



# Data Visualization in Power BI

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# Lorenzo Vercellati



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ITALIA

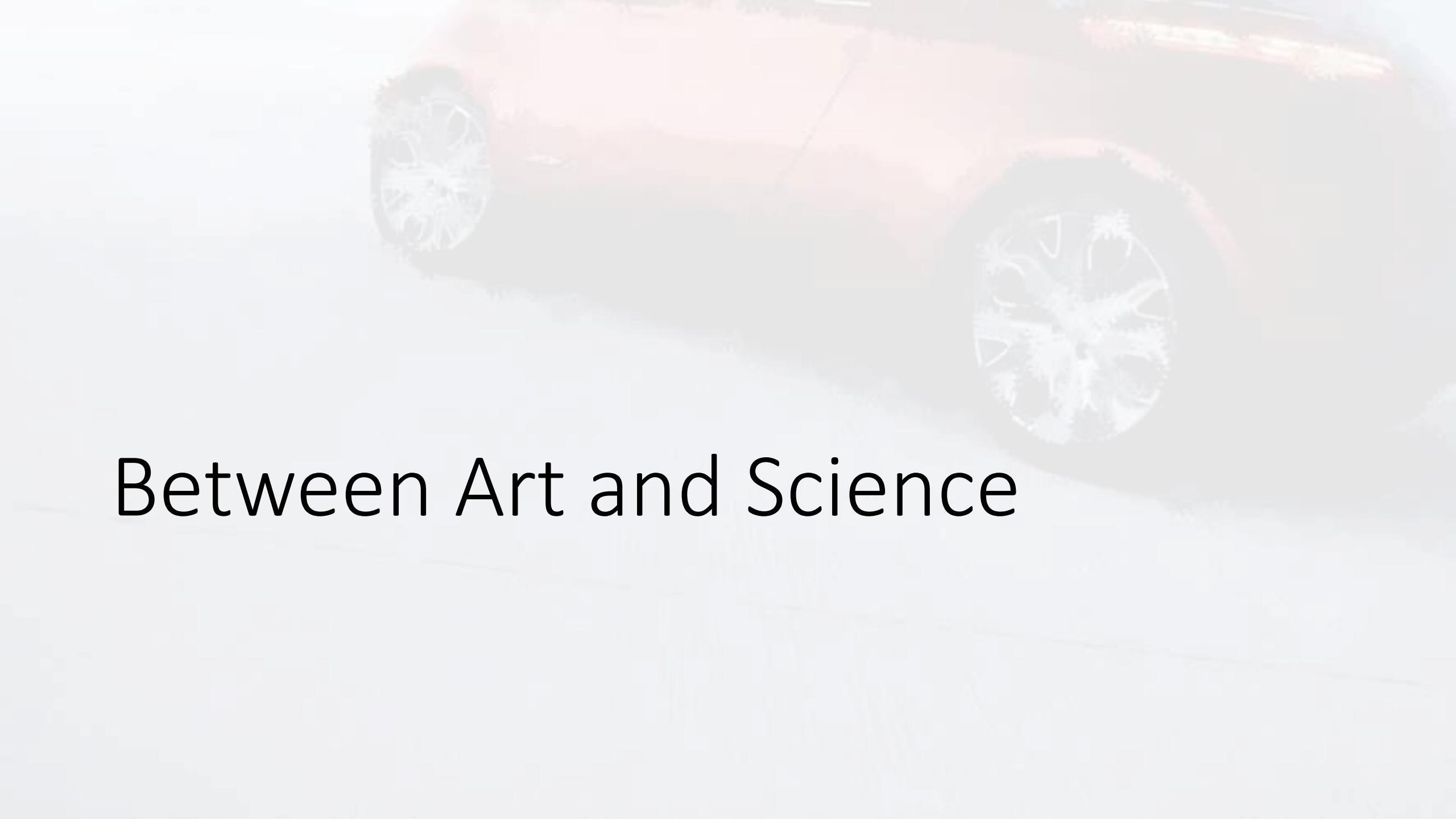
BI & Power BI Architect @ Lucient Italia  
20 years burning on “Data Realm”  
Giving my little contribution to the  
community



A photograph of a massive iceberg floating in the ocean. The top portion of the iceberg is white and jagged, while the submerged base is a deep, translucent blue. The surrounding water is a clear, vibrant blue.

# Session Goals & Agenda

- Identify the best practice to develop an effective and efficient data visualization
- Who is a data storyteller?
- Types and Goals of a data visualization
- Visualization Guidelines
- Main visuals Best practices



Between Art and Science



# Skills

## Artistic Half Skills

- Communication
- Innovation
- Taste

## Scientist Half Skill

- Perception Rules
- Visualization Best Practices
- Data Storytelling Theory
- Power BI Tips & Tricks

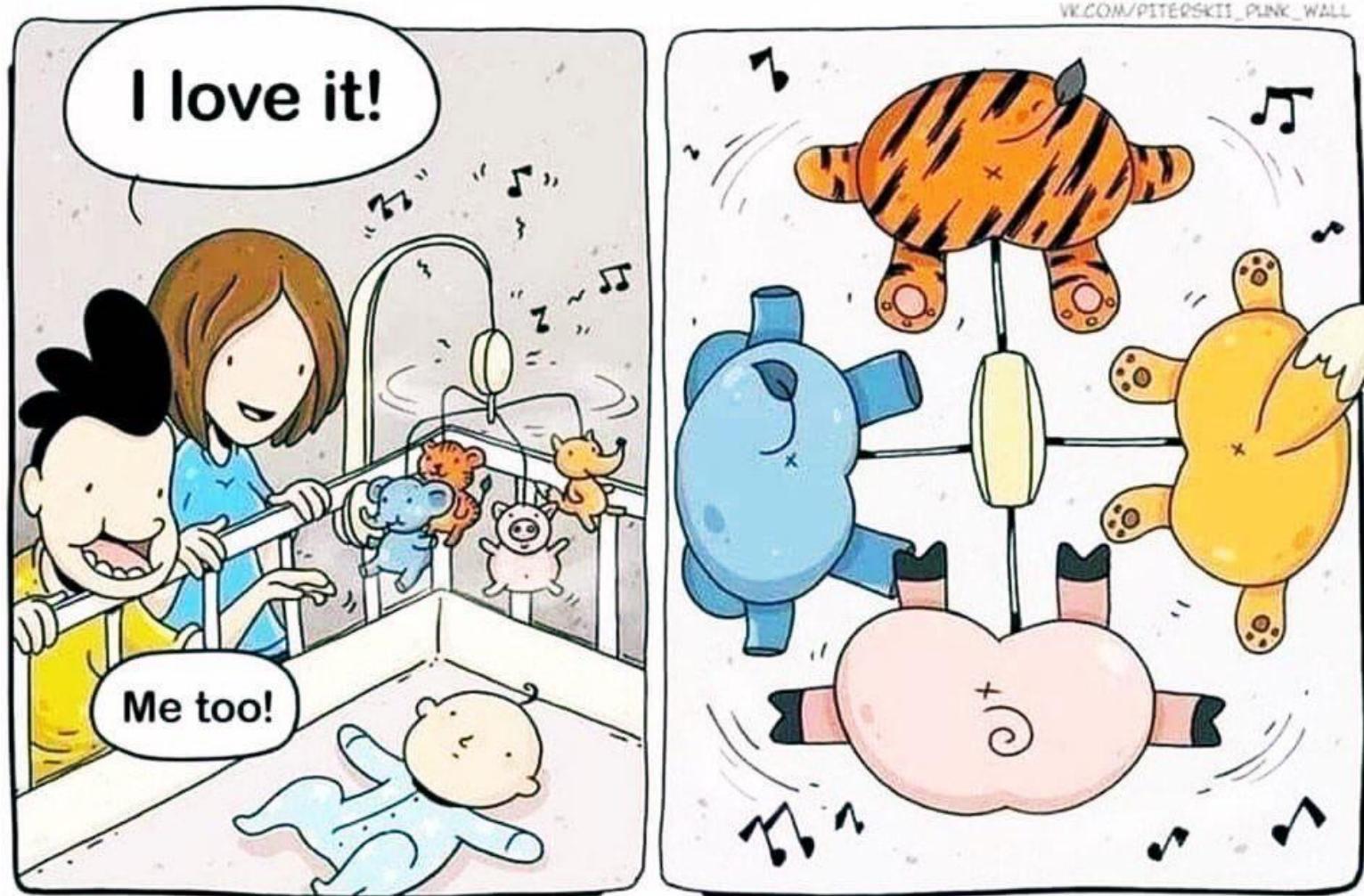


*“Hard Work never beats Talent  
when Talent works hard”*



# Data Visualization Foundations

UI <> UX



# Dashboards



*A dashboard is a visual display  
of  
the most important information needed to  
achieve one or more objectives  
that has been  
consolidated on a single computer screen  
so it can be  
monitored at a glance*

