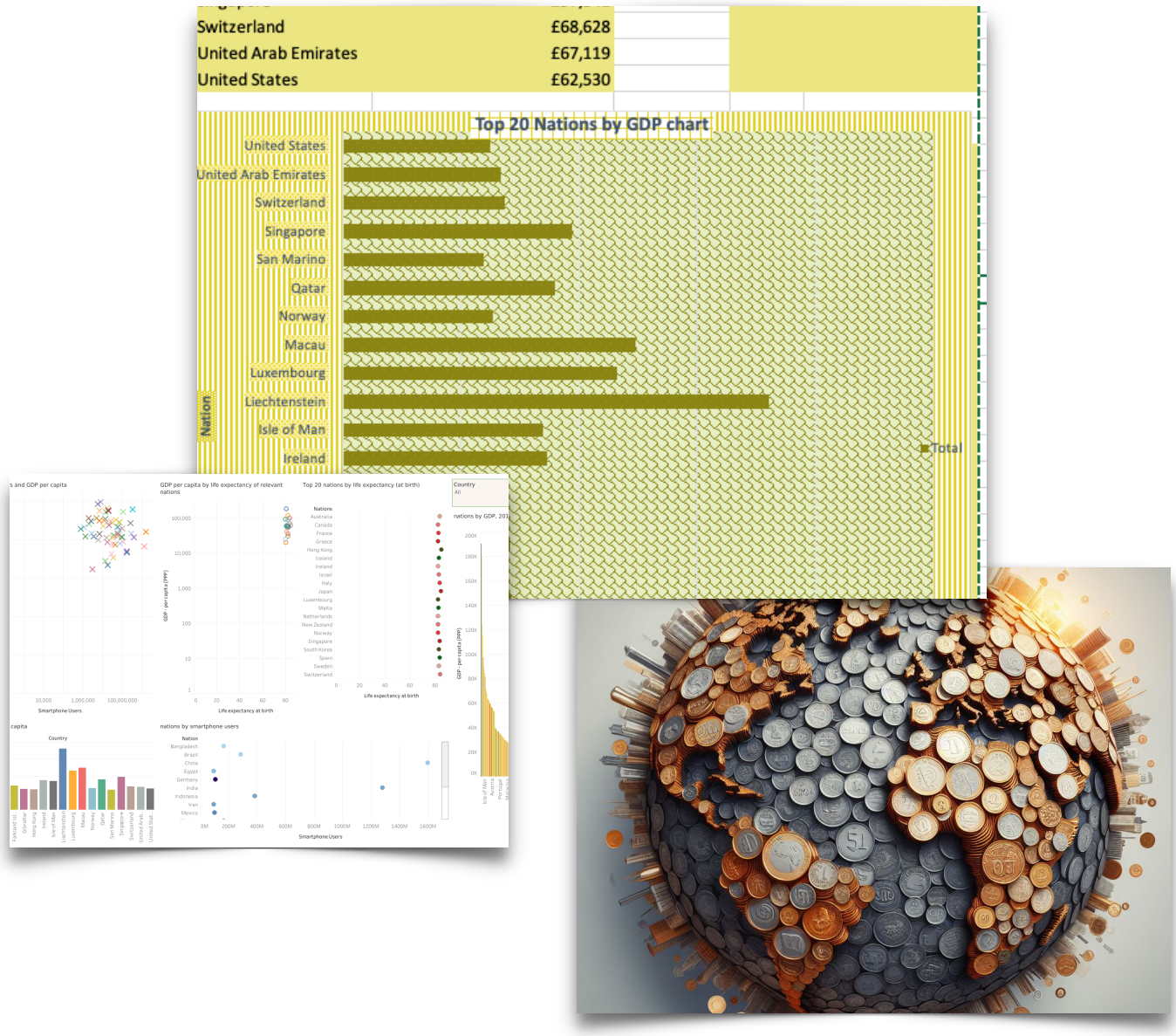
Wealth of Nations



Scenario

Data visualisation has become an essential business capability to help transform information into insights that can drive meaningful business outcomes and improved experiences. Today, most organisations have accumulated a wealth of data from the different corners of their businesses they are then unable to see how this data can help them make better decisions, making actions and results.

