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**FIT5147 Data Exploration and Visualization**

**“Data Visualisation Project: Is Covid just a flu? If not, will it be?”**

**Yuzhou Chen (32272960)**

**Tutorial: 05**

**Tutor: Anh Tran & Rita Hoang**

**Introduction**

This data visualisation project, as the extension of the data exploration project, aims to turn all the findings as well as conclusions from the earlier project into a series of interactive visualisations, which allow users to understand the background of the project, the process of explorations, and the conclusion efficiently. More importantly, to allow user to not only visualise the findings, but also to interact with the data, if they are interested into particular sections, and present the data allowing quick, or at the best scenario, immediate conclusions to be drawn.

**Design**

Since the research areas were not naturally organised in any consistent way, which involved many cross-topic merging and comparisons in order to build up a convincing argument, it was difficult to simply present the findings and arguments from my point of view. For that reason, it is considered necessary to structure and arrange the contents, in a way that is continuous and fluent so that the readers understand why I would make comparison between several distinct concepts and based on what when comparisons were performed.

1. **Primary Layout**

The overall layout for narrative visualisation design was first adapted from one of the examples discussed by Gershon and Page (2001) as the primary foundation, or layer, if you will. The logic flow and timeline of the author were represented by the scrolling activity. With introduction of the purpose of the study as the starting point, readers follow author’s logic flow by continuously scrolling down of the page. The strengths of such design include continuity and scalability. The former provides structured and guidance for readers to think linearly while the latter allows possibility to add more different branches, if there is any, to the main branch (main flow).

1. **Narrative Structure & Design**

Following the primary layout, the next step would be how to convey the details of the findings as well as some key concepts that will be involved when explaining. Though, images hold a great amount of information that readers could grasp quickly, it also requires not only labels and titles, but also reasonable amount of texts to explain the contexts and how findings are related. Therefore, another layer was added on top of the primary layout, which turned out to be as if a blend including slide show and annotated chart elements as well (Segel & Heer, 2010). This design was presented in both sheet 3 and sheet4, which emphasised continuity of the narrative than constant interactions with readers (Appendix).

1. **Storytelling with Data Visualisation**

Finally, it came to the data visualisation part. When readers proceed to a new section, there it presents a big header following a short and memorable fragment to explain the context avoiding long and bullet-pointed description that is difficult to grasp (Gerhson & Page, 2001). As for the data visualisation, the choices of searching for template were aligned with some of the case studies discussed by Segel and Heer (2010), in which the consistency of the visual platform has been considered. For instance, the bar plot that allows readers to click on a button to change the input variable.

**Implementation**

In short, the final implementation has been completed based on the final design of the previous Five-design-sheet including almost all the features. To assist the implementations, external templates were included and were listed as the following:

1. Button to change input variable in bar plot:

Link: <https://d3-graph-gallery.com/graph/barplot_button_data_csv.html>

1. Line chart with zoom:

Link: <https://d3-graph-gallery.com/graph/line_cursor.html>

1. Choropleth Map with hover effect:

Link: <https://d3-graph-gallery.com/graph/choropleth_hover_effect.html>

1. Circular bar plot template:

Link: <https://d3-graph-gallery.com/graph/circular_barplot_template.html>

Although, templates could save time and efforts for appending the actual SVG element into the web page, the challenging part for a beginner is that you will never find an exact template that could perfectly cover your data or data type. Therefore, not only understanding the code from templates were crucial for later adding additional visualisation based on the original design, but also data wrangling are difficult too due to data merging will also be involved for some of the visualisations.

* **Line Chart**

The difficult part of the line chart was that my project required two lines, instead of just one. Adding additional line to an interactive line chart consisting a zooming functionality was not beginner-friendly since the ‘brush’ component, which allow zooming, would not easily accept additional line. Thus, I was required to understand the code and created another new line chart and overlapped one on another. The second challenge was to construct a X-axis with date-time as the scale. This had involved not only relearning the scale feature of d3, but also to do data wrangling ensuring all the data is in correct date format.

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* **Choropleth Map**

Implementation of map was one the most difficult parts of the project. As the template included very limited of comments, it also included a csv dataset and JSON dataset for drawing out the map with hover effects as well as the choropleth characteristic. The original template employed both set of data as a combination to produce a complete product. My approach was to fetch the original csv and to merge with my dataset based on the shared “country name” column.

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After merging, I was required to find a way to integrate the wrangled csv data into the original JSON dataset to draw out a new map with the maturity of the colour representing the ‘new\_cases’ as well as more relevant data for each region to be integrated into the additional self-made tooltip.

**User guide**

* **Choropleth Map**

Tooltip will be presented when the mouse is moved over the selected region of the map. Colour range representing the confirmed cases.

**Map

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* **Circular Plot**

Tooltip will be presented when mouse is moved over the selected bar.

**Chart

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* **Ratio Visualisation**

Tooltip will be presented when mouse goes over the selected triangle, which representing the fatality rate.

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* Bar Chart

For bar chart, user can click on the variable, which they would like to examine. Tooltip will be presented when mouse is moved over the selected bar.

Chart, bar chart

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* Line Chart

For line chart, zooming is available by highlighting the area that you find it interesting. Double click for returning back to the initial state.

Chart, line chart

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Chart

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URL to the web page:

<https://franky-d3-5147.s3.amazonaws.com/Data_visualisation_project/5147_DVP.html>

**Conclusion**

To sum up, the findings were adapted from the earlier data exploration project, and were presented at the bottom of the page along with the limitations of the study.

As for the reflection, I chose D3 as the primary approach for data visualisation because I recently learned the front-end including html, CSS and JavaScript and would like to gain more experience with it. In hindsight, the difficulty of the chosen topic has a huge impact on later data explorations, which in turn might limit the richness of fancy visualisations. For this topic, it is crucial to have large amount of dataset across countries, datetime and types of virus so that the design of map as the trigger to different pages could be integrated into the current design allowing more wholistic explorations of the topic. Also, qualitative data should also be included by playing with the APIs of various social media platform, which may produce many intriguing data such as the side effects of different people and etc. However, this is a skill that I did not have and thus, it becomes a regret.

**Bibliography**

Gershon, N.D., & Page, W. (2001). What storytelling can do for information visualization. Communications of the ACM, 44, 31 - 37.

Segel, E., & Heer, J. (2010). Narrative visualization: Telling stories with data. IEEE transactions on visualization and computer graphics, 16(6), 1139-1148.

**Neumorphism Animation:**

<https://codepen.io/ma_suwa/pen/eYdZVML>

**CSS Typing Effect:**

<https://codepen.io/denic/pen/GRoOxbM>

**Button to change input variable in bar plot:**

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**Circular bar plot template:**

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**Appendix**

**A paper with writing on it

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**A piece of paper with writing on it

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