

Module 4 - Session 2 - Data Visualisation

Working effectively with data

CivicDataLab

2021/10/21 (updated: 2021-10-21)

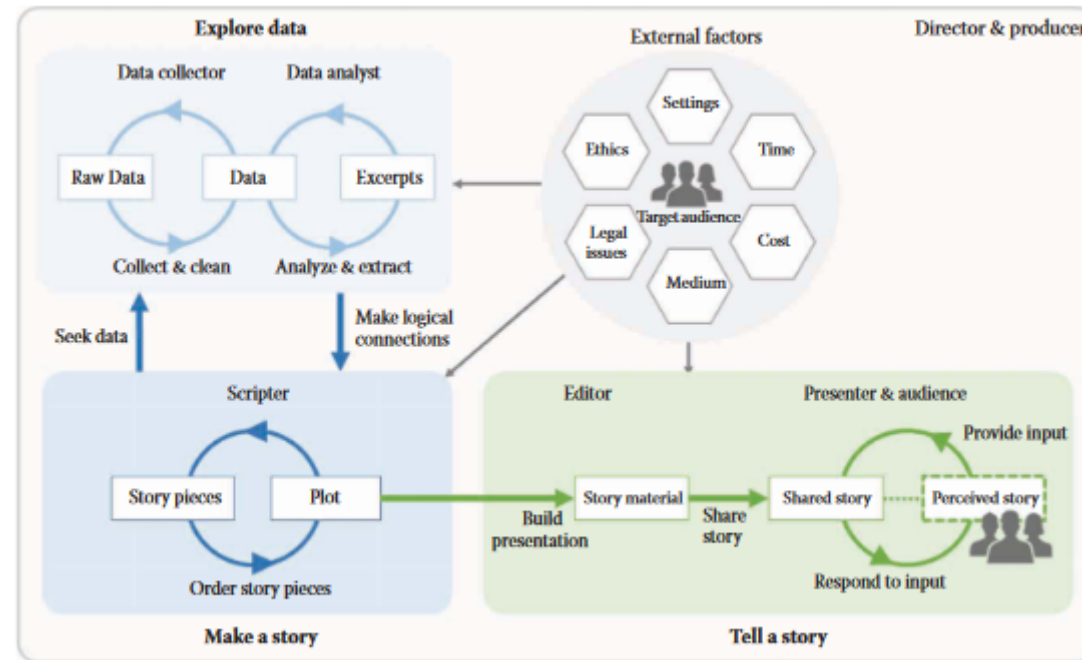
RECAP

Topics covered in the last session:

1. The data viz quadrant
2. What restricts us from visualising data
3. Data viz storytelling components **Story | Audience | Medium**
4. Activity - Building a narrative
5. Activity - Reading a data viz
6. Building accessible data visualisations - Check the [Chartability project](#)
7. How to select the most appropriate graph for your data
8. Things to avoid when developing visualisations
9. Information sharing framework when working with external consultants on data viz projects

Slides | Video

The data viz storytelling process



The storytelling process from the story idea to visually shared stories.¹

[1] Data Driven Storytelling

Data Viz - The Tooling Landscape

Visualisation Tools

Types	Description	Graphical-Based	Code-Based
Chart Templates Based	<ul style="list-style-type: none"> • Pre-defined configurations • Limited data flexibility • Harder to change • <i>Analogy: Idioms</i> 	<ul style="list-style-type: none"> • Excel / Sheets • RawGraphs • Flourish 	<ul style="list-style-type: none"> • Highcharts.js • Chart.js • Google Charts
Grammar Based	<ul style="list-style-type: none"> • Flexible configuration • Defined grammar • Based on data structure • <i>Analogy: Syntax</i> 	<ul style="list-style-type: none"> • Charticulator • Data Illustrator • Tableau • Kepler (Geo) 	<ul style="list-style-type: none"> • VegaLite.js • G2Plot • Leaflet (Geo) • Deck.gl
Components Based	<ul style="list-style-type: none"> • Individual components • Understand data for vis • Blocks to assemble • <i>Analogy: Words</i> 	<ul style="list-style-type: none"> • NodeBox • Framer (+ Code) • ... 	<ul style="list-style-type: none"> • D3.js • Vega.js (json) • VisX (react) • Ant Vision
Sketch Based	<ul style="list-style-type: none"> • Drawing on canvas • Limited data understanding • Do everything from scratch • <i>Analogy: Letters</i> 	<ul style="list-style-type: none"> • Figma • Sketch • InVision • Illustrator <p>(Static Vis Mostly)</p>	<ul style="list-style-type: none"> • p5.js • pts.js • paper.js • nodes.io

