

DataViz with Tableau

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DALL-E: a zen themed of vector graph/diagram with grey and redcolor objects and white surrounding

Data Viz Tools



- **Pros:** Free, integrates well with Google services, user-friendly, and good for real-time collaboration.
- **Cons:** Limited data modeling, can be slow with large data sets.



- **Pros:** Strong data modeling, integrates with Microsoft ecosystem, has advanced AI tools.
- **Cons:** Can be costly for advanced versions, and has a steeper learning curve.



tableau

- **Pros:** Excellent for complex data and visualization, great community support.
- **Cons:** More expensive (but supported from Pusintek with SLDK) and can be less intuitive for simple reports.



Tableau, what is it for?



Visual analytics



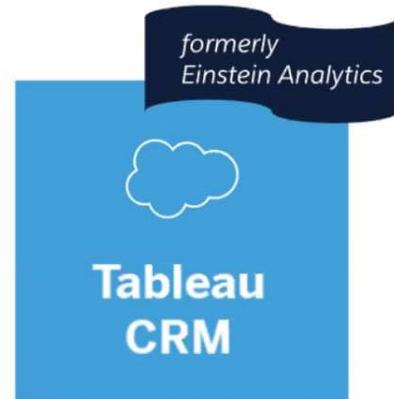
Visual data preparation



Analytics platform
self-managed



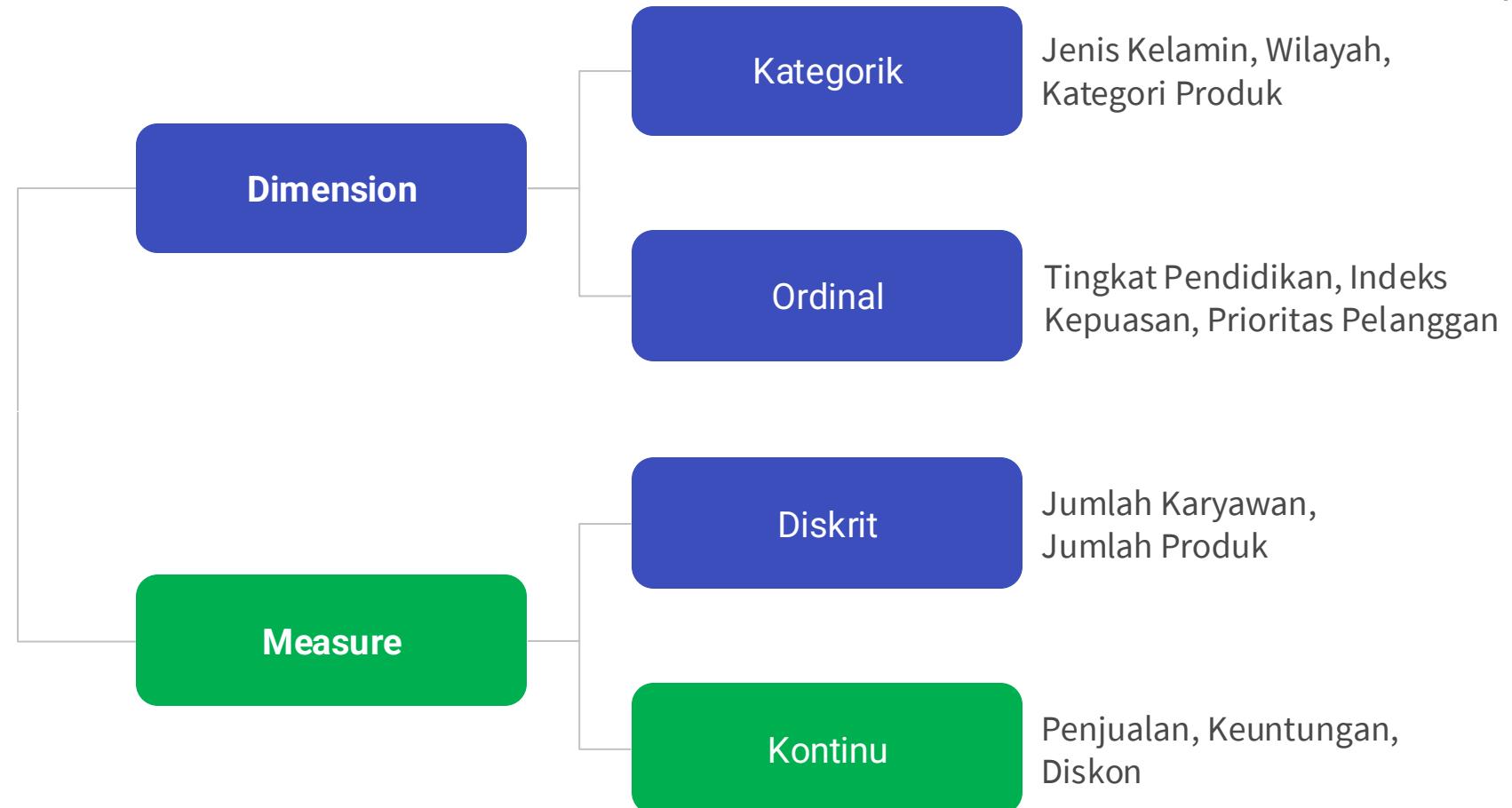
Analytics platform
as a service



Native Salesforce
analytics



Tipe Data di Tableau



Why data visualization is important



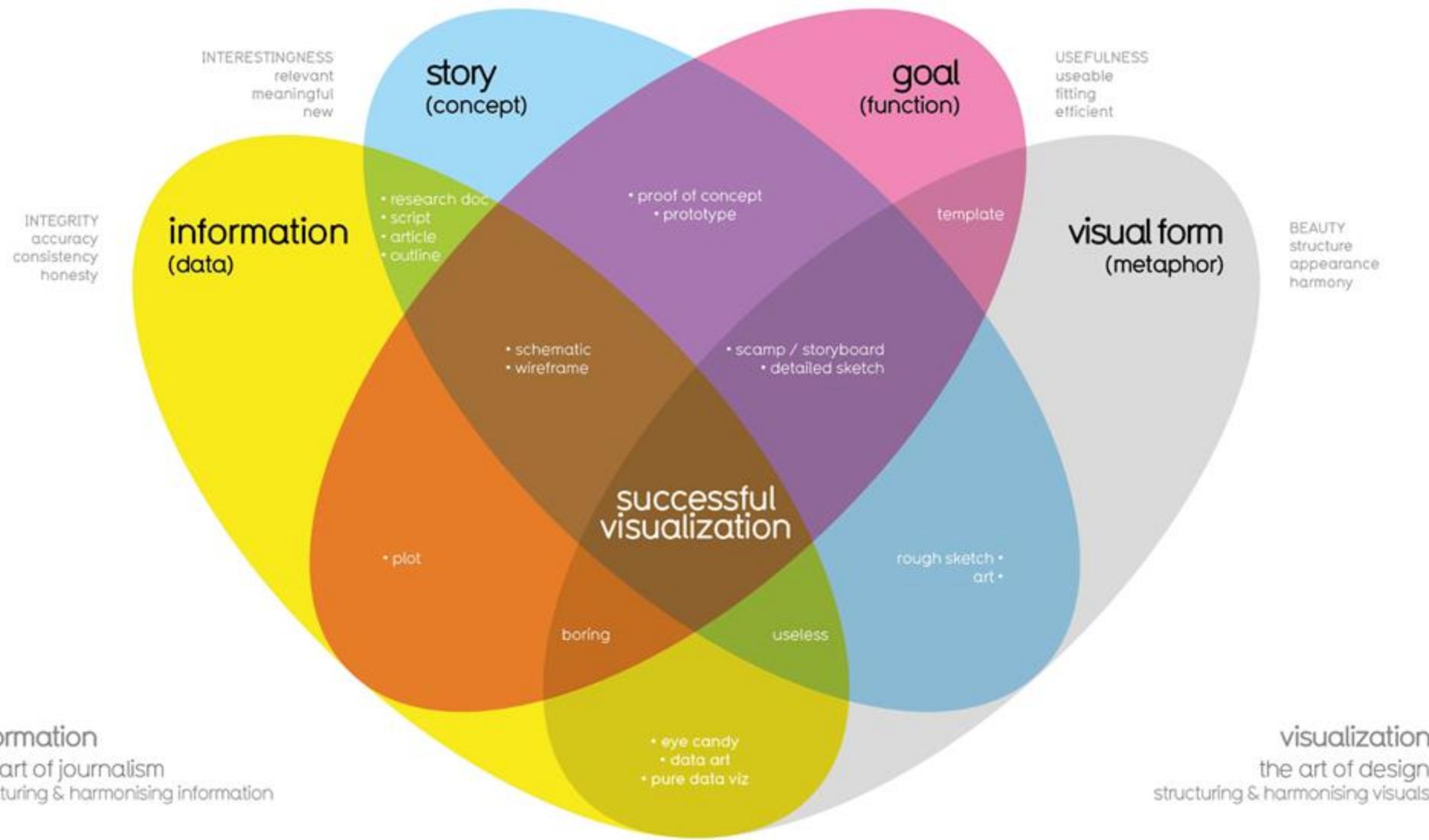
It helps people **see**,
interact with, and
better **understand** data.

The right visualization can bring everyone on the same page,
regardless of their level of expertise.



What Makes a Good Visualization?

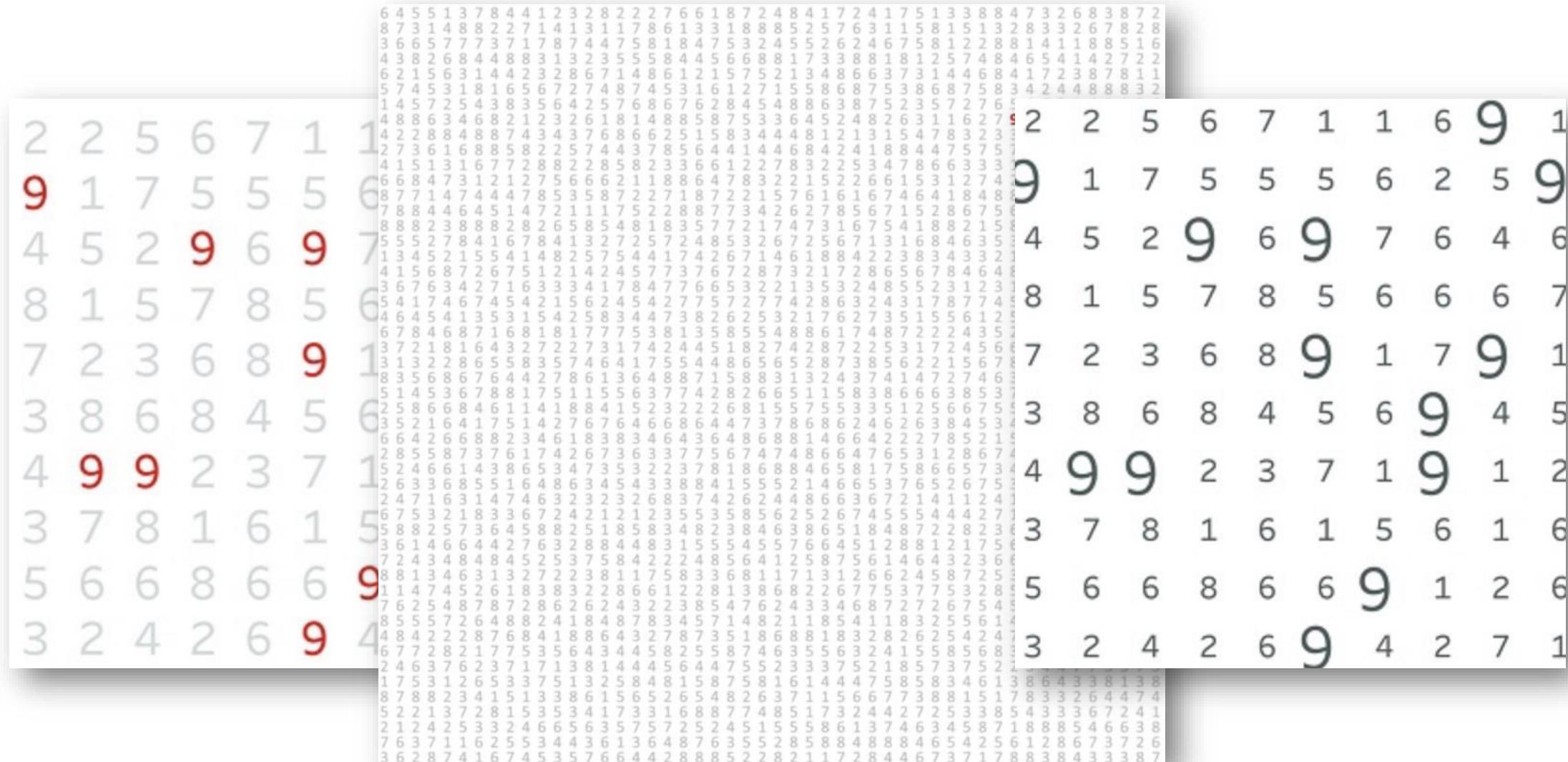
explicit (implicit)



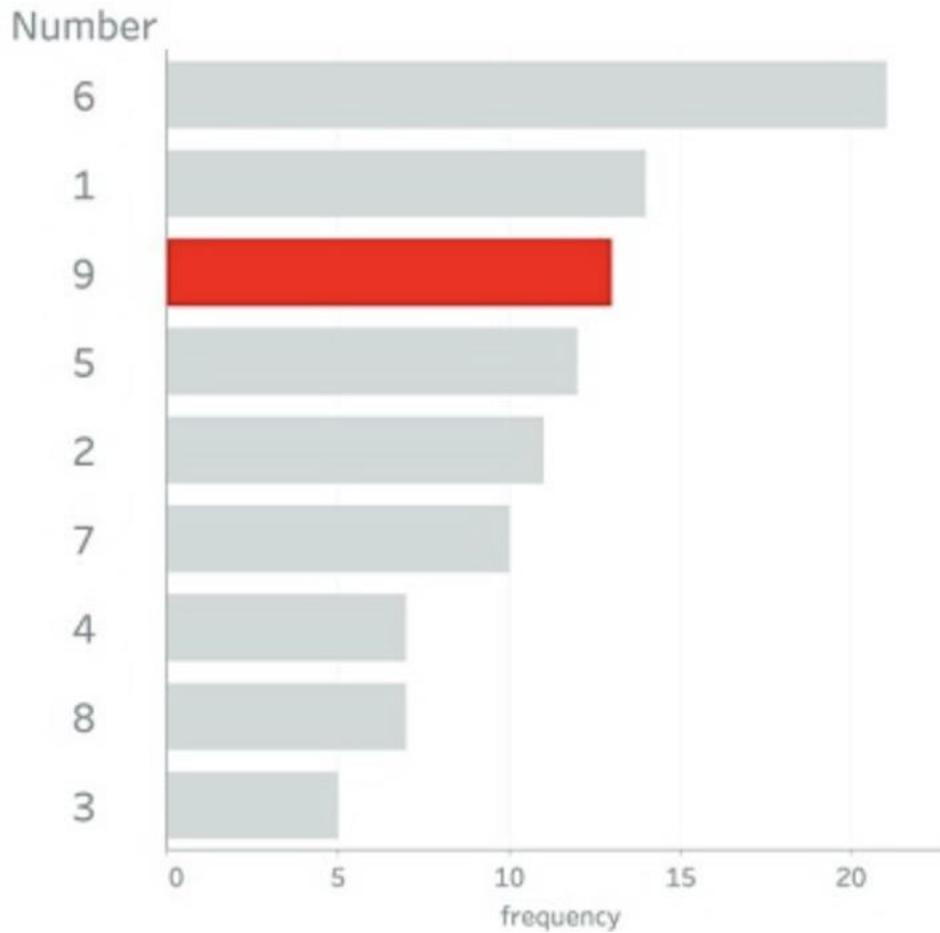


**How do we
visualize data?**

How many 9s are here?