I have been asked to look at the data workbook and get familiar with it to make to create this visual report that will show the data in the form of visualisations and maps using Tableau to the client's requirements. I will also consider the data protection and computer misuse policies.

First Task - Policies and procedures

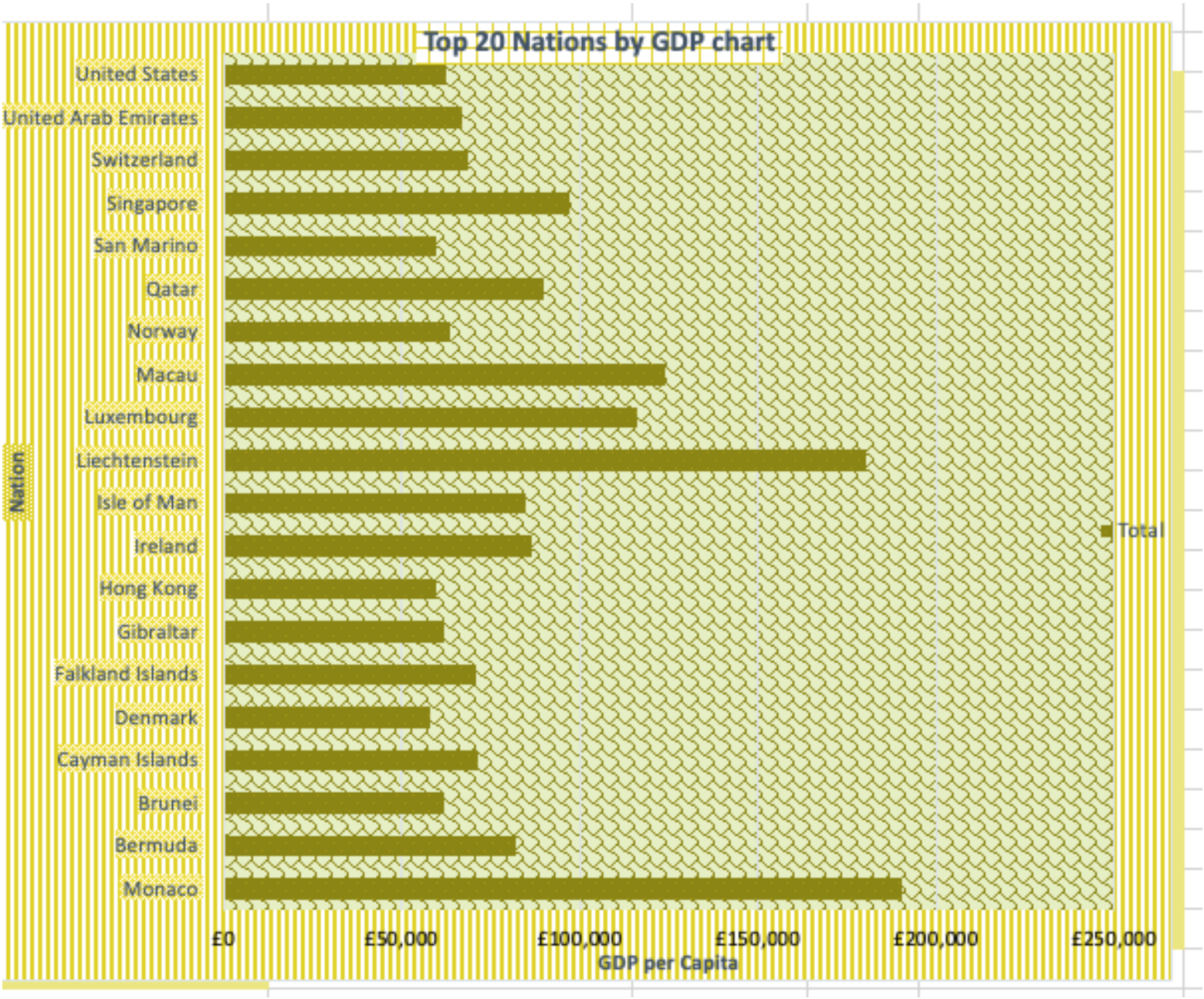
As part of the data protection act, all collected data must adhere to a strict protocol surrounding usage purposes, fairness and transparency.

