



Data Schools

Data Visualisation

1. Overview

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Outline

- ❑ The science of visualisation: Humans are visual creatures
- ❑ Visualisation makes data accessible
- ❑ The four pillars of data visualisation
- ❑ Choosing the right chart: know your data
- ❑ Tools and tips: best practices
- ❑ The programming part to visualise data

Our brain is a pattern-detecting machine

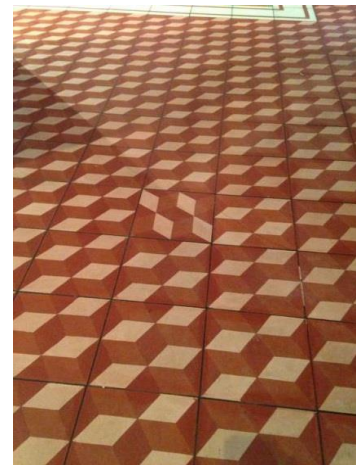
We are extremely good at detecting **patterns** and **pattern violations**:

- trends
- gaps
- outliers

Visual
cortex



Eye-Brain Connection = Faster pattern recognition



Visualisation makes data accessible

- Show the data
- Induce thinking about the substance
- Avoid distorting what the data has to say
- Present many numbers in a small space
- Make large data sets coherent
- Encourage the eye to make comparisons
- Reveal data at several levels of detail

1. Purpose - why this visualization

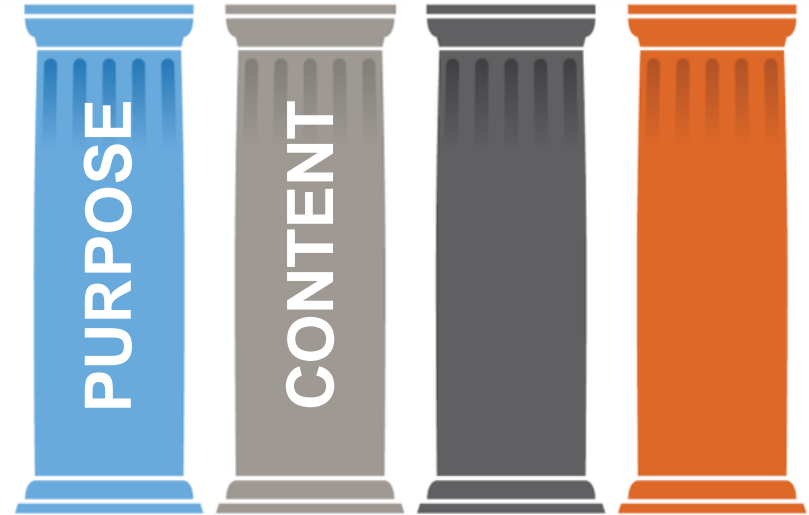
For the creators:

- **Why** am I doing this visualization?
- Who is it for?
- What do they need to understand?
- What actions do you need to enable?
- How it will be consumed?
- What is the most important takeaway message?



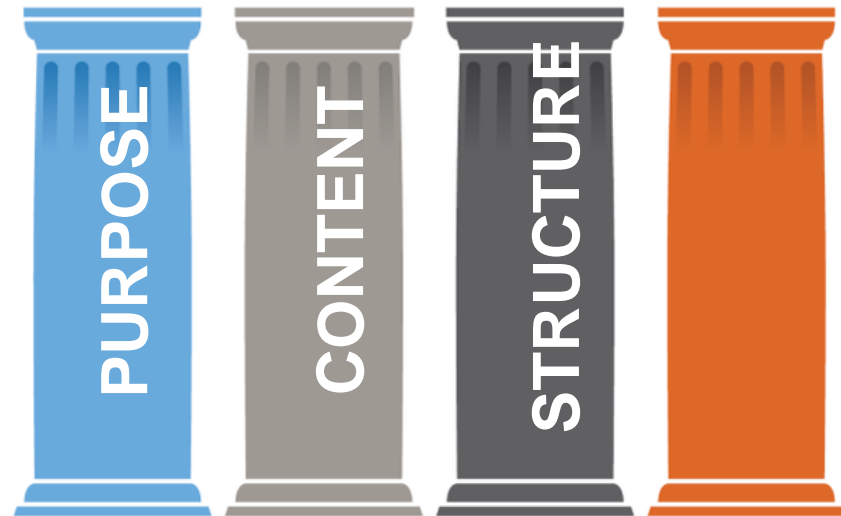
2. Content - what to visualize

- **What** data matters?
- What **relationships** (in the data) matter?
- Informed by the purpose!
- What's *excluded* is as important as what's *included*