Now count for each number!



2	2	5	6	7	1	1	6	9	1
9	1	7	5	5	5	6	2	5	9
4	5	2	9	6	9	7	6	4	6
8	1	5	7	8	5	6	6	6	7
7	2	3	6	8	9	1	7	9	1
3	8	6	8	4	5	6	9	4	5
4	9	9	2	3	7	1	9	1	2
3	7	8	1	6	1	5	6	1	6
5	6	6	8	6	6	9	1	2	6
3	2	4	2	6	9	4	2	7	1



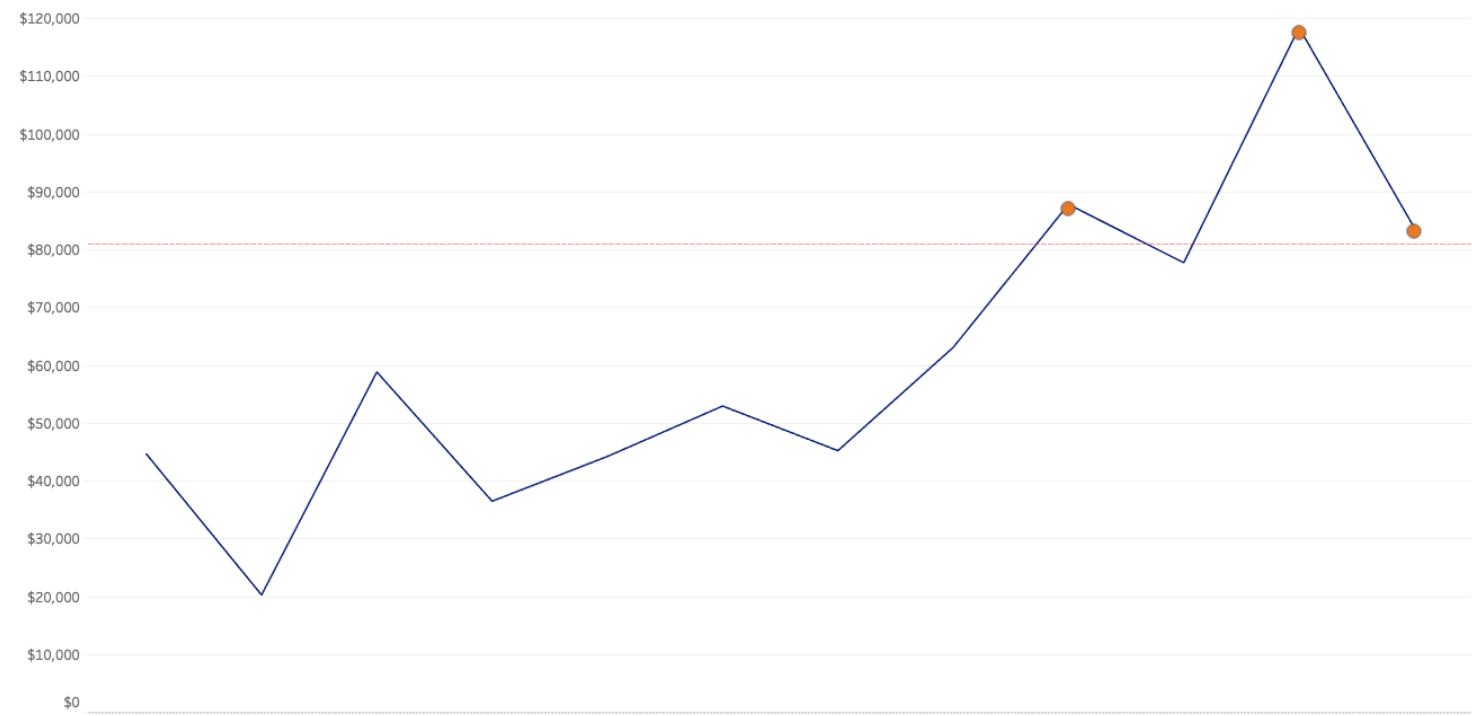
Which month had the highest sales?

Can you name the **TOP 3** performing months?

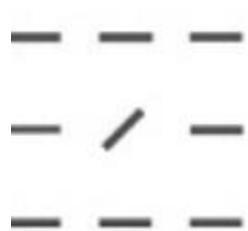
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
\$44,703	\$20,301	\$58,872	\$36,522	\$44,261	\$52,982	\$45,264	\$63,121	\$87,867	\$77,777	\$118,448	\$83,829

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
\$44,703	\$20,301	\$58,872	\$36,522	\$44,261	\$52,982	\$45,264	\$63,121	\$87,867	\$77,777	\$118,448	\$83,829

Now how
about this?
Easier?



Pre-Attentive Principles



Orientation



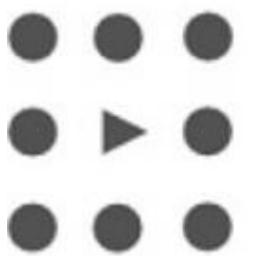
Length



Width



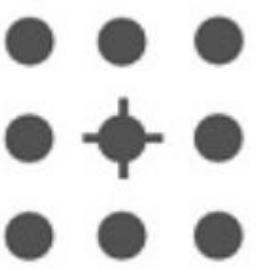
Size



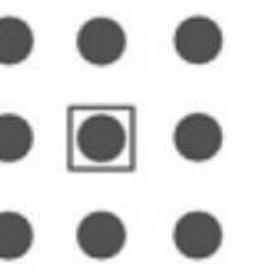
Shape



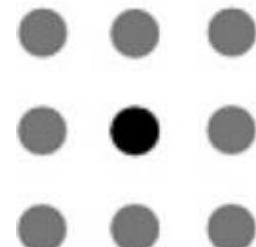
Curvature



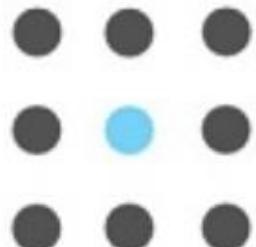
Added Marks



Enclosure



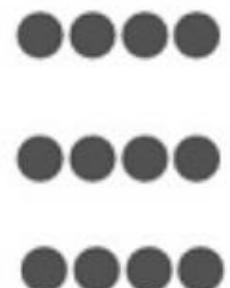
Color Value



Color Hue

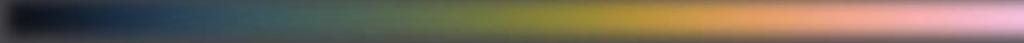


Position



Spatial Grouping





Use of Color



Use of Color in Data Visualization

SEQUENTIAL

color is ordered from low to high



DIVERGING

two sequential colors with a neutral midpoint



CATEGORICAL

contrasting colors for individual comparison



HIGHLIGHT

color used to highlight something

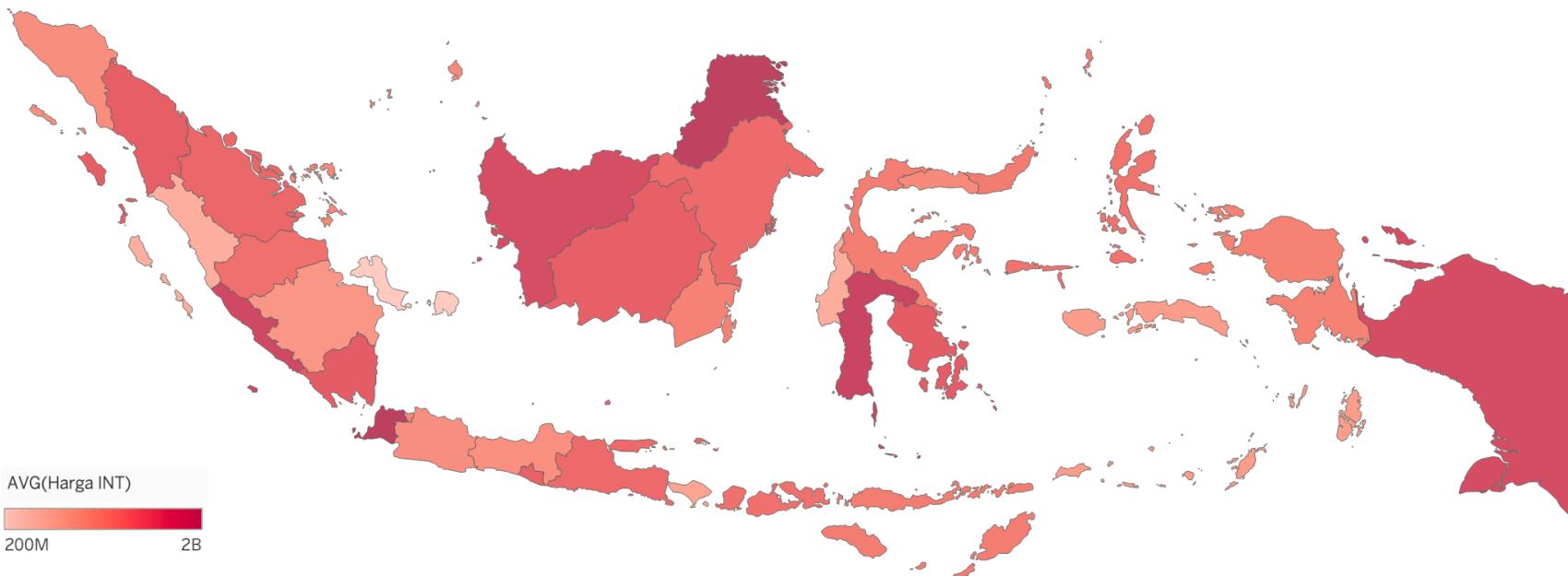
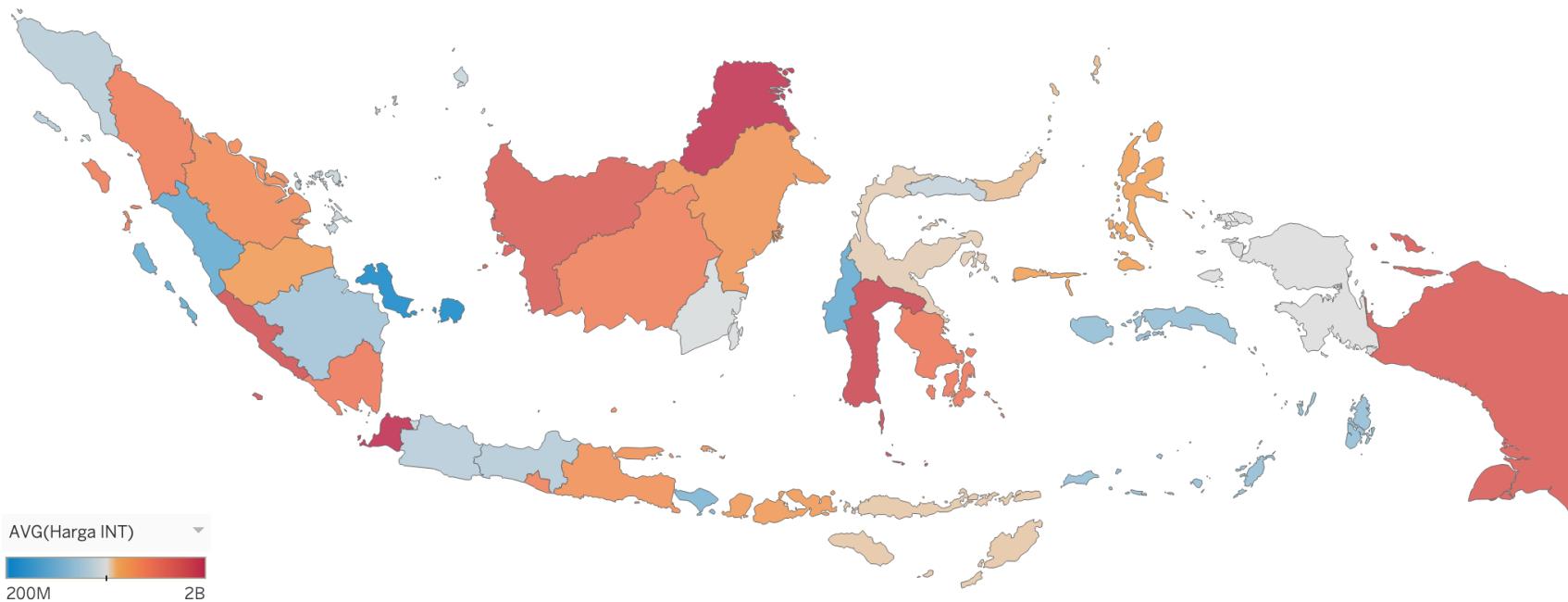


