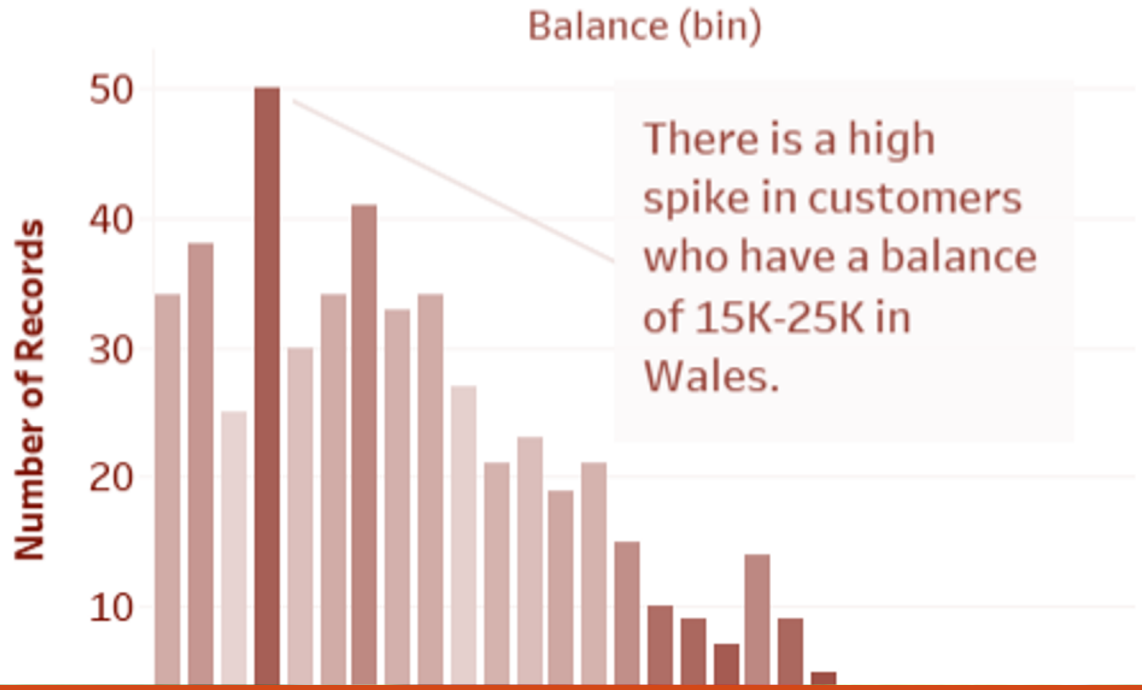
The balance of accounts situated in Wales are unevenly distributed.

Balance Classification



9. Anatomy of Storytelling Dashboards

Who is the Audience?

Knowing the audience will help you identify the storytelling dashboard's **presentation requirements**.

Avoid general audiences: address **lines of business** instead (finance, HR, etc.)

Identify **decision-makers** and the various audience **roles**.

Ask the following questions:

- what relationship do you have with them?
- how do they perceive you?
- how do you establish trust and credibility?

Audience Data Storytelling Needs

We need to know how the results will be used **(actions):**

- what decisions are people going to make from the analysis?
- how often are they going to be looking at the data?
- how often do they expect the data to be refreshed?

What does the audience **need to know**?

Additional Questions

What does the audience need to know about data **availability**?

- is the data clean?
- can it be accessed?
- is it being “massaged”, used to paint a rosy picture?

How much will the audience need/want to **interact** with the charts?

- are they passive?
- can they run limited filtering?
- what data can they download (if any)

Storyboarding

Storyboarding is a crucial exercise: it is a way to summarize the flow of information into a **coherent whole**.

It helps us determine how many **pages/elements per page** we might need.

This is **NOT** the same as designing the **layout** of a dashboard.

Storyboarding is used to **define** the dashboard's **story** and eventual **content**.

