

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 \(data-goblins.com\)](#)

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 \(data-goblins.com\)](#)

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

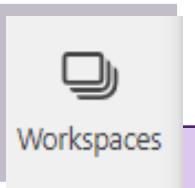
User Experience



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

REPORT TRAINING CHECKLIST

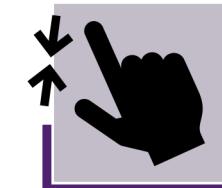
Power BI Report Checklist — DATA GOBLINS (data-goblins.com)



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



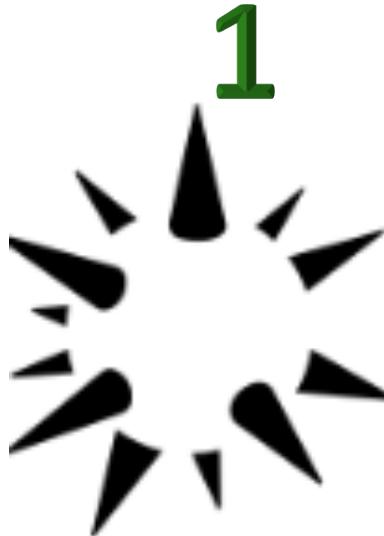
- Reset to default
- Subscribe and use subscriptions
- Comments



- 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

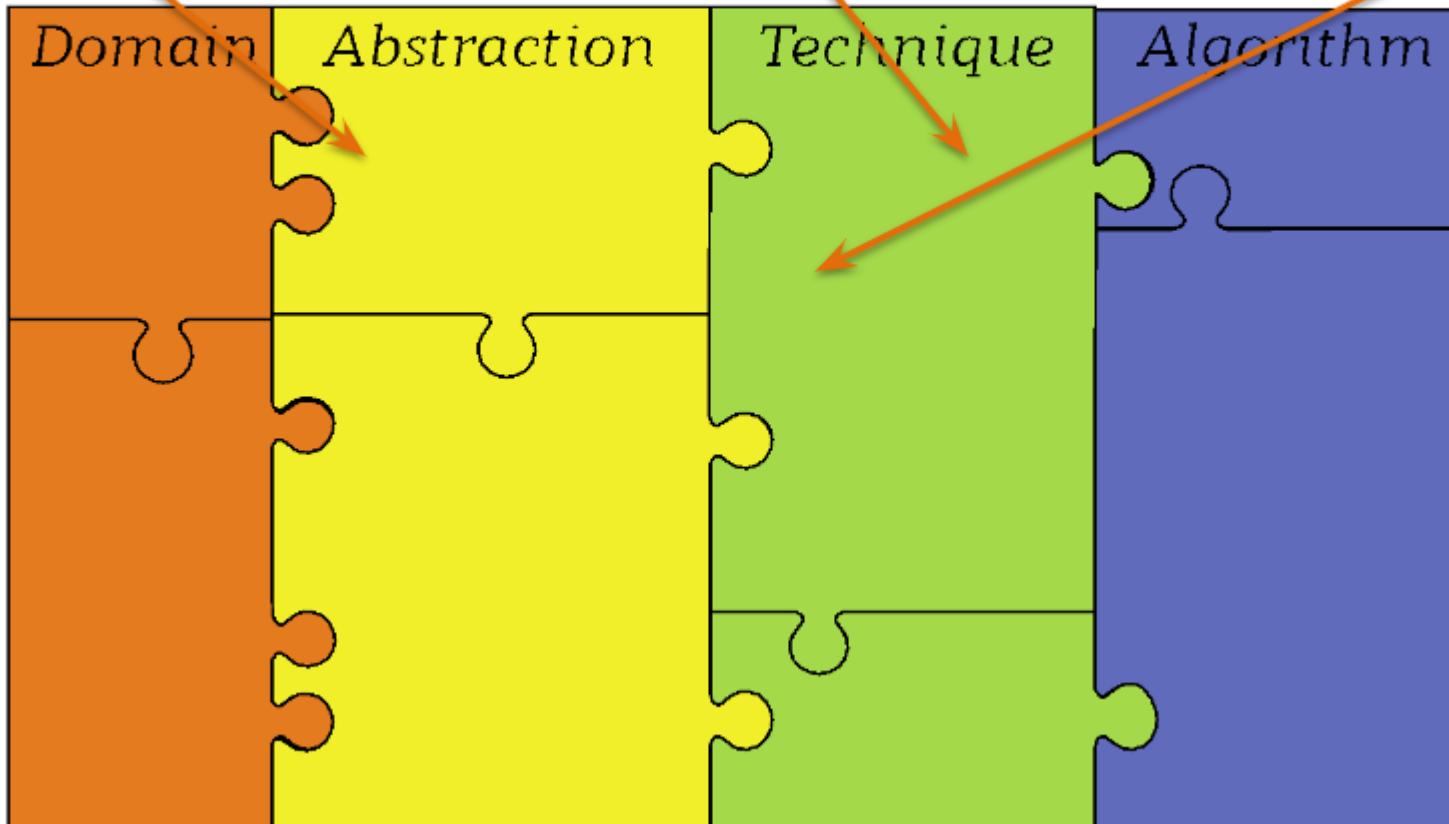


Criteria of algorithm

- 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

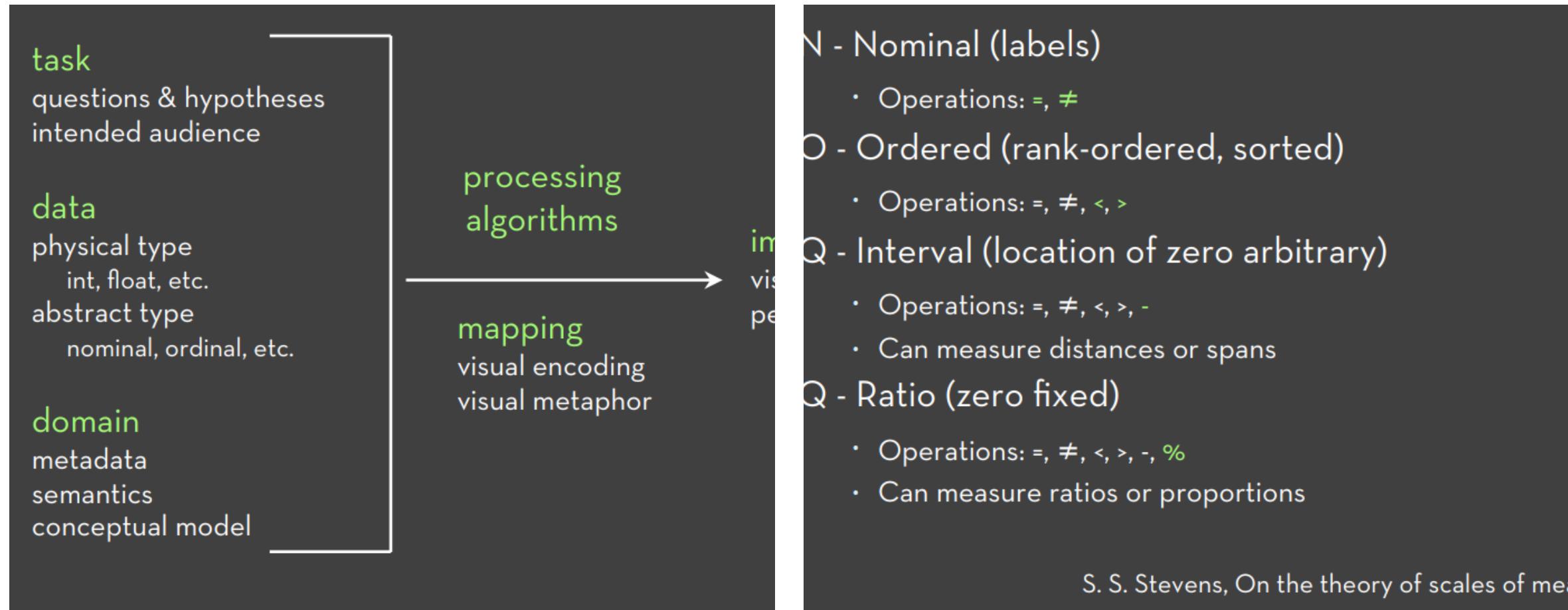
ASK

Given the data and tasks, are my choices in representation effective and expressive?



THE BIG PICTURE

Converting domain to visualization

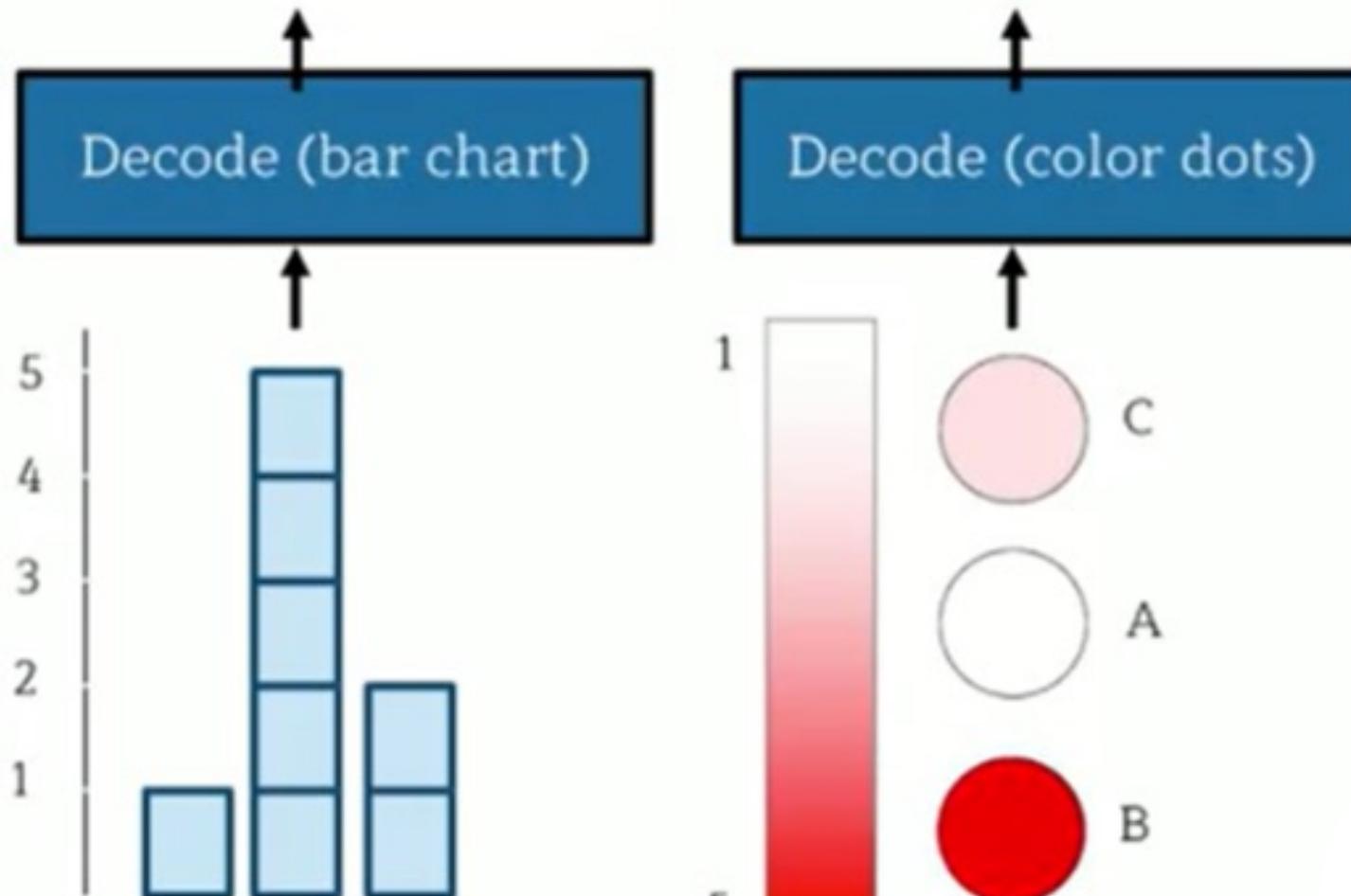


Name	Score
A	1
B	5
C	2

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

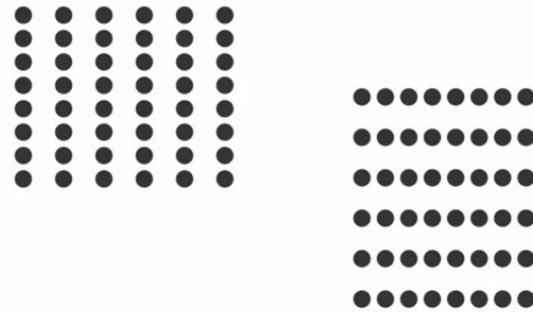
**The more objects
the harder it gets**

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

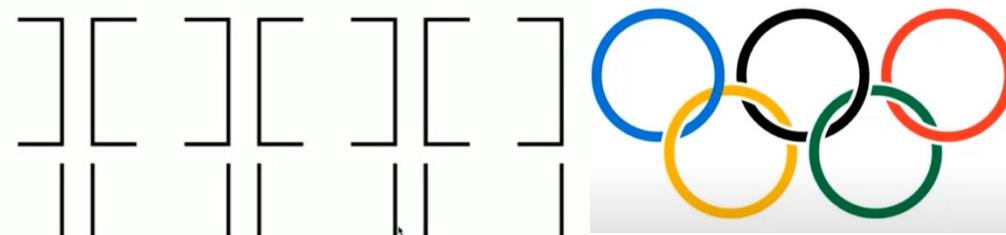
EFFECTIVENESS

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

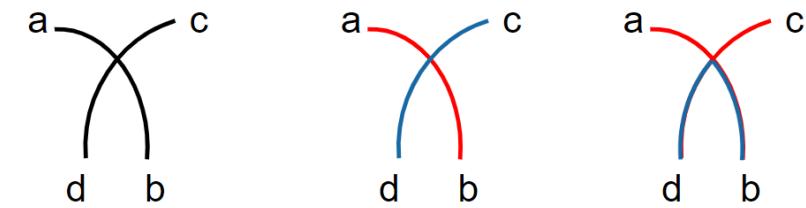
Principles - Proximity



Principles - Closure



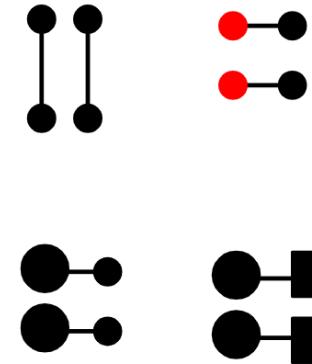
Principles - Continuation



Principles - Similarity



Principles - Connectedness

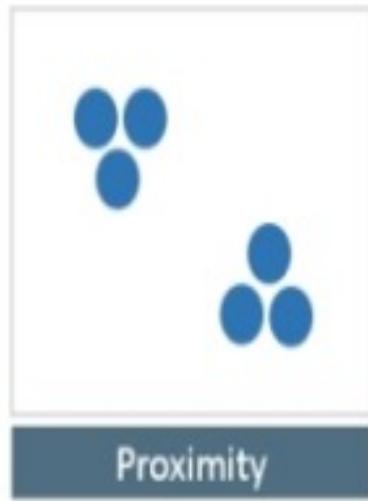


EFFECTIVENESS
'GESTALT PSYCHOLOGY' THE SIMPLEST AND MOST STABLE
INTERPRETATIONS ARE THE ONES THAT ARE FAVORED

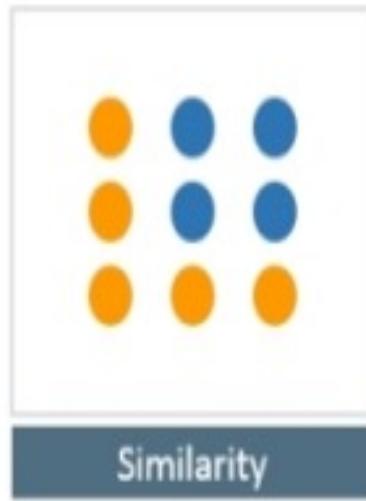
- **Proximity:** When we see multiple elements located near one another, we tend to see them as a group. For example, we can visually distinguish clusters in a scatter plot by grouping the dots according to their position.
- **Similarity:** Our brain associates elements that are similar to each other (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

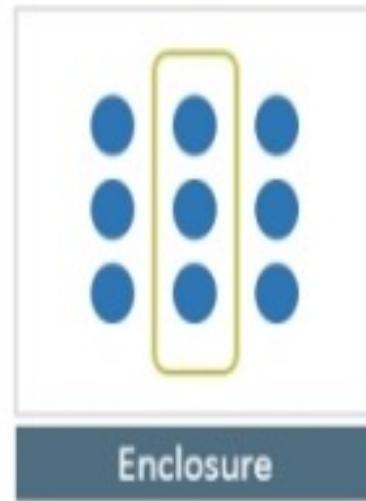
‘GESTALT PSYCHOLOGY’ THE SIMPLEST AND MOST STABLE
INTERPRETATIONS ARE THE ONES THAT ARE FAVORED