ALERT

color used to alert or warn reader



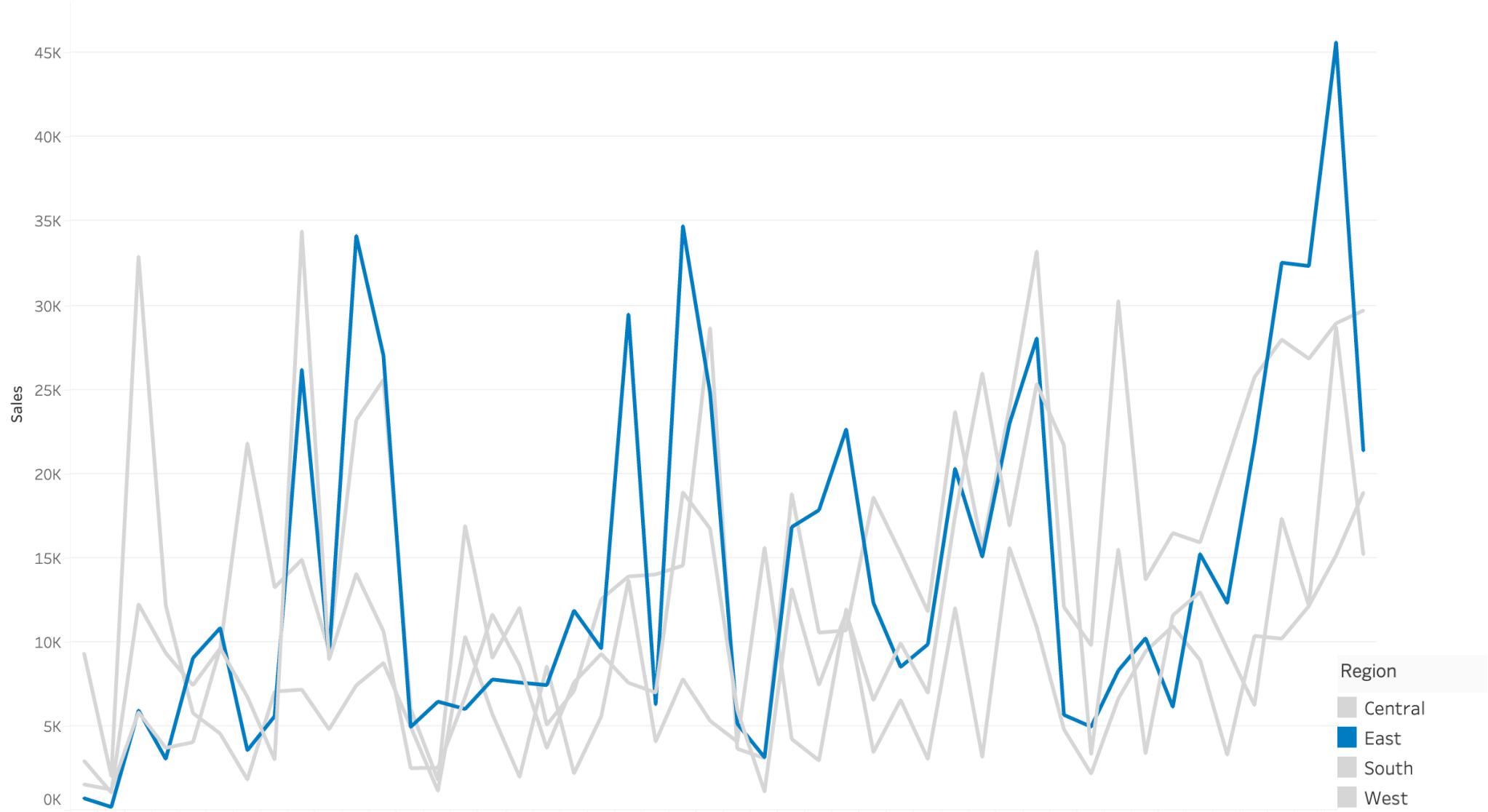
Diverging vs Sequential Colors



Categorical Colors



Highlight Colors



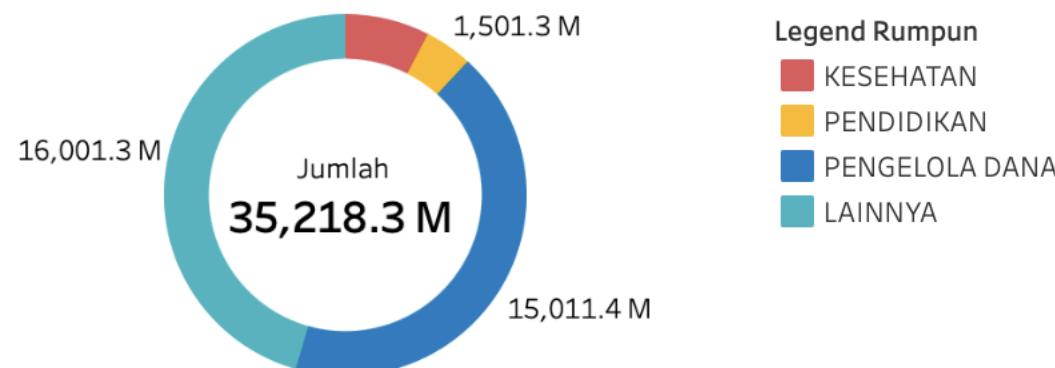
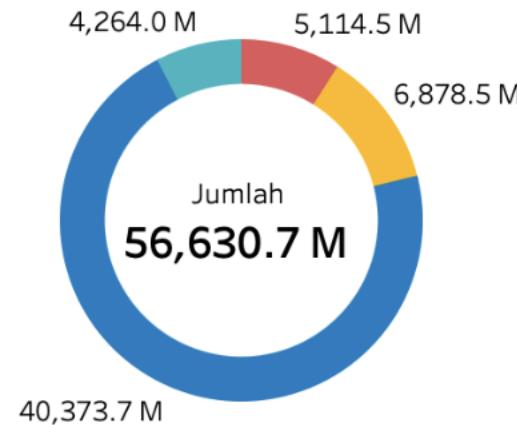
Alerting Colors

Regional M..	Order Date															
	2020			2021				2022				2023				
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Chuck Magee	-697	2,050	6,536	11,121	1,742	4,368	5,802	9,277	3,809	8,859	3,565	4,369	2,196	5,181	6,292	20,412
Fred Suzuki	2,674	4,446	1,402	3,358	2,560	2,289	4,464	-995	5,656	3,382	3,592	5,072	3,575	3,572	3,243	-1,541
Roxanne Rodriguez	139	969	-2,004	1,435	-220	1,535	2,900	7,502	-275	223	565	19,523	3,921	3,099	2,744	-2,192
Sadie Pawthorne	1,979	4,220	7,583	6,473	5,473	4,008	3,714	7,601	2,438	4,130	8,525	9,230	14,166	3,652	15,267	12,339

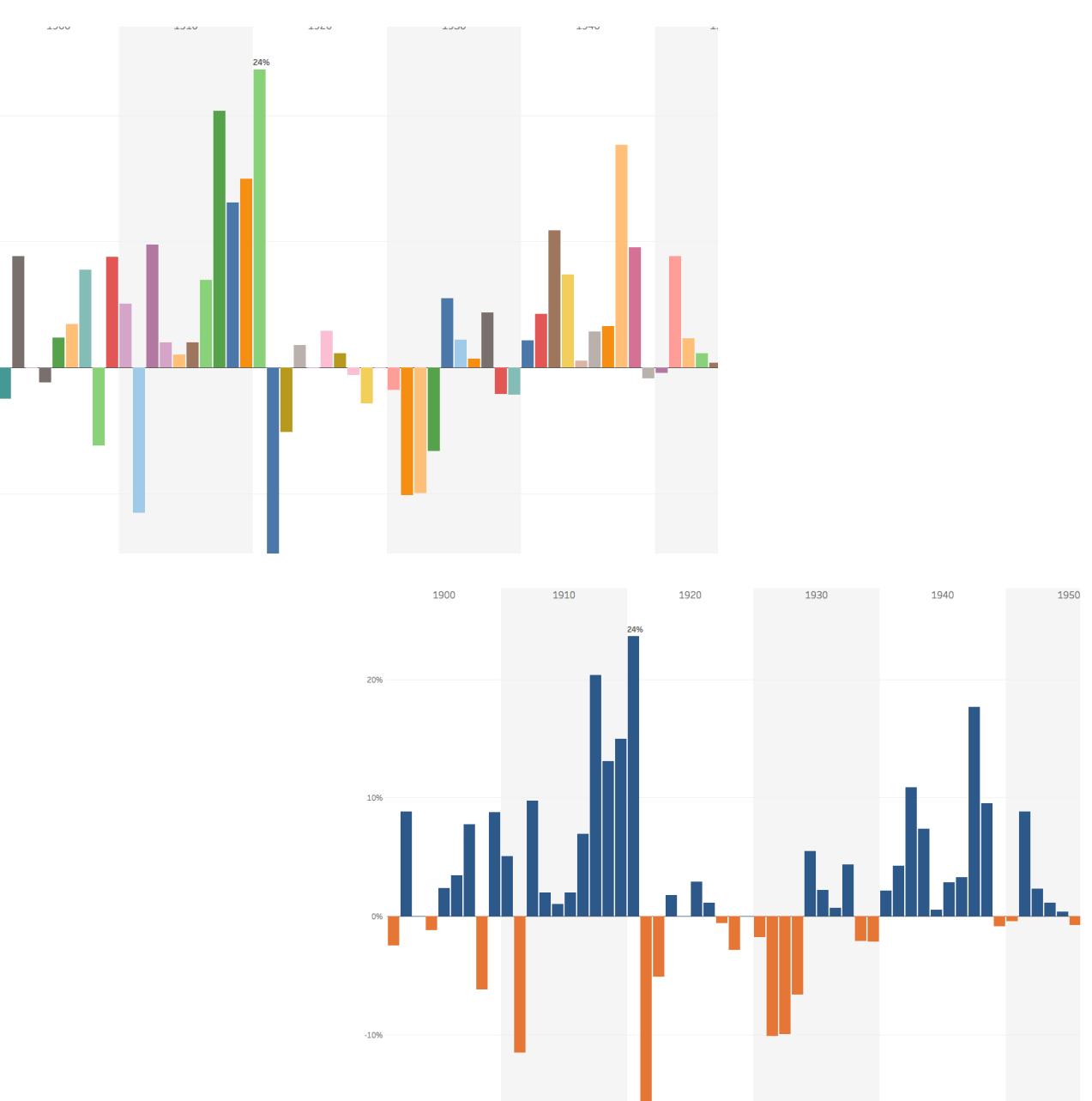
Maintain Color Identities

Once a color is assigned to an attribute, be consistent with the usage of that color.

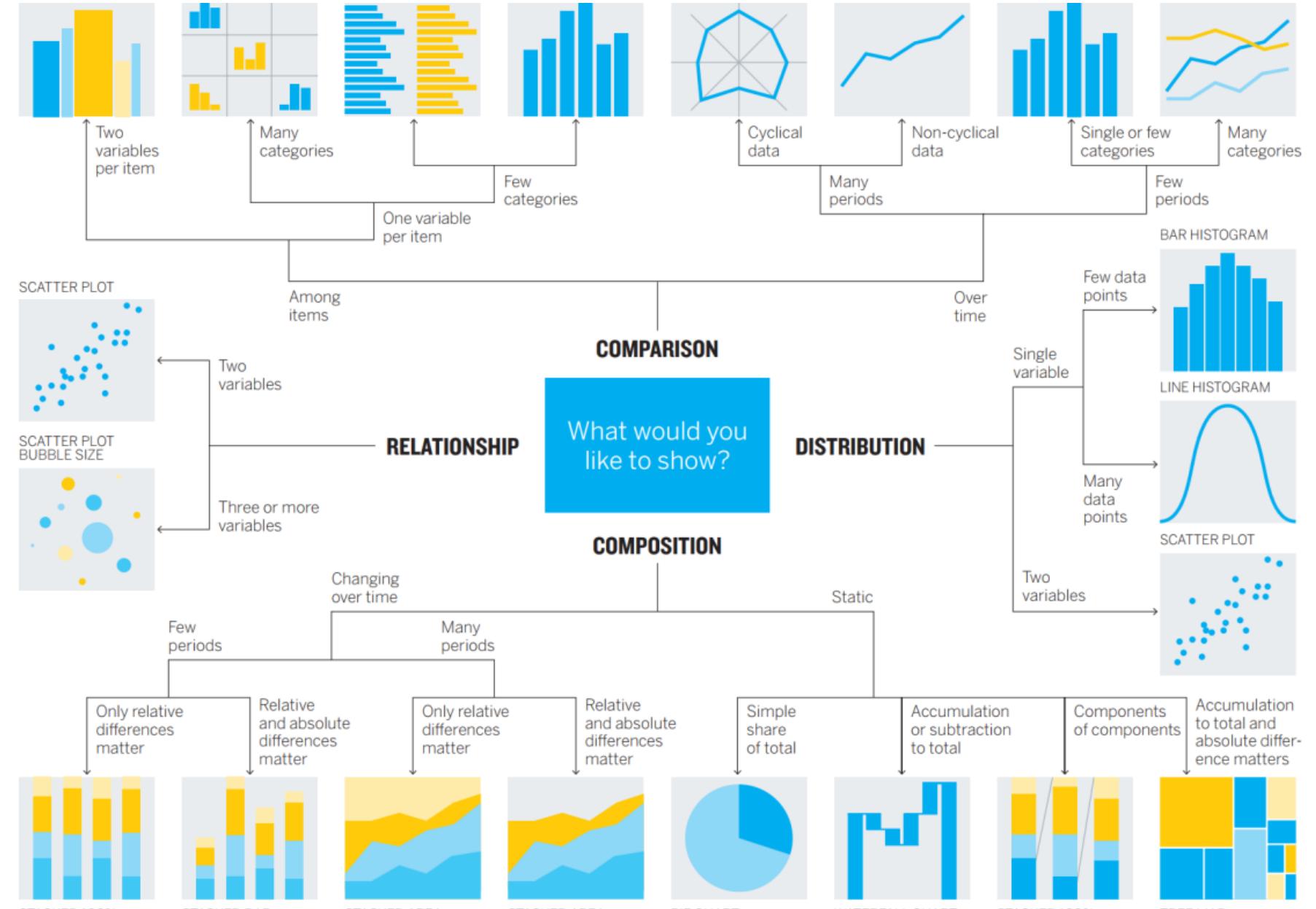
This eliminates confusion and establishes identity throughout a workbook.



