Design 4

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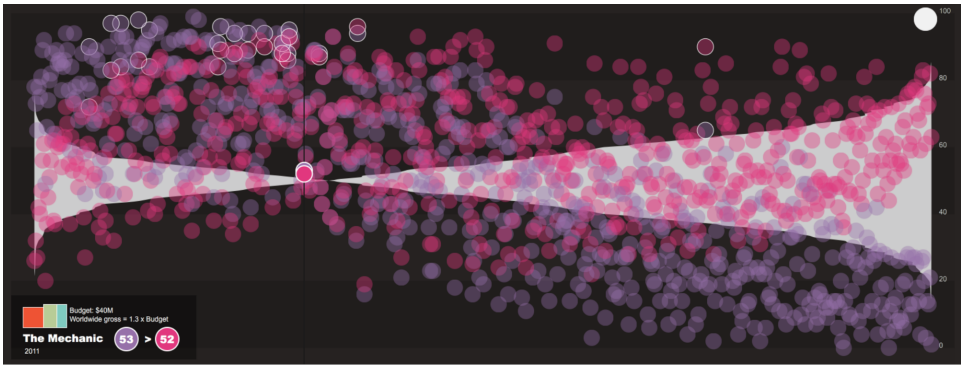

Figure 1: Confluence by Harshawardhan Nene and Kedar Vaidya

1.0.1 Consensus

We all think that the variable of the x-axis in not intuitive and it seems they tried to put too much information in one visualization without proper labeling or color encoding.

1.0.2 Color and interaction aspects

- Selecting individual data points (pairs of circles) is a bit hard, as you cannot just hover over them, but instead, you're scrolling over the horizontal axis.
- There is a lack of contrast between the chosen colors (pink and purple), the colors are all equally bright. They could have encoded information in the brightness.
- The fact that you can see additional information about a movie when clicking on a pair of dots is quite nice. The way the information if shown when just hovering over them is horrific, though.
- The dots are too big to be able to differentiate them from eachother, because the plot is way too crowded.
- It's hard to see correlations or patterns in this plot, even when selecting subsets of the data. This is partly because you can not alter the variables on the axes and partly because the data is poorly encoded into the circles.

1.0.3 Improvements and refinements

- The dots should be more distinguishable. They could add lines around the circles, make them smaller and add contrast.
- Make it easier to see correlations. This is a big one, as that's what these kind of visualizations are for. The variables on the axes should be selectable or at least chosen more wisely.
- Add a legend. Show what those dots are exactly.
- Make the movies searchable, or label a subset (for example the most popular movies).
- The data to ink ration could be much smaller by changing the dot size (specially when the size is not encoding information).
- The Y-axis could be bigger. It will give the visualization some room and it will appear less crowded.
- The lie factor is close to one, i.e. when the value shifts 10%, the position shifts by that same amount.
- The visual variables used are position (value) and color (group). They could have visually encoded other things, like the amount of (dis)agreement between the audience and the critics.
- They could have added trend lines for the data to aid with interpreting it.

2 Problem 2

2.0.4 Which map promotes an easier visual search for buildings?

- Both show building names, but **Apple Maps** (figure 3) shows perspective.
- Apple Maps provides more visual aspects like the color and a clearer logo. Apple Maps consists of a pattern recognition.
- For example Apple Maps shows the name of a park in green and it provides a logo of a tree. For universities the signs are gray and the logo provides a book.
- The buildings are in a clear and simple gray. You have the option to show the map in 3D or not. In 3D vision you will see more details about the height and width of the building.
- There are even lines between the buildings in Google Maps. So you could see how you can walk between the buildings. Also in Google Maps you can look into some buildings. If it is a famous building then Google Maps shows some pictures inside the building.

Figure 2: Google Maps visualization of buildings.

