

Process Book

Project Name: Game Sales Vis

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Overview and Motivation

Every year it feels like the gaming industry sees the same stories—record sales, unfathomable market reach, and questions of how much higher the market can go. We're already far past the point of gaming being the most significant earning media sector, with an estimated \$165 billion in revenue generated in 2020. The expansion is expected to make the global gaming industry worth \$321 billion by 2026, according to PwC's Global Entertainment and Media Outlook 2022-26.

So it is of practical importance to study the sales of games because we can derive from these data the ups and downs of game platforms and game genres. And what kind of sales changes have occurred during platform and technology changes?

At the same time, the University of Utah has a strong EAE program. EAE's students may go into game development and game distribution in the future. In that case, studying this issue will be helpful for their future career horizon and give them a sharper vision to find future growth.

Related Work

1. We have considered different ways to show the visualization. Due to the various types of visualizations, we decided to have separate pages to show the results. For the layout of the website, we have referred to this website.
(<https://www.slotsonlinecanada.com/game-of-canada/locations/>)
2. We show different related visualizations on each page. So we can consider every page as a dashboard. The knowledge related to the dashboard discussed in class helped us to design each page's layout. We also refer to other's dashboard designs to get inspiration.
(<https://www.justinmind.com/ui-design/dashboard-design-best-practices-ux>)
3. We refer to this visualization to create time series chart.
(<https://bl.ocks.org/robbyngit/89327a78e22d138cff19c6de7288c1cf>)

Questions

The objective of this visualization is to tell the story of the history and evolution of the Video Games Market how it becomes such a big market and how it is composed.

Data

We will use video game sales data in Kaggle([Video Game Sales | Kaggle](#)) to visualize. This dataset is scraped from VGChartz.

Data structure:

- Rank - Ranking of overall sales
- Name - The games name
- Platform - Platform of the game's release (i.e. PC, PS4, etc.)
- Year - Year of the game's release

- Genre - Genre of the game
- Publisher - Publisher of the game
- NA_Sales - Sales in North America (in millions)
- EU_Sales - Sales in Europe (in millions)
- JP_Sales - Sales in Japan (in millions)
- Other_Sales - Sales in the rest of the world (in millions)
- Global_Sales - Total worldwide sales.

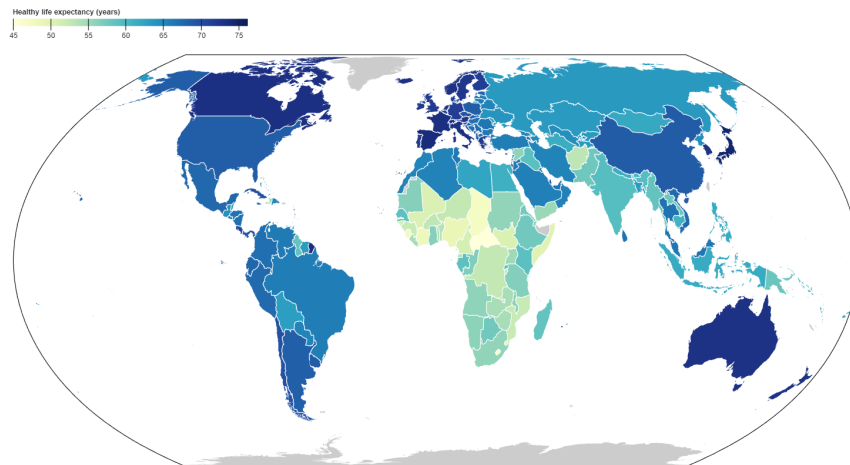
Data cleaning:

There is some game information that needs to have a release date. So we use the other video game dataset in the Kaggle (<https://www.kaggle.com/datasets/jummyegg/rawg-game-dataset>) to get the release date. This dataset has a release date that accurate to the day. At first, we wanted to combine those two datasets to get a more precise release date. However, the combination will cost more than 6000 to be deleted due to the missing game information. After discussion, we decided to save those 6000 data and have the release date accurate to the year.

We used python to create code that can search for the missing release date of some games in this new dataset and got a new CSV file as our dataset.

Exploratory Data Analysis

When we first looked at the data, we wanted to use the map to show the game sales of different regions. Since the data only has four regions' sales, it's hard for us to use the map as our main visualization like the one below:

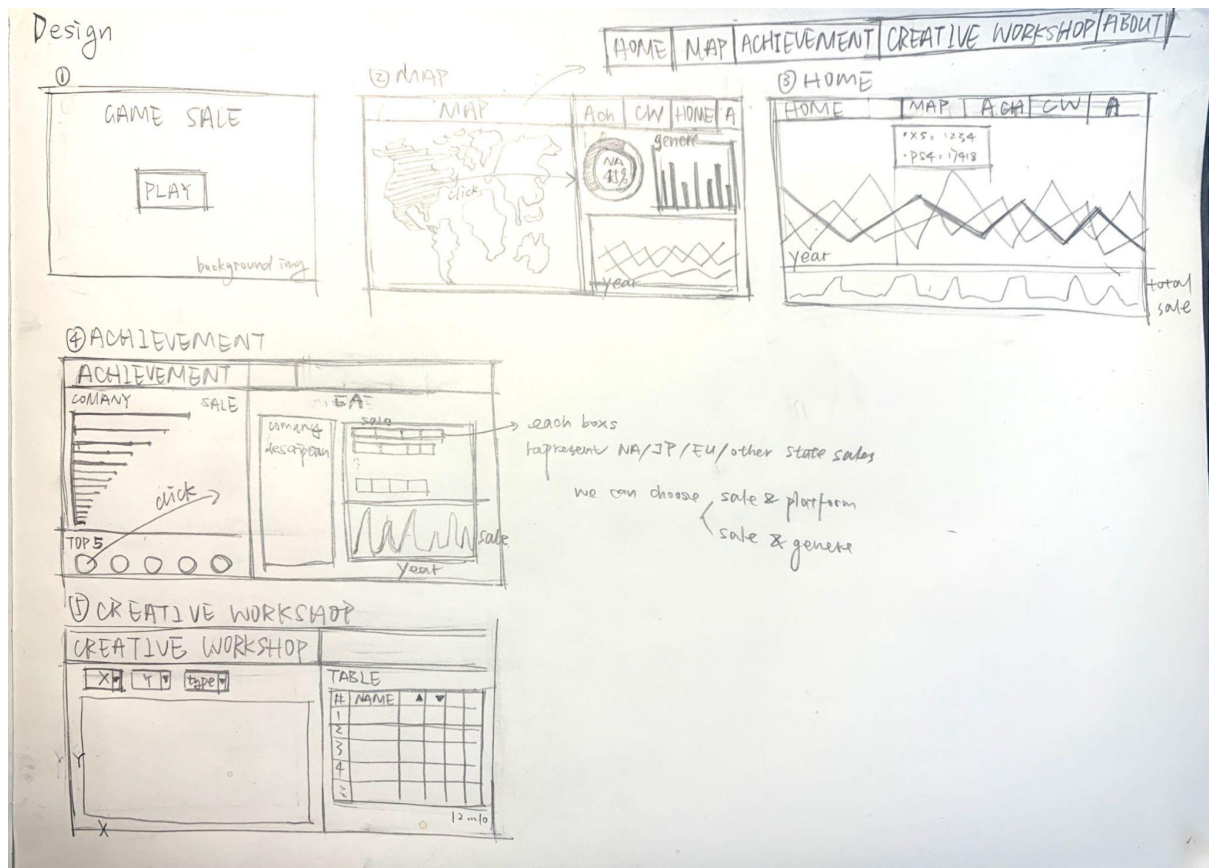


Then we decided to discover other charts to visualize the data. For example, the line chart can be used to show the relationship between the year and the sales of the different genres. Additionally, we divide the dataset into four aspects in order to show the visualizations more clearly.

Design Evolution

We have built four-page to show the visualizations of the dataset. So we will discuss each design evolution separately.

Prototype Design



When opening the web page, show something in summary, then click the play to enter the vis.

- **Home:** show the sales of different hardware year by year.
- **Map:** The left side is the world map. When you click on the region, the right side shows the regional game sales data.
- **Achievement:** show the achievement of these game companies. There is a count-down list of these companies, and below the list are some typical companies we choose. When you click these companies, the right side will show the description of the company, the genres of their products, and sales.
- **Creative workshop:** here, you can search in our database and customs the chart x and y axis, exploring the relationship of these properties.
- **About:** some additional information.

Peers and TA's feedbacks

Peer Review Feedback

Bryce:

1. Our dataset only shows big companies but not small studios.
2. we can also classify the platform and genres like publisher
3. sales may disappear and re-appear in the chart and he thinks our visualization should consider it.
4. In the creative workshop, we can have an instruction about it, because users may think it's broken due to the code implementation.
5. On our maps page: decide to show what is the default, and the global sale portion shows 100 percent, or other design
6. visual encodings: color design.
7. The color we use can have to be meaningful and related.
8. If you select one on a page, then you change your page, and also shows what you select.
9. Decide the priority of these pages, so if we cannot finish all the pages we can decide to cut something..
10. Animation: the portion pie chart fill up, draw lines, icons gray out, and gray in.

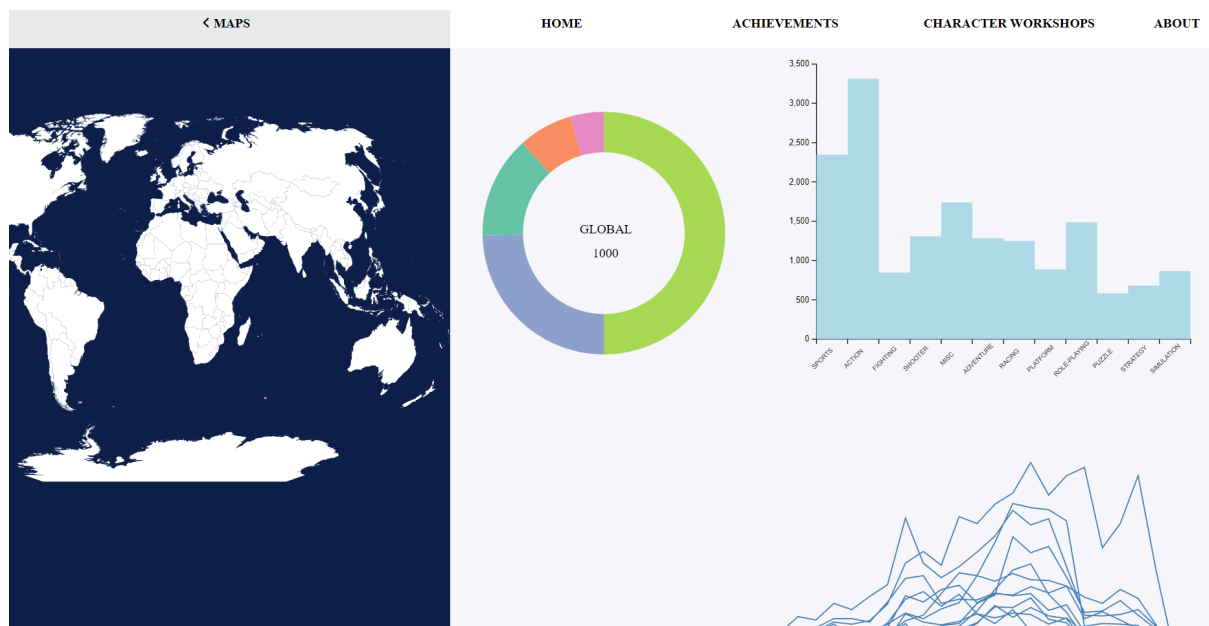
TA's Review Feedback

I recommend adding a short storytelling component to highlight some critical trends in the game sales. This will make your project stand out from other projects. Apart from this, I like the project proposal, and I am excited to see how this turns out.

