

# Module 4 - Session 1 - Data Visualisation

## Working effectively with data

CivicDataLab

2021/10/12 (updated: 2021-10-12)



1. To understand a concept visually



To understand a concept visually
To demystify what a data point represents



- 1. To understand a concept visually
- 2. To demystify what a data point represents
- 3. For making decisions Spatial data visualisations are good examples of how a map can help in simplyfying complex geographical patterns that further contributes to effective decision making.



- 1. To understand a concept visually
- 2. To demystify what a data point represents
- 3. For making decisions Spatial data visualisations are good examples of how a map can help in simplyfying complex geographical patterns that further contributes to effective decision making.
- 4. To explore an idea



- 1. To understand a concept visually
- 2. To demystify what a data point represents
- 3. For making decisions Spatial data visualisations are good examples of how a map can help in simplyfying complex geographical patterns that further contributes to effective decision making.
- 4. To explore an idea
- 5. To engage with a diverse set of stakeholders



- 1. To understand a concept visually
- 2. To demystify what a data point represents
- 3. For making decisions Spatial data visualisations are good examples of how a map can help in simplyfying complex geographical patterns that further contributes to effective decision making.
- 4. To explore an idea
- 5. To engage with a diverse set of stakeholders
- 6. **It's fun**

#### SeriesHeat by Jim Vallandingham

## The Data Viz Quadrant





#### **Idea Illustration**

#### civic data lab

#### **Hype Cycle for Emerging Technologies**



### **Idea Generation**





## Visual Discovery/Exploration





## Every data viz



#### Reports linked under each theme

Judicial Appointments						
ADR						
Diversity						
COVID-19						
Government Litigation						
Others						
2	4	6	8	10	12	14



1. Data, that is well documented



1. Data, that is well documented

2. Missing context about the domain or subject matter expertise



- 1. Data, that is well documented
- 2. Missing context about the domain or subject matter expertise
- 3. Familiarity with the tools to process and visualise data



- 1. Data, that is well documented
- 2. Missing context about the domain or subject matter expertise
- 3. Familiarity with the tools to process and visualise data
- 4. Asking the right questions



- 1. Data, that is well documented
- 2. Missing context about the domain or subject matter expertise
- 3. Familiarity with the tools to process and visualise data
- 4. Asking the right questions
- 5. Building convincing narratives tailored for specific stakeholders



- 1. Data, that is well documented
- 2. Missing context about the domain or subject matter expertise
- 3. Familiarity with the tools to process and visualise data
- 4. Asking the right questions
- 5. Building convincing narratives tailored for specific stakeholders
- 6. Unequal distribution of data literacy



- 1. Data, that is well documented
- 2. Missing context about the domain or subject matter expertise
- 3. Familiarity with the tools to process and visualise data
- 4. Asking the right questions
- 5. Building convincing narratives tailored for specific stakeholders
- 6. Unequal distribution of data literacy



## **Telling stories using Data**

**Stories** 



## **Telling stories using Data**

Stories | Audience



## **Telling stories using Data**

Stories | Audience | Medium

1. Factoid Stories - Why does this one data point stand out from the others?





Factoid Stories - Why does this one data point stand out from the others?
Interaction Stories - Why do these do aspects of the data change with each other?



Factoid Stories - Why does this one data point stand out from the others?
Interaction Stories - Why do these do aspects of the data change with each other?

3. Comparison Stories - What is the meaningful difference between these parts?



1. Factoid Stories - Why does this one data point stand out from the others?

- 2. Interaction Stories Why do these do aspects of the data change with each other?
- 3. Comparison Stories What is the meaningful difference between these parts?

4. Change Stories - What made this part of the data change from this to that?



- 1. Factoid Stories Why does this one data point stand out from the others?
- 2. Interaction Stories Why do these do aspects of the data change with each other?
- 3. Comparison Stories What is the meaningful difference between these parts?
- 4. Change Stories What made this part of the data change from this to that?
- 5. Personal Stories How does this data connect to the lives of the audience?

Knowledge about the intended user of a data visualisation. What can it change ?

1. Presentation of information



Knowledge about the intended user of a data visualisation. What can it change ?

- 1. Presentation of information
- 2. Content granularity



Knowledge about the intended user of a data visualisation. What can it change ?

- 1. Presentation of information
- 2. Content granularity
- 3. Visualisation Narratives



Knowledge about the intended user of a data visualisation. What can it change ?