Storyboarding Example

1. State intended hiring goal for the year

2. Describe what is driving the hiring (Fed Gov't Init)

3. Show how close/far the goal is as of today

4. Show which departments have the highest requirements

5. Demonstrate which groups are impacted the most

6. Ask/tell the reader how they can help

Creating a Narrative

There are a number of ways of constructing a **narrative**, including:

- chronological
- most important first, or least important first
- begin with the end
- success first, bad news last, or bad new first, success last

Advice: tell the story of the data in a number of different ways

Some dashboards are temporary but some will be a constant reference: this has an impact on how the data should be presented.

Maintaining a Clear Narrative

Horizontal logic:

- if your visualizations span many pages then the title of each page should tell you the story
- reinforce with an executive summary dashboard or report at the beginning

Vertical logic:

- whether one page or many, the content should reinforce the title and vice versa (self-reinforcement)
- there should be a logical link between all the elements, tags and visual aids on the page

Engaging Memory

There are different types of memories, we need to understand how they are engaged when we tell stories:

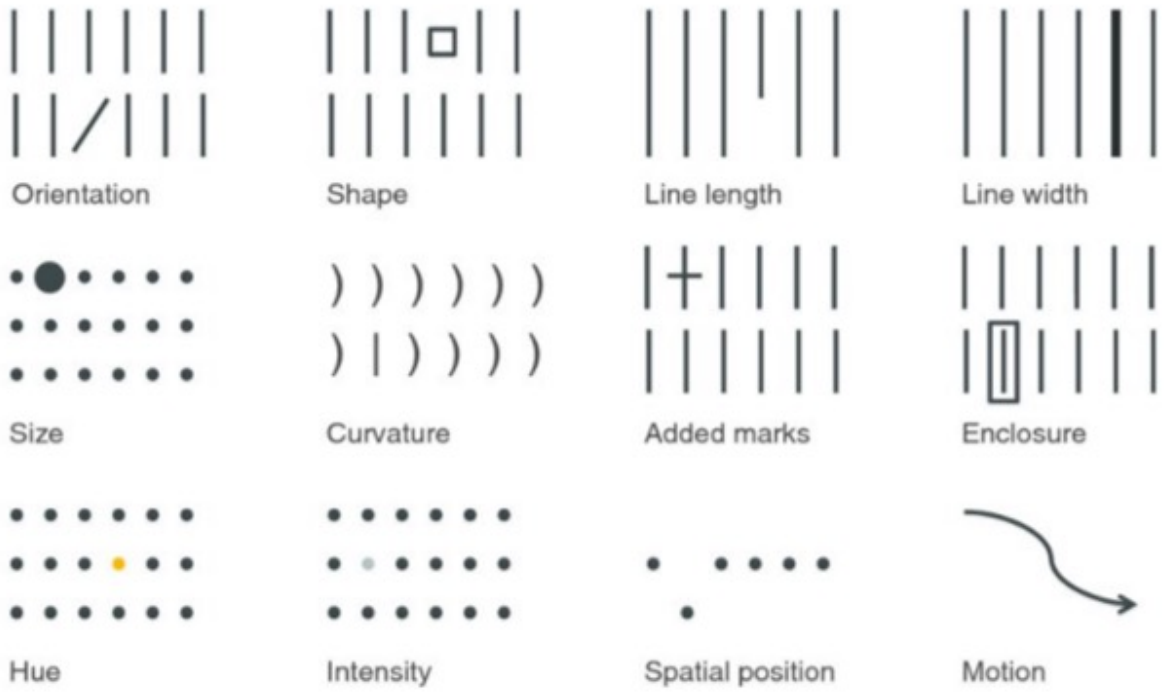
1. **iconic memory** – directs the eye
2. **short-term memory** – limits how many charts are found in dashboards
3. **long-term memory** – helps the audience remember what they saw

Engaging Memory

Iconic memory is the visual sensory memory (SM) register relating to the visual domain and a fast-decaying, high-capacity store of **visual info**.

Iconic memory is **brief** and provides a **coherent representation** for the entire visual perception.

It is tuned to **pre-attentive attributes**.



Engaging Memory

Short term memory can hold ~4 chunks of visual information at a given time.

