Youtube video

Map Plot (2-3 minutes explanations)

* Functionality of the custom visualizations and SunCharge questions

A map overview, centered around Europe is provided, where the countries covered by the distribution centers of SunCharge are colored in different saturations of green. Color saturation is used to compare countries in terms of the total number of orders made by a country to the corresponding distribution center. A stronger saturation indicates, higher total number of orders and thus, SunCharge can easily identify which countries have a higher impact on its supply chain.

The viewer can access details on demand by simply hovering over a country. Information is provided in absolute numbers, percentages and in a bar plot.

The absolute numbers provide information on the distribution center that covers the customers of this country. Information such as center’s name, total sales, total orders and total customers are provided.

The percentages provide information on the contribution of the country to the center. A country with high percentages of customers and sales, would indicate that this country has contributes highly to its center in terms of customers and sales. Low percentages would mean that the country does not play a vital role in sales and customers and thus the company is advised to take action to increase the market share in these countries. The delayed orders percentage is critical for the company as a high value would mean that most orders made by customers of this country to the center, were in fact delayed. This could mean a weak link in the supply chain regarding this country.

The bar-plot provides information on all the countries covered by the specific distribution center. The blue bars show, how many orders are on time, out of all the orders made to the specific centers, while the red bars show, the delayed orders per country out of all the orders. At the same time, the green line compares the countries in terms of sales made to the center. SunCharge can compare the countries covered by the center. Suncharge can easily identify which country, has the lowest sales and highest sales to the distribution center. In addition, inner and outer country comparisons are possible. For example, SunCharge can compare the blue and red bar, to compare delayed with on-time orders, while at the same time SunCharge can compare the red bars and blue bars among countries, to see which country has the most or least delays and the most or least on-time orders.

Visual Encodings Used in the visual

Image of the actual design next to the intended design

The overview of the visual is a map visualization where spatial areas in the shape of countries are used to as marks to represent the countries. Since we want compare countries in terms of the total number of orders to the distribution centers, color saturation is the channel of choice as it is ideal for highlighting quantitative differences. Thus, countries, with stronger saturation are linked with higher total number of orders to the corresponding distribution center.

*Image of overview and legend with arrows to the legend label “quantitative differences” and arrow to the countries with label “Shades of Green used for color saturation”.*

A “details on demand” feature is implemented, allowing the user to interact with the visual just by hovering over a country of choice. These details include information in absolute numbers and in percentages. They provide knowledge to the viewer on the volume of sales, orders, and customers between the chosen country and the distribution center that covers that country.

Moreover, a rectilinear layout appears which contains a bar plot and a line plot with two y-axis and one x-axis. The right y-axis refers to the line plot while the left y-axis refers to the bar plot. The x-axis is shared by the two plots. The layout describes 5 different dimensions (features). The total number of orders (1st dimension) is described on the left y-axis. The total number of sales (2nd dimension) is described on the right y-axis while the country names (3rd dimension) are described on the x-axis. The delayed and on-time orders dimensions (4th and 5th dimension) are included in the visual through the color hue channel and with different bars for each feature. For comparison, delayed orders are signaled using red color while on-time orders are signaled using blue color. In addition, the line plot, allows to compare the contribution of sales of each country to the distribution center. The line plot is colored differently, in green, to help the user separate this plot from the bar plot, and understand it’s different usage in the layout.

*Image of hover output with annotations explaining each part*

Comparison of the two images. What is missing, what should be included.

The actual design of the map visualization is not very far from the intended design. The two main differences are the following:

* Details on demand are obtained by clicking on a country instead of hovering. Clicking would allow for more interaction, as the viewer would hover on the red or blue bar and obtain the percentages and absolute numbers, regarding the delayed/on-time orders. In our actual design, the user obtains the bar-plot by hovering on the country and can compare the countries, but interaction with the bar plot itself is not possible. Instead, the percentages and absolute numbers appear above the bar-plot as variables.
* Additionally, to the bar plot, an area mark of the shape of the country appears when clicking to a country. The shape is filled with color hue, to separate the delayed orders from the on-time orders in a conceptually easy way for the viewer. This interaction was not made possible in our actual visual but would be interesting to see applicable under ideal conditions.

Part 5

How timely and efficient is the delivery of sales orders to the end customer from a  
logistic standpoint? This question addresses the issue at the distribution center level and subse-  
quently, at the customer region (country) level. Delays per region are investigated

On the country level, the overview of the map already provides insights on which countries contribute more to their corresponding distribution centers in terms of total number of orders from customers in these countries. Color saturation allows us to easily identify the countries with the highest number of orders. France, Germany, and Sweden appear to have the highest number of orders, followed by Portugal, Greece, Poland, Belgium and Czech Republic.

On the distribution center level, the following conclusions regarding the distribution centers is drawn:

Distribution center 4: From the line plot, it is concluded that Germany has the highest contribution to this center, in terms of product sales. Netherlands has the lowest sales contribution to the center. A comparison of the blue and red bars among the countries of the bar plot, reveals that that Germany also has the highest number of on-time orders and delayed orders, in absolute numbers, compared to the other countries covered by the center. At the same time, for Germany delayed orders (red bar) cover a small part of the on-time orders (blue bar), which in percentages translate to 20.46 % of the total orders.

Im*age of the bar plot for distribution center 4 with annotations on the above conclusions*

Distribution center 5: Similarly to the explanation given for distribution center 4, Czech Republic has the highest contribution to center 5, in terms of sales and the highest number of on-time orders. In terms of delays, Poland and Czech Republic have similar delays in both absolute number and in percentages related to their on-time orders. Hungary has the lowest sales in absolute numbers thus contributing the least to the center.

Distribution center 6: France has the highest number of sales contribution to the center. In addition, France the highest number of on-time orders and delayed orders, compared to other countries of the center. Lowest sales belong to Switzerland.

Distribution center 7: Only United Kingdom is cover by center 7, thus comparison among countries is not possible. It is interesting to mention that only 8 customers contribute to the orders made in United Kingdom to center 7.

Distribution center 8: Sweden leads in terms of contribution to the center, having the highest number of orders and the highest number of sales.

Final notes on findings:

It is noteworthy to mention that across all countries, irrelevant of the distribution center, the percentage of order delays compared to on-time orders is similar and around 20%. In addition, the center with the highest number of customers in total is Germany with 423 customers, while the lowest score belongs to Switzerland with just 1 customer. An interesting conclusion is also the fact that there seems to exist a positive correlation between the number of orders and number of sales. For every distribution center, the country with the higher number of orders (on-time and delayed) also has the highest number of sales. Another interesting correlation, is the positive relationship between number of customers in a country, and the high position of this country in terms of sales and number of orders, when compared to the rest of the countries covered by the corresponding distribution center. Thus, the features “customers”, “number of orders” and “sales” have positive relations with one another.

Part 5

Patterns discovered in the map visualization, findings 🡪 include images of the conclusion with annotations where to optimize

Initial patters vs new patterns (connection with first questions)