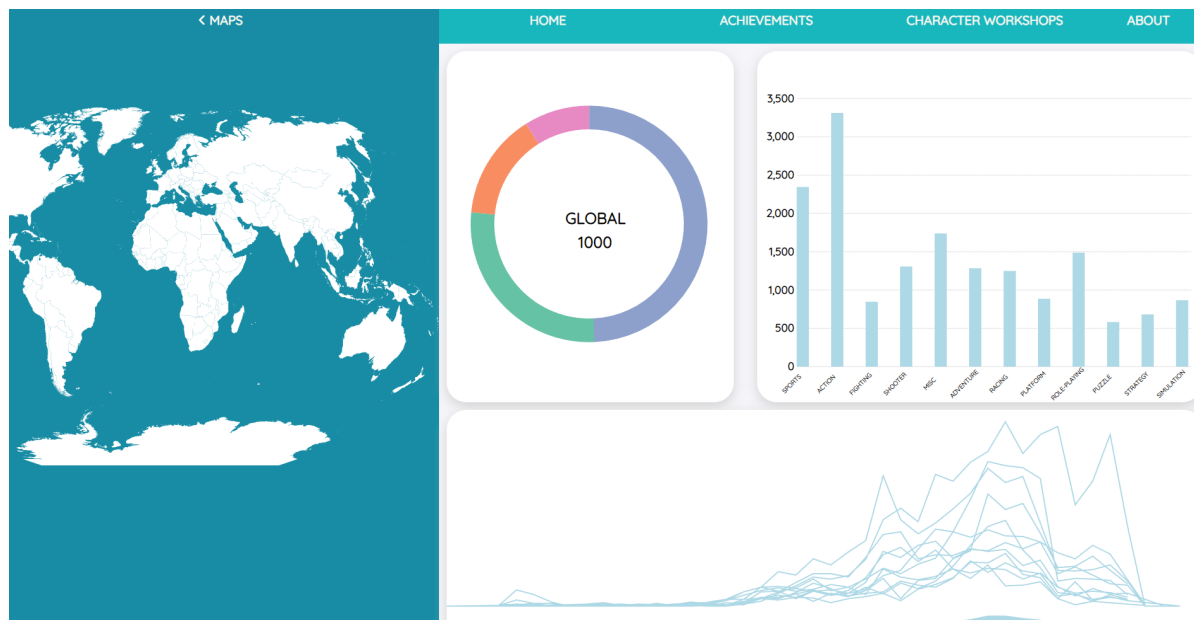
Project Milestone Update

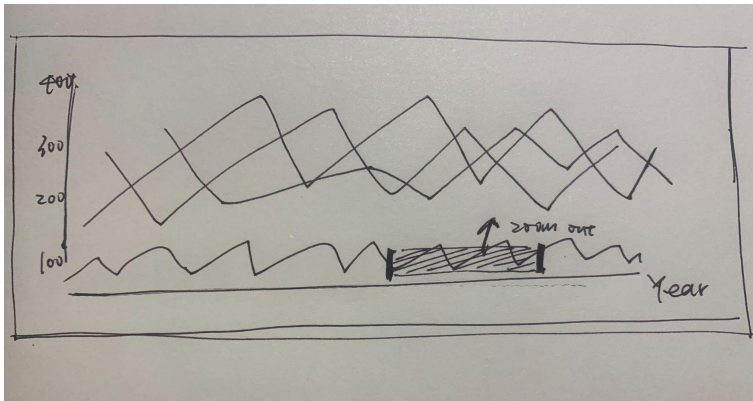
Considering all the reviews above, we reconsidered our prototype and changed some design; the detail is shown below.

Map page



At first, we decided the left was the map, and the right showed the different charts related to different regions. However, the right part looks very weird in this layout. Every chart is independently put on the page. So to make the form more comfortable, we refer to the typical design strategy of the dashboard. Adding the box outside each chart to make it look more coherent.





For the time series chart, users can choose the time range they want using the brush, and the result will show on top of the overview chart. By doing this, we can let users see the line chart more clearly.

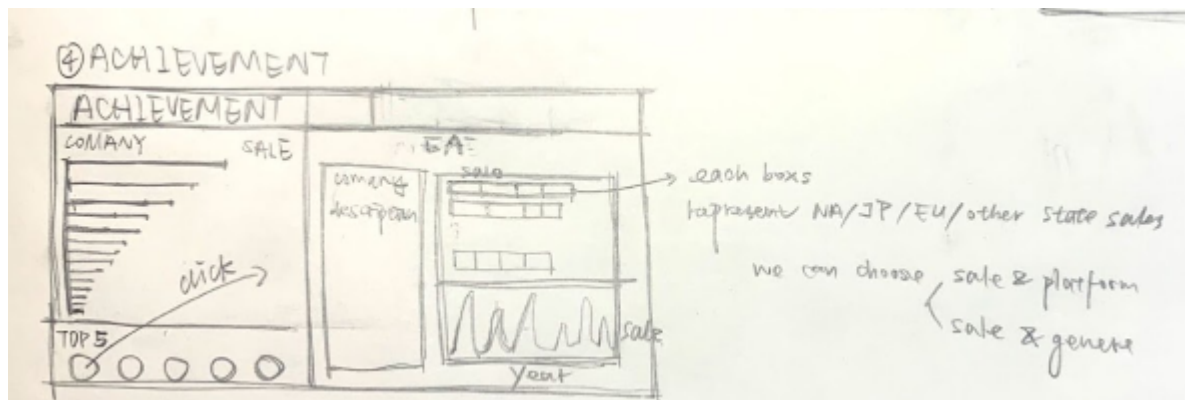
Platform page

Init the webpage and the data it will be used.

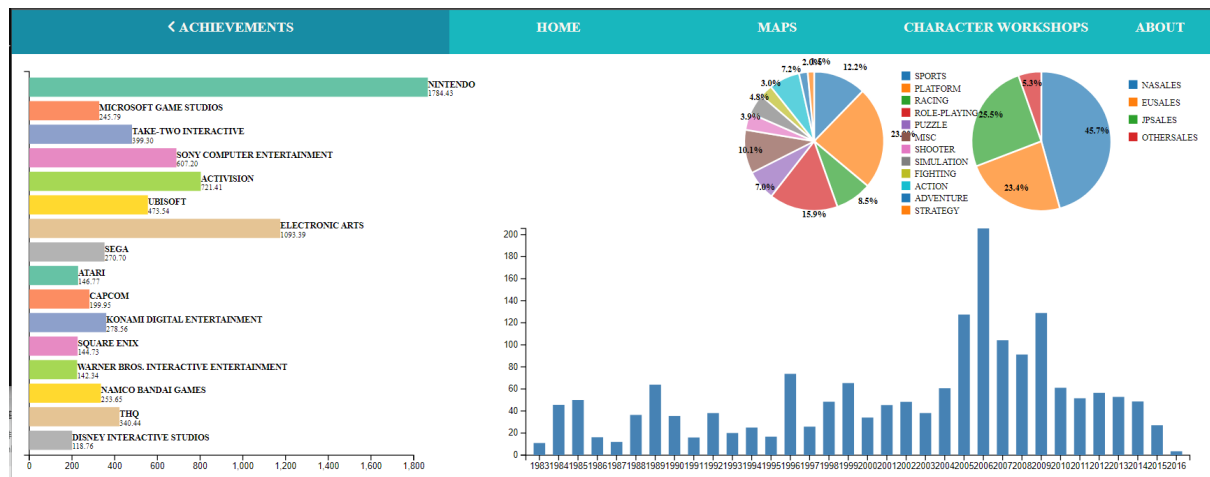


Company page

Previous Design:



Progress Update:



According to our design, We work on implementing the bar chart of the company and sales; because many companies' names are longer, we change our design to put them at the end of the bar along with their total sales. In the future, we will add some icons about Top5 companies.

