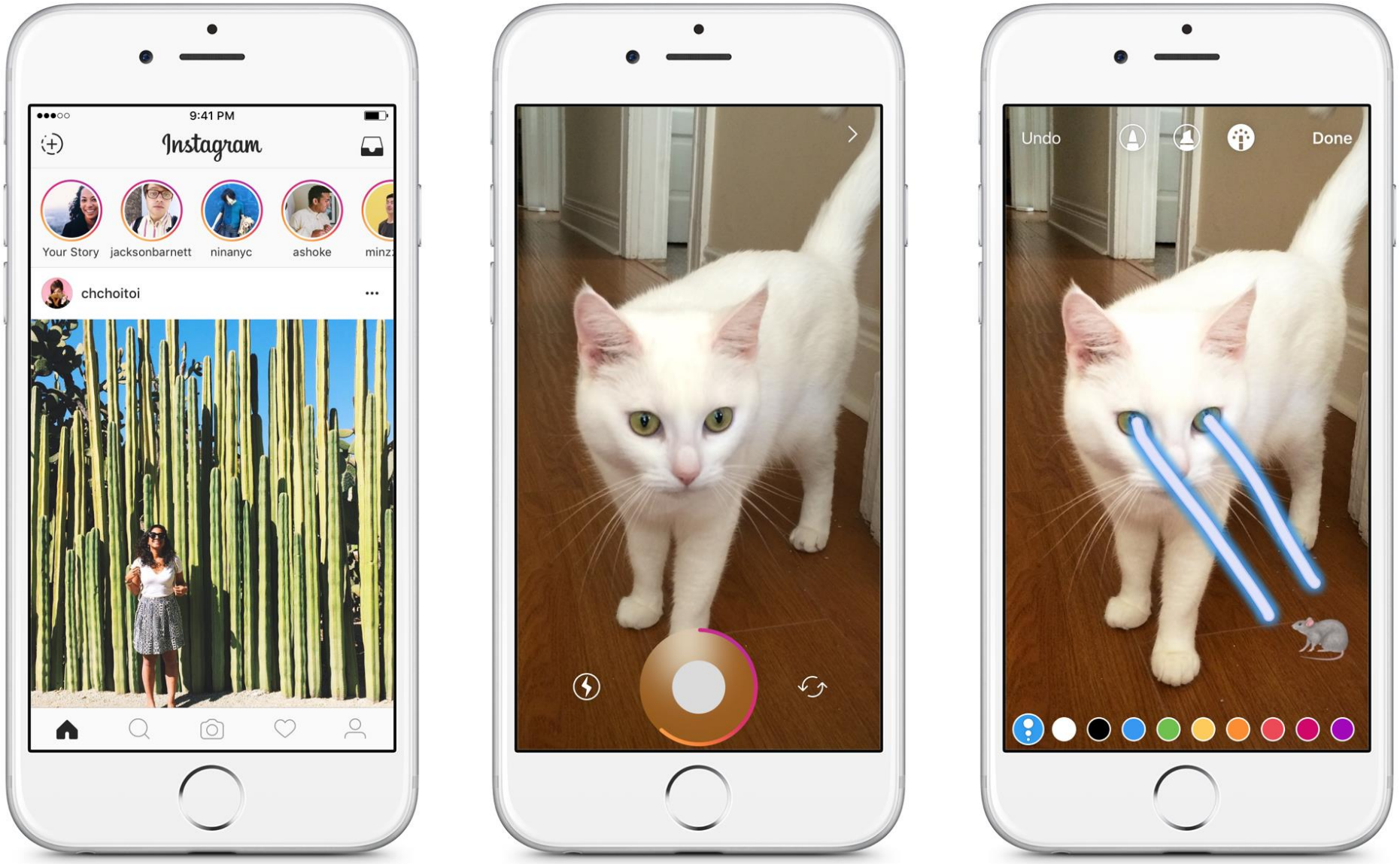
॥ त्वं ज्ञानमयो विज्ञानमयोऽसि ॥
IIT Jodhpur

Excellence above all
SME

Technology • Innovation • Leadership

The Power of Stories

Dr. Deepak Saxena, SME IIT Jodhpur

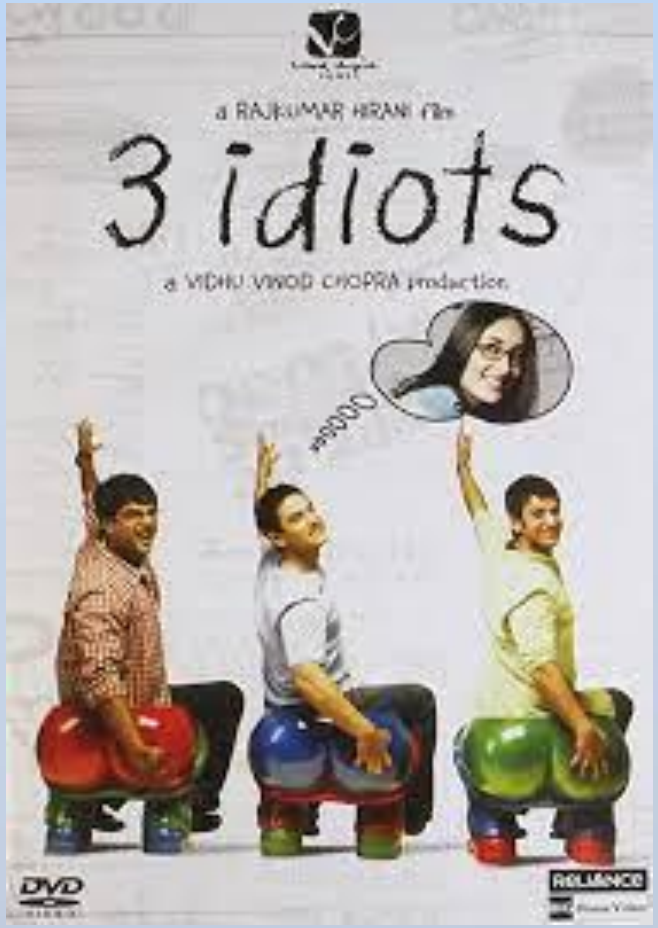

9:41 PM
Instagram
Your Story
jacksonbarnett
ninanyc
ashoke
chchoitoi
Undo
Done

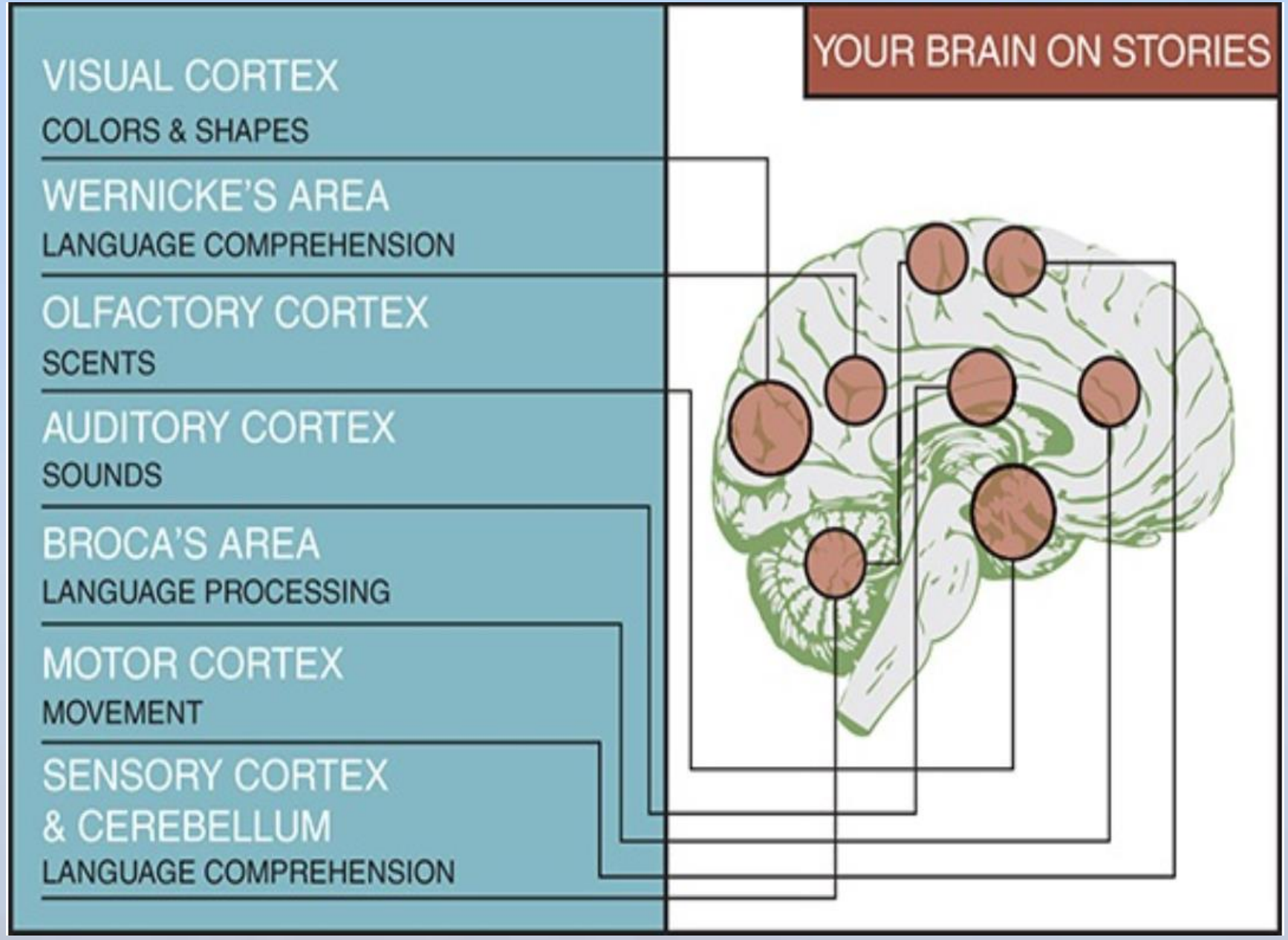
Data vs Visualization vs Presentation

3/4 cup Penne Pasta or any Pasta
1/2 teaspoon Salt
4-5 cups Water
For Veggies:
1/2 teaspoon Oil
1/4 cup chopped Carrot
1/4 cup chopped Green Capsicum
1/4 cup chopped Red Capsicum
1/4 cup chopped Broccoli
Salt to taste

Data vs Visualization vs Presentation

Another example

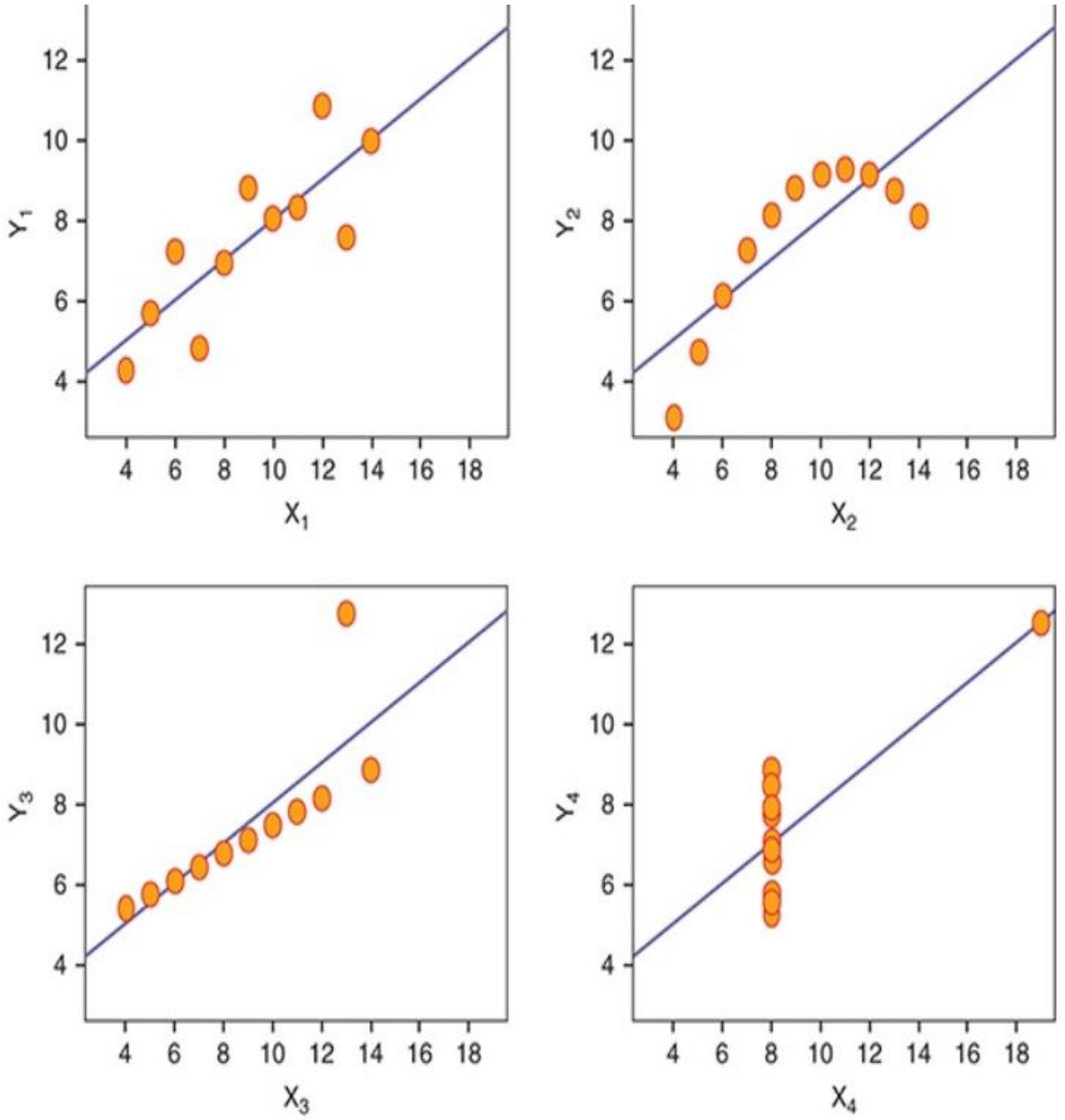



YOUR BRAIN ON STORIES
VISUAL CORTEX
COLORS & SHAPES
WERNICKE'S AREA
LANGUAGE COMPREHENSION
OLFACTORY CORTEX
SCENTS
AUDITORY CORTEX
SOUNDS
BROCA'S AREA
LANGUAGE PROCESSING
MOTOR CORTEX
MOVEMENT
SENSORY CORTEX
& CEREBELLUM
LANGUAGE COMPREHENSION

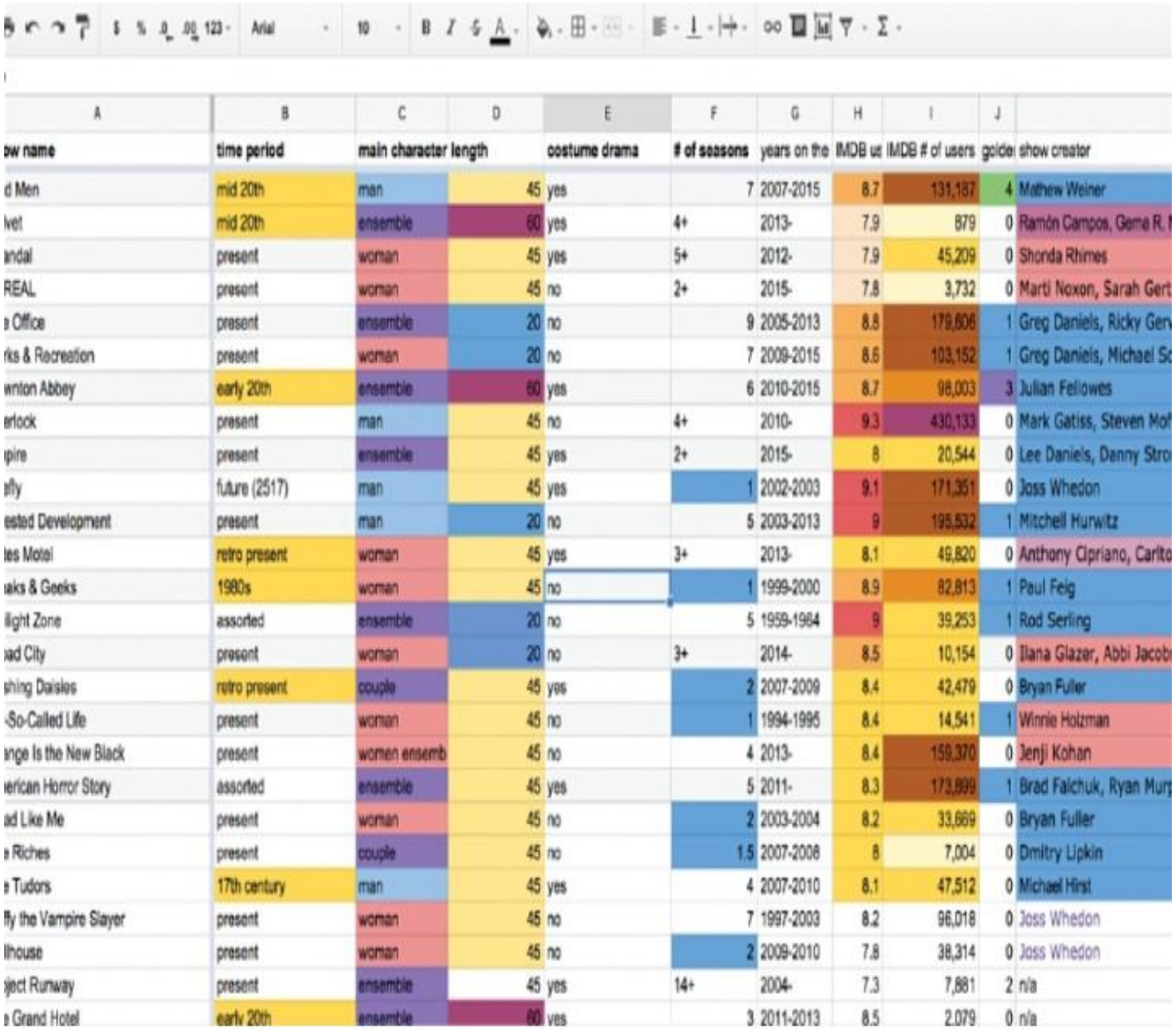
Anscombe's Quartet

	I		II		III		IV	
	X	Y	X	Y	X	Y	X	Y
	10	8.04	10	9.14	10	7.46	8	6.58
	8	6.95	8	8.14	8	6.77	8	5.76
	13	7.58	13	8.74	13	12.74	8	7.71
	9	8.81	9	8.77	9	7.11	8	8.84
	11	8.33	11	9.26	11	7.81	8	8.47
	14	9.96	14	8.1	14	8.84	8	7.04
	6	7.24	6	6.13	6	6.08	8	5.25
	4	4.26	4	3.1	4	5.38	10	12.5
	12	10.84	12	9.13	12	8.15	8	5.56
	7	4.82	7	7.26	7	6.42	8	7.91
	5	5.68	5	4.74	5	5.73	8	6.88
MEAN	9.00	7.5	9.00	7.5	9.00	7.5	9.00	7.5
STD	3.32	2.03	3.32	2.03	3.32	2.03	3.32	2.03
CORR	0.82		0.82		0.82		0.82	
LIN REG	y = 3.00 + 0.500x		y = 3.00 + 0.500x		y = 3.00 + 0.500x		y = 3.00 + 0.500x	

Anscombe's Quartet Visualized

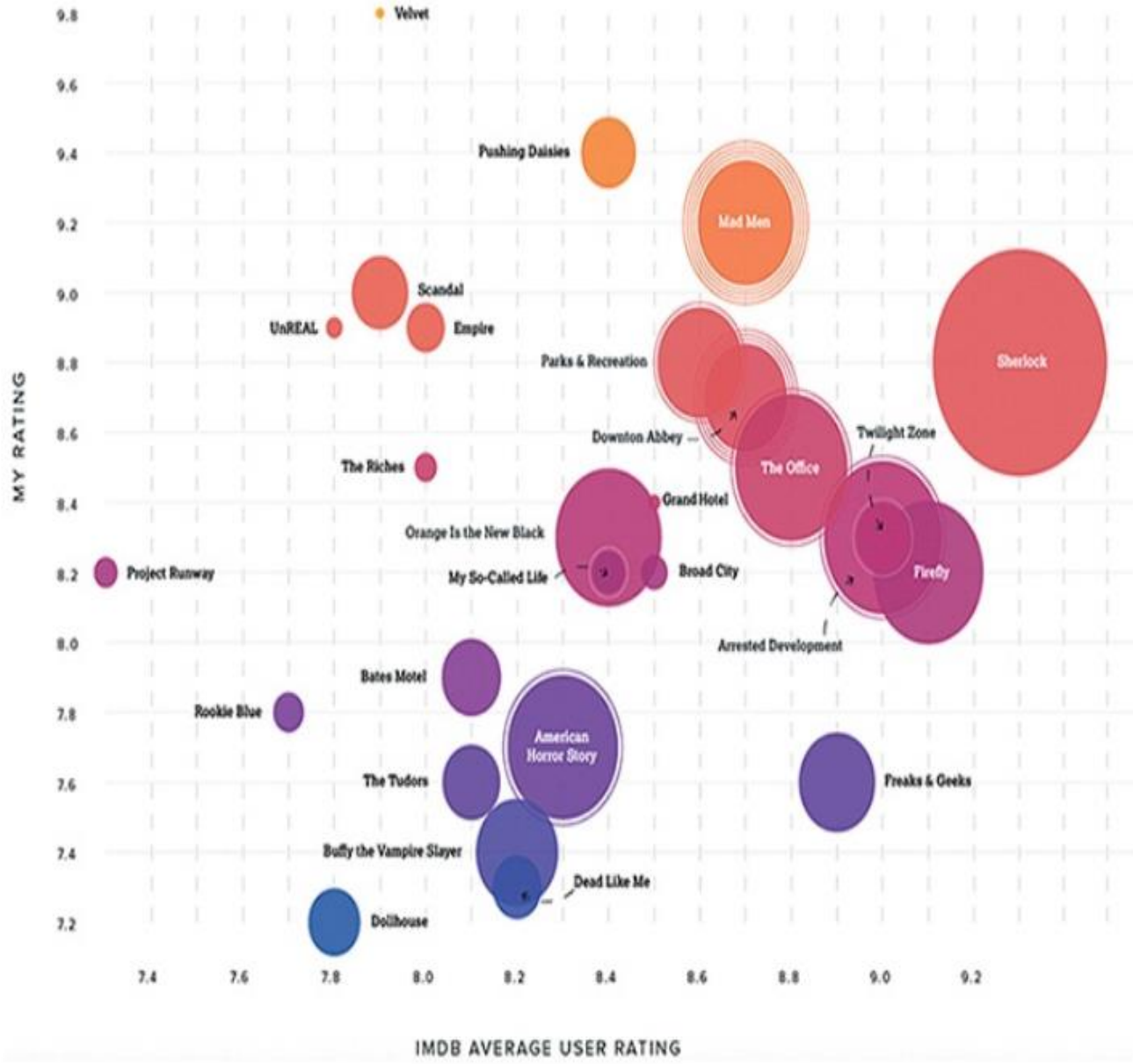


Chelsea Carlson's Netflix story



A	B	C	D	E	F	G	H	I	J	
ow name	time period	main character	length	costume drama	# of seasons	years on the	IMDB ut	IMDB # of users	golde	show creator
d Men	mid 20th	man	45	yes	7	2007-2015	8.7	131,187	4	Mathew Weiner
lvet	mid 20th	ensemble	60	yes	4+	2013-	7.9	879	0	Ramón Campos, Gema R.
ndal	present	woman	45	yes	5+	2012-	7.9	45,209	0	Shonda Rhimes
REAL	present	woman	45	no	2+	2015-	7.8	3,732	0	Marti Noxon, Sarah Gert
Office	present	ensemble	20	no	9	2005-2013	8.8	179,606	1	Greg Daniels, Ricky Ger
ks & Recreation	present	woman	20	no	7	2009-2015	8.6	103,152	1	Greg Daniels, Michael Sc
nton Abbey	early 20th	ensemble	60	yes	6	2010-2015	8.7	98,003	3	Julian Fellowes
rlock	present	man	45	no	4+	2010-	9.3	430,133	0	Mark Gatiss, Steven Mof
pire	present	ensemble	45	yes	2+	2015-	8	20,544	0	Lee Daniels, Danny Stro
fly	future (2517)	man	45	yes	1	2002-2003	9.1	171,351	0	Joss Whedon
sted Development	present	man	20	no	5	2003-2013	9	195,532	1	Mitchell Hurwitz
es Motel	retro present	woman	45	yes	3+	2013-	8.1	49,820	0	Anthony Cipriano, Carlto
aks & Geeks	1980s	woman	45	no	1	1999-2000	8.9	82,813	1	Paul Feig
light Zone	assorted	ensemble	20	no	5	1959-1964	9	39,253	1	Rod Serling
ad City	present	woman	20	no	3+	2014-	8.5	10,154	0	Ilana Glazer, Abbi Jacob
shing Daisies	retro present	couple	45	yes	2	2007-2009	8.4	42,479	0	Bryan Fuller
-So-Called Life	present	woman	45	no	1	1994-1995	8.4	14,541	1	Winnie Holzman
nge Is the New Black	present	women ensemb	45	no	4	2013-	8.4	159,370	0	Jenji Kohan
erican Horror Story	assorted	ensemble	45	yes	5	2011-	8.3	173,899	1	Brad Falchuk, Ryan Murp
ad Like Me	present	woman	45	no	2	2003-2004	8.2	33,669	0	Bryan Fuller
Riches	present	couple	45	no	1.5	2007-2008	8	7,004	0	Dmitry Lipkin
Tudors	17th century	man	45	yes	4	2007-2010	8.1	47,512	0	Michael Hirst
ffy the Vampire Slayer	present	woman	45	no	7	1997-2003	8.2	96,018	0	Joss Whedon
lhouse	present	woman	45	no	2	2009-2010	7.8	38,314	0	Joss Whedon
ject Runway	present	ensemble	45	yes	14+	2004-	7.3	7,881	2	n/a
Grand Hotel	early 20th	ensemble	60	yes	3	2011-2013	8.5	2,079	0	n/a

Chelsea Carlson's Netflix story



Visual Cues

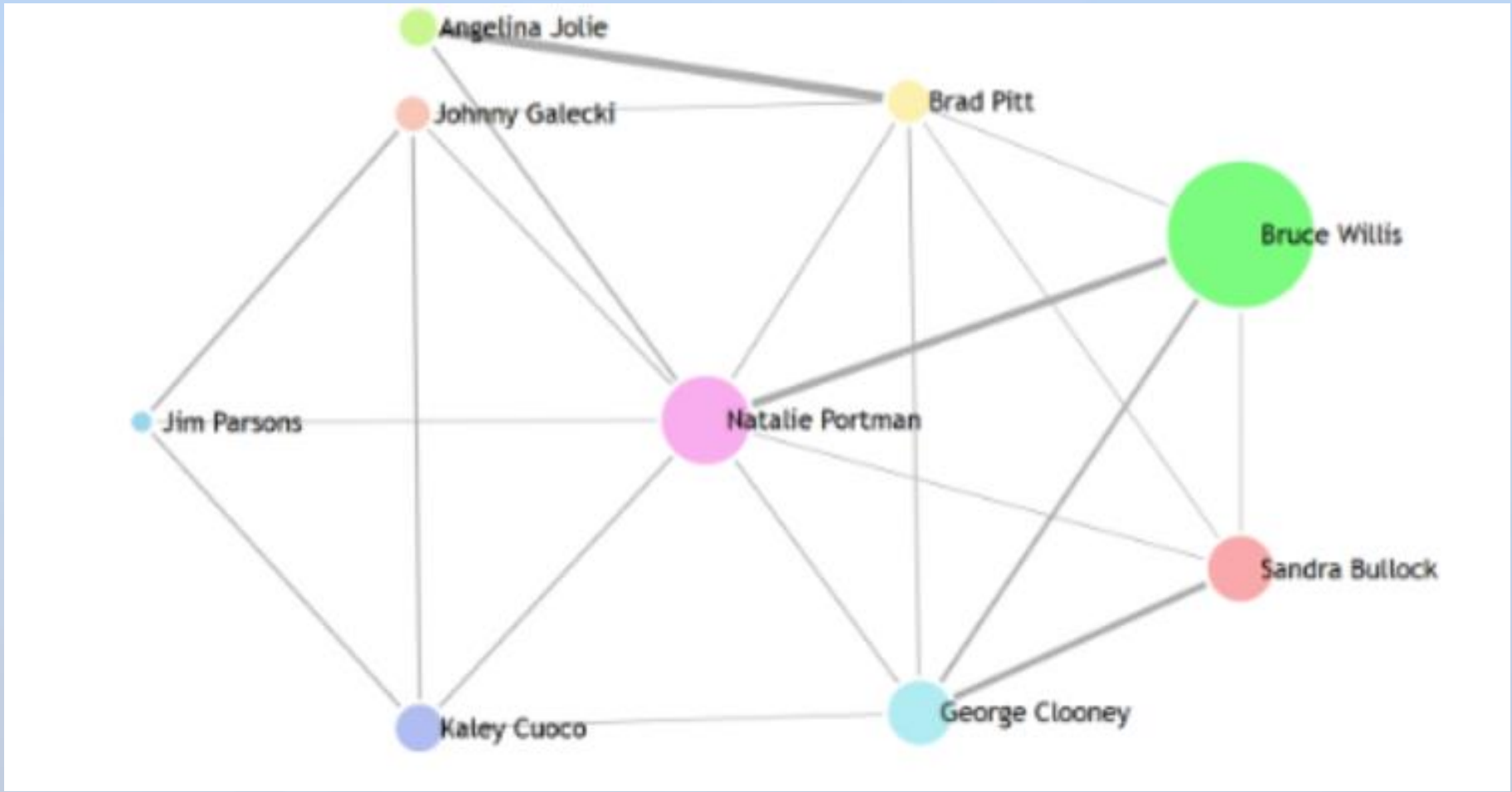
Printer troubleshooter

		Rules							
Conditions	Printer prints	No	No	No	No	Yes	Yes	Yes	Yes
	A red light is flashing	Yes	Yes	No	No	Yes	Yes	No	No
	Printer is recognized by computer	No	Yes	No	Yes	No	Yes	No	Yes
Actions	Check the power cable			✓					—
	Check the printer-computer cable	✓		✓					—
	Ensure printer software is installed	✓		✓		✓		✓	—
	Check/replace ink	✓	✓				✓		—
	Check for paper jam		✓		✓				—

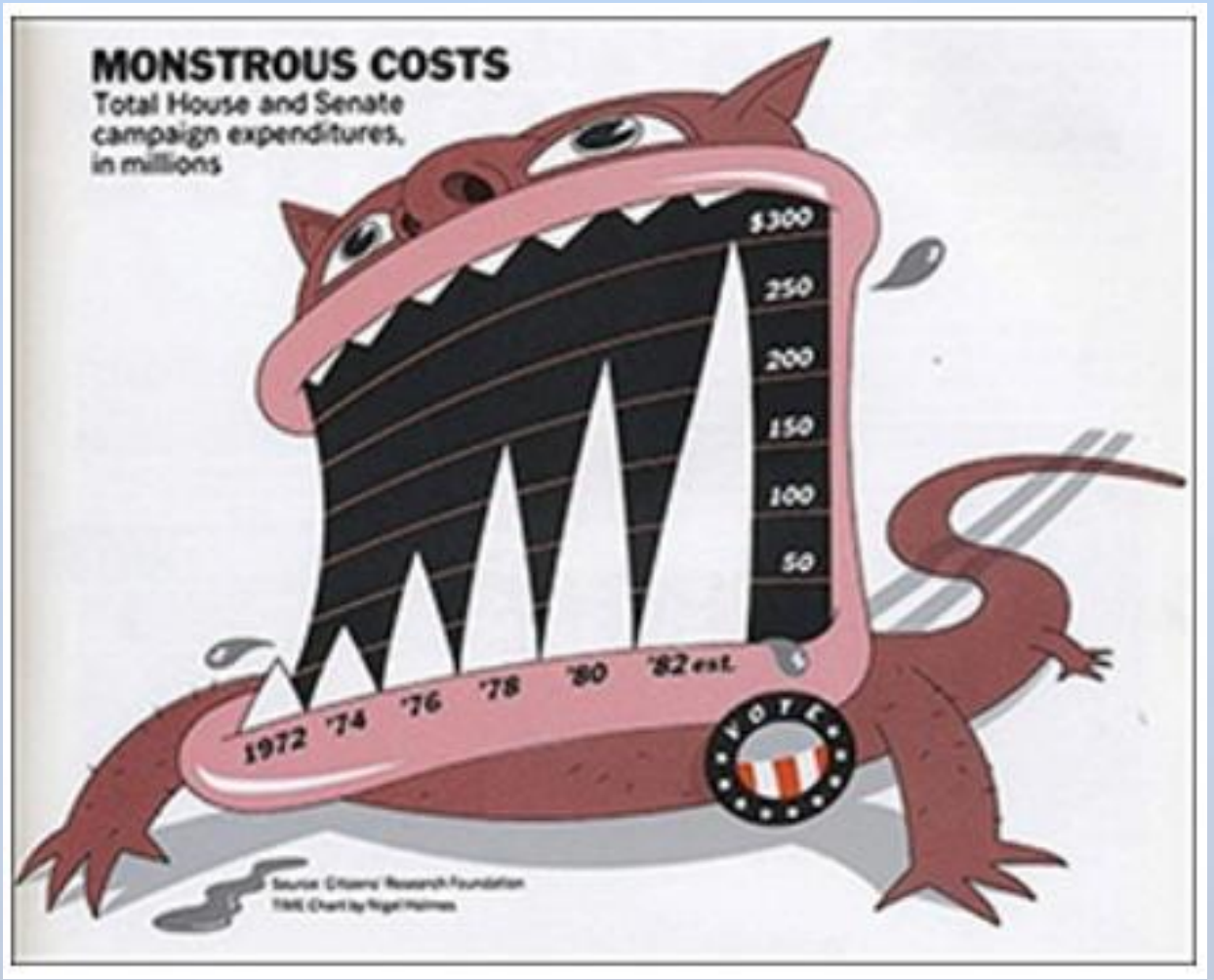
Printer troubleshooter

		Rules							
Conditions	Printer prints	No	No	No	No	Yes	Yes	Yes	Yes
	A red light is flashing	Yes	Yes	No	No	Yes	Yes	No	No
	Printer is recognized by computer	No	Yes	No	Yes	No	Yes	No	Yes
Actions	Check the power cable			✓					—
	Check the printer-computer cable	✓		✓					—
	Ensure printer software is installed	✓		✓		✓		✓	—
	Check/replace ink	✓	✓				✓		—
	Check for paper jam		✓		✓				—

Visual Cues


Angelina Jolie
Johnny Galecki
Brad Pitt
Bruce Willis
Jim Parsons
Natalie Portman
Sandra Bullock
Kaley Cuoco
George Clooney

More visual cues?



॥ त्वं ज्ञानमयो विज्ञानमयोऽसि ॥
IIT Jodhpur

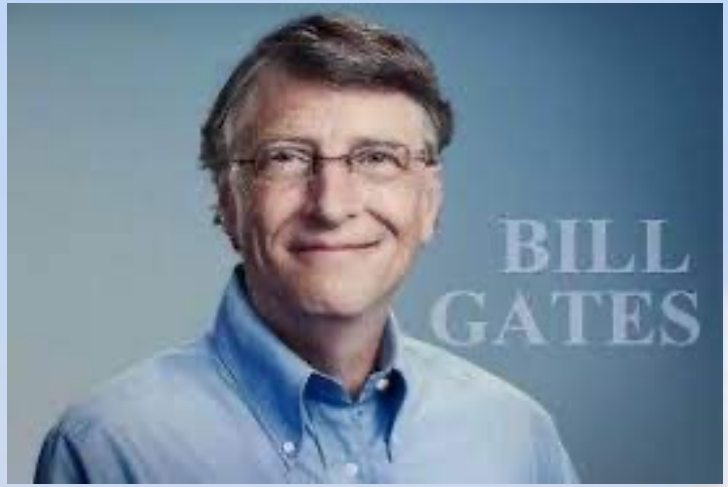
Excellence above all
SME

Technology • Innovation • Leadership

Context and Storytelling

Dr. Deepak Saxena, SME IIT Jodhpur

Content is king…



Gary Vaynerchuk

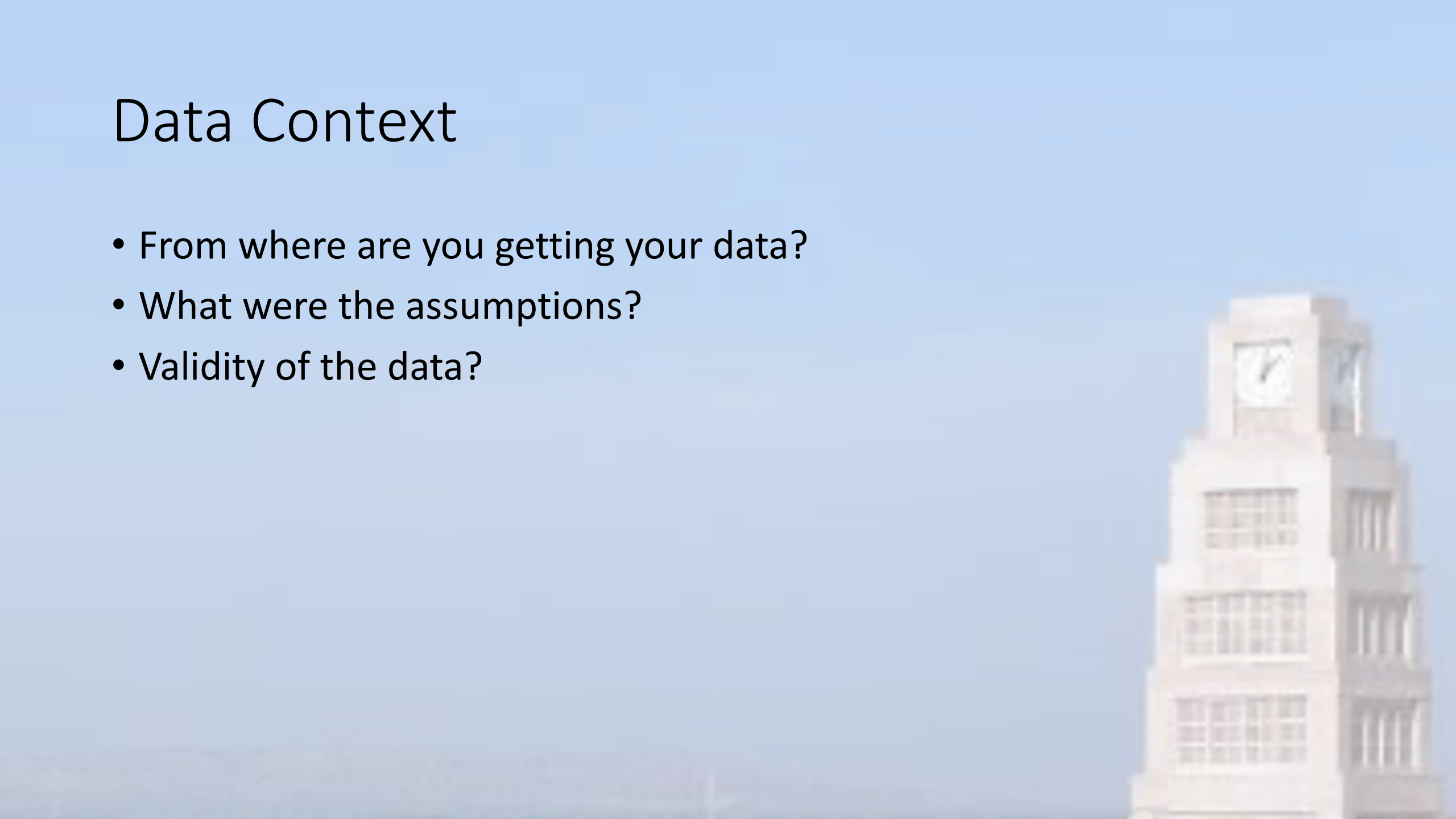
…but context is God.

