

# VISUALIZATION 101



# WHY SHOULD YOU CARE?

.....NO ONE IS PAID TO  
EXPLORE, THEY  
ARE PAID TO FIND



# AGENDA

- 1 Design for your audience
- 2 Choose to display metrics based on why they matter.
- 3 Make sure your KPIs are relevant to the organization's objectives.
- 4 Context is KING 
- 5 Expressiveness and Effectiveness (Gestalt), Technique (Mackinlay)
- 6 Who doesn't love a checklist?
- 7 Tufte and Dashboard principles with examples

# HOW FAMILIAR ARE YOU WITH THESE POWER BI FEATURES AND TOOLS

**1** Sorting and Sort Axis

**2** Field Parameters and their capabilities.

**3** Calculation Groups and Tabular Editor.

**4** Slicer Panel and Bookmarks

**5** Hierarchical slicers

# REPORT CHECKLIST: EXPAND WITH EXPERIENCE

Power BI Report Checklist — DATA GOBLINS ([data-goblins.com](http://data-goblins.com))

## Layout & Design



- Use company color palette and theme JSON. This will set colors, font and titles for consistency
- Add a title/summary page and / or appendix/ FAQ etc.
- Label report objects clearly and consistently i.e. in selection pane
- Set default sort on visuals
- Set chart axes to start at 0 (unless explicitly not desired)

## Accessibility



- Set visual layer order and tab order
- View and test the report on different screens, browsers and contexts.
- Check accessibility of contrast, colors and fonts

# REPORT CHECKLIST: EXPAND WITH EXPERIENCE

Power BI Report Checklist — DATA GOBLINS ([data-goblins.com](http://data-goblins.com))

## Testing & Performance



- Set and test all interactions
- Test the report with a variety of filter combinations.
- Eliminate unnecessary visuals
- Document testing cases, queries , methods and results
- Test report performance with performance analyzer

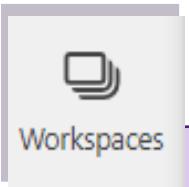
## User Experience



- Add links for users to report issues and submit requests/ideas
- Synchronize slicers where necessary
- Set interactions between visuals

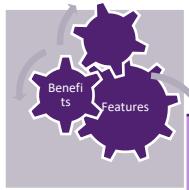
# REPORT TRAINING CHECKLIST

Power BI Report Checklist — DATA GOBLINS ([data-goblins.com](http://data-goblins.com))

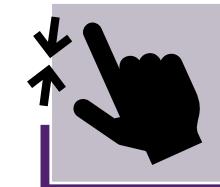


Workspaces

- Give report walkthrough
- Demonstrate questions answered by visuals
- Request access in AAD group



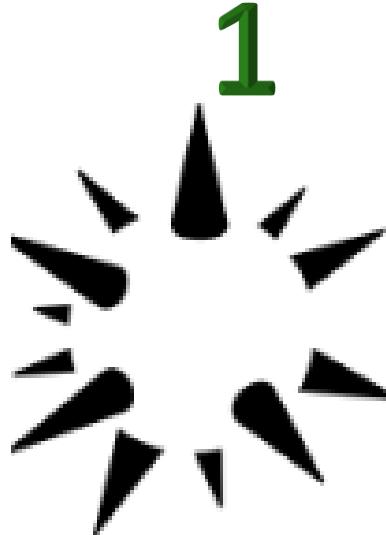
- Reset to default
- Subscribe and use subscriptions
- Comments



- Drill down and up
- Buttons
- Filter pane
- Cross-filtering and cross highlighting
- Slicers
- Drill through
- Show as table
- Personal bookmarks

# NAME DROPPING MENTIMETER

Converting domain to visualization

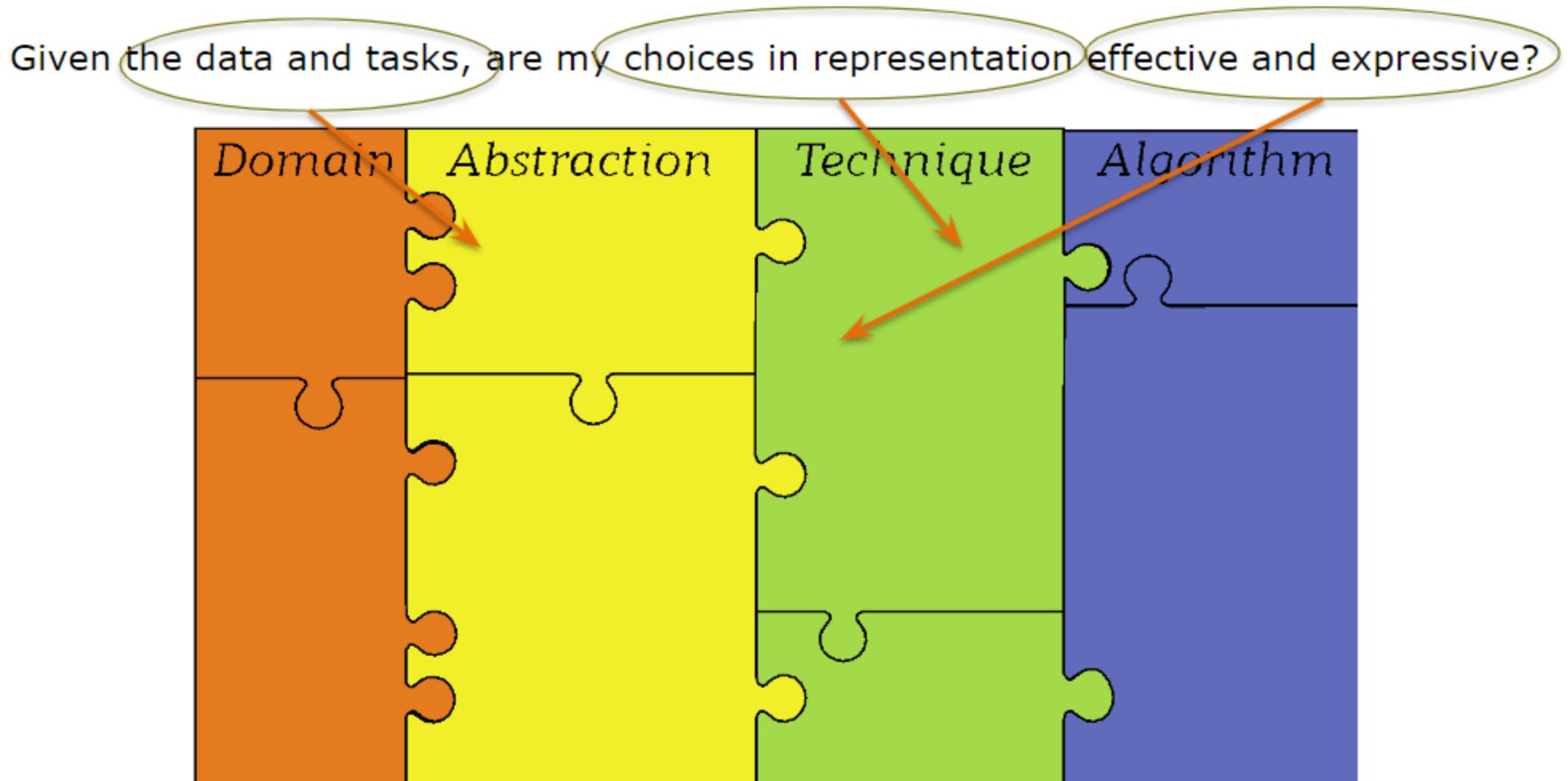




## Criteria of algorithm

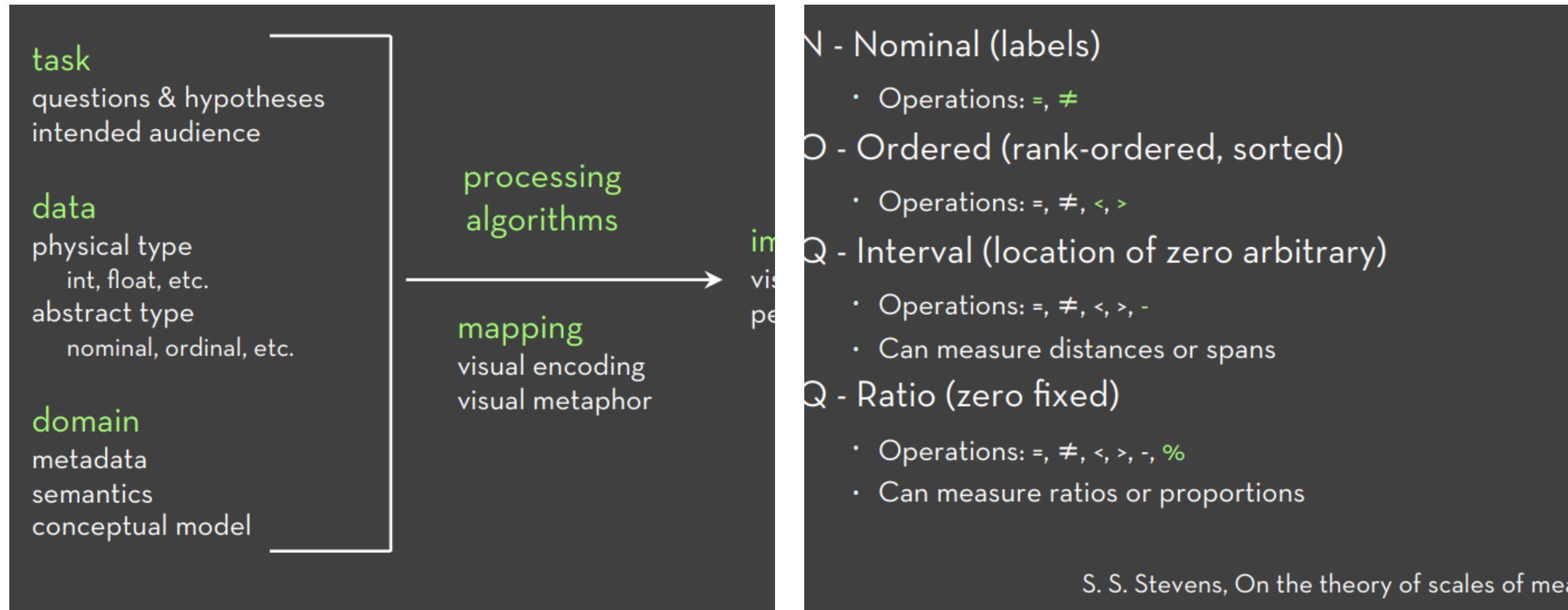
- Expressiveness
  - A set of facts is expressible in a visualization if the visualization expresses all the facts in the set of data and only the facts in the data
- Effectiveness
  - A visualization is more effective if the information conveyed by one visualization is more readily perceived than the information in another visualization

# ASK



# THE BIG PICTURE

Converting domain to visualization

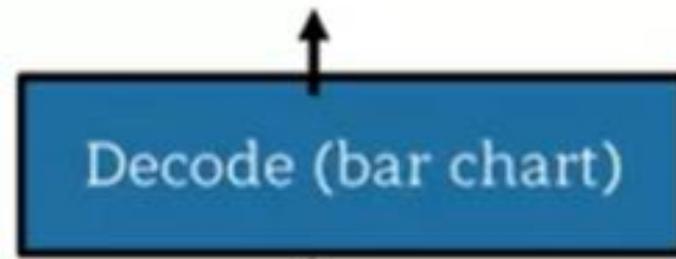


Name	Score
A	1
B	5
C	2

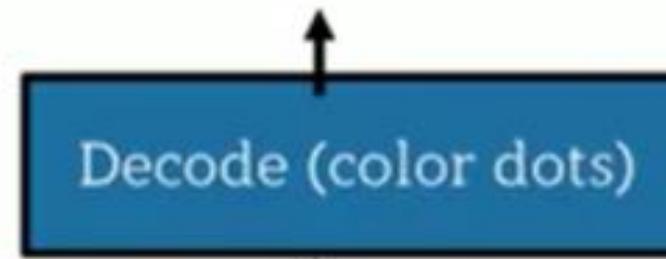
True answer

**EXPRESSIVE :**  
**DECODE WHAT WAS  
ENCODED**

Name:N:x position  
Score:Q:length  
mark:bar



Name:N:y position  
Score:Q:density  
mark:point:circle



# Gestalt Principles



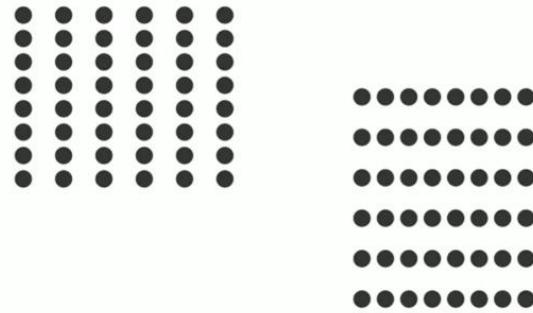
- How humans see the world

**The more objects  
the harder it gets**

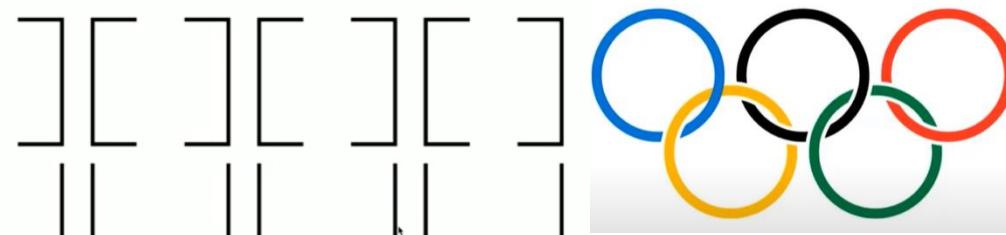
- Relative Importance of Objects
- Done correctly it's invisible

**EFFECTIVENESS**  
**'GESTALT PSYCHOLOGY'** THE SIMPLEST AND MOST STABLE  
INTERPRETATIONS ARE THE ONES THAT ARE FAVORED

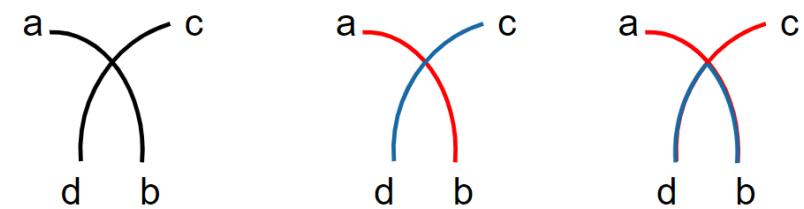
Principles - Proximity



Principles - Closure



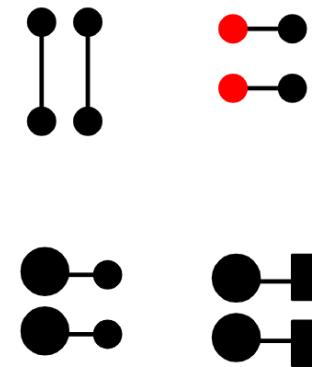
Principles - Continuation



Principles - Similarity



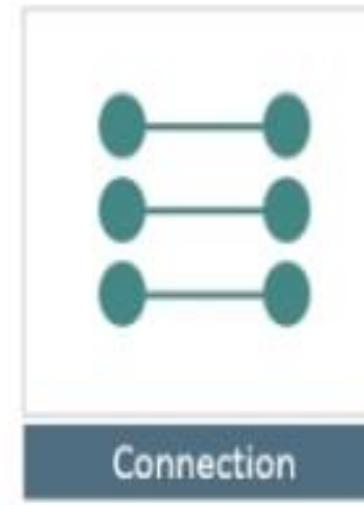
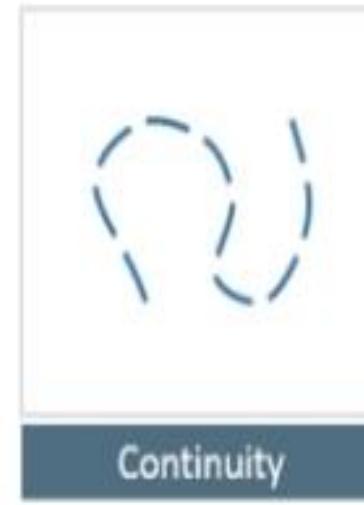
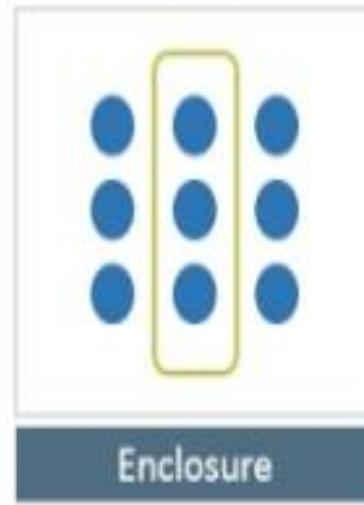
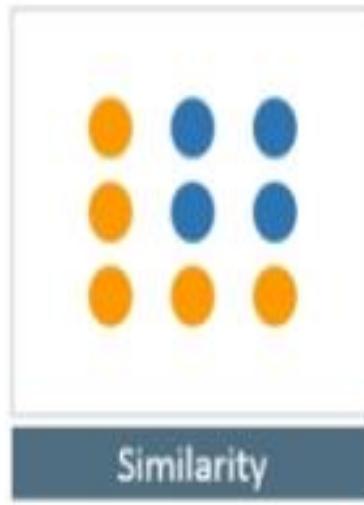
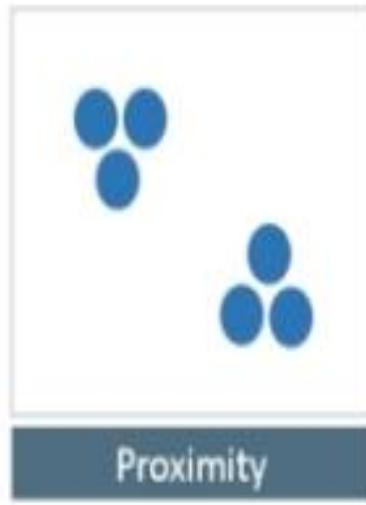
Principles - Connectedness



**EFFECTIVENESS**  
**'GESTALT PSYCHOLOGY'** THE SIMPLEST AND MOST STABLE  
INTERPRETATIONS ARE THE ONES THAT ARE FAVORED

- **Proximity:** When we see multiple elements located near one another, we tend to see them as a group. For example, we can visually distinguish clusters in a scatter plot by grouping the dots according to their position.
- **Similarity:** Our brain associates elements that are similar to each other (shape, size, color, or orientation). For example, consider a chart with color encoding. Even if they are not grouped, we can associate the bars that share the same color.
- **Enclosure:** If a border surrounds a series of objects, we perceive them as a group. For example, if a scatter plot has two reference lines that wrap the elements between 20 and 30 percent, we automatically see them as a cluster.
- **Closure:** When we detect a figure that **looks incomplete**, we tend to perceive it as a closed structure. For example, even if we discarded the borders of a bar chart, the axes would form a region that our brain isolates without the need of extra lines.
- **Continuity:** If a number of objects are aligned, we usually perceive them as a continuum. For instance, consider the notion of different blocks of code when you indent a script.
- **Connection:** If a set of objects are connected by a line, we also see them as a group. For example, a scatter plot with lines and symbols (dots connected by lines).