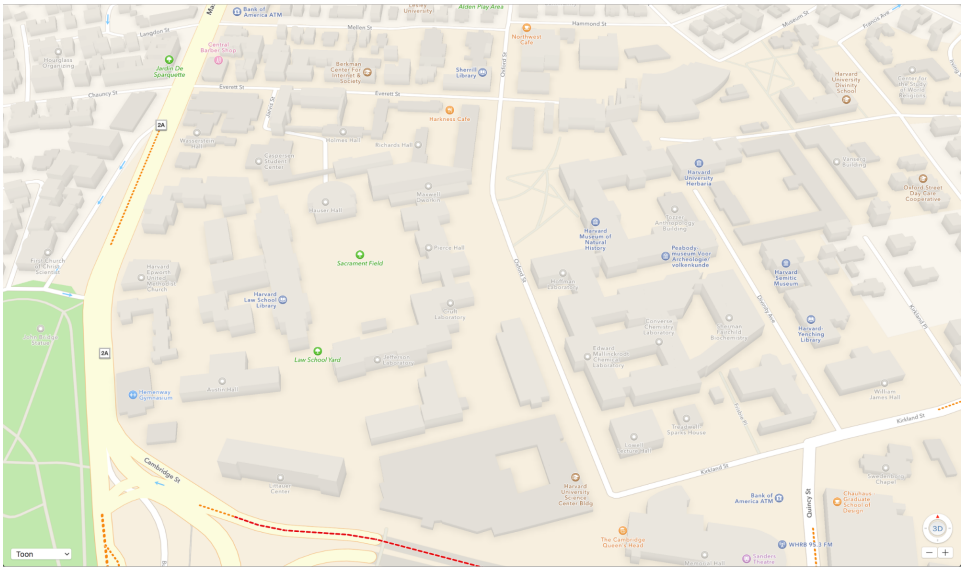

Figure 3: Apple Maps visualization of buildings.

2.0.5 Which map more effectively visualizes routes from a random point A to point B?

- **Google Maps** (figure 4 provides more options and more visual information regarding your route. It will, for example, indicate the possible traffic choke-points.
- For the indication Google Maps shows a little legend. The user has a more clear vision for the traffic choke-points. From green to dark red.
- Also if you choose the option to go with the bike or going for a walk, you will see dots instead of one line in Google Maps. In Apple Maps you don't have the option to go with the bike. But if you like to get a walk you will only see a line. There is no difference.
- You can read more details about the city in Google Maps.
- Also Google Maps makes it more clear if you chose to go with the car. You can see it near the blue line. Near the blue line you will also see the total amount of minutes and the total amount of kilometers.

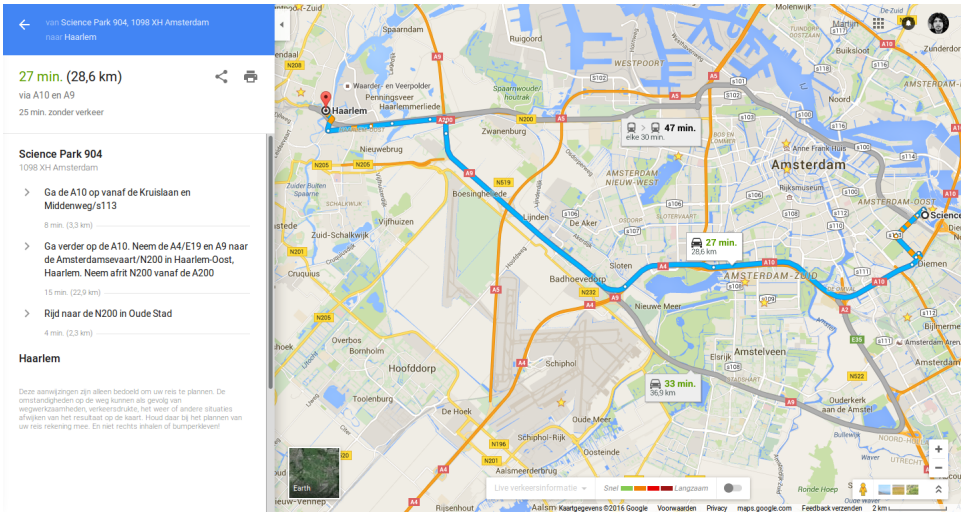

Figure 4: Google Maps visualization of a route.