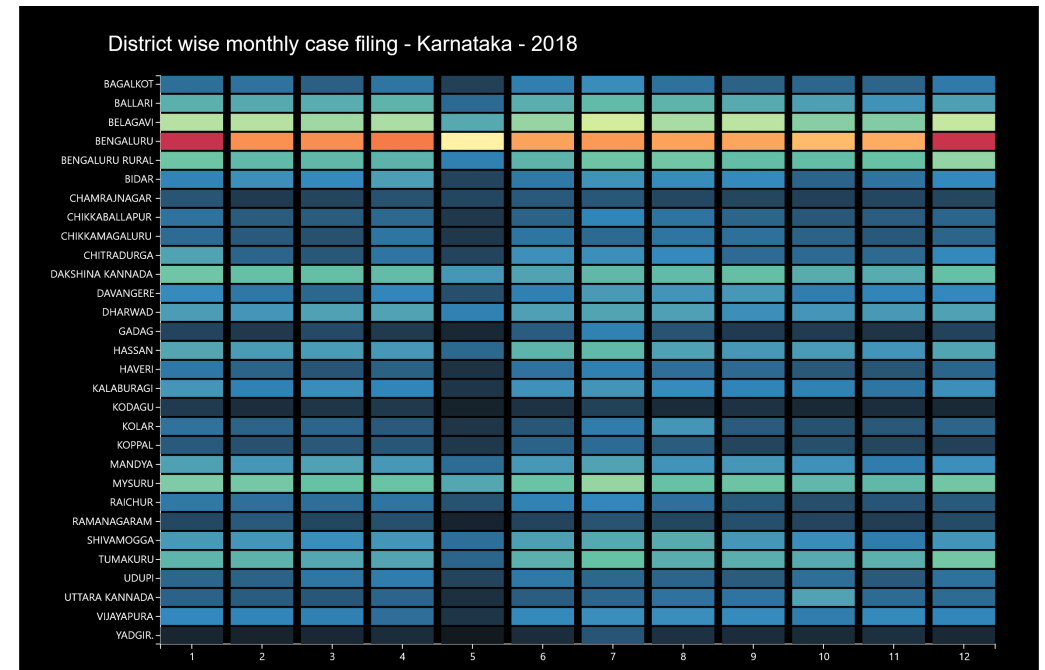
Static viz

Charticulator

Objective : Plot month wise cases for all districts of Karnataka from the year 2018



Charticulator is a project from Microsoft Research.



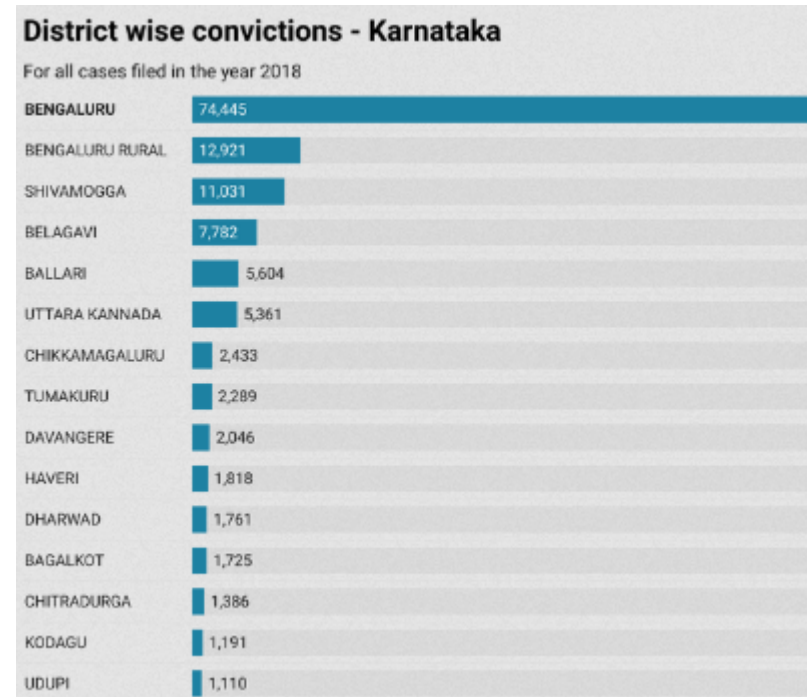
[Tool](#) | [Dataset](#)

DataWrapper

Objective : Plot district wise total conviction cases for all districts of Karnataka from the year 2018

Datawrapper

Datawrapper helps some of the world's best teams to tell their stories with data.



