

# Adopting computational thinking in data stories

Making the transition  
to data journalism

Presented by Hanna  
Duggal

# Webinar outline

- > What is computational thinking
- > Self-identity, theory and practice
- > Paradigms of thinking and toolkits to use

# Femicide in Kyrgyzstan

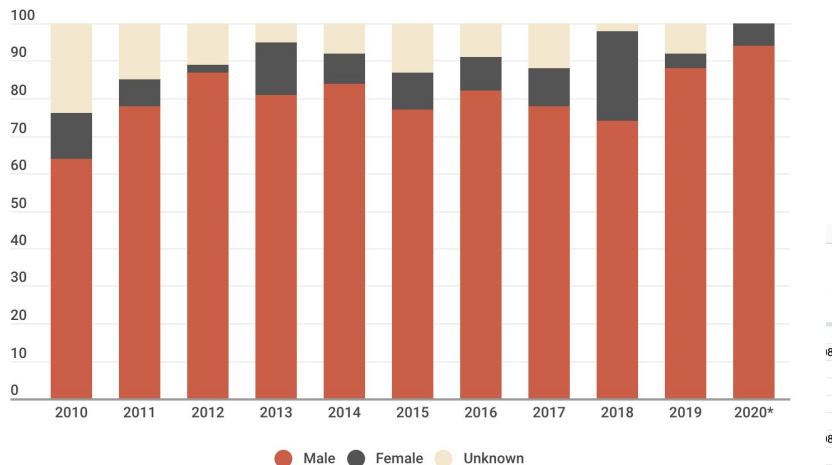
[“I would have killed her anyway”](#)  
[Kloop's investigation of femicide in Kyrgyzstan](#)

> Journalists at Kloop looked at the prevalence of femicide in Kyrgyzstan

> How did they go about telling this story?

On average, 8 out of 10 female murder victims are killed by men

The gender distribution of women's murderers by year, %



Download data

Source: General Prosecutor's Office of the Kyrgyz Republic  
\*Data taken from the first nine months of 2020

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1	N по порядку	ID случая	
7	207	198	<a href="https://svodka.akipress.org/news/1477?from=svodka&amp;place=Озгоруш">https://svodka.akipress.org/news/1477?from=svodka&amp;place=Озгоруш</a>
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Таласская область	26	5	2008	
Чуйская область	7	3	2008	21.03.2008
Бишкек			2008	18.10.2008
Чуйская область	2	8	2009	
Чуйская область	2	8	2009	
Джалал-Абадская область			2009	19.09.2009
Ошская область	7	9	2009	

# Computational thinking

*“The thought processes involved in formulating problems and their solutions so that the solutions are represented in a form that can be effectively carried out by an information-processing agent”*

**Jeannette Wing**

# Computational thinking

*“The **thought processes** involved in **formulating problems** and their **solutions** so that the solutions are represented in a form that can be effectively carried out by an **information-processing agent**”*

**Jeannette Wing**

> Computational thinking is **analytical**

# Computational thinking process



# Decomposition



- > Pulling apart steps of a process
- > Compositing into smaller steps
- > Solvable by computer or human

