BUSINESS ANALYTICS

EFFECTIVE VISUALISATIONS

EFFECTIVE VISUALISATIONS

- DATA VISUALISATIONS
  - THE PROCESS OF DISPLAYING DATA IN A VISUAL CONTEXT TO COMMUNICATE PATTERNS, TRENDS OR SUMMARY OF THE DATA.
  - IT IS IMPORTANT TO DISPLAY INFORMATION IN AN EFFECTIVE WAY SO AS TO CLEARLY AND CONCISELY COMMUNICATE ANALYTICAL CONCLUSIONS.
  - EFFECTIVE DATA VISUALISATION HELPS AN AUDIENCE ANALYSE, UNDERSTAND AND DRAW CONCLUSIONS THROUGH SUMMARISATION OF DATA.

EFFECTIVE VISUALISATIONS

- SIMPLICITY OF COMMUNICATING DATA DRIVEN CONCLUSIONS IS ONE REASON FOR THE POPULARITY OF DASHBOARDS AND KEY PERFORMANCE INDICATORS OR KPI'S
- DATA CAN BE COMMUNICATED VISUALLY IN A VARIETY OF FORMATS AND EFFECTIVE DATA VISUALISATION WILL HELP MAKE INFORMED DECISIONS AND JUDGEMENTS BASED ON RESULTS OF THESE PRACTICES.

EFFECTIVE VISUALISATIONS

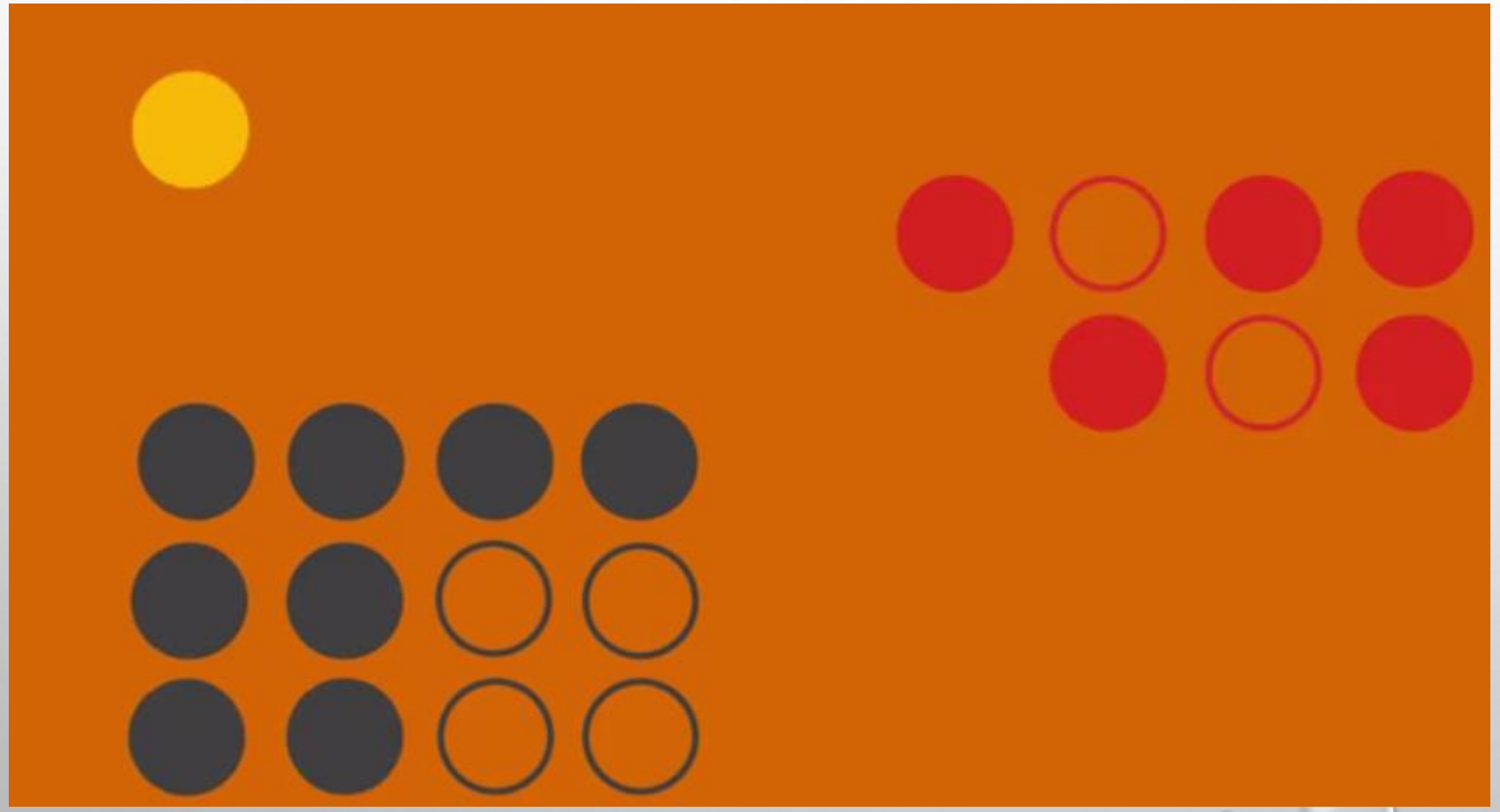
- TABLE DATA OR CHART?
- DATA VISUALISATION FORMATS ALL HAVE THEIR OWN MERITS.
- CHARTS CAN SHOW RELATIVE DIFFERENCES AMONG VALUES PRESENTED.
- CHARTING GROWTH OVER TIME SHOWS A TREND OVER TIME.
- CHARTS ARE A SUMMARY TECHNIQUE, ALLOWS FAST INTERPRETATION AND DRAWING OF CONCLUSIONS.

CLIENT A REVENUE				
	2013	2014	2015	2016
Revenue ($M)	100	108	112	120
YoY Growth	-2%	8%	4%	7%