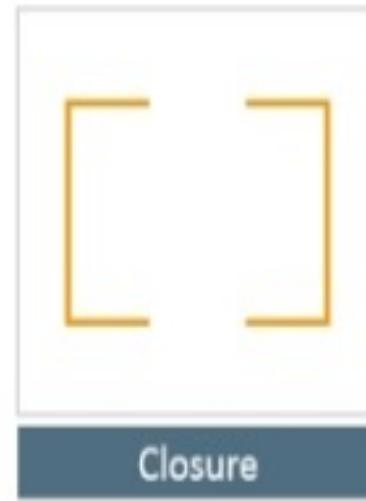
Proximity



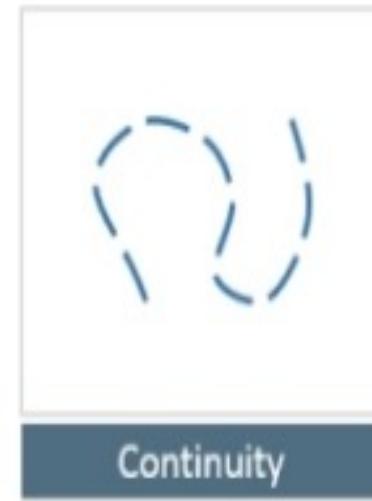
Similarity



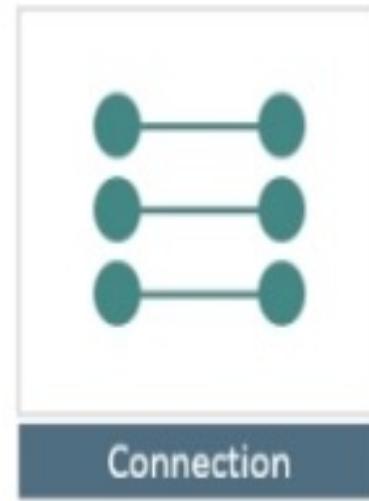
Enclosure



Closure



Continuity



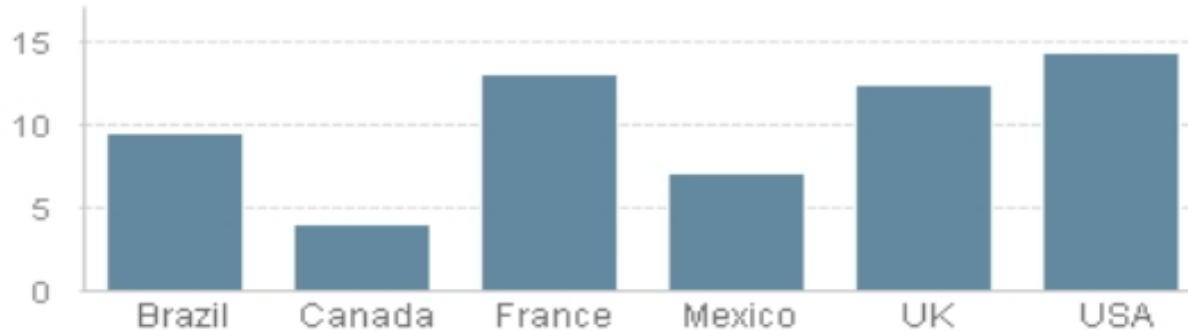
Connection

EFFECTIVENESS

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

EFFECTIVENESS

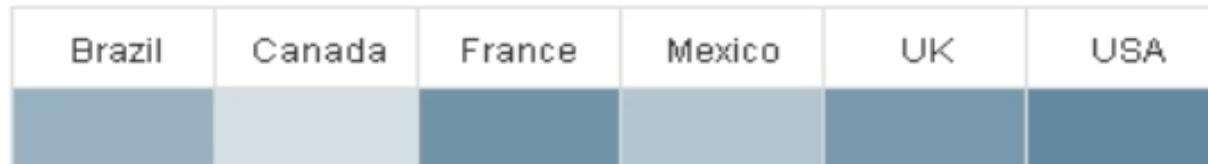
Bar Chart (Position along a common scale)



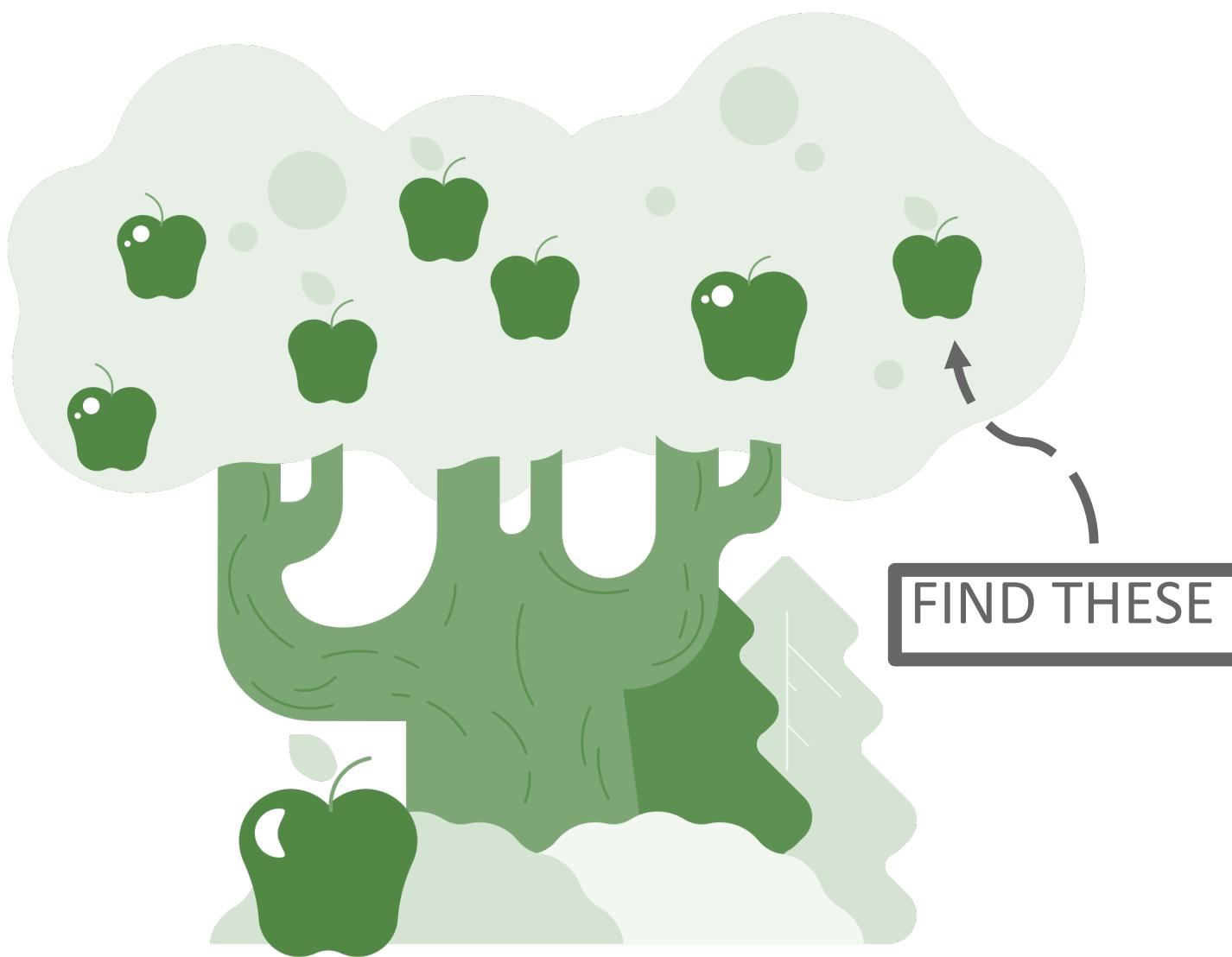
Bubble Chart (Size)



Heat Map (Color Saturation)



TECHNIQUES DEVELOPED FROM EMPIRICAL DATA ON VISUAL PERCEPTION

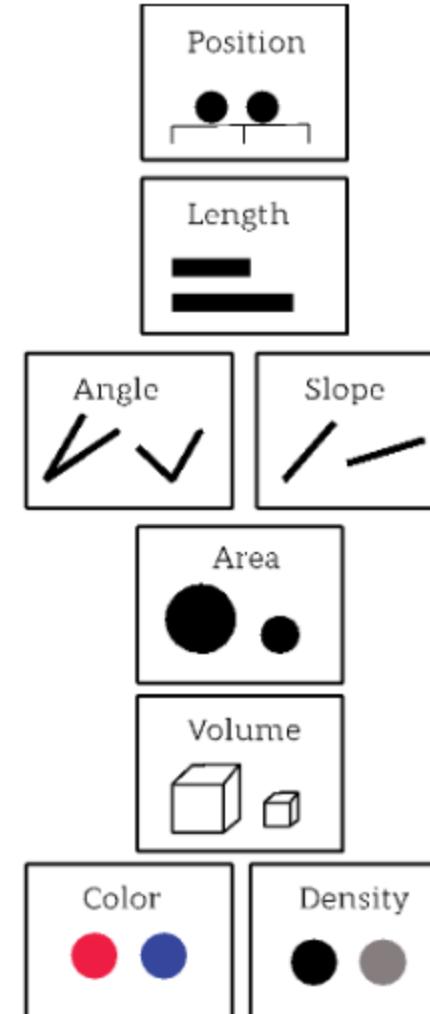


MACKINLAI – A PRESENTATION TOOL

More accurate



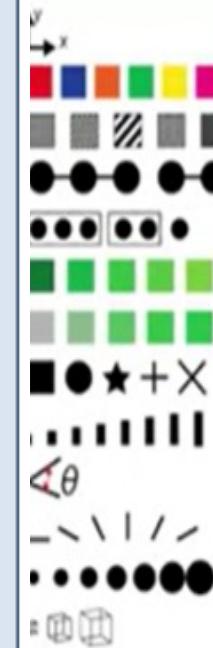
Less accurate



EMPERICAL DATA ON VISUAL PERCEPTION



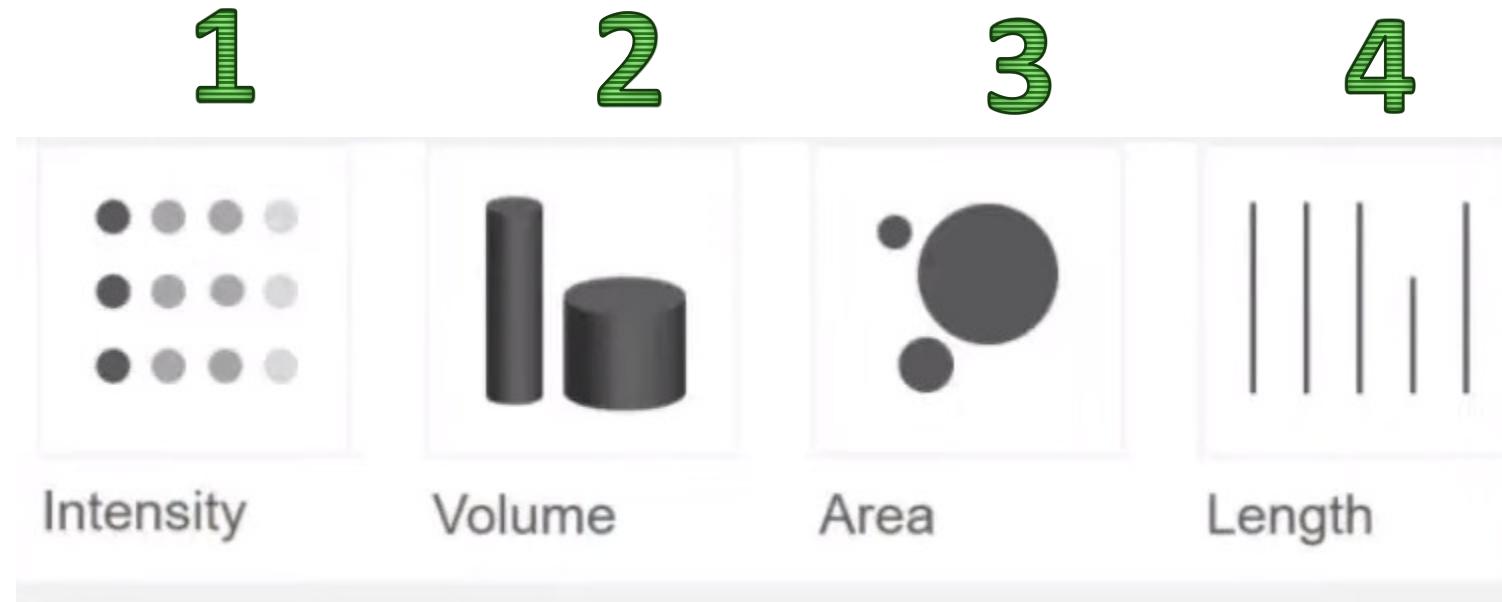
	Quantitative	Ordinal	Nominal
Position		Position	Position
Length		Density	Color Hue
Angle		Color Sat.	Texture
Slope		Color Hue	Connection
Area		Texture	Containment
Volume		Connection	Density
Density		Containment	Color Sat.
Color Sat.		Length	Shape
Color Hue		Angle	Length
Texture		Slope	Angle
Connection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



MACKINLAY – MENTIMETER

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

1

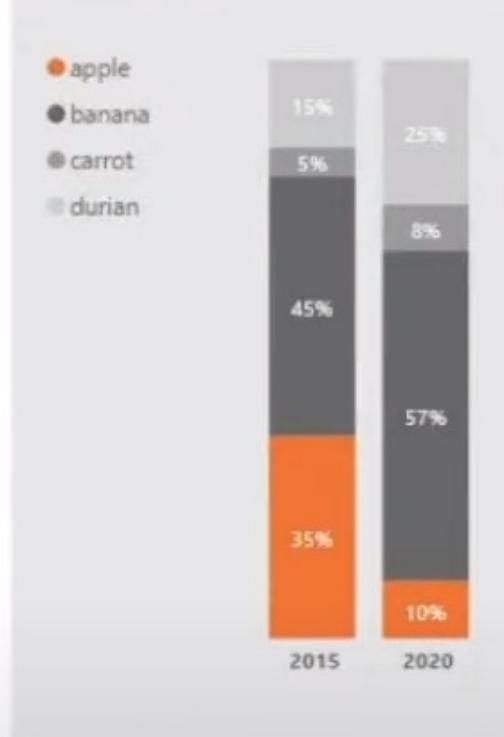
2

3

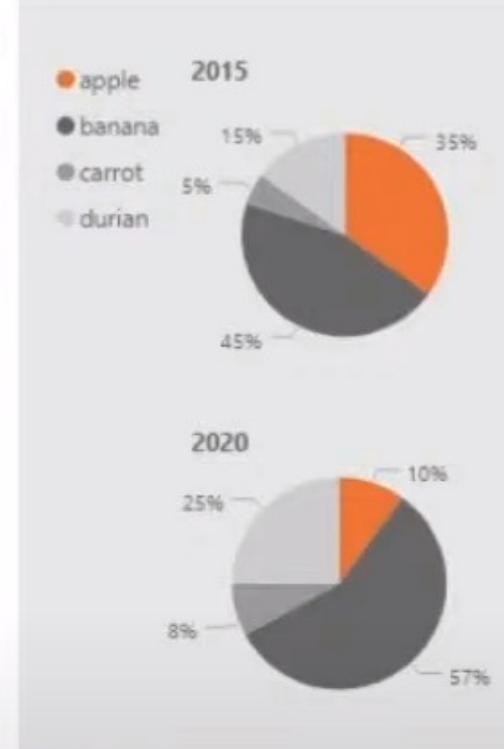
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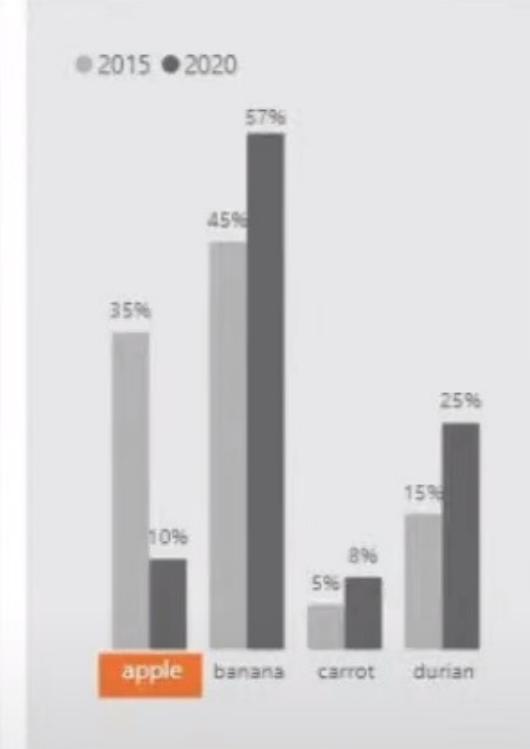
slope graph



