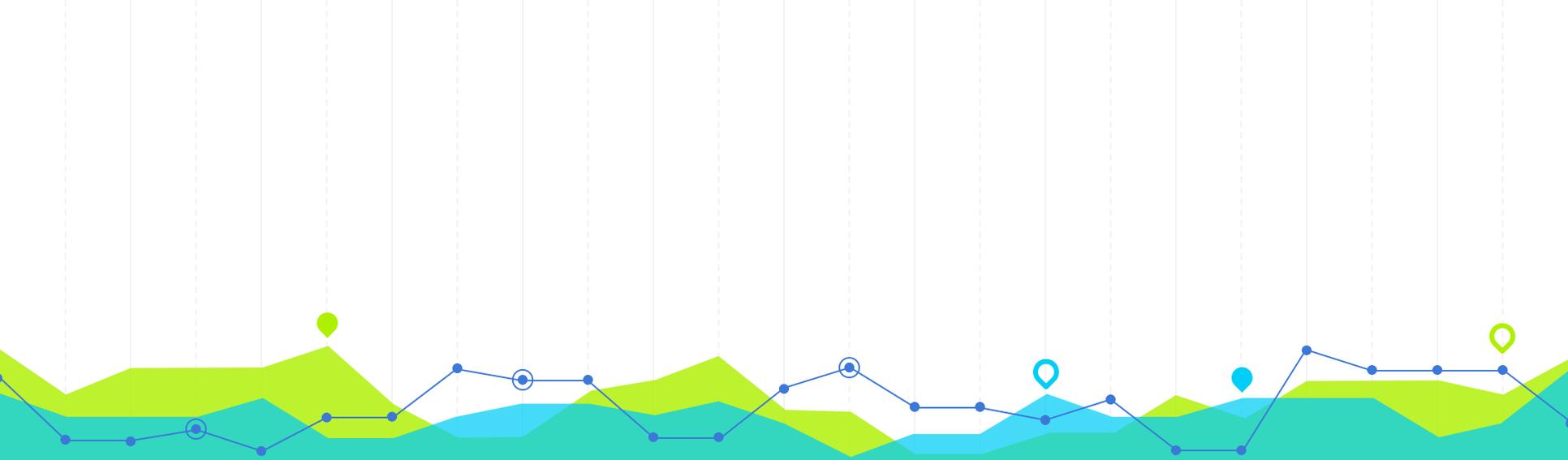
Make use of the visual analytics power **easily** and **effectively**:

- *Reference lines* and *trend lines* to visually evaluate the plots
- *Forecasting* to make predictions with a confidence level
- *Statistical tools* like average lines, median and *Box Plots*
- K-means bundled clustering



# HOW DOES IT LOOK LIKE?





# Dashboard and stories

Let's make it more visual!

# 4

## WHAT IS A DASHBOARD?

- ◉ Powerful tool for mixing multiple views in a unique one
- ◉ Allow us to create interactive and common filters for all the sheets grouped
- ◉ Excellent tool for generic views



# DASHBOARDS - EXAMPLE

## Dashboard 1

shipping date



AVG Shipping cost



Order Priority

- Critical
- High
- Low
- Medium

Prom. Shipping Cost

1,4 155,7

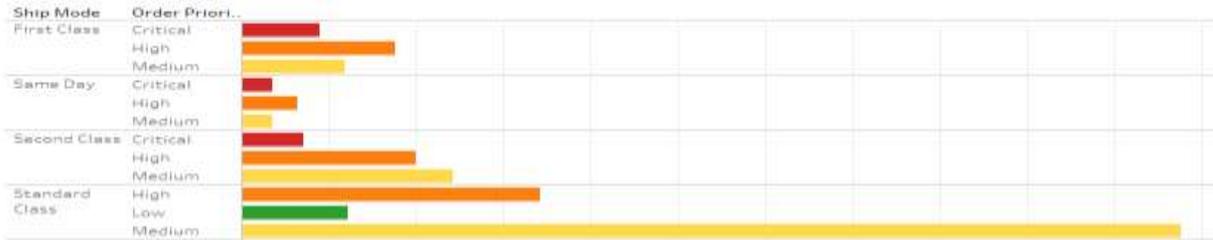
Ship Mode

- (Todos)
- First Class
- Same Day
- Second Class
- Standard Class

Market

- (Todos)
- Africa
- Asia Pacific
- Europe
- LATAM
- USCA

## Priority Cost



## WHAT IS A STORY IN TABLEAU?

- ◉ Sheet that contains a sequence of worksheets or dashboards that work together to convey information
- ◉ All methods that are able for datasheets and dashboards apply to stories
- ◉ Powerful navigation tool for presentations



# STORIES - EXAMPLE

## Why have driving fatalities decreased in the United States?

The fatality rate has declined over the past 35 years.