# Abstraction



- > Pulling apart steps of a process

- > Compositing into smaller steps

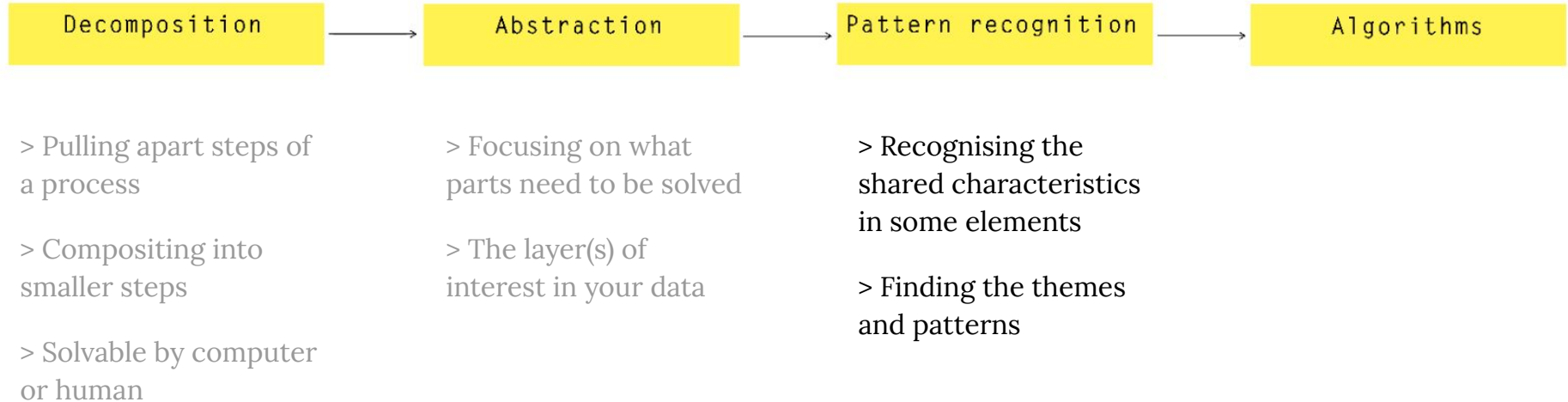
- > Solvable by computer or human

- > Focusing on what parts need to be solved

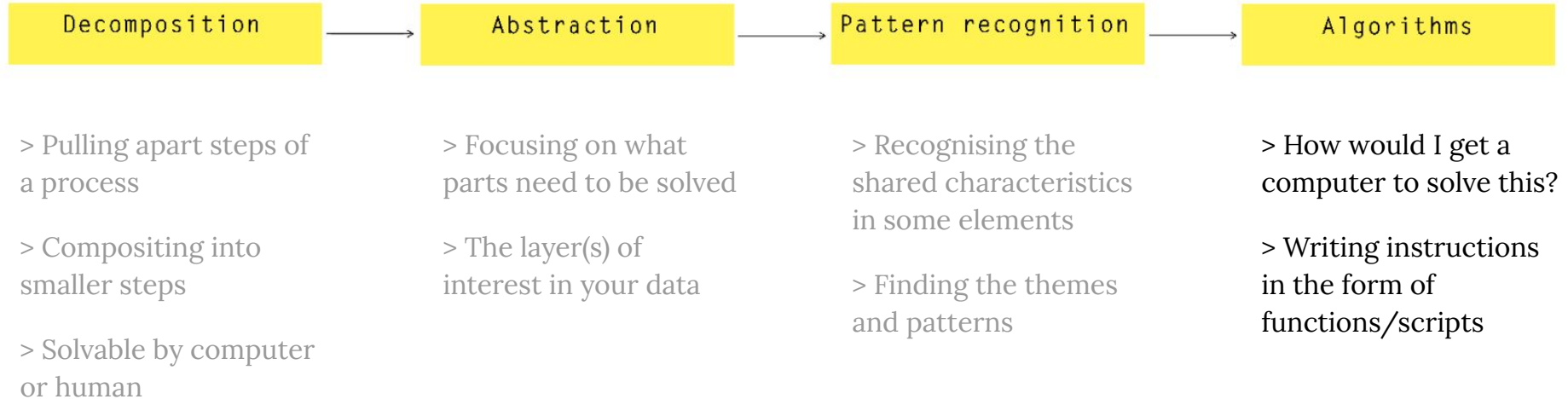
- > The layer(s) of interest in your data



# Pattern recognition



# Algorithms



# Where to start?

> The idea

What is the story?

Why does it matter?