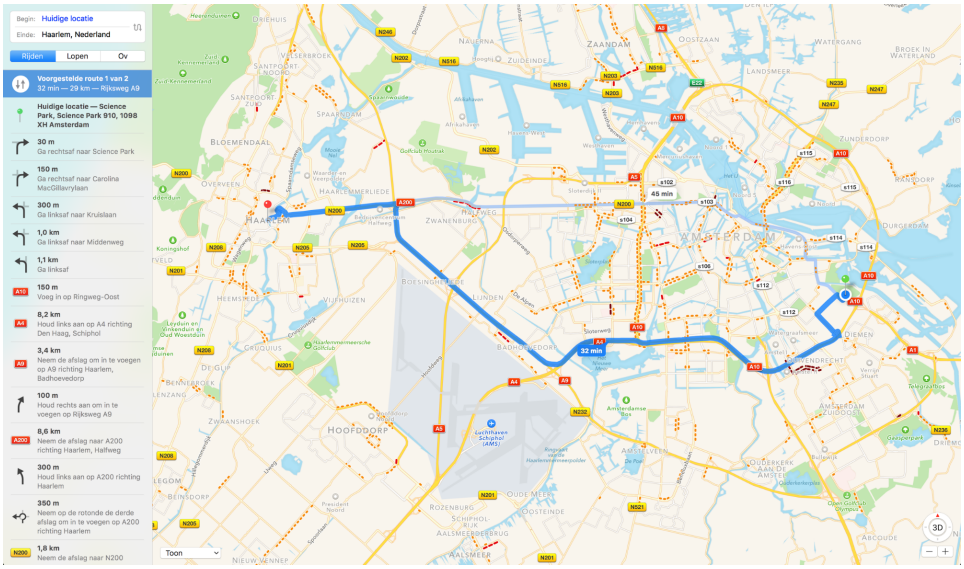

Figure 5: Apple Maps visualization of a route.

2.0.6 Which map is an overall better visualization, and why?

- **Apple Maps** (figure 7) has a cleaner look and is less distracting, while providing more information when zoomed in. The sign for showing buildings has different colors for restaurants, hotels or schools. Also these signs have different logo's.

- There is no clear vision anymore in Google Maps. The colors are in

one line. The blue and the gray are on one line in the color range. So people won't see things that pops out. Like roads or buildings.

- In Apple Maps you will find some different colors that are not in one line in the color range. Different luminance and clarity. The rivers pops out a little less than the rivers in Google Maps. This is better because the rivers are less important than the streets or buildings in a city. Also the logos for the buildings have more different colors. From purple to yellow.

- Even the roads has more difference in color in Apple Maps. They have colors like gray for the little roads, white for the normal roads, light yellow for the bigger roads and dark yellow (also a thicker line) for the high ways. In Google Maps the difference between roads are less clear.

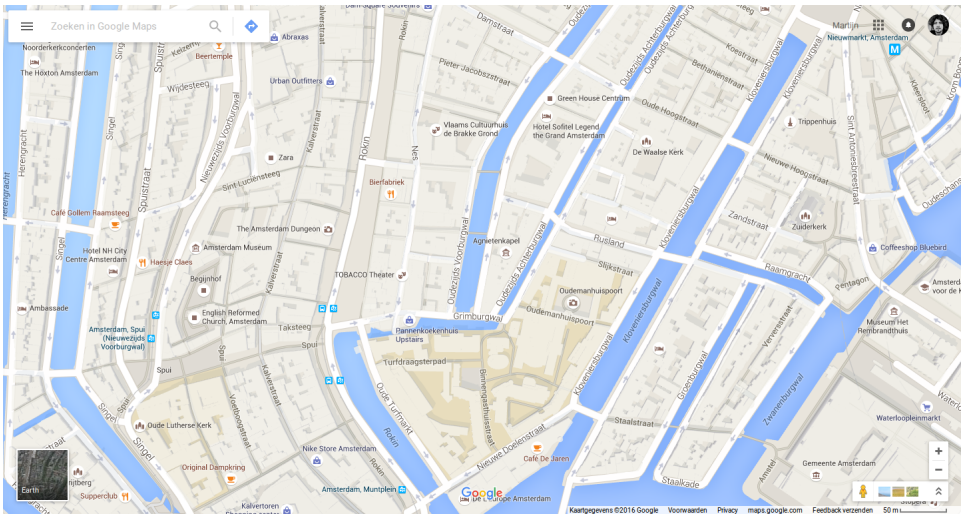

Figure 6: Google Maps general visualization.

