Global Happiness Analytics: A Data-Driven Visualization of Well-Being Across Nations Individual Report

Group 25

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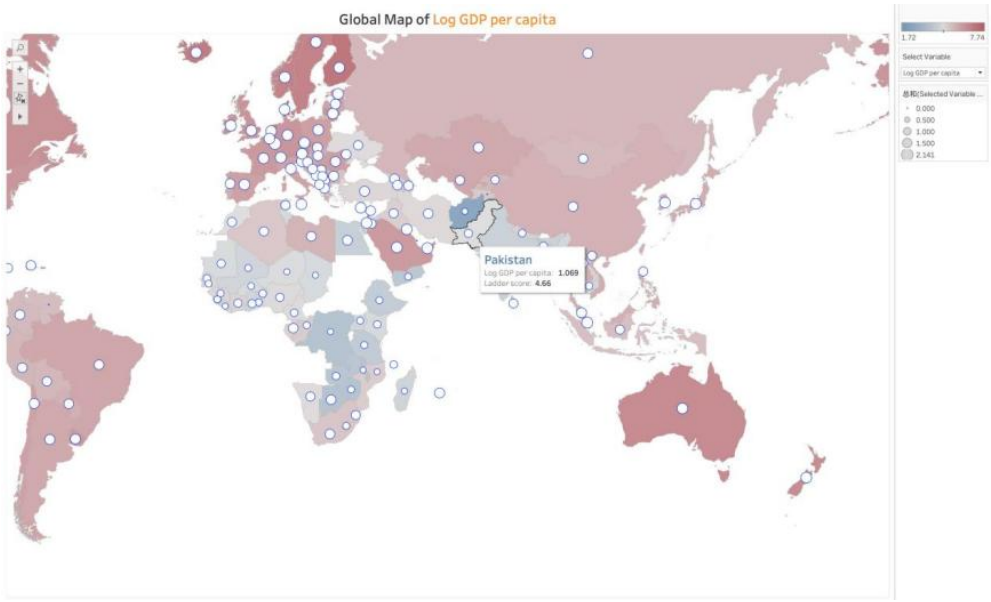
1. Data Preparation

The study of global happiness is an important field that has drawn significant public attention, as it helps us understand the differences in happiness levels across regions and the driving factors behind them. In this analysis, I focused on five key parameters from the 2024 World Happiness Report dataset: generosity, healthy life expectancy, GDP per capita, perceptions of corruption, and social support. Using data visualization methods, I aimed to reveal their distribution characteristics on a global scale and the disparities between regions. Below is the visualization plan I developed based on the data characteristics. Firstly, I divided the analysis variables into three categories: first, the Ladder Score was selected as the core research subject; second, five key socio-economic variables were chosen for correlation analysis, including generosity, healthy life expectancy, logarithm of GDP per capita, perceptions of corruption, and social support, to explore their impact on the happiness index; moreover, national and regional indicators, as well as other auxiliary variables, were incorporated to facilitate subsequent geographical grouping analysis and to provide supplementary explanations for the model. To study the yearly changes in the data, I incorporated the time variable (Year) from the dataset and combined it with other indicators, such as Country Name and Life Ladder, to analyze cross-year trends. Additionally, I created calculated fields to extract the maximum (MAX) and minimum (MIN) values of variables during the change process, such as Generosity and Healthy Life Expectancy at Birth, to comprehensively present the dynamic changes in the happiness index and its driving factors.

