



Applying data visualisation best practices on use cases

Direction Access to and Reuse of Public Information

Unit EU Open Data and CORDIS

Sector EU Open Data

ISA2 programme



What's ISA2?

ISA2 supports the development of **digital solutions** enabling public administrations, businesses and citizens in Europe to benefit from **interoperable cross-border and cross-sector public services**.

How OP is involved in ISA2?

OP is aiming at improving open services in the areas of:

- Data visualisation
- Linked open data
- Persistent identification



EU DataViz 2019 conference



publications.europa.eu/en/web/eudataviz/home



Agenda

- 09:00 Introduction
Makeover 1: CO2 emissions per capita
- 10:30 Coffee break
Makeover 1: presentation
Makeover 2: 2020 Headline Indicators
- 12:00 - 13:00 Lunch
Makeover 2
Makeover 2: presentation
- 14:30 Coffeebreak
Makeover 3: Non-participation in tourism
Makeover 3: presentation
- 16:30 Q&A



INTRODUCTION





Participants

Institution/DG and role?

What data and tools do you work with?

Experience in data visualisation?

Expectations for today?



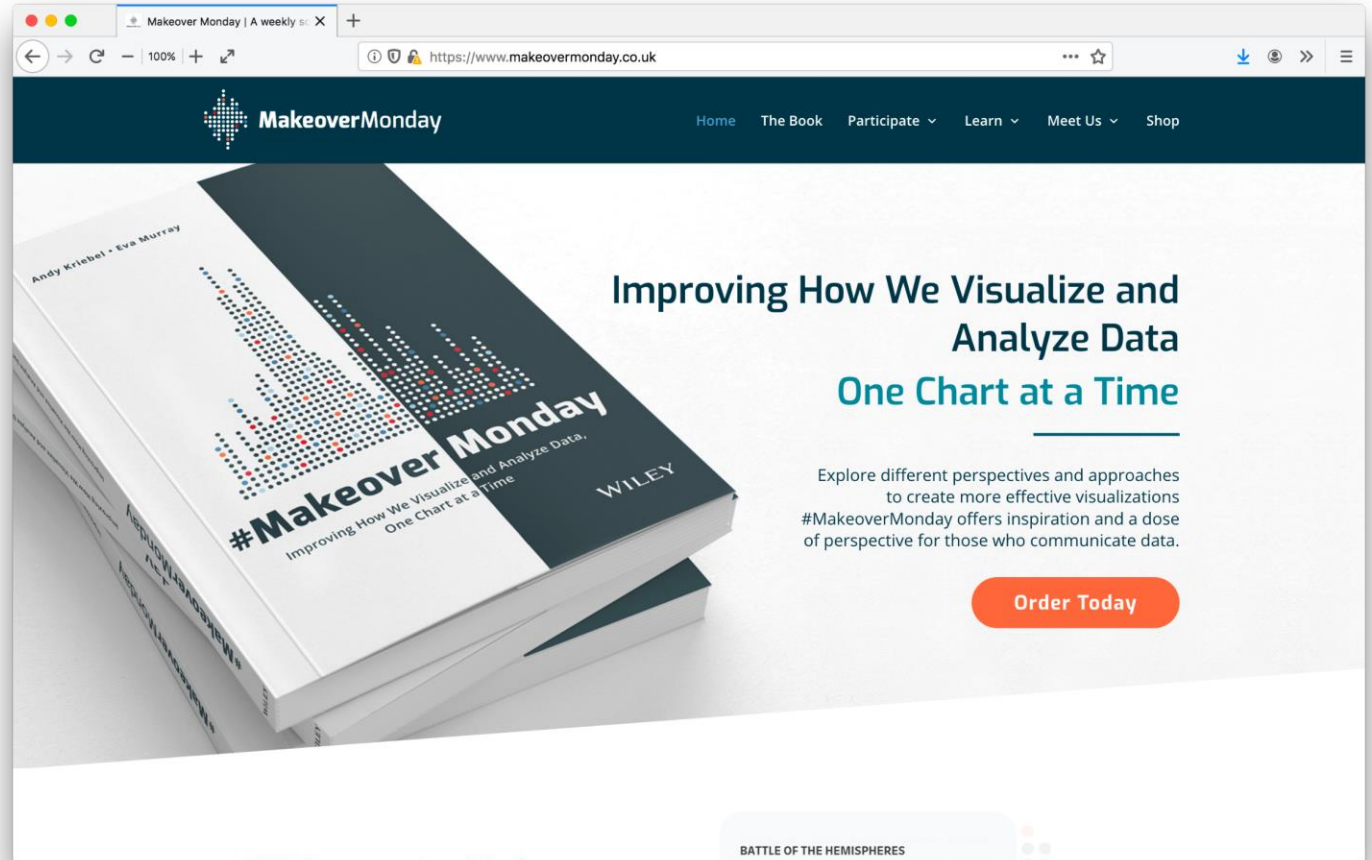
MAKEOVERS



Makeovers

Learning by doing

Based on Makeover Monday



Makeovers

Learning by doing

Makeover Monday

trimydata.com

1. List what works well
2. List what could be improved
3. Make an alternative visualisation



Makeovers

Learning by doing

Makeover Monday

1. Inspect, understand the data
2. (add additional data)
3. Find an angle (+ target audience)
4. Filter, aggregate, reshape data
5. Choose chart type(s)
6. Sketch/develop visualisation(s) (tool is free to choose!)
7. Share visualisation
8. Get feedback



3 tools

Visual Vocabulary

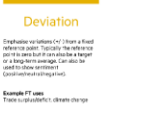
Choose a chart type

By the Financial Times

Deviation

Explain variances (or show a best reference point). Typically, the reference point is used to find the average (or a key performance indicator) of a data set (e.g. the average score on a test).


Example FT uses
There is an average of 18 days for...



Correlation

Show the relationship between two or more variables. Be careful that you are not assuming a causal relationship. It is always the relationship, not the cause, that can be used to make the point.


Example FT uses
Researcher's analysis of the relationship between... and... in...



Ranking

Show who or what is better and how often they are. The higher the ranking, the better. The higher the number, the worse. It is always the ranking, not the number, that can be used to make the point.


Example FT uses
Researcher's analysis of the relationship between... and... in...



Distribution

Show who or what is better and how often they are. The higher the ranking, the better. The higher the number, the worse. It is always the ranking, not the number, that can be used to make the point.