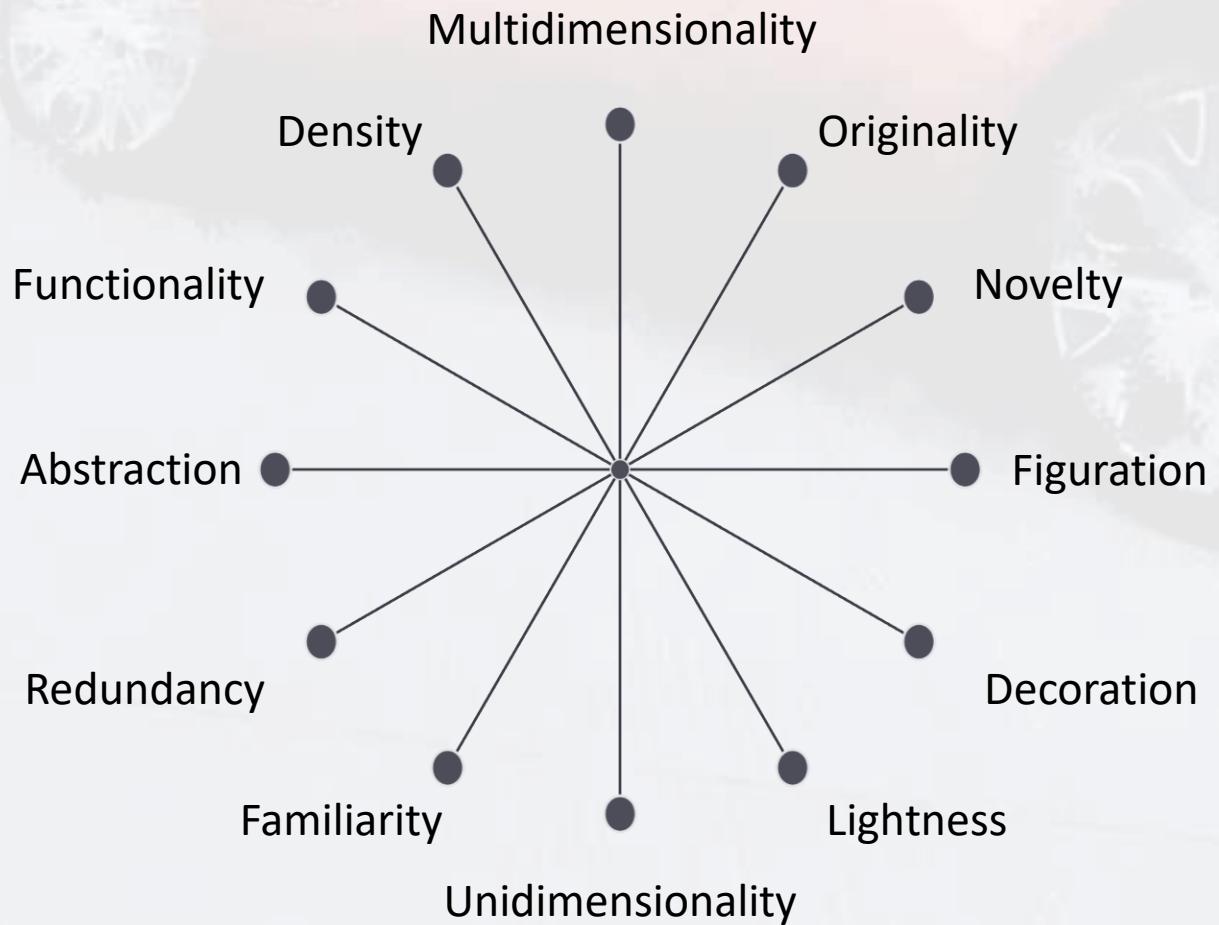
# Reports



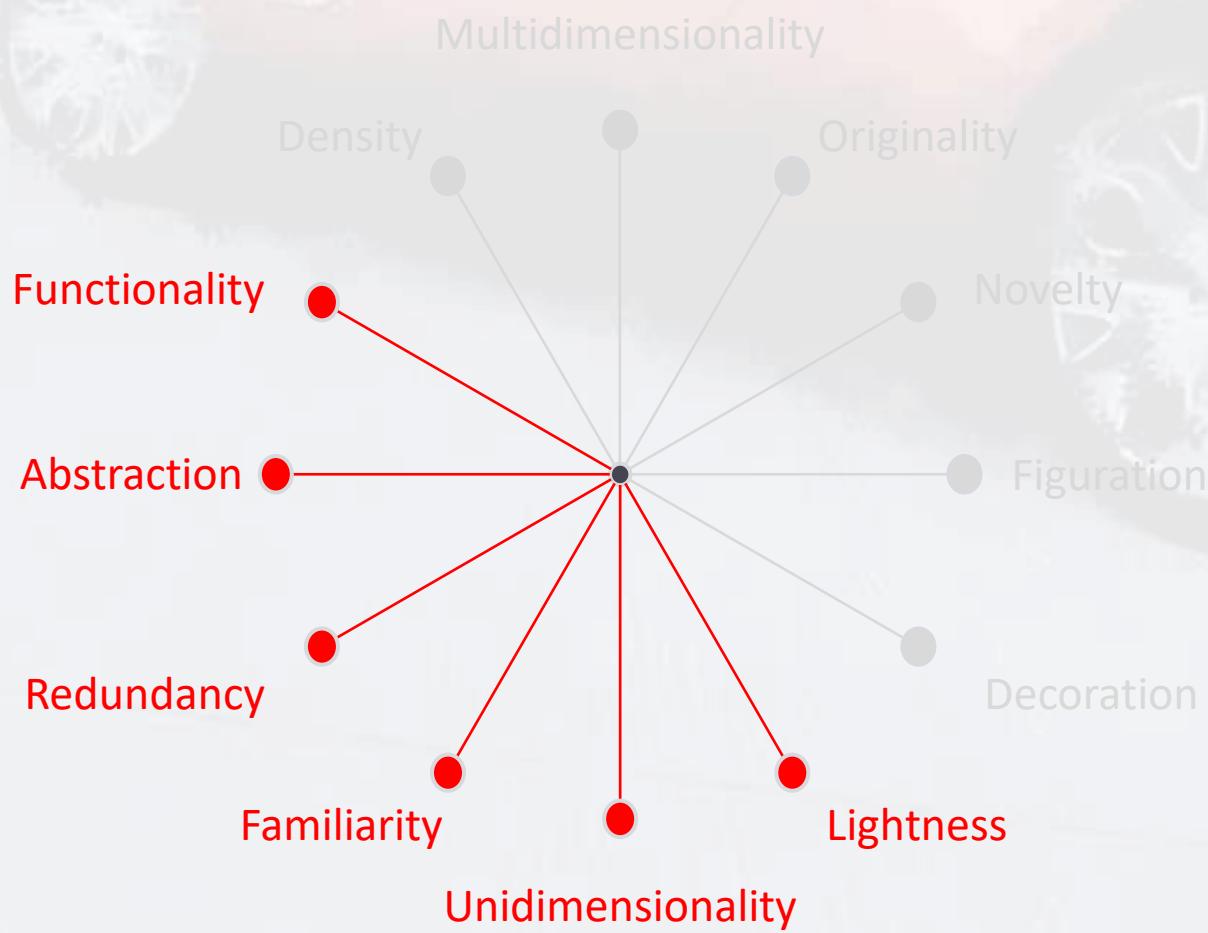
# Storytelling



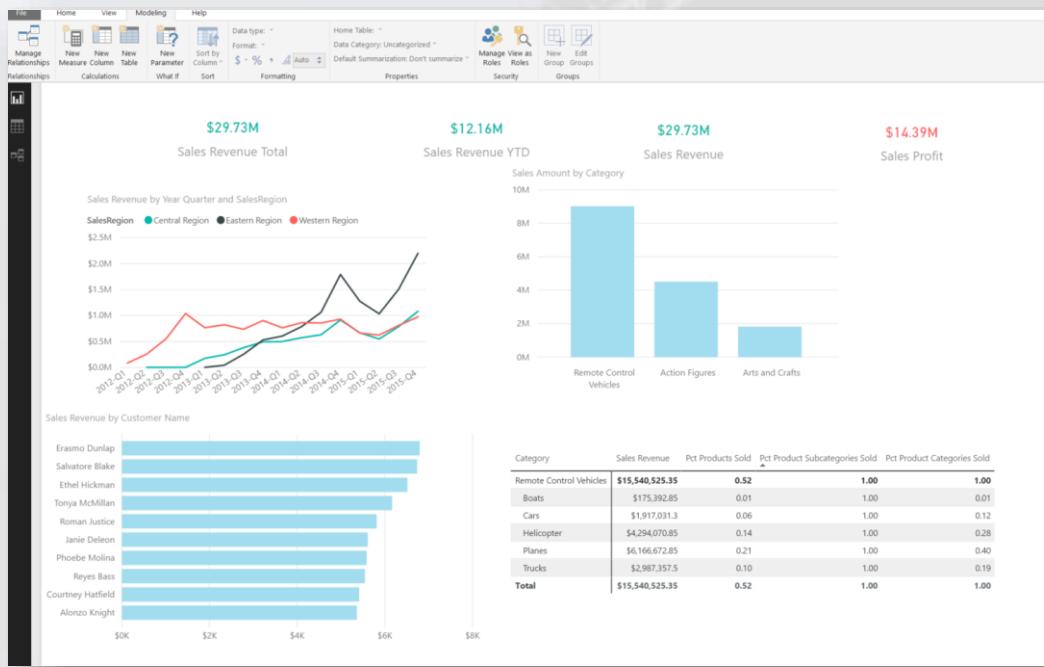
# The Visualization Wheel



# The Visualization Wheel



# Functionality vs Decoration



*“Is beauty sometimes useful?*

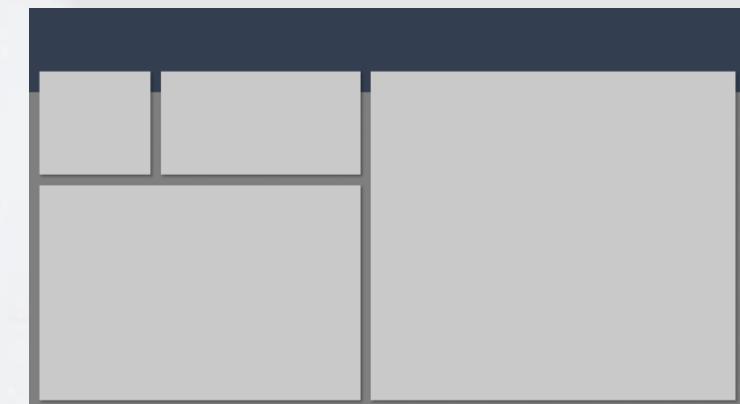
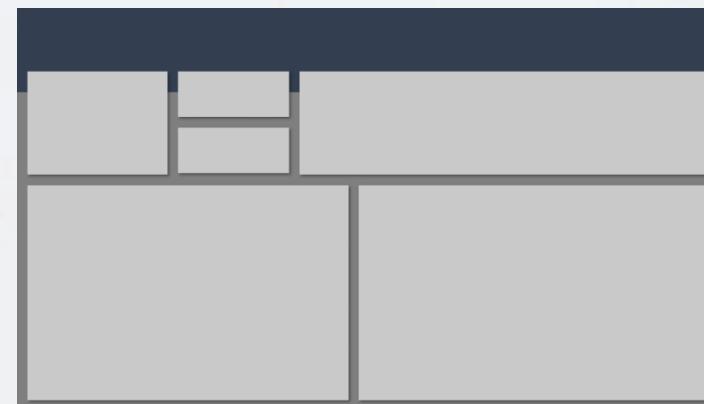
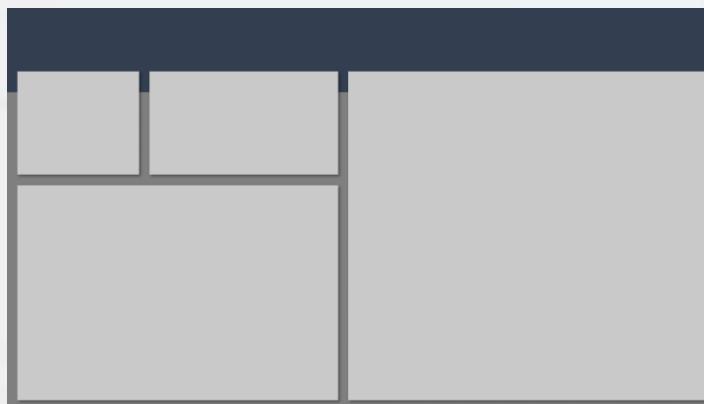
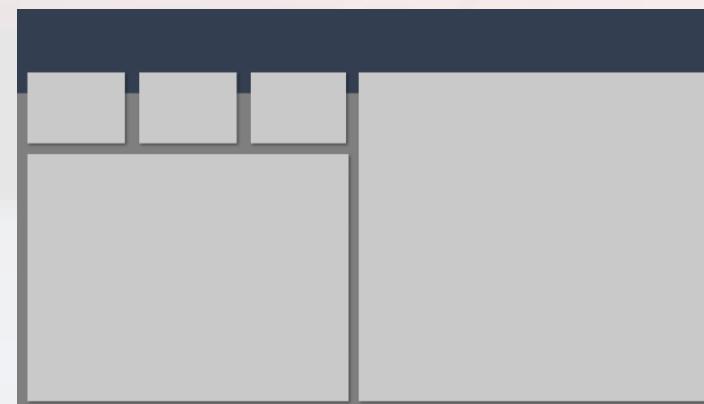
*Certainly.*

