Telling your story through data visualisation

Direction Access to and Reuse of Public Information

Unit EU Open Data and CORDIS

Sector EU Open Data
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
## Upcoming training & workshop sessions

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and also **webinars**... stay tuned!
Data visualization events in 2019

EU DataViz 2019 - Data Visualisation for the Public Sector

- Date: 12 November 2019
- Venue: European Convention Center - Luxembourg
- Website: https://publications.europa.eu/eudataviz
- e-mail: op-eu-dataviz@publications.europa.eu
Agenda

09:00  Introduction
       Introduction to storytelling
10:30  Coffee break
       Journalistic techniques for data storytelling
12:00 - 13:00  Lunch
       Data story patterns, genres and structures
14:30  Coffee break
       Storytelling with chart design
       Exercise: sketching a data story
16:30  Q&A
1. INTRODUCTION
Participants

Institution/DG and role?
What data do you work with?
Experience in data visualisation?
Expectations for today?
2.

INTRODUCTION TO STORYTELLING
Storytelling
Once upon a time...
Vlaamse Volksvertegenwoordigers

Alfabetisch | Deelstaatsenatoren | Per fractie | Per kieskring | (Uitgebreid) Bureau | Alle contactgegevens downloaden

A

Imade Annouri
Groen

Björn Anseeuw
N-VA

B

Lionel Bajart
Open Vld

Rob Beenders
SP-A

Jan Bertels
SP-A
Storytelling
Once upon a time...
Storytelling

Elements of a story

Once upon a time, somewhere

there was someone or something

who did something or something happened to him/her/it

which resulted in him/her/it/someone doing or being something else

Context

Character

Cause

Effect
Engage with people, by means of emotions + curiosity

Let people learn, understand, remember
Storytelling

Examples of stories

Stories are everywhere

Literary stories, movies

Sports games

Religion

Politics

Brands

...

News stories
Storytelling

Why stories work

Kurt Vonnegut

The Shape of Stories
Storytelling

Literary stories

Narrative techniques

Story arc
Narrator
Cause and effect
Sensory language
Crosslinking
Appeal
3. JOURNALISTIC TECHNIQUES FOR DATA STORYTELLING
Inform rather than entertain

Curiosity driven rather than emotion driven
Journalistic techniques
5W
(+ 1H)

Where  Context
When   Context
Who    Character
What   Cause + effect
Why    (How)
Journalistic techniques

Inverse pyramid

Journalistic reality:
Fixed length
Breaking news

"When in doubt, leave things out"

"Cut from the bottom"
Journalistic techniques

Inverse pyramid

Examples

Boris Johnson under fire over row with partner as top Tories raise fears

Scamp the Tramp is champ at World's Ugliest Dog Contest
Journalistic techniques
Make it personal

“What’s in it for me?”

Put the "you" in the headline

See How Your Salary Compares

The best and worst places to grow up: how your area compares

How Much Hotter Is Your Hometown Than When You Were Born?

Wann war zuletzt weiße Weihnacht in…
Journalistic techniques
Put in people

We are empathic beings

It is much easier to relate to a person than to a number, a dot or an average

What the Tax Bill Would Look Like for 25,000 Middle-Class Families

Homan Square
4. **DATA STORY PATTERNS**
Data story patterns

Evolution over time

Line charts (Vonnegut’s Shape of Stories)

The Greenland ice sheet is melting unusually fast

Battling Infectious Diseases in the 20th Century: The Impact of Vaccines

The chart that defines our warming world
Data story patterns
Zoom in

Start with the overview, than zoom to interesting details

Cancer prevalence and survival rates

Lazy Members of Parliament
Data story patterns
Zoom in

Start with the overview, than zoom to interesting details
Data story patterns

Zoom out

Start with a single data point, then zoom out to general overview

- Living in China’s Expanding Deserts
- The story of a house: how private equity swooped in after the subprime crisis
- Guns
Data story patterns
Contrast

Juxtapose 2 (or more) things against each other

The Myth of the Criminal Immigrant

The Gender Pay Gap

How terrorism in the West compares to terrorism everywhere else

Population pyramid Qatar
Data story patterns

Intersections

Something overtakes something else

- Chance of Winning Presidency
- How to make a bump chart
- Bar chart race
Data story patterns