When presented with more chunks (such as data points on a graph), chunks need to be processed **in and out of memory**.

Generally, we try to form **bigger**, **focused chunk hierarchies** (Gestalt).

Engaging Memory

Long-term memory is built up over a lifetime and is the basis for pattern recognition and general cognitive processing.

It is an aggregate of **visual** memory and **verbal** memory.

Images help us recall long-term memory, making the story "**stick**".

Context-providing text helps:

You have currently selected 28,711 ATIP requests totaling 6,597,612 pages of information

VS

ATIP Requests

30K	6.6M	230
requests	pages	pages/request

[Based on a idea by C. Nussbaumer Knaflic, *Storytelling With Data*]

WEEKLY number of boats sold (20X6) – Store #16

2 8 6 9 4 0 8 6 0 9 8 7 6

9 3 4 8 5 8 6 7 4 8 6 7 6

2 9 6 7 3 0 3 9 8 6 7 3 9

3 9 6 7 4 9 6 7 4 9 6 7 4

Yearly goal: **290**
20X6 total: **307**

Do these numbers look **reasonable?**

2 8 6 9 4 0 8 6 0 9 8 7 6

9 3 4 8 5 8 6 7 4 8 6 7 6

2 9 6 7 3 0 3 9 8 6 7 3 9

3 9 6 7 4 9 6 7 4 9 6 7 4

Most frequent weekly number of boats sold:
6
(11 times)

Occurred: **randomly**
(as expected)

2 8 6 9 4 0 8 6 0 9 8 7 6

9 3 4 8 5 8 6 7 4 8 6 7 6

2 9 6 7 3 0 3 9 8 6 7 3 9

3 9 6 7 4 9 6 7 4 9 6 7 4

Another frequent weekly number of boats sold: **8**

Occurred: **5 times immediately before a 6 (out of 7)**
(surprising)

2 8 6 9 4 0 8 6 0 9 8 7 6

9 3 4 8 5 8 6 7 4 8 6 7 6

2 9 6 7 3 0 3 9 8 6 7 3 9

3 9 6 7 4 9 6 7 4 9 6 7 4

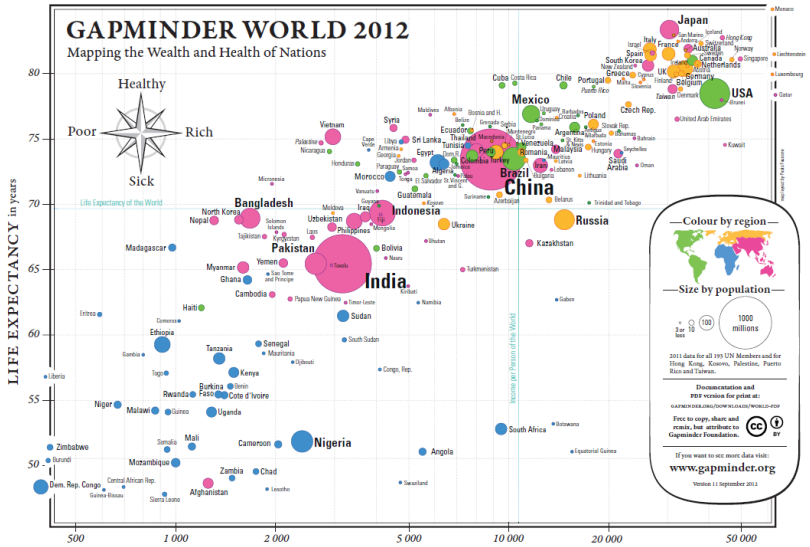
Another frequent weekly number of boats sold: **7**

Occurred: **7 times immediately before a 6 (out of 8)**
(surprising)