Example FT uses
Researcher's analysis of the relationship between... and... in...



Change over Time

Show changes to things over time. The higher the number, the better. The higher the number, the worse. It is always the number, not the ranking, that can be used to make the point.


Example FT uses
Researcher's analysis of the relationship between... and... in...



Magnitude

Show the size of things. The higher the number, the better. The higher the number, the worse. It is always the number, not the ranking, that can be used to make the point.


Example FT uses
Researcher's analysis of the relationship between... and... in...



Part-to-whole

Show how a whole is made up of its parts. The higher the number, the better. The higher the number, the worse. It is always the number, not the ranking, that can be used to make the point.


Example FT uses
Researcher's analysis of the relationship between... and... in...



Spatial

Show the location of things. The higher the number, the better. The higher the number, the worse. It is always the number, not the ranking, that can be used to make the point.

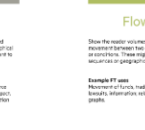
Example FT uses
Researcher's analysis of the relationship between... and... in...



Flow

Show the flow of things. The higher the number, the better. The higher the number, the worse. It is always the number, not the ranking, that can be used to make the point.

Example FT uses
Researcher's analysis of the relationship between... and... in...



Designing with data

There are so many ways to visualise data - how do we know which one to pick? Use the categories across the top to decide which data relationship is most important in your story, then look at the different types of chart within the category to form some initial ideas about what might work best. This list is not meant to be exhaustive, nor a wizard, but is a useful starting point for making informative and meaningful data visualisations.

[ft.com/vocabulary](https://www.ft.com/vocabulary)



3 tools

Chartmaker Directory

By Andy Kirk

How to make chart x with tool y

The Chartmaker Directory website interface. The browser address bar shows 'chartmaker.visualisingdata.com'. The page title is 'THE CHARTMAKER DIRECTORY'. There is a search bar 'Filter by chart name or AKA' and a legend for 'Reference Type' (Example, Solution) and 'Chart Families' (Categorical, Hierarchical, Relational, Temporal, Spatial). The main content is a grid with chart types on the y-axis and tools on the x-axis. The tools listed are Amazon QuickSight, ArcGIS, ChartJS, D3.js, Datawrapper, FusionCharts, Gephi, Google Charts, Highcharts, Infogram, JetPack Data, and JM.

