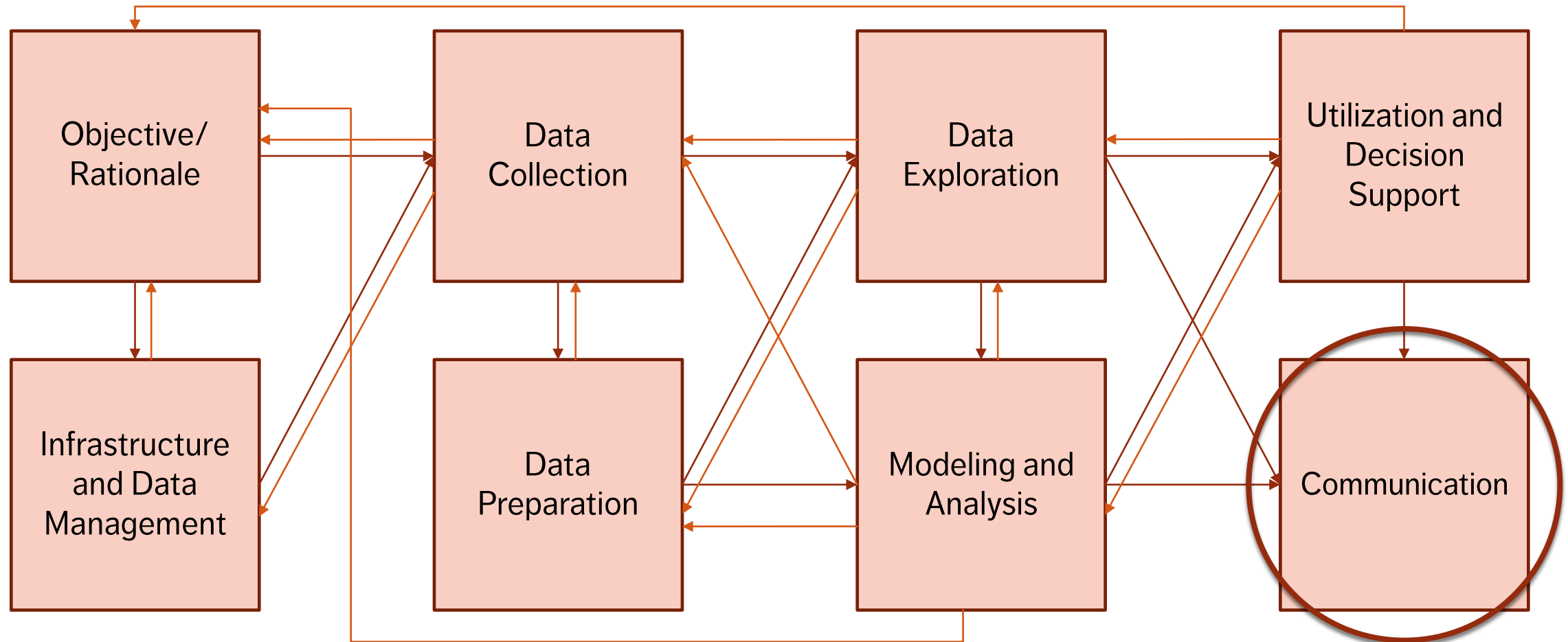

STORYTELLING WITH DATA

THE (MESSY) ANALYSIS PROCESS



WHO IS THE AUDIENCE?

Avoid general audiences: address **Lines of Business** (finance, engineering, 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?

WHAT IS NEEDED FOR THEM TO KNOW OR DO?

Ask for **action**:

- 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?

HOW DO WE COMMUNICATE EFFECTIVELY WITH THE AUDIENCE?

What data is **actually available**?

