

## Narrative Visualization Project Essay

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### Messaging

In this narrative visualization, **life expectancy** in the selected 10 countries is the main topic I investigated. The messages I want to convey are how the life expectancies are different among countries, between genders, and how it is related to the GDP per Capita in these countries. After visualizing life expectancy by countries, viewers can observe which countries have longer or shorter life expectancy. Viewers may also note the life expectancy difference between male and female (i.e. female has longer life expectancy than male) which is validated in scene 2-3. After exploring the main scene 2, we found that the life expectancy has some sort of relationship with the economy condition of the country. Then viewers can dig more into main scene 3 to see how GDP per Capita is related with life expectancy. And it is found that normally higher GDP per Capita leads to longer life expectancy.

### Narrative Structure

My narrative visualization follows the **interactive slideshow** structure. There is an author directed path through the visualization of life expectancy differences and its relationship with GDP per Capita. Along this path, viewers can drill down into more details in each slide. For example, in the slide discussing about life expectancy differences, viewers can explore male life expectancy differences between 2000 and 2012, female life expectancy between 2000 and 2012, and life expectancy by gender in 2012 by clicking different slide numbers (i.e. scene 2-1, scene 2-2, and scene 2-3). In the slide discussing life expectancy relationship with GDP per Capita, viewers can also switch the relationship between male and female by clicking different slide numbers (i.e. scene 3-1, and scene 3-2). If viewers are not interested in the details, they can continue by clicking the "next" button in each page.

### Visual Structure

For all the scenes in this narrative visualization, same background color, chart background color, scene layout (i.e. one chart followed by some descriptions), chart and text centering are used for visualization consistency. Scene titles, axes, and legends are provided in all scenes to help viewers understand the data. Slide numbers as well as "back" and "next" buttons are also provided to help viewers navigate between scenes.

In the first scene discussing about life expectancy differences, there are three sub-scenes. In scene 2-1 and scene 2-2, grouped line charts are rendered. Same color sets are used in lines and legends to help viewer transition between scenes and be aware that the countries plotted have the same color between scenes. Annotations with labels and circles are rendered together with the charts to urge the viewer to focus on the important parts of the data in each scene. In scene 2-3, a grouped bar chart is rendered along with annotations to help viewers to focus.

In the second scene discussing life expectancy relationship with GDP per Capita, there are two sub-scenes. In scene 3-1 and scene 3-2, grouped scatter plots are rendered. Again, same color

sets are used in points and legends to help viewer transition between scenes. Annotations with labels and arrows are also provided to help view to focus on those important part of the charts.

## Scenes

There are four main scenes including the opening and closing scenes in my narrative visualization. They all share the same scene template. The opening and closing scenes serve as the starting and ending point for the visualization. The second scene discussing about life expectancy differences have three sub-scenes for viewers to explore. The third scene discussing life expectancy relationship with GDP per Capita have two sub-scenes for viewers to explore. The second scene is ordered before the third scene because the second one is a more general visualization over the life expectancy itself while the third one digs more into the details. In another word, viewers can have some hypothesis (e.g. life expectancy is related with country's economy) in main scene 2 which can be further validated in main scene 3. It is more natural to provide a general analysis before comparing the details.

## Annotations

I used the d3-annotation library made by Susie Lu for annotations to follow a template (color (#ff6961, font type Times New Roman, font size 0.8 em, etc.). I used this template because it is easy to implement, has good annotation design, and has enough color contrast between background and annotations. Important findings (e.g. life expectancy increases as GDP per Capita increases) to convey the messaging are pointed out in charts by annotations. By helping viewers to focus on important trends in data, annotations support the messaging. Annotations change within one main scene but do not change in any sub-scenes. Because in main scenes, there are different findings I want to highlight among different sub-scenes so that annotation changes are needed. And observations in any sub-scenes can be shown directly without any change.

## Parameters

The **slide number** (e.g. scene 2-1, scene 2-2, etc.) is the parameter that control the state. The states of the narrative visualization include beginning scene, scene 2-1, scene 2-2, scene 2-3, scene 3-1, scene 3-2, and ending scene. The state and scene are defined by the numbers after the word "scene". For example, parameter "scene 3-1" indicates that the state is third main scene and first sub-scene. Current slide number is in black color and other available slide numbers are in gray color.

## Triggers

The **slide number**, **"back" button** and **"next" button** are the triggers that connect user actions to changes of the narrative visualization states. Current slide number is in black color and other available slide number triggers are in gray color to inform viewers that they are able to switch between sub-scenes. When available, "back" button and "next" button are shown at the bottom of the page as red rectangles and white text to inform viewers that they are able to move backward or forward between main scenes.