*Is beauty always useful?*

*Certainly not.”*

- *Stephen Few, “Should data visualization be beautiful?”*

# Familiarity into Originality



# Uni vs Multi Dimensionality



Bookmarks  
Drillthrough  
Page Tooltips  
Sync Slicers

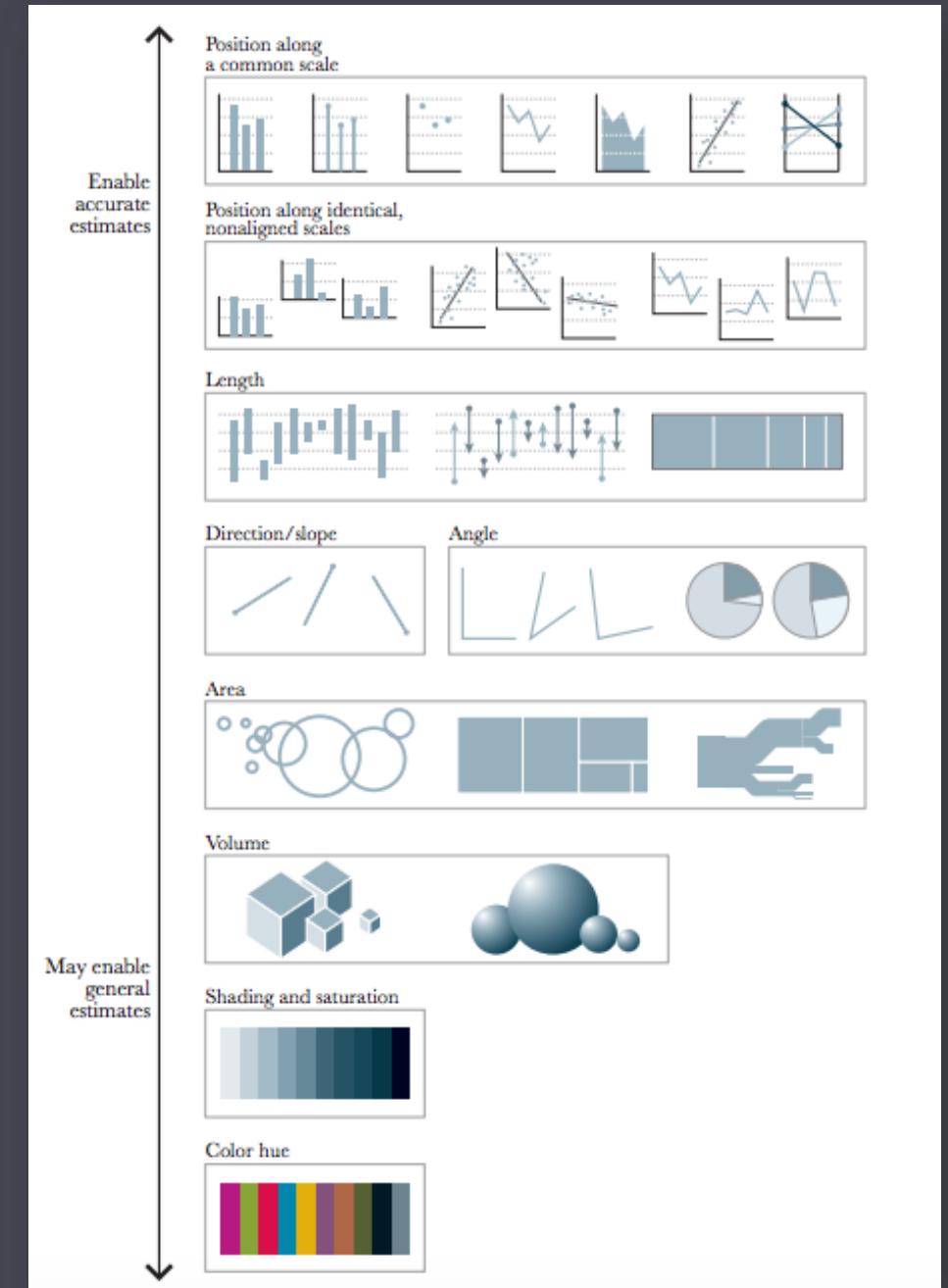
# Differences

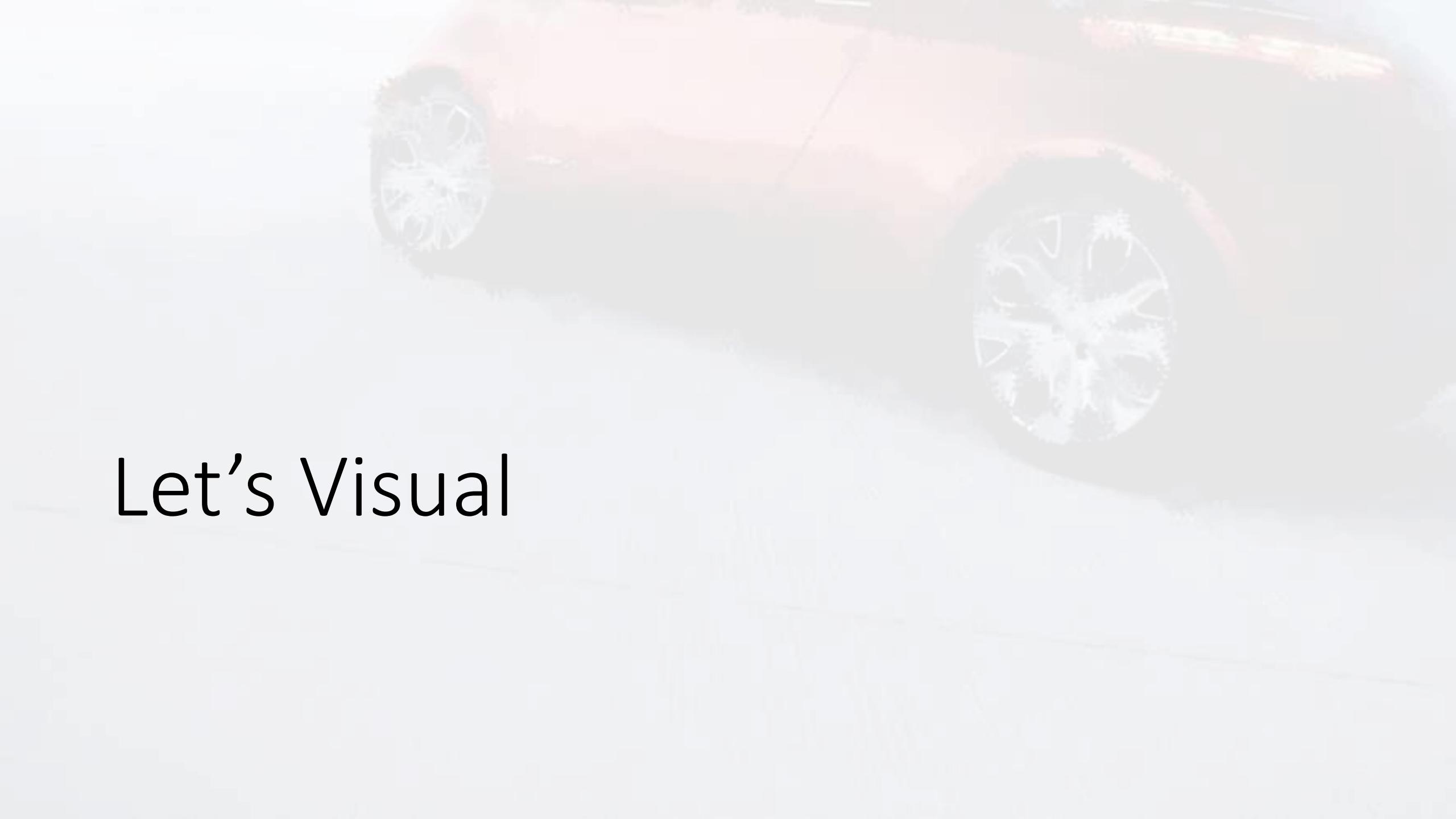
4	3	6	7	9	8	1	2	5	5	1	1	5	6	1	1	5	8	1	3	4
1	5	3	4	5	1	1	5	2	6	1	3	1	9	2	5	1	2	1	8	9
5	2	1	6	1	1	6	1	2	4	1	8	1	6	1	5	8	2	1	4	1
1	4	1	8	1	9	5	1	2	8	1	9	1	1	5	1	1	5	1	1	6
2	6	1	9	1	5	1	2	2	1	4	1	6	1	8	2	1	4	1	2	4

4	3	<b>6</b>	7	9	8	1	2	5	5	1	1	5	<b>6</b>	1	1	5	8	1	3	4
1	5	3	4	5	1	1	5	2	<b>6</b>	1	3	1	9	2	5	1	2	1	8	9
5	2	1	<b>6</b>	1	1	<b>6</b>	1	2	4	1	8	1	<b>6</b>	1	5	8	2	1	4	1
1	4	1	8	1	9	5	1	2	8	1	9	1	1	5	1	1	5	1	1	<b>6</b>
2	<b>6</b>	1	9	1	5	1	2	2	1	4	1	<b>6</b>	1	8	2	1	4	1	2	4

Human brain works better on  
**tone** differences than on  
shape difference

# Cleveland - McGill





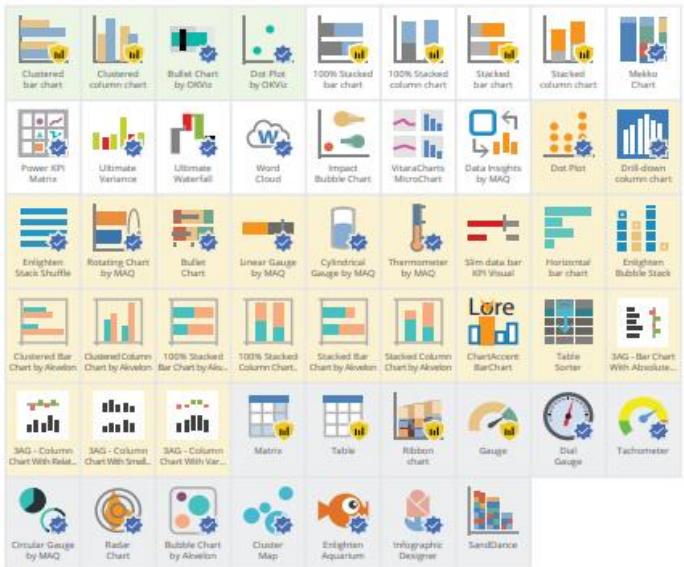
Let's Visual

# The Wild Bunch



## COMPARISON

To compare the magnitude of measures



## CHANGE OVER TIME

To display the changing trend of measures



## RANKING

To rank measures in an order



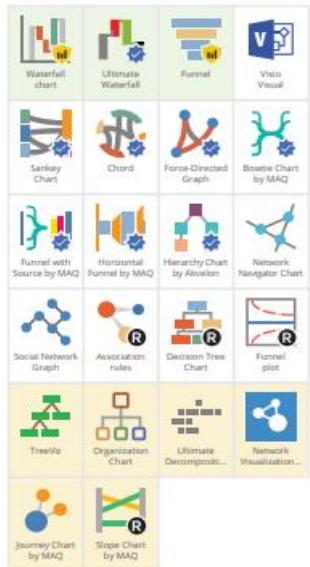
## SPATIAL

To display measures over spatial maps



## FLOW

To display a flow or dynamic relations



## PART-TO-WHOLE

To identify the parts making up a measure total



## DISTRIBUTION

To display the distribution of values



## CORRELATION

To show correlations between measures



## SINGLE

To present single values



## FILTER

To control report filters



## NARRATIVE

To tell a story with data



## MISCELLANEOUS

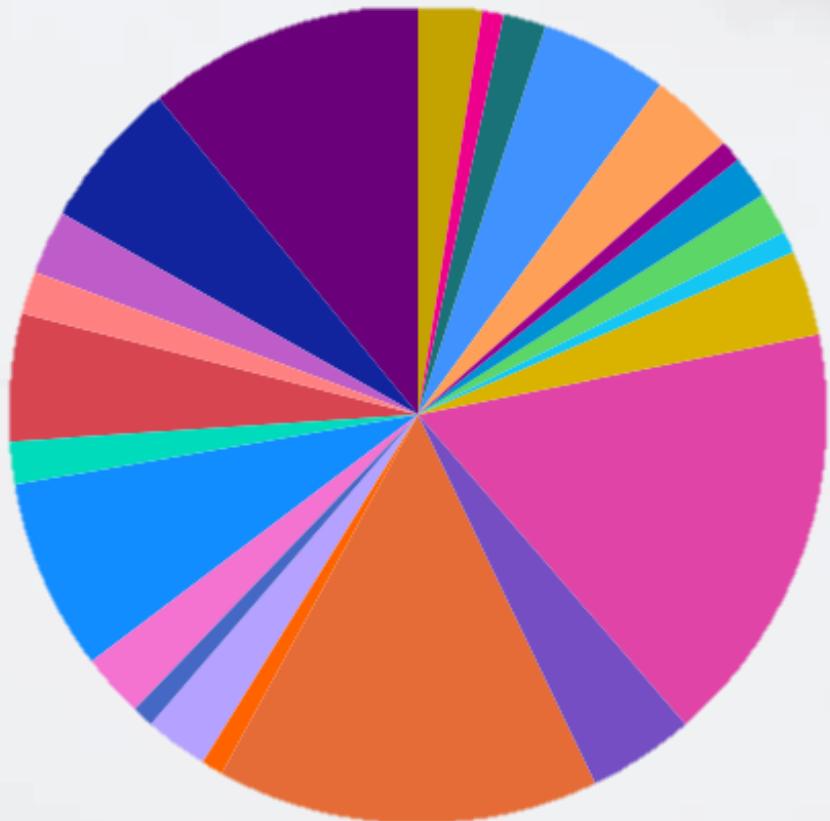




No more Pie Chart

Leave them to those  
who can really get  
something out of it!