Various Contexts

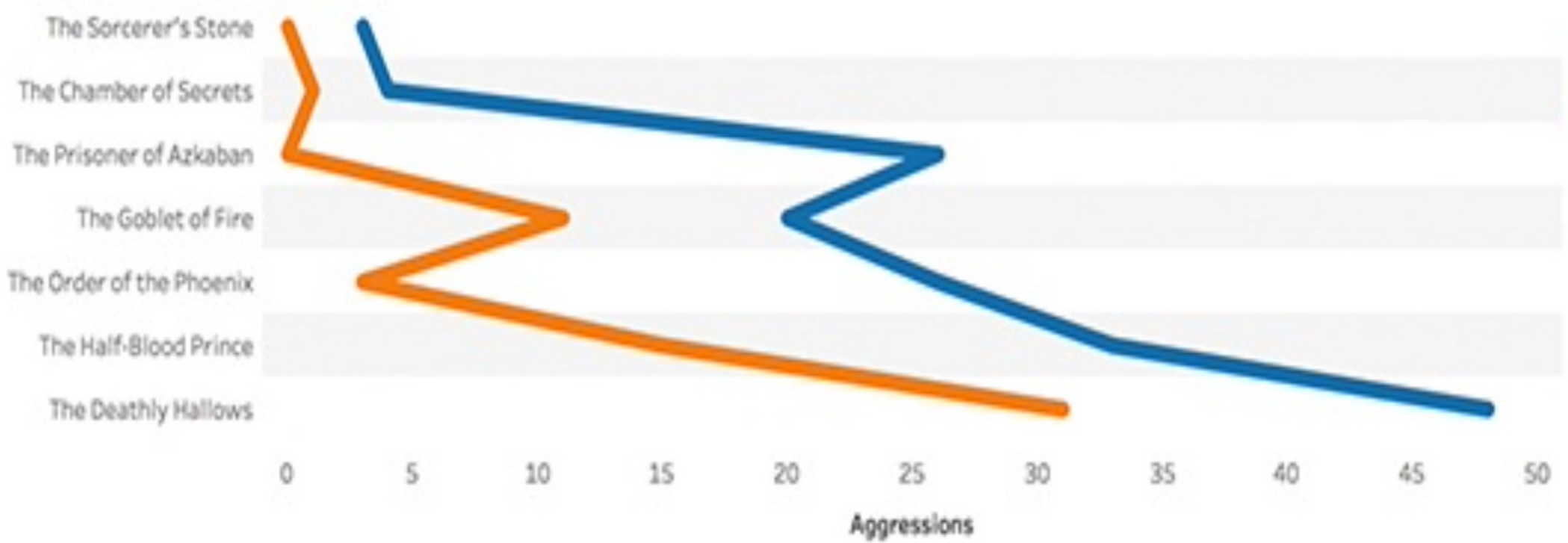
- Data Context
- Structure Context
- Audience Context
- Presentation Context

Data Context

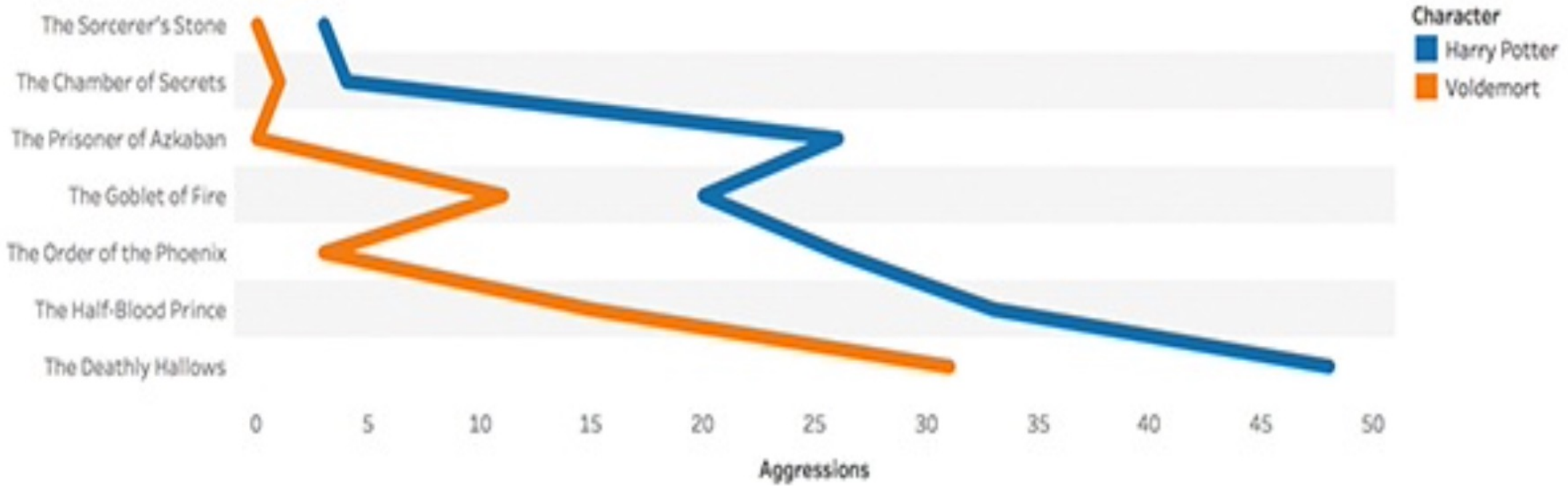
- From where are you getting your data?
- What were the assumptions?
- Validity of the data?

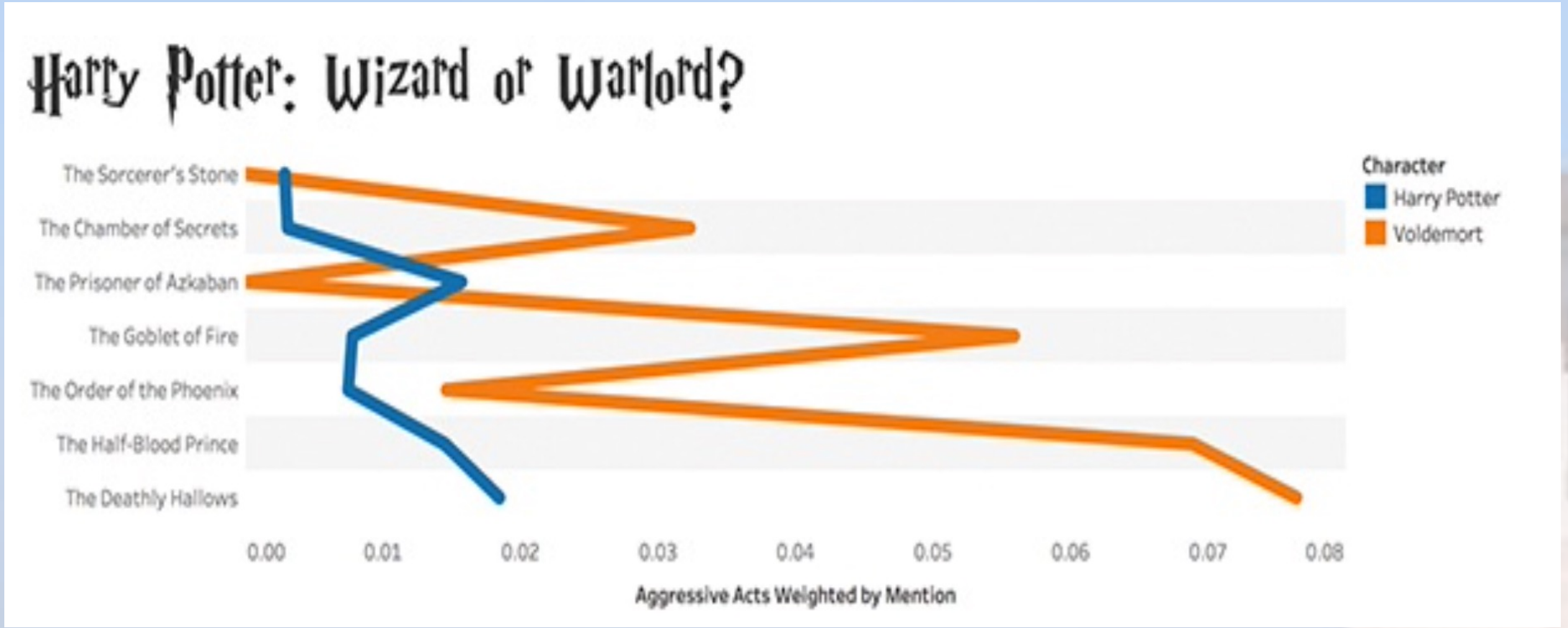


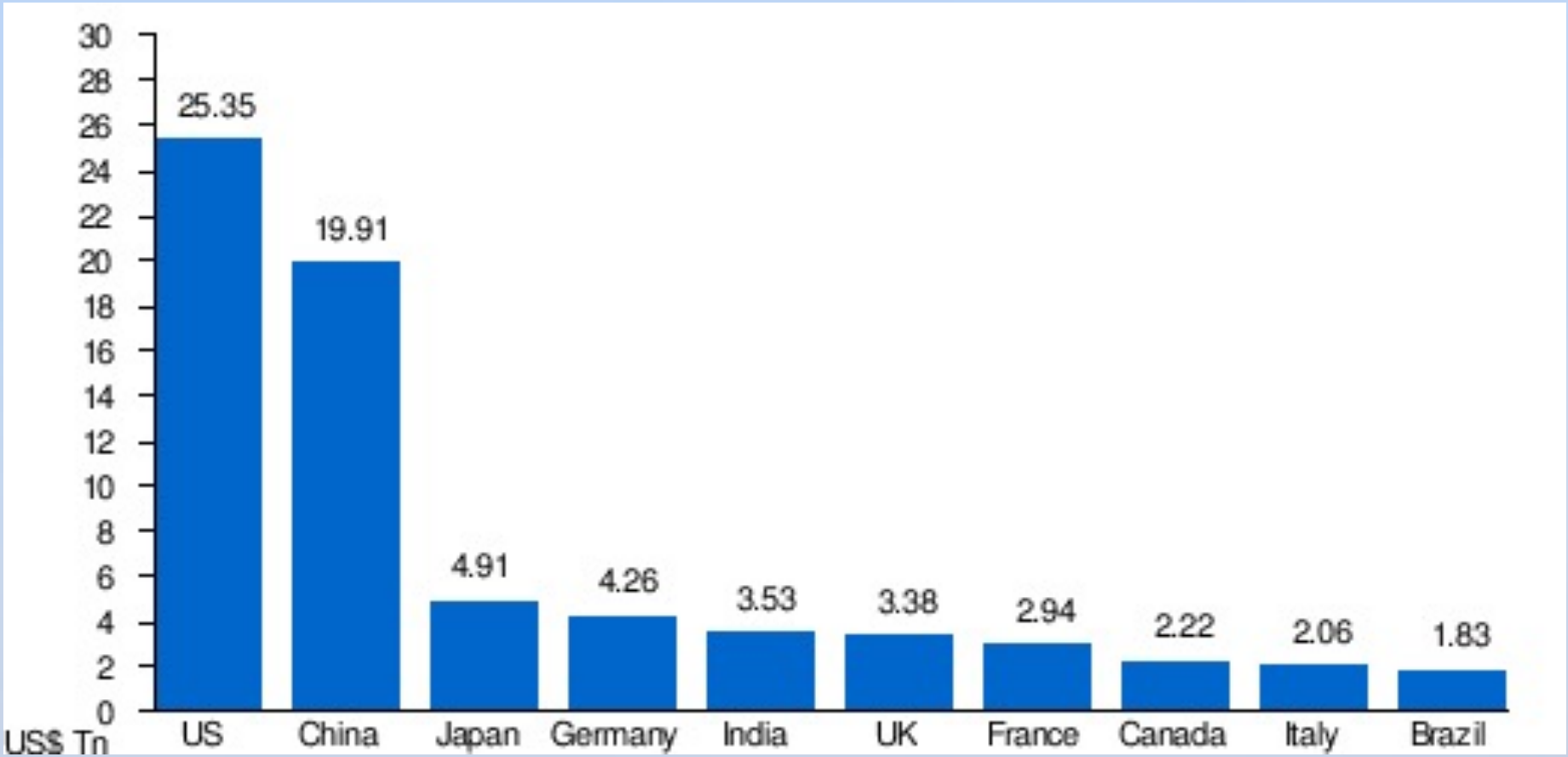
Harry Potter: Wizard or Warlord?



Harry Potter: Wizard or Warlord?

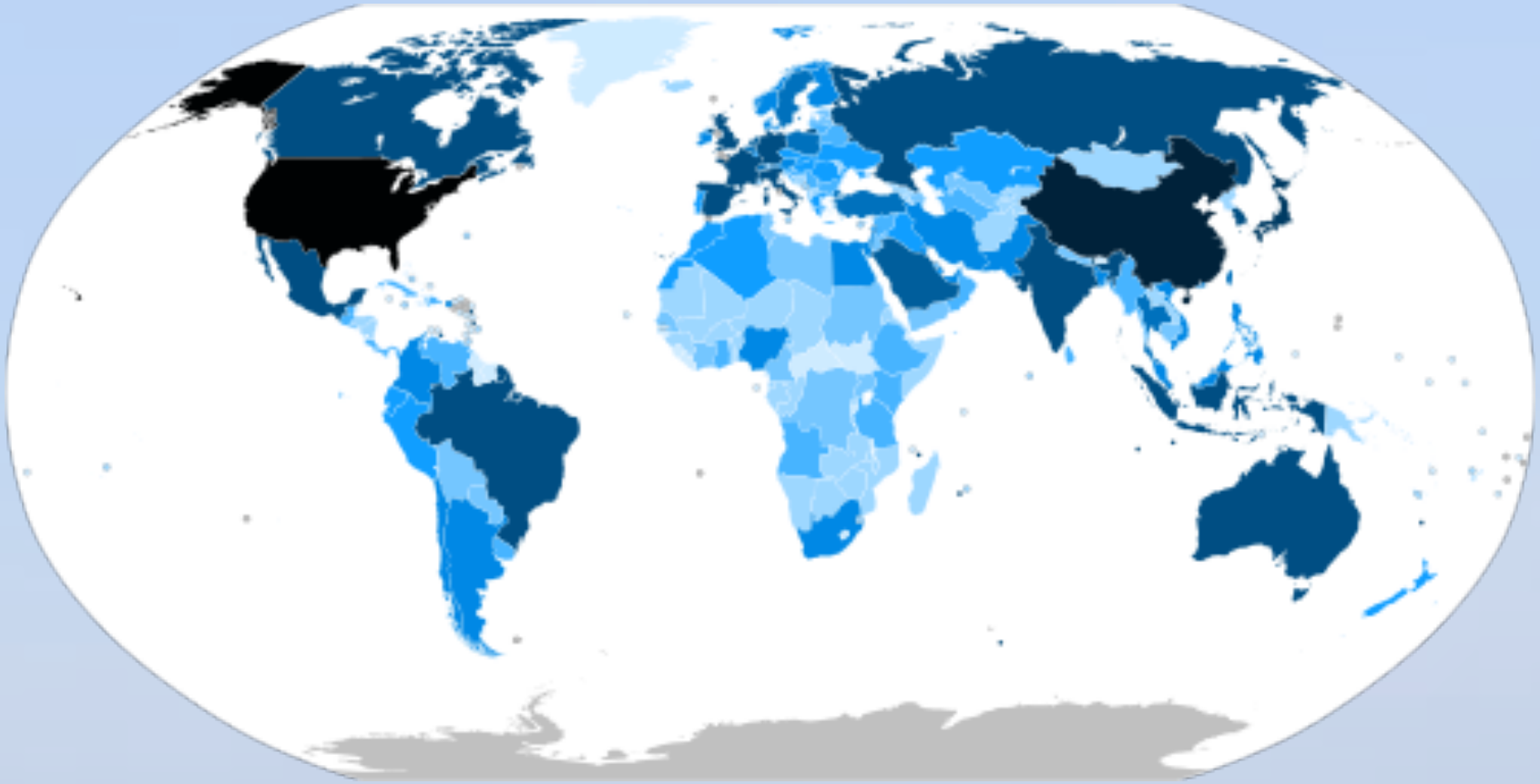



Harry Potter: Wizard or Warlord?
The Sorcerer's Stone
The Chamber of Secrets
The Prisoner of Azkaban
The Goblet of Fire
The Order of the Phoenix
The Half-Blood Prince
The Deathly Hallows
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
Aggressive Acts Weighted by Mention
Character
Harry Potter
Voldemort



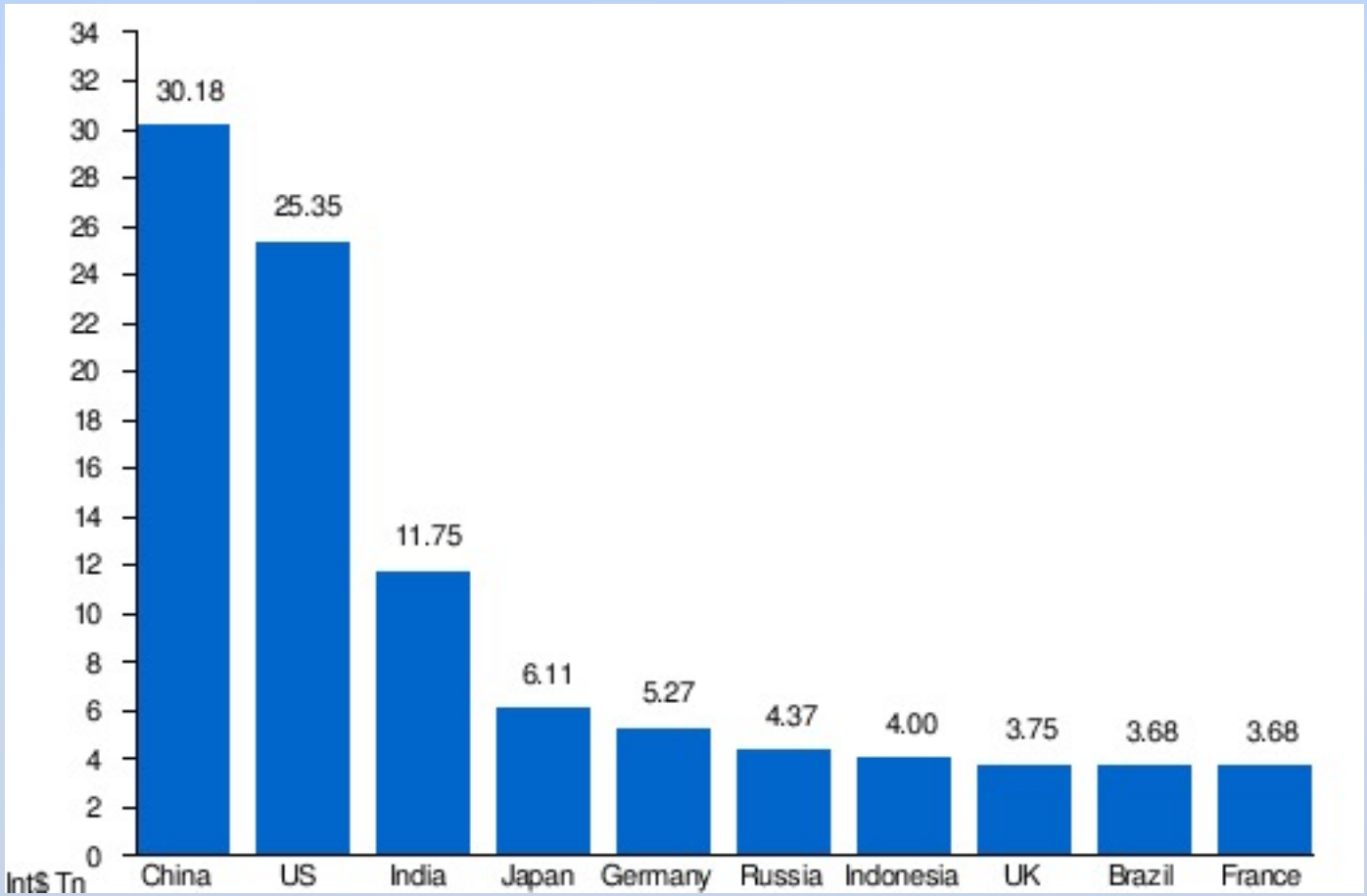
Largest economies in the world by Nominal GDP in 2022 according to International Monetary Fund estimates

Nominal GDP: The market value of the final production of goods and services within a country in a given period using that year's prices (also called "current prices")



Countries by nominal GDP in 2019[n 1]

> $20 trillion	$750 billion – $1 trillion	$50–100 billion
$10–20 trillion	$500–750 billion	$25–50 billion
$5–10 trillion	$250–500 billion	$5–25 billion
$1–5 trillion	$100–250 billion	< $5 billion

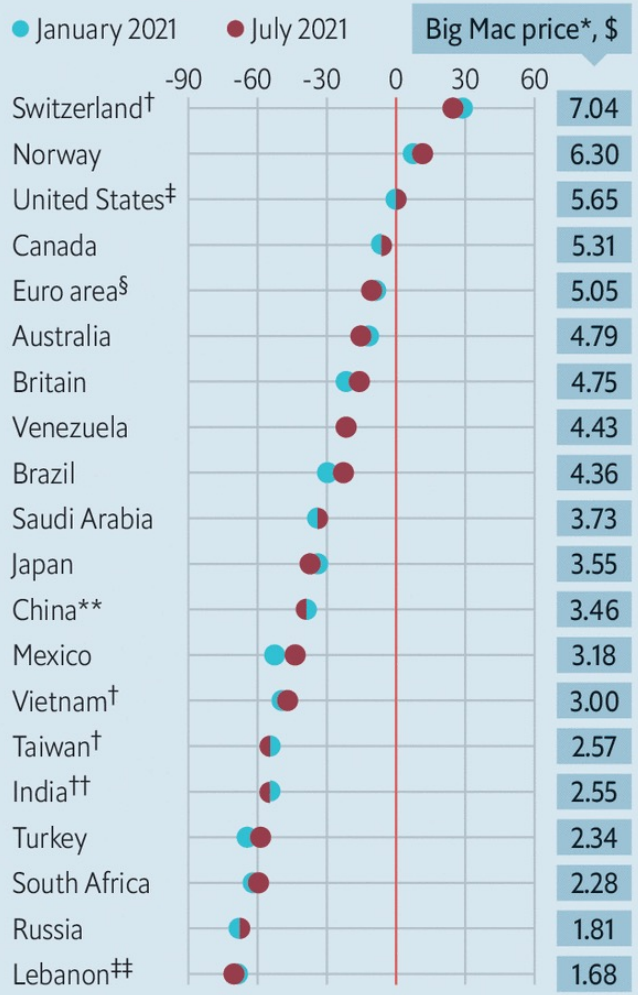


Largest economies in the world by PPP GDP in 2022 according to International Monetary Fund estimates

PPP: Purchasing Power Parity

The Big Mac index

Local currency under(-)/over(+) valuation against the dollar, selected currencies, %

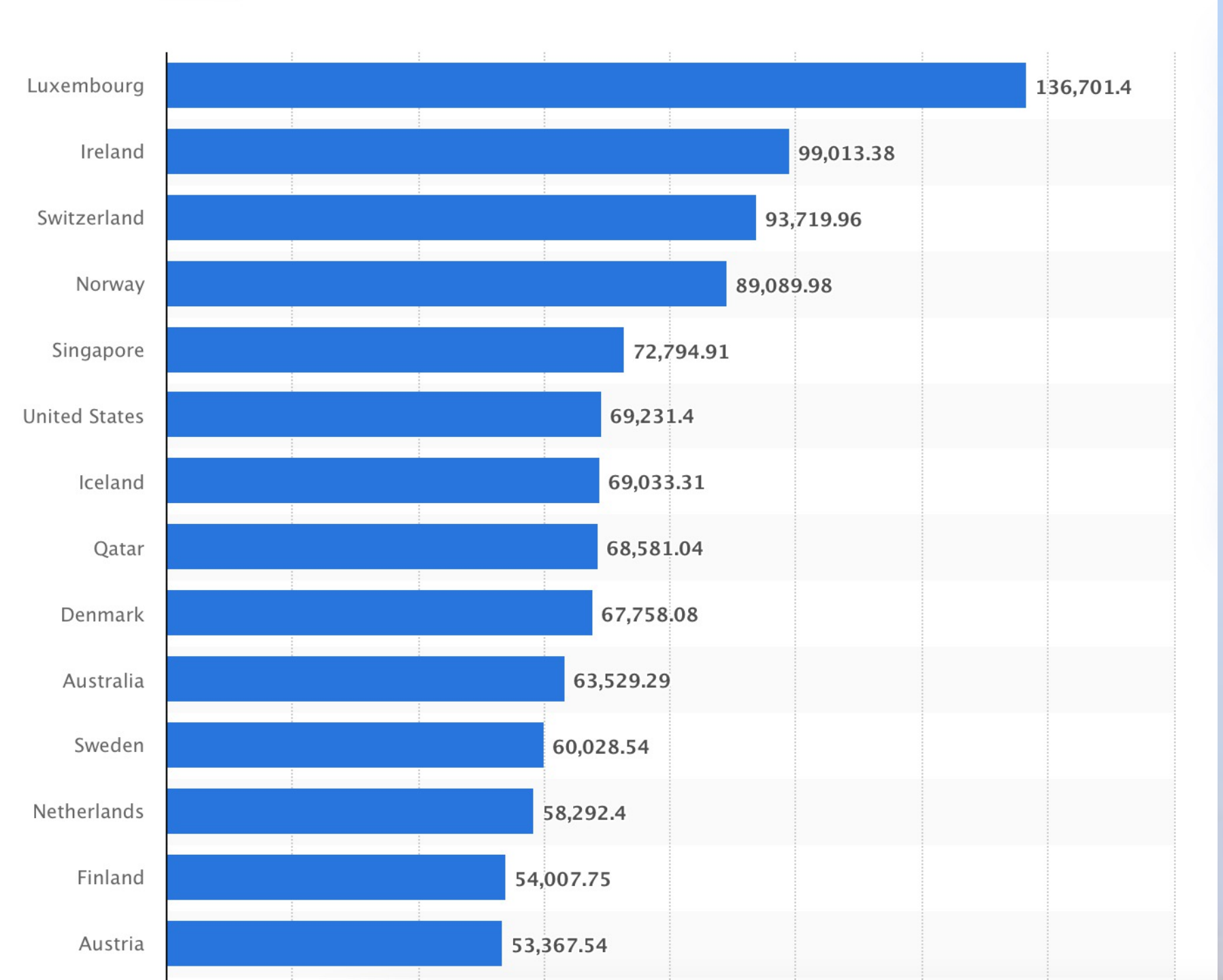


*At market exchange rates (July 20th 2021) †Subject to "enhanced engagement" with US Treasury ‡Average of four big cities §Weighted average of member countries **Average of five cities ††Maharaja Mac ‡‡Unofficial exchange rate

Sources: McDonald's; *The Economist*

Explore the full, interactive version of our Big Mac index at economist.com/BigMac

Top Countries by GDP Per Capita, 2021 (Source: Statista.com)



Structure Context

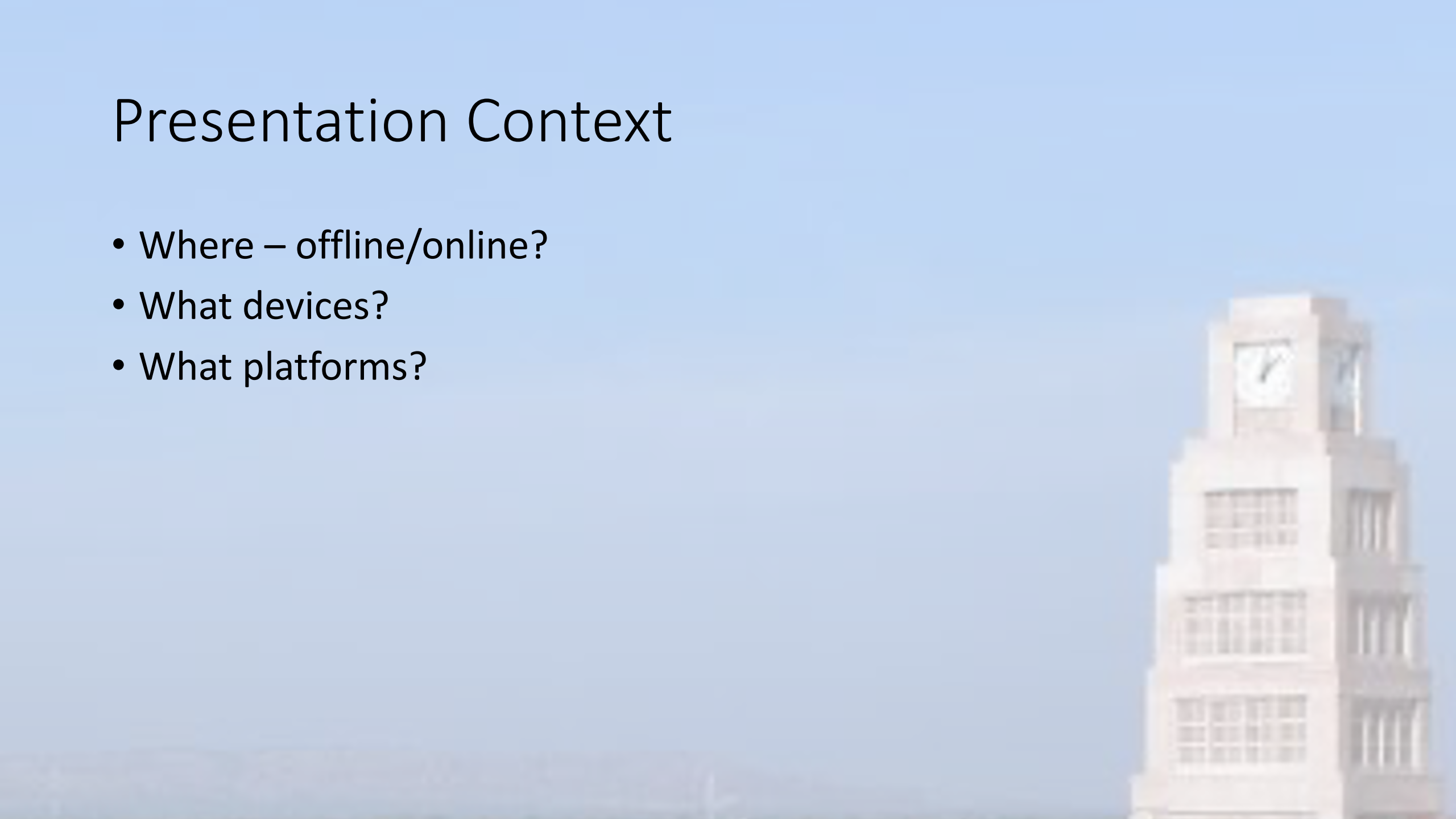
- Change over time
- Drill down
- Zoom out
- Contrast
- Spread
- Intersections
- Factors
- Outliers

Audience Context

- Who are your audience?
- What is your relationship with the audience?
- Pre- and post-presentation?

Presentation Context

- Where – offline/online?
- What devices?
- What platforms?



Some Good Examples

- https://archive.nytimes.com/www.nytimes.com/interactive/2009/12/05/world/climate-graphic-players.html?ref=world

- https://www.gapminder.org/answers/how-does-income-relate-to-life-expectancy/.

Classification of Visualizations

Dr. Deepak Saxena, SME IIT Jodhpur

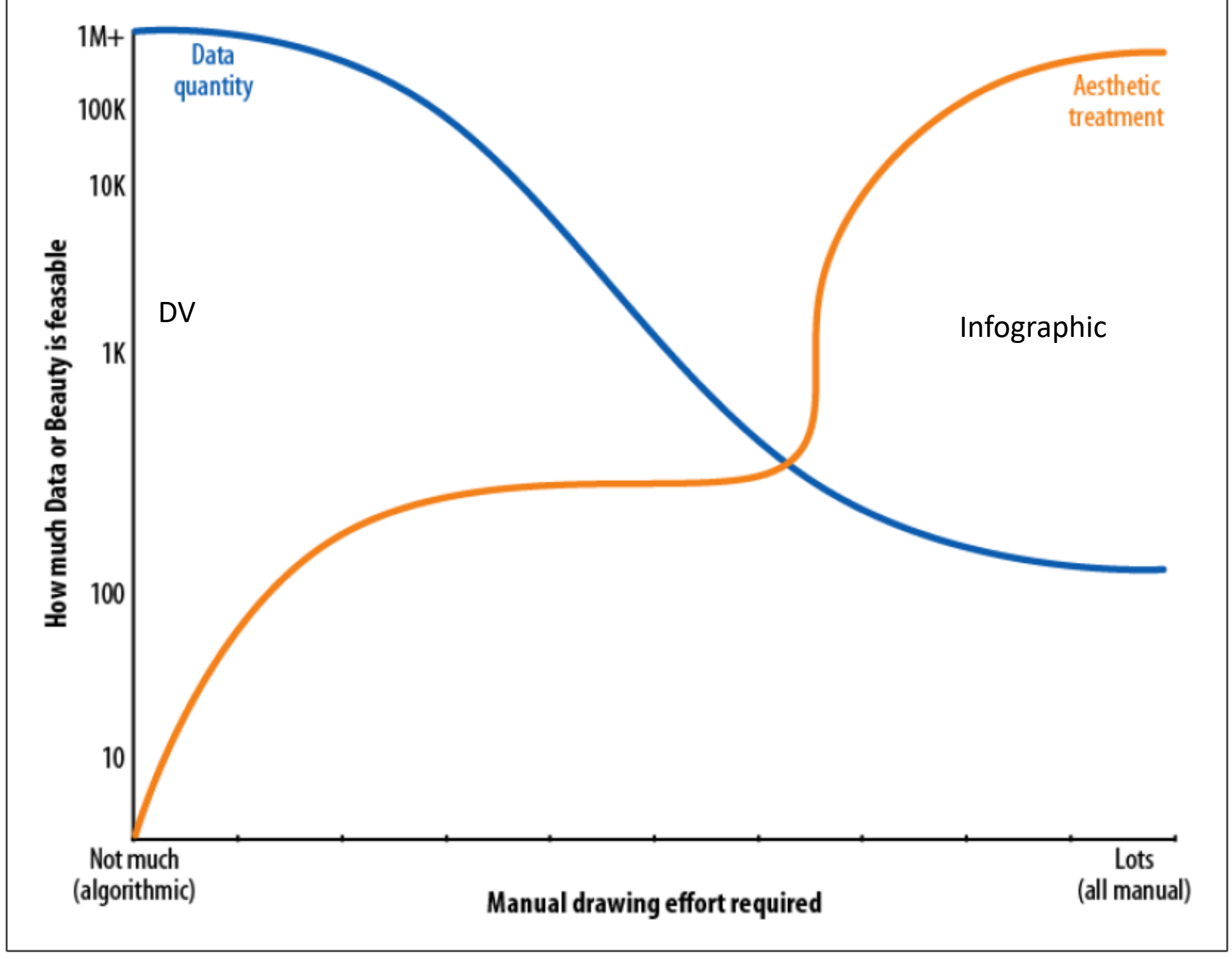
Infographic

- Manually drawn (and therefore a custom treatment of the information);
- Specific to the data at hand (and therefore nontrivial to recreate with different data);
- Aesthetically rich (strong visual content meant to draw the eye and hold interest);
- Relatively data-poor (because each piece of information must be manually encoded).

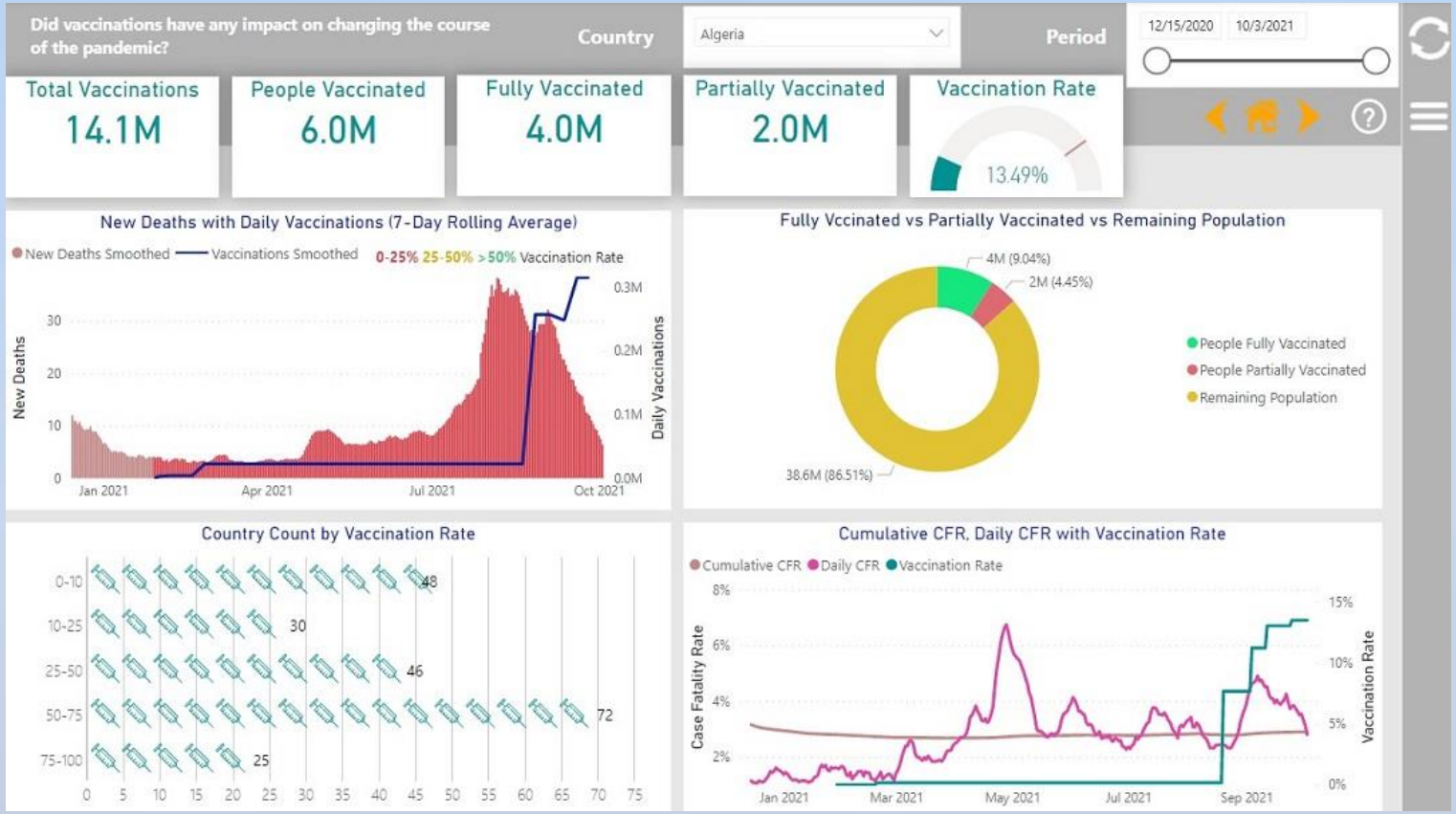
Data/Information Visualization

- Algorithmically drawn (may have custom touches but is largely rendered with the help of computerized methods);
- Easy to regenerate with different data (the same form may be repurposed to represent different datasets with similar dimensions or characteristics);
- Often aesthetically barren (data is not decorated);
- Relatively data-rich (large volumes of data are welcome and viable, in contrast to infographics).

Infographic vs Visualization



Infographic vs Visualization



Data Visualization

Infographic

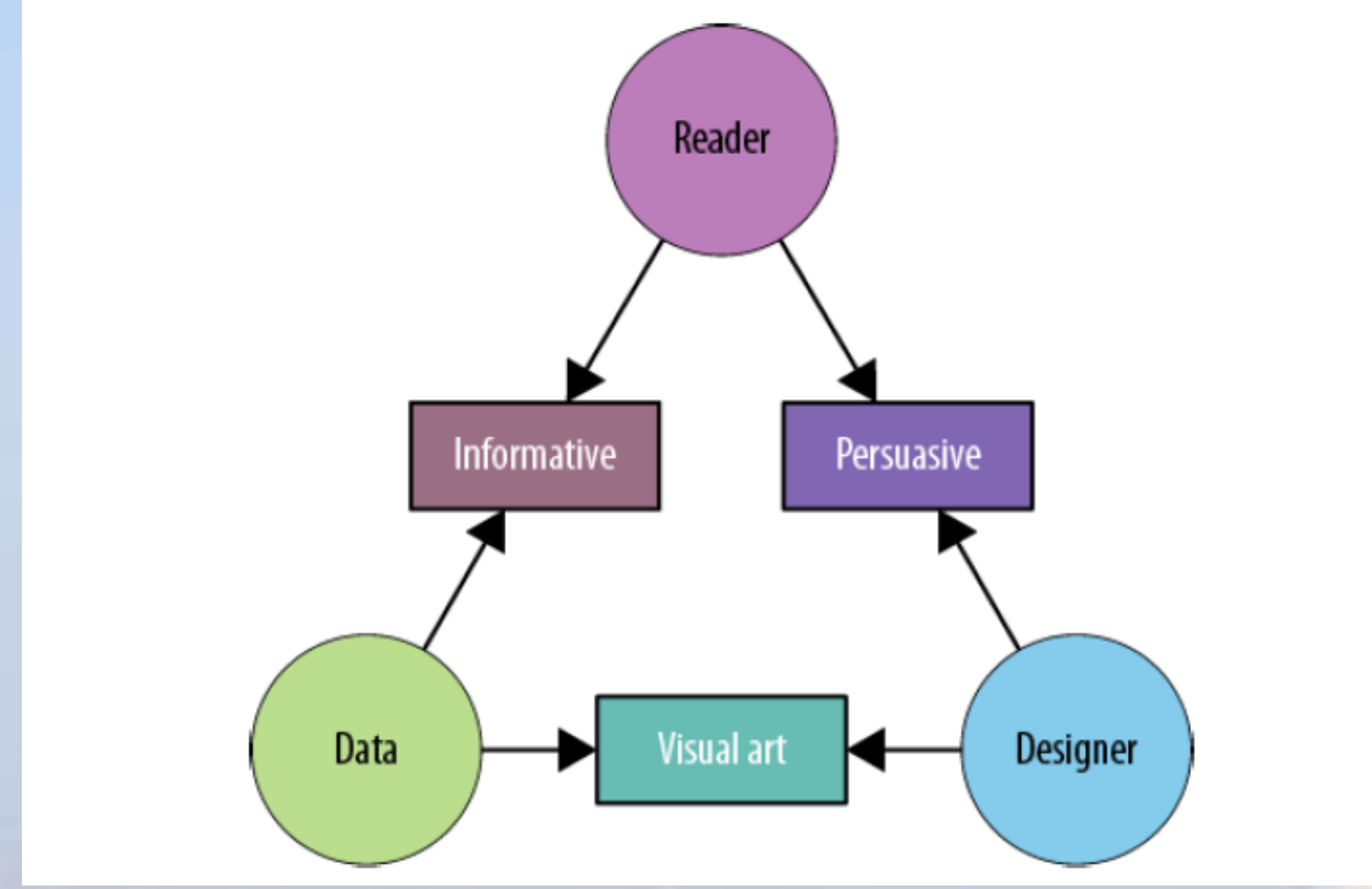
Types of Visualizations: Exploratory

- Exploratory data visualizations are appropriate when you have a whole bunch of data and you're *not sure what's in it*.
- When you need to get a sense of what's inside your data set, translating it into a visual medium can help you quickly identify its features, including interesting curves, lines, trends, or anomalous outliers.
- Exploration is generally best done at a high level of granularity. There may be a whole lot of noise in your data, but if you oversimplify or strip out too much information, you could end up missing something important.
- This type of visualization is typically part of the *data analysis* phase, and is used to find *the story the data has to tell you*.

Types of Visualizations: Explanatory

- Explanatory data visualization is appropriate when you already know what the data has to say, and you are *trying to tell that story to somebody else*.
- Whoever your audience is, the story you are trying to tell (or the answer you are trying to share) is *known to you at the outset*, and therefore you can design to specifically accommodate and highlight that story.
- In other words, you'll need to make certain *editorial decisions* about which information stays in, and which is distracting or irrelevant and should come out.
- This is a process of selecting focused data that will support the story you are trying to tell.
- Explanatory data visualization is part of the presentation phase.