The data collected for this report contains a global scale of information for a set of countries. Certain methods of data collection have been used to make estimates on life expectancy, total smartphone users and gross domestic product per capita for a range of years. This data was provided as a Microsoft Excel file containing three sheets, ‘Life expectancy’, ‘Smartphone users’ and ‘GDP’.

The collection of this data does not involve the breach of internet protocols or unauthorised access of any systems to my knowledge. None of this data has been reproduced or used for any purpose other than analysis and collation by myself in this report.

Second Task - Excel

Using pivot tables in excel, I filtered data on the GDP sheet. The new table only had data from the year, 2019 and for the top twenty countries based on GDP per capita. On the new sheet I created a chart to display the relevant data points.



Above, we can see a bar chart displaying GDP per capita on the x-axis and the twenty nations concerned on the y-axis to display the different

levels of GDP in each country. From this chart, it is easy to see that Monaco and Liechtenstein are among the nations with the strongest GDPs while Denmark and San Marino rank lower with a significant absolute difference apparent between the maximum and minimum GDPs per capita amongst the top twenty economies.

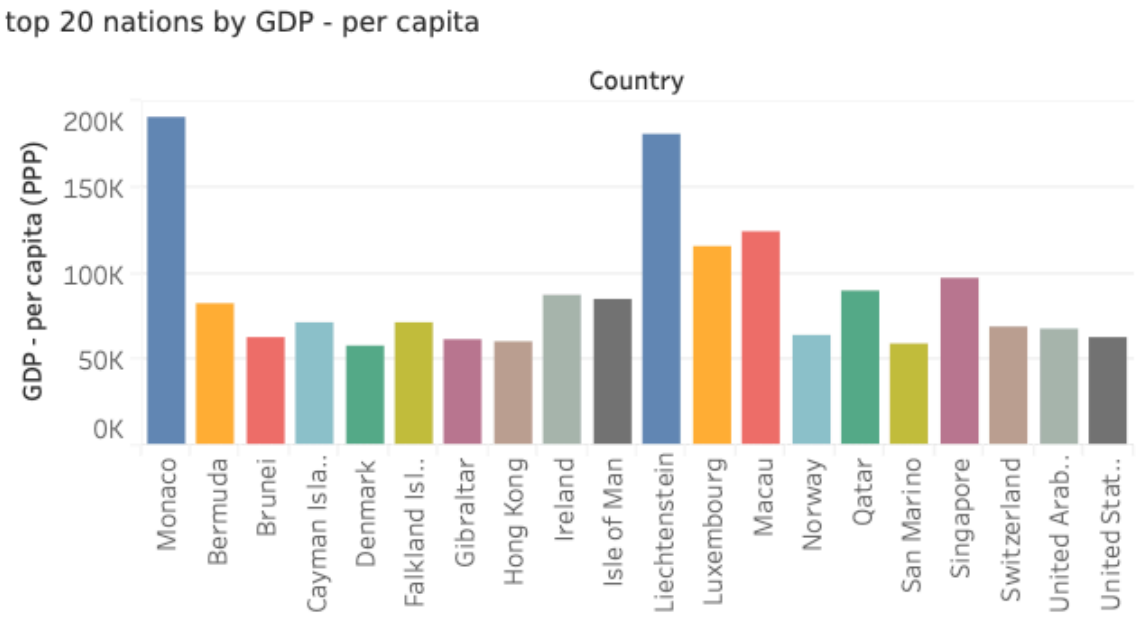
The data

A closer look at the data reveals two sheets, ‘Life Expectancy’ and ‘Smartphone Users’ which contain data on the life expectancy at birth of 80 countries and the number of smartphone users recorded for 100 nations.

The links between these variables and GDP may be very interesting especially for a study done on a large scale. However, with common countries amongst the GDP records and the potential affecting variables, life expectancy and smartphone users, I decided to track the relationship between GDP and the remaining data fields. From that, it was possible to see some correlations between the data points especially with the use of logarithmic scales to adjust the ranges between points and make it easier to infer trends, relationships and outliers.

Third Task - Tableau

To summarise the key points of my analysis in the form of a dashboard, I used Tableau to create some different visualisations of the data.