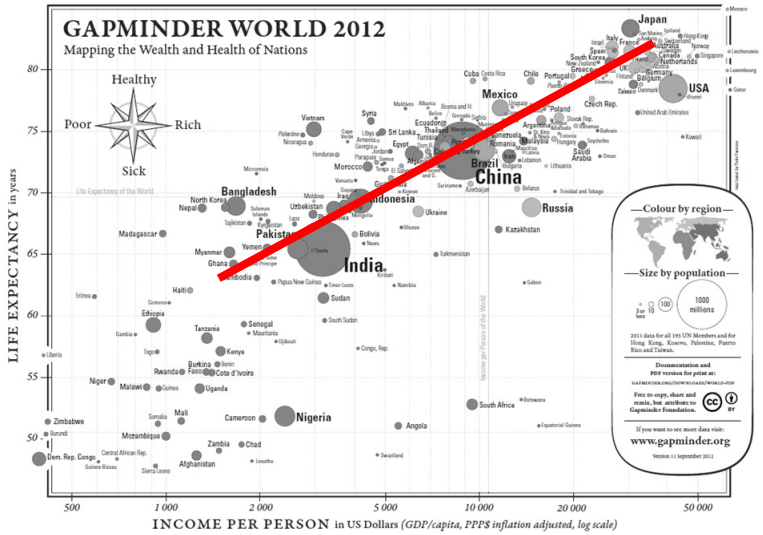
VERDICT: The two last charts suggest that the weekly sale numbers **are not random**, and that they may have been falsified. We recommend **performing an audit** of sales for store #16.

[Based on a chart by the Gapminder Foundation]

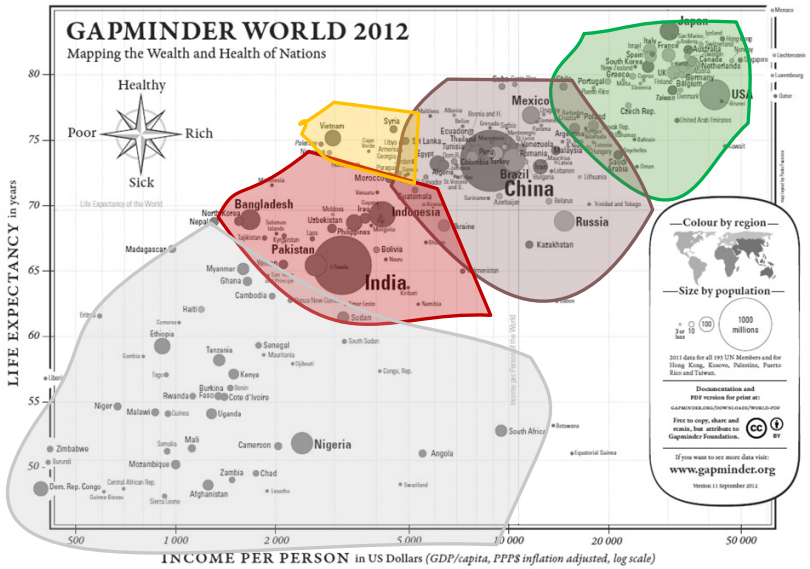
The Health and Wealth of Nations (2012) – Gapminder



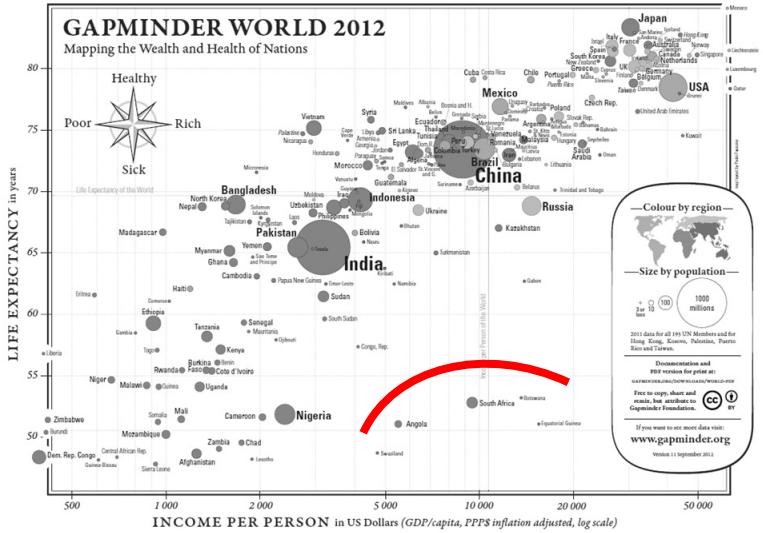
2012 **life expectancy** of nations (health, vert.) against the **log of the GDP per capita** (wealth, hor.); colour represents **world regions**, size is **population**.



