DATA STORYTELLING

Your Current Approach

EXERCISE: HOW DO YOU TOAST A BREAD? DRAW IT!

LESSONS LEARNT:

1.

2.

3.

Two Approaches To Data Storytelling

Approach A

1. You have a **key message**

Our planet is experiencing global warming & climate change

2. You source for **supporting data**

- planet's average surface temperature has risen ~0.9 degrees Celsius,
- The rate of Antarctica ice mass loss has tripled in the last decade
- Global sea level rose about 8 inches in the last century.
- Since the beginning of the Industrial Revolution, acidity of surface ocean waters has increased by about 30 percent

Approach B

1. You have a set of **streamlined data**

Year	'60	'65	'70	'75	'80	'85	'90	'95	'00	'05	'10	'15	'20
°C	0.4	0.6	0.65	0.7	0.66	0.84	0.82	1	0.95	1.1	1.2	1.17	1.2

2. You identify the **key message**

Our planet is experiencing global warming & climate change

Case Study

Top performers in Dec 2020

By team

Team	Total Sales ($)	Achieved
A	10,000,000	140%
B	8,000,000	120%
C	7,000,000	105%

Note: All teams have the same sales target

By Sales Persons

Name	Team	Total Sales
John	A	3,000,000
Brandon	B	2,000,000
Sarah	C	2,800,000

Can you spot 2 errors in the tables?

4 Parts To Data Storytelling

01

Understand the _____

02

Turn data into _____

03

Turn insights into _____

04

_____ the visual story

Step 1:

Understand The Context

1 Making Data Purposeful

Meaning comes with…

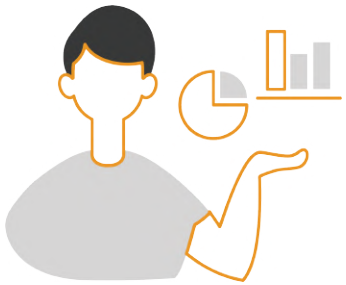
Example(s):

Context influences…

Example(s):

Components That Affect Your Story

How you tell the story on each slide would be dependant on these:



P

Why are you presenting this piece of information?

R

Who are you presenting this piece of information to?

A

What can they do/what do you want them to do with this piece of information?

Case Study Scenarios

A

- You are the HR executive
- Audience - HR Manager
- Purpose for presentation:
  Review the effectiveness of award ceremonies and recognition of teams and employees.

B

- You are the Head of HR
- Audience - Sales manager who wants more budget to hire more people
- Purpose for presentation:
  To convince Sales manager to not hire more sales people and propose an alternative to increase their sales performance.

C

- You are the Head of Strategic Sales for the Country
- Audience - Head of Strategic Sales for APAC
- Purpose of presentation:
  Review the effectiveness of the sales team and performance and propose steps to increase the sales performances.

D

- You are HR executive
- Audience - HR manager of the Country
- Purpose of presentation:
  Review talent management strategy to increase and maintain overall sales performance.

Case Study Exercise

(i) What additional data points do you need in order to fulfil the purpose of the presentation?

(ii) Why are these new data points important?

Looking Beyond The Obvious

Top performers in 2020

BY TEAM

Team	Total Sales ($)	Achieved
A	10,000,000	150%
B	8,000,000	120%
C	7,000,000	105%

BY SALES PERSONS

Name	Team	Total Sales
John	A	3,000,000
Sarah	B	2,800,000
Brandon	C	2,000,000

A Different Side Of The Story

Team	Total Sales ($)	Achieved	No. sales people in a team	Average Sales per person	Number of sales training attended
A	10,000,000	150%	25	400,000	1
B	8,000,000	120%	16	500,000	3
C	7,000,000	105%	16	437,500	1
D	6,500,000	97%	10	650,000	3
E	3,600,000	54%	12	300,000	0

At first glance, it might seem as though Tony did the most impressive job because he achieved the highest sales target. But!:

if we are equipped with additional information **(in orange)**, the story will be different.

HOW WOULD THE NEW PIECE OF INFORMATION CHANGE THE STORY?

Data Fallacies To Avoid

The Simpson’s Paradox

When a trend appears in different subsets of data but reverses or disappears when the groups are combined.

How to avoid:

1. Involve cross-functional teams to offer different perspectives.
2. Identify potential lurking variables.
3. Ensure all groups in the data are accurately represented.

Case Example of the Simpson’s Paradox

Watch Video: How statistics can be misleading - Mark Liddell

Step 2:

Turn Data Into Actionable Insights

Case Study Data Set:

Top performers in 2020

Team	Total Sales Rev ($)	% of Rev Target Achieved	Total sales Profit ($)	No. sales people in a team	Ave Sales/ person	No. of sales training attended	Training Spend ($)	Total salary per team($)	Employee benefits ($)
A	10,000,000	150%	2,500,000	25	400,000	1	25,000	1,800,000	100,000
B	8,000,000	120%	3,200,000	16	500,000	3	33,600	1,152,000	120,000
C	7,000,000	105%	1,050,000	16	437,500	1	16,000	1,152,000	90,000
D	6,500,000	97%	3,250,000	10	650,000	3	18,000	720,000	50,000
E	3,600,000	54%	1,800,000	12	300,000	0	0	864,000	36,000

WHAT ARE THE RELEVANT ACTIONABLE INSIGHTS FROM THIS SET OF DATA?

PICK THE RELEVANT DATA POINTS FOR YOUR PRESENTATION.

2 Turn Data Into Actionable Insights

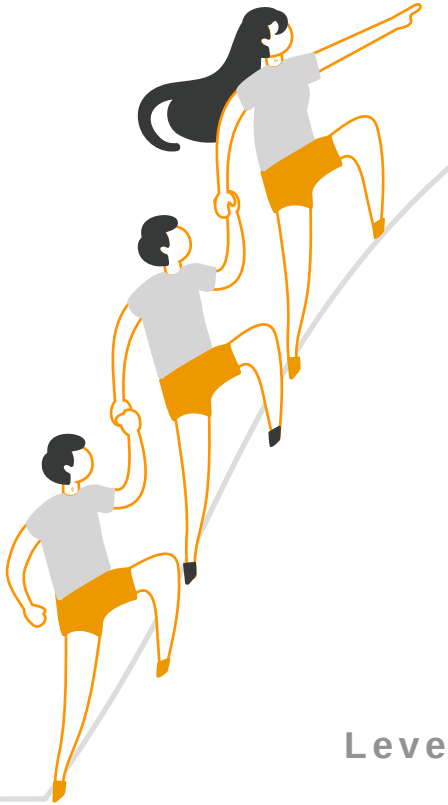


Photo credit: Freepik

Level 3:

WHAT ACTION TO TAKE BASED ON WHAT IS HAPPENING:

Make training mandatory for all groups for the next 12 months.

Level 2:

WHAT IS HAPPENING:

Sales **increased** one month after standardised training was launched for pilot group.

Level 1:

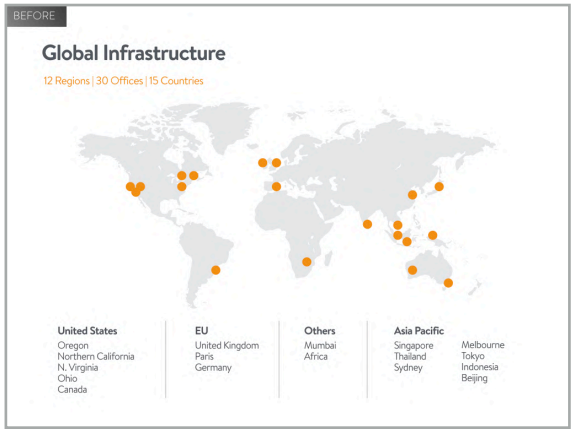
WHAT IS:

Sales performance

Best Practices For Headlines

#1 SHOW WHAT MATTERS TO THE AUDIENCE

BEFORE



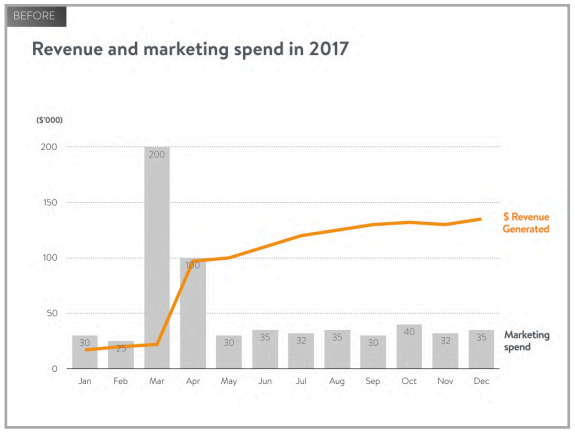
AFTER

NOTES/REFLECTION:

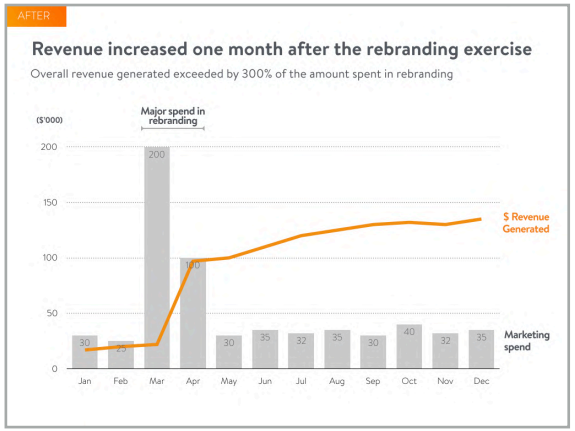
Best Practices For Headlines

#2 BE CONCRETE AND SPECIFIC | SHOW CAUSE AND EFFECT

BEFORE



AFTER



NOTES/REFLECTION:

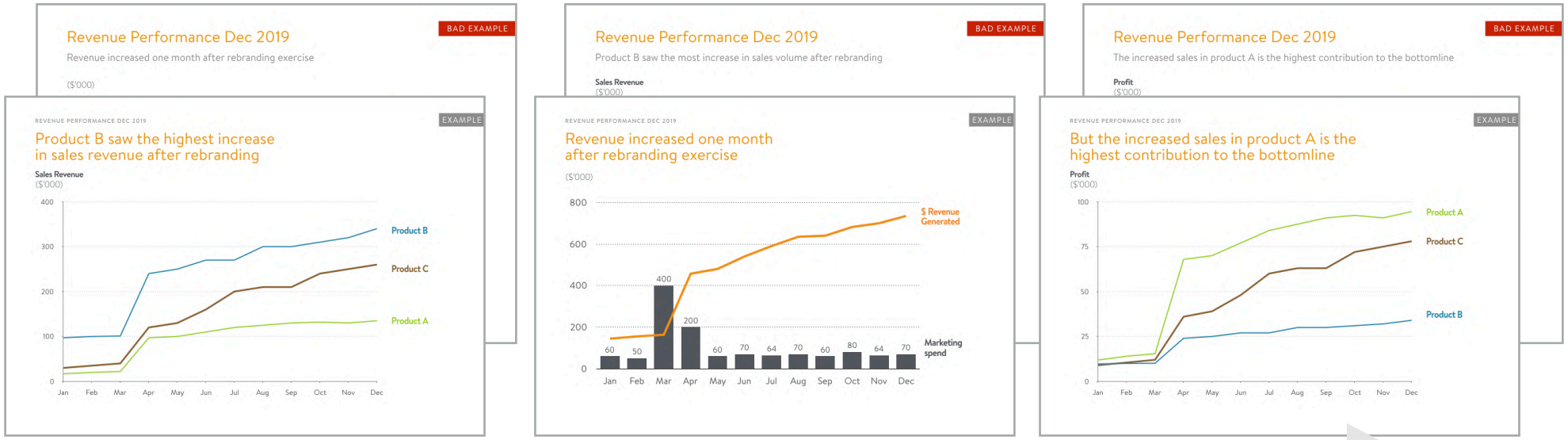
Best Practices For Headlines

#3 USE METAPHORS TO INCREASE MEMORABILITY & ENGAGEMENT

Before	After
Making banking experiences seamless	Making banking experiences a walk in the park
The ideal opportunity to implement the new policy	The golden opportunity to implement the new policy
Begin your innovation journey with us	Jumpstart your innovation journey with us
Unstable economy	Seesawing economy
Uncertain times	Turbulent times
Revenue decreased	Revenue dipped/fell

NOTES/REFLECTION:

Best Practices For Headlines



#1 USE HEADLINES TO CONNECT THE DOTS

Use your headline as fragments of a story. If your headline on one slide connects with the next, reading all of the headlines on all slides would form a story.

#2 DO NOT USE REPEATED HEADLINES

If your intention of repeating the headline is for the audience to identify which segment of the presentation you are at, reduce that segment header and place it above the main header. The main header should always contain insightful key message.

Case Study Exercise

CREATE A HEADLINE WITH ACTIONABLE INSIGHT FOR THE CHOSEN SCENARIO:

Step 3:

Turn Insights Into Visual Stories

3 Visualising Data

What is good design?

1. .....

   .....

2. .....

