

## CS416 Final Project Essay

In this project, I present the relationship between the HDI-human development index, to all different parameters such as GNI- Gross National Income per capita, life expectation at birth, years of schooling, etc. I try to use the GNI as an introduction to HDI, leading viewers to a free roam through different parameters and their impact on HDI distribution, giving them how these other parameters affect the HDI through a Martini-glass structure.

### **Messaging:**

The message I am trying to communicate is to show the positive correlation between GNI, life expectation at birth, and years of schooling as three impacting factors, standing for three aspects-economy, health/medication level, and education level, and their effect on the human development index. I want to show that all three factors strongly correlate to HDI.

### **Narrative Structure:**

I convey my message throughout the project through a Martini-glass structure. In my project, there are three scenes. Intuitively, we will always think that the HDI is highly related to the economy of that area. So, I use the GNI as a natural clue to lead the viewer to proceed.

The *first* scene is a scatterplot, providing an overview of how GNI correlates with HDI; the *second* plot is a bar chart, showing GNI against the county ranking of HDI, providing a detailed and precise view of how the HDI ranking with GNI; the *last* scene will be a freeform exploration, where the viewer could change the parameters in between *GNI*-as the indicator of economy development, *life expectation*-as the indicator of medical development, and *years of schooling*-as the indicator of education development.

So, we have the first two scenes in increasing details on GNI to lead the viewer into the free-roaming chart, transferring from control from me(author) to the viewer and completing the martini-glass structure.

## **Visual Structure:**

The first scene is a scatterplot. In this scene, the x-axis is HDI, and the y-axis is GNI. The data are presented as circles, with color to be an HDI color scale consisting of all charts, helping the user understand the development level intuitively. The location of the circle and the general trend can easily lead the viewer to develop a sense that the GNI is mostly positively correlated with HDI. There is a button to invite the user to go to the next scene to dive deeper into the data.

The second plot is a bar chart showing GNI against the county ranking of HDI. In this scene, the y-axis is GNI, but the x-axis changes to the country in the ranking of HDI. From the previous scene overview, this scene provides a more direct, detailed presentation of which country has the highest HDI instead of the general trend. The color scale of HDI also persists here to give a consistent presentation. I also use buttons to navigate to the freeform scene (the last one).

The last chart will be a freeform exploration of all three parameters. In this case, I choose a scatter plot, showing all the datum information while the circle's location persists to the parameter that the user chooses vs. the HDI. The circle's color persists as the color scale of HDI to give a consistent view throughout all scenes and a consistent and intuitive presentation of the human development level. The Y-axis is the user's chosen parameter, and the x-axis is the HDI. The locations of the circles let the user understand the general correlation with the current parameter with HDI.

## **Scenes:**

There are three scenes in the visualization.

Intuitively, we will always think that the HDI is highly related to the economy of that area. So, I try to use the GNI as a natural clue to lead the viewer to proceed. The first scene is a scatterplot with the color also showing the HDI. This chart tries to give the viewer a general overview of the trend and how this parameter correlated with the HDI. We can see some anomalies here, but the overall trend is positively correlated.

The second plot is a bar chart showing GNI against the county ranking of HDI. From the overview, we can narrow down from the general trend to the more detailed and direct ranking of each country's HDI and GNI. We now have a complete overview of how GNI interacts with HDI through the first two scenes.

The third plot is a free form exploration; the viewer could use buttons to change between parameters and plot them against HDI to see the correlation. The previous scenes lead the viewer through the correlation of GNI vs. HDI, how this scene is open to the viewer to navigate freely to more parameters, and the overall trend of the influence on HDI.

### **Annotations:**

The annotations template in three scenes are consistent throughout three scenes. It is bold and in the center/near center locations for the first two scenes to present what I want to let the viewer notice in words. In the last scene, I left the annotation at the side to prevent it from overlapping with the data circles. The font style and location are easily noticed and correspond to the martini-glass structure's first stages, letting the author direct the viewer to the free-roam scene and giving the viewer a choice. It stays the same in a single scene since I want the author's direction to be consistent with clarity.

### **Parameters:**

The parameters that I have used are GNI, life expectations at birth, and years of schooling. And the states are the parameters vs HDI charts/scenes, showing their relationship with HDI. In each scene, the HDI will be plotted against the selected parameter, or the parameter will be plotted against HDI, and their spatial location will indicate the correlation between the parameter with HDI of that specific datum.

### **Triggers:**

In the early stages, there are buttons to lead the viewer to proceed. The button navigates the user from scene to scene, moving from an overview of GNI vs. HDI to the actual country ranking of HDI vs. GNI in an author-directed path. In the last scene (the free

roam session), there are also buttons to change the displaying parameters to let the viewer see the different impacts of different parameters. All these buttons are designed to have scaling/darkening effects to show that the button can be pressed for the concern of affordance.