INTRODUCTION TO INFORMATION VISUALISATION TECHNIQUES FOR HUMANISTIC SCHOLARSHIP:
A SERIES

CHAPTER 1:
Why visualize?

CHAPTER 2:
Getting to data

CHAPTER 3:
Choosing and creating a visualisation

CHAPTER 4:
Do's and don'ts of designing data visualisations

This introduction was developed as part of a series on information visualisation for the humanities developed for the KU Leuven Faculty of Arts. The series was authored by Houda Lamqaddam, under the supervision of Prof. dr. Margherita Fantoli.

Find more on the work done in DH by the KU Leuven Faculty of Arts on the following page: https://www.arts.kuleuven.be/digitalhumanities/english.

KU LEUVEN

Chapter 3
Choosing and creating a visualisation

Which chart for which data? Which chart for which task?

You have maybe heard of pie charts, maps, or bar charts. There are several other chart types that may be more adapted to your data type, and to the function you want to serve with your visualization. For instance, pie charts are great at showing proportions in an easy-to-read format. Relationships will be better seen through a network representation. Comparisons of values across categories (or time) will be well supported by a bar chart. You can use an online tool such as the datavizcatalogue to find a list of chart types that fit your goal best.

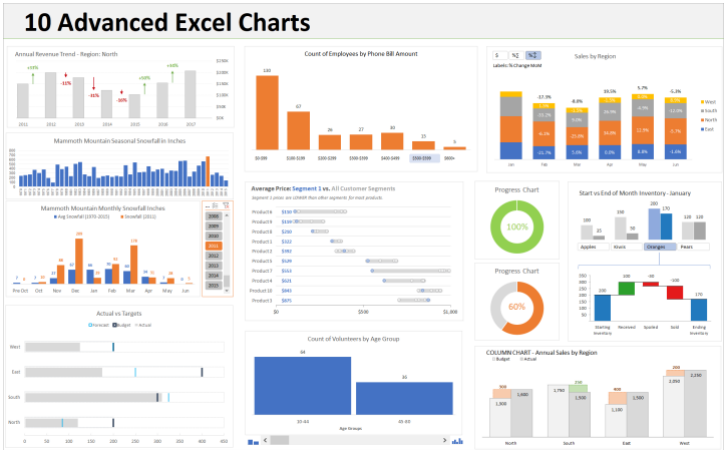
Remember: the only actual rule at this stage is that the visualization represents the data **accurately**. It is critical that you check whether the values in your data transfer to the visual representation correctly. Whether the chart type is the most adapted, the easiest to read, and so on, are important additional elements. However, the values must be depicted accurately first and foremost.

If you've decided on what chart type would fit you best, you can play around with charting tools, depending on your needs and your familiarity level. Here are a few options for all types of backgrounds and goals.

Spreadsheet tools

This is often the easiest option and does not require you to install any additional tool. Spreadsheet tools such as Excel, Numbers or Google Sheets are not specifically designed for visualization design, however, they do pack a good number of charting tools that can manage a variety of needs. They will allow you to create bar charts, line charts, and more complex options.

The main difference here is that an online tool such as Google Sheets will make it easier to collaborate with colleagues.



Source: https://www.excelcampus.com/charts/10-advanced-charts/

Resource: https://www.tutorialspoint.com/excel_data_analysis/excel_data_analysis_visualization.htm

Visualisation tools

If you want to create more complex and interactive visualizations than spreadsheets will allow, you may want to look at visualization tools. These need to be installed on your computer, but do not require any handling of code or programming. Rather, they use simple interactions to create complex and interactive representations of your data.

Note: Most of these tools will have a free account type for researchers or students. Make sure you look that up before paying any costly membership.

1. **Tableau**:

   Tableau is a very powerful one-stop-shop for the majority of your visualization needs. It takes in a data file (excel, csv, or database) as input, and lets transform your data into complex interactive visualization with a simple click. You can pick one of its 'recommended' chart types for your data, or design your own by dragging and dropping columns into visual encodings. Tableau can also be used to create dashboards, or to publish your visualization to a web page where it can be shared publicly.

   ☆ Check out our Tableau tutorial here: https://zenodo.org/record/7733937

   Resource: http://miriamposner.com/classes/dh201w21/tutorials-guides/data-visualization/getting-started-with-tableau-public/

2. **Gephi**:

   If your material is about links and relationships, then Gephi is a good option to consider. Gephi is a powerful tool for handling large datasets and creating network visualizations, as well as

providing in depth statistical analysis features. These features together can allow you to find the most influent person in your network for instance, or identify cliques. Gephi also has an important user base in the humanities, which means you can often find online tutorials and relevant examples for your research.

📎 Resource: https://libguides.brown.edu/gephi

3. **ArcGIS**:

   If you are looking for ways to represent spatial data, there are a number of software options, the most well-known of which is ArcGIS. With ArcGIS, you can create maps, perform spatial analysis, or model geographic phenomena. Whereas a tool like Tableau can also be used to visualize data onto maps, ArcGIS is a better choice for researchers who need to work with spatial data in an in-depth manner.

   📎 Resource: https://learn.arcgis.com/en/paths/gis-for-humanities/

Scripting

In the case where your needs are not met with any of the off-the-shelf tools describe above, you may want to develop your own bespoke visualization. This can allow you to create anything you want, but it does requires that you have some experience with coding (or that you are willing to learn).

1. **Python libraries**:

   If you have experience with performing data analysis, you may have already used Python libraries such as matplotlib or plotly. These libraries come with many options for basic or complex charts. They are very flexible, which means you have a lot of control on what you create, but that learning curve can be steep.

   📎 Resource: https://gilberttanner.com/blog/introduction-to-data-visualization-inpython/

2. **Observable Notebooks**:

   These are web-based visualization scripts where you can write and run your code block by block, and easily share the results. Observable comes with a large variety of Javascript libraries and a ton of publicly shared notebooks that are made for reusing and resharing – making it very easy to have results fast by making use of the massive community knowledge.

   ☆ Check out our Observable tutorial here: https://observablehq.com/d/7827a6a46922e25a

   📎 Resource: https://observablehq.com/@observablehq/workshop-intro-to-data-vis-plot-d3

3. **R**:

   Similarly to Python, R also allows you to create charts using scripts and libraries. R is very popular among statisticians and data analysts, and can be extremely powerful. You will find that some people prefer R, and others prefer Python, but they both will allow you to create visualisations based on complex data.

Resource: https://www.geeksforgeeks.org/data-visualization-in-r/

For more recommendations of tools for different purposes, check out the following resources:

- Jessica Parr's digital tools list: http://jessicaparr.org/digital-tools/
- Weltliteratur's 'Which dh tools are actually used in research?' https://weltliteratur.net/dh-tools-used-in-research/