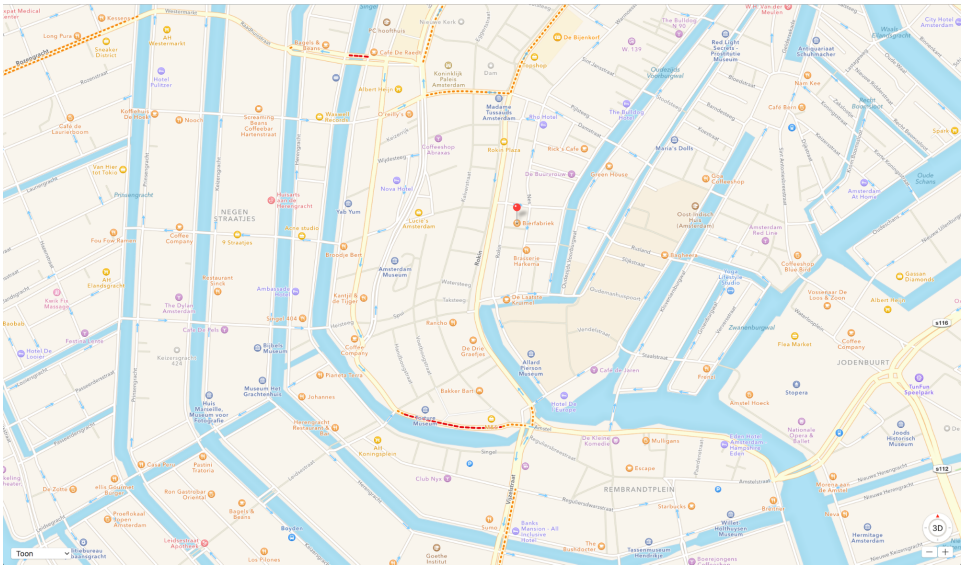

Figure 7: Apple Maps general visualization.

3 Problem 3

3.1 Introduction

We have chosen for a visualization by Eurostat, showing, in their own words, "data on European regions at NUTS 2 level, grouped into different statistical domains" [1]. These domains include, but are not limited to, economy, health and education. At the left side, a map is shown with color-coded information for different regions at NUTS 1, 2 and 3 level (presumably, NUTS 1 and 3 level were added later). On mouse-over, a pop-up appears with additional information for that region. At the right side there is some statistical information available in either a distribution plot, a scatter plot, a bar chart or a data table. Additionally, there is a timeline at the bottom which can be automatically scrolled. See figure 8 for a screenshot.

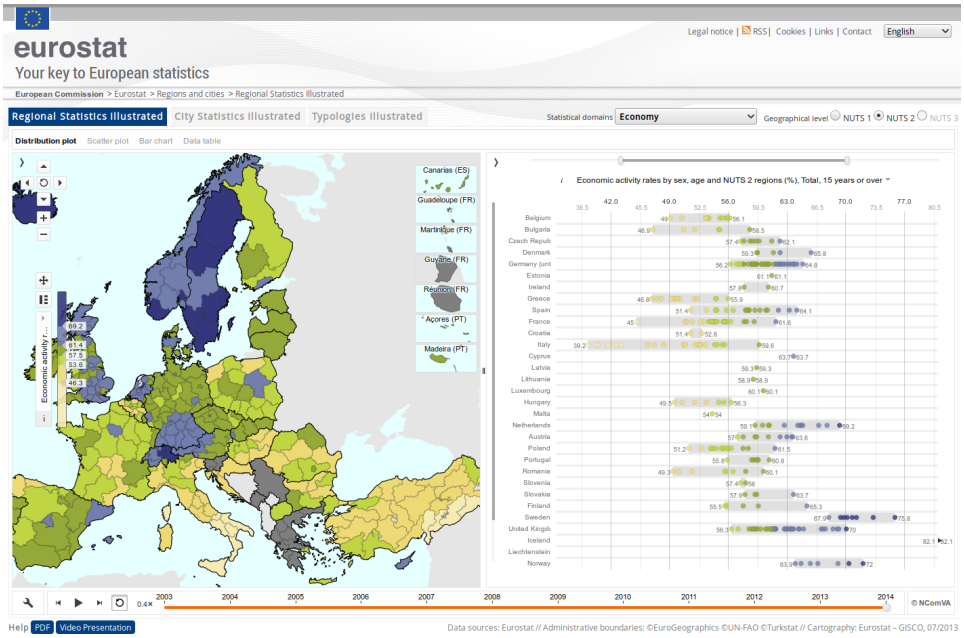

Figure 8: "This interactive tool contains data on European regions at NUTS [1, 2 and 3] level, grouped into different statistical domains." [1]

