

# Data Visualisation

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## **1) Background:**

Data has been taken from The World Bank (<https://data.worldbank.org/>). The data provided is open source and can be accessed by any person irrespective of the objective, i.e. commercial or non-commercial maneuver's. The site offers a lot more than just providing data; one can manipulate data and create live graphs, diverse categories for exploration, database repository on diverse subjects and insight on the ongoing or pending projects undertaken by World bank worldwide.

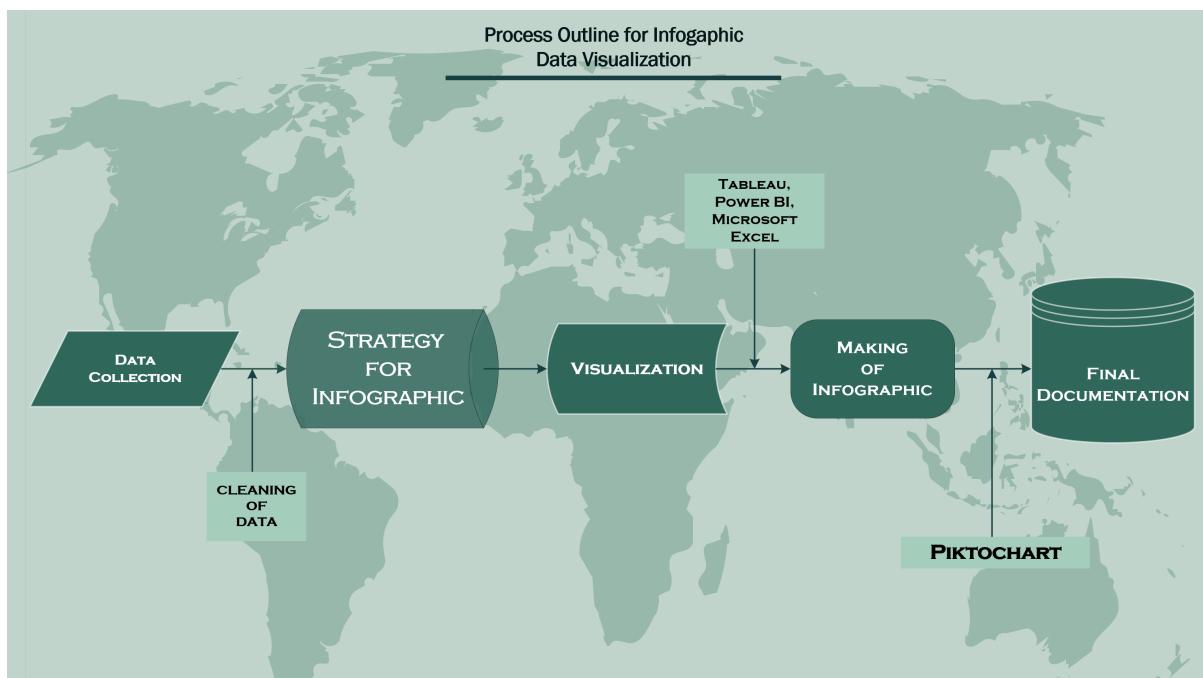
API's are provided by World bank on some datasets to the developers for analysing and visualisation of data. This will help the people around the world to deduce complex problems in a very straightforward manner.

This infographic contains the world indicators data which covers each and every aspect such as birth rate, business tax rate, CO<sub>2</sub>, days to start business, ease of business, energy usage, GDP, health expenditure/capita, infant mortality rate female/male, life expectancy female/male, mobile phone usage, internet usage, total population, distinct regions, tourism inbound/outbound and distinct years.

The data has many variables which help in analysing the development of the world over the last decade. The data is sufficient enough to provide insight into the future of these indicators, which can help in improving the growth of countries worldwide.

The dataset provides an insight into the most relevant parameters of all the countries which help in accessing the evolution of the people and some alarming statistics which should not be ignored. These indicators help in summarising the various factors affecting the evolution of a country over the years in a nutshell.

## **2) Outline of the process:**



### 3) Specifications

This infographic contains three blocks and a footer which sketches various world development indicators such as GDP, CO<sub>2</sub> emissions, Tourism, Energy, Population.