Be Careful Not To Become The Next Vincent van Gogh



Common Chart Types



Choosing a Chart Type

5 primary types of visual mappings that content creators and consumers should understand:

1. Comparison, represented as a bar
2. Spatial, represented as a map
3. Temporal, represented as a line
4. Compare two measures, represented as a scatterplot
5. Precise number, represented as a text table





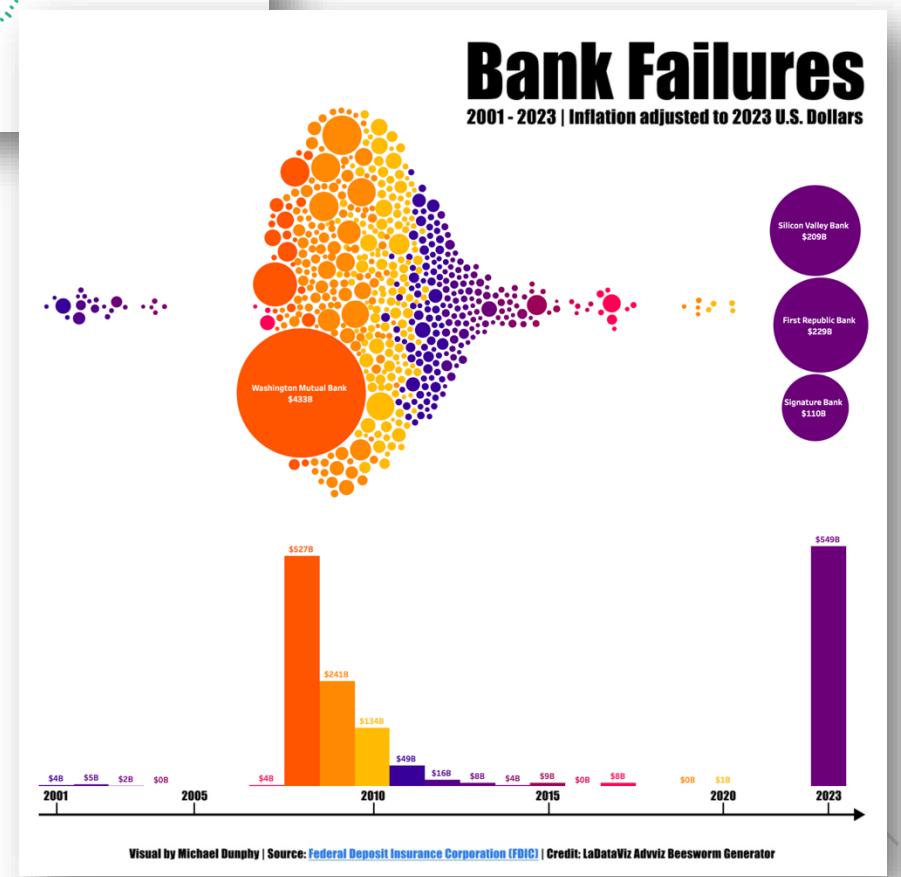
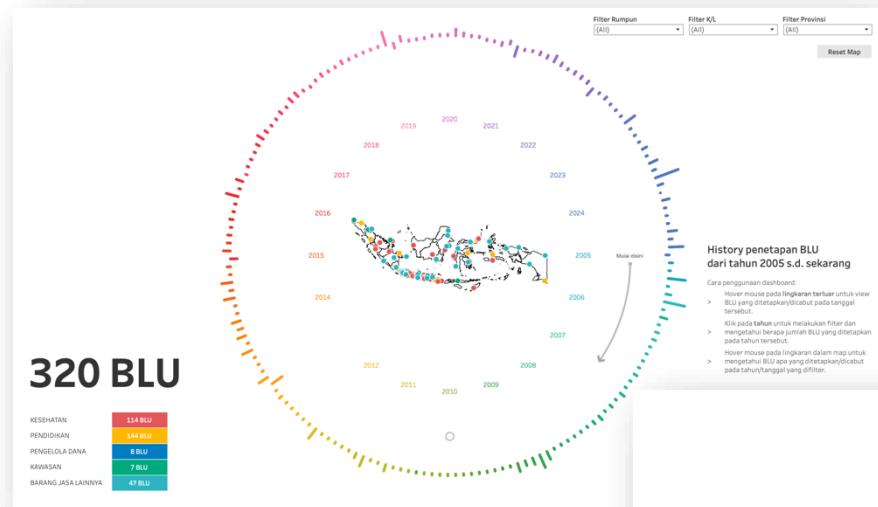
I've made the right chart,
now moving on to **Dashboard**...

“A dashboard is a visual display of data used to monitor conditions and/or facilitate understanding.”

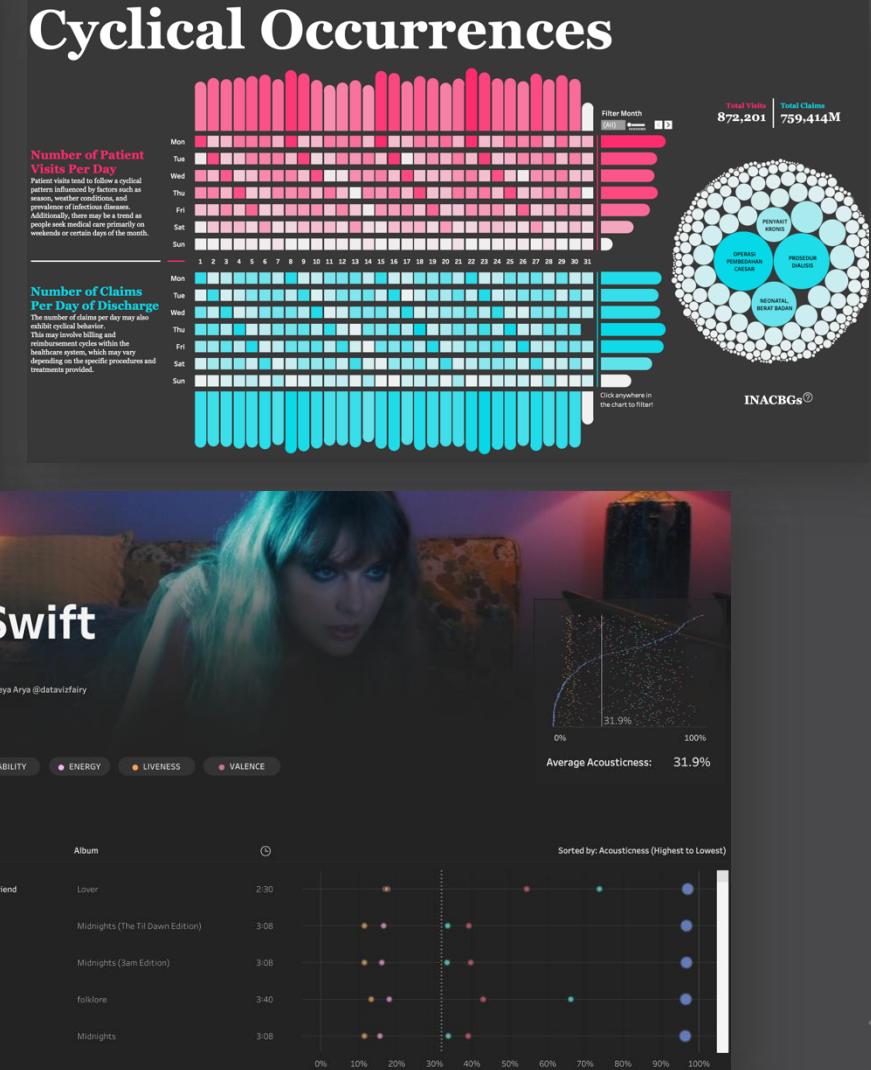
The Big Book of Dashboards (2017)



In what way
the dashboard
could inform to
the people who
need to
understand
them?



What question are you trying to answer?

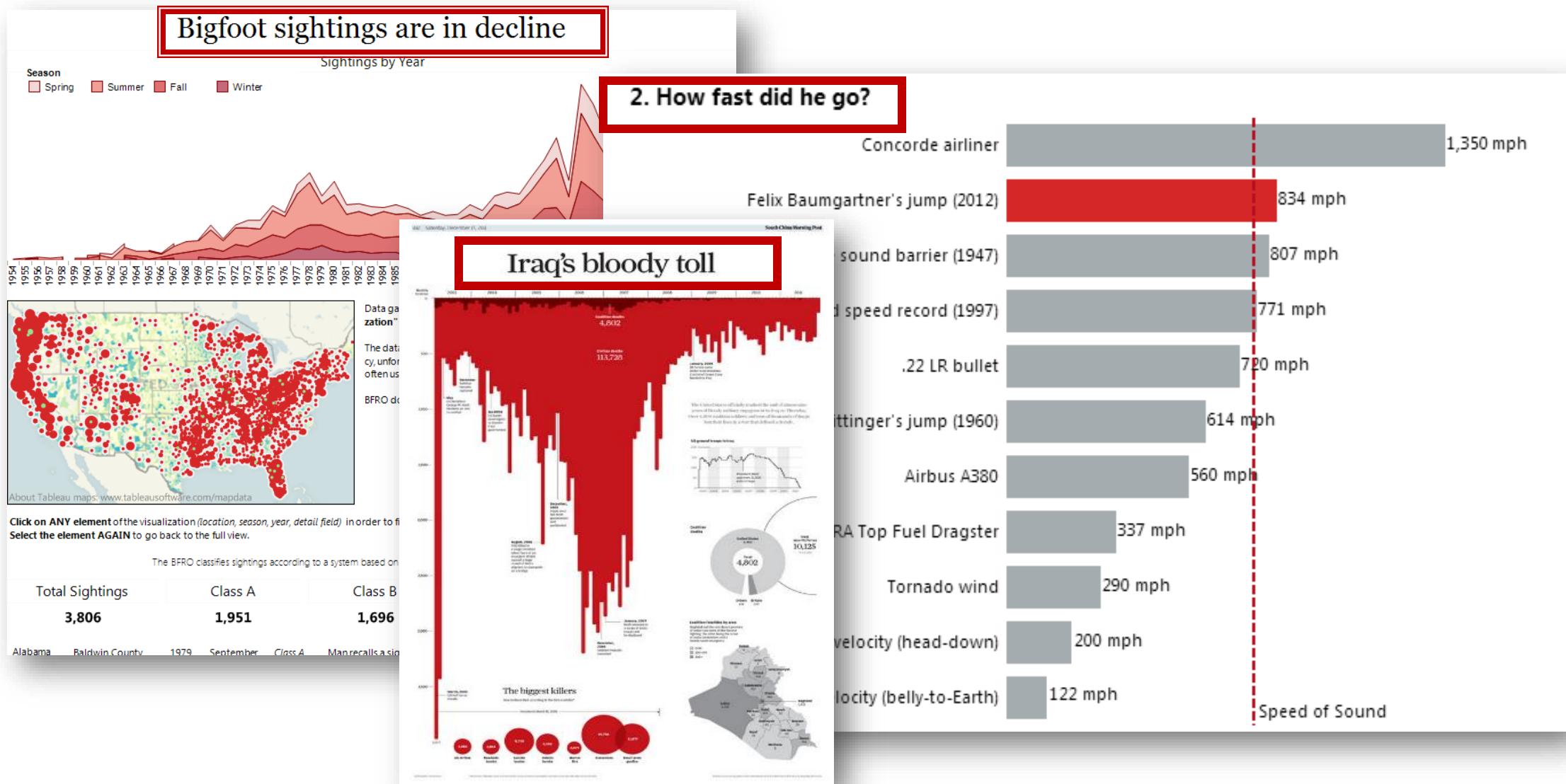


Title

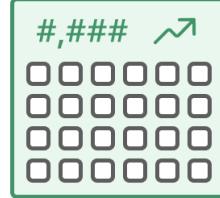
A concise, descriptive title can make a huge difference in garnering attention and making a chart more **memorable**.



Do your titles capture attention?



The 3-30-300 rule



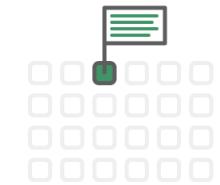
3 seconds:

Users should get an overview of the most important questions and areas.



30 seconds:

Users should filter and zoom to identify periods and categories to focus on.



300 seconds:

Users should get details-on-demand to inform their decisions and actions.



Guidelines on Dashboard Making



Focus on specific questions

Avoid creating a report that tries to show everything.



Go from top-left to bottom-right

Place the most important information in the top-left of the report.



Use color to steer attention

Make it quick and convenient for users to get what they need.



Limit ink and information

Avoid overwhelming users with too much to see and think about.



Keep it simple

Choose the right charts for the data, users, and questions.



Make it convenient

Help users spend as little time on the report as possible.



Dashboard Flow

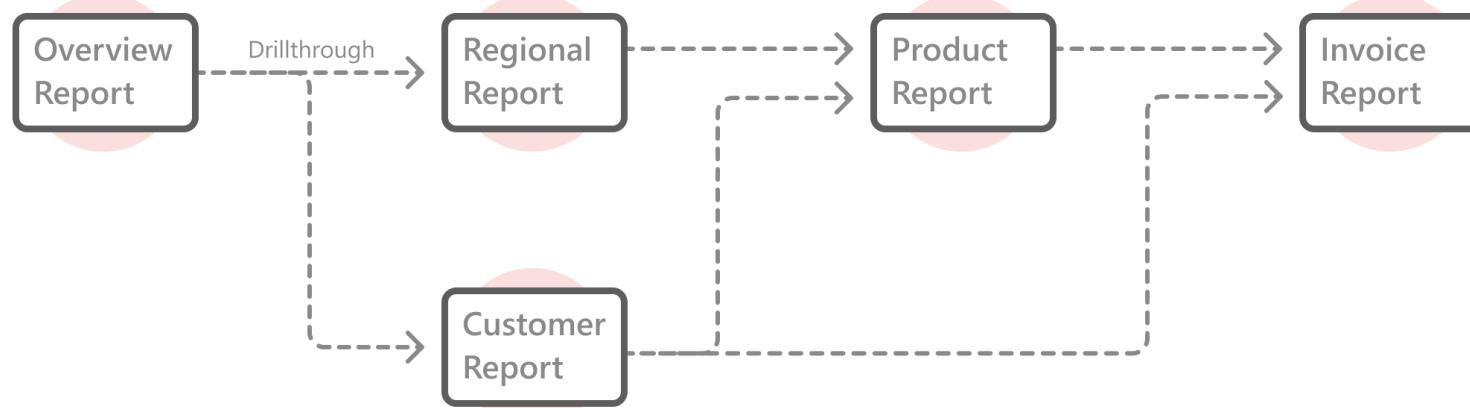
Detail



A flow that depicts how users navigate reports to answer their questions.



Reports or report pages in a single workspace or app



Inverted Pyramid

Most Newsworthy Info

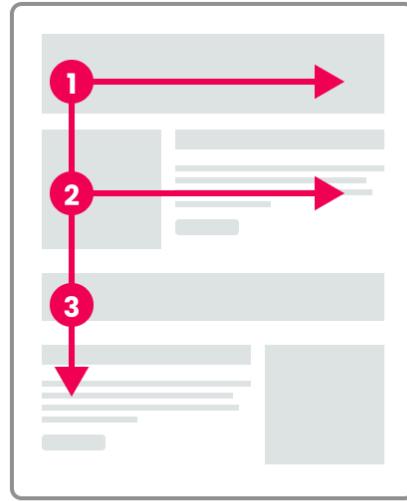
Who? What? When? Where? Why? How?

