

COURSE:
**DATA
VISUALIZATION
FOR REPORTS
AND PRESENTATIONS**

LET'S START! 



COURSE:
**DATA
VISUALIZATION
FOR REPORTS
AND PRESENTATIONS**

MODULE 1

INTRODUCTION



Objectives



To get acquainted with:

- The **concept** of Data Visualization
- The **purposes** of Data Visualization
- The **basic principles** of Data Visualization
- The **limitations** of Data Visualization

1 COURSE: DATA VISUALIZATION FOR REPORTS AND PRESENTATIONS

2 COURSE: DATA VISUALIZATION FOR REPORTS AND PRESENTATIONS

3 Objectives: To get acquainted with: The structure of the course, The purpose of Data Visualization, The basic principles of Data Visualization, The limitations of Data Visualization.

4 Vision: Passion, Sharing, Clarity, Utility, LOVING VISUALS, Creativity, Fun.

5 Scope: Network diagram showing interconnected concepts like Data, Design, and Communication.

6 Comparison between MLC and Data Visualization (Distance).

7 Course Structure: A table listing course modules and their durations.

8 COURSE: DATA VISUALIZATION FOR REPORTS AND PRESENTATIONS

9 COURSE: DATA VISUALIZATION FOR REPORTS AND PRESENTATIONS

10 What is Data Visualization? To communicate concepts using visual resources instead of only text.

11 Purposes of Datarviz: Transparency (water bottles).

12 Purposes of Datarviz: Visibility (woman in white).

13 Purposes of Datarviz: Facilitates analysis (woman with glasses).

14 Theory of change: A flowchart showing the relationship between Vision, Strategy, and Implementation.

15 COURSE: DATA VISUALIZATION FOR REPORTS AND PRESENTATIONS

16 COURSE: DATA VISUALIZATION FOR REPORTS AND PRESENTATIONS

17 Human Ingredients: A grid of numbers representing human factors.

18 Digital Ingredients: A background of blue digital data points.

19 Musical Ingredients: A musical staff with notes.

20 Ingredients of Datarviz: Pre-Attentive features (eye and brain).

21 Pre-Attentive Features: Form, Texture, Position.

22 Pre-Attentive Features: Form, Texture, Position.

23 Personalization: A diagram showing the 'GESALT' principle.

24 Icons: A set of icons representing various data visualization elements.

25 Analysis Patterns: A diagram showing various data visualization patterns.

26 Conclusion about Data Visualization: Our brain finds meaning decoding analog patterns (Height, wider, closer, longer, forms). Communication is more important than text.

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28 COURSE: DATA VISUALIZATION FOR REPORTS AND PRESENTATIONS

29 Visual test: Pink elephant.

30 Visual test: A purple alien-like creature.

31 Visual words: Small.

32 Visual words: Red Yellow Blue Green.

33 Visual words: Red Yellow Blue Green.

34 Visual words: South, North, East, West.

35 Visual words: Down, Right, Left, Up.

36 Visual words: A diagram showing a flowchart.

37 Visual words: ABCDE, FGH, IJK, LMN, OPQ, RST, UVW, XYZ.

38 Visual words: You will read this first. Add what you will read first.

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40 COURSE: DATA VISUALIZATION FOR REPORTS AND PRESENTATIONS

41 Data or Information Visualization: A diagram showing the flow from Data to Information.

42 Data or Information Visualization: A diagram showing the flow from Data to Information.

43 Dimensions: A diagram showing the dimensions of data visualization.

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45 COURSE: DATA VISUALIZATION FOR REPORTS AND PRESENTATIONS

46 COURSE: DATA VISUALIZATION FOR REPORTS AND PRESENTATIONS

47 Datarviz Principles: Truthfulness, Accuracy, Clarity, Useful, Aesthetic, Customized.

48 Datarviz Principles: Truthfulness.

49 Datarviz Principles: Accuracy.

50 Datarviz Principles: Clarity.

51 Datarviz Principles: Useful.

52 Datarviz Principles: Aesthetic.

53 Datarviz Principles: Customized.

54 Datarviz Principles: Truthfulness, Accuracy, Clarity, Useful, Aesthetic, Customized.

55 What makes Good Information design? A diagram showing the components of good information design.

56 Datarviz Indicators: Information.

57 Datarviz Indicators: Information.

58 Datarviz Indicators: Information.

59 Datarviz Indicators: Information.

60 Data or Information Visualization: A diagram showing the flow from Data to Information.

61 Datarviz Indicators: Information.

62 Definition: "Graphical excellence is that which gives the viewer the greatest number of ideas in the shortest time with the least ink in the smallest space."

63 Good Datarviz: Remove anything that is removable. Each visual resource (color, form) has a purpose.

64 Good Datarviz: Perfection is reached, not when there is nothing more to add, but when there is nothing left to remove.

65 Content: Content & Target audience.

66 Limitations: Accessibility problems (visually impaired, color-blind, etc.), Some people may dislike it, Alignment with your organization visual branding, It's subjective.

67 Visual inclusiveness: A diagram showing the components of visual inclusiveness.

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69 COURSE: DATA VISUALIZATION FOR REPORTS AND PRESENTATIONS

70 Datarviz formula: Data Visualization = Thinking Visually + Making Visuals.

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WHAT IS
DATA VISUALIZATION



What is Data Visualization?



To communicate **concepts**
using **visual resources**
instead of (only) **text.**

Purposes of Dataviz



Transparency

Purposes of Dataviz



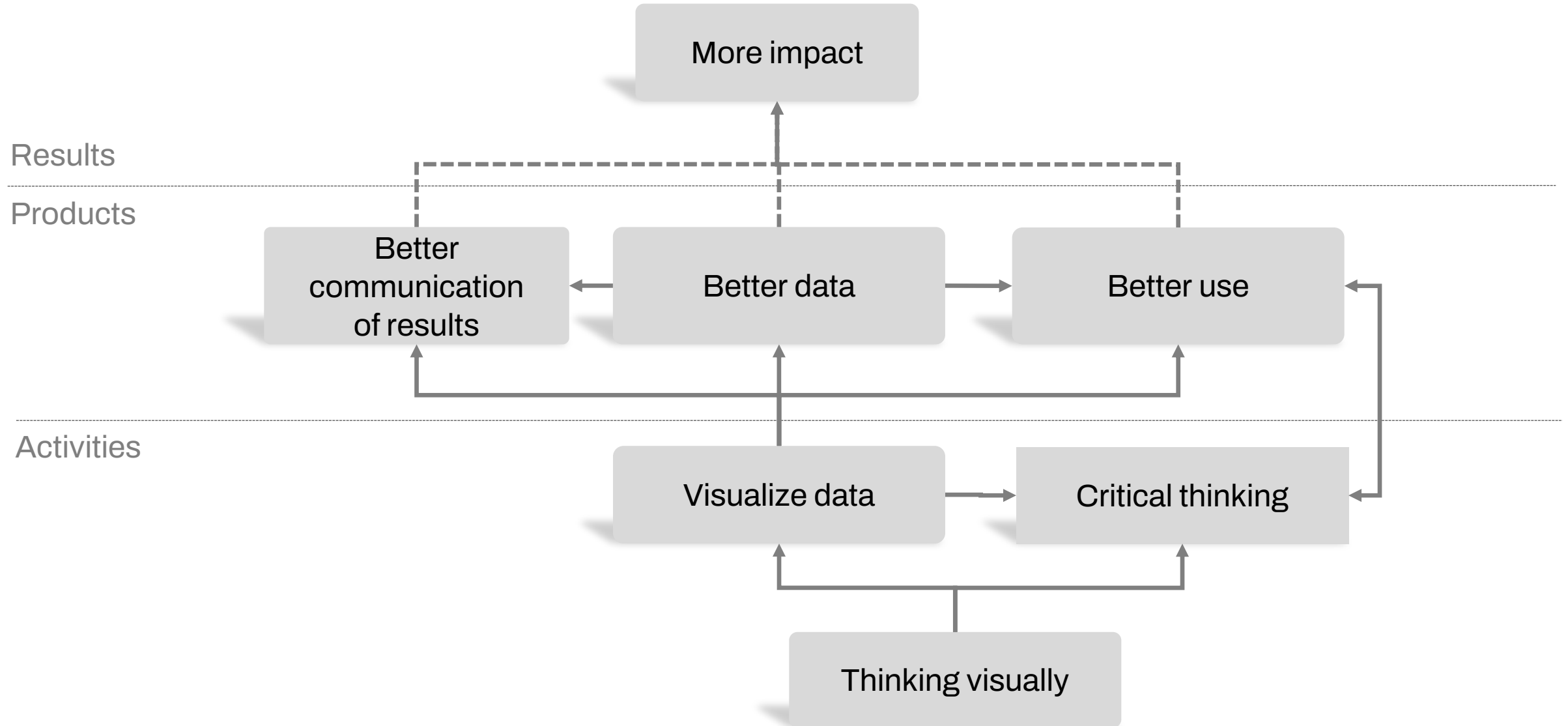
Visibility

Purposes of Dataviz



Facilitates analysis

Theory of change



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COURSE:

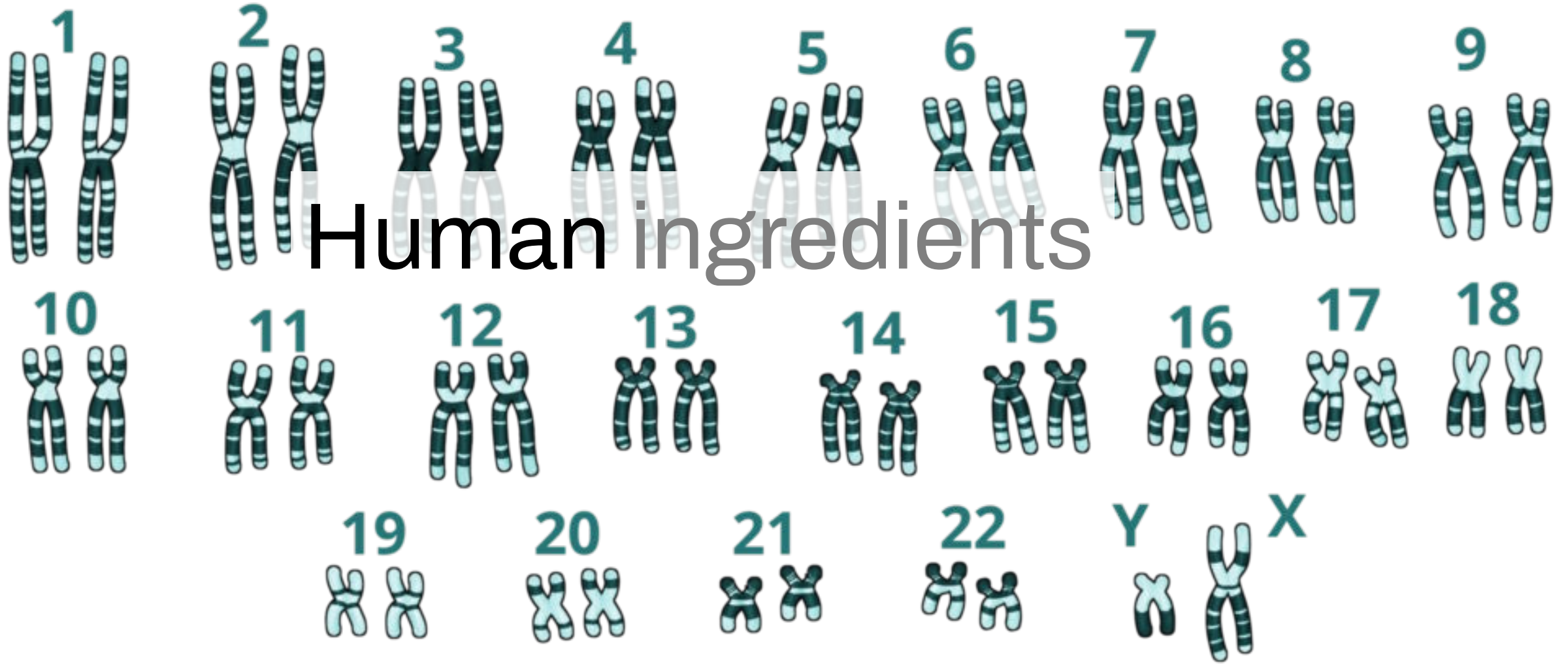
DATA VISUALIZATION FOR REPORTS AND PRESENTATIONS

MODULE 1

INTRODUCTION

"INGREDIENTS"





Human ingredients



Digital ingredients

Trio:

A page of handwritten musical notation on aged paper. The score consists of several staves of music. The top section features a treble clef and a 4/4 time signature. The notation includes various note values, rests, and dynamic markings such as 'f' and 'p'. A large white circle is superimposed on the right side of the page, partially overlapping the musical staves. The paper shows signs of age, including yellowing and some foxing.

**Musical
ingredients**

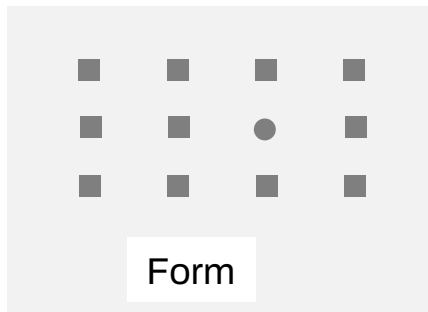
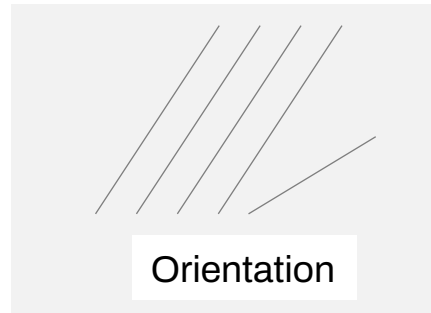
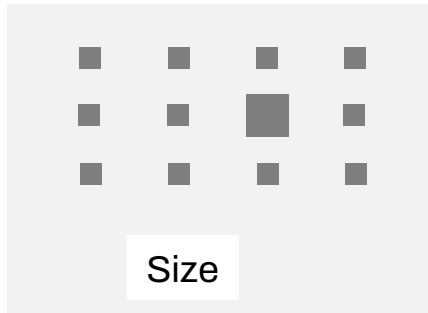
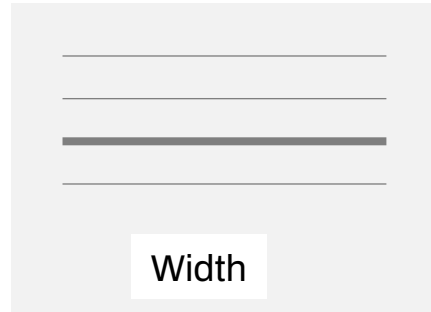
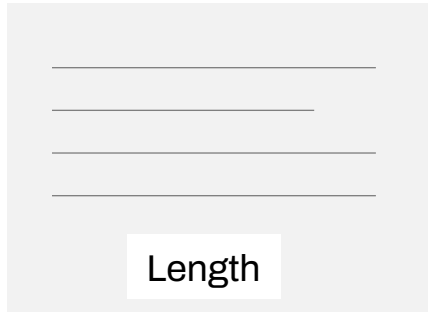
Ingredients of Dataviz



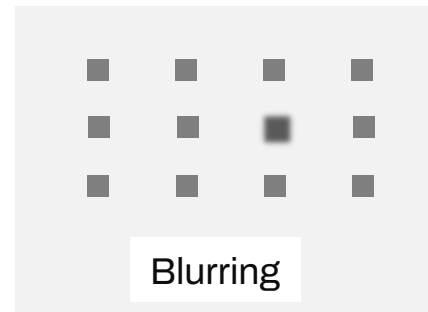
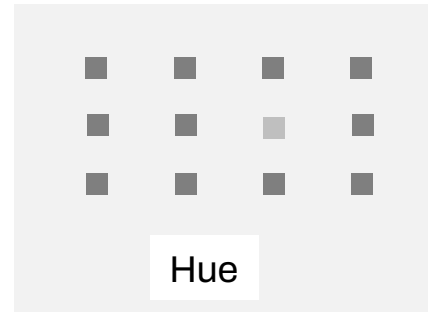
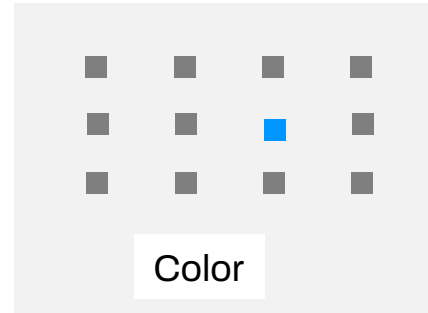
Pre-Attentive features

Pre-Attentive Features

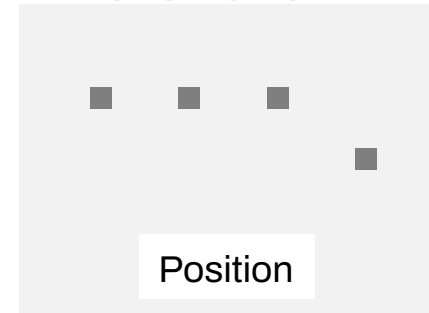
Form



Texture

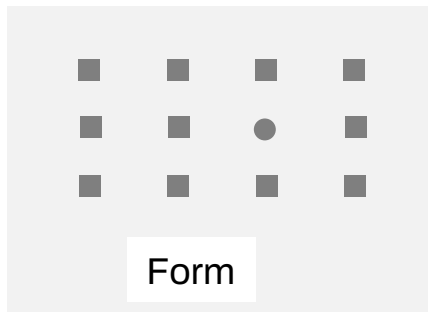
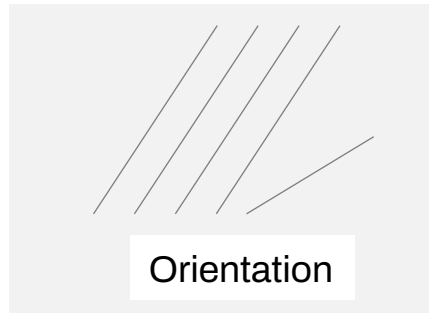
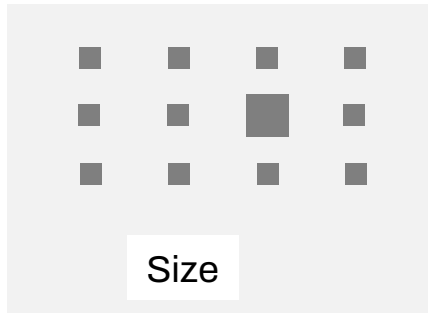
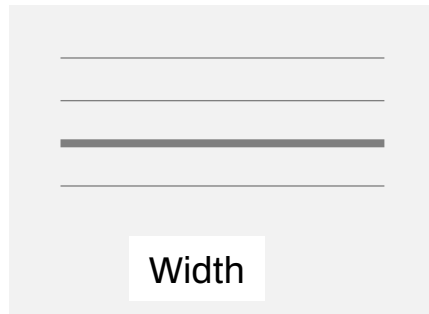
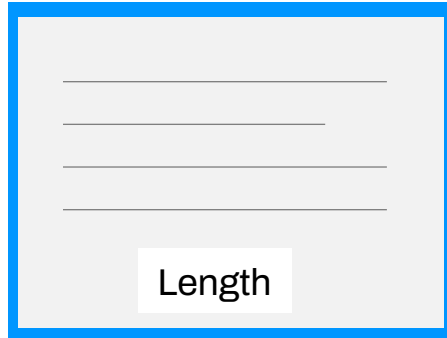


