

Narrative Visualization Of Coronavirus (COVID-19) Pandemic

Overview

An interactive slideshow layout was used to narrate the story of the Coronavirus Pandemic (COVID-19) and its spread across the U.S.A. The presentation is a linearly ordered slideshow built using D3 JavaScript library in combination with HTML5 and CSS to depict the narrative visualization.

Messaging

The presentation intends to narrate a story of Coronavirus Pandemic (COVID-19) and its spread across the U.S.A in a contextual and directed manner and provides an ability for the reader to explore various dimensions of Coronavirus Pandemic such as confirmed cases, deaths, recovery in last few months. Viewers should be able to see the various cases in each state by each month. Similarly, they could depict the various cases of the U.S by monthly.

Viewers could conclude by a brief look at the presentation that are Coronavirus Cases Rising Or Falling In Your State or the Country itself.

Narrative Structure

An interactive slideshow layout was used to narrate the story of the Coronavirus Pandemic (COVID-19) and its spread across the U.S.A. from January 2020 to July 2020. The presentation is structured with the following scenes for viewers to drill-down details at each scene for additional details:

1. **Overview of Coronavirus Pandemic:** This section showcases the overview of the spread of the virus across the countries and current status of US states. The page has a scatter plot and a US map annotated with additional information for the viewer to get deeper access to information in it.
2. **Confirmed Cases:** Every state is following a different coronavirus trajectory. New York and Washington were hit hard during the pandemic's early days, for example. This chart provides the number of confirmed cases of novel coronavirus over the past few months by state via the Bar chart. Viewers could drill-down the additional details by tool-tips on each bar. They could also drill-down further by applying filters via dropdown containing a list of states.
3. **COVID-19 Deaths:** At least 143,000 Americans have died of covid-19. This scene depicts the deaths caused by coronavirus in the past few months across the nation via the Bar chart. Viewers could drill-down the additional details by tool-tips on each bar and could also drill-down further by applying filters via dropdown containing a list of states.
4. **COVID-19 in the U.S:** COVID-19 Cases Continue To Surge In States Across The U.S. This section reflects the overall picture of the number of confirmed cases, recovered and death and their rates across different states via Bar chart. Viewers could drill-down the additional details by tool-tips on each bar and use the dropdown to filter by month.

Visual Structure

1. Each scene has a chart to depict the coronavirus pandemic across various dimensions such as confirmed cases, deaths, recovered over the past seven months.
 - Scatter plot –
 - The scatter plot is displayed in the overview section to showcase Total confirmed Cases of each country of the world and its population. It also has a tooltip to see total confirmed cases, total deaths, total recoveries and country's population.
 - Choropleth chart –
 - The map view of the density of confirmed coronavirus cases across the nation. The legend associated with the chart provides the hint with the color associated in a state to refer to the number of confirmed cases. It also has a tooltip to see cases in the last seven days, cases for 100k people plus total deaths in the state.
 - Bar Charts –
 - The presentations have used bar charts to display various dimensions of the coronavirus pandemic in each scene.
 - Each bar chart is associated with a dropdown to filter the data associated with the chart.
2. The presentation used slide show genres to navigate from scene to scene. Each scene has a NEXT and PREVIOUS button to navigate author-led linearly ordered scenes.
3. Viewers could also navigate to previous scenes using the NAV bar from any scene. It provides a more viewer directed path. Also, each scene has multiple tooltips, annotations, and filters for viewers to drill-down additional details.
4. Each scene has an information-based alert to let viewers know to drill down for additional details.

Scene

1. **Overview of Coronavirus Pandemic:** This section showcases the overview of the spread of the virus across the countries and current status of US states. The current world confirmed cases depicted in a scatter plot with tooltips to provide numbers at each data point of two quantitative continuous fields –
 - Number of Confirmed Cases which is a quantitative continuous variable.
 - Population which is a quantitative continuous variable.Also, a choropleth has been drawn to portray the volume of confirmed cases for a state. A legend provides a hint on the density of the number of the confirmed cases. Choropleth has a tool-tip associated with each state on the map, which provides the number of cases in the last seven days, cases for 100k people plus total deaths associated with the state.