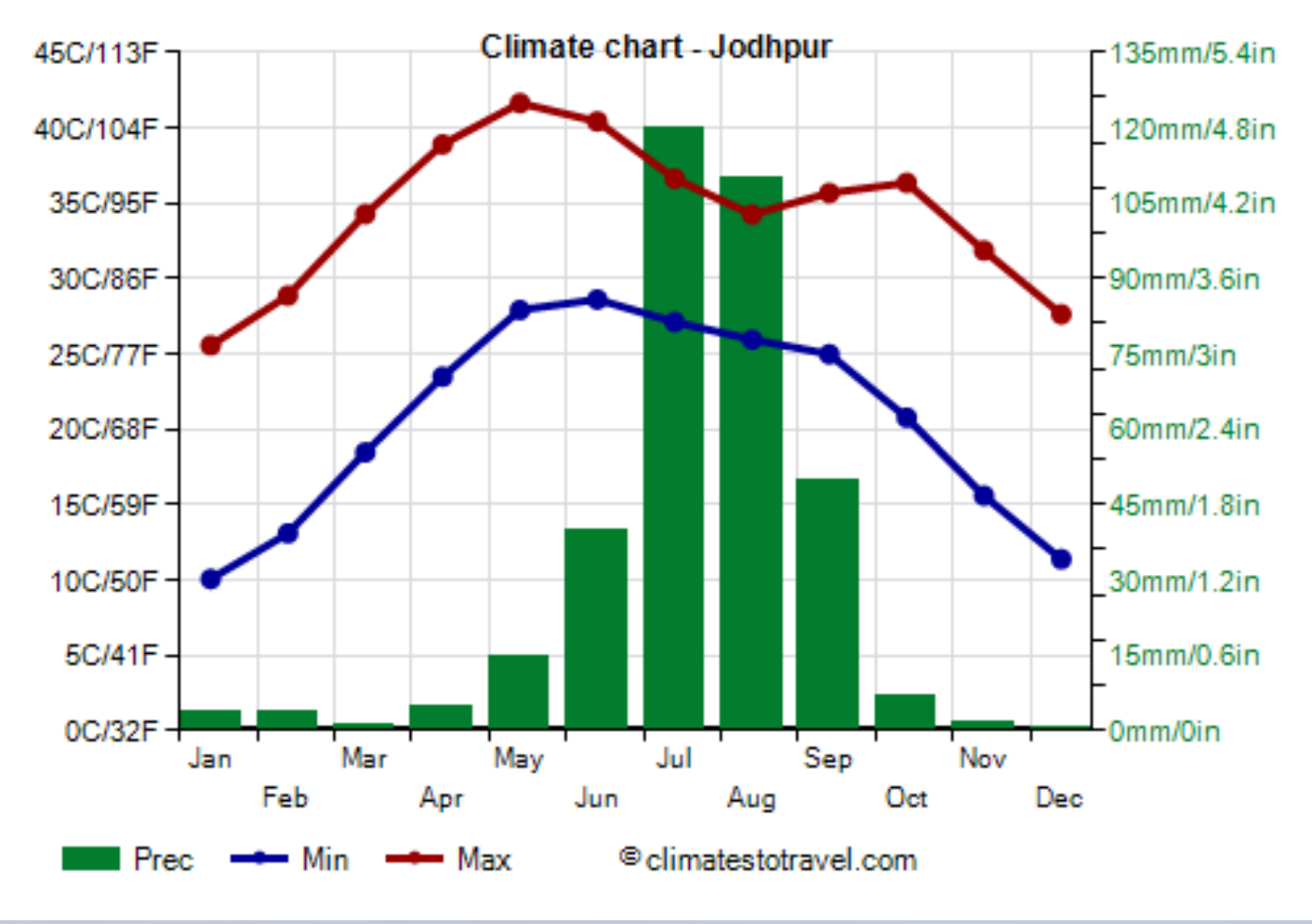
Explanatory Visualization can be of three types



Informative

- Aims for a neutral presentation of the facts in such a way that will educate the reader (though not necessarily persuade him).
- Informative visualizations are often associated with broad data sets, and seek to distill the content into a manageably consumable form.
- Ideally, they form the bulk of visualizations that the average person encounters on a day-to-day basis

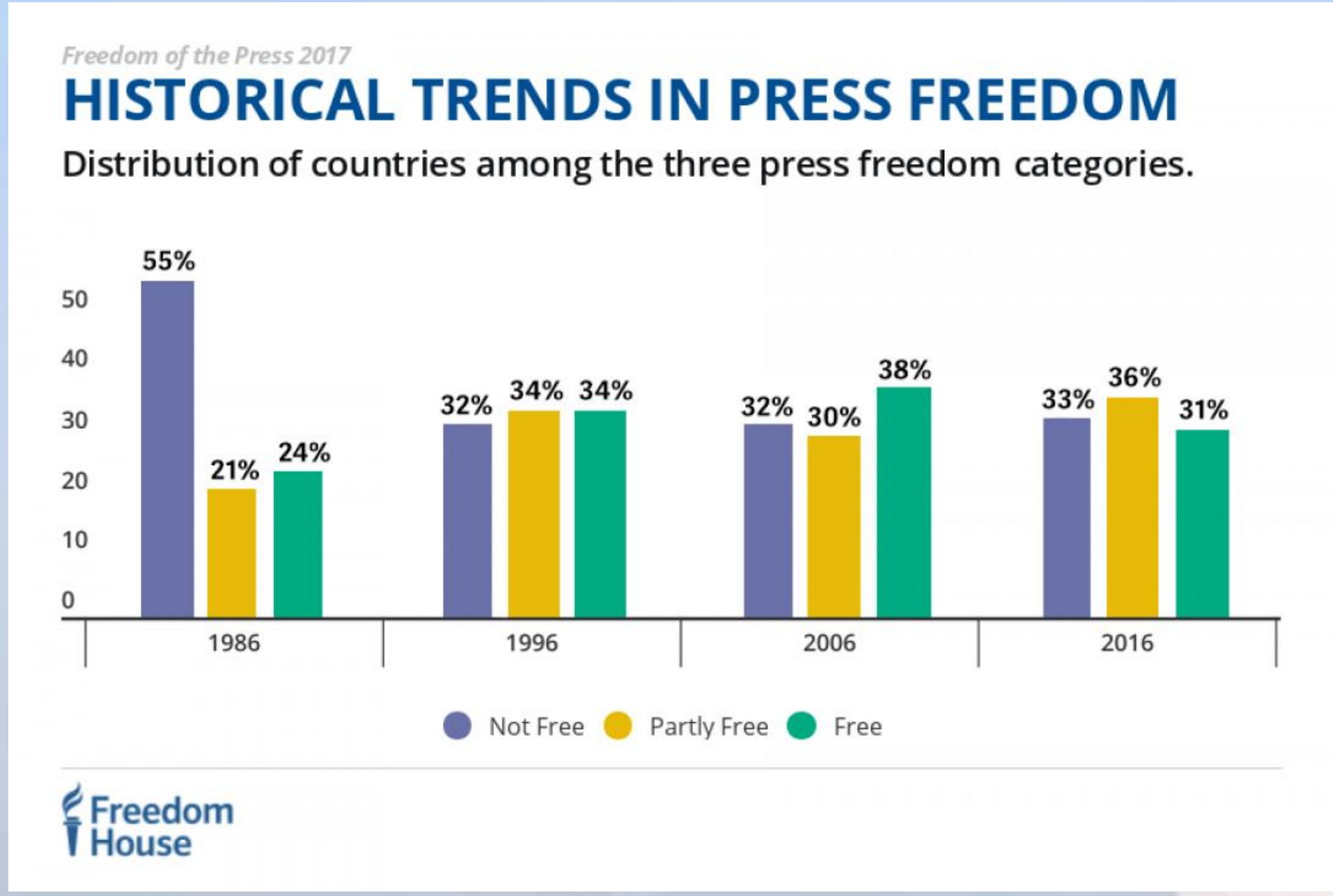
Informative Visualization



Persuasive

- Primarily serves the relationship between the designer and the reader. It is useful when the designer wishes to change the reader's mind about something.
- It represents a very specific point of view, and advocates a change of opinion or
- action on the part of the reader. In this category of visualization, the data represented
- is specifically chosen for the purpose of supporting the designer's point of view, and is
- presented carefully so as to convince the reader of same.

What it may be suggesting?



Persuasion

1% of Indians take home 22% of the country's income.

1% of Indians account for 45% of all flights.

3% of Indians make up all unique credit card holders.

2.6% of Indians invest in mutual funds.

8% of Indian households constitute 100% car ownership.

6.5% of Indian users account for about 44% of UPI transactions.

5% of Indian users account for about 33% of orders placed on Zomato.

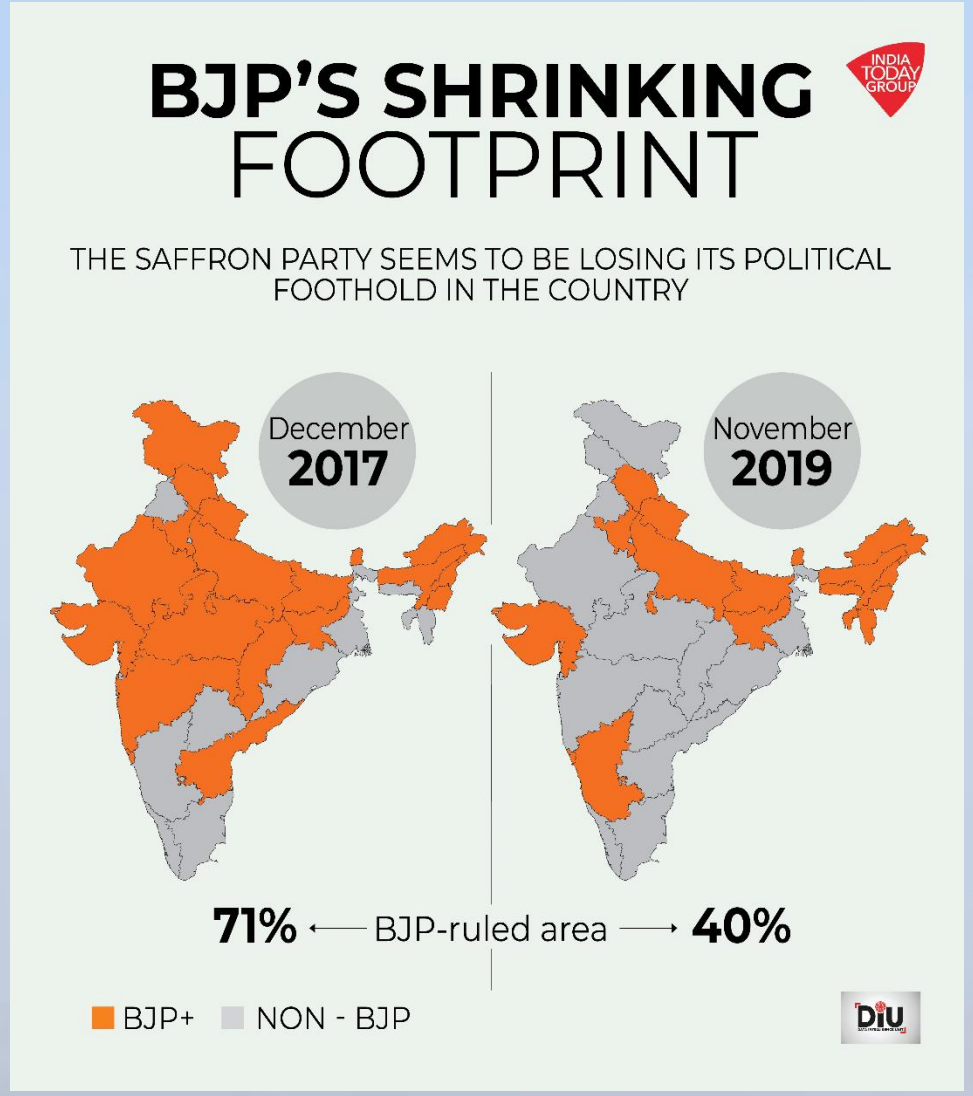
7.4% of urban Indians read an English newspaper.

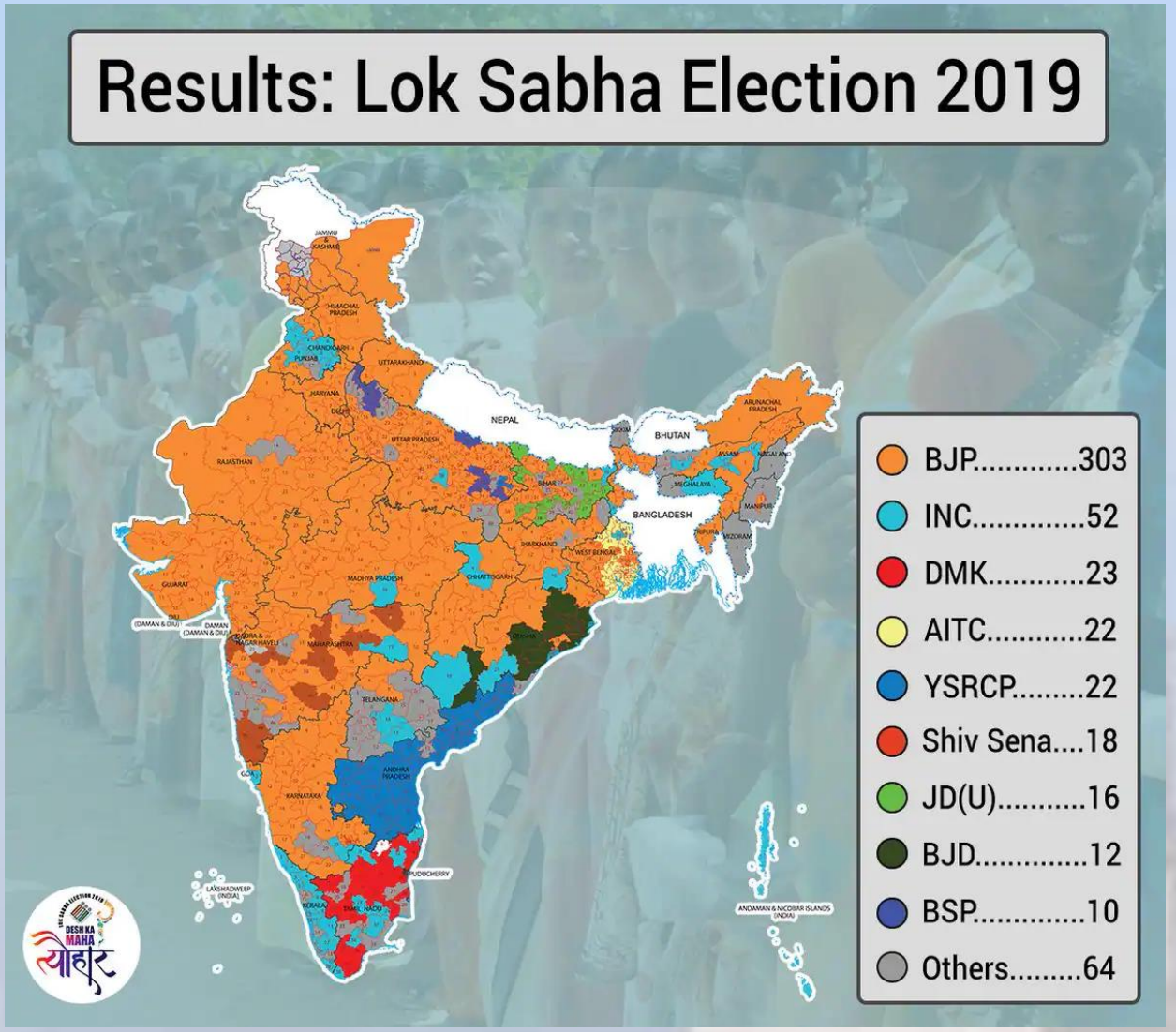
Do the math. Thank You.

Hindustan Times | THE HINDU | The Telegraph | THE TIMES OF INDIA

All data presented sourced from The Indus Valley Report, 2023 by Blume Ventures (bit.ly/indusvalley2023). Total Readership data is based on IRS Q4, 2019.

Persuasion

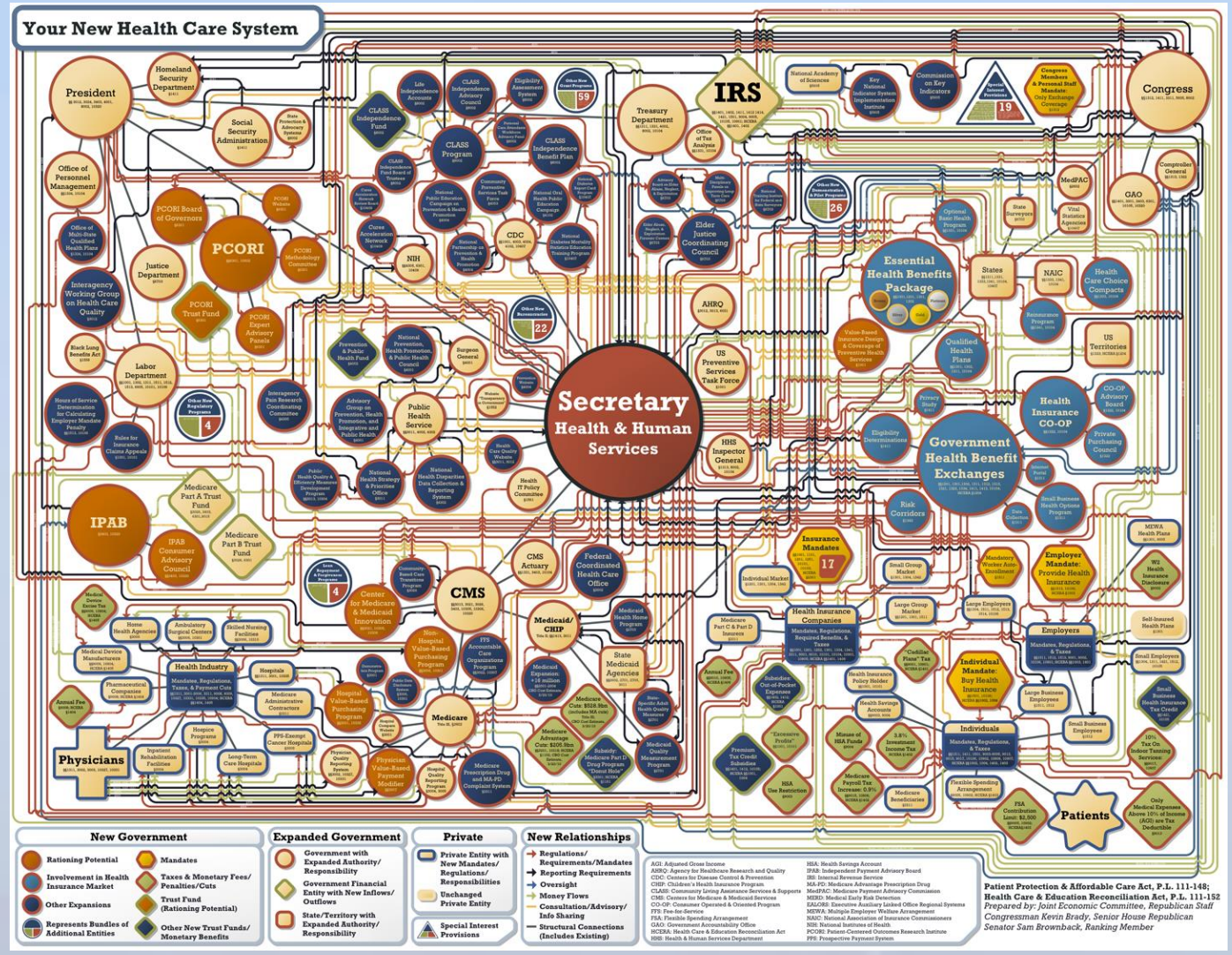

BJP'S SHRINKING FOOTPRINT
INDIA TODAY GROUP
THE SAFFRON PARTY SEEMS TO BE LOSING ITS POLITICAL FOOTHOLD IN THE COUNTRY
December 2017
November 2019
71% ⟵ BJP-ruled area ⟶ 40%
BJP+
NON - BJP
DIU


Results: Lok Sabha Election 2019
BJP.....303
INC.....52
DMK.....23
AITC.....22
YSRCP.....22
Shiv Sena....18
JD(U).....16
BJD.....12
BSP.....10
Others.....64
NEPAL
BHUTAN
BANGLADESH
DESH KA MAHA त्योहार

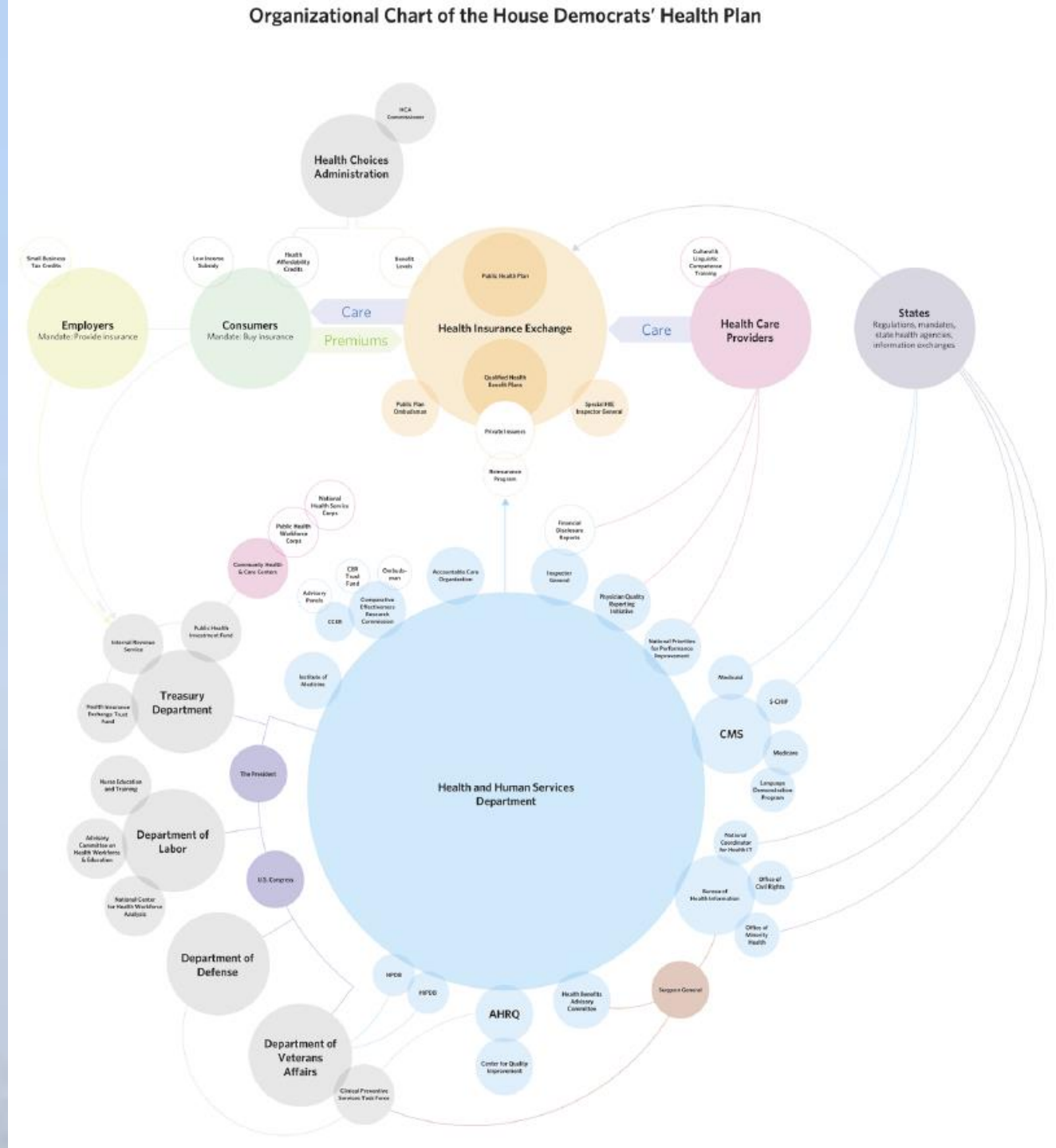
Visual Art

- Primarily serves the relationship *between the designer and the data*.
- Visual art is unlike the previous two categories in that it often entails *unidirectional* encoding of information, meaning that the reader may not be able to decode the visual presentation to understand the underlying information.
- Whereas both informative and persuasive visualizations are meant to be easily decodable - *bidirectional* in their encoding - visual art merely translates the data into a visual form.

American Healthcare System



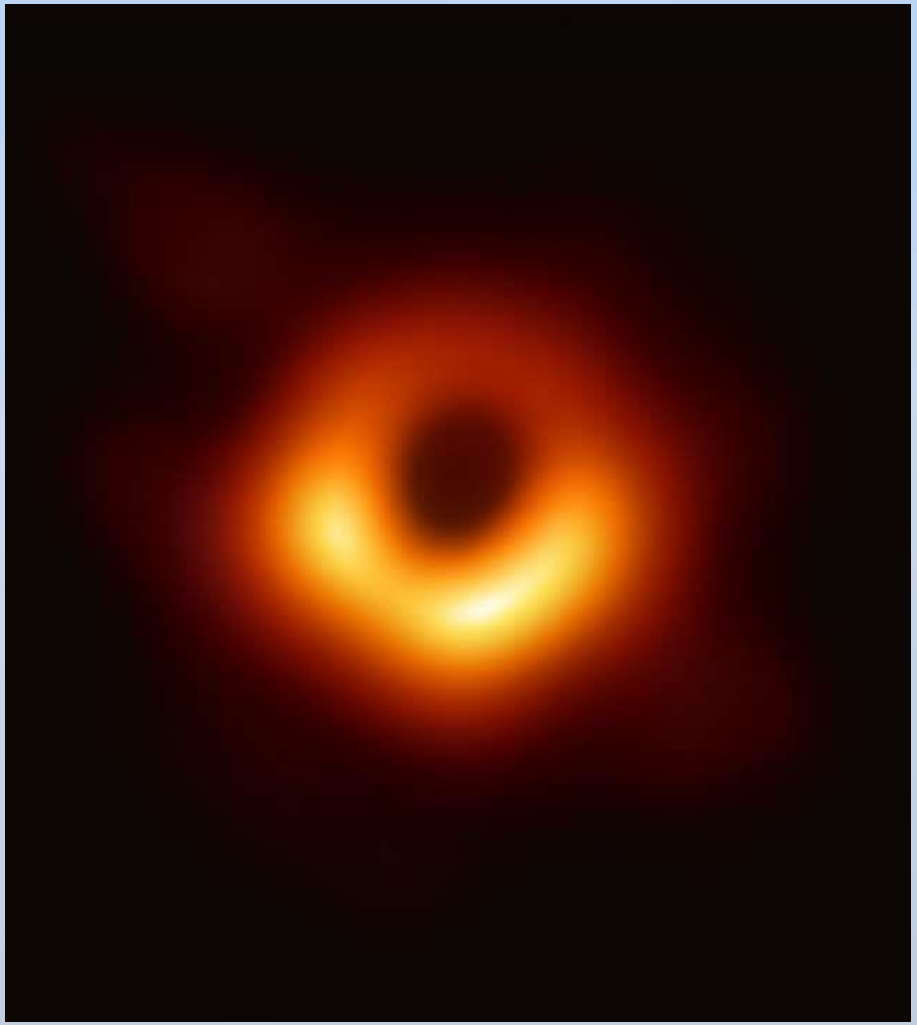
Prepared by
Republicans (US)



American Healthcare System

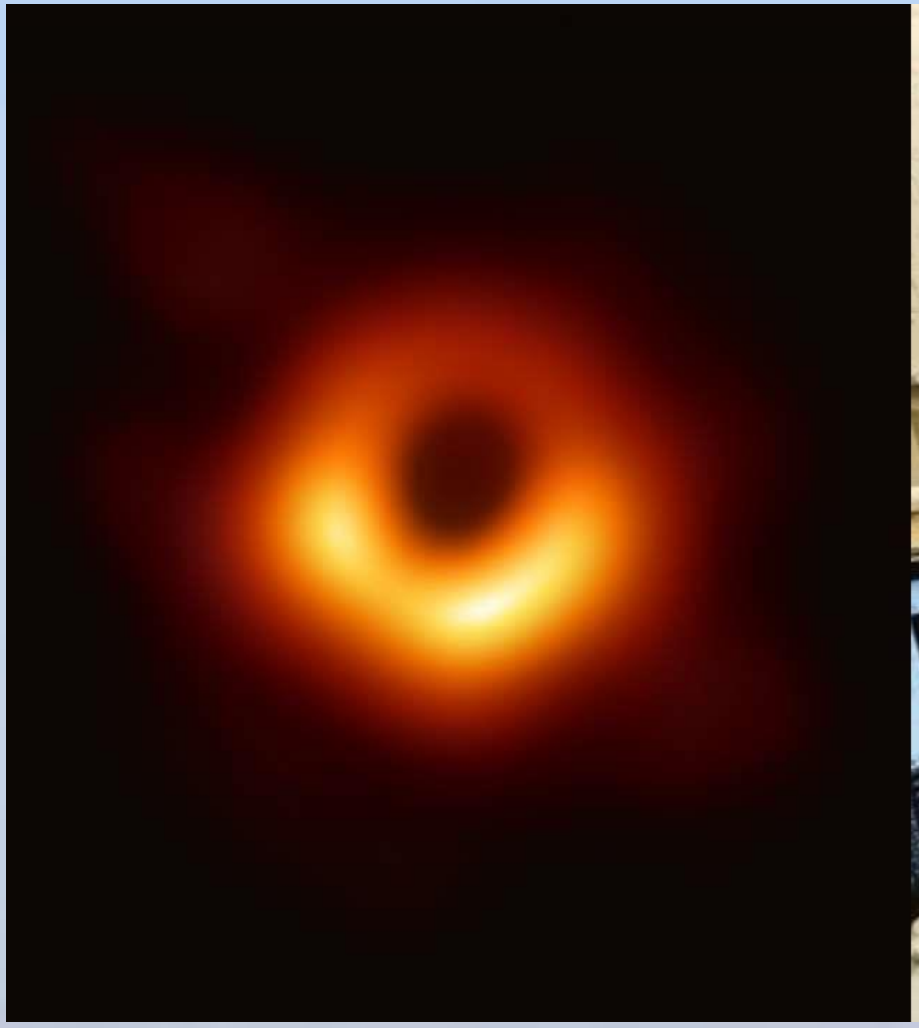
Prepared by A citizen designer, Robert Palmer

Possibly the greatest visual art



First ever image of a Black Hole

The artist



First ever image of a Black Hole

Katie Bouman, PhD (MIT), Assistant Prof. CalTech

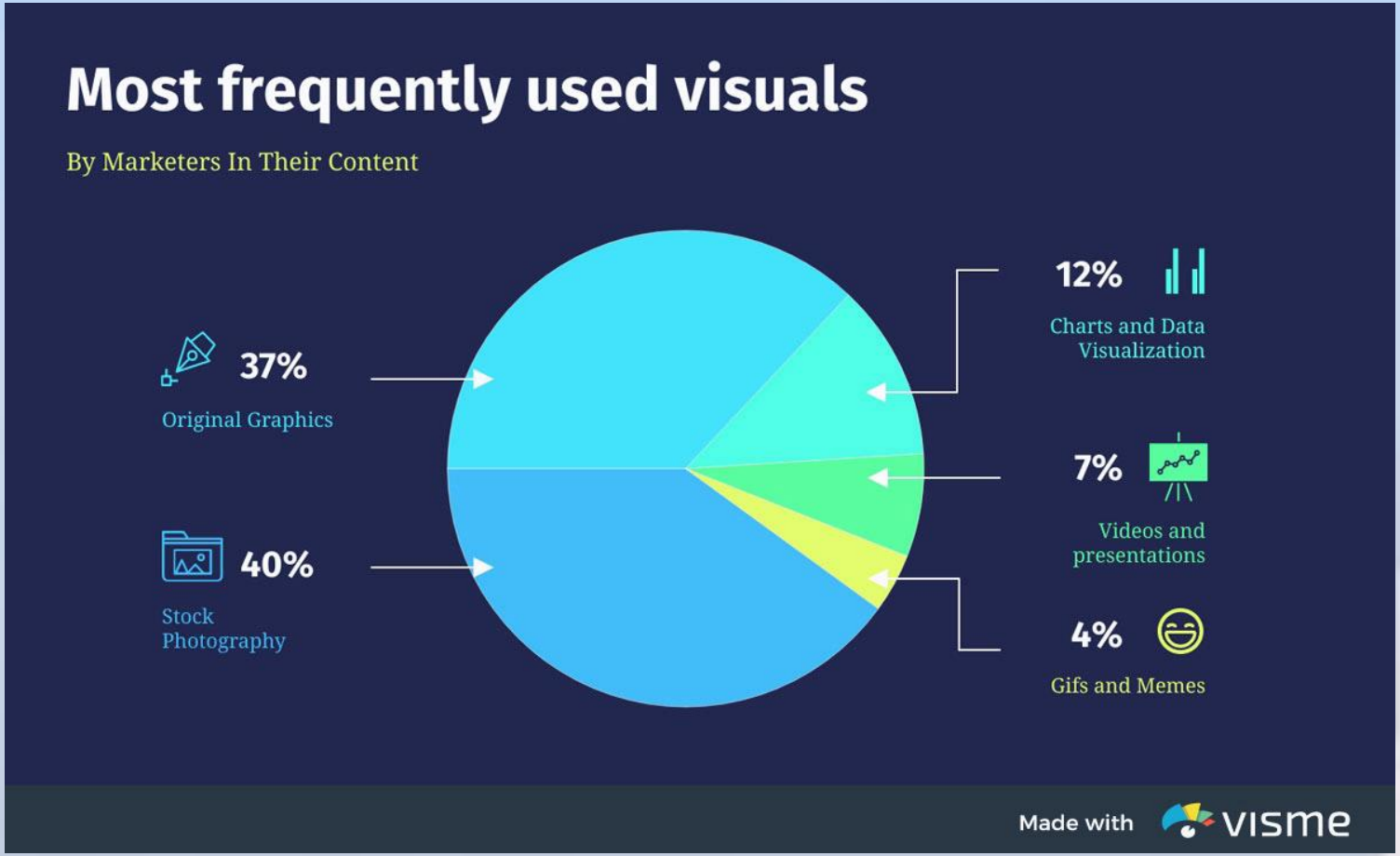
Alternatively…

32-types of Charts

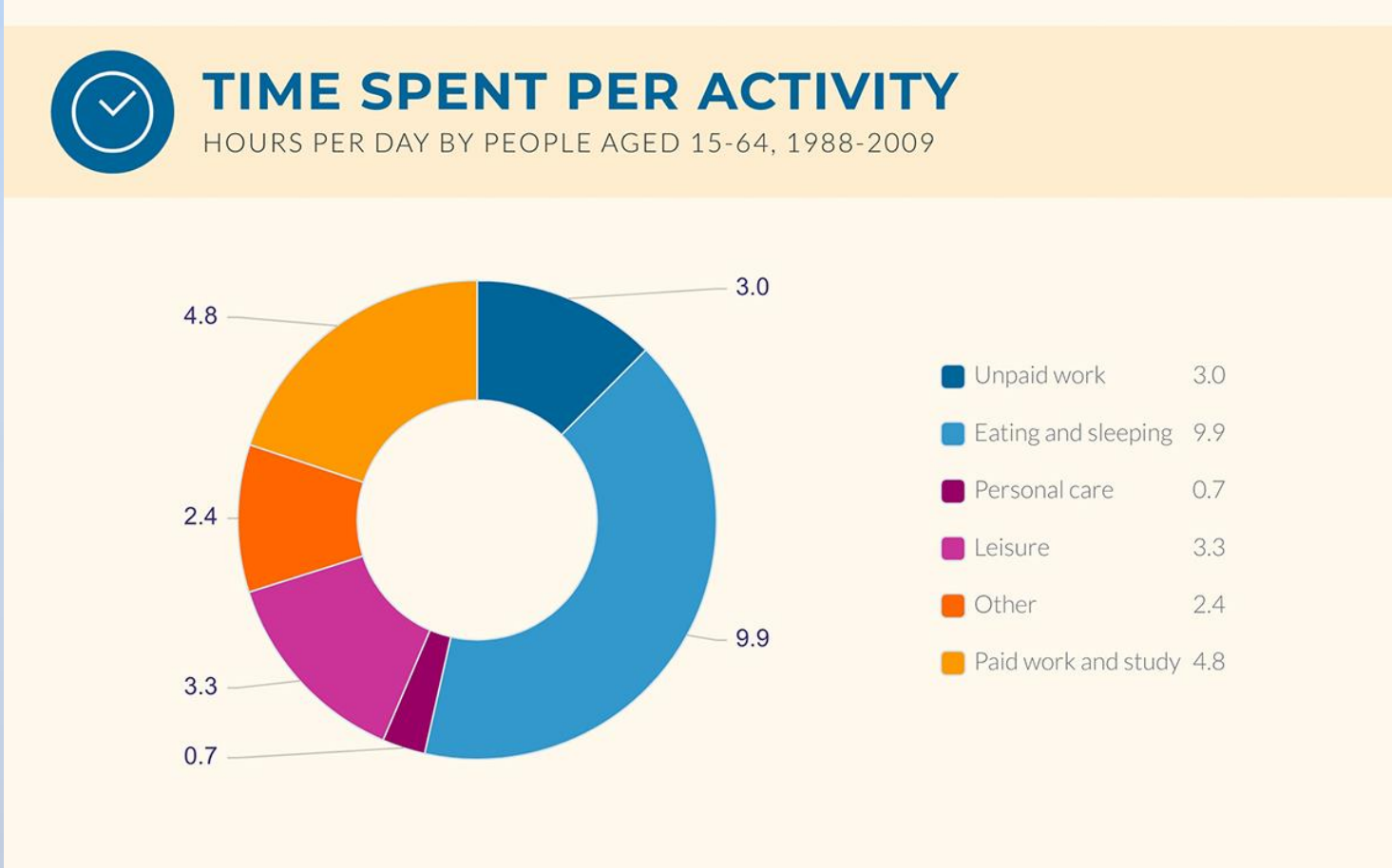
Source: https://visme.co/blog/data-visualization-types/