	Amazon QuickSight	ArcGIS	ChartJS	D3.js	Datawrapper	FusionCharts	Gephi	Google Charts	Highcharts	Infogram	JetPack Data	JM
Bar chart	●			●●●●	●	○		●●	●●●	○●	●○	
Clustered bar chart	●			●	●	○		●●			○●	●
Bullet chart				●	●	○						●
Dot plot				●								●
Connected dot plot				●	●							
Pictogram				○						○		
Bubble chart				●●●●○		○		●				
Radar chart			○	●		○			○			



3 tools

Data Visualization Checklist

By the Stephanie Evergreen and Ann K. Emery

Rate your visualisation
Learn basic rules of visualisation design

datavizchecklist.stephanieevergreen.com

Data Visualization Checklist

by Stephanie Evergreen & Ann K. Emery
February 2018

This checklist is meant to be used as a guide for the development of high impact data visualizations. Rate each aspect of the data visualization by circling the most appropriate number, where 2 points means the guideline was fully met, 1 means it was partially met, and 0 means it was not met at all. n/a should not be used frequently, but reserved for when the guideline truly does not apply. For example, a pie chart has no axes lines or tick marks to rate. If the guidelines has been broken intentionally to make a point, rate it n/a and deduct those points from the total possible. Refer to the Data Visualization Anatomy Chart on the last page for guidance on vocabulary and the Resources at the end for more details.

Text	Guideline	Rating
Graphs don't contain much text, so existing text must encapsulate your message and pack a punch.	<p>6-12 word descriptive title is left-justified in upper left corner Short titles enable readers to comprehend takeaway messages even while quickly skimming the graph. Rather than a generic phrase, use a descriptive sentence that encapsulates the graph's finding or "so what?" Western cultures start reading in the upper left, so locate the title there.</p>	2 1 0 n/a
	<p>Subtitle and/or annotations provide additional information Subtitles and annotations (call-out text within the graph) can add explanatory and interpretive power to a graph. Use them to answer questions a viewer might have or to highlight specific data points.</p>	2 1 0 n/a
	<p>Text size is hierarchical and readable Titles are in a larger size than subtitles or annotations, which are larger than labels, which are larger than axis labels, which are larger than source information. The smallest text - axis labels - are at least 9 point font size on paper, at least 20 on screen.</p>	2 1 0 n/a
	<p>Text is horizontal Titles, subtitles, annotations, and data labels are horizontal (not vertical or diagonal). Line labels and axis labels can deviate from this rule and still receive full points. Consider switching graph orientation (e.g., from column to bar chart) to make text horizontal.</p>	2 1 0 n/a
	<p>Data are labeled directly Position data labels near the data rather than in a separate legend (e.g., on top of or next to bars and next to lines). Eliminate/embed legends when possible because eye movement back and forth between the legend and the data can interrupt the brain's attempts to interpret the graph.</p>	2 1 0 n/a
	<p>Labels are used sparingly Focus attention by removing the redundancy. For example, in line charts, label every other year on an axis. Do not add numeric labels *and* use a y-axis scale, since this is redundant.</p>	2 1 0 n/a