Position

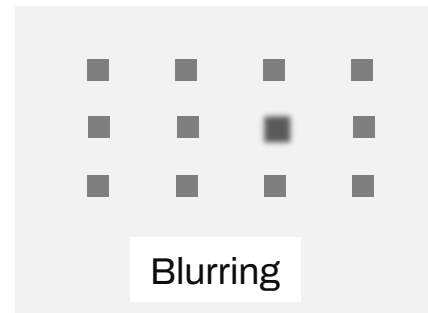
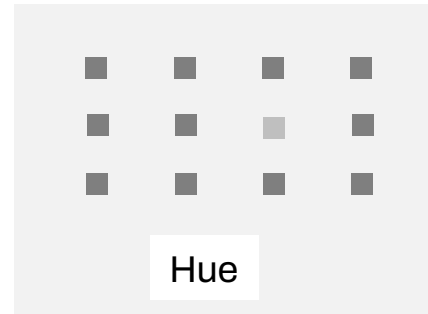
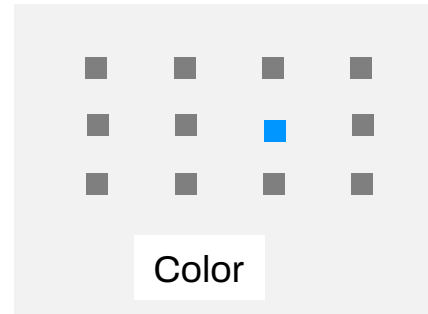


Pre-Attentive Features

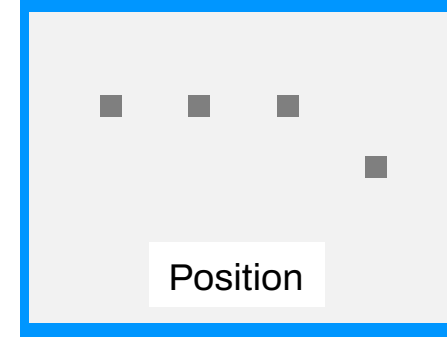
Form



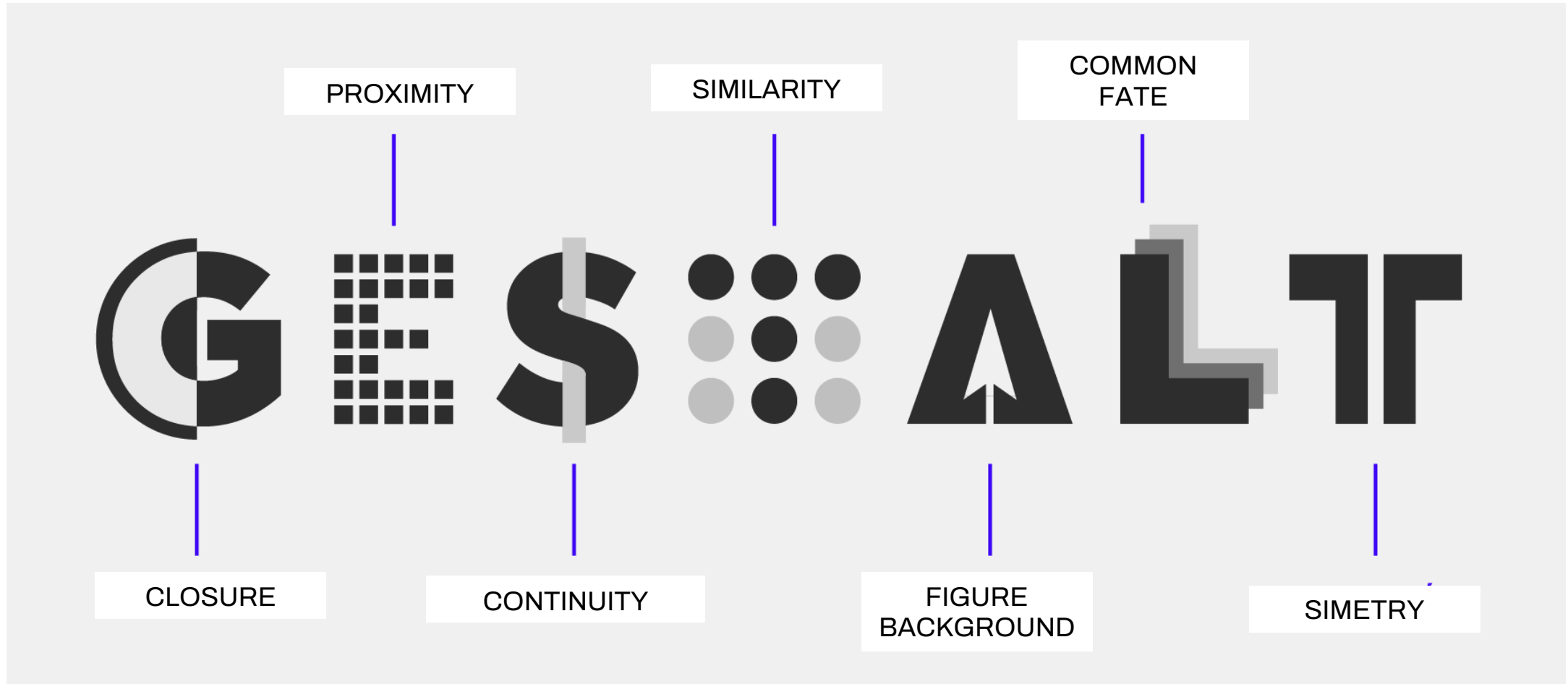
Texture



Position


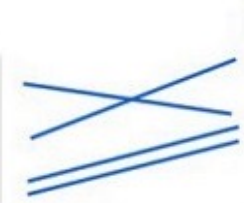
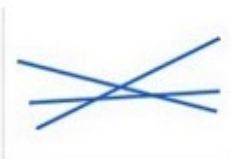






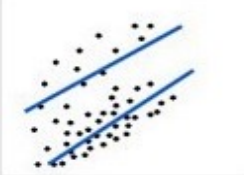

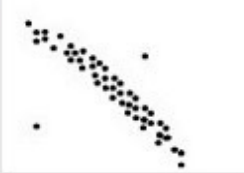


Analytic patterns



<https://imborrable.com/blog/teoria-de-la-gestalt/>

Analytical Patterns

| Pattern | Example | Pattern | Example |
|---|---|-----------------------------------|---|
| High, low and in between |  | Non-intersecting and intersecting |  |
| Going up, going down and remaining flat |  | Symmetrical and skewed |  |
| Steep and gradual |  | Wide and narrow |  |
| Steady and fluctuating |  | Clusters and gaps |  |
| Random and repeating |  | Tightly and loosely distributed |  |
| Straight and curved |  | Normal and abnormal |  |

<https://www.fusioncharts.com/blog/data-visualization-tips-and-tricks-to-turbocharge-your-charts/>

Conclusion about Data Visualization

Our brain sees
**pre-attentive
features**
(size, color,
length, forms)

Our brain finds
meaning decoding
analytical patterns
(higher, wider, closer,
same color...)

Communicates more **efficiently** than **text**

(though not always).

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VISUAL TESTS



Visual test

Pink
elephant

Pink
elephant



Visual test

Little purple
four-armed
and three-legged
monster
of funny appearance
and awakened attitude



