



REPORT ON FIT3179 ASSIGNMENT

2

Link to visualization: <https://tongjetkit.github.io/FIT3179-A2/>



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Number of Words: 1000

1 Domain

1.1 Description of Dataset – What?

The domain of the dataset (World Happiness Report up to 2023. (2023, September 9)) is a comprehensive evaluation of happiness index score and the factors influencing it including GDP per capita, healthy life expectancy and freedom on each country for every year. The data is sourced from Kaggle which is a dataset database for data scientist. The author of the dataset is from the World Happiness Report 2023 (11th ed.) which was written by a group of independent experts (The World Happiness Report. (2023, June 20)) and is a publication of the Sustainable Development Solutions Network, powered by the Gallup World Poll data. The happiness ranking in the dataset is based on individual's own assessment of their lives to the single-item Cantril Ladder life-evaluation.

1.2 Why?

The dataset is compiled for governments and any concerned individuals to assess the current state of happiness both globally and within our country which then will help determining the social and economic development of a country. Furthermore, it offers a reflective standpoint, allowing for comparisons with countries that achieve higher happiness scores, which can guide the development of improved strategies and actions. Ultimately, the dataset also pinpoints specific areas within the happiness factors that governments should focus on for improvement.

1.3 Data Preprocessing

After going through the datasets, I decided to preprocess the data by compiling all the data for each year into a file and add a Latitude and Longitude column for the dataset as well. Furthermore, the dataset includes entries with values of 0 and missing entries for particular years. Despite conducting a comprehensive review of the report, I couldn't find any guidance on how to impute substitute values for these scenarios. Therefore, I made the decision to retain them, with the understanding that these values will be excluded from the visualization.

1.4 Visualization

To help visualize the data, I have created a visualization using Vegalite (Vegalite. (n.d.)) which can be seen using the link above. The entire visualization can be seen in Appendix A.

2 Idioms

2.1 Bump Chart

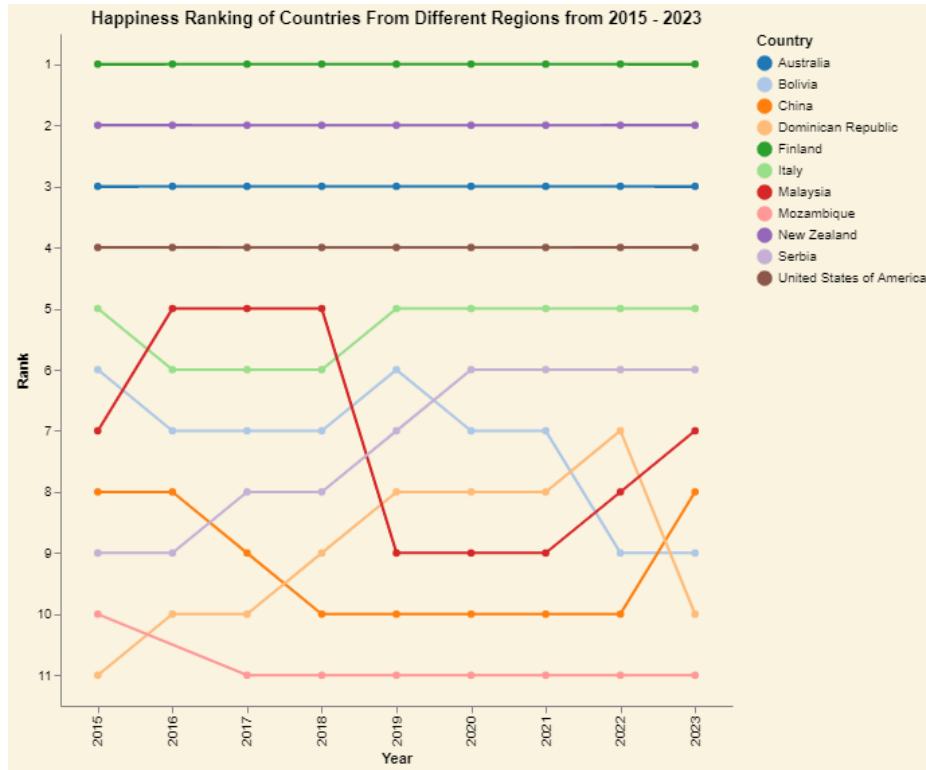


Figure 1: Bump Chart

I have created a Bump Chart (Figure 1) to visualize the ranking of happiness score for some countries from 2015 to 2023. Governments can utilize this visualization to compare countries and gain insights to their performance over the years and pinpoint the reasons behind significant ranking changes for self-improvement. Readers can also hover over each point on the line to see the ranking and happiness score for each country at each year. The reader can also click on the legend itself to highlight the country while others will fade off. This will then help reader to read and understand the visualization better with some tooltip and filtering.