   .....

3. .....

   .....

> What separates design from art is that design is meant to be.
>
> *- Cameron Moll*

3 Steps To Effective Data Visualisation

I _ _ _ _ _ _ _

S _ _ _ _ _ _ _

A _ _ _ _ _ _ _

STEP 1:

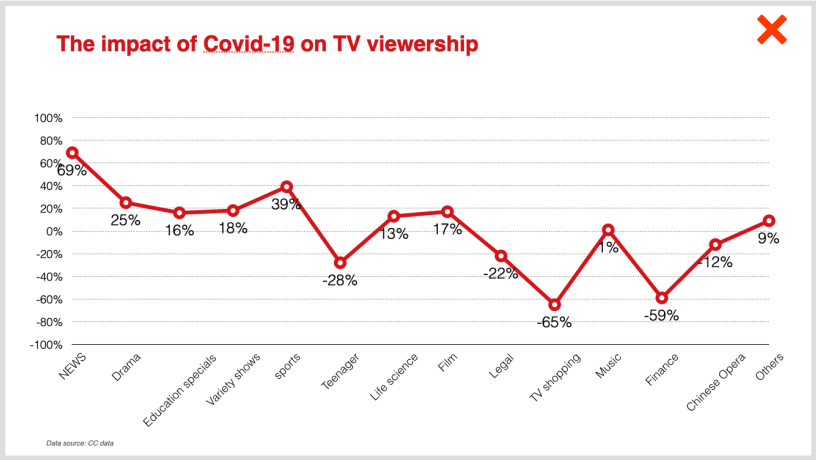
Identify

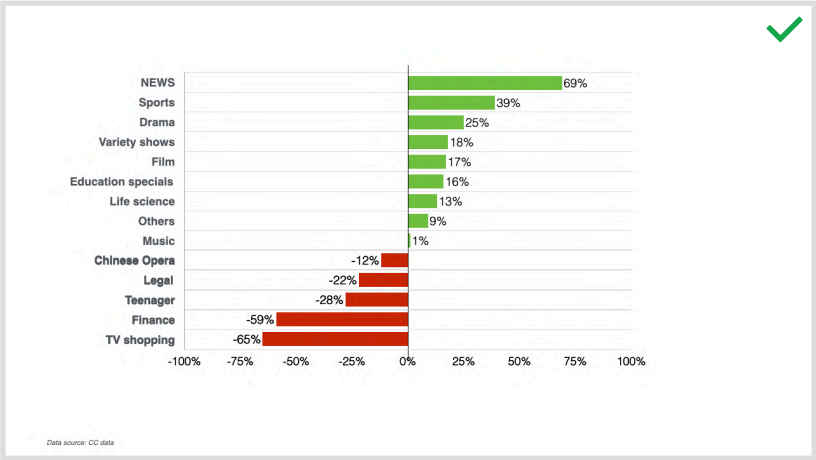
- What is your key message?
- What visuals would most effectively convey the key message?
- Do we need a chart?

What Visuals Would Most Effectively Convey The Key Message?

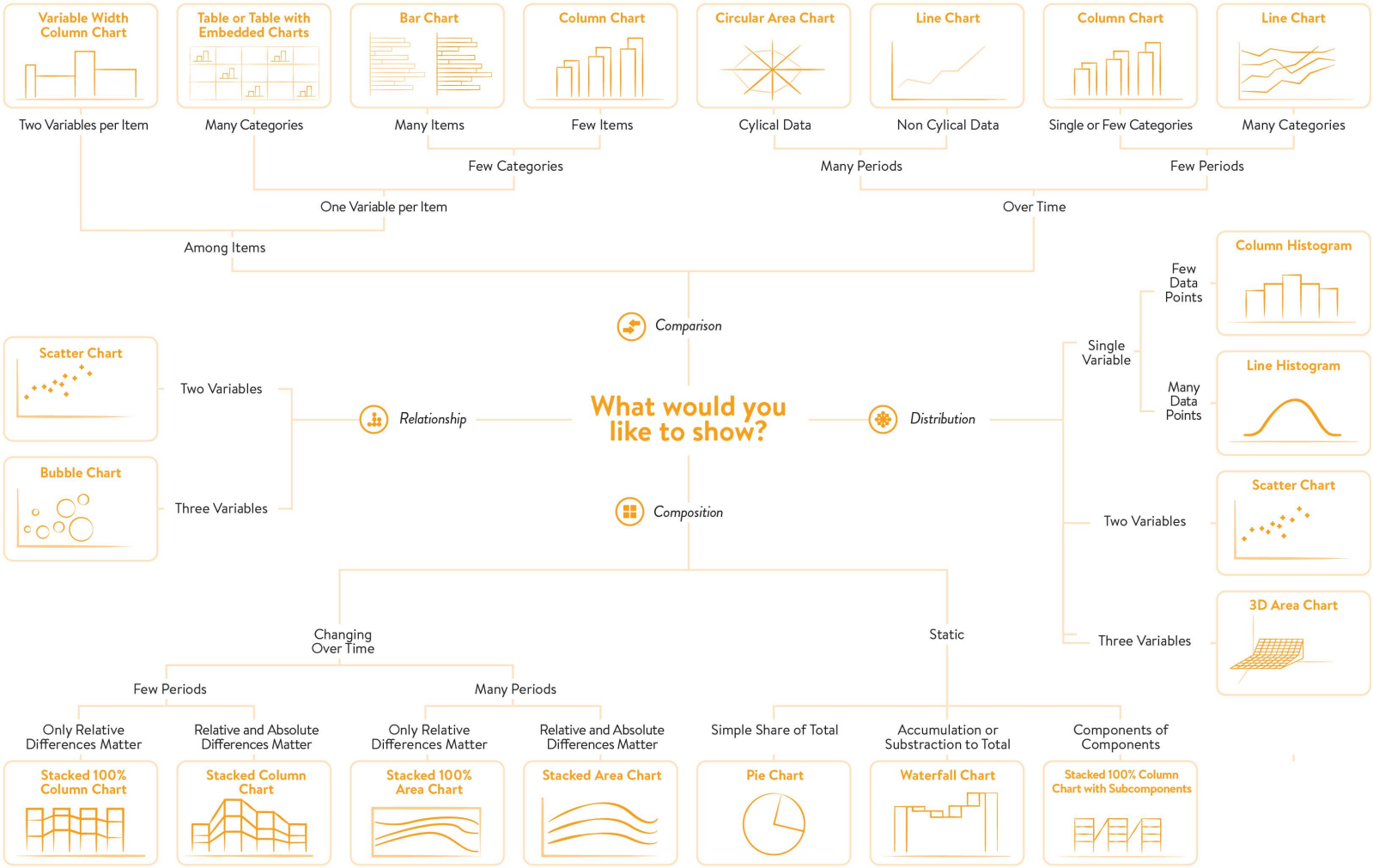
Which is a more effective chart to use?

Understanding how your audiences are conditioned to process data and charts is important.





Choose The Right Chart To Tell Your Story



Putting Meaning Behind Facts And Figures

MONTH-ON-MONTH SALES GROWTH

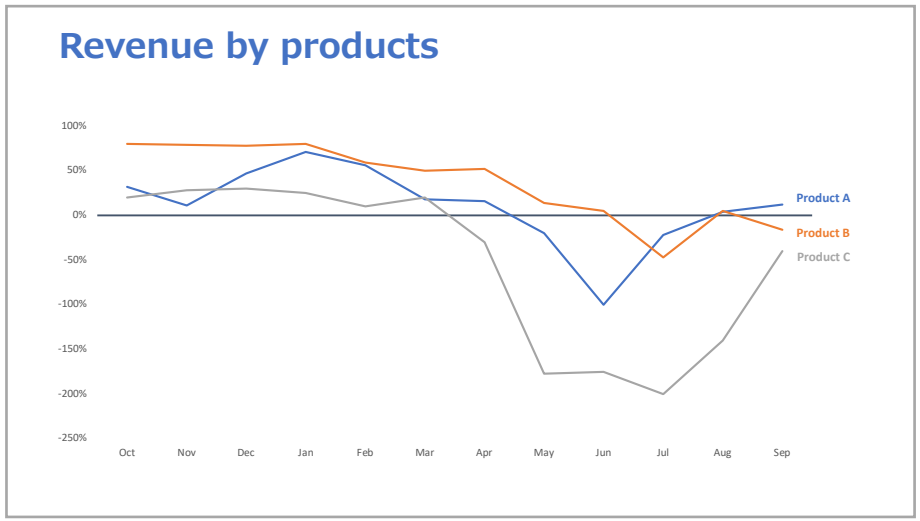
	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
Product A	32%	11%	47%	71%	56%	18%	16%	-20%	-100%	-22%	4%	12%
Product B	80%	79%	78%	80%	59%	50%	52%	14%	5%	-47%	5%	-16%
Product C	20%	28%	30%	25%	10%	20%	**-30%**	**-177%**	**-175%**	**-200%**	**-140%**	**-40%**

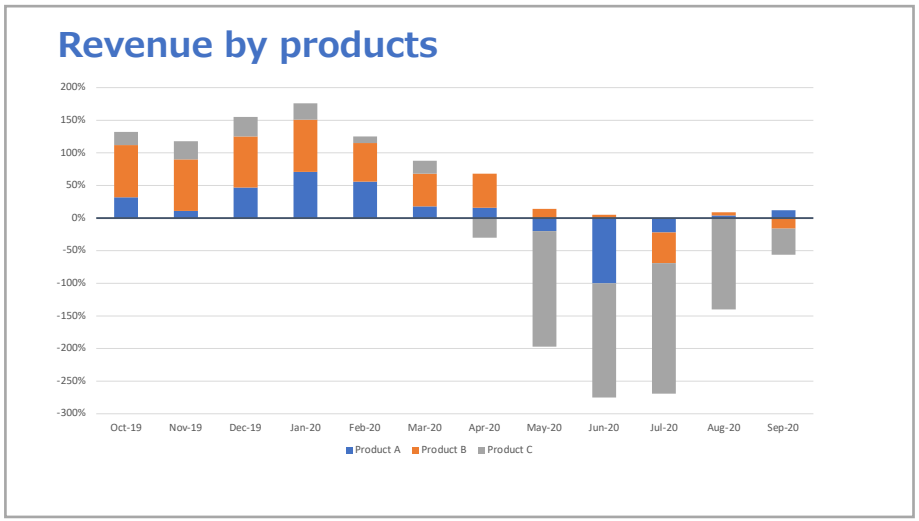
What do these number tells us?

1. Comparison:
   - Are things changing for the better or worse as compared to the past?
   - Are some products performing better than others?
2. Correlation/ Cause & Effect:
   - What are the causes/potential reason(s) behind the change?
3. Composition:
   - Which product contributed the most to the change?

Understand The Pros & Cons Of Each Chart

Not all charts are made equal. To choose the most effective chart, be clear about the message you want to showcase and the intent. Example, do you want to show a high-level overview or do you want to zoom into the nuances?





Comparison

- Revenue comparison of each product
- Month-on-month revenue comparison

Comparison and composition

- Composition of monthly revenue by product contribution
- Month-on-month revenue comparison

Exercise:

How would you show the correlation between the number of claims and dollar amount per claim for each age group?

Age Group	Number of claims	$ Amount per claim
1-10	40	3620
11-20	121	1204
21-30	100	950
31-40	70	5018
41-50	130	10050
51-60	150	1200

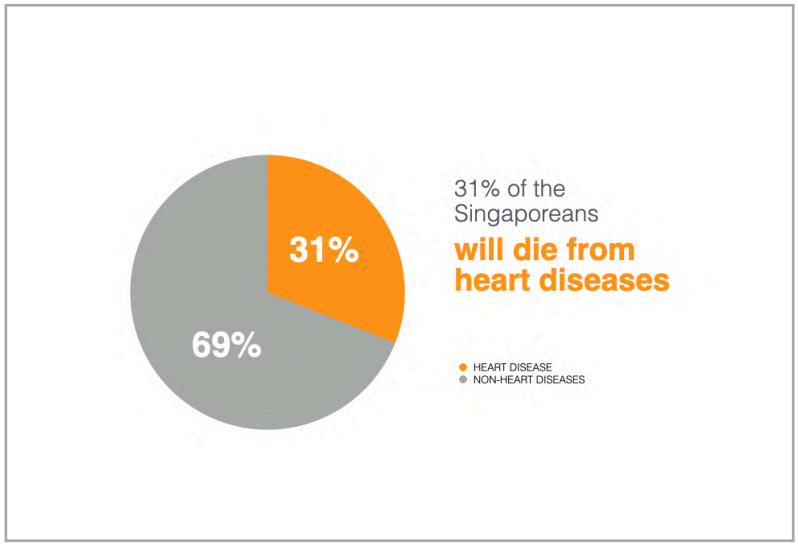
Exercise:

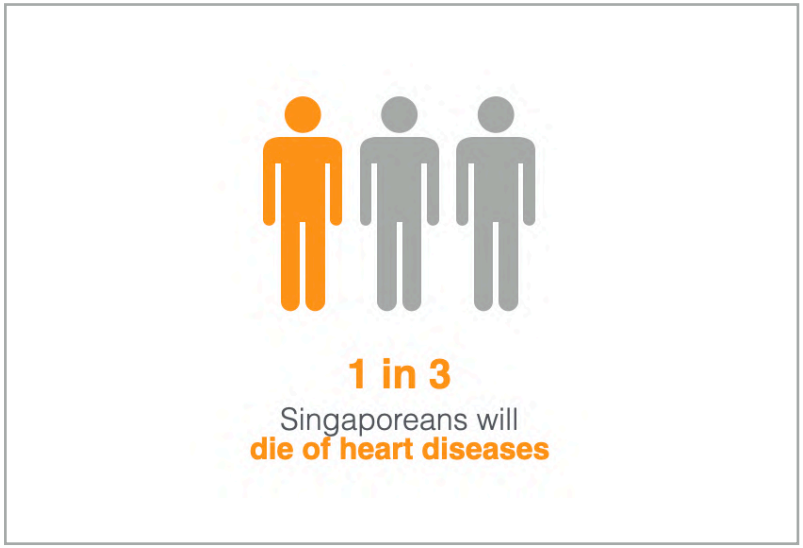
How would you show the proportion of:

- Female and male in each age group, and
- Female and male for ALL age group?