Type #1: Bar Chart

Type #2: Pie Chart

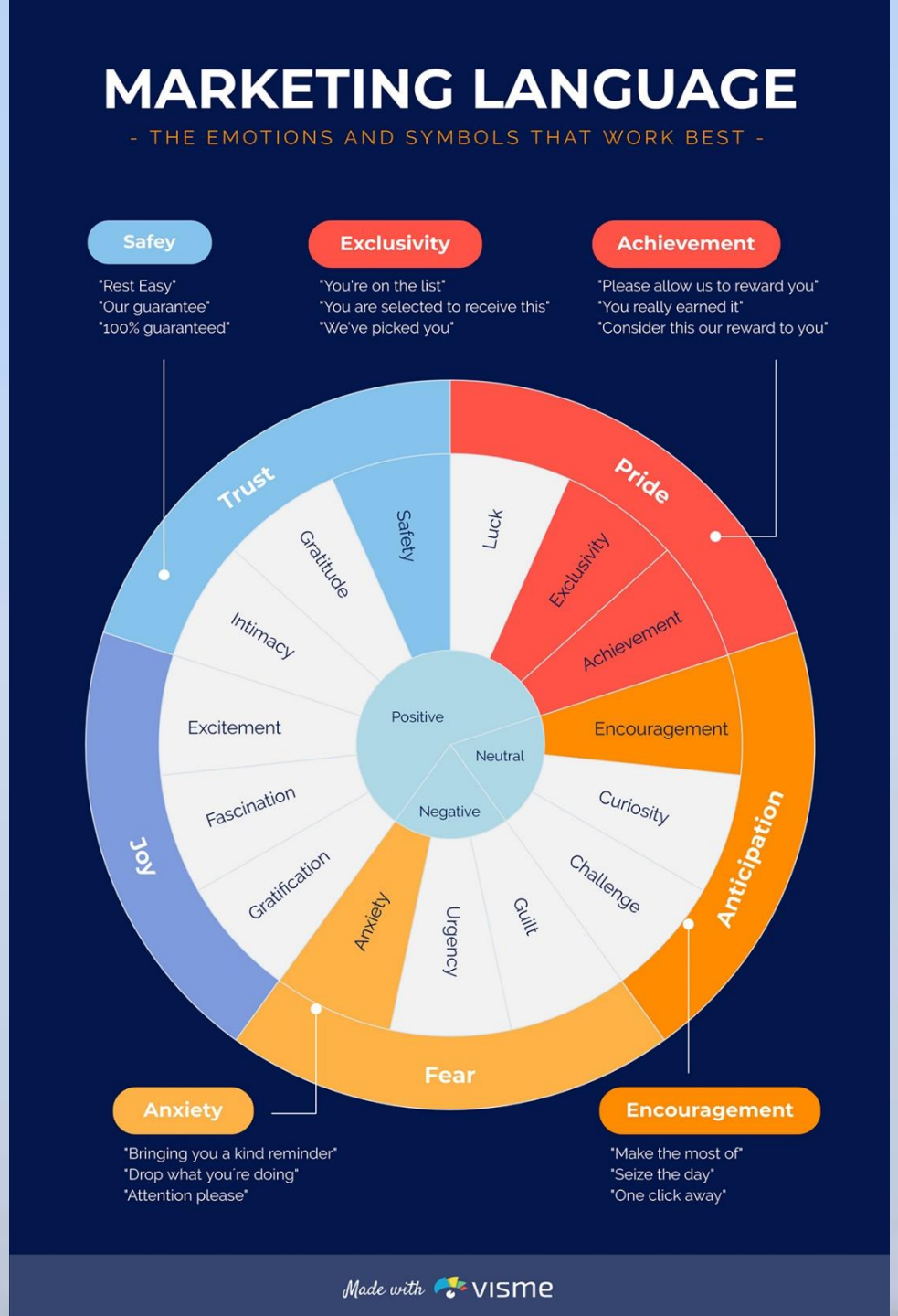


Type #3: Donut Chart

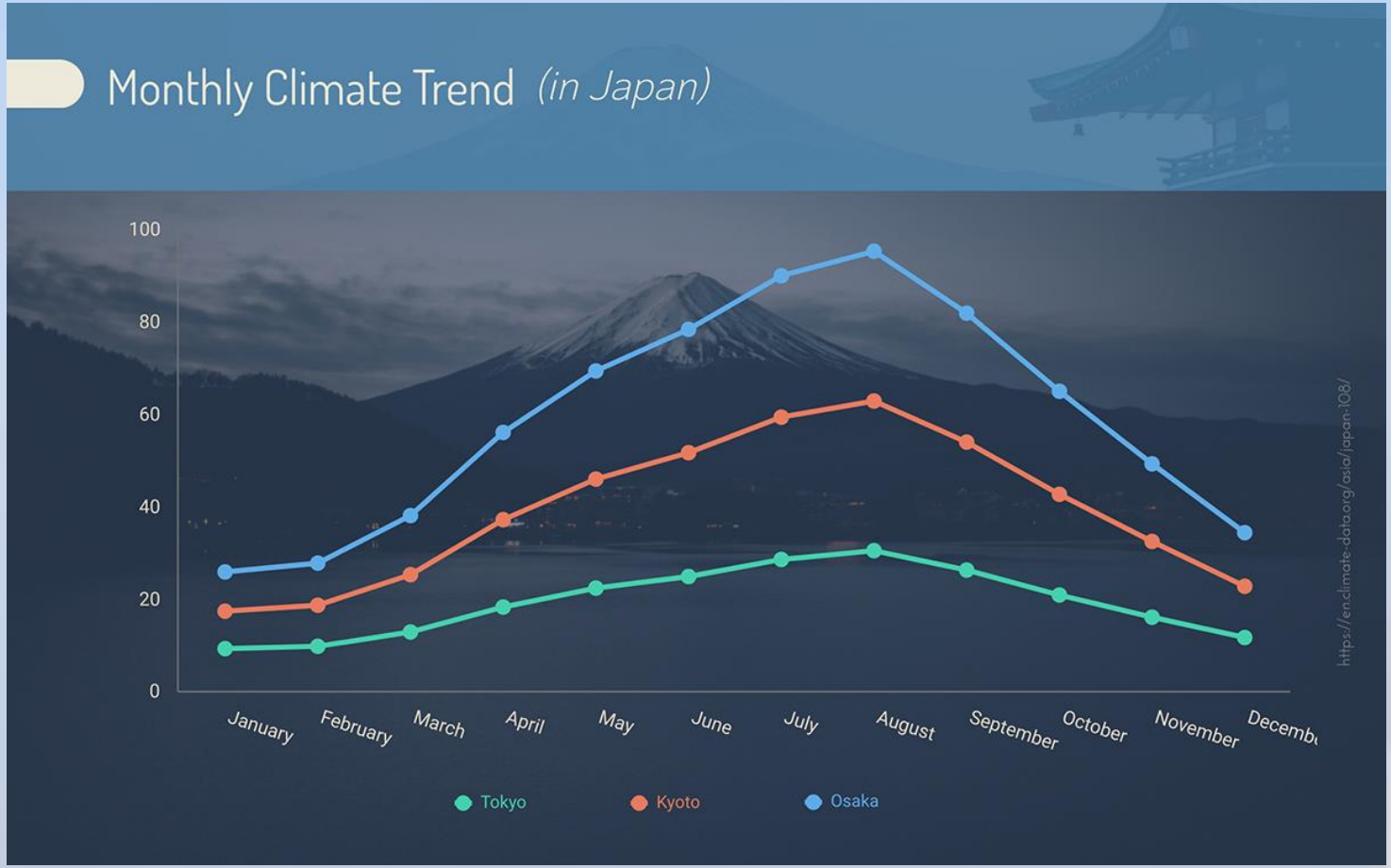


Type #4: Half Donut Chart

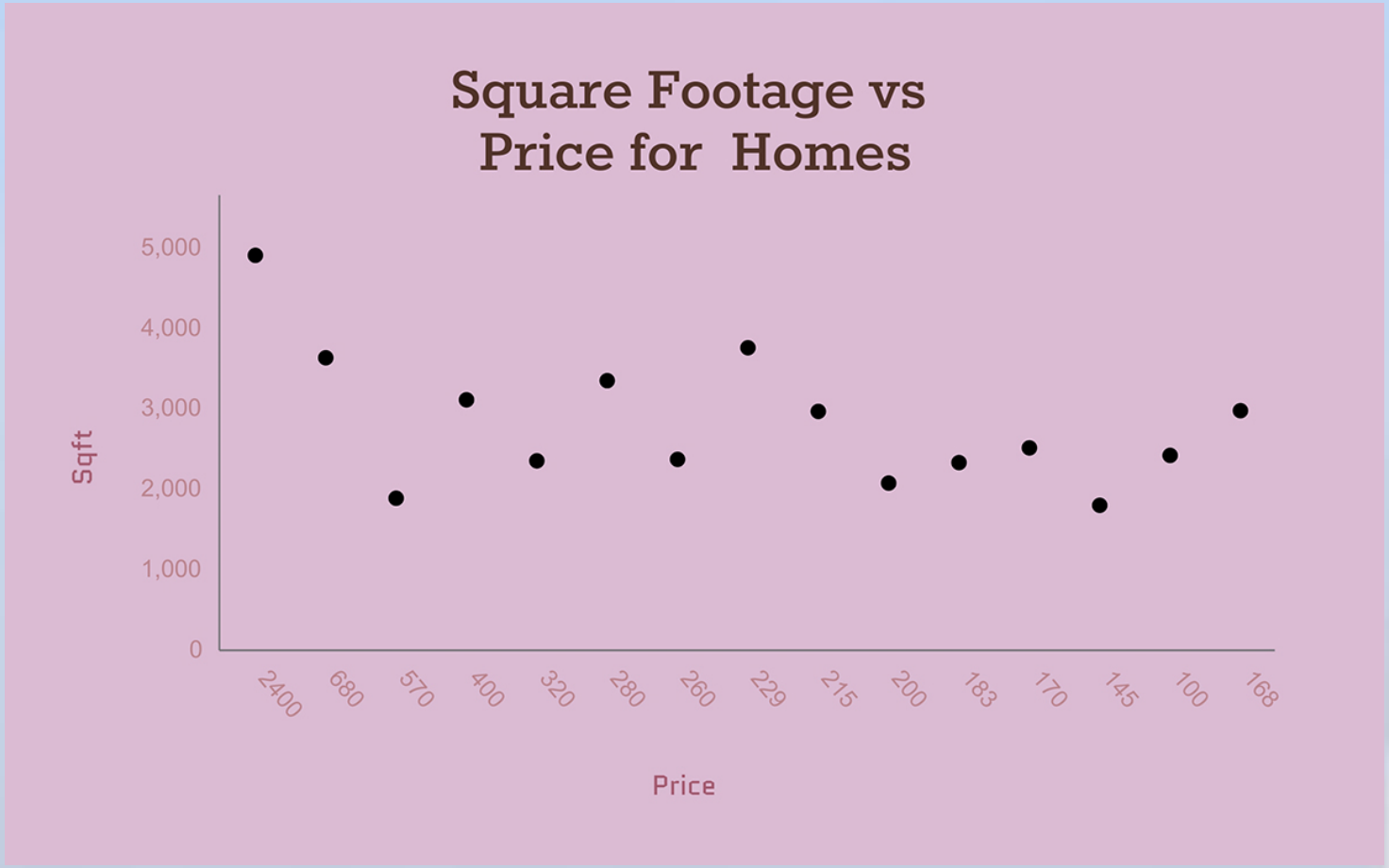
Type #5: Multi-Layer Pie Chart



Type #6: Line Chart

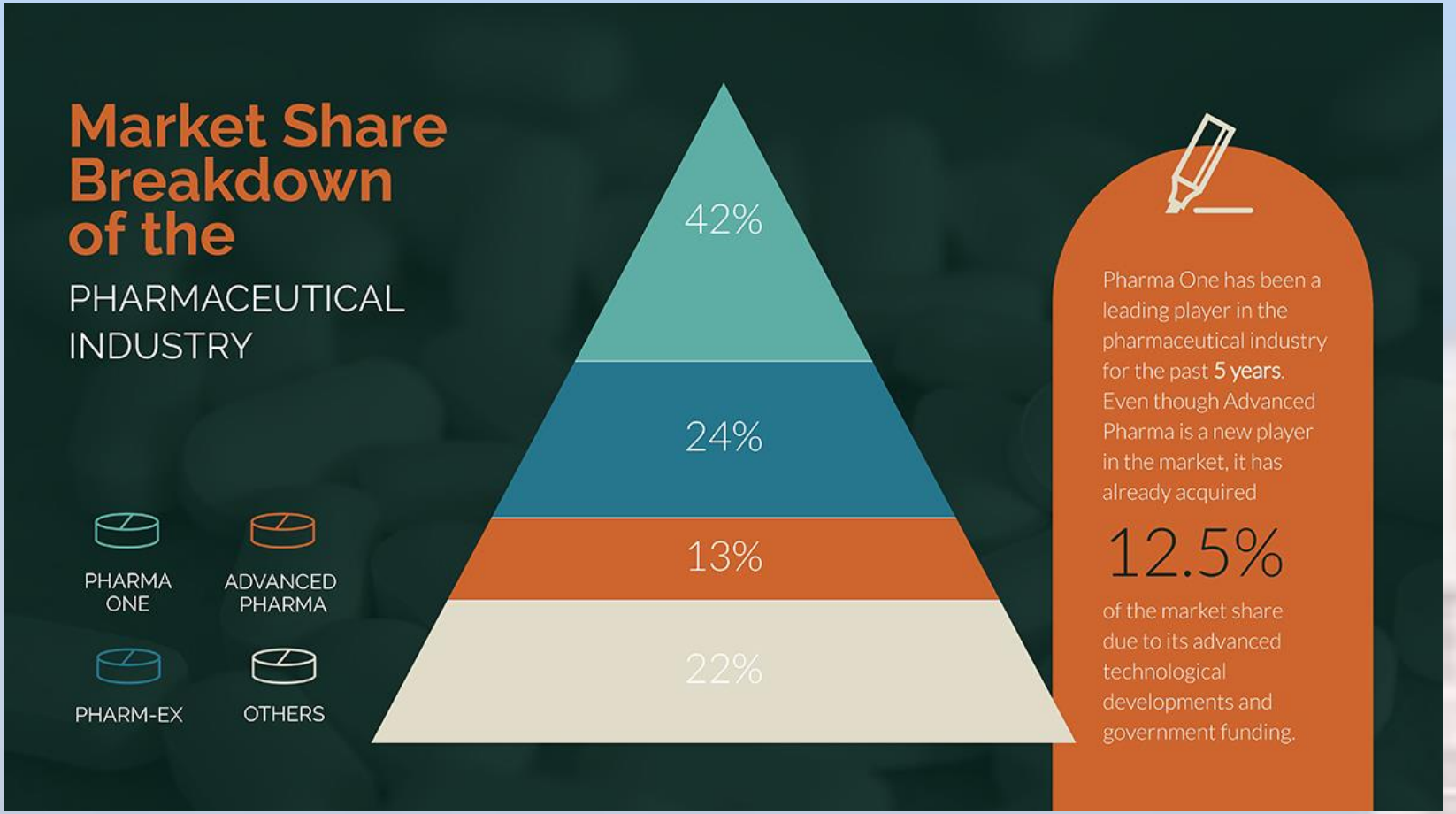


Type #7: Scatter Plot

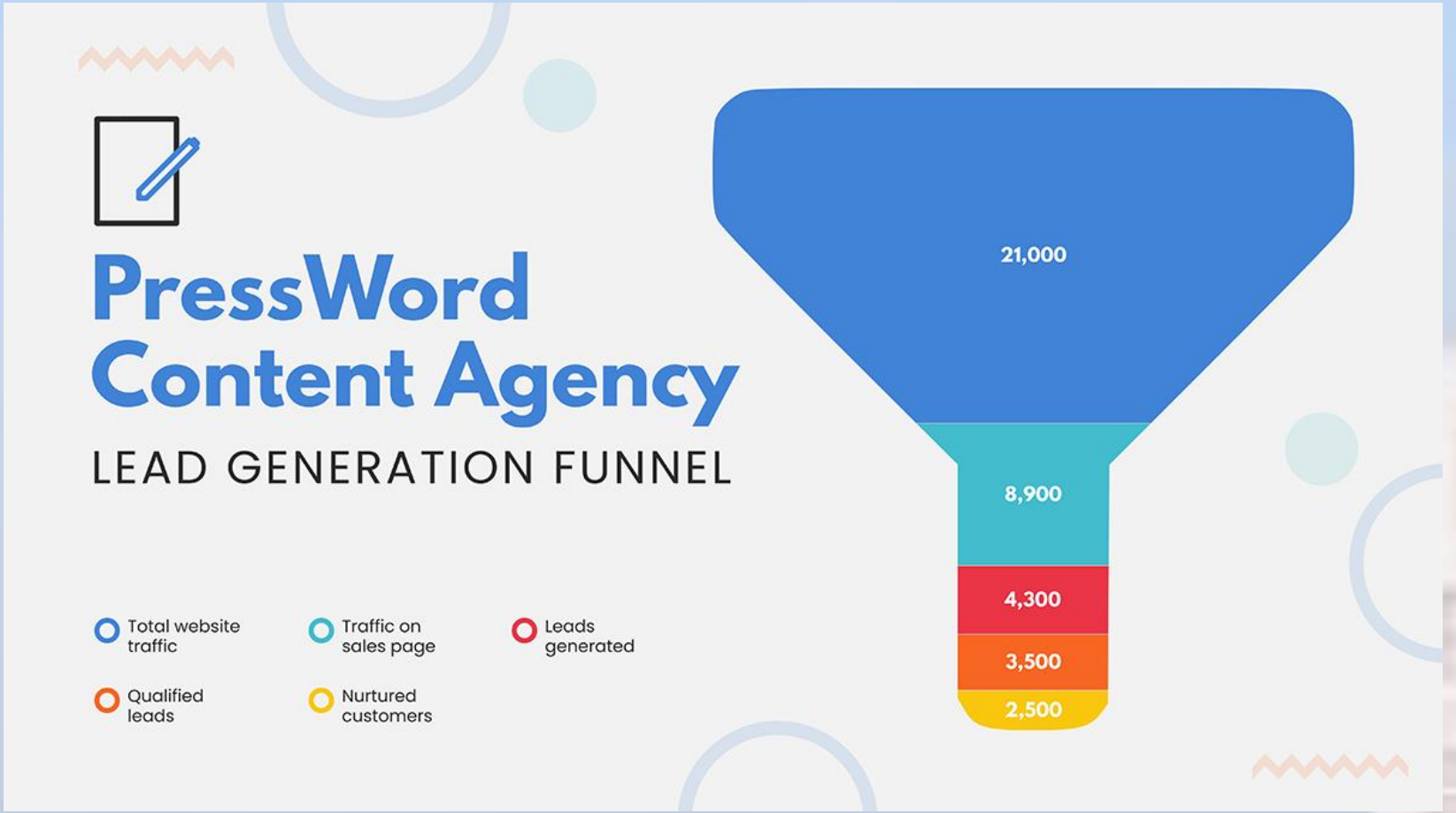


Type #8: Cone Chart

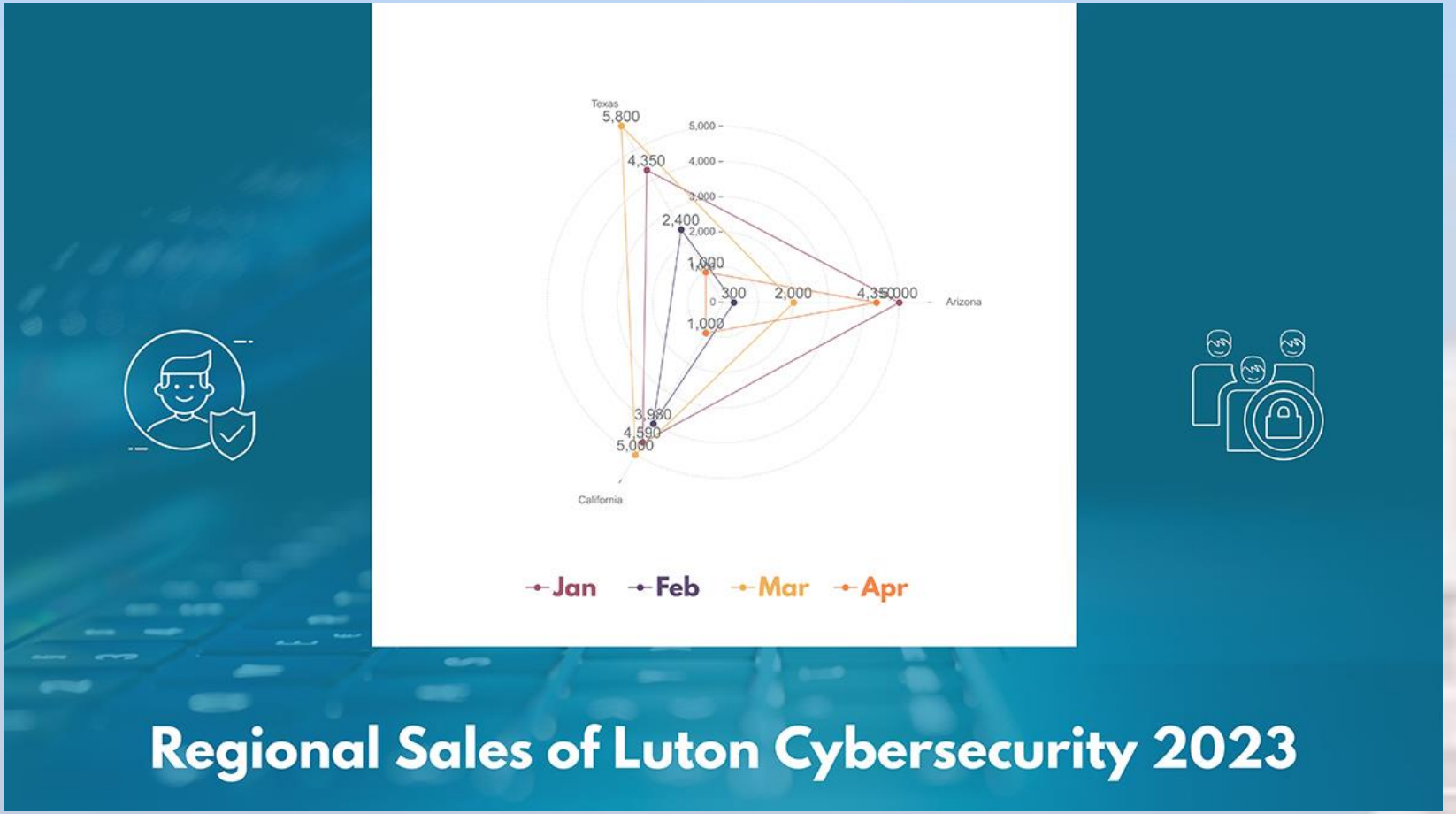
Type #9: Pyramid Chart



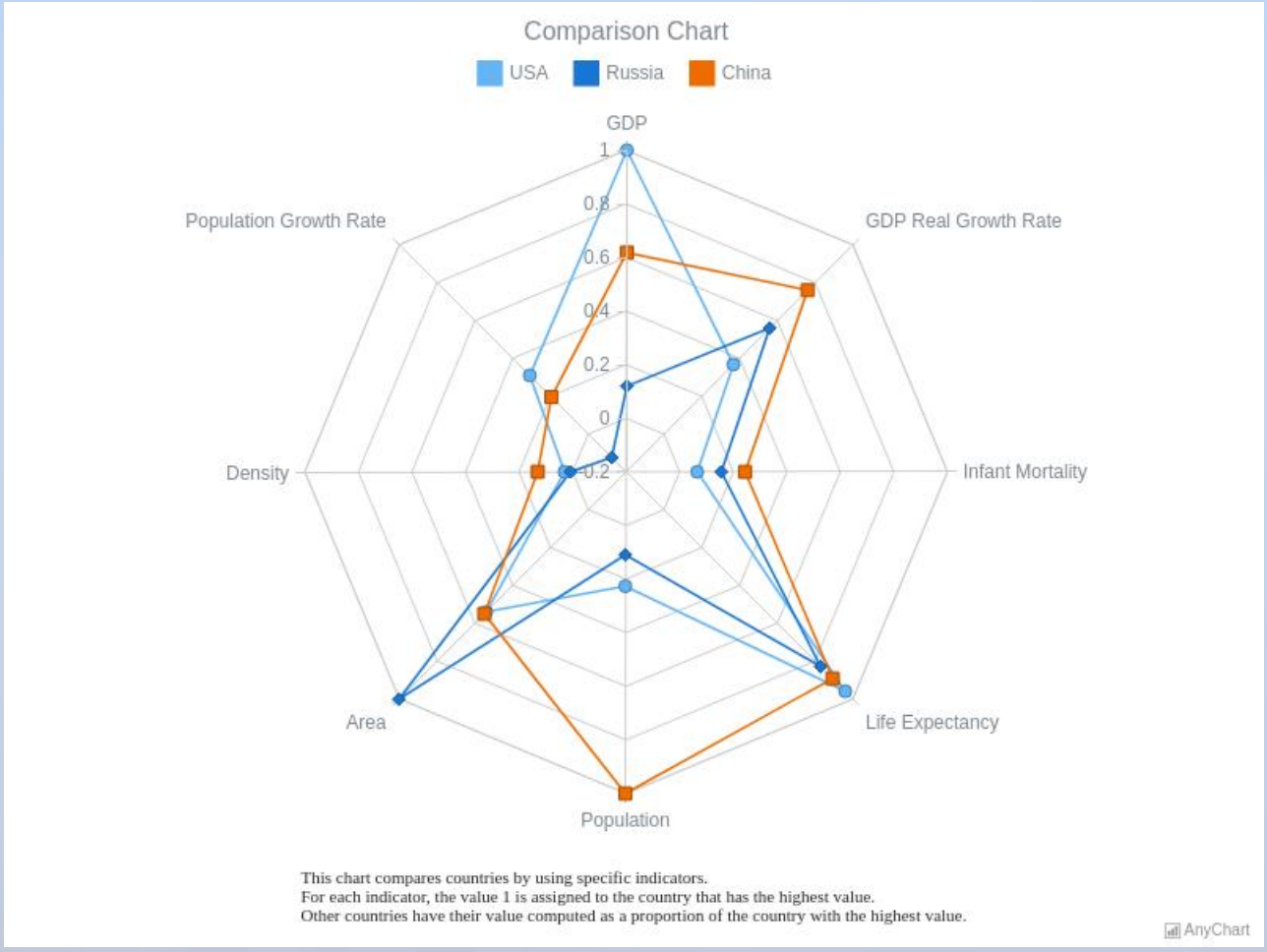
Type #10: Funnel Chart



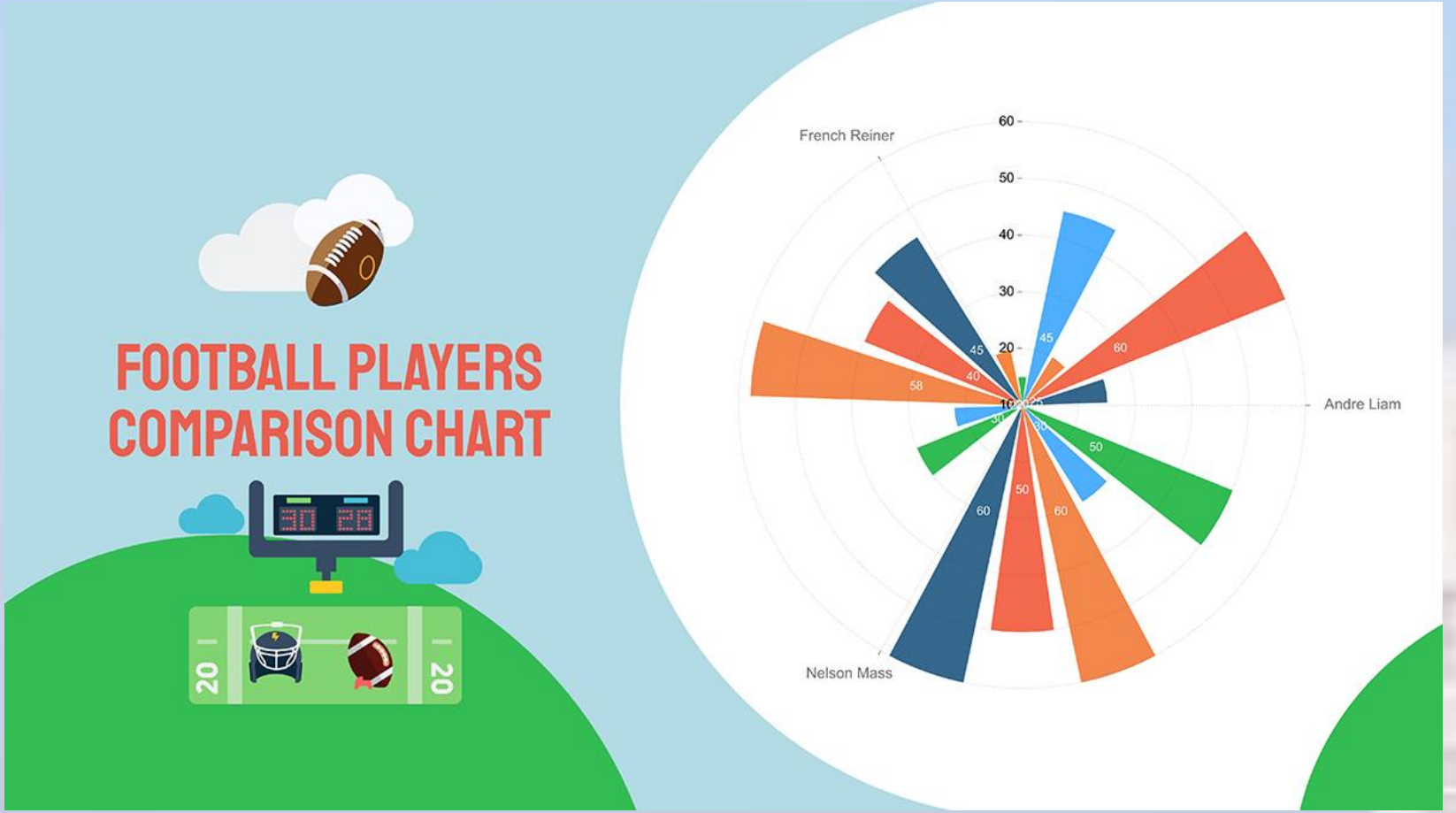
Type #11: Radar Triangle



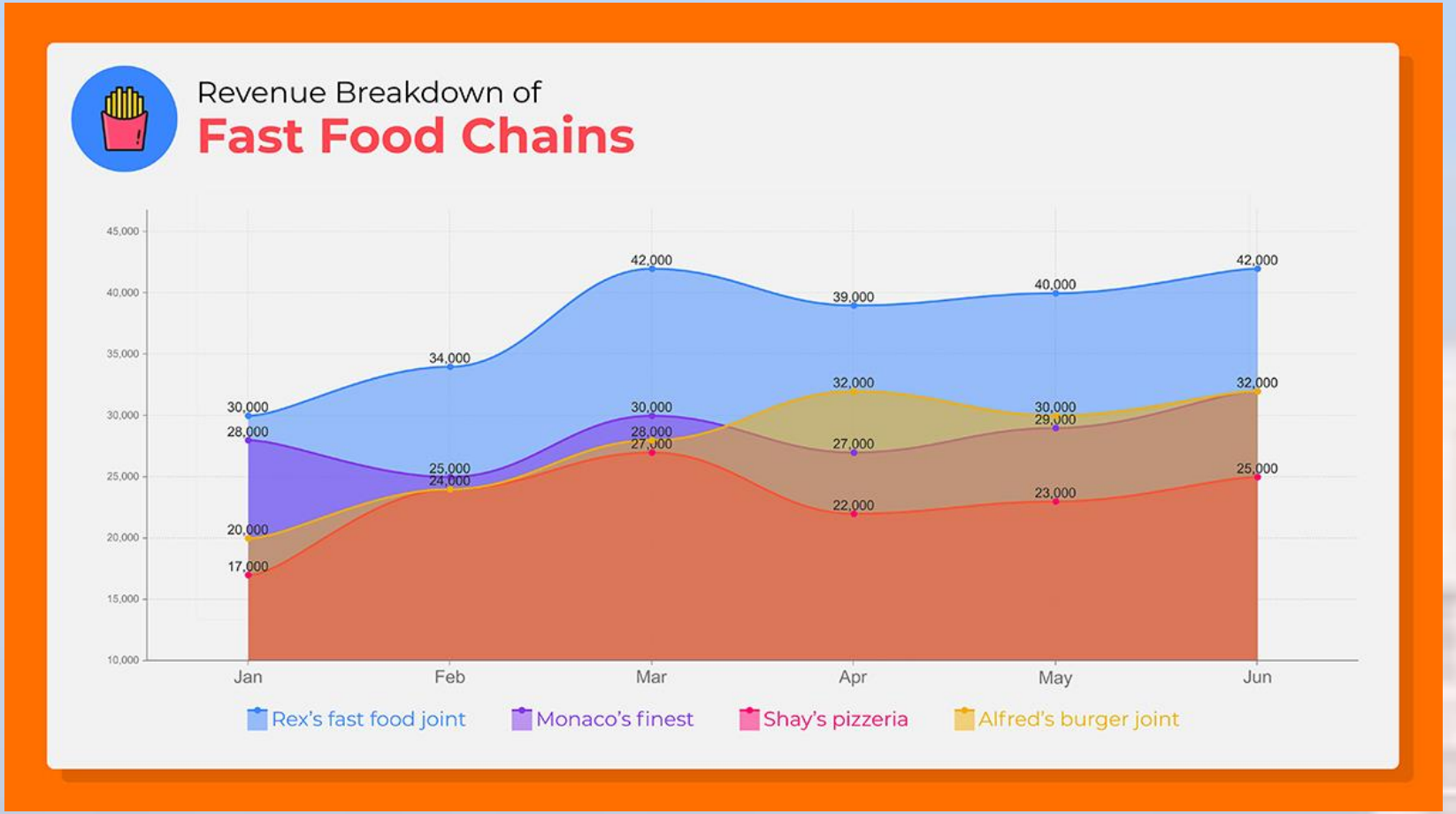
Type #12: Radar Polygon



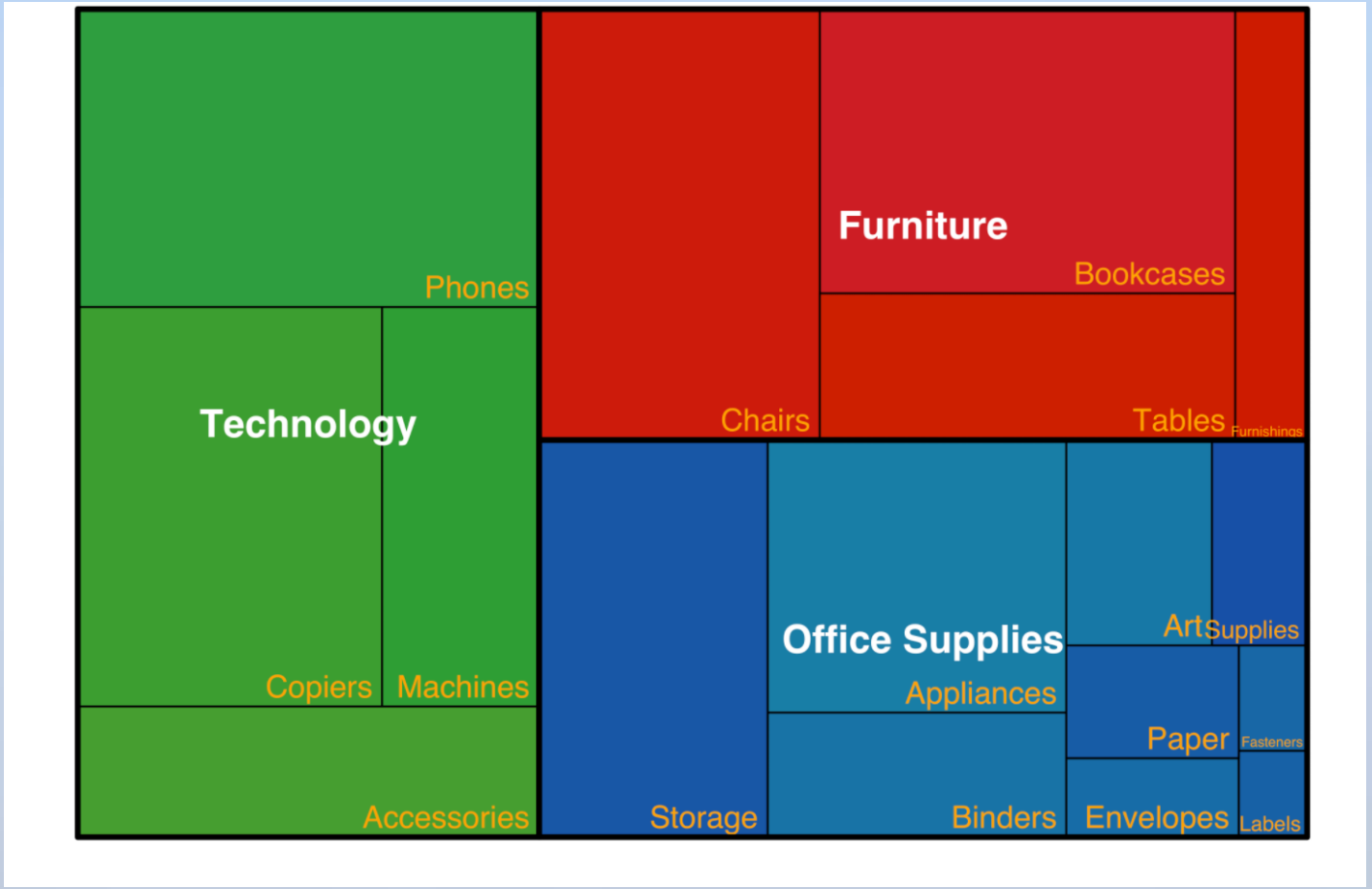
Type #13: Polar Graph



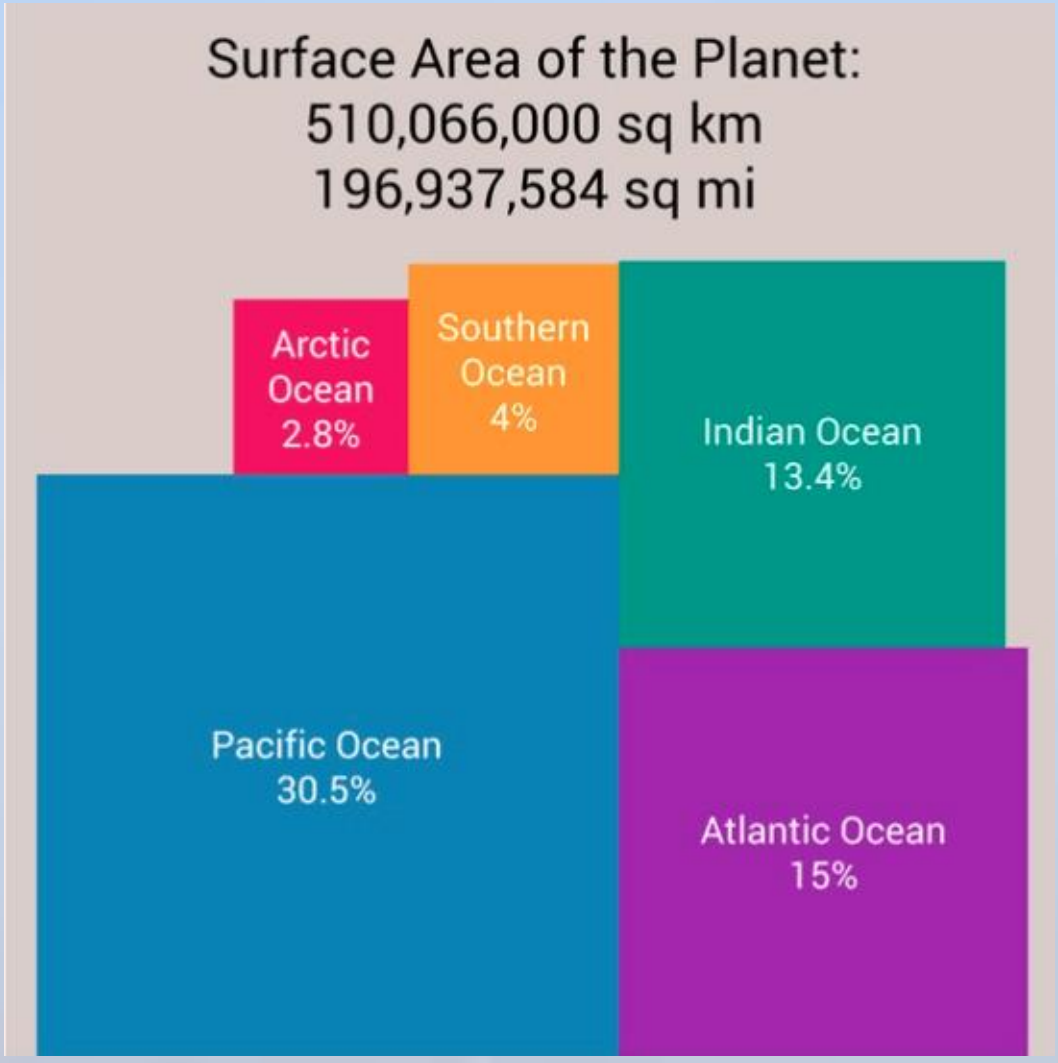
Type #14: Area Chart



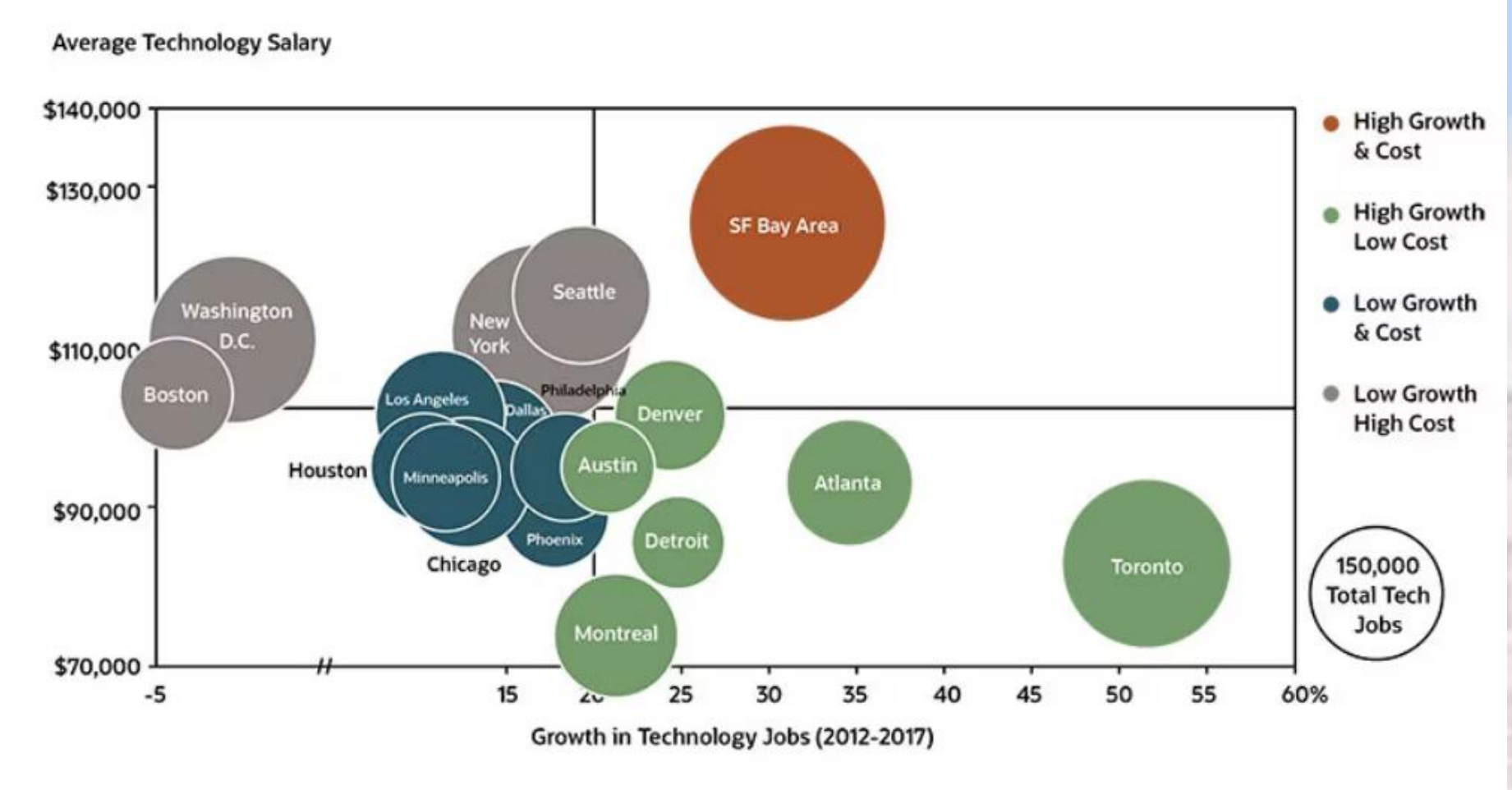
Type #15: TreeMap



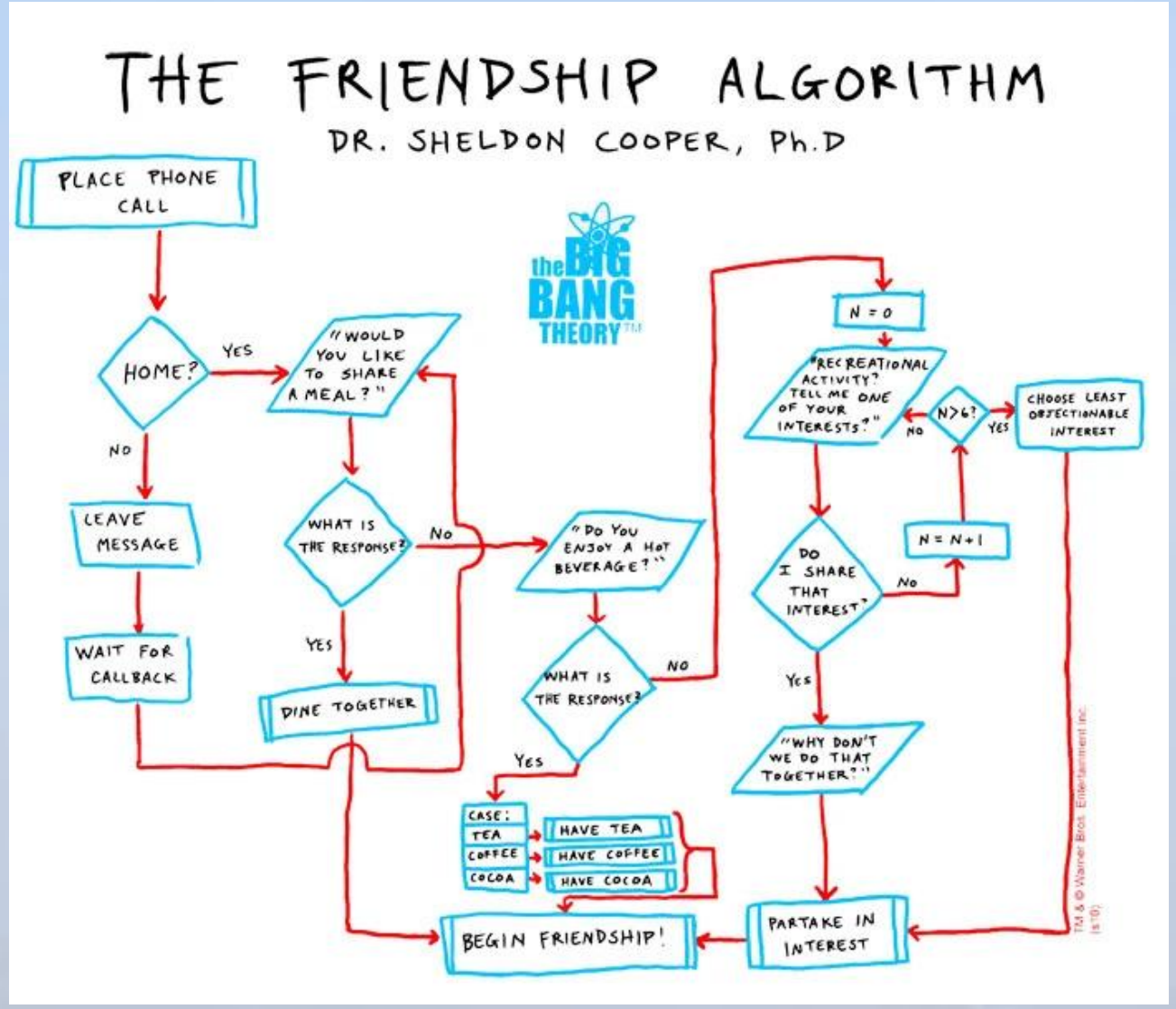
Type #15a: Proportional Area Chart



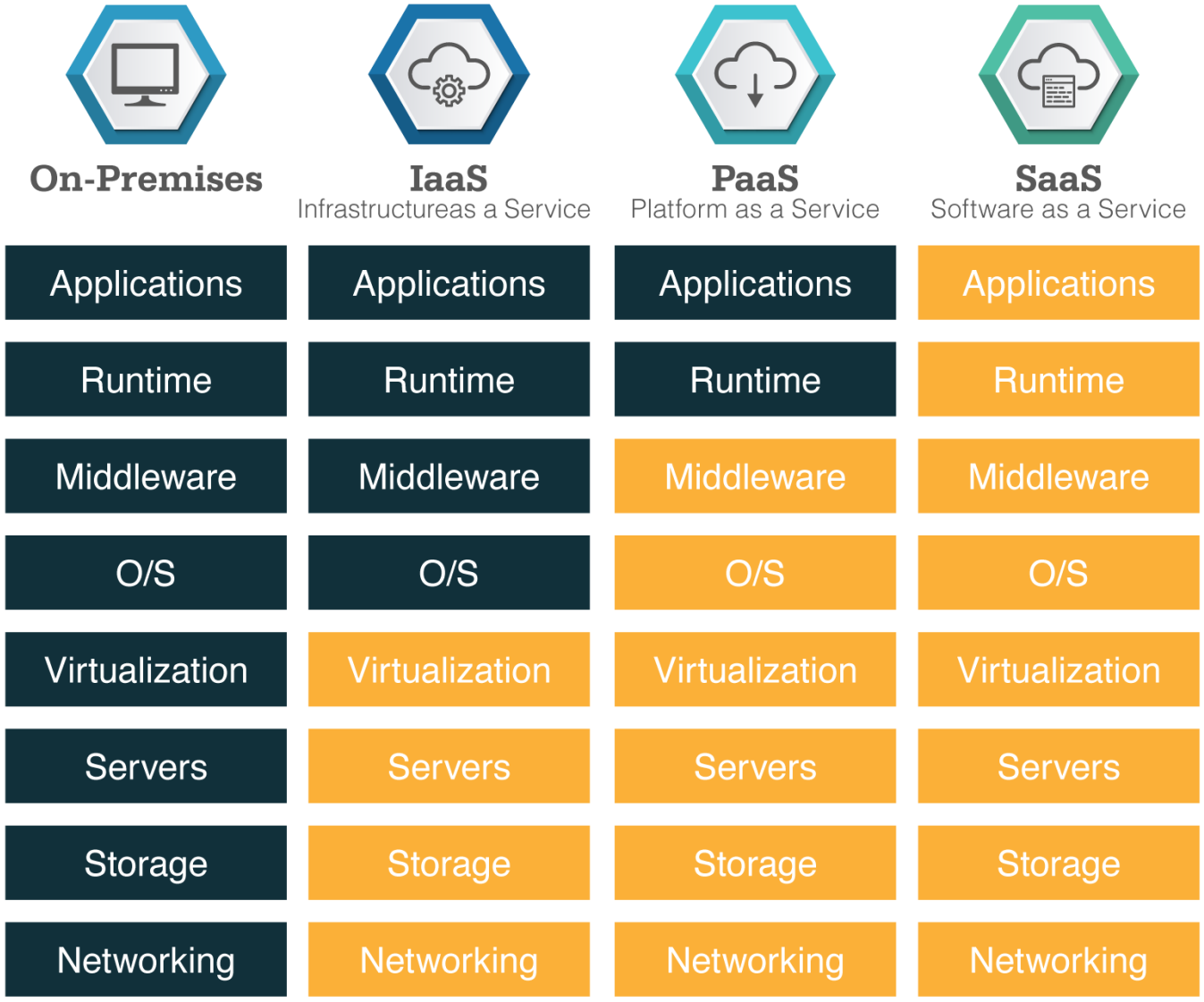
Type #15b: Bubble Chart



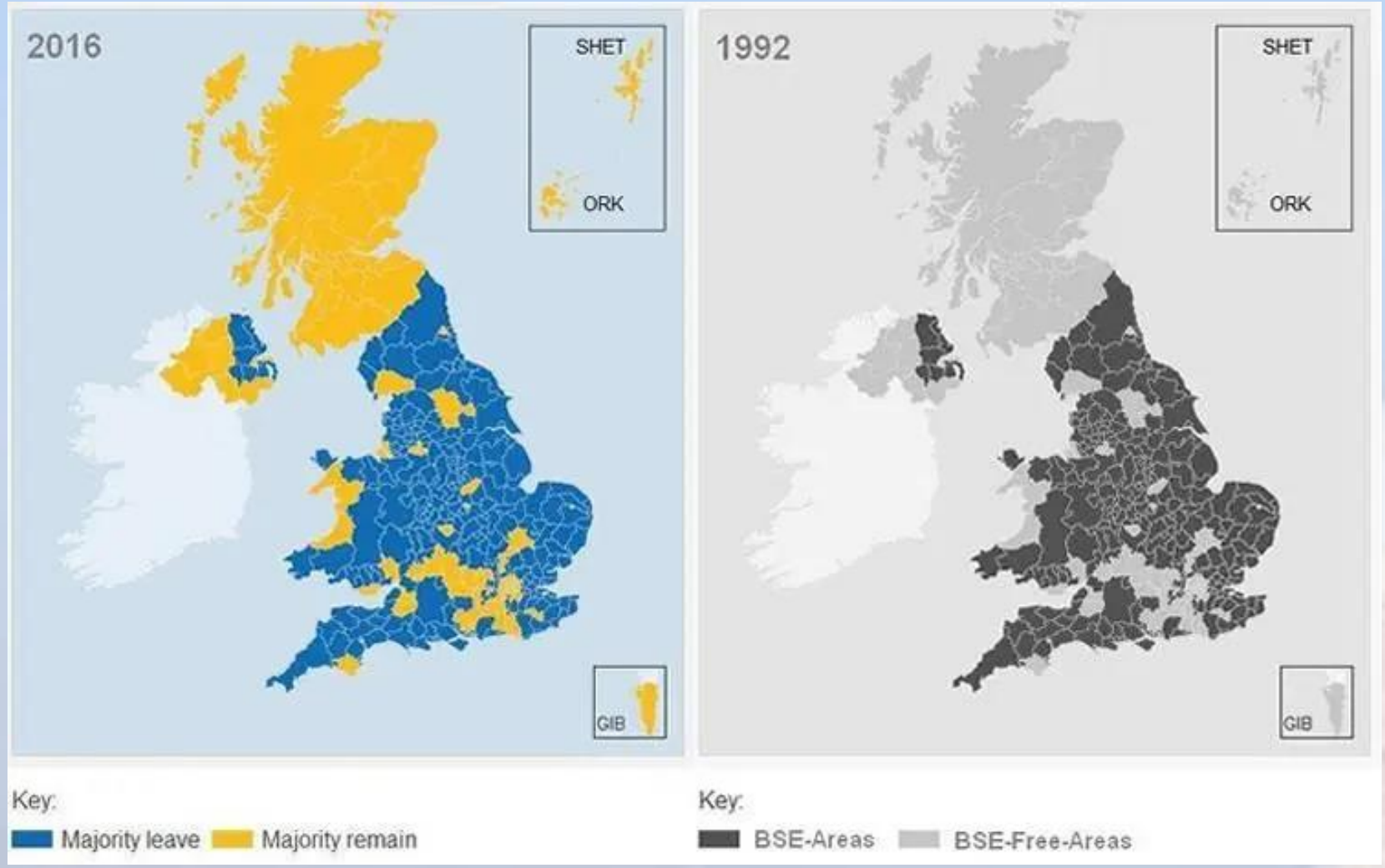
Type #16: Flowchart



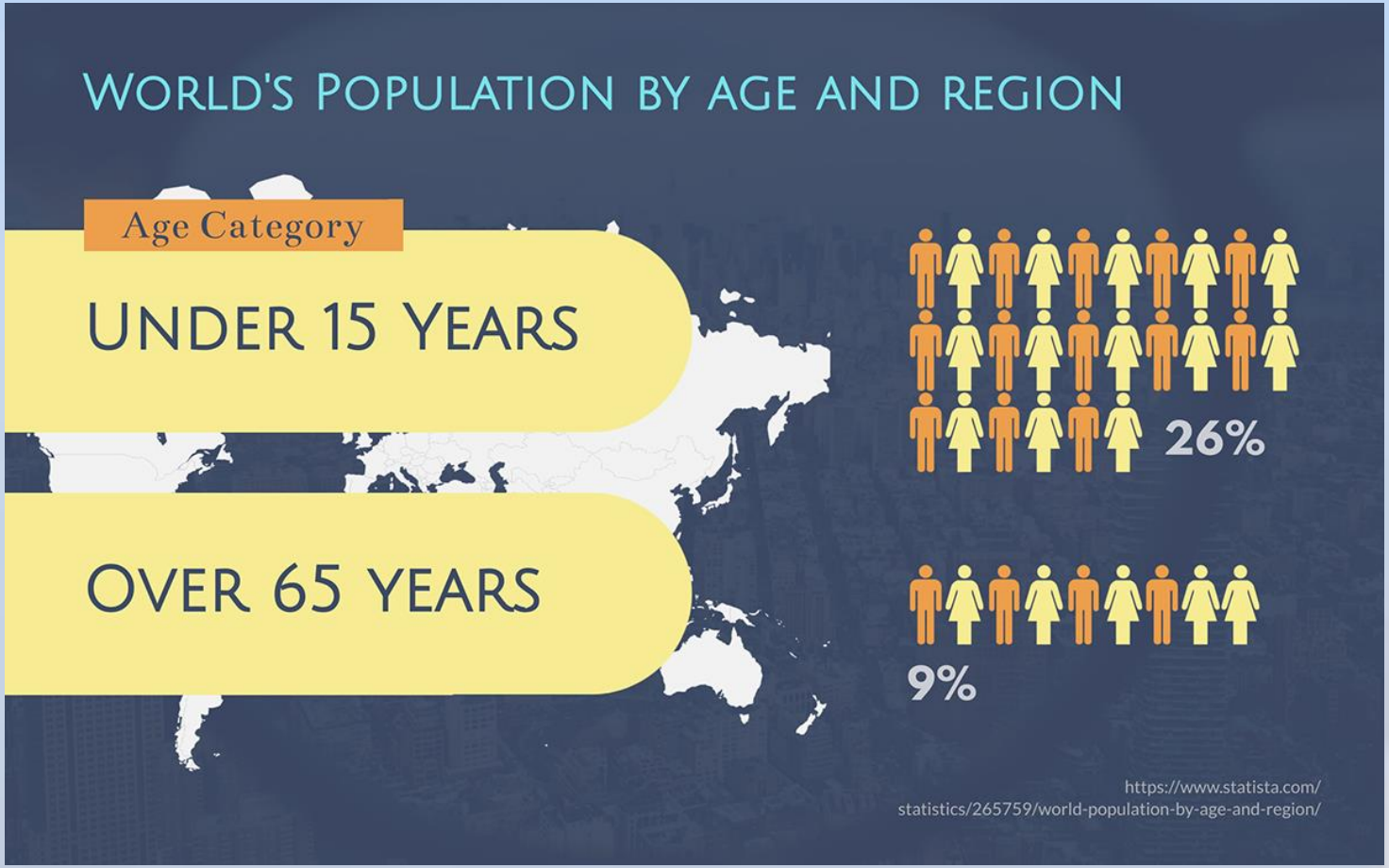
Type #17: Table



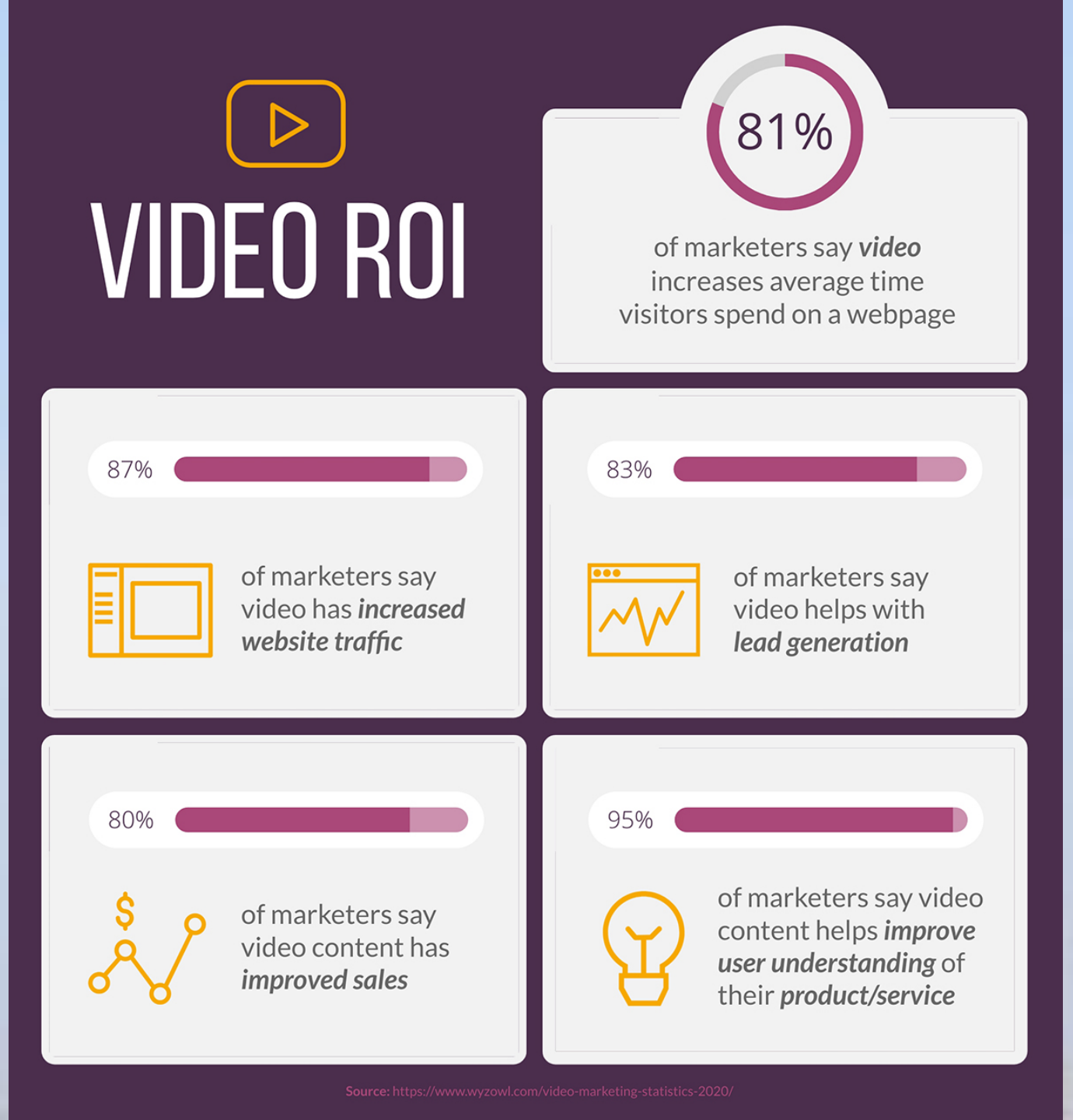
Type #18: Geospatial Map



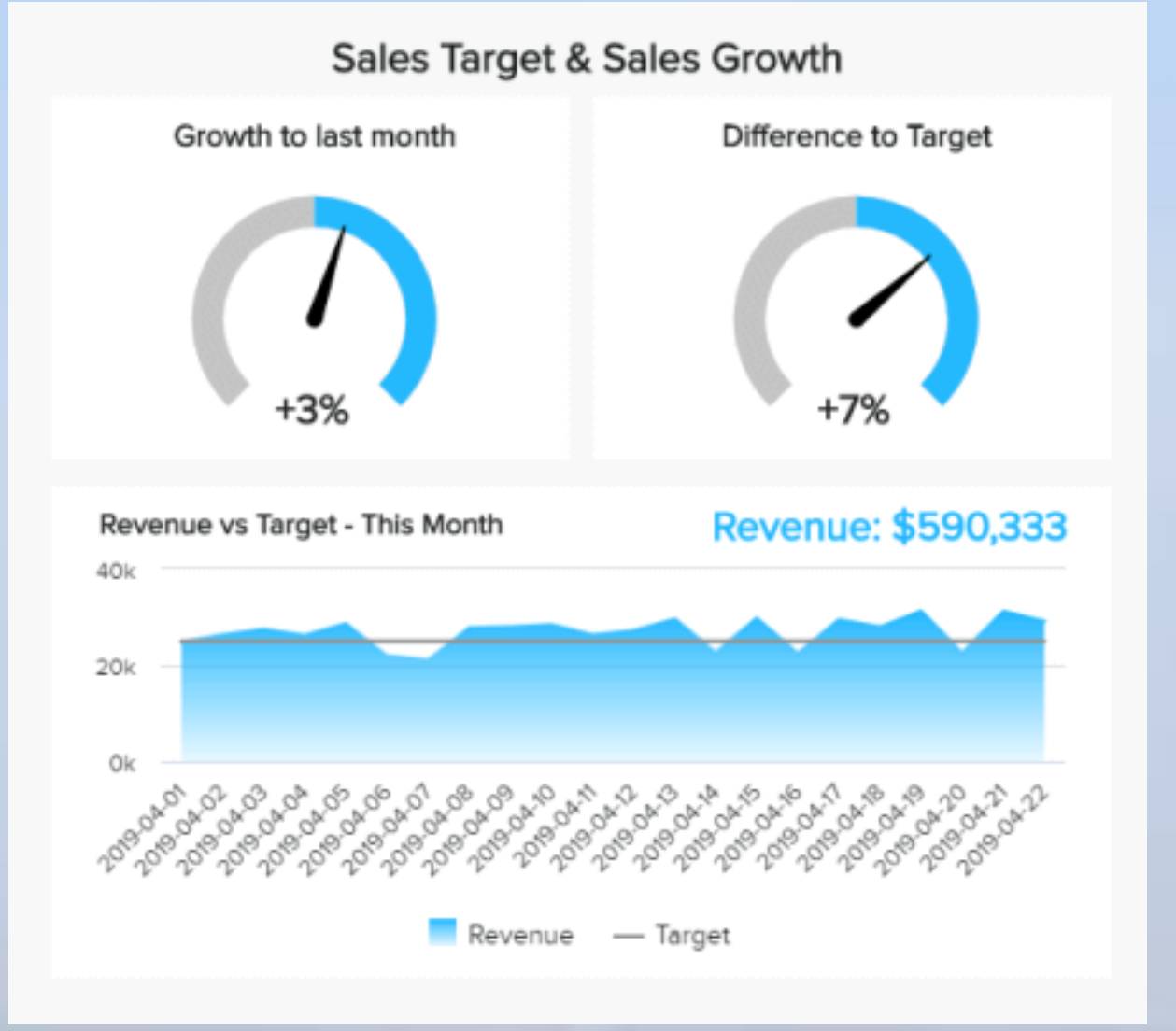
Type #19: Icon Array



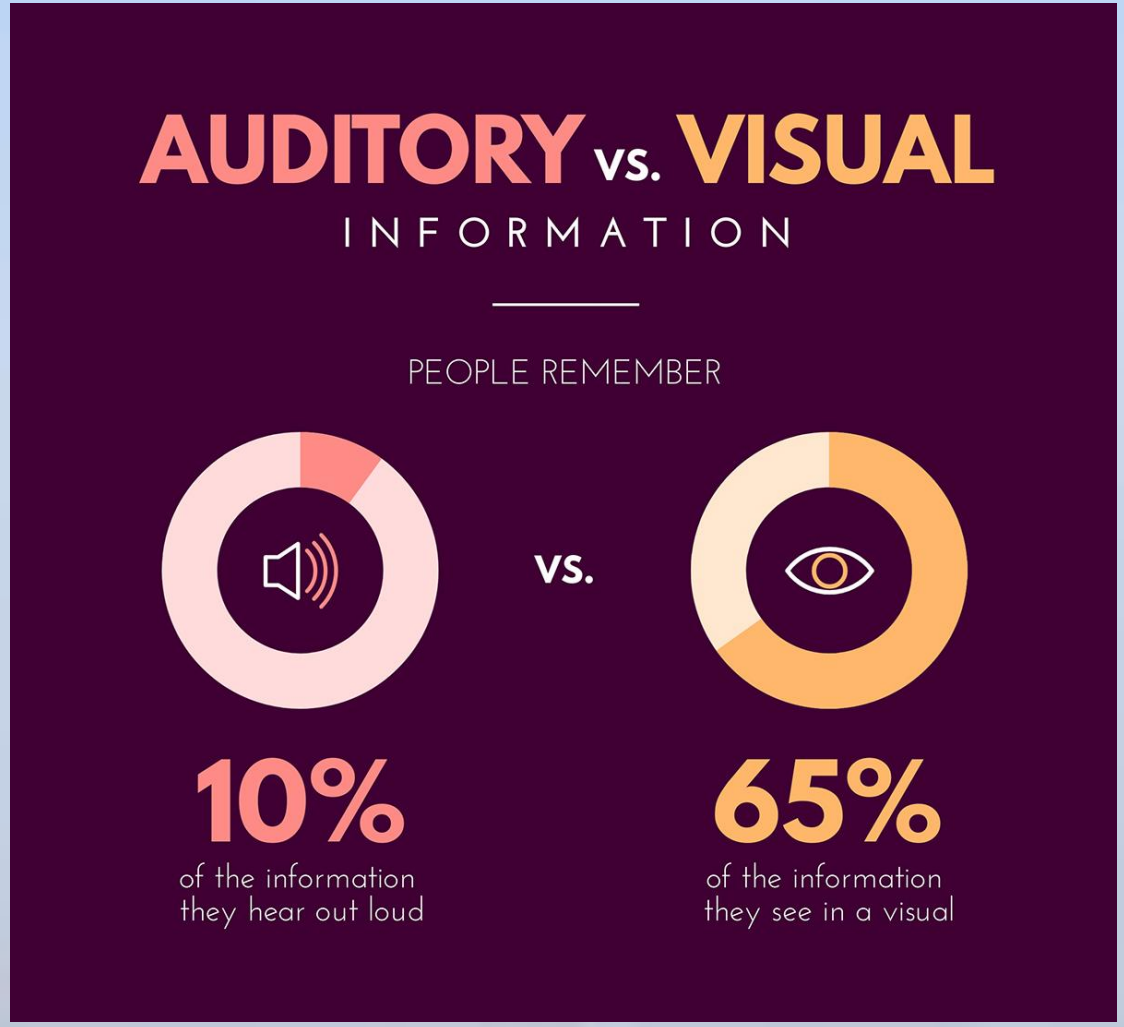
Type #20: Percentage Bar



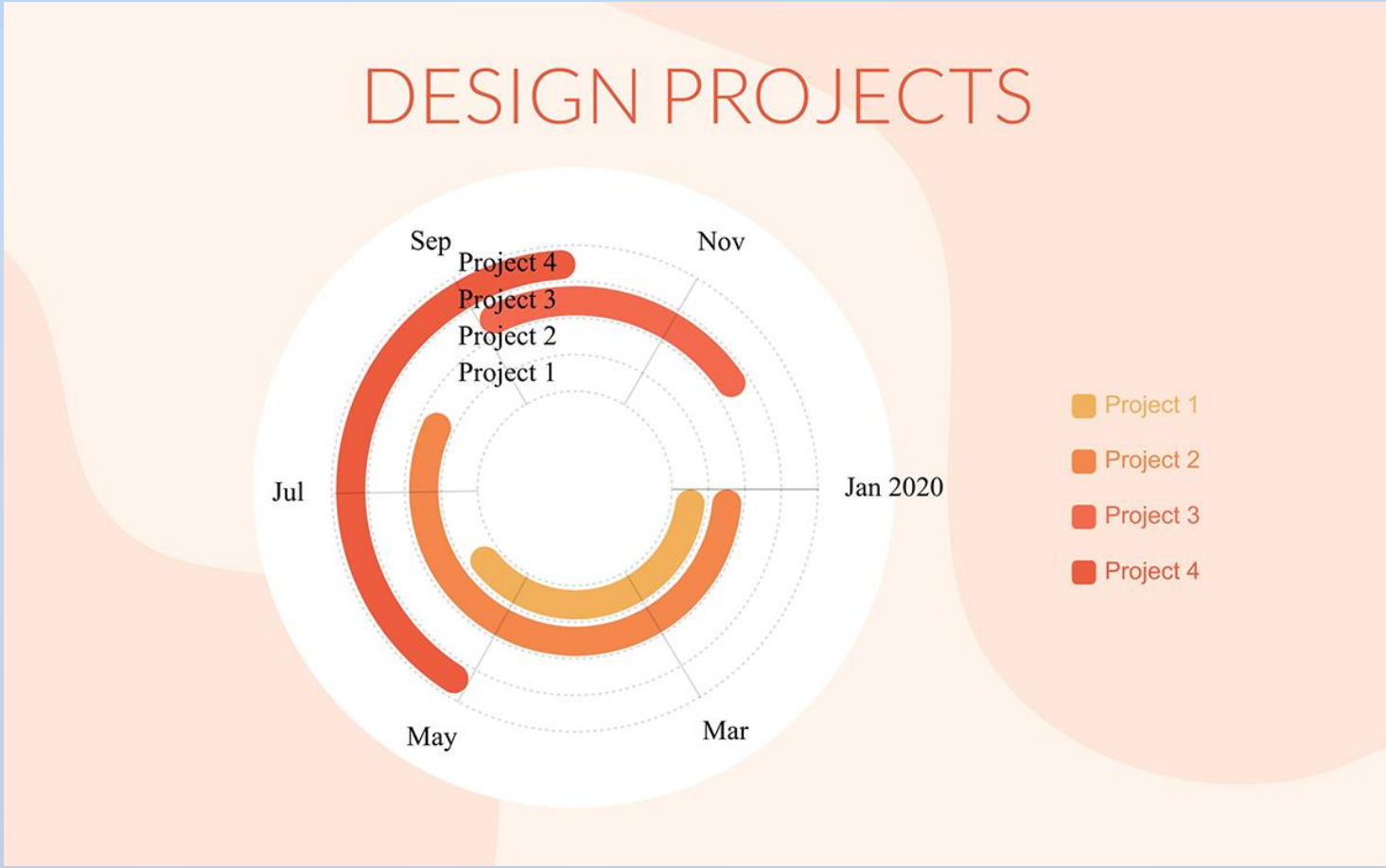