Then is the sales-years chart, now it is a bar chart, and We will change it into a line chart to be easier to track the sales trend. Besides, it now only shows the global sales related to years. We may add some checkboxes to change the region.

Above the sales-years chart, we now have added two pie charts to show the portion of regional sales out of global sales. And the genres portion of a particular company.

It should be clarified that the data shown on the right side is specified as "Nintendo," We will add interaction with the Top5 icons to change the company it showed.

We will also add some storytelling methods to this page so readers can better understand our visualizations.

The problem here is we are stuck on the company description; we found it difficult to add a beautiful textbox by simply using d3.js. Another problem is the data shown on the pie chart cannot display correctly. We may try other UI components in those cases for a better visual effect.

Updates 11.11:

Add a simple info box and change the sales-years bar chart to the line chart.

User design page



For the user design page, we have a table showing all the data. And by clicking the header, the user can sort the data by the header. The left is the canvas. At first, we have the blank canvas. But after peer review, we decided to show the default visualization, so the user won't think some fault happened on this page.

TA's Milestone Feedback:

Map page:

We lack labels in every chart; Should have story telling part to tell about each page answer which questions.

There is a question of our 2017 data, so TA give us three options to solve this problem:

1. cut down the line chart. 2. find the data of 2017. 3. explain that question.

Achievement page:

TA suggested that there needn't have icon just click the bar is fine. And show all company's information instead of top 5;

The right part can change pie chart change to waffle chart.

And the line chart's year labels are too much.

User design page:

Add a tutorial.

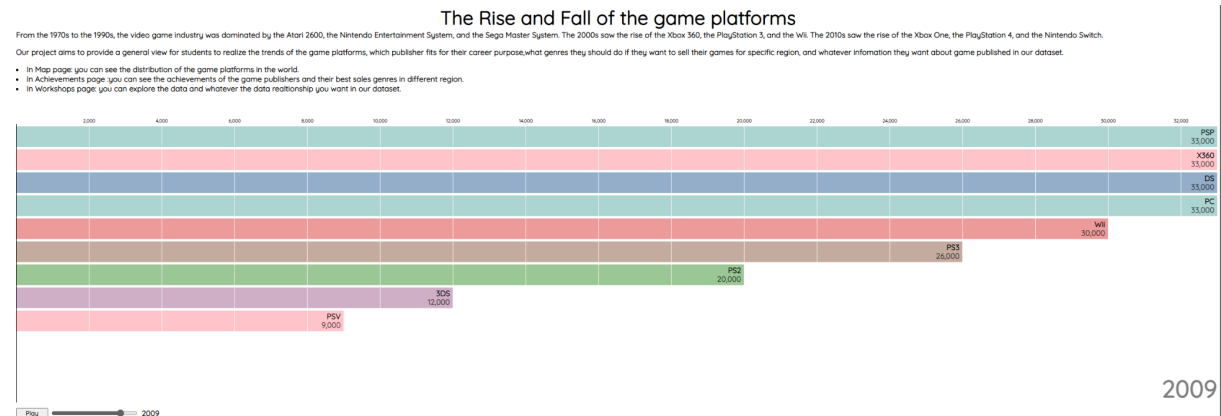
Home page :

In the top of this page, we can show we solve what questions, the dataset, the background.

In the bottom of this page: add a data race part.