In 1974 - Speed Limits were introduced.

A late 70's gas shortage signaled a lull.

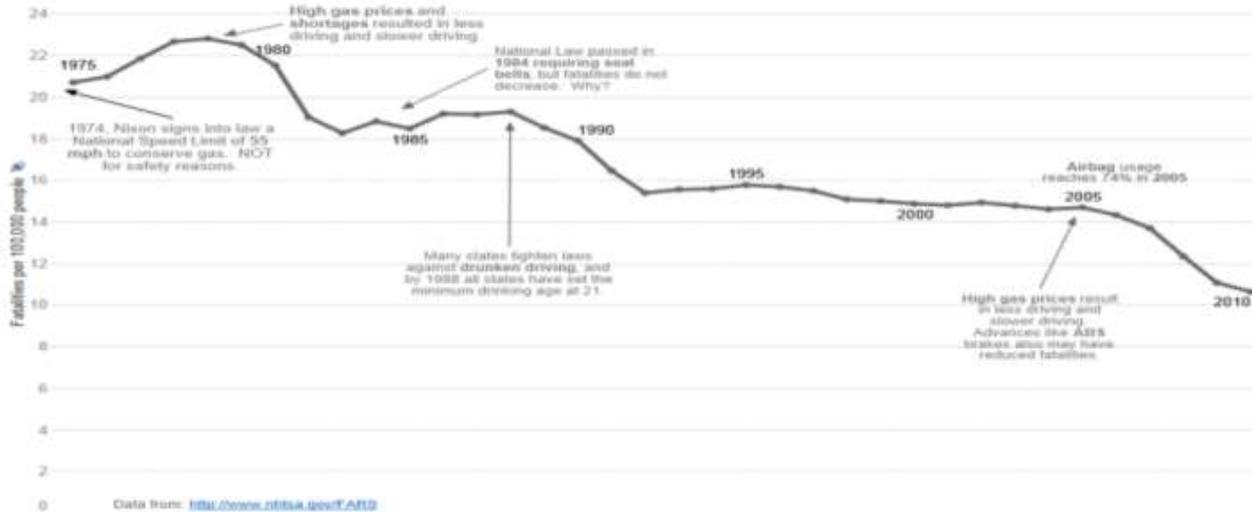
Seatbelt laws had minimal impact.

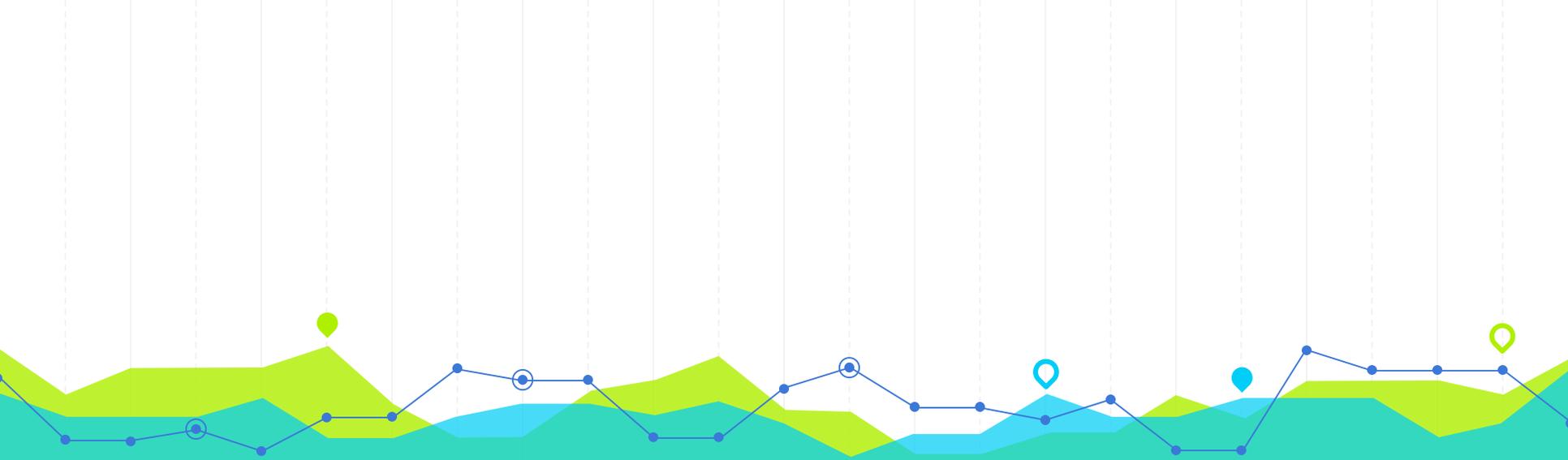
But in 1988 something changed.