Makeover 1

CO2 EMISSIONS PER CAPITA



Makeover 1

CO2 emissions per capita

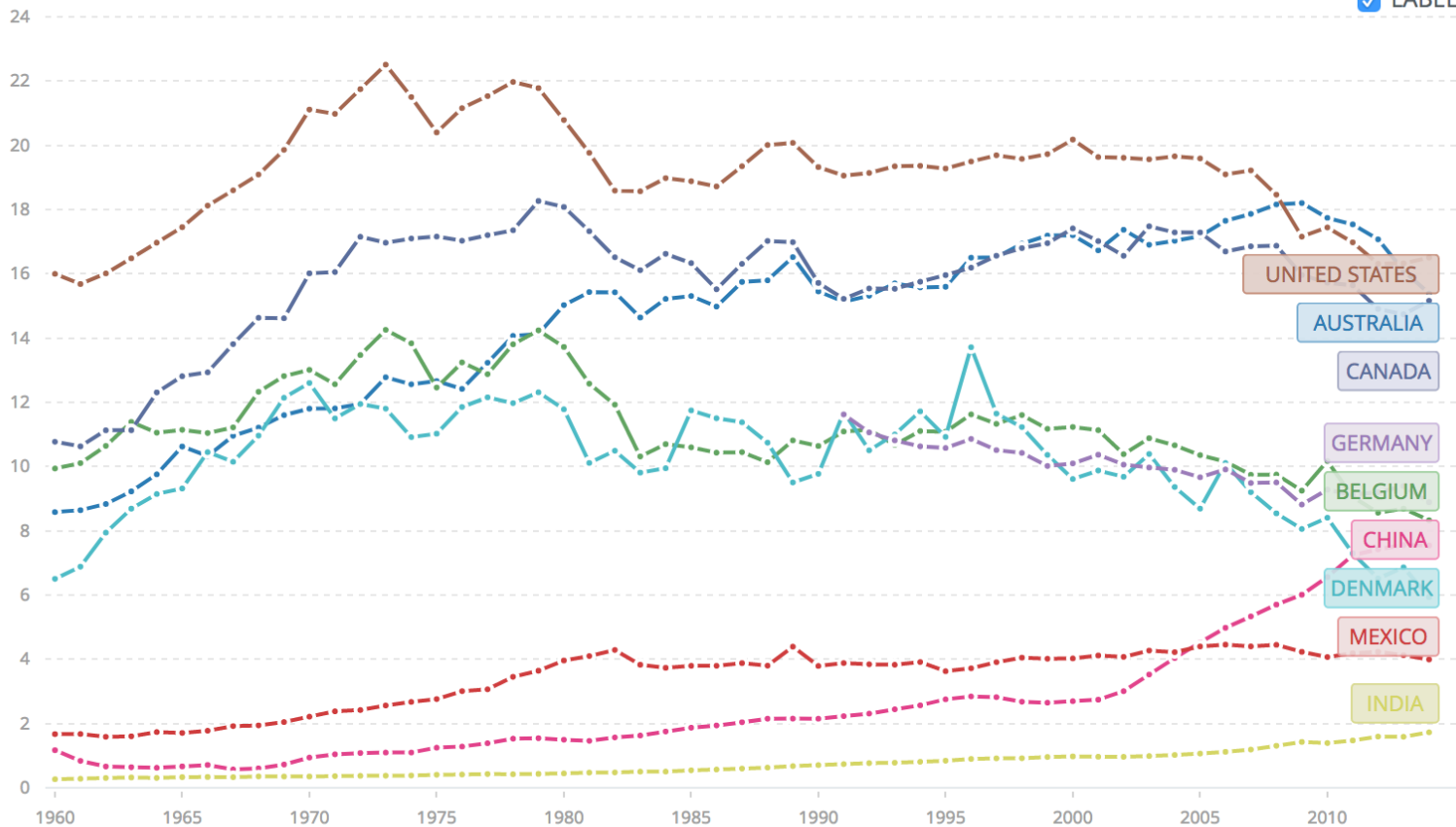
Line Bar Map

Also Show

Share

Details

LABEL



Makeover 1

CO2 emissions per capita

Data: tinyurl.com/yxc9urym

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Makeover 1
CO2 emissions per capita

Showtime!

www.makeovermonday.co.uk/gallery

trimydata.com/2019/05/26/mm2019-week22/



Makeover 2

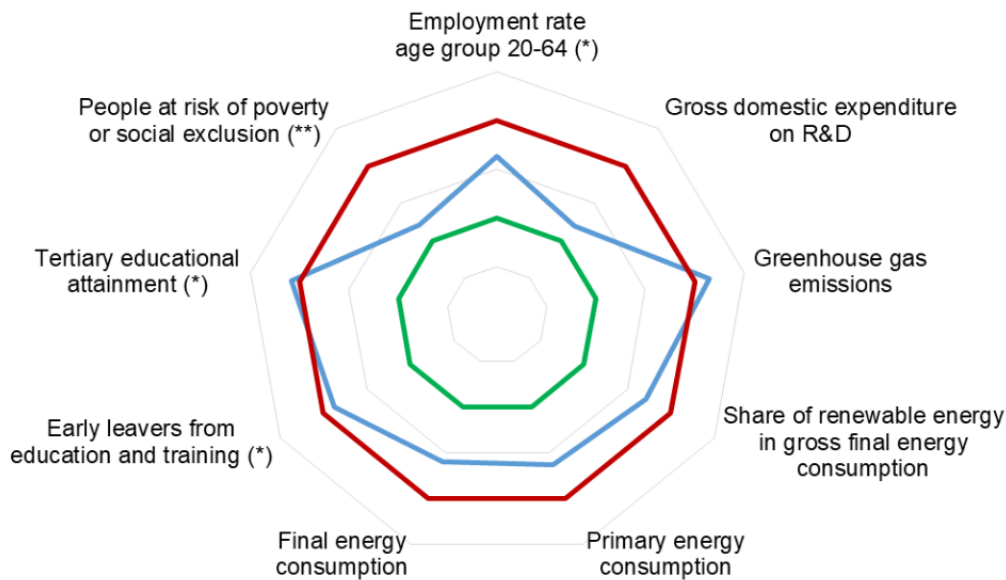
2020 HEADLINE INDICATORS



Makeover 2

2020 Headline Indicators

Europe 2020 headline indicators: target values and progress since 2008 (2017 data)



* 2018 data
 ** EU-27
 Source: Eurostat

— EU-28 — Target (Index=100) — Base year (2008)

ec.europa.eu/eurostat

The **employment** target is within reach, if it continues to grow at the current pace. The EU has already met the tertiary **education** target and is approaching the target of early leavers from education and training.