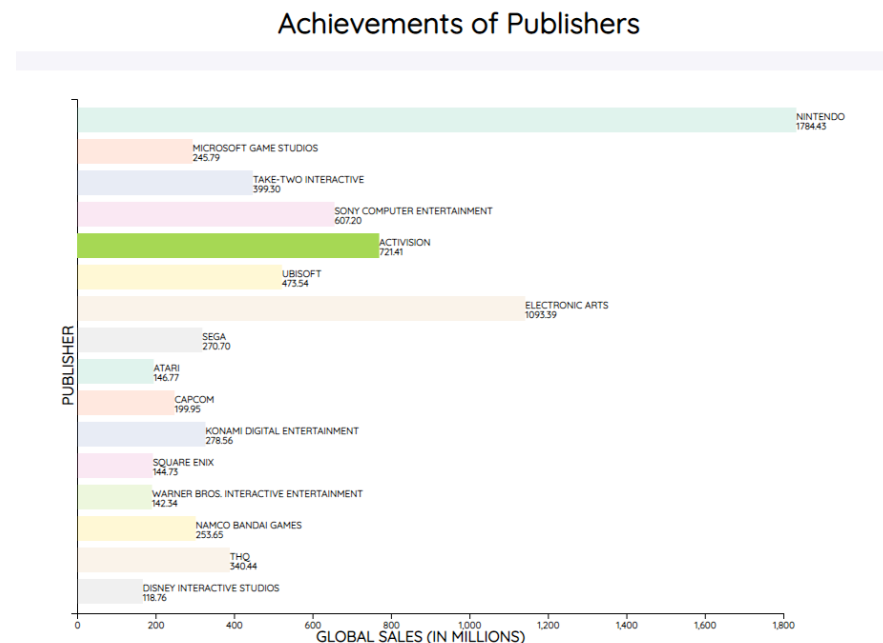
Final Result

Home Page

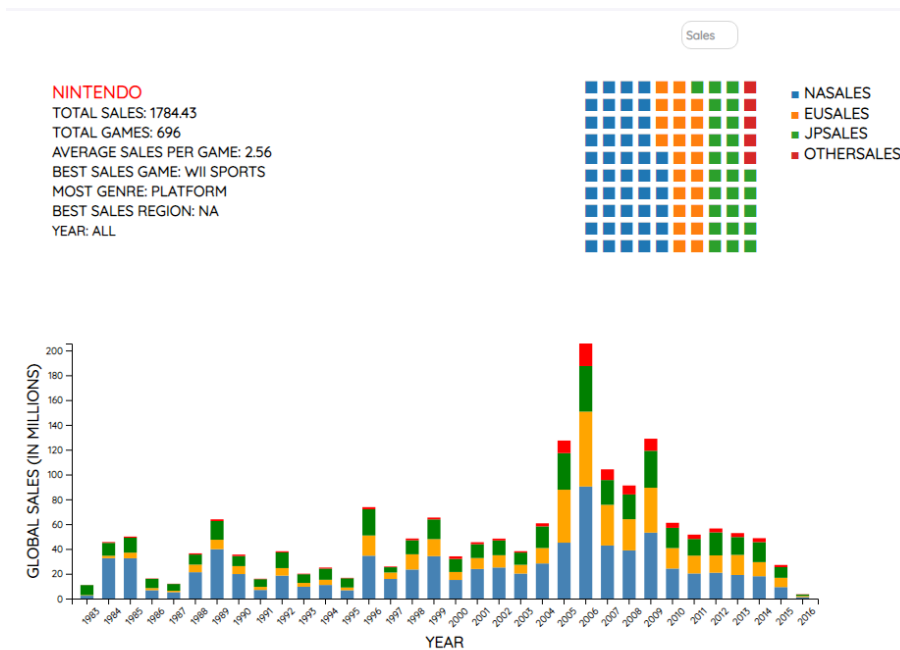


The home page has a bar chart data race with a scrubber; we can get the rise and fall of the game platforms. The viewers can use this section to learn how to choose the platform used to develop the game and summarize the law of the platform's rise and fall, so they can have a deeper understanding of the new VR platform that is now emerging. Also, this page describes our purpose and how viewers can use each page.

Achievement page



In this part, we want to "award" those publishers with global sales larger than 100 million, so we call this page the achievement page. This bar chart shows the description of their global sales. And when you click each bar, the infobox below changes this publisher's information.

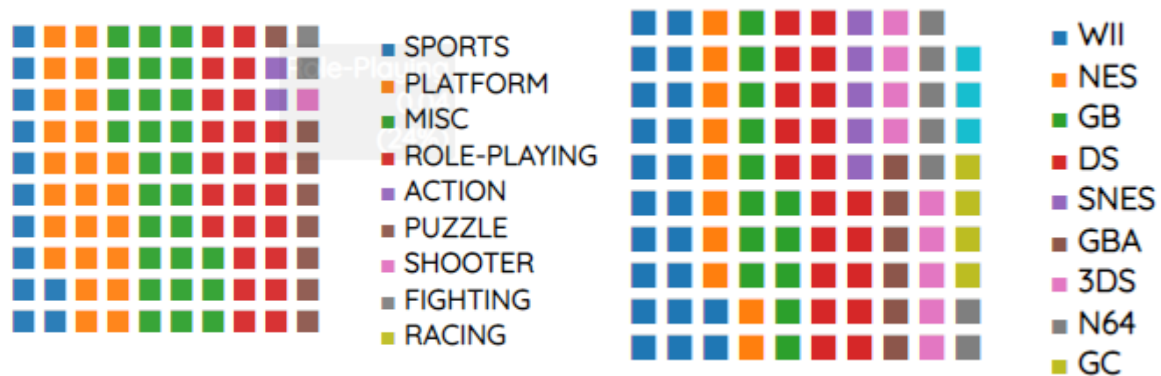
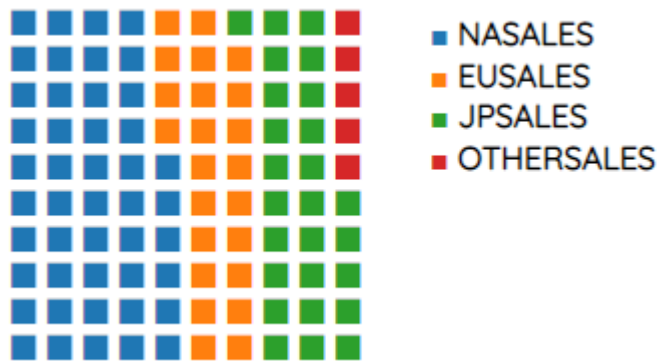


This part is a brief view of the info part of each publisher. It consists of a general infobox, a waffle chart, and a stacked bar chart.

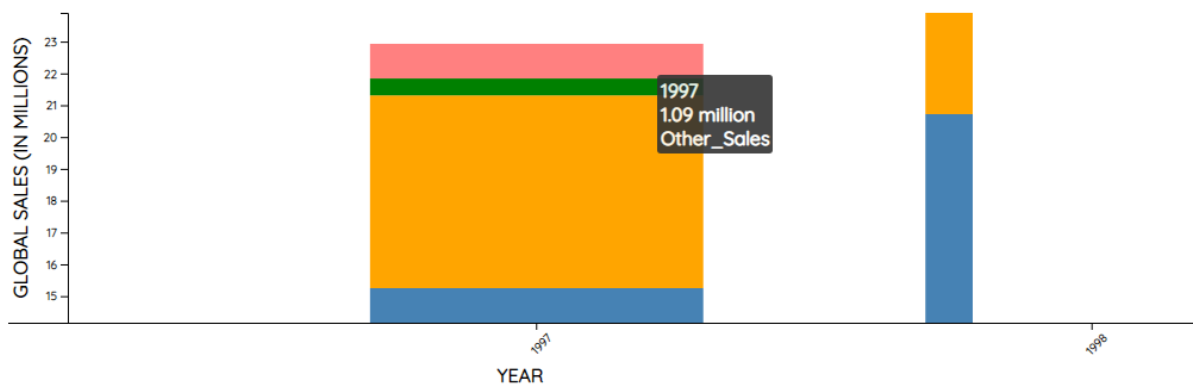
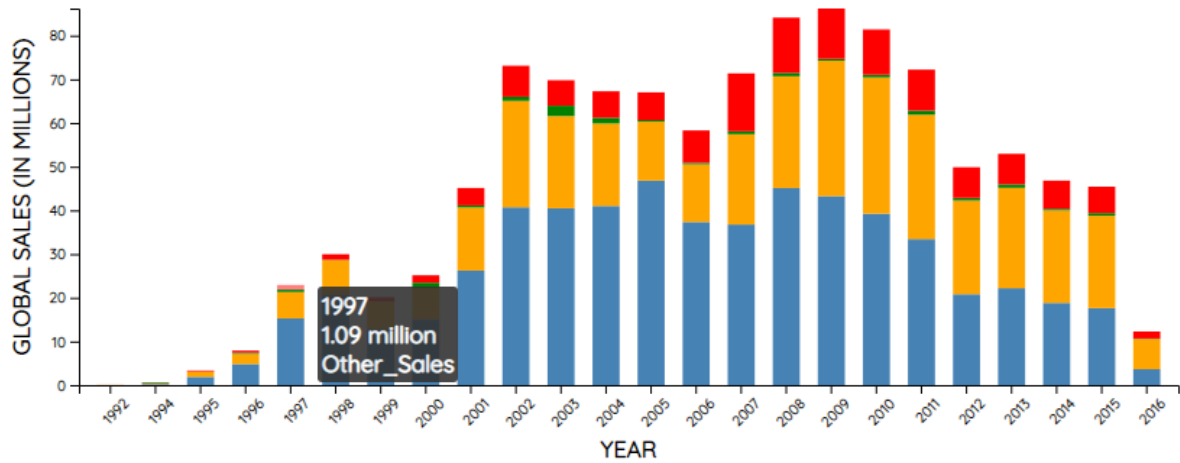
NINTENDO
TOTAL SALES: 1784.43
TOTAL GAMES: 696
AVERAGE SALES PER GAME: 2.56
BEST SALES GAME: WII SPORTS
MOST GENRE: PLATFORM
BEST SALES REGION: NA
YEAR: ALL