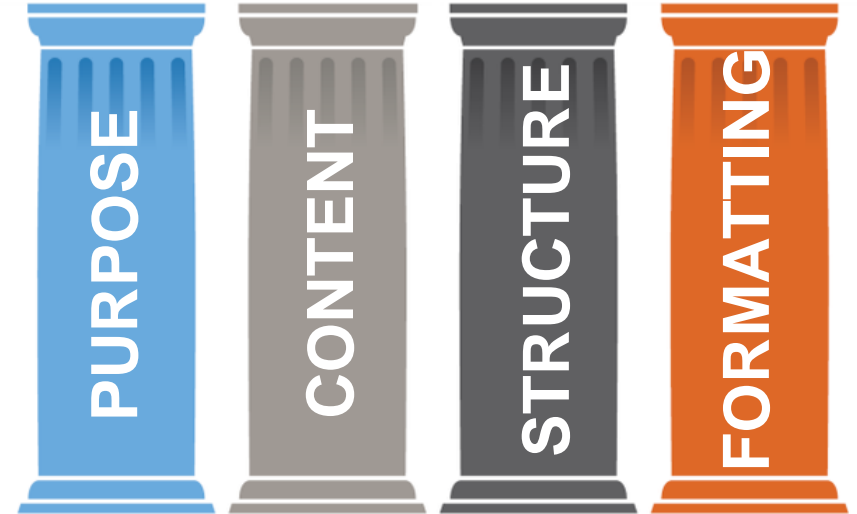
3. Structure - how to visualize it

- **How** can the most important data and relationships be revealed the best?
- **Choose** meaningful layout and axes!
- Use both axes (both, not three..)
- Informed by purpose and content!