> Hypothesis-driven vs data-driven

# Hypothesis-driven vs data-driven

## Hypothesis-driven

- > A strong hypothesis
- > Confirming or disconfirming a lead
- > Sampling

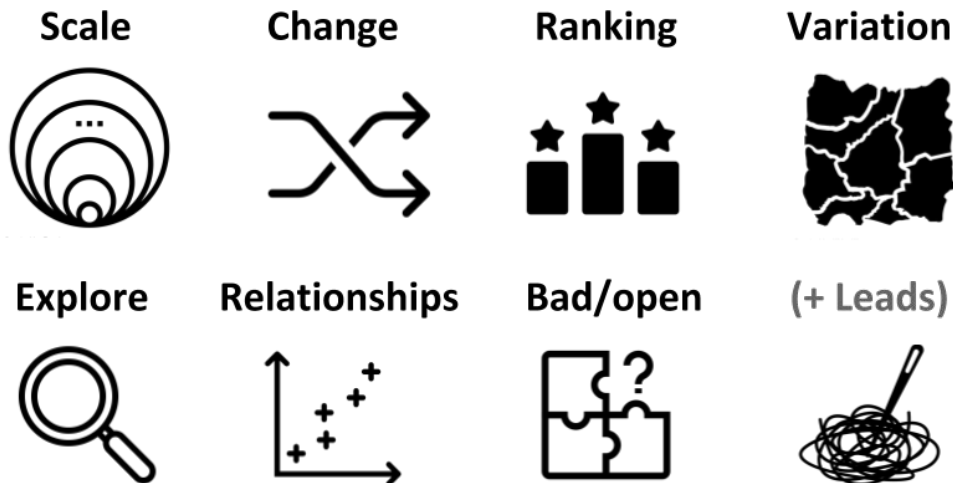
## Data-driven

- > A light hypothesis
- > Exploring information to find new leads
- > Completeness of data

# Story angles

- > Scale - identifying a big problem
- > Change - things going up/down
- > Ranking - best/worst in dataset
- > Variation - expect equal treatment
- > Explore - 'call to action'
- > Relationships - 'x' related 'y'?
- > Bad/open - stories about data itself i.e. lack of data

## 7 common angles for data stories



ONLINE JOURNALISM

BLOG

Icons: the Noun Project: Becris (scale), Adrian Coquet (change and ranking), Kirby Wu (variation), Aradila Studio (explore) Trevor Dsouza (relationships), Iconpai (bad data), Kirill Ulitin (leads)

Credit: Paul Bradshaw

# Example: using police data

- > Data-driven approach
- > Light hypothesis
- > Story angle: Variation + change

## Met police more likely to use force against BAME people



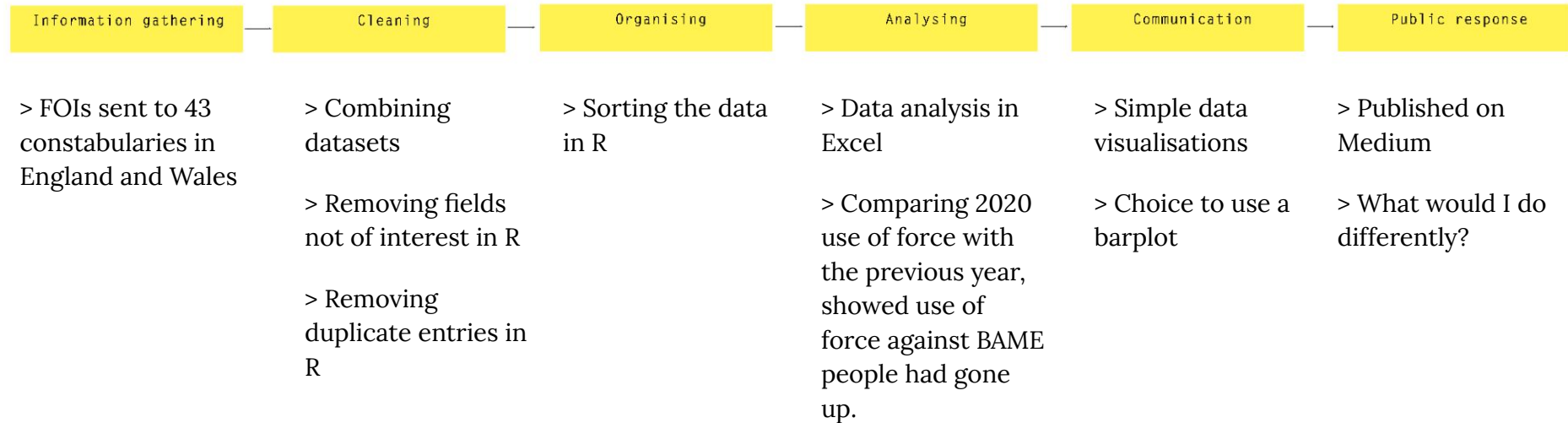
Hanna Duggal Jan 21 · 4 min read



Footage of Met police using force. Source: Channel 4 News

Metropolitan Police are more likely to use force against BAME people, the latest data reveals.

