World of Video Games

Process Book

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Introduction

At the start of the project, we needed to find a theme that everyone was interested in and ensure that there was sufficient diversity in the related data. After brainstorming and exploration, we decided to focus on video games, known as the ninth art. This is a fascinating theme with multiple dimensions to explore.

The datasets we found on Kaggle include sales data for video games that sold over 100,000 copies, compiled from vgchartz.com, a list of popular video games from 1980 to 2023, providing release dates, user and critic ratings, and summaries of the games, as well as details on 686 video game publishers. This information is useful for comprehensive analysis in conjunction with other video game datasets and can strongly support relevant data visualization on our website.

Our project offers a comprehensive exploration of the global video game landscape, providing detailed visualizations of the industry's development. We delve into the evolution of gaming platforms, market trends, and the popularity of various genres, creating an online gaming archive. Our goal is to provide users with a multidimensional understanding of video games, regardless of their prior experience. This will enable them to gain deep insights into the history and current trends of video games and, hopefully, help them discover games that match their preferences through an innovative experience.

Visualizations and Technologies

Main Interactive Components

1. Evolution of Platforms: Reveal the evolution of games across different platforms (line chart)

2. Game Genre Popularity: Explore the popularity among different game genres over the time (dynamic bubble chart)

3. Tonality of Platforms: Analyze the tonality of games released on each platform (chord chart)

4. Publishers Trends: Showcase the rise and fall of top publishers' game sales, revealing the dynamics of the gaming industry (bar race)

5. Games Selection: Select favorite video games based on different features (bubble chart)

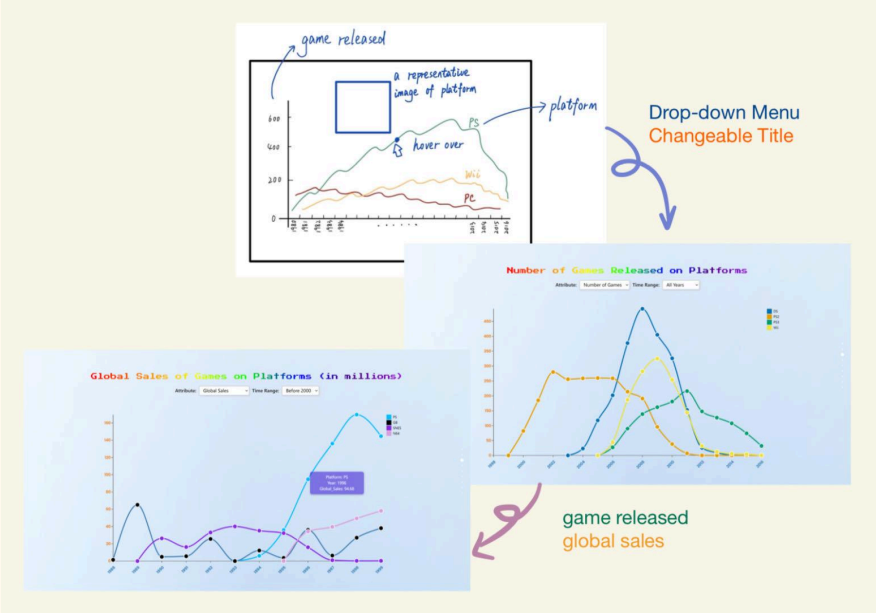
6. Recommendation: Recommend highly acclaimed video games with related PVs (video player)

Data Visualization Technologies

- **fullPage.js:** For creating full-screen scrolling websites. It allows for transitions between pages, making our story telling more smoothly.
- **jQuery:** For loading web pages dynamically. It helps in managing content more efficiently and keeping our HTML files organized.
- **D3.js:** For binding data to a Document Object Model and then creating interactive and dynamic data visualization.
- **Apache ECharts:** For creating interactive graphs using canvas.

Sketches to Visualization

1. Number of Games Released on Platform



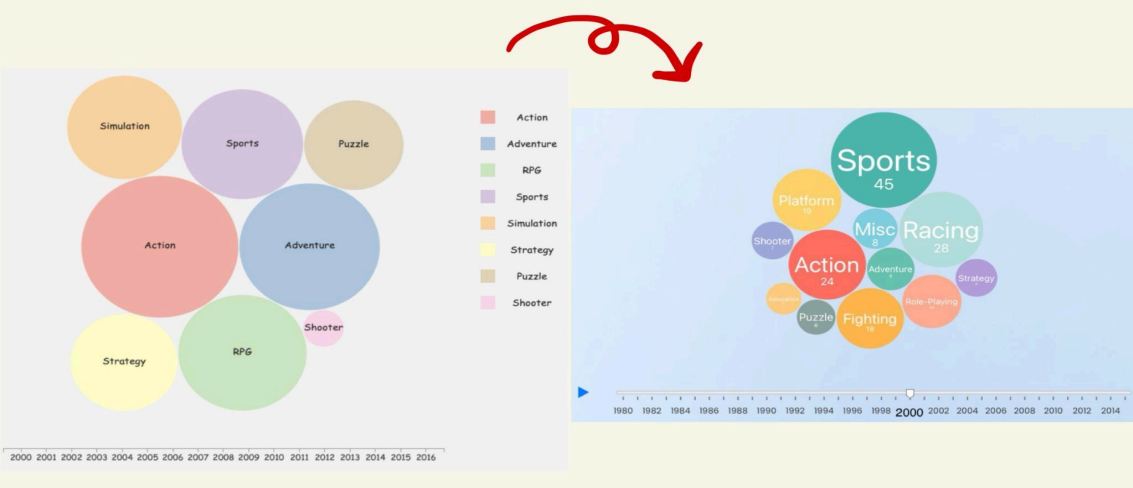
As the beginning of our video game journey, this page displays an interactive line chart that shows the number of games released or sales data for various gaming platforms over a specified time range, which allows users to gain insights into the trends and performance of different platforms over time.