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

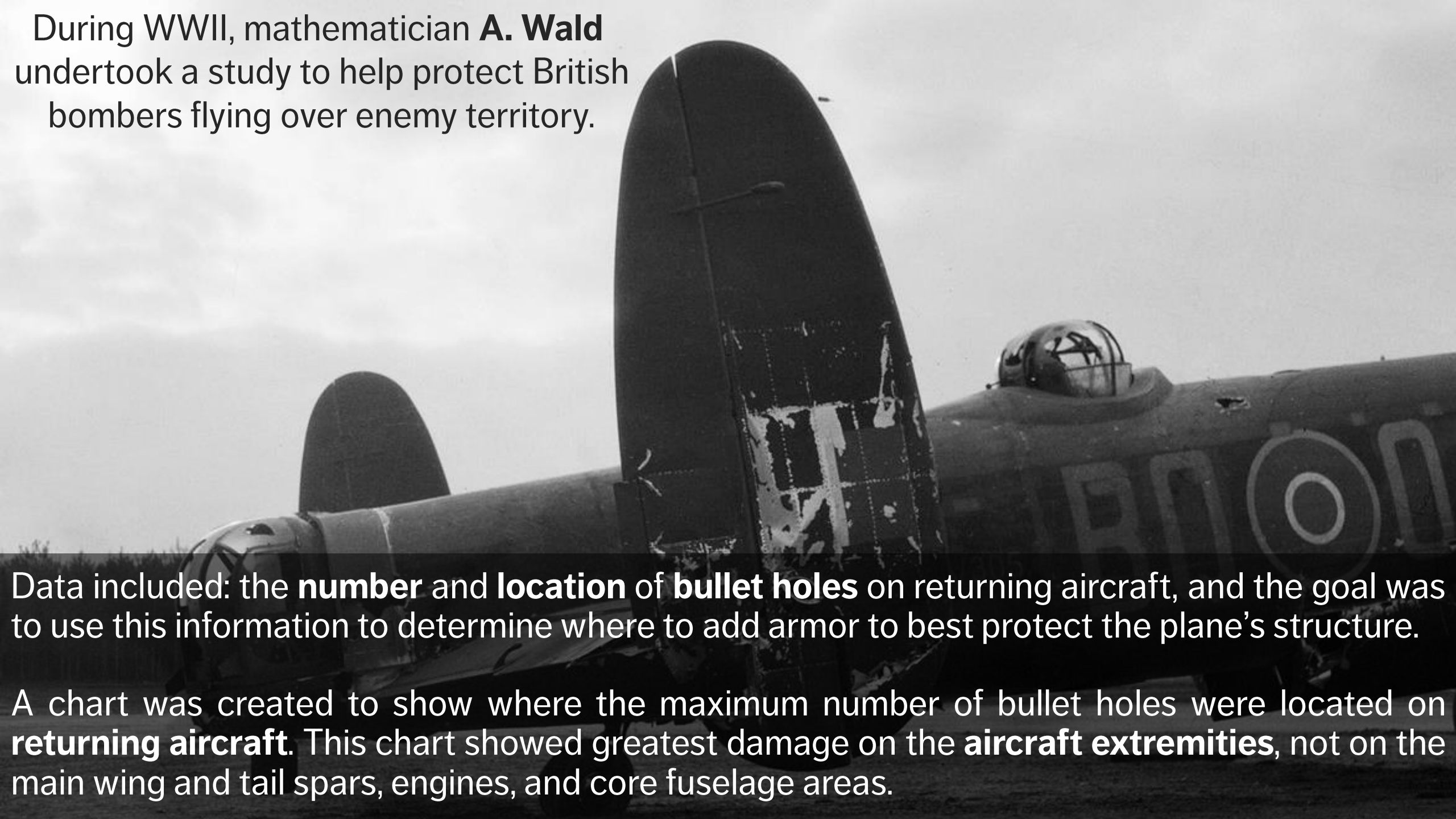
How much will the audience need/want to **interact** with the charts?

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

During WWII, mathematician **A. Wald** undertook a study to help protect British bombers flying over enemy territory.

Data included: the **number** and **location** of **bullet holes** on returning aircraft, and the goal was to use this information to determine where to add armor to best protect the plane's structure.

A chart was created to show where the maximum number of bullet holes were located on **returning aircraft**. This chart showed greatest damage on the **aircraft extremities**, not on the main wing and tail spars, engines, and core fuselage areas.