- 1. Presentation of information
- 2. Content granularity
- 3. Visualisation Narratives
- 4. Intended Outcomes



1. Static (Media articles, Infographics) vs Interactive (Web Applications, Websites, etc)



Static (Media articles, Infographics) vs Interactive (Web Applications, Websites, etc)
Language to communicate



- 1. Static (Media articles, Infographics) vs Interactive (Web Applications, Websites, etc)
- 2. Language to communicate
- 3. Structuring the narratives



- 1. Static (Media articles, Infographics) vs Interactive (Web Applications, Websites, etc)
- 2. Language to communicate
- 3. Structuring the narratives
- 4. Accessibility



- 1. Static (Media articles, Infographics) vs Interactive (Web Applications, Websites, etc)
- 2. Language to communicate
- 3. Structuring the narratives
- 4. Accessibility
- 5. Stakeholder specific




**Convince Me** - To practice making data-driven arguments that try to convince different people

1. Share a data viz with the group



- 1. Share a data viz with the group
- 2. Questions to ask:
  - 1. Is there an intended audience ?
  - 2. Is there an argument being made ?
  - 3. Are they trying to get the audience to do something ?
  - 4. Who are the stakeholders in the system it describes ?



- 1. Share a data viz with the group
- 2. Questions to ask:
  - 1. Is there an intended audience ?
  - 2. Is there an argument being made ?
  - 3. Are they trying to get the audience to do something ?
  - 4. Who are the stakeholders in the system it describes ?
- 3. Pick people from the group as identified stakeholders



- 1. Share a data viz with the group
- 2. Questions to ask:
  - 1. Is there an intended audience ?
  - 2. Is there an argument being made ?
  - 3. Are they trying to get the audience to do something ?
  - 4. Who are the stakeholders in the system it describes ?
- 3. Pick people from the group as identified stakeholders
- 4. People from the audience use the data to make an argument to convince the stakeholders



- 1. Share a data viz with the group
- 2. Questions to ask:
  - 1. Is there an intended audience ?
  - 2. Is there an argument being made ?
  - 3. Are they trying to get the audience to do something ?
  - 4. Who are the stakeholders in the system it describes ?
- 3. Pick people from the group as identified stakeholders
- 4. People from the audience use the data to make an argument to convince the stakeholders
- 5. If the stakeholder gets convinced, they take a step forward



- 1. Share a data viz with the group
- 2. Questions to ask:
  - 1. Is there an intended audience ?
  - 2. Is there an argument being made ?
  - 3. Are they trying to get the audience to do something ?
  - 4. Who are the stakeholders in the system it describes ?
- 3. Pick people from the group as identified stakeholders
- 4. People from the audience use the data to make an argument to convince the stakeholders
- 5. If the stakeholder gets convinced, they take a step forward
- 6. Ask people about why they made an argument and why they thought it would convince a certain stakeholder



**Convince Me** - To practice making data-driven arguments that try to convince different people

- 1. Share a data viz with the group
- 2. Questions to ask:
  - 1. Is there an intended audience ?
  - 2. Is there an argument being made ?
  - 3. Are they trying to get the audience to do something ?
  - 4. Who are the stakeholders in the system it describes ?
- 3. Pick people from the group as identified stakeholders
- 4. People from the audience use the data to make an argument to convince the stakeholders
- 5. If the stakeholder gets convinced, they take a step forward
- 6. Ask people about why they made an argument and why they thought it would convince a certain stakeholder

7. Ask the stakeholders what convinced them and what didn't

# **Types of Arguments**



- Did you make someone feel guilty?
- Did you appeal to a sense of responsibility?
- How central was the data to your argument?
- Did you relate to person's point of view or where they are coming from?



- Double-check your assumptions about an audience
- Use different approaches for different audiences

mmon Pitfalls

 Be true to your data (show a big difference and make it relevant)

#### **Data Stories**

civic data lab

1. What's really warming the world ? *Evaluating arguments* 

#### **Data Stories**

civic data lab

- 1. What's really warming the world ? *Evaluating arguments*
- 2. US Gun Deaths Gun Control vs Gun Rights



Vital Coronavirus Information Is Failing the Blind and Visually Impaired



Vital Coronavirus Information Is Failing the Blind and Visually Impaired



Vital Coronavirus Information Is Failing the Blind and Visually Impaired

Few things to consider while **designing data viz** solutions:

1. Use **alt text** to provide a one-sentence summary of the chart



Vital Coronavirus Information Is Failing the Blind and Visually Impaired

- 1. Use **alt text** to provide a one-sentence summary of the chart
- 2. Provide access to raw data



Vital Coronavirus Information Is Failing the Blind and Visually Impaired

- 1. Use **alt text** to provide a one-sentence summary of the chart
- 2. Provide access to raw data
- 3. If you're using color, think of how you can convey the same distinctions to people with **colorblindness**



Vital Coronavirus Information Is Failing the Blind and Visually Impaired

- 1. Use **alt text** to provide a one-sentence summary of the chart
- 2. Provide access to raw data
- 3. If you're using color, think of how you can convey the same distinctions to people with **colorblindness**
- 4. If you're using visual media, consider how **blind people can consume your content**.