**First Block:**

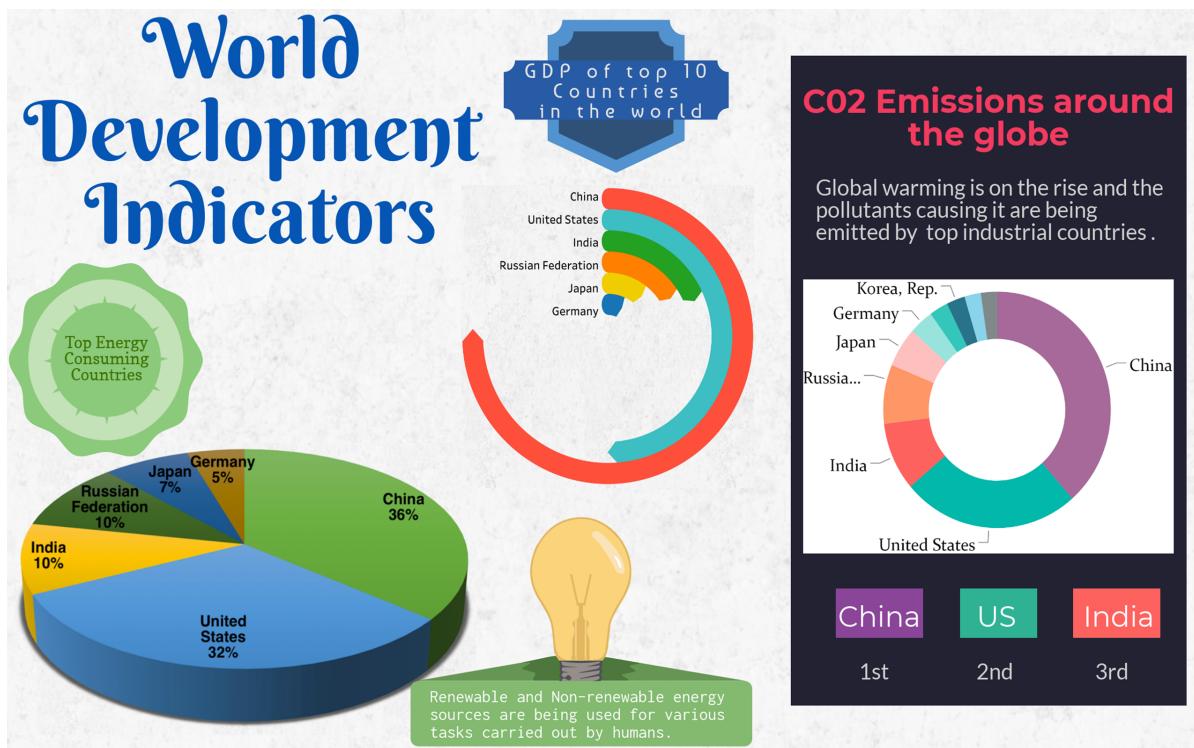


Figure:1 [7]

The first block consists of three visualisations, i.e. The Energy consumed by countries, GDP of top 10 countries and CO<sub>2</sub> emissions.

i. Renewable and Non-renewable sources of energy are being used to their full potential for a variety of things such as providing electricity (by utilising solar energy, thermal energy, hydro energy etc.), fuel for machinery and vehicles (Oil refineries, coal mines etc.). Increased utilisation of natural resources has led a rapid depletion which has forced countries around the world to move to Renewable sources of energy, decreasing the dependence on non-renewable sources of energy.

ii. GDP of the world's top countries has been illustrated with the help of Radial Pie Gauge Chart. China has the highest GDP of all followed by United States, India, Russia, Japan, Germany over the last decade. GDP tells us the rate of growth a country in various sectors such as health, education, Employment etc.

iii. CO<sub>2</sub> emissions have been on the increase since the industrial revolution. Top three countries having the most significant share in emissions are China, United States, and India. CO<sub>2</sub> emissions have led to the depletion of the Ozone layer which protects every living being from the Ultra Violet rays of the sun (which is harmful).

Global warming is an alarming for the whole world as the CO<sub>2</sub> content is on the increase and temperatures are rising every year. Climate change has taken the world by surprise and is affecting millions of lives all over the world. The water crisis is the most prevalent cause of global warming, 70% of Earth is covered with oceanic water which is too expensive to purify. With a recent case of Cape Town which is facing a massive water crisis and is approaching 'Zero Day', when water resources for regular use such as drinking, bathing, washing clothes etc.

