Monash University: Assessment Cover Sheet

Student name	Fung	Ka Ki	
School/Campus	Clayton	**Student's I.D. number**	32249594
Unit name	FIT3179 Data visualisation - S2 2023		
Lecturer's name	A/Prof. Bernie Jenny	**Tutor's name**	Ria Kalachetty
Assignment name	Data Visualisation II Report	**Group Assignment: No** **Note, each student must attach a coversheet**	
Lab/Tute Class: 03_OnCampus	**Lab/Tute Time:** Monday 8 am - 10 am	**Word Count:** 828	
Due date: 15-10-2023	**Submit Date:** 12-10-2023	**Extension granted** ☐	

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FIT3179 - Data Visualization
Assignment 2 - Data Visualization 2

Student Name: Ka Ki Fung
Student ID: 32249594

Word Count: 828
URL: https://kfun0006.github.io/FIT3179/Assignment%202/

1. Domain

The visualisation focuses on analysing corporations using the "Top 2000 Global Companies" dataset published by Forbes in 2020. The main goal of it is to explore this dataset and uncover insights, about these companies. The visualisations the been created will cover aspects, such as the locations and average market values of these global companies how they are distributed across different continents and countries and the intricate relationship between financial metrics, like assets, sales, profits, asset turnover ratios and return on asset ratios. The visualisations aim to provide a comprehensive perspective on the global corporate landscape. These insights are intended to empower professionals in finance, business, and research, enabling them to make more informed decisions within the intricate realm of global corporate analysis.

2. What

The dataset that obtained is called "Top 2000 Companies Globally" from Kaggle, which serves as the source for all of the visualisations. To make it easier and more efficient to create visualisations like maps, radial plots and bar charts I used a separate CSV file. This custom CSV file contains the necessary data for these visualisations. It's worth mentioning that although there are datasets, in my CSV folder they all originate from the same main dataset.

3. Why and How

Dot Map: The dot map is a cornerstone of our visualisation approach. It provides a geographic representation of the top 2000 global companies, making it easy for users to understand their global distribution. To enhance user interaction, I've integrated four interactive elements:

- Slider for Minimal Mean Market Value: This slider allows users to set a minimum threshold for the mean market value, enabling them to filter the data according to their specific criteria.

- Slider for Total Market Value: Similar to the first slider, this one permits users to select a total market value threshold, refining their data view.

- Map Zoom Controls: Incorporating zoom controls and a centre selector improves map interactivity. This feature is particularly valuable for precise observation in areas with overlapping marks on the map, facilitating pinpointing of areas of interest.