**EFFECTIVENESS  
'GESTALT PSYCHOLOGY' THE SIMPLEST AND MOST STABLE  
INTERPRETATIONS ARE THE ONES THAT ARE FAVORED**



Proximity

Similarity

Enclosure

Closure

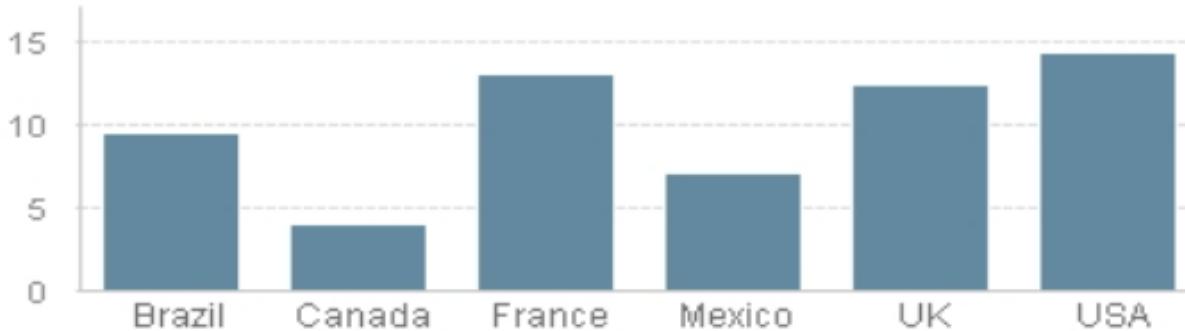
Continuity

Connection

**EFFECTIVENESS**  
**'GESTALT PSYCHOLOGY'** THE SIMPLEST AND MOST STABLE  
INTERPRETATIONS ARE THE ONES THAT ARE FAVORED

# EFFECTIVENESS

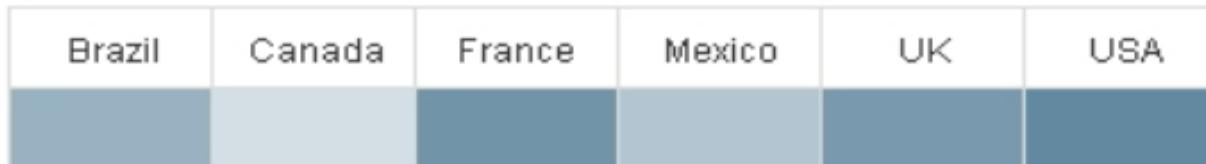
Bar Chart (Position along a common scale)



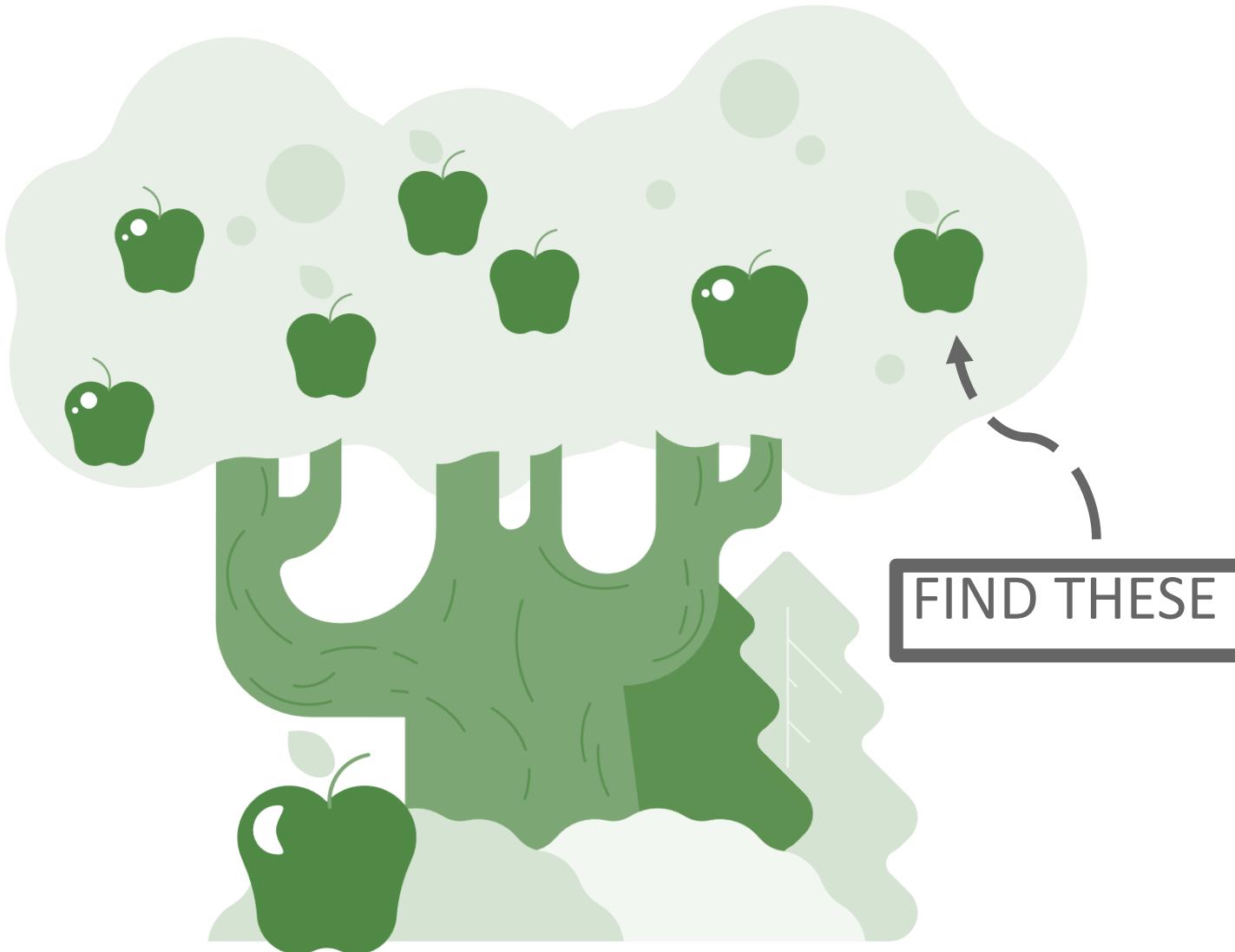
Bubble Chart (Size)



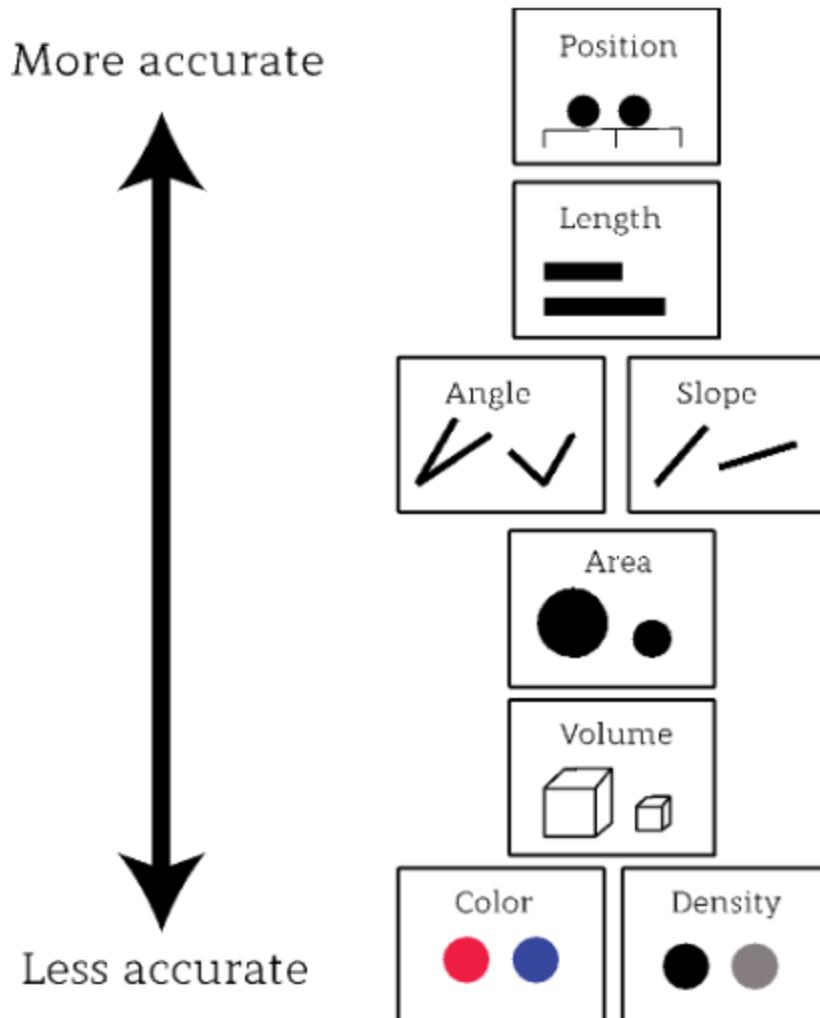
Heat Map (Color Saturation)



# TECHNIQUES DEVELOPED FROM EMPIRICAL DATA ON VISUAL PERCEPTION



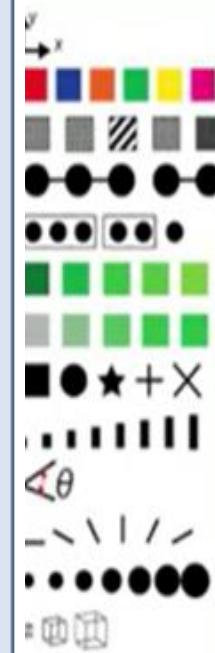
# MACKINLAY – A PRESENTATION TOOL



# EMPERICAL DATA ON VISUAL PERCEPTION



	Quantitative	Ordinal	Nominal
Position		Position	Position
Length		Density	Color Hue
Angle		Color Sat.	Texture
Slope		Color Hue	Connection
Area		Texture	Containment
Volume		Connection	Density
Density		Containment	Color Sat.
Color Sat.		Length	Shape
Color Hue		Angle	Length
Texture		Slope	Angle
Connection		Area	Slope
Containment		Volume	Area
Shape		Shape	Volume

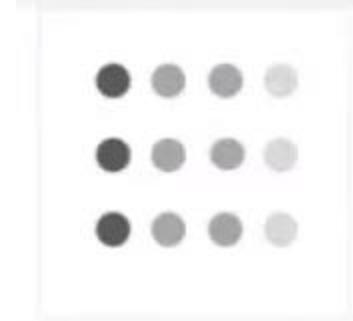


m Mackinlay

# MACKINLAY – (WARM UP NOT MENTIMETER)

Which Visual helps us perceive most accurately the difference in value 120 and 100?

1



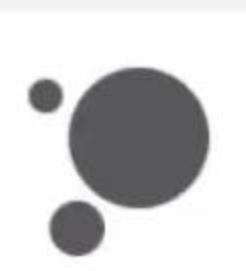
Intensity

2



Volume

3



Area

4



Length

# MACKINLAY – MENTIMETER

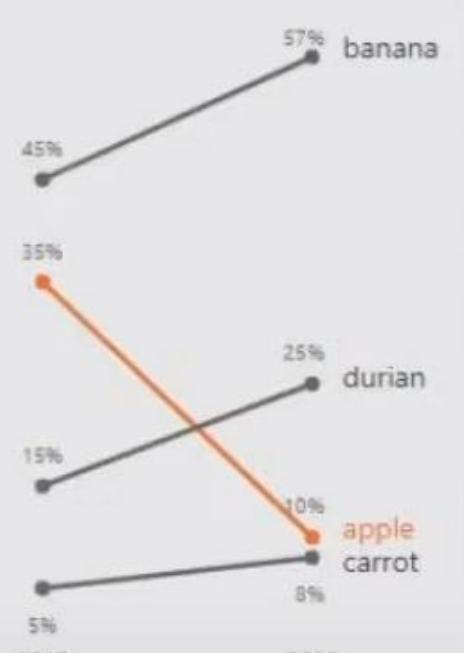
Which Visual helps us perceive most accurately the change in magnitude of product likeability magnitude from 2015 to 2020?

