Showcase of d3.js and its possibilities in infographics using the Ukraine conflict as an example (WiP)

Luis Rothenhäusler (20202459)

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1 Introduction

The postmodern world produces huge amounts of data every second. Analyzing this data leads to better informed decision making in every sector. Yet the wast amounts of created data are often hard to comprehend with the human mind. Infographics is about finding ways to represent this data in visually appealing, yet easily understandable visual representations. Doing this quickly and always up to date can be crucial. There are many tools available to help with the creating of infographics. This thesis will be a deep dive into the possibilities of one of these tools, the 'd3.js'(D3) library for JavaScript. To show its capabilities we will create graphics, giving an overview of the Ukraine as a sovereign nation and the current events unfolding, using publicly available data.

2 Basics

This chapter gives an overview of the different aspects and concepts necessary to understand and follow the thesis.

Infographics "Infographics (a clipped compound of "information" and "graphics") are graphic visual representations of information, data, or knowledge intended to present information quickly and clearly. They can improve cognition by utilizing graphics to enhance the human visual system's ability to see patterns and trends." [1]

Technologies The project will be built using mainly JavaScript and HTML, with a bit of CSS. This allows to easily adapt the results into all kinds of web based applications, without compatibility issues which could arise by using a framework. Additionally we use the D3.js library. It "[...] is a JavaScript library for manipulating documents based on data. D3 helps you bring data to life using HTML, SVG, and CSS." [2]

Versioning control is done using a git repository. For easy access, the repository is hosted on github. Offline data is not provided in git directly, as the files are too big. Their sources are provided though.

To faster comprehend the huge amounts of available raw data, Python is used. It helps quickly parsing the data and identifying interesting aspects.

Diagrams Diagrams or charts are visual representations of data. They help to understand and comprehend big amounts of data. There are three main use-cases for diagrams. The first is to represent how parts of a whole are in relation to each other. A typical example is the pie-chart. The second use-case is to compare the same data over an amount of time or between different data points, like bar-charts or line graphs. The third use-case is to show relations between different aspects of a general topic, like a mind-map. Many, more complex, diagrams combine different use-cases in their approach. For example a world map with country lines shows the make-up of a whole in

[1] https://en.wikipedia.org/wiki/Infographic - 31.03.2022
[2] https://d3js.org/ - 31.03.2022

parts, the total landmass and the countries individual shares. At the same time countries can be color coded, according to i.e. the population density, making it possible to compare different individual values against each other.

Data Data is produced everywhere. Most of it is created in a commercial setting. But there are many public data sources available as well. Some is open source or available through api requests. Yet most of the available data on current events is highly individual and not machine readable. This thesis only uses data which is publicly available and machine readable. As this thesis focuses on the technical implementation and to show the possibilities of D3, we do neither need nor claim the data to be correct or unbiased. Even so data from sources generally perceived as reliable, like UNICEF or the UN, is preferred.

3 Selection process

Selecting the data and diagrams to show is not an easy task. The first step will be to find data interesting enough warrant presentation. The selected data should create a general overview of the Ukraine. Therefore the selected data should come from a wide variety of fields. In some cases other countries' data might be beneficial for context and comparison. The possible representations for the data also play an important role in the selection process. As the goal is to create a showcase, we want to find diagrams of different styles and use-cases. If there are certain diagram styles we want to include in the showcase, appropriate data might be selected to make this possible. It is important to note, that the combination of data and representation should always feel natural and not forced through necessity. But as this thesis focusses on the technical possibilities of D3, the selected diagrams are not necessarily the best didactic choices for presenting their data.

4 Creating a showcase

The showcase is centered around the country of Ukraine. There will be a country view with several markers. Some markers might be chosen for their geographic location, some to provide an equal distribution. Each marker can be interacted with. In doing so, it will show one diagram and therefore aspect of the Ukraine. This will bring all the individual diagrams together to create a coherent overview. Ukrainian government websites or news providers can use the showcase for information and to provide context for the current events. Any interested person will be able to find an overview of the country, as well as the possibilities of D3.

5 Expectations

Choosing interesting and representative data for the showcase will be a challenge. Every person has different interests and could find different aspects interesting. Furthermore it is very difficult finding machine readable data about the ongoing conflict. Yet the amount of data available on the country is enormous. Looking through all the available data is a huge time investment. Therefore it is important not to get carried away in wanting to present more and more. I think the possibilities of creating the showcase are quite unlimited. It will be an interesting journey going through and refining the different aspects. But I do think the benefits of having such a showcase can be quite strong. Besides acting as a baseline and possible starting point for others in understanding and working with D3, a lot, if not most, people, including myself, only have a vague idea about the Ukraine as a country. By creating this showcase I hope to provide context about the country we so commonly see in the news today. It might even motivate people to increase or start their active involvement against the war.