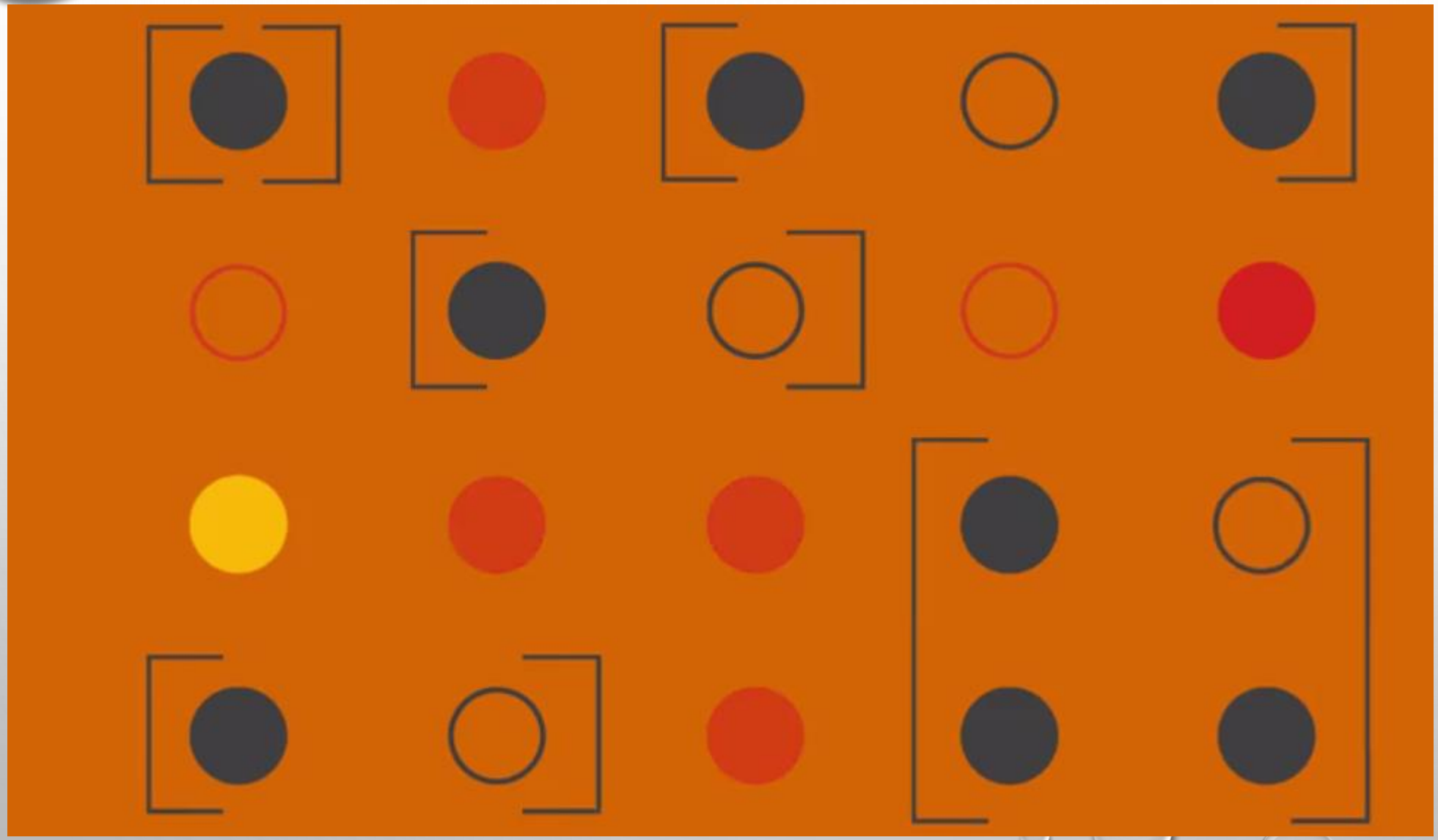
EFFECTIVE VISUALISATIONS

- VARIOUS USES FOR ILLUSTRATIVE CHARTS AND SUMMARIES.
- REPORTING, STATUS UPDATES AND AS PART OF A DASHBOARD.
- WHY ARE SOME CHARTS ARE EASIER TO UNDERSTAND THAN OTHERS?
- TOO MANY LINES? TOO MUCH COLOUR? TOO MANY NUMBERS?
- STUDIES SHOW THAT WHEN OBJECTS ARE SIMILAR IN SHAPE AND COLOUR, OR LOOK SIMILAR TO ONE ANOTHER, WE PERCEIVE THEM AS A GROUP.
- CONTINUITY OCCURS WHEN TWO OR MORE OBJECTS ARE LINKED IN A WAY IN WHICH THE EYE IS COMPELLED TO MOVE THROUGH ONE OF THEM AND CONTINUE TO THE NEXT SUCH AS A DATA LINE.

EFFECTIVE VISUALISATIONS



SIMILARITY



- LINKING

EFFECTIVE VISUALISATIONS

- LINKING OBJECTS IN A CHART
- OBJECTS ENCLOSED IN A BORDER OR COLOUR ARE PERCEIVED TO BELONG TOGETHER.
- BANDED ROWS IN A TABLE
- POINTS OF CONNECTION (OBJECTS CONNECTED BY A LINE) PERCEIVED AS BEING TOGETHER
- OBJECTS PLACED CLOSE TOGETHER AGAIN PERCEIVED AS BEING TOGETHER
- TEXT CAN HELP TO HIGHLIGHT POINTS OF INTEREST OR CONCLUSIONS IN DATA VISUALISATIONS

EFFECTIVE VISUALISATIONS

- THE ORIENTATION OF TEXT AND THE IMPACT IT CONVEYS TO THE AUDIENCE.
- VERTICAL TEXT CAN BE DIFFICULT TO READ AND SLOW DOWN COMPARISONS.
- SIZE AND DATA VISUALISATION TRADITIONALLY INDICATES IMPORTANCE.
- HOWEVER, BE CAREFUL WHEN USING SIZE ALONE FOR COMPARISON AS INDIVIDUALS OFTEN HAD DIFFICULTY ASSESSING HOW MUCH BIGGER ONE ITEM IS FROM ANOTHER. E.G PIE CHARTS
- COLOUR IS ANOTHER WAY TO COMPARE ITEMS, IT CAN AID YOUR MESSAGE, BUT CAN BE DISTRACTING TO THE AUDIENCE.

EFFECTIVE VISUALISATIONS

- CONSISTENCY OF COLOUR THROUGHOUT GRAPHICS IS ALSO IMPORTANT.
- STICKING TO A COLOUR PALETTE OR COLOUR SCHEME OR MAKING SURE ALL THE SHADES MATCH AS THEY SHOULD.
- LENGTH AND DIRECTION OF OBJECTS HELPS COMPARE ITEMS.
- E.G. IN A BAR CHART, THE LONGER BAR TRANSLATES TO GREATER VALUE BEING REPRESENTED.

EFFECTIVE VISUALISATIONS

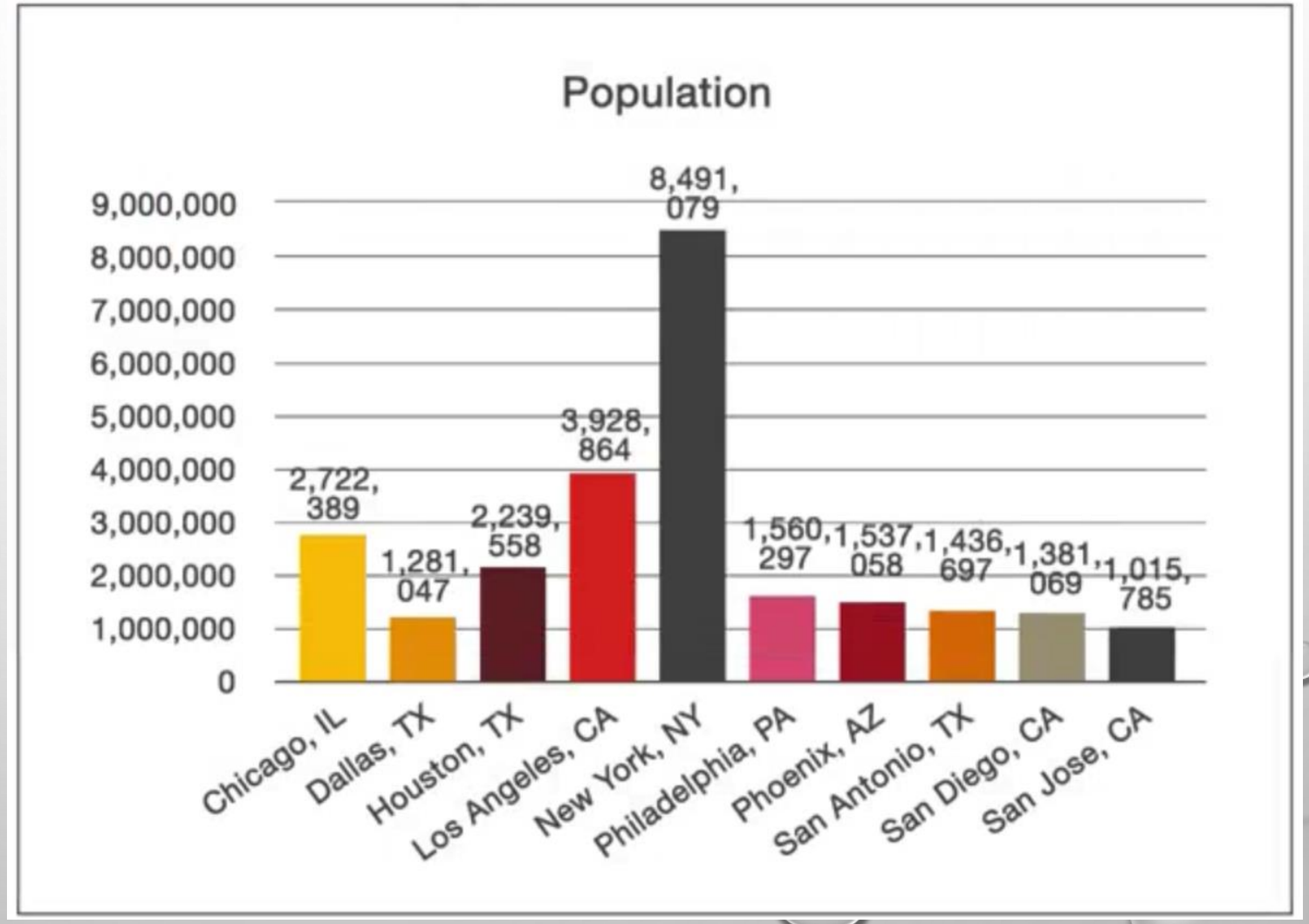
- LESS IS MORE, YOUR CHART SHOULD CONVEY ONE MESSAGE TO YOUR AUDIENCE.
- USE TITLES AND LABELS TO GIVE YOUR AUDIENCE AN UNDERSTANDING OF YOUR MESSAGE.
- YOU WANT YOUR AUDIENCE SPENDING THEIR TIME EXPLORING AND THINKING ABOUT YOUR MESSAGE AND THE UNDERLYING DATA, NOT ORIENTING THEMSELVES TO WHAT THEY'RE LOOKING AT.
- USE COLOUR INTENTIONALLY AND NOT FOR DECORATIVE PURPOSES.
- LESS COLOUR IS OFTEN BETTER.

