OIL & GAS
Top 10 countries by Export, Production & Price (2000 - 2014)

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BACKGROUND

The data of oil and gas is stored and maintained by Harvard dataverse project, it is an open source data repository software where it helps many researchers, journals, institutions, developers to conduct their research on the real-time data. The dataset used for visualization is about oil and natural gas with its prices, production, and exports from 1932 – 2014 of nearly 187 countries with their trends on price, production & export quantity. Oil production and prices data are from 1932 – 2014 and gas production and prices are for 1955-2014.

The dataset includes 41 columns out of which for this project 12 columns have been used for the visualization and they are country name, year, oil & gas production where it includes their production share separately, export quantity of oil and gas which consists of metric tons of oil export per year and billions of cubic feet per year, real & nominal price where real value is calculated by adjusting the change in the value without any adjustment and nominal price is defined as the value calculated without any adjustment.

For this infographic I have taken years from 2000 to 2014.

Link:https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/ZTPW0Y

PROCESS

WRITING DOWN THE GOALS TO BE ACHIEVED
Firstly, before thinking about design, layout, charts or aesthetics, goals were written on a paper with clear, achievable goals.

COLLECTING THE DATA & PREPROCESSING IT FOR INFOGRAPHICS
Data was collected from the Harvard Dataverse website, the file is in CSV format. Unwanted columns were removed in Microsoft Excel.

VISUALIZATION THE DATA
ICCORE method [3] i.e. Inform, Compare, Change, Organize, Reveal Relationship & Explore method is used to pick the best chart for the visualization. Explanation of ICCORE method is as follows:
Inform**:** Conveying a message without requiring many contexts to understand should be kept in the mind. For example, making a numeric number stand out.
Compare**:** Using a bar chart, column chart, bubble chart to compare the independent values & use donut chart, pie chart or tree map to compare parts of a whole.
Change**:** Showing trends over time. For example, line chart, area chart or timeline can be used to show trends over time.
Organize**:** Using list or table to show rank to look up for specific values & flowchart to show order in process.
Reveal relationship: In an infographic if there is a complex relationship scatter plot & multi-series plot can be used
Explore**:** Developing the infographic in such a way that reader should explore the data & insights by looking at the infographics.

CREATING THE LAYOUT
Creating a layout with natural flow. For this infographic multi row grid is used. For developing the layout and style https://www.visme.co is used.A3 size sheet was used to create the layout (11.7 x 16.5 inches)

ADDING STYLE TO THE DESIGN
Once the layout is done, theme for infographic was set by using contrasting colors orange and blue for oil and gas respectively

SPECIFICATION

Story behind the infographic:
Global demand for oil and gas has increased tremendously, due to this oil prices are shooting upwards. One of the major reasons is developing countries such as China and India have been rapidly growing, their economies have become urbanized and industrialized. So as the demand is high, the production of oil and gas is increasing and the country who is producing more oil and gas is benefiting the most.
The developed infographic is divided infographics into 3 sections that are Production, Export, and Prices. All three factors production, export, and prices are correlated to each other. These factors directly influence the economy of the country.

PRODUCTION:
Oil Production: After analyzing the dataset of 14 years from 2000-2014, Saudi Arabia is the largest oil producer and its economy is majorly dependent on oil. Over a period of 14 years, Saudi exported 6720,831,691 barrels. Russia is the second largest producer in the world with production of 6666401376 barrels. Both Saudi Arabia and Russia have the largest share of the production. United states is the third largest producer with 4,437,790,330 followed by Iran, China, Mexico, Canada, Venezuela, UAE and Kuwait.
Gas Production: United states has been the largest natural gas producer with over 71K barrels. Russia is the second largest with production of 63K barrels followed by Canada, Algeria, Iran, Norway, Qatar, Saudi Arabia, United Kingdom and Netherlands.

EXPORT:
Oil Export: Saudi Arabia is the largest oil exporter of oil, over the period of 14 years Saudi Arabia has exported 88K M Barrels. Russia is the second largest exporter of oil with 60K M barrels followed by Iran, Norway, Nigeria, Canada, UAE, Mexico, Venezuela and Iran.
Gas Export: Russia is largest Gas exporter with 103,300 Barrels over the period of 14 years. Canada is the second largest gas exporter with 49K Barrels and Norway with 41K Barrels followed by Algeria, Netherlands, Indonesia, Turkmenistan, Qatar, Malaysia and United States.

REAL PRICE VS NOMINAL:
Price refers to price of a barrel. Nominal value is calculated using,

$$Nomial\ Price = \ Price/Mult\ nominal$$

Where, mult nominal is the inflation multiplier.