2. **Confirmed Cases:** The number of confirmed cases are the key dimension of Coronavirus Pandemic. This scene depicts the number of confirmed cases across the past seven month via the Bar chart. Viewers could also drill-down the additional details by tool-tips on each bar and use the dropdown to filter by state.

Following fields are used to depict the bar chart and its filter:

- *Drop-down (Filter)* – State names which are a discrete and an independent variable
- *X-axis of bar chart* – Month which is a discrete and an independent variable
- *Y-axis of bar chart* – Number of Confirmed Cases which is a dependent and quantitative continuous variable.

Upon usage of the filter, the scene displays selected state's confirmed cases over the past seven months.

3. **COVID-19 Deaths:** Novel coronavirus outbreak has already killed nearly 650,000 globally. Number of deaths another important criterion for an analysis of the Pandemic. This scene depicts the deaths by covid-19 across the last seven months via the Bar chart. Viewers could also drill-down the additional details by tool-tips on each bar and use the dropdown to filter by state.

Following fields are used to depict the bar chart and its filter:

- Drop-down (Filter) – State names which are a discrete and an independent variable
- X-axis of bar chart – Month which is a discrete and an independent variable
- Y-axis of bar chart – Number of Deaths which is a dependent and quantitative continuous variable.

Upon usage of the filter, the scene displays selected state's coronavirus related deaths over the past seven months.

4. **COVID-19 in the U.S :** What is the U.S. situation now ? To answer this question we need data. This scene shows three main aspects of the pandemic. Total confirmed cases, Total deaths, Total recoveries. Unless like scene-1 and scene-2, it shows those three main aspects of the pandemic via a single Bar chart.

Viewers could also drill-down the additional details such as ratio of confirmed cases, recoveries and deaths by tool-tips on each bar and use the dropdown to filter by month.

Following fields are used to depict the bar chart and its filter:

- Drop-down (Filter) – Month which is a discrete and an independent variable
- X-axis of bar chart – Types which is a categorical and an independent variable
- Y-axis of bar chart – Number of cases which is a dependent and quantitative continuous variable.

Annotation Usage

Three types of annotations are used.

- Static textual annotations that are embedded directly into the visualization. Its purpose is to highlight key points of interest, such as the highest number of Cases and analytical facts, that shape the story, and the presentation is trying to communicate. Static annotations are used in all the scenes to communicate a point of view. A consistent annotation style, fill color and text font are employed for all these static annotations.
- Dynamic annotations (e.g., tooltips) that change context as the viewer hovers over each visual mark in the chart. Tooltips provide a means to visualize the quantitative and categorical values of each data point in the depicted chart. They are employed on all charts in all scenes of the story.
- Legends that tie colors on a choropleth chart are used to portray ordinal and quantitative data categorization of state and volume of the confirmed cases in each state. Without the use of legends, it would be difficult for the viewers to understand charts showcasing multiple colors on it.

The static textual annotations, tooltips, and legends are cleared on leaving each scene; as each scene has a unique context.

Parameter Usage

Parameters are used to filter subsets of the data, in all the scenes presented in the presentation passed via various triggers such as events. Scene 1- Confirmed Cases, Scene 2 – COVID-19 Deaths has a drop-down with a list of states to portray the volume of Coronavirus pandemic confirmed cases and deaths. Scene 3 – COVID-19 in the U.S has a drop-down with a list of months, providing viewers to filter by month on the Coronavirus pandemic data. Overall, it provides the analytical view of the Coronavirus pandemic concentrated at various states on different dimensions.

Triggers

As mentioned above, parameters are passed to the main chart via various triggers such as user interface events. In the presentation, Scene 1 to 3 has incorporated the on-change event of the drop-down UI component. The on-change event handler, in turn, uses the data value (e.g., parameter) to select the data visualized in the accompanying bar charts.

Other window events, such as mouse hover and mouse out are used to trigger the toggling on and off the tooltips. The “X” and “Y” parameters are passed by these window events to signal the windowing system where to render the tooltips.

Viewers are made aware of the available triggering events by helpful hints that are displayed when the page load event is triggered on each scene.