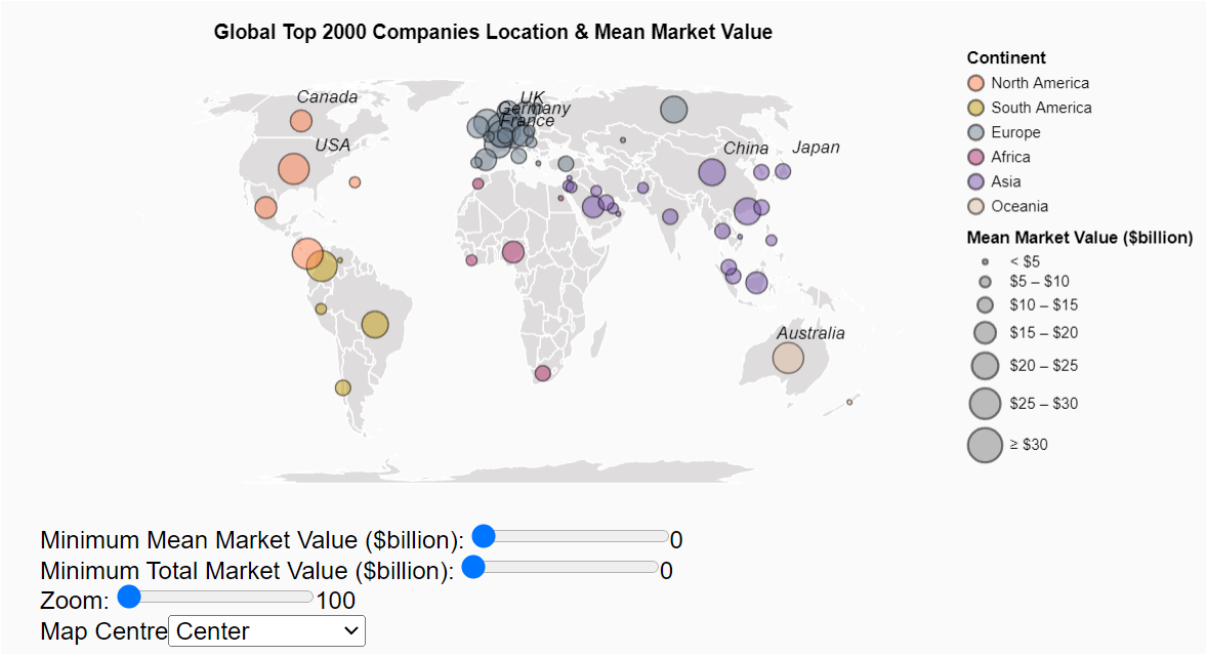


figure 1. Dot map

Radial Plots: Radial plots are employed to depict the distribution of global companies across continents and countries. To address variations in data volumes for different countries, I've introduced a continent selector within the Country-wise Distribution radial plot. This selector aids users in overcoming visibility issues in smaller countries with lower data volumes.

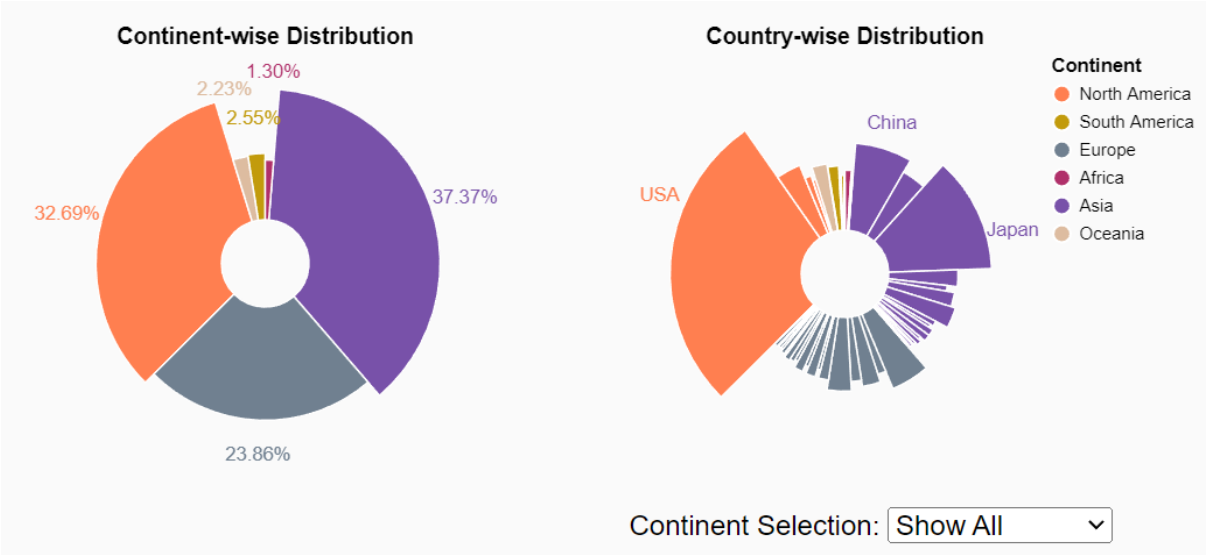


figure 2. Radial Plots

Bubble Charts: Our bubble charts provide insights into the financial metrics of these companies. To enhance the user experience, I've integrated three interactive features:

- Brushing Tool: This tool enables users to explore the performance of companies with similar asset values, allowing for a more detailed analysis within specific asset ranges.

- Selector for Continents: This selector empowers users to filter data by continent, facilitating a more focused analysis of companies within a specific geographical region.