Small

Big

Visual tricks

Red Yellow

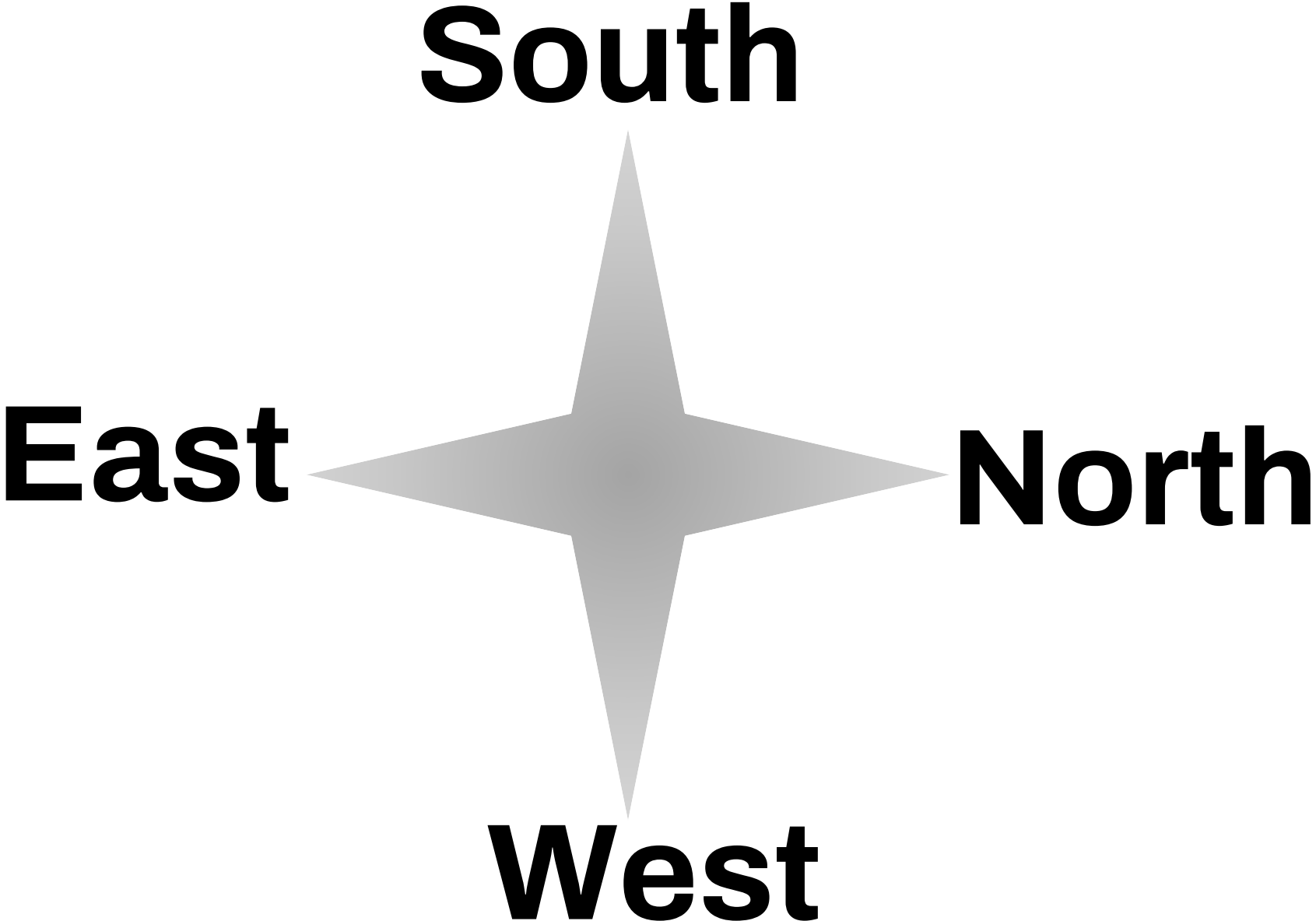
Blue Green

Visual tricks

Red Yellow

Blue Green

Visual tricks



Visual tricks

Down

Right

Left

Up

Visual tricks



Visual tricks



Visual tricks

And you will read this last

**You will read
this first**

And then you will read this

Then this one

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DATA AND
INFORMATION



Data or Information Visualization



Facts.
Raw material.
Non understandable.

Data analyzed.
Understandable.
Comprehensible.

Consequences of
understanding information

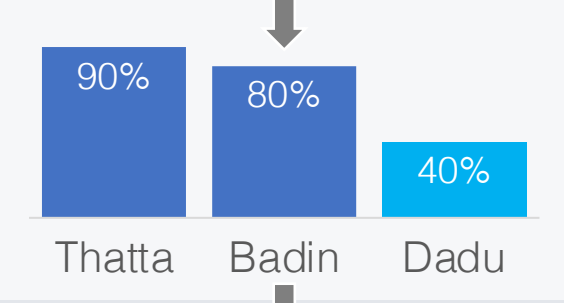
Data or Information Visualization

DATA

QUANTITATIVE

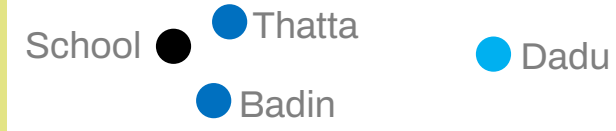
| Nombre | Cotización | Var % | Máx. | Min. | Var % año | Vol. (mill. €) | Capit. (mill. €) | PER | Rent/Div | Hora |
|--------------------|------------|---------|--------|--------|-----------|----------------|------------------|--------|----------|-------|
| 1 ACS | 36,41 | 0,69 % | 36,45 | 36,00 | 7,63 | 14,59 | 11,222 | 11,07 | 5,29 | 17:35 |
| 2 ACERINOX | 8,37 | 1,41 % | 8,37 | 8,26 | -3,42 | 5,89 | 2,260 | 14,44 | 5,91 | 17:35 |
| 3 AENA SA | 165,00 | 0,55 % | 165,15 | 163,70 | 21,55 | 15,11 | 24,750 | 17,78 | 4,44 | 17:35 |
| 4 AMADEUS | 67,06 | 1,12 % | 67,06 | 66,08 | 10,22 | 27,28 | 28,370 | 24,29 | 1,87 | 17:35 |
| 5 ACCIONA | 91,60 | -0,81 % | 92,65 | 91,30 | 23,95 | 3,41 | 4,988 | 17,77 | 3,94 | 17:35 |
| 6 BBVA | 4,89 | -0,02 % | 4,93 | 4,84 | 5,38 | 67,31 | 32,342 | 7,34 | 5,41 | 17:35 |
| 7 BANKIA | 1,78 | 0,88 % | 1,79 | 1,75 | -30,57 | 11,73 | 5,422 | 8,42 | 7,26 | 17:35 |
| 8 BANKINTER | 6,29 | -0,22 % | 6,35 | 6,26 | -10,40 | 11,83 | 5,649 | 10,52 | 4,78 | 17:35 |
| 9 CAIXABANK | 2,55 | 0,35 % | 2,57 | 2,53 | -19,50 | 28,09 | 15,227 | 8,13 | 5,71 | 17:35 |
| 10 CELLNEX TELE... | 38,84 | 1,52 % | 39,21 | 38,11 | 73,47 | 40,53 | 14,958 | 339,33 | 0,23 | 17:35 |
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| 12 COLONIAL | 11,42 | 0,09 % | 11,46 | 11,37 | 40,38 | 4,36 | 5,802 | 40,63 | 1,90 | 17:35 |
| 13 ENDESA | 23,91 | -0,54 % | 24,09 | 23,86 | 18,78 | 11,92 | 25,315 | 16,68 | 6,03 | 17:35 |
| 14 ENAGAS | 20,87 | -0,86 % | 21,21 | 20,83 | -11,61 | 18,83 | 4,972 | 11,76 | 7,68 | 17:35 |

| | | |
|-------|------|--------|
| Badin | Dadu | Thatta |
| 80% | 40% | 90% |



School performance in Dadu needs to improve

QUALITATIVE



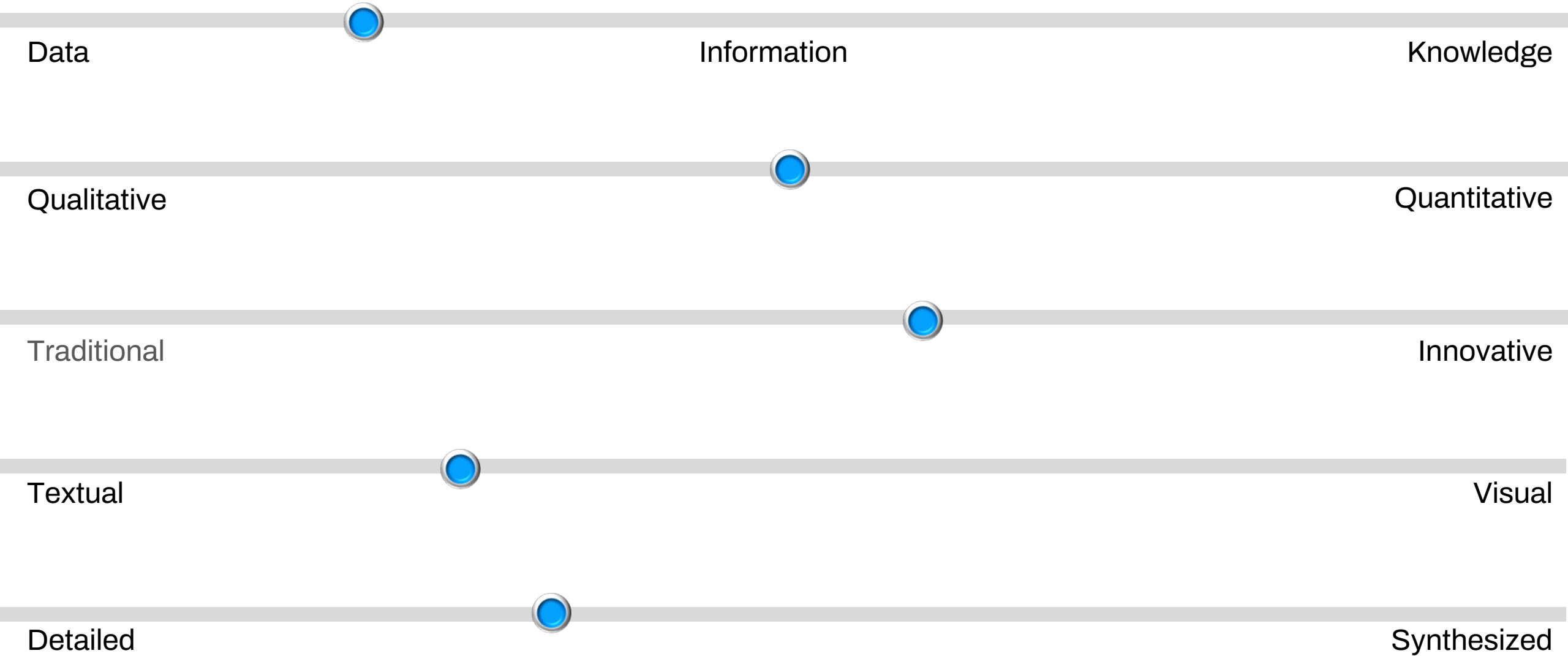
Students from Dadu live in a remote area with accessibility challenges