Important Details

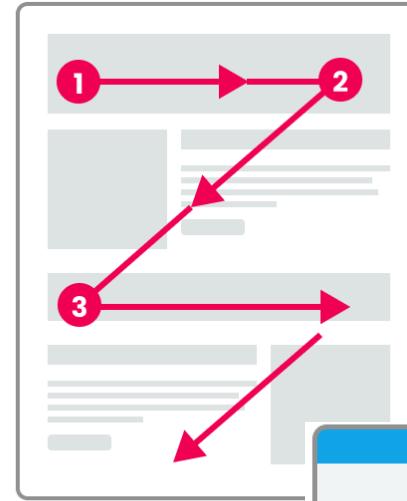
Other General Info



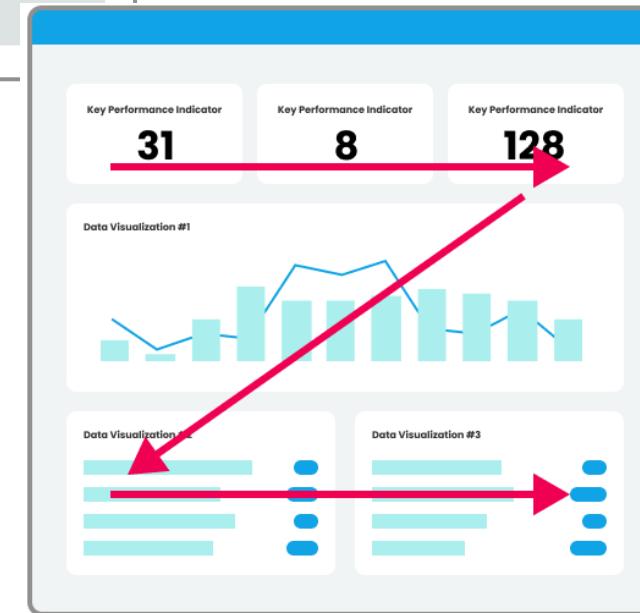
Dashboard Flow



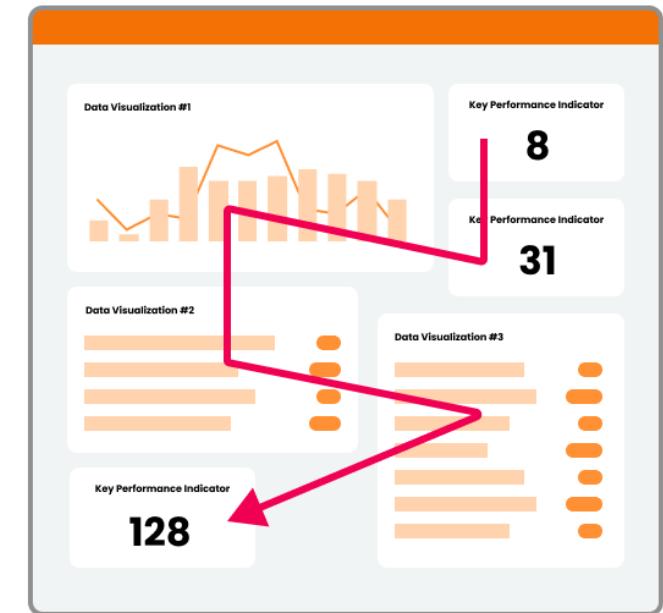
F-Pattern



Z-Pattern



✓ Logical flow

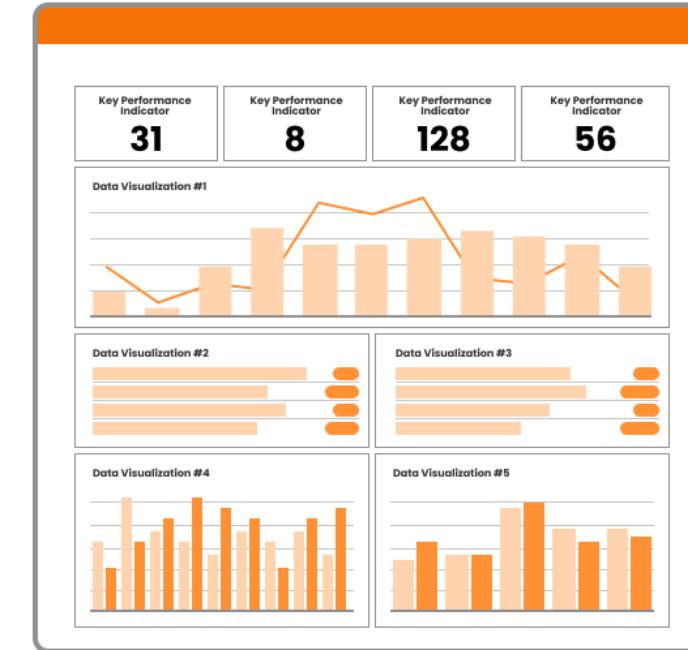


✗ Disorderly flow





✓ White space and fills



✗ Clutter and gridlines

Don't be afraid of
WHITE SPACE





“There Are No Perfect Dashboards”

The Big Book of Dashboards (2017)





BE CREATIVE

BE UNIQUE

BE YOU!

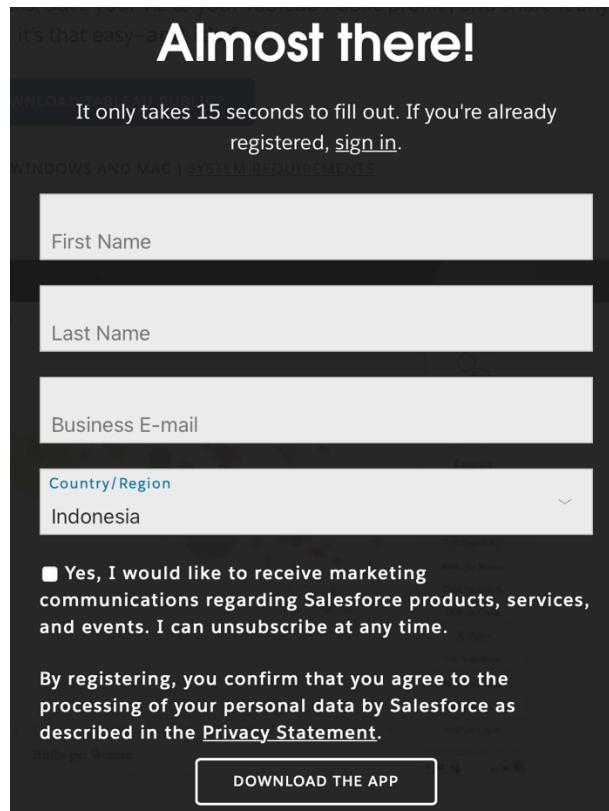


Prepare your Tableau Public



Download Tableau Public

1. Visit <https://www.tableau.com/products/public/download>.
2. Click  DOWNLOAD TABLEAU PUBLIC



3. Once the window opens, enter your first & last name, e-mail, and country, and click  DOWNLOAD THE APP
4. Install the downloaded file (TableauPublic.exe/dmg).
5. Open your installed Tableau Public!

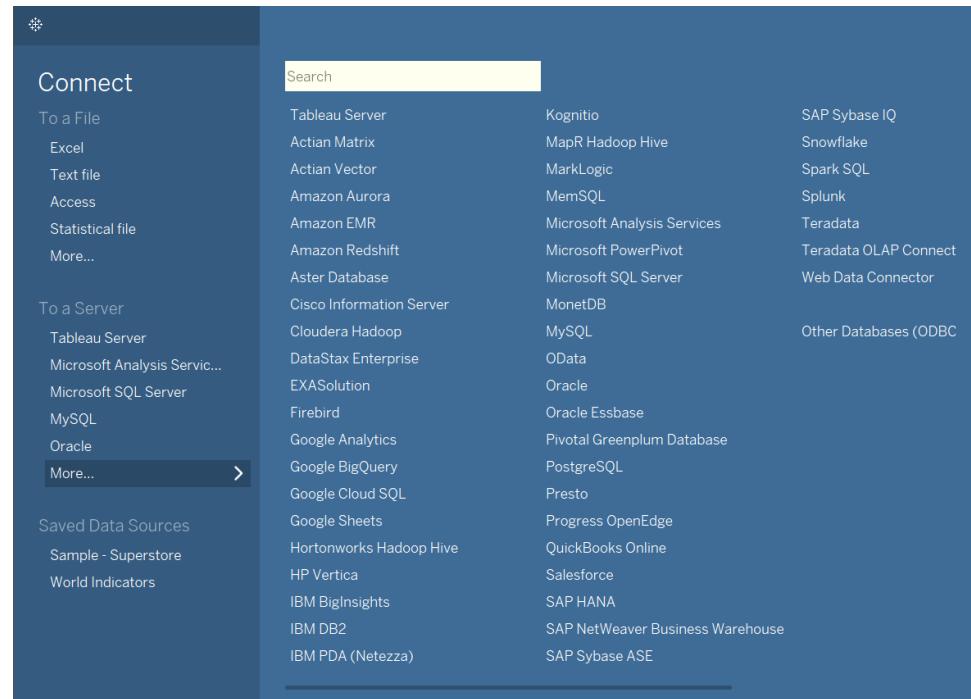
Connect to Your Data



Start Page

The start page in Tableau Public is a central location from which you can do the following:

- Connect to your data.
- Discover and explore content produced by the Tableau community.



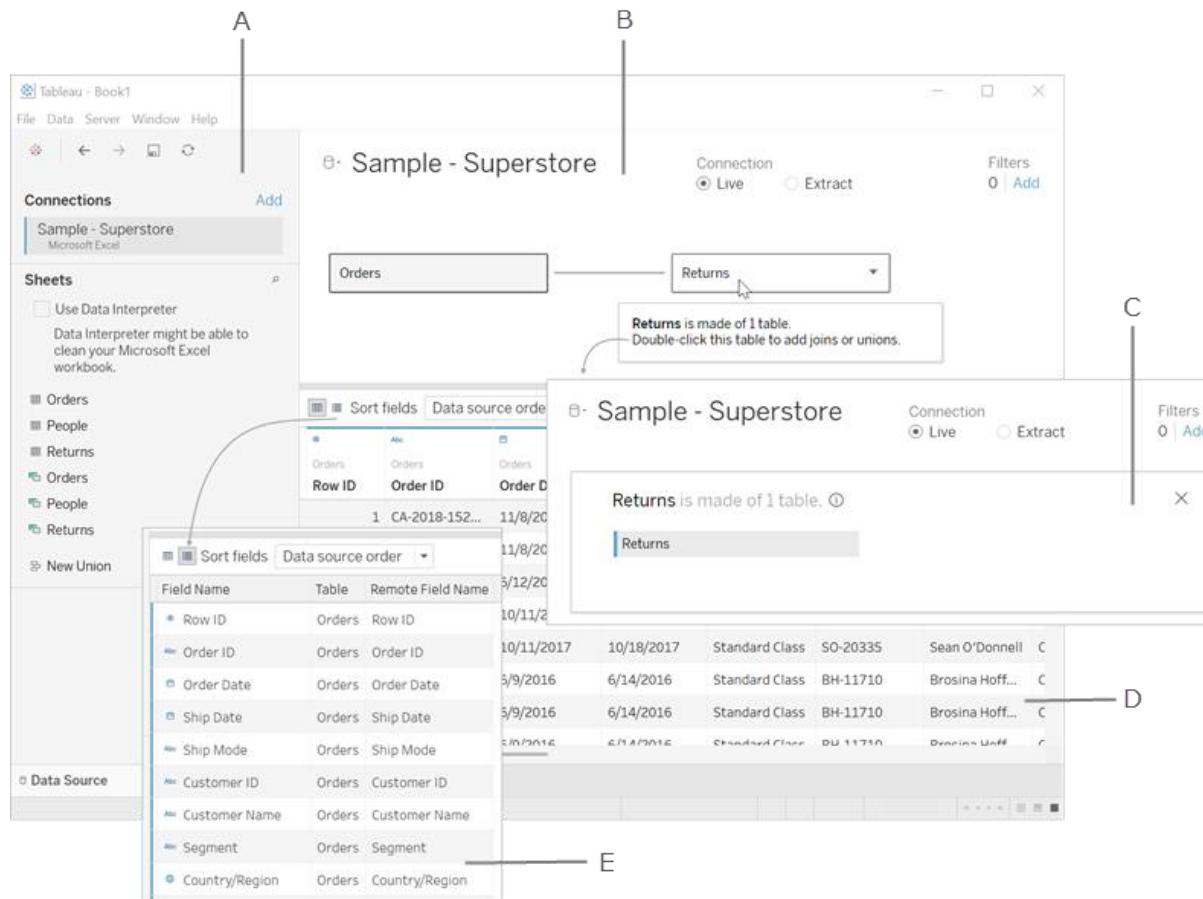
To follow along with examples in the Tableau Desktop documentation, you'll usually use the **Sample - Superstore** data source from here:

https://public.tableau.com/app/learn/sample-data?qt-overview_resources=1#qt-overview_resources

Or this one, **Global Superstore** for more diverse data:

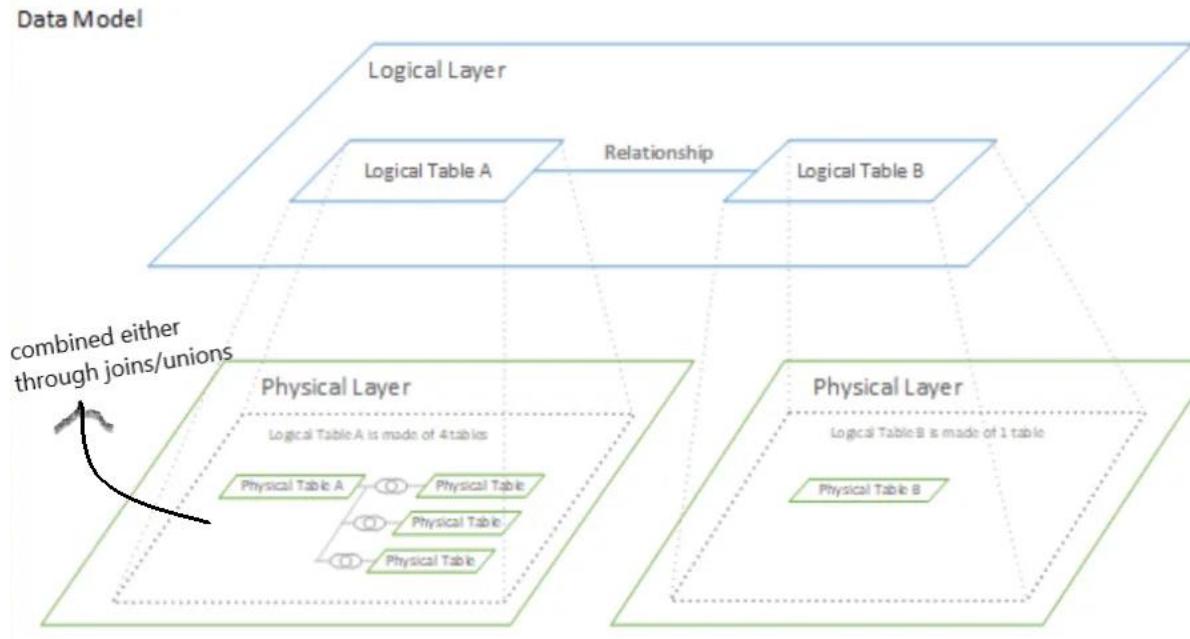
[https://github.com/yannie28/Global-Superstore/blob/master/Global_Superstore\(CSV\).csv](https://github.com/yannie28/Global-Superstore/blob/master/Global_Superstore(CSV).csv)

Data Source Interface



- A. Left pane:** Displays the connected data source and other details about your data.
- B. Canvas Logical layer:** The canvas opens with the logical layer, where you can create relationships between logical tables.
- C. Canvas Physical layer:** Double-click a table in the logical layer to go to the physical layer of the canvas, where you can add joins and unions between tables.
- D. Data grid:** Displays first 1,000 rows of the data contained in the Tableau data source.
- E. Metadata grid:** Displays the fields in your data source as rows.