Type #21: Gauge



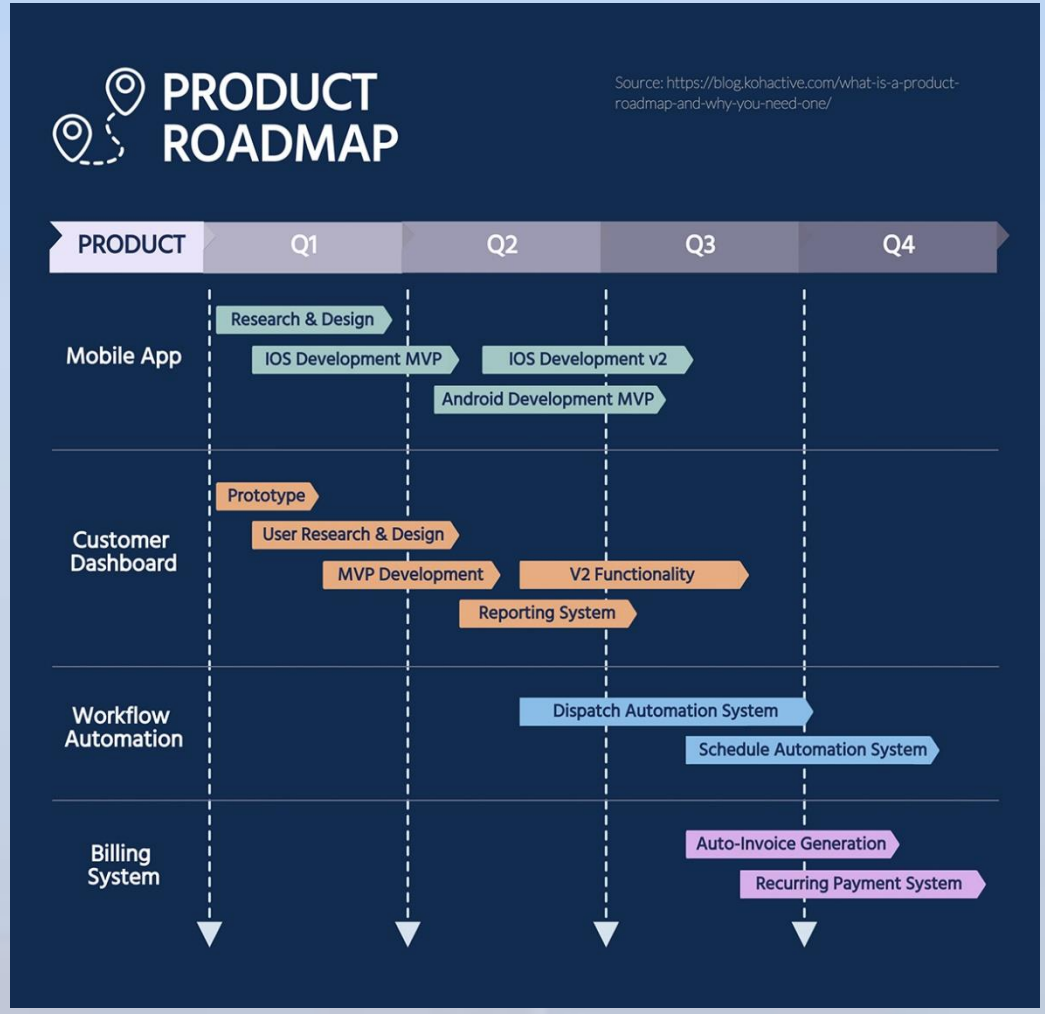
Type #22: Radial Wheel



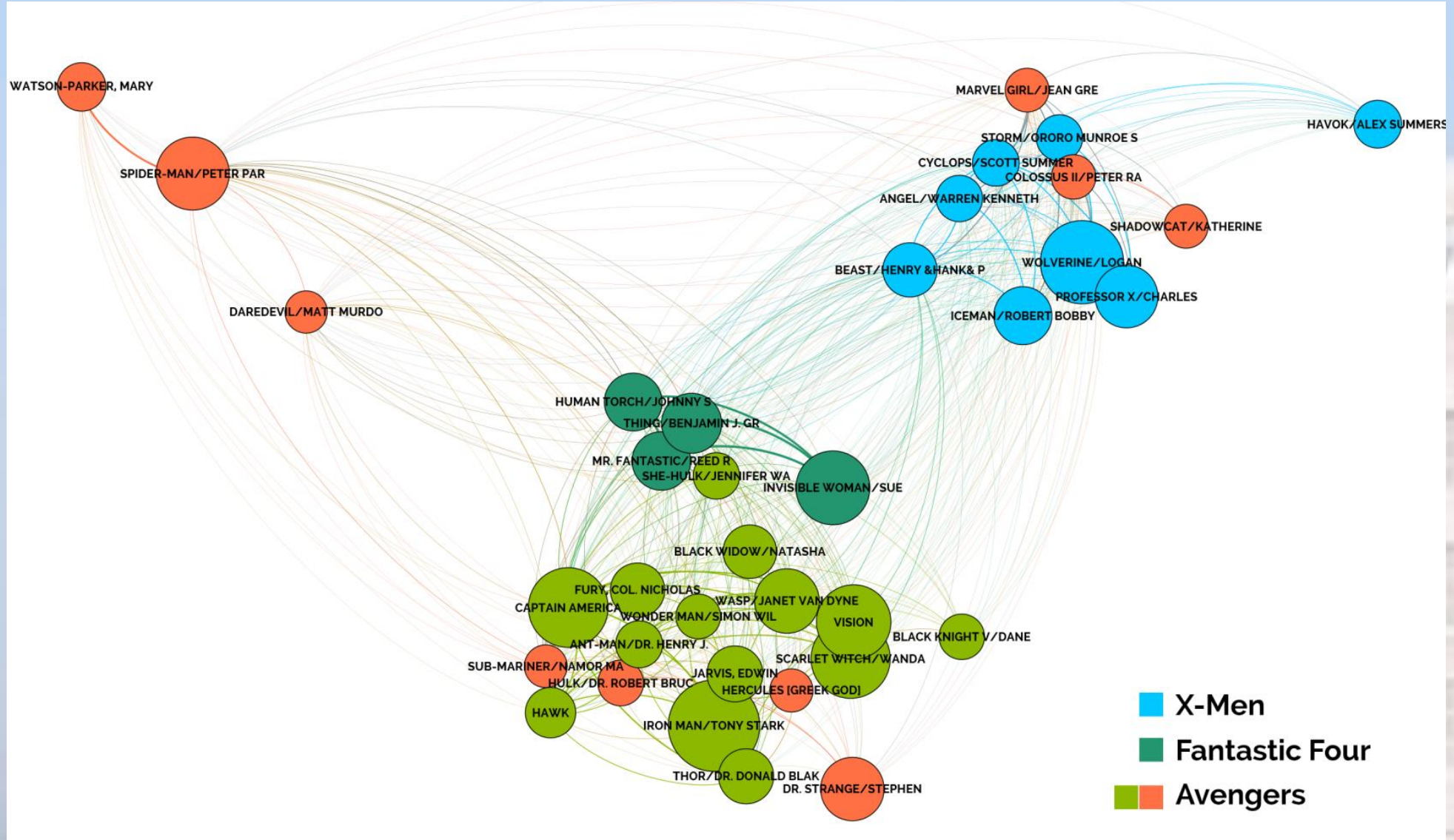
Type #23: Concentric Circles



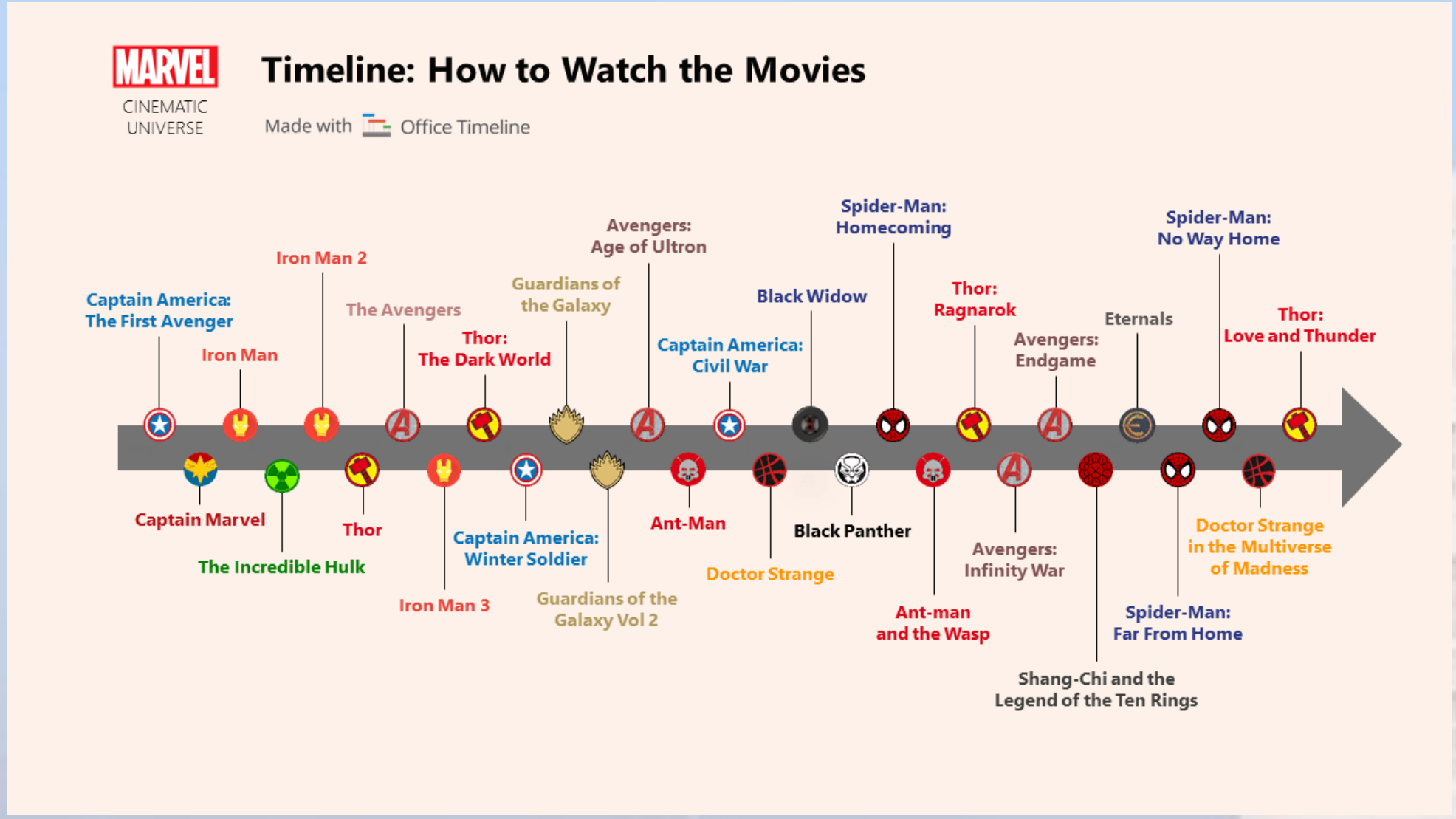
Type #24: Gantt Chart



Type #25: Network Diagram

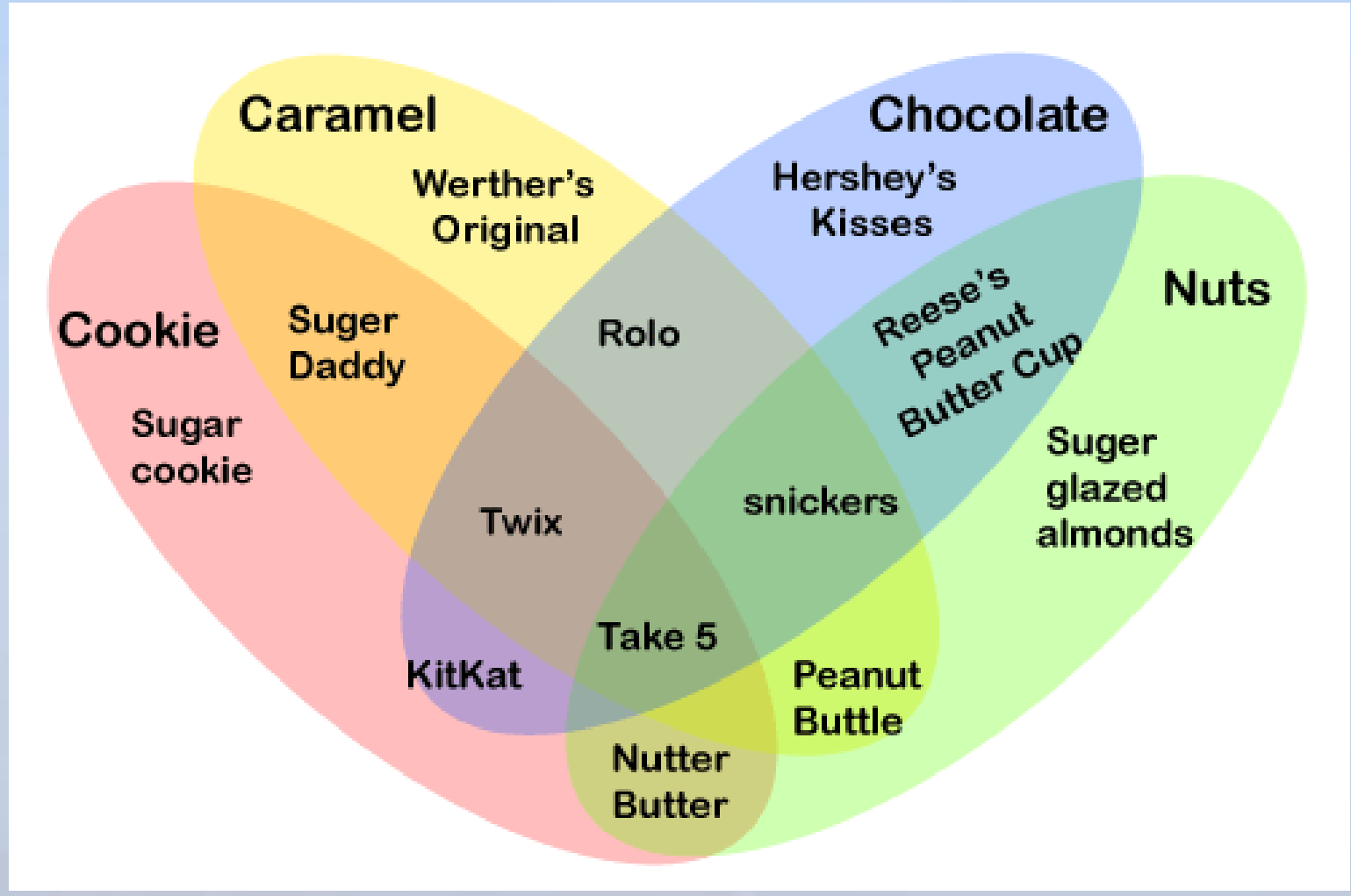


Type #26: Timeline



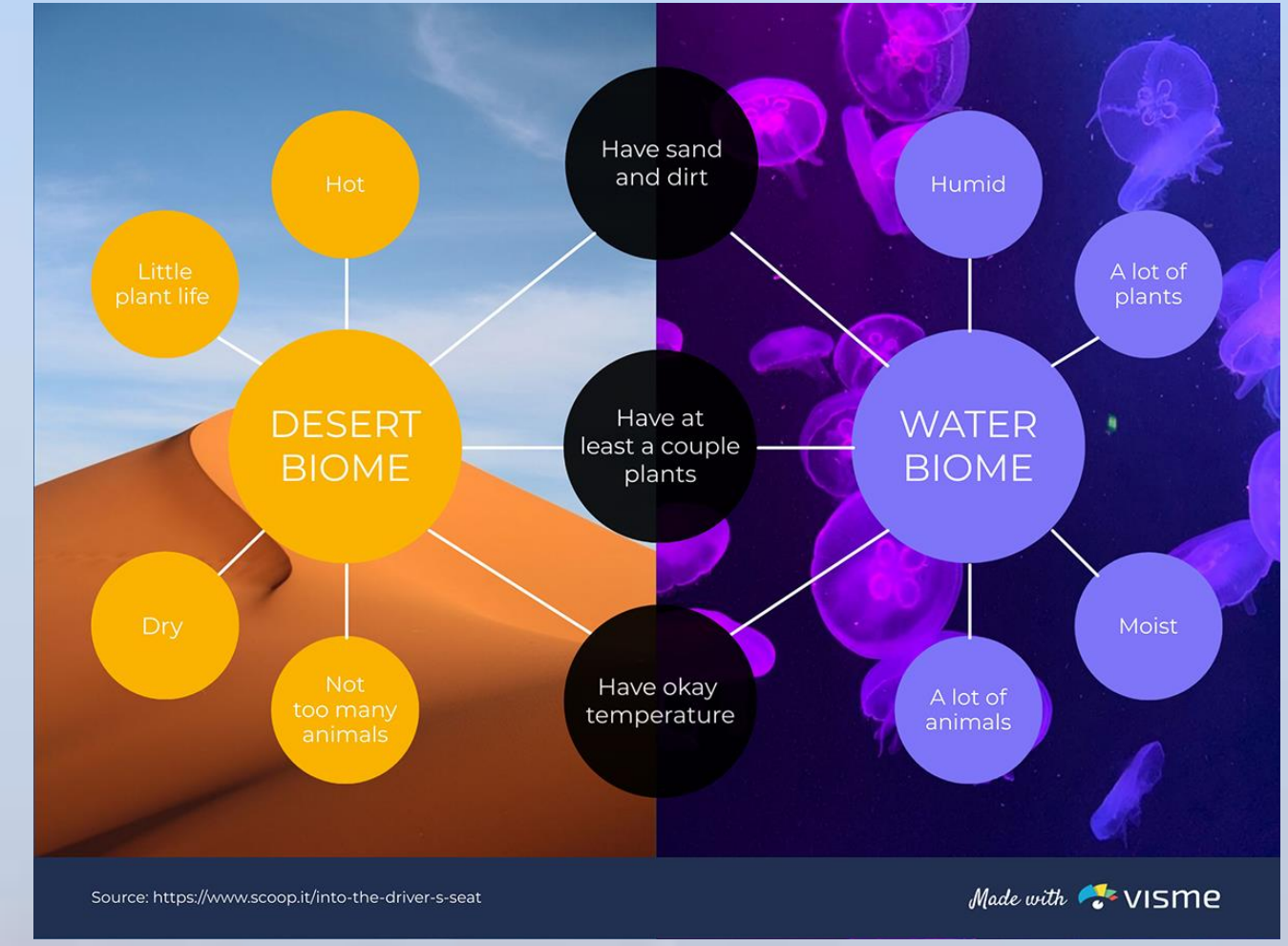
Type #27: Venn Diagram

Type #27a: Venn (Oval) Diagram

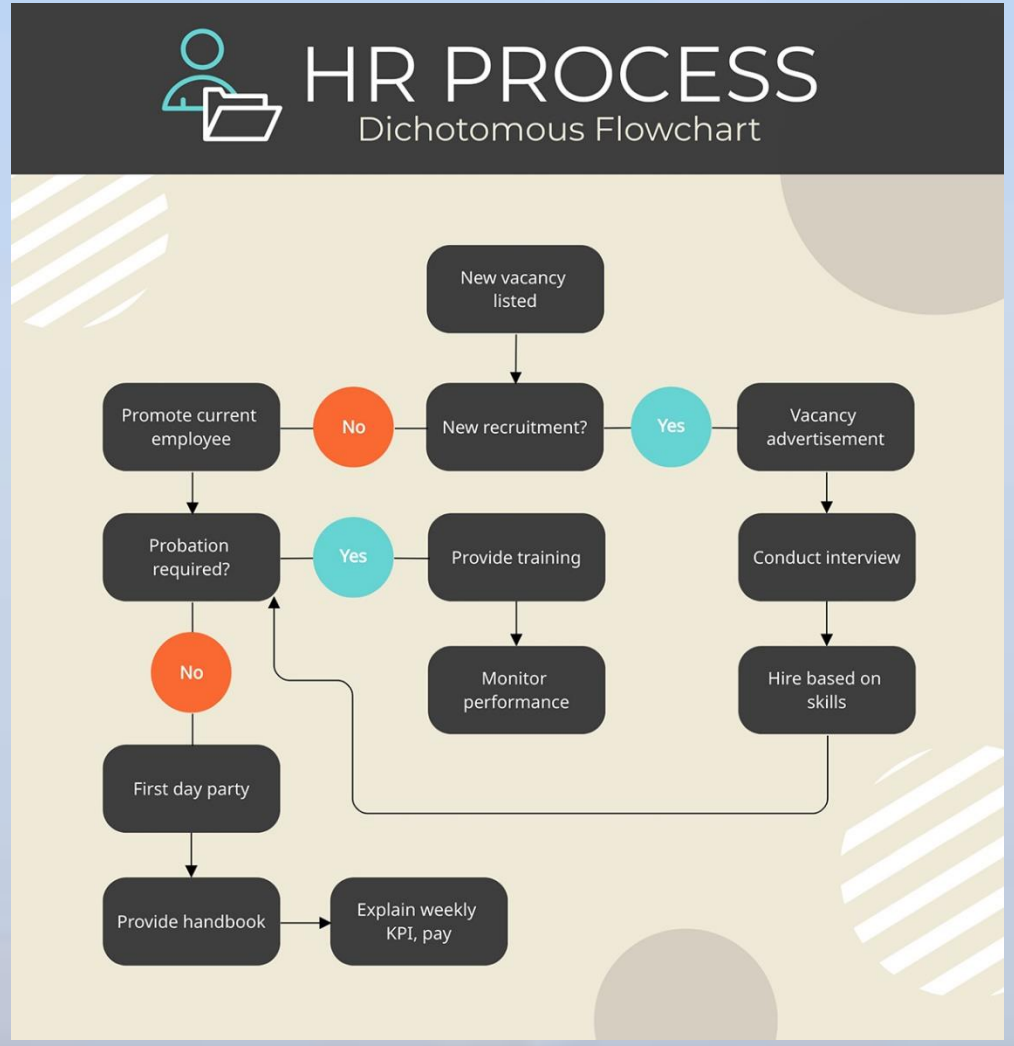


Type #28: Histogram

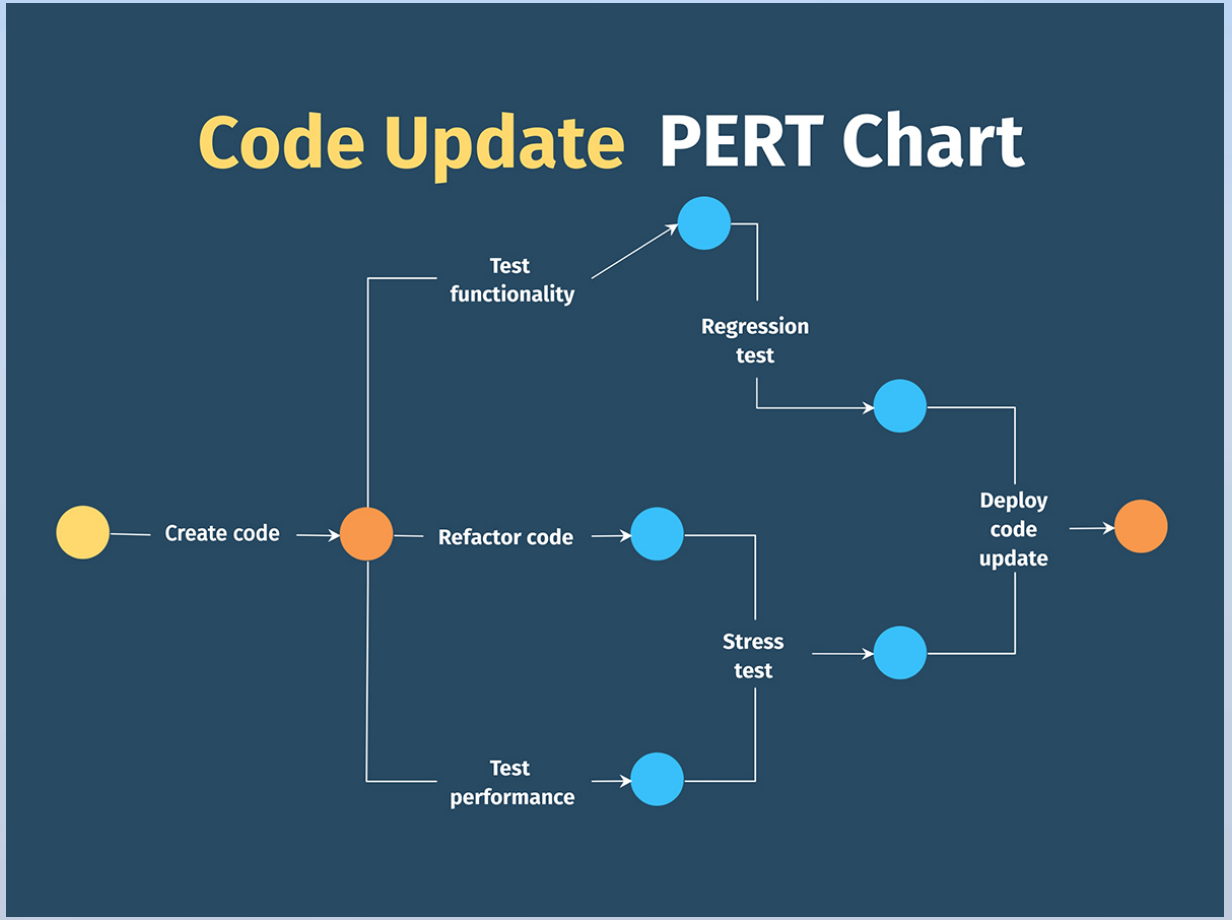
Type #29: Mind Map



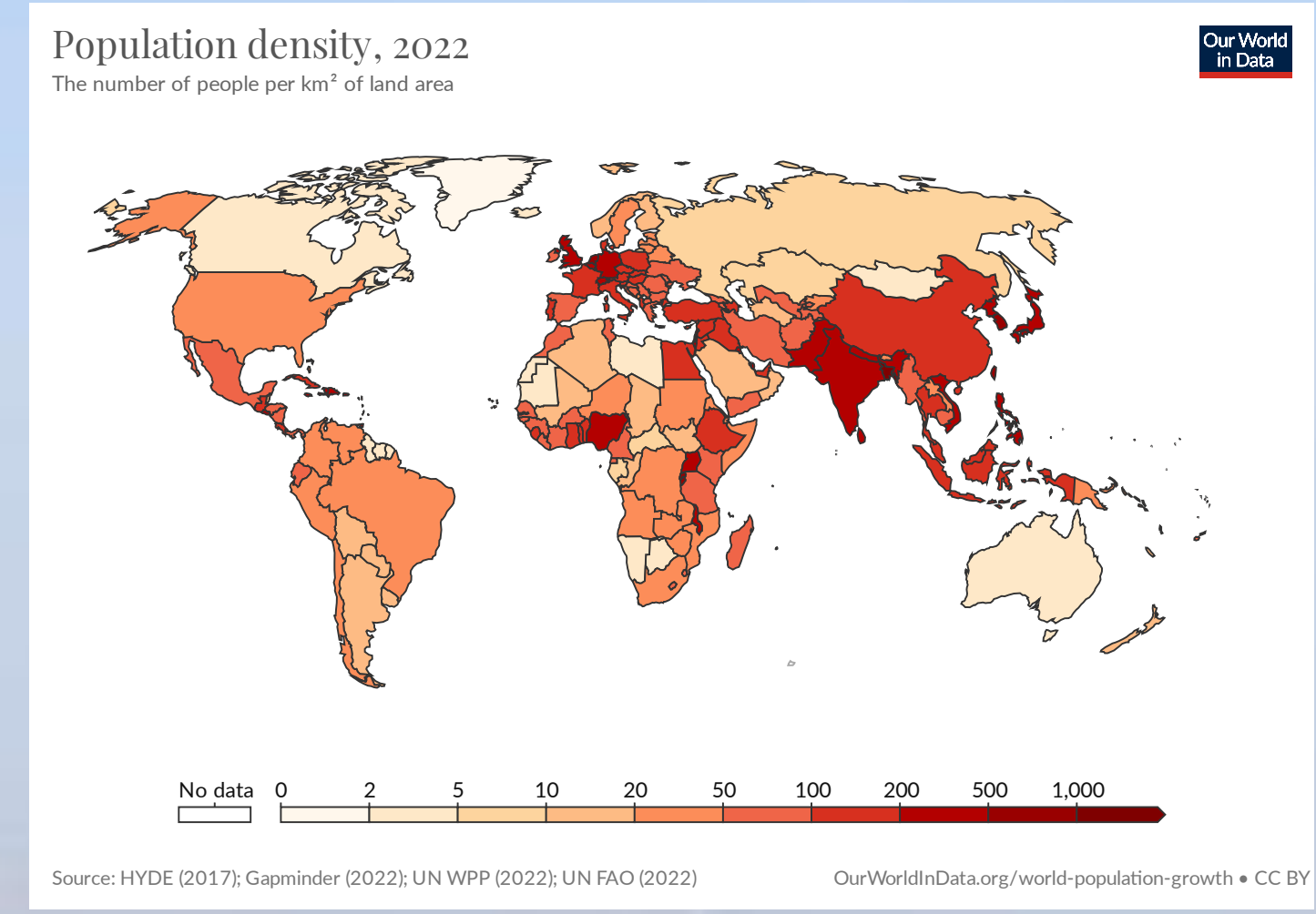
Type #30: Dichotomous Key



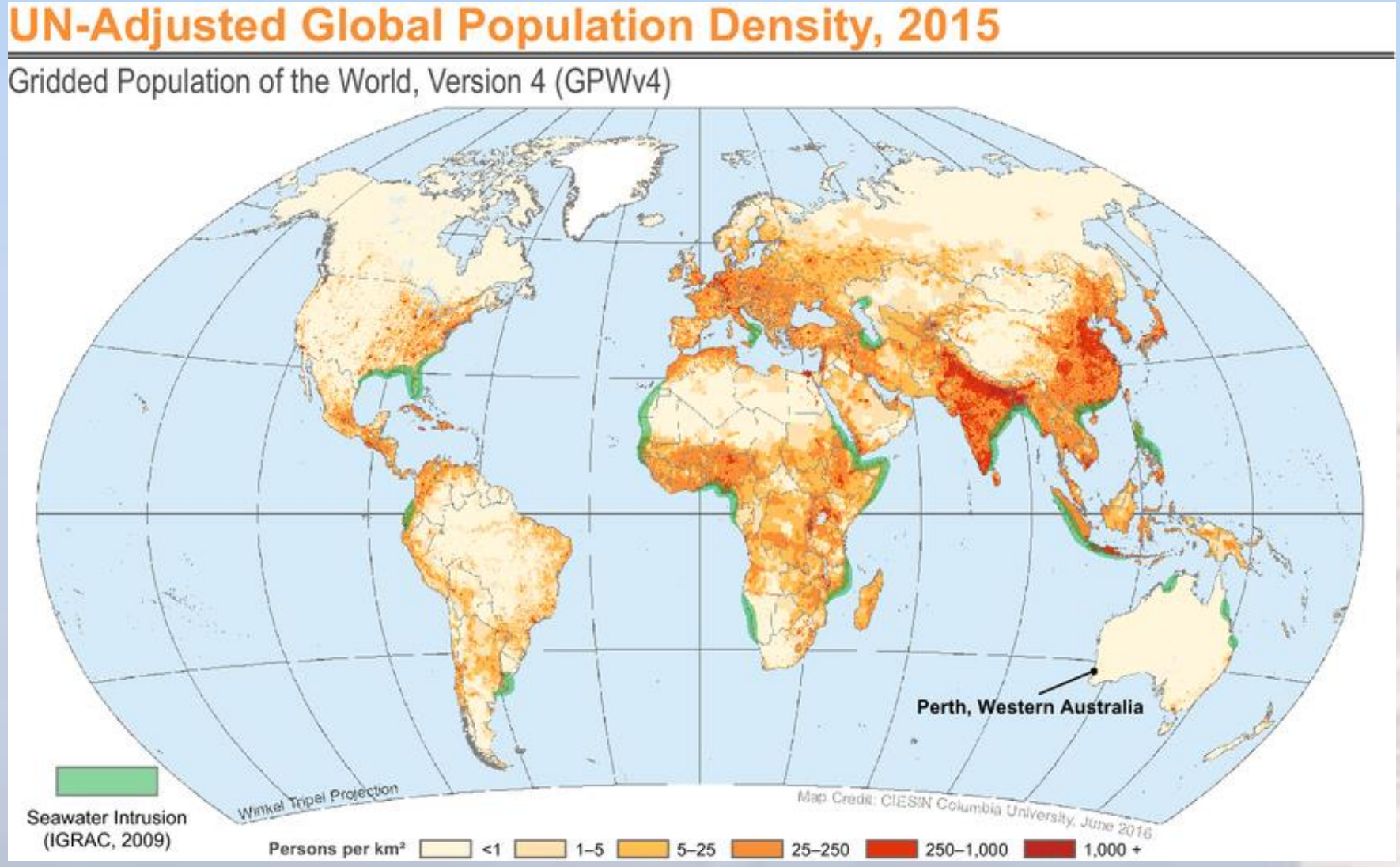
Type #31: PERT Chart



Type #32: Choropleth Map



Type #32a: Heat Map



Tableau

1) Tableau Desktop
2) Tableau Server
3) Tableau Online
4) Tableau Reader
5) Tableau Prep builder
6) Tableau Public

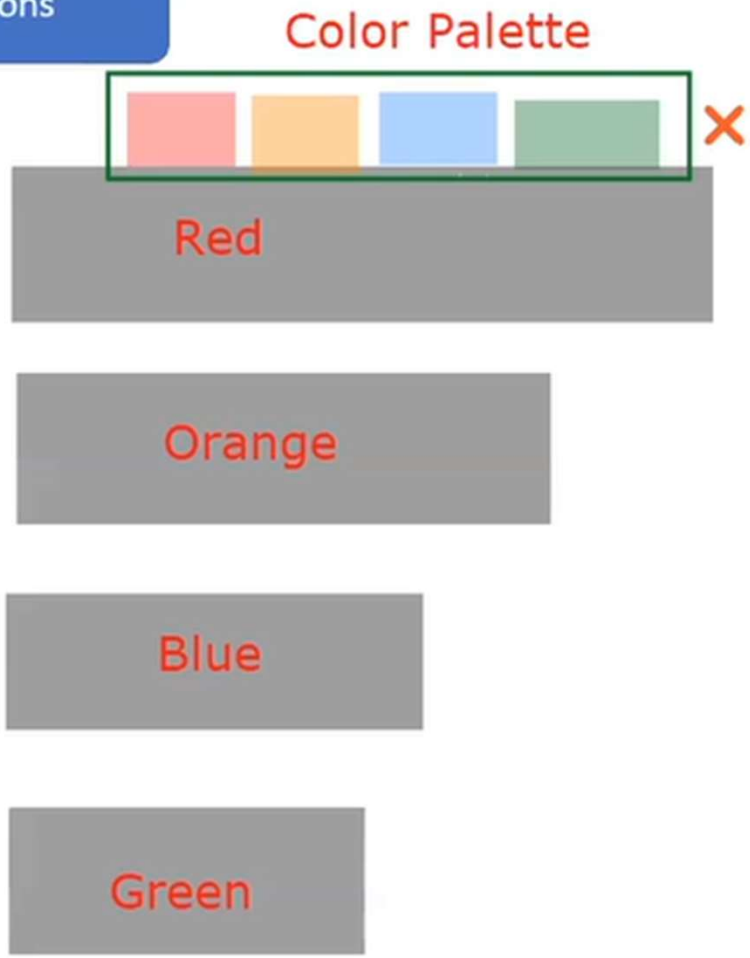
File Extensions

1) .twb → Tableau Workbook
2) .twbx → Tableau Packaged Workbook
3) .tds → Tableau Data Source
4) .tdsx → Tableau Packaged Data Source
5) .tde/.hyper → Tableau Data Extract
6) .tbm → Tableau Bookmark
7) .tps → Tableau Preferences

Workbook = Data + Worksheet + Dashboard + Story

File Extensions

1) .twb → Tableau Workbook
2) .twbx → Tableau Packaged Workbook
3) .tds → Tableau Data Source
4) .tdsx → Tableau Packaged Data Source