- Slider for Rank Range: The slider allows users to select the rank range they wish to observe, making it easier to delve into companies within a specific rank bracket.

figure 3. Bubble Charts

Bar Charts: To further improve the user's ability to observe the top companies in terms of sales, profits, assets, and market value, I've divided the original grouped bar chart into four

separate bar charts. The selector at the bottom of the chart enables users to effortlessly switch between these four types of data.

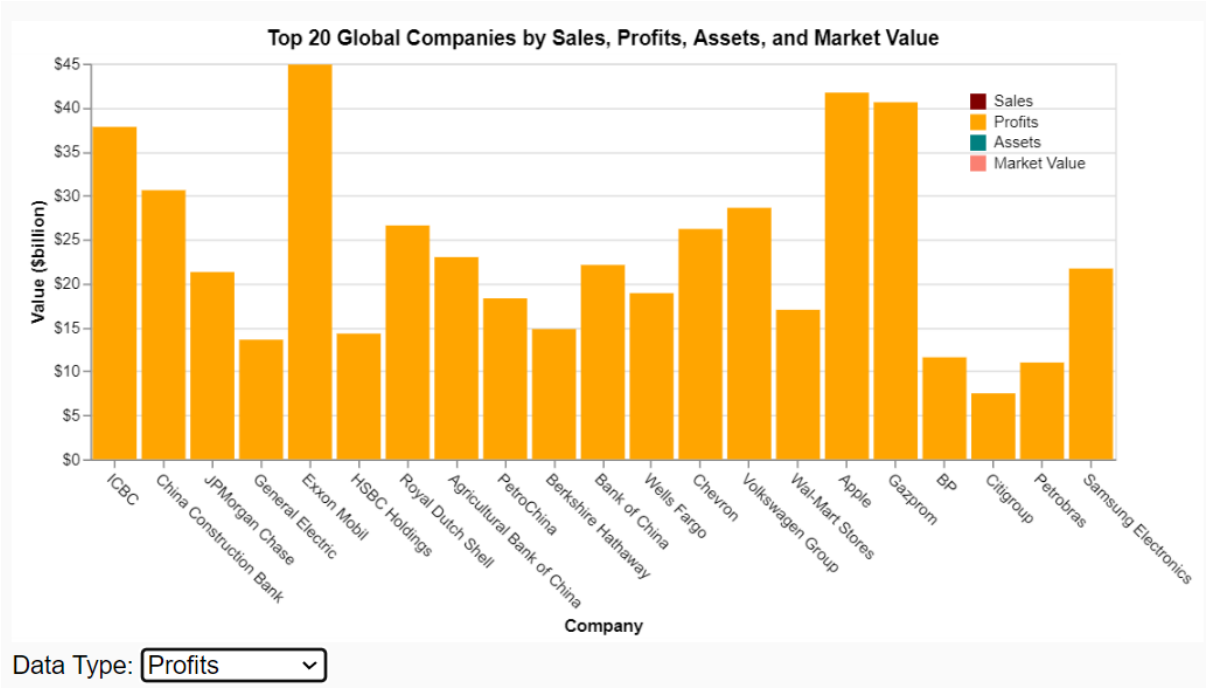


figure 4. Bar charts

4. Design

Layout: Throughout the visualisation I have used borders to separate different sections of content. Each bordered section follows a layout pattern; the first row contains charts and subsequent columns include accompanying text.

Colour: For titles and sub titles, in the visualisation I have opted for a colour. This choice distinguishes them from text colours. Adds a sense of stability. As for the colours used within each continents dataset in the charts they are uniform but chosen with some of the guidelines: avoiding colours like red, green and blue while ensuring they remain distinct from one another. Additionally specific coloured texts within the visualisation act, as highlights and are associated with continents. These texts are matched in colour to their continents enhancing readers understanding.

Figure-ground: To emphasise the content and minimise distractions chart visuals feature marks in eye catching colours with varying opacity while grid lines and maps are presented in shades of grey. Texts are carefully crafted with weights and colours to highlight their importance and set them apart from regular text.

