Narrative Visualization - Video Game Sales

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Abstract

This visualization project offers valuable insights into the dynamic world of video games and how the industry evolves, helping users discover trends that drive game development success. It investigates game sales data[1] from VGChartz, aiming to observe which platforms are driving global sales and the most successful games in different regions. The project provides a comprehensive understanding of the gaming industry and its continuous transformation.

1. Message

We aim to showcase the captivating and ever-changing world of the global video game industry through a narrative visualization. The visualization emphasizes the importance of exploring data using interactive tools like sliders, hover-over details, and clickable elements to gain deeper insights. Additionally, it uncovers intriguing spikes in sales associated with major console releases, while also highlighting the dominance of key publishers like Nintendo, Electronic Arts, Activision, and Sony. Overall, the project provides a captivating journey through the evolving landscape of the gaming industry and offers valuable insights into the growth of game sales over time.

2. Narrative Structure

The narrative visualization follows the "drill-down story" structure. It begins by introducing an interactive world map displaying overall sales for each region. Users can then drill down to a specific region of interest. From there, they are directed to a line chart depicting yearly sales of that region, where they have the option to further drill down into specific year ranges. By doing so, they can explore the bar chart showcasing top games and publishers for the selected years.

Throughout the visualization, various interactive options are offered, enabling users to query data they are interested in, such as game sales over specific year ranges, console releases, game information tooltips, and top game publishers. At each layer of the visualization, users have the flexibility to drill down deeper into specific insights or go back to the higher-level view to explore other regions.

The drill-down story structure empowers users to tailor their exploration and discover meaningful trends and patterns within the gaming industry's sales data. It provides a flexible and engaging experience, allowing users to iteratively refine their queries and uncover valuable insights that align with their interests and curiosities.

3. Visual Structure

The narrative visualization begins with a world map featuring bubbles representing overall sales in each region, and we choose this visual approach to showcase the regional differences in sales data. This initial presentation provides users with an overview of how game sales vary across different regions, highlighting potential disparities in gaming preferences and market demand. The size of the bubbles changes based on the selected year, providing a visual representation of sales numbers for a more immersive experience. When users click on a specific bubble, they are redirected to the corresponding line chart, which enables them to delve deeper into the yearly sales trends specific to that region.

Then, a line chart showcases the yearly sales for the selected region. The line chart is ideal for displaying quantitative data like years and sales, allowing users to observe trends over time, akin to tracking stock market performance. Slider changes highlight relevant data points on the line graph, and annotations for major console releases aid in identifying patterns, such as sales spikes after new console launches. Clicking on data points in the line graph redirects users to corresponding bar charts for more specific data exploration.

Next, users explore bar charts to identify the top-sold games and publishers. Bar charts are well-suited for comparing nominal game/publisher names against quantitative sales data. This view further piques users' interest in investigating console release trends and other patterns. Detailed information, including genres, publishers, and consoles, is accessible via tooltips for deeper investigations.

Last, in each scene's description, we have highlighted the interactions users can perform with bright colors, ensuring they are aware of the interactive elements. Additionally, when things are interactive, the mouse cursor changes to a pointer, indicating that users can click and hover to explore further. Importantly, as users drill down from one scene to another, the queried year from the slider is preserved, maintaining data connections and avoiding any confusion. This seamless transition allows users to navigate through the visualizations without losing context and empowers them to investigate various aspects of the video game industry, making the exploration process engaging and informative. The titles of each scene also reflect the user's chosen region and the specific data they are examining, facilitating smooth transitions and enabling a coherent understanding of data connections between scenes.

3.1. Scenes

Scenes in the Narrative Visualization:

1. World Map with Bubbles - This scene provides an overview of global video game sales with bubbles representing different regions. The bubble size changes dynamically using a slider to reflect the queried year's sales, and a play button allows looping through the years to observe data changes over time. Hovering over a bubble reveals region information tooltips, and clicking on a bubble directs the user to Scene 2 with the selected region, start year, and end year.

2. Line Chart of Yearly Sales - The line chart illustrates sales trends over time, with annotations highlighting major console releases. Data dots are highlighted when within the queried years, and clicking the play button shows tooltips for each year's sales data. By clicking on the data dots, users can navigate to Scene 3, showcasing the top-selling games and publishers for the chosen region, start year, and end year. A back button is available to return to Scene 1, preserving the start and end years.
3. Bar Charts of Top-Sold Games and Publishers - In this scene, bar charts present sales data for games and publishers, offering tooltips for deeper insights. Users can use the switch button to toggle between viewing game sales and publisher data. A back button is provided to return to Scene 2 with the preserved start and end years for seamless navigation between scenes.

Order of Scenes

The scenes are ordered in a drill-down story structure (1-2-3), enabling users to explore the data hierarchically. At each layer, users have the flexibility to drill down or go up a level, while retaining their chosen year range and region. This hierarchical approach facilitates a seamless and interactive data exploration experience, giving users the freedom to delve deeper into specific aspects of the global video game industry while maintaining data connections throughout their journey.

This sequential order ensures that users have the flexibility to explore the data progressively, starting with an overview and then delving deeper into specific regions and timeframes of interest. The drill-down approach encourages engagement and empowers users to query data based on their preferences, resulting in a more comprehensive understanding of the game sales data.

3.2. Annotations

In Scene 2, the line chart depicting regional game sales uses annotations to emphasize the years of major console releases. These annotations consist of a line pointing to the data dot representing the year of the console release, accompanied by a chatbox displaying the name of the console. The annotations are strategically positioned to ensure they do not obstruct the line chart and are placed near the corresponding data points for clarity.