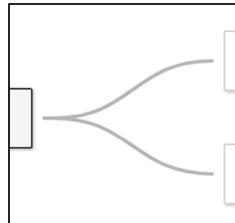
Logical & Physical Layer



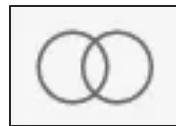
Logical Layer → The default data canvas view in our Data Source Page. It enables to join the data using *Relationships (or Noodles)*. While combining data from multiple tables, we don't specify joins in the Logical Layer. Instead, we perform Relationships where Tableau automatically chooses an adequate join type based on data and analysis.

Physical Layer → This can be regarded as a sub-logical layer; double-click a logical table to access it. It enables a combination of data using Joins/Union. Tables joined in the Physical Layer are known as Physical Tables and are merged into a single flat table after transformations.

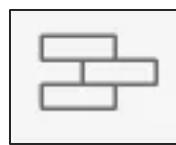
Combine Data Methods



Relationship makes data joining easy for all and doesn't explicitly require *knowledge of joins/unions*. **The relationship can only be made in the Logical Layer**. These are like a contract between two tables based on some matching field; following that contact, Tableau automatically performs appropriate joins and combines the data.



Joins are a traditional method to combine our data based on certain conditions. In Tableau, **Joins can only be done in the physical layer**. To create a join, double-click on a logical table.



Union is a way to append two data connections with the same number of columns and data types. **This happens in the Physical layer**, which can be accessed by double-clicking on a Logical Table.



Bookshop
Movie Adaptations

Data blending is the best for connecting data with **different file formats or between multiple data sources**. Blending requires two connections, namely primary and secondary. The first chosen connection will be deemed primary (green) and later will be secondary (orange).

“Use RELATIONSHIPS if you can, JOIN if you must, BLEND if you absolutely must.”

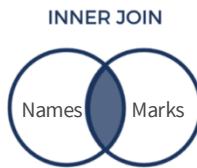
~ Donabel Santos

Joins

Tableau supports four types of joins: **Inner, Outer, Left, Right.**

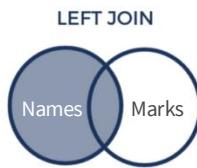
For illustrations, let's take two tables:
Names and **Marks**.

Names		Marks	
student_id	student_name	student_id	marks
1	John	1	29
2	Tyler	3	74
3	Josh	5	90
4	Adam	6	66
5	Barney	7	78



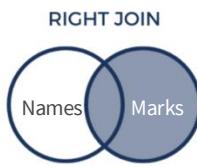
Inner Join represents only common values in both tables.
If a value isn't entirely matched in either table, it will be dropped immediately.

student_id	student_name	marks
1	John	29
3	Josh	74
5	Barney	90



Left Join represents all the values from the left table,
If a value from the right table doesn't match, it will be assigned as *null*.

student_id	student_name	marks
1	John	29
2	Tyler	null
3	Josh	74
4	Adam	null
5	Barney	90



Right Join represents all the values from the right table.
If a value from the **left table** doesn't match, it will be assigned as *null*.

student_id	student_name	marks
1	John	29
3	Josh	74
5	Barney	90
6	null	66
7	null	78



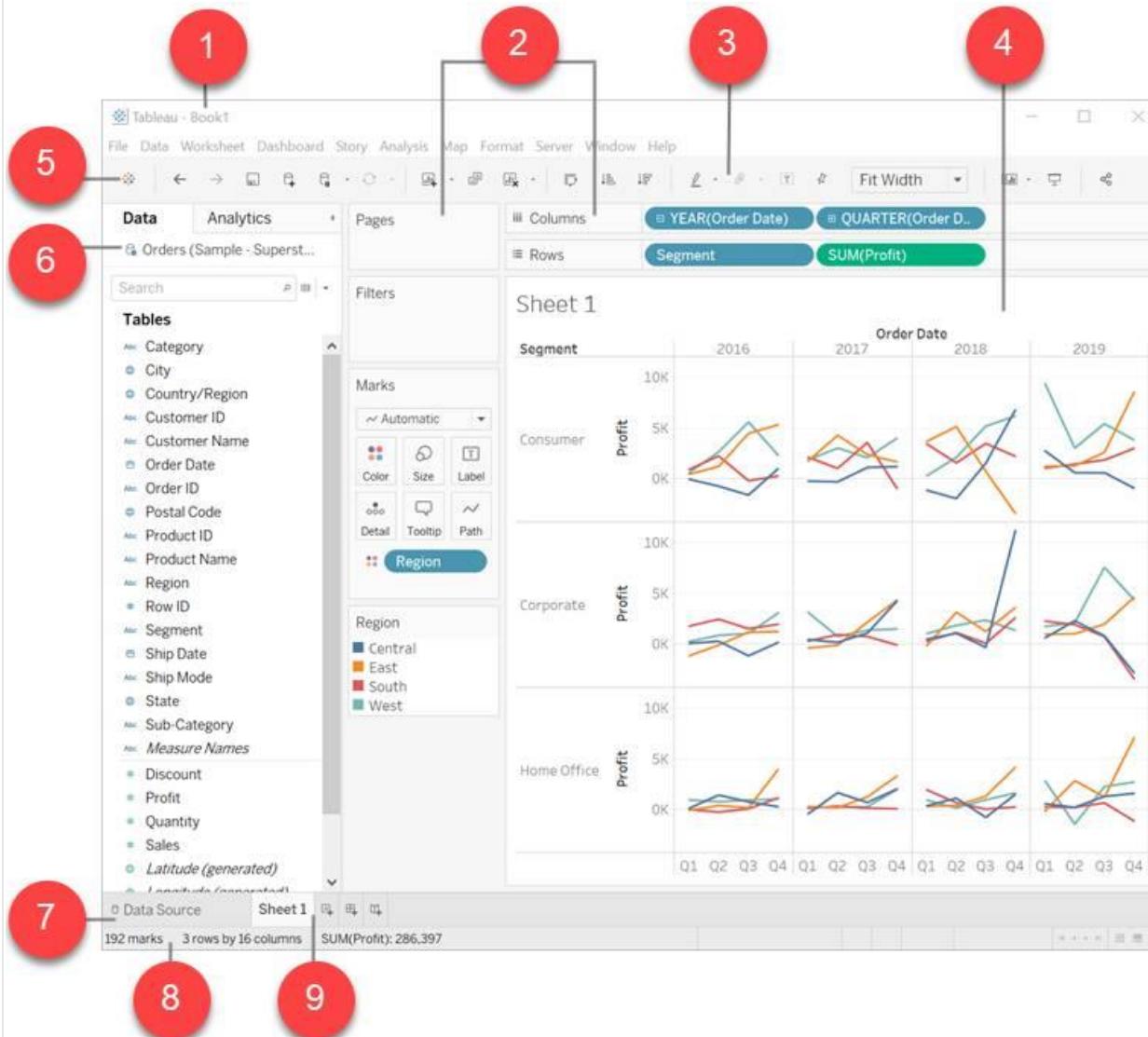
Outer Join represents all the values from both tables.
If a value from either table doesn't match, there will be a null value.

student_id	student_name	marks
1	John	29
2	Tyler	null
3	Josh	74
4	Adam	null
5	Barney	90
6	null	66
7	null	78

Create Charts

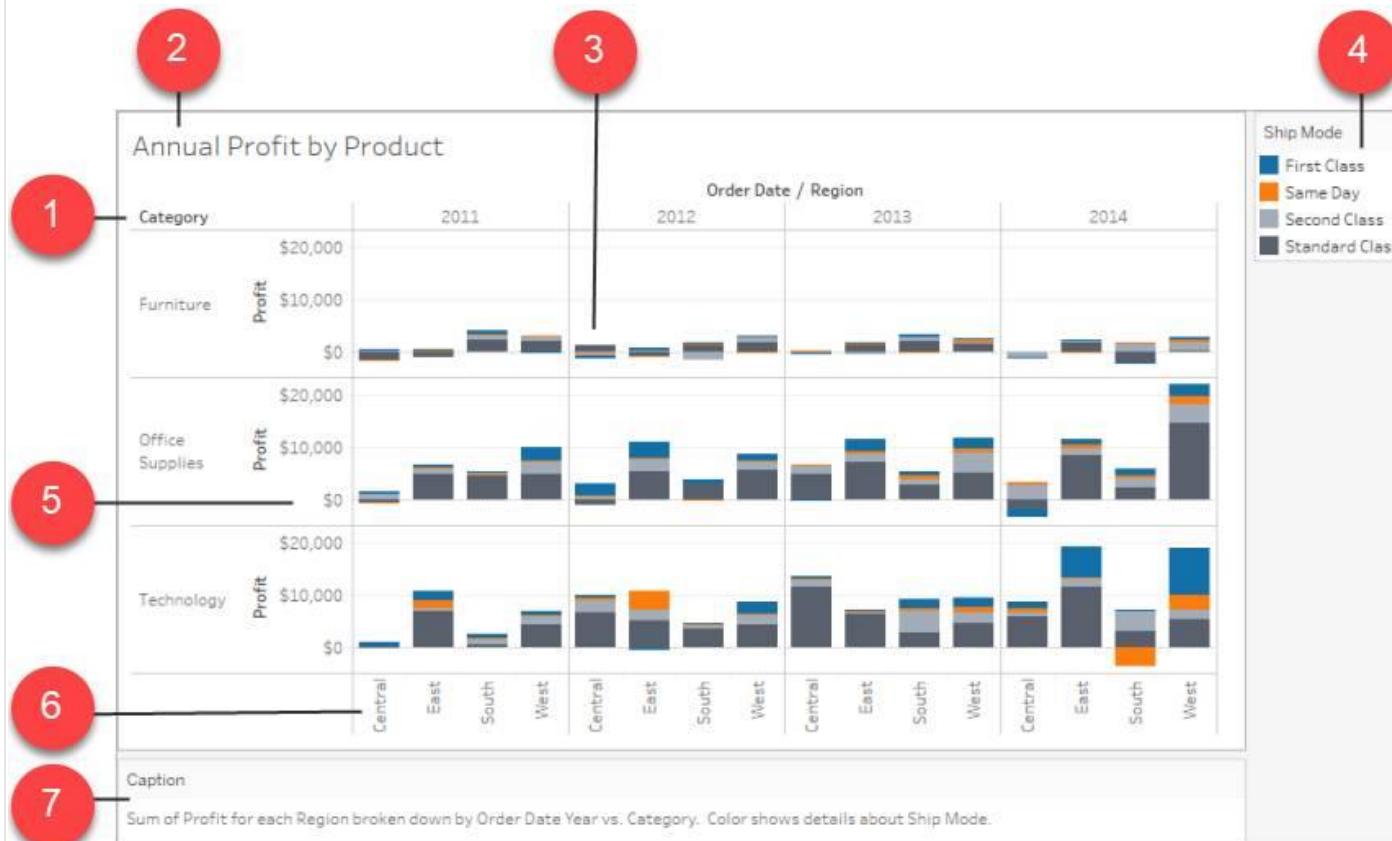


Worksheet Interface



1. **Workbook name:** A Tableau workbook is similar to an Excel® workbook. It can contain one or more worksheets (or dashboards or stories) and holds all of your work. You can save it and share it just like any other file. When you open Tableau, a blank workbook is automatically created.
2. **Cards and shelves:** Drag fields to the cards and shelves in the workspace to add data to your view. By placing fields on shelves or cards, you build the structure of your visualization.
3. **Toolbar:** Access commands, analysis, and navigation tools.
4. **View:** The canvas in the workspace where you create a viz. The finished visualization may include charts, graphs, maps, and more.
5. **Tableau icon:** Takes you to the Start page, where you can connect to data.
6. **Side bar:** In a worksheet, the side bar contains the Data pane and the Analytics pane.
7. **Data source tab:** Takes you to the Data Source page where you can view your data.
8. **Status bar:** The status bar displays information about the current view and descriptions of menu items.
9. **Sheet tabs:** Tabs represent each sheet in your workbook. This can include a worksheet, dashboard, or story.

View Interface



1. **Field label:** The label of a field added to the row or column shelf that describes the members of that field.
2. **Title:** The name that you give your worksheet, dashboard, or story.
3. **Mark:** The data that represents the intersection of the fields (dimensions and measures) included in your view. Marks are represented using lines, bars, shapes, and maps.
4. **Legend:** A key that describes how the data is encoded in your view.
5. **Axis:** This is created when you add a measure (fields that contain quantitative, numerical information) to the view. By default, Tableau generates a continuous axis for this data.
6. **Header:** The member name of a field.
7. **Caption:** Text that describes the data in the view.

The Data Pane

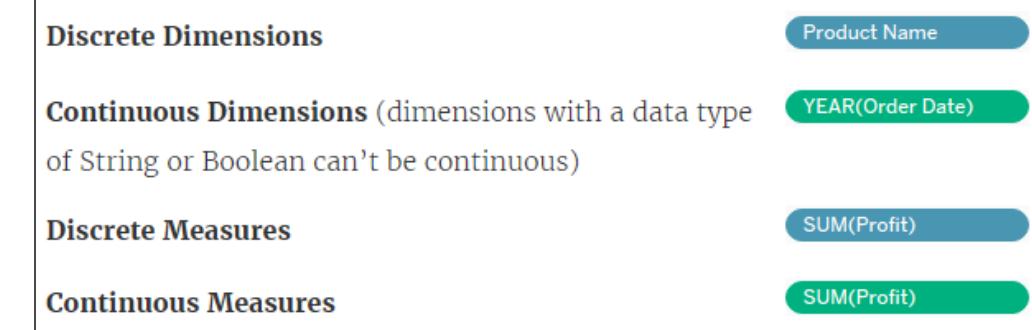
- **Dimension fields:** Fields that contain qualitative values (such as names, dates, or geographical data). You can use dimensions to categorize, segment, and reveal the details in your data. Dimensions affect the level of detail in the view.
- **Measure fields:** Fields that contain numeric, quantitative values can be measured. You can apply calculations to them and aggregate them. When you drag a measure into the view, Tableau applies an aggregation to that measure (by default). Examples of measures: sales, profit, number of employees, temperature, frequency.
- **Calculated fields:** If your underlying data doesn't include all of the fields you need to answer your questions, you can create new fields in Tableau using calculations and then save them as part of your data source. These fields are called calculated fields.
- **Sets:** Subsets of data that you define. Sets are custom fields based on existing dimensions and criteria that you specify.
- **Parameters:** Values that can be used as placeholders in formulas, or replace constant values in calculated fields and filters.