## Second Block:

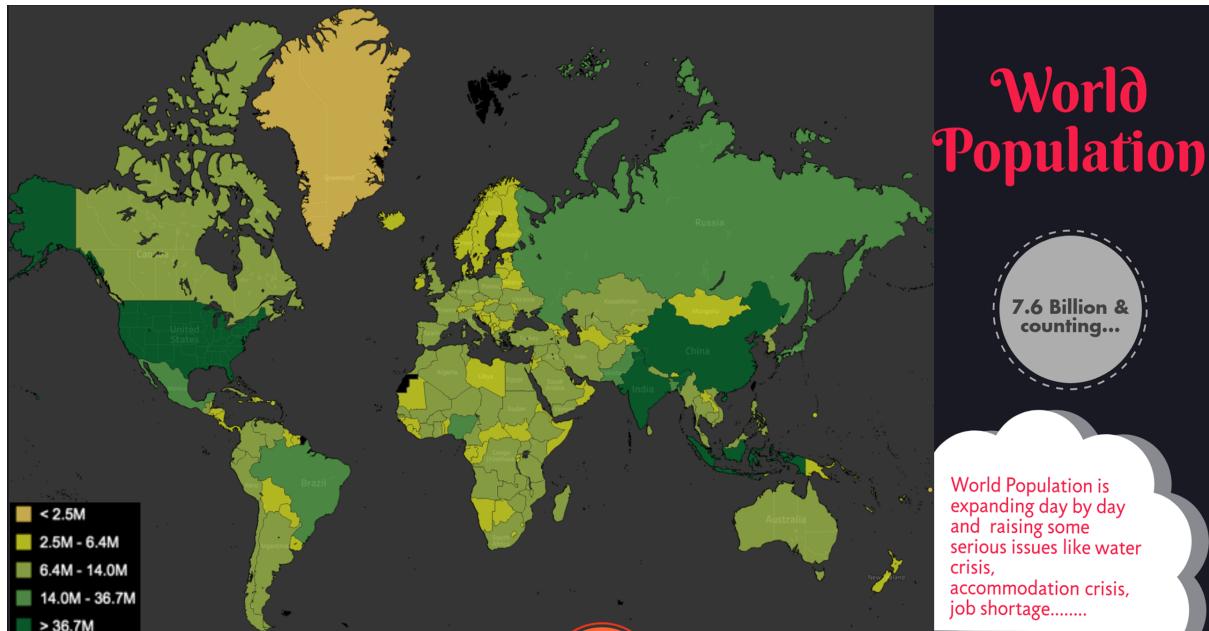


Figure:2 [6]

World population has been on the rise and currently is around 7.6 billion. This is a very alarming situation too as the accommodation for that many people are creating problems around the globe. The land present for accommodation is less than the people living in many countries. Countries like India and China having billions of people will soon have accommodation crisis, food shortage, water shortage and so on. If individual countries do not control the population, they might end up utilising their natural resources and left with nothing to survive. With the rise of the population, there has been an exponential increase in pollution all over the world. Pollution has been creating many problems such as contaminated air, water bodies etc. Pollution has resulted in health epidemics, and millions of people are suffering.

## Third Block:



Figure:3 [8]

World tourism is increasing day by day, and people are going crazy over travelling and exploring the world (accessible as well as non-accessible places). The most visited country is United States, followed by China, Germany and so on. These countries promote their most attractive places which people cannot resist. The inbound and outbound of tourists increase the economy of the place, and it helps in the development of people living there.

The tourism industry is proliferating as the technology is improving, more and more people have the means to travel and look for places easily. Tourism is affected by various factors such as safety of the place, attractiveness, accommodation, fashion etc. Countries are trying their level best to provide the tourists with every resource that is needed so that the influx can increase and so can their growth.

## **4) Justification**

- a) As shown in ***Figure 1***, three charts have been used i.e. Pie Chart, Radial Pie Gauge Chart and Donut Chart.
  - i. **Pie Chart**  
Pie Chart has been used to picturize the highest energy consumption in the world. Pie charts are used to show the percentage divided into slices to demonstrate the mathematical proportion. Here countries have been sliced up to show the share of energy utilized by them [1].
  - ii. **Radial Pie Gauge Chart**  
In routine gauge, charts describe speed and pressure of vehicles, machinery etc. However the GDP of top 10 countries has been represented as a radial pie chart because it shows competition and growth of the countries over the past decade. It is the best way to showcase the competitiveness between countries around the globe [2].
  - iii. **Donut Chart**  
Used for portraying the relationship between the different set of variables. CO<sub>2</sub> emissions have been increasing over the past few decades. It is a significant factor in contributing to the increase in global warming and pollution. Here the donut chart outlines the contributions of the developed and developing countries towards the escalating CO<sub>2</sub> emissions [3].
- b) As exhibited in ***Figure 2***, tableau's default world map has been utilised. To render the diversity of the total population of the world distributed over six categories, i.e. less than 2.5 million, 2.5 to 6.4 million, 6.4 to 14 million, 14 to 36.7 million and more than 36.7 million. World map is the best way to illustrate such data. Because a pie chart would be too congested to show data of 200+ rows discretely, a bar chart would have been inappropriate to depict such data as the variation in values is highly irregular. The six categories were created by making bins with the help of calculated field. Bins helped in representing the world population in a very understandable way, distinguishing the highly populated countries from sparsely populated countries.
- c) ***Figure 3*** portrays the tourism around the globe using butterfly chart. It is the best way to illustrate the comparison between two set of variables side by side. The tourism industry is on a boom and here are the top countries showing the inbound and outbound tourism. People around the globe love to travel to various countries for different reasons such as beautiful landscapes, cheaper accommodations, easy accessibility, historical importance, cultural values, safety etc. The chart here presents the United States as the top country where people fly in and out very frequently, followed by China, Germany, United Kingdom, India, Republic of Korea, and Russia

## **5) Technologies Used**

- I. **Tableau** was used for making most of the visualisations. In particular, the world map embedded in the tableau is used to show the diversity of the total population of the world. Two more visualisations were created, i.e. Radial Pie Gauge chart & Butterfly chart illustrating the highest GDP, the influx of tourism (Inbound) and the people leaving a particular country (Outbound).
- II. **Power BI** was used to depicting the CO<sub>2</sub> emissions around the globe with the help of Donut chart. The top 10 countries with highest emissions were showcased such as India, China, United States and so on.
- III. **Microsoft Excel** was used to produce the 3-D Pie chart which represents the energy usage of the developing and developed nations.

- IV. **Piktochart** has been used for the development of this infographic. The use of shapes & icons, photos and lines embedded in the piktochart has been utilised to its maximum potential. Various backgrounds have been used concerning the colour scheme. The colour scheme for Tableau, Power BI and Excel are different, and they have been taken care of because Color is an integral part of the infographic. A3 dimensions have been used for the completion of the infographic.

## **6) Short Reflection**

The tool used for the development of infographic is 'Piktochart', which is available online for everyone's usage. Piktochart supplies a wide variety of templates but not just for an infographic; it includes posters, Reports, flyers, and presentations. The tool also has a vast diversification of Shapes & Icons, Animated icons, Lines, Photos and Photo Frames for a wide range of categories which made visualisation of the data plain-sailing.

The road of building the infographic was not at all comfortable. The difficulties arose one after the other; it started with arranging the visualisations in an A3 sheet with proper size and visibility had to be taken into account. The toughest part was yet to come, and as further progress was made calibration of the colouring scheme with the model was the most time-consuming. Manipulation of data was callous as removing and adding components with multiple layers of play was quite a hassle. The uniformity of the infographic had to be maintained with the change in shape & size, colouring scheme altogether.

Icons and images were used to support the visualisations made from Tableau/Power BI. The primary motive behind the Infographic 'World Indicators' was to set out the idea of illustrating the factors affecting the growth of countries around the globe such as energy, GDP and tourism.

## **7) References**

1. Pie Charts [2018] [Online] Available on: <https://www2.le.ac.uk/offices/lid/resources/numerical-data/pie-charts> [Assessed on 2018/03/16]
2. Radial Gauges [2018] [Online] Available on: <https://www.dundas.com/support/blog/types-of-data-visualizations-radial-gauges> [Assessed on 2018/03/16]
3. Present your data in a donut chart [2018] [Online] Available on: <https://support.office.com/en-us/article/present-your-data-in-a-doughnut-chart-0ac0efde-34e2-4dc6-9b7f-ac93d1783353> [Assessed on 2018/03/16]
4. The World Bank [2018] [Online] Available on: <https://data.worldbank.org/> [Assessed on 2018/03/08]
5. Piktochart [2018] [Online] Available on: <https://create.piktochart.com/dashboard> [ Assessed on 2018/03/14]
6. Tableau Solutions [2018] [Online] Available on: <https://www.tableau.com/solutions/gallery/> [Assessed on 2018/03/07]
7. Super Data Science [2018] [Online] Available on: <https://www.youtube.com/watch?v=w6qEG7AyDYo&t=1s> [Assessed on 2018/03/14]
8. Create Diverging Charts- Andy Kriebel [2018] [Online] Available on: [https://www.youtube.com/watch?v=ynhRql3\\_iwU&t=611s](https://www.youtube.com/watch?v=ynhRql3_iwU&t=611s) [Assessed on 2018/03/14]
9. Butterfly Chart [2018] [Online] Available on: <http://beatexcel.com/butterfly-chart/> [Assessed on 2018/03/16]

## 8) Infographic