The relationship between **health** and **wealth** is **roughly linear**, at least when they are both high enough – is it a **causal relationship**?



We see roughly 5 nations groups (**clusters**), when we only focus on health and wealth. Would these groups be stable when using **other variables**?



There are **outliers** in the bottom right quadrant (**wealthy, but not healthy**); 4 of them are in southern Africa – a manifestation of **apartheid**?

NOTES: The relation between health, wealth, and region can clearly be seen in the charts, but the big surprise might be that life expectancy is as high as it is across the board. Can we get more insight from other variables?

Visual Processing

Perception is fragmented – eyes are **ever scanning**.

Visual thinking seeks **patterns**

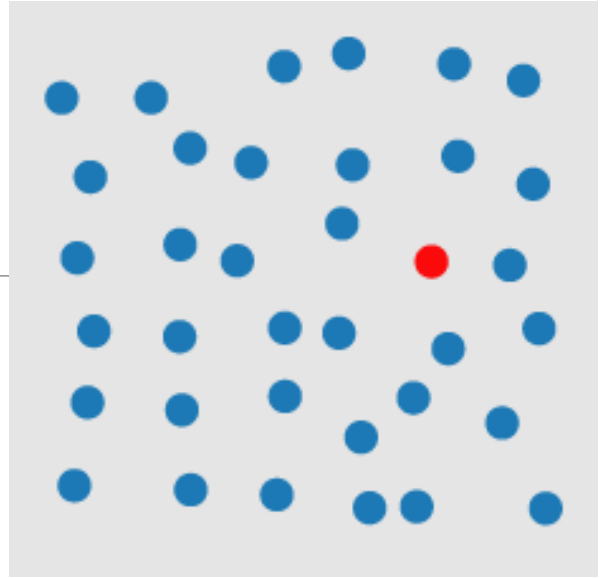
- **pre-attentive processes:** fast, instinctive, efficient, multitasking gather information and build patterns:

  features → patterns → objects

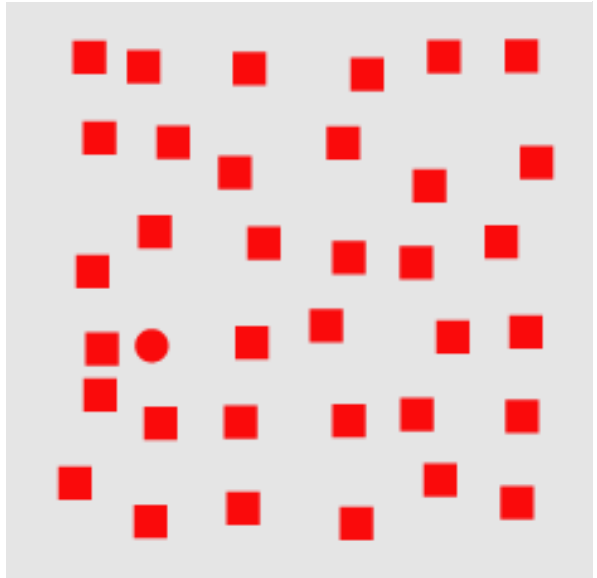
- **attentive process:** slow, deliberate, focused discover features in the patterns:

  objects → patterns → features

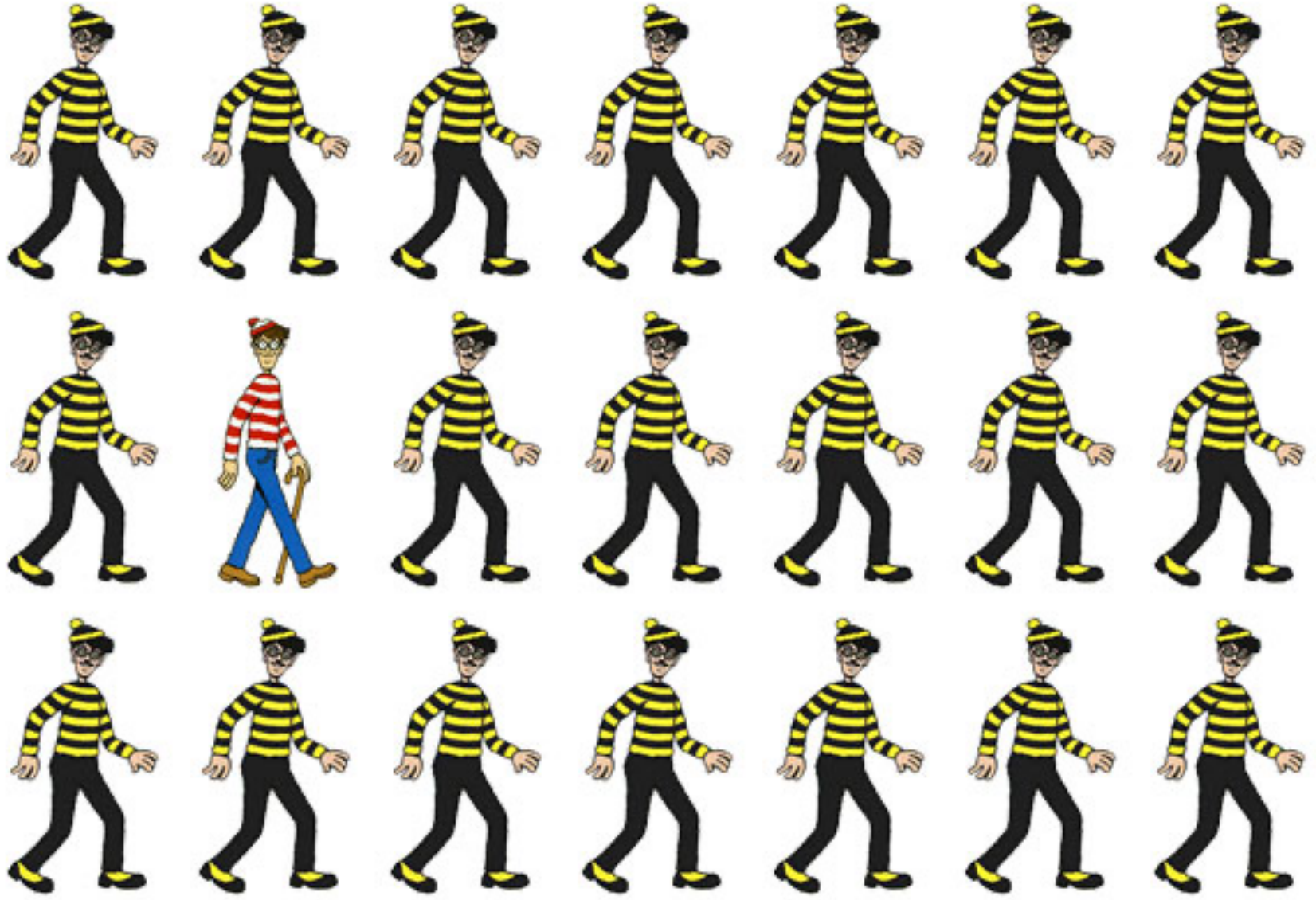
pre-attentive



attentive



[L. Groeger, A Big Article About Wee Things, ProPublica.com]