The Data Pane: Blue vs. Green

Tableau represents data differently in the view depending on whether the field is discrete or continuous).

Continuous and *discrete* are mathematical terms.

- **Continuous** means "forming an unbroken whole, without interruption". These fields are colored green. When a continuous field is put on the Rows or Columns shelf, an axis is created in the view.
- **Discrete** means "individually separate and distinct." These fields are colored blue. When a discrete field is put on the Rows or Columns shelf, a header is created in the view.



The Data Pane: Blue vs. Green examples

- In the example on the left, because the **Quantity** field is **Continuous**, it creates a horizontal axis along the bottom of the view. The green pill and the axis help you to see that it's a continuous field.
- In the example on the right, the **Quantity** field is **Discrete**. It creates a horizontal headers instead of an axis. The blue pill and the horizontal headers help you to see that it's discrete.
- The SUM aggregation indicates that it's a measure. The absence of an aggregation function in the **Quantity** field name indicates that it's a dimension.



Tooltip

Tooltips can make the difference between a user loving your visualization and not understanding it.

- Use a proper font
- Identify the most important part of the tool tip and make it your title
- Change measure names/values to make them specific and understandable
- Include proper units
- Remove command prompts

Ship Status:	Shipped Late
Customer Name:	Nick Zandusky
Order Date:	7/10/2016
Order ID:	CA-2016-134222
Product Name:	GBC Standard Therm-A-Bind Covers
Ship Mode:	Same Day
Days to Ship Actual:	1

Default

vs

Modified

Same Day - Shipped Late

1 days to ship

Product Name: GBC Standard Therm-A-Bind Covers

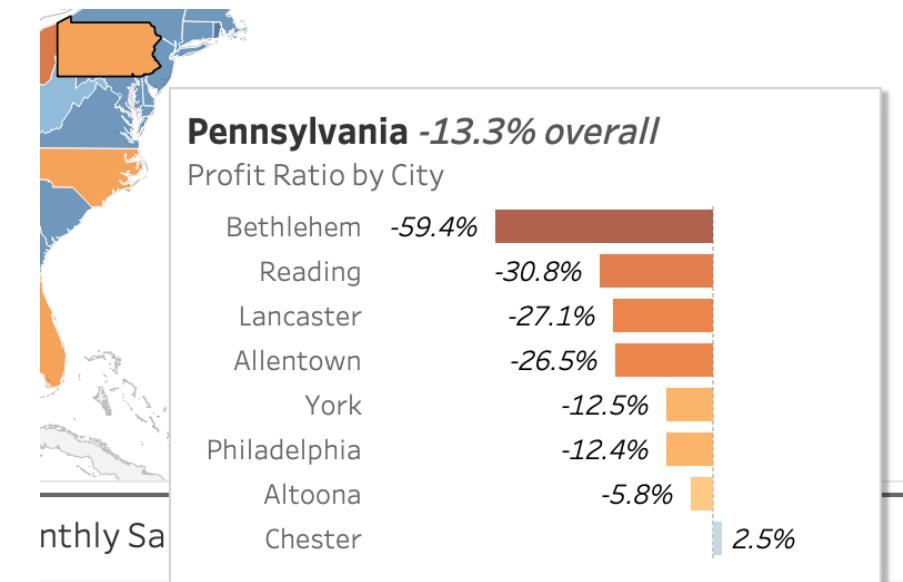
Customer Name: Nick Zandusky

Order Date: 7/10/2016

Order ID: CA-2016-134222

Viz in Tooltips, what are they good for?

- Highlighting trends
- Describing the distribution of data
- Layering different levels of time or geography
- String aggregations – getting rid of that!



Executive Overview - Profitability (All)

Sales

\$1,820,895

Profit

\$231,963

Profit Ratio

12.7%

Profit per Order

\$59.04

Sales per Customer

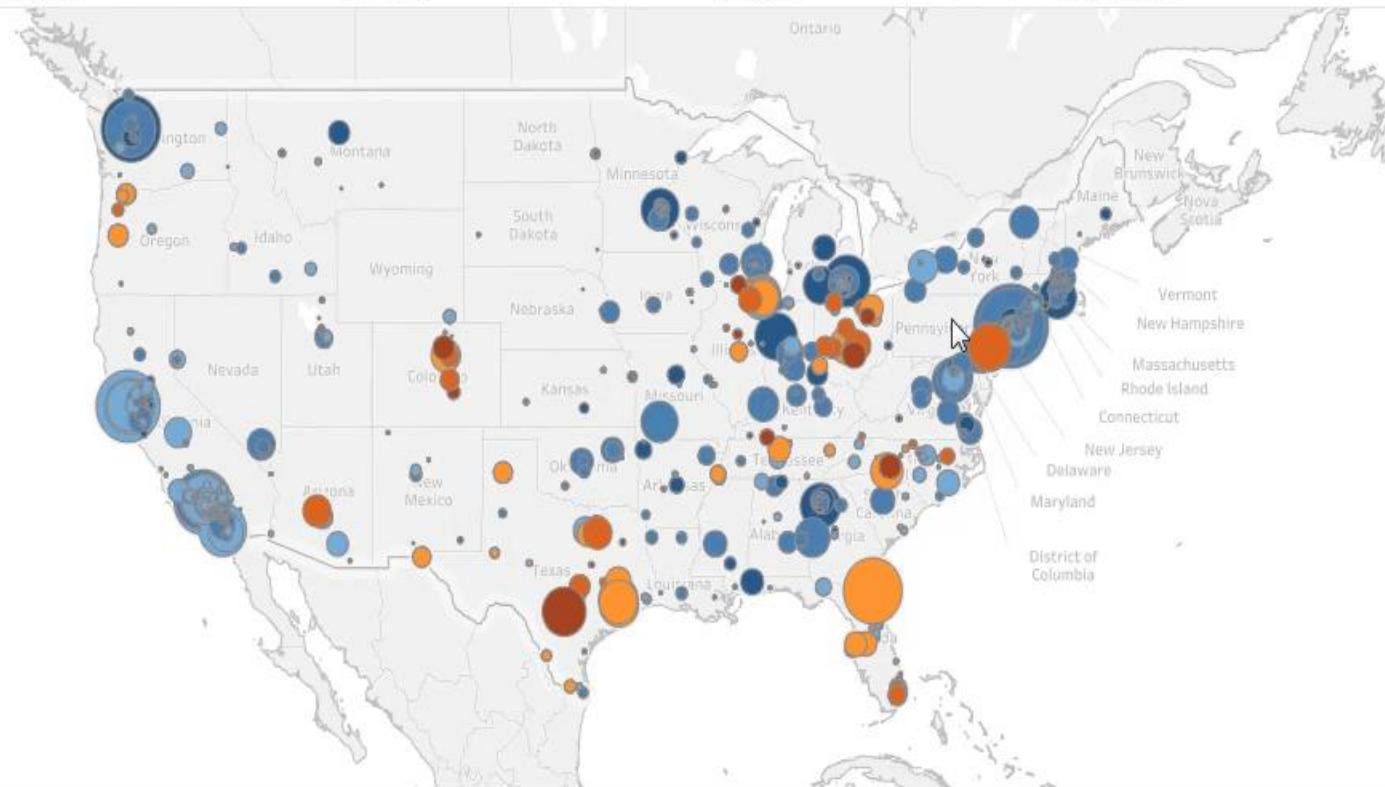
\$2,313.72

Avg. Discount

15.71%

Quantity

29,793



Region

(All)