2. Visualization

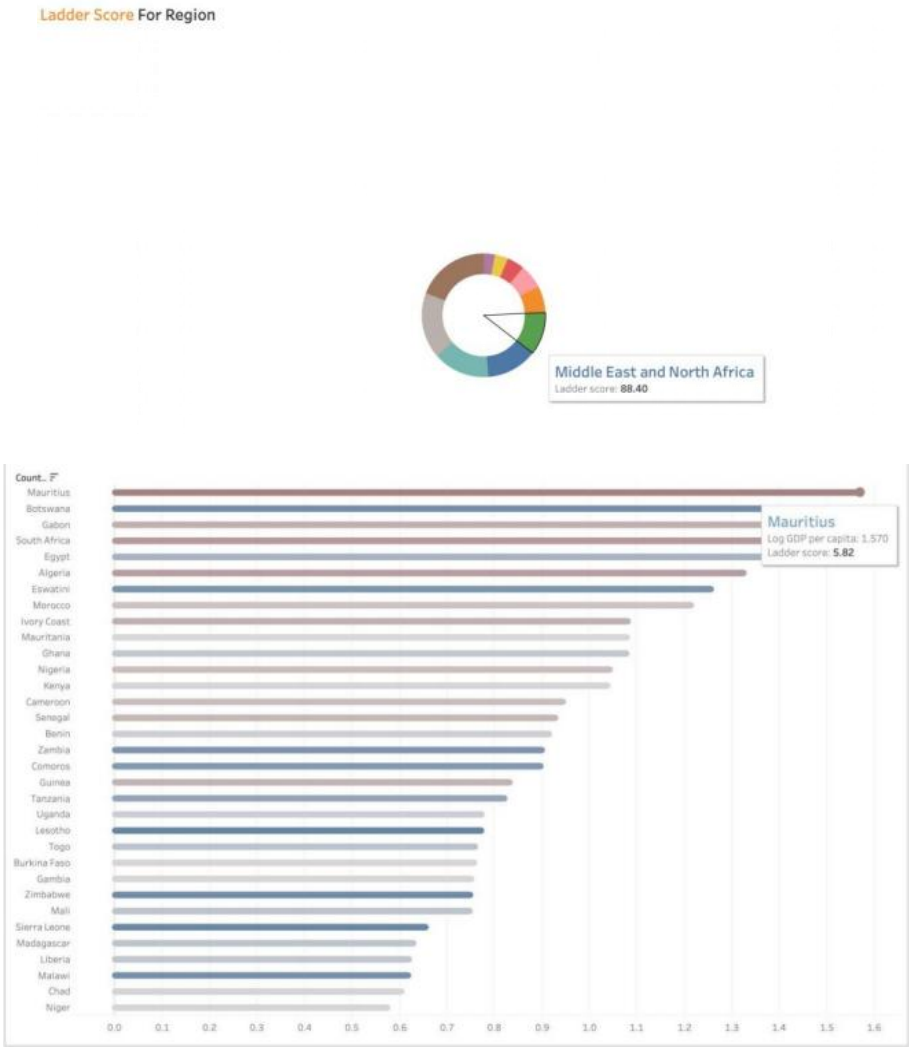
This map visualizes the global distribution of the happiness index (Ladder score) and a selected parameter, with color and circle size representing the values of the happiness index and the selected parameter, respectively. The color gradient from red to blue reflects the transition of the happiness index from high to low, while the size of the circles represents the magnitude of the selected parameter (e.g., social support). The choice of red and blue as the color gradient is not only because red is often associated with happiness, warmth, and positive emotions, while blue is linked to calmness or negative emotions, but also because the strong contrast between these two colors makes it easier to distinguish data levels. Additionally, the red-to-blue gradient is particularly suitable for representing continuous data trends from high to low. Regions with higher happiness levels, such as Northern Europe, North America, and Australia, are typically

accompanied by larger circles, indicating higher values for social support or other selected variables. Conversely, regions with lower happiness levels, such as Sub-Saharan Africa and parts of South Asia, have smaller circles, reflecting weaker performance in these parameters. This visualization highlights the potential relationship between the selected parameter and the happiness index. In the exploratory analysis, I selected five parameters sequentially to observe their relationship with the happiness index. However, relying solely on circle size and color does not provide a clear observation of specific correlations, prompting me to conduct further analysis. I used a line chart combined with a timeline to visually present the changing trends of different parameters across different years. To clearly highlight key points, I created new calculated fields, Max and Min, to identify the maximum and minimum values of the variables, making it easier to pinpoint critical time periods. As shown in the figure, this method not only reveals the overall trends of the variables but also highlights key years, providing a clear perspective for analyzing the dynamic changes of the variables.