Vital Coronavirus Information Is Failing the Blind and Visually Impaired

- 1. Use **alt text** to provide a one-sentence summary of the chart
- 2. Provide access to raw data
- 3. If you're using color, think of how you can convey the same distinctions to people with **colorblindness**
- 4. If you're using visual media, consider how **blind people can consume your content**.
- 5. If you're using animation, factor in people with epilepsy, ADHD, or cognitive disabilities, and **give the user control of the animation**.



Vital Coronavirus Information Is Failing the Blind and Visually Impaired

- 1. Use **alt text** to provide a one-sentence summary of the chart
- 2. Provide access to raw data
- 3. If you're using color, think of how you can convey the same distinctions to people with **colorblindness**
- 4. If you're using visual media, consider how **blind people can consume your content**.
- 5. If you're using animation, factor in people with epilepsy, ADHD, or cognitive disabilities, and **give the user control of the animation**.
- 6. If you're using sound, such as **sonification**(use of non-speech audio to convey information or perceptualize data) or spoken aspects, **think of the deaf**.



Vital Coronavirus Information Is Failing the Blind and Visually Impaired

Few things to consider while **designing data viz** solutions:

- 1. Use **alt text** to provide a one-sentence summary of the chart
- 2. Provide access to raw data
- 3. If you're using color, think of how you can convey the same distinctions to people with **colorblindness**
- 4. If you're using visual media, consider how **blind people can consume your content**.
- 5. If you're using animation, factor in people with epilepsy, ADHD, or cognitive disabilities, and **give the user control of the animation**.
- 6. If you're using sound, such as **sonification**(use of non-speech audio to convey information or perceptualize data) or spoken aspects, **think of the deaf**.

Look at accessibility as an opportunity to hone your skills, to move beyond the ordinary, and to provide an intentional experience for your users.

#### **Accessibility Resources**

- 1. Why Accessibility Is at the Heart of Data Visualization
- 2. Accessible COVID-19 Pandemic Data
- 3. Dataviz Accessibility Resources Github
- 4. Accessibility Fireside Chat Data Visualization Society





**Deconstructing a data viz** - Build your visual skills by taking apart an example visualization



**Deconstructing a data viz** - Build your visual skills by taking apart an example visualization

**Why** - *This activity helps you build the skills (data processing, design, storytelling) by taking apart work that others have done (the good and the bad) to build your critical eye.* 



**Deconstructing a data viz** - Build your visual skills by taking apart an example visualization

**Why** - *This activity helps you build the skills (data processing, design, storytelling) by taking apart work that others have done (the good and the bad) to build your critical eye.* 

How - Discuss the visualisation



**Deconstructing a data viz** - Build your visual skills by taking apart an example visualization

**Why** - This activity helps you build the skills (data processing, design, storytelling) by taking apart work that others have done (the good and the bad) to build your critical eye.

How - Discuss the visualisation

1. The data it uses.



**Deconstructing a data viz** - Build your visual skills by taking apart an example visualization

**Why** - This activity helps you build the skills (data processing, design, storytelling) by taking apart work that others have done (the good and the bad) to build your critical eye.

How - Discuss the visualisation

1. The data it uses.

2. The ways it shows that data.



**Deconstructing a data viz** - Build your visual skills by taking apart an example visualization

**Why** - This activity helps you build the skills (data processing, design, storytelling) by taking apart work that others have done (the good and the bad) to build your critical eye.

How - Discuss the visualisation

- 1. The data it uses.
- 2. The ways it shows that data.
- 3. The narrative it is trying to tell.



**Deconstructing a data viz** - Build your visual skills by taking apart an example visualization

**Why** - This activity helps you build the skills (data processing, design, storytelling) by taking apart work that others have done (the good and the bad) to build your critical eye.