1

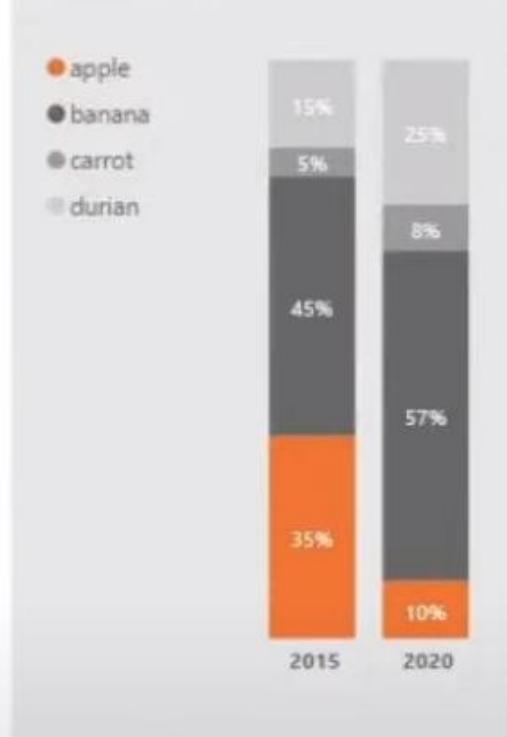
2

3

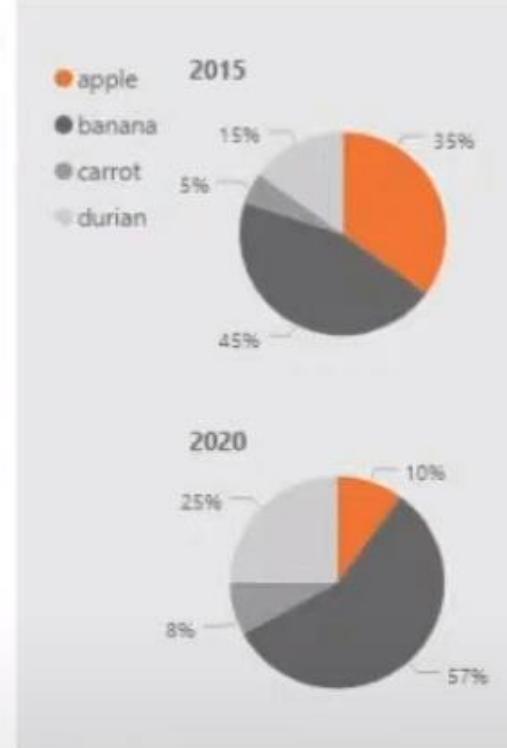
4



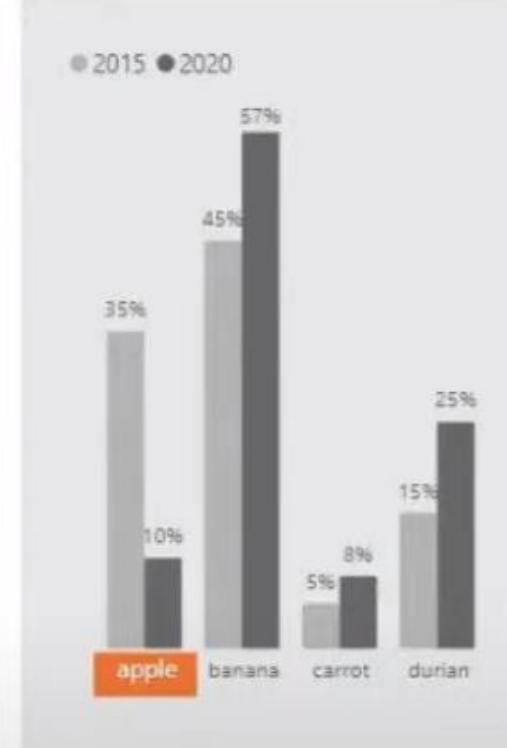
slope graph



100% stacked column

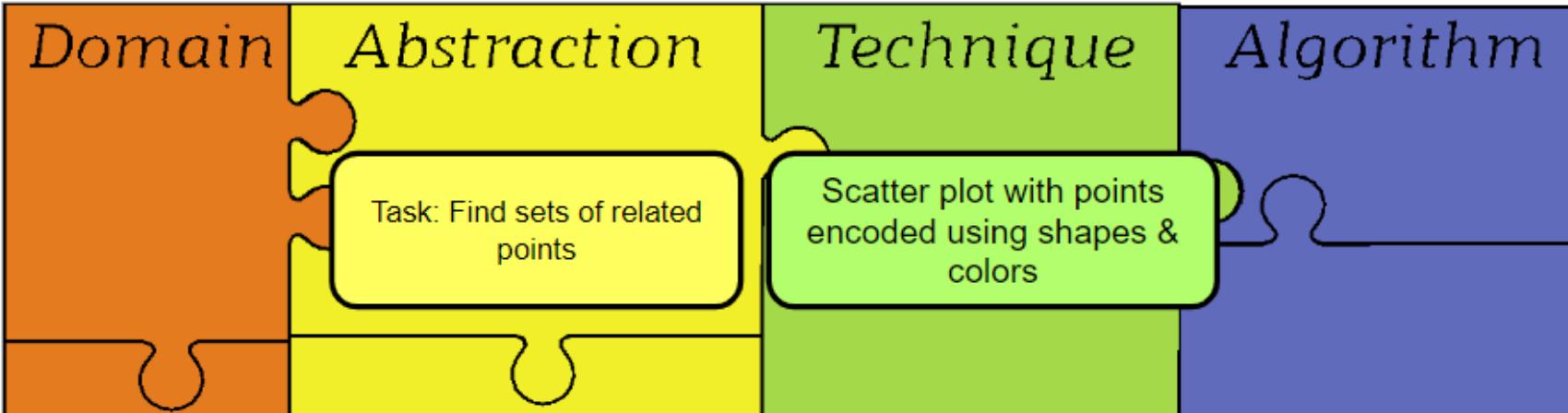


pie

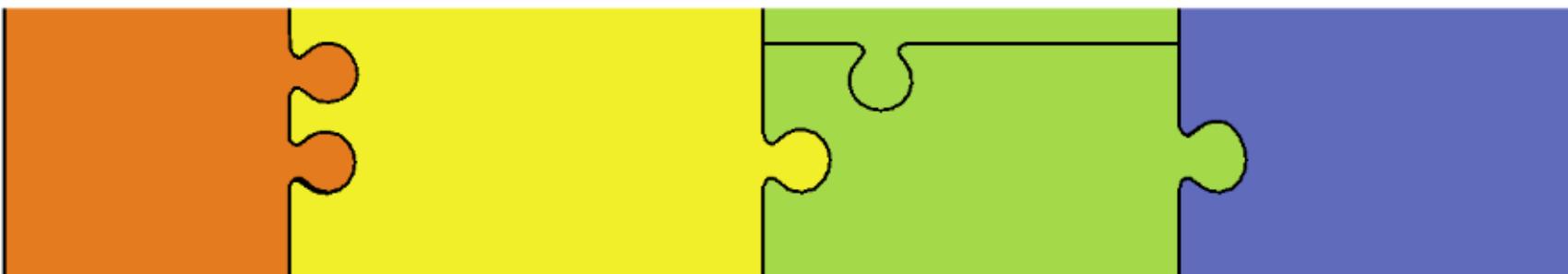


clustered column

# ASK



Effective because we can pick out targets using pre-attentive processing



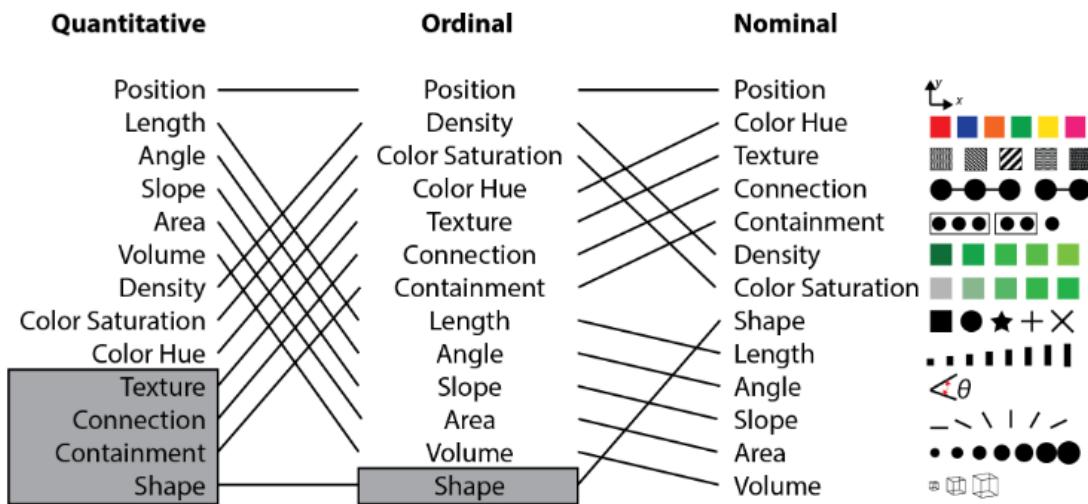
## Takeaways

- Easy to find salient features in the data
- Can be used in design

# IMPLEMENT

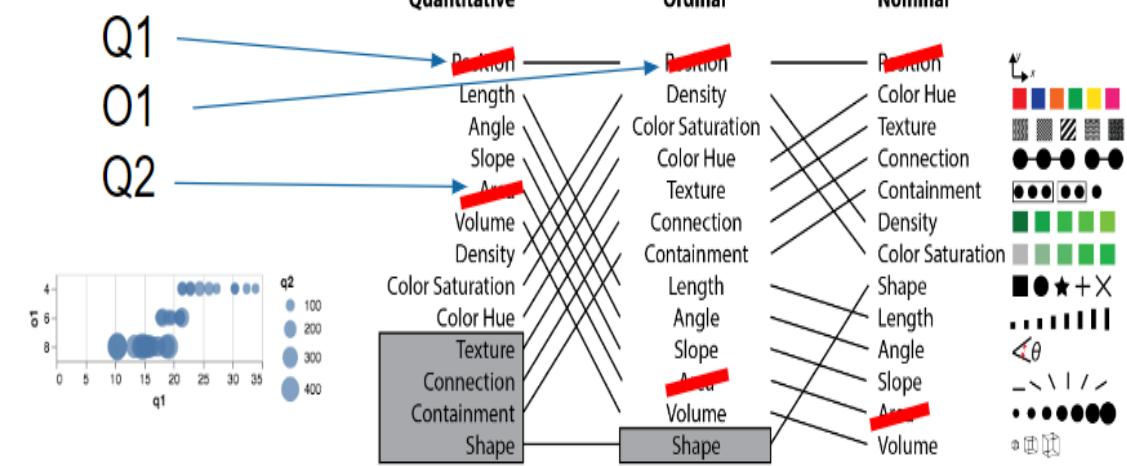
Be greedy:

1. pick best rep. given your most important comparison,
2. cross off list,
3. continue with next most important

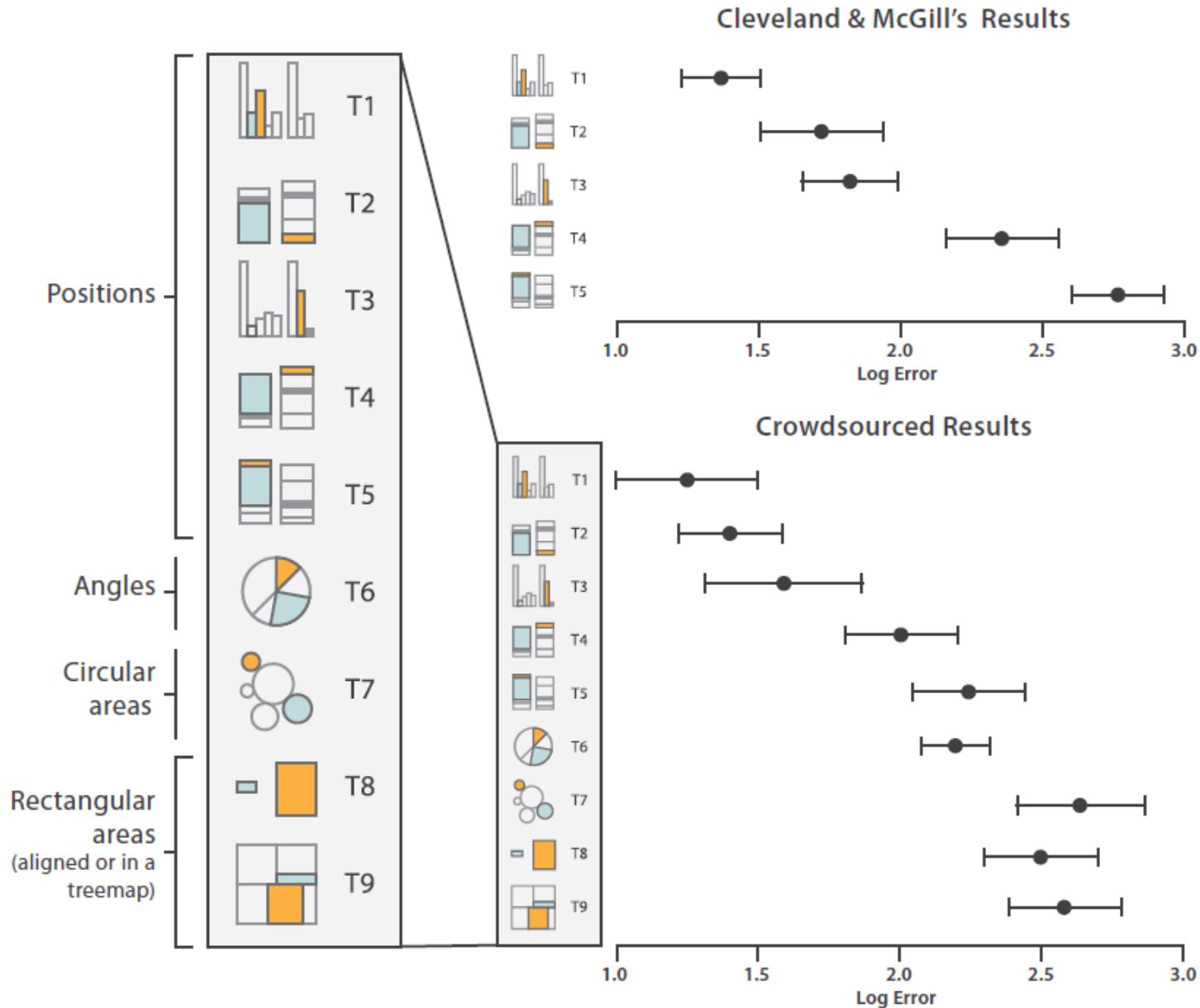


## Ranking of Perceptual Tasks

In order of importance



# EMPIRICAL EVIDENCE



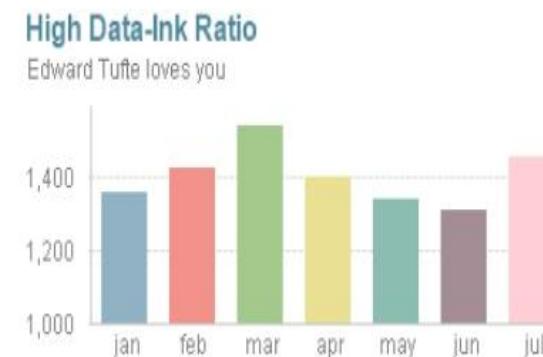
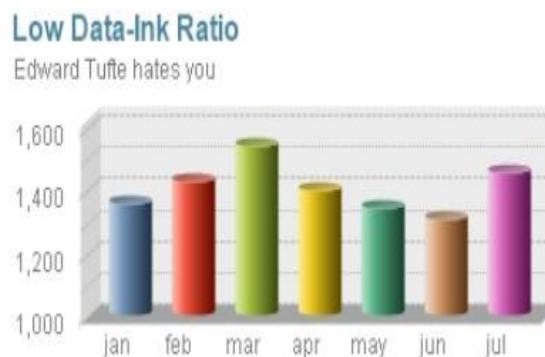
# DATA INK RATIO

A core principle introduced by Edward R. Tufte in his book, *The Visual Display of Quantitative Information*.

- **Data-Ink:** This includes all the nonerasable portions of the graphic that are used to represent the actual data. These pixels are the core of the visualization and cannot be removed without losing some of its content.
- **Non-Data-Ink:** This includes any other elements that's not directly related to the data or that don't convey anything meaningful to the reader.

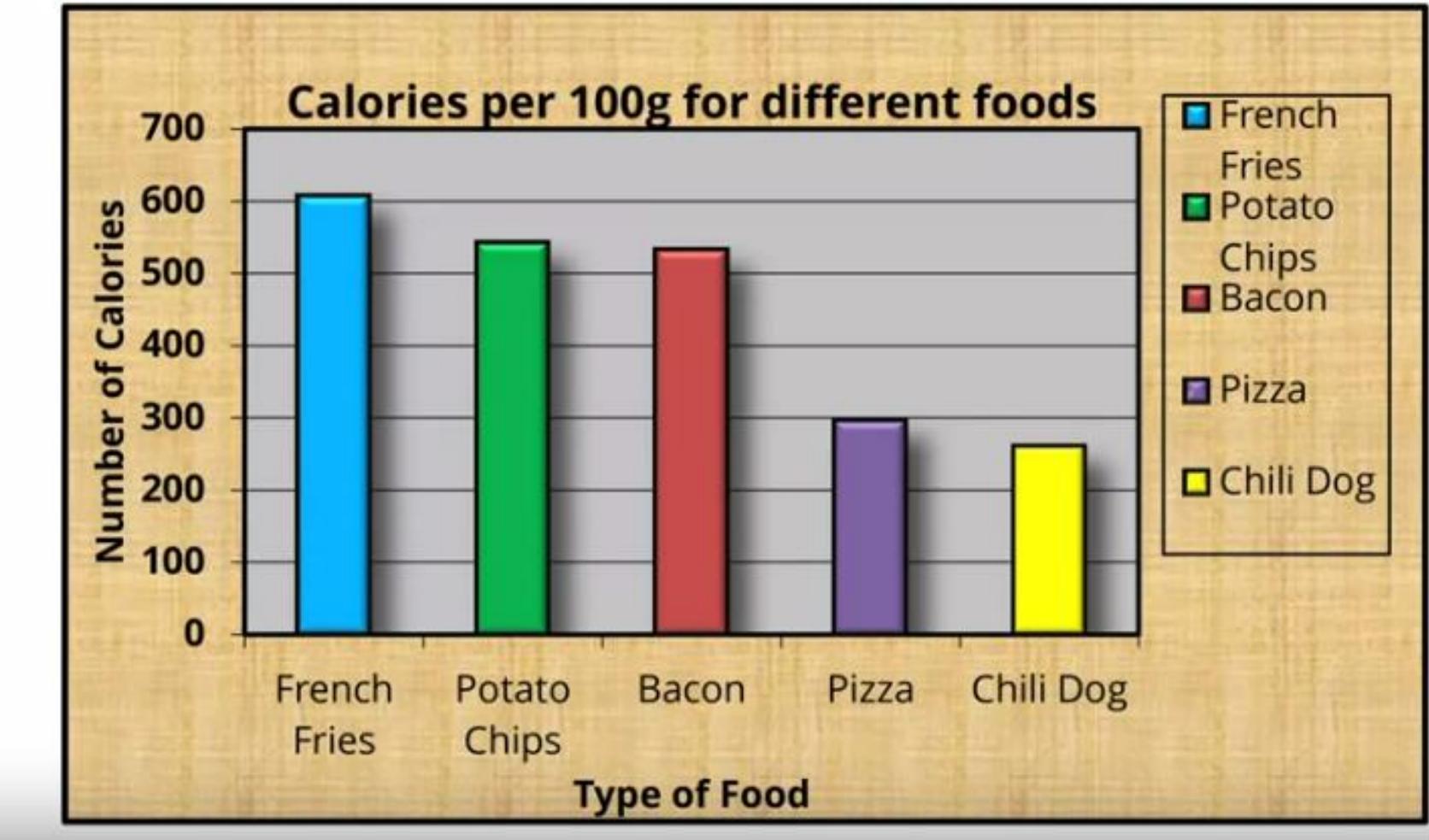
Defined as the proportion of a graphic's ink devoted to the nonredundant display of information