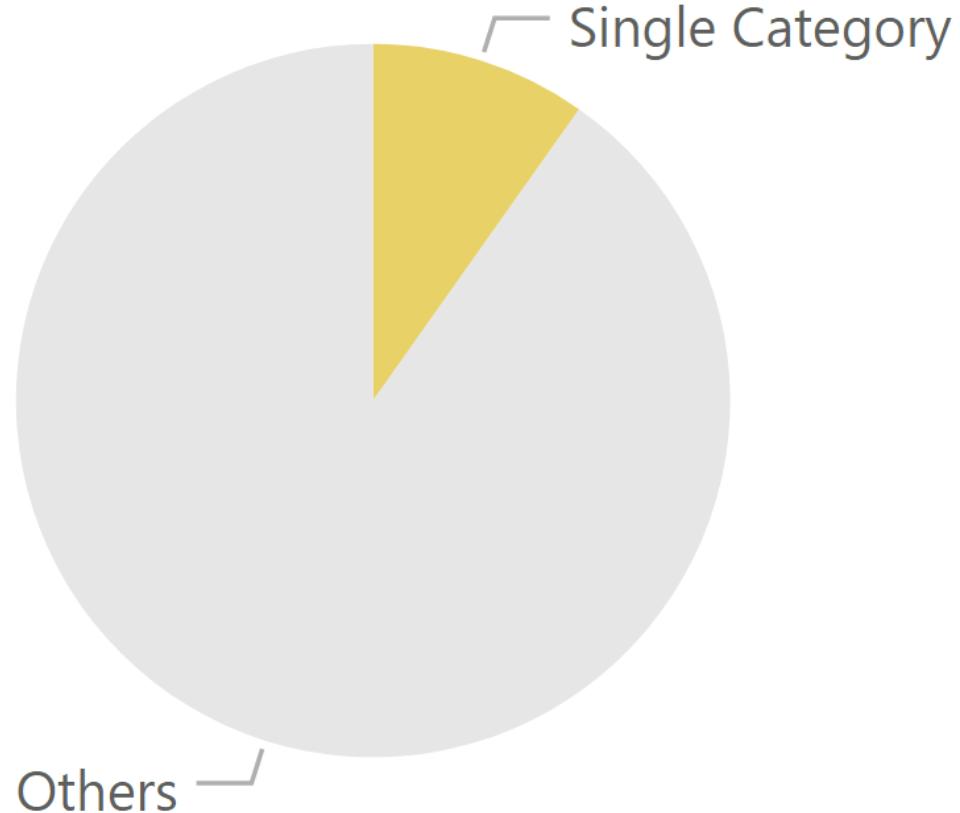
# Rainbow Chart



- No evaluable difference
- Too many colors to manage
- Needs labels
- Needs legend

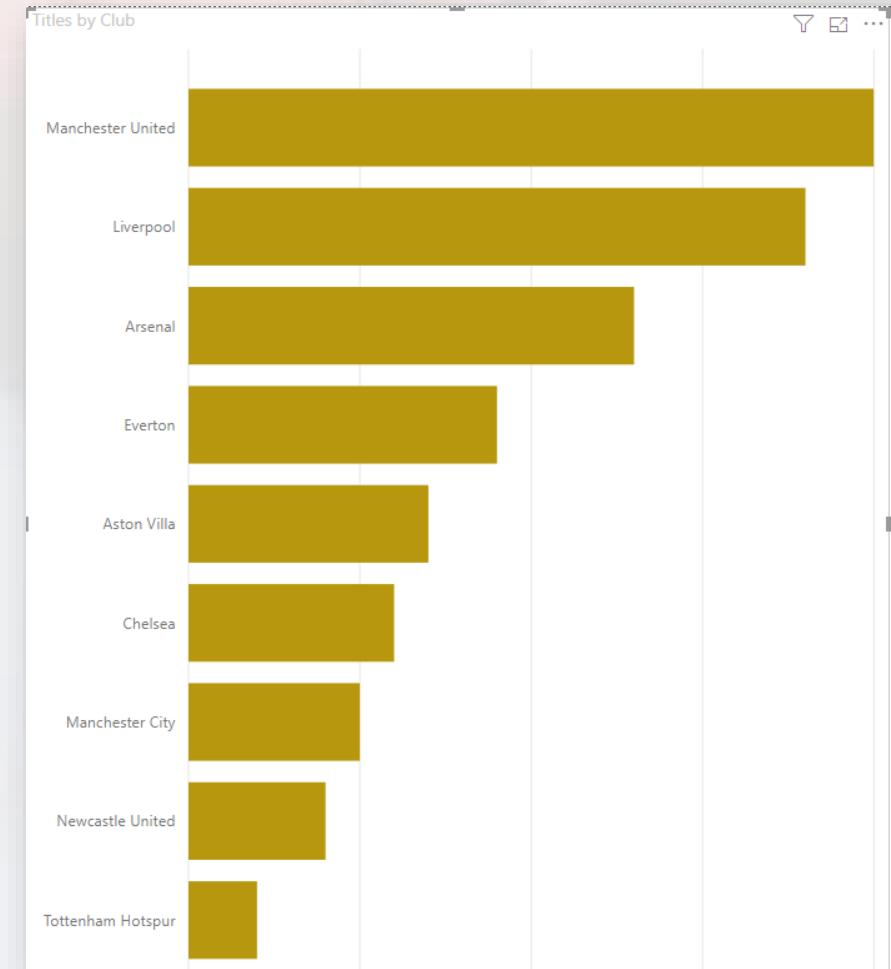
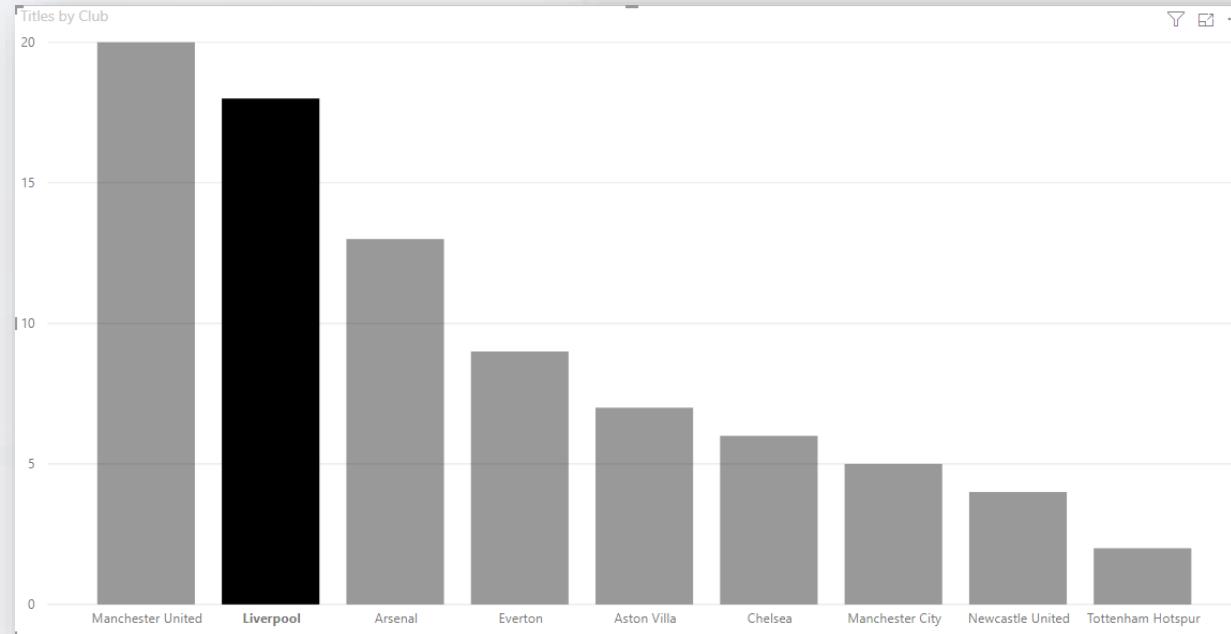
*“If you can eat it,  
Don’t use it in Power BI”*