Age group	Female	Male	SubTotal	Female (%)	Male (%)	SubTotal/ Total (%)
21-30	1400	1247	2647	53%	47%	28%
31-40	2400	1018	3418	70%	30%	36%
>41	2105	1450	3555	59%	41%	37%
Total	5905	3715	9620	61%	39%	100%

Do We Need A Chart?





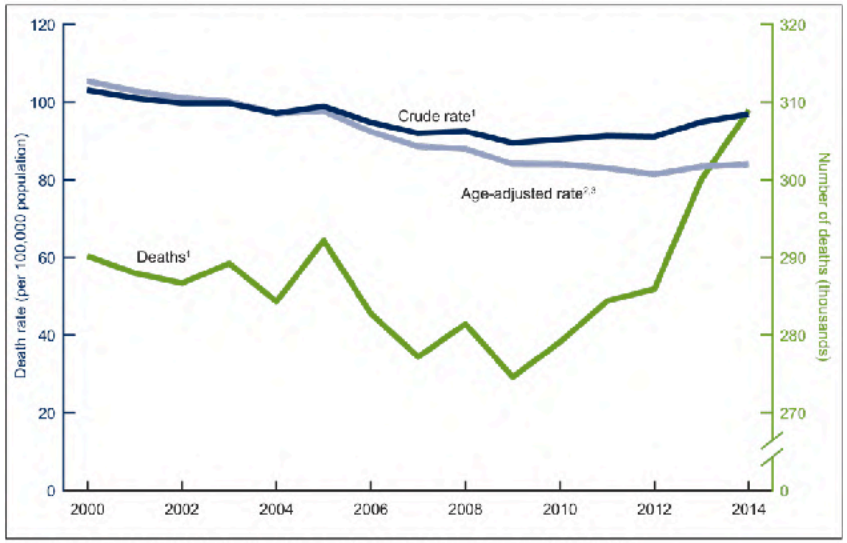
Do We Need A Chart?

In situations when you are unable to create any charts due to the limited data points you have at hand, you can consider using infographics instead. Infographics usually feature main figures.

Example of when to use charts:

To illustrate the following y.o.y trends trend of people who died of heart diseases.

Figure 1. Number of and crude and age-adjusted rates for heart failure-related deaths: United States, 2000–2014



[1]Declining trends in the number of and crude rates for heart failure-related deaths from 2000 through 2009 were statistically significant ($p < 0.05$) and their increases from 2009 through 2014 were also significant ($p < 0.05$).
[2]Declining trend in the age-adjusted rate for heart failure-related deaths from 2000 through 2012 was statistically significant ($p < 0.05$).
[3]Increase in the age-adjusted rate from 2012 through 2014 was significant ($p < 0.05$).
NOTES: Heart failure-related deaths are those with heart failure (ICD–10 code I50) reported anywhere on the death certificate (i.e., as an underlying or contributing cause of death). Access data table for Figure 1 at: http://www.cdc.gov/nchs/data/databriefs/db231_table.pdf#1.
SOURCE: CDC/NCHS, National Vital Statistics System mortality data, 2000–2014.

Source: https://www.cdc.gov/nchs/products/databriefs/db231.htm

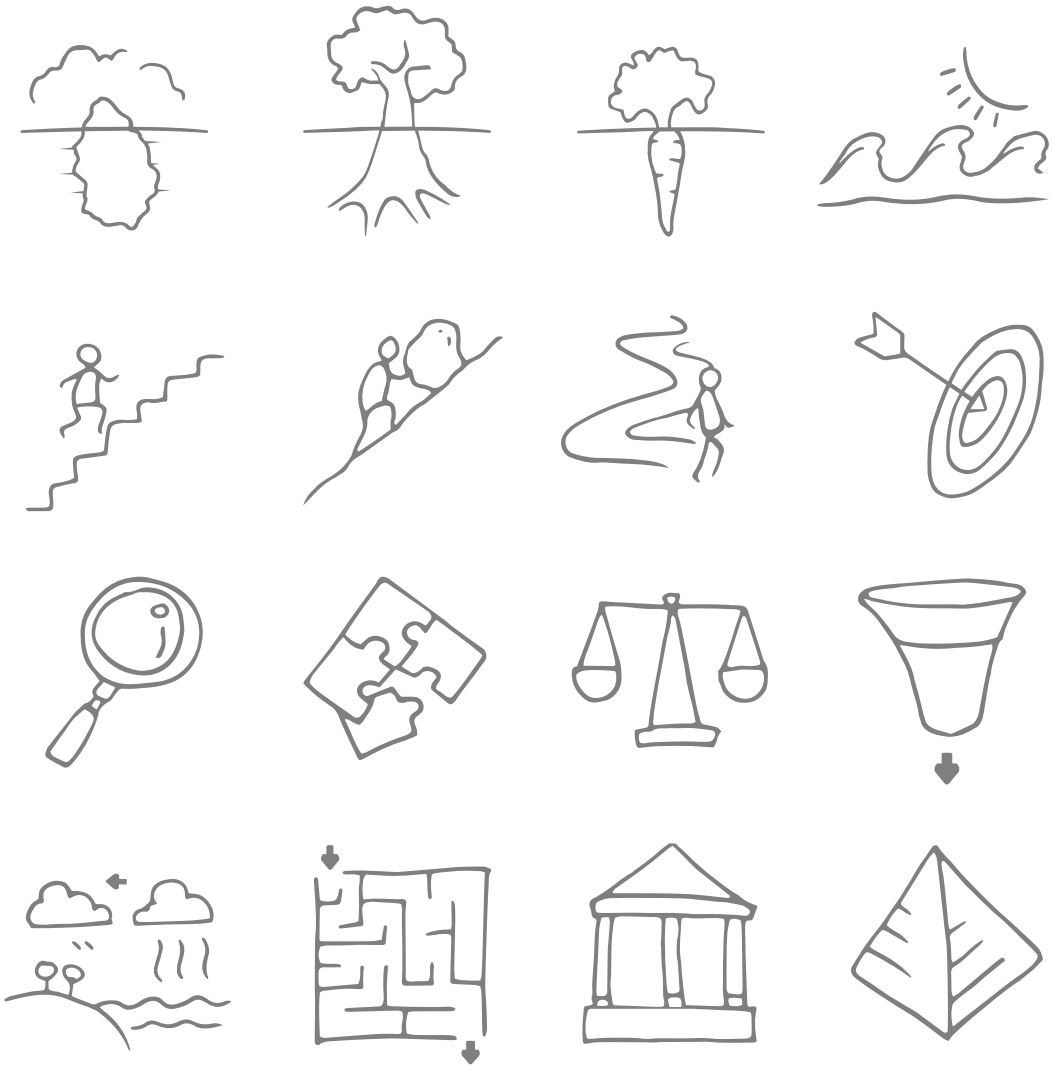
Example of when to use infographics:
To feature main and big statistics about heart diseases

Source: https://www.healthline.com/health/heart-disease/statistics

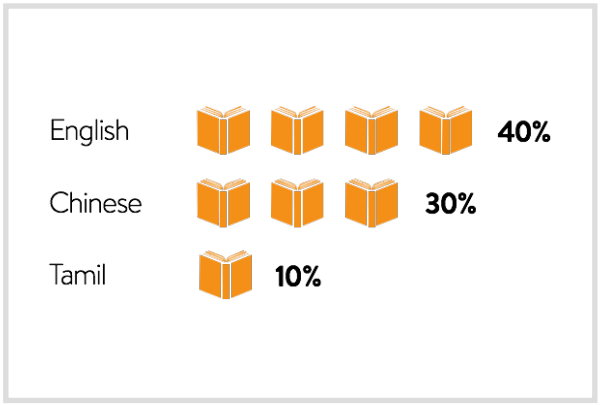
Use Visual Metaphors

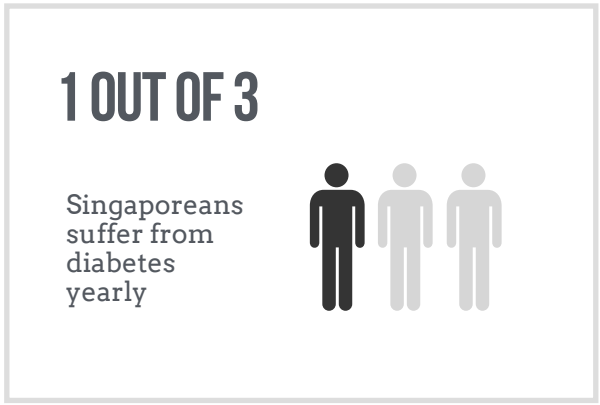
Rule of thumb:
if you have three data points or less, a chart may not be necessary.

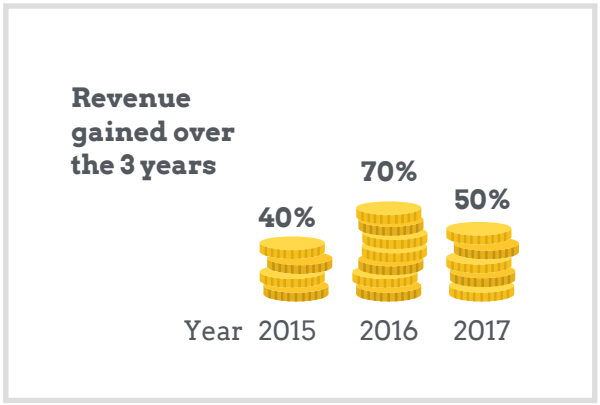
Consider using some of the visual metaphors instead to communicate your data!