EFFECTIVE VISUALISATIONS

- CHART JUNK IS ANY NONESSENTIAL INFORMATION ADDED TO A CHART.
- GOOD TEST IS TO REMOVE AN ELEMENT FROM YOUR CHART AND ASSESS IF YOUR AUDIENCE WILL STILL UNDERSTAND YOUR MESSAGE. IF THEY CAN, YOU SHOULD REMOVE IT.
- USE CALL-OUTS TO HIGHLIGHT KEY MESSAGES AND DIRECT THE AUDIENCE TO FINDINGS.
- UNDERSTAND THE CONSTRAINTS OF YOUR MEDIUM (BLACK AND WHITE VS COLOUR)

EFFECTIVE VISUALISATIONS

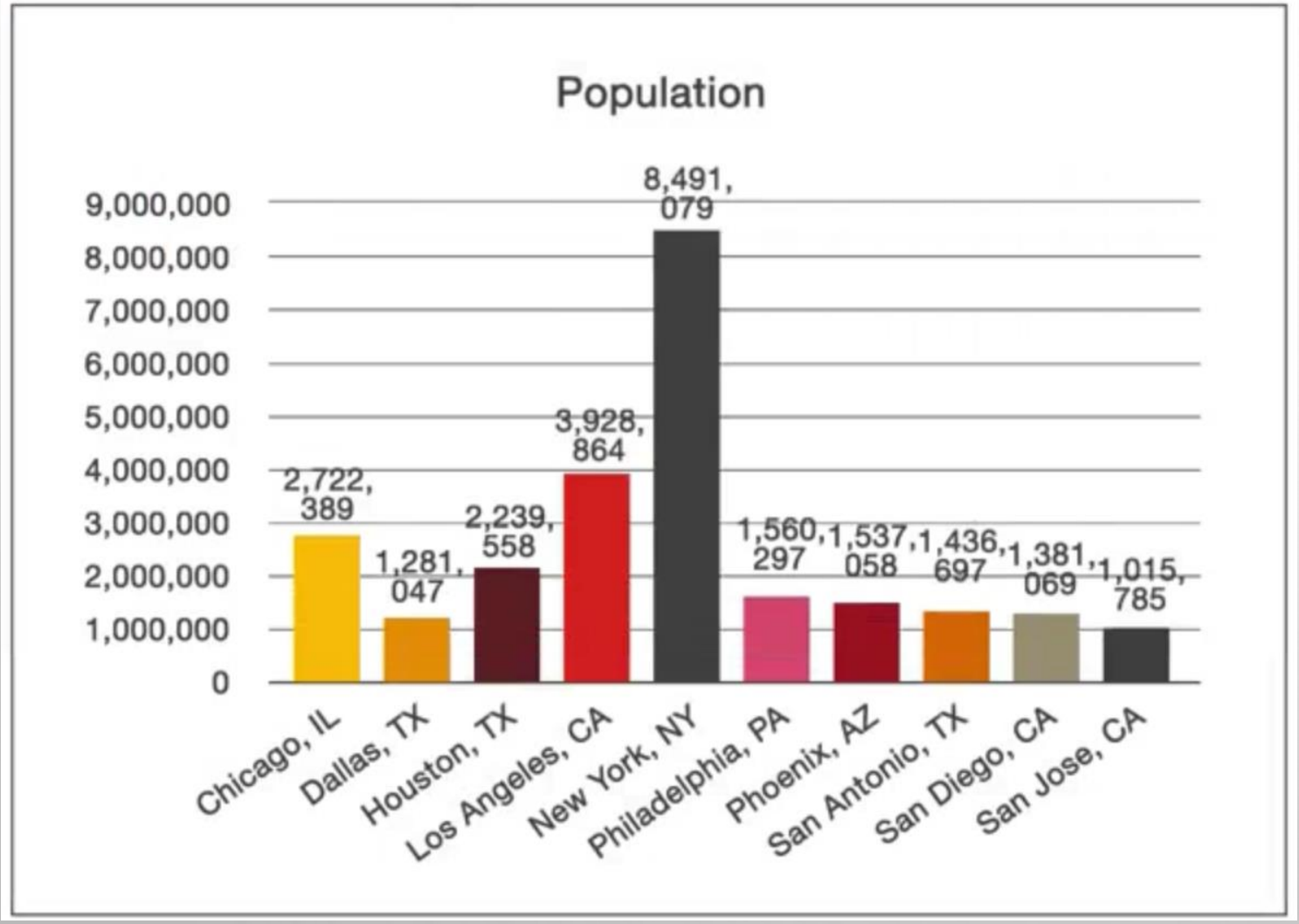
- WHAT DOES THIS CHART COMMUNICATE?



EFFECTIVE VISUALISATIONS

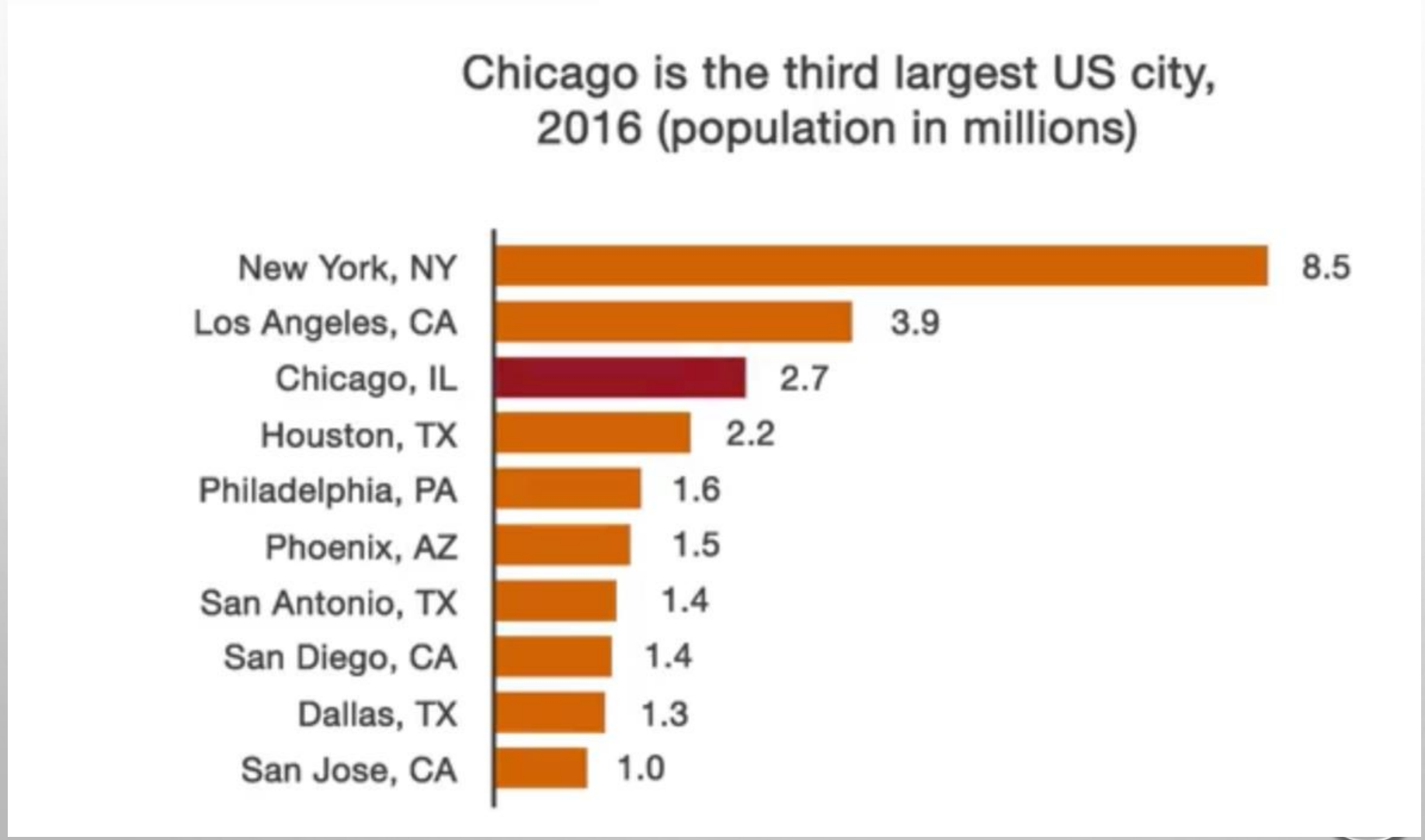
- THE CHART WAS TO COMMUNICATE THAT CHICAGO WAS THE THIRD MOST POPULAR CITY IN THE COUNTRY IN 2016.
- THE CHART CURRENTLY DOES NOT MAKE IT EASY TO DISCOVER THAT FACT.
- HOW COULD WE IMPROVE THE CHART?

EFFECTIVE VISUALISATIONS



- COLOUR?
- DATA LABELS?
- ROUNDING?
- SCALE?
- GRID LINES?
- ORDER?
- ORIENTATION?
- TITLE?

