
VISUALISATION CRITIQUE PRESENTATION

BEMM461

Video Link : https://universityofexeteruk-my.sharepoint.com/:v:/g/personal/d202_exeter_ac_uk/EQmCpDyGUI9BnAWkWc7la2cBrHQUyHoKaXliTdJS7tq0MA?e=rHSxz6

WHAT IS DATA VISUALISATION ?

- In the world of big data, data visualisation is essential for analyzing massive amounts of information and making data-driven decisions.
- Data visualisation is a process of visualizing the information so that we can see the patterns and connections that matter and allows an individual to focus on the information as per their requirement.
- The data will be represented in the form of common graphics, such as charts, plots, infographics, and even animations.



THE AIR WE BREATHE

Healthy - Less than 12.1 ug/m³

Moderate - 12.1 ug/m³ to 35.4 ug/m³

Unhealthy - Greater than 35.4 ug/m³

This visualization examines the global prevalence of air pollution measured by PM2.5 and some of the contributing factors. PM2.5 refers to atmospheric particulate matter (PM) that have a diameter of less than 2.5 micrometers. Because the PM2.5 travels deeper into the lungs AND because PM2.5 is made up things that are more toxic (like heavy metals and cancer causing organic compounds) PM2.5 can have worse health effects than the bigger PM10 particles.

THE GLOBAL DIVIDE

The map below shows a significant global divide between cities that are home to healthy air and cities that are home to unhealthy air.

Use the parameter below to toggle between counts of cities and people.

City

55
44
60



Johannesburg, South Africa

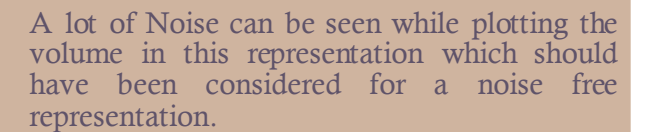
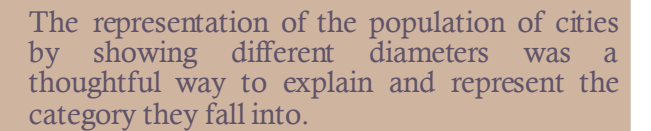
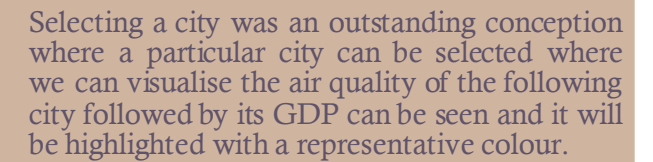
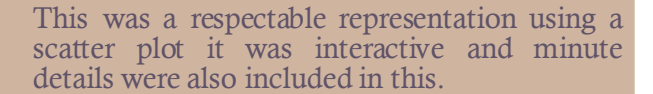
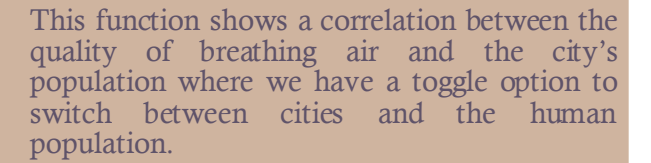
The Air We Breathe

Designed by - Christian Felix

- I chose this scatter plot visualisation as it was interactive and real-time.
- In this, it represents the quality of the air which we breathe which is a major anchor of a living habitat.
- The visualisation was published on October 7 2020 and is backed by datasets from WHO and Pangaea data.
- The air quality for the respected cities are represented by using tri-colour green which means the air is healthy, white represents moderate and yellow represents unhealthy breathing air.

City: Bangalore, India
 PM2.5 Category: Unhealthy
 Modeled GDP Change: 0.1%
 GDP: \$4K
 PM2.5: 63.2 ug/m3

Population
 -- 7M+
 -- 5M
 -- 3M
 -- 1M



Strengths and Weaknesses

STRENGTHS



This plot takes multiple non-linear scalar variables and uses them to represent using different axes.



While working on the implementation looking at this visualisation the process will accelerate because of the precise representation of the visuals.