2.2 Scatterplot

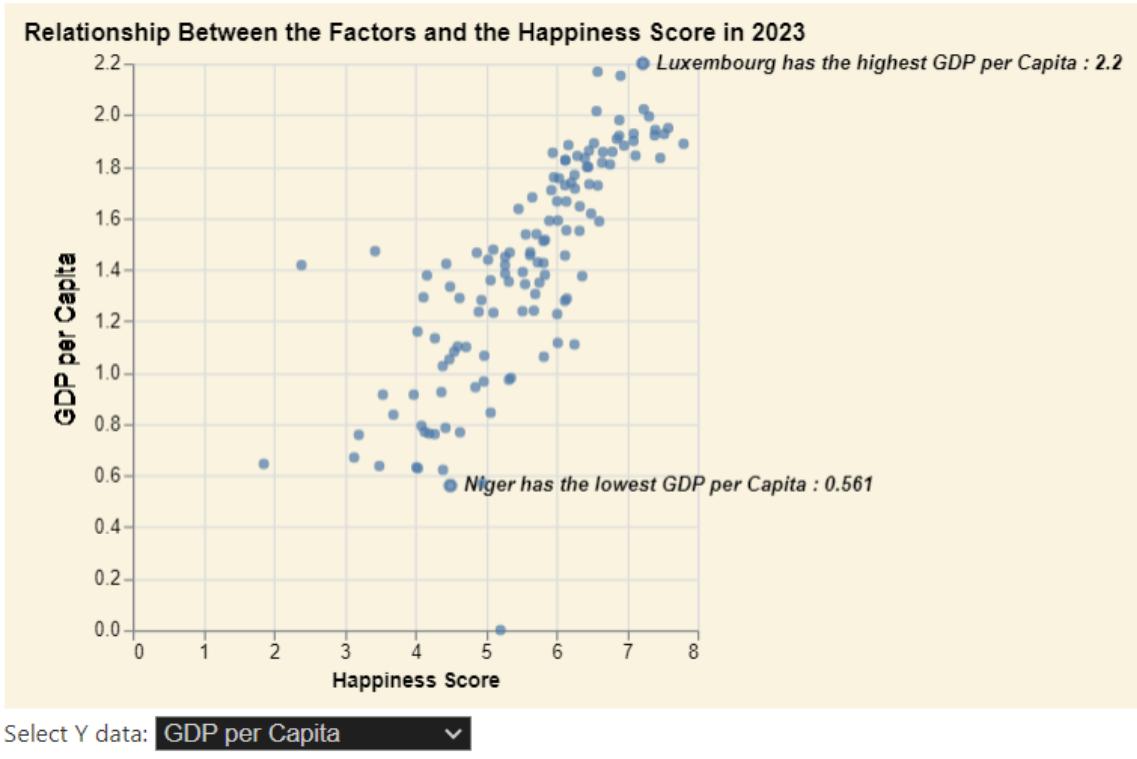


Figure 2: Scatterplot

Then to visualize the correlation between the factors and the happiness index score. I have created a scatterplot(Figure 2) as it visualizes relationships between 2 variables and the trend. This visualization will have data in 2023 as we are currently in 2023 so this data would better relate to us. It also helps show the distribution of factors and costs so governments can identify which factor affect the happiness score the most. For this scatterplot, I have added a dropdown box which readers can use to select the factor to visualize the correlation. Moreover, a tooltip is also added to each dot to display the happiness score and the factor value. Lastly, text annotations are also added to the scatterplot to identify the country with the highest and lowest factor value.

2.3 Choropleth Map

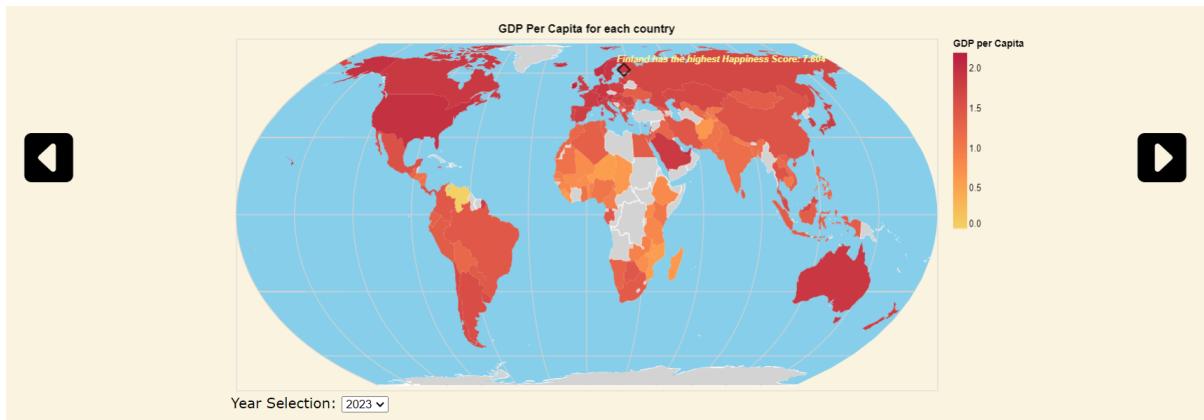


Figure 3: Choropleth Map

I've created choropleth maps (Figure 3) for each factor to visualize their global distribution, aiding in the identification of regional disparities. Readers can then further investigate to identify the cause through the explanation below. Readers can easily switch between years using dropdown boxes to track factor trends over time. Tooltips are also provided to show country names, years, and factor values. For unavailable data, grey fields with tooltips indicate their absence. Text annotations highlight the highest happiness country each year. A user-friendly slideshow is also created to allow readers to navigate these maps.