# Just a small slice



Use pie chart only to put in evidence a single part vs. Total

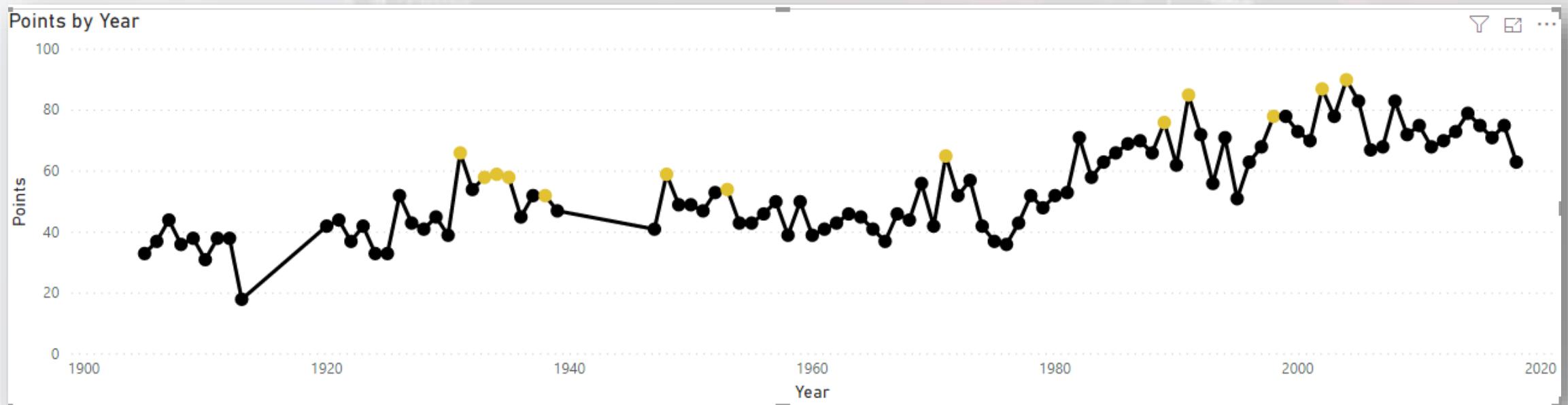
# Categorical Data



Column or bar chart

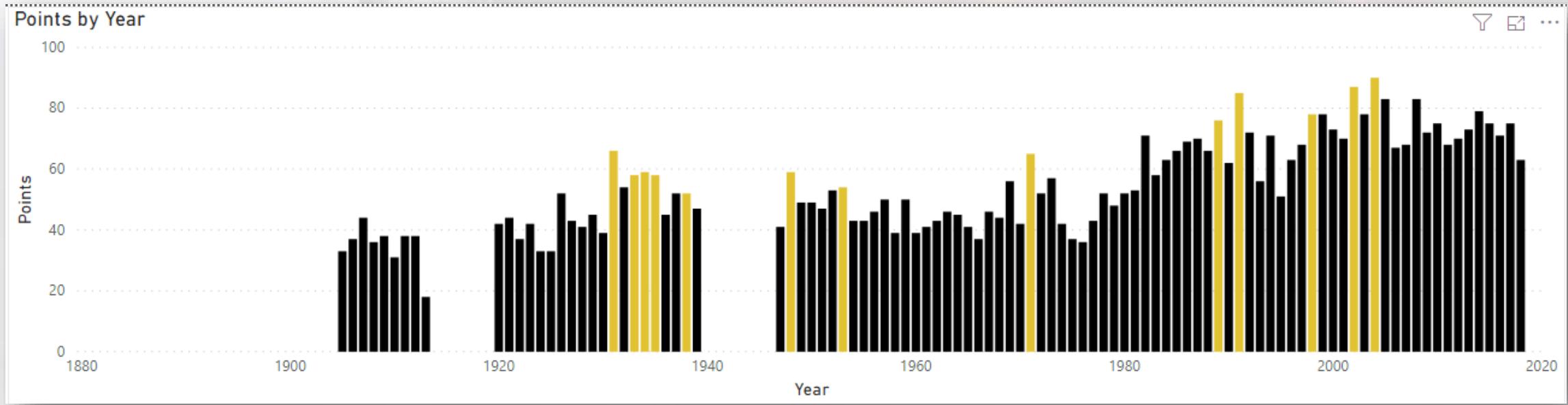
# Pie vs Bar Demo

# Time Series



Time line

# Time Series

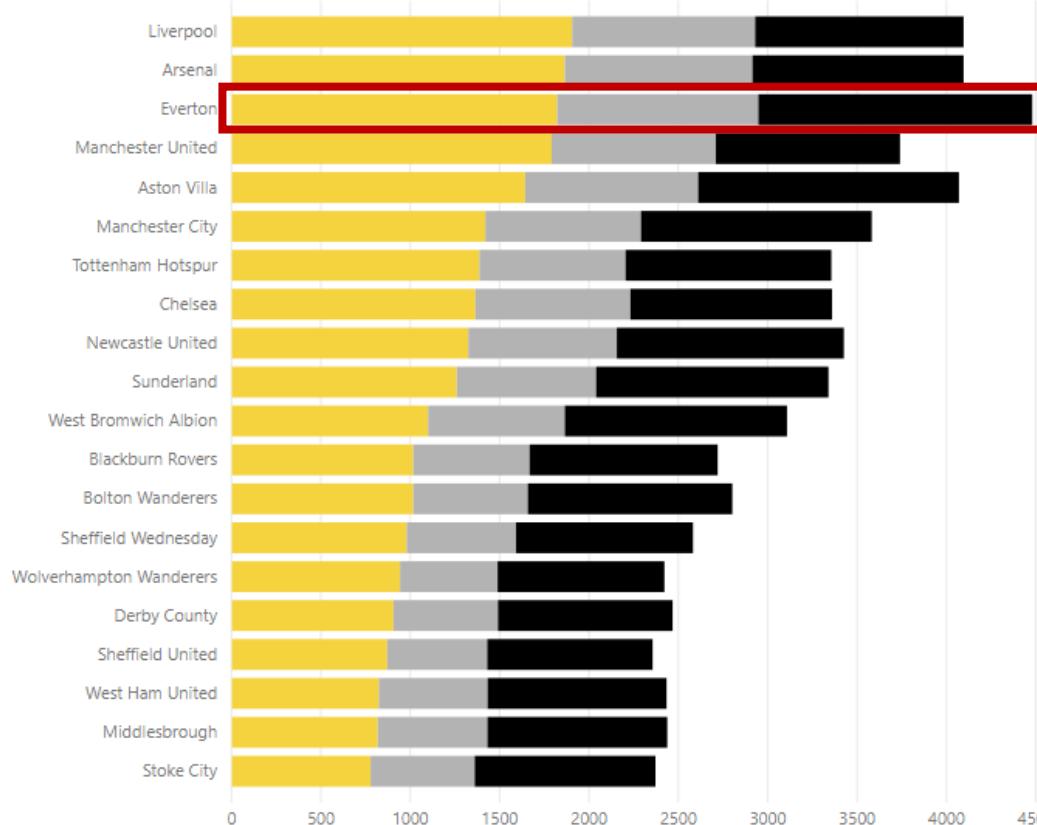


Sometimes column chart  
Column, No bar! Time is from left to right

# Stacked Charts

Win, Draw and Lost by Club

● Win ● Draw ● Lost

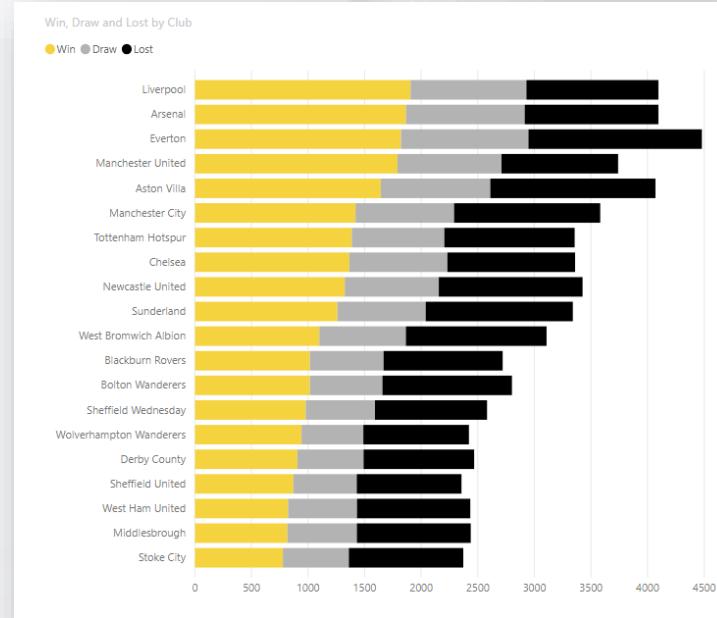


Use moderately

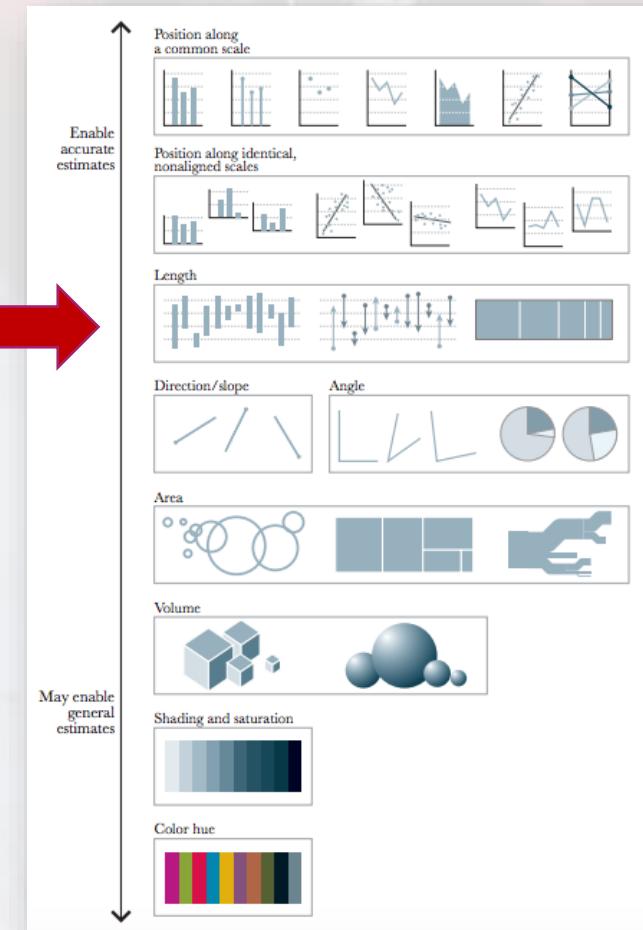
They are the right choice only when we must display multiple instances of a whole and its parts, with

emphasis on the whole

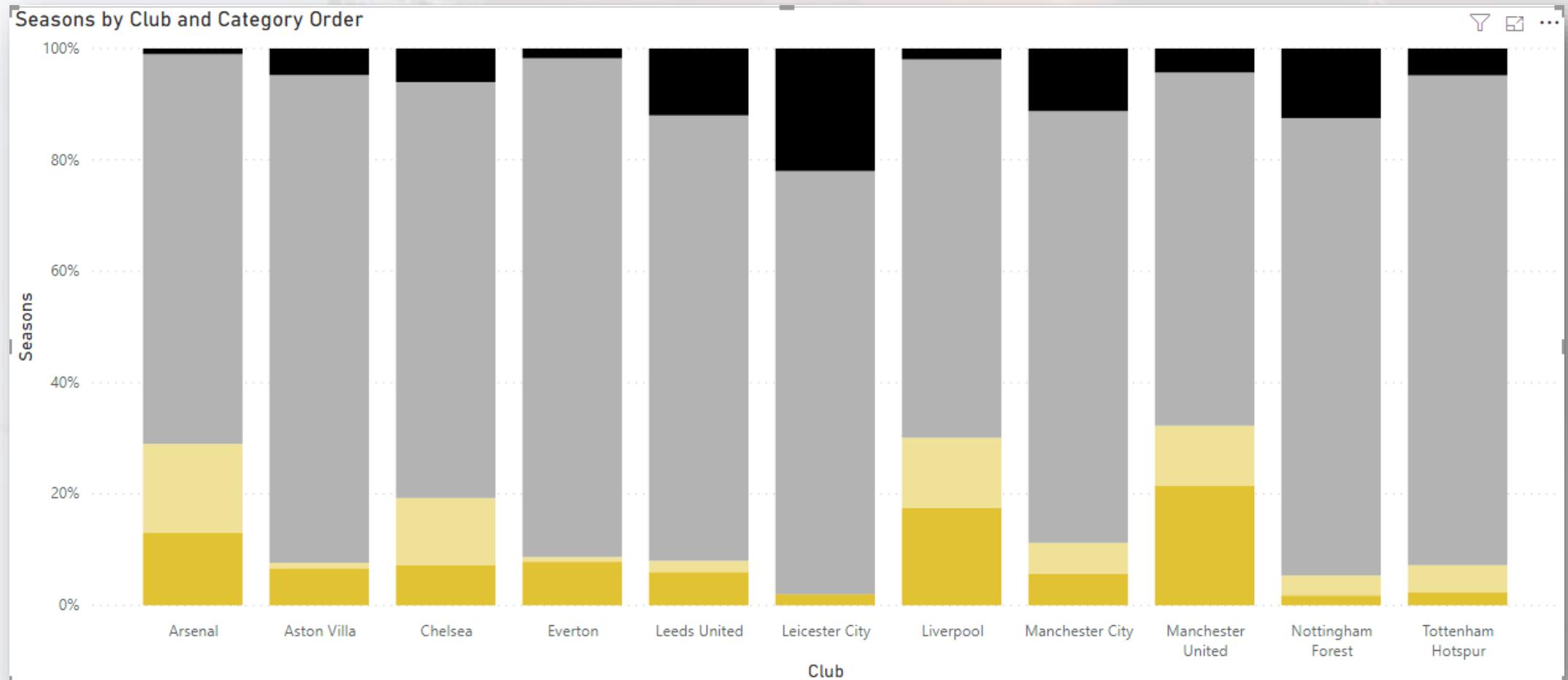
# Stacked Charts



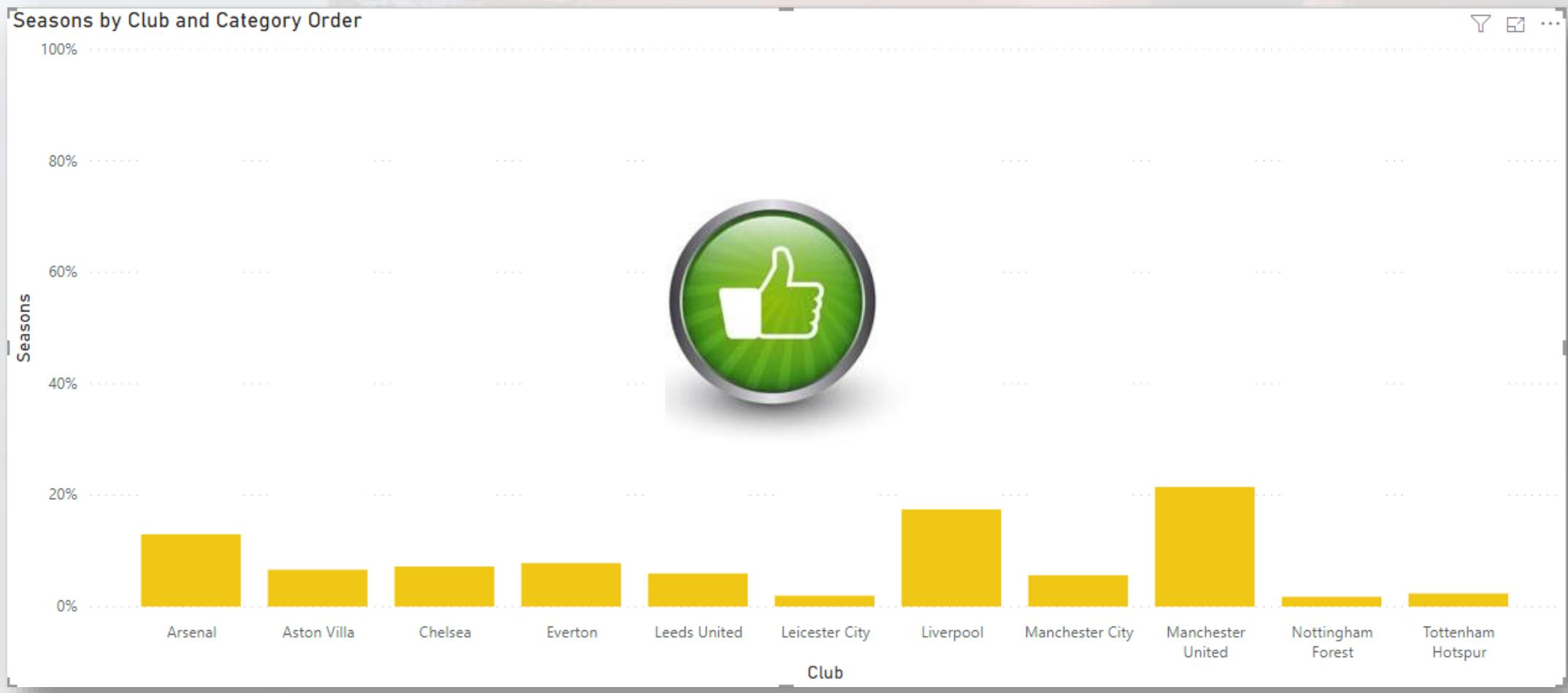
Remember Cleveland – McGill!