3.2 Objective and target audience

The objective of this visualization is to convey statistical data from multiple domains to the target audience and let them compare regions to one another on two different NUTS levels. Eurostat does not mention what that target audience consists of, but presumably the target audience is the general public, or anyone that is interested in these statistics and is able to understand them in the way that they are presented.

3.3 Interactive elements

3.3.1 General elements

There are certain elements that are not inside the map or statistical visualizations and that are always visible. At the top left of the page, right above the map, you can select the type of statistical visualization that you would like to see on the right side. More to the right you can select from which domain you want to see the data. Still to the right, you can select the geographical level. This will change the map view to show larger or smaller regions and it will add or subtract data points in the statistical views on the right.

At the bottom of the page, there is a timeline on which you can manually select a year to view the data from, or you can choose to let the timeline scroll automatically. At the left of the timeline are controls to set the speed, skip forward or backward and to play or pause the timeline.

3.3.2 Map elements

On the map, all countries are interactive, by hovering your mouse over them. Then, a pop-up will appear with additional information for that region.

On the top left, controls are shown to zoom, pan and rotate the map. Right beneath the map controls, is the legend, with on the top left controls to alter its position and its view (qualitative or quantitative). A bit down is a pop-out menu with options to show different variables within the chosen domain.

3.3.3 Distribution plot elements

At the top of the distribution plot, a bar is shown to change the scale of the horizontal axis (which therefore acts like a zoom control). Additionally, different data points can be selected and are highlighted on the map.

The same menu that is shown no the map to select different variables, is also shown in the right pane for all selectable visualizations.

3.3.4 Scatter plot elements

At the top right, a control is shown to alter the scale. This will zoom all circles, to make it easier to compare them.

The variables on the horizontal and vertical axes are selectable right next to each axis.

Underneath the plot, there are controls to show or hide the labels for each data point, and the axes can be scaled differently.

3.3.5 Bar chart elements

The bar chart can be either shown as a scrollable chart, or, by clicking the icon at the bottom left, in focus mode, where all bars are shown, but only a subset thereof are shown large and the rest is compressed into a smaller space. The bars on which to focus are selectable by dragging the sliders on the left.

3.3.6 Data table elements

At the top of the data table, you can set whether all regions are shown, or only a selection, if you want to include the identifier code for each region and if you want to include the units of the variables. Also, the width of the columns can be set, you can select which variables to show and the table can be transposed.

3.4 Discussion

There are elements to alter the view of the visualization and elements to alter the dataset and/or its variables. We think that this visualization is very well designed and most elements proof to be useful in certain situations where the standard view does not suffice. For example, if some datapoints are too small, you can just zoom them. If the legend is unreadable, you can alter it's appearance and make it readable again. If you want to see different variables: no problem, they are selectable within each pane and each visualization. Whether you want to focus on a subset of the data of you want to search for correlations, it can all be done. Virtually everything that one would be interested in to see can be shown by interacting with the visualization. The dataset is the limiting factor, not the visualization itself.

References

[1] Eurostat. *Eurostat Regional Statistics Illustrated: Usage guide*. 1.0 edition, 2013.

[2] Jeffrey Heer and Ben Shneiderman. Interactive dynamics for visual analysis. *Queue*, 10(2):30, 2012.

[3] Michelle Q Wang Baldonado, Allison Woodruff, and Allan Kuchinsky. Guidelines for using multiple views in information visualization. In *Proceedings of the working conference on Advanced visual interfaces*, pages 110–119. ACM, 2000.

[4] C. Ware. *Visual Thinking: for Design*. Morgan Kaufmann series in interactive technologies. Elsevier Science, 2010.