100% stacked column

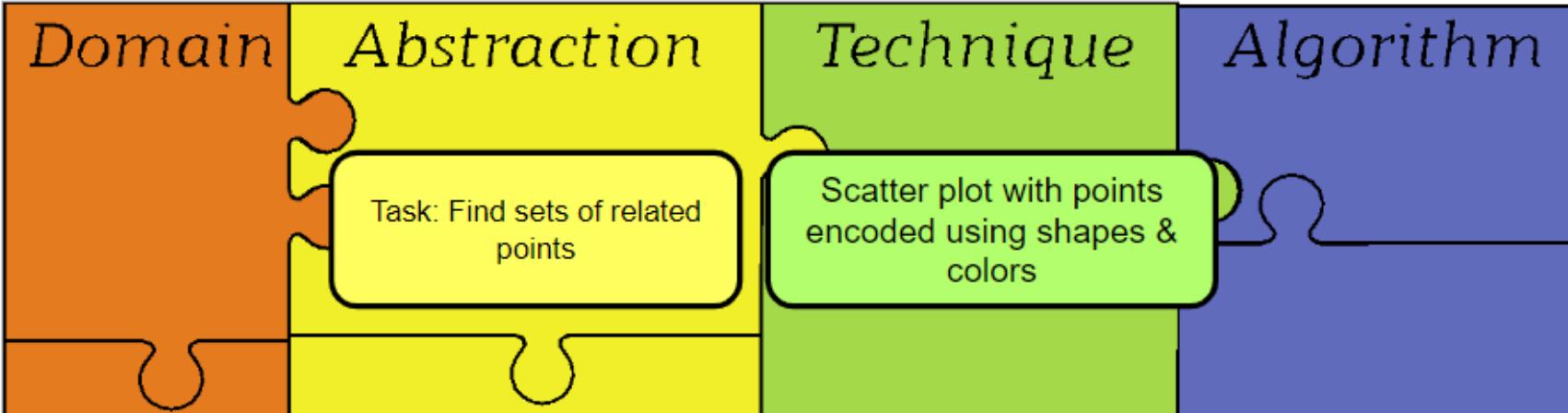


pie



clustered column

ASK



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



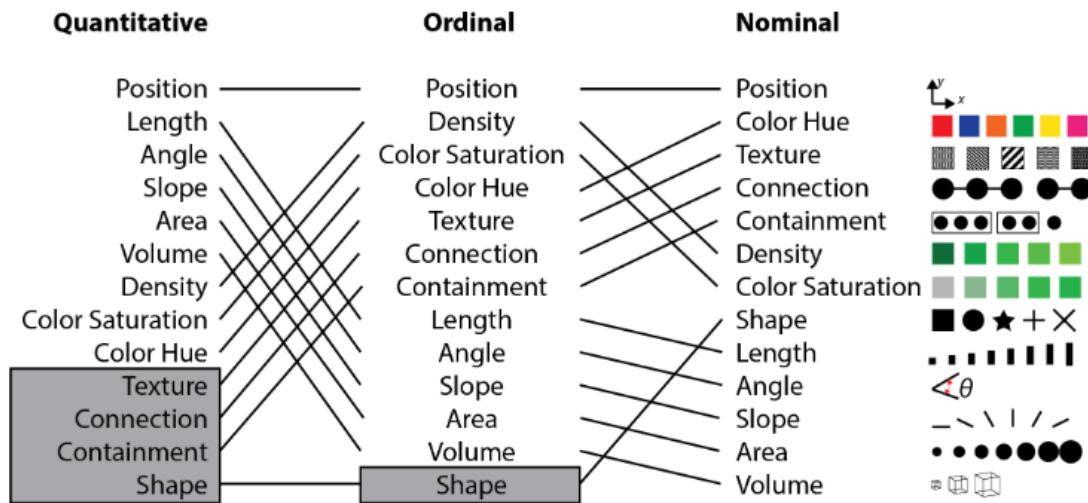
Takeaways

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

IMPLEMENT

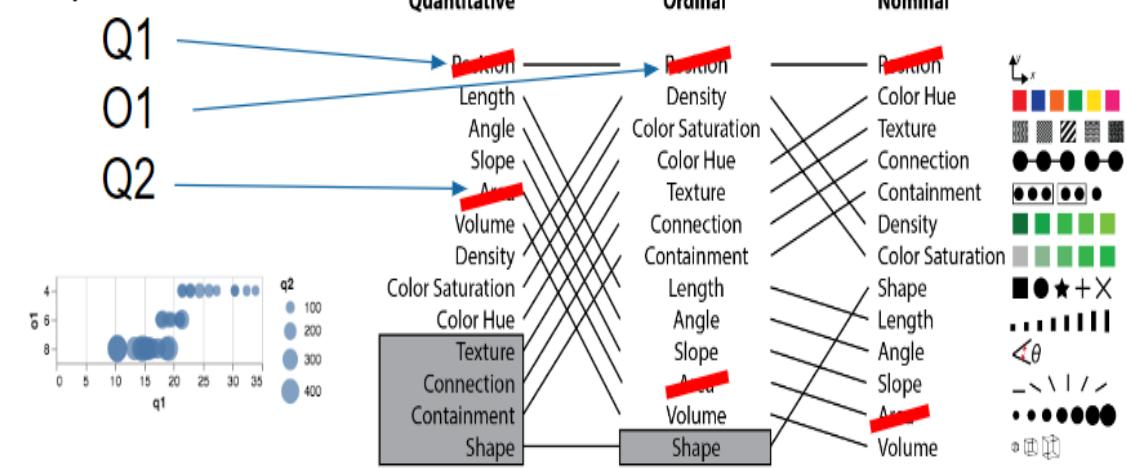
Be greedy:

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

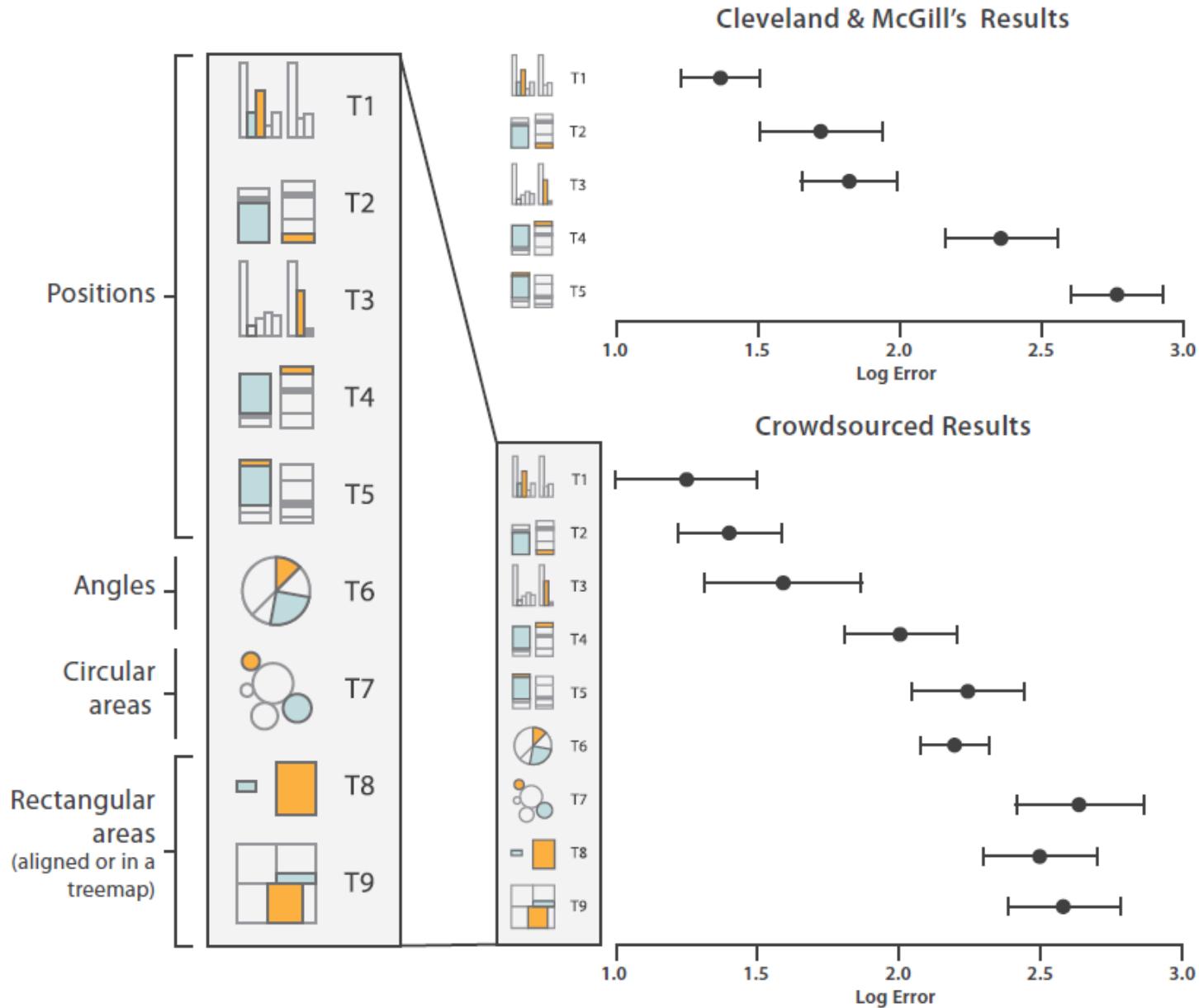


Ranking of Perceptual Tasks

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 

Low Data-Ink Ratio

Edward Tufte hates you



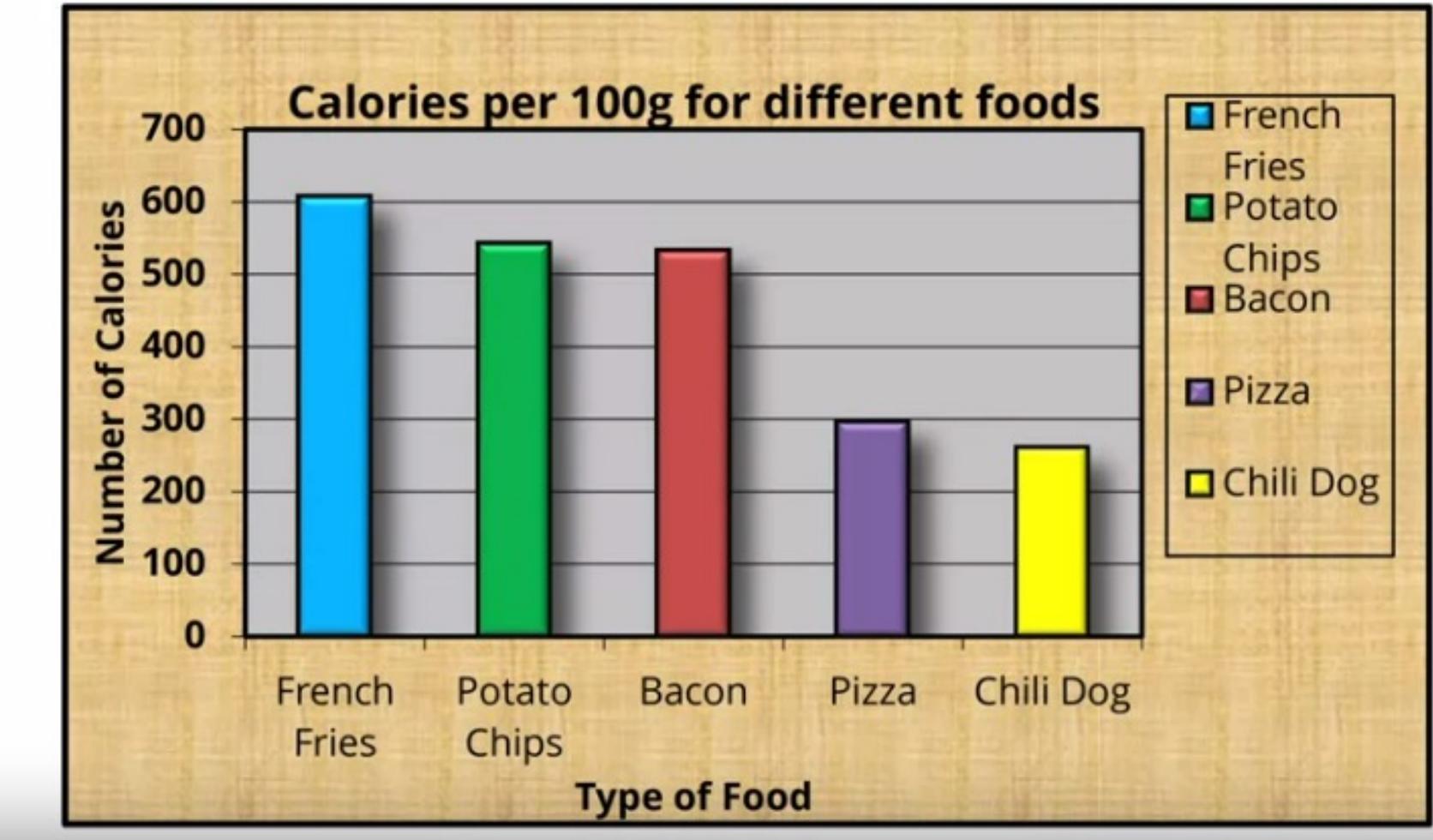
High Data-Ink Ratio

Edward Tufte loves you



DATA INK RATIO

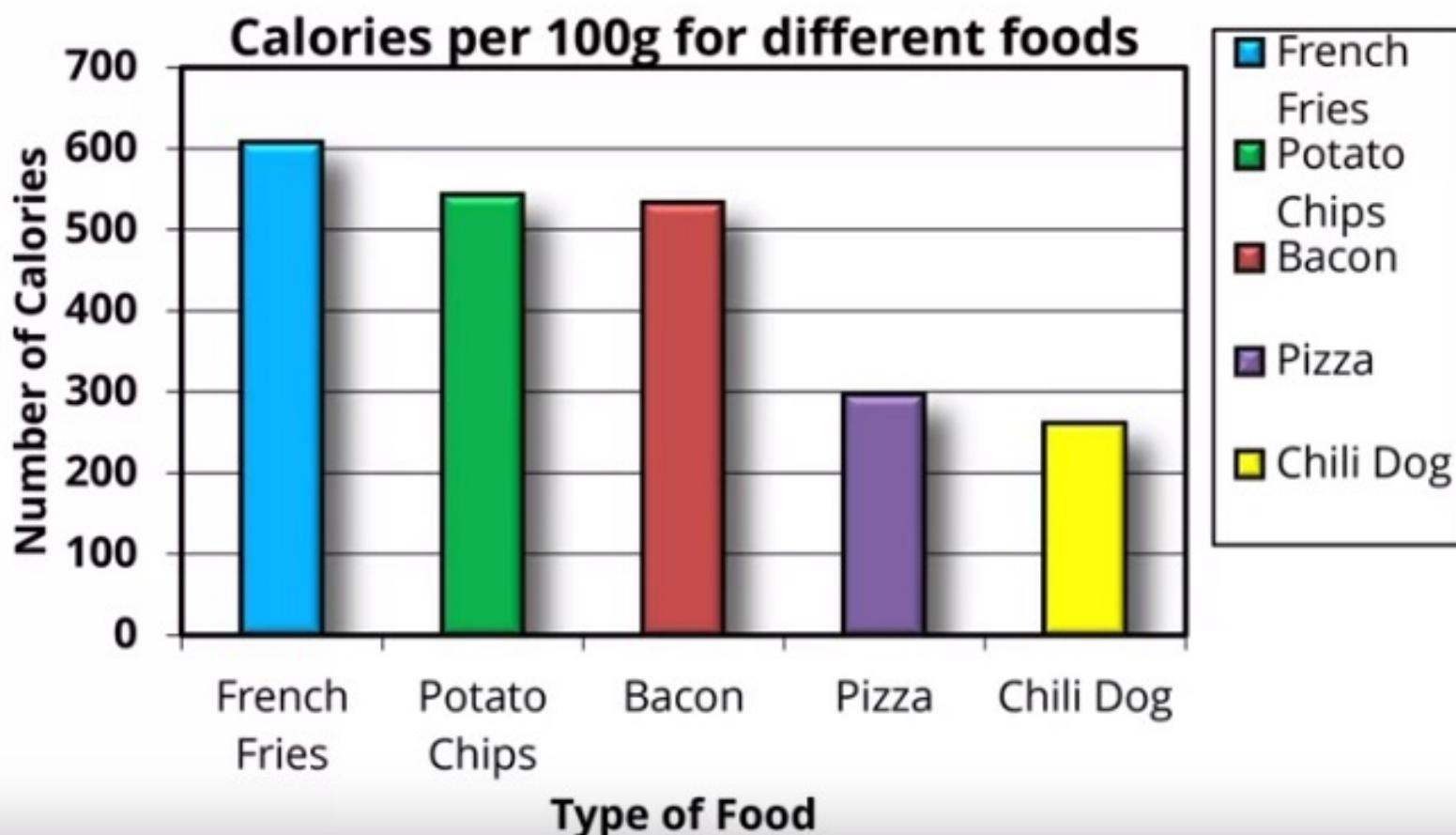
Remove backgrounds





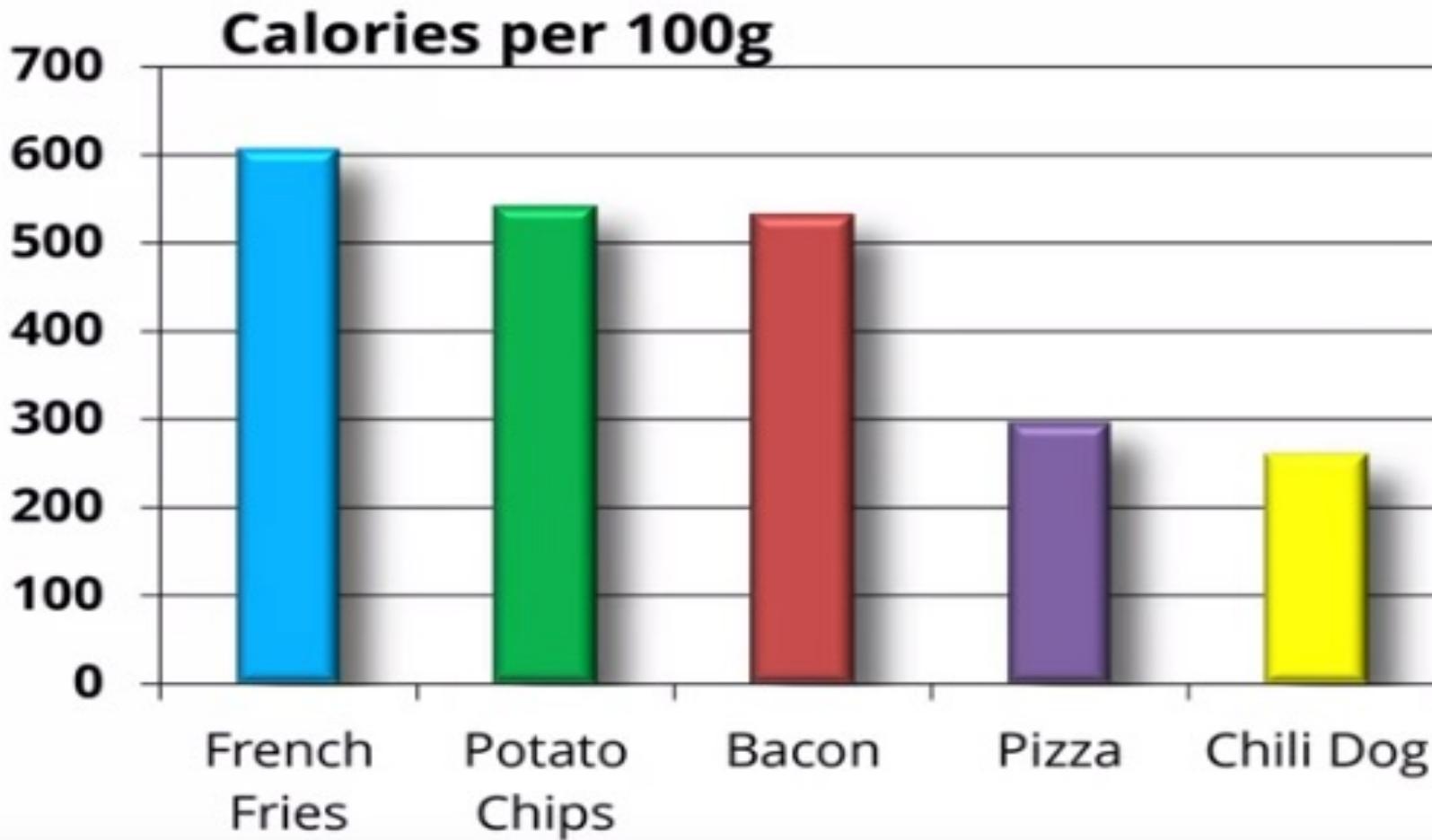
Series Labels

Remove redundant labels

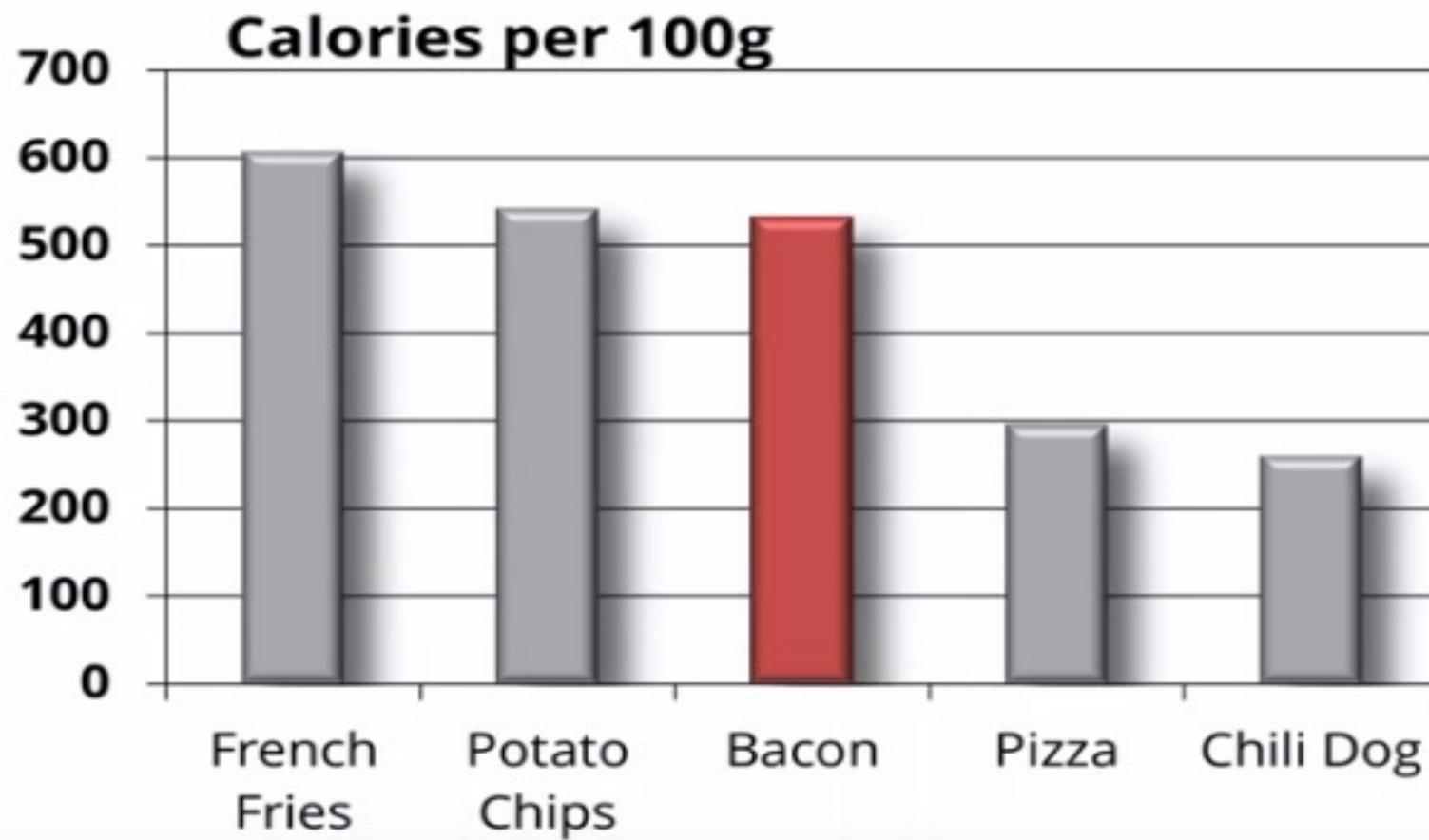


DATA INK RATIO

Reduce colors

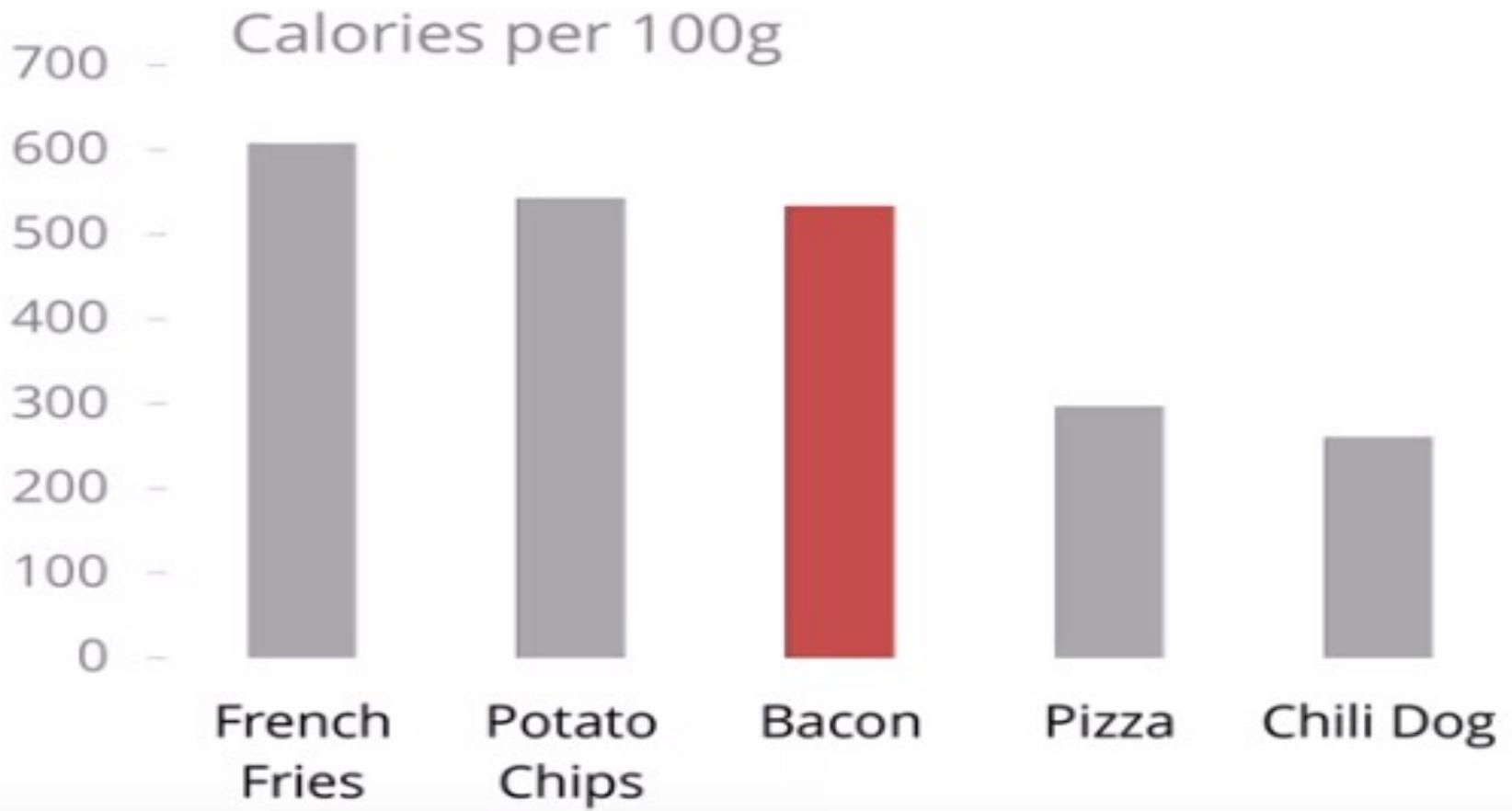


Remove special effects



DATA INK RATIO

Direct label



DATA INK RATIO

Direct label



Calories per 100g

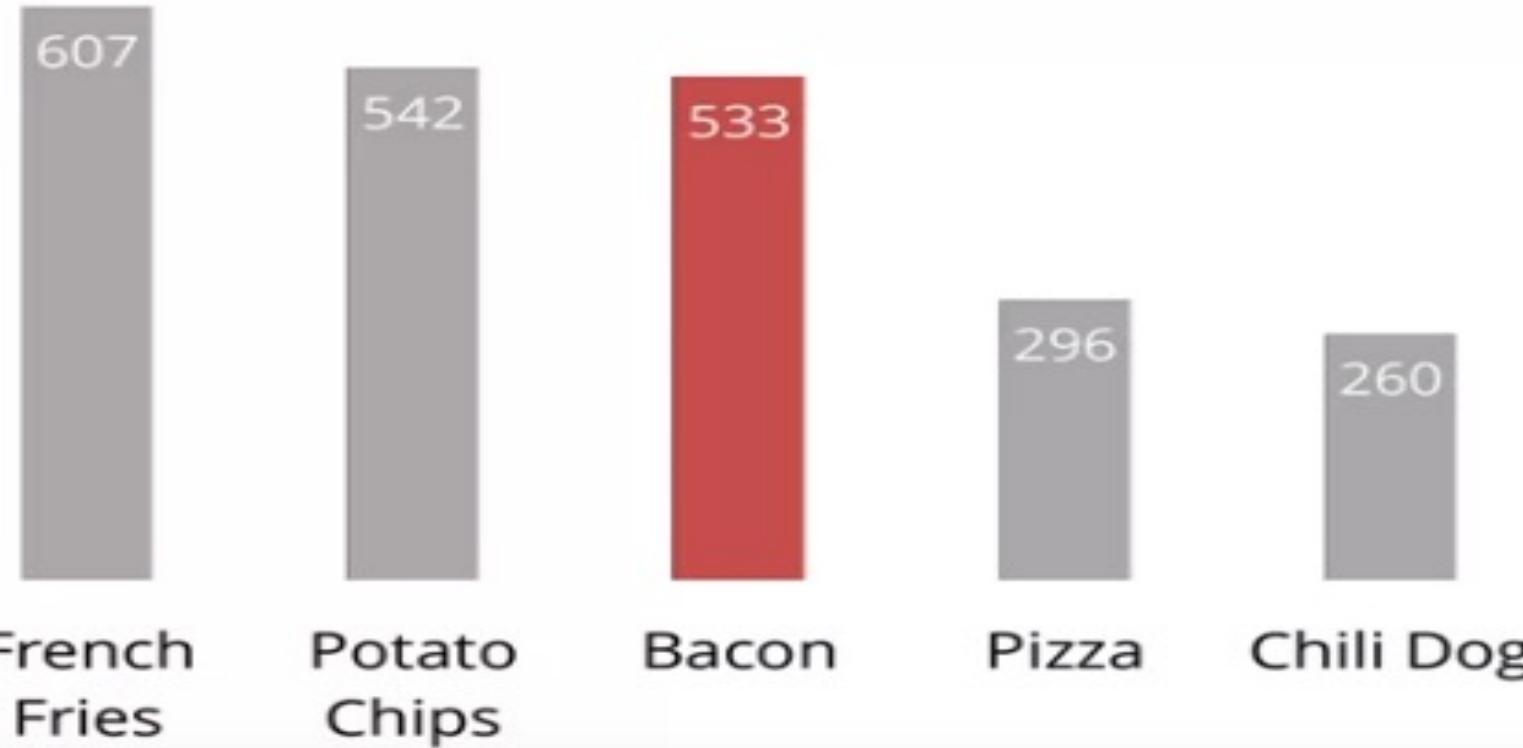


CHART JUNK

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



Top 7: Sales per Country (USD)

Germany	\$2,339,305
France	\$1,676,977
Canada	\$1,046,078
USA	\$720,095
Brazil	\$707,206
Austria	\$700,655
Ireland	\$480,985