# Example: using police data



# Self-identity, theory and practice

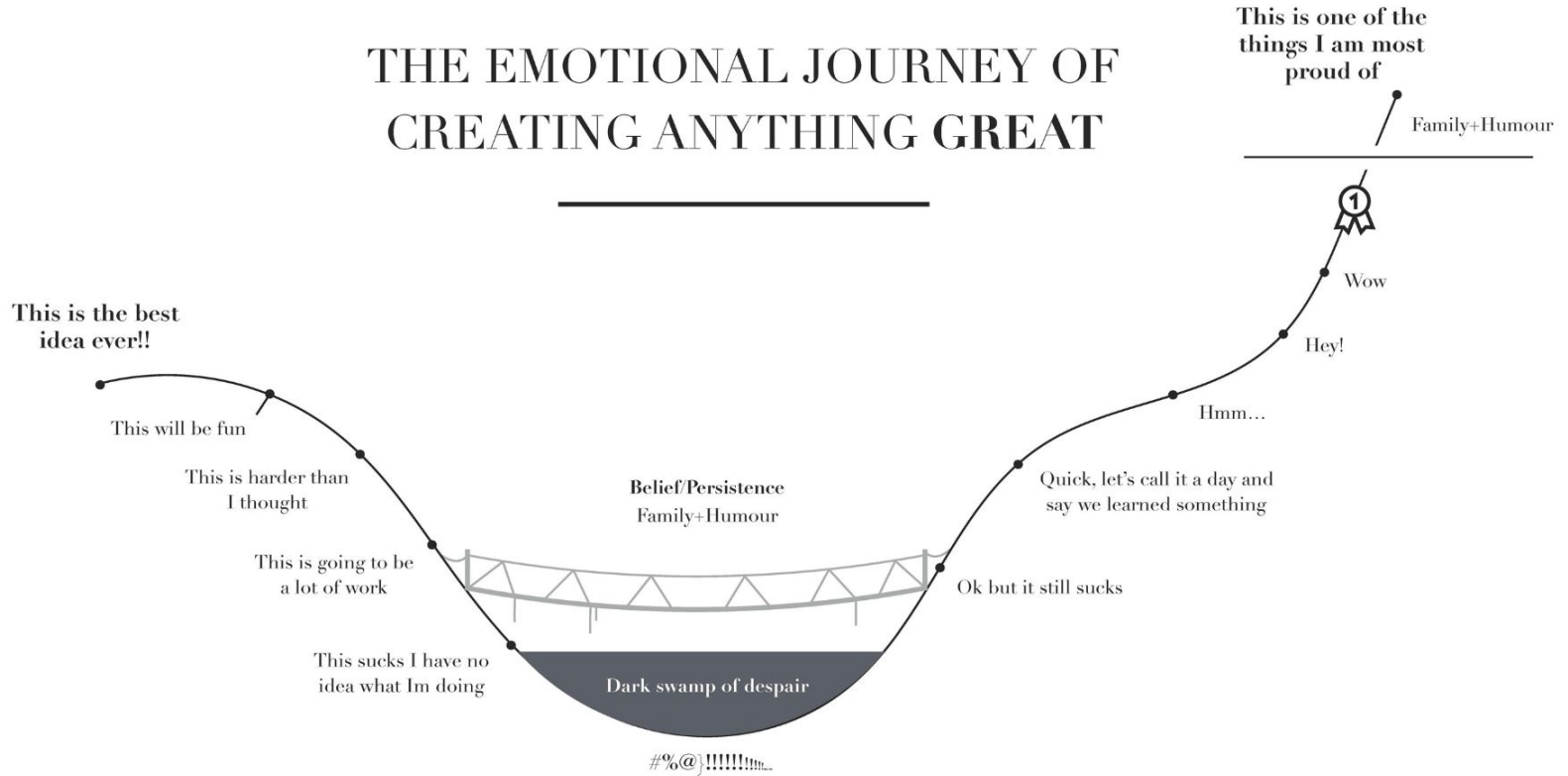
```
1 curl 'https://3tzau2bnpu-dsn.algolia.net/1/indexes/*/queries?
20(4.8.0)%3B%20Browser%3B%20instantsearch.js%20(4.2.0)%3B%20J
2 -H 'Connection: keep-alive' \
3 -H 'x-algolia-application-id: 3TZAU2BNPU' \
4 -H 'x-algolia-api-key: f3f54e2629fb29af51828f984180265b' \
5 -H 'User-Agent: Mozilla/5.0 (iPhone; CPU iPhone OS 13_2_3 l
like Gecko) Version/13.0.3 Mobile/15E148 Safari/604.1' \
6 -H 'content-type: application/x-www-form-urlencoded' \
7 -H 'Accept: */*' \
8 -H 'Origin: https://www.elysee.fr' \
9 -H 'Sec-Fetch-Site: cross-site' \
10 -H 'Sec-Fetch-Mode: cors' \
11 -H 'Sec-Fetch-Dest: empty' \
12 -H 'Referer: https://www.elysee.fr/' \
13 -H 'Accept-Language: en-US,en;q=0.9,he;q=0.8' \
14 --data-raw '{"requests":[{"indexName":"prod_all","params":"
T%20type%3Aevent&highlightPreTag=__ais-highlight__&highligh
uesPerFacet=20&facets=%5B%22categories.fr%22%2C%22president
22categories.fr%22%2C%22topics.fr%22%2C%22president.name%22
es.fr%3ADiscours%22%2C%22president.name%3ANicolas%20Sarkozy
15 --compressed
```