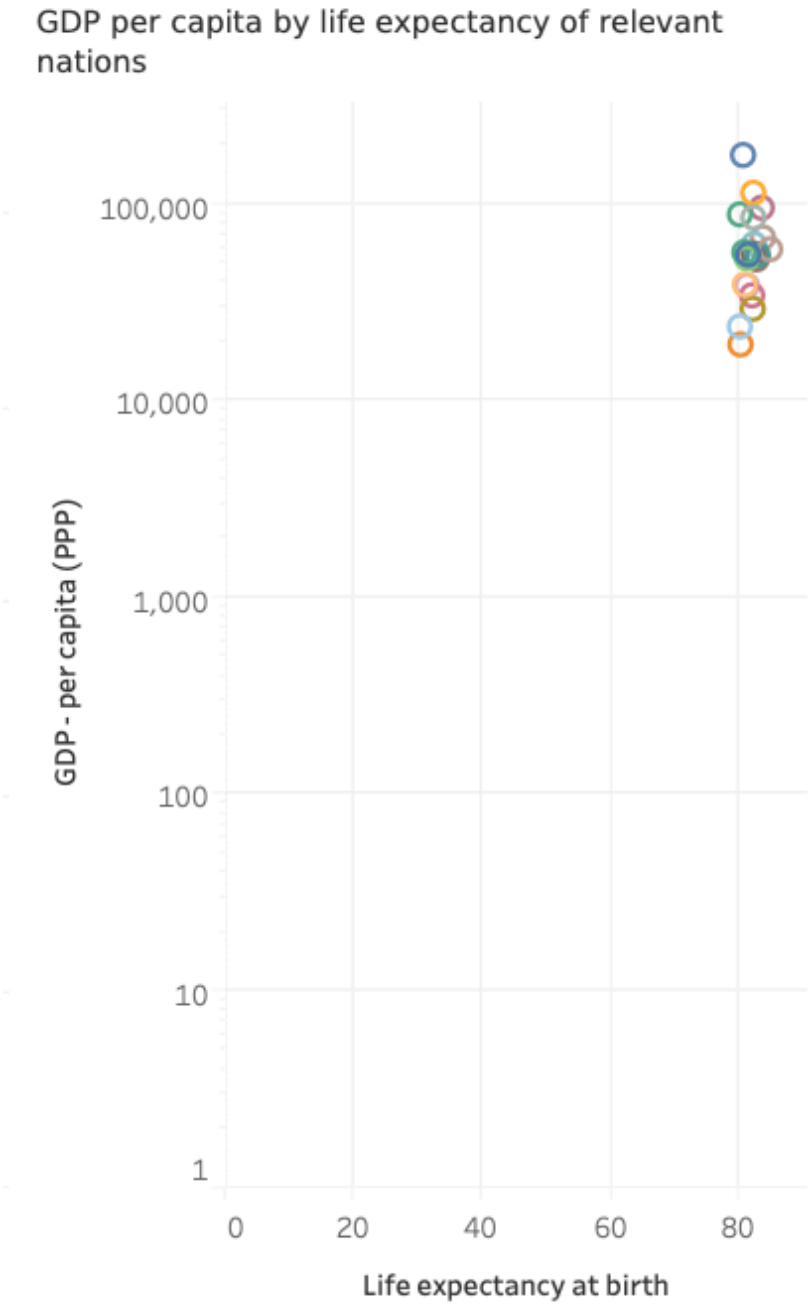
The bar chart above displays the top twenty nations by GDP per capita using a colour scheme to represent the different economies. The bars show the levels of GDP per capita for each nation. We can see that 'Monaco' and 'Liechtenstein' have the largest bars at first glance and observe other patterns within the top twenty.

In the visualisation on the left, a list of twenty different countries have been sorted based on the 'life expectancy at birth' variable. It can be noticed that these top values do not differ very much from each other. In the extended filter with all the nations, the range of life expectancy is greater, from about 70 years to 84. In the top 20 chart on the left, it can be seen that the values are from late 70s to mid 80s.