Order Date

1/3/2014 6/30/2017

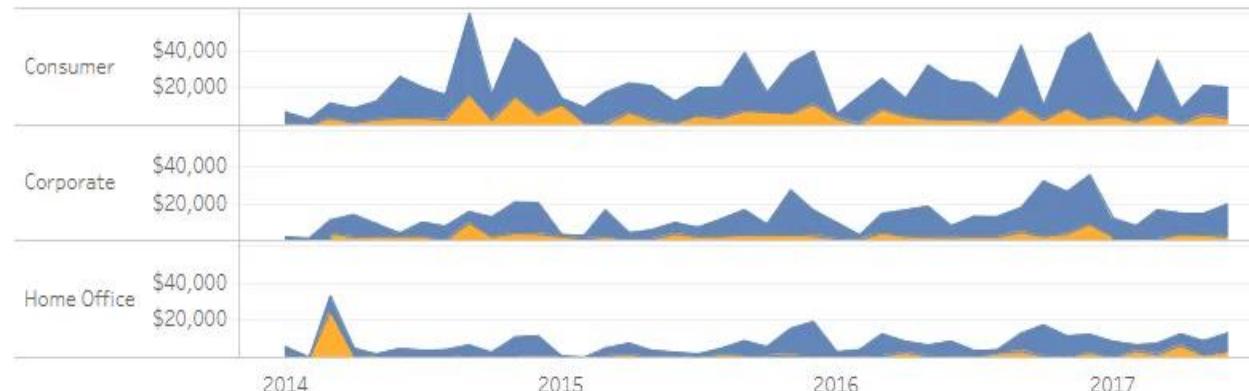
Profit Ratio

-270.0% 50.0%

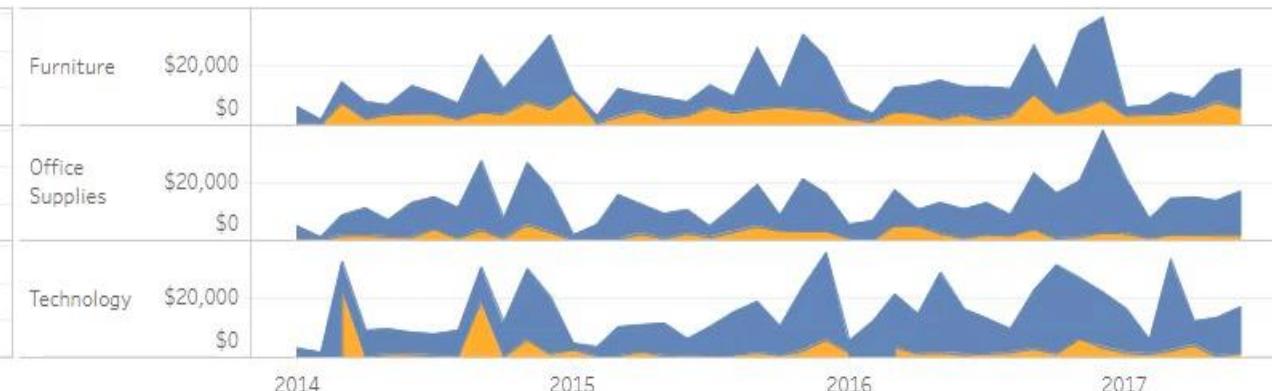
Profit Ratio

-50.0% 50.0%

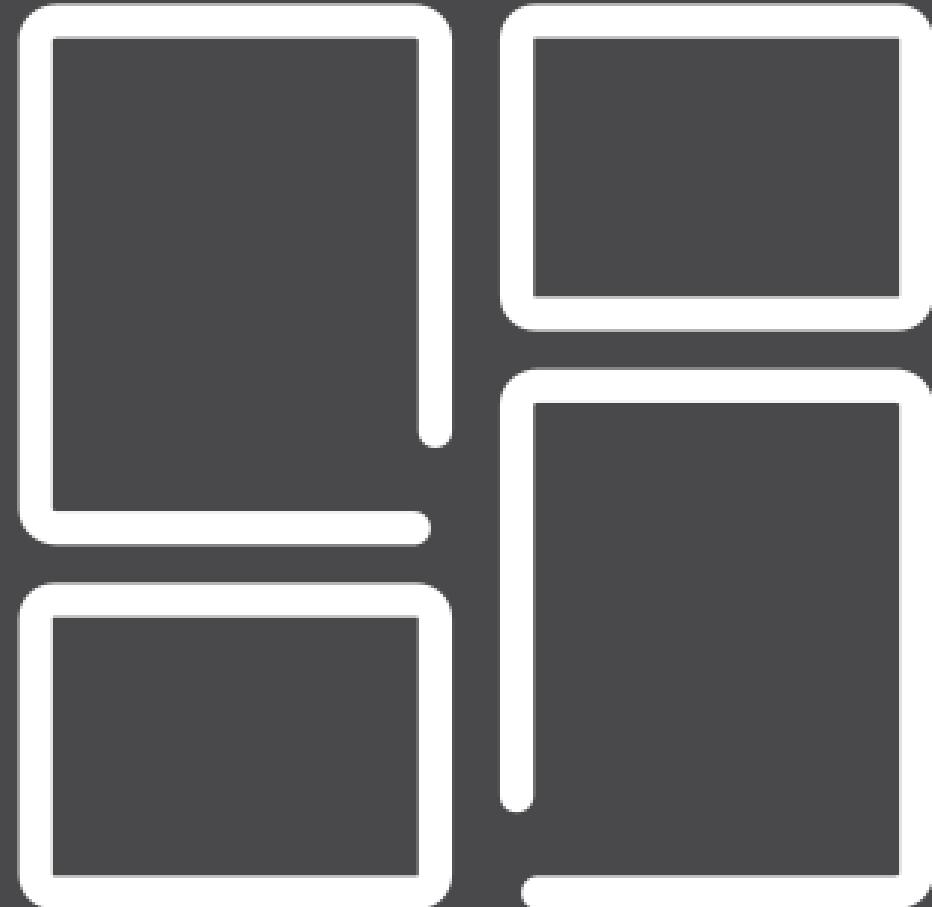
Monthly Sales by Segment - States: All



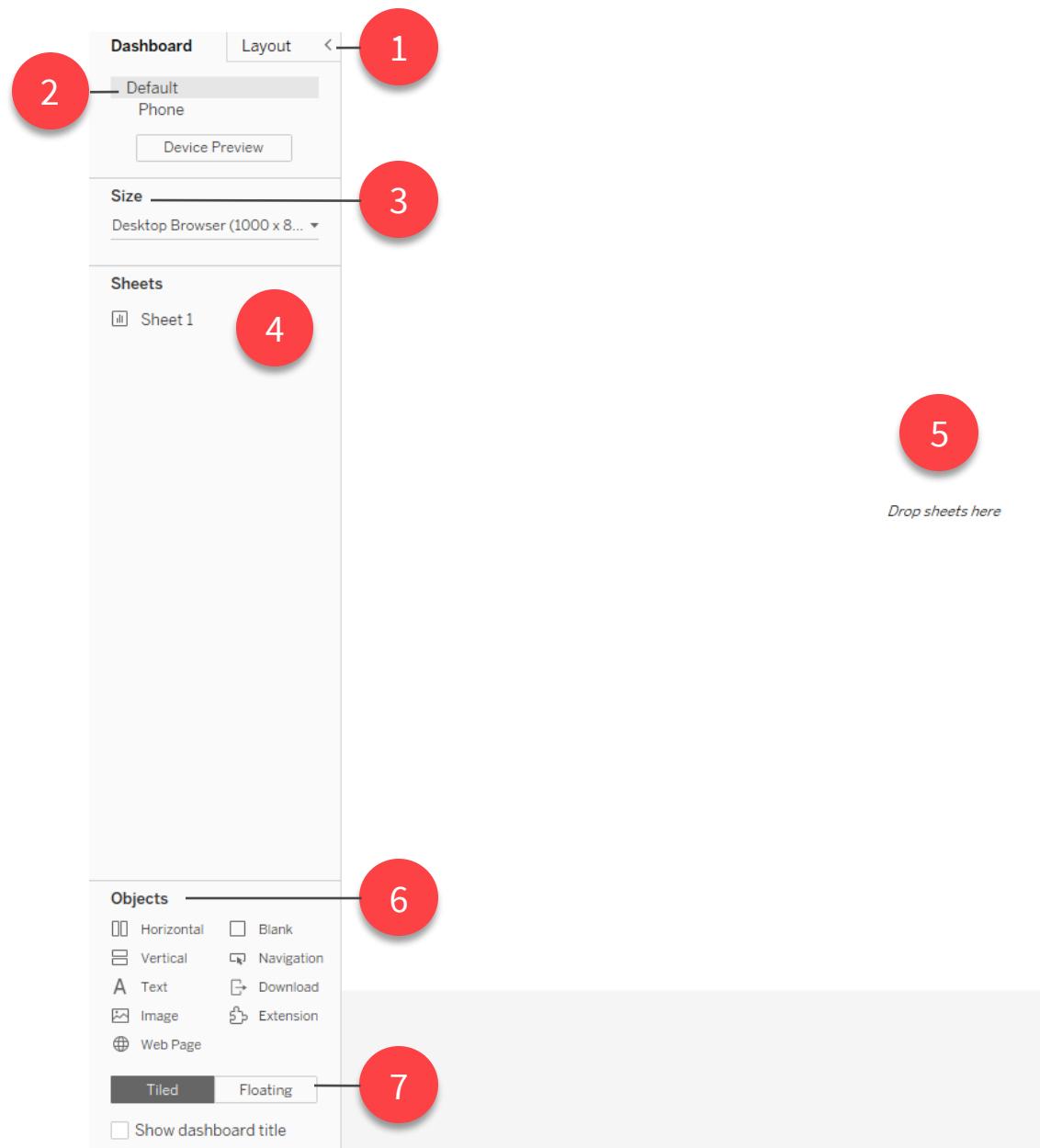
Monthly Sales by Product Category - States: All



Create a Dashboard

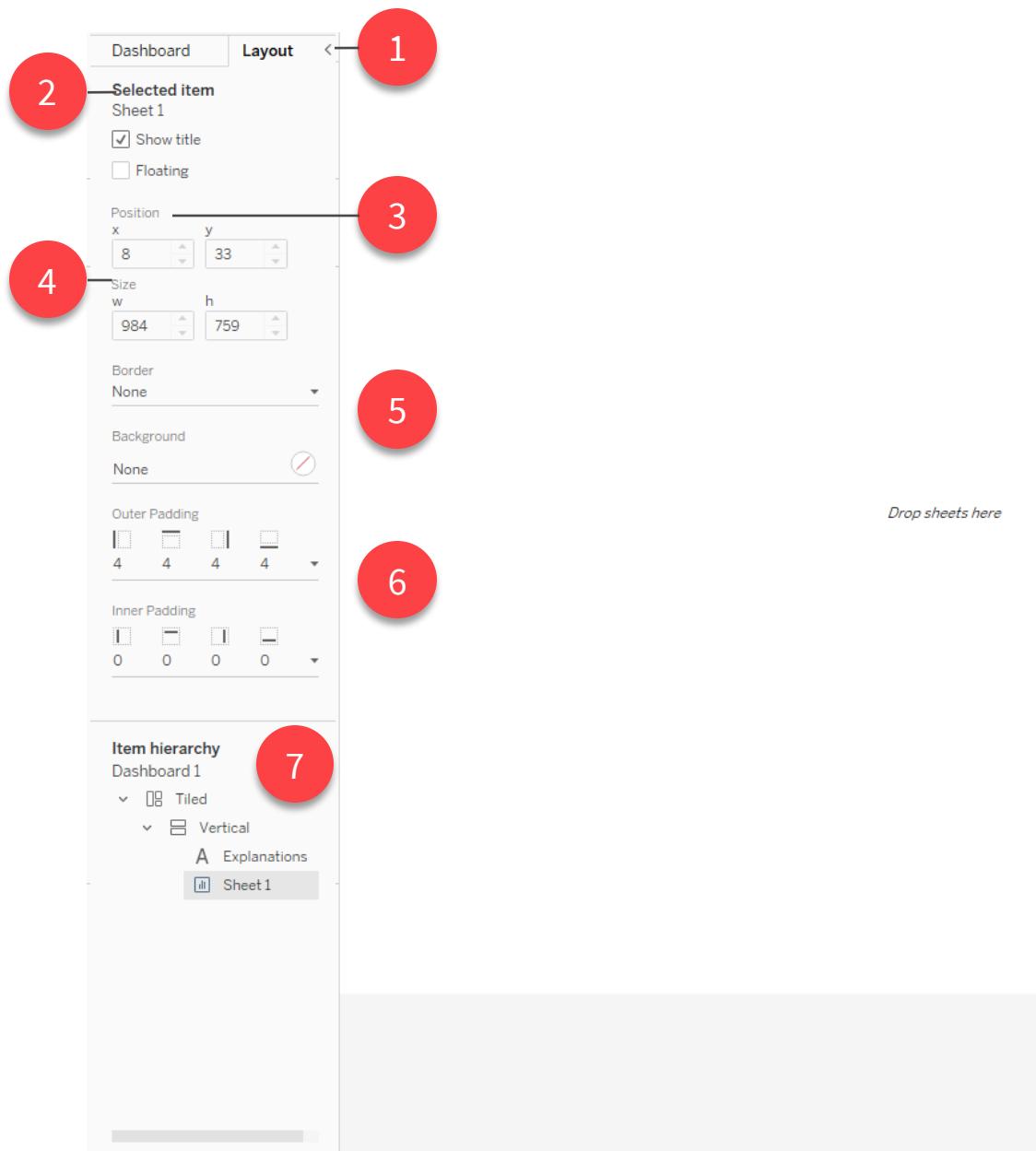


Dashboard Tab Interface



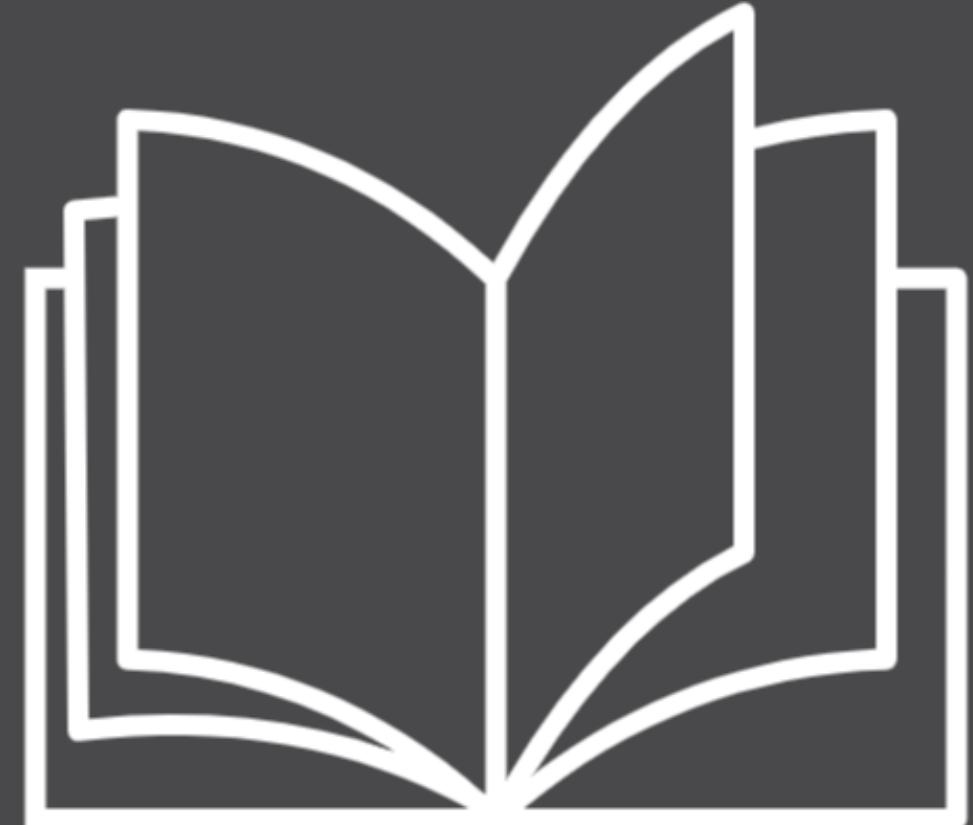
- Sidebar Tab:** To switch between Dashboard and Layout menu.
- Device Preview:** To switch between default web or mobile view. User have to adjust the layout of the dashboard to maintain visibility between devices.
- Size:** Configure the size of your dashboard to your liking or requirements.
- Sheets:** Your created graphs for each worksheet are here.
- Dashboard View:** Drag and drop your graphs/sheets in here.
- Objects:** This is the tools to support your work in creating a viz. Similar to designing a web, a Tableau Dashboard needs containers (horizontal & vertical objects), text, image, blank (/br), navigation, download button, and extension.
- Tiled vs. Floating:** Tiled items don't overlap; they become part of a single-layer grid that resizes based on the overall dashboard size, while Floating items can be layered over other objects.

Dashboard Layout Tab Interface



1. **Sidebar Tab:** To switch between Dashboard and Layout menu.
2. **Selected Items:** You can configure title of the sheet to show or not and make it float or tiled.
3. **Position:** Configure the position of a sheet by moving its axis (x and y).
4. **Size:** Configure the size of a sheet by its width and height.
5. **Border and Background:** Assign a border and a background along with the colors.
6. **Paddings:** Adjust the padding of a sheet.
7. **Item Hierarchy:** Reposition your sheets and objects in here, especially if there are any floating contents.

Create a
Story



Stories

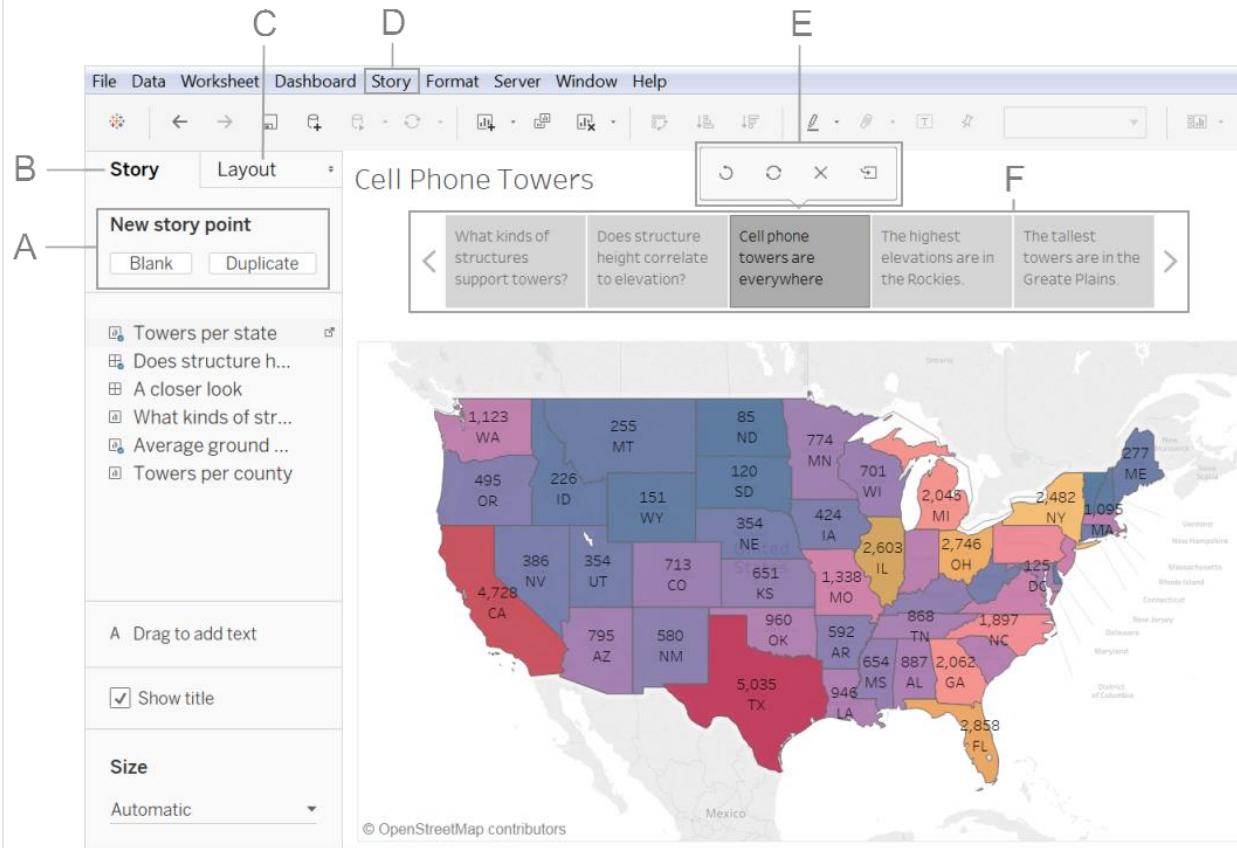
In Tableau, a **story** is a sequence of visualizations that work together to convey information. You can create stories to tell a data narrative, provide context, demonstrate how decisions relate to outcomes, or to simply make a compelling case.

A story is also a collection of sheets, arranged in a sequence. Each individual sheet in a story is called a **story point**.

When you share a story—for example, by publishing a workbook to Tableau Public, Tableau Server, or Tableau Cloud—users can interact with the story to reveal new findings or ask new questions of the data (similar to Slideshow in PowerPoint®).



Story Interface



- A. **Options for adding a new story point:** Choose Blank to add a new point or Duplicate to use the current story point as the starting place for your next point.
- B. **The Story pane:** Use this pane to drag dashboards, sheets, and text descriptions to your story sheet. This is also where you set the size of your story and display or hide the title.
- C. **The Layout pane:** This is where you choose your navigator style and display or hide the forward and back arrows.
- D. **The Story menu:** Use this menu in Tableau Desktop to format the story or copy or export the current story point as an image. You can also clear the entire story here or show or hide the navigator and story title.
- E. **The Story toolbar:** This toolbar appears when you mouse-over the navigator area. Use it to revert changes, apply updates to a story point, delete a story point, or create a new story point out of the current, customized one.
- F. **The navigator:** The navigator allows you to edit and organize your story points. It's also how your audience will step through your story. To change the style of the navigator, use the Layout pane.