NINTENDO
TOTAL SALES: 1784.43
TOTAL GAMES: 696
YEAR: 2006
REGION: JP
BEST SALES GAME: NEW SUPER MARIO BROS.
BEST SALES GENRE: PLATFORM

This part has two variations; the left is the default one. It shows the total sales of this publisher, the total games they published, average sales per game, their best sales game of all years, the genre they published most, and which region they sell their games most. And the right one is shown when you click on the stacked bar; you can know the detailed data of the selected region and year.

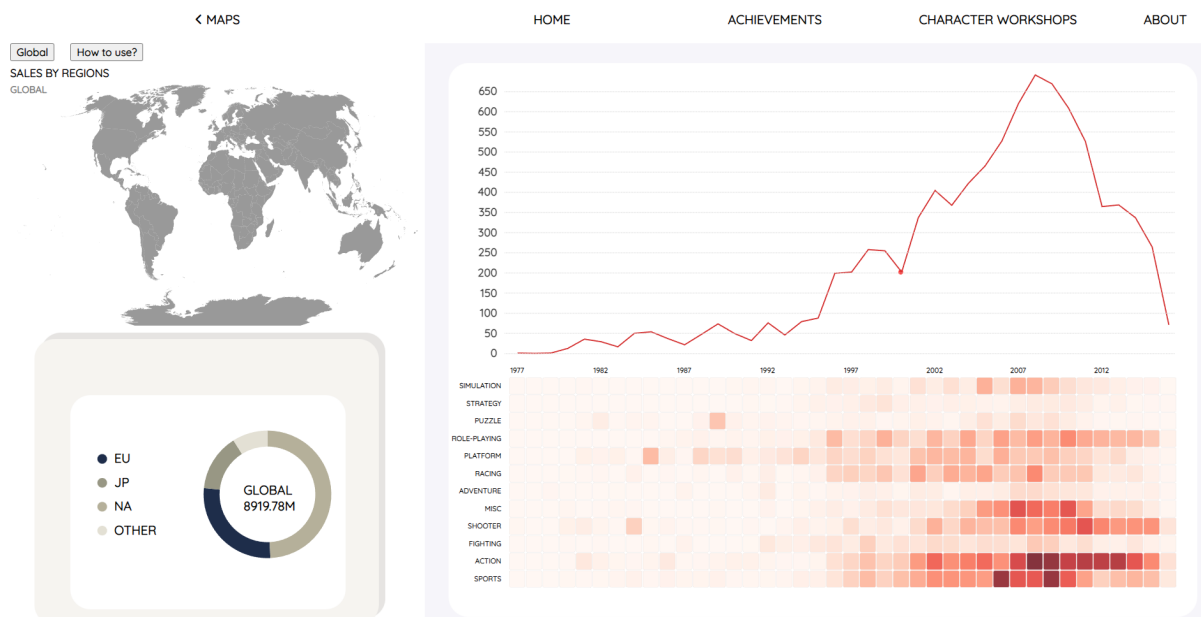


There are three variations of the waffle chart. The first one is the default; it shows the region sales distribution. The second one is displayed by clicking the stacked bar or changing the dropdown menu. If it shows when you click the stacked bar, it represents genre sales of the selected region and year. And if indicated by a dropdown menu, it means the genre's sales of the publisher across the years and areas. The platform waffle chart has the same meaning as the former one.



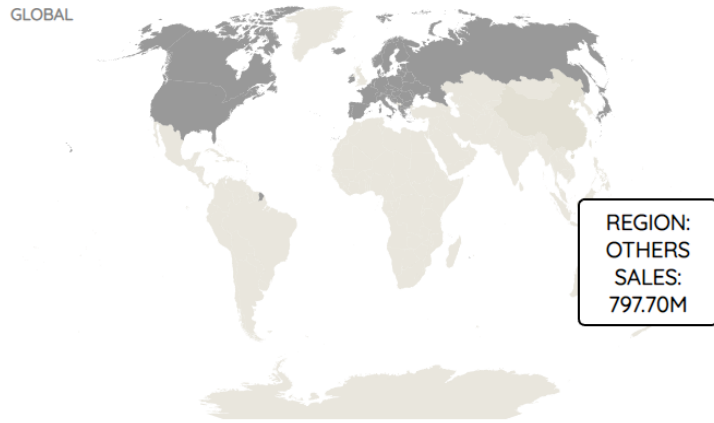
Regarding the stacked bar chart, some publishers may focus on specific regions and have fewer sales in other areas. In that case, it may have trouble getting the tooltip. So we added the zoom, and you can drag to see the zoomed-in result.