2.4 Stacked Bar Chart

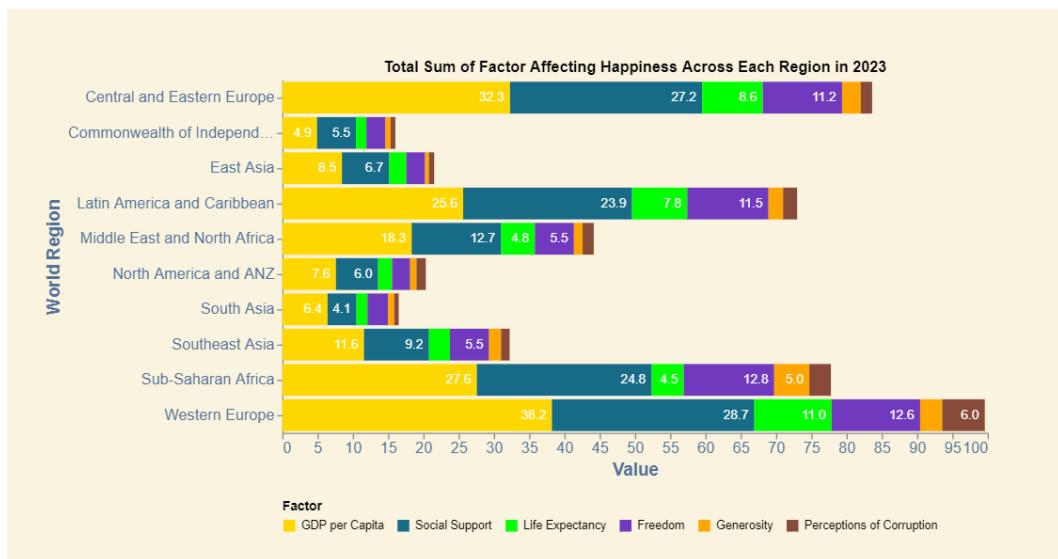


Figure 4: Stacked Bar Chart

Lastly, to help visualize the distribution of factors across different regions in 2023, I have created a stacked bar chart (Figure 4) that shows the total value for each factor for each region. This visualization will help readers to identify which factor contribute much to the happiness score and which region is the happiest. They can then get a further understanding through the explanation done below. I chose to view data in 2023 as we are currently in 2023 so this data would better relate to us. In this visualization, users can filter the factor to visualize by clicking on the legend which will then isolate the bar. Moreover, a tooltip is added for better clarity to show the value of each factor.

3 Design

3.1 Layout

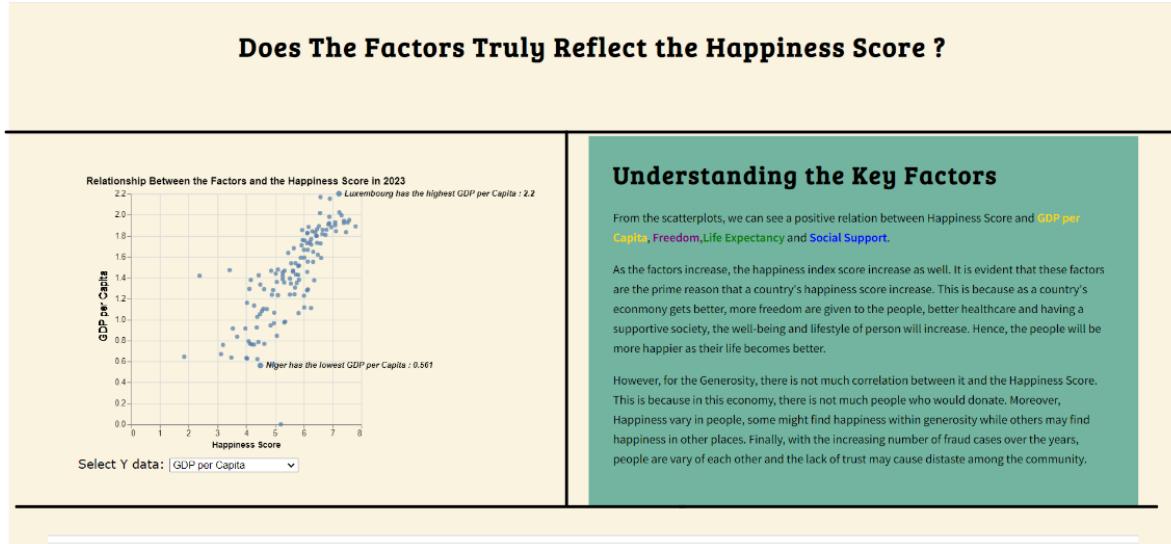


Figure 5: Sightlines

For the layout of the visualization, I opt for a vertical dashboard view so we can improve the user's readability by organizing the content which then can help reduce cognitive load. Moreover, vertical layouts are better in story telling so we can guide users through our visualization in a structured manner. Although a horizontal grid dashboard view would be sufficed as well however, to avoid cluttering the visualizations, I decided to use a vertical dashboard view instead. Moreover, it is much more space efficient organized. The dashboard is also symmetrical and balanced to improve readability so readers can view my visualization clearly. Minimal sight lines (Figure 5) are also used to align visualization to show connectivity. There are not many whitespaces used as a compact layout promotes visual cohesive to make it easier for readers to identify the relationship between the visualization elements so they can process information better.

3.2 Colours

The screenshot shows the title "WORLD HAPPINESS REPORT" in large red letters. Below it is a section titled "Does The Factors Truly Reflect the Happiness Score ?". A grid of six cards explains the factors: GDP per Capita (yellow), Social Support (blue), Life Expectancy (green), Generosity (orange), Freedom (light blue), and Perception of Corruption (grey). To the right, a box titled "Understanding the Key Factors" discusses the correlation between these factors and the happiness score.

WORLD HAPPINESS REPORT

Does The Factors Truly Reflect the Happiness Score ?

GDP PER CAPITA
GDP per Capita is the measure of a country's economic output per person divided by its population.

SOCIAL SUPPORT
Social Support is the perception and actuality that one is cared for and has assistance available from other people. It is the national average response of the question "If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?"

LIFE EXPECTANCY
Life Expectancy is the measurement the span of a life which starts at birth. This is based on the data from the World Health Organization (WHO).

GENEROSITY
Generosity is the quality of someone being kind and generous to other people. It is the national average of response to

FREEDOM
Freedom is the power or right to act, speak, or think as one wants. It is the national average of responses to the GWP

PERCEPTION OF CORRUPTION
Perception of Corruption is an index shows the perceived levels of the public sector corruption. It is the national average of the

Understanding the Key Factors

From the scatterplots, we can see a positive relation between Happiness Score and **GDP per Capita**, **Freedom**, **Life Expectancy** and **Social Support**. As the factors increase, the happiness index score increase as well. It is evident that these factors are the prime reason that a country's happiness score increase. This is because as a **country's** economy gets better, more **freedom** are given to the people, **better healthcare** and having a supportive society, the well-being and lifestyle of person will increase. Hence, the people will be **more happier** as their life becomes better. However, for the **Generosity**, there is **not much correlation** between it and the Happiness Score. This is because in this economy, there is not much people who would donate. Moreover, **Happiness vary in people**, some might find happiness within generosity while others may find happiness in other places. Finally, with the **increasing number of fraud cases** over the years, people are vary of each other and the **lack of trust** may cause distaste among the community.