Dadu needs special actions to overcome the challenges

INFORMATION

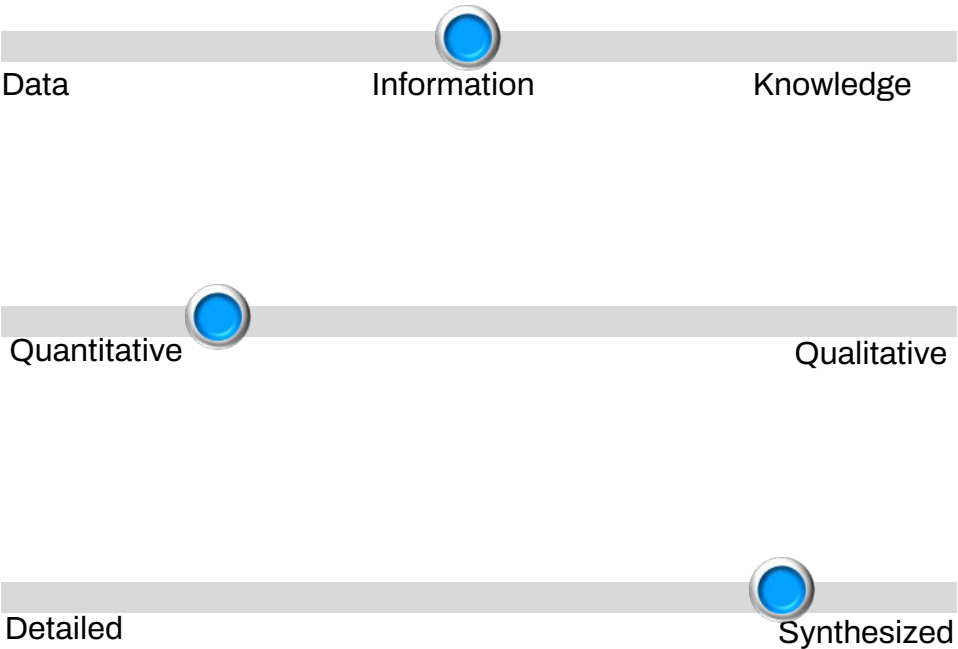
KNOWLEDGE

Dimensions

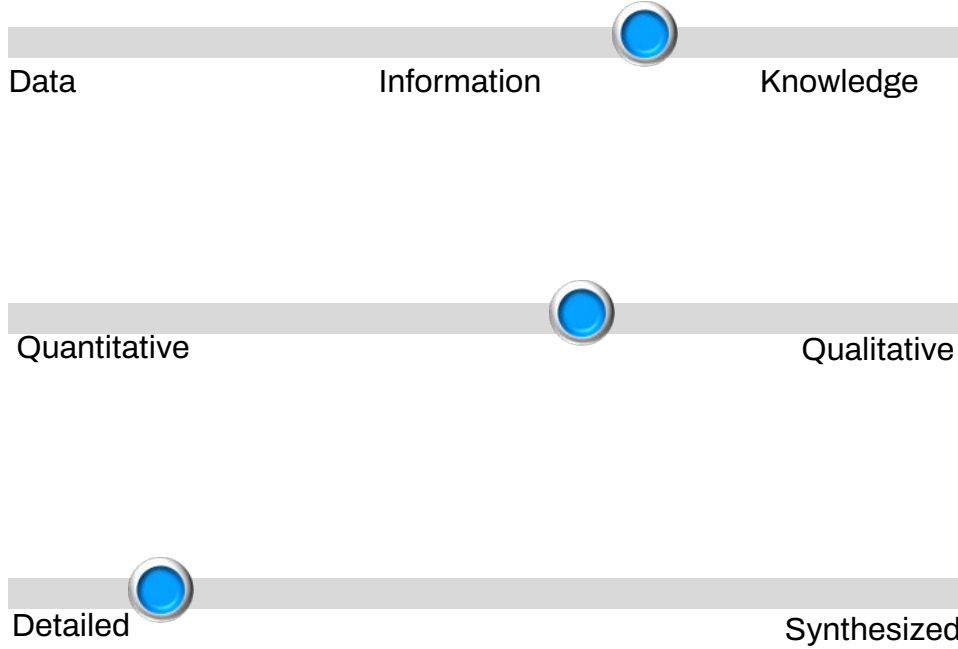


Dimensions

Dashboard



Reports



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PRINCIPLES
AND INDICATORS



Dataviz Principles



Truthfulness



Accuracy



Clarity



Useful



Aesthetic

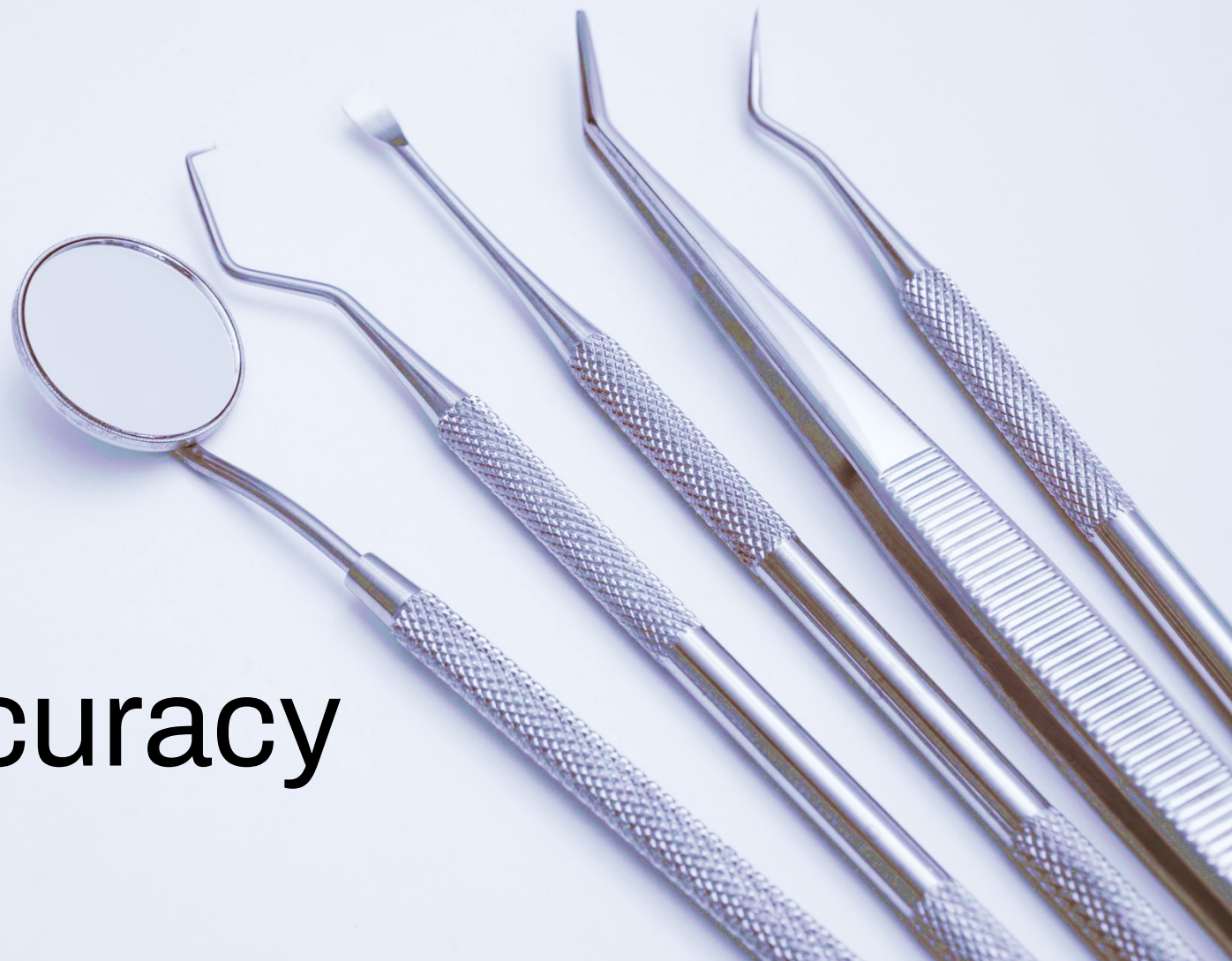


Customized

Dataviz Principles

Truthfulness

Dataviz Principles



Accuracy

Dataviz Principles