Components

A whole composed of components

Drugs, gold, cash and alcohol

All 5.5 million Belgian cars in one graphic

A world of languages - and how many speak them

Four Ways to Slice Obama’s 2013 Budget Proposal
Data story patterns

Outliers

Very high or very low values

What Lies in Irma’s Path

The Greenland ice sheet is melting unusually fast

Where the Labour Market is Tightening

Ergebnisse der Grünen bei Europa
Data story patterns
Outliers

Birth and death rates in Japan

![Birth and death rates in Japan graph](image)
Data story patterns
Repetition

Fairy tales (Red Riding Hood, 3 little pigs, ...) also use this technique

What’s really warming the world

How work has evolved for Switzerland’s women and men
Data story patterns

Repetition

Small multiples are a visualisation technique that uses repetition
Data story patterns
Gradual visual reveal
Start simple, add complexity and data step by step

How Trump’s Trade War Went From 18 Products to 10,000

Reading the Brexit tea leaves

Rock ‘n poll
Data story patterns

Humans behind the dots

Make abstract data more relatable, connect emotionally

Homan Square

The terrible numbers that grow with each mass shooting

The figures behind the faces
Data story patterns

Make a guess

Test own assumptions, curiosity

You draw it

Gamification

You draw the charts: 60 years of change

Wissen Sie noch, wo Deutschland geteilt war?

How well can you identify news trends?
Data story patterns

Surprising, unusual

Breaking conventions attracts attention

Data and Politics World Map

The glass ceiling persists
Data story patterns

Concretise

Make numbers less abstract

Household Income Distribution in the U.S. Visualized as 100 Homes

Isotype

Wee people
5.

DATA STORY GENRES
Data story genres
Magazine style

Migration since the Brexit vote: what's changed in six charts

The UK contribution to the EU budget

6 Reasons That Pay Has Lagged Behind U.S. Job Growth
“The annotation layer is the most important thing we do. Otherwise it's a case of here it is, you go figure it out.”

- Amanda Cox, New York Times
Data story genres
Annotated chart

Clearing the air

Arctic Ice Reaches a Low Winter Maximum

Is now the right time to buy property in London?

Bailout cost will be a burden for years
Data story genres
Partitioned poster

Mostly for print
Also known as infographic

La Catedral, al detalle

EU Youth Report Infographics

En Europe, le grand écart des populations
Data story genres
Flow chart

How Google dominates virtually every step of buying and selling ads online

The Man Trying to Make Sense of Brexit Is Tired and Would Like to Stop Now

512 Paths to the White House
Data story genres

Comic strip

Datacomics

A day in the life of Americans

Historia de Zainab
Data story genres

Slide show

A 3-D View of a Chart That Predicts The Economic Future: The Yield Curve

How Belgium is heating up

Flourish stories

Going Grey
Data story genres
Video/animation
Datagifs
Thirty is the new twenty
Ages of women at first birth, selected countries

Eastern Europe

1995

Czech Republic: 8.7%
Estonia: 9.5%
Poland: 8.5%

Romania: 7.6%
Bulgaria: 7.4%
Hungary: 7.2%

Southern Europe

Greece: 8%
Spain: 7.6%
Portugal: 7.8%
1946 : Jean

Source : Insee

LeMonde.fr/lesdecodeurs
Household income in 2014 dollars (% of adults)

1971

FT graphic Alan Smith, Source: Pew Research Center
Share of **CHICAGO** residents within 1 or 2 miles of a Wal-Mart

**2005**
- >1% within 1 mile
- 4% within 2 miles
Women's 800-meter Freestyle

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Belmonte</td>
<td>Spain</td>
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<td>Ashwood</td>
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<tr>
<td>Smith</td>
<td>USA</td>
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<td>Kapas</td>
<td>Hungary</td>
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<td>Ledecky</td>
<td>USA</td>
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<td>Carlin</td>
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<tr>
<td>Friis</td>
<td>Denmark</td>
</tr>
<tr>
<td>Kohler</td>
<td>Germany</td>
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Race shown at 12x speed.
Data story genres
Video/animation

Why data visualisation needs a play button

Bar chart race

On an average day in the Netherlands

Wealth inequality in America

The Shadow Peace
6. DATA STORY STRUCTURES
Data story structure

Explanatory vs exploratory

Explanatory = Author-driven

Linear path
No interactivity
Storytelling + efficient communication
Data story structure

Explanatory vs exploratory

Exploratory = User-driven

No clear path
Interactive
Storyforming
Data story structure

Author-driven vs reader-driven

Martini Glass structure

Author-driven first
Reader-driven in the end (sandbox)

Extension of the inverted pyramid
Data story structure
Author-driven vs reader-driven
Martini Glass structure

Racing to parliament

The Complete History of the NBA
Data story structure
Author-driven vs reader-driven

Interactive slideshow

Author-driven sequence of slides
Reader-driven interaction within each slide
Data story structure
Author-driven vs reader-driven
Interactive slideshow

A 3-D View of a Chart That Predicts The Economic Future

Hot Dogs: America’s Most Popular Breeds
Data story structure
Author-driven vs reader-driven

Drill-down story

Reader-driven sequence
Data story structure
Author-driven vs reader-driven

Drill-down story

Example?
7.