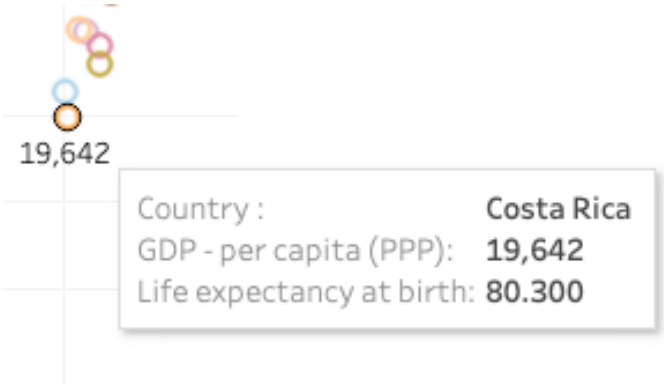
On the right, a diagram with a logarithmic y-scale (GDP per capita) and a x-scale that represents the 'Life expectancy at birth' column. Using a logarithmic scale on the y-axis, it is possible to modify the distribution of data since it creates symmetry in the GDP per capita scale across the column for easier comparison.

The nation denoted by a red circle, Costa Rica at around 20,000 GDP per capita having a life expectancy of about 80 while the nation denoted by a blue circle across it above 100,000 GDP per capita has a life expectancy of about 81.

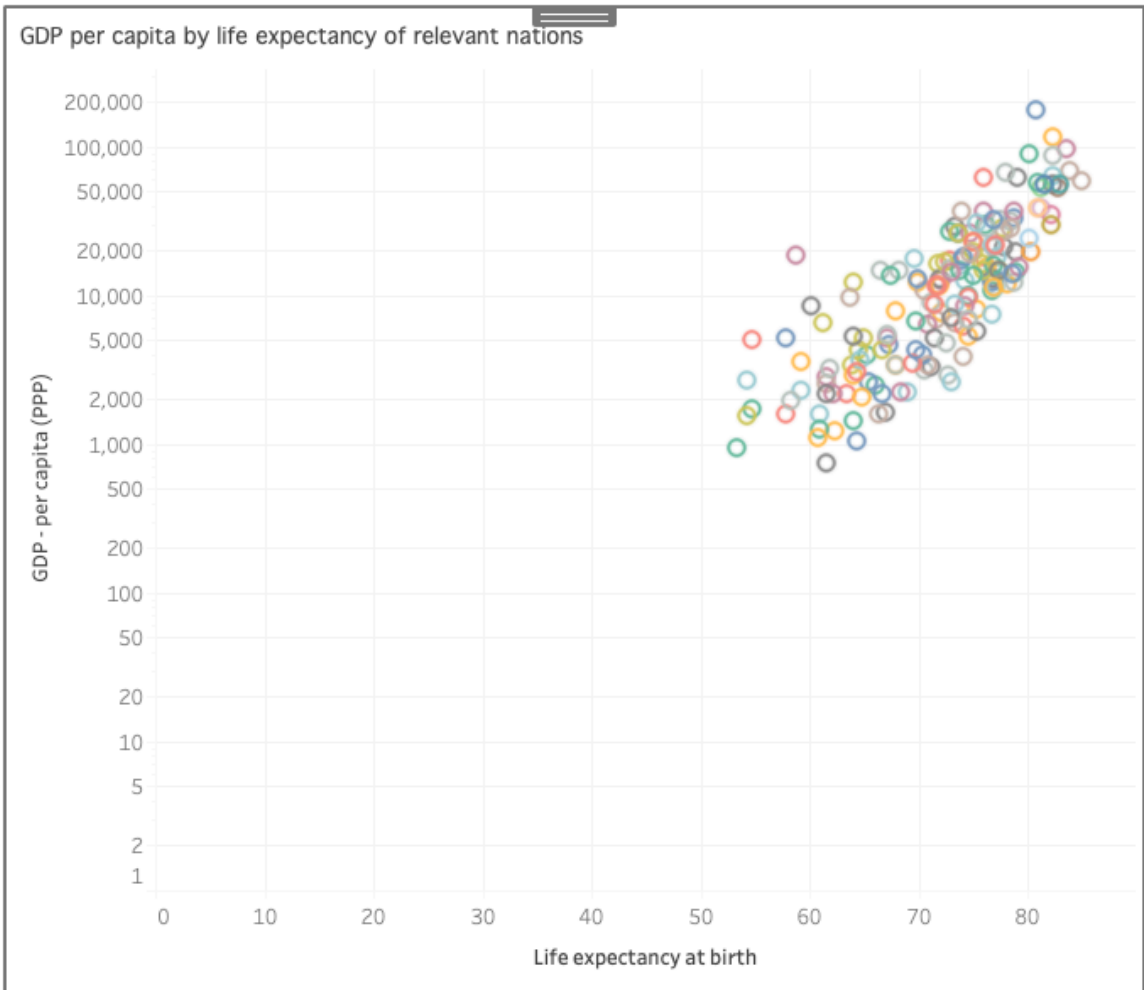
From this chart alone, it is hard to tell the effect of the GDP per capita of a nation on the life expectancy of its inhabitants. When more data is included from the dataset comprising of about 70 nations, there is a noticeable upwards trend where the life expectancy at birth increases as the GDP-per capita increases. In our top 20 selection on the left, 'Liechtenstein' can be seen to have the highest GDP per capita in our data but also a life expectancy only



slightly above that of 'Costa Rica' which is also selected as shown in this image to the right. One or both sets of values may be shown to be outliers since they do not correlate with the trend.

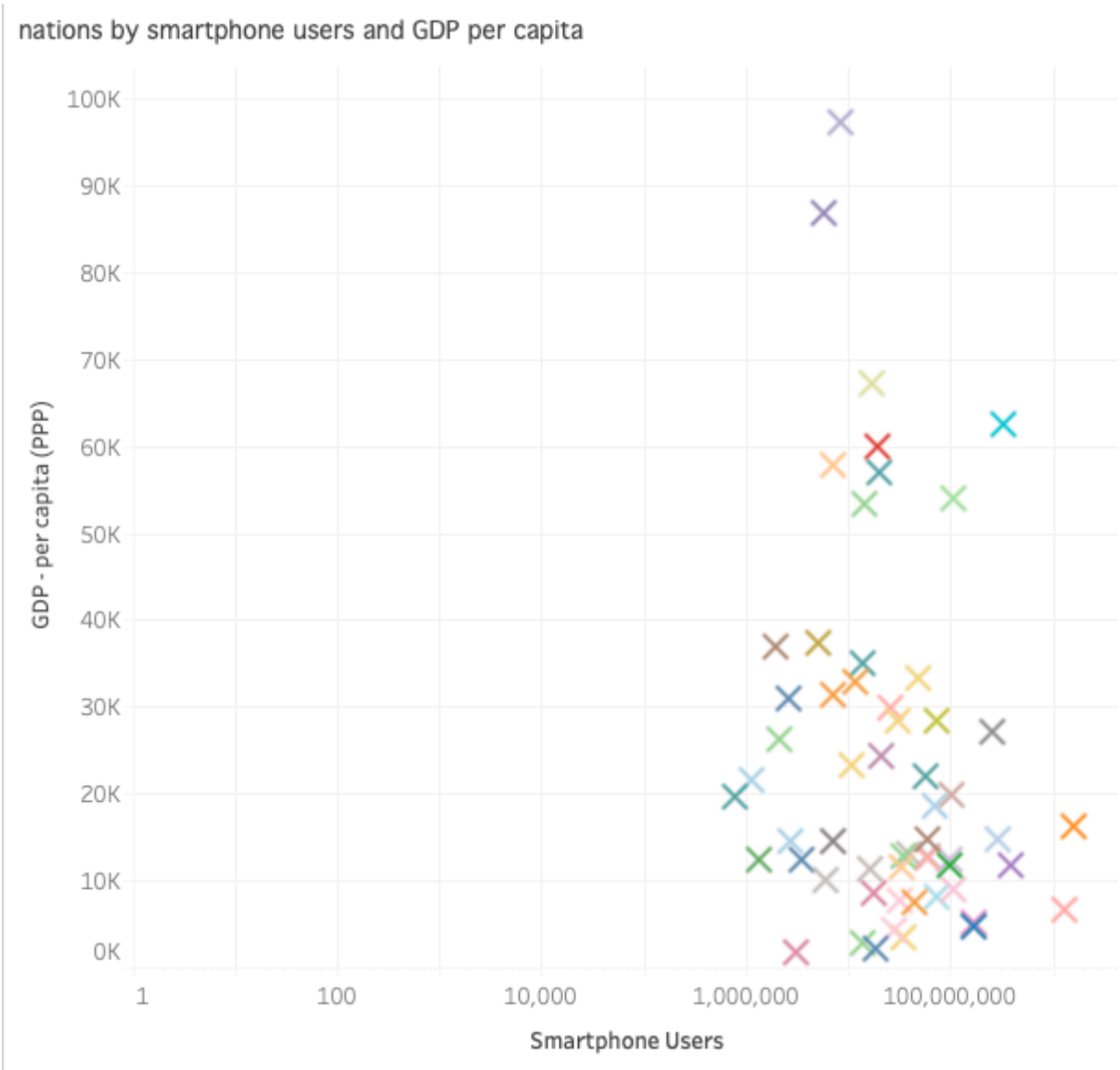


In the case where a filter is excluded, the available data



creates this visualisation (logarithmic GDP per capita scale) which compares life expectancy to the GDP so each data point displays both values. In this chart, there is an uptrend; as the GDP per capita increases, so does the life expectancy at birth. This shows that GDP may play an important role in the overall life expectancy for the people of a nation. Amongst the nations in the top 20 correlations were Switzerland, Hong Kong and Singapore. At the

other end was, Nigeria, Afghanistan and Mozambique. Meanwhile, Equatorial Guinea shows a lower life expectancy at 59 than Costa Rica expecting citizens to grow till 80 across to the right although they have similar economies measured by GDP per capita. This may be an outlier or there a range of reasons for this variance observed in the two data points.



In this display, we examine the relation between 'GDP per capita' and 'Smartphone Users'. There is a trend showing that the number of smartphone users are not very affected by the GDP per capita. In this chart, I use a logarithmic x-axis, 'smartphone users' which has a constellation of nations at the bottom ranging from a million and extending beyond a hundred million. The scale of smartphone users increases by a hundred times whereas the GDP per capita remains the same. This changes

the shape of the data and makes it possible to compare the values of GDP per capita by the smartphone users. In the tooltip of each selection, the GDP per capita and number of smartphone users are detailed to allow for easy observation. There were clear indications from the cluster of nations at the bottom of the chart where GDP ranged from zero to forty thousand while sharing a range of values between half a million and over hundred million smartphone users. There were values above the constellation extending beyond the fifty thousand GDP per capita mark while remaining limited within the same smartphone users range with none of them having a greater value than the nations with the most smartphone users.

At the top of the chart where GDP per capita is at its peak, there are two plots denoted to the nations, Singapore and Ireland. They are parallel to the left plotted ‘X’’s beginning before a million. This indicates either anomalies due to an already low population in these nations or a non-correlation between rising GDP and a rising number of smartphone users.

Reflection

In the wealth of nations report, I took a look at three sets of data on various countries relating to their gross domestic product, life expectancy and number of smartphone users.

The top twenty nations were filtered and examined firstly. Monaco, with the greatest GDP did not have data on other factors such as life expectancy and number of smartphone users. The next greatest GDP per capita was Liechtenstein which also topped the life expectancy comparison due to having a high GDP but did not have one of the highest life expectancies and veered s bit to the left side of the chart.

After investigating the relationship between GDP and life expectancy it can be concluded that with greater GDP comes the possibility of a greater life expectancy for a nation. This certainly is feasible as a government with a stronger economy may be more likely to provision for healthcare adequately and sustain a nation such that the overall life expectancy improves as a result of their citizens living longer. Other factors that contribute to this trend that can be explored in subsequent reports by delving into the variables which affect life expectancy as well as those that affect a nation's standard of living.

In the smartphone users by GDP chart, there is a non-correlation between the two variables since this chart shows the level of GDP per capita does not dictate a trend in the number of smartphone users. There are many factors relating to GDP which may affect the number of smartphone users in a nation as with life expectancy. It may be linked to a country having less availability of certain devices or its people being affected by economic hardships and opting for cheaper phones. There may be mass importation or production of mobile devices in low GDP, highly populated nations like India and Nigeria which increases the number of smartphone users without any influence by GDP per capita.

To conclude, more data collection can be done on the integration of technology in a nation and values can be calculated to represent total casualties in relation to hospital admissions in a defined set of nations to create a more thorough analysis.