Typography: When it comes to choosing fonts there isn't one reason that determines the choice. However I have made sure that titles, subtitles and regular text use fonts to make them visually distinct. Moreover I have organised all the texts into two column layouts to ensure readability and keep the line length between 10 to 12 words, which is considered ideal.

Storytelling: In terms of the storytelling approach used in this visualisation I have structured it like a canvas where charts and texts are carefully arranged in an order. Additionally certain sections include guiding sentences, at the end of each border to help readers follow a progression through the visual content.

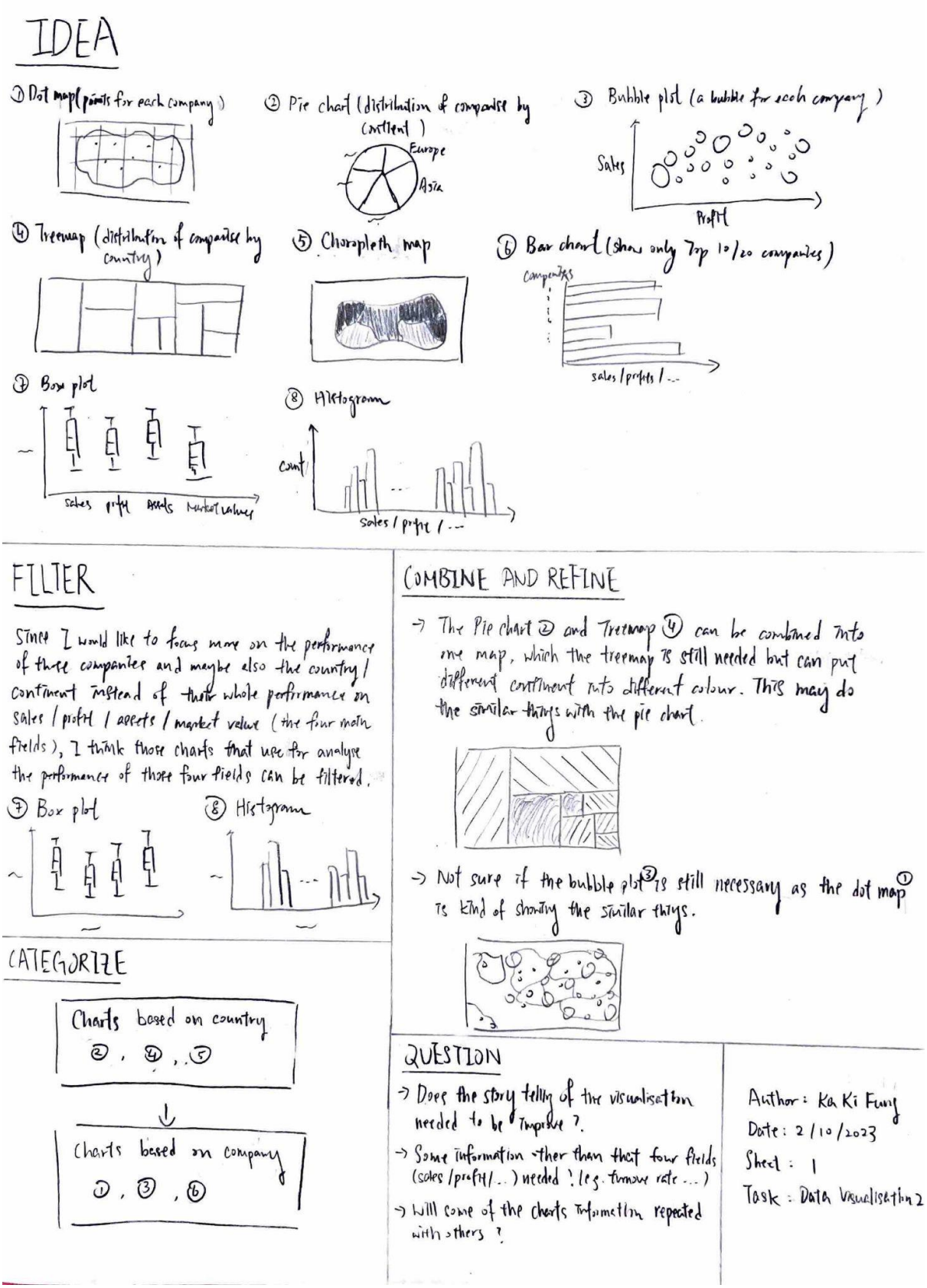
5. Reference

Joakim A. (2023). Top 2000 Companies Globally. Kaggle. https://www.kaggle.com/datasets/joebeachcapital/top-2000-companies-globally

