

CS 416 Data Visualization Final project descriptive essay

By Takumi Li (feiyang3)

Messaging. What is the message you are trying to communicate with the narrative visualization?

The main goal of this narrative visualization is to present the **changes** in the import/export quantity of aquaculture products in Europe **by year**. Users can also explore the differences in changes in **different countries** and **different commodities** (fish/crustaceans), by using the drop-down list and render button. Also, the visualization allows the user to find the max imports/exports and max net gain/loss year for each country, and they could explore the data and conclude any result of their interests.

Narrative Structure. Which structure was your narrative visualization designed to follow (martini glass, interactive slide show, or drop-down story)? How does your narrative visualization follow that structure? (All of these structures can include the opportunity to "drill down" and explore. The difference is where that opportunity happens in the structure.)

Because this project ended up with data for 42 countries, I thought a **Drill-Down Story** would be the ideal narrative structure for the narrative visualization. When a user accesses the visualization page, he or she is invited to choose a certain country and commodity, which are the two parameters that control the state of the visualization. When that operation is completed, the visualization/"main scene" is produced as soon as the "Render!" button is pushed. A dual line chart is plotted by default (imports and exports). A legend is also created, which explains what each line/symbol in the visualization signifies. The user may then freely explore the visualization.

Visual Structure. What visual structure is used for each scene? How does it ensure the viewer can understand the data and navigate the scene? How does it highlight to urge the viewer to focus on the important parts of the data in each scene? How does it help the viewer transition to other scenes, to understand how the data connects to the data in other scenes?

Structure: As the basic visual structure for each scene (a combination of country and product), a line chart was developed, which was complemented by a legend, axis names, colors, and annotations. Viewers could quickly comprehend what they were looking at and tell the difference thanks to the legend and axis labels.

Highlighting: As part of the visual layout, there are two vertical lines of maximum net gain/loss to assist viewers move from scene to scene and year to year. Another line of the year will be highlighted (which changes with the mouse cursor) to show which year the viewers are looking at. Furthermore, imports are blue and exports are red, and users may choose to examine only one of them, allowing users to investigate them independently. Furthermore, the specific amount of imports and exports for a given year is supplied as "demand information" in a tooltip box.

Transition: The year of maximum imports/exports is highlighted by square dots for each scene, allowing visitors to compare various scenes. Furthermore, vertical lines represented years of maximum net gain/loss, allowing viewers to quickly see how the data moved from scene to scene.

Scenes. What are the scenes of your narrative visualization? How are the scenes ordered, and why?

Each country and commodity combination may be considered as a separate scene. As a result, the user has $42 \times 2 = 48$ scenes to investigate. They are simply rendered by the user himself/herself, and hence the order is determined by the user. Because I don't know what information the user would be interested in, a predetermined order of scenes would be less useful.

Annotations. What template was followed for the annotations, and why that template? How are the annotations used to support the messaging? Do the annotations change within a single scene, and if so, how and why.

Not only is the line chart plotted in the main scene, but some significant symbols/annotations are also presented there. Each line chart shows the maximum import and export (as red/blue squares) as information of interest for the user. If both line charts (imports and exports) are plotted, the visualization will also display two vertical lines. These lines show the maximum net gain and maximum net loss of the commodity and display only if the net difference is greater than zero.

These vertical annotations, like the maximum import/export symbols, have the same purpose: they serve as points of interest to the user. I picked these specific annotations to display on the main scene because I believed they would be of interest to the user when exploring the visualization.

Parameters. What are the parameters of the narrative visualization? What are the states of the narrative visualization? How are the parameters used to define the state and each scene?

When a user accesses the visualization page, he or she is invited to choose a certain **country and commodity**, which are the two parameters that govern the state of the visualization. These two parameters determine the relative data of the user's interests, and line charts are generated for the users. The user may also modify the scene's state by clicking on the top left corner and filtering only one **imports/exports** line chart.

Triggers. What are the triggers that connect user actions to changes of state in the narrative visualization? What affordances are provided to the user to communicate to them what options are available to them in the narrative visualization?

When the user hovers the mouse over the graphic, a **vertical line** based on the mouse location appears over the nearest year. Small circles appear on the line chart(s) to help the user understand the position of the specific data value(s). Furthermore, a **tooltip box** will show near the mouse. This tooltip box displays pertinent information (such as the year, data value(s), and Net Gain/Loss), giving the user with "information on demand." If both line charts are plotted, the tooltip will show **Net Gain/Loss**. To provide aesthetic consistency, the information displayed in the tooltip box is also **color coded**. "Net Gain" was coded as green because people associate gains with (as in stock markets), while "Net Loss" was coded as purple.

When the user hovers the mouse over the legend section's top left (over "Imports"/"Exports"), the text **changes opacity** and the mouse icon turns to a pointer. This is to illustrate that by clicking on the highlighted keyword, the user may **narrow the visualization** to just plot imports or exports. When the user clicks on the term, the visualization refreshes, and the keyword that the user did not click on vanishes, while the keyword that the user selected on changes color, indicating that the filter was successful. The visualization depicts both imports and exports as soon as the user clicks on the colored term.