EFFECTIVE VISUALISATIONS



EFFECTIVE VISUALISATIONS

- DESIGN PRINCIPLES:
- KEEP THE COLOUR SCHEME SIMPLE, DO NOT USE BACKGROUND COLOURS, 3D EFFECTS DO NOT BENEFIT THE AUDIENCE, AVOID FANCY FORMATTING (GRADIENTS, PATTERNS, SHADOWS, GLOW, ETC)
- AVOID JUNK: GRIDLINES, BORDERS, TOO MANY LABELS, LEGEND WHERE IT IS NOT NEEDED, AXIS THAT HAVE NO VALUES.
- FORMAT NUMBERS TO LARGE AMOUNTS (E.G. 30M, 23K ETC) AVOIDS USER HAVING TO COUNT ZEROS!
- DATA TABLES CAN BE APPROPRIATE INSTEAD OF DATA LABELS

EFFECTIVE VISUALISATIONS

- DESIGN PRINCIPLES
- USE CHART TITLES TO PRESENT A MESSAGE WITHOUT TAKING UP MORE SPACE ON A DASHBOARD
- SORT YOUR DATA BEFORE CHARTING
- LIMIT THE USE OF PIE CHARTS
- A SINGLE CHART CAN LOOSE EFFECTIVENESS IF YOU PLOT TOO MUCH DATA ON IT
- ASPECT RATIO REFERS TO THE RATIO OF HEIGHT TO WIDTH. A SKEWED ASPECT DISTORTS CHARTS

EFFECTIVE VISUALISATIONS

- USE CHARTS THAT ARE FAMILIAR: AREA, BAR/COLUMN, LINE OR PIE.
- TRENDLINES CAN BE DISTRACTING

EFFECTIVE VISUALISATIONS

- SIMILAR PRINCIPLES CAN BE APPLIED TO TABLES SO THAT A TABLE CAN CONVEY THE PRIMARY COMPONENTS OF A DATA STORY WITHOUT THE ADDED DISTRACTION OF VISUAL ELEMENTS.
  - BANDING OF ROWS OR COLUMNS
  - CELL PADDING, MARGIN, SPACING OF COLUMNS
  - LOGICAL ORDER
  - ROUNDING

City	State	Area (sq mi)	Population
New York City	New York	468.9	8,550,405
Chicago	Illinois	234.0	2,695,598
San Francisco	California	231.9	864,816
Atlanta	Georgia	134.0	463,878
Dallas	Texas	385.8	1,300,092

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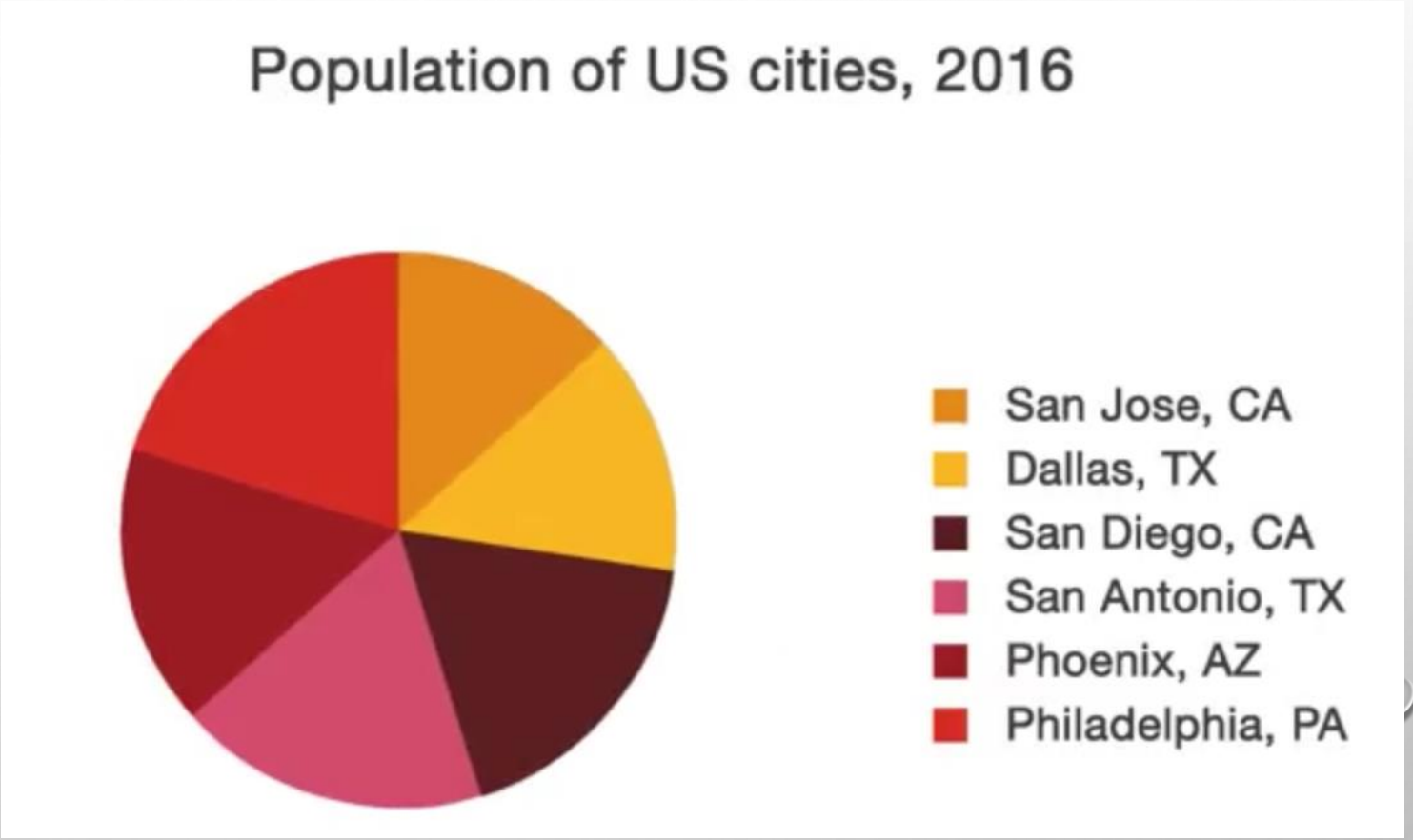
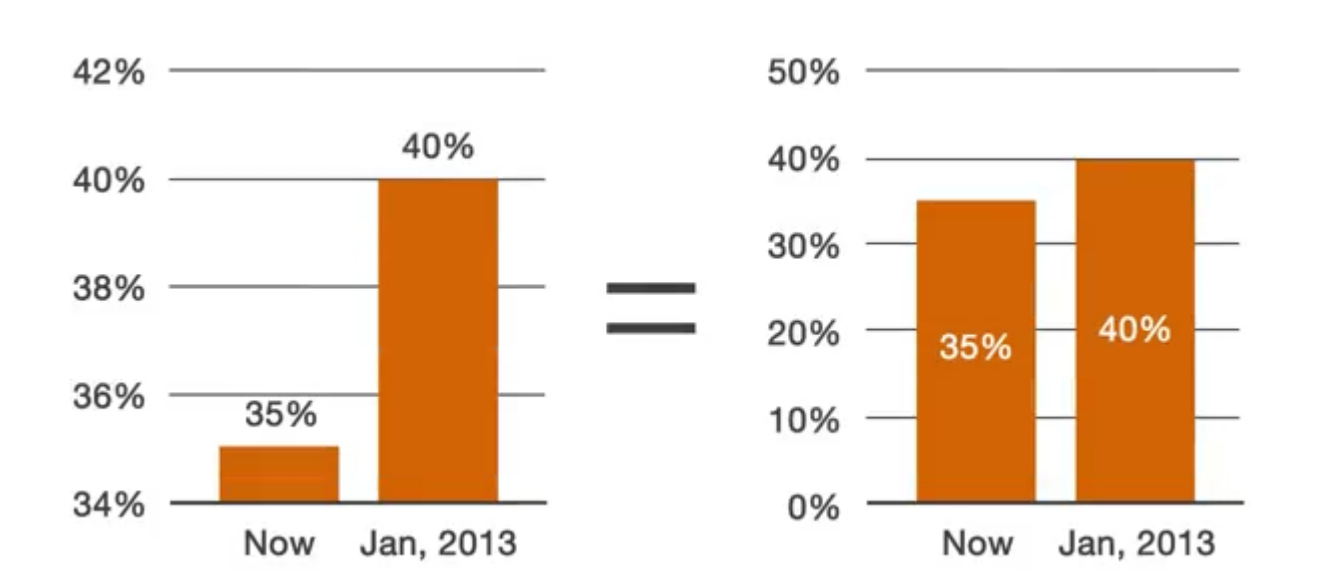
EFFECTIVE VISUALISATIONS