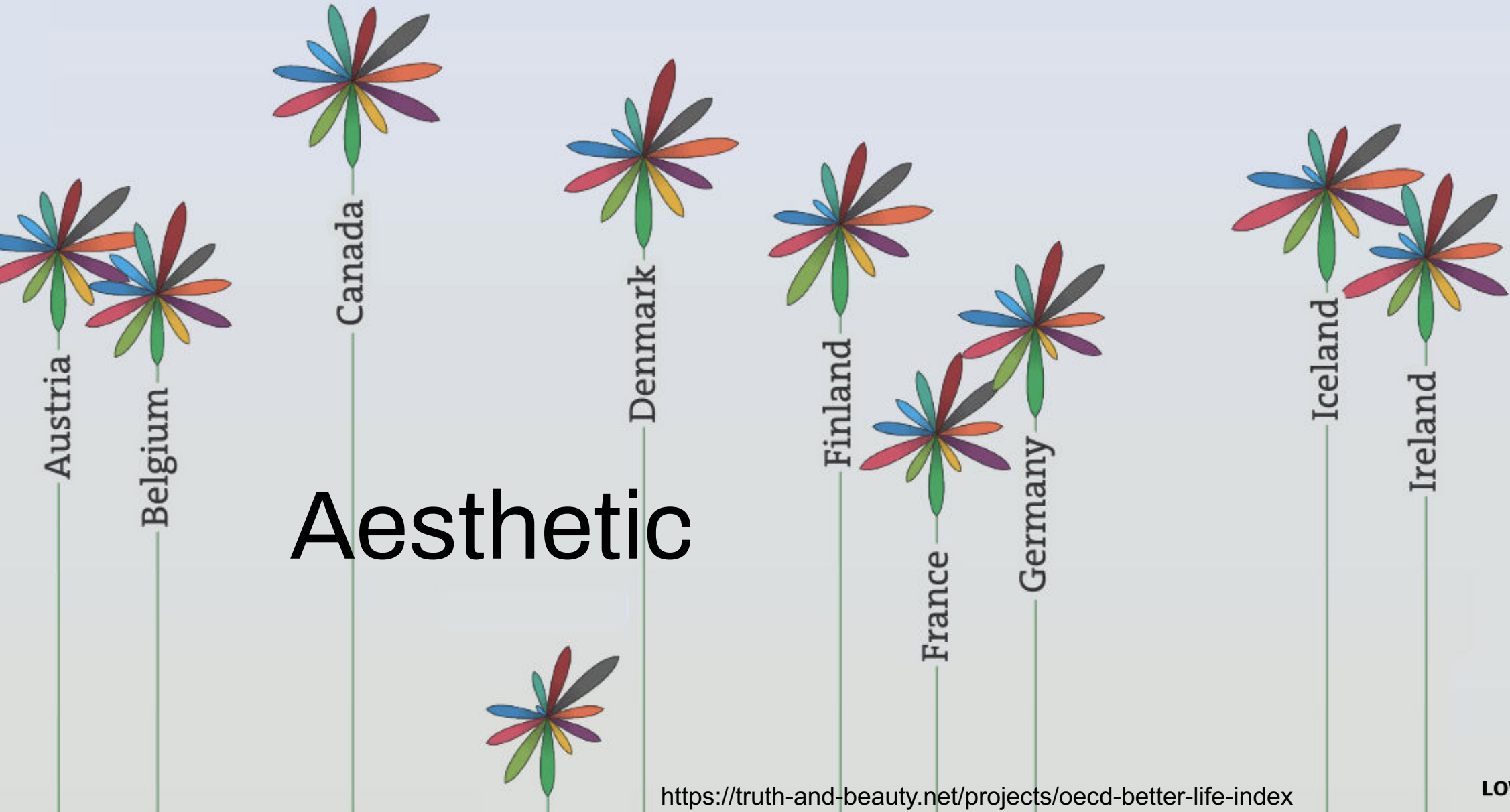
An underwater photograph of a swimming pool. The water is clear and blue. Lane lines are visible on the pool floor and ceiling. The word "Clarity" is written in white text in the center of the image.

Clarity

Dataviz Principles

Useful

Dataviz Principles



Aesthetic

Dataviz Principles



Customized

Dataviz Principles



Truthfulness



Accuracy



Clarity



Useful



Aesthetic

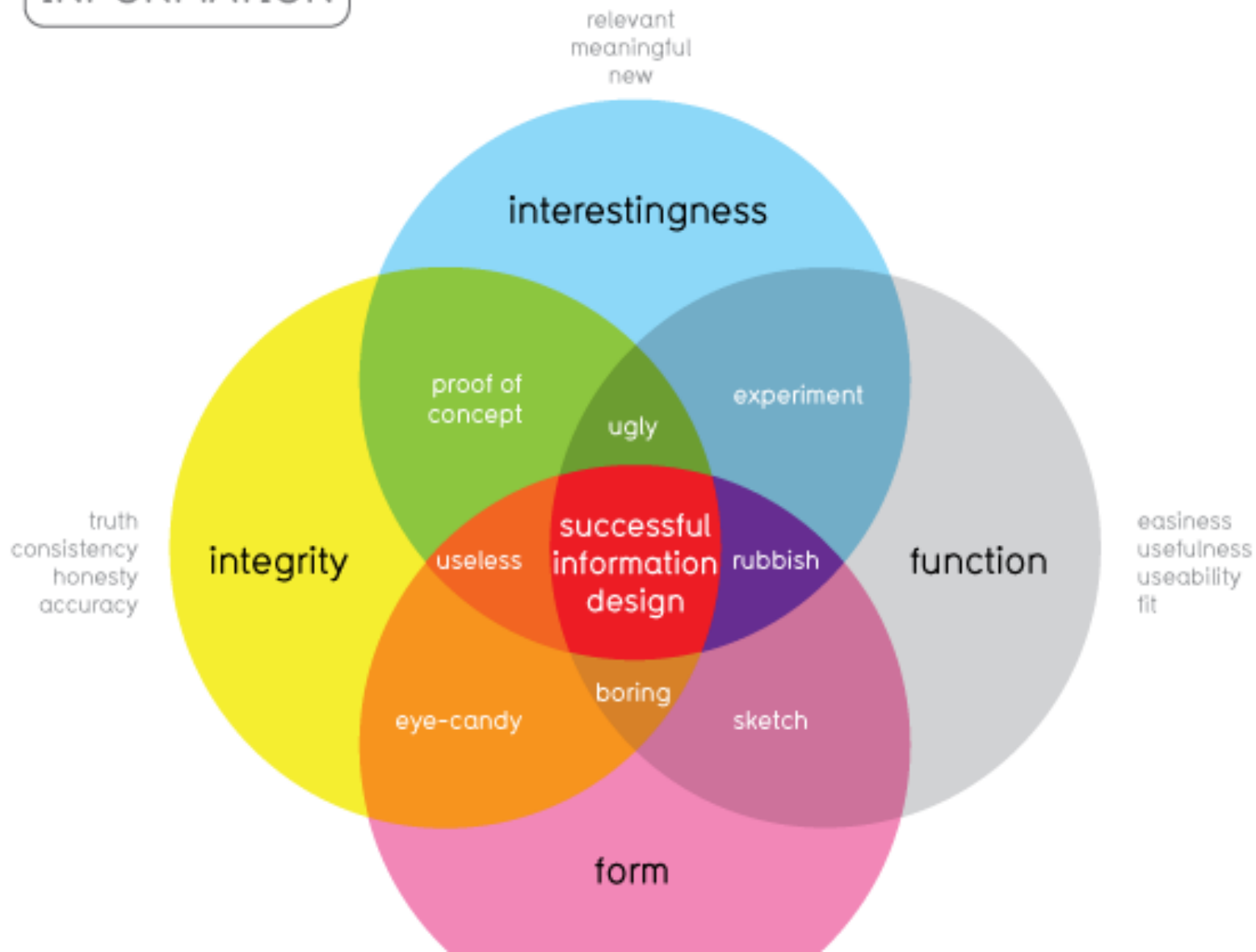


Customized

What Makes Good Information Design?