Dynamic (or Interactive) viz

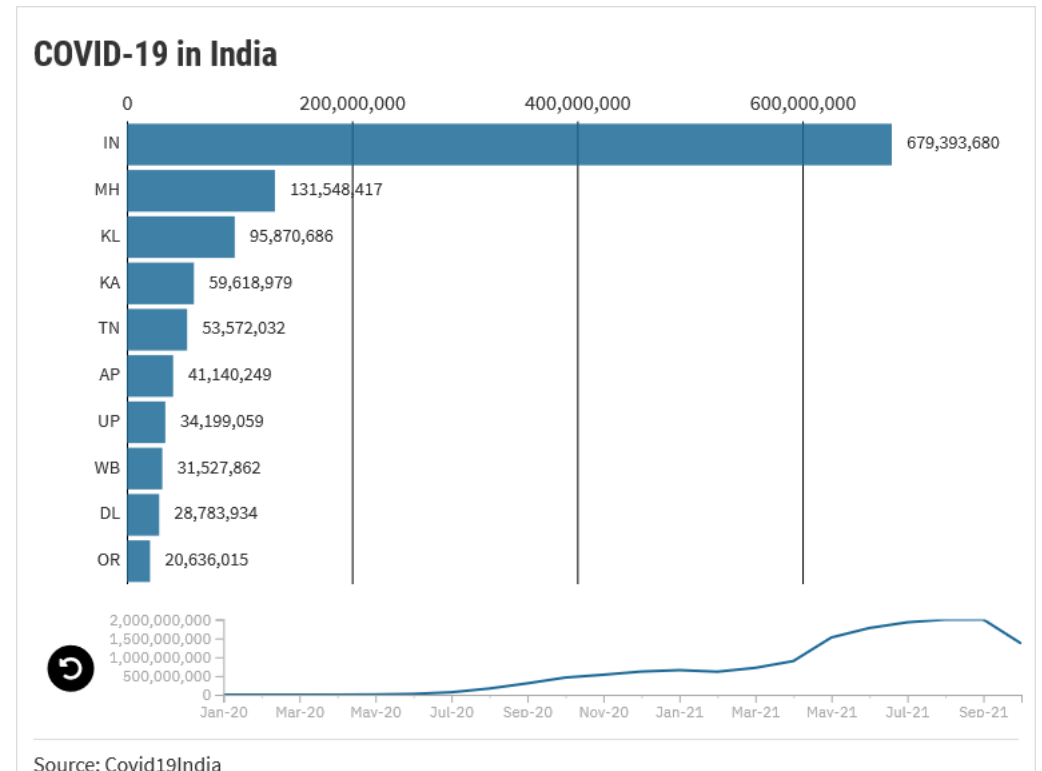
Flourish

Objective : Plot the spread of COVID-19 across states from Jan, 20 - Oct, 21

Flourish



Beautiful and easy data visualization and storytelling



COVID-19 Dynamic Data Viz



Maps

Maps - StoryMap - KnightLab



StoryMapJS is a free tool to help you tell stories on the web that highlight the locations of a series of events.