5) .tde/.hyper → Tableau Data Extract
6) .tbm → Tableau Bookmark
7) .tps → Tableau Preferences



Data Types

1) String → plain text, cust name, email-id
2) Numerical → int/float
3) Date → dd-mm-yyyy
4) Date-time → dd-mm-yyyy hh-mm-ss
5) Boolean → True|False
6) Geographical → location

Dimensions

1) Discrete Values
2) CANNOT Apply any AGGREGATE functions

Measures

1) Continuous Values
2) CAN Apply Aggregation

Installation

1) Tableau Desktop Professional Edition → Tableau Professional

1) Tableau Desktop Public Edition → Tableau Public

Basic Chart Types

- Bar Chart
- Pie Chart
- Symbolic Maps
- Filled Maps
- Line Chart
- Dual Axis Charts

Marks

- Color
- Size
- Text
- Detail
- ToolTip
- Pages
- Filters

Filters

- Dimension Filter
- Measure Filter
- Quick Filter

Calculations

Types of Calculations:

1) Basic Calculations

2) LOD's

3) Table Calculations

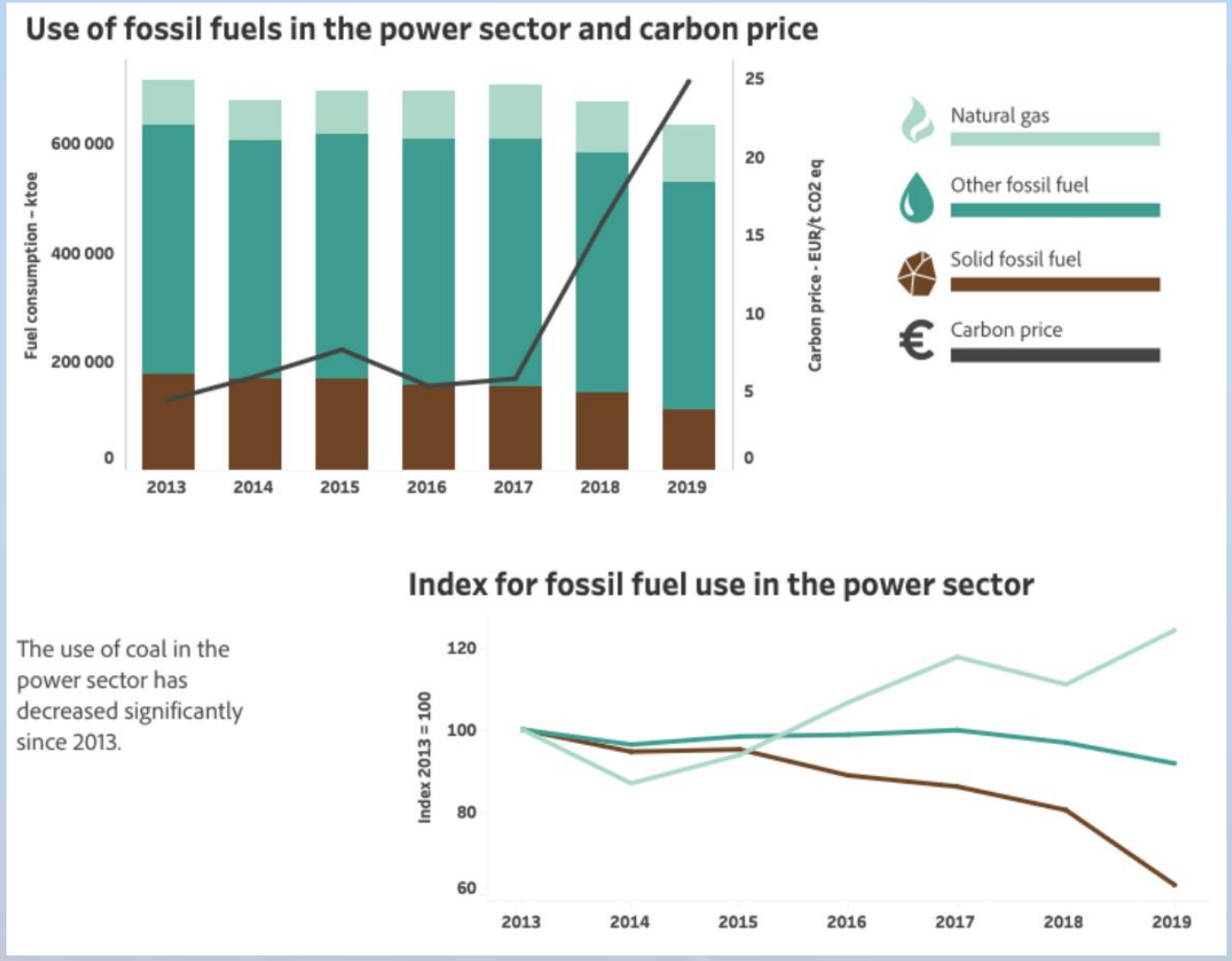
3 Types of LoD’s

- Fixed
- Include
- Exclude

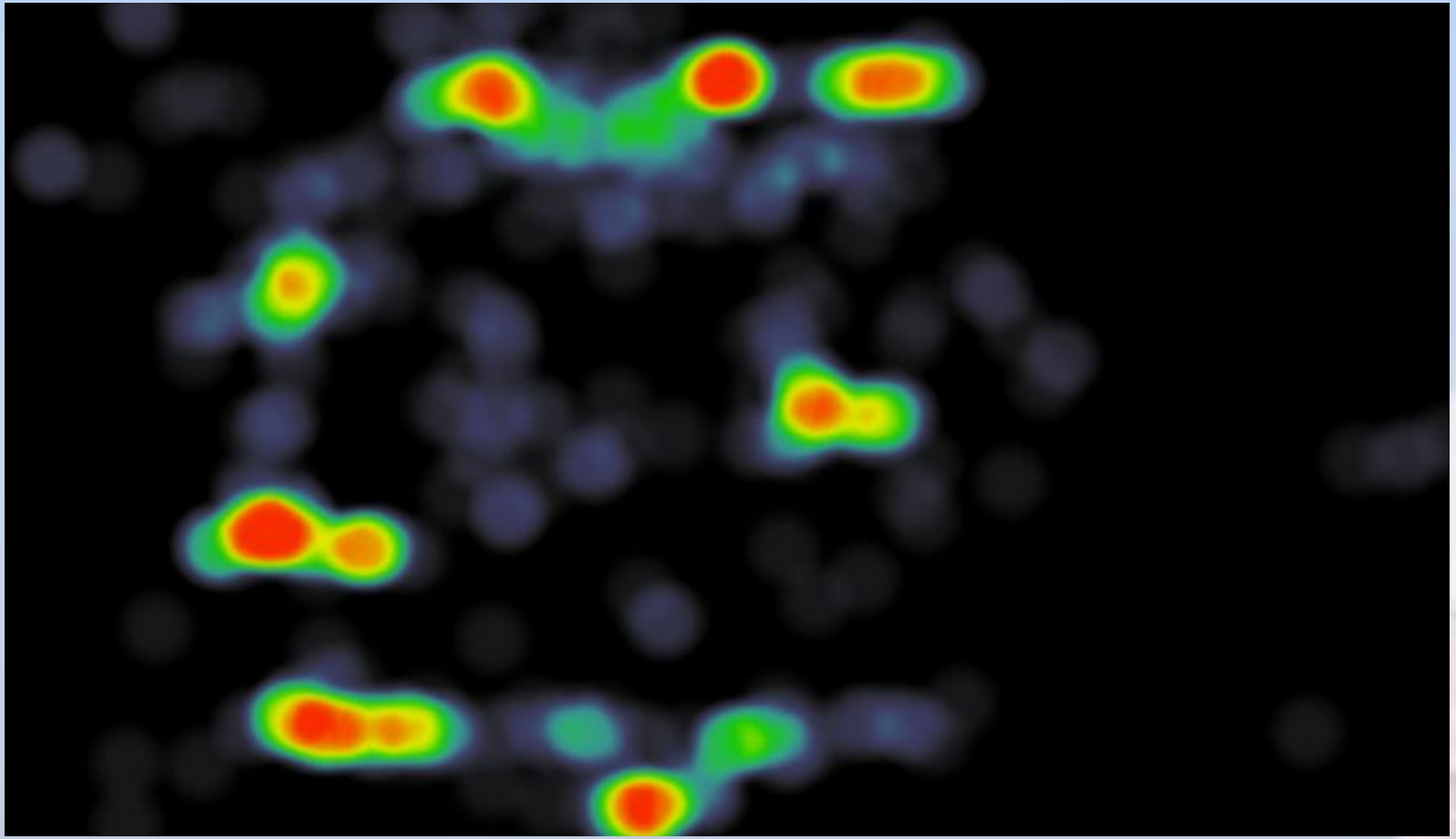
What not to do

Dr. Deepak Saxena, SME IIT Jodhpur

Don’t Avoid Common Visual Associations

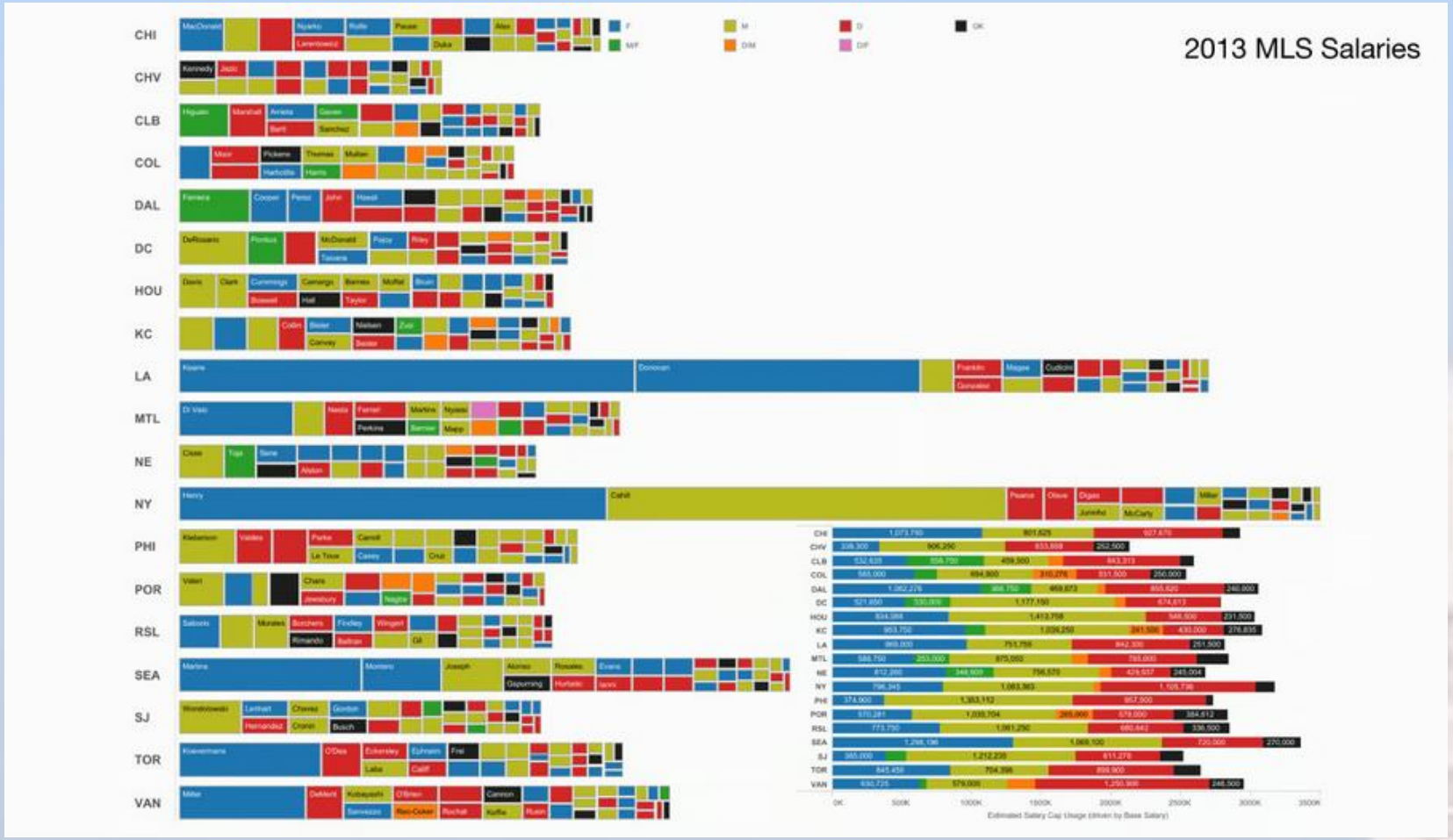


Don’t have high degree of color contrast

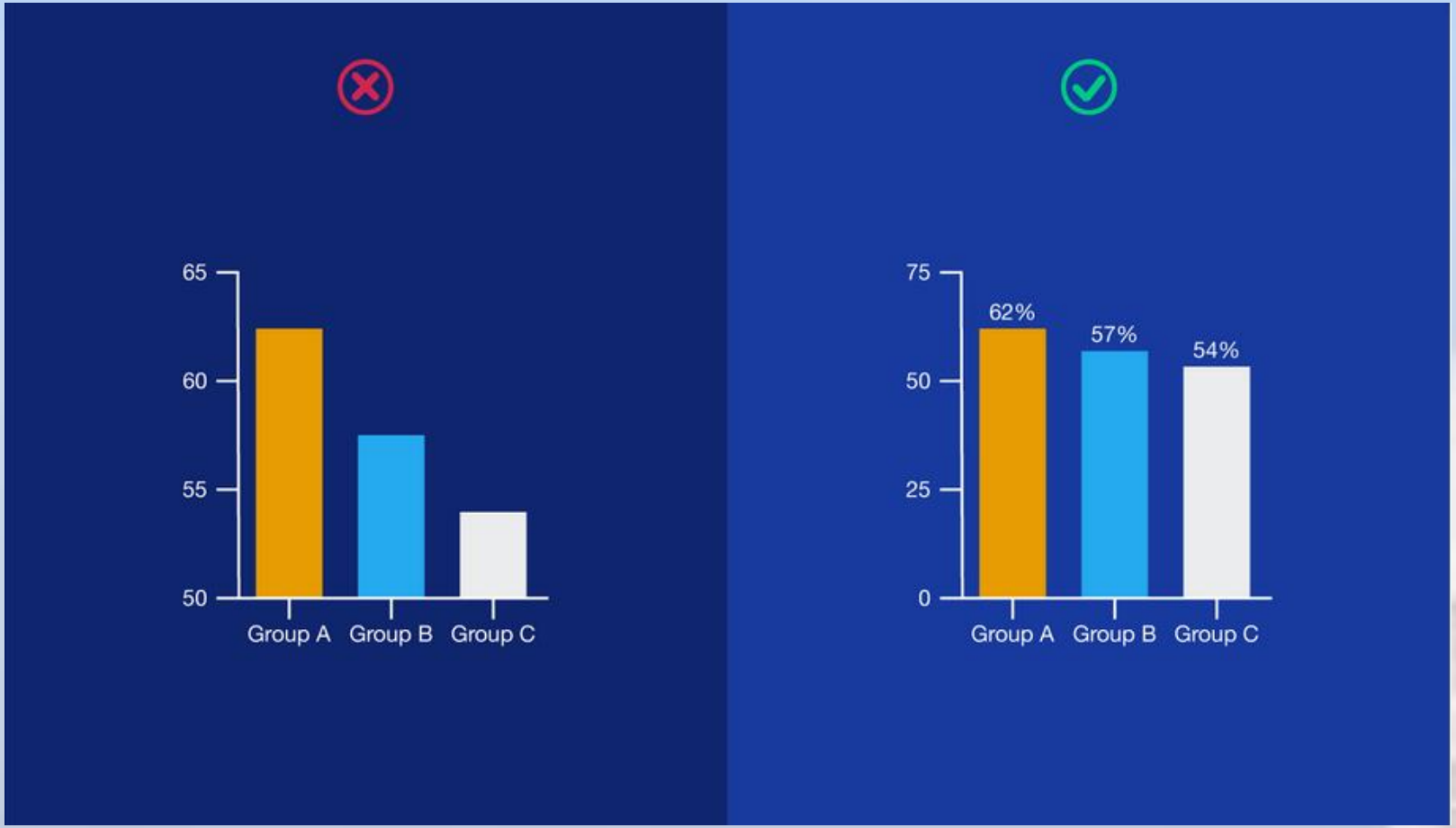


Don’t use 3-D Graphics unless absolutely necessary

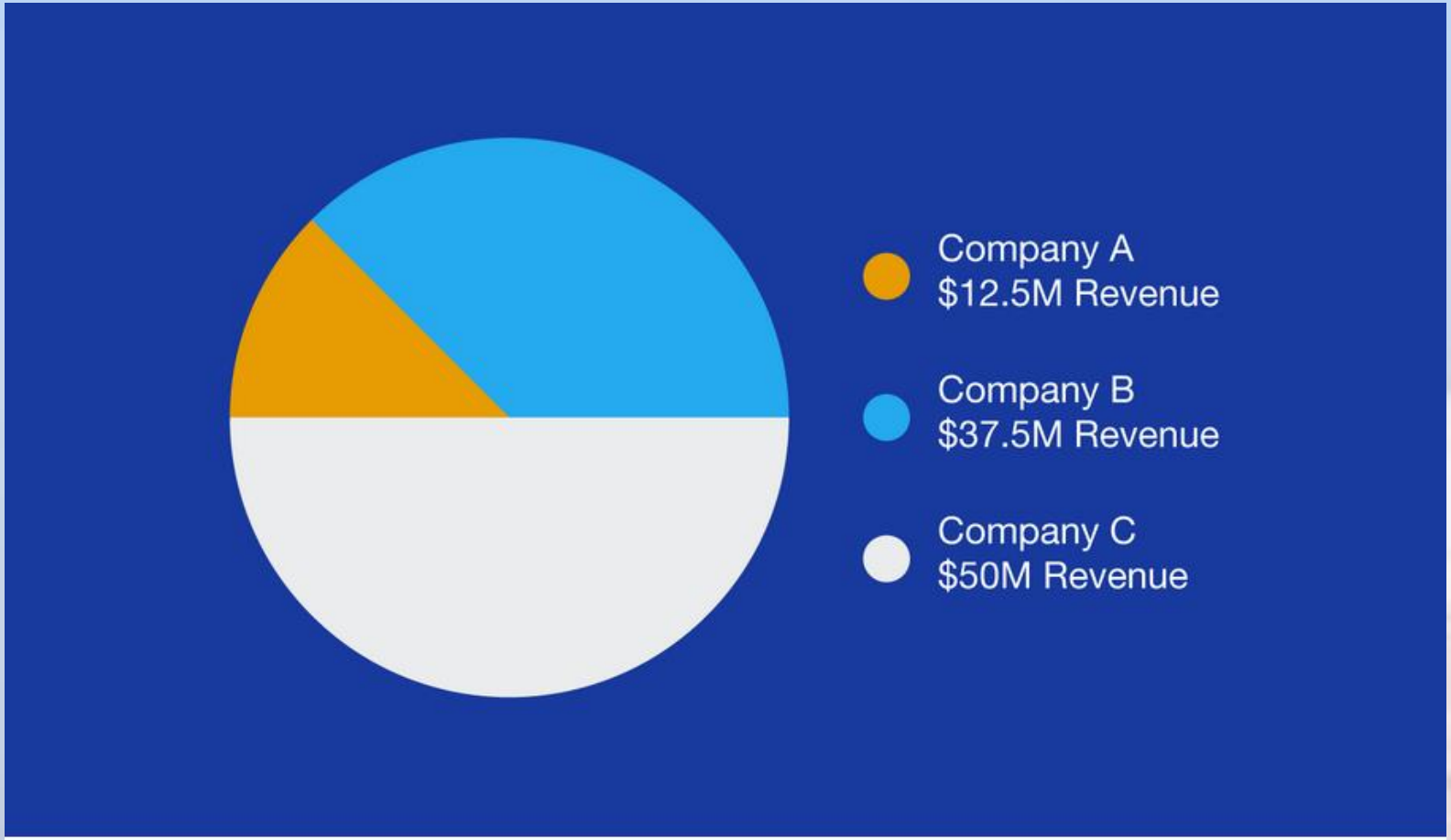
Don’t put too much data in one visualization