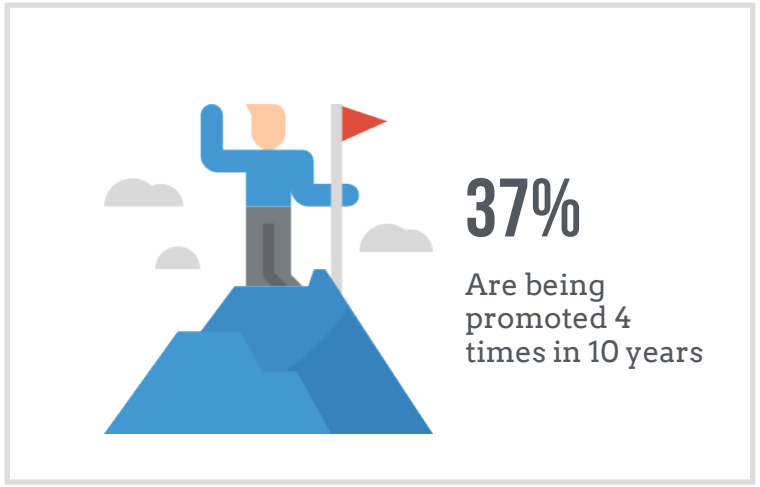
1. Use Icons As Units



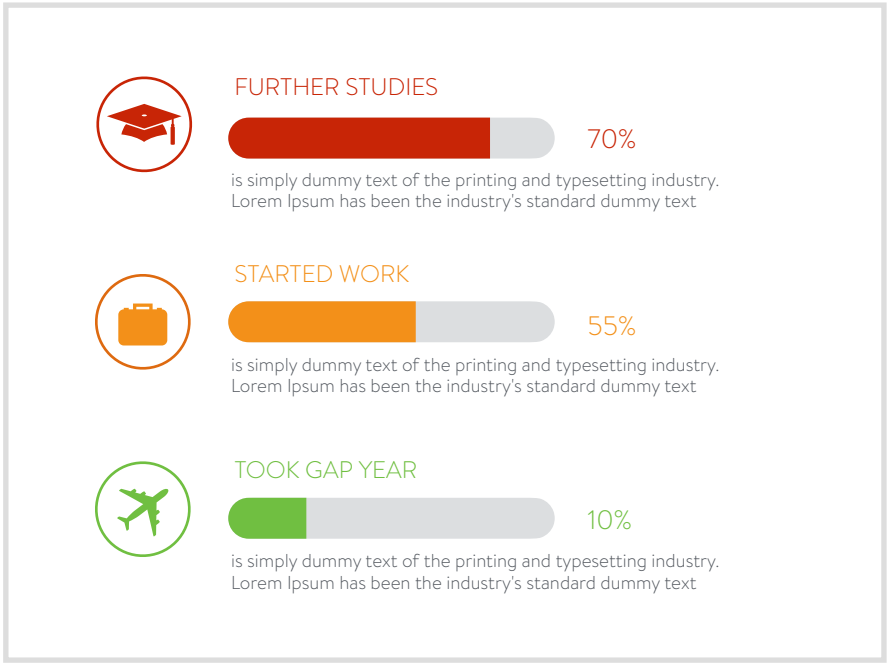




2. Bold Number With An Icon

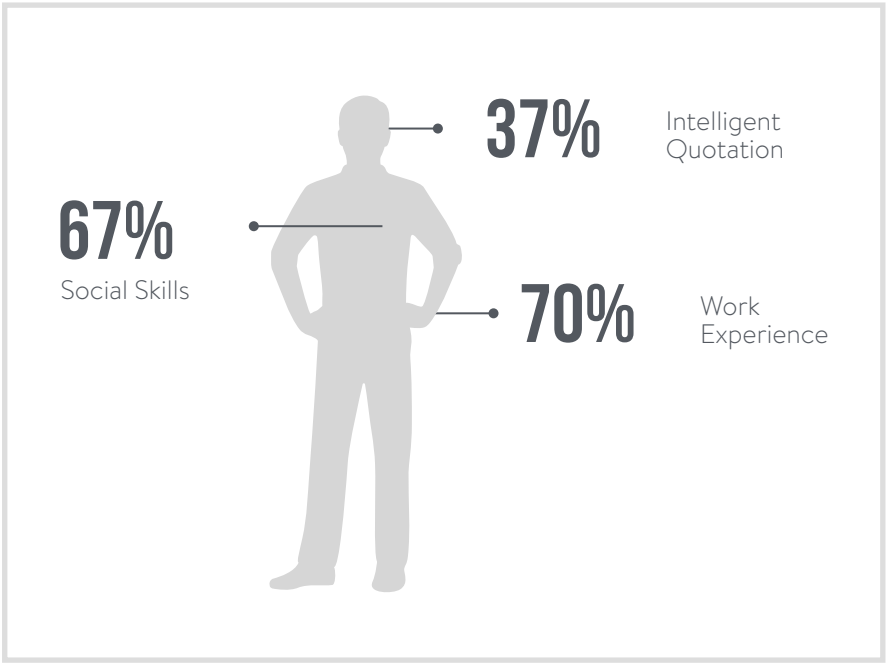


3. Pair Icons With Charts/Table

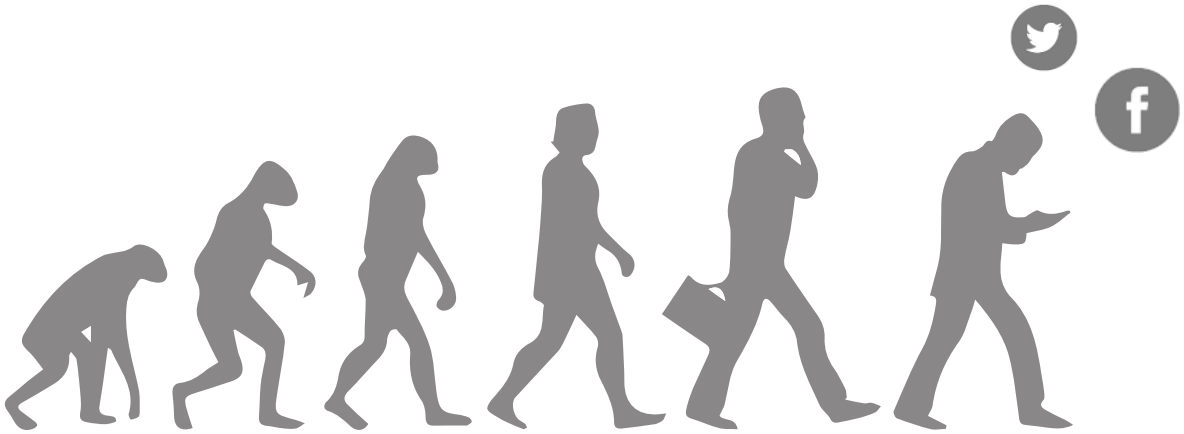


Source: https://www.goldscape.net/gold-coin-comparison/

4. Dissect A Main Object



5. Progression Over Time



The Final Touch

#1 Contain text in an invisible "box"

By having the same length for your line of texts

#2 Background & Contextual "Decor"

Add background illustrations of objects that are contextual and relevant to the topic

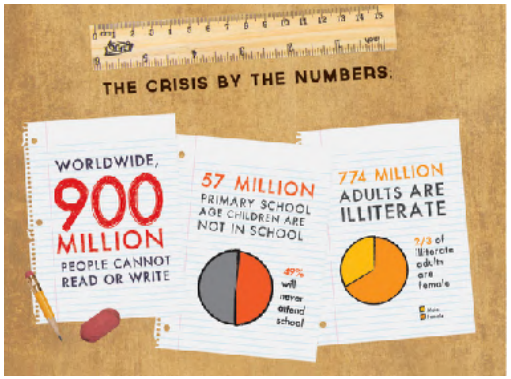
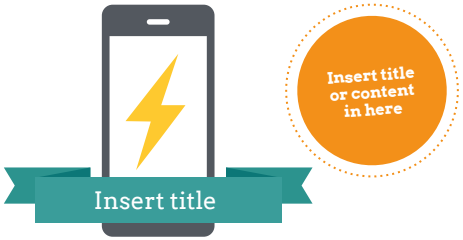
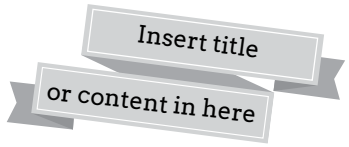


Image Source: Buildon about the Global Education Crisis:

#3 Use ribbons/ shapes

Especially useful for headlines or whenever you want to highlight a key piece of information

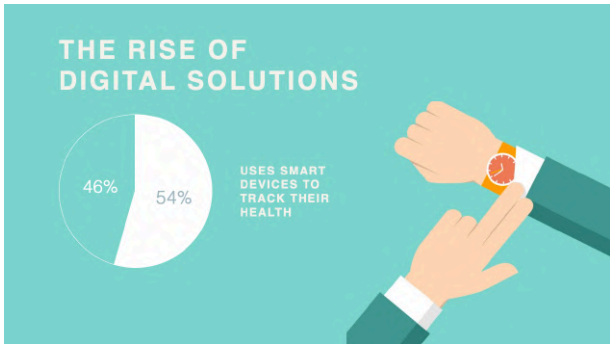




Choosing The Right Graphics

Choose the style that matches the context

Corporate Setting



Marketing Setting

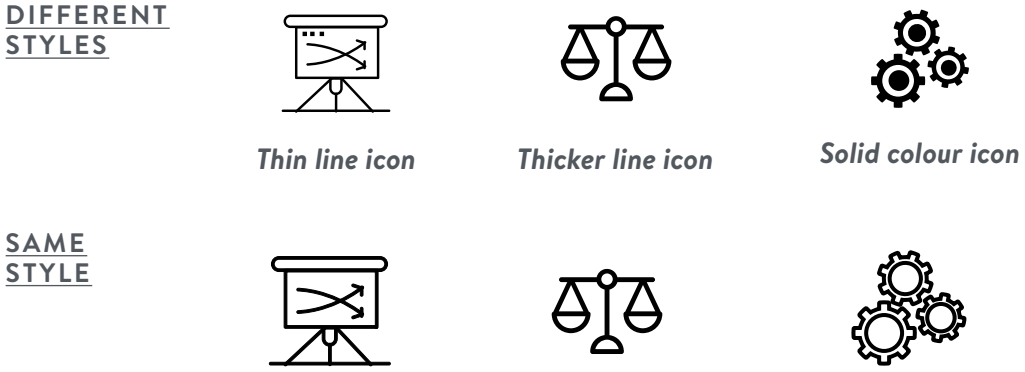
Tips on using icons

Use visual words for your key points.

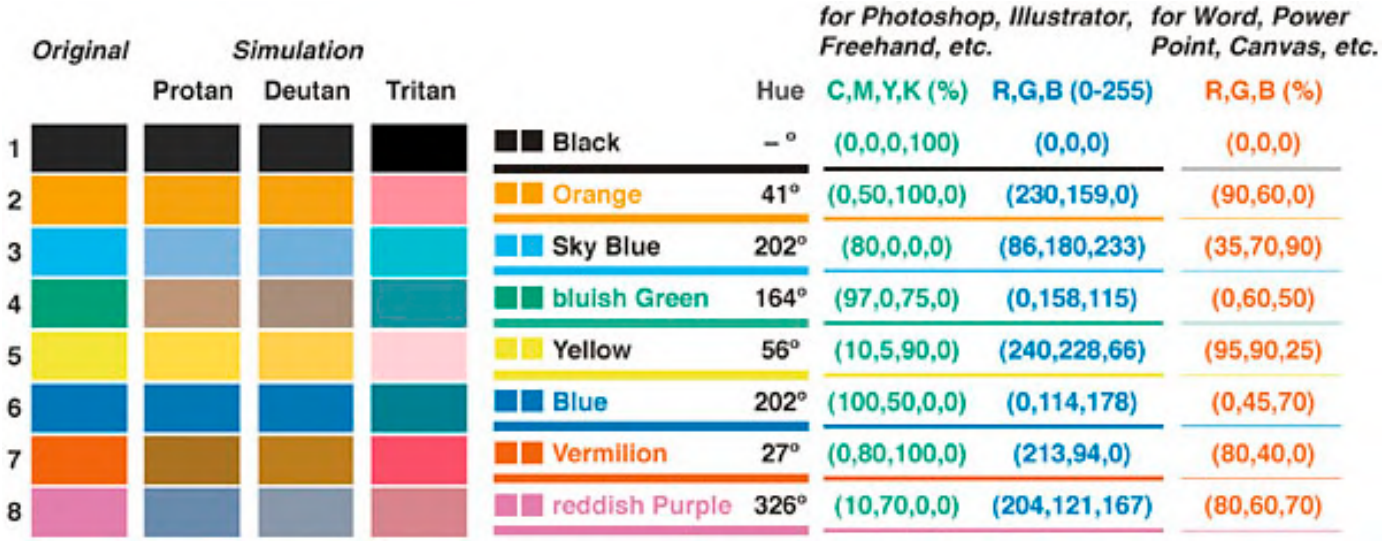
If your points contain adjectives, pair it with a noun.

Use icons with consistent style

When selecting your icons, ensure that they are of the same style



Colourblind-Friendly Palette



	Original	Simulation: Protan	Simulation: Deutan	Simulation: Tritan		Hue	for Photoshop, Illustrator, Freehand, etc. C,M,Y,K (%)	for Photoshop, Illustrator, Freehand, etc. R,G,B (0-255)	for Word, Power Point, Canvas, etc. R,G,B (%)
1					Black	– °	(0,0,0,100)	(0,0,0)	(0,0,0)
2					Orange	41°	(0,50,100,0)	(230,159,0)	(90,60,0)
3					Sky Blue	202°	(80,0,0,0)	(86,180,233)	(35,70,90)
4					bluish Green	164°	(97,0,75,0)	(0,158,115)	(0,60,50)
5					Yellow	56°	(10,5,90,0)	(240,228,66)	(95,90,25)
6					Blue	202°	(100,50,0,0)	(0,114,178)	(0,45,70)
7					Vermilion	27°	(0,80,100,0)	(213,94,0)	(80,40,0)
8					reddish Purple	326°	(10,70,0,0)	(204,121,167)	(80,60,70)

Source: http://jfly.iam.u-tokyo.ac.jp/color/image/pallete.jpg

Resources:

www.colororacle.org
www.color-blindness.com/coblis-color-blindness-simulator

Effective Use Of Colours

Use soft & muted colours for text

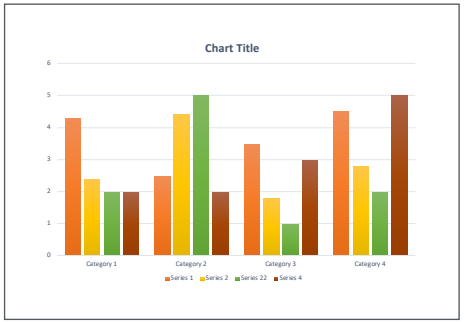
Avoid using bright shades that are *jarring to the eyes like this*

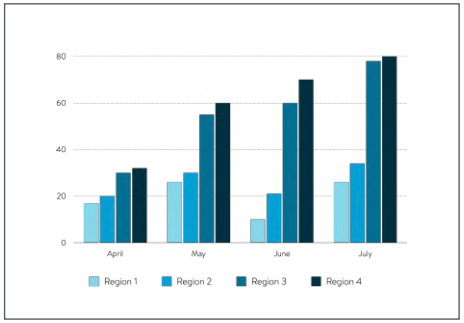
- They are painful for the eyes to read.