- WHAT CAN YOU INTERPRET FROM THIS PIECHART?
- SIMILAR DATA POINTS?
- LITTLE VARIABILITY



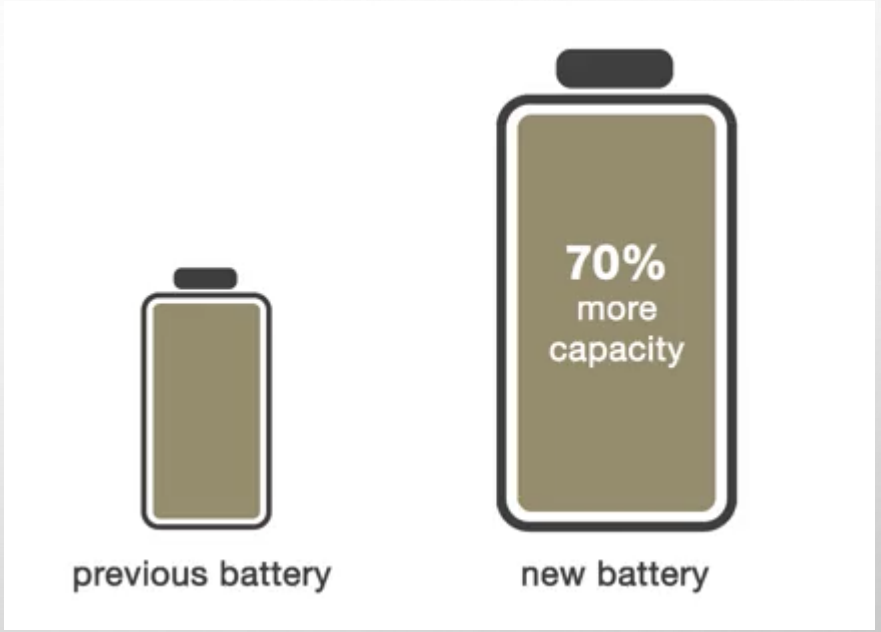
EFFECTIVE VISUALISATIONS

- INEFFECTIVE CHARTING:
  - USING A PIE CHART WHEN THE DATA POINTS ARE SIMILAR.
  - CHARTS WITH A THIRD DIMENSION THAT COMMUNICATE NO INFORMATION (3D PIE)
  - INACCURATE SCALING



EFFECTIVE VISUALISATIONS

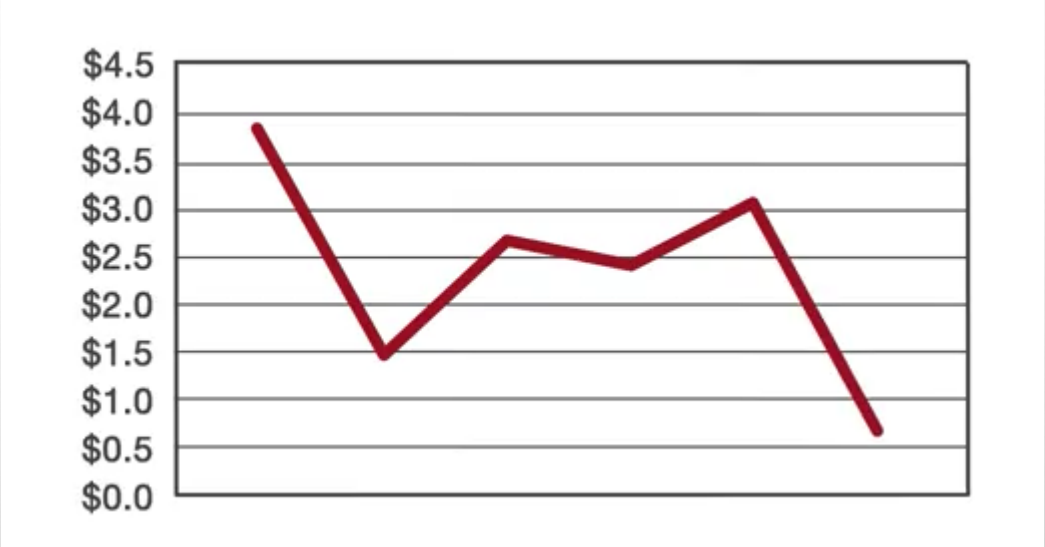
- INFOGRAPHICS
  - ENSURE THE MESSAGE IS CLEAR AND IS NOT MISLEADING TO THE READER



EFFECTIVE VISUALISATIONS

- MISSING LABELS

COMMON TO MISS AN AXIS OR TITLE LABEL, THIS FORCES READER TO MAKE ASSUMPTIONS



EFFECTIVE VISUALISATIONS

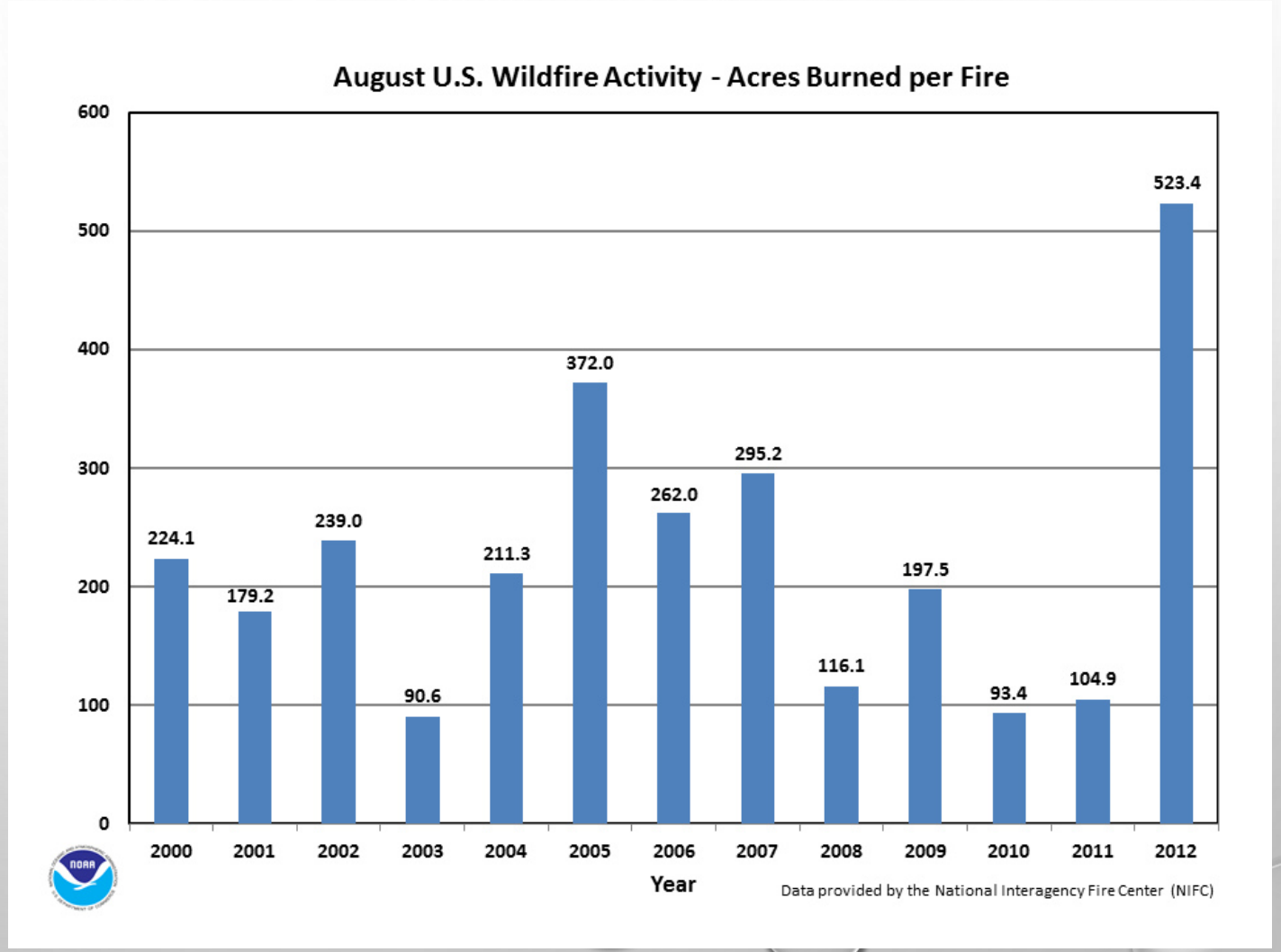
- SELECTING THE OPTIMAL CHART FOR CONVEYING A MESSAGE IS CRITICAL
  - DISCRETE OR CONTINUOUS?
  - COMPARE MORE THAN ONE VARIABLE?
  - SHOW DEPENDENT STEPS OR PATTERNS?
  - BAR/COLUMN, LINE, COMBINATION, GANTT, HEAT MAP AND 100% STACKED CHART.