**How** - Discuss the visualisation

- 1. The data it uses.
- 2. The ways it shows that data.
- 3. The narrative it is trying to tell.
- 4. Evaluating whether it combines those to tell the data story well

#### Activity 2 - Examples

1. Line of Succession



#### Activity 2 - Examples

Line of Succession
IJR - 2021 - Vacancies- Pg 33



civic data lab

**Resource** - From Data to Viz

**Resource** - From Data to Viz

#### Features

1. Helps in selecting charts to build as per the type of datasets available



**Resource** - From Data to Viz

- 1. Helps in selecting charts to build as per the type of datasets available
- 2. Basic description of what works where



**Resource** - From Data to Viz

- 1. Helps in selecting charts to build as per the type of datasets available
- 2. Basic description of what works where
- 3. Code to implement the charts across multiple platforms



**Resource** - From Data to Viz

- 1. Helps in selecting charts to build as per the type of datasets available
- 2. Basic description of what works where
- 3. Code to implement the charts across multiple platforms
- 4. Lists common mistakes for all chart types



civic data lab

**Resource** - From Data to Viz

- 1. Helps in selecting charts to build as per the type of datasets available
- 2. Basic description of what works where
- 3. Code to implement the charts across multiple platforms
- 4. Lists common mistakes for all chart types
- 5. Linked data stories to check how different charts were used for visualisations.
# Data to Viz - Selecting charts

Resource - From Data to Viz

#### Features

- 1. Helps in selecting charts to build as per the type of datasets available
- 2. Basic description of what works where
- 3. Code to implement the charts across multiple platforms
- 4. Lists common mistakes for all chart types
- 5. Linked data stories to check how different charts were used for visualisations.
- 6. Open Source Link



#### Data Viz - Things to avoid



1. Spotting visualisation lies

# Data Viz - Things to avoid

civic data lab

1. Spotting visualisation lies

2. Examples of quantitative info that is poorly designed for communication



A **process** to convey the requirements.



A **process** to convey the requirements.

What should be shared:

1. Project Information - What is needed ?



A **process** to convey the requirements.

What should be shared:

1. Project Information - What is needed ?

2. Call-to-Action - How will the output be used by different stakeholders ?



A process to convey the requirements.

- 1. Project Information What is needed ?
- 2. Call-to-Action How will the output be used by different stakeholders ?
- 3. Audience Who are the stakoholders ?



A process to convey the requirements.

- 1. Project Information What is needed ?
- 2. Call-to-Action How will the output be used by different stakeholders ?
- 3. Audience Who are the stakoholders ?
- 4. Use of Data Visualisation How will the viz be used e.g. on website, printed reports, social media, etc



A process to convey the requirements.

- 1. Project Information What is needed ?
- 2. Call-to-Action How will the output be used by different stakeholders ?
- 3. Audience Who are the stakoholders ?
- 4. Use of Data Visualisation How will the viz be used e.g. on website, printed reports, social media, etc
- 5. How to make the viz more accessible to a diverse set of stakeholders



A **process** to convey the requirements.

- 1. Project Information What is needed ?
- 2. Call-to-Action How will the output be used by different stakeholders ?
- 3. Audience Who are the stakoholders ?
- 4. Use of Data Visualisation How will the viz be used e.g. on website, printed reports, social media, etc
- 5. How to make the viz more accessible to a diverse set of stakeholders
- 6. Data
  - 1. Source
  - 2. Data Biography
  - 3. Metadata about the variables
  - 4. Assumptions



A process to convey the requirements.

What should be shared:

- 1. Project Information What is needed ?
- 2. Call-to-Action How will the output be used by different stakeholders ?
- 3. Audience Who are the stakoholders ?
- 4. Use of Data Visualisation How will the viz be used e.g. on website, printed reports, social media, etc
- 5. How to make the viz more accessible to a diverse set of stakeholders

6. Data

- 1. Source
- 2. Data Biography
- 3. Metadata about the variables
- 4. Assumptions
- 7. Timelines



A process to convey the requirements.

What should be shared:

- 1. Project Information What is needed ?
- 2. Call-to-Action How will the output be used by different stakeholders ?
- 3. Audience Who are the stakoholders ?
- 4. Use of Data Visualisation How will the viz be used e.g. on website, printed reports, social media, etc
- 5. How to make the viz more accessible to a diverse set of stakeholders

6. Data

- 1. Source
- 2. Data Biography
- 3. Metadata about the variables
- 4. Assumptions
- 7. Timelines

Viz for Social Good - Justice and Peace project



#### **Queries and Feedback**