"What the meow is this?"



# THE EMOTIONAL JOURNEY OF CREATING ANYTHING GREAT



THE EMOTIONAL JOURNEY IS **INEVITABLE** AND PERHAPS NECESSARY

# Passing the threshold

- > Transformative - a significant change in perception
- > Irreversible - unlikely to be forgotten
- > Integrative - exposing interrelatedness of something
- > Troublesome - troublesome knowledge

# Paradigms of thinking

> How we view the world

> Thought patterns, assumptions, methods, contributions

1. How to find or access data
2. Data literacy: descriptive and predictive statistics, significance, etc.
3. Coding of big data
4. Data visualisation: telling stories using charts, maps, infographics

"I know how to break down a problem into smaller problems when it comes to something technical"

"Perform operations on a dataset manually and intuitively. Then generalise your intuition into a systematic approach using programming."

"I usually start sketching with words first, very light initial ideas for outputs and then shift towards mapping the data experience journey in a modular way that I can disassemble and assemble"

"Your dataset is kind of like a source. Your job is to interview it like any other source. You understand as much as you can and back it up with other sources"

"You start with a puzzle, a question. It's a permanent process of zooming in and zooming out. Without me saying anything the instinct was to zoom in to certain parts of the network and interrogate those nodes"

"I know how to break down a problem into smaller problems when it comes to something technical"

Web developer

"Perform operations on a dataset manually and intuitively. Then generalise your intuition into a systematic approach using programming."

Programmer

"I usually start sketching with words first, very light initial ideas for outputs and then shift towards mapping the data experience journey in a modular way that I can disassemble and assemble"

Information designer

"Your dataset is kind of like a source. Your job is to interview it like any other source. You understand as much as you can and back it up with other sources"

Journalist

"You start with a puzzle, a question. It's a permanent process of zooming in and zooming out. Without me saying anything the instinct was to zoom in to certain parts of the network and interrogate those nodes"

Social scientist

# Example 1: Sport Climbing

## Climbing at the Olympics

- > Data-driven approach
- > Scraped data from the IFSC
- > Visual storytelling



Credit: Niels de Hoog

# Example 1: Sport Climbing

## Climbing at the Olympics

- > Data-driven approach
- > Scraped data from the IFSC
- > Visual storytelling

“Try to find something you’re passionate about - that will carry you through the difficulty of what you’re learning”