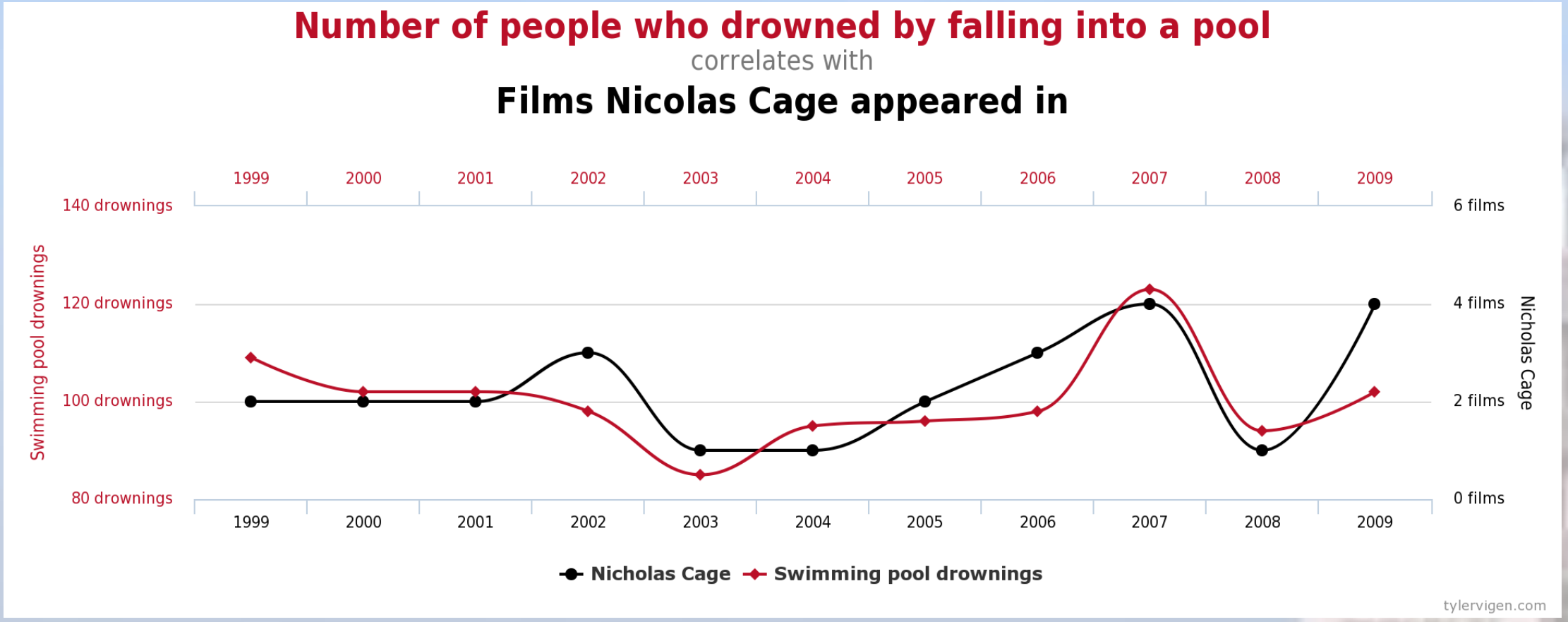
Don’t omit baseline/truncate scales



Use logic (there in no one-size-fits-all visualization)



Correlation is not causation



Dashboarding

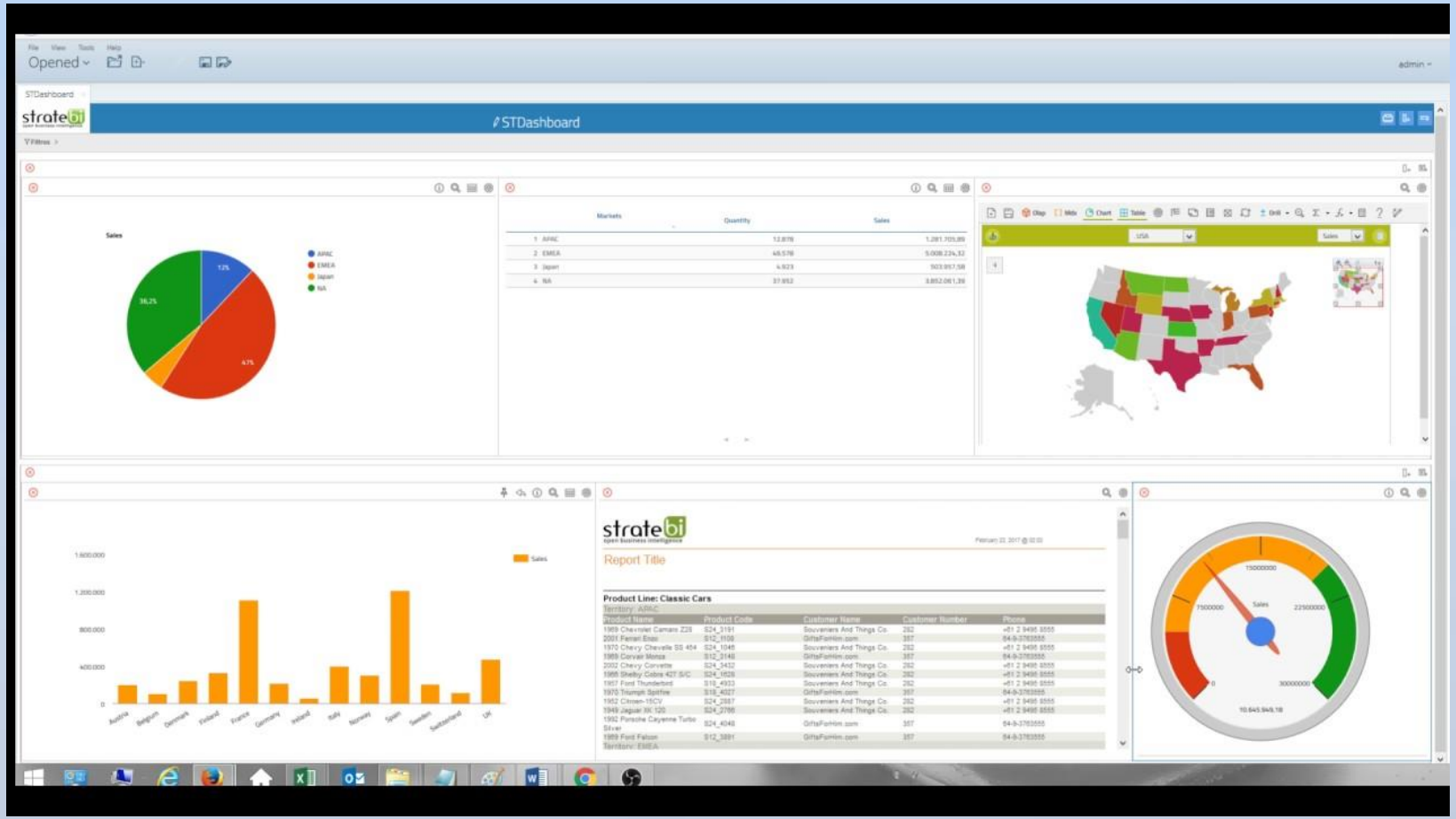
Dr. Deepak Saxena, SME IIT Jodhpur

Where have you heard the term dashboard outside visualization context?

Data Dashboard

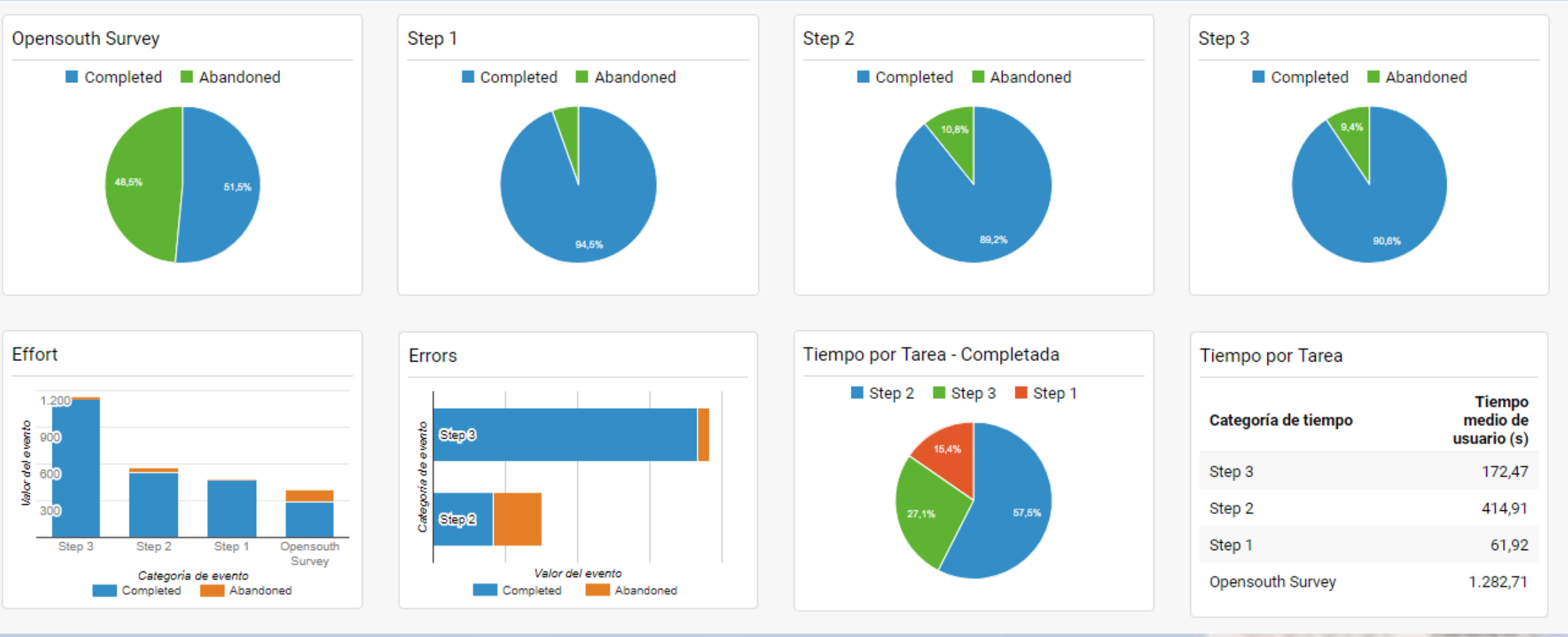
- A tool used to track, analyze, and display data - usually to gain insight into the overall wellbeing of an organization, department, or specific process.

Bad dashboard designs



Too much white space with little contextual information

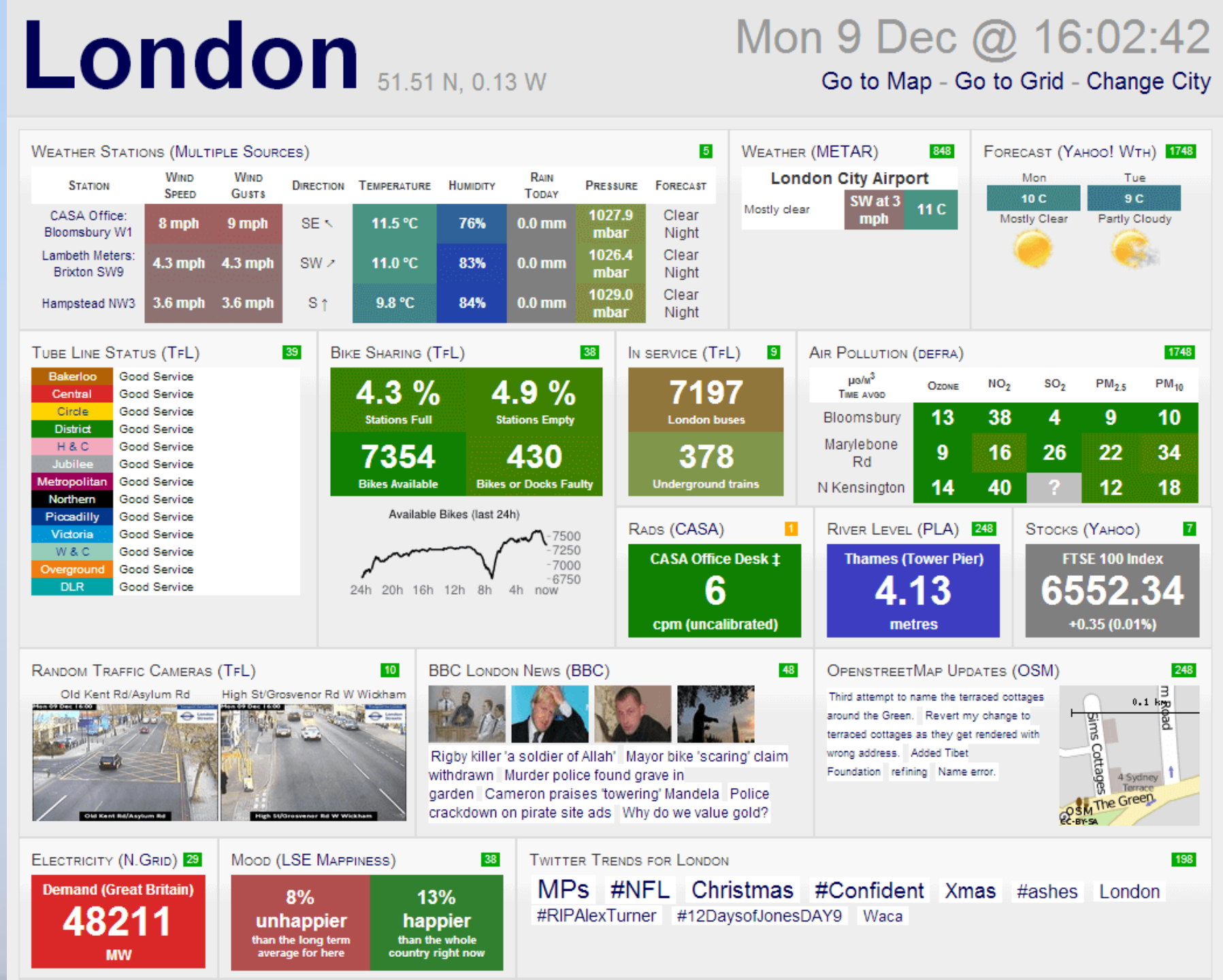
Bad dashboard designs



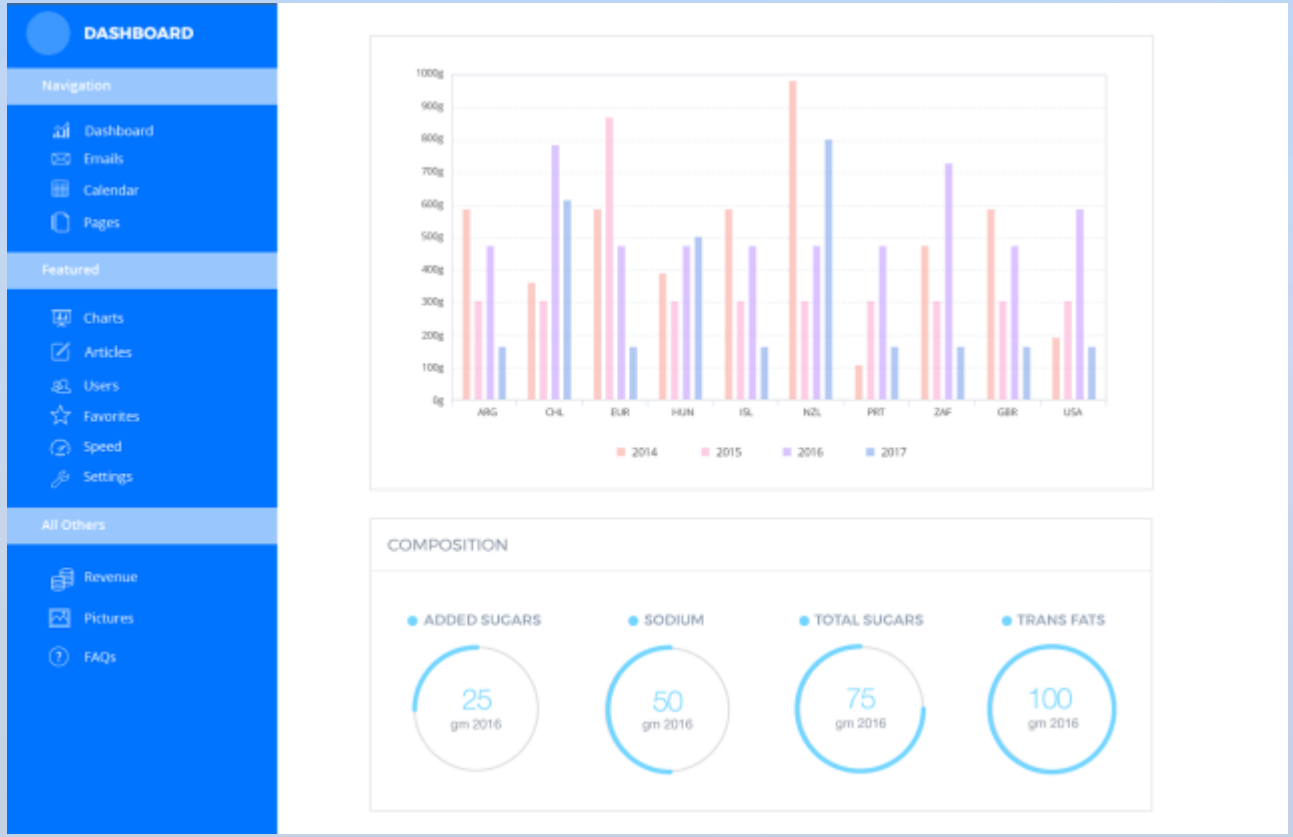
Lack of consistency

Bad dashboard designs

- Too much information
- Too many colours



Bad dashboard designs



What you wish to focus?

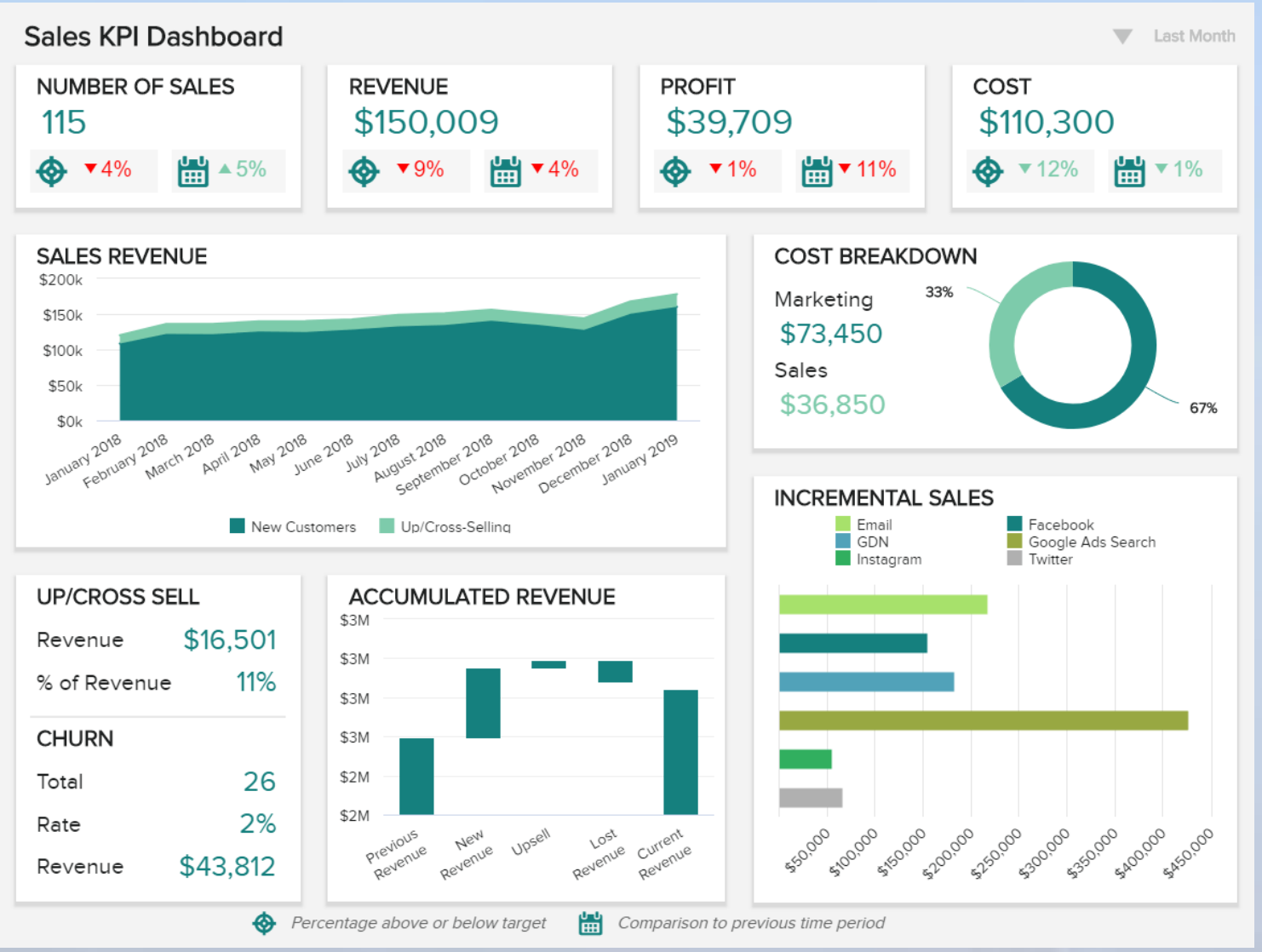
Bad dashboard designs

Too much variety

Bad dashboard designs

Too much variety

Good Dashboard Design



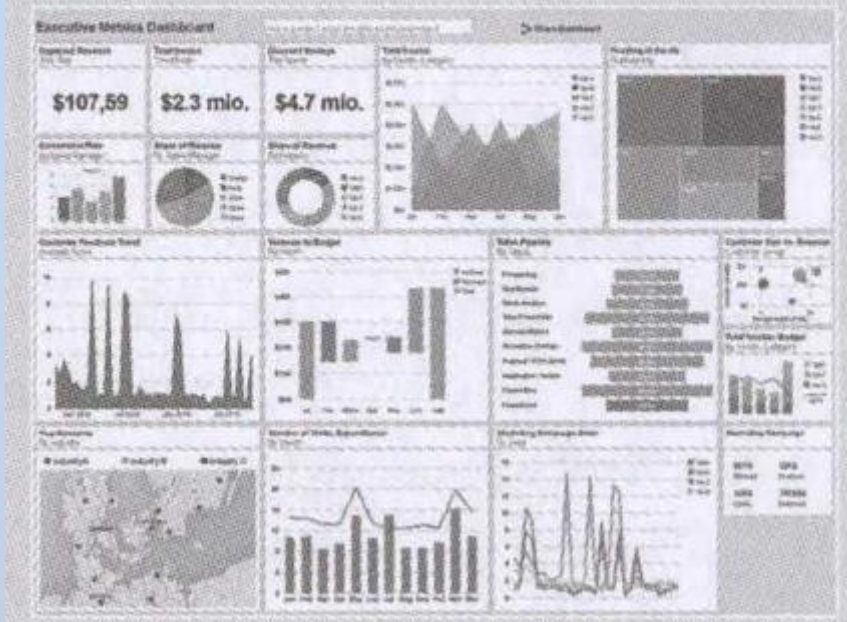
- Consider your audience
- Choose relevant KPI
- Provide context
- Round your numbers
- Choose few colours and stick to them
- Be consistent with labelling and formatting
- Test on different devices

Questions to ask before making dashboards

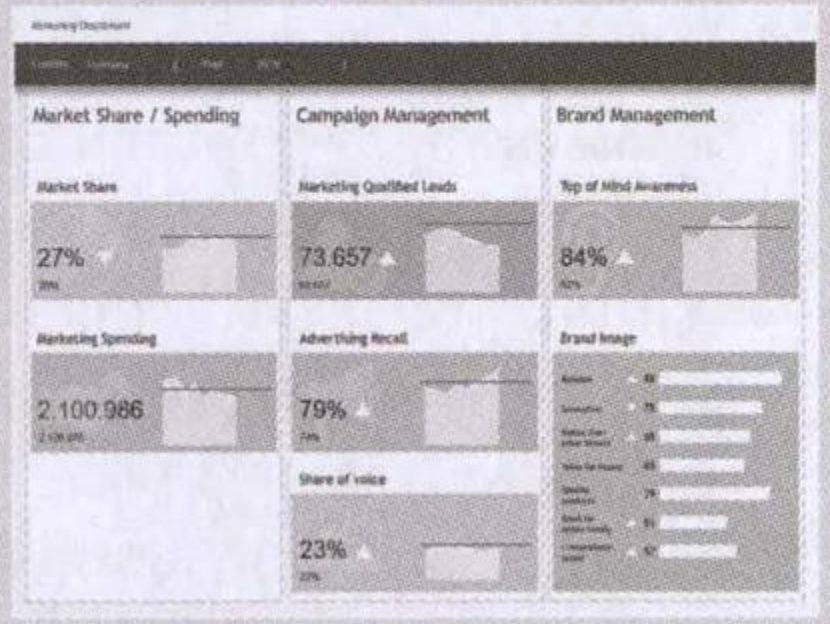
- Are you backed by your senior management?
- Does your dashboard concept fit your corporate culture?
- Does your dashboard add value and does it support the user in their daily management tasks?
  - Have you decided on the right KPIs?
  - Are the data easy to understand?
  - Are you following a call-to-action approach?
  - Is your dashboard designed to gain insight?
  - Does your dashboard encourage user to take action?
- Do you have a dashboard vision?

Exploratory vs Operational Approach

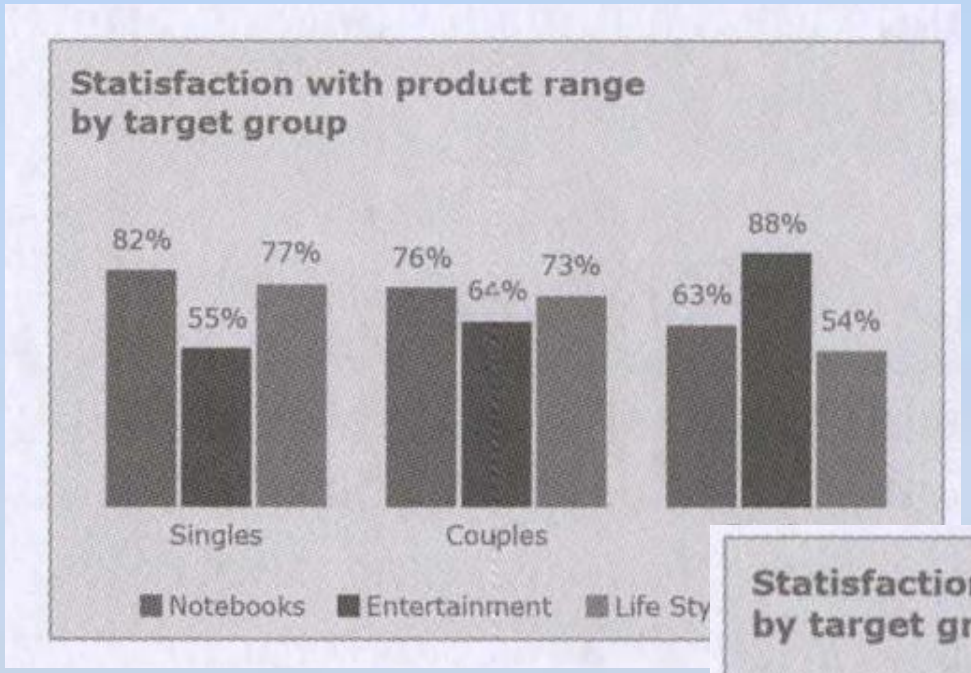
Exploratory Approach (User and data driven)
The goal of an exploratory user driven approach is to find answers to new questions and explore a wide range of topics interactively.

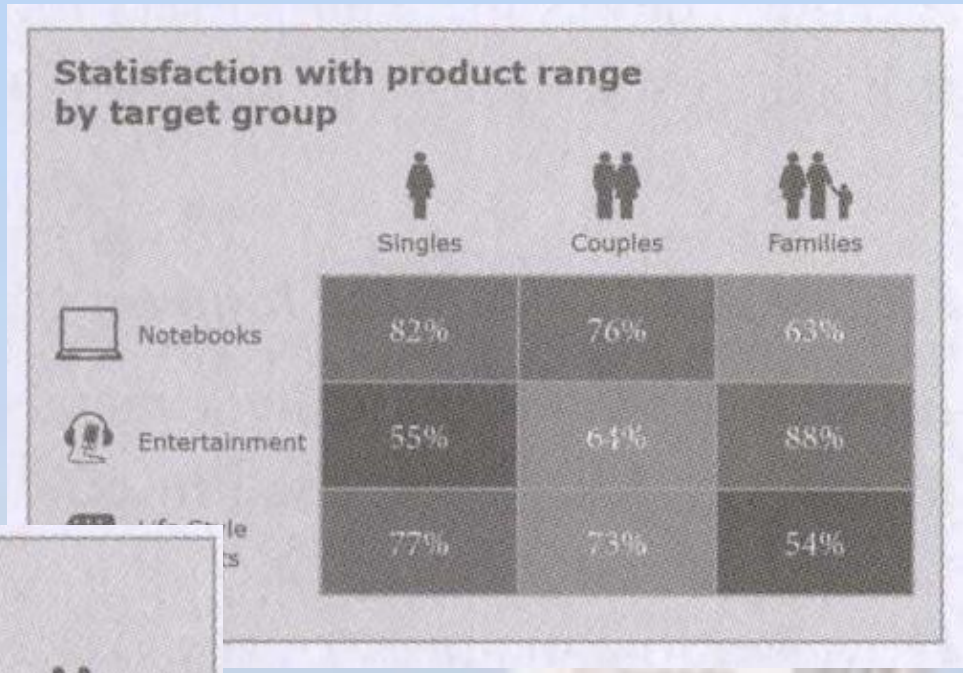


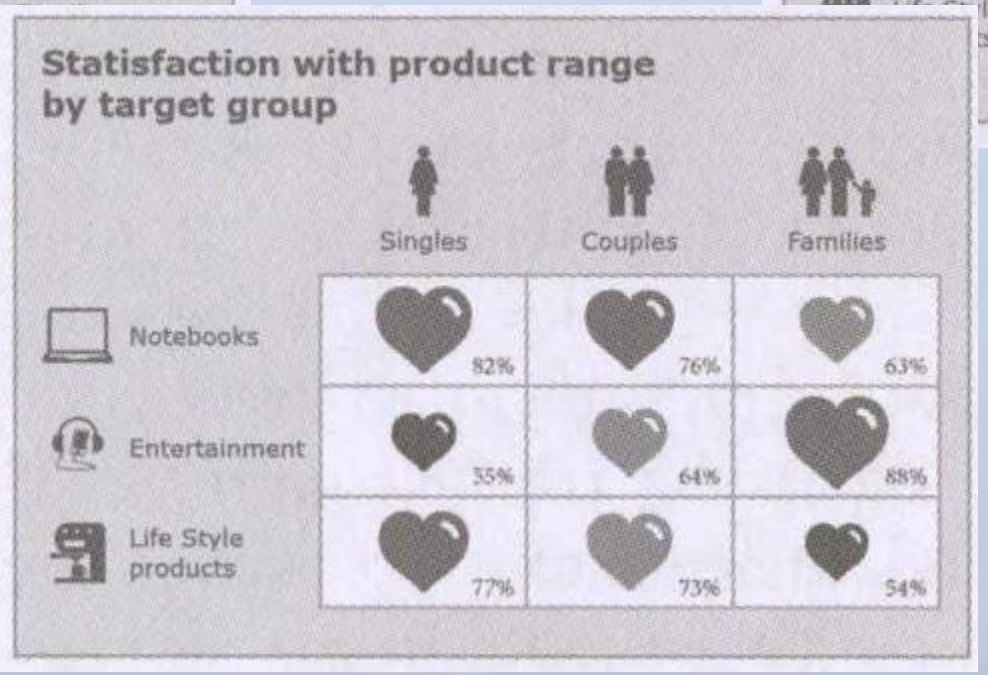
Operational Approach (Task and hypotheses driven)
The goal of an operational approach focuses on tasks such as assessing performance, understanding deviance and introducing appropriate measures.



From charts to infographic







From dashboard to insights

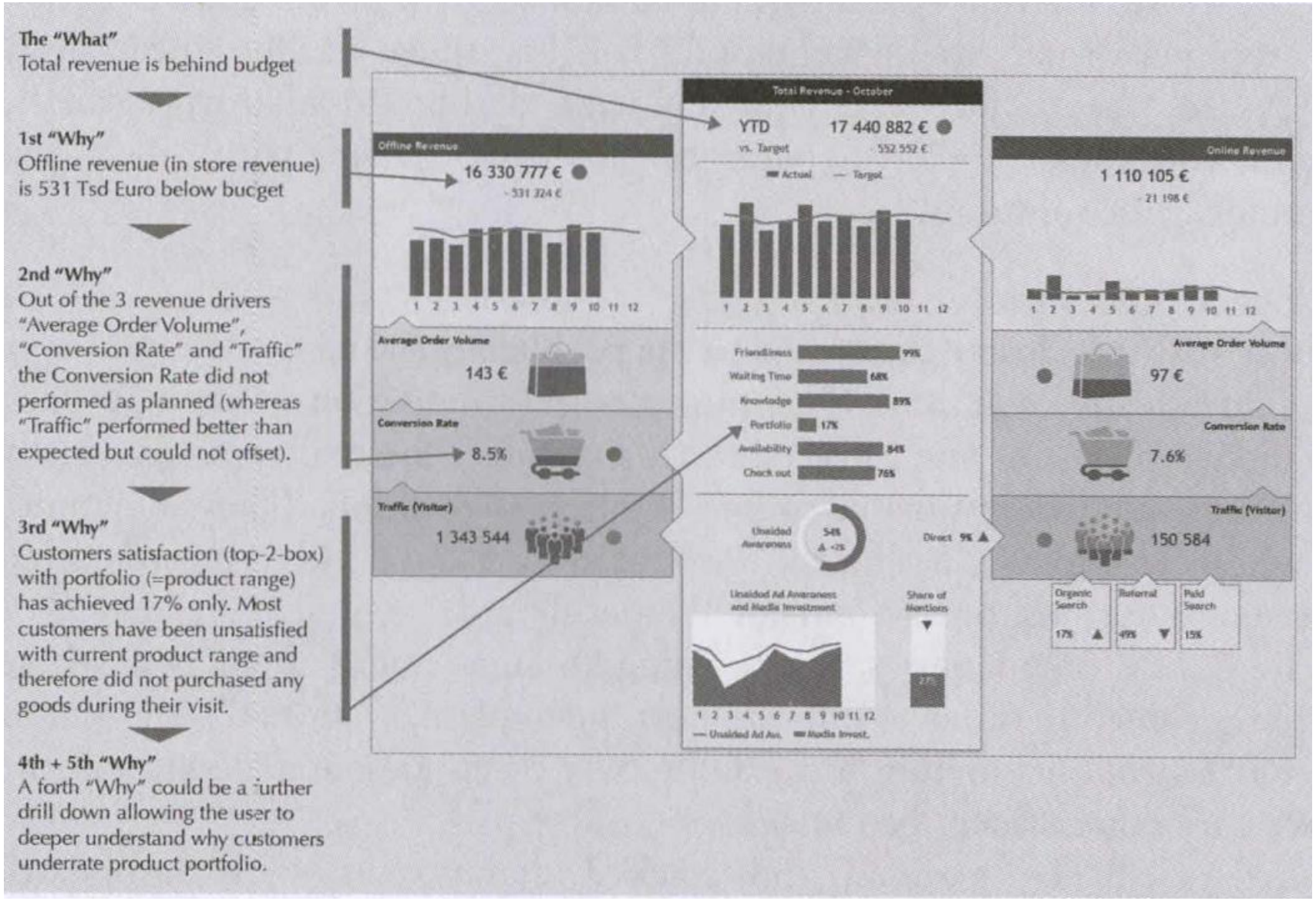
The "What"
Total revenue is behind budget

1st "Why"
Offline revenue (in store revenue) is 531 Tsd Euro below bucget

2nd "Why"
Out of the 3 revenue drivers "Average Order Volume", "Conversion Rate" and "Traffic" the Conversion Rate did not performed as planned (whereas "Traffic" performed better than expected but could not offset).

3rd "Why"
Customers satisfaction (top-2-box) with portfolio (=product range) has achieved 17% only. Most customers have been unsatisfied with current product range and therefore did not purchased any goods during their visit.

4th + 5th "Why"
A forth "Why" could be a further drill down allowing the user to deeper understand why customers underrate product portfolio.




OUR NEW DASHBOARD HAS ALL OF THE DIFFERENT KPI'S WE CAN TRACK NOW.
WHAT'S THAT KPI TRENDING TO ZERO?
IT MEASURES HOW WELL WE UNDERSTAND THEM ALL.
TOM FISH BURNE
©marketoonist.com

Successful dashboard implementation in practice

How to overcome implementation barriers and ensure long-term sustainability

Alexander Skorka
Dapresy, Germany

This paper examines how dashboard applications might be transformed in order to maintain interest and user attention. Although dashboards are an integral part of today's marketing and market research environment, many dashboard applications share the unfortunate downside that, over time, the dashboard becomes less interesting and might be neglected by the user. The upside, however, is that you can do something about it. Consider the following questions:

- Are you backed by your senior management?
- Does your dashboard concept fit your corporate culture?
- Does your dashboard add value and does it support the user in their daily management tasks?
  - Added Value 1: Have you decided on the right KPIs?
  - Added Value 2: Are the data easy to understand?
  - Added Value 3: Are you following a call-to-action approach?
  - Added Value 4: Is your dashboard designed to gain insight?
  - Added Value 5: Does your dashboard encourage user to take action?
- Do you have a dashboard vision?

If you are able to answer all of these questions with 'Yes' right away, congratulations! You are a dashboard pro. If you can't, here is some food for thought for you that will help transform short-term dashboard hype into a sustainable success story.

Are you backed by your senior management?

First of all, you need to ensure support from your management. It is a good idea to win the CEO as a sponsor, as they can boost your dashboard project and ensure good collaboration between all necessary employees

Received (in revised form): 9 Septembet 2016

DOI: 10.2501/IJMR-2017-017

and departments. What is more important, however, is to involve users, as their decision-making processes will change with the introduction of a dashboard that will also measure their performance.

To ensure a successful start of your dashboard application, it's crucial that you consider the views and habits of your users. You need to know which challenges might arise while implementing a dashboard and look into the following three aspects.

1. Is transparency one of your corporate values?
2. Are users prepared to change their habits?
3. Is your company ready to take decisions based on data?

Is transparency one of your corporate values?

Corporate cultures are changing – from a rather information- and hierarchy-based communication to a cross-level dialogue. Top-down decisions are replaced by participative decision-making processes. Control is superseded by trust and more autonomy at all decision-making levels. A culture of 'knowledge is power' turns into 'knowledge is for sharing'. What is created is a learning organisation that enhances the need to use data and information in all corporate areas.

This might not be to everyone's liking, as it means that all of a sudden the company is transparent, making the status of departments, or even individual employees, visible. We know what their goals are and how well they are doing in achieving them. Not everyone likes this level of transparency, as it becomes impossible to show facts and circumstances in a better light using traditional presentation tools. What's more, the introduction of a dashboard might reveal a wrong decision previously taken by a manager.

Are users prepared to change their habits?

Take a close look at your future dashboard users. What are their current habits, how do they gather information and how do they make decisions? Are PowerPoint files, Excel spreadsheets and hard copies still dominating, because it's supposedly a lot easier and quicker that way?

What's interesting here is that most of us regularly surf the internet on our smartphones to gather information. So why shouldn't we also use a smartphone or computer to prepare the next important corporate decision? Why is the internet so much more successful than many dashboards? Does the answer really lie in the reluctance of people to change their beloved habits? Or is it the supply of information that is just not right at the

moment, the difficult usability or non-appealing design of information? We are prepared to change our habits if we see added value.

Highlight this added value by creating a dashboard that is convincing, and sell it accordingly. That's right! Marketing is part of the plan at the beginning. Make the benefit visible, but don't just talk about it. Run a stress test every time the opportunity arises – for example, in a meeting – and use the dashboard live. Nothing is more convincing than answering a question spontaneously with a few clicks in front of everyone.

Don't forget about top decision makers. They are role models. If they don't adhere to new information processes, there is a certain risk that other users will also avoid your dashboard initiative. Train your senior management on the new technologies. For instance, compile a visual manual that illustrates the dashboard and how it works based on use cases. Explain your vision to them, what you want to achieve in the long run, how easily they can gather and analyse information, and how the dashboard will contribute to the company's future success.

Is your organisation ready to accept BIRDs? Why you have to silence HiPPOs first!

One of the aspects that needs to be considered when implementing dashboard solutions is the way decisions are made and who is responsible for the final decision.

In times of little information and non-digital information, it makes sense to let knowledgeable people in the company decide. They will do so based on their experience, considering common patterns and correlations they have seen and adopted over the years. This process is often called 'intuition'. For particularly important decisions, the decision-taking parties are high up in the hierarchy of their organisation. So businesses rely on the HiPPOs in their organisation – the 'Hi'ghest-'P'aid 'P'erson's 'O'pinion. A common practice in the world of business – even today.

Johann Wolfgang von Goethe once said: 'Nothing is more terrible than ignorance in action.' You could add that nothing is more frustrating than an opportunity that you recognise too late, and nothing is more frightening than a risk that you recognise too late.

Rational leadership requires expertise. And successful management is essentially a matter of having the right kind of information. This is why more and more top managers follow the BIRD principle: 'B'usiness 'I'ntelligence 'R'elated 'D'ecisions. According to this principle, management needs to accept that it can be overruled by data, and personal intuition

recedes into the background. This doesn't mean that there are no more experts for individual subject areas; experts still play an important role in decision making. They are part of the group who decides which challenges the company needs to address.

Top managers will have to learn that they are no longer valued for their HiPPO-like answers, but because they ask the right questions and let the BIRDs take the final decision.

The success and failure of a dashboard project therefore also depend on the decision-making culture in your company. Do relevant managers accept data invalidating their intuitive views? If they don't, your dashboard project might be bound to fail. You will often come across doubt regarding data quality and applied analyses, especially if your dashboard has a 'different opinion'. Ensure that the views regarding BIRDs change. High-quality data, the right analyses and intuitive usability are a good way to start. Design a fitting concept and add value for your user. A good sign of being on the right track is when managers begin to ask 'What does our data say?' before taking important decisions.

Does your dashboard concept fit your corporate culture?

In order to answer this question, you first need to know what the two basic approaches for dashboard applications are. The first one is the exploratory approach. Dashboard users independently explore the data sources they require. The analysis is user based. The reporting approach, on the other hand, offers a predefined framework of information and analytic methods. The analysis is task based. The user and their management tasks receive systematic and structured support.

You might also come across a third approach: a system as a 'source of reference'. This dashboard software provides easy and quick access to a large number of data points. Unfortunately, this approach usually lacks the exploratory side of things and the task-based focus, which is why we will concentrate on the other two types.

