Design Critique 7

Pim van Alphen, 11082887

Introduction

This visualisation consist of two different parts, a part about the gains and losses of jobs and a part about the national unemployment. I will consider each to be a visualisation on its own, mainly because the two are not linked in any way, except roughly for the subject of matter. The publishers of the visualisation also think of them as being separate, considering the fact that they made a link at each visualisation, which makes the page jump to the other visualisation.

The visualisations have been published on the website of the Wall Street Journal, an international business focussed daily newspaper from the USA. This indicates that the intended audience for this visualisation are the readers of this newspaper, so people with interests in business and finance.

Visualisation 1: "Winners and Losers: Job Gains and Losses"

This visualisation shows the gains and losses of jobs in the different sectors of the labor market. It consists of two parts. The first part is a kind of bar chart. it shows a set of bars consisting of dots representing the different sectors. Each dot is positioned above or below the zero, indicating whether the sector has gained or lost jobs. The color of the dots indicates how great the gain or loss has been. Bars are positioned along the x axis (although the axis isn´t drawn as a line) based on the month. When hovering over one of the dots, the name of the sector and the gain or loss in percentages is shown in a tooltip, and the dots in the other bars representing the same sector are given a black dot in their centre.

The second part of the visualisation is a detailed view of the data presented above. It is a table like structure showing the data for a specific month for each of the sectors. The headers indicate variables like sector size and change in jobs in absolute and relative numbers.

The two parts are linked together in several ways. When one bar in the graph is clicked on, a month is selected and the data in the table is adjusted to represent the data of that month. When a header of the table is clicked on, the data of the table will rearrange itself in different ways for the different headers clicked on, but it will always separate the data in two blocks, one for the sector with job losses and one for the sectors with job gains. The dots in the bars will rearrange according to the header clicked on.

The visualisation succeeds in showing a lot of data about the job gains and losses per month for each sector. The table gives a detailed overview on the data for that month, so answering a particular question about one of the data points is easy. Relationships between data points, on the other hand, is not so easily derived from this visualisation. Relationships between sectors in a specific month can be derived from the table by selecting a header to sort the sectors on, but this sorting is not consequent for the different headers. All headers sort the sectors in two categories based on the jobs gained or the jobs lost, but those sub selections are sorted different for each header, for example sector size is sorted from small to large and then from large to small (for the job gained and the job lost categories, respectively), while monthly change is sorted form large to small and small to large. This inconsistency is reflected in the bar chart. The dots of the bar chart are sorted as a header is clicked, but first the table need to be consulted to see if the dots on the outside represent the big or the small values. Another troublesome endeavour is trying to find out which month you are looking at. The months are shown on a tooltip when you hover over a dot in the bar chart. When you click on

the dot, the data in the table changes to represent that month, but nowhere in the visualisation you can find out which month you have selected.

As stated before, a lot of data is shown in this visualisation, and the data is very dense. Each dot in the bar chart encodes two data points based on position and one based on color. The position of the dot relative to the other dots in the column gives insight on the relative value, and the interactivity of hovering over a dot shows the relative value of itself over time. No absolute data can be derived from the bar chart, and that's where the table, which is also data dense, is used. Almost all things shown in the visualisation show or clarify data. The amount of data comes at the cost of proximity. While the table provides useful information and guidance for the bar chart, it is too large to be entirely viewed when also watching the bar chart.

The graphical integrity of the visualisation is not fully intact. Each dot in the bars is placed along the x axis according to month, but the y axis is used solely for displaying all the dots. The spacing between all dots on the same column is equal, while it could be the case that the relative difference between two dots is bigger than that of two other dots in the same column. It makes even less sense to compare the dots on the same row, because their differences can vary even more, which feels counter intuitive. Another point on integrity is the data which the outlying dots confer. While each step in color corresponds to a difference of 0.25% from the previous one, the difference in the outliers can reach up to 2.80%, more than double the difference.

The overall design of the visualisation is pleasing. A diverging multi hue colorscheme is used to encode the job change in percentage. This is a good choice, since the data departs from and extends to either side of the zero. The green and red used makes the differences less readily insightfull for the colorblind, but it doesn't hinder the information transfer because those colors are not situated directly next to each other. The choice for the color blue at the end of the spectrum can be discussed, since it doesn´t necessary follow green in an ordinal way. The colors are consistent throughout the visualisation and contrast well enough with each other and the background.

