Narrative Visualization Project

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Messaging. *What is the message you are trying to communicate with the narrative visualization?*

The World Development Indicators dataset provides many metrics of measuring the growth of countries around the world. However, it is common knowledge that resources are not equally divided amongst countries, and there are people around the world without access to even the most basic amenities, such as shelter, food, electricity, appropriate sanitation, and clean water. The message I am trying to convey through this narrative visualization is to highlight trends in access to water, sanitation, and electricity, for various countries around the world. Through this visualization, the user will be guided through a curated data exploration into understanding such trends. Hopefully, it may even serve to raise awareness on the severity of such issues around the world.

Narrative Structure. *Which structure was your narrative visualization designed to follow (martini glass, interactive slide show or drop-down story)? How does your narrative visualization follow that structure?*

This narrative visualization follows the martini glass structure. There are five scenes that allow the user to get a preliminary understanding of the dataset, to guide them through varying trends in prototypical countries around the world, and to set them up for the interactive stage of the visualization. The final scene is an interactive visualization that allows users to choose their own metrics and countries to analyze, and to compare their trends against worldwide trends or those of other countries.

Visual Structure. *What visual structure is used for each scene? How does it ensure that the viewer can understand the data and navigate the scene? How does it highlight to urge the viewer to focus on the important parts of the data in each scene? How does it help viewers transition to other scenes, to understand how the data connects to the data in other scenes?*

A minimalistic scene navigation visual structure is used so that the user follows the most intuitive path towards understanding the data. The design is intentionally such that users can only navigate to the next page (or start over once the final scene is reached) to achieve this. Hamburgers, navigation menus, and buttons would only serve to confuse the user in this case, as this visualization is much easier to understand with a certain order of scenes. All scenes in this visualization follow a common format, with the top part of the scene serving to describe the country in question and reasoning for the trends in the data. Below this, an SVG element (generated using D3.js) plots the data trends of the different metrics for the country in question. A legend and a description for all the WDI dataset indicators used is provided at the bottom of each scene, for the sake of convenience.

Scenes. *What are the scenes of your narrative visualization? How are the scenes ordered? Why are the scenes ordered this way?*

The six scenes are ordered intentionally to provide the most intuitive storytelling experience possible for the user. The first scene depicts the worldwide trends for access to water, sanitation, and electricity — this serves to initially introduce the user to the format of the charts and data, from the most generalized perspective possible. The user then proceeds forward through the scenes using the singular navigation button, allowing them to see the same trends in different countries. However, progressively as the user moves forward through the visualization, the countries are progressively less developed. In fact, after the first scene, the scenes visualize trends in CAN (Canada), CHN (China), IND (India), and NGA (Nigeria). As such, the trends become more concerning as percentages of the respective populations with access to basic amenities decrease drastically. The second scene shows Canada, where more than 98% of the entire population has access to all the amenities in question. In contrast, the fifth scene shows Nigeria, where more than half the population does not have access to certain amenities. This progressively sharp contrast serves to highlight the key realizations of this data visualization, as well as to make the user aware of these unfortunate trends, now backed by data. In the final scene, the user can test out various countries and their different metrics to compare them and draw their own insights, which will hopefully help to confirm the realizations from the narrative visualization.

Annotations. *What template was followed for the annotations, and why that template? How are the annotations used to support the messaging? Do the annotations change within a single scene, and if so, how and why?*

For each data point in the line charts from any scene, an “on hover” event will display a tooltip for that data point. This is implemented using d3-tooltip. This tooltip annotation pops up and displays the country code in question, as well as the percentage value for that year and that specific metric. To facilitate the user’s understanding, the text color in the tooltip corresponds to the color that is always used for that metric throughout the visualization. Annotations do not change within a single scene. They do change in the final scene, but only when the user adds their own lines to the chart — these lines will similarly be populated with data points that trigger informational tooltips on hover events. I built it in this minimalistic way to provide the user with as much information as possible without redundant information that confuses the user and takes away from the key realizations derived from each scene.

Parameters. *What are the parameters of the narrative visualization? What are the states of the narrative visualization? How are parameters used to define the state and each scene?*

Each scene has 2 parameters: Country Code and Indicator Metric. The Country Code is fixed for all of the first five scenes, and they are set in the following order: WLD (world), CAN (Canada), CHN (China), IND (India), and NGA (Nigeria). All of the six indicator metrics (access to electricity - urban, access to electricity - rural, access to sanitation - urban, access to sanitation - rural, access to water - urban, access to water - rural) are plotted in the first five scenes. Internally, D3 uses both parameters to query the WDI dataset API to query the appropriate data and plot the necessary lines in the line chart. For the final scene, however, the user can interact with the scene to choose specific metrics and countries to analyze. Here, the appropriate query is run with both selected parameters on “on change” events.

Triggers. *What are the triggers that connect user actions to changes of state in the narrative visualization? What affordances are provided to the user to communicate to them what options are available to them in the narrative visualization?*

There are four separate triggers in this narrative visualization. The first is the “Next Scene” navigation button, which allows the user to transition between scenes. The user is guided through five scenes where the country is fixed and all six metrics are displayed on the line chart. In the final scene, there are three triggers. The country selection section allows the user to select their desired country to be queried and plotted (first parameter - country code), while radio button option allows the user to select their desired metric to be queried and plotted (second parameter - indicator metric). When an “on change” event is detected within the country selection section, the line chart will plot one new line using the aforementioned sections to decide the two parameters selected. This newly generated line can easily be compared against the lines corresponding to their worldwide metric counterparts or against other user-created lines corresponding to their metric counterparts in other countries. However, should the line chart become too cluttered, a “Clear Graph” button is available to reset the scene to simply show just the worldwide metrics. New lines can be added again as desired. Finally, there is a “Start Over” button that allows the user to start again from the first scene. Overall, the triggers in this narrative visualization serve to allow the user to navigate through the different scenes at their own pace, as well as to freely interact with the last scene of the martini glass visualization in order to plot their own line charts to analyze similar metrics for other countries and derive their own insights.

Final Thoughts. *Summary of insights as well as a brief personal reflection on the narrative visualization project*.

The narrative visualization project was a great practical way to gain valuable experience with the nuances of the D3 library, as well as to learn interesting new facts about developing countries along the way. Given more time, this visualization could be improved. The elements that are interactive are a bit cumbersome, and overlapping lines are very difficult to discern. These issues could be addressed with “on hover” line events and by redesigning the UI of the interactive scene with more modern technologies (rather than simple dropdown menus and radio buttons). Nevertheless, I found the project to be a great learning experience.

While it is concerning to see that there are still so many people without access to basic amenities (even to this day!), the upward data trends for most development indicator metrics serve as a beacon of hope for the future. Even the most impoverished countries seem to be developing at a rapid pace, and that is great news. While there is always more we can do to raise awareness and create a call to action, I believe that even seemingly small contributions can make a difference in creating a better tomorrow. And to that end, I’ve truly enjoyed working on this project.