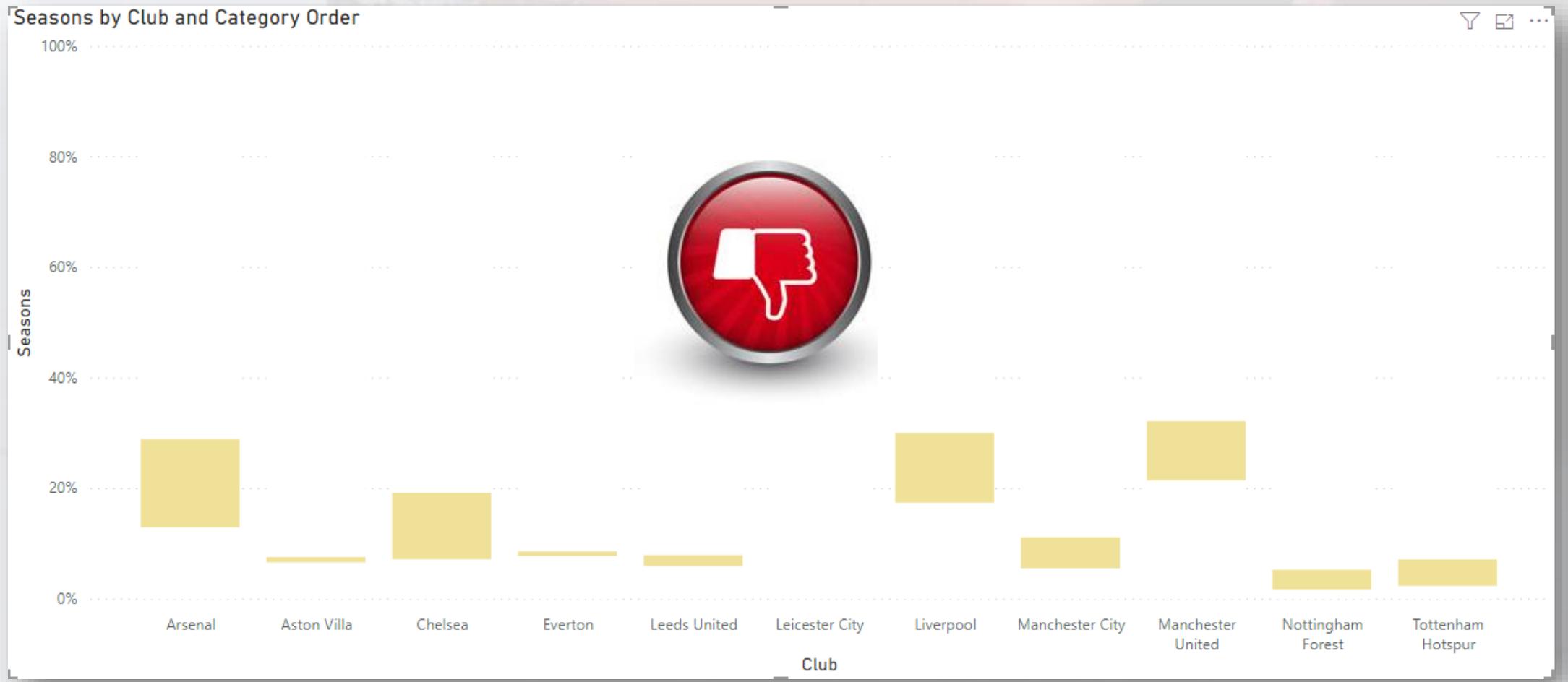
# 100% Stacked Charts



# Stacked Charts

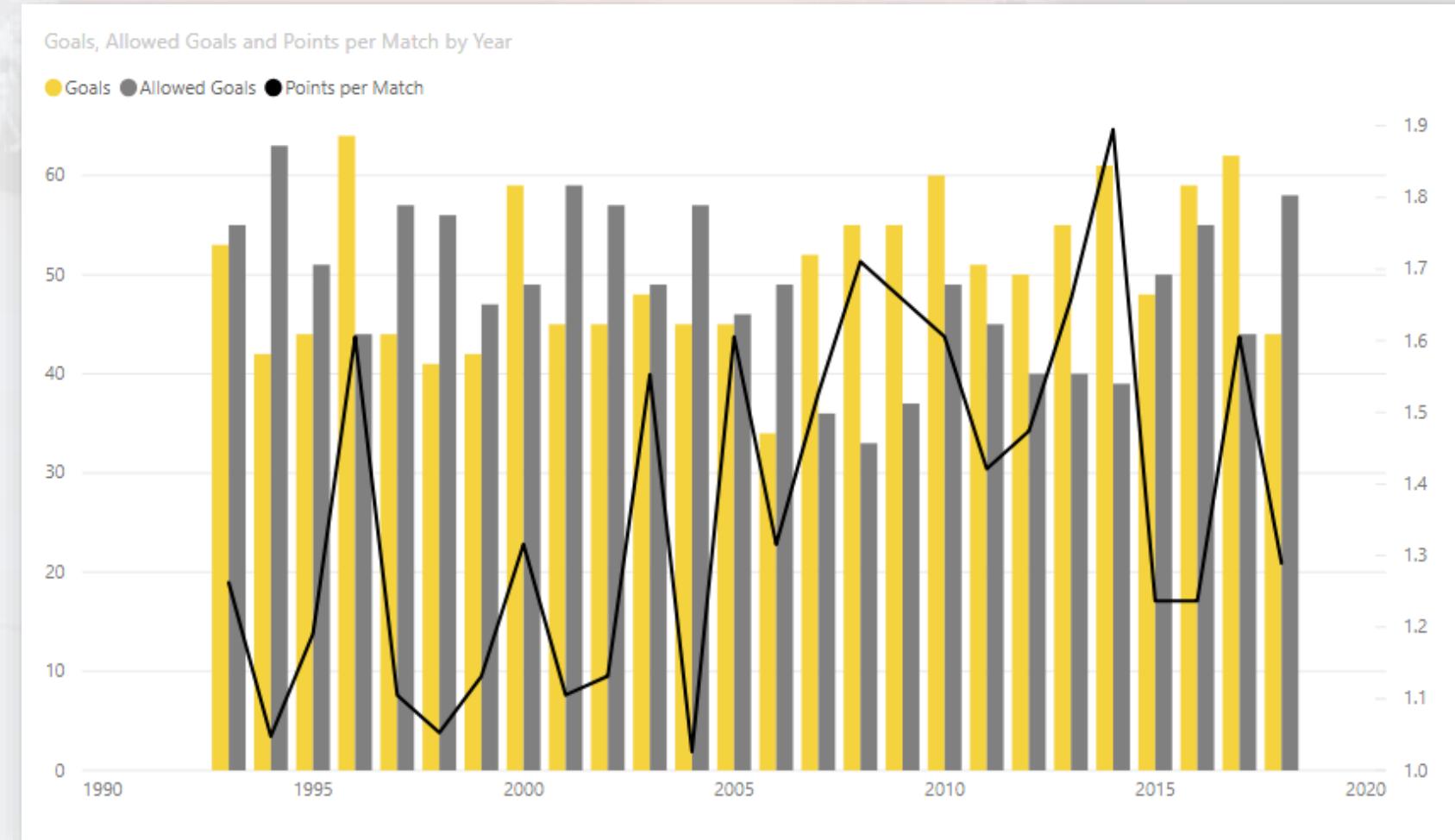


# Stacked Charts

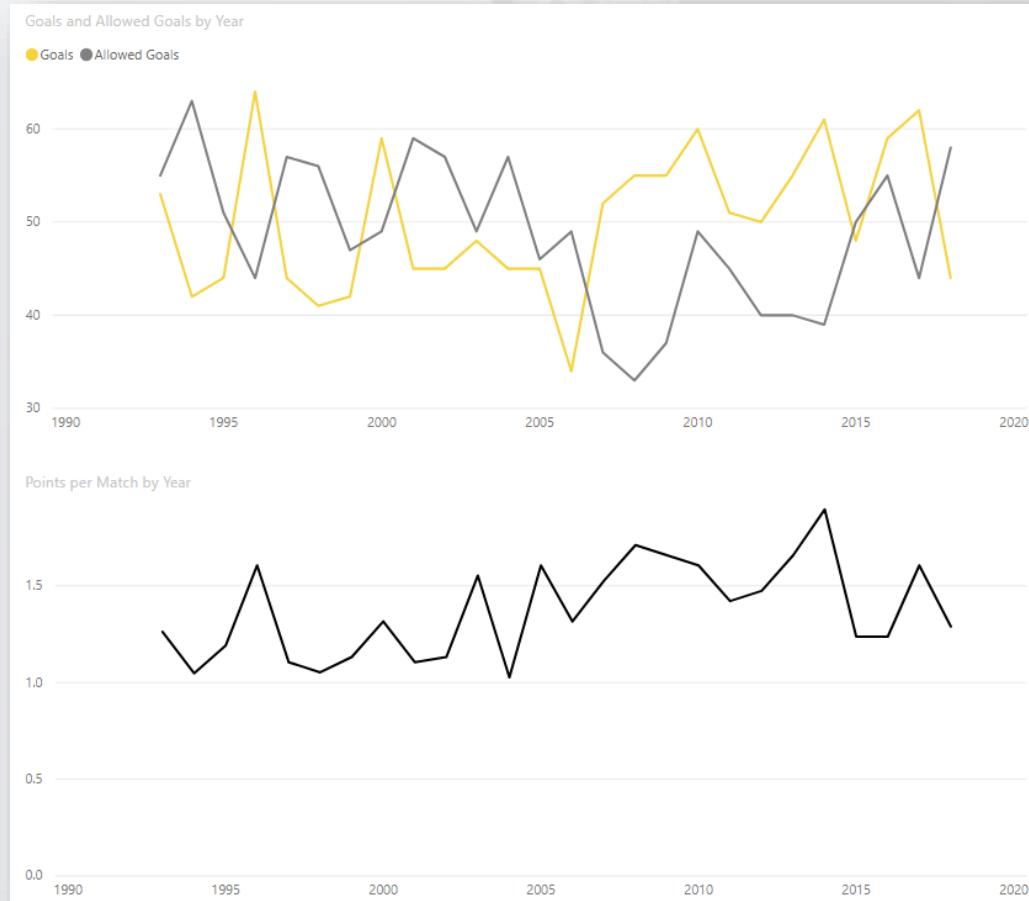


# Combo Chart

Different series in the same chart could suggest correlation: be sure correlation is real!