Use soft colour shades that are muted

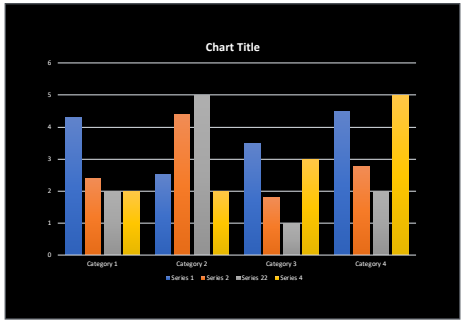
Dark grey for lengthy sentences

Avoid using too many colours





Avoid Black background



Exercise: Visualise The Key Message

Marketplace trends - un- and under-banked

2011 FDIC National Survey of Unbanked and Underbanked Householders[1]

- 8.2 percent of US households are unbanked. This represents 1 in 12 households in the nation, or nearly 10 million in total.
- The proportion of unbanked households increased by an estimated 0.6 percentage point since the 2009 survey.
- 20.1 percent of US households are underbanked versus 18.2 percent in 2009. This represents one in five households, or 24 million households.
- 29.3 percent of households do not have a savings account, while about 10 percent do not have a checking account. About two-thirds of households have both checking and savings accounts.

Source: 2011 FDIC National Survey of Unbanked and Underbanked Households. September 2012

Exercise: Visualise The Key Message

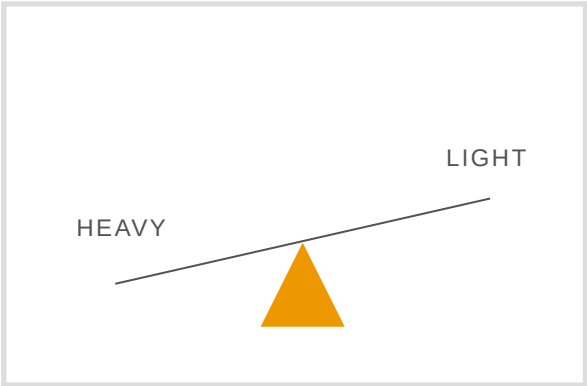
NOTES/REFLECTION:

Different Types Of Data

QUANTITATIVE	QUALITATIVE
23 Y.O	YOUNG
182 CM	TALL
50KG	SKINNY
OWNS 10 PAIR OF SHOES	SHOPAHOLIC

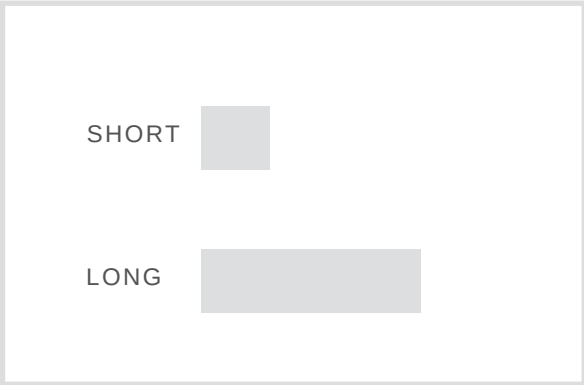
Types Of Qualitative Data

Weight



Height

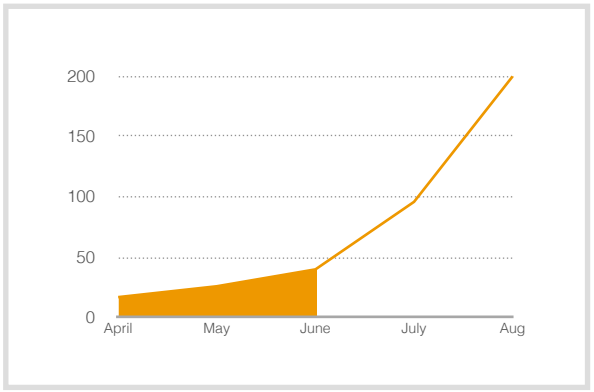
Length



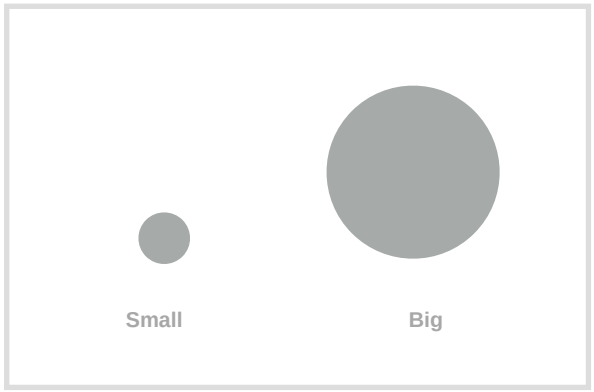
Colours

Types Of Qualitative Data (Size)

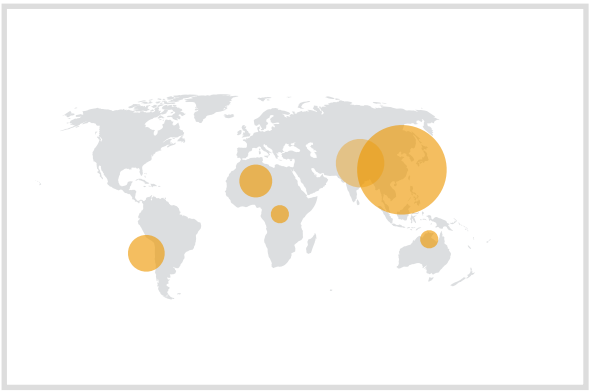
Surface area



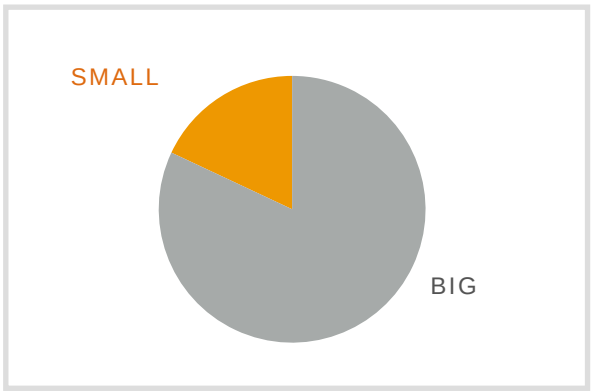
Size



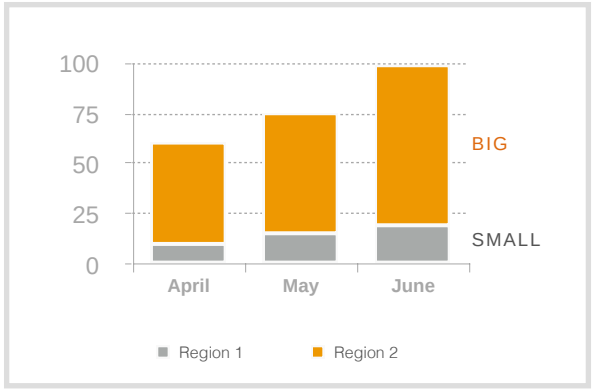
Surface area+ size



Proportions



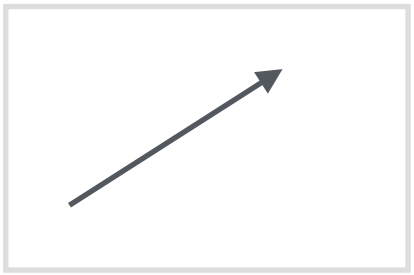
Proportions



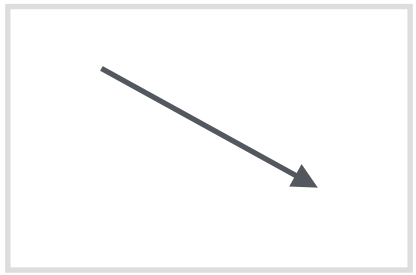
Proportions

Different Types Of Qualitative Data (Motion)

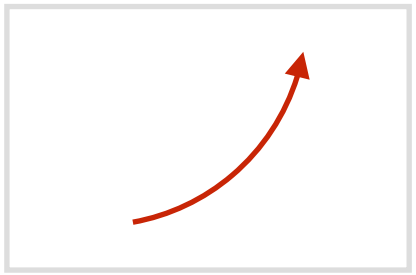
INCREASE



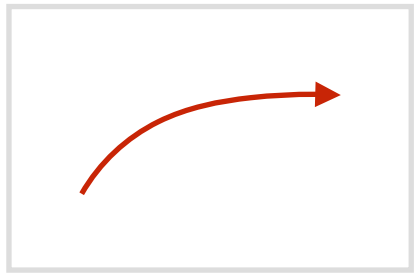
DECREASE



FAST

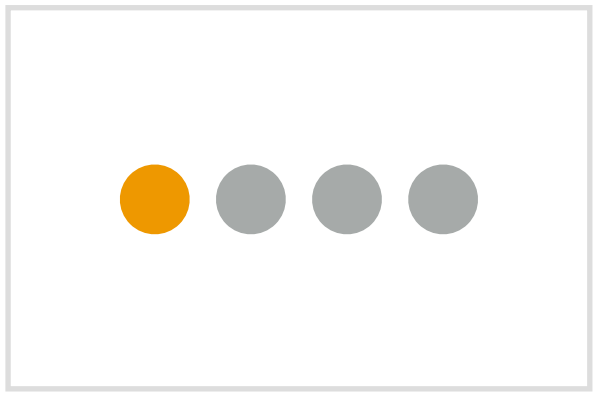


SLOW

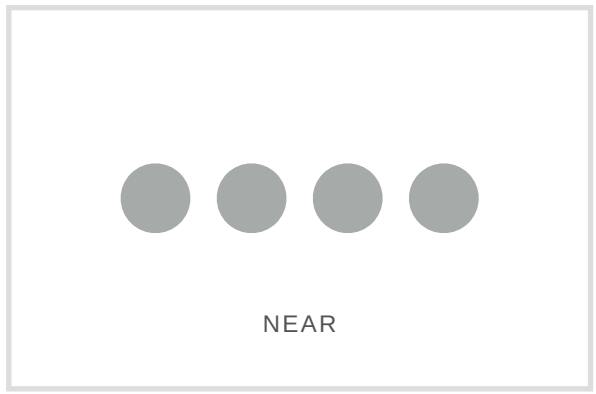


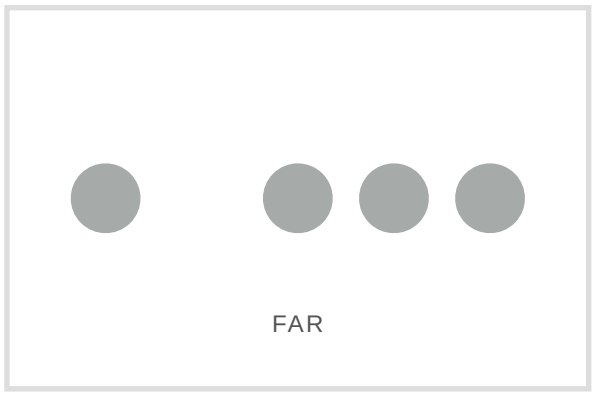
Different Types Of Data (Grouping)

Colours

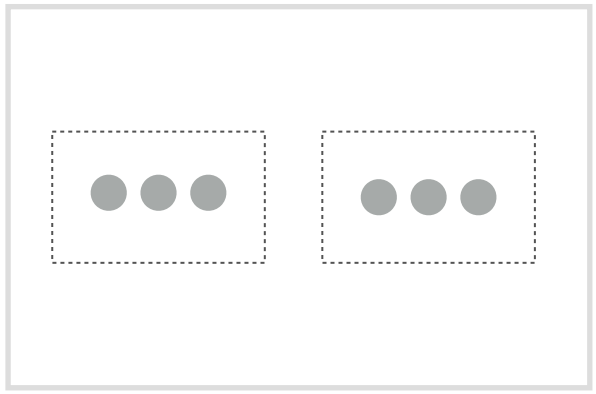


Proximity





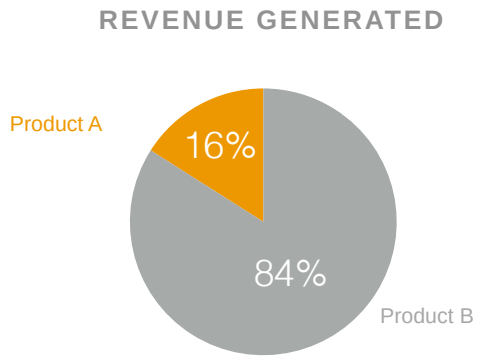
Parameter



Guidelines To Using Different Types Of Data

#1 Avoid having more than 2 data points in one layer/ group

✔



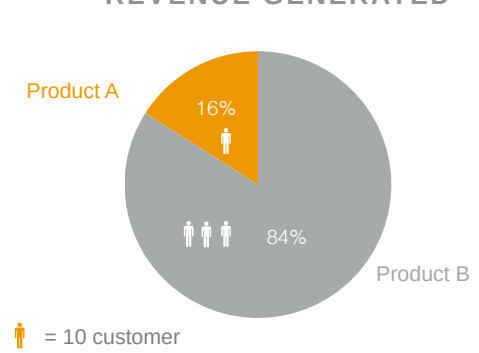
2 DATA POINTS:

1. Quantitative: Percentage
2. Qualitative: proportion

MESSAGE:

The contribution of Product A and B to the Revenue

✘



3 DATA POINTS:

1. Quantitative: Percentage
2. Qualitative: proportion
3. Quantitative: units (icons)

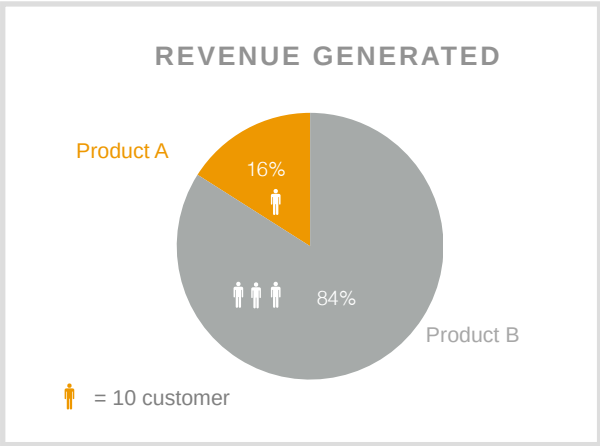
MESSAGES:

1. The contribution of Product A and B to the Revenue
2. How many customers purchased Product A & B

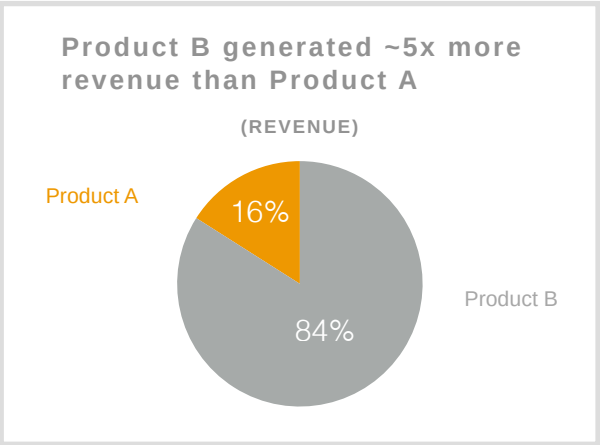
Guidelines To Using Different Types Of Data

#2 one key message per chart and/or per slide

BEFORE:



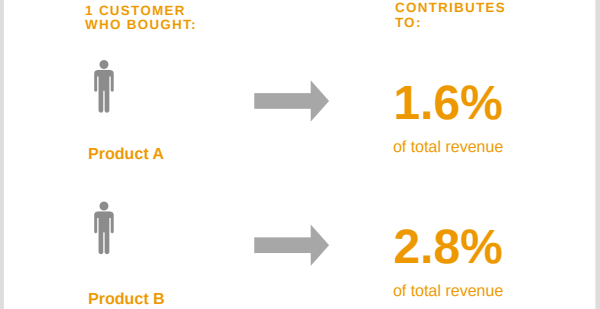
AFTER V1:



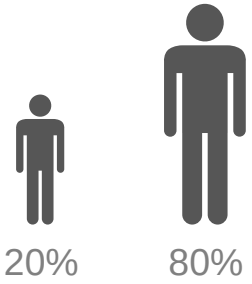
AFTER V2:

The revenue generated per customer for Product B is higher than product A

	% revenue/ customer	% of total revenue	Number of customers
Product A	1.6%	16%	10
Product B	2.8%	84%	30

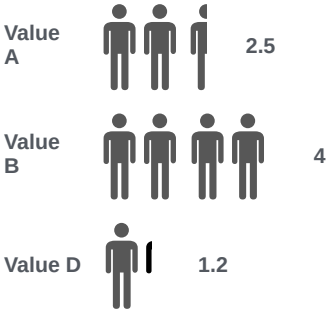


The Dos & The Don'ts



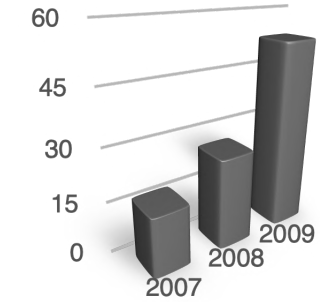
DO NOT

compare quantitative information by using size and heights.



DO NOT

compare quantitative information by using partial icons if your data is not in whole and even numbers.

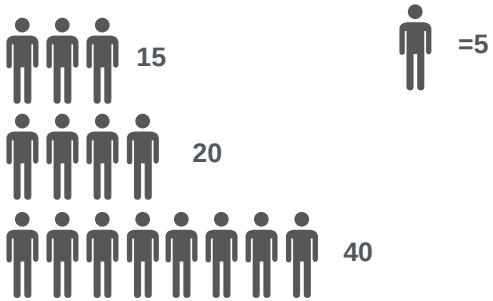


DO NOT

use 3D charts.

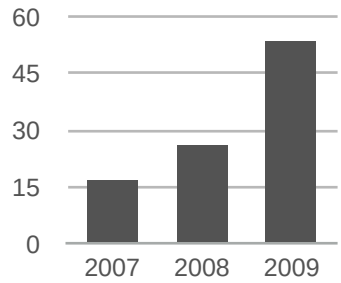
DO

If the quantity is in whole numbers, use icons as quantitative units and colours to create contrast.



DO

Use icons as quantitative units if they are multiples of a complete icon, in 1, 2, 5, 10, 50 and 100.



DO

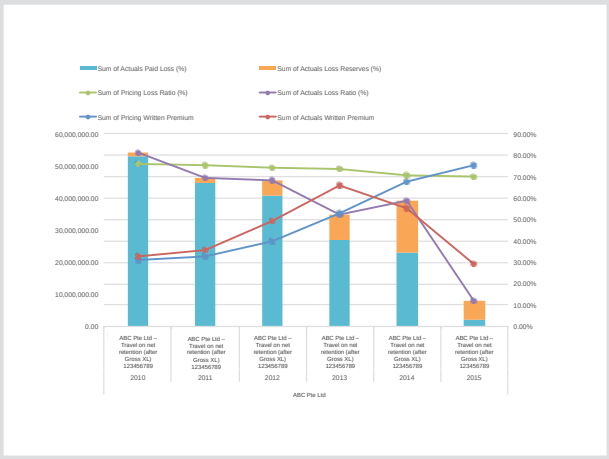
Use flat charts.

STEP 2:

Simplify

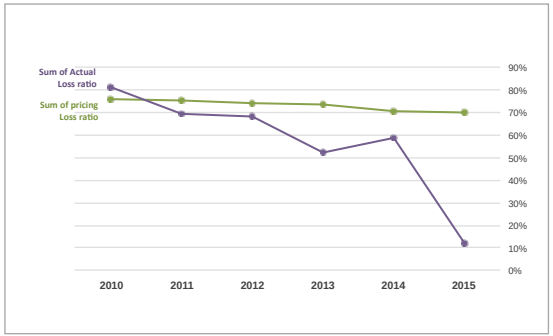
- One key message per slide/chart
- Remove unnecessary elements
- Merge repeated elements

(a) One Key Message Per Slide/Chart

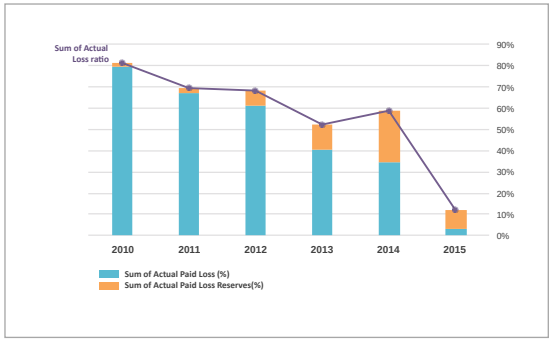


Do I have more than one key message in each slide?

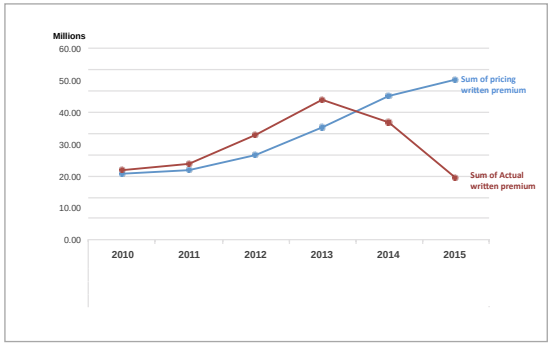
Can I split them up?