Arvind S., Dominik M., Kanit W & Jeffrey H. (2017). Document. Vega-Lite: A Grammar of Interactive Graphics. https://vega.github.io/vega-lite/docs/

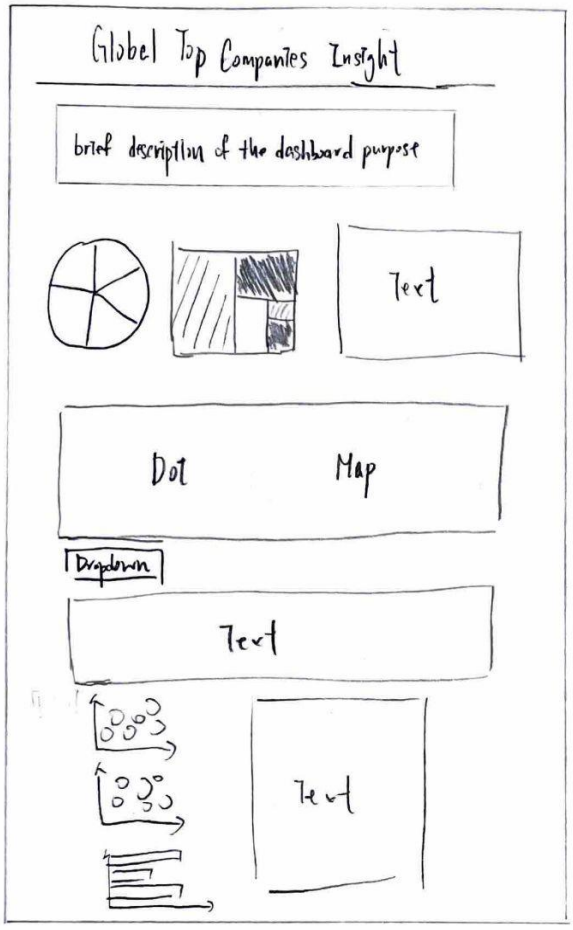
How to create Grouped Bar Chart in Vegalite. (2021). stackoverflow. https://stackoverflow.com/questions/68616163/how-to-create-grouped-bar-chart-in-vegalite

6. Appendix



Appendix 1. Five design sheet sheet 1

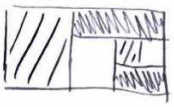
LAYOUT



Author : Ka Ki Fung
Date : 2/10/2023
Sheet : 2
Task : Data Visualisation 2

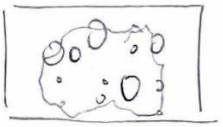
OPERATION

① Treemap coloured by continent



② Interaction - dropdown list of continent

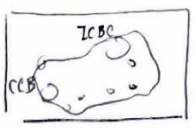
③ Zoomable map



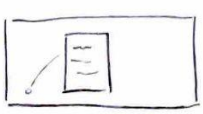
FOCUS

① Texts should be next to or under a chart.
So people will read it after looking through the chart.

② The dropdown list will change the information showed on the map, or maybe the bubble charts and bar charts as well.

③ 

A Text annotation will be shown for the top 3 or 5 companies in the map

④ 
Tooltips will be used in the dot map, bubble chart and treemap.