**Data Ink Ratio = Data Ink / Total Ink** ▲



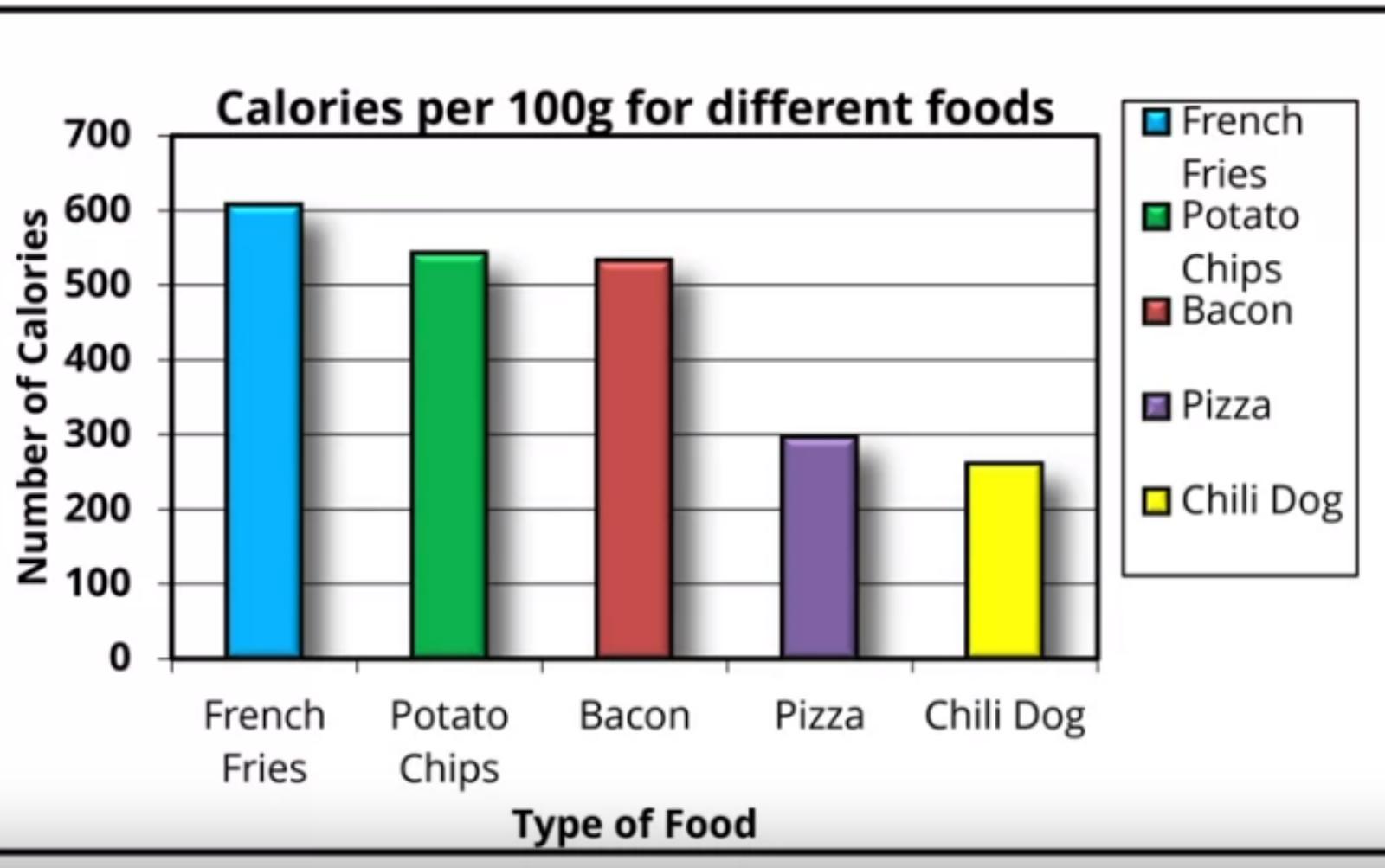
# DATA INK RATIO

Remove backgrounds



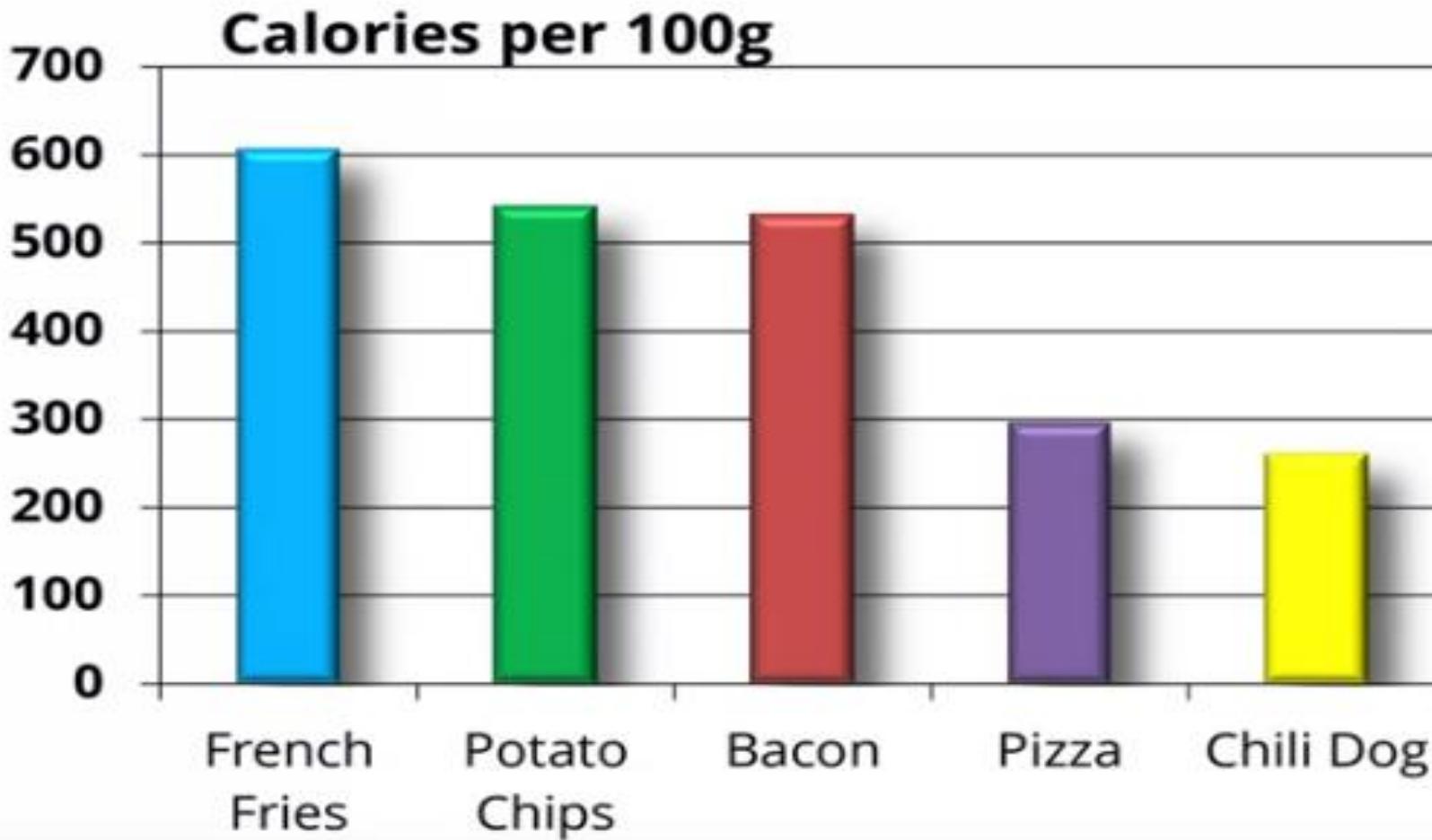


Remove redundant labels



# DATA INK RATIO

Reduce colors

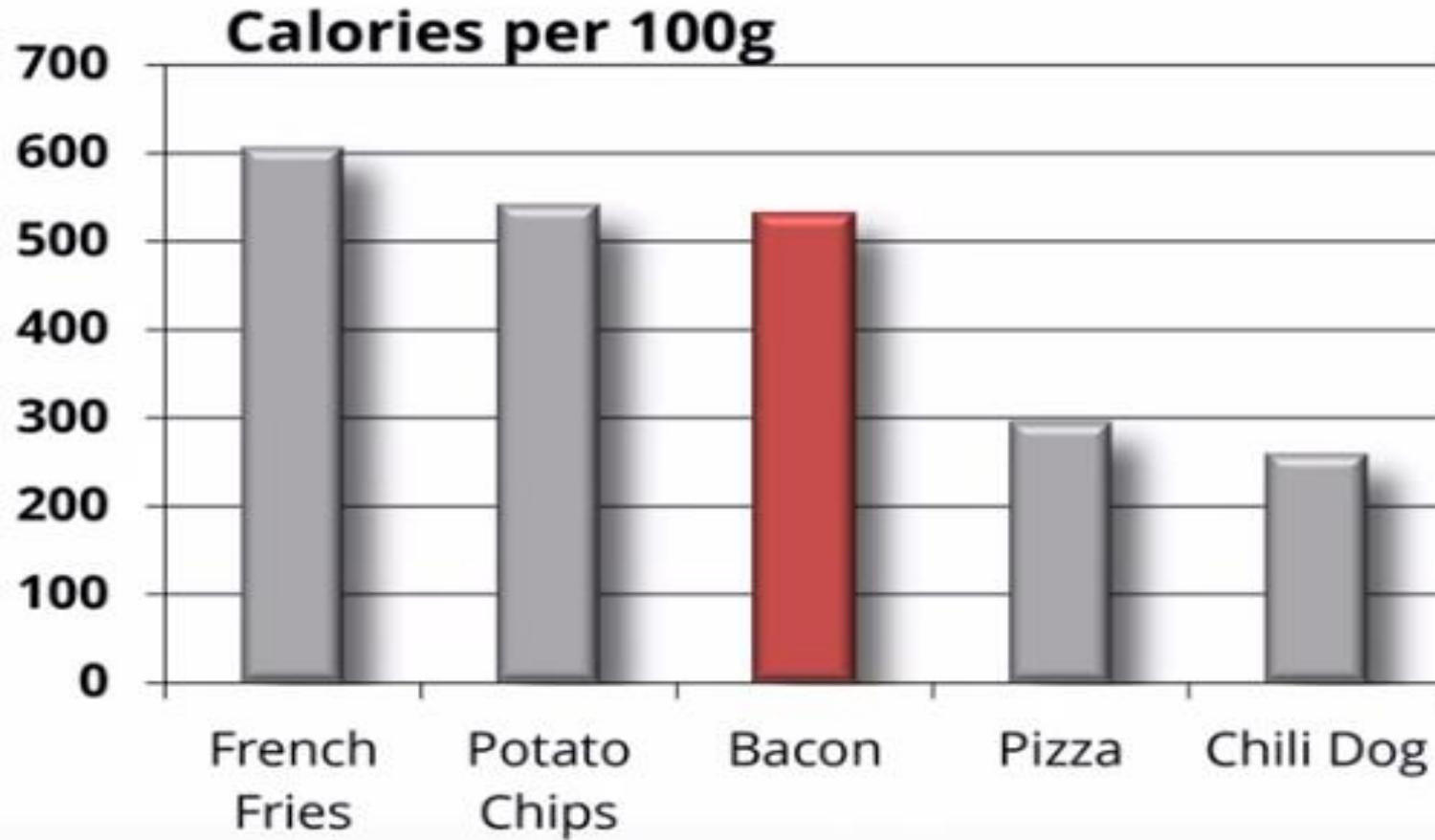


# DATA INK RATIO



Emphasize

## Remove special effects

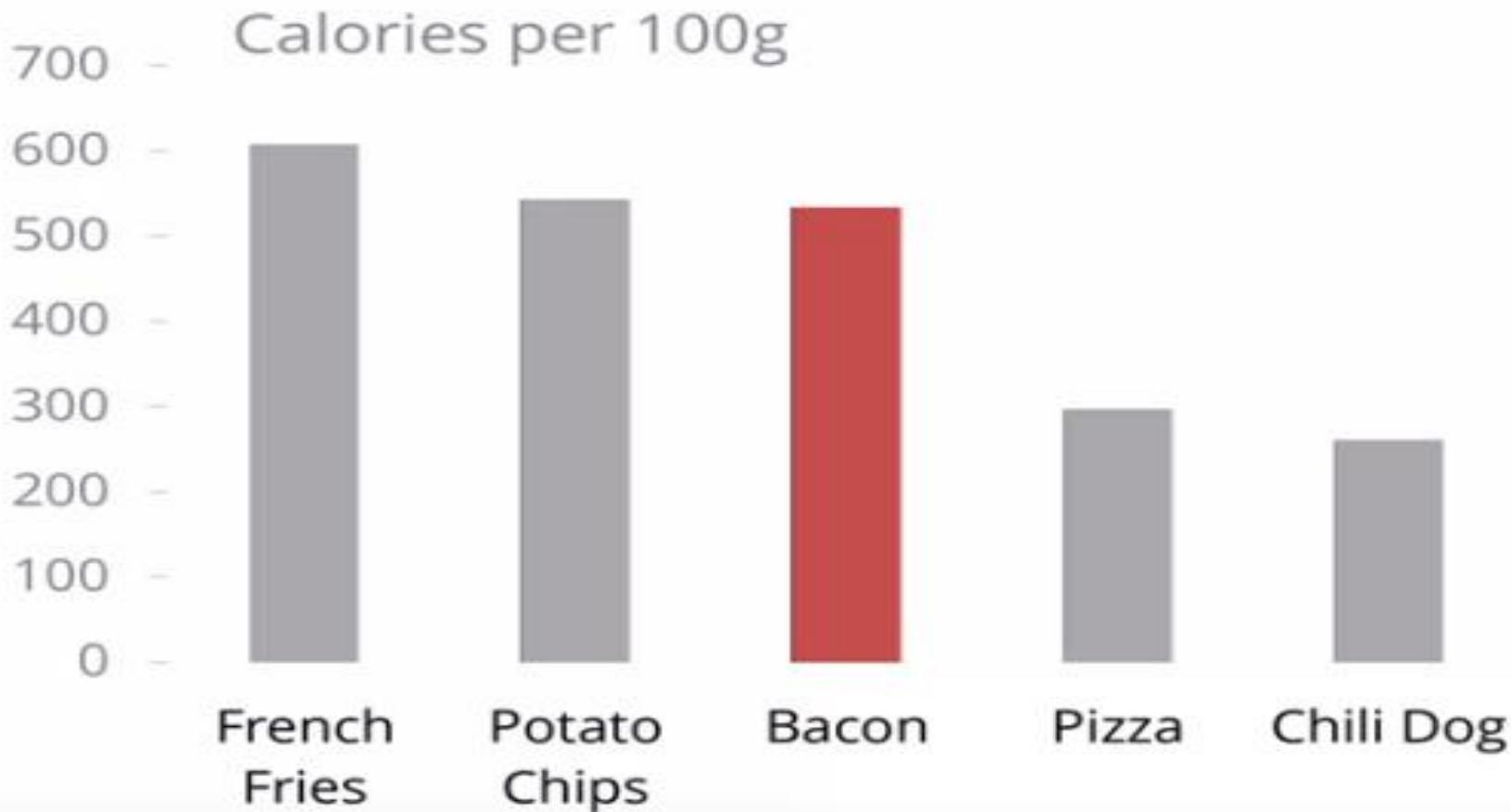


# DATA INK RATIO



Emphasize

## Direct label



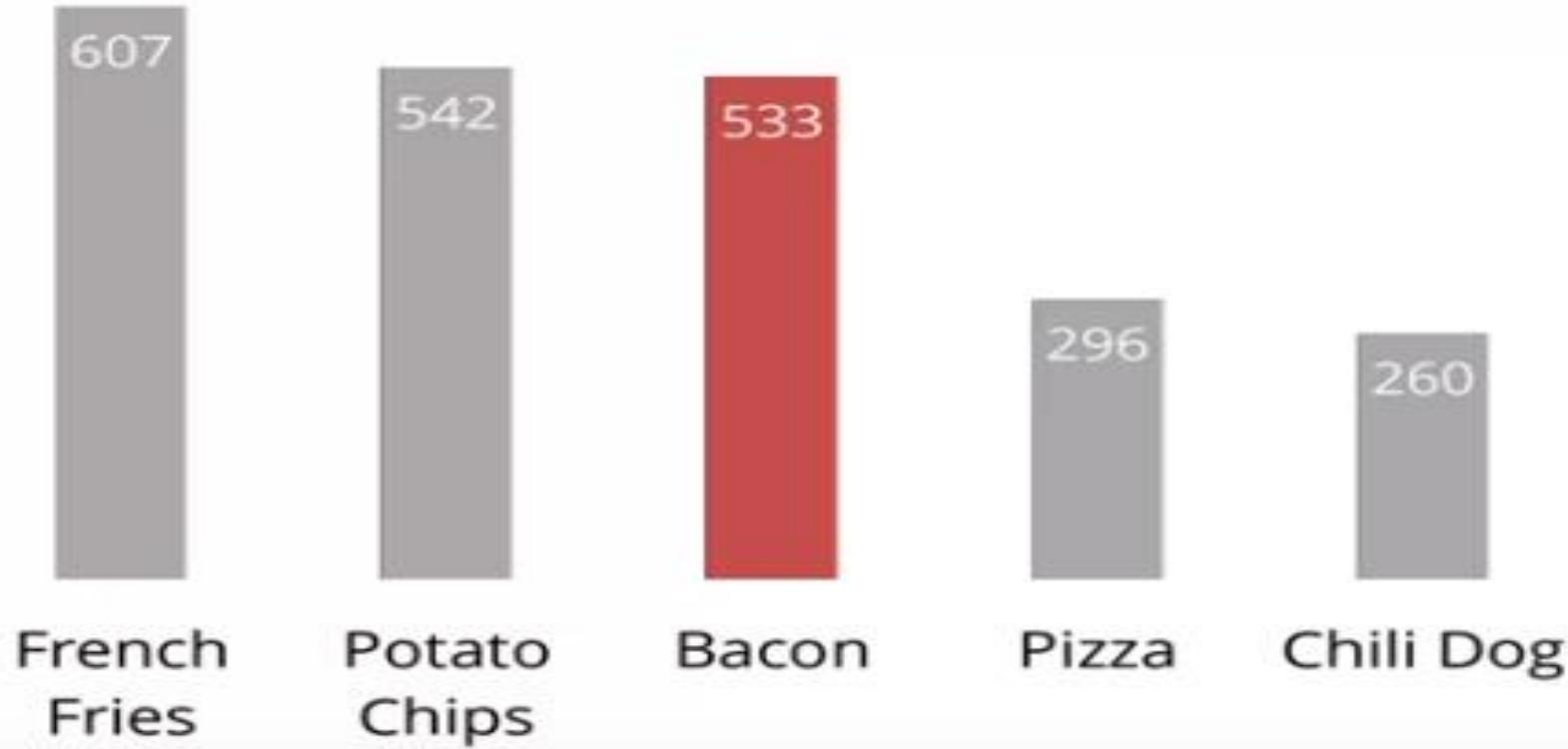
# DATA INK RATIO

## Direct label



Emphasize

Calories per 100g



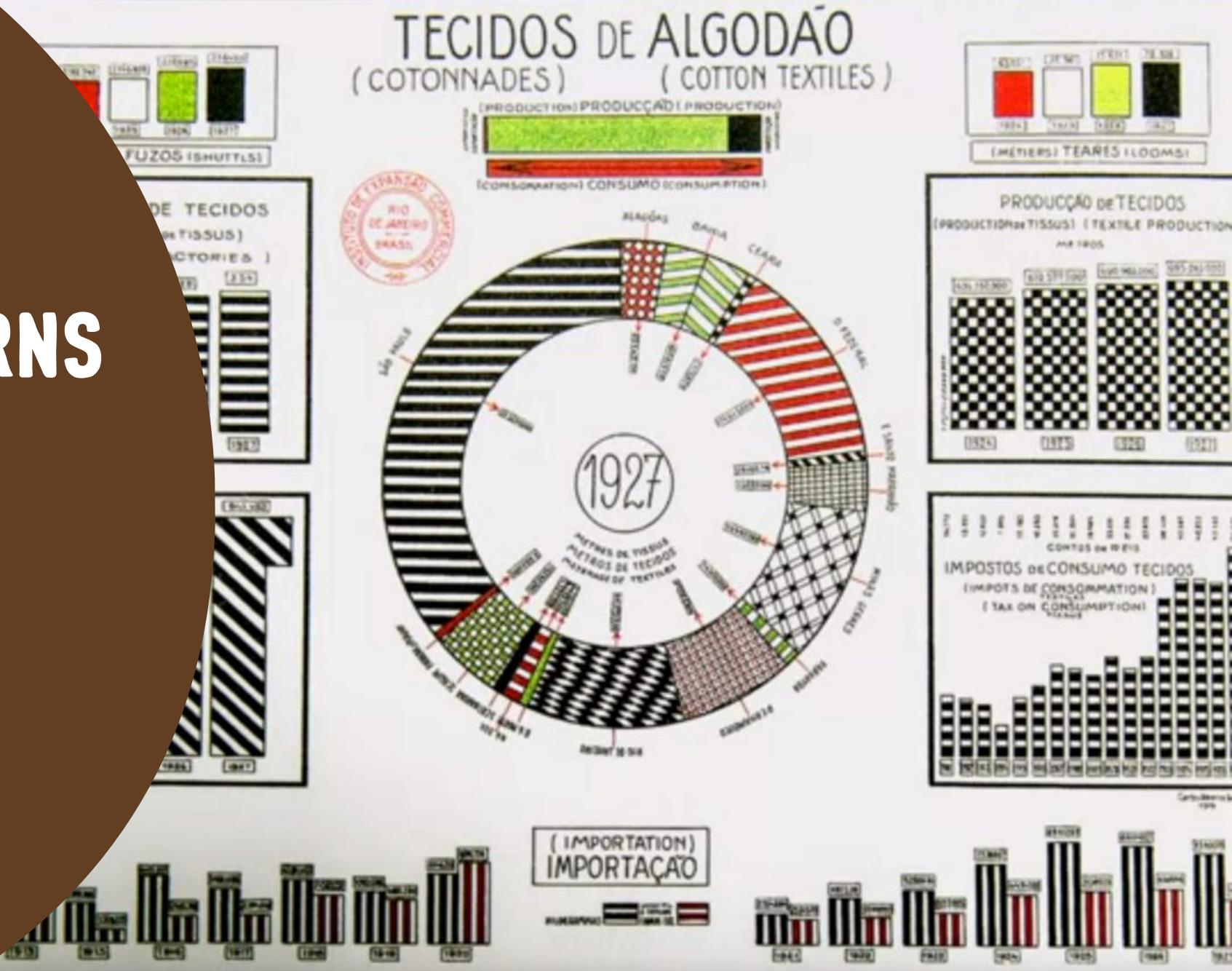
# CHART JUNK

Refers to all the elements that distract the viewer from the actual information in a graphic.



- Heavy gridlines
- Frames
- Redundant labels
- Ornamental axes
- Backgrounds
- Overly complex fonts
- Shadows
- Images
- or other effects included only as decoration.