Map page

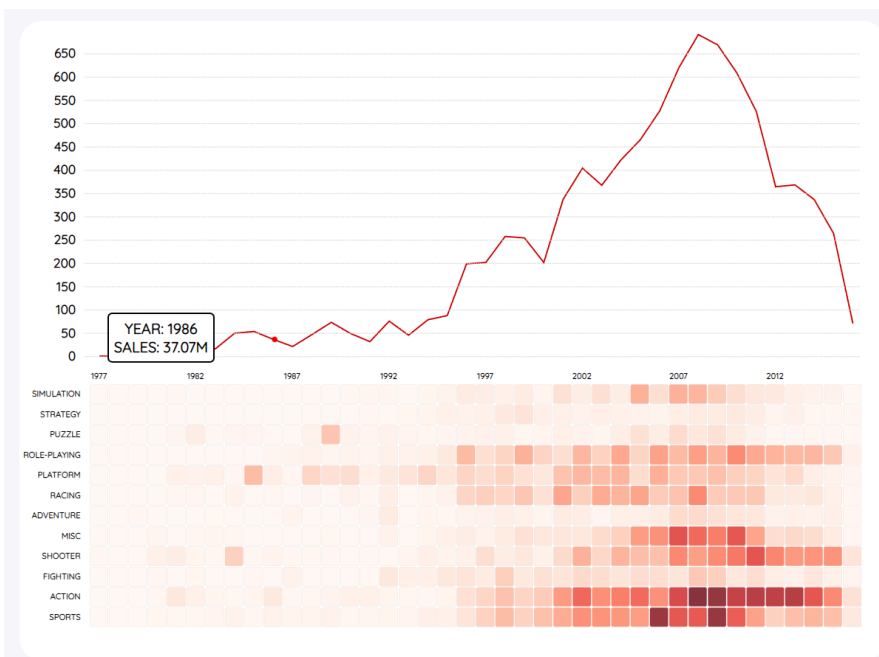


SALES BY REGIONS

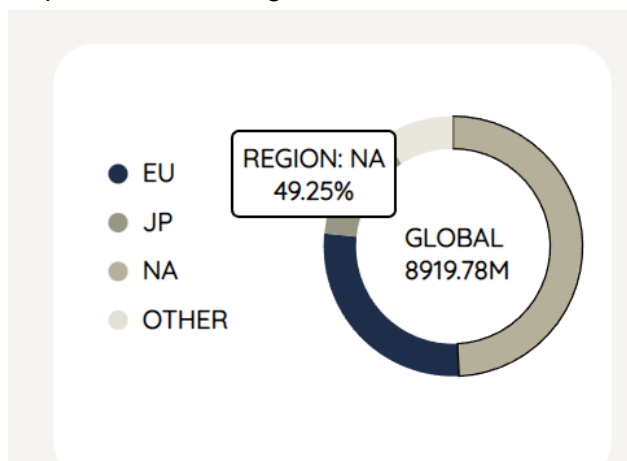
GLOBAL



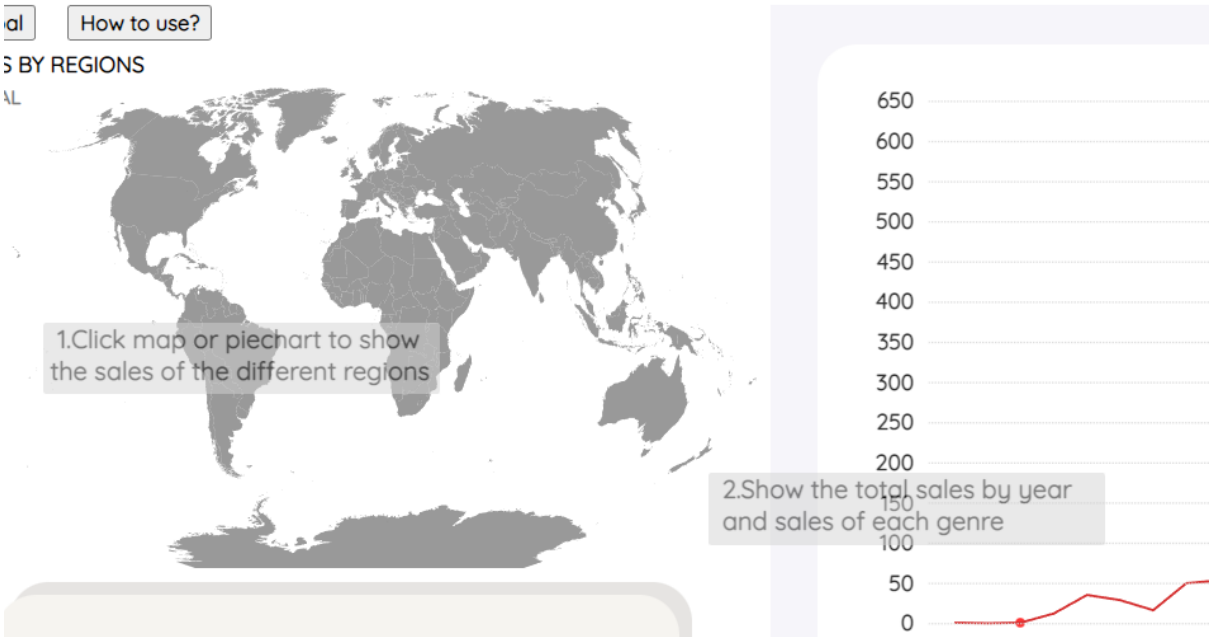
The top left part uses a map chart to show the total sales of the different regions.



The top right part uses a line chart to show the total sales by year. The heat map shows each genre's sales by year. When clicking the region on the map chart, this part will change into the data of the specific regions. For instance, when you click the North American region on the map, the line chart will show the total sales of North America by year. And the heat map will show each genre's sales in North America by year.