EFFECTIVE VISUALISATIONS

- WHICH CHART?
  - DO YOU WANT TO COMPARE VALUES?: COMPARING ONE OR MANY VALUE SETS, THESE EASILY SHOW YOU LOW AND HIGH VALUES. COLUMN, BAR, LINE, SCATTER PLOT
  - DO YOU WANT TO SHOW THE COMPOSITION OF SOMETHING?: SHOW HOW INDIVIDUAL PARTS MAKE UP THE WHOLE OF SOMETHING. PIE, STACKED BAR, STACKED COLUMN, AREA, WATERFALL
  - DO YOU WANT TO SHOW THE DISTRIBUTION OF YOUR DATA?: HELP UNDERSTAND OUTLIERS, NORMAL TENDENCY, RANGE OF VALUES. SCATTER PLOT, LINE, COLUMN, BAR.
  - DO YOU WANT TO BETTER UNDERSTAND THE RELATIONSHIP BETWEEN VALUE SETS?: SHOW HOW ONE VARIABLE RELATES TO ONE OR MANY OTHERS. SCATTER PLOT, BUBBLE, LINE

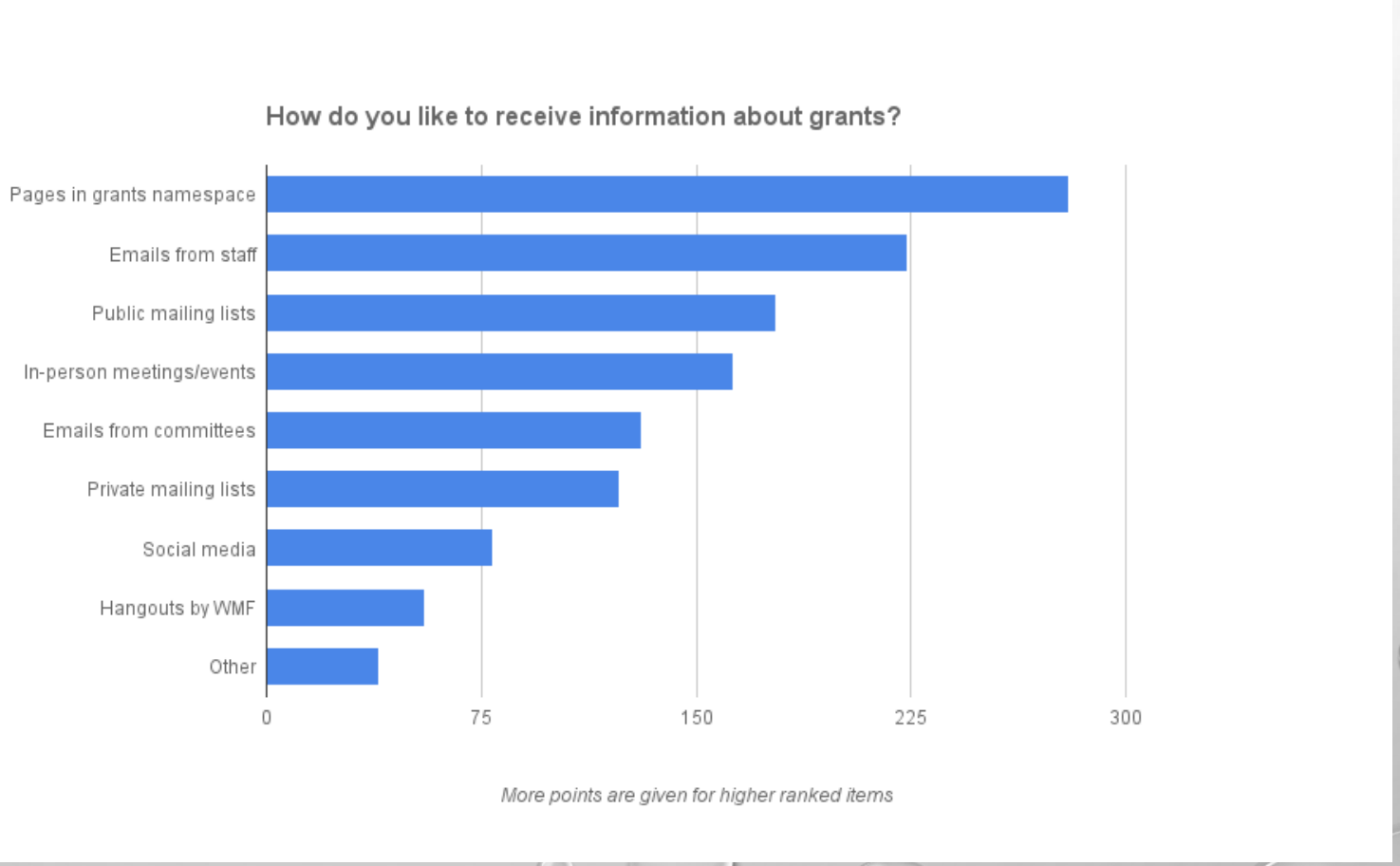