Maps - Designing a Road Trip around India

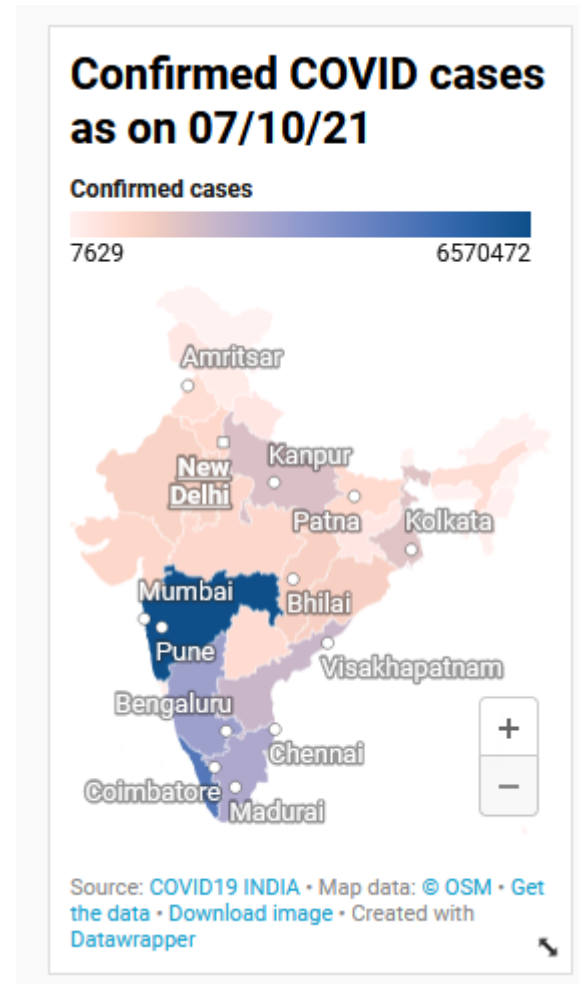


Maps - Static

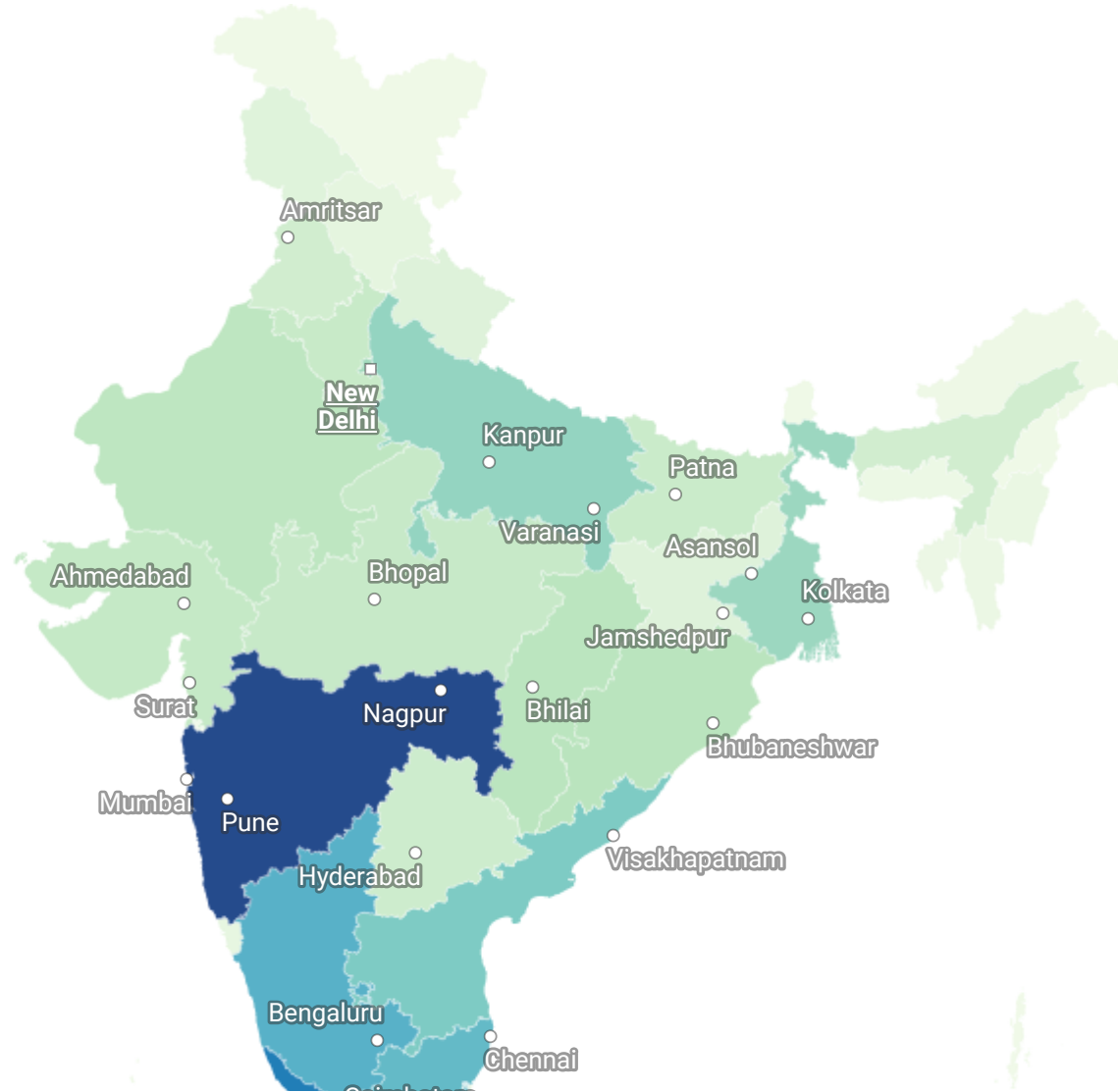
Create beautiful maps with Datawrapper

More than static maps: responsive, customizable and live-updating.