- 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

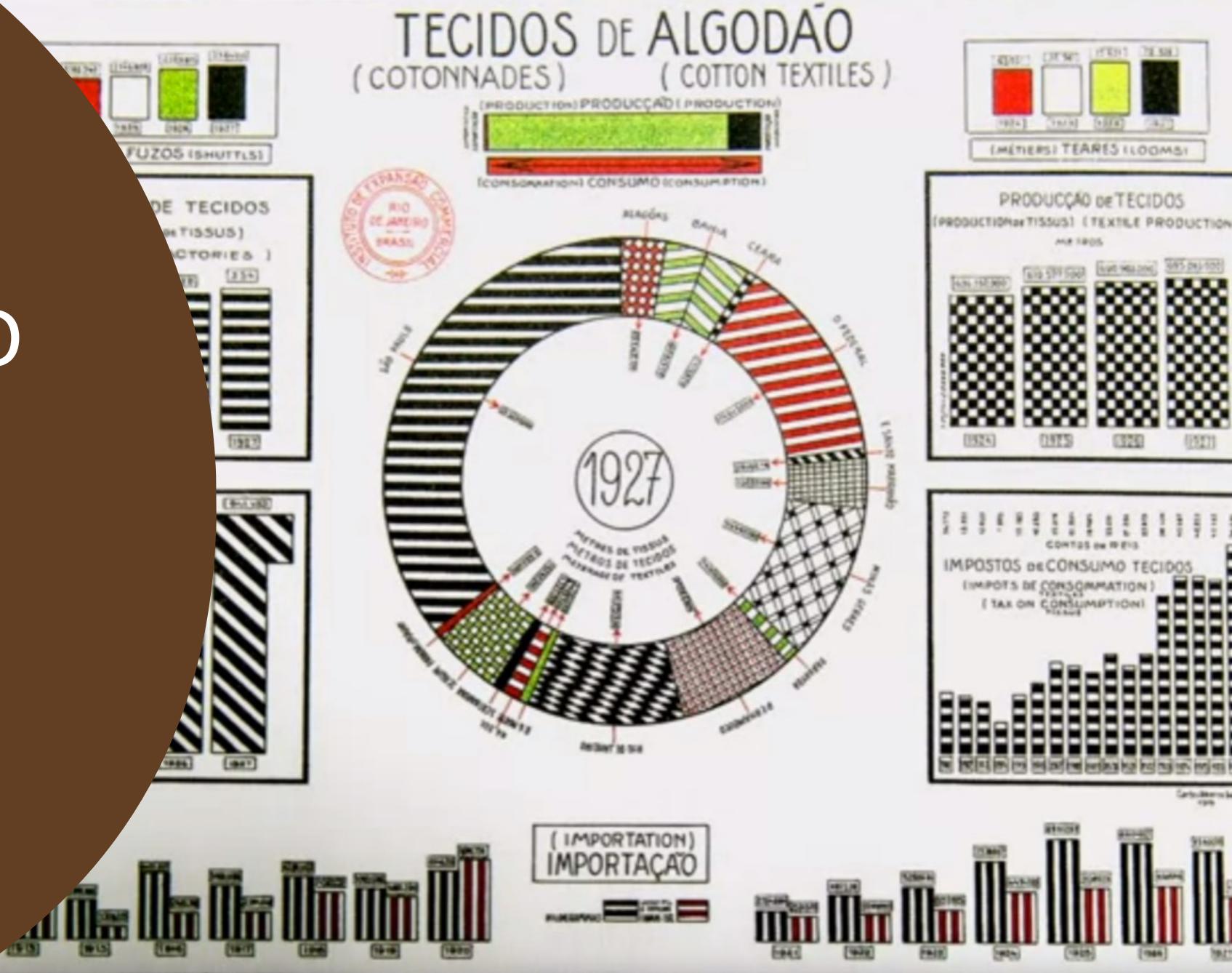
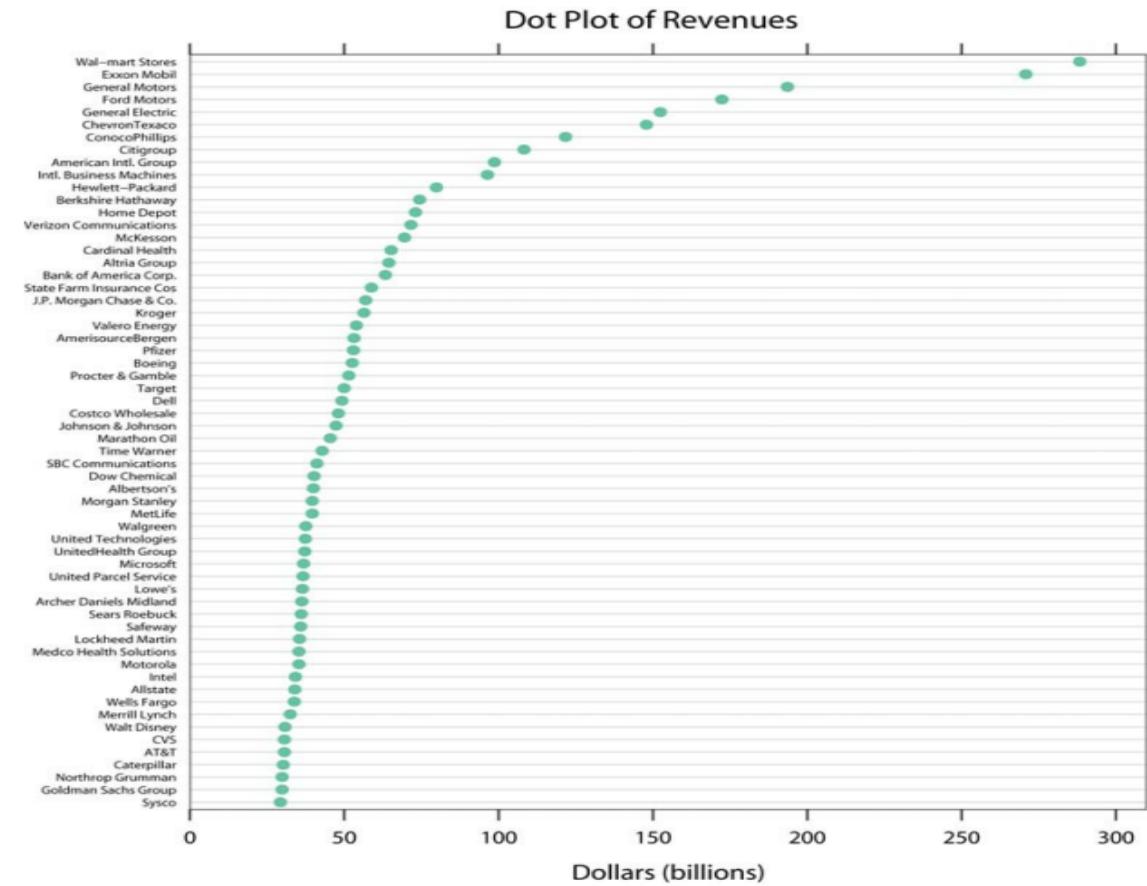
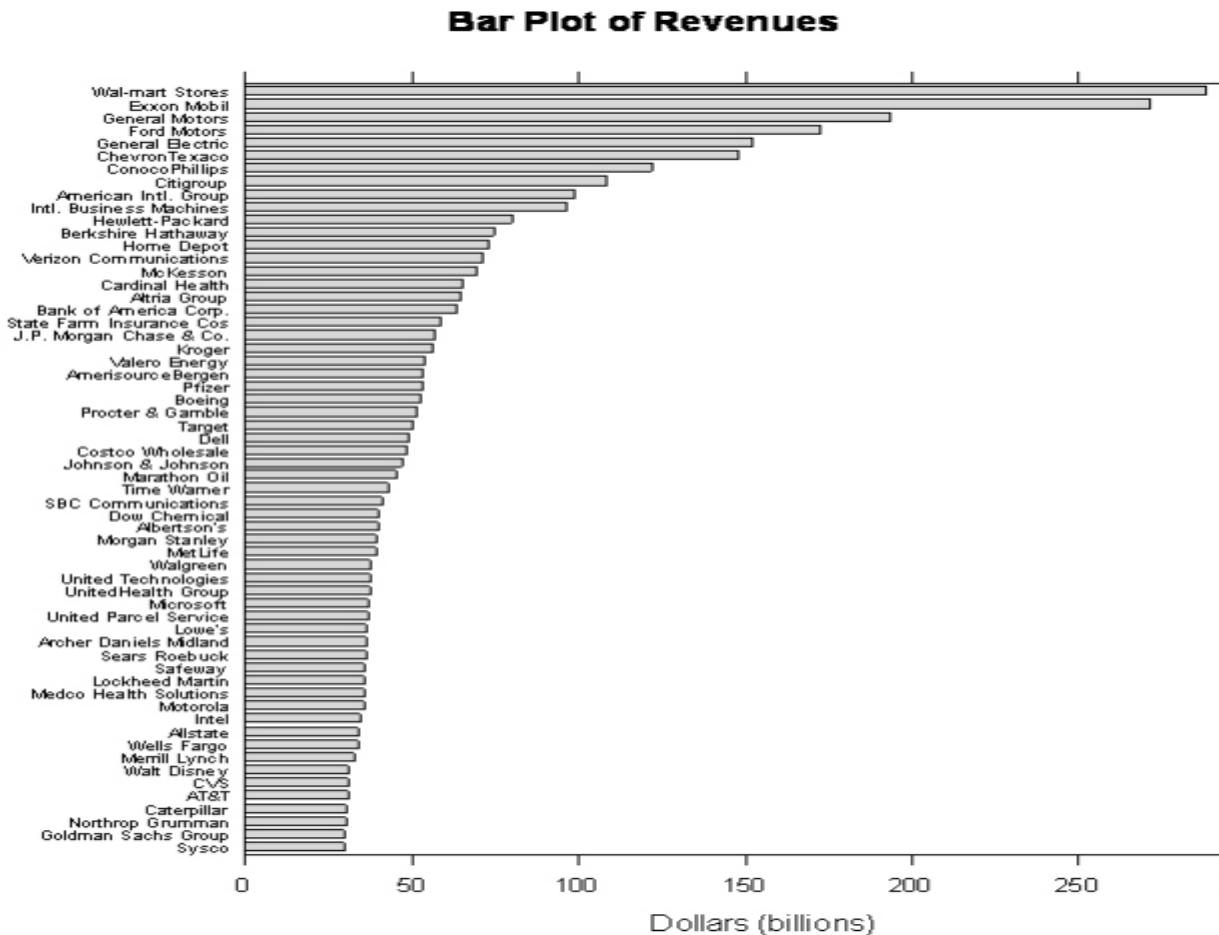




CHART JUNK

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

Lollipop Chart





Bar Chart

LIE FACTOR

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



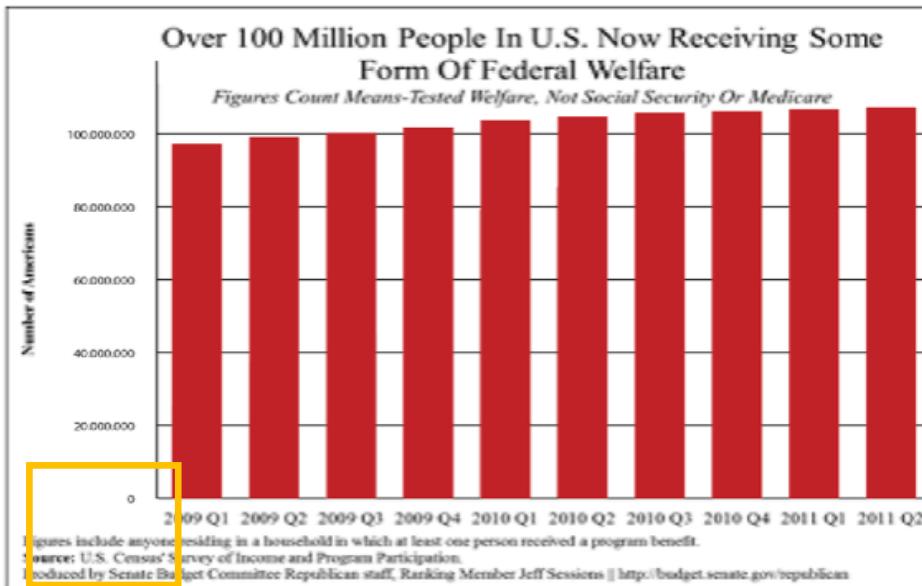
LIE FACTOR

THE BLOG

Over 100 Million Now Receiving Federal Welfare

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

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."



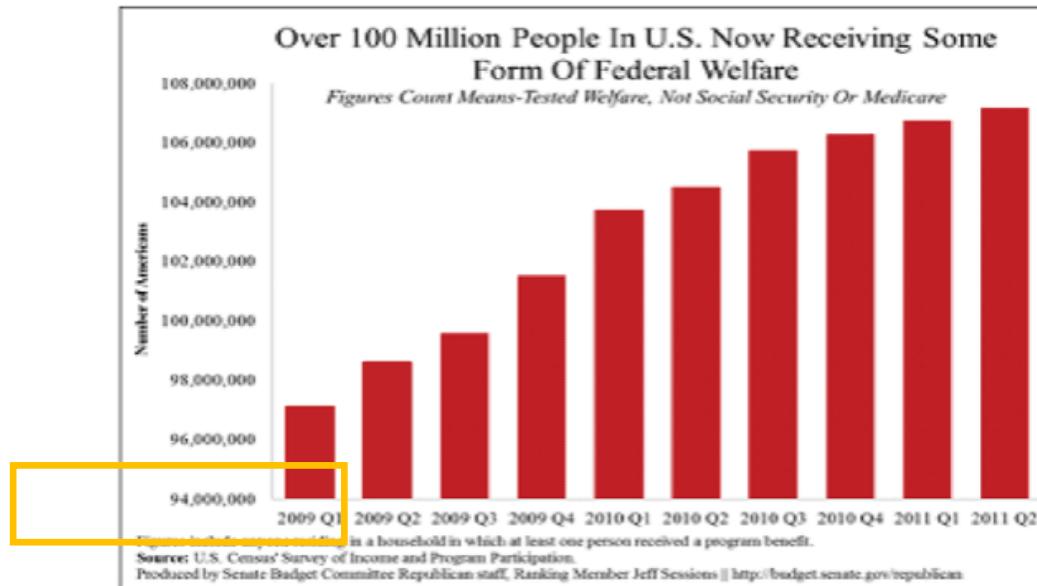
lie factor: 1

THE BLOG

Over 100 Million Now Receiving Federal Welfare

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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: 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
Comparison Trend analysis or Breakdown and ranking									
Part to whole Compare part to total or analyze accumulation									
Series Comparison Compare two or more data series									
Variance Analyze deviation/variance to plan, PY, FC, etc.									
Integrated variance Compare variance to base value (gap analysis)									
Contribution of variance Analyze correlation									