Figure 6: Colour

For the colour, I use colours that correlates to happiness which are yellow orange and green (Figure 6). For the title of the website, it is highlighted in orange to accent from the beige background (Figure 6). The yellow colour is used for the word “happy” in the title (Figure 6). Light blue colour is used as the background of the text box to highlight the explanation (Figure 6). I also ensure that the colour used in the textbox is consistent. Furthermore, for the factors I use the same colours that are applied in the charts for consistency (Figure 6).

3.3 Figure Ground

Is Happiness Skewed?

From the chart on the right, it is evident that **GDP per Capita** and **Li**
important things in life. With those anyone will be happy.

Figure 7: Figure Ground

To apply figure ground, I bold every title of each section to accentuate it (Figure 7). Besides that, I also increase the font size of the title while ensure the paragraph has a smaller font size. Any important words are also highlighted with another colour to accent it.

3.4 Typography and Storytelling

Understanding the Key Factors

From the scatterplots, we can see a positive relation between Happiness Score and **GDP per Capita**, **Freedom**, **Life Expectancy** and **Social Support**.

As the factors increase, the happiness index score increase as well. It is evident that these factors are the prime reason that a country's happiness score increase. This is because as **a country's economy gets better**, more **freedom** are given to the people, **better healthcare** and having a **supportive society**, the well-being and lifestyle of person will increase. Hence, the people will be **more happier** as their life becomes better.

However, for the **Generosity**, there is **not much correlation** between it and the Happiness Score. This is because in this economy, there is not much people who would donate. Moreover, **Happiness vary in people**, some might find happiness within generosity while others may find happiness in other places. Finally, with the **increasing number of fraud cases** over the years, people are vary of each other and the **lack of trust** may cause distaste among the community.

Figure 8: Typography

The typography (Figure 7) used in this visualization is Sans-Serif (Green) and Serif (Red). Sans-serif is used in paragraphs and details as it increases readability while Serif is used in titles. There is a mix used of Bold and Light font weight to differentiate between important and insignificant text. The storytelling used in this visualization is comic strip as there is a defined order of viewing the visualization. The reader should read the visualization from top to bottom.

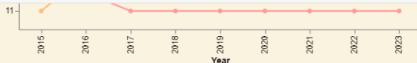
References:

- 1) World Happiness Report up to 2023. (2023, September 9). Retrieved from
<https://www.kaggle.com/datasets/sazidthe1/global-happiness-scores-and-factors>
- 2) The World Happiness Report. (2023, June 20). Retrieved from
<https://worldhappiness.report/>
- 3) Vegalite. (n.d.). Retrieved from <https://vega.github.io/vega-lite/>

Appendix A

Webpage Visualization





Among the countries from different regions, from 2015 - 2023. It is evident that **Finland has kept its place as the happiest country**. Then followed by New Zealand then Australia. Finland has secured its 1st place ranking due to various factors like:

1. Creating a **well-established healthcare system, public education system**
2. **World Class Water Management System**
3. Have a **robust and stable economy and low income inequality**
4. Committed to individual freedom such as **freedom of expression, press and religion** and also promotes **equal opportunities for all genders**.

These few steps and policies done by New Zealand have successfully provided a sense of security and prosperity to their people which in turn promotes happiness, well-being and provide a high quality of living environment.

For Malaysia, our ranking **rose to 4th place in 2016** but then dropped **tremendously in 2019**. However, in 2023 we were able to secure 6th place. There is a tremendous decline due to:

1. Relatively high crime rate in Southeast Asia(68%) according to the World Crime Rate Ranking
2. High number of reports of environmental pollution in various parts of Malaysia especially in water pollution

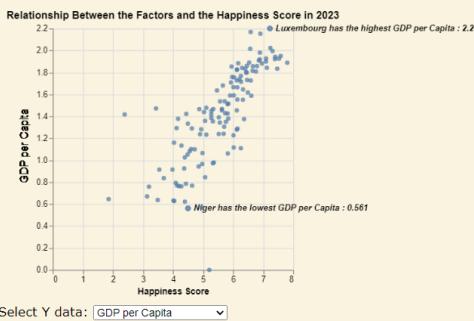
Does The Factors Truly Reflect the Happiness Score ?

Understanding the Key Factors

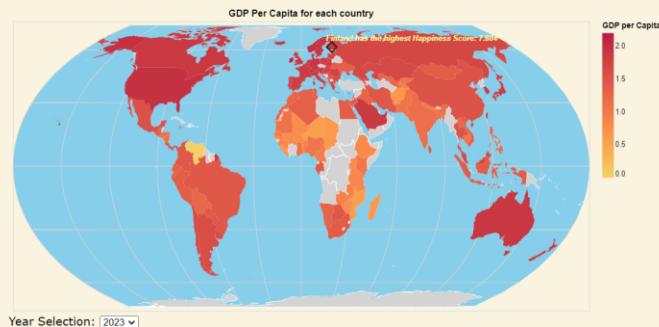
From the scatterplots, we can see a positive relation between Happiness Score and **GDP per Capita, Freedom, Life Expectancy and Social Support**.

As the factors increase, the happiness index score increases as well. It is evident that these factors are the prime reason that a country's happiness score increases. This is because as a country's economy gets better, more freedom are given to the people, better healthcare and having a supportive society, the well-being and lifestyle of person will increase. Hence, the people will be **more happier** as their life becomes better.