EFFECTIVE VISUALISATIONS

- COLUMN CHART, HAS THE HEIGHT OF EACH BAR SCALED TO ITS VALUE TO ALLOW COMPARISON TO OTHER COLUMNS
- MOST COMMON

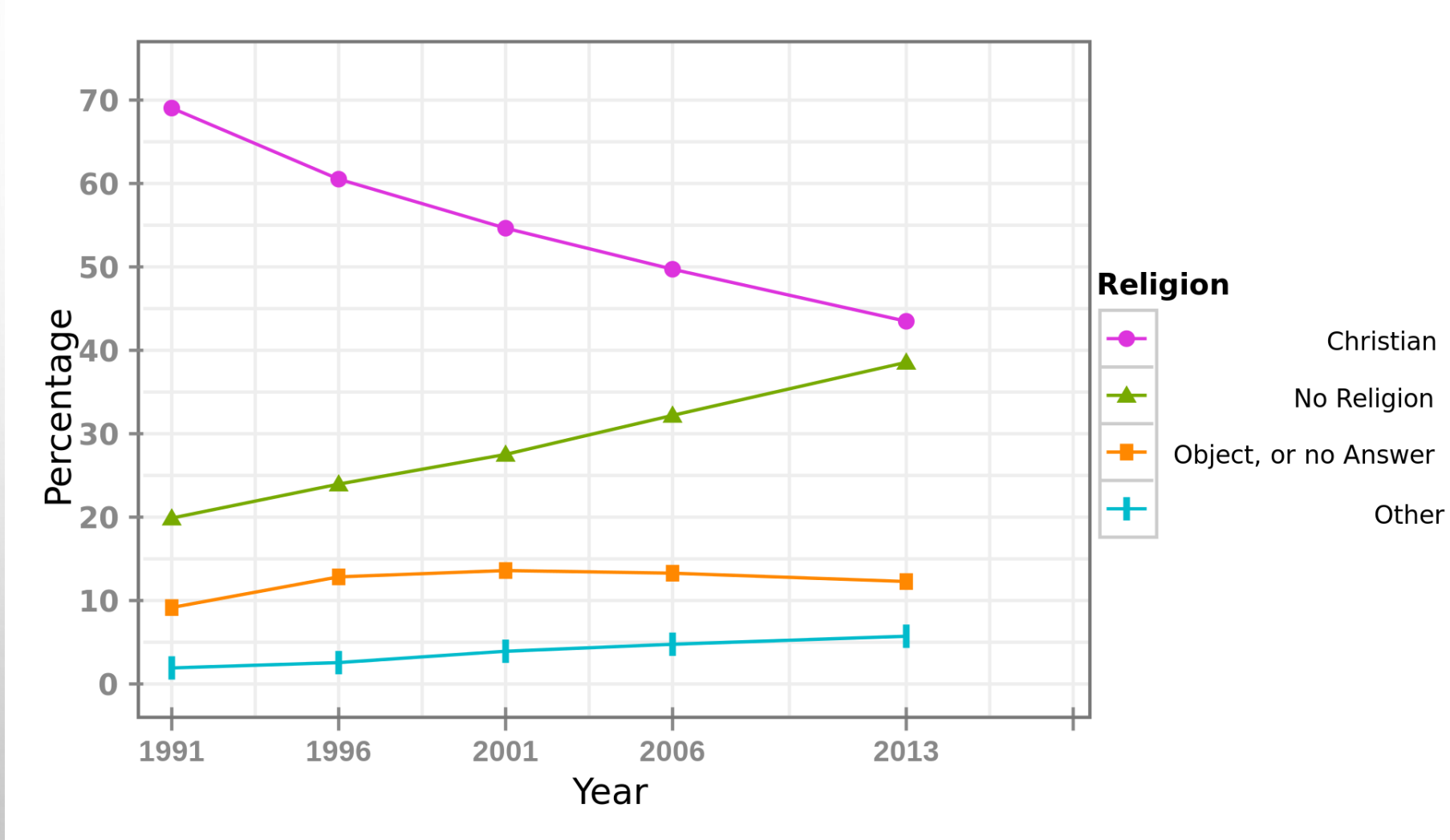


EFFECTIVE VISUALISATIONS

- BAR CHART SHOWS EACH BAR HORIZONTALLY, EACH BAR IS SCALED TO ITS VALUE

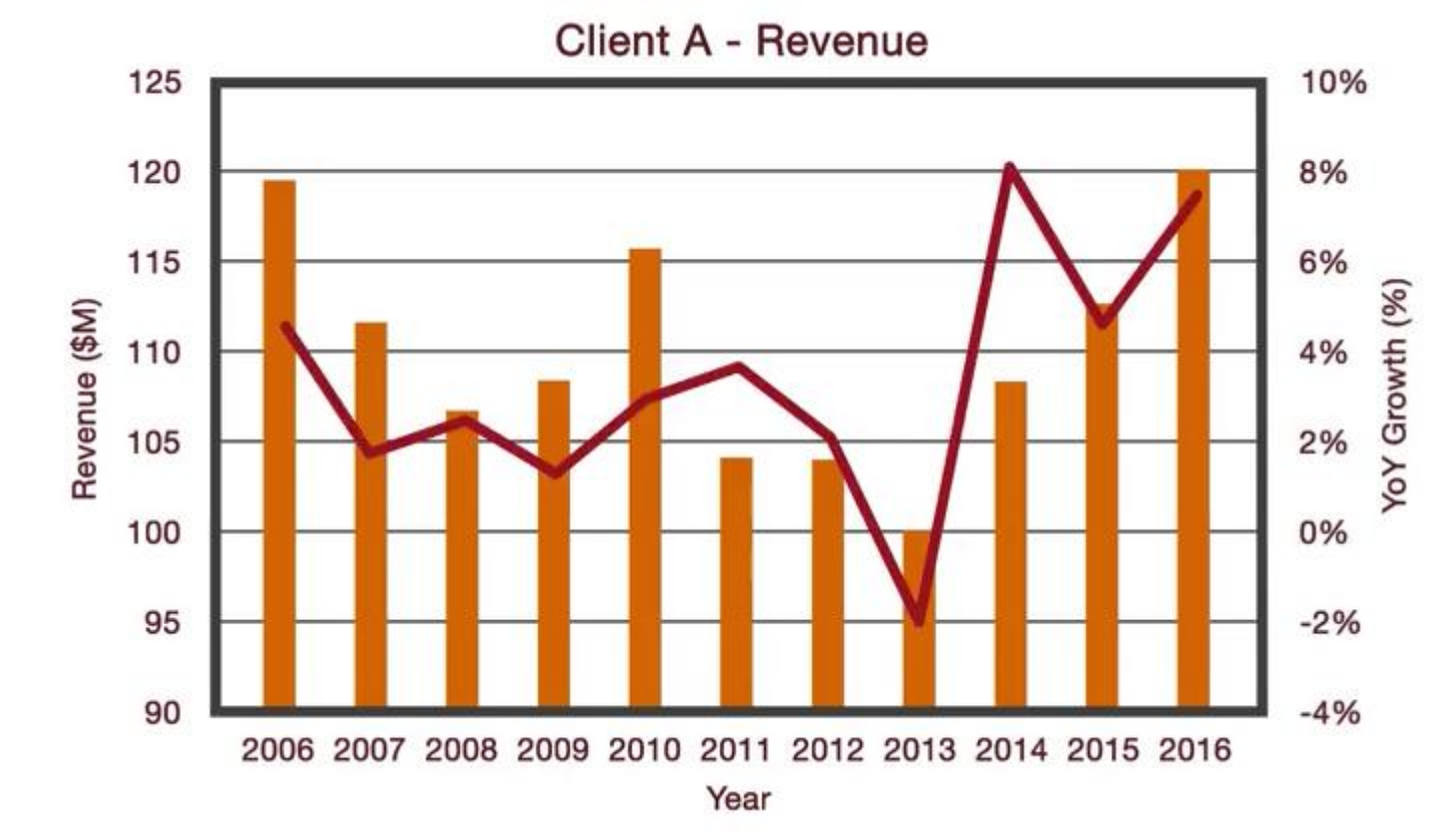


- LINE CHART


70
60
50
40
30
20
10
0
Percentage
1991
1996
2001
2006
2013
Year
Religion
Christian
No Religion
Object, or no Answer
Other

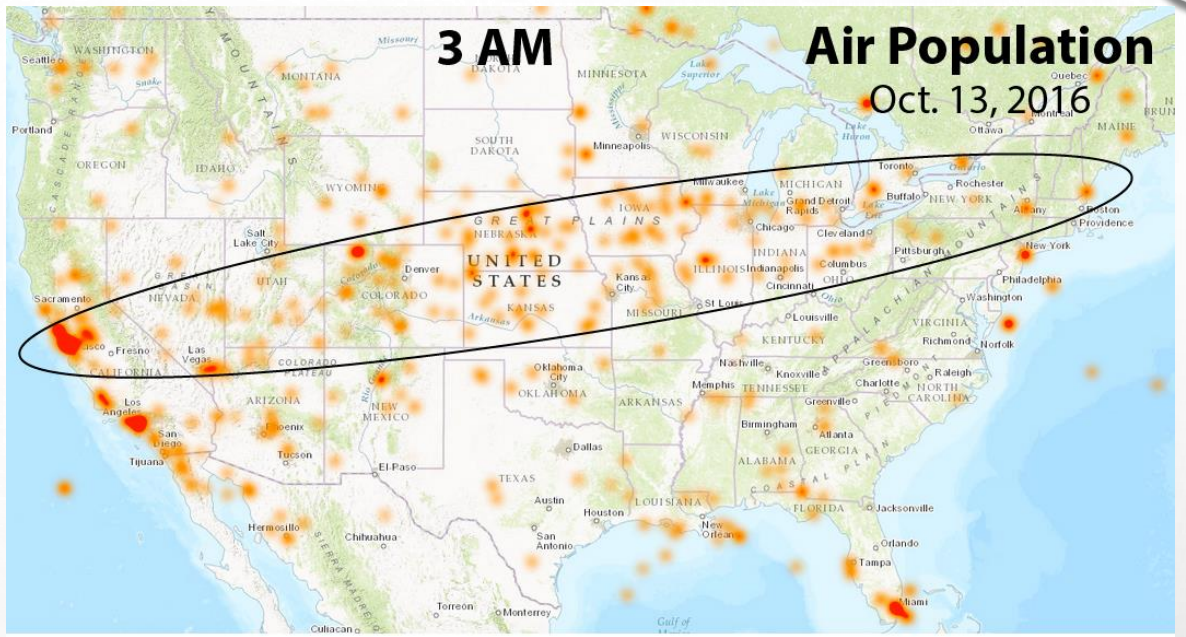
EFFECTIVE VISUALISATIONS

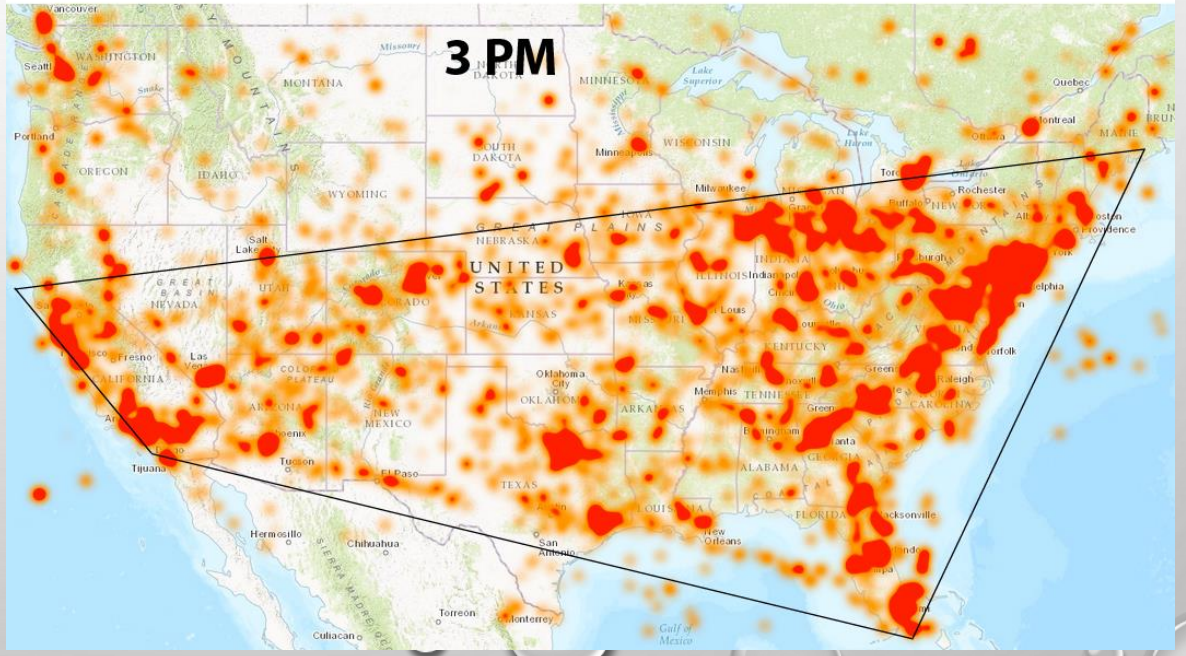
- COMBINATION LINE AND BAR CHART SHOWS HOW TWO VARIABLES RELATE TO EACH OTHER
- USEFUL FOR MULTIPLE SERIES OF DATA IN ONE VISUALISATION