STORYTELLING WITH CHART DESIGN
## Chart design

### Chart type

#### Visual Vocabulary

---

### Visual vocabulary

**Designing with data**

There are as many ways to visualise data as there are ways to tell a story. Here are some initial ideas about what might work best. This list is not meant to be exhaustive, nor is it a useful starting point for making a design that makes sense of the data your audience needs to understand.

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*Source: ft.com/vocabulary*
Chart design

Highlighting

Labels and annotations

Arctic Ice Reaches a Low Winter Maximum

Color

Purchasing power in Belgium

Size and bolding

The Departed: Britain’s Government Is Breaking Records for Upheaval

Enclosing (box, region)

You draw the charts: 60 years of change

Pointers

Motion
Once upon a time, this was a Very Important Thing

Across the globe, personality is rated as more important than looks

Economically and Physically, Blackpool is Unwell

LeBron James Scores 5,995th Playoff Point, Taking the Record From Michael Jordan
Chart design
Fonts
Hierarchy

Top-left to bottom-right

You will read this first
And then you will read this
Then this one

And you will read this last
8. COMBINING VISUALISATIONS AND TEXT
Combining with text

Titles

Usually first thing people look at first

Let the title tell the story

Same message as chart
Combining with text

Data labels

Put the key numbers (most recent value, ...) on the chart

Don’t label every data point

Stress with a data mark
Text - visualisation integration

Text on charts

Titles (or at least units) are needed to interpret a visualisation.

Datalabels provide hierarchy: not all data points are equally important.
Almost 6 million Brits signed up to stop Brexit

Petition to Revoke Article 50 and remain in the EU • Sign Up Count

21/03 12:00
22/03 12:00
23/03 12:00
24/03 12:00
25/03 12:00
26/03 12:00
27/03 12:00

Based on Ben Howard • Source: petition.parliament.uk • Get the data • Created with Datawrapper
Text - visualisation integration
Text on charts

Annotations make the reader focus and tell the story even more.

Almost 6 million Brits signed up to stop Brexit
Petition to Revoke Article 50 and remain in the EU - Sign Up Count

Based on Ben Howard  •  Source: petition.parliament.uk  •  Get the data  •  Created with Datawrapper
Combining with text

Axis text

Axis title
Should support reading and interpreting the data

Axis labels
Should not compete for attention

Leave out axis
Try direct labelling if you can

Economically and Physically, Blackpool is Unwell

Link text and chart with color

LeBron James Scores 5,995th Playoff Point, Taking the Record From Michael Jordan
SUMMARY
Summary

**Narrative techniques**
- Story arc
- Narrator
- Cause and effect
- Sensory language
- Crosslinking
- Appeal

**Journalism**
- 5W
- Inverted pyramid
- Make it personal
- Put in real people

**Data story patterns**
- Evolution over time
- Zoom in
- Zoom out
- Contrast
- Intersections
- Components
- Outliers
- Repetition
- Gradual visual reveal
- Humans behind the dots
- Make a guess
- Surprising, unusual
- Concretise

**Data story genres**
- Magazine style
- Annotated chart
- Partitioned poster
- Flow chart
- Data comic
- Slide show
- Video/animation

**Data story structure**
- Martini glass
- Interactive slideshow
- Drill down story

**Visualisation**
- Visual Vocabulary
- Integrating text & viz
Exercise
Sketching a data story

Data
- Yearly gdp/capita
- By EU country

Sketch out a data story, thinking about
- storytelling techniques
- chart types
- chart design
- data storytelling patterns
- data storytelling genres

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<th>Year</th>
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<tbody>
<tr>
<td>Belgium</td>
<td>2008</td>
<td>30100</td>
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<tr>
<td>Bulgaria</td>
<td>2008</td>
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<td>...</td>
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<td>...</td>
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<tr>
<td>Sweden</td>
<td>2017</td>
<td>36300</td>
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<tr>
<td>UK</td>
<td>2017</td>
<td>31600</td>
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Resources

Data story patterns
- Narrative patterns for data-driven storytelling
- 7 Data Story Types

Data story genres and structures
- Narrative Visualization: Telling Stories with Data

Choosing a chart type
- Visual Vocabulary

Data visualisation tools
- Chartmaker directory

Books
- Storytelling with data
- Data-driven storytelling
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