DISCUSSION

→ Not much visualisation in the country based part (only two charts)

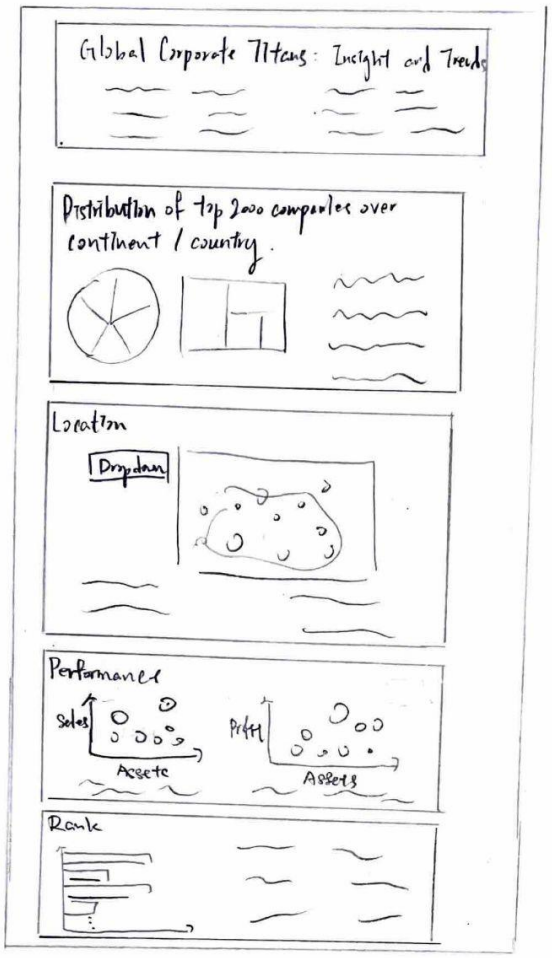
→ Not clear bounds

→ May need to add some sub-title or grid / box to let reader easiler to identify what contents they are reading

→ pretty much enough explanation for the graphs.

Appendix 2. Five design sheet sheet 2

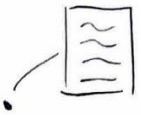
LAYOUT



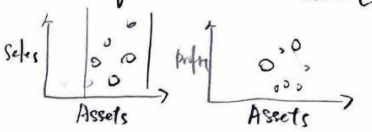
Author : Ka Ki Fung
Date : 2/10/2023
Sheet : 3
Task : Data visualisation 2

OPERATION

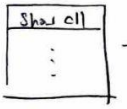
① Tooltip for treemap, dot map, bubble chart



② Brushing Interaction - bubble charts

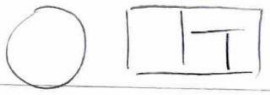


③ Dropdown list - Dot map



- continent

④ Clicky Interaction - pie chart treemap



FOCUS

① Text annotation for top 3 or 5 companies in the dot map.

② Different Boxes contained different domain contents have been separated into different boxes.

③ The point size of the bubble chart will be defined by the turning rate and return on assets rate.

④ The Bar chart at the end will only contain top 10 or 20 companies, and the market price of them will be shown.

DISCUSSION

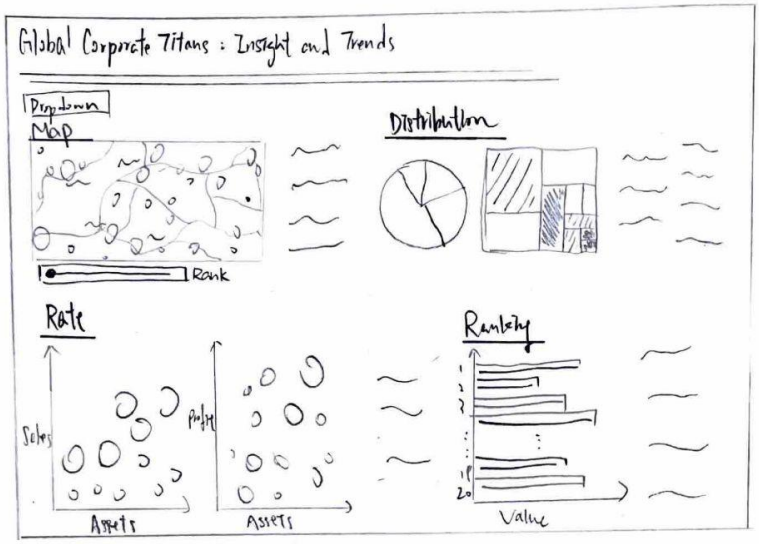
→ Charts and texts have been put in different container. Reader can easily tell what contents are belong together.