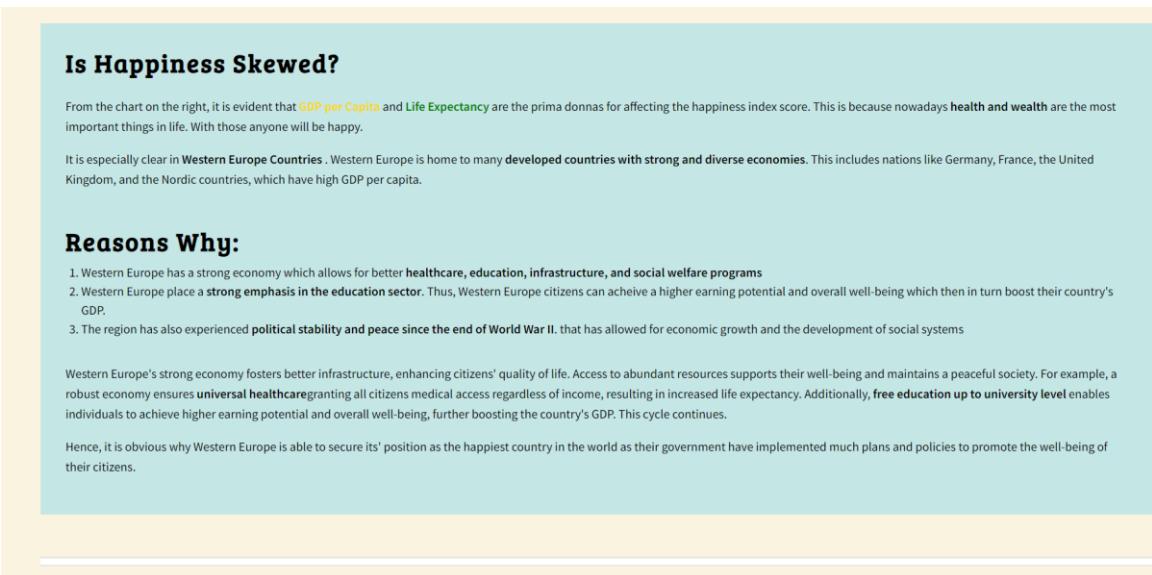
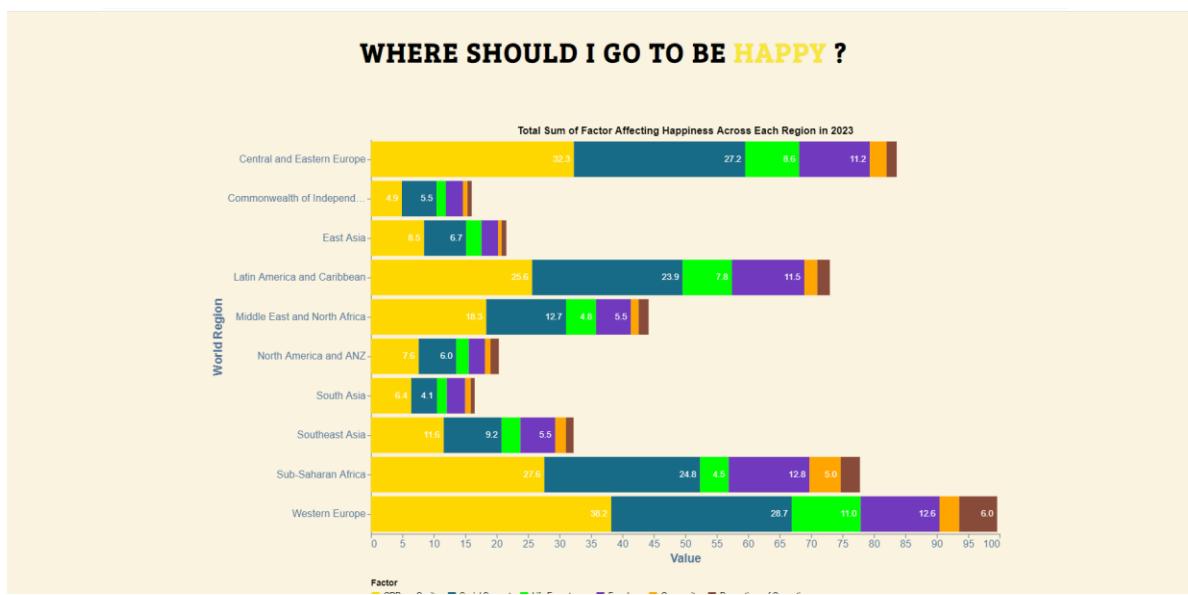
However, for the **Generosity**, there is **not much correlation** between it and the Happiness Score. This is because in this economy, there is not much people who would donate. Moreover, **Happiness varies in people**, some might find



