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CS416 Data Visualization

**What is the URL of your narrative visualization?**

1. **[1 point]** Does the URL connect to a functioning web page?

Yes: https://aspargo2.github.io/vizfin/

**B. Upload a PDF file essay describing your narrative visualization as required by the assignment instructions.**

2. **[5 points]** Does the essay state what messaging was intended by the narrative visualization?

   The Paycheck Protection Program or PPP was a government program designed to give companies forgivable loans to help keep people employed and companies from failing during lockdowns due to COVID-19. Because of how quickly the virus spread, how rapidly everything shut down, and how quickly the government sent out enormous amounts of money, there has been a lot of fraud and waste with money going to people that did not need it. NBC news reported hundreds of billions of dollars stolen, many by people not even in the country. The message of my narrative visualization is to highlight to the user the amount spent in a short amount of time, the little information known about the money spent, and how someone might look for suspicious data.

**Narrative Structure**

3. **[2 points]** Does the essay indicate which structure the narrative visualization was designed to follow (martini glass, interactive slide show or drop-down story)?

   My narrative visualization follows a martini glass structure, walking the user through several slides before allowing freeform exploration of the data

4. **[3 points]** Does the narrative visualization follow that structure?

   Yes, it does. Each scene the user can only hover to see additional information, or use the “Back” and “Next” buttons to follow my story flow until the last scene where they can filter or group the data how they like

**D. Visual Structure**

5. **[2 points]** Does the essay indicate what visual structure is used for each scene?

   My page uses linear ordering and the user can interact with the data by changing the grouping of the data, hovering over data to see values, or changing date filters. It uses messaging by having descriptive paragraphs providing context and guidance at the top of each scene.

6. **[1 point]** Does the essay indicate how the visual structure ensures the viewer can understand the data?

   The linear ordering ensures the viewer reads each point and see it visualized to understand the context without just getting lost in the data. Allowing only hovering until the end ensure the user does not derail into exploration before the message has been conveyed.

7. **[1 point]** Does the essay indicate how highlighting is used to get the viewer to focus on the important parts of the data in each scene?

   Each scene has a key takeaway to highlight to the user, so annotations are used to make sure the user is drawn to that point. For example, the first scene is meant to show a spike in the data on a certain day so annotation on that point is there to draw the users attention

8. **[1 point]** Does the essay indicate how the visual structure helps the viewer transition to other scenes, to understand how the data connects to the data in other scenes?

   The central chart will remain unmoved from scene to scene, and each scene will be displaying the same data set, only filtered or grouped differently to support the message. This keeps the user in context. By doing this grouping and filtering one step at a time, the user isn't immediately disoriented and can understand the changes. Augmenting this with a textual narrative helps walk the user along a story keeping them rooted in the narrative. The flow of the page is to first read the text up top that provides context, then the navigation buttons so the user knows that they are there, then read the chart below it to visually see the message and any points of interest. Below the chart is a legend explaining the bar colors. This has information and components ordered in the natural way the user would encounter them in order of importance.

**E. Scenes and Visual Ordering**

9. **[2 points]** Does the essay identify the scenes of the narrative visualization?

   The visualization is broken into several scenes:
   1. A scene showing all the data, highlighting a spike in loans on a 5/28.
   2. A scene showing data for only 5/28, highlighting the biggest lender (FHB)
   3. A scene showing data on 5/28 for only FHB, highlighting the largest NAICS code (722511 which is restaurants)
   4. A scene showing data on 5/28 for only FHB for NAICS code 722511, highlighting the largest zip code, with the addition of a picture to show that zip code on a map for visual reference
   5. Final scene allows user to change grouping and date range

10. **[1 point]** Does the essay discuss ordering (e.g. the order of elements in a chart or the ordering of scenes)?

    The chart is always ordered by date on the x axis and shows loan amount on the y axis. This helps keep context from scene to scene. While sorting by number could be helpful, the largest bar lengths are clear enough for a user to understand without having to sort first. Ordering is discussed a bit in number 8 above as well. The scenes are ordered in a progressive, linear fashion to add an additional filter each scene as a user looks for something suspicious until reaching scene 4 where it turns out that there is nothing suspicious. Even though the final conclusion is that the loans look legitimate, the guided scenes still walk the user through what an analyst or detective might do with data looking for suspicious activity.

11. **[2 point]** Do the charts used as scenes effectively present the data?