Today's software solutions usually support both of the above-mentioned approaches to a certain extent.

The exploratory approach (user- and data-driven analysis)

The main goal of this approach is to provide answers to new or comprehensive questions or subjects that have not yet been explored. This approach implies that the users know best what kind of information they need and in which way. The most important feature of a suitable dashboard

application is therefore flexibility – flexibility in terms of easy integration of new data sources or being able to quickly change the analytic method applied. What's key in this approach is that you can look at data from different perspectives, slice and dice data as required, and consequently identify new correlations across data sources in an interactive way.

To reach this goal, the dashboard user needs to know what they are doing. They need to identify what kind of information is relevant for decision making, determine the quality of available data and whether they provide an adequate basis for analysis. They need to be able to confidently deploy different analytic methods and accurately assess existing sources of error. With this approach, the user is responsible for the accuracy, completeness and adequateness of the insights gained. Thus, the exploratory approach also entails risks, but these can be minimised through 'self-service governance'.

Self-service governance means complying with guidelines while handling data – throughout their life cycle. There is much more to this than simply applying measures to make sure that key information won't fall into the wrong hands. It needs to lay the foundations for ensuring necessary quality, integrity and security of data. It needs to effectively avoid harmful consequences for the company, which can occur due to inconsistent or incomplete data, incorrectly applied analytic methods, uncontrolled growth of KPIs, data protection and data security gaps or unregulated sharing of results.

The operational approach (task and hypothesis driven)

Unlike the exploratory approach, the operational approach focuses on tasks such as assessing performance, understanding deviance and introducing appropriate measures. Consequently content, the scope of analyses and visualisation are clearly defined and tailored to different management tasks and areas of responsibility. It informs the user and recurring tasks are being actively supported. With this approach, comprehension, accurate interpretation and an action-based focus are more important than the exploratory side of things.

Therefore, dashboards fulfilling this role need to be professional and intuitive communication platforms that actively support the user and enable them to take effective action. This entails, however, additional effort during the design phase. Factors such as data quality, selection of KPIs, analytic methods and visualisation need to be considered – and this takes time. Decision makers and expert users, by implication, receive quick and precise answers to practically relevant questions, without the need to think about data sources, correlations or analytic methods (Figure 1).

The impact of corporate culture on the choice of dashboard approaches

Corporate culture and business success are interconnected in today's world, as corporate culture has a significant impact on communication, behaviour, innovation capacity and many other success factors.

According to Robert Quinn and John Rohrbaugh's 'Competing Values Framework' (Quinn & Rohrbaugh 1983), there are four different types of business culture:

1. Create (culture of innovation)
2. Compete (culture of competition)
3. Control (culture of organisation)
4. Collaborate (team culture).

These four types are determined by different manifestations of individual cultural values (see Figure 2). Please note that there are no right or wrong cultures or values. In fact, the culture needs to fit the company, its background, its employees and, first and foremost, its vision and strategy.

Your corporate culture needs to inform your dashboard design (Figure 3), as values and their manifestations determine the expectations your users

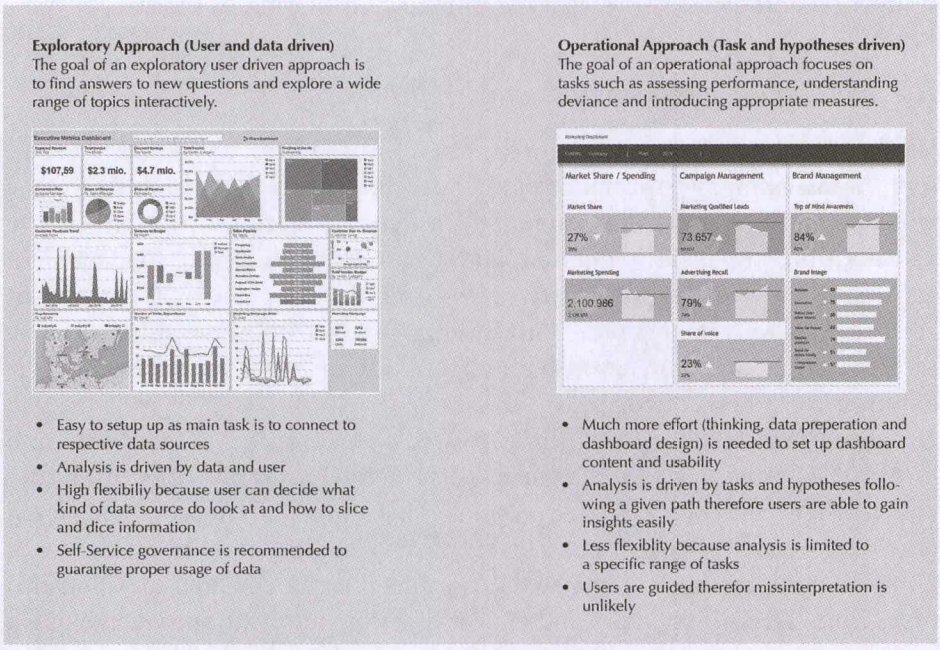


Figure 1 Exploratory approach (user and data driven) vs operation approach (task and hypothesis driven)

have for actual content, preferred working practices and scope of function. At the same time, the dashboard – as an important tool of communication – influences corporate culture and an organisation's values, and can even change them (see 'Are you backed by senior management?', above).

The higher the need for flexibility in a culture and the higher the degree of external orientation, the more exploratory and user-driven a dashboard application needs to be. Pressure to innovate and rapidly changing market conditions call for exploiting and analysing new data sources on a regular basis. Standardised reporting with predefined KPIs and analyses would nip unconventional thinking and curiosity in the bud and might not be accepted by the users.

If your corporate culture, however, is based on aspects like stability and internal processes, the reporting approach is the right choice. Values such as responsibility, quality, security, risk minimisation and control are pertinent indicators. Optimising processes, and increasing efficiency and effectiveness requires continuous measurement of KPIs and a clear alignment with management tasks.

The corporate culture tells us a lot about the requirements for designing a dashboard. So be aware of the values that your company embodies. These values constitute the foundation, as they give insight into preferences of dashboard users – the way they think, act and work. And one thing is for

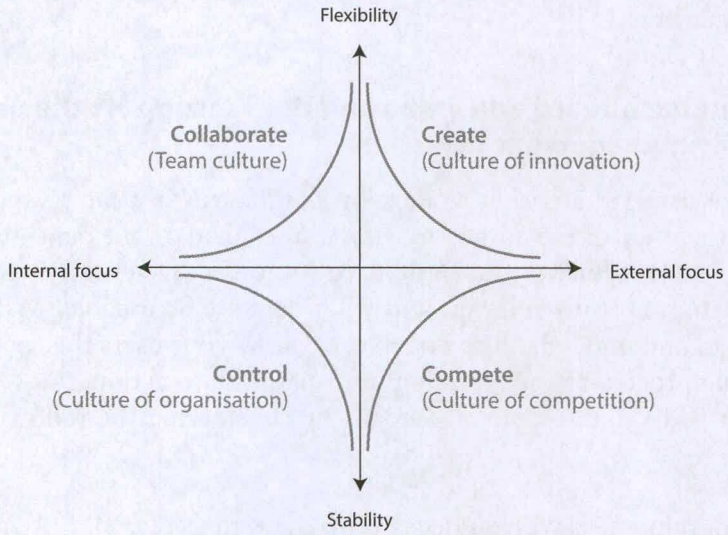


Figure 2 Corporate cultures (Robert Quinn's and John Rohrbaugh's 'Competing Values Framework')

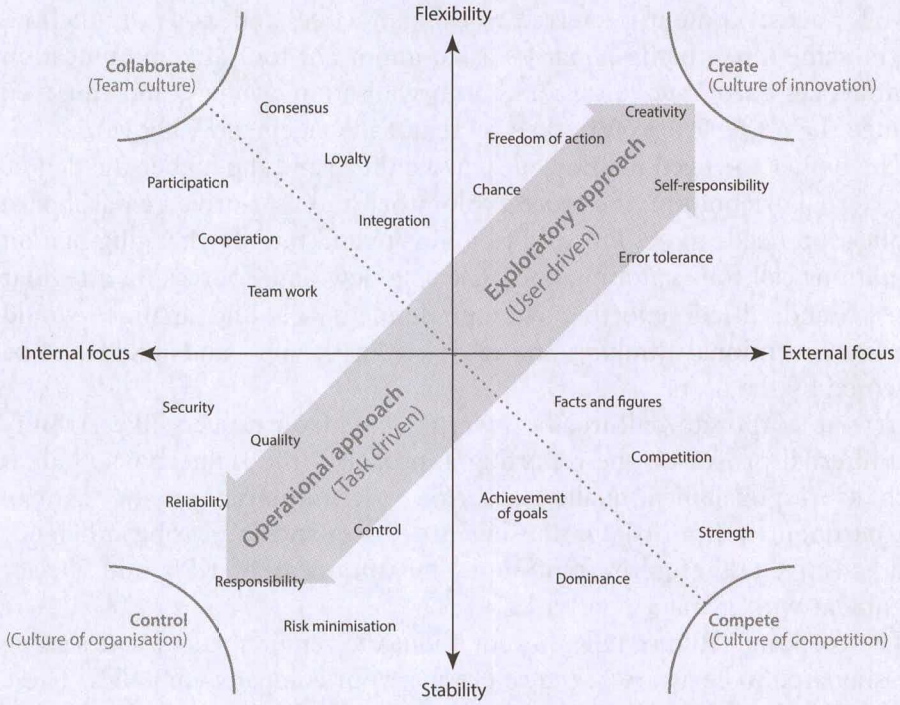


Figure 3 What approach to use depending on your corporate culture

sure: the dashboard application needs to convince the user and not just your top management.

Does your dashboard add value and does it support the user in their daily management tasks?

Using pure data visualisation to develop dashboards is a faulty approach. Focus on the users of the dashboard first, rather than on the data – this will add the value that makes your dashboard successful. Determine what kind of information is really relevant and what data are actionable. Make it as easy to read and understand as possible, to show your users the causes and support the process of transforming information into action.

You can add value to your dashboard by considering the following five questions.

1. Added Value 1: Have you decided on the right KPIs?
2. Added Value 2: Are the data easy to understand?
3. Added Value 3: Are you following a call-to-action approach?

4. Added Value 4: Is your dashboard designed to gain insight?
5. Added Value 5: Does your dashboard encourage users to take action?

Added Value 1: Have you decided on the right KPIs?

The success or failure of a dashboard is closely linked to data visualisation: focus on users and their tasks, and you're likely to succeed; focus purely on data visualisation, and you'll fail. That's because tailoring your dashboard to user needs transforms ideas into action, and data visualisation into visual management support.

So what specific measures can you take to ensure such success? The key is to provide information that is relevant to users, meaning that they have the tools to influence them.

Consider your daily commute to work. If you drive, you use the most widely used dashboard of all: the car's. Thankfully (for purposes of this article), that dashboard is a perfect example of a badly designed one, because designers were primarily concerned with pure data visualisation.

Now consider your commute home from work. You can compare that journey to reaching your organisation's goals. You want to achieve your goal quickly and in a cost-effective way (effectiveness and efficiency). You are a considerate driver, you observe the rules of the road, and you try to minimise the risk of errors. To reach your goal successfully, you need data related to your goal and your driving habits.

Now let's take a closer look at your car's dashboard (Figure 4). From left to right there is a display for engine temperature, RPM, current speed, fuel level, and, below the tachometer, the total number of miles driven over the life of your car.

But, for that commute home, you really only need two out of those five readings: fuel level and speed. You probably check your fuel level before leaving. Or maybe you are among drivers like those who rely on the car's early warning system, which informs you of low levels (see also 'Are you following a call-to-action approach?'). While driving, you will mostly check your current speed and alter it as necessary to road conditions and changing speed zones as you encounter them.

It's far less likely that you will pay much attention to your ongoing mileage or RPM. Why? Because neither piece of information is relevant for the actual journey. Those are two good examples of traditional data visualisation, in which all available data are visualised even if not relevant to daily activity. What remains is the engine temperature. Even though a temperature that is too high could affect your journey, you won't pay much attention to

Figure 4 Dashboard of a car

it because you have learned two lessons over time: the display has never changed; and, if the temperature is too high, a control light will warn you.

As you can see, the speed display is the only one that actually leads to action. At least two out of the other four could be eliminated. Unfortunately, that's also the case with many marketing dashboards that primarily just visualise data. So, whenever you set up a dashboard, think of this simple example. Avoid visualising data just because you can.

Think of users and their tasks. Make sure that the information is relevant to and has a direct impact on them: it is useful only when users have the knowledge and tools to change a given situation. In any case, dashboards should contain actionable information. Otherwise, you might as well use a presentation that depicts the data and is updated from time to time. After all, why would I log on to a dashboard that shows numbers I already know because they rarely change, and numbers I can hardly influence because I don't have the tools?

Added Value 2: Are the data easy to understand?

Aesthetics, clarity and expressiveness are the cornerstones of successful visualisation.

Since their invention in 1786 by Scotsman William Playfair, bar charts, pie charts and line graphs have become the standard in data visualisation. If used properly, they offer clarity but, all too often, this is at the expense of aesthetics and expressiveness.

Alongside the results of the actual data analysis, attractive visualisations can help you to make more informed decisions. Communicating critical information to the intended target group is essential. Data analysis is no longer reserved solely for business analysts, as a growing number of

stakeholders are demanding actionable information. Since analytical and marketing knowledge is often available only in limited circumstances, a clear and simple visual presentation of complex issues is required. At the same time, modern media are setting new standards in infotainment, against which modern dashboards must be measured.

It's not surprising that an increasing number of companies are placing more and more value on professional information designs. The results of a current study by the BARC consultation and market research institute (BARC 2014) show that more than three-quarters of the companies interviewed (78%) rate information design as 'important' or 'very important'. Taking these facts into consideration it is crucial to come to grips with the different options of data visualisation.

Charts, a presentation form that is supported by almost all dashboard applications, are still the most widely used form of data visualisation. They offer one decisive advantage: they help you visualise proportions. Noticeable anomalies are easily recognised. The importance of individual partial aspects is clearly visible and trends can be identified immediately.

However, the answers to questions such as 'What information is being presented here? What exactly is being compared, what partial aspects are shown?' spring to the observer's mind only after intensive scrutiny. In the case of complex presentations with a lot of data points, attention is split as the eye must dart between the chart itself, the labels on the axes and the legend. The result? Many users focus on individual anomalies only and find it hard to see the big picture (Figures 5 and 6).

Added Value 3: Are you following a call-to-action approach?

A call to action is basically a visual hint that prompts the user to take certain measures. It has been used in advertisements, particularly in online ads, for years. The purpose of an ad without a call to action is raising awareness. However, the majority of addressees will not get active and search for further information, let alone order the promoted product. This is where a call to action comes in handy. Buttons like 'Order now' or 'Register now' engage the user and trigger action. If there is no call to action, most addressees will stay passive. The user will take the initiative and, for example, order the product, only once the pressure to act exceeds a certain threshold.

In the context of dashboards, this means that informing the user is not enough – a dashboard needs to trigger action. In our increasingly complex world, we often can't see the forest for the trees. Too much information, too many details, distract us from what actually matters – getting active.

Imagine you get only one second of your user's attention. The message of a call to action would be: 'You need to take action here.' Therefore, a call to action needs to be the first thing that catches the user's attention. It is all about maximising the effect with minimal information. The actual details, like precise values, recede into the background and serve as supporting factors.

Visual calls to action can be implemented in two different ways. You can either deploy a visual alert or opt for a particularly emotional design, which might clearly highlight differences or developments and therefore attract the attention of the user. Whereas the second type is rarely seen in dashboards, the visual alert is a common tool to draw attention to abnormalities. Often, there is a symbol – for example, an exclamation mark – which shows the user an exceptional KPI deviation.

This eliminates the need for the user to analyse the situation and decide where to act and how urgent it is. The dashboard highlights fields of action based on predefined rules and determines their priority. Therefore, a call to action provides orientation and makes sure that the user recognises the need for decision or action as such. A call to action creates trust and confidence – especially for less experienced users, as the risk to overlook something or misinterpret the urgency is minimised.

An additional alert system can be implemented to further reduce the risk of overlooking important information. The alert system can warn the user via email if a KPI is noteworthy or starts to decrease.

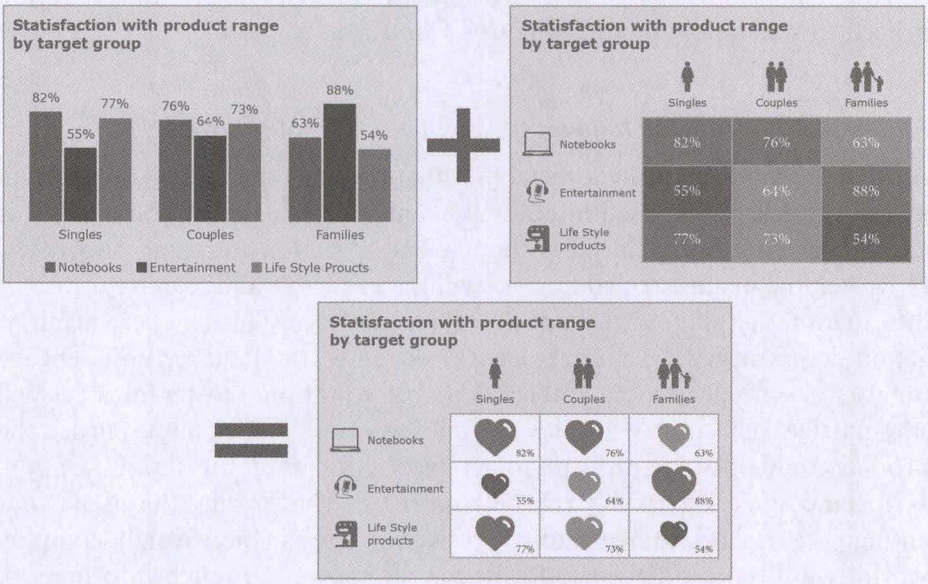


Figure 5 From traditional chart to infographic

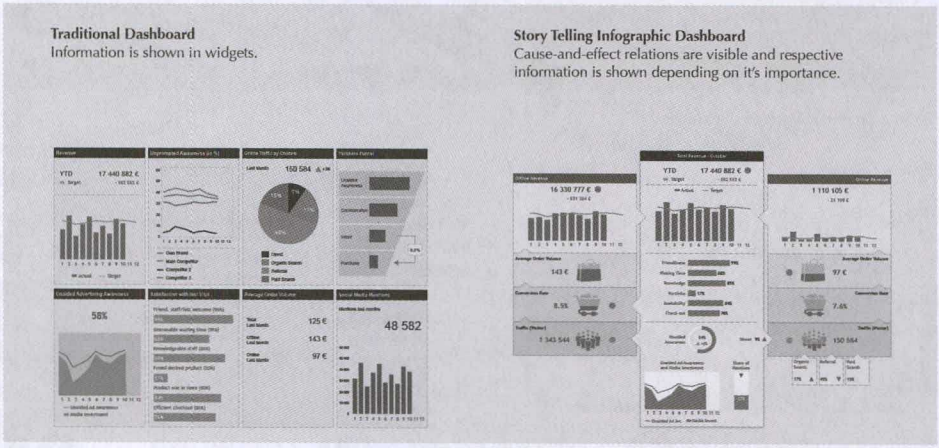


Figure 6 From traditional dashboard to infographic dashboard: both dashboards show the same information but right-hand version allows user to understand cause-and-effect relations and visualise information depending on their importance

This kind of system is particularly interesting for top management levels, when a huge number of units has to be monitored and it is time consuming to regularly check the KPIs of all units. In this case, active support through an alert system would be of great value. For example, the top management of a globally operating company can be informed via email, if there is a certain KPI deviation in one of its local branches.

Such a system is also a good idea for KPIs that need to be monitored on a daily or even hourly basis. With an alert system like this, the user can concentrate on implementing the actual measures, rather than continuously monitoring KPIs and making sure to identify action fields.

If a call to action refers to an imminent problem, it is called an early warning system. This can be compared to the fuel gauge of a car, which flashes as soon as you are about to run out of fuel – the dashboard points out a possible problem before it is too late to act.

Added Value 4: Is your dashboard designed to gain insight?

A call to action is no guarantee that it will actually happen. It is only a starting point, an initial spark that activates the process to find your way from identifying a need for action to taking effective measures. Therefore, a call to action needs to be included in an overall concept, which results in an action-focused dashboard application. Such a dashboard concept consists of three components:

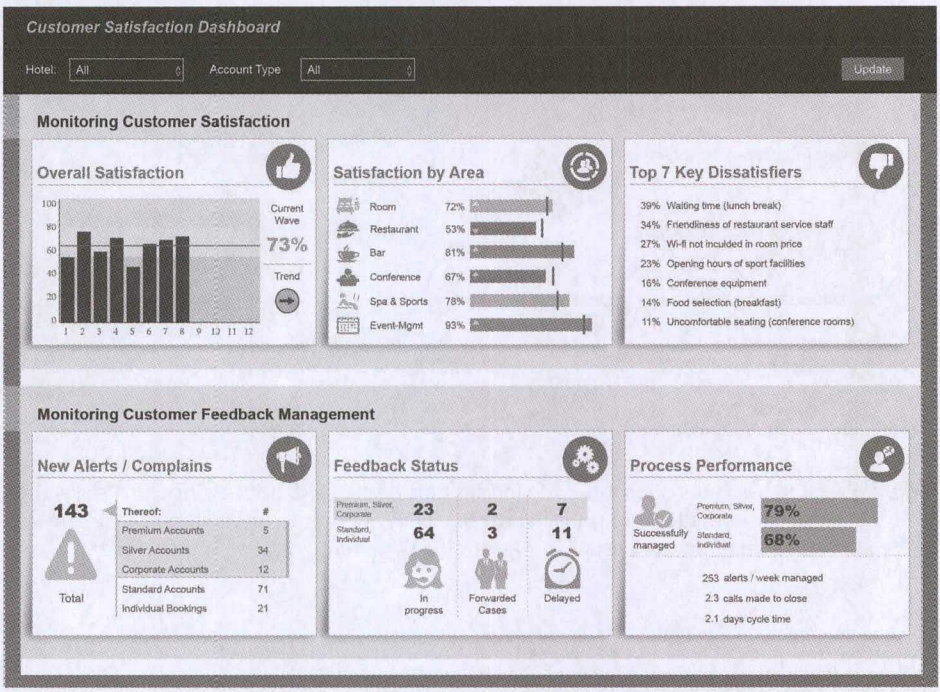


Figure 7 Call-to-action examples: a traffic light system can support users to identify fields of action – in this case satisfaction with the restaurant and conference areas needs immediate attention and action

1. inform about needs for action
2. deliver insight regarding causes
3. foster and request effective action.

Insight means having a deep and clear understanding of a situation and the actual cause of the problem. That is why a dashboard application needs to actively support root-cause analyses. This can either happen in an exploratory and user-driven way or the user is gradually led from problem to cause.

While the exploratory approach builds on a deep understanding of the potential array of causes, the operational approach also supports less experienced users. The root-cause analysis takes place on a given, clear path to insight. The user is systematically led from the 'what' (= identifying a deviation or change) to the 'why' (= understanding the cause).

The path to insight is based on the '5 Whys'. Originally, this was a method used in quality management to determine cause-and-effect-relationships.[1]

[1] 1 Kiichirō Toyoda (founder of Toyota); the '5 Whys' method is based on the Japanese philosophy 'Genchi Genbutsu', which literately means 'go to the source and find out'; this is one of the core principles at Toyota.

The goal of the 5 Whys is to find the cause for a deviation, a failure or a problem. The number of questions is not limited to five; this is only a symbolic figure. The important thing is to keep asking until the cause of the failure or deviation is clearly identified and all doubts are eliminated. Using this approach prevents the dashboard user from just scratching the surface and helps to get to the core of a problem in order to take effective measures.

Example

The KPI of customer satisfaction surprisingly decreased significantly. In order to be able to take effective measures, the cause for this development needs to be identified using the 5 Whys:

1. Why are our customers not satisfied?
   → The evaluation of the cost–benefit ratio is deteriorating
2. Why is the evaluation of the cost–benefit ratio deteriorating?
   → The evaluation of product quality is deteriorating
3. Why is the evaluation of product quality deteriorating?
   → Performance parameters of the new devices are said to be outdated compared to competitors
4. Why are the new devices said to be outdated (the new product is significantly better than earlier generations)?
   → Our customers don't know about many of the improvements
5. Why do our customers not know about the improvements?
   → Advertisement is more about raising awareness for the new devices, rather than highlighting the improved benefit for the user.

Depending on the extent of information available in the company, management levels involved and way of working, the amount of time and detail of such an analytic path can differ.

While it is highly likely that the analytic path can be fully depicted in a dashboard at operations level (for example, in store management), this can be challenging at strategic level. The complexity and amount of possible path options might cause costs related to the set-up and maintenance of the dashboard to explode. It should not be the goal of a top-level dashboard to enable full analysis of every operative detail. Usually, the 5 Whys-levels are sufficient here as well. At the very latest, at the sixth 'Why', it is time to transfer the root-cause analysis to someone responsible for a certain aspect.

This means that the path to insight can go beyond the limits of a dashboard. Reasons for this might be that further information needs to be collected, experts questioned and discussions to be held with colleagues, or a different system – for example, ERP or CRM software – needs to be used. This will often need to be supported by further, more exploratory analyses that help identify and understand unknown, unexplored or new cause–effect relationships. It is key to consider this part of the analysis path from the beginning and offer help to the users, as well as to show the user what the next analytic steps might look like. Often, it is enough to include contact details of colleagues in the dashboard that can be contacted regarding certain situations. This is how you avoid the user being unsure about how to continue the root-cause analysis and thus the path to insight leading to nowhere.

The path to insight is focused on the core question, 'Where can we pinpoint the problem?', and in some cases also, 'When did we notice there was a problem and how did it develop?'

Where can we pinpoint the problem?

A company, service team or product is usually controlled by 5 to 15 KPIs. This approach enables the people in charge to monitor progress efficiently, as well as in a focused way, and to identify potential action fields. KPIs, however, are not intended to explore the cause of things, due to the compression of information.

A path to insight turns the compression process around and separates a KPI into its individual components. Let's have a look at the KPI of customer satisfaction. It can be divided into KPIs like 'retailer-related satisfaction', 'product-related satisfaction' and 'service-related satisfaction'. The KPI of 'retailer-related satisfaction' can be further categorised into indicators like 'employee friendliness', 'consultancy skills' and 'product portfolio', to name but a few.

What's behind this analytical approach is the question of how the parts of a KPI influence the result and in what way. Aspects that have a particularly negative impact on the result need to be identified. This type of perpetrator analysis sheds light on how to tackle the problem and take action.

It needs to consider the impact that every aspect has on the overall result. This is the only way of getting down to the real cause of a problem. Imagine you measure your product satisfaction. You ask your customers how satisfied they are with the product they most recently purchased. Let's further imagine you have ten products in your portfolio. These ten contribute to the overall revenue to a different extent. For which product

are you going to take action first? For the one with the worst customer reviews? Probably not. In order to define the priority of action fields, you need to consider the customer reviews of every product with regard to the revenue they generate. The higher the share of revenue, the more important it is for your company's success to increase customer satisfaction.

Depending on the kind of topics, a perpetrator analysis might consider various aspects in order to identify the actual cause of a problem. These can include customer segments, regions or the widely known '7 Ps' of the marketing mix (Product, Price, Promotion, Place, People, Processes and Physical environment) (Booms & Bitner 1981), among others.

In many cases, a gradual combination of a few of these dimensions helps to draw a precise picture of the cause (Figure 8).

Added Value 5: Does your dashboard encourage users to take action?

If you don't take action, the insight you gain is useless. The goal of a professional dashboard can be achieved only by getting the user to act. And the goal is to turn information into insight and insight into effective action.

Unfortunately, this last step is also the most difficult one for the user. The users obviously have to take the decisions on their own, as the system

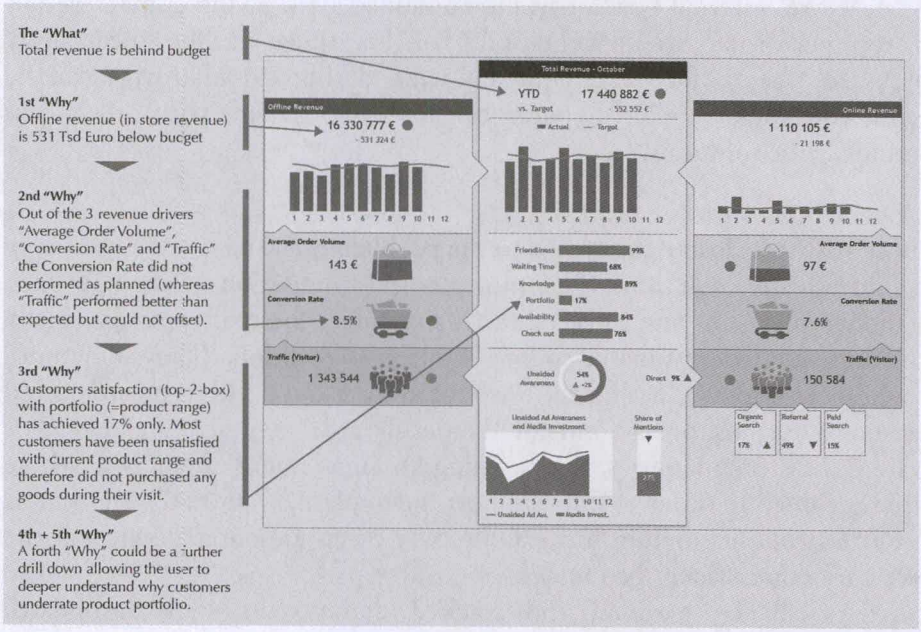


Figure 8 From information to insights: drilling down into the true cause of a problem – the '5 Why' method

cannot do that for them (yet). However, before you are able to take an effective decision, the possible solutions need to be clear. And this is where a dashboard can actively support the user.

1. Integrated sets of measures
Integrated sets of measures mainly help inexperienced users by offering predefined solution approaches for different action fields. The user simply picks the suitable action from a list. This is mainly helpful for operative tasks, as this field is the most likely to allow for forecasting of potential problems. An expert team can develop suitable measures and precise instructions for action beforehand and deliver them to the user via the dashboard system. This increases an orientation towards action while enhancing the effect of individual suggestions for action through standardisation and ongoing optimisation.

2. Learning from others
Larger companies especially require an active exchange of experience between departments. The goal is to learn from the best. Questions like 'Where have we overcome such a problem in the past?' are the key to effective action. It is not about reinventing the wheel, but rather about effectively utilising past experiences.

Therefore, internal benchmarking combined with giving contact details of top performers is very helpful. Possible steps can be successfully discussed face to face and company-wide dashboard platforms can be useful additions. People in charge can discuss problems with others and find ideas for solutions.

3. Discussions with the team
Those who are closely connected to the problem are usually the most likely to find effective solutions. This motto is the foundation of the approach to discuss problems and causes directly in teams. These discussions usually constitute an underestimated source of potential solutions. They sometimes can be held digitally, within the dashboard by using build-in or connected discussion forums, or live, outside the dashboard.

To decide on measures is one thing, to implement them is a whole different story. In order to fully support the implementation, the steps need to be recorded in written form. Only by writing measures down will the necessary commitment be created.

Action can be planned and tracked digitally in your dashboard. Additionally, every user has a digital action plan to record an action in combination with targets, people in charge and timescales. Larger

companies in particular can use the system to coordinate and consolidate the actions of different departments, and to track progress.

You can also print urgent action fields onto posters. This will help a team to regularly discuss, decide on and record measures by gathering around the poster, for example. It is especially useful for teams with only a few colleagues having access to a computer. It is a good idea to centrally position the printed poster with all documented actions where it is visible to everybody – perhaps even visible to the client.

Anything that helps the user to take effective action is welcome. A dashboard application can and should actively support this process, not only by backing the actual root-cause analysis, but also by helping the user to work out effective solutions.

Do you have a dashboard vision?

To achieve real sustainability, you have to have a dashboard vision – a picture of how your dashboard will look in the future. Draw a clear, easy-to-understand image of your dashboard in the near and distant future. Show your user today how the dashboard will develop over time, what data and information will be added, and what additional features will provide more value to them.

Normally you start focused and provide information for a very specific topic like, say, a brand tracker. But of course today it seems much easier than ever before to base decisions on facts in all aspects of marketing because marketing departments have even greater access to an ever-increasing amount of different data sources. The term 'data driven marketing' is on everyone's lips and it promises to be the answer for increased efficiency in marketing. Therefore, a long-term vision is to move from a single data source dashboard (e.g. brand tracker) to a 'single point of truth' (SPOT) that becomes the venue where people who want to make fact-based decisions meet.

However, it is precisely this vast array of data that is posing huge challenges and demands intelligent, forward-thinking solutions. Above all there are two main challenges to consider for marketing:

1. increasing fragmentation of the information landscape in marketing
2. ever more complex decision making.

Challenge 1: Increasing fragmentation of the information landscape in marketing

Market research data still form the largest proportion of information used in the decision-making process. In the past few years, however, the sands have

been shifting. Large market research studies with lengthy questionnaires are being replaced with short real-time surveys asking about current issues. For this reason, companies are increasingly working with a range of specialist agencies. The net result of this is an increased fragmentation of information because every agency delivers data, results and findings in a different format – perhaps a cross tab report, a PowerPoint presentation with the main findings and recommendations, an SPSS or Excel file, or even a dashboard.

Added to this are new information sources, like social media, CRM and web data. Even weather data are increasingly playing an important role in marketing decisions and are expanding the information horizons for decision makers.

This vast range of data and information silos presents new challenges to marketing – and these challenges need to be addressed. In particular, fast access to each data source must be guaranteed, without having to immerse yourself in each system and going on a tedious hunt around various file servers. Data silos also make it difficult to analyse across different data sources. The result is that correlations between information from different sources are very hard to discover, even though they are key to today's marketing decisions.

Furthermore, data and information should not be the preserve of business analysts. In reality, data and information must be made available to every member of a company's staff, and without any organisational, technical or analytical hurdles to overcome. It is vital to avoid the need for training, or learning syntax, as well as to minimise the chances of anyone misinterpreting the data.

Data and information are the most important assets of a company. This must not be lost just because files are untraceable or employees leave the company and take the knowledge of specific data sources with them. Effective decisions can be made only when data and information are reliable and complete. Information stored within files is at greatest risk. With continual adjustments to meet new requirements, different variations of files are created that bear little relationship to the original. In this way, you soon have multiple truths emerging because information gets changed, amended or deleted.

Challenge 2: Ever more complex decision making

Marketing decisions are becoming increasingly complex. A question such as 'Which region and target group should I address, using which channel and what kind of campaign to get the best ROI?' typifies this increased complexity.

Offline business is increasingly supplemented by online activity. The media choices for advertising are increasing. Traditional advertising channels, such as TV, radio and print, are broadened or even replaced by digital media. Communications (advertising message and design) are increasingly created as if aimed at one specific customer (marketing to a target audience of one). This also increases the internal competition for resources. Product managers, ad agencies, media agencies, webmasters and those responsible for communications in social media or at the point of sale, all demand their share of the budget to reach their own targets. Yet it is the efficient and effective sharing of resources that is the key to success in marketing.

At the same time, the need to prove the effectiveness of individual marketing activities and demonstrate a corresponding return on investment (ROI) is increasing. The more success you have in this area, the greater the chance of getting approval for an increased budget to support new activities, or at least reducing the likelihood of budget cuts.

Only those who quickly get to the right information will be able to win in the battle of demonstrating success and obtaining an effective share of resources.

Challenge 3: Solution – the single point of truth approach

An increasing granularity in data and in decision making is forcing marketing executives to look for new solutions.

Data and information cannot be stored in project- or file-based silos if employees are to retain the overview, reach effective marketing decisions at all levels, and measure and report on success. All relevant information needs to flow into one tool – but how?

Many companies are investing significant amounts of time and money in creating data cubes. The aim is to unite different data sources into one system, so it becomes a 'single source of truth' that is the basis for all future marketing decisions. This is an ambitious undertaking because file-based information has to be transferred into database structure, meta-data harmonised and further background information added.

The greatest challenge, however, is to assess future information needs correctly. Only if it is clear which marketing activities to plan is it possible to determine the relevance of each data source, the depth and breadth of data to acquire, and their granularity. Companies unable to estimate this tend to play it safe by using more data and in a higher granularity than they need. This turns the 'single source of truth' initiative into a truly long-term venture.

Today, companies need to adapt quickly to changing circumstances. In this situation, it is not the most comprehensive dashboard with the most bells and whistles that you need, but the one that can adapt most rapidly to the changing needs of the user.

A dashboard that cannot quickly or easily adjust to new or changed information requirements causes what we call 'bypassing'. In this scenario, people still have to meet their information needs, so individuals or even whole departments are forced to create their own dashboards, possibly manually in Excel.

What is required instead is a flexible approach that adapts quickly to new situations and thus makes lengthy set-up and development phases superfluous. In contrast to 'single source of truth', the concept of a 'single point of truth' is created, offering a meeting place for all decision makers. It also means that the dashboard takes from other systems (such as ERP, CRM or web analytics) only the data it actually needs. When information needs change, the corresponding data in the dashboard can be swapped for other data coming from an original source.

Changes to the data themselves are only ever undertaken in the original systems. In this way, the original systems ('mother systems') continue to portray the complete truth and are available to business analysts for short-term, often extensive, analyses that go beyond the scope of the dashboard. The dashboard itself focuses on supporting the current marketing activities.

Summary

To create and implement a sustainable dashboard you need a handful of success factors. Above all the user should be the centre of all your considerations. He has to experience the dashboard as a true benefit. Think of how the dashboard can support users during their daily work; therefore you never should think from the data perspective only. Ask existing and future users to provide feedback about information that is needed but missing, or how usability and visualisation can be improved to help understand complex data more easily. Do not forget that in the end a dashboard is about impact. Dashboards that just provide information but do not support the process of understanding the why and the true cause of a problem, and that do not enable and encourage users to take action, are not sustainable. Work on an ongoing further development; be responsive to changes. Nothing frustrates users more than working with outdated and incomplete information.

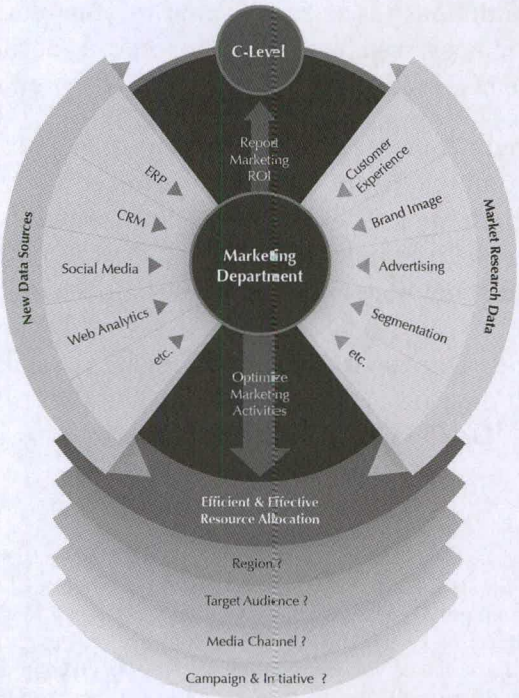


Figure 9 Increasing fragmentation of the information landscape in marketing

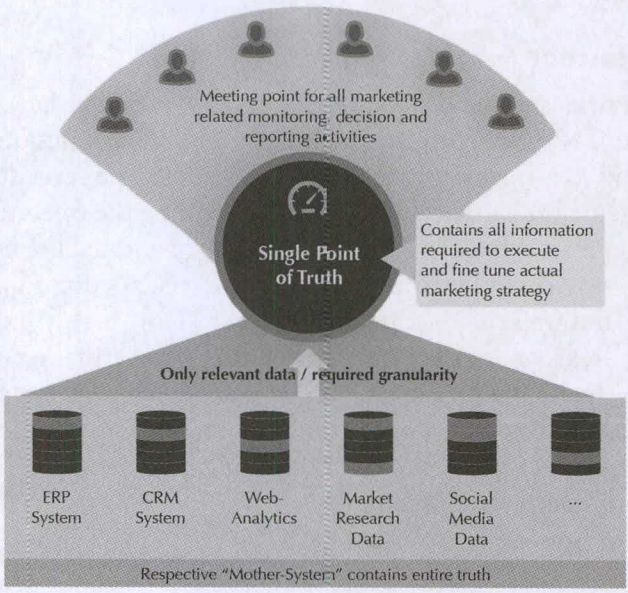


Figure 10 The single point of truth approach

Remember: continuously add more value to your dashboard. Keep in mind that developing a sustainable dashboard is a journey and work on the following five perspectives to provide steadily more benefit to users.

1. **Provide the right content**: Is information missing and should be added? Can information that is not needed be removed?
2. **Visualise for 'dummies'**: Do you use infographics and storytelling techniques to make complex data easy to understand?
3. **Prioritise action fields**: Do users see and understand the priorities of action fields?
4. **Enable insights**: Does your dashboard provide the ability to get as close as possible to the true cause of problems?
5. **Drive impact**: Does your dashboard encourage users to take action?

References

Booms, B. & Bitner, M.J. (1981) Marketing strategies and organizational structures for service firms, in Donnelly, J.H. & George, W.R. (eds) *Marketing of Services*. Chicago, IL: American Marketing Association, pp. 47–51.

Business Application Research Center (BARC) (2014) Information Design 2014. Status quo, Nutzen und Herausforderungen von Information-Design-Initiativen in der DACH-Region (English translation: Information Design 2015. Status quo, benefits and challenges of information design initiatives in the DACH-Region (German-speaking countries)).

Quinn, R.E. & Rohrbaugh, J. (1983) A spatial model of effectiveness criteria: towards a competing values approach to organizational analysis. *Management Science*, **29**, pp. 363–377.

About the author

Alexander Skorka spent more than three years working as head of technical operations at TNS Germany, managing the entire production chain from data collecting to information delivery. Prior to that, he served as a member of the management board at Kantar Health, heading the operational units as well as market research teams. He started his professional life as a managing director of a service and training provider for visual communication, data visualisation and presentation design. As such, he is highly experienced in the market research industry and an expert in information visualisation and delivery. In his role as COO of Dapresy Group he helps customers make the most of Dapresy's products by both creating solutions based on the Dapresy product portfolio and consulting customers on how to think 'dashboard' to maximise outcomes.

Address correspondence to: Alexander Skorka, Karlstr. 38/1, 89073 Ulm, Germany.

Email: alexander.skorka@dapresy.com

Don’t Zooming in on Favorable Data (i.e. show the context)