→ Will the filters be to much? All most every chart got a filter.

→ Is the information enough for the reader? Should I focus more on the performance of the specific companies? (eg. top 10)

Appendix 3. Five design sheet sheet 3

LAYOUT

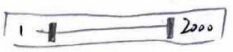


Author : Ka Ki Fung
Date : 3/10/2023
Sheet : 4
Task : Data visualisation 2

OPERATION

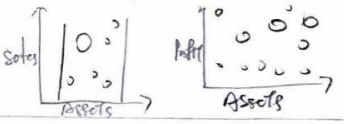
① Dropdown list - continent
Allow user to filter content

② Scroll bar - Rank
Allow user to filter contents with the Rank range they want.



③ Tooltip - Map, Treemap, bubble plot (bar chart?)

④ Brushing Interaction - bubble chart



FOCUS

① The map is showing each point per company, using market value for size, and continent / country for colour.
Text annotation will use for top 3 or 5 companies.

② The two bubble charts will be using assets for x axis and sales / profits as y-axis, while turnig over rate / return on assets rate will be the size. Each point a company etc.

③ The bar chart will only show the top 10 / 20 companies and maybe using market value as the length

DISCUSSION

→ Viewer can see all the data in one page - no need to scroll down

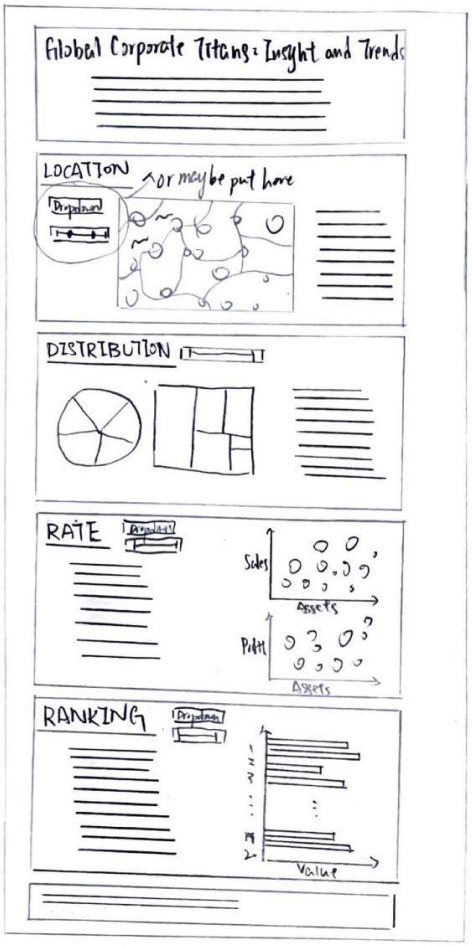
→ Is kind of too much information in one sight.

→ It may confused the reader as some texts are next to a chart that does not relate to them.

→ The drowdown list and scroll bar can give change to all charts (except the distribution part)

Appendix 4. Five design sheet sheet 4

LAYOUT



Author : Ka Ki Fung
Date : 3/10/2023
Sheet : 5
Task : Data Visualisation 2

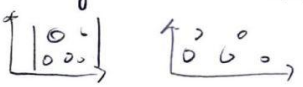
OPERATION

① Dropdown list - continent

② Scroll bar - Ranking

③ Tooltip

④ Brushing interaction - bubble charts



FOCUS

① Dot Map
- → One company per point → Text annotation : Top 5
- → SIZE : Market value
- → Colour / Shape : Continent / Country

② Pie chart, Treemap
- → Showing the count of records

⑤ Authorship at the end

③ Bubble charts
- → x-axis : assets
- → y-axis : sales / profit
- → SIZE : turnover rate / return-on assets rate
- → colour / shape : continent / country

④ Bar chart
- → Top 20 companies → length : Market value ?

DISCUSSION

→ Clear border for each domain. Viewer will not be confused by unrelated contents.

→ May need to do experiment on the placement of the filter / charts / texts in each box.

→ There is a chance that the treemap will not be used as I am not sure if a treemap can be created using vega-lite.

Appendix 5. Five design sheet sheet 5