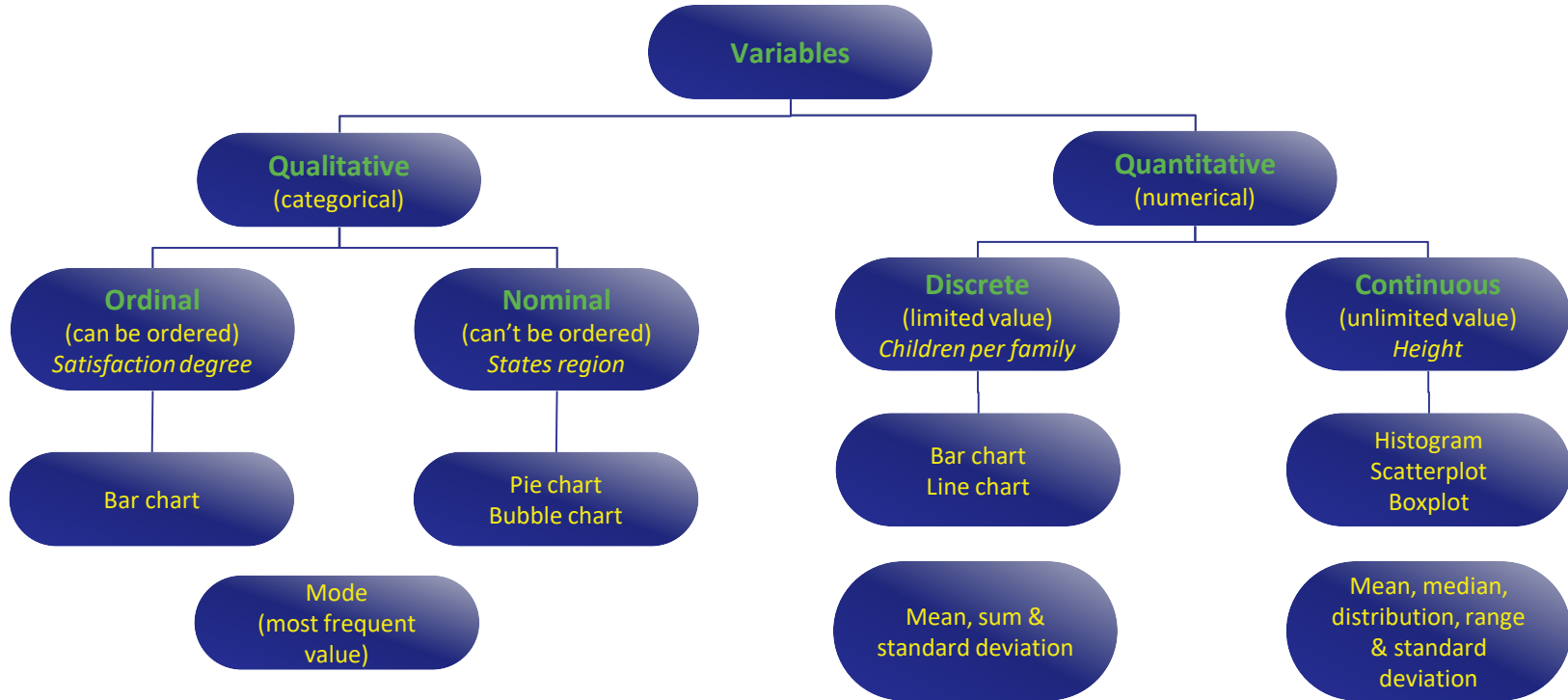


4. Formatting - how to make it appealing

- **How** it should look and feel?
- How will it be consumed?
- Makes data and relationships accessible
- Makes importance visible
- Informed by purpose, content and structure!













Guide to data type and how to graph them



Do's and don'ts in data design & visualization



- Use one color to present each category.  DOs
- Order data sets using logical hierarchy.  DOs
- Use high contrast color combinations such as Red/Green or Blue/Yellow.  DON'Ts
- Use callouts to highlight important or interesting information.  DOs
- Use 3D charts.  DON'Ts
- Visualize your data in a way that it's easy for readers to compare values.  DOs
- Add chart junk.  DON'Ts
- Use more than 6 colors in a single layout.  DON'Ts
- Use icons to enhance comprehension.  DOs
- Use italic, bold or underline text.  DON'Ts

The programming approach to visualize data

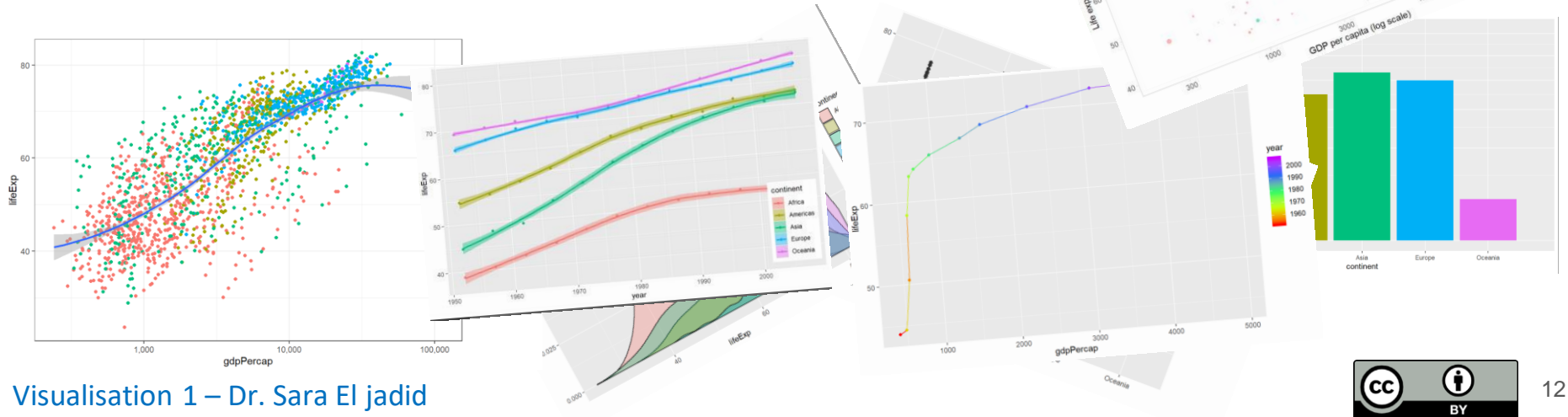


- Generate plots from data according to their type (discrete, continuous ...)
- Manage plot settings
- Produce plots from data in a data frame
- Modify and customize a plot
- Create complex and fancy plot



You will manage to create

- 1D plots: Bar plots for discrete variables
- 1D plots: density plots and boxplots for continuous variables
- 1.5D: Layers & Time series plots
- Plotting a summary
- 2D: Scatterplots
- Advanced customized and fancy plot : Bubble plot and an interactive plot





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A picture is worth a thousand of words

Thank you