# CHART JUNK : REMOVE PATTERNS AND GRIDS

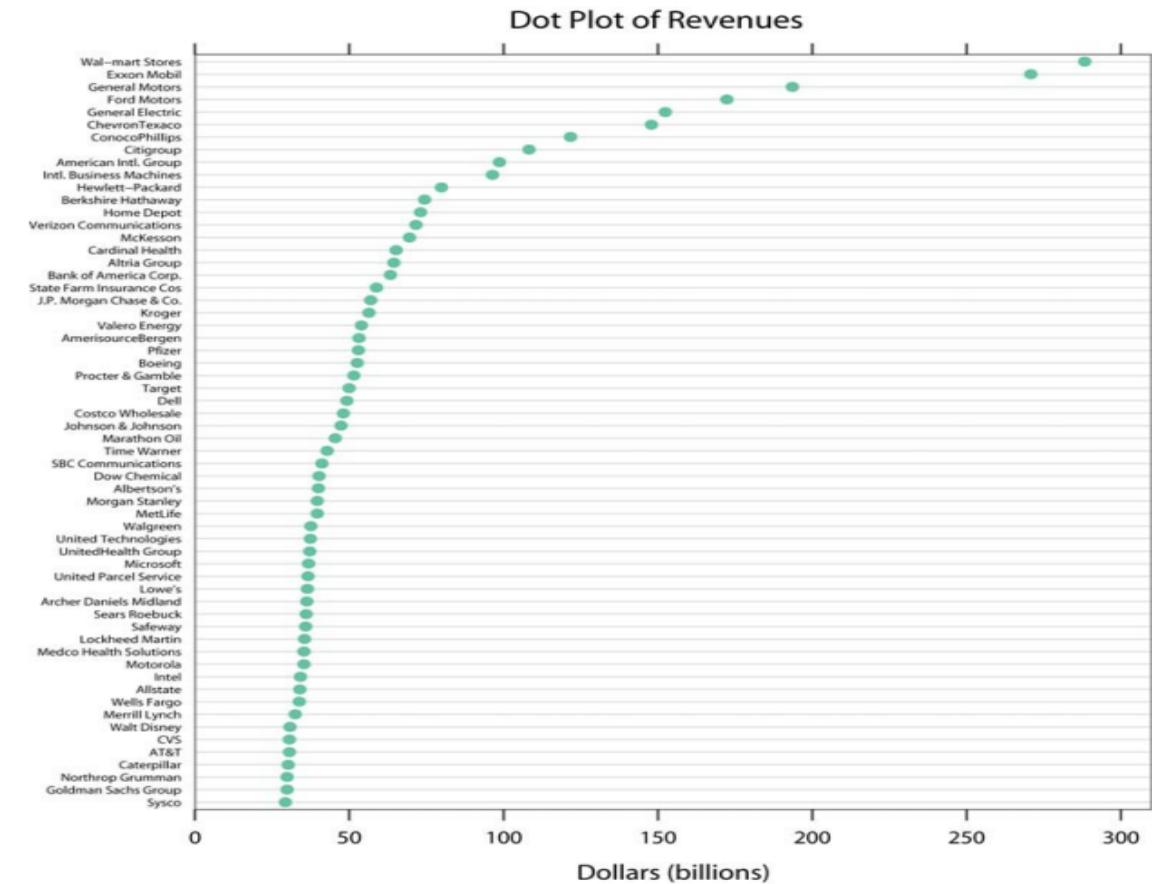
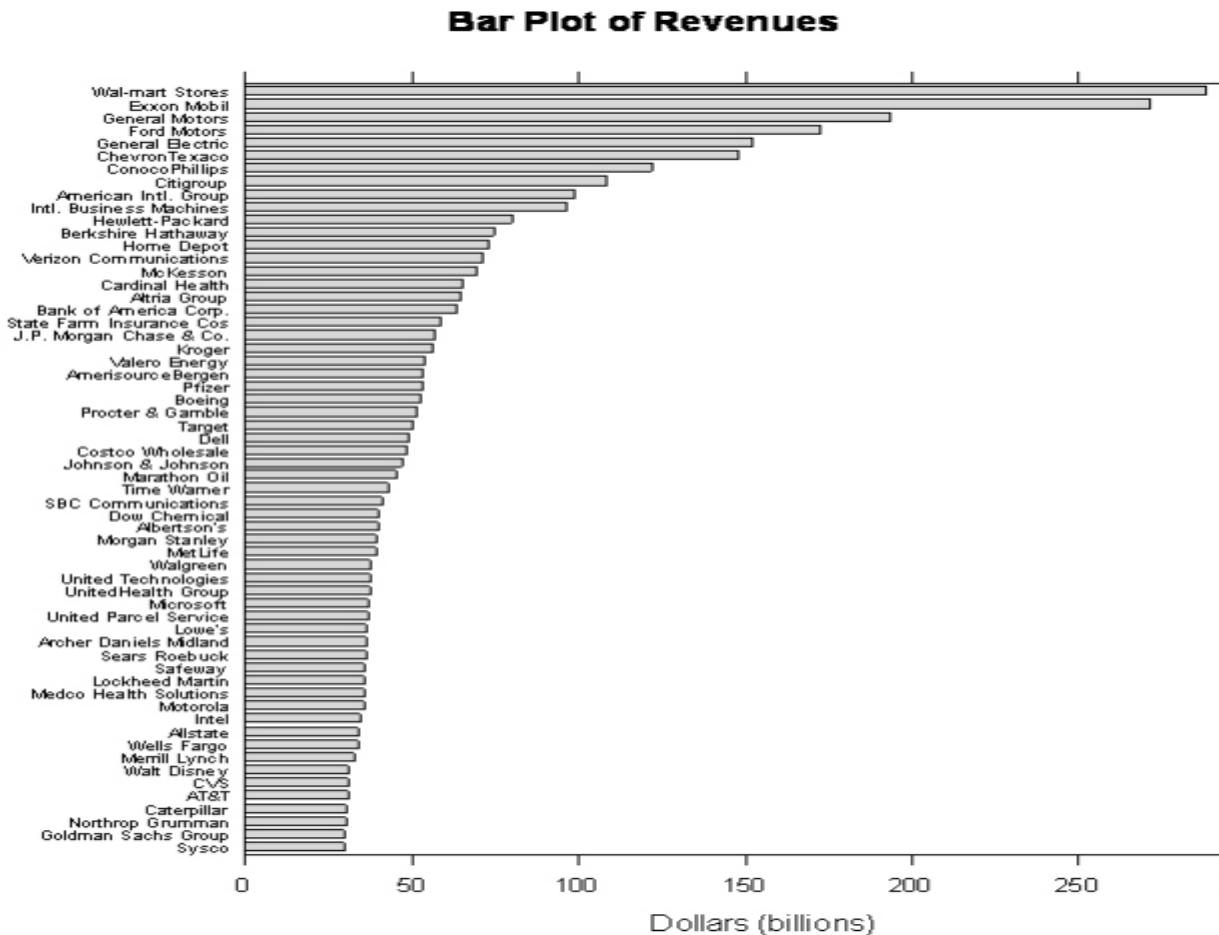




# CHART JUNK

Refers to all the elements that distract the viewer from the actual information in a graphic.

Lollipop Chart





# LIE FACTOR

Bar Chart

$$\text{Lie Factor} = \frac{\text{Size of the effect in the visual}}{\text{Size of the effect in the data}}$$



# LIE FACTOR

Bar Chart

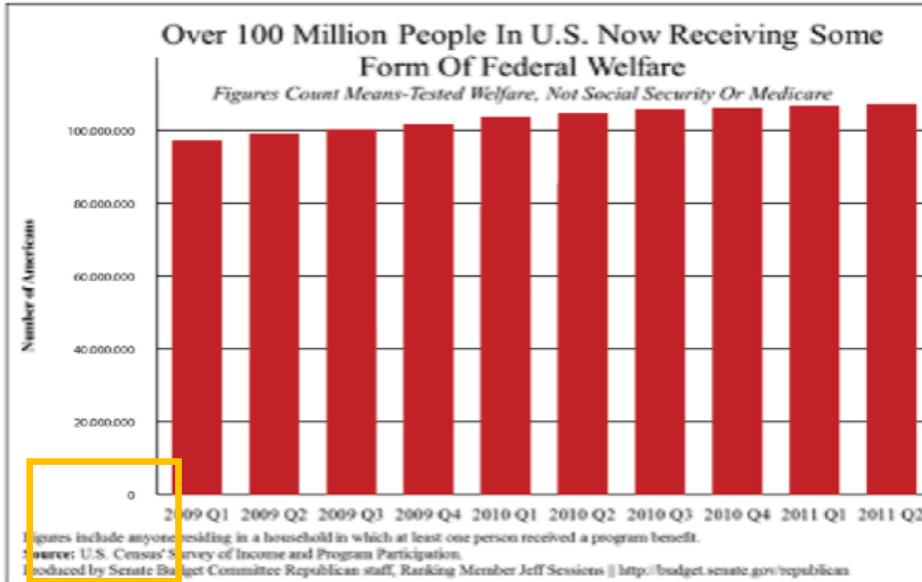
## THE BLOG

### Over 100 Million Now Receiving Federal Welfare

2:40 PM, AUG 8, 2012 - BY DANIEL HALPER

[EMAIL PAGE](#) [PRINT](#) [A+](#) [LARGER TEXT](#) [A-](#) [SMALLER TEXT](#) [REPORT A PROBLEM](#)

A new chart set to be released later today by the Republican side of the Senate Budget Committee details a startling statistic: "Over 100 Million People in U.S. Now Receiving Some Form Of Federal Welfare."



lie factor: 1

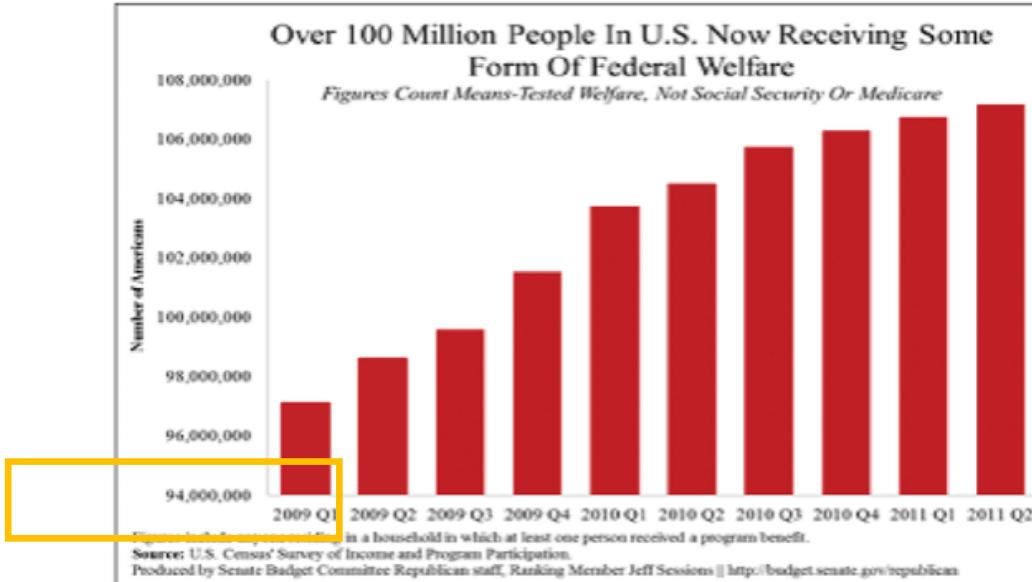
## THE BLOG

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lie factor: 16,08

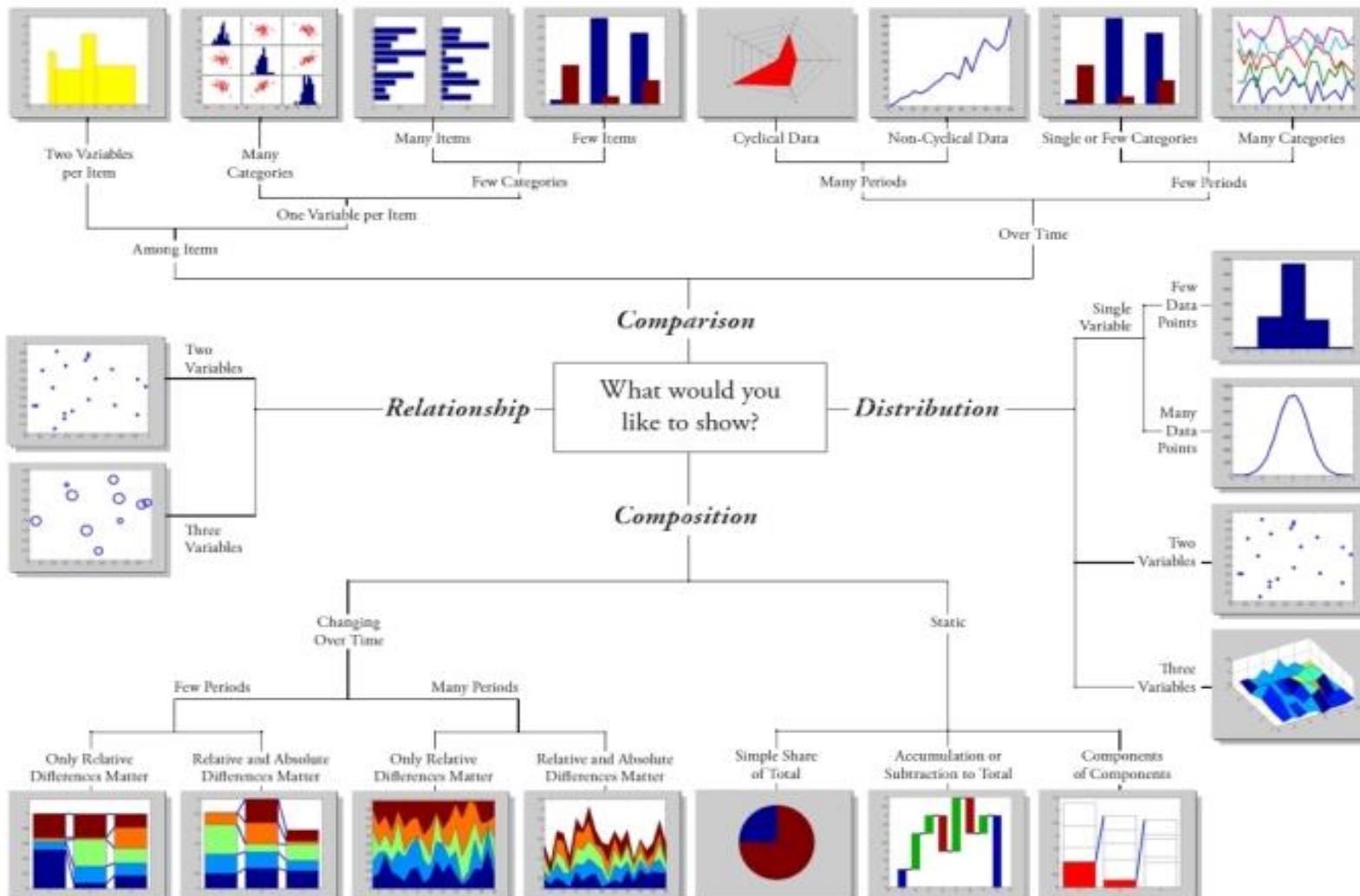
# CHART SELECTOR

## ||| Zebra BI Chart Selector

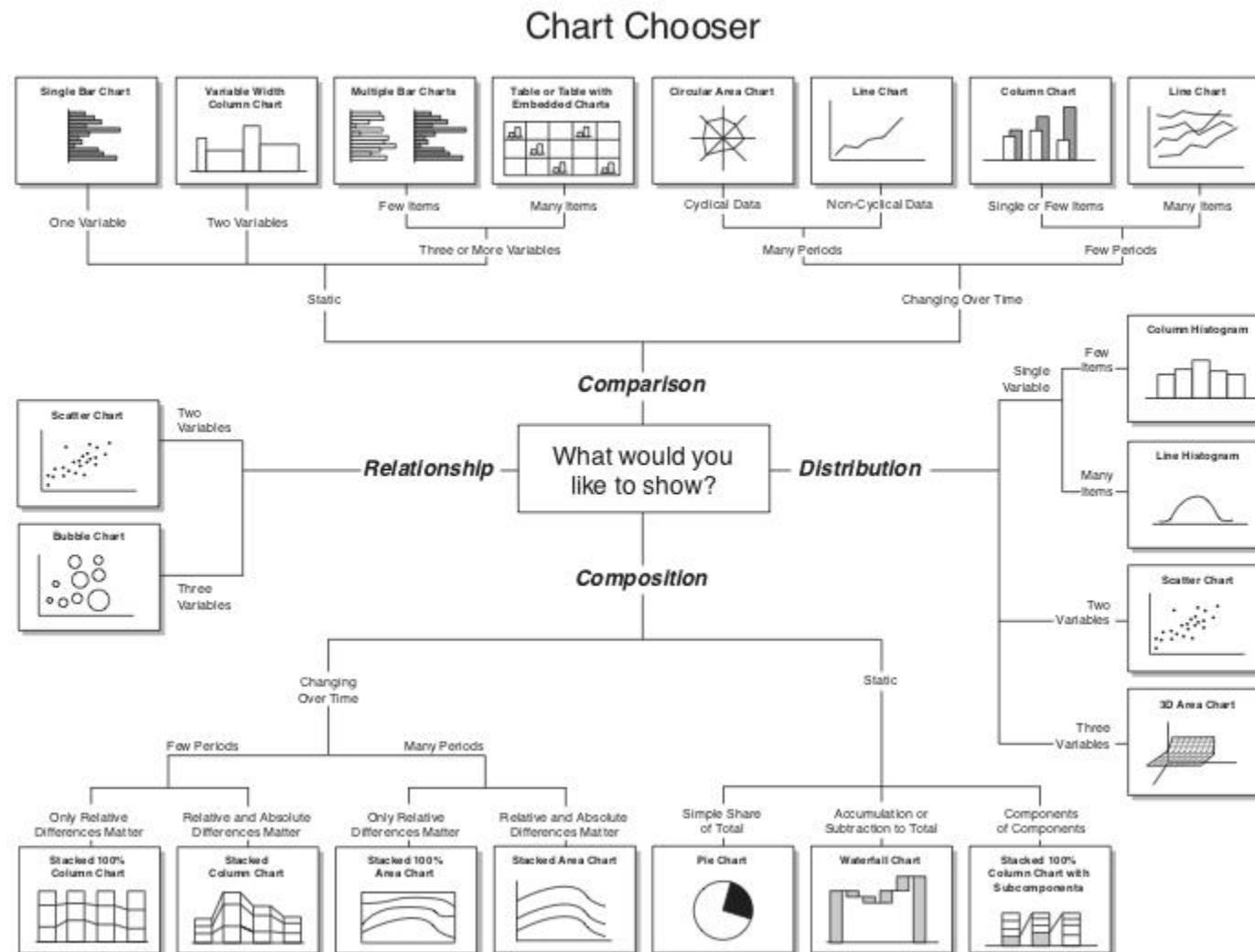
	Structure - charts with vertical axis		Time series - charts with horizontal axis			Multiple charts			
	Column	Dot	Column	Line	Area	Dot	Extended	Combo	Small multiples
<b>Comparison</b> Trend analysis or Breakdown and ranking									
<b>Part to whole</b> Compare part to total or analyze accumulation									
<b>Series Comparison</b> Compare two or more data series									
<b>Variance</b> Analyze deviation/variance to plan, PY, FC, etc.									
<b>Integrated variance</b> Compare variance to base value (gap analysis)									
<b>Contribution of variance</b> Analyze correlation									