And by the 2000's safety equipment came standard.

New Blank Point

Duplicate





# Calculations

Or how to manipulate the data set

# 5

# TYPES OF CALCULATIONS

## Calculations

Manipulate the dataset over which tableau is running.  
The operations are performed by the underlying database.

## Table Calculations

Manipulate the current view, operations are performed on the view by Tableau, without passing through the underlying database.



# CALCULATIONS ON WHAT?

- ◉ **String**
- ◉ **Logic**
- ◉ **Date**
- ◉ **Type**
- ◉ **...**

# CALCULATIONS SYNTAX

The screenshot shows a data tool interface with the following components:

- Dimensions Panel:** Lists fields such as `Dispatch_Key`, `Dispatch_Date_Time`, `Dispatch_Time`, `Location_Block`, `Month`, `Psu`, `Text_General_Code`, and `Measure Names`.
- Measures Panel:** Lists fields such as `Dis_Dist`, `Hour`, `Lat`, `Lon`, `Police_Districts`, `UCR_General`, `Number of Records`, and `Measure Values`.
- Filters and Marks Card:** Shows a 'Filters' section and a 'Marks' section with 'Automatic' selected and options for 'Color', 'Size', 'Text', 'Detail', and 'Tooltip'.
- Context Menu:** A menu is open over the 'Create Calculated Field' option, listing actions like 'Create Parameter...', 'Group by Folder', 'Group by Data Source Table', 'Sort by Name', 'Sort by Data Source Order', 'Hide All Unused Fields', and 'Show Hidden Fields'.

Example Calculation

```
IF [Text_General_Code] = "Example"  
THEN "Do something"
```

```
ELSEIF [Text_General_Code] = "Example 2"  
THEN "Do nothing"
```

```
ELSE "Do something else"  
END
```

The calculation is valid.