David McCandless // v1.0 // Nov 09
InformationIsBeautiful.net

INFORMATION

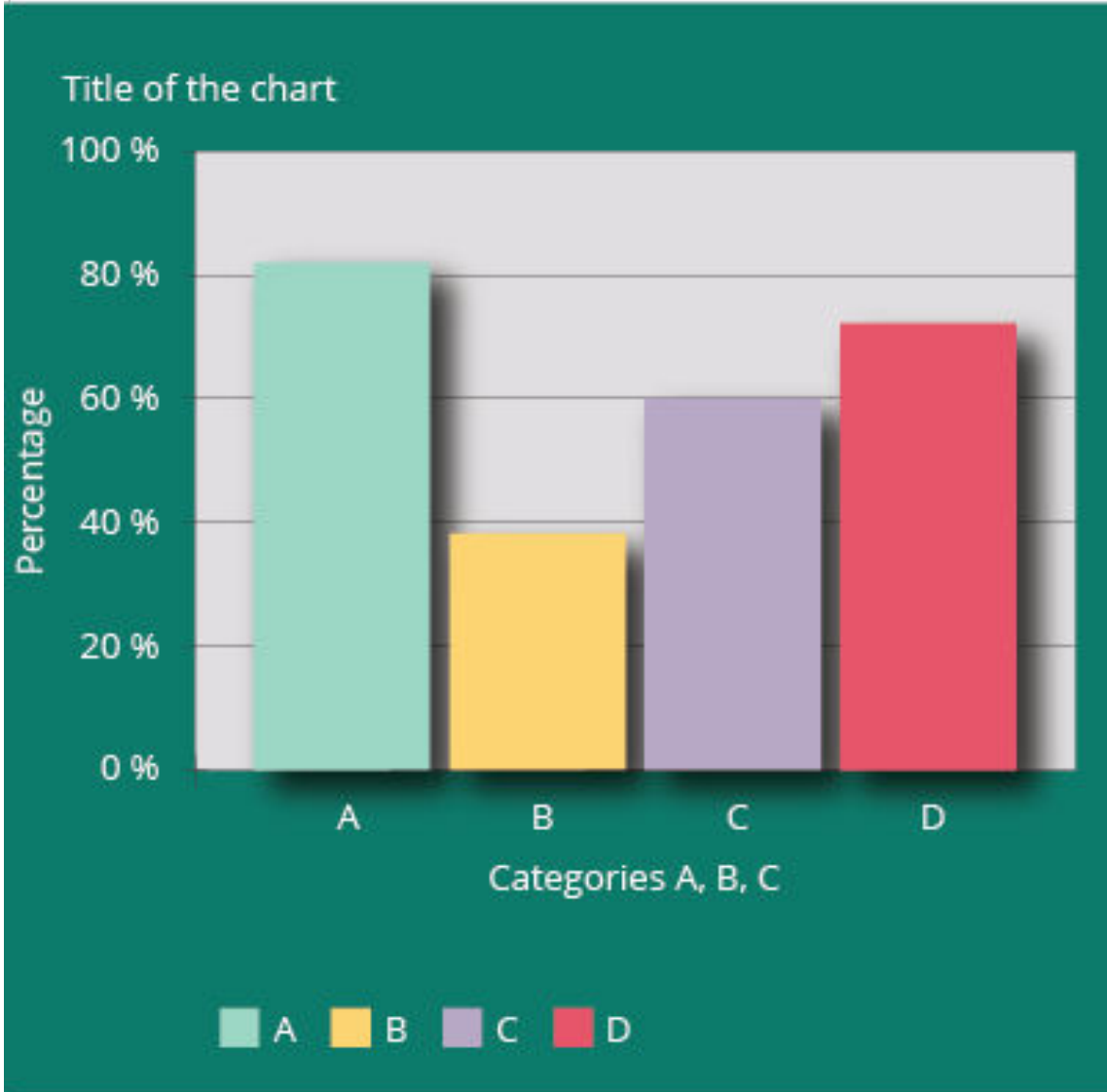


Dataviz Indicators

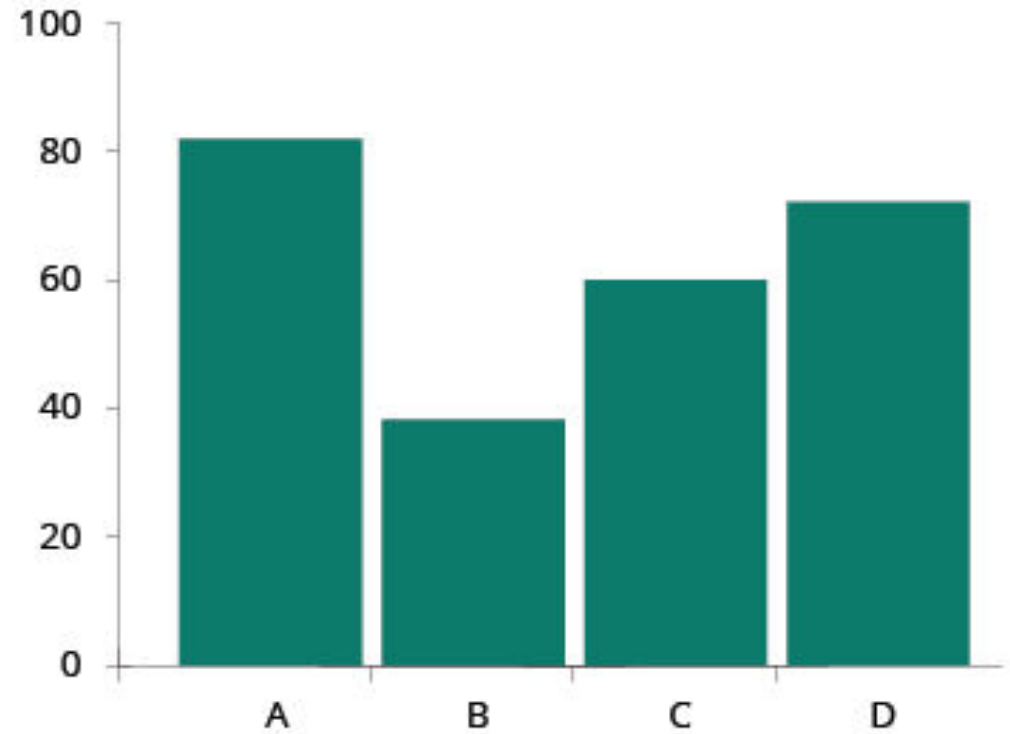
Elaboration

$$\text{Ratio 1} = \frac{\text{Information}}{\text{Ink}}$$

Dataviz Indicators



Title of the chart
Percentage



Dataviz Indicators

Elaboration

$$\text{Ratio 1} = \frac{\text{Information}}{\text{Ink}}$$

$$\text{Ratio 2} = \frac{\text{Information}}{\text{Space}}$$

European asylum seeker application decisions

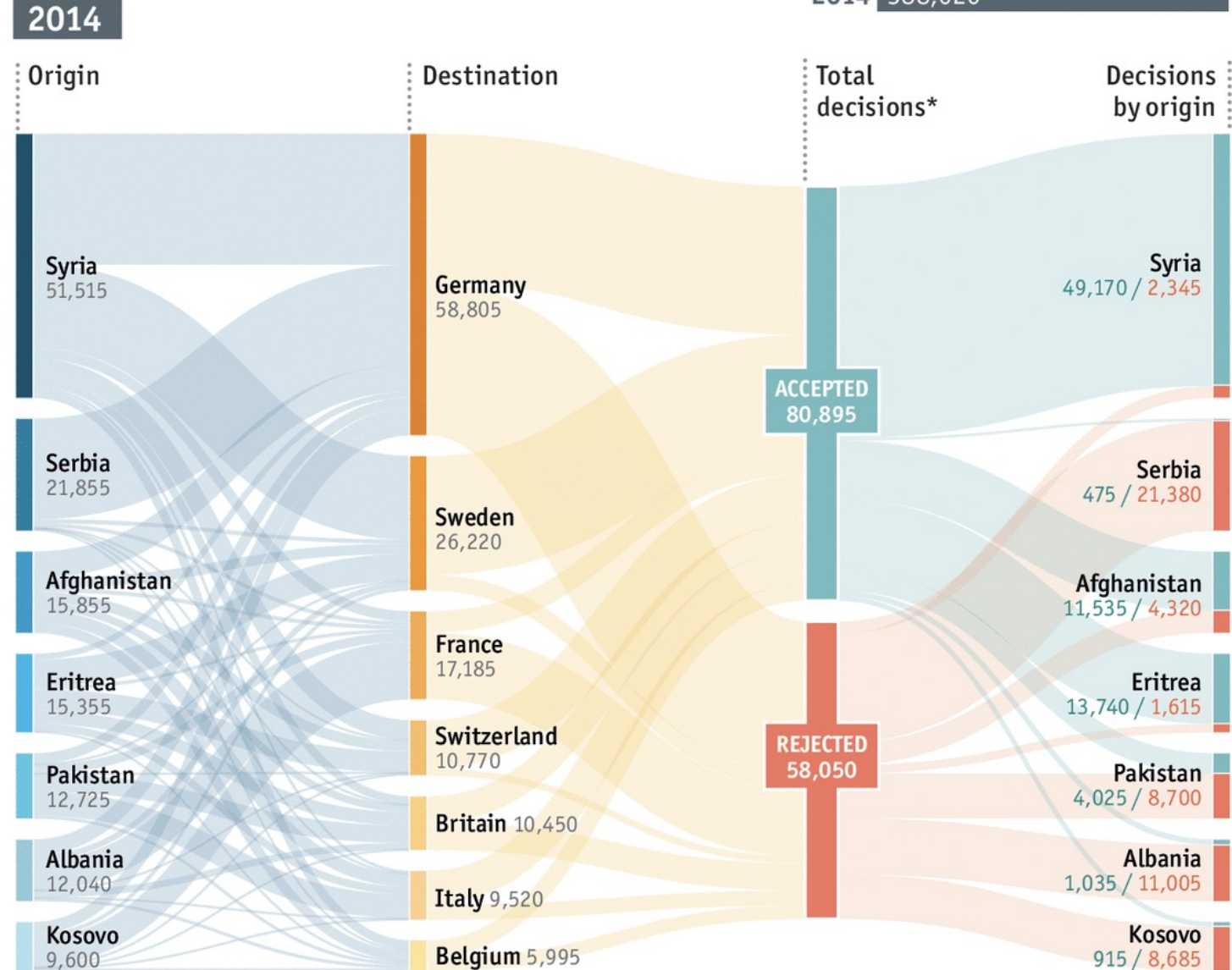
Main origin and destination countries

<https://datavizproject.com/data-type/alluvial-diagram/>

Total asylum decisions

2012 316,625

2014 388,620



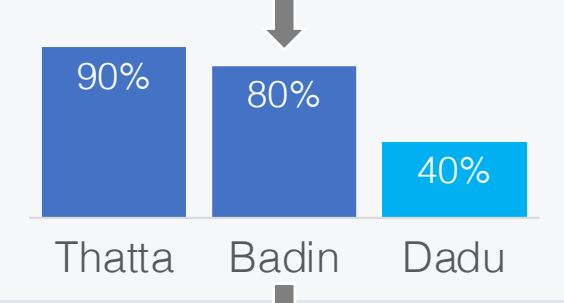
Data or Information Visualization

DATA

QUANTITATIVE

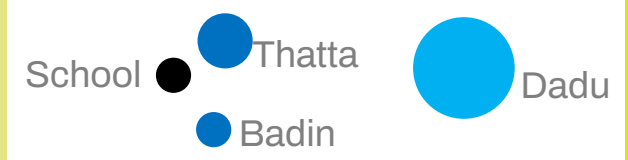
| Nombre | Cotización | Var % | Máx. | Min. | Var % año | Vol. (mill. €) | Capit. (mill. €) | PER | Rent/Div | Hora |
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| 8 BANKINTER | 6,29 | -0,22 % | 6,35 | 6,26 | -10,40 | 11,83 | 5,649 | 10,52 | 4,78 | 17:35 |
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| | | |
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| Badin | Dadu | Thatta |
| 80% | 40% | 90% |



School performance in Dadu needs to improve

QUALITATIVE



Students from Dadu live in a remote area with accessibility challenges

Dadu needs special actions to overcome the challenges

INFORMATION

KNOWLEDGE

Dataviz Indicators

Elaboration

$$\text{Ratio 1} = \frac{\text{Information}}{\text{Ink}}$$

$$\text{Ratio 2} = \frac{\text{Information}}{\text{Space}}$$

Results

Indicator 3 = Learning and joy

Indicator 4 = # of compliments

Indicator 5 = % of engagement and feedback

Definition

“Graphical excellence is giving the viewer the greatest number of **ideas** in the shortest **time** with the least **ink** in the smallest **space**.”

