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Data Visualization EN.605.662.81.FA23

Project #3 – Interactive Visualization using Tableau and Power BI

Introduction:

In this project, we're immersing ourselves once again in the dynamic realm of video game sales. However, this time, we're harnessing the formidable capabilities of Tableau and Power BI to craft an interactive visualization that goes beyond traditional analysis. The dataset at our disposal boasts 10 variables and a robust 16,000 rows, providing a rich tapestry of information. After delving into the details of the data, I transitioned into designing my data, utilizing both Tableau and Power BI to provide interactive visualization for my analytical questions. The root of this attempt rests in the interaction of effective data exploration and detailed design—a combination that is pivotal in composing accurate charts capable of offering profound insights and predictions across various areas.

Dataset:

Data Element	Category	Min	Max	Mean	Std. Dev.	Description
Game Title	Nominal					The title of the video game
Platform	Nominal					the gaming platform on which the game is available
Year of Release	Quantitative	1980	2020			the year the game was released
Genre	Categorical					the genre or category of the game
Publisher	Nominal					the publisher of the game

NA Sales (in million)	Quantitative	0	41.49	0.265	0.817	sales in north america in the million units
EU Sales (in million)	Quantitative	0	29.02	0.147	0.505	Sales in Europe (in million units)
JP Sales (in million)	Quantitative	0	10.22	0.778	0.309	Sales in Japan (in million units)
Other Sales (in million)	Quantitative	0	10.57	0.048	0.189	Sales in other regions (in million units)
Global Sales (in million)	Quantitative	0.01	82.74	0.537	1.56	Total global sales (in million units)

Analytical questions:

1. Which Genre Dominates the Market?
2. How have Sales evolved over time?
3. Which platform is the most successful?
4. What is the relationship between sales in different Regions?
5. How does publisher affect sales?

Power BI designs:

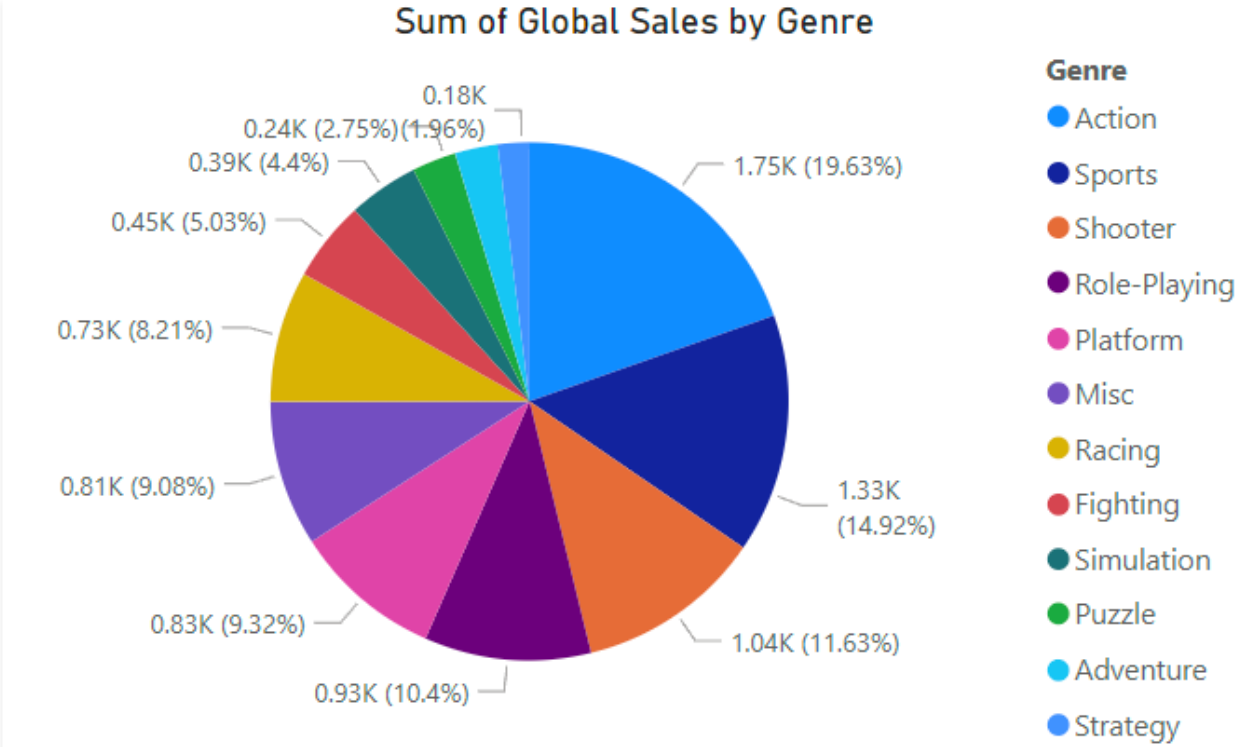
Three analytical questions answered with power BI dashboard:

1. **Which genre dominates the market?**
2. **Which platform is the most successful?**
3. **How does publisher affect sales?**