CHART SELECTOR

Chart Suggestions—A Thought-Starter

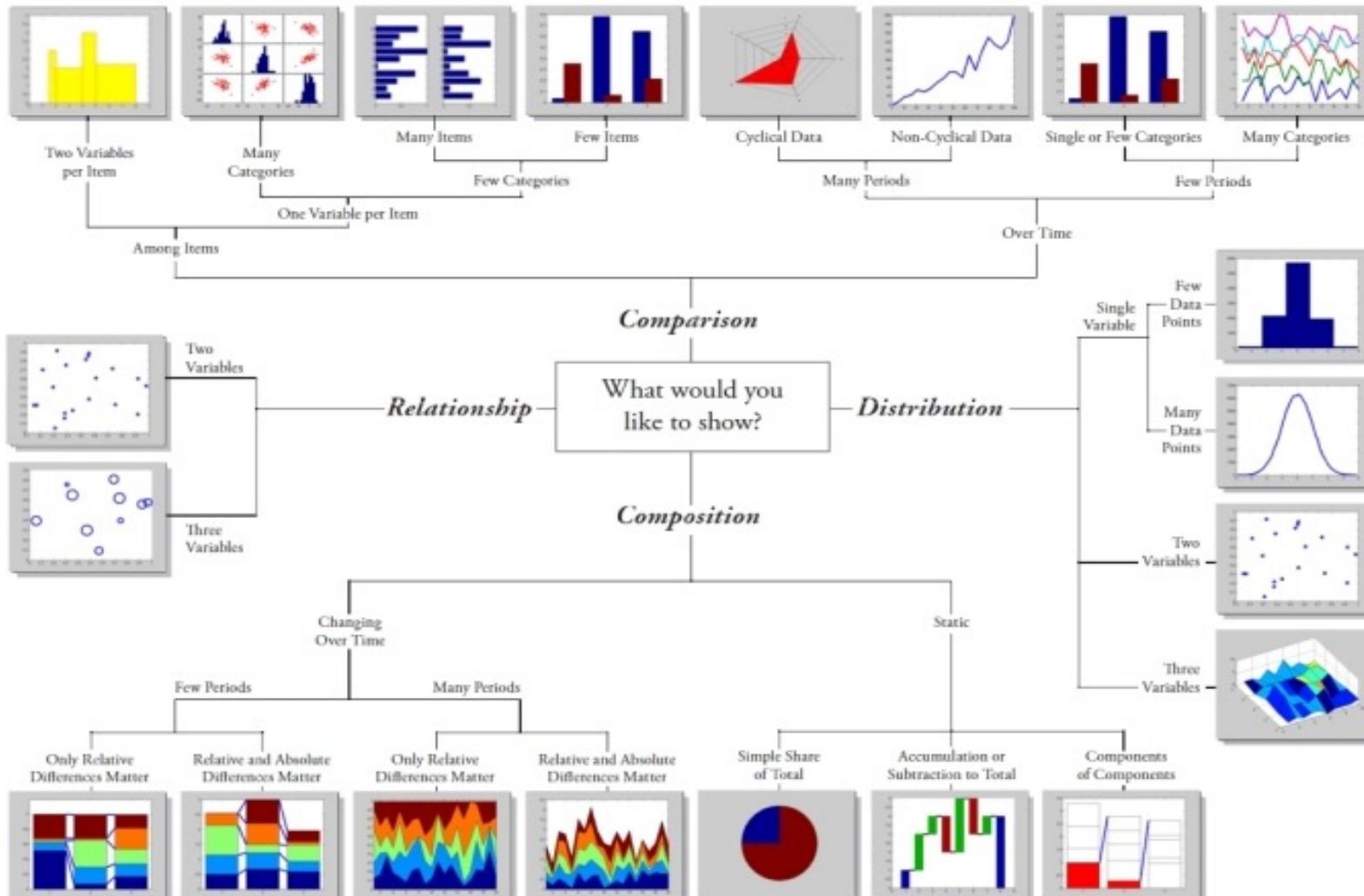
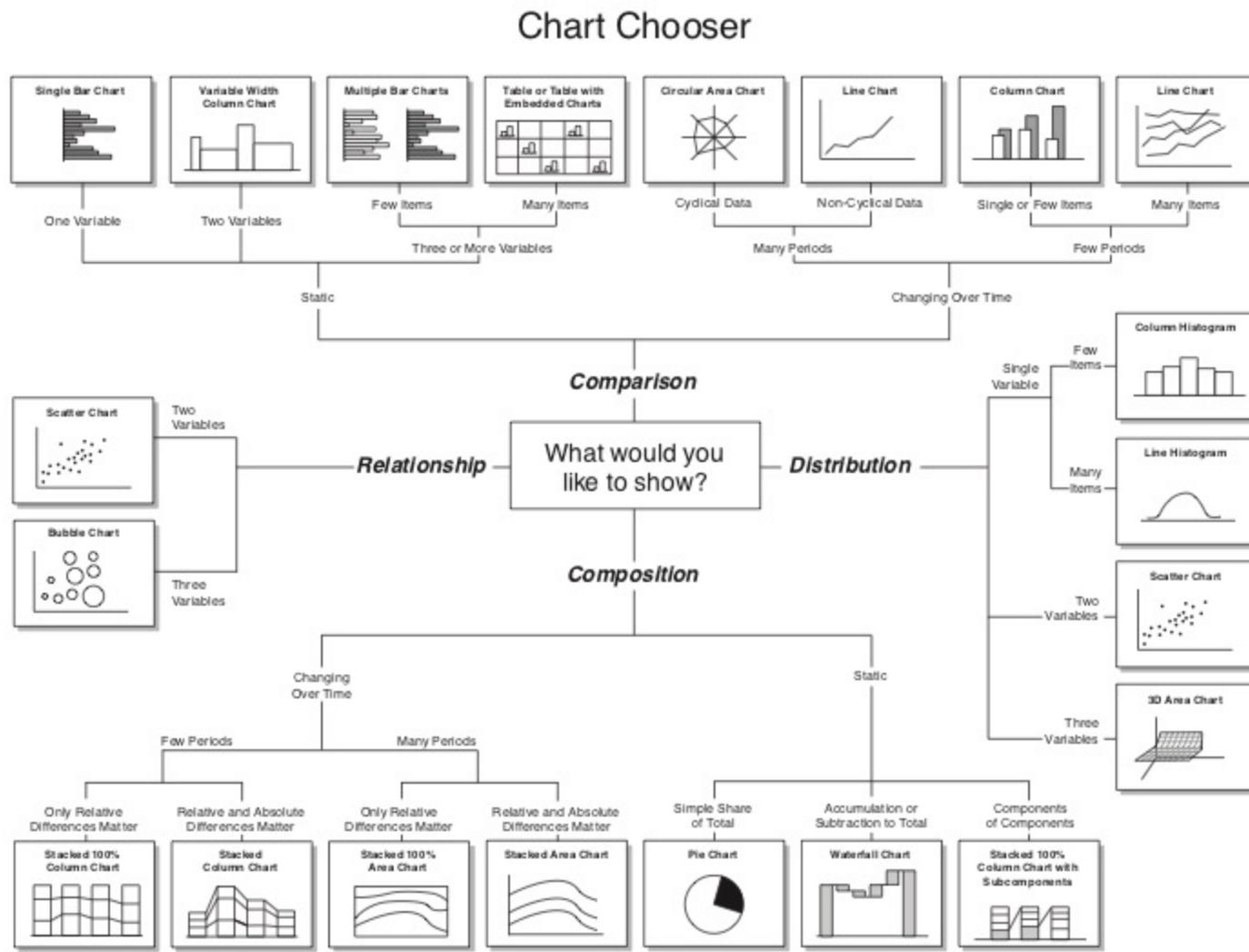


CHART SELECTOR



Choosing a good chart - The Extreme Presentation(tm) Method
(typepad.com)

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www.extremepresentation.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

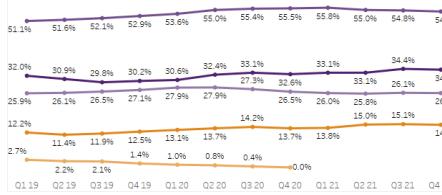
Line Chart

Ideal:

- Time-Series for non-cyclical data
- Identifying trends
- Multiple categories over time

Non-Ideal:

- Distributions
- Relationships
- Composition



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

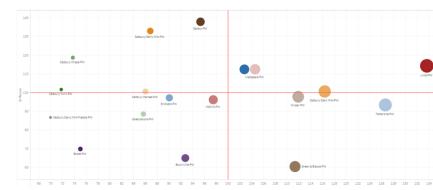
Slope graph



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

The advantage of a slope is that you can show both the relative and absolute change across a dimension. This adds value to category comparisons because users can not only visually identify large relative changes, but focus on the larger absolute differences. Having multiple lines - one for each category - gives the user a lot of information expressed concisely in a single visual.

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



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

Bubble Chart

Ideal:

- Relationship between 3 variables
- Overlay on maps

Non-Ideal:

- Comparing across categories
- Proportions
- Compositions

VISUALIZATIONS – EXISTING RECOMMENDATIONS

Visualizations

Guidelines for choosing visualizations types

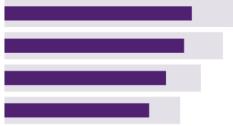
Bar Chart

Ideal:

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- Difference between categories
- Single Variable Distributions (histogram)

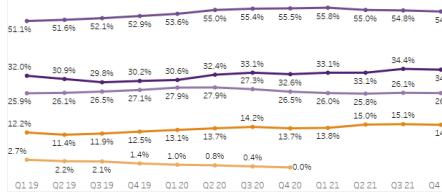
Non-Ideal:

- 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
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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:

- Time-Series for non-cyclical data
- Identifying trends
- Multiple categories over time

Non-Ideal:

- Distributions
- Relationships
- 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

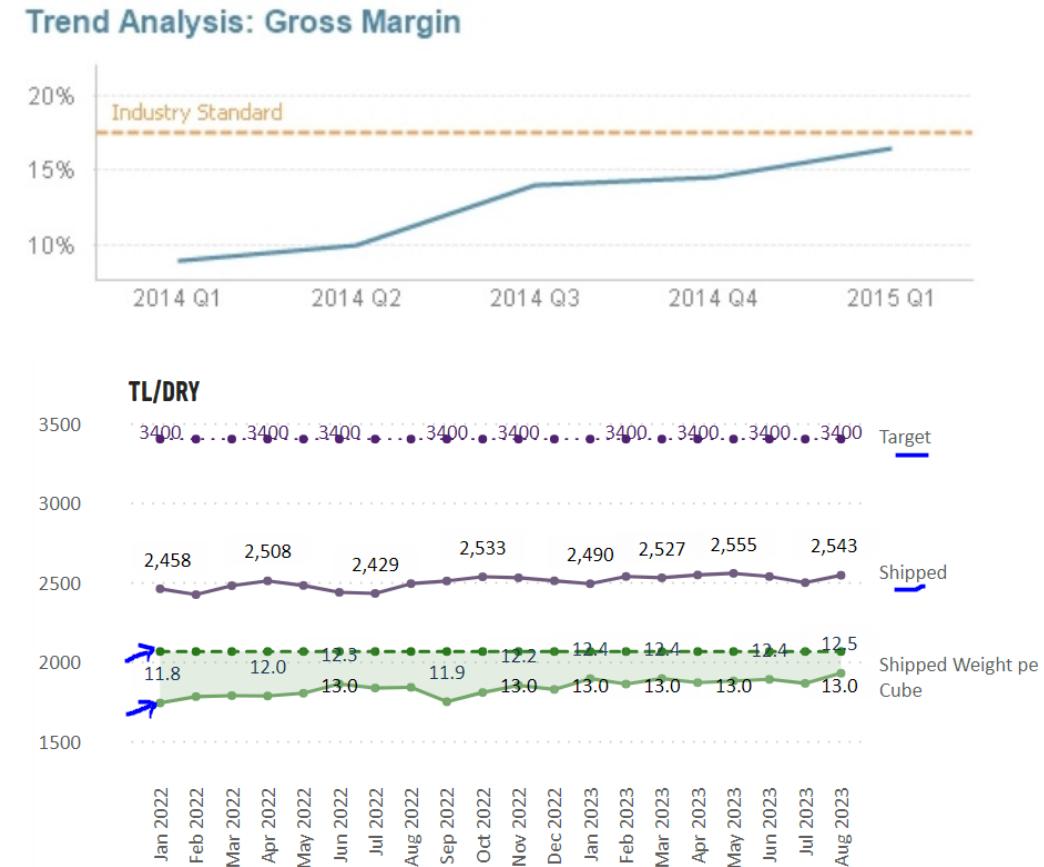
And then you will read this

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.



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

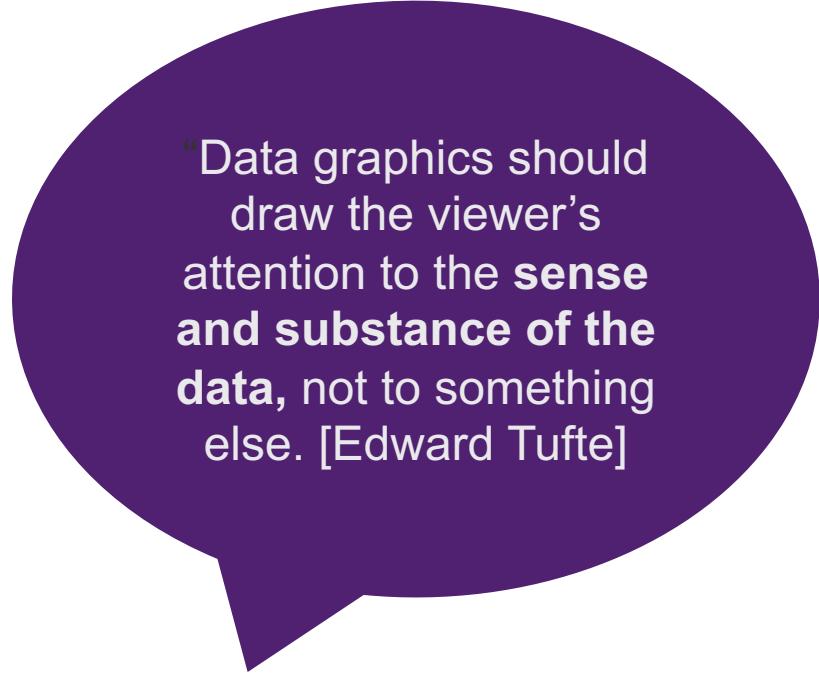
Field Parameters and Calculation groups (use Tabular Editor)

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]

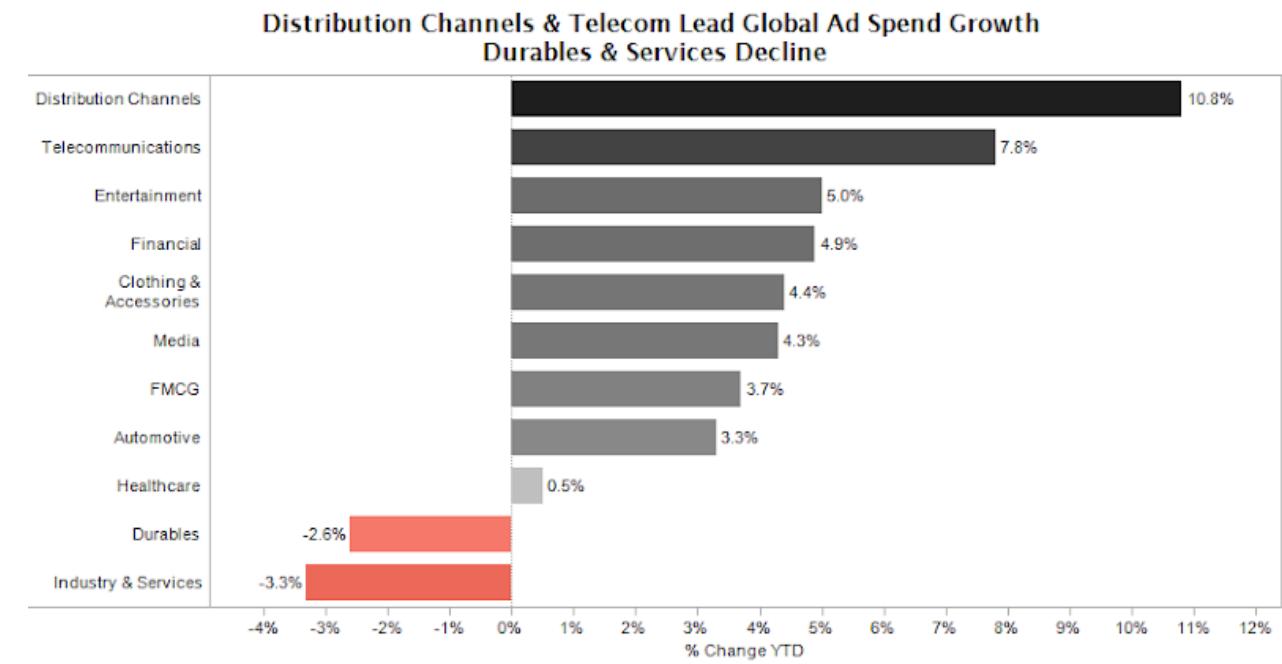
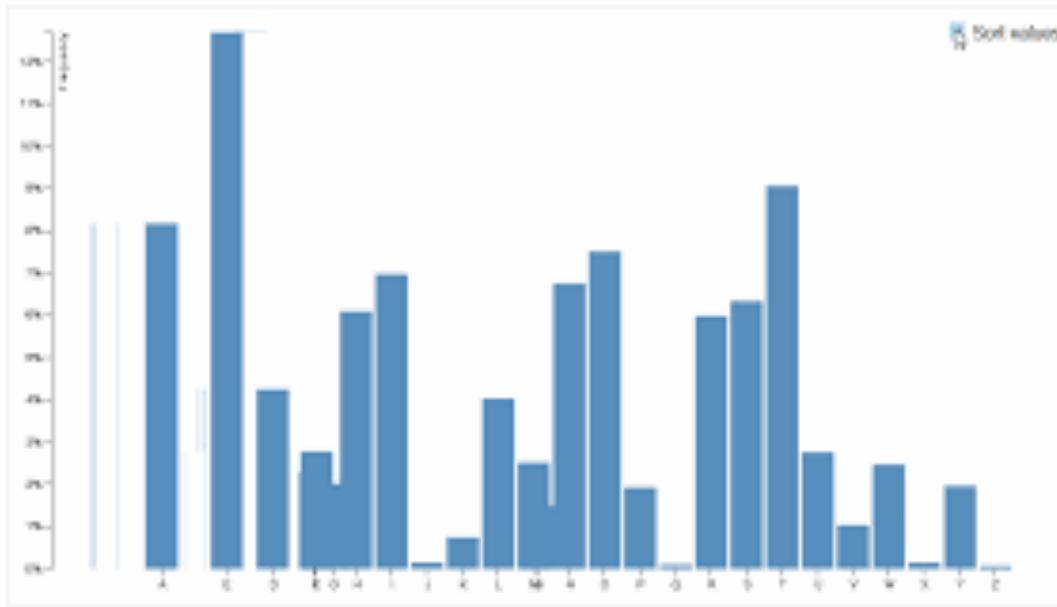
DASHBOARD DESIGN BEST PRACTICES IN POWER BI