Tool | **Dataset**



Confirmed COVID cases as on 07/10/21



Tables

Table - Datawrapper

Objective : Display the total number of registered calls of women users across states from 2016-17 till 2019-20

Datawrapper

Create responsive tables with Datawrapper





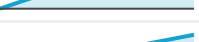
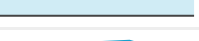







State/UTs	2016-2017	2017-2018
DELHI	98,949	140,715
GUJARAT	111,584	129,265
ANDHRA PRADESH	44,715	215,300
TELANGANA	0	170,610
PUNJAB	123,545	108,253
UTTAR PRADESH	12,551	188,142
JHARKHAND	62,923	77,993
MAHARASHTRA	43,250	79,645
TAMIL NADU	0	0
BIHAR	45,908	43,119
MADHYA PRADESH	18,503	26,279
ORISSA	0	28,197
CHANDIGARH	15,318	13,625
KERALA	382	17,794
RAJASTHAN	0	1,323
CHHATTISGARH	1,103	1,830
ARUNACHAL PRADESH	8	3,314

Table - Women help line scheme

Women Help Line Scheme

Total number of registered calls of women users across states from 2016-17 till 2019-20

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	State/UTs	2016-2017	2017-2018	2018-2019	2019-2020	Total ▼	Trends
1	DELHI	98,949	140,715	172,519	326,515	738,698	
2	GUJARAT	111,584	129,265	172,352	208,224	621,425	
3	ANDHRA PRADESH	44,715	215,300	235,425	82,106	577,546	
4	TELANGANA	0	170,610	281,917	111,522	564,049	
5	PUNJAB	123,545	108,253	126,607	193,908	552,313	
6	UTTAR PRADESH	12,551	188,142	204,632	100,987	506,312	
7	JHARKHAND	62,923	77,993	143,423	116,550	400,889	
8	MAHARASHTRA	43,250	79,645	141,970	5,544	270,409	
9	TAMIL NADU	0	0	68,831	111,363	180,194	
10	BIHAR	45,908	43,119	36,254	12,255	137,536	
11	MADHYA PRADESH	18,503	26,279	38,982	49,479	133,243	
12	ORISSA	0	28,197	23,321	18,294	69,812	
13	CHANDIGARH	15,318	13,625	12,759	13,352	55,054	

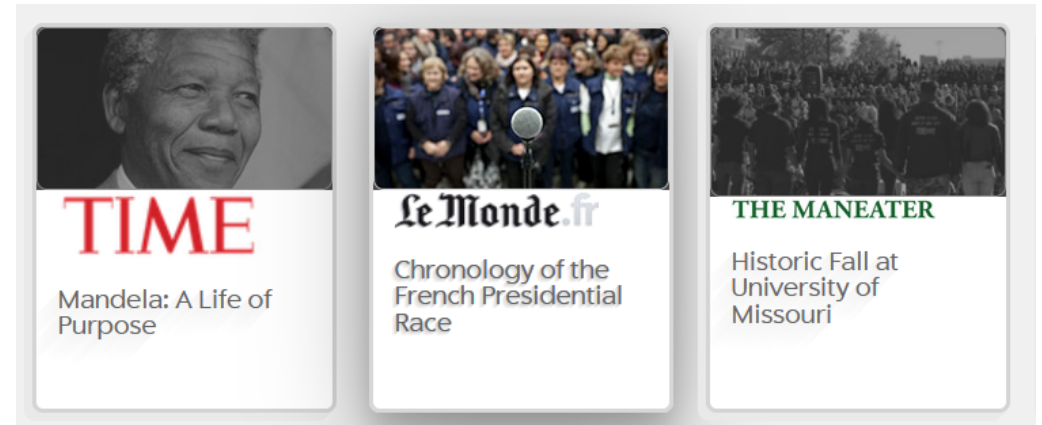
Timeline

Timeline - KnightLab



Timeline JS
Easy-to-make, beautiful timelines.

TimelineJS is an open-source tool that enables anyone to build visually rich, interactive timelines.