When I visualize social support as shown in the chart, it reveals its changing trend from 2004

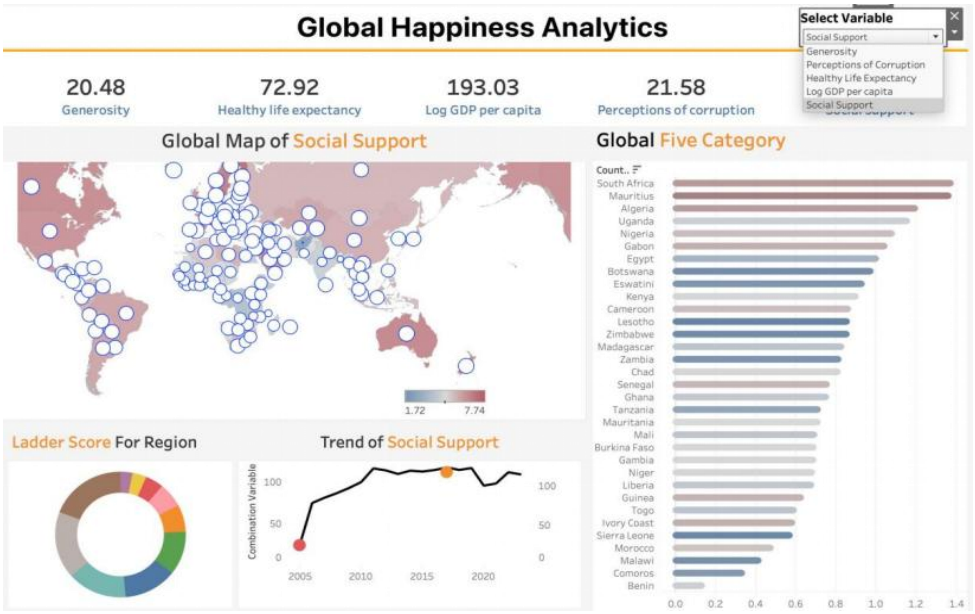
to 2024. Overall, the variable shows a significant increase from 2004 to 2010, followed by a slower growth rate and slight fluctuations between 2015 and 2018. However, a noticeable decline occurs after 2019, potentially influenced by external factors. By marking the maximum and minimum values, the chart clearly highlights the variable's peak (around 2017) and lowest point (2004). By visualizing five different parameters, I observed that significant fluctuations occur during major global events such as the COVID-19 pandemic, particularly in GDP. To further validate my observations, I plan to apply new visualization methods in the next step. To further explore the factors influencing the happiness index, based on the dataset, I decided to combine the Ladder Score with regional information to analyze countries within the same region that exhibit significant differences in their happiness index. This approach can help identify which parameters are responsible for the noticeable variations in happiness levels among countries sharing similar geographical, cultural, or economic contexts.



To further explore the factors influencing the happiness index, based on the dataset, I decided to combine the Ladder Score with regional information to analyze countries within the same region that exhibit significant differences in their happiness index. For example, as shown in the chart, the Middle East and North Africa region has a Ladder Score of 88.40, while the lowest region is South Asia. From the visualization, I observed that regions with lower happiness indices and those with higher indices often include countries that were historically colonies, particularly

under British and French rule. Since the happiness levels of such colonies have been studied in the past, I plan to filter out countries that were former British and French colonies to specifically analyze the distribution of the five parameters within these countries. Therefore, for the second chart, I chose a bar chart to visualize the selected countries. The chart uses color to represent the happiness index levels and bar length to display the magnitude of the parameters. Next, I will conduct a more detailed analysis of the happiness index.

3.Final Dashboard



The "Global Happiness Analytics" dashboard integrates the aforementioned charts and achieves coordinated multi-chart interactions, enabling multi-dimensional visualization. The top section provides an overview of key statistical indicators, including global averages of Generosity, Healthy Life Expectancy, Log GDP per Capita, and Perceptions of Corruption, offering a reference for overall trends. The global map uses a color gradient to represent happiness index levels, with circle size reflecting the magnitude of social support, making it easier to identify geographical distributions and outliers. The pie chart displays the happiness index distribution across different regions, facilitating regional comparisons. The line chart illustrates the trend of social support from 2004 to 2024, with clearly marked peaks and troughs highlighting critical turning points. The bar chart on the right represents parameter magnitudes through bar lengths and happiness index levels through colors, providing a detailed perspective for comparing parameters across countries. Users can also use the dropdown menu in the top-right corner to switch parameters, enabling dynamic exploration of the relationships between different variables and the happiness index. After conducting cross-dimensional analysis of the dashboard by region, country, and time, I found that happiness index is strongly associated with GDP and social support. Additionally, global happiness levels are not only influenced by historical and geographical factors but also shaped by cultural and social systems.

Limitation：The limitation of my analysis lies in its focus on a macro perspective, which does not address the specific micro-level factors influencing the happiness index. However, my team members will be responsible for conducting a detailed micro-level analysis to complement this study.