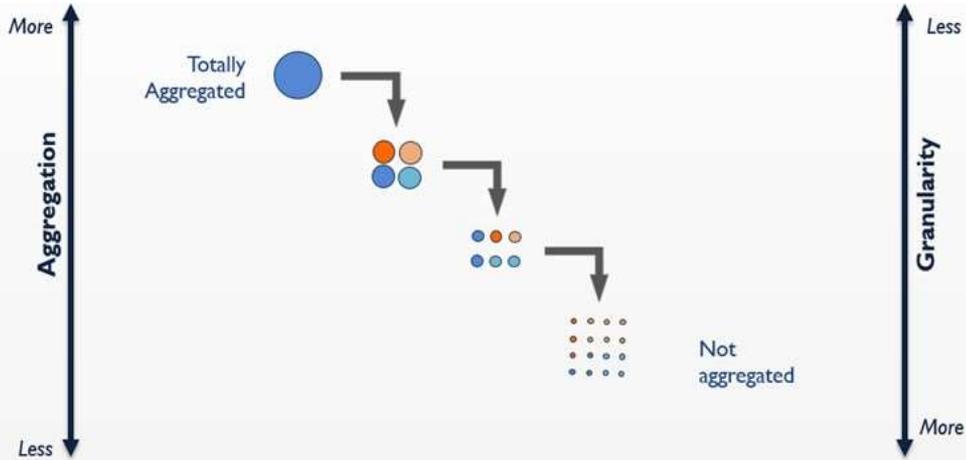
Apply

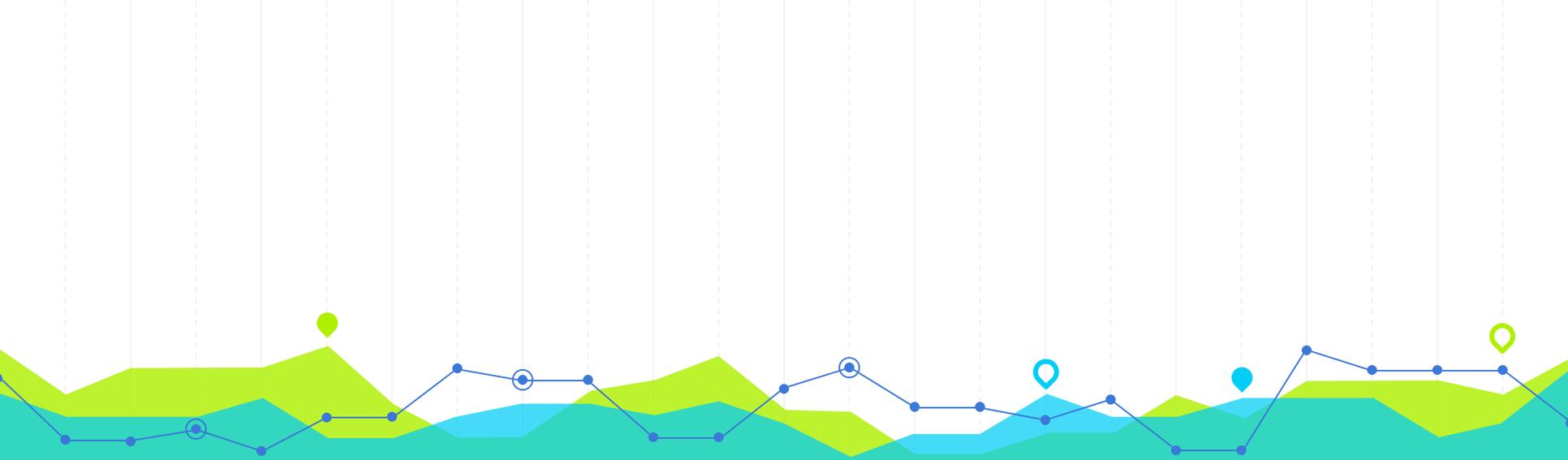
OK

# LOD expressions

**Level of Detail** expressions introduce the capability to specify the exact level of aggregation within a calculation itself.

Level of Detail





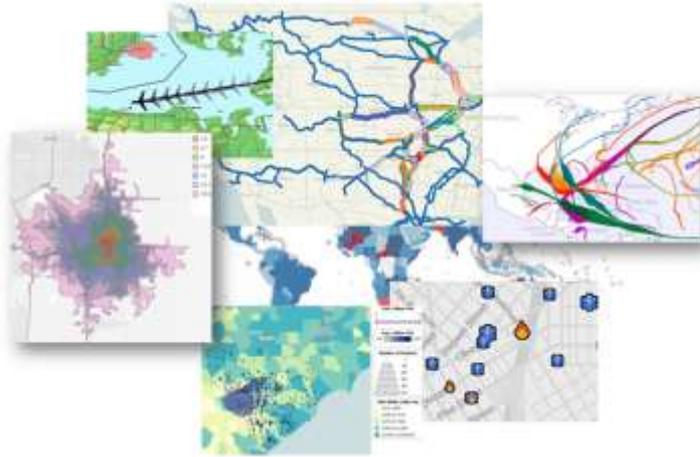
# Mapping, Similar Tools & Tableau Online

Let's give some meaning to that data!

6

## THE POSSIBILITIES ARE INFINITE

**Online maps, WMS** and **Mapbox** let you create your own **custom** background map or **connect** to one



**Automatically** recognize and **display** geographic data and associated **metrics** at different geographic granularities



# TABLEAU'S COMPETITORS



# TABLEAU DESKTOP VS THE REST

	 Power BI	 pentaho	 QlikView
Download & Installation	✓	✓	✓
Data Connection	✓	=	✓
Data Manipulation	=	✗	✗
Graphic Ability	=	=	=
Cost	✗	?*	✗

\*Pentaho asks for a specific price depending on the desired solution: we suppose that, in the average, is more expensive than Tableau.

# WHAT HAS TO OFFER TABLEAU ONLINE?



- Skip hardware cost & setup time
- Connection with other users
- Support live data connections
- Secure

# THANKS!

**Any questions?**