SORTING

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

- 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

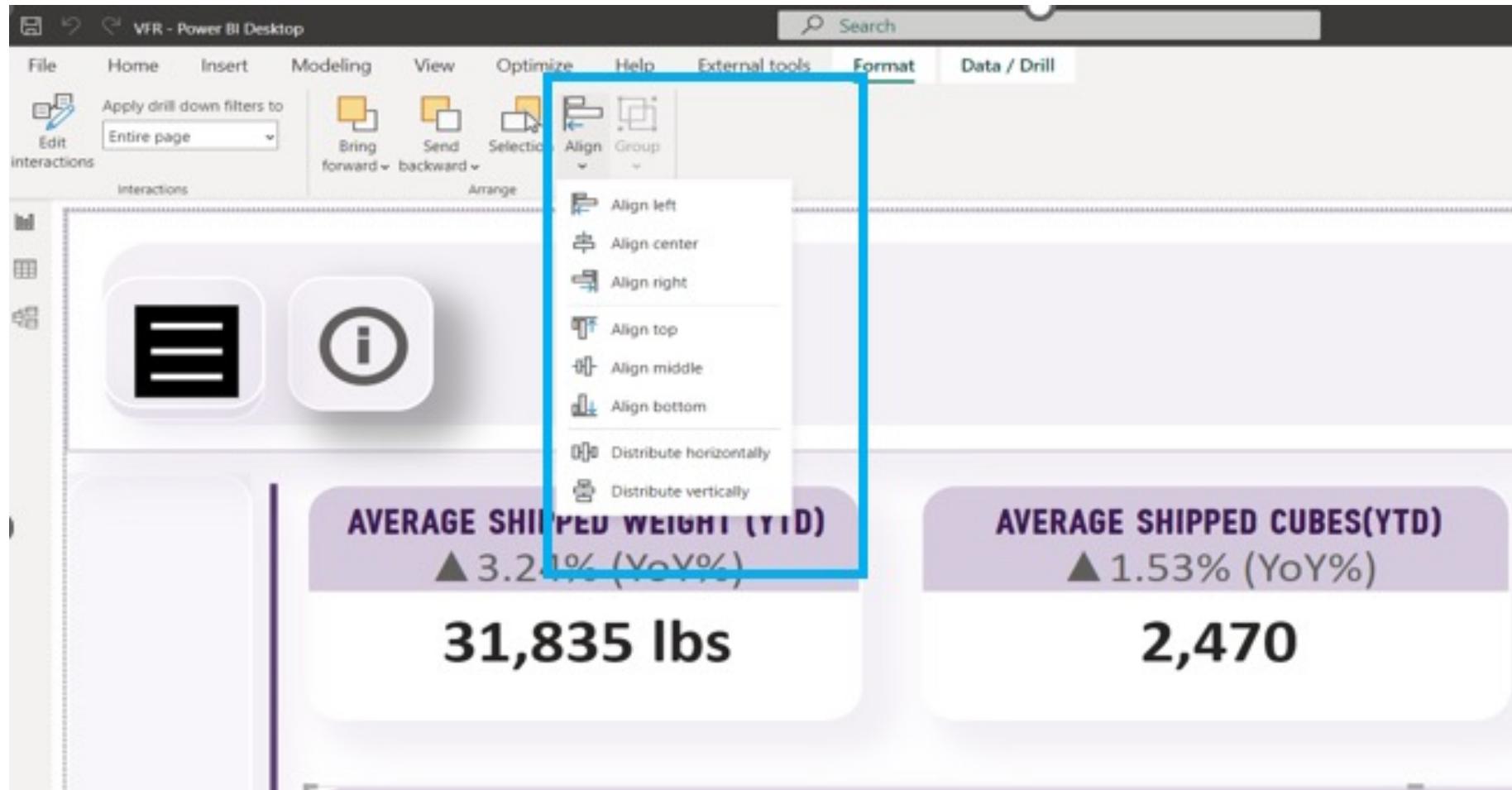
QUICK WINS.....NO ONE IS PAID TO EXPLORE, THEY ARE PAID TO
FIND 

- **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 

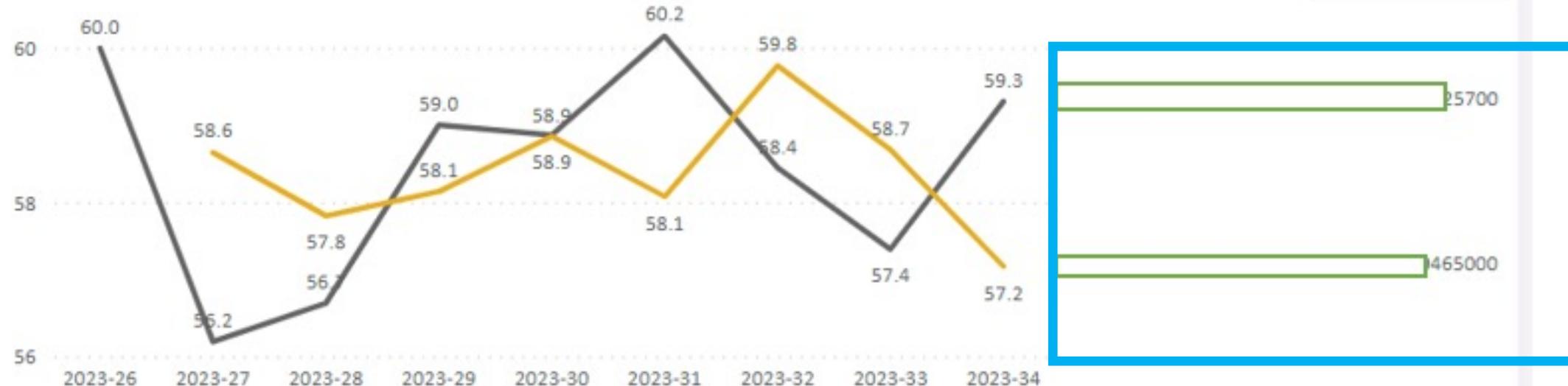


DASHBOARD DESIGN BEST PRACTICES IN POWER BI

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

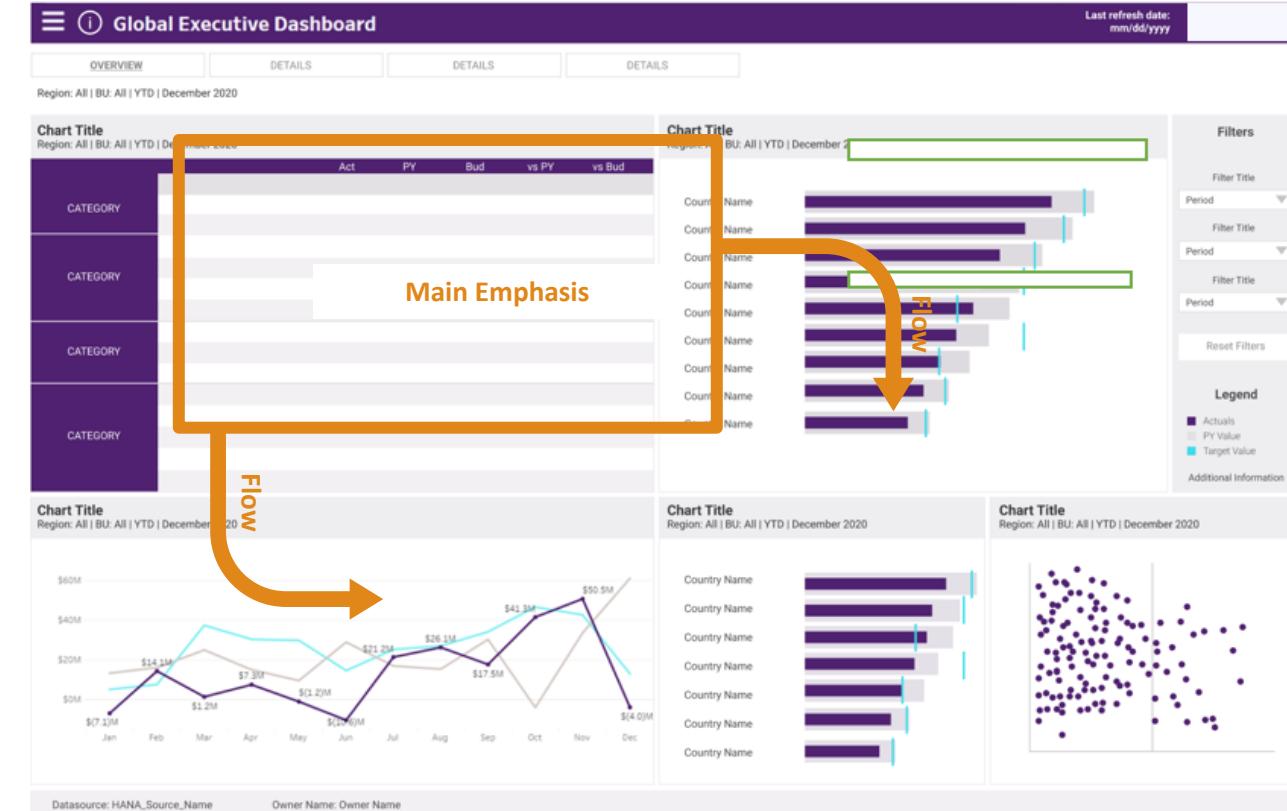
2. Ideal flow is left to right and top to bottom

3. Group global filters/legends together and individual filters/legend with respective visuals

4. Use consistent colors/layouts

5. Separate visually using borders

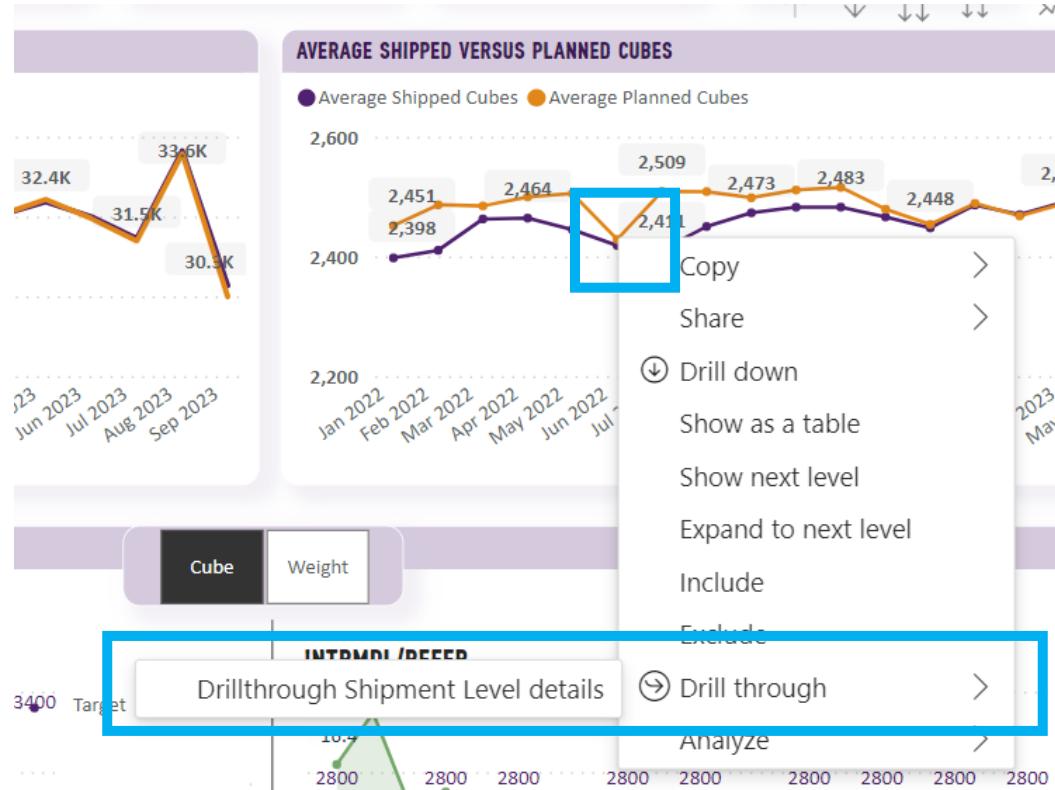
6. Keep tables and details towards the bottom/right



VISUALIZATIONS – DRILLTHROUGH FOR DETAILS

DRILLTHROUGH

Visuals that are specific for the business analysis



SHIPMENT DETAILS DRILL THROUGH

Date Range:

Origin	Origin Type	Destination	Destination Type	Mode/Tmp	Average Weight/Pallet	Average Cube/Pallet
Total	EMM	MORRIS L INC	RDC	TL/DRY	347.59	97.99

BOL LEVEL TABLE

BOL Document	Mode	Temp	Shipped Weight	Max Weight	Shipped Weight Under Planned %	Shipped Cubes	Max Cube	Shipped Cube Under Planned %
TL	DRY	11760	44,320.00	75.33%	5,313	5,400.00	1,361	1,361%
TL	DRY	11760	44,320.00	75.33%	5,313	5,400.00	1,361	1,361%
TL	DRY	11760	44,320.00	75.33%	5,313	5,400.00	1,361	1,361%
TL	DRY	11760	44,320.00	75.33%	5,313	5,400.00	1,361	1,361%
TL	DRY	10280	44,320.00	77.14%	2,840	5,400.00	16,47%	16,47%
TL	DRY	14555	44,320.00	67.43%	2,573	5,400.00	24,325	24,325%
TL	DRY	8810	44,320.00	80.00%	2,485	5,400.00	28,911	28,911%
TL	DRY	8810	44,320.00	80.00%	2,485	5,400.00	28,911	28,911%
TL	DRY	8810	44,320.00	80.00%	2,485	5,400.00	28,911	28,911%
TL	DRY	8400	44,320.00	80.99%	2,366	5,400.00	30,415	30,415%
TL	DRY	8400	44,320.00	80.99%	2,366	5,400.00	30,415	30,415%
TL	DRY	7980	44,320.00	81.90%	2,148	5,400.00	33,881	33,881%
TL	DRY	7980	44,320.00	81.90%	2,148	5,400.00	33,881	33,881%

SHIPMENT MATERIALS

BOL	Material Full	Ordered Weight (lbs)	Shipped Weight (lbs)	Ordered Cubes	Shipped Cubes
Total		10,080	3,840		
		2,100	582		
		12,180	3,411		

VISUALIZATIONS – MULTIPLY USING CALCULATION GROUPS

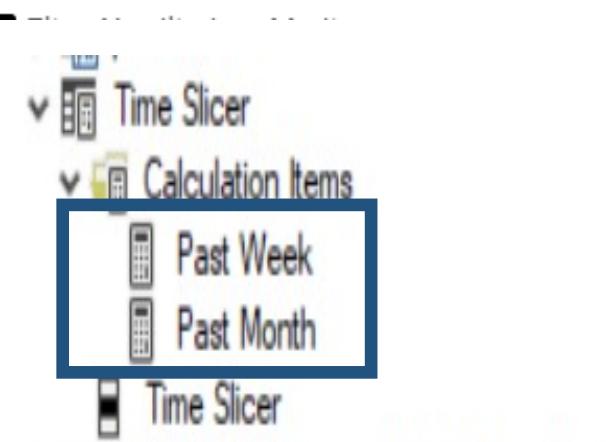
PARAMETERS

💍 ONE GROUP TO RULE THEM ALL

X MATRIX

	SELECTEDMEASURE()	CALCULATION ITEMS
Month Name	Total Sales	
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		44,365,028.02	44,365,028.02	
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