Users can change the attribute and the time range of the data displayed on the chart by selecting from the "Attribute" and "Time Range" dropdown menu. The chart title updates automatically based on the selected attribute to reflect the data being displayed. Hovering over data points reveals a tooltip with detailed information about the platform, year, and the selected attribute value.

Since the pop-up information card function is implemented many times in the following pages, this page cancels this feature in the original plan and replaces it with the dropdown menu function.

2. The Popularity among Different Game Genres

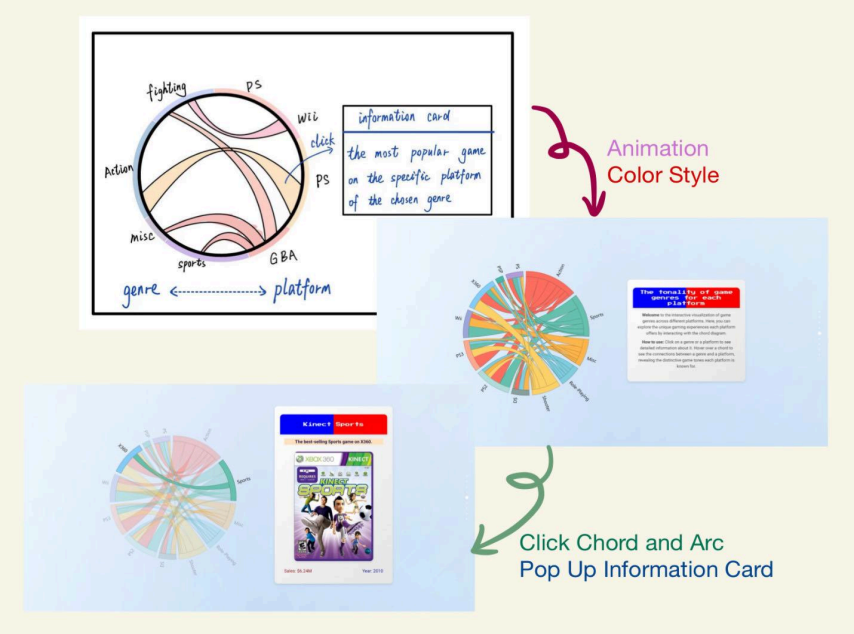
Then, we will explore the popularity among different game genres. As designed in our sketch, we have implemented a dynamic bubble chart. This bubble chart will display the number of games in different genres. The size of each bubble will represent the number of games in a specific genre. Additionally, there will be a timeline illustrating the years. The bubble chart will dynamically change over time to reflect the number of games released in different genres each year, allowing for a more intuitive understanding of the popularity trends of various genres. This timeline is implemented with a slider, providing interactive visualization with the slider that can auto-play or be manually adjusted to a specific year. This dynamic bubble chart visualization meets all the requirements specified in milestone 2.



3. The Tonality of Game Genres for Each Platform

Next, as we designed in the sketch, we tried to analyze the tonality of games released on each platform. We present an interactive chord diagram that illustrates the relationship between game genres and platforms, where arcs

representing platforms and genres, and ribbons indicate their connections. The thickness of the ribbons represents the amount of sales.



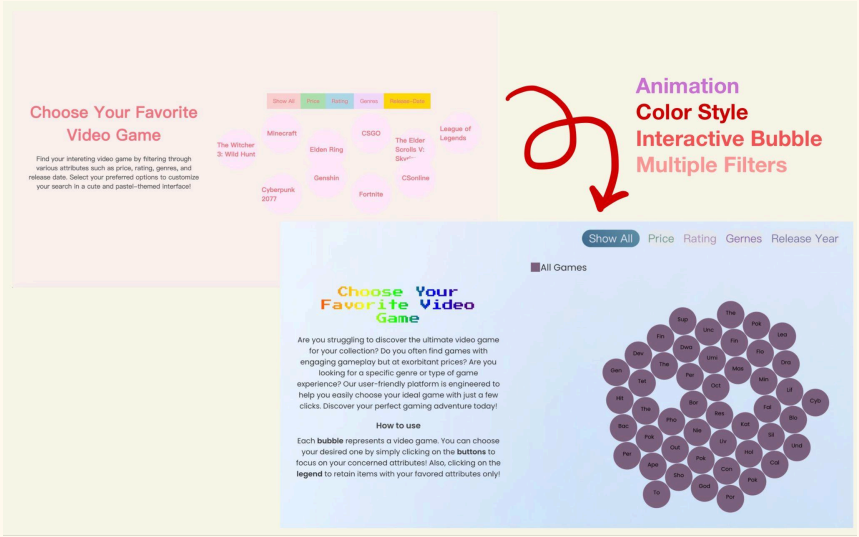
Users can interact with the diagram by clicking or hovering over the arcs and ribbons. When hovering over an arc or ribbon, it will highlight the related elements. When an arc is clicked, detailed information about the selected genre or platform is displayed, including a description, release year for platforms, or typical games for genres. When a ribbon is clicked, details about the most popular game within that genre and platform are shown, including the game's title, description, sales figures, release year, and image.