EFFECTIVE VISUALISATIONS

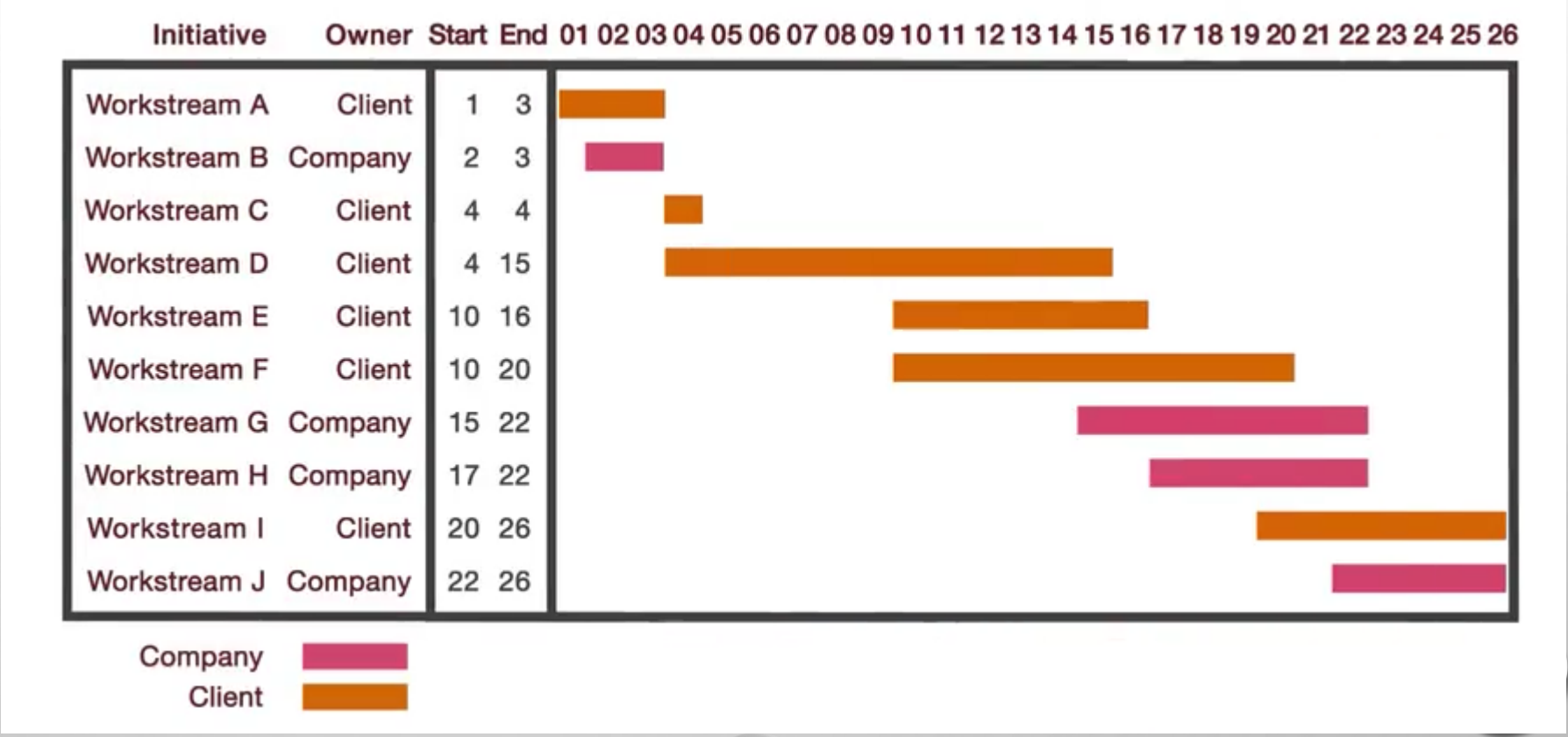
- HEAT MAP ENCODES VALUES AS COLOURS ALLOWING FOR PATTERNS TO BE IDENTIFIED MORE EASILY.





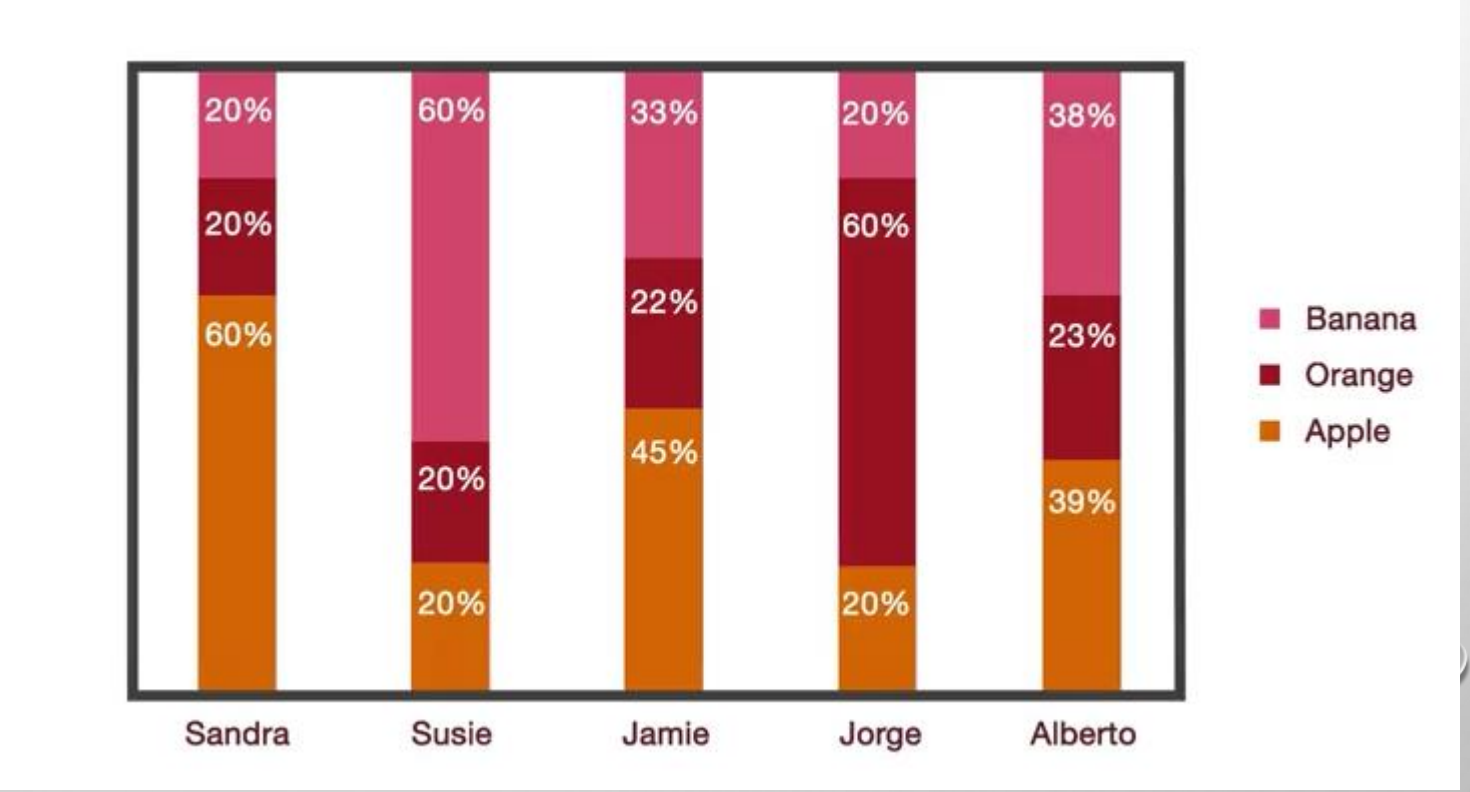
EFFECTIVE VISUALISATIONS

- A GANTT CHART HELPS VISUALIZE RELATED TIMELINES, THEY ARE COMMON IN BUSINESS THOUGH OFTEN POORLY IMPLEMENTED.



EFFECTIVE VISUALISATIONS

- 100% STACKED CHART DISPLAYS RELATIVE PROPORTIONS OF MULTIPLE VARIABLES' CONTRIBUTIONS TO A VALUE.



RESOURCES

- HTTPS://VISUAL.LY/PRODUCT/INFOGRAPHIC-DESIGN
- HTTP://WWW.RHYTHM-OF-FOOD.NET/#FOOD-TRENDS
- HTTP://WWW.INFORMATIONISBEAUTIFUL.NET/VISUALIZATIONS/TOP-500-PASSWORDS-VISUALIZED/
- HTTPS://VIMEO.COM/121462010
- HTTP://WWW.WORLDOMETERS.INFO/WORLD-POPULATION/
- HTTP://ONEMILLIONTWEETMAP.COM/HTTP://FLOWINGDATA.COM/
- HTTP://FLOWINGDATA.COM/2015/12/15/A-DAY-IN-THE-LIFE-OF-AMERICANS/
- HTTP://MFVIZ.COM/TRIANGULATE/HTTPS://WWW.SIGNS.COM/BRANDED-IN-MEMORY/
- HTTPS://KAGGLE.COM/DATASETS