    Yes, they do. Each scene follows a template of textual context up top, a central chart showing data with some annotation highlighting the point of interest, and consistent navigation buttons to progress through the scenes. This keeps the viewer oriented throughout use. Some of the scene charts (namely scene 3) is not the ideal visualization for seeing the largest in a group because all of the groups are pretty small and packed together. Having a bar chart or table ordered by value would help the user identify the largest value. I chose against this however in order to keep the chart layout consistent as switching the axes could potentially confuse a user. I instead use an annotation to draw the user's attention to the largest value and it is still easily confirmable with the human eye.

**F. Annotations**

12. **[2 points]** Does the essay discuss annotations?

    It does. I use annotations on each scene except the last exploration scene to highlight the key takeaway for the scene and provide some additional detail

13. **[1 point]** Does the essay discuss a template for the annotations?

    The annotation template is consistent with each annotation being a circle with a line connecting to some text that explains why that point is significant. They are all framed as a question and answer to help the user “get into character” as a detective. Looking at some data, a real detective might ask themselves “What’s this?”, so each annotation is framed as the user seeing some outlier or point of interest, and then a short description of what that point represents.

14. **[2 points]** Are the annotations in the narrative visualization effective and consistent?

    The annotations are all consistent, draw the users attention to the primary point(s) of interest, and explain why that point is significant. The also act to weave together the narrative text above with the visual chart below.

**G. Parameters and States**

15. **[1 point]** Does the essay identify the parameters of the narrative visualization?

    The parameters are the text at the top of the scene, the annotations, the grouping field (lender, naics code, zip code, etc), date range filters, y axis maximum value, and custom filters on other those same fields (lender, naics code, or zip code, etc).

16. **[1 point]** Does the essay identify the states of the narrative visualization?

    The visualization has one state for each scene depending on that scene’s particular filters. Then a large number of possible states at the end when the user can explore the data. Each scene will set the parameters from a preset list, and the last scene has a form where a user can modify the parameters to change the chart.

17. **[1 point]** Does the essay indicate how are the parameters are used to define the state and each scene?

    Going to each scene sets parameters which determine the filters in the state for that scene. So, when I click the “next” button, this triggers parameters to be changed which changes the state on the page by setting various variables to the appropriate values. This updated state is then applied in order to generate the appropriate scene based on those parameters.

18. **[1 point]** Does the narrative visualization use parameters to control its state?

    It does. Hitting the “Next” or “Back” button updates the “currentSceneIndex” field which is the primary value in the state machine as it determines which scene to render. The page itself also has a state which is updated based on the parameters updating. So, for instance, the filter/grouping form is only displayed in the last scene.

19. **[1 point]** Does the narrative visualization use parameters to control each scene?

    Yes, each scene is determined by the parameters contained in my list of scenes. Which scene to render and the values to actually draw the chart and page are determined by the underlying state which is set by the parameters.

**H. Triggers**

20. **[2 points]** Does the essay indicate the triggers that connect user actions to changes of state in the narrative visualization?

    The primary triggers are the “Next” and “Back” buttons which allow the user to navigate between scenes. The user can also hover over a chart element to see additional information which is also a trigger. Lastly, on the final slide the user can enter various values to group and filter the data which are a series of triggers which update the state and subsequently the scene. This has a “Submit” button which refreshes the page with the user entered values

21. **[1 point]** Does the essay indicate what affordances are provided to the user to communicate to them what options are available to them in the narrative visualization?

    The narrative visualization is intended to be simple and clear to the user. The user is only presented with two buttons to click until the last scene, and the buttons enable/disable depending on whether that is valid. So on the first scene, the “Back” button is disable to show the user it is not clickable. It also uses a standard cursor everywhere, so nothing on the page looks clickable or scrollable other than the navigation buttons.

22. **[1 point]** Does the narrative visualization implement and respond to user events properly?

    Yes, the user is able to navigate forward and backward between scenes, hover to see additional information, and enter values to group/filter the chart on the last scene. I will note that the user entered values are brittle in that they must be formatted and valid. I did not implement more “user-proof” interfaces for entering the information. For instance, a dropdown list would be safer and clearer to the user as well as being less error-prone, but that was beyond the scope of the project.

23. **[1 point]** Does the narrative visualization make any effort at all to communicate what options are available to the user?
    Yes, the text at the top of the page encourages the user to use the “Back” and “Next” buttons to navigate between scenes. As these are the only options available, that seems sufficient.