Three example timeline cards are shown:

- TIME**: Mandela: A Life of Purpose
- Le Monde.fr**: Chronology of the French Presidential Race
- THE MANEATER**: Historic Fall at University of Missouri

Tool

Timeline demo - Women in Computing



Resources - To select a chart



Visual vocabulary

Designing with data

There are so many ways to visualise data - how do we know which one to pick? Use the categories across the top to decide which data relationship is most important in your story, then look at the different types of chart within the category to form some initial ideas about what might work best. This list is not meant to be exhaustive, nor a wizard, but is a useful starting point for making informative and meaningful data visualisations.

Ranking	Distribution	Change over Time	Magnitude	Part-to-whole
<p>Use when an item's position in an ordered list is more important than its absolute or relative value. Don't be afraid to highlight the peaks or troughs.</p> <p>Example FT uses Market, department, budget tables, constituency election results.</p>	<p>Show values in a dataset and how often they occur. The chart can be used to measure or compare a distribution or to highlight the best or worst performing or equalities in the data.</p> <p>Example FT uses Income distribution, population (GDP/head) distribution, revealing inequality.</p>	<p>One emphasis is changing trends. These are best done for weekly measurement or extended series (monthly, quarterly or yearly data). Choosing the correct time period is important to provide a realistic context for the reader.</p> <p>Example FT uses Share price movements, economic time series, sectoral changes in a market.</p>	<p>Show size comparisons. These can be relative (not being able to see large differences) or absolute (being able to see how different things are). Showing a range of numbers for change, bars, tables or pie charts can be useful.</p> <p>Example FT uses Company production, market capitalisation, values in general.</p>	<p>Show how a single entity can be broken down into its component elements. If the reader is not used to this type of chart, consider a magnitude type chart instead.</p> <p>Example FT uses Local budgets, company structure, national election results.</p>
<p>Ordered bar The standard way to display the ranks of values. Each value is equal in size, but the height of the bar indicates its rank.</p>	<p>Histogram The standard way to show a statistical distribution. Keep the gaps between columns small to highlight the shape of the curve.</p>	<p>Line The standard way to show changing time series. If data are negative, consider markers to represent data points.</p>	<p>Columns The standard way to compare the sizes of things. Must always start at 0 on the scale.</p>	<p>Stacked column/bar A simple way of showing part-to-whole relationships. Can be difficult to read with more than a few components.</p>
<p>Ordered values See above.</p>	<p>Dot plot A simple way of showing the change or range between two or three discrete categories.</p>	<p>Columns Columns work well for showing change over time. Not usually used with only one series of data at a time.</p>	<p>Bar See above. Good when the data are not too close together and there are few categories.</p>	<p>Networks A good way of showing relationships between things. Can be difficult to read with more than a few nodes.</p>
<p>Ordered proportional symbols Use when there are a few categories. The size of the symbol represents the difference between data points in the same series.</p>	<p>Dot size plot Good for showing individual values in a distribution. Can be a good alternative to a bar chart when the values are not too close together.</p>	<p>Columns + line markers A good way of showing the relationship over time between an overall trend and a series of data.</p>	<p>Faceted columns As per standard columns but allows for multiple series. Can be difficult to read with more than 2 series.</p>	<p>Pie A common way of showing part-to-whole relationships. Can be difficult to read with more than a few segments.</p>
<p>Dot size plot Each point in a series is a circle. The size of the circle represents the value. They work best when highlighting individual values.</p>	<p>Barcode plot Use for categories, or good for comparing all the values. They work best when highlighting individual values.</p>	<p>Shape Good for showing changing data as long as the reader can distinguish between the shapes. Not usually used with only one series.</p>	<p>Faceted bar See above.</p>	<p>Donut Similar to a pie chart - but the center can be a good way of making space to include more information about the data (eg text).</p>

1. From Data to Viz
2. FT - Visual Vocabulary
3. Information design for the human brain

Other Resources

Creating accessible data viz

- The [Chartability project](#)
- [Accessibility Features Demo - HighCharts](#)

Tools

- [Visualisation Tools](#)
- [RAWGraphs](#)
- [DataWrapper](#)
- [For creating infographics - Infogram](#)
- [Dashboard - Metabase](#)
- [Dashboard - Superset](#)

Links

1. [Creating responsive data visualisations](#)
2. [Visualizing How India Reacted to Decriminalization of Homosexuality](#)
3. [India in Pixels](#)
4. [Demo of how data can tell any story you want, ode to Tokyo](#)
5. [Data Viz - Style Guides](#)
6. [PolicyViz](#)
7. [How to Use Storytelling Conventions to Create Better Visualizations](#)

Queries and Feedback