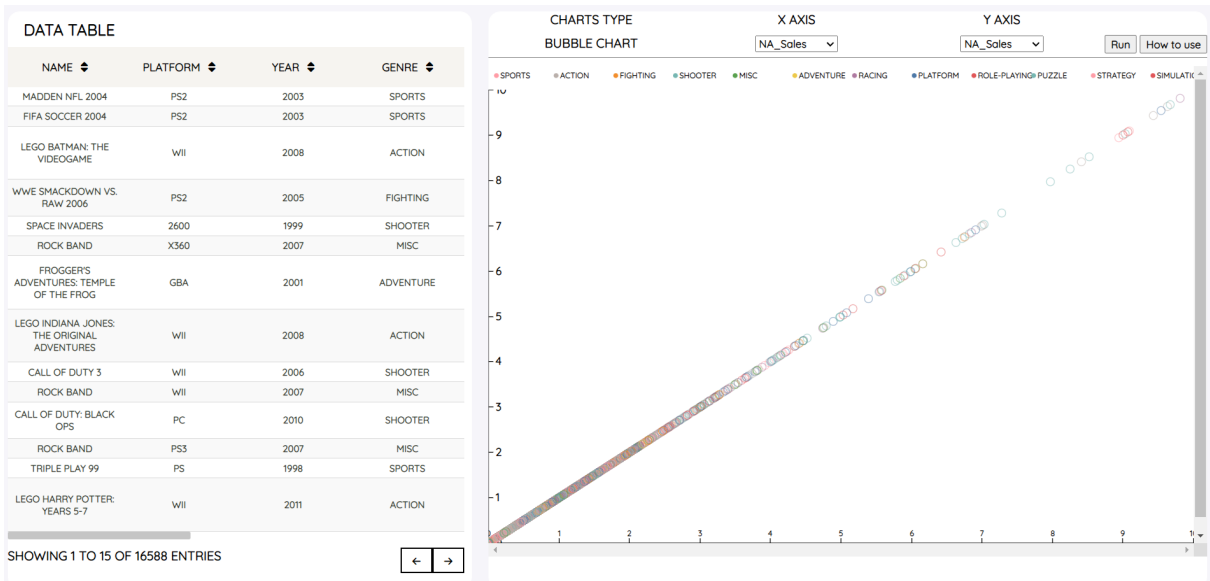


The donut chart shows the percentage of the specific region sales of global sales. Users can also click specific regions to change the line chart and heat map.



Users can click the “How to use?” button to show the description of this page.

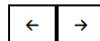
Character workshops page



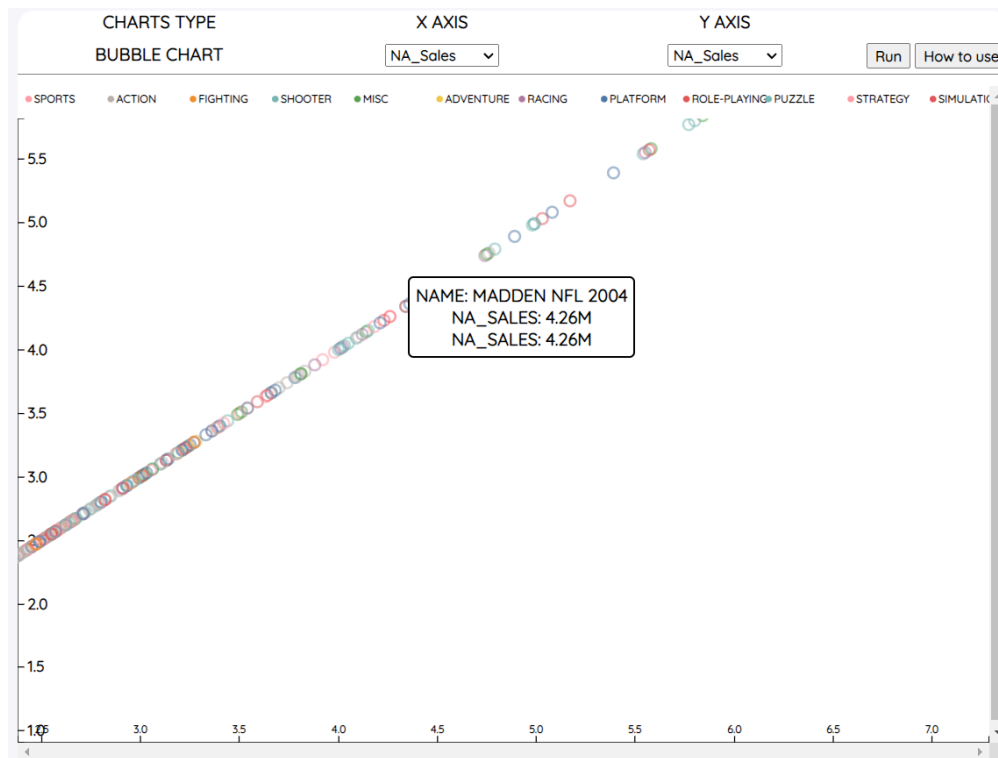
DATA TABLE

NAME	PLATFORM	YEAR	GENRE
MADDEN NFL 2004	PS2	2003	SPORTS
FIFA SOCCER 2004	PS2	2003	SPORTS
LEGO BATMAN: THE VIDEOGAME	WII	2008	ACTION
WWE SMACKDOWN VS. RAW 2006	PS2	2005	FIGHTING
SPACE INVADERS	2600	1999	SHOOTER
ROCK BAND	X360	2007	MISC
FROGGER'S ADVENTURES: TEMPLE OF THE FROG	GBA	2001	ADVENTURE
LEGO INDIANA JONES: THE ORIGINAL ADVENTURES	WII	2008	ACTION
CALL OF DUTY 3	WII	2006	SHOOTER
ROCK BAND	WII	2007	MISC
CALL OF DUTY: BLACK OPS	PC	2010	SHOOTER
ROCK BAND	PS3	2007	MISC
TRIPLE PLAY 99	PS	1998	SPORTS
LEGO HARRY POTTER: YEARS 5-7	WII	2011	ACTION

SHOWING 1 TO 15 OF 16588 ENTRIES

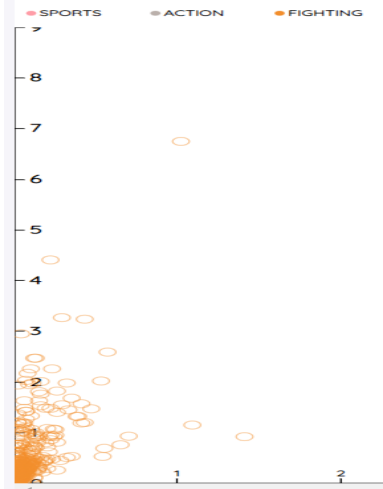


The left part is a table that shows the whole dataset. Users can click the header to sort the data.

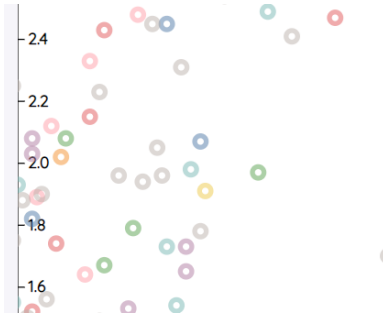


The right part is a bubble chart. Users can click the selector to choose a different XY axis. When hovering the bubble, it will show the specific information.

Because the number of the dataset is too large, there are many circles on the chart. We have two ways to see circles clearly.



First, users can click the label to show the specific dataset.



Second, users can zoom in on the chart to see the details.