# CHART SELECTOR

## Chart Suggestions—A Thought-Starter



# CHART SELECTOR



## Choosing a good chart - The Extreme Presentation(tm) Method [typepad.com](http://typepad.com)

# VISUALIZATIONS – TYPICAL AND EFFECTIVE

VISUALIZATIONS

Guidelines for choosing visualizations types

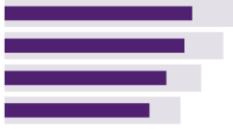
## Bar Chart

### Ideal:

- Comparing data across categories
- Difference between categories
- Single Variable Distributions (histogram)

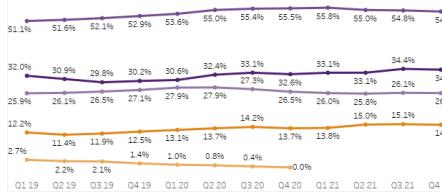
### Non-Ideal:

- Show data over time



**Example Use:** Sales across regions, volume of sales, spend across categories, comparing previous year data

## Line Chart



**Example Use:** Sales over time, market growth, forecasting, revenue trends

## Slope graph



**Example Use:** year-over-year or month-over-month.  
Also can be used as a KPI

## Scatterplot



**Example Use:** Concentration analysis, sales patterns, cost analysis, outlier identification, trends, identifying lagging products

## Heat Map

Material	Exceptions	Exce
440000006..	209	
440000006..	623	
44000015..	724	
44000017..	91	
44000030..	368	
44000033..	826	
44000036..	815	
44000037..	496	
44000047..	734	
44000059..	685	
44000067..	426	
44000067..	573	

**Example Use:** Segment analysis, product sales across regions, sales across brands

## Bubble Chart



### Ideal:

- Relationship between 3 variables
- Overlay on maps

### Non-Ideal:

- Comparing qualitative data
- Categorization
- Composition

**Example Use:** Sales concentration, product comparisons, Sales across regions, product comparisons

# VISUALIZATIONS – EXISTING RECOMMENDATIONS

VISUALIZATIONS

Guidelines for choosing visualizations types

## Bar Chart

### Ideal:

- Comparing data across categories
- Difference between categories
- Single Variable Distributions (histogram)

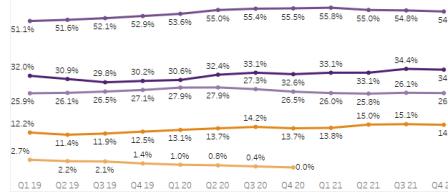


### Non-Ideal:

- Show data over time

**Example Use:** Sales across regions, volume of sales, spend across categories, comparing previous year data

## Line Chart



**Example Use:** Sales over time, market growth, forecasting, revenue trends

## Heat Map

### Ideal:

- Relationship
- Multivariate Analysis
- Distribution

### Non-Ideal:

- Proportions
- Comparisons across more than 2 categories

Material	Exceptions	Exce
440000006..	209	
440000006..	623	
44000015..	724	
44000017..	91	
44000030..	368	
44000033..	826	
44000036..	815	
44000037..	496	
44000047..	734	
44000059..	685	
44000067..	426	
44000067..	573	

**Example Use:** Segment analysis, product sales across regions, sales across brands

## Tree Map



### Ideal:

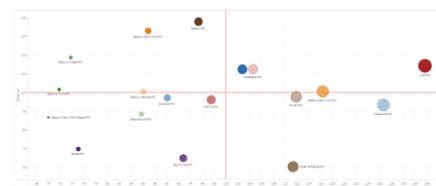
- Proportions
- Compositions
- Hierarchical Data

### Non-Ideal:

- High # categories
- Relationships

**Example Use:** Market share, product sales breakdown, region comparisons. Top 5 vs Bottom 5, comparing budget across years

## Scatterplot



**Example Use:** Concentration analysis, sales patterns, cost analysis, outlier identification, trends, identifying lagging products

### Ideal:

- Distributions
- Relationships
- Correlations

### Non-Ideal:

- Comparing qualitative data
- Categorization
- Composition



## Bubble Chart

### Ideal:

- Relationship between 3 variables
- Overlay on maps

### Non-Ideal:

- Comparing across categories
- Proportions
- Compositions

**Example Use:** Sales concentration, product comparisons, Sales across regions, product comparisons

# DESIGN BEST PRACTICES SUMMARY

- 1 Annotate and Highlight areas to draw the viewer's attention to what you want them to learn, annotate.
- 2 Create sparse visuals so that the information to be conveyed stand out. This can be done by using muted colors if there are many data points and you want to highlight one in reference to the others.
- 3 Use the same color across a certain feature. In other words, be consistent in the usage of positive and negative tones or say Shipped is always purple and Planned is always orange. This reduces **movement of eye to legend** repeatedly.
- 4 Apply the principle of how the eye moves for the placement of the visuals. Ideal flow is left to right and top to bottom.
- 5 When using interactivity, **set defaults** to the one that should most likely be of interest to the user.
- 6 Derive the conclusion out and then decide how to present it. Smarter narratives can make this dynamic.
- 7 Normalize the data and create log scales to compare features of two very different dimensions on the same axis.

# BEST PRACTICES : ARRANGEMENT AND PLACEMENT

And you will read this last

You will read this first

And then you will read this

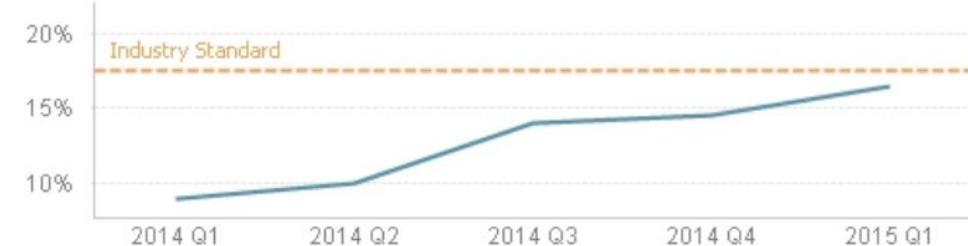
Then this one

# BEST PRACTICES : CONTEXT IS KING

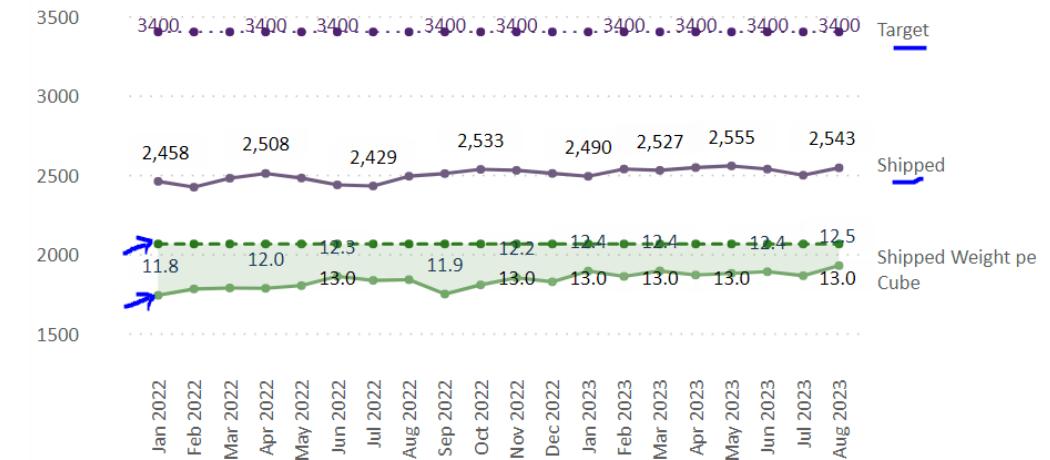


1. Design for your audience.
  - Learn from Stakeholders WHY a KPI Matters and “how relevant they are to the organization’s objectives.”(EI)
2. Keep the dashboard **simple and intuitive** – a picture should be worth 1,000 words!
  - Limit your visuals to 3-5 per dashboard (EI)
3. **Provide Context Create** charts relative to a target and origin (0,0)
4. **Highlight the time period of report preferably on menu bar.**  
Display last refresh time.

Trend Analysis: Gross Margin



TL/DR



A dashboard is a visual display of the most important information needed to achieve one or more objectives; consolidated and arranged on a single screen so the information can be monitored at a glance.

# DASHBOARD DESIGN BEST PRACTICES IN POWER BI

## Dashboard Elements

### 1 Remove Chart Junk

Axis labels in titles, Grid Lines and Data labels

Filters Move to Slicer Panel and print value on page

### 2 Multiply Visualizations

Field Parameters and Calculation groups (use Tabular Editor)

### 3 Annotate and show insights

Smart Narratives

Series Labels and data labels with leader lines

### 4 COLORS

“Data graphics should draw the viewer’s attention to the **sense and substance of the data**, not to something else. [Edward Tufte]

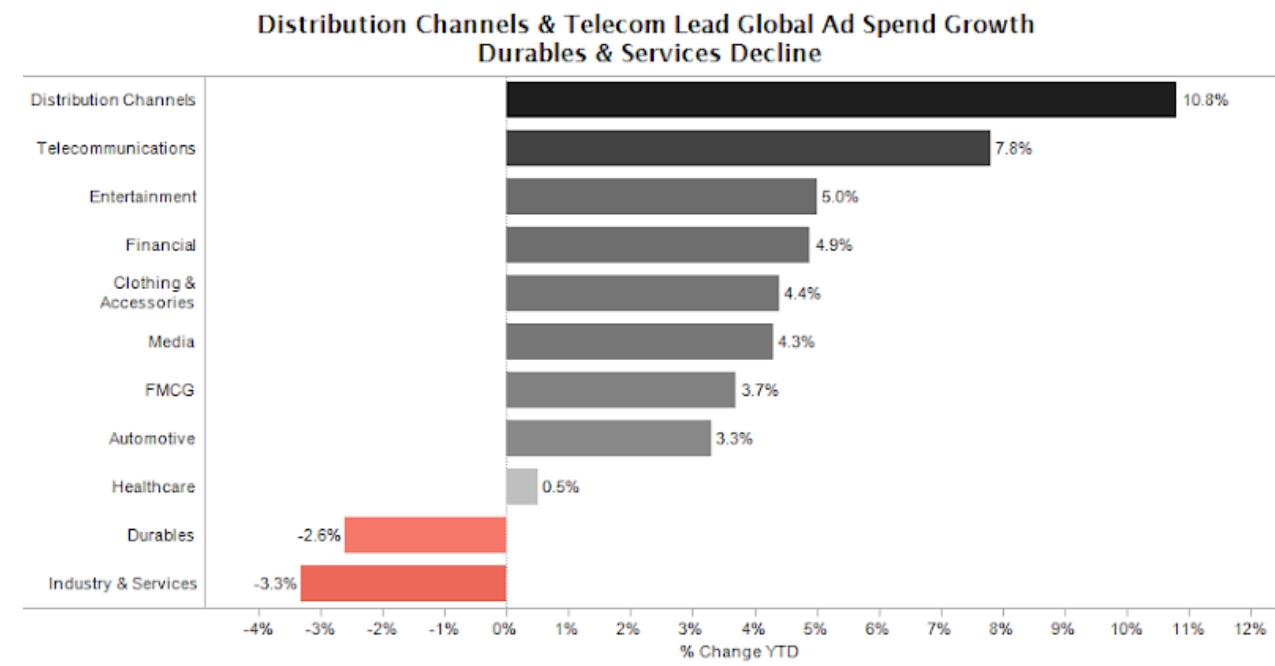
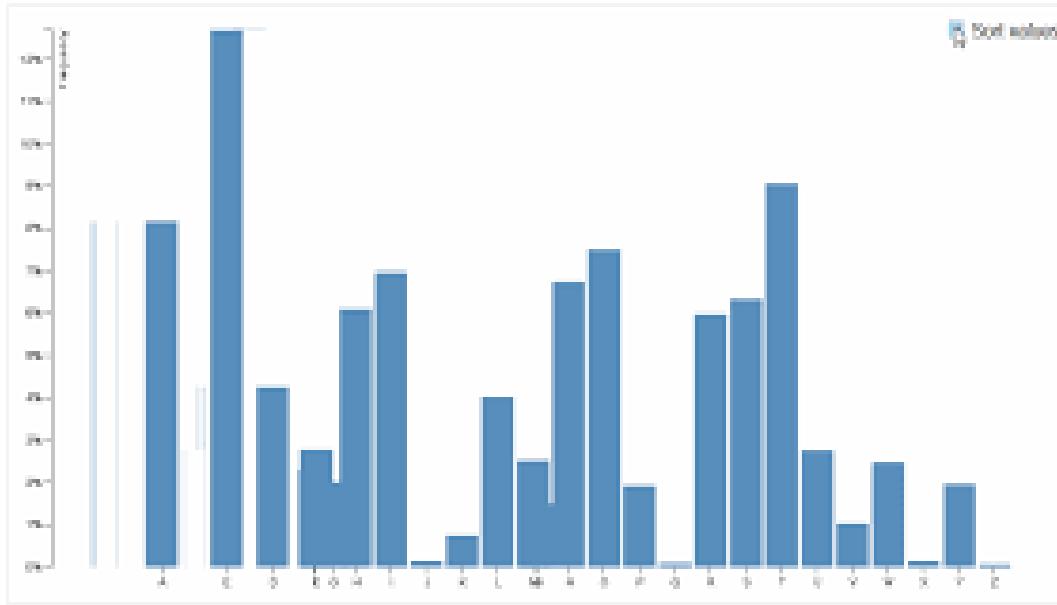
# DASHBOARD DESIGN BEST PRACTICES IN POWER BI

QUICK WINS.....NO ONE IS PAID TO EXPLORE, THEY ARE PAID TO FIND 🔎

▲ SORTING

- Whether you are working with a list box, a bar chart, or a straight table, sorting an object is always advisable as it adds context to the data. It can help you find the most commonly selected items in a list box, distinguish which element is bigger on a pie chart when the slices are similar, or easily spot the outliers in other graphic representations.

## Sortable Bar Chart



# DASHBOARD DESIGN BEST PRACTICES IN POWER BI

 SCROLL BARS

QUICK WINS.....NO ONE IS PAID TO EXPLORE, THEY ARE PAID TO FIND

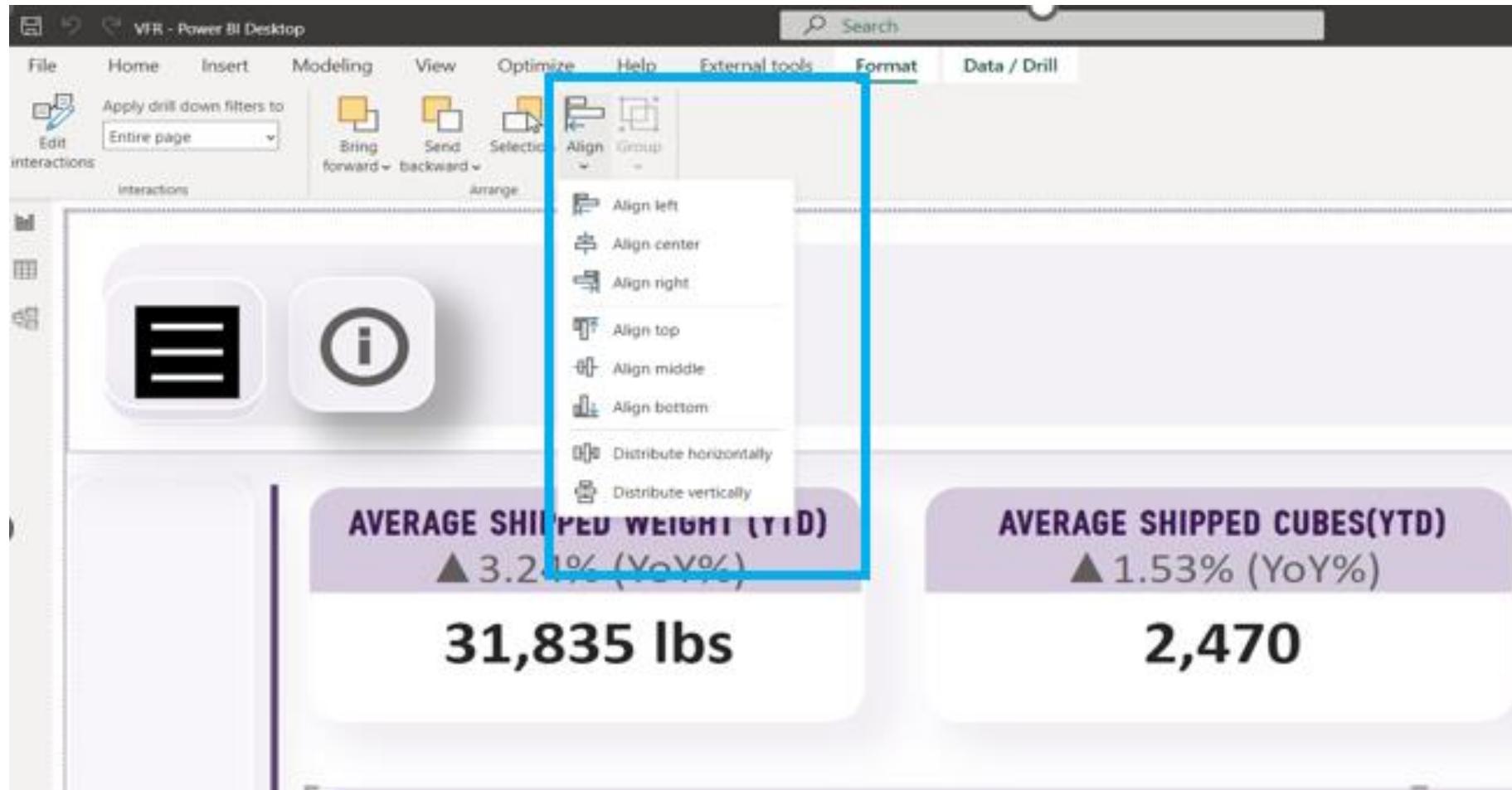


- **Avoid scroll bars**
- Stephen Few ([Perceptual Edge](#)) emphasizes that all the information in a dashboard must fit on a single screen. While I believe that there is no harm in splitting the data in multiple sheets, it is undeniable that scroll bars reduce the overall usability of an application. If the user has to continuously scroll right and left to read all the figures in a table, or if she must go up and down to see the filter panel, she will end up getting tired and eventually discard your dashboard.