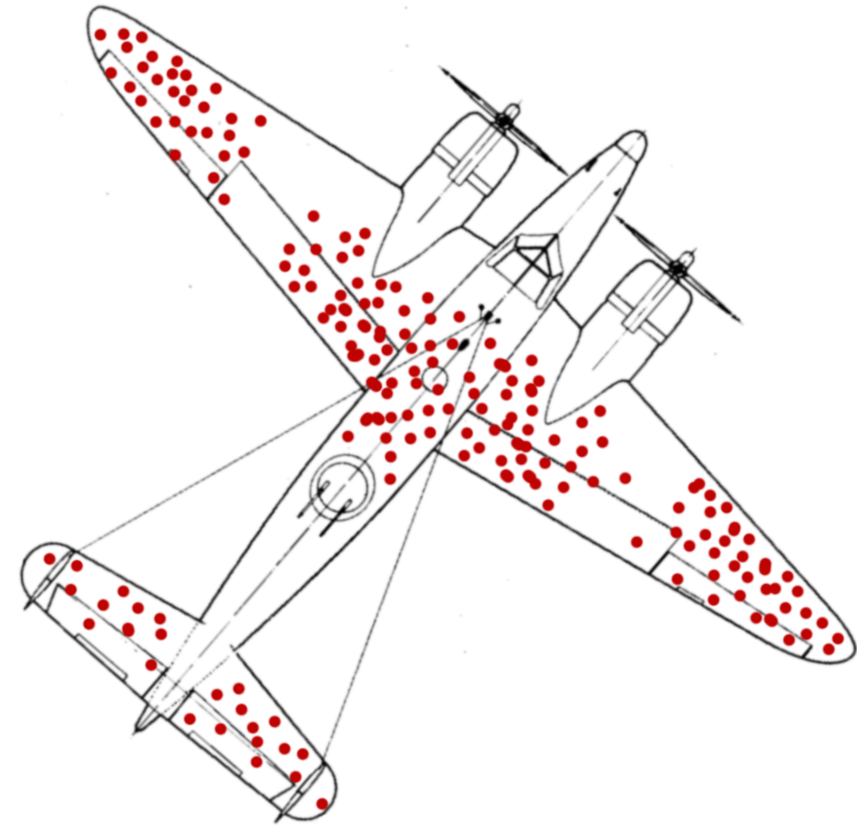


WALD'S STORY

As such, the Air Ministry wanted to add armor to the **extremities**. Wald suggested they were **dead wrong**.

To avoid “**survivorship bias**”, armor should be added to the areas with the **fewest holes**: if no returning planes had holes in their wing spars and engines, then even a few holes in those locations were **deadly**.

Take-Away: the data that is missing may be as important to story than the data that is there.



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:

- 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

TYPES OF MEMORIES

Telling stories engages our memory:

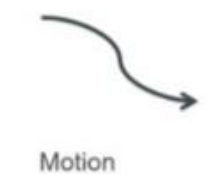
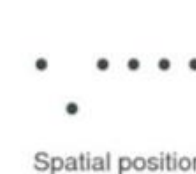
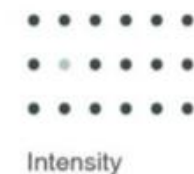
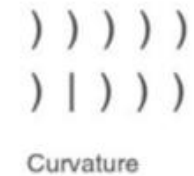
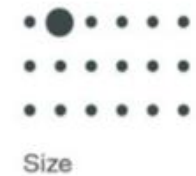
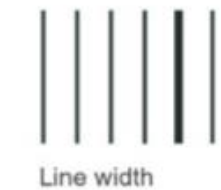
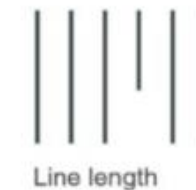
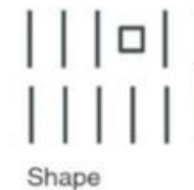
1. iconic memory
2. short-term memory
3. long-term memory

ICONIC MEMORY

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

Iconic memory is **very brief** (< 1000 ms) and provides a **coherent representation of our entire visual perception**.

Tuned to **pre-attentive attributes** (subconscious accumulation of information from the environment).



SHORT-TERM MEMORY

We can hold ~4 chunks of visual information in **short-term memory** 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** hierarchies of chunks (Gestalt principles).

LONG-TERM 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 also makes a difference:

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

vs

28,711
requests

6,597,612
pages

STORYBOARDING

Storyboarding 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 story** and the dashboard's **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

EXERCISE

Individually or in teams, prepare a storyboard for the dashboard you designed in the previous section.