Europe has made substantial progress in the area of **climate change and energy** and is on track with the Europe 2020 greenhouse gas, renewable energy and energy efficiency targets.

Investment in **R&D** as well as **risk of poverty and social exclusion** remain at a distance from targets.



Makeover 2

2020 Headline Indicators

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Makeover 2

2020 Headline Indicators

Showtime!





Makeover 3

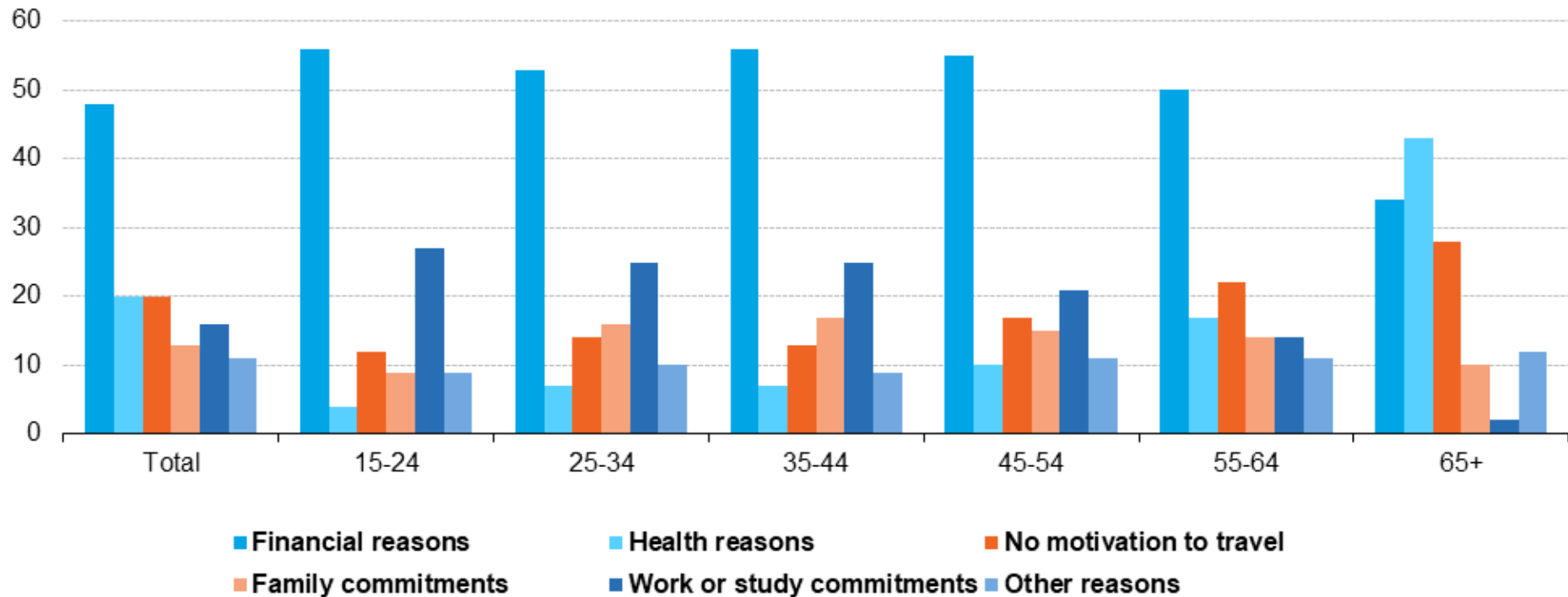
NON-PARTICIPATION IN TOURISM



Makeover 3

Non-participation in tourism

Main reasons reported for not participating in tourism by age group, EU-28, 2016 (%)



Source: Eurostat (online data code: tour_dem_npage)

Makeover 3

Non-participation in tourism

Data: tinyurl.com/yxc9urym

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Makeover 3
Non-participation in tourism

Showtime!



Round table