‘The Visual Display of Quantitative Information’, Edward Tufte.

Good Dataviz

Remove anything that is *removable*

Each visual resource (**color**, **lines**) has a **purpose**

Good Dataviz

“**Perfection** is reached, not when there is nothing more to add, but when there is **nothing left to remove.**”

Antoine de Saint-Exupery

Format

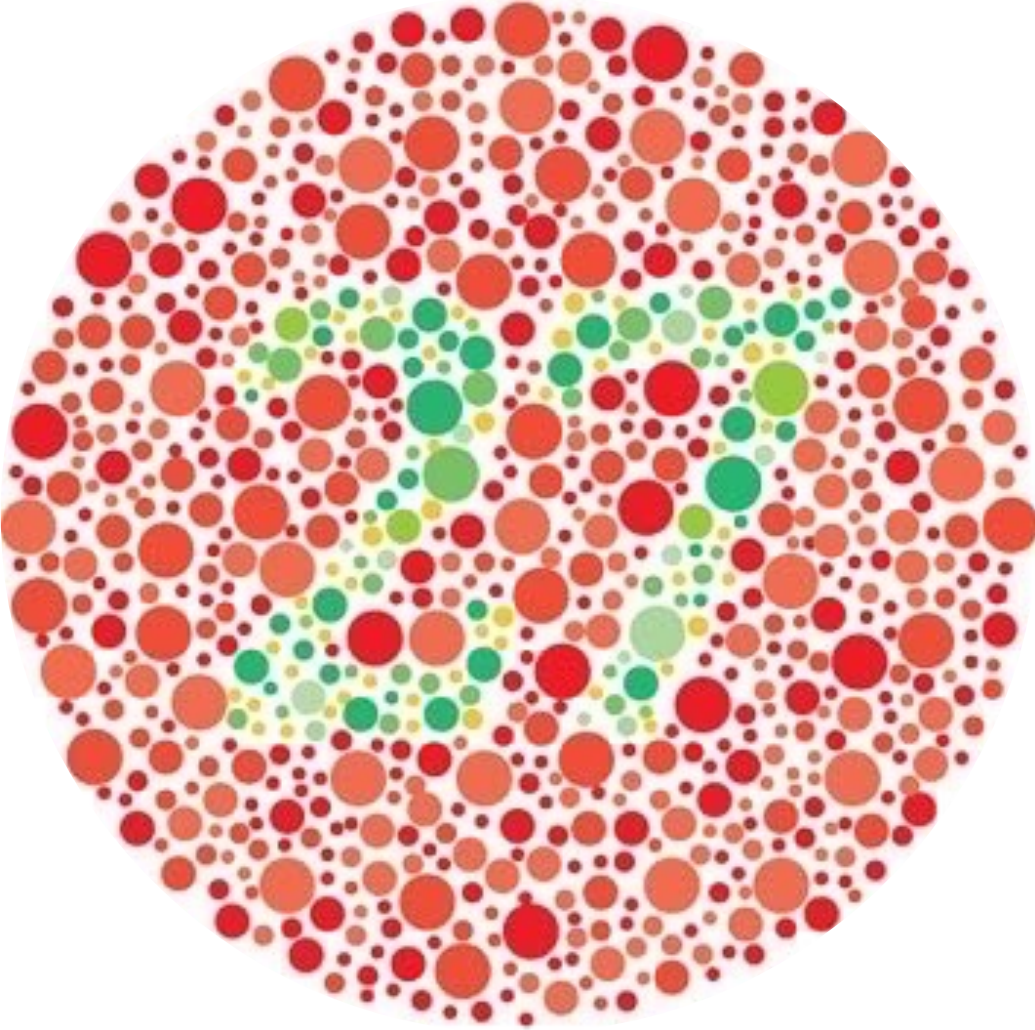
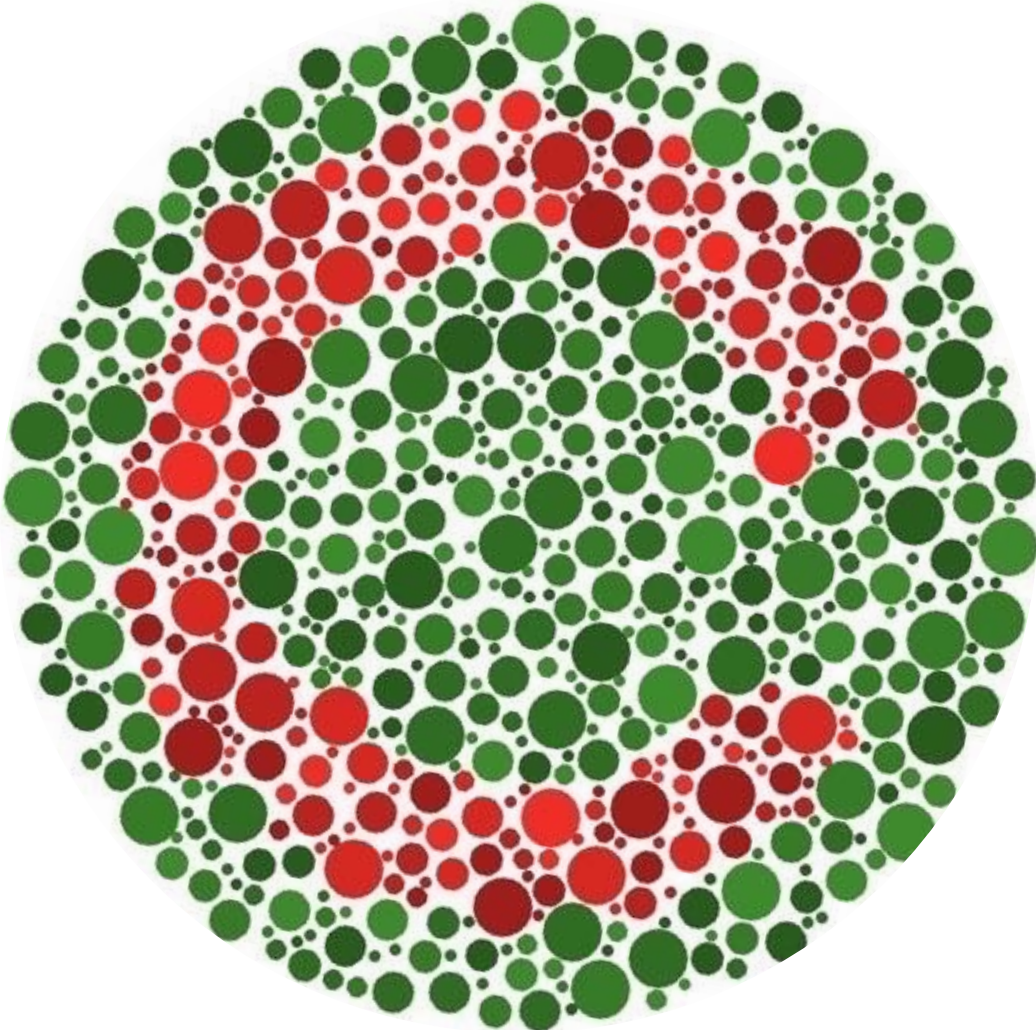
Content

(+ Target audience
+ Purpose)

Limitations

- 1 Accessibility problems
(visually impaired, color-blind, others)
- 2 Some people may not relate to it
(types of intelligences)
- 3 Alignment with your organization visual branding
- 4 It's subjective

Visual inclusiveness



COURSE:

DATA VISUALIZATION FOR REPORTS AND PRESENTATIONS

MODULE 1

INTRODUCTION



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MODULE 1

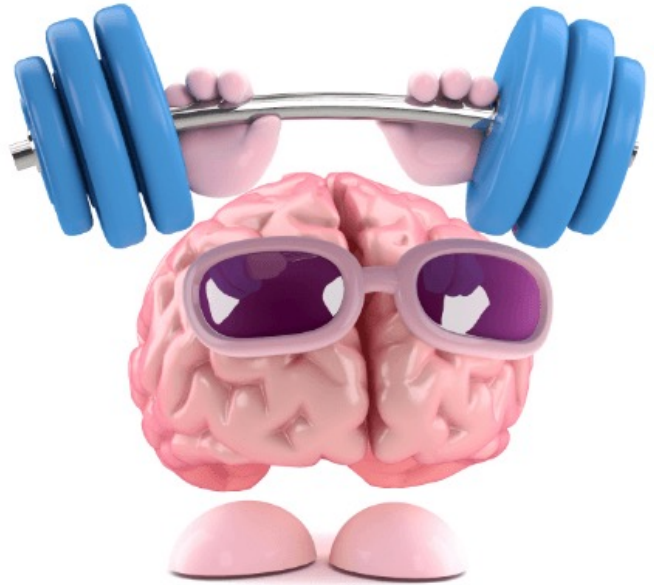
INTRODUCTION

THE "FORMULA"



Dataviz formula

Data Visualization =



Thinking visually

+



Making visuals



To get acquainted with:

- ✓ The concept of Data Visualization
- ✓ The purposes of Data Visualization
- ✓ The basic principles of Data Visualization
- ✓ The limitations of Data Visualization

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