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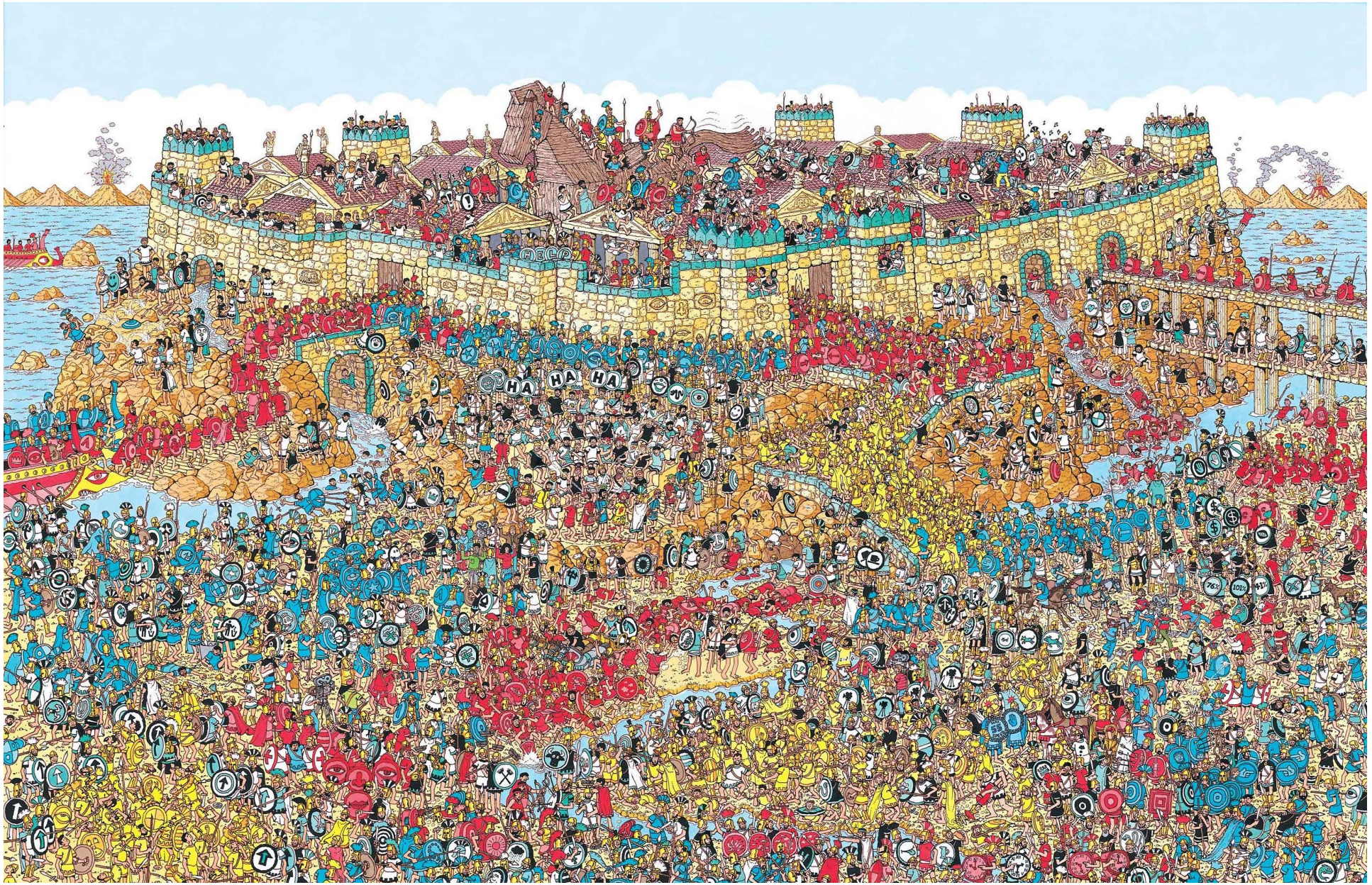

Suggested Reading

Anatomy of Storytelling Dashboards

The Practice of Data Visualization
Visualization and Storytelling

Effective Storytelling Visuals

- Anatomy of Storytelling Dashboards

Exercises

Anatomy of Storytelling Dashboards

1. Consider a data question of interest to you. Identify the target audience and the goals for your storytelling dashboard.
2. Identify the presentation requirements for your dashboard.
3. Create a storyboard for your dashboard.
4. What type of narrative and logic do you think would best serve your needs?