Distribution of Factors Across the World

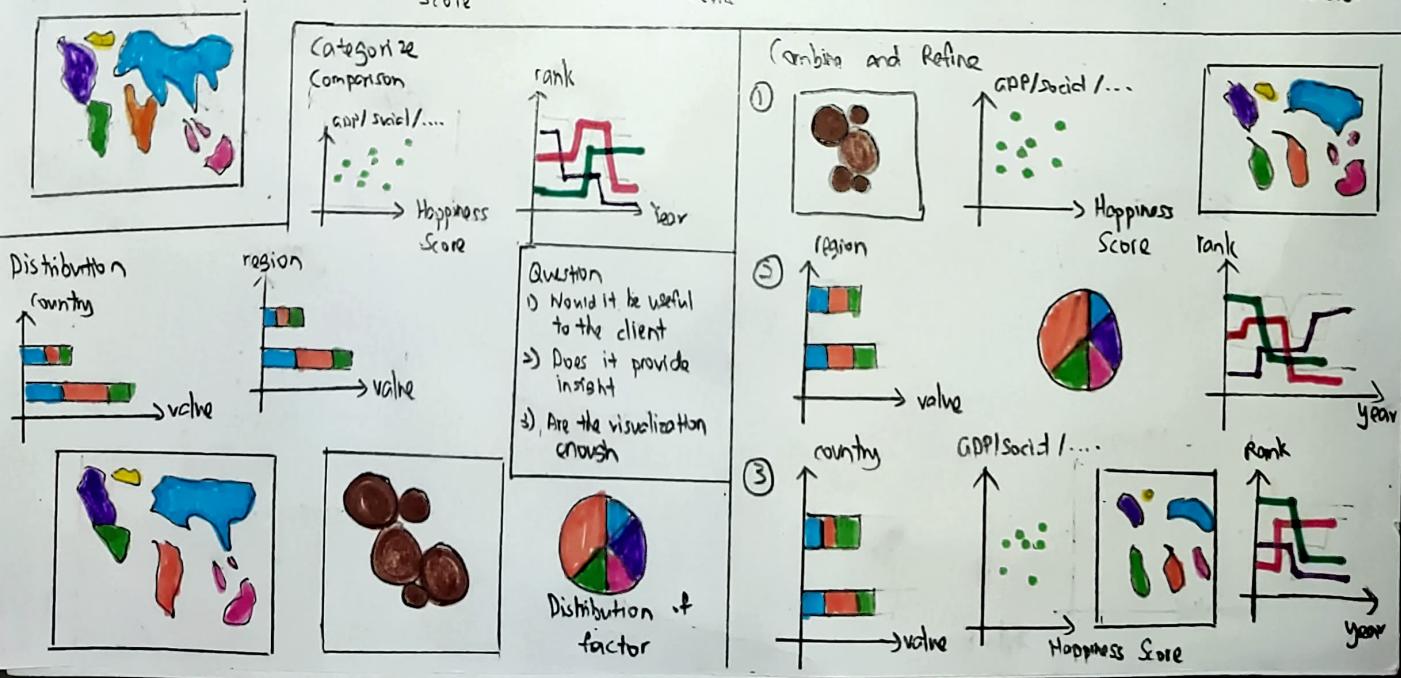
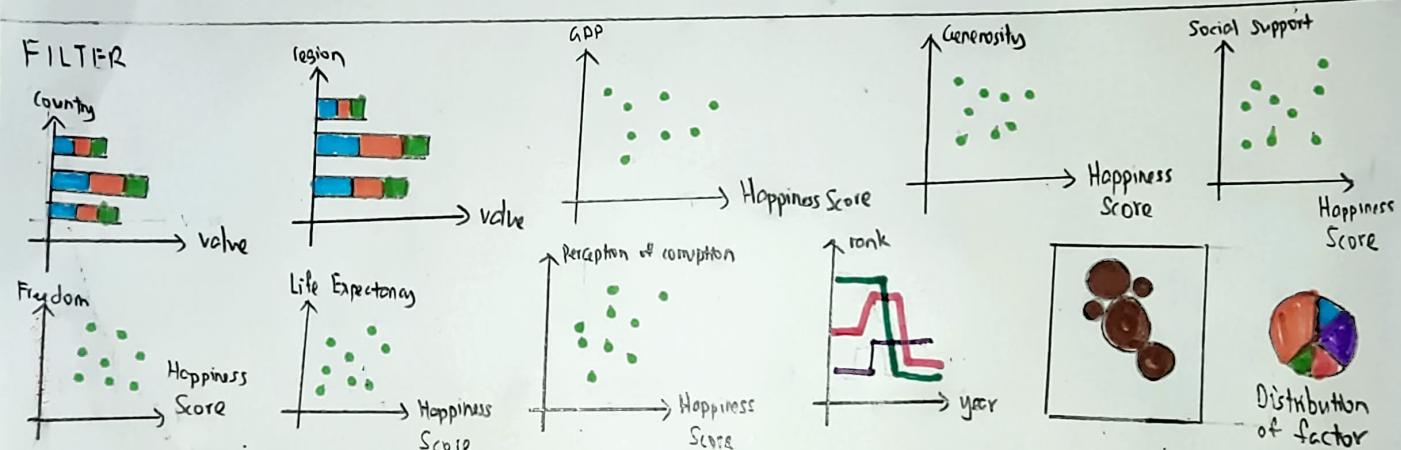
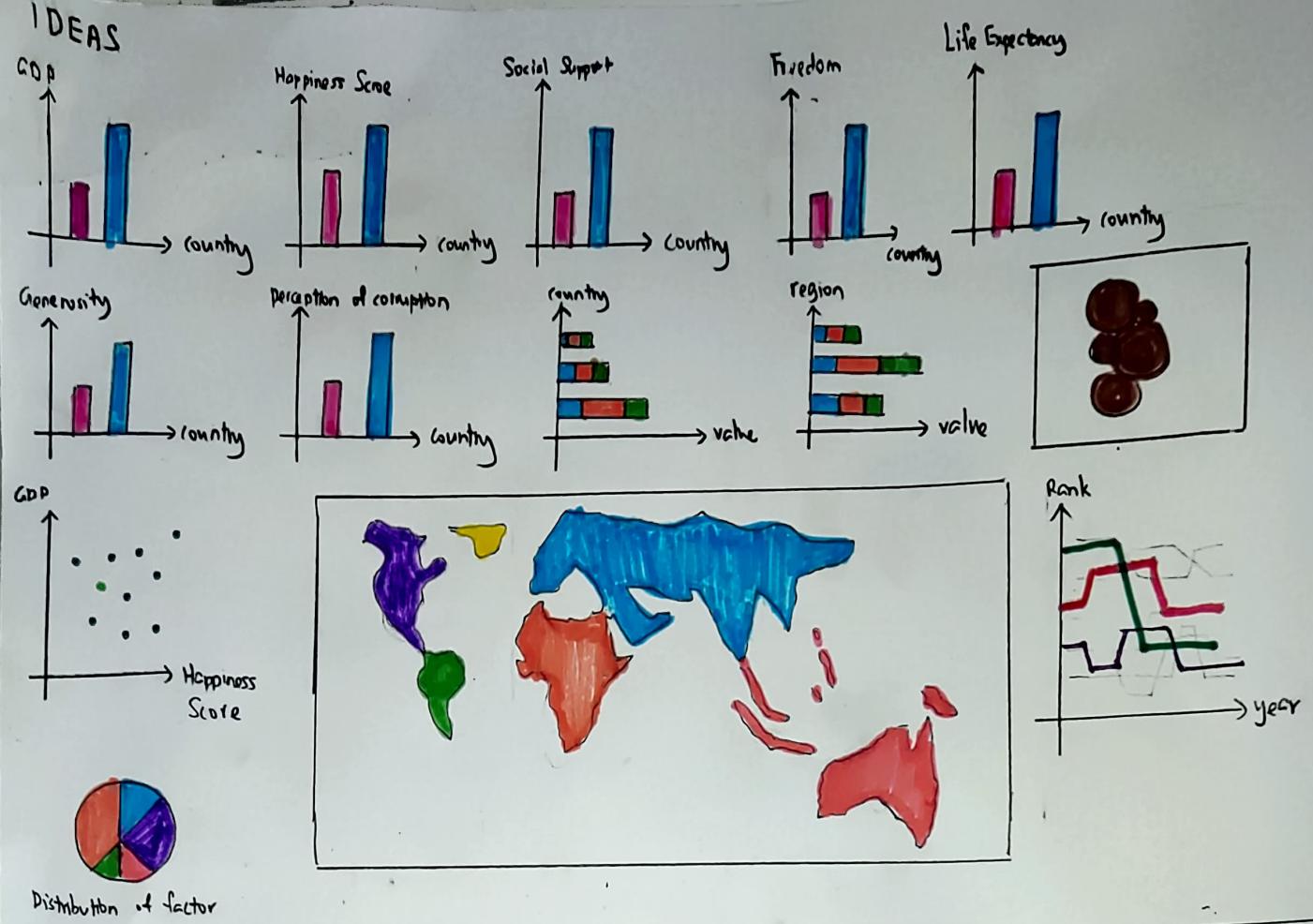