Credit: Niels de Hoog



## Example 2: Viz in the wild



vizinthewild

Message



62 posts

571 followers

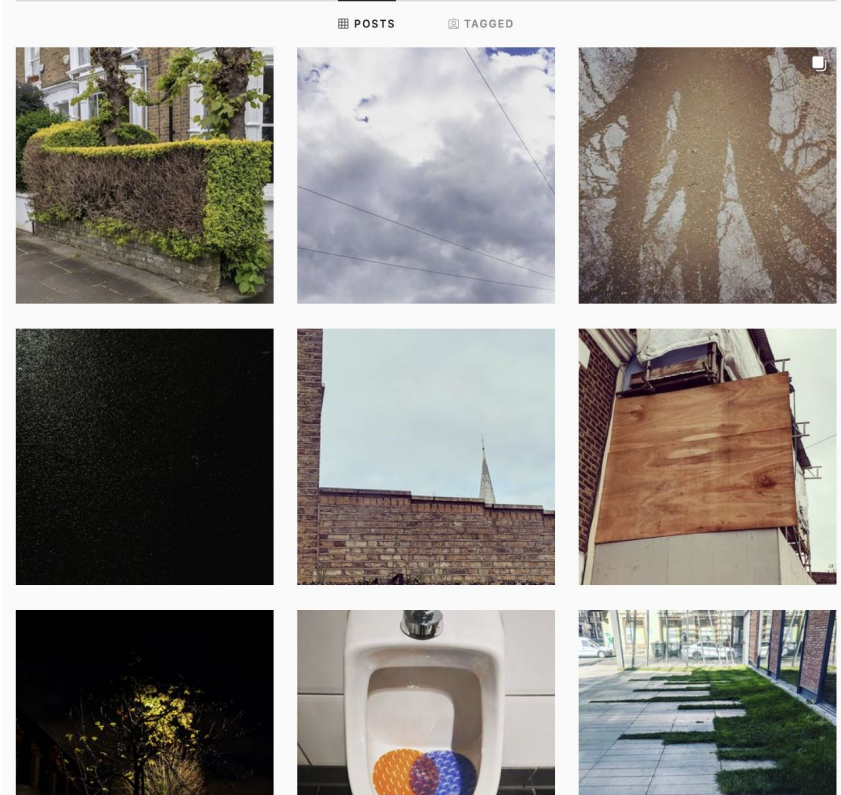
1,987 following

Viz in the wild

Viz in the wild is a collection of those unseen, overlooked and often missed expressions of data, devices or interpretation of data... Welcome.

> [Viz in the wild \(@vizinthewild\)](#) •  
[Instagram photos and videos](#)

“Viz in the wild was a way for me to visually explore how visualisation types could function and how I might be able to take a visualisation and break it free from flat land only existing in a 2D environment”



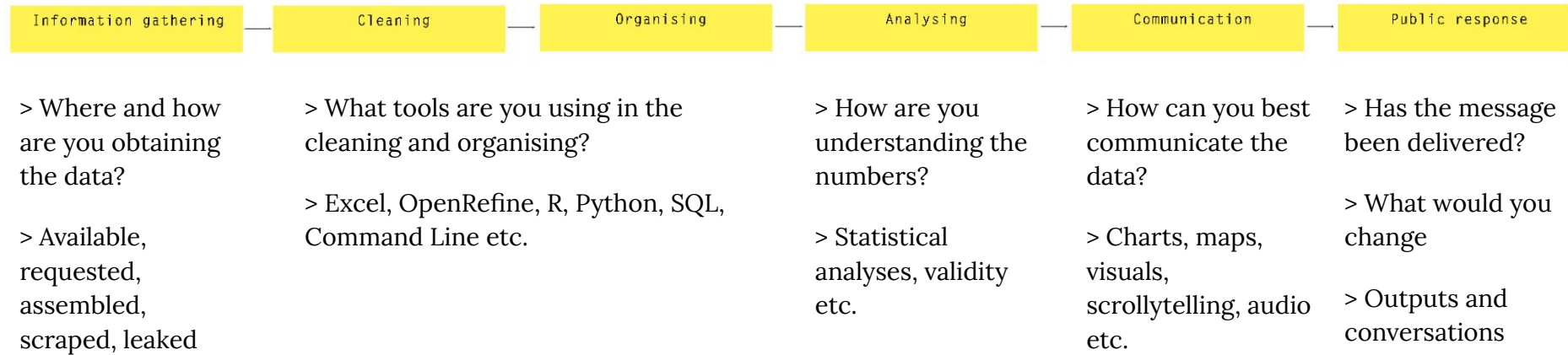


# Example 3: Collective Action Networks in Egypt

- > Research design
- > Convergent parallel approach
- > Interviews and creation of dataset
- > Question > boundary specification > data collection > data analysis > interpretation (loop)



# Toolkits to use



# Collaboration

- > What is the value of collaboration?
- > Mixed approaches, where and how is value added along the chain?

Thank you for listening!