

CS498 Data visualization 7-3-3 Create a Narrative Visualization task

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Datasource: <https://www.worldbank.org/en/research/brief/World-Panel-Income-Distribution>

Source code: <https://github.com/denisafanasev/cs498DataVisualization>

Web view: <https://denisafanasev.github.io/cs498DataVisualization/>

Messaging

In this narrative visualization, the main theme is to examine the relationship between changes in a country's population size and the difference in per capita income between the poorest and richest segments of the population. The message I want to convey is that, as we can see in the case of the study of changes in the population of each country and changes in income differentials, these changes are loosely related.

In order to investigate the connection between the change in population size and the change in the difference in income between the richest and poorest people we have constructed a graph plotting the change in income level over 10 years from the population size over 10 years (from 1988 to 2008). It is expected that in the case of such a link, the countries with the largest change in the population level would have the greatest change in the difference in incomes of the population. But the graph shows that this dependence is absent, because the scatter of countries is not dependent on these 2 parameters. The graph highlights 3 countries that most clearly demonstrate this. You can exhaust these countries in more detail both in absolute and relative values.

Visualization provides an opportunity to examine the changes in both relative and absolute values of these indicators. Viewers can see and assess trends in these indicators. The main page (Scene 1) summarizes the current state of the country's population, the difference between GDP per capita between the richest and poorest people, and the change in income differences since 1988. Further, the user can examine in detail each country and the dynamics of these indicators in both absolute and relative values in Scene 2 and Scene 3.

Narrative Structure

My narrative visualization follows the drilldown structure. On the main page (scene 1), the user sees the overview of all the data and can then move on to either scene 2, which shows the absolute dynamics of the indicators, or scene 3, which shows the dynamics of changes in relative indicators, of his choice. In this way, users can explore the dynamics of any country of their choice.

Scene 1:

This slide shows a summary of all countries on the scatter plot graph.

- **Axis X** - relative change in population over 10 years (from 1988 to 2008)
- **Axis Y** - relative change in income difference over 10 years (from 1988 to 2008)
- **Axis Z** - population in 2008

Below the graph there are 2 buttons that allow the user to switch to a detailed study of the dynamics of the indicators for each country of his choice. To go to the graph, the user has to select a country and click the corresponding button.

The graph shows annotations and detailed data in the form of tooltips.

Scene 2:

This slide shows the visualization of absolute population size and the difference between GDP per capita for the poorest and wealthiest segments of the population.

The linear chart shows the number of populations depending on the year.

The barchart chart shows the levels of GDP per capita for the poorest and richest segments of the population for each year of measurement of these indicators.

User can navigate between countries using the navigation buttons below the graph. The graph shows annotations and detailed data in the form of tooltips.

Scene 3:

This slide shows the relative size of the population and the difference between GDP per capita for the poorest and wealthiest segments of the population.

The red line shows the level of change in GDP per capita for the poorest and wealthiest segments of the population for each year of measurement and the blue line shows changes in population size. The graph illustrates the relationship between these indicators. User can navigate between countries using the navigation buttons below the graph. The graph shows annotations and detailed data in the form of tooltips.

Visual Structure

For all scenes, this narrative visualization uses the same background color, the background color of the chart, the location of the scene (i.e. a single chart with subsequent descriptions), the alignment of charts and text for to provide a consistent visualization sequence. Scene names, axes and legends are given in all scenes, to help the audience understand the data. Slide numbers as well as back and forth buttons also are used to facilitate navigation between scenes. Annotations are also provided to help the user to focus on important parts of the charts. There are data detalization in the form of tooltips on each graph.

Scenes

My narrative visualization has three main scenes (and 3 subscene for scenes 2 and 3), including the opening scene and two drilldown scenes. They all use the same scene template. The second and third scene are independent, and the user chooses, to which one of them it is necessary to make the transition from the main stage (from Scene 1). In other words, viewers can put forward a hypothesis (e.g., a change in the GDP per capita difference between the poorest and wealthiest segments of the population depend on the size of the population of a given country) on the main stage, which can then be tested on stage 2 or 3 at the user's choice.

Annotations

I used the d3 notation library created by Susie Lou to annotate on a template. I used this template because it is easy to implement, has a good abstract design and sufficient color contrast between the background and annotations. Important values necessary for studying the information are given in the diagrams in the form of annotations.

Parameters

The slide number (e.g., Scene 2, Scene 3, Country for detail, etc.) is a parameter, who control the fortune. Narrative visualization states include scene 1, scene 2, scene 3. The status and scene are defined by the numbers after the word "scene". For example, the "scene 3" parameter indicates that the state is the third scene. The "scene" parameter is displayed on scene 1, 2 and 3, the "country" parameter is displayed on scene 2 and 3. The second parameter is country. User can navigate by each country for detalization in Scenes 2 and 3 via navigation buttons.

All parameters showed in the title of the scene.

Triggers

The slide number, the Overview button, the Absolute Values button and the Relative Values, Previous country and Next country button are triggering that link user actions to changes in the narrative visualization state. Buttons are displayed at the bottom of the page in the form of colored rectangles with white text, informing viewers about the possibility of moving back and forth between the scenes, if any.