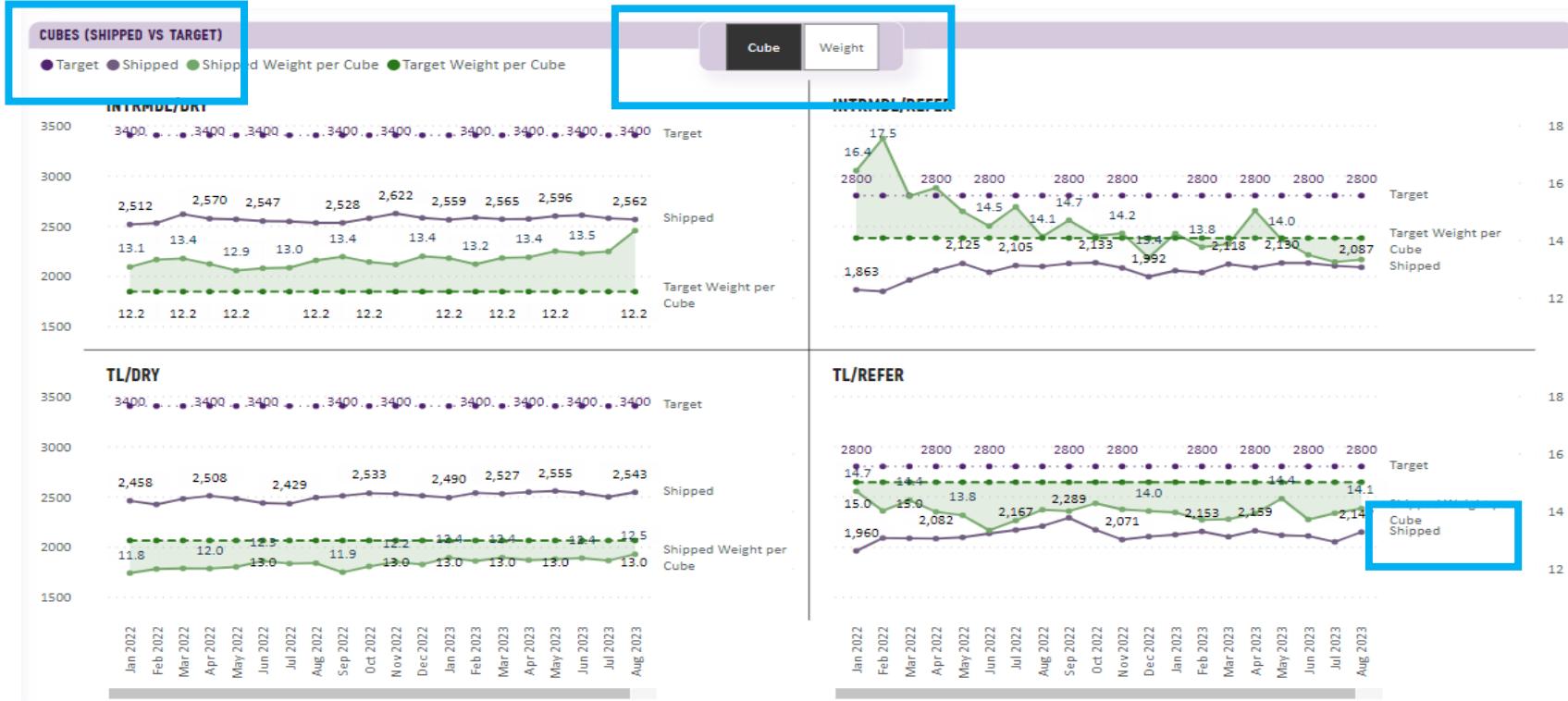
ONE GROUP TO RULE THEM ALL

X AXIS | X VISUALS

CASES OVERHANG ANALYSIS

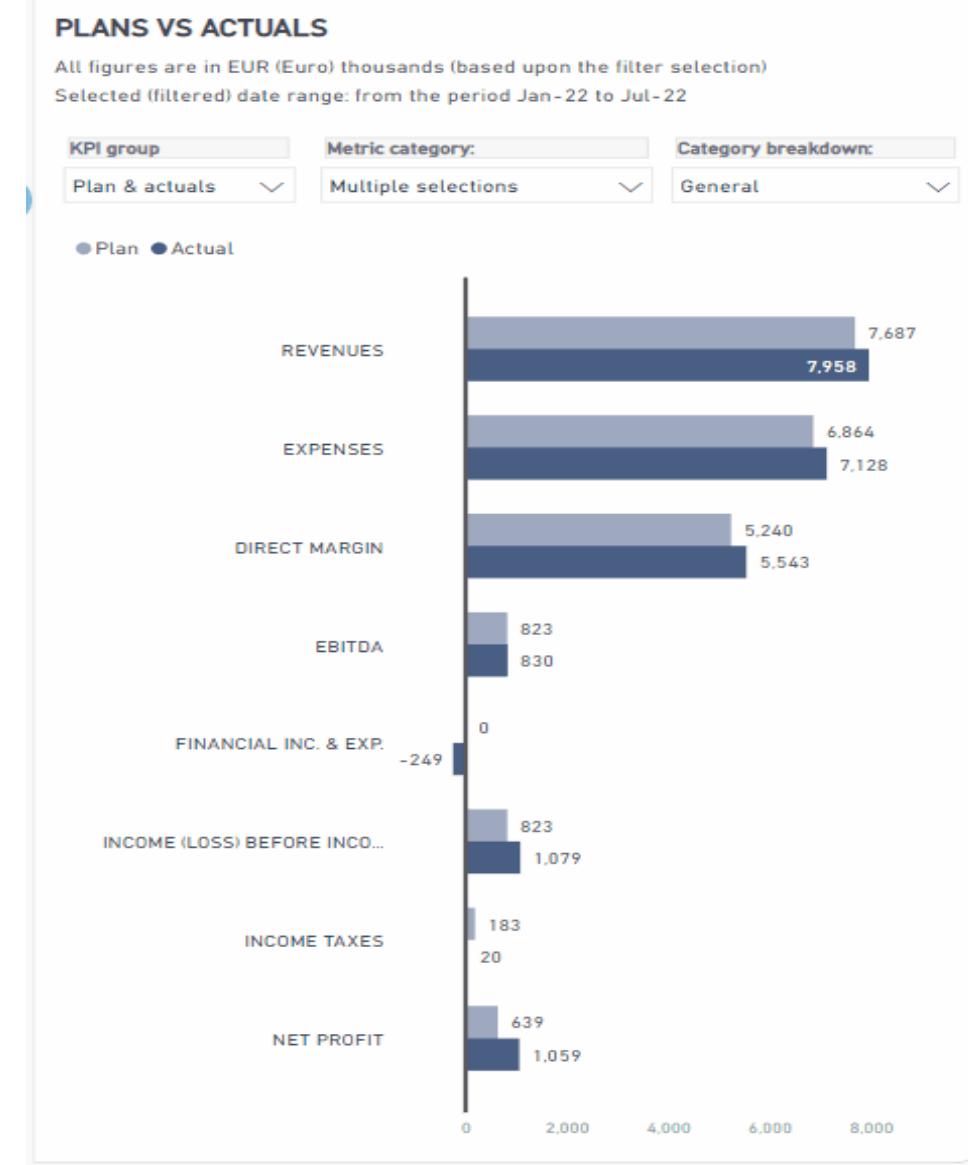
1/1/2023 - 5/31/2023

Number of materials to rank (1-30): Apply Top "N" filter: NO YES Rank Materials By: Shipped Pallets % Ordered Pallets % Shipped Cases % Ordered Cases %



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

1/1/2023 - 5/31/2023

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 Ordered
	48,522	100.00%	2,841,096	100.00%	52,063	100.00%	3,128,204	100.00%	
34	22.52%	4,750	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

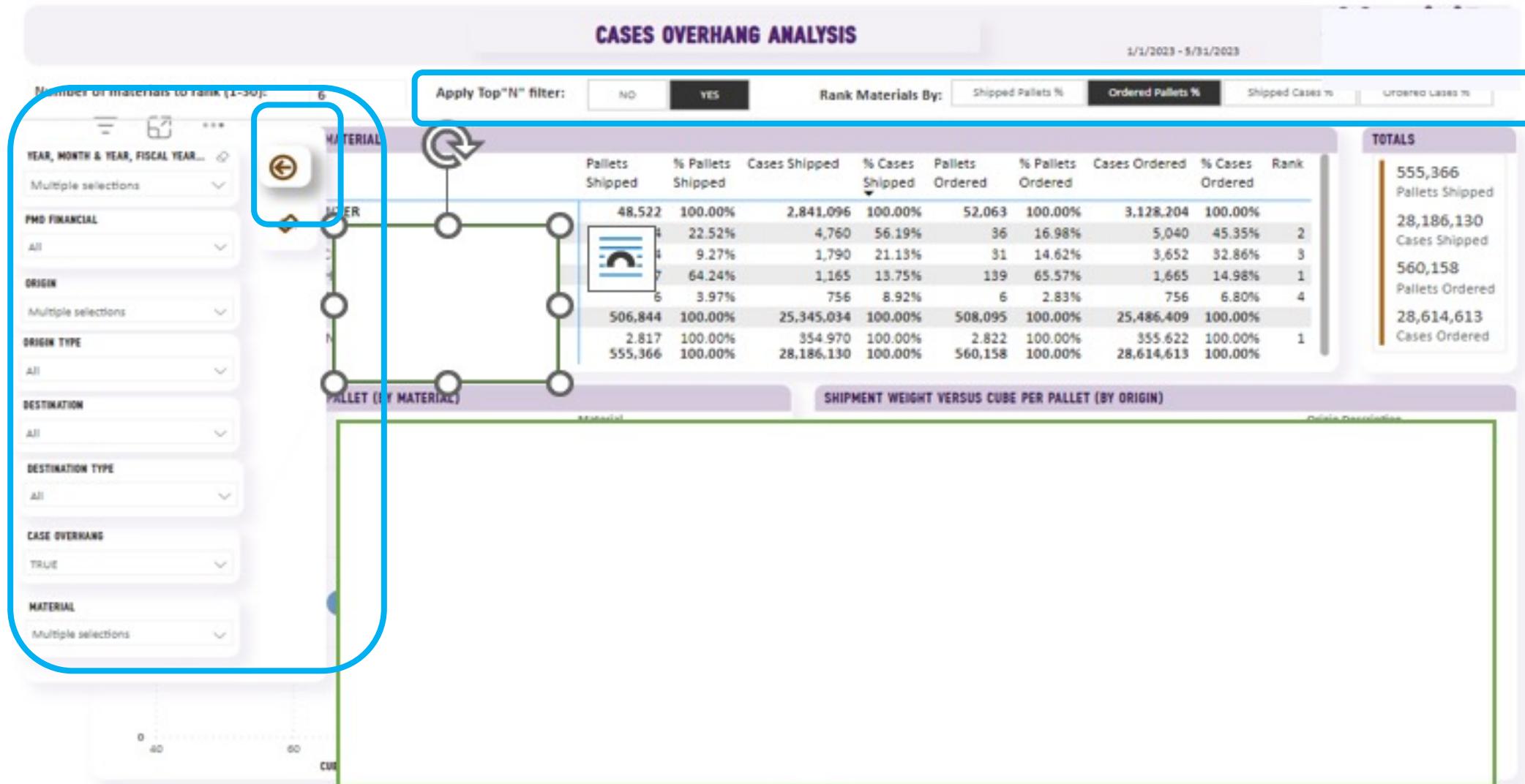
→

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

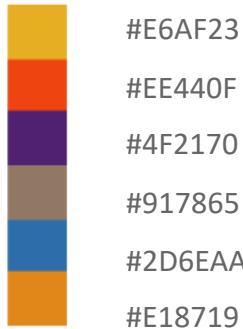
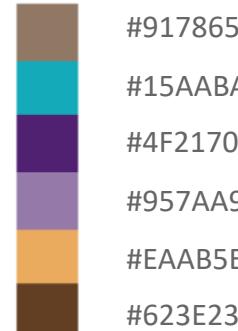
- – Actuals – #4f2170 || Purple
- – PY Value- #DEDBE0 || Light grey
- – value – #7ff1f2 ||
- – Alert – #E18719 || Orange
- – Negative value (#a52323) || Red
- – Positive value (#287819) || Green

COMPANY THEME COLORS

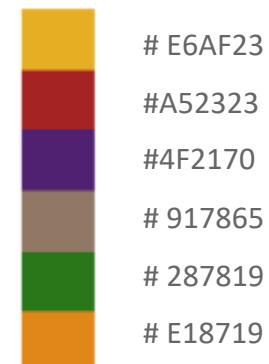
Import Color Palette using company theme

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

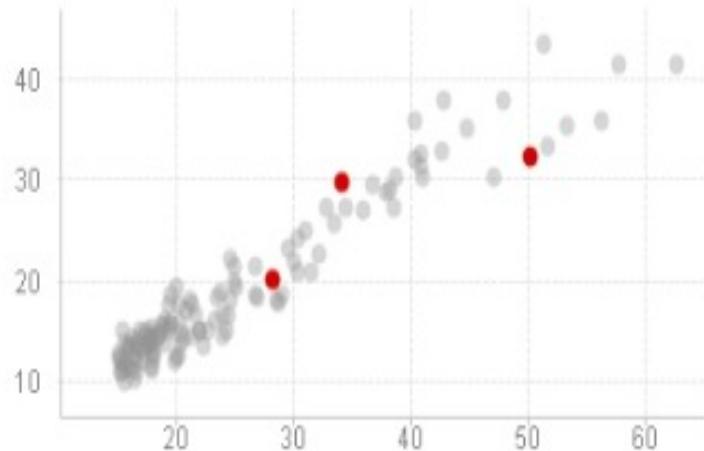
Refers to all the elements that distract the viewer from the actual information in a graphic.

HOW MANY 2s CAN YOU FIND?

54687**2**013**2**46654687843
21760513**2**1687065013**2**0
6846**2**103135**2**587750861

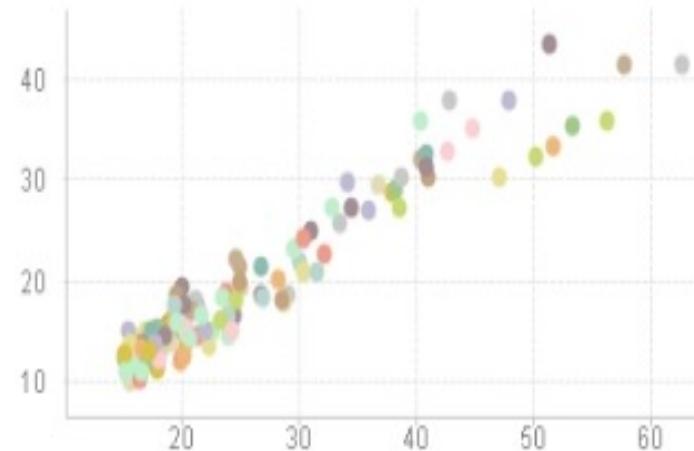
Color Contrast

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



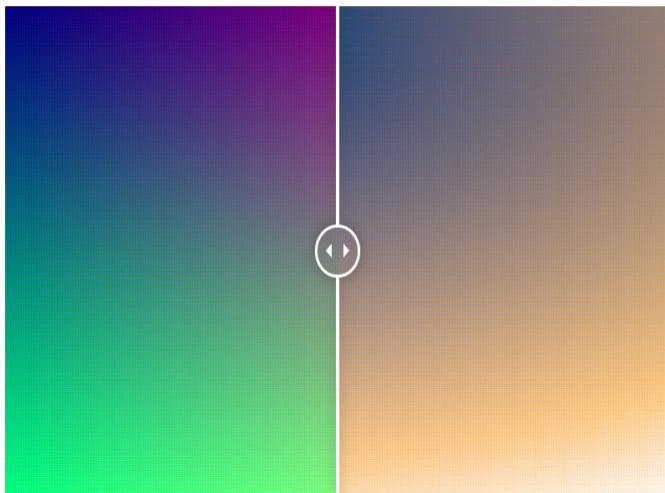
RESOURCES FOR DESIGNING FOR THE COLOR BLIND

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.

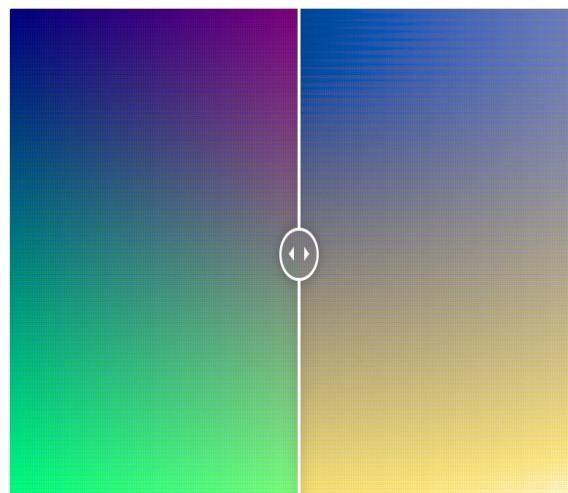
Green (deutan) color blindness

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

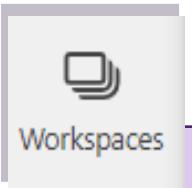
User Experience



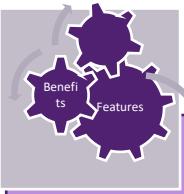
- Add links for users to report issues and submit requests/ideas
- Synchronize slicers where necessary
- Set interactions between visuals

REPORT TRAINING CHECKLIST

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



- 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 \(delta-assoc.com\)](#)