The Pursuit of Happiness: How Does GDP per Capita Matter?

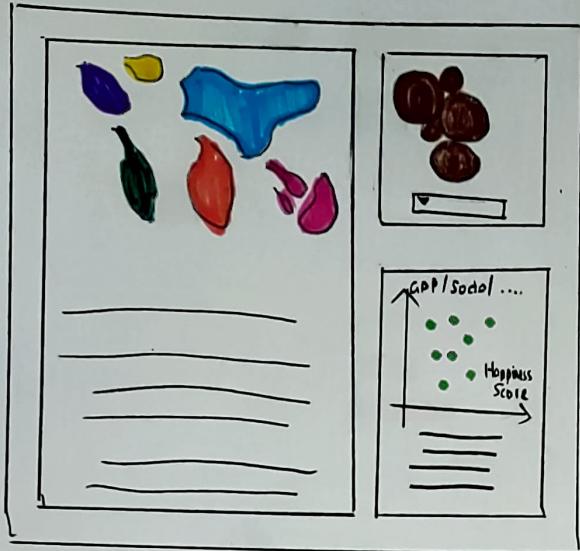


5 Design Sheet

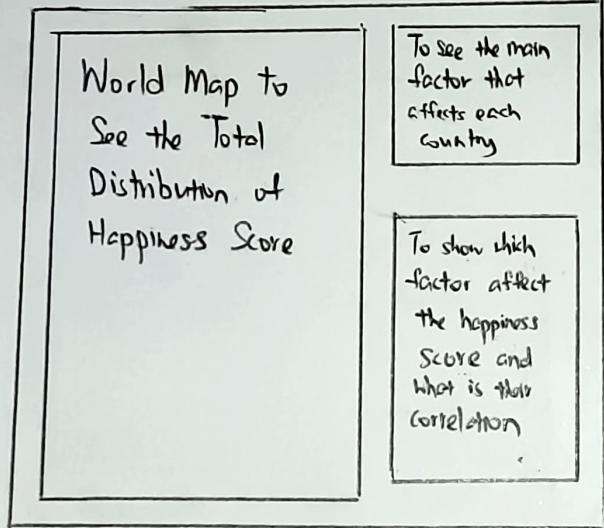
by Tong Jet Kit



LAYOUT



FOCUS

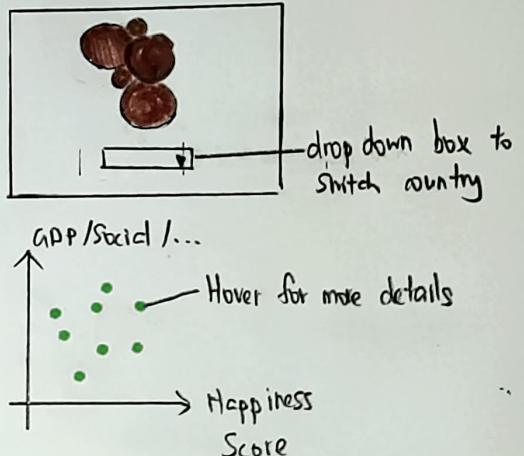
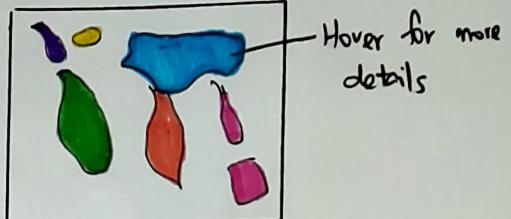


Title : Focus Layout View.
Author : Tong Jet Kit
Date : 15 / 10 / 2023

Sheet : 2

Task : World Happiness Report

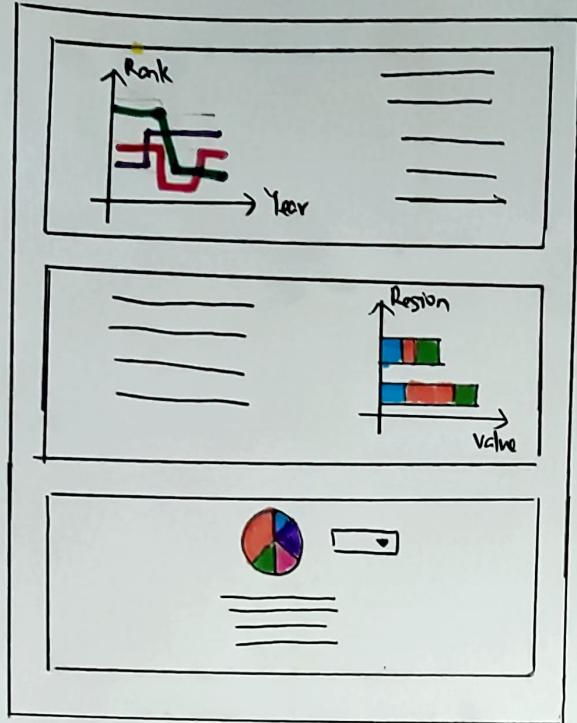
OPERATIONS



DISCUSSION

- 1) Is there sufficient visualization?
- 2) Can the subtopics link to the main topic?
- 3) Able to relate between each visual element