For the past 5 years, the actual pricing loss ratio is lower than the forecasted



The actual pricing loss ratio in 2015 dipped due to the fall in Actual paid loss

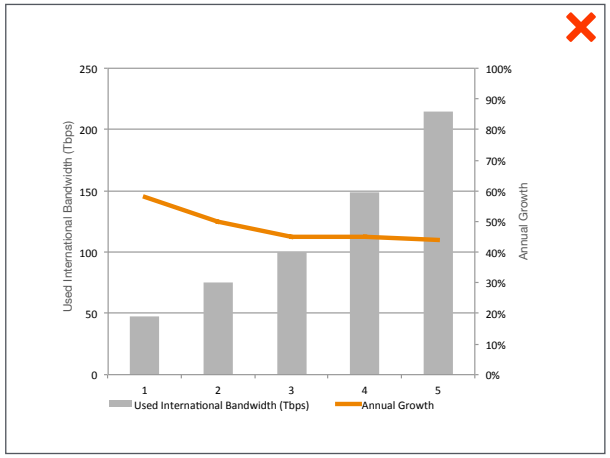


The sum of actual written premium also saw a sharp drop in 2015

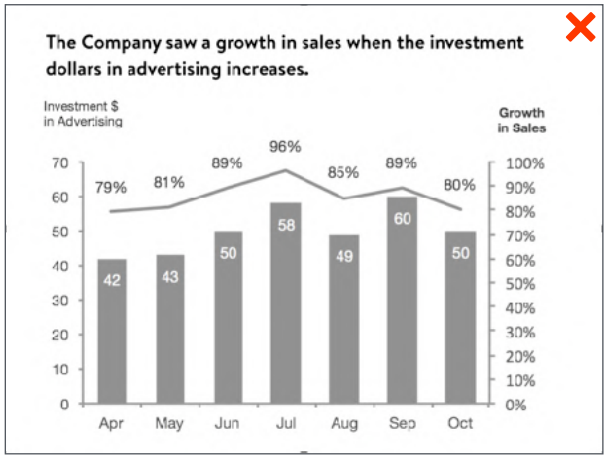
(b) Remove unnecessary elements

i. The dual Y-axis

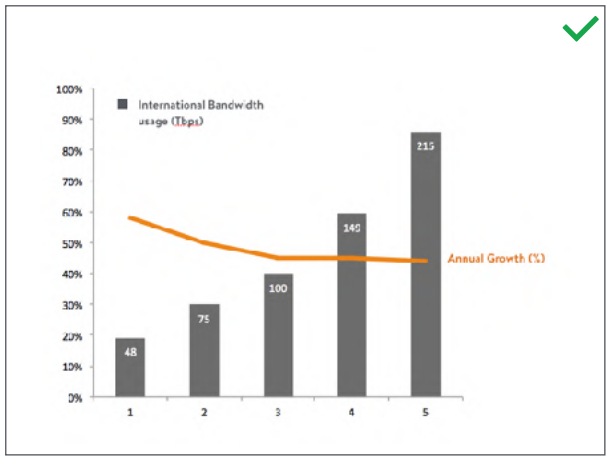
Before



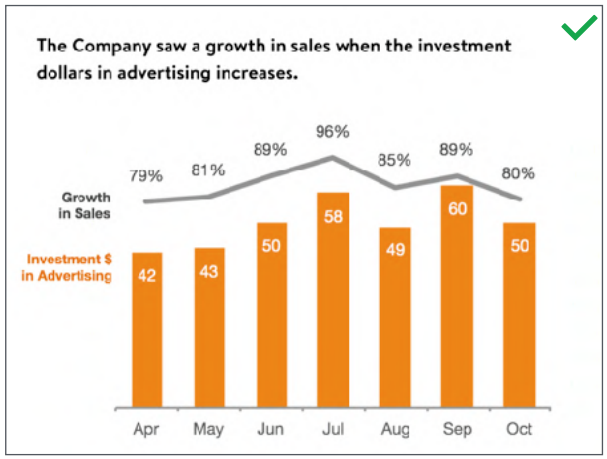
Before



After



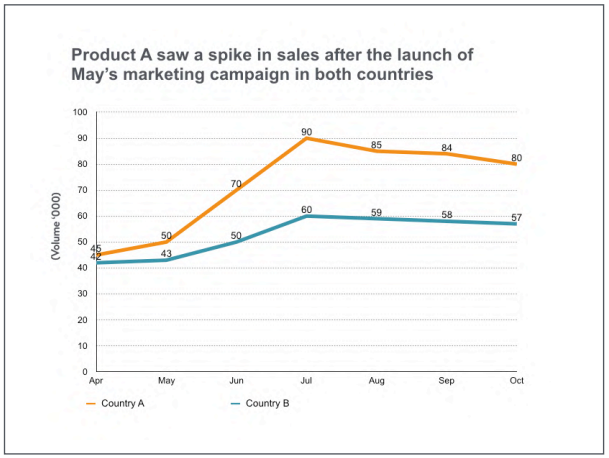
After



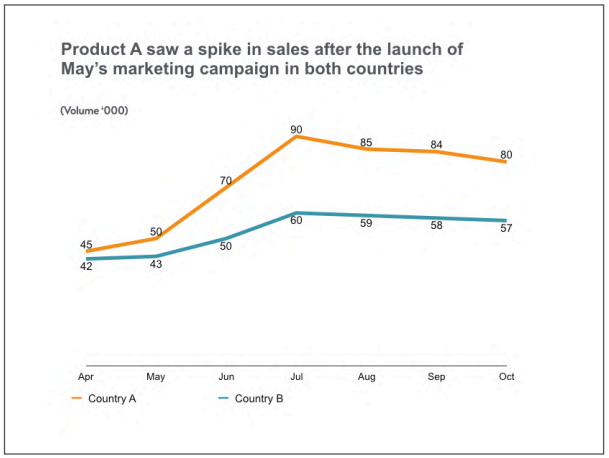
(b) Remove unnecessary elements

ii. Gridlines

Before

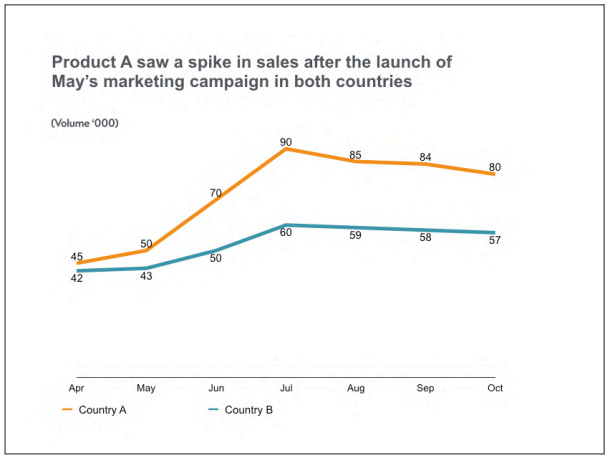


After

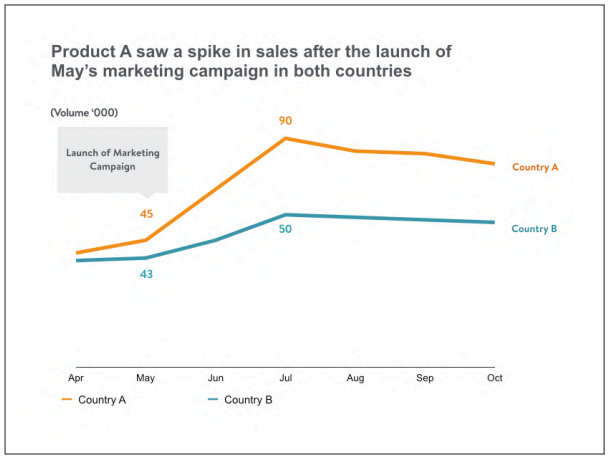


iii. Values labels

Before



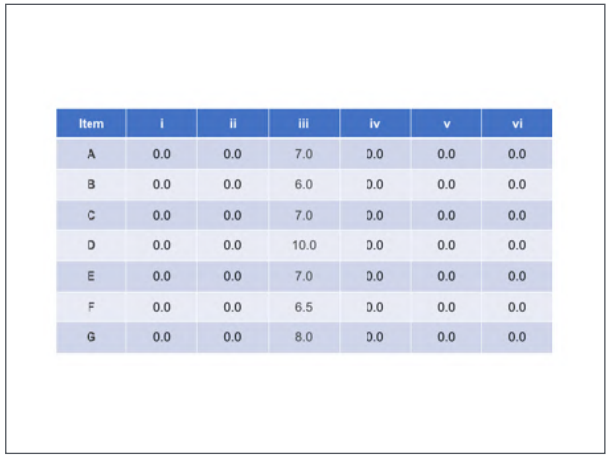
After



(b) Remove unnecessary elements

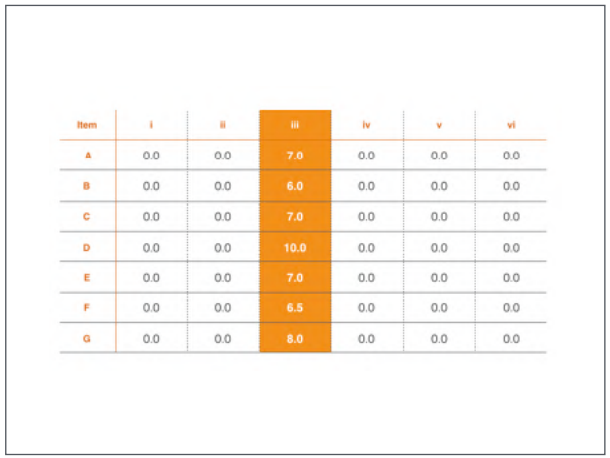
vi. Colours

Before



Item	i	ii	iii	iv	v	vi
A	0.0	0.0	7.0	0.0	0.0	0.0
B	0.0	0.0	6.0	0.0	0.0	0.0
C	0.0	0.0	7.0	0.0	0.0	0.0
D	0.0	0.0	10.0	0.0	0.0	0.0
E	0.0	0.0	7.0	0.0	0.0	0.0
F	0.0	0.0	6.5	0.0	0.0	0.0
G	0.0	0.0	8.0	0.0	0.0	0.0

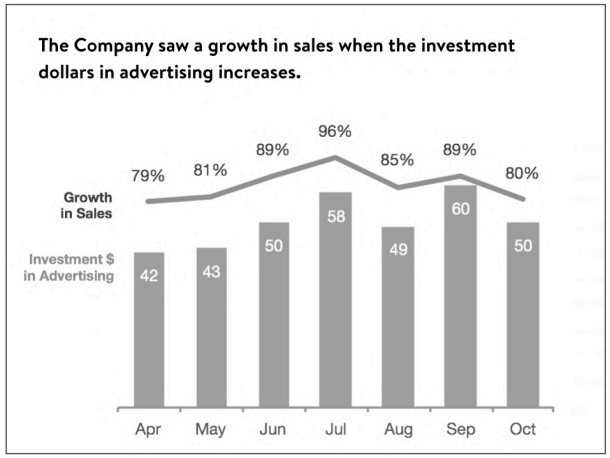
After

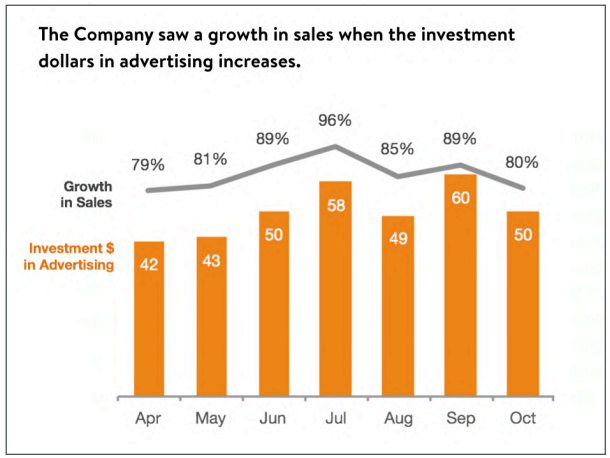


Item	i	ii	iii	iv	v	vi
A	0.0	0.0	7.0	0.0	0.0	0.0
B	0.0	0.0	6.0	0.0	0.0	0.0
C	0.0	0.0	7.0	0.0	0.0	0.0
D	0.0	0.0	10.0	0.0	0.0	0.0
E	0.0	0.0	7.0	0.0	0.0	0.0
F	0.0	0.0	6.5	0.0	0.0	0.0
G	0.0	0.0	8.0	0.0	0.0	0.0

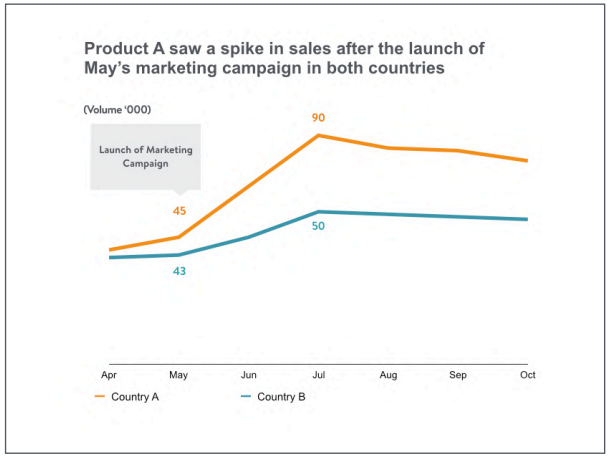
(c) Grouping

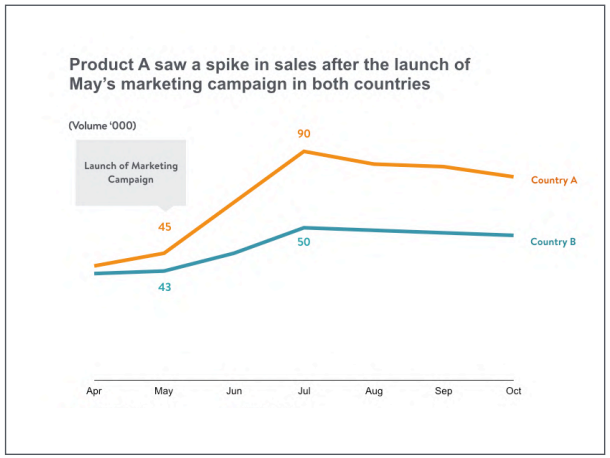
i. Colours





ii. Position of legend



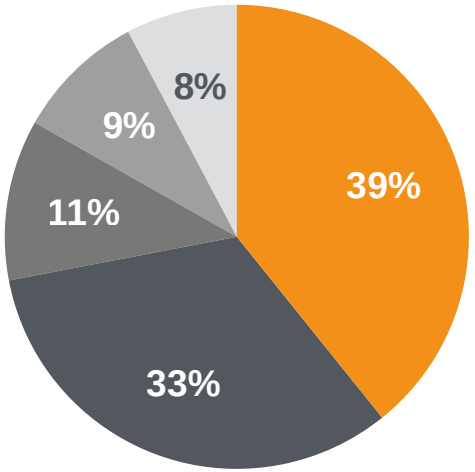


STEP 3:

Amplify

- Contrast with colour(s)
- Contrast with size
- Add call outs/labels

(a) Use Colours To Contrast

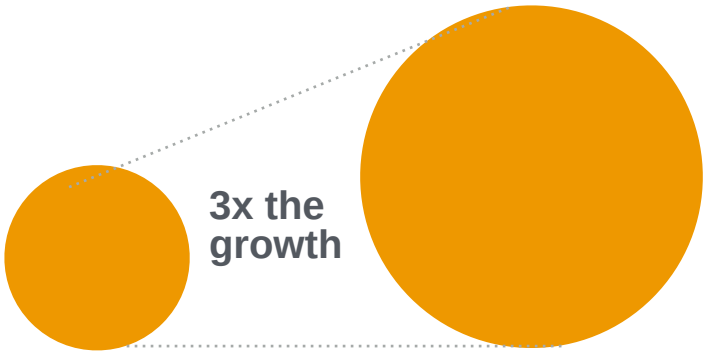


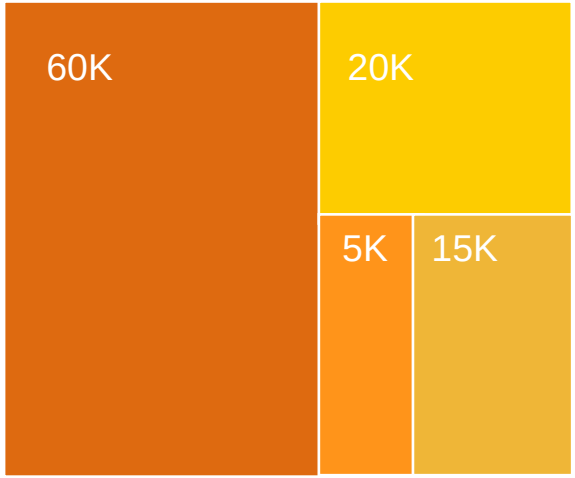
PSI level

Country	0:00	3:00	6:00	9:00	12:00
A	45	50	51	57	70
B	61	62	61	65	60
C	120	130	145	130	133
D	20	24	23	21	20