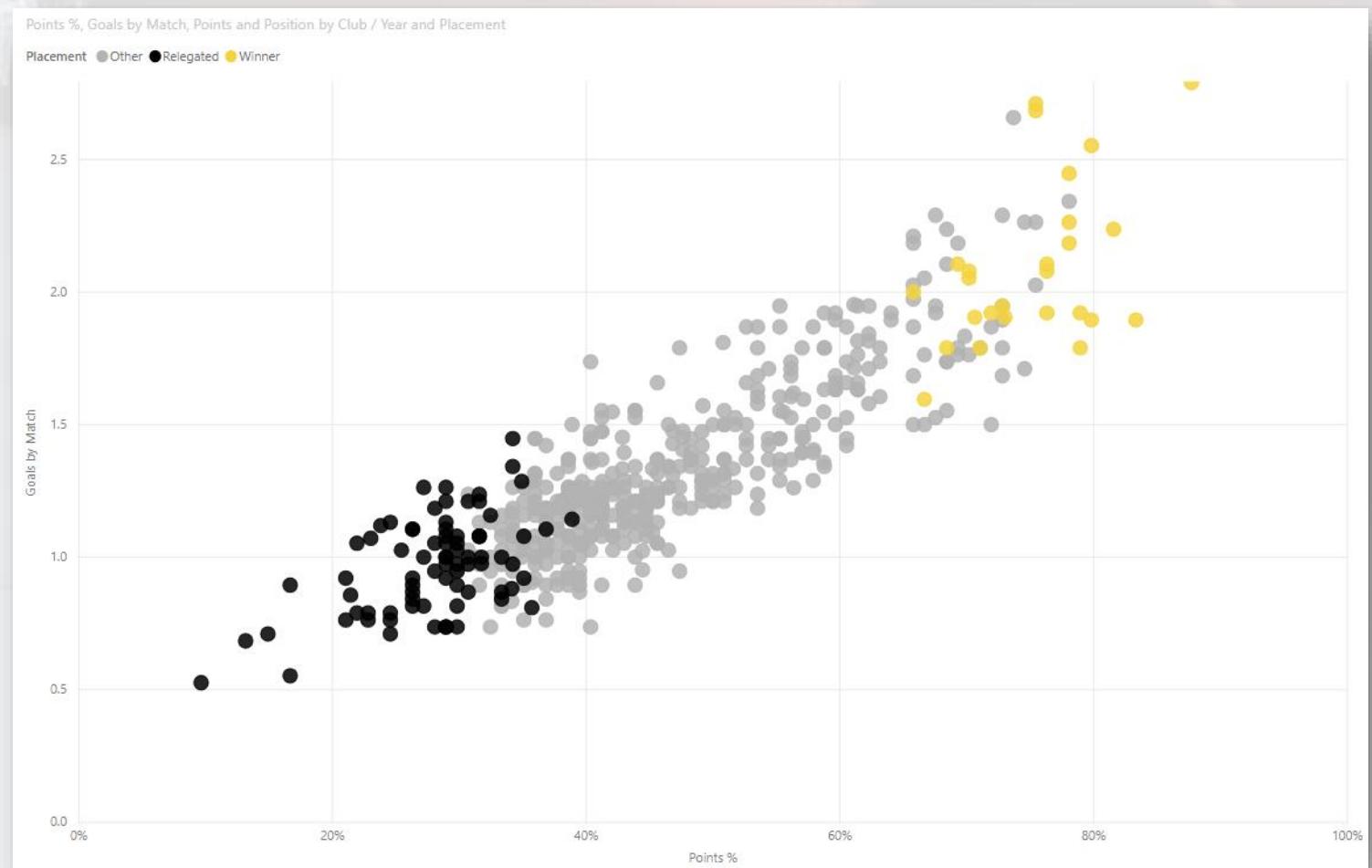
# Splitted Combo Chart



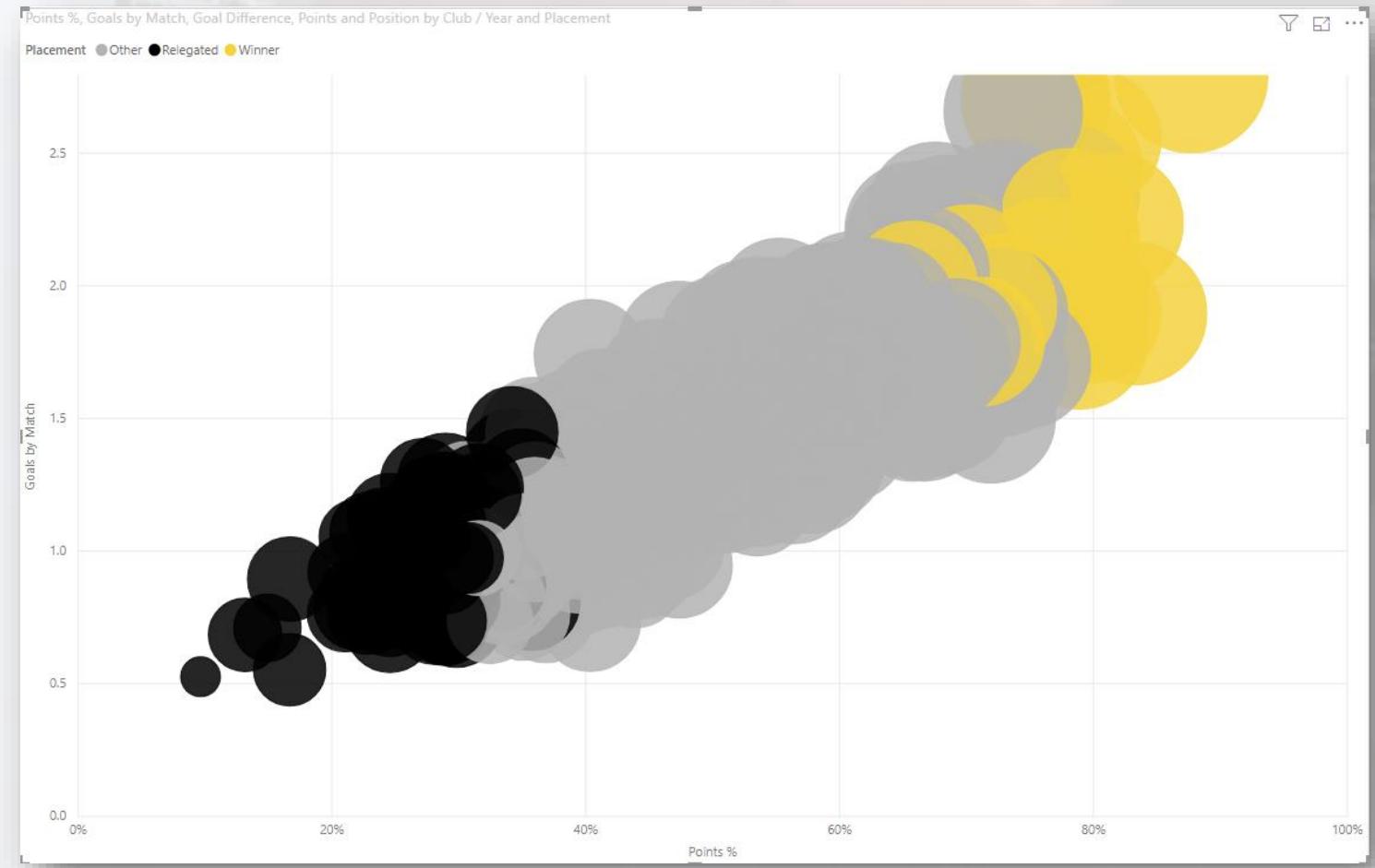
Split them if you have space enough

# Relationships Between Measures

## Scatterplot



# Don't use size if you can



Don't use size if you can

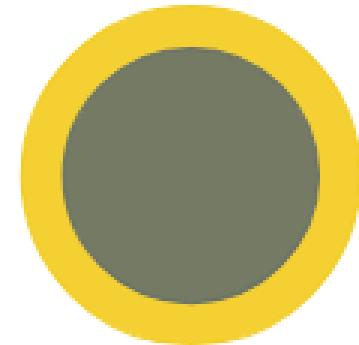
?

7

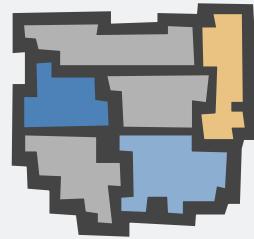
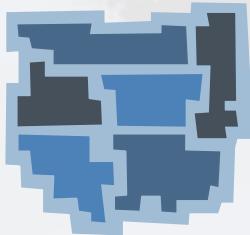
13

# Bubble Size Demo

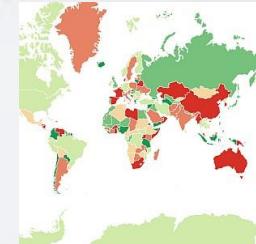
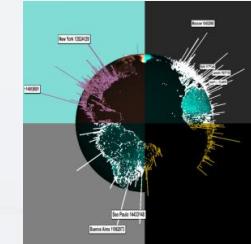
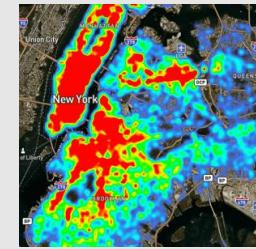
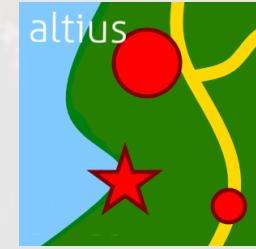
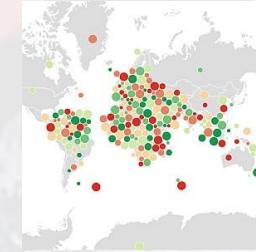
Don't use size if you can



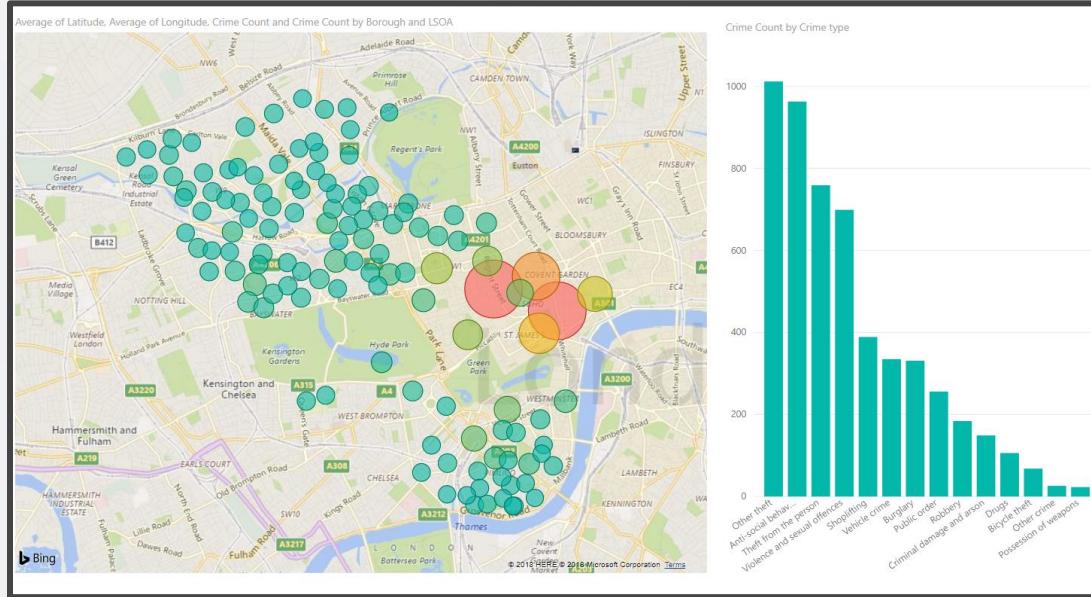
# Maps: Which one? When? How?



Out of  
the Box  
Vs.  
Custom



# Map



- Categorize your data to help Bing Service
- Use combination of Location field and Longitude and Latitude with drill down for good results

# Shape Map



A shape map is a visual built to show comparisons of regions on a map by applying different colors to each region.

Create your custom shape maps using [mapshaper.org](http://mapshaper.org) or free tools like [QGis](#)

You can also update manually your TopoJSON

# Shape Map



*Tables and Matrices  
are the cause of 95% death  
of data visualization projects*

# Tables & Matrices

Club	Played	Win	Draw	Lost	F	A	GA	GD	Points
Manchester City	38	32	4	2	106	27	3.93	79	100
Manchester United	38	25	6	7	68	28	2.43	40	81
Tottenham Hotspur	38	23	8	7	74	36	2.06	38	77
Liverpool	38	21	12	5	84	38	2.21	46	75
Chelsea	38	21	7	10	62	38	1.63	24	70
Arsenal	38	19	6	13	74	51	1.45	23	63
Burnley	38	14	12	12	36	39	0.92	-3	54
Everton	38	13	10	15	44	58	0.76	-14	49
Leicester City	38	12	11	15	56	60	0.93	-4	47
Bournemouth	38	11	11	16	45	61	0.74	-16	44
Crystal Palace	38	11	11	16	45	55	0.82	-10	44
Newcastle United	38	12	8	18	39	47	0.83	-8	44
West Ham United	38	10	12	16	48	68	0.71	-20	42
Watford	38	11	8	19	44	64	0.69	-20	41
Brighton & Hove Albion	38	9	13	16	34	54	0.63	-20	40
Huddersfield Town	38	9	10	19	28	58	0.48	-30	37
Southampton	38	7	15	16	37	56	0.66	-19	36
Stoke City	38	7	12	19	35	68	0.51	-33	33
Swansea City	38	8	9	21	28	56	0.50	-28	33
West Bromwich Albion	38	6	13	19	31	56	0.55	-25	31

Avoid:

- Borders
- Strong Background colors
- Scrollbar (if it's possible!)

Use Conditional Formatting  
Responsibly!

*Is There Anybody Out There?*

# Custom Visuals?

Power BI Visuals

MARKETPLACE MY ORGANIZATION

Add-ins may access personal and document information. By using an add-in, you agree to its Permissions, License Terms and Privacy Policy.

