

Narrative Visualization of Age of Countries Using HTML and JavaScript

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1. Messaging:

In this visualization, I want to guide my readers through the topic about the physical age of countries around the world, which was represented by the median age of the population in that country. I would like my readers to have an overview of age-map around the world, discover the pattern and discuss the driven factors behind the pattern.

2. Narrative structure:

The narrative structure was designed in a “Martini” structure with three interactive charts that direct the reader from an overview of median age distribution around the world to more details behind it. However, since only the last chart renders the viewer the more explorative opportunities to change the states of the data, it is not a “drill-down” design for the entire structure. All content was built using only HTML and the basic “D3js” script.

The webpage starts with a choropleth-map of median-age around the world, then directed audience to two different plots, a scatter-plot and a bar-chart, which revealed the driven factors behind the color pattern in the map of overview.

The interactive communication started at the beginning of the webpage, where the readers can hover mouse over the world-map to see the value of highlighted country. The interaction continued in other two plots and audience can use either brushing or drop-down menu to view more organized details about the data.

3. Visual Structure:

- 3.1. For the overview chart (choropleth world map), in addition to the static color-shades that rank the age of countries from young to senior, viewers can also hover the mouse on country which in turn is highlighted to bright yellow color to urge a focus on this country. Furthermore, when the viewer moves the mouse, the median age value of the country will display at the bottom of the map.
- 3.2. The correlation between the two factors (life expectancy and fertility rate) that directly affect the median age of the country is displayed by the scatter plot. The circles that represent values of individual countries are grouped by geographic regions (i.e. Europe, Africa) and coded into different colors. However, the country

names are not labeled next to circles for the cleanness of the plot. Instead, when the viewer places the mouse on the plot, a “+” shows up and encourages the viewer to brush a square area of the circles. The selected circles are immediately highlighted by bolder but the same color (higher opacity), and a table with country name, region name (with the same color code of the legend) and median age pops up at the bottom of the scatter plot.

- 3.3. The details of the age structure (distribution of different age groups) of different income economies is another layer of the discussion, and is shown by the slides of bar charts, where the viewer can choose options of income economies through a drop-down menu implemented at the up-left corner of the chart and check the transition of the distribution of age groups between economies.
- 3.4. A link between the three interactive charts was built through the bookmark right below the paragraph of each section. The viewer can jump between each section without scroll the page to view the content of each section.

4. Scenes

The three major charts: the choropleth map, the scatter plot and the bar chart made up the entire story and are ordered from general overview (the map) to the more and more detailed analysis of the data. The final bar chart was built on the conclusion drawn from the previous charts and revealed more details about the data.

For the final bar chart, there are four scenes, and each shows the age structure of a chosen income economy. In the drop-down menu, the scenes are ordered by economy income from high to low, but the viewer has the flexibility to choose whatever scene he/she wants to see and there is no restriction on the viewing order.

5. Annotations

Tooltips are the annotation method used for this visualization and are placed either below the chart (the choropleth map, the scatter plot) or right next to the mouse cursor (the bar-chart). They are used for showing detailed information that are not obvious or not able to display in a concise format directly on the chart (i.e. the country name and median age of each circle of countries in the scattered plot). They change upon the associated mouse event, such as mouse-over and brushing.

6. Parameters

The parameter used for the final bar-chart for transition between scenes is one of the data dimensions, the type of income economy. Within each scene, the parameters that determine the look of the bar chart (the position and the height) are the other data dimension (the age group) and the data measure (the percentage of the age group in population), respectively.

When the transition parameter changes, the heights of the bars change based on the updated new values, which exhibits a slide show (or a controlled animation) of age structure dynamics on economy groups.

7. Triggers

The triggers for the final slide show of bar chart is the connection between parameters of transition. When the economy type changes the bar height values change from previous state to the current state, while the positions of the bars remain the same (same four age groups for all states). Such a change was provided to the viewer as the drop-down menu and can go any order or direction the viewer intends to.