Good | Moderate | Unhealthy

(b) Use Size To Contrast





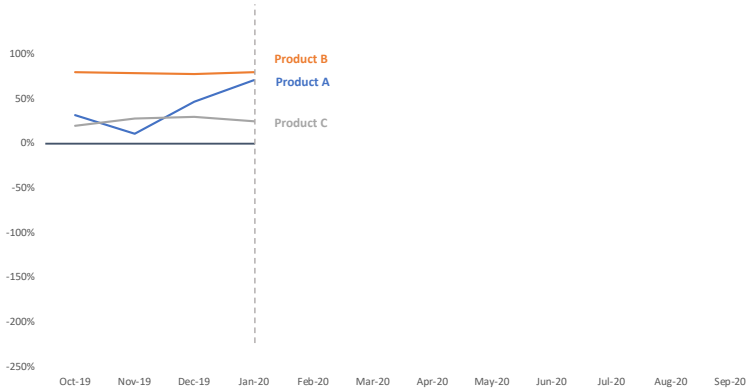
(C) Use Label To Highlight

Revenue spiked after the marketing campaign launch in March

Use Labels And Animation To Tell The Story

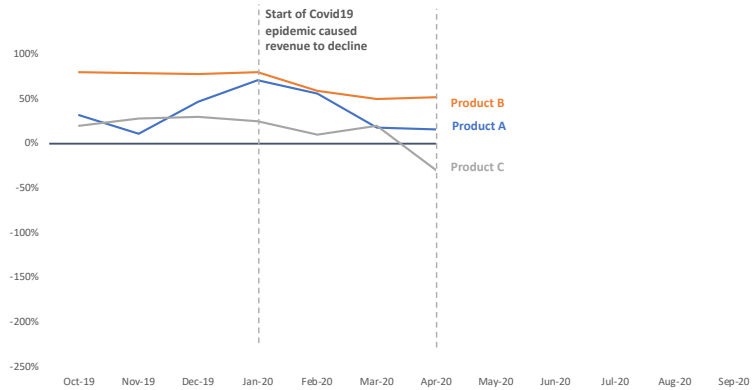
1

Stable revenue generated from Oct to Jan



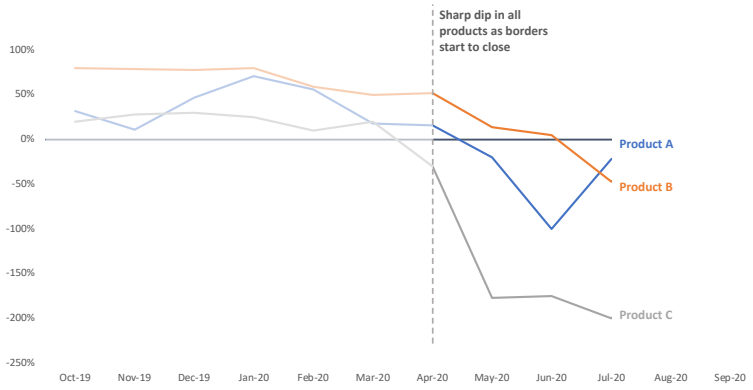
2

Until the pandemic started in January 2020



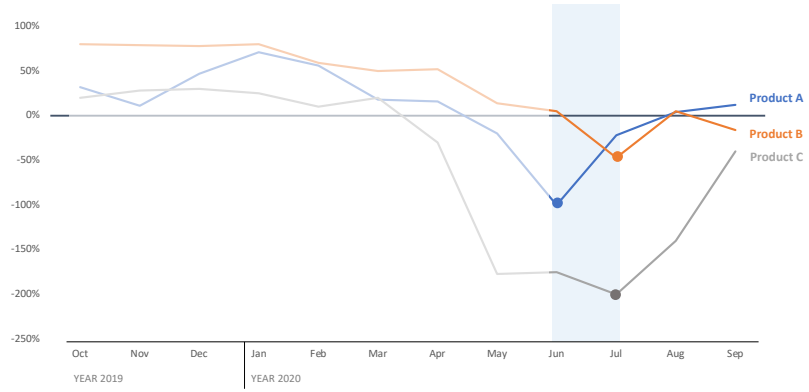
3

And revenue plunged since April 2020



4

New implementation plan in June-July Allowed us to bounce back in a month



Be Clear On The Focal Point Of The Story

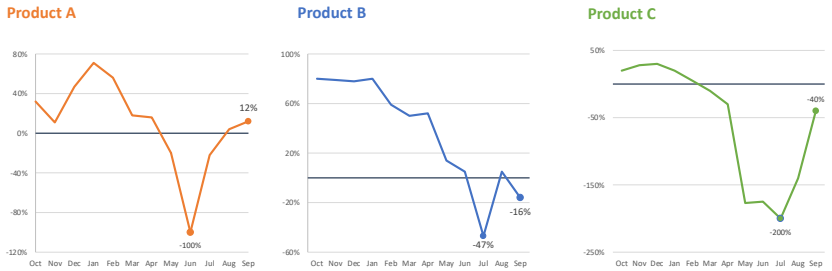
There are many different stories within the same set of data. Be clear on the key message you want to convey. Do you want to communicate success or failure? Rather than bombarding your audience with all the details, highlight only the essential elements that is in line with your narrative.

Cause and effect (good)

Revenue in FY2020

New implementation plan allowed us to bounce back in a month

The change rolled out in June-July was successful in getting us back on our feet. Product A gained full recovery.

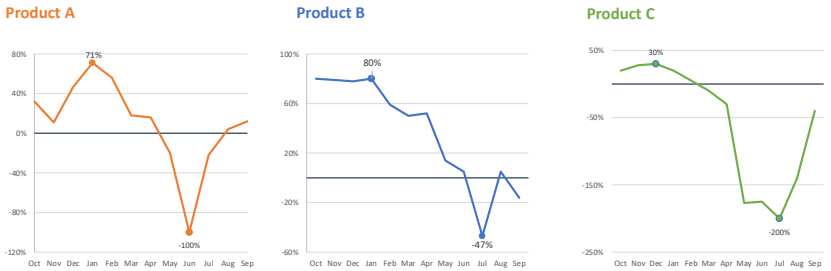


Cause and effect (bad)

Revenue in FY2020

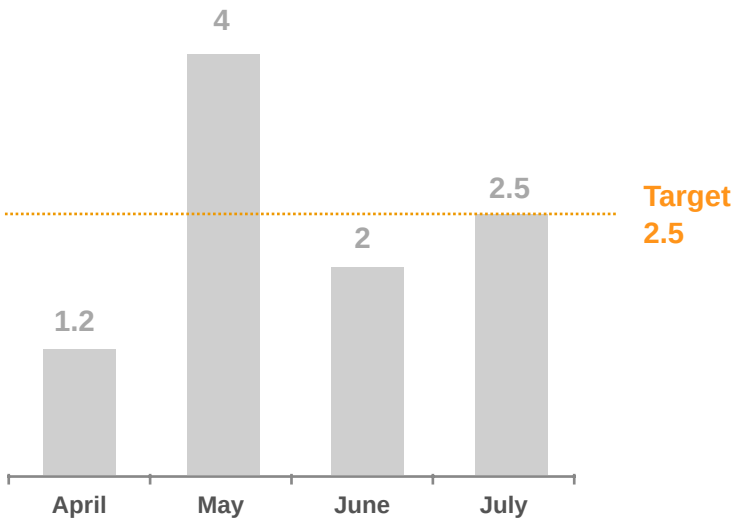
Revenue dipped across the board due to unprecedented times

Since the start of Covid-19 pandemic in Jan, the company experienced a plunge in revenue



Visual Elements That Tell A Story

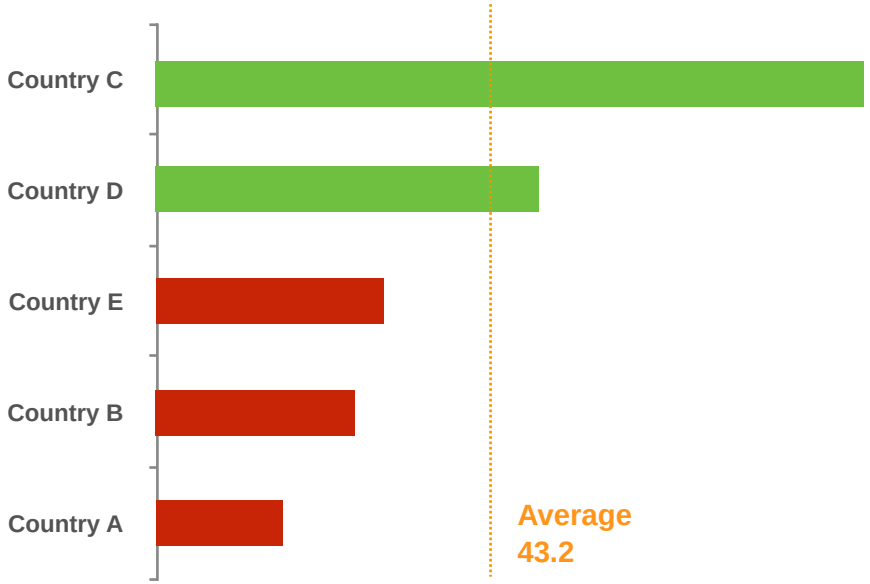
Did it hit the target?



Dotted line (target)

To show the benchmark and give a clear view of which month exceeded the target and which did not.

How did it fair on average?

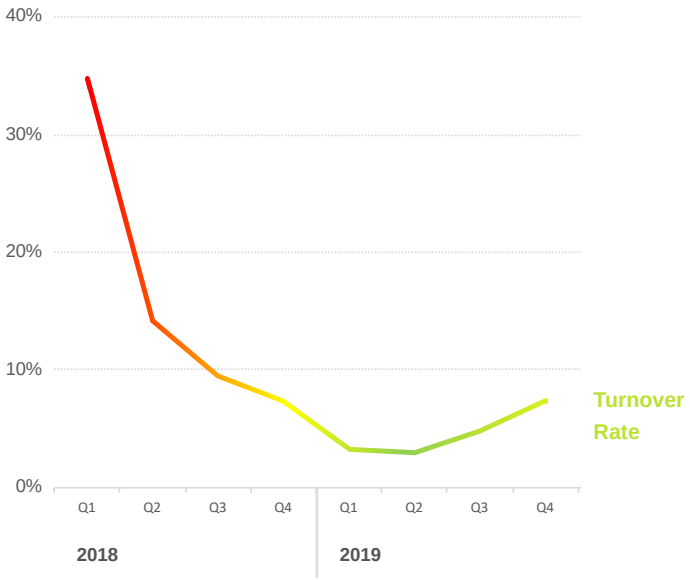


Dotted line (Average) + red and green

To show the average standard and categorise the countries' performances according to the "good" and the "bad".

Visual Elements That Tell A Story

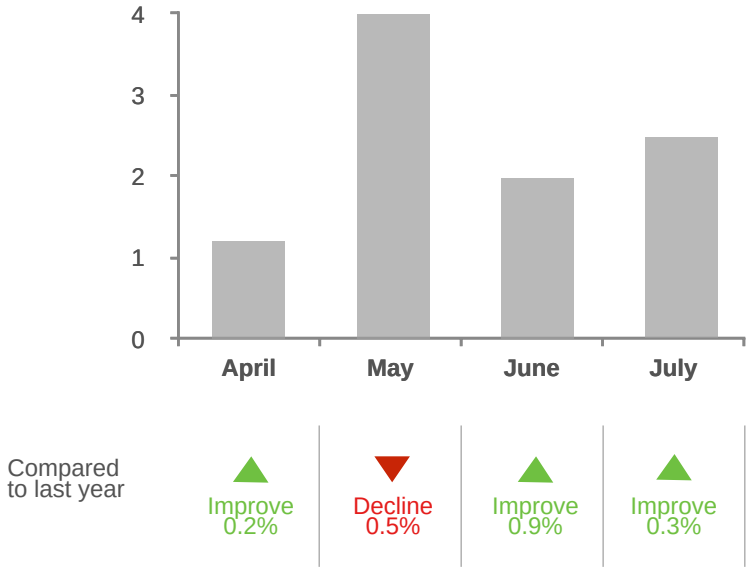
Is it optimal, good or bad?



Colour spectrum

To show a trend with the additional colours to help viewers infer that the turnover rate for certain quarters of the year was not ideal.

How was it compared to the past?



Green and red arrows

To offer a month-on-month comparison and comparison with the previous year, without over cluttering the slide with additional bars of last year's performance.

Exercise:

The introduction of FinTech in 2010 resulted in a steep rise of bank activities on Mobile and it is forecasted that it will continue to rise.

Note: Assume that this year is 2019. And 2020 is a forecasted number

YEAR	2005	2010	2015	2020
TELEPHONE	100	85	74	64
BRANCH	600	502	427	268
INTERNET (DESKTOP)	320	565	705	528
MOBILE APP	30	86	895	2,341