Search 

Suggested for you ▾

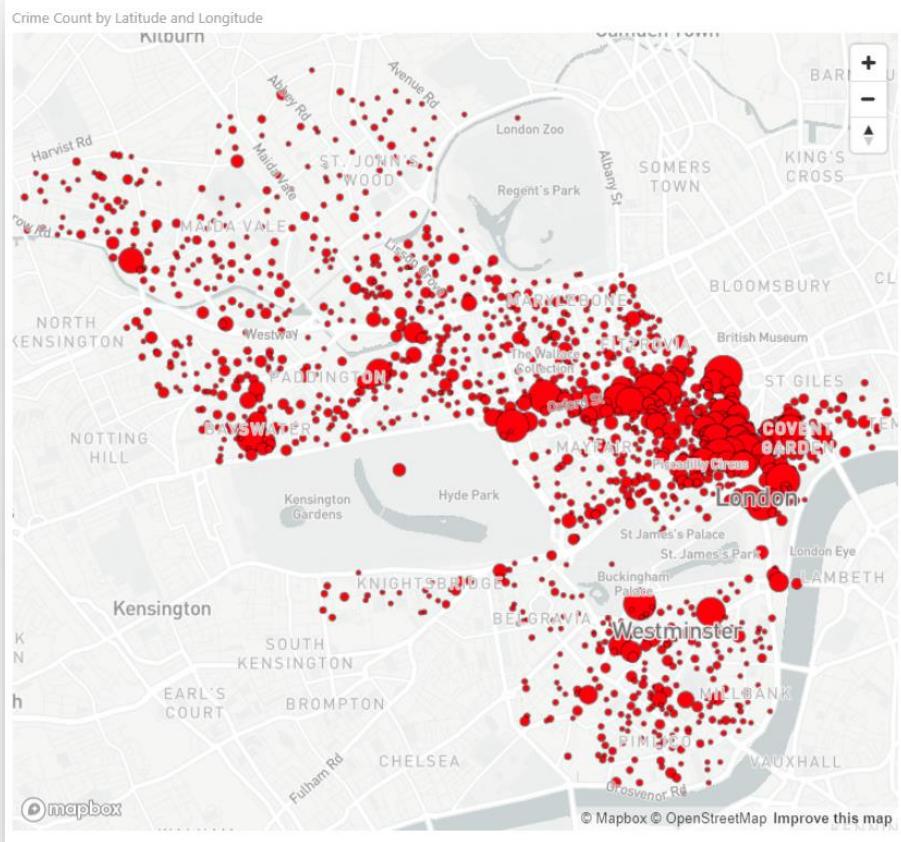
Category	Visual Name	Description	Action
All	Infographic Designer	Beautify your reports with easy-to-create infographics	
Advanced Analytics	Word Cloud	Create a fun visual from frequent text in your data	
Data Visualizations	Mapbox Visual	Next gen maps. Create heatmaps, shape maps, circles, and clusters using big location data.	
Editor's Picks	Timeline Slicer	Graphical date range selector to use for filtering dates	
Filters			
Gauges			
Infographics			
KPIs			
Maps			
Power BI Certified			
Time			

Category Filter: All

- All
- Advanced Analytics
- Data Visualizations
- Editor's Picks
- Filters
- Gauges
- Infographics
- KPIs
- Maps
- Power BI Certified
- Time

Why not?

# Mapbox



- Requires access token
- Shows large number of points
- Multiple background layers, including custom
- Cluster, Heatmap, Circles & Choropleth
- Need to aggregate data manually

# Synoptic Panel

## SYNOPTIC DESIGNER FOR POWER BI

Synoptic Designer is the companion tool of [Synoptic Panel](#), a certified custom visual for Microsoft Power BI created by OKViz.

 EDITOR     GALLERY    ABOUT

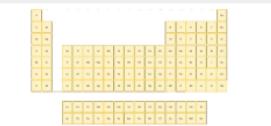
GENERAL COUNTRY/TERRITORY



Timetable



Day of Week by Hours of Day



SQL Wes's Periodic Table of ...



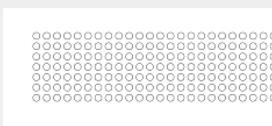
Plantar Foot Diagram



Body Areas



Human Body



Day & Hour Matrix



Clock



Batting Zone



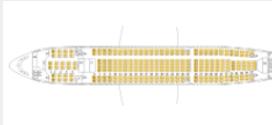
Basketball Half Court



Generic Store

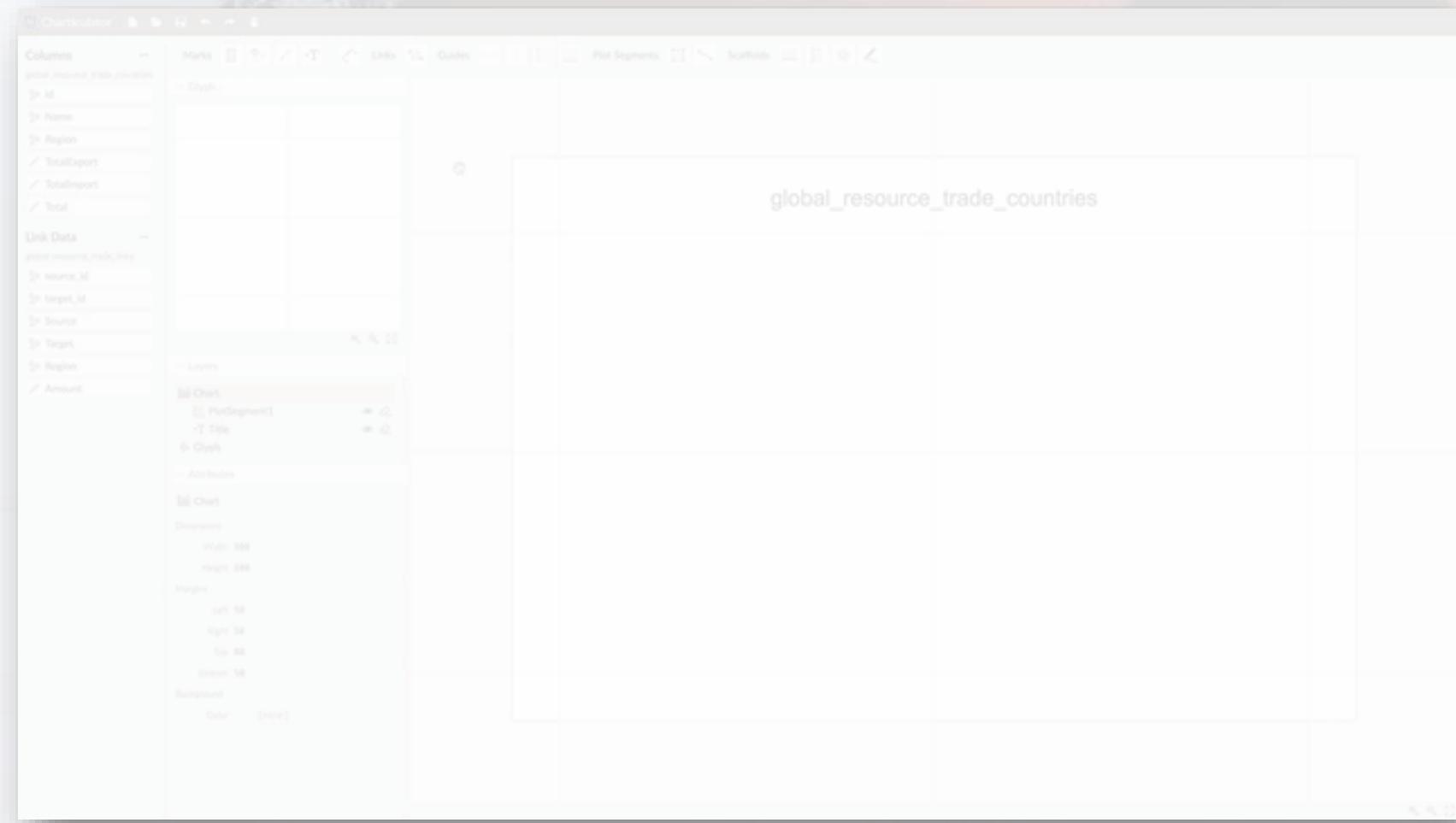


Human Body



Generic Airplane

# Charticulator



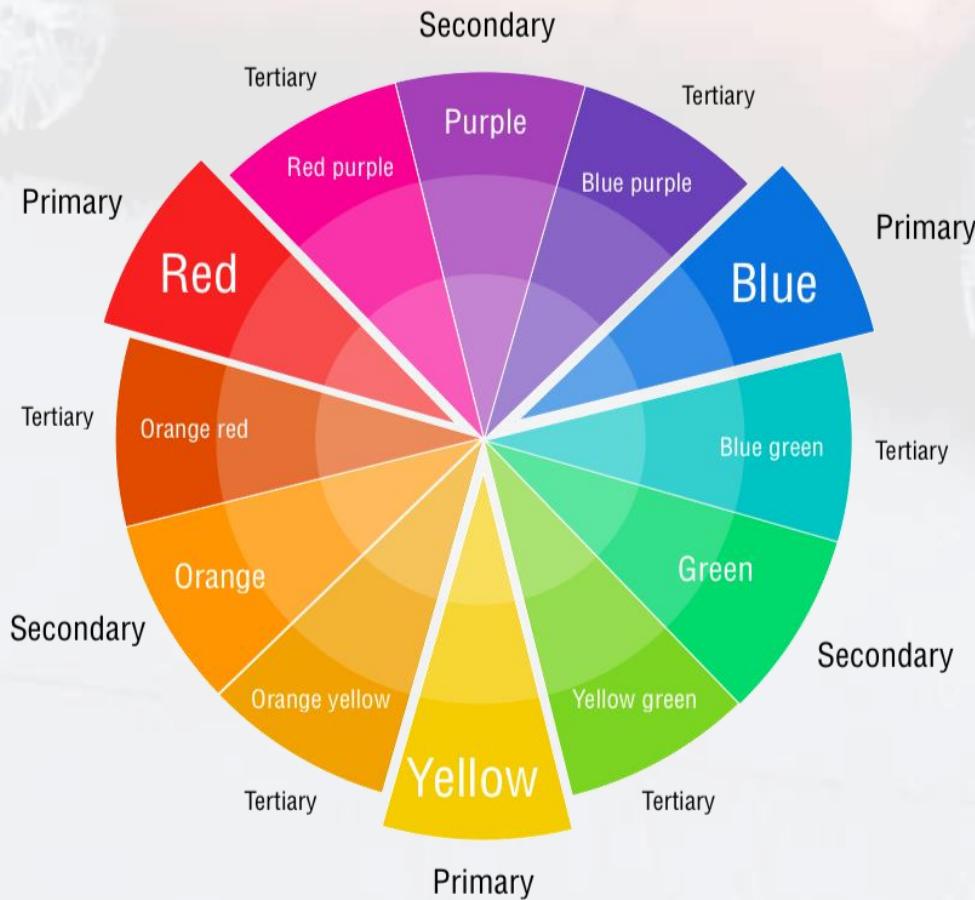




# Colors

- Colors must have a significant meaning
- Mind Color consistency
- Follow your artistic talent but also some designer guide!

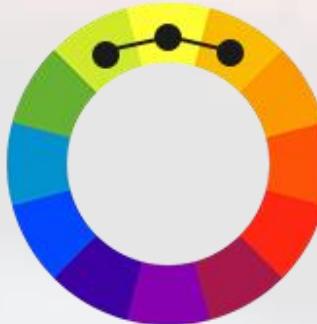
# Color usage



# Color usage



Complementary



Analogous



Triadic



Split Complementary



Tetradic

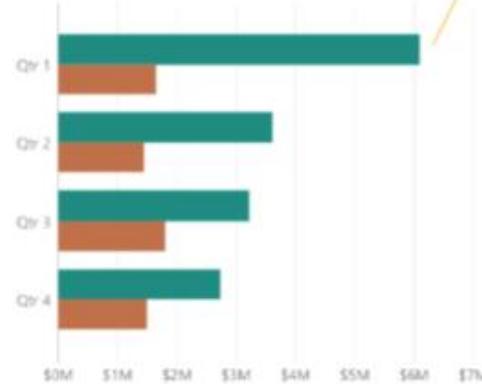
# Consistency



This Year Sales by Chain



This Year Sales by Quarter and Chain



This Year Sales by Chain



This Year Sales by Quarter and Chain



# Recap



Welcome to  
the Viz Club



1<sup>st</sup> Rule

You do not use Pie Chart

2<sup>nd</sup> Rule

You do not use Pie Chart

Less is more

Keep it  
Simple!



Keep it  
Clear!

*“A report is like a joke:  
If you have to explain it,  
it's bad design”*

# Perfection

---

*It's not when you have  
nothing else to add,  
It's when you have  
nothing to take away*

# Bibliography

- Alberto Cairo, The Truthful Art
- Alberto Cairo, The Functional Art
- Cole Nussbaumer Knaflic, Storytelling With Data
- Stephen Few, Information Dashboard Design

# Useful Links

- <http://www.storytellingwithdata.com/>
- <https://www.perceptualedge.com/>
- <https://micoyuk.com/>
- <https://blog.hubspot.com/marketing/color-theory-design>
- <https://coolors.co/>
- [Home | Charticulator](#)

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[Lorenzo Vercellati | LinkedIn](#)

[@supergimi / Twitter](#)

[Data Pied Piper – Medium](#)





Thank you!