4. Sales Performance of the Top Game Publishers

As we delve into the world of video games, we cannot overlook their creators. We used a bar race visualization to dynamically depict the annual sales performance of the top

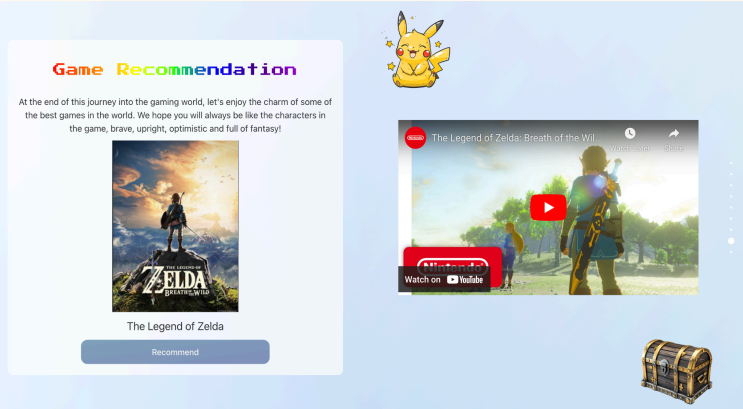
ten game publishers from 1994 to 2015. This visualization highlights the rise and fall of different publishers' game sales, revealing the stalwarts of the industry and the emerging dark horses who seized opportunities to rise to prominence. Additionally, we assigned each bar representing a game publisher a color from their company logo or their signature game theme.

5. Choose Your Favorite Video Game



This page is one of the most complex figures on our website, aiming to let the user easily find his favorite video game. In the early stages of design, the style we want is as shown in the upper left corner of the picture above. Each bubble represents a game, and will show the game's details on the left-hand side by clicking these bubbles. Users can filter the games they are interested in by clicking on the attributes (price, rating, genres and release date) in the upper right corner. The final version basically realizes the original design. We have modified the color combination to make it more relevant to the theme of the game. At the same time, we added a lot of interactions, such as the animation generated after filtering the bubbles and when the mouse is placed on the bubbles, the bubbles will become larger. Finally, we also support multi-attributes filtering to give a better user experience.

6. Game Recommendation



The final page is about the game recommendation. The prototype of this idea was not designed in Milistone2, because we were struggling with how to present this recommendation. This first idea is to use a graph to show it, where each node represents a game and the distance between two nodes indicates their correlation. But we finally abandoned this plan. On the one hand, this design is technically difficult to implement, and we have not found a very suitable library for it. On the other hand, the effect presented is not intuitive. Users still cannot immediately judge whether they like the recommended games. At the same time, there are already many pictures containing bubbles on the website. More related pictures may cause users to be disgusted. Therefore, we ultimately chose to use the game's promotional video to showcase our recommendation directly. Just click the "Recommend" button, and our website will recommend some high-quality games to you randomly.

Challenges

Unification of Web Style

Another challenge was maintaining a consistent style across pages. Each team member had different aesthetic preferences. We had to reconcile these differences, balancing between pixel art, vibrant colors, and light color schemes. After much discussion, we agreed on the current design: a subtle

metallic blue background, complemented by playful elements inspired by rainbow colors and the red-and-blue palette of retro gaming consoles.

Integration of All Pages

When all the individual pages were successfully loaded, we encountered style conflicts during integration. Specifically, the stylesheets introduced in the "Choose Your Favorite Video Game" page (such as bootstrap.min.css and bulma.min.css) conflicted with other custom styles defined in our own CSS files. This required us to fine-tune and adjust the page styling more granularly. Due to our limited familiarity with CSS rules, we spent a considerable amount of time learning how to resolve this issue.

Peer Assessment

All three of us worked together on brainstorming, data collection, data analysis, website development, and report writing. For the website, each of us was mainly responsible for two pages. Specifically, Erchang worked on Figure 1 (Evolution of Platforms) and Figure 3 (Tonality of Platforms), Jingbang was responsible for Figure 2 (Game Genre Popularity) and Figure 4 (Publisher Trends), and Haotian focused on Figure 5 (Game Selection) and Figure 6 (Recommendation). We also provided strong support to each other when facing difficulties.