LAYOUT



Title : Slideshow Layout View

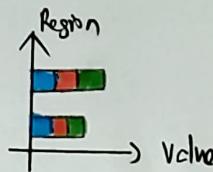
Author : Tong Jet Kit

Date : 15/10/2023

Sheet = 3

Task : World Happiness Report

OPERATIONS

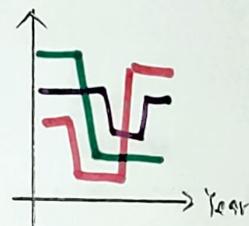


click to filter data



dropdown box to switch country

Rank



click to isolate a part

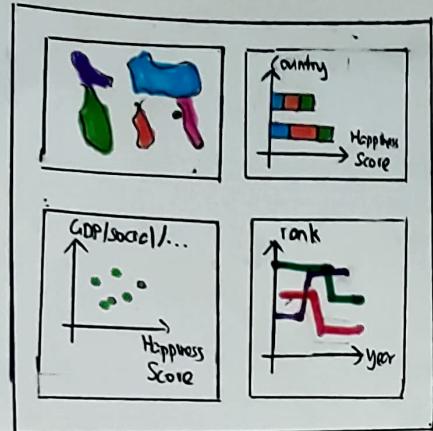
FOCUS

- Show ranking as a fun fact
- Show the distribution of each factor for each region
- Show the distribution of each factor for each country to show the main reason

DISCUSSION

- 1) Is it feasible to complete
- 2) Can the topics link to each other
- 3) Confuse the viewer?

LAYOUT



Title: Grid Layout View

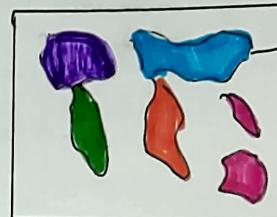
Author: Tong Jet Kit

Date: 15/10/2023

Sheet: 4

Task: World Happiness Report

OPERATIONS



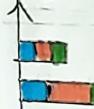
Hover for details

GDP/social/...

→ Happiness Score

dropdown box to switch Y data

country



value

click to filter data

FOCUS

World Map to see distribution of happiness score

Distribution of each factor for each country

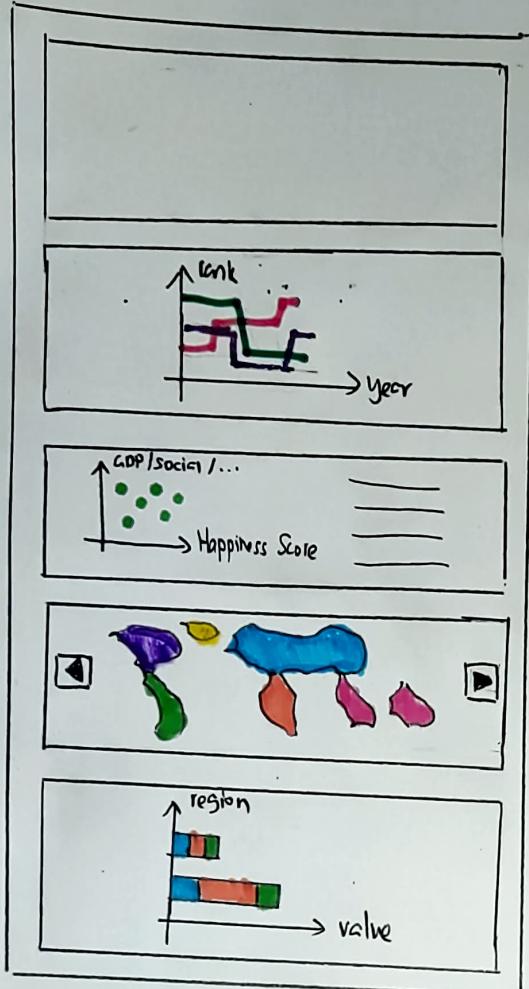
Show correlation between factor and happiness score

Show ranking to show how each factor can help contribute to happiness

DISCUSSION

- 1) Would the topic link to each other
- 2) Redundant information?
- 3) Does it confuse the viewer as the visual elements are clumped up

LAYOUT



FOCUS

- General information on World Happiness Report
- Ranking of countries to show why the factors contribute through example
- Show correlation and why
- Show distribution for each year on each factor
- To show the main factors and which region will make you more happy

Title : Final Design sheet

Author : Tong Jet Kit

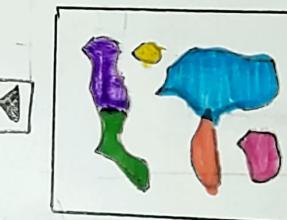
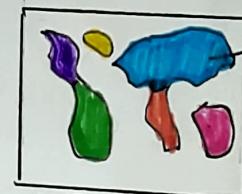
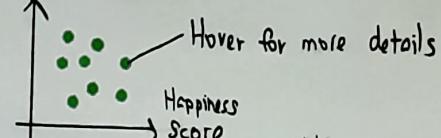
Date : 15/10/2023

Sheet : 5

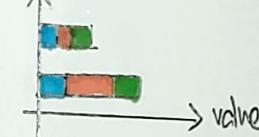
Task : final Implementation Design

OPERATIONS

GDP / Social / ...



Region



DETAILS

- Design via Javascript, HTML and CSS
- VegaLite to create the chart
- Estimated 2~3 weeks to design, build, test and release