Furthermore, when users hover over other data dots on the line chart representing different years, toolboxes appear above the annotations to showcase details of console releases related to those years. It's important to note that more comprehensive console release information is available inside the tooltip, while the annotation only highlights the most popular consoles.

To maintain a clear and uncluttered visual experience, the annotation location is adjusted based on the selected region. Each region's annotation box is positioned relative to the data points, ensuring that vital information is accessible without obscuring the line chart.

By employing a consistent annotation template and thoughtful positioning, it effectively communicates the impact of major console releases on regional game sales, providing users with valuable insights into the gaming industry's dynamics.

3.3. Parameters

Parameters:

1. **region**: Represents the region selected by the user for data exploration. It can be one of the following values: "North America," "Europe," "Japan," "Rest of the World," or "Worldwide." This parameter defines the specific region for which the data will be visualized.
2. **startYear**: Specifies the starting year of the queried data range. The user can select any year between 1980 and 2020 as the starting point for the visualization.
3. **endYear**: Specifies the ending year of the queried data range. The user can select any year between 1981 and 2021 as the endpoint for the visualization. The end year should be greater than the start year to create a valid range.
4. **isPlaying**: A boolean parameter indicating whether the "Play" button is activated. When set to "True," the visualization automatically loops through the years, displaying the data for each year consecutively. When set to "False," the user has control over the year range using the slider.
5. **currentDataSet**: Determines the type of data displayed in the bar chart of Scene 3. It can be set to either "games" or "publishers," allowing the user to switch between visualizing the top-selling games or the dominant publishers within the selected year range.

The states of the narrative visualization are determined by the combinations of the parameter values. Each state represents a unique configuration of the parameters, defining the specific scene displayed to the user at any given moment. For example:

A. Scene 2: region = "Japan," startYear = 1985, endYear = 2005, isPlaying = False
B. Scene 3: region = "North America," startYear = 1990, endYear = 2010, currentDataSet = "publishers"

Usage in Defining Scenes: Each scene in the narrative visualization is constructed based on the parameters' values.
Scene 1, the world map with bubbles, the "startYear," "endYear" and "isPlaying" parameters are used to determine what year range of data should be visualized or loop through data in years.
Scene 2, the line chart of yearly sales, utilizes the "region," "startYear," "endYear," and "isPlaying" parameters to present the relevant sales data for the chosen region and year range or highlight data of the looping years.

Scene 3, the bar charts of top-sold games and publishers, employs the "region," "startYear," "endYear," and "currentDataSet" parameters to showcase the most successful games or publishers within the selected year range for the chosen region.

By dynamically adjusting the scenes based on the parameters' values, the narrative visualization offers users the flexibility to explore the data in a personalized and interactive manner, uncovering insights and patterns specific to their interests.

3.4. Triggers

• Click on the bubble in Scene 1 to redirect to Scene 2 with region, startYear, and endYear parameters, allowing users to explore the line chart of yearly sales for the selected region.

• Click on the dots in Scene 2 to redirect to Scene 3 with region, startYear, and endYear parameters, enabling users to investigate the bar charts of top-selling games and publishers within the chosen year range.

• Click on the "Switch Publisher/Game" button in Scene 3 to toggle between visualizing the top games and top publishers, providing users with the option to explore different aspects of the data.

• Click on the "Back to Game Sales" button in Scene 3 to redirect to Scene 2 with preserved region, startYear, and endYear parameters, allowing users to go back to exploring yearly sales trends.

• Click on the "Back to World Map" button in Scene 2 to redirect to Scene 1, giving users the option to return to the world map with bubbles and choose a different region.

• Use the "Play" button to toggle the "isPlaying" parameter in Scenes 1 and 2, enabling an automated loop through the years to observe data changes over time.

• Interact with the left handle of the slider in Scene 2 to adjust the "startYear" parameter, allowing users to set the starting year for the data visualization.

• Interact with the right handle of the slider in Scene 2 to adjust the "endYear" parameter, allowing users to set the ending year for the data visualization.

• Hover over the bubbles in Scene 1 to reveal tooltips displaying information about regional sales, providing users with additional details without the need to click.

• Hover over the dots in Scene 2 to reveal tooltips showing yearly sales and console releases, allowing users to gain insights into the impact of major console launches.

• Hover over the bar charts in Scene 3 to reveal tooltips presenting information about top-selling games and publishers, facilitating a deeper investigation of each data point.

By incorporating these triggers and affordances, the narrative visualization encourages user engagement and exploration, making it easier for users to understand their available options and the connections between different scenes and data points.

4. Conclusion

In conclusion, this narrative visualization project effectively communicates the captivating and ever-changing world of the global video game industry. Through a well-designed drill-down story structure, users can explore the data in a hierarchical manner, starting with an overview of regional sales on a world map and then drilling down to specific regions, yearly sales, and top-selling games and publishers. The visual structure utilizes world maps, line charts, and bar charts with annotations and tooltips to highlight essential data points and facilitate data exploration.

The carefully crafted scenes guide users through each step of the visualization, ensuring a seamless flow of information. Annotations provide valuable insights into major console releases and are strategically placed to avoid clutter. Moreover, the use of parameters and triggers empowers users to interact with the data, such as selecting regions, adjusting year ranges, and toggling between different data views.

Overall, this narrative visualization successfully delivers its message by allowing users to explore and discover trends and patterns in game sales, console releases, and top-selling games and publishers. It empowers users to gain deeper insights into the gaming industry's evolution over time, making it an engaging and informative experience for any gaming enthusiast or data analyst.

Appendix

[1] *Gregory Smith. (2022). Video Games Sales [Data set]. Zenodo. https://doi.org/10.5281/zenodo.5898311*