Visualisation 2: "Jobs Come, Jobs Go: National Unemployment"

This visualisation shows national unemployment rates month by month. It consists of two parts. The first part is a heat map, which maps unemployment rate to the year and month, respectively on the horizontal and the vertical dimension. The rate itself is coded as color of the blocks, as is the indication of missing data. When hovering over a block in heat map, a tooltip appears showing the year and month and the percentage of unemployment, and the corresponding values along the axes turn darker.

The second part of the visualisation is a line chart with an option box located below it. The line chart shows the unemployment rate with the rate being displayed on the y axis and the time on the x axis. The option box shows buttons with varying categories which can be toggled, one at a time. When an option is selected in the option box, a second line in blue appears in the line graph, showing the unemployment rate for the selected category. Another set of tiny grey lines representing the other categories is drawn in the line chart. When hovering over the bar chart, a vertical line and dots on the lines appear, following your mouse cursor. A tooltip is also shown, displaying date and the values of both the overall line and the blue line.

The two parts of this visualisation are linked to each other. When you hover over either part of the visualisation, the corresponding values are highlighted in the other part. Hovering over the line chart gives the corresponding box in the heat map a black outline, and a similar effect happens vice versa. When an option is selected, the heat map changes, showing only the data for the specific selection.

This visualisation shows, just as the previous one, a lot of data. The heat map shows time specific data on the unemployment rate at that time, making it easy to perform a query for rates at specific times. When you know how to read the heat map you can try to distinguish trends on it, but this task is easier to perform on the line chart. The option box gives you the possibility of narrowing down your queries even further, although you cannot make them more specific because only one option can be activated at a time. The same data can be read from the line chart, although its more easy to see patterns from the lines, while it´s a little harder to view data on a specific moment in time. Comparison of two different groups is only possible in the line chart. Even more lines are drawn corresponding to the non-selected group of a category, but when categories consist of more than 2 groups, you can't tell which line is which group anymore because the lines are not named.

The data in the line chart is very dense, the graph is very small but up to 6 lines are drawn in it. This makes it hard to derive data from anything else than the blue and black line (overall and selection unemployment rate respectively). Since the grey lines are not standing out and are not the focus of the attention, they only clutter the line chart. Even more, the scaling is also adjusted so the grey lines fit in, making the lines which are important even smaller than they were before. So those grey lines can't be selected, the contrast is low, they adjust the scaling and diminish the lines which are selected, so they can be considered as junk.

Just as in the previous visualisation, the coloring of the blocks in the heat map damages the integrity of the heat map. Each color step is a single percent increase in unemployment, ranging from 2% to 11%. Every month with an unemployment rate of 11% or more is colored dark red, but those values can go up to 20%. This makes it so that for some selections, the heat map is almost totally colored dark red, while there are differences between the months for these selections.

The heat map uses a diverging multi hue color scheme ranging from green to red. This colorscheme Is poorly chosen when considering colorblindness. The red and greens often appear next to each other, making it hard for colorblinds to distinguish both from each other. Also, a divergent color scheme is not needed when data is ordinal, a sequential color scheme would suffice. I, being a color seeing male, think this heat map is aesthetically pleasing, but I can imagine not everyone feels that way about this heat map.

Conclusion:

Both visualisations aimed at depicting the ebb and flow of the jobs and employment on the labor market. The visualisations featured a lot of specific data, encoded in different ways. Interaction was used in both to clarify details or relationships between data points. Some of the interaction was actually confusing, for example it took me a while to get to know the first visualisation, since the relationship between the headers and the dotted bar chart was not readily seen. Sometimes it was even obscuring, for example in the line chart when a selection was made. Still, I think the visualisation has achieved its goal.

If I had to make an adjustments to the visualisation, I would cut the heat map, because what it offers, is already given by the line graph. It is visually pleasing, but the visualisation is already loaded with data, so it could be a little less. I would definitely leave the dotted bar chart in the visualisation, as this was the first time that I did see one, and although I think this kind of visualisation disturbs the integrity of the data, it is an unique way to present nominal variables multiple times along an axis.

All in all this is a complete visualisation, with a lot of data, which sometimes comes at the cost of clarity or contrast, and with some slight points of improvement.