The heterogeneity in color usage will elevate the important characteristics of the visualisation, which will help in better communication for the audience.



The problems can be easily detected and rectified with the help of this visualisation.



Data flow can be easily observed such as maximum and minimum attributes using this visualisation.

WEAKNESSES

In this visualisation, association with two variables such as GDP vs Air Quality increases the complexity because of the overcrowd in the visualization.



Magnifying reduces the quality of the visualisation and is a major drawback.



As the multi-dimensional problem is considered data from many major cities are missing which should be considered.



The representation of the relation between two quantitative variables PM and GDP is crowded which confuses the viewer.



More data is shown in the front end which makes the user scroll left-right, up-down leading to confusion which may later lead to false conclusions .



<https://public.tableau.com/app/profile/thecfelix/viz/TheAirWeBreatheIronVizFinal/TheAirWeBreatheIronVizFinal>

Munzner's Four-Level Validation



- Level 1:- For this level, our target audience should be decided with a detailed comprehension of the visualisation. Air purifier enterprises and top influencers, WHO, NGOs, and air quality activists will be our target group.
- Level 2:-Secondly, this level focuses on data abstraction asking what is shown? And task abstraction asks what is the user looking at? The first abstraction shows the world map with the cities where the air is healthy, moderately healthy, and unhealthy. Task abstraction shows the air pollution perspective of different cities which one needs for the implementation and understanding.
- Level 3:-In this validation, the visualisation will mainly focus on visual encoding and interaction idiom asking how it is shown? In this visualisation because of considering multiple attributes noise has been increased which will confuse the viewer. But the manipulation instructions makes the process effortless.
- Level 4:- The last validation talks about the algorithm computation, in this, the buffering can be seen while manipulating the visualisation which could have been reduced(*Four Levels for Validation 2014*).

Audience

- The primary audience will be NGO activists, Influencers, and air prevention and pollution control activists. Looking at the visualisation they can schedule their program according to the impact on the cities.
- The air purifier company will be our second turnout using this visualisation they can target and promote their product.
- The audience will be WHO, they collect the data by assessing this visualisation conduct analysis and spreading awareness by announcing guidelines to the multi-dimensional audience across the world(*Air pollution* 2019).

Questions it aims to answer?

- Which cities are most affected by air pollution?
- Is the income of the country co-related with a harmful effect like air pollution?
- Does population impact air pollution?
- Which cities have a healthy atmosphere?





GOOD OR BAD VISUALISATION

❑ The air we breathe is a satisfactory visualisation. The usage of different bright colors is appreciated which will help during the interpretation. Considering the data, the visuals were justified but the downside is, the complexity is more while analyzing the data visuals. The toggle option is a great way to display the interactive nature of the visualisation . Minute details like the abbreviation of PM are also missing which makes the visualisation less informative and could have been handled. The visualisation focuses on a limited amount of data in terms of cities.



RECOMMENDATIONS AND CONCLUSION

- For this visualisation instead of considering the GDP the main root cause of the pollution should be represented.
- The resolution should be retained while magnifying the visual.
- The data which includes the details of major cities should be used to deploy this visualisation.
- Instead of showing the population as a volume which is overlapped in this visualisation it could be shown in a rectangular box which is visually most enticing to the viewers.

REFERENCES

- Munzner, T. (2021, October 24). *Nested Model (Ch 4) I, Visualization Analysis & Design, 2021*. YouTube.
<https://www.youtube.com/watch?v=KXswx4QSkHc&feature=youtu.be>
- *Air pollution*. (2019, July 30). <https://www.who.int/health-topics/air-pollution>
- (2023). Tableau.com. <https://public.tableau.com/app/profile/thecfelix/viz/TheAirWeBreatheIronVizFinal/TheAirWeBreatheIronVizFinal>
- V. (2016, February 12). *Four Levels for Validation—Chapter 4*. Visual World.
<https://jenniewblog.wordpress.com/2016/02/12/four-levels-for-validation-chapter-4/>