Oil price vs nominal price: From the year 2000 price of oil rose significantly until 2009 where it went to 61 dollars from 97 dollars, this was due to financial crisis. Then again, the prices of oil rebounded grew in a linear fashion and rose to 111 dollars in 2011. Real price and nominal prices were almost in year 2000, then it was 20 dollars difference until year 2009. The difference between them increased tremendously to 30 dollars in year 2014.

Gas price vs nominal price: Natural gas price was 3 dollars in year 2000 and there was not any difference between the real price and gas price. In year 2005 gas price was at peak 9 dollars and difference between real price and nominal price was 2 dollars. Then there was a sudden fall and the price was 4 dollars.

JUSTIFICATION

TECHNIQUE
Choosing the right infographic is really important, by referring ICCORE method [3] data visualization is being produced.
Visualization used in the infographics are:
1. **World map chart:** To represent export of oil and gas, shades of orange and shades of orange is used.
2. **Donut Chart:** Donut chart is used to share of countries exporting oil and gas.
3. **Highlight Table:** Highlight table is used to show the figures of oil exported by countries in total over the period of 14 years.
4. **Lollipop Chart:** To represent production of oil and gas lollipop chart is used.
5. **Dual Line Chart:** Dual line chart is used to compare real price vs nominal price of Oil and Gas.

LAYOUT
The layout used here is Visualize Article layout. The layout of the infographic developed is really simple, focused here is more on visuals rather than text. It has been divided into 3 sections. Production, Export, and Prices. The first section consists of Production which subdivided into 2 sections i.e. Oil and Gas production. The second section consists of Gas Export and Oil Export, where the world map, donut chart and figures od top 10 countries are used. The third and final section consists of oil and gas prices.

STYLE
Line art style is used in this infographic because the story is simple and straightforward. A3 page size with Lato font is being used throughout the infographics.

COLOUR
To get your message across everyone who is going through the infographic, choosing the right color scheme is really important.
As blue and orange are complimentary colors, blue and orange color are consistently used throughout the infographic. And instead of adding more colors, shades of orange and shades of blue are used throughout the infographics [2].

Gas: *Blue color & shades of blue is used to represent gas*. Shades of blue is used to measure gas export; as there is top 10 countries who export gas, the 1st country is represented by dark blue color i.e. Russia who is having the largest number of gas exported and light blue color is used to represent the country who stands 10th in ranking i.e. Qatar.

Oil: *Orange and shades of orange is used to represent oil.* Shades of orange is used to measure oil export; as there is top 10 countries who export oil, the 1st country is represented by dark orange color i.e. Saudi Arabia who is having the largest number of oil exported and light blue color is used to represent the country who stands 10th in ranking i.e. Iraq.

TECHNOLOGIES

For developing this infographic, I have used various tools such as

TABLEAU

Tableau is the best software for creating dashboards, as compare to different BI tools tableau is easy to use. It is easy to connect with different data sources. Almost each and every functionality is drag and drop.

VISME.CO

Visme.co is an online based tool used to build presentations, infographics, wireframes, etc. Without any great graphic design abilities, you can use Visme. It has an option to import to images, charts, etc. according to the user's choice. Alignment of the visualization used is really simple to do, it maintains the neatness of the article.

EXCEL

Excel is great tool to analyze large amount of data. With powerful filtering and sorting tools, it allows to sort out a large amount of data.

REFLECTION

It was a good learning experience although there were various challenges while creating the infographics.

To organize the information in a structured manner and using less text and more visualization I had to use my creative skills. Only most important information is considered while creating the infographics. It was a challenge to use few words and more visualization for creating this infographic. Dataset had various other parameters which could not be analyzed because of A3 sheet size constraint. While creating visualization in Tableau, to change the color of the background and removing the axis and border to match the infographics was a challenging task. Visme is great tool, alignment of graph and text was easy to do.

REFERENCES:

1 Williams, R. (2019). *The Importance of Infographics*. [online] Third & Grove. Available at: https://www.thirdandgrove.com/the-importance-of-infographics [Accessed 25 Mar. 2019].
2 Adobe (2019). *Adobe Color*. [online] Available at: https://color.adobe.com/create/color-wheel/ [Accessed 25 Mar. 2019].

3   NEDIGER, M. (2019). *How to Make an Infographic in 5 Steps [Step-By-Step Guide] - Venngage*. [online] Venngage. Available at: https://venngage.com/blog/how-to-make-an-infographic-in-5-steps/ [Accessed 25 Mar. 2019].