# DASHBOARD DESIGN BEST PRACTICES IN POWER BI

ALIGN

QUICK WINS.....NO ONE IS PAID TO EXPLORE, THEY ARE PAID TO FIND 

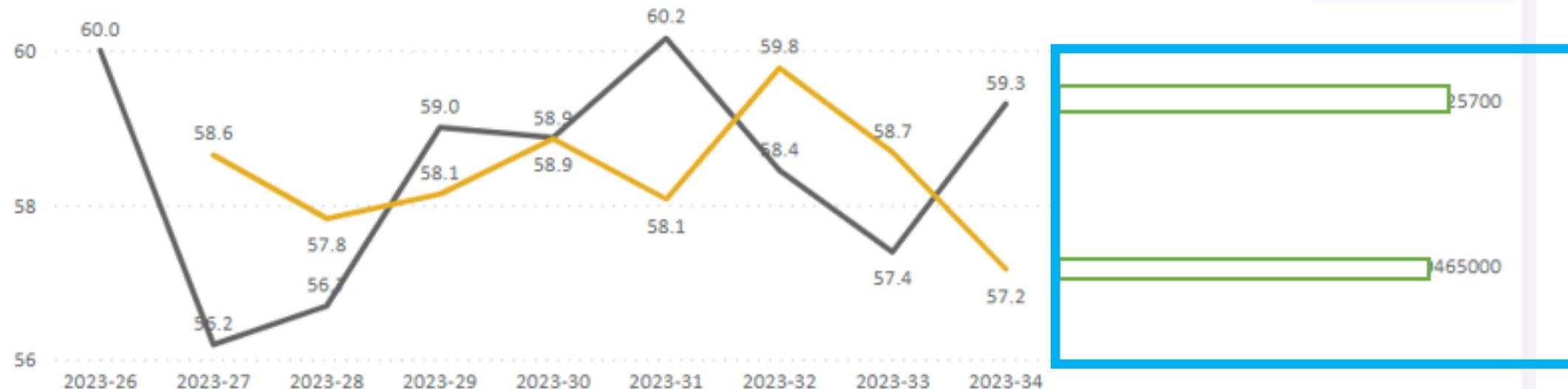


# DASHBOARD DESIGN BEST PRACTICES IN POWER BI

SERIES LABELS

QUICK WINS.....NO ONE IS PAID TO EXPLORE, THEY ARE PAID TO FIND 🔎

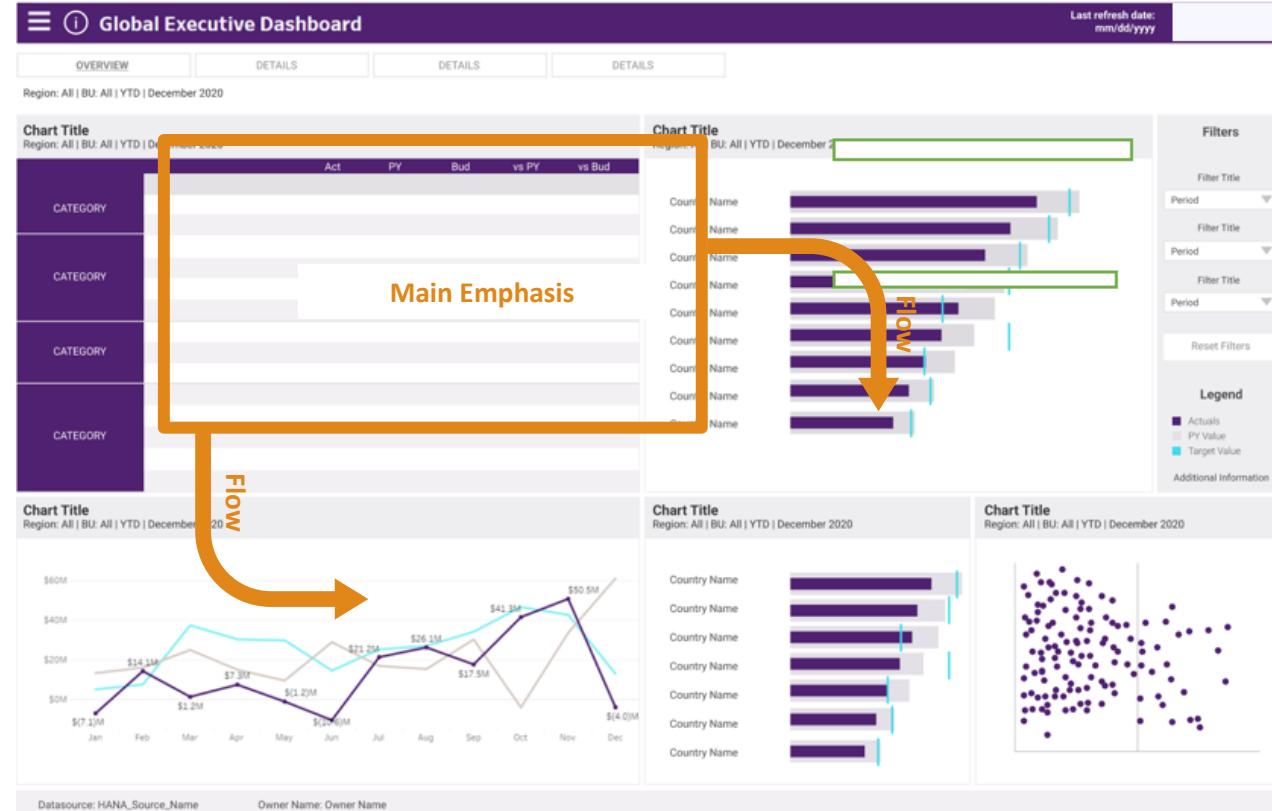
AVERAGE PALLETS FOR ALL SHIPMENTS CARRYING MATERIAL



# LAYOUT, CLUTTER AND FLOW (EI)

Utilize high view sections, minimize clutter and convey information for ideal flow

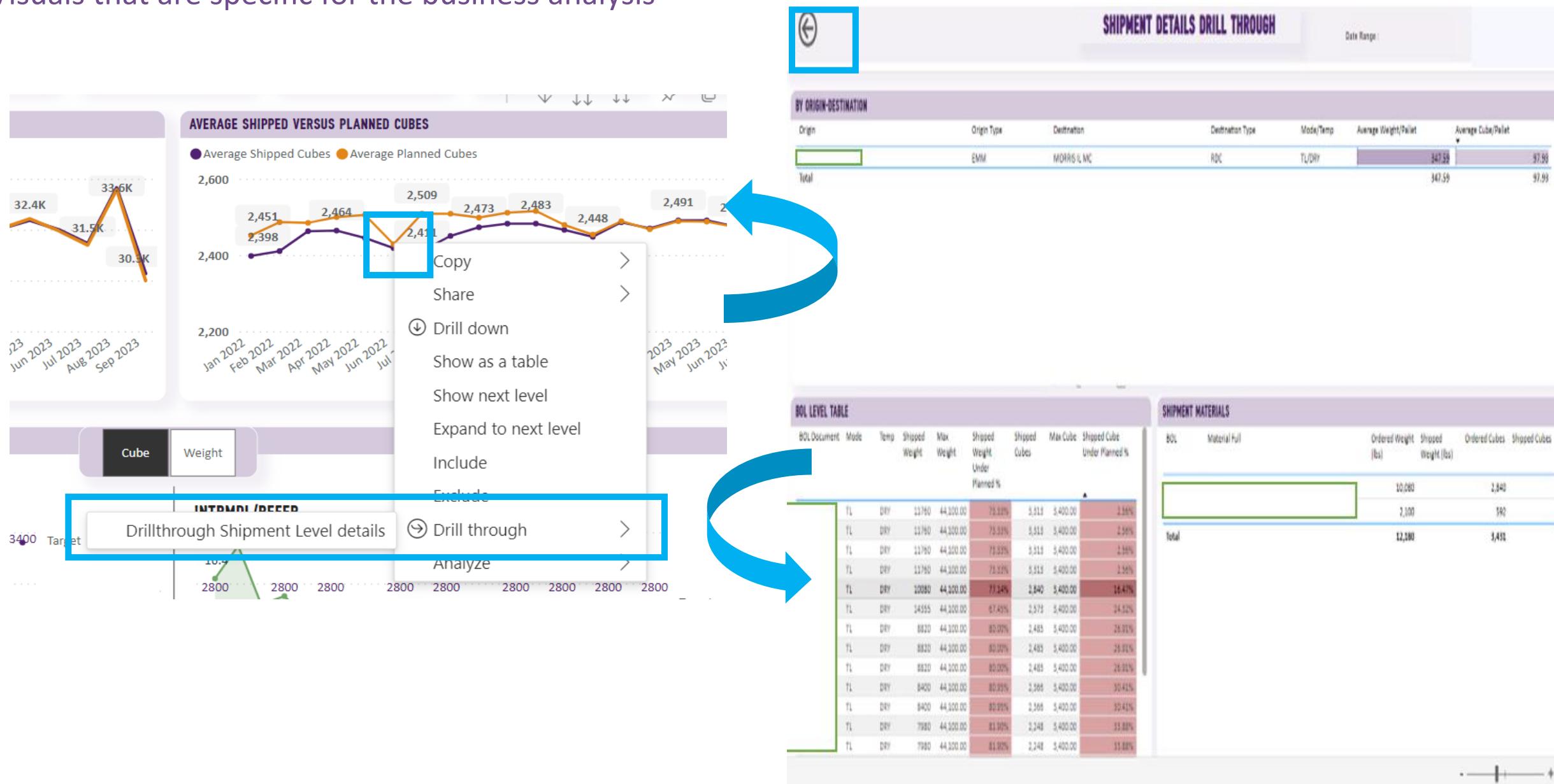
1. The most important/main KPI's and visuals to the top-left or center
  2. Ideal flow is left to right and top to bottom
  3. Group global filters/legends together and individual filters/legend with respective visuals
  4. Use consistent colors/layouts
  5. Separate visually using borders
  6. Keep tables and details towards the bottom/right



# VISUALIZATIONS – DRILLTHROUGH FOR DETAILS

DRILLTHROUGH

Visuals that are specific for the business analysis



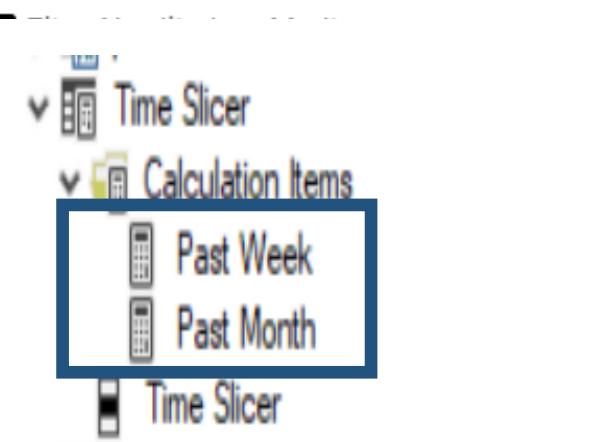
# VISUALIZATIONS – MULTIPLY USING CALCULATION GROUPS

PARAMETERS

⌚ ONE GROUP TO RULE THEM ALL

X MATRIX

	SELECTEDMEASURE()	CALCULATION ITEMS		
Month Name	Total Sales	Name		
February	9,069,088.50	<input type="checkbox"/> PY		
March	8,557,316.37	<input type="checkbox"/> CY		
April	8,942,370.86	<input type="checkbox"/> Running Total		
May	8,619,195.53	<input checked="" type="checkbox"/> Previous Month		
June	9,177,056.77			
Calendar Year Number	PY	CY	Running Total	Previous Month
2020		<b>44,365,028.02</b>	<b>44,365,028.02</b>	
January		9,069,088.50	9,069,088.50	
February		8,557,316.37	17,626,404.87	9,069,088.50
March		8,942,370.86	26,568,775.73	8,557,316.37
April		8,619,195.53	35,187,971.25	8,942,370.86
May		9,177,056.77	44,365,028.02	8,619,195.53
June			44,365,028.02	9,177,056.77
July				44,365,028.02



# VISUALIZATIONS – OPTIONS USING FIELD PARAMETERS

PARAMETERS

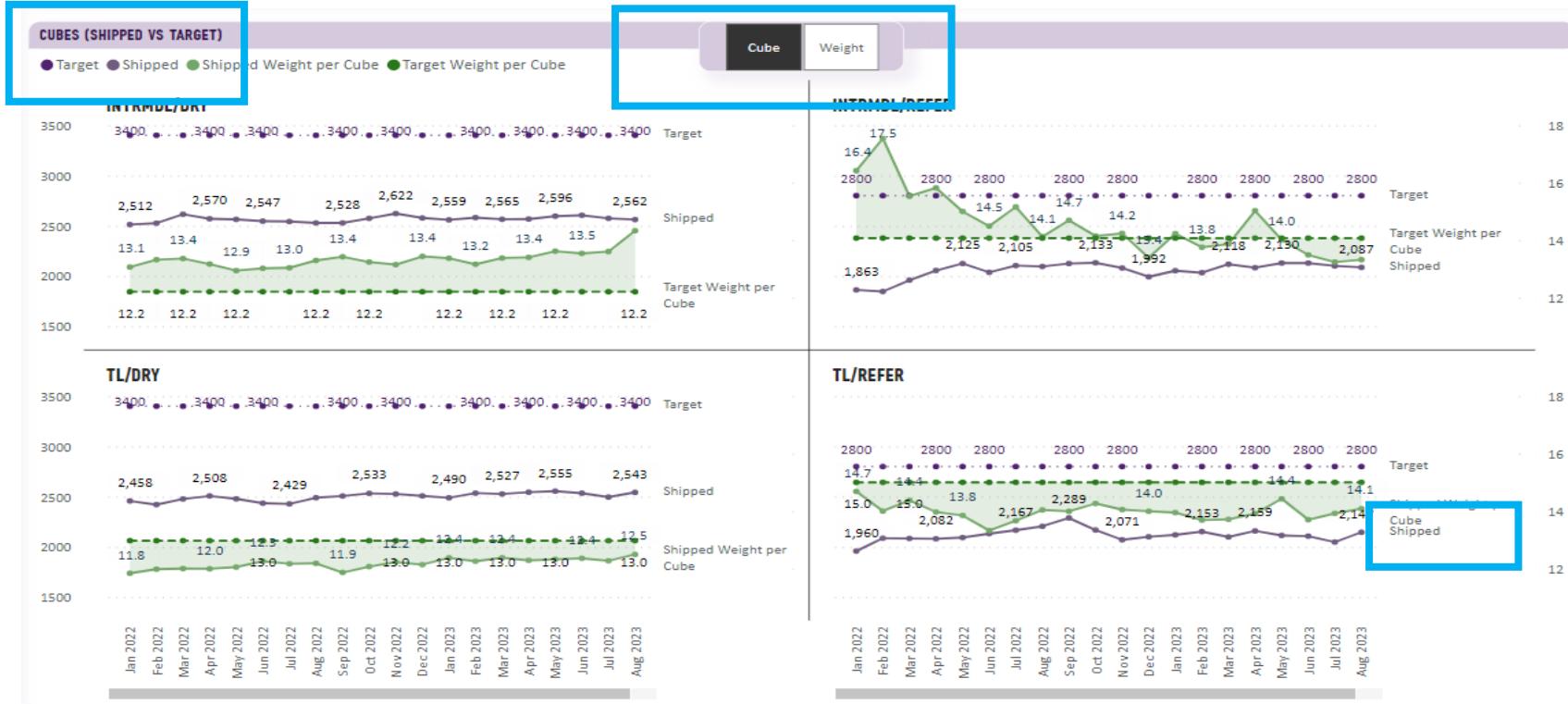
ONE GROUP TO RULE THEM ALL

X AXIS | X VISUALS

## CASES OVERHANG ANALYSIS

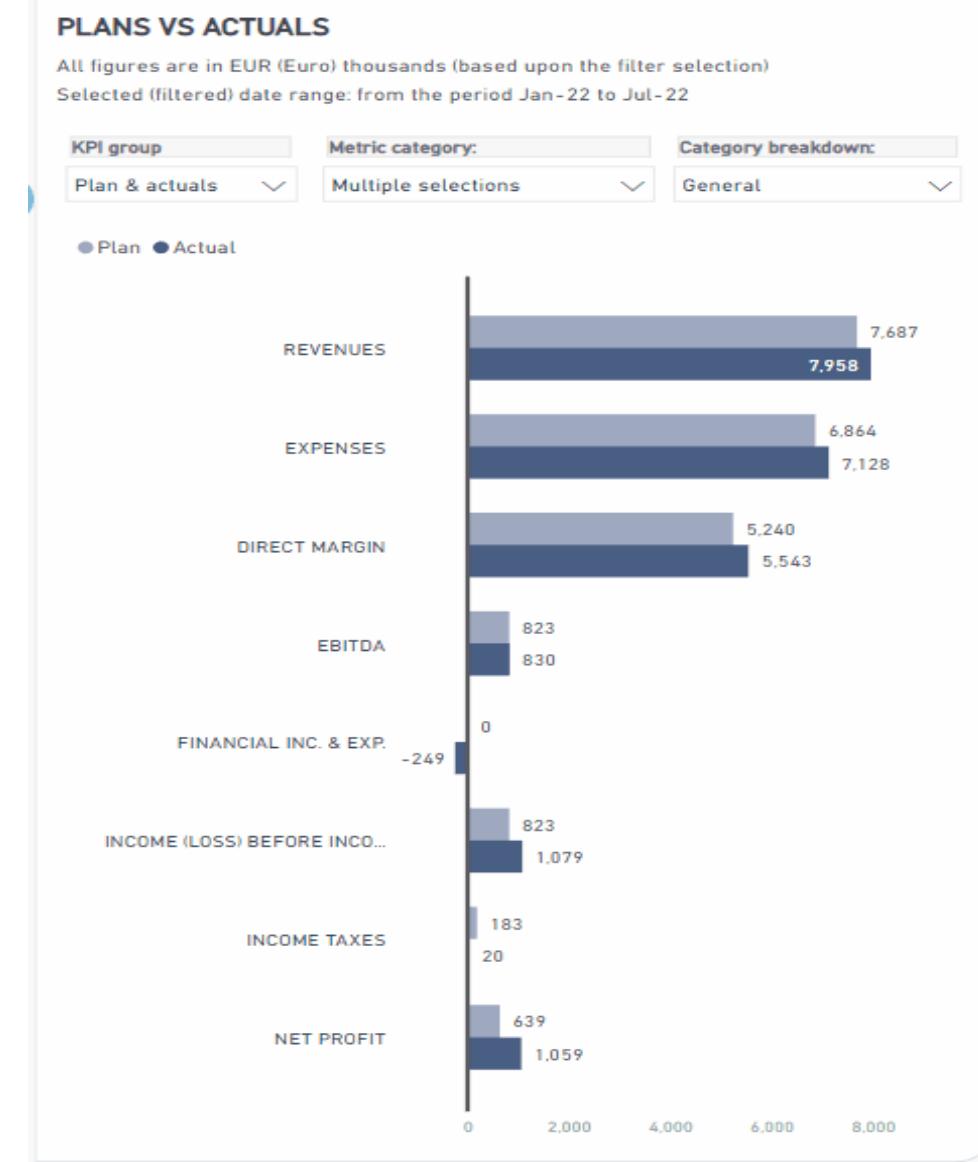
1/1/2022 - 9/30/2023

Number of materials to rank (1-30):  Apply Top "N" filter:   Rank Materials By:



# VISUALIZATIONS – OPTIONS USING FIELD PARAMETERS

⌚ ONE PARAMETER TO RULE THEM ALL



# TOOLTIPS

★ Enhance tips on hover using Tooltip report pages



Visualizations

# FILTERS

## Sample Slicer Panel

**CASES OVERHANG ANALYSIS**

1/1/2013 - 5/31/2013

Number of materials to rank (1-30): 6      Apply Top "N" filter:  NO  YES

Rank Materials By:  Shipped Pallets %  Ordered Pallets %  Shipped Cases %  Ordered Cases %

Origin	Pallets Shipped	% Pallets Shipped	Cases Shipped	% Cases Shipped	Pallets Ordered	% Pallets Ordered	Cases Ordered	% Cases Ordered	Rank
	48,522	100.00%	2,841,096	100.00%	52,063	100.00%	3,128,204	100.00%	
34	22.52%	4,760	56.19%	36	16.98%	5,040	45.35%	2	
14	9.27%	1,790	21.13%	31	14.62%	3,652	32.86%	3	
97	64.24%	1,165	13.75%	139	65.57%	1,665	14.98%	1	
6	3.97%	756	8.92%	6	2.83%	756	6.80%	4	
506,844	100.00%	25,345,034	100.00%	508,095	100.00%	25,486,409	100.00%		
2,817	100.00%	354,970	100.00%	2,822	100.00%	355,622	100.00%	1	
555,366	100.00%	28,186,130	100.00%	560,158	100.00%	28,614,613	100.00%		

**TOTALS**

555,366	Pallets Shipped
28,186,130	Cases Shipped
560,158	Pallets Ordered
28,614,613	Cases Ordered

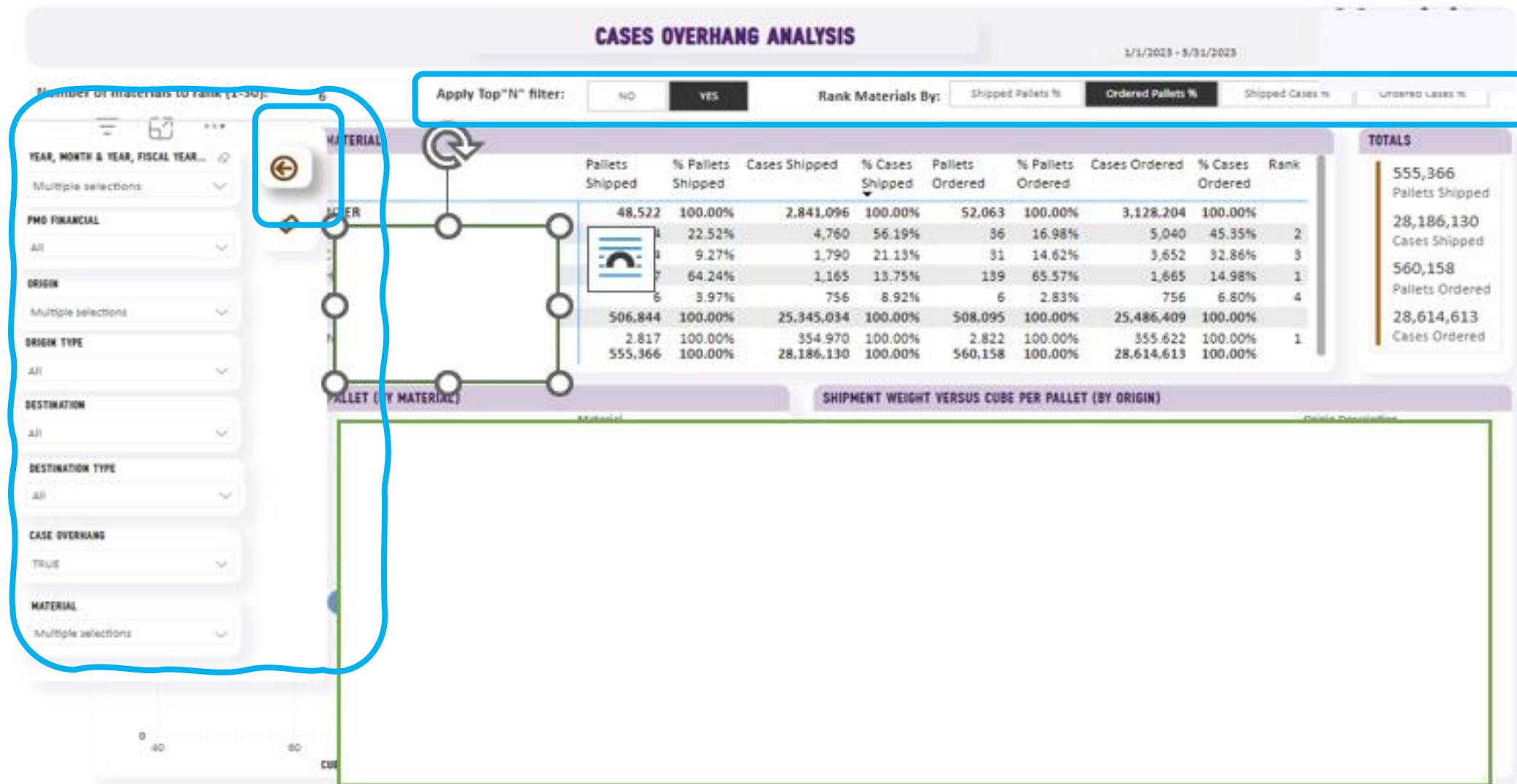
→

**SHIPMENT WEIGHT VERSUS CUBE PER PALLET (BY MATERIAL)**

**SHIPMENT WEIGHT VERSUS CUBE PER PALLET (BY ORIGIN)**

# FILTERS

## Sample Slicer Panel



# VISUALIZATIONS - COLORS

- Colors (for additional colors see Company / Corporate Guidance)
- Use the theme
- Be consistent
- Use color sparingly
- **Discrete Color Sequence (Below) and Continuous Colors Sequences**

- – **Actuals** – #4f2170 || Purple
- – **PY Value**- #DEDBE0 || Light grey
- – **value** – #7ff1f2 ||
- – **Alert** – #E18719 || Orange
- – **Negative value** (#a52323) || Red
- – **Positive value** (#287819) || Green

# COMPANY THEME COLORS

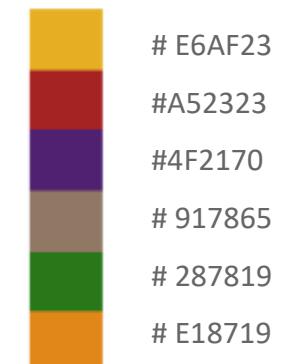
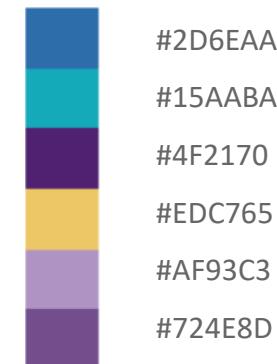
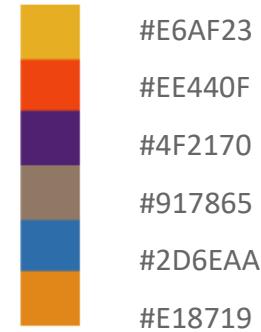
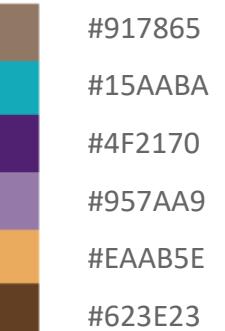
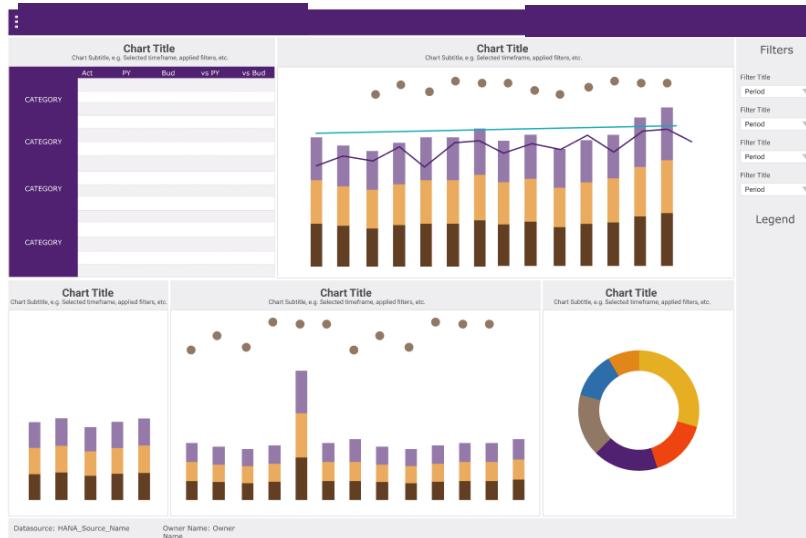
Import Color Palette using company theme

# VISUALIZATIONS - EXAMPLE : WHAT MUST I FOCUS ON?.....

!!!!?



NO FOCUS



## EFFECTIVE USE OF COLOR MENTIMETER

How many “2” did you find?

546872013246654687843

217605132168706501320

684621031352587750861

## EFFECTIVE USE OF COLOR MENTIMETER

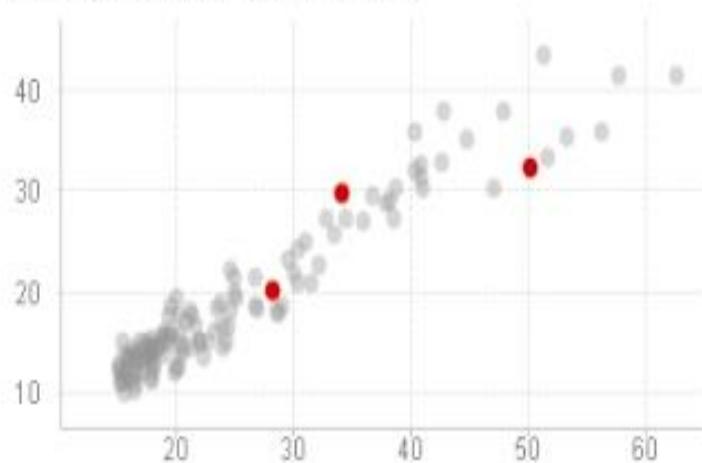
Refers to all the elements that distract the viewer from the actual information in a graphic.

HOW MANY 2s CAN YOU FIND?

54687**2**013**2**46654687843  
**2**1760513**2**1687065013**2**0  
6846**2**103135**2**587750861

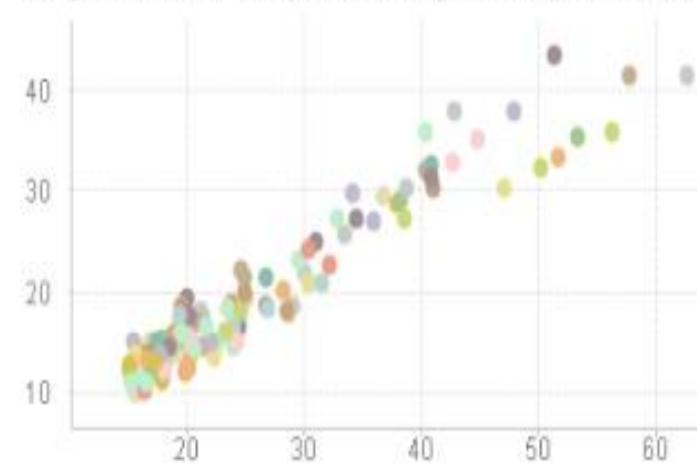
## Color Contrast

It is easy to spot the important bubbles.



## Color Galore

Using too many colors impedes focusing on the important items.



- Gray should be included in any palette as it helps to balance the intensity of other colors. Besides, it gets along pretty well with almost every style.
- Associate colors with ideas. For example, if you use blue to represent the sales in the first tab, follow that rule in the entire application. This will make your dashboards easier to follow and let the users work more efficiently.



- Respect the **RAG** convention—red for negative, amber for alert, and green for positive.

# Picking colors

- For ordered data –
  - Luminance in HSL space
  - (Possibly not grayscale)
  - Saturation can work
    - not as easily discernable and interacts
- For nominal data
  - Hue



# YOU MAY NOT NEED COLOR AT ALL

NOT IDEAL



BETTER



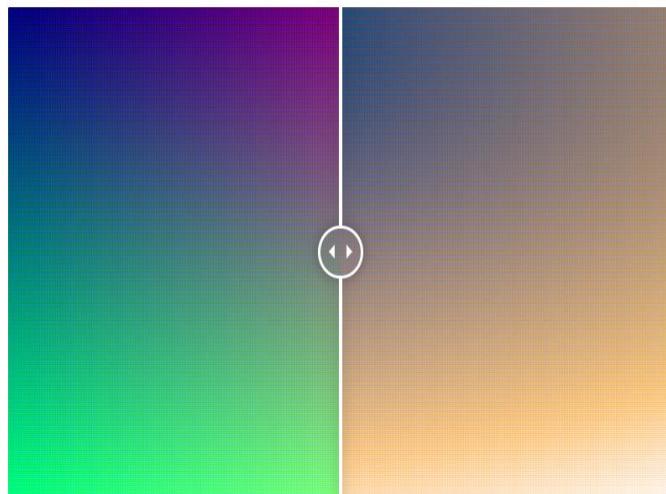
# RESOURCES FOR DESIGNING FOR THE COLOR BLIND

## Resources for Designing for the Colorblind - We are Colorblind

Around 1 in 12 men and 1 in 200 women have some form of color blindness. People with color blindness (also known as Color Vision Deficiency) face daily usability and accessibility challenges with websites, webapps, webshops, and apps in their daily life.

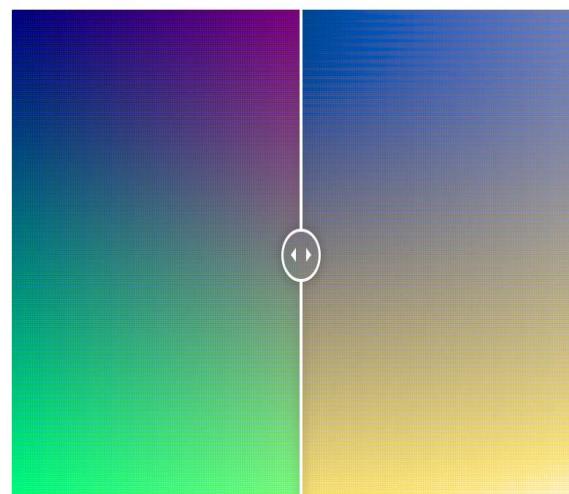
### **Green (deutan) color blindness**

The green-weak (*Deuteranomaly*) and green-blind (*Deutanopia*) colorblind have problems with any color that has some **green** in it.



### **Red (protan) color blindness**

The red-weak (*Protanomaly*) and green-blind (*Protanopia*) colorblind have problems whenever a color has some **red** in it.



# REPORT CHECKLIST

Power BI Report Checklist — DATA GOBLINS (data-goblins.com)

## Layout & Design



- Use company wide color palette and theme JSON. This will set colors, font and titles for consistency

- Add a title/summary page and / or appendix/ FAQ etc.

- Label report objects clearly and consistently i.e. in selection pane

- Set default sort on visuals

- Set chart axes to start at 0 (unless explicitly not desired)

## Accessibility



- Set visual layer order and tab order

- View and test the report on different screens, browsers and contexts.

- Check accessibility of contrast, colors and fonts

# REPORT CHECKLIST

Power BI Report Checklist — DATA GOBLINS (data-goblins.com)

## Testing & Performance



- Set and test all interactions
- Test the report with a variety of filter combinations.
- Eliminate unnecessary visuals
- Document testing cases, queries , methods and results
- Test report performance with performance analyzer

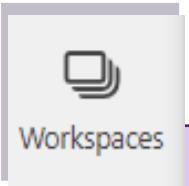
## User Experience



- Add links for users to report issues and submit requests/ideas
- Synchronize slicers where necessary
- Set interactions between visuals

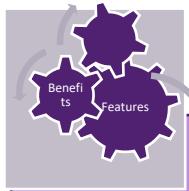
# REPORT TRAINING CHECKLIST

Power BI Report Checklist — DATA GOBLINS ([data-goblins.com](http://data-goblins.com))

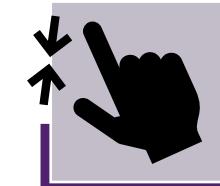


Workspaces

- Give report walkthrough
- Demonstrate questions answered by visuals
- Request access in AAD group



- Reset to default
- Subscribe and use subscriptions
- Comments



- Drill down and up
- Buttons
- Filter pane
- Cross-filtering and cross highlighting
- Slicers
- Drill through
- Show as table
- Personal bookmarks

# LOGOS & ICONS

Common images used in the Dashboards : Use as designed by company

# SUMMARY

*"PERFECTION IS ACHIEVED, NOT WHEN THERE IS NOTHING MORE TO ADD,  
BUT WHEN THERE IS NOTHING LEFT TO TAKE AWAY."*

- ANTOINE DE SAINT- EXUPERY

# SUMMARY

***"Simplicity is the ultimate sophistication."***

- ANONYMOUS

# RESOURCES

[PowerPoint Presentation \(washington.edu\)](#)

[2. All about Dashboard Design Best Practices | Creating Stunning Dashboards with QlikView \(oreilly.com\)](#)

[The Art of Insight: How Great Visualization Designers Think: 9781119797395: Business Communication Books @ Amazon.com](#)

[5 Principles of Visual Perception | Principles of Data Visualization \(ucdavisdatalab.github.io\)](#)

[Perceptual Edge](#)

[Create Beautiful Yet Effective Data Viz Using Why-What-How Framework by Grace Teoh \(Preview\) - YouTube](#)

[CSE442-VisualEncoding.key \(washington.edu\)](#)

[Microsoft PowerPoint - CS448B-20111013-Perception.ppt \[Compatibility Mode\] \(stanford.edu\)](#)

[Business Insights: Overview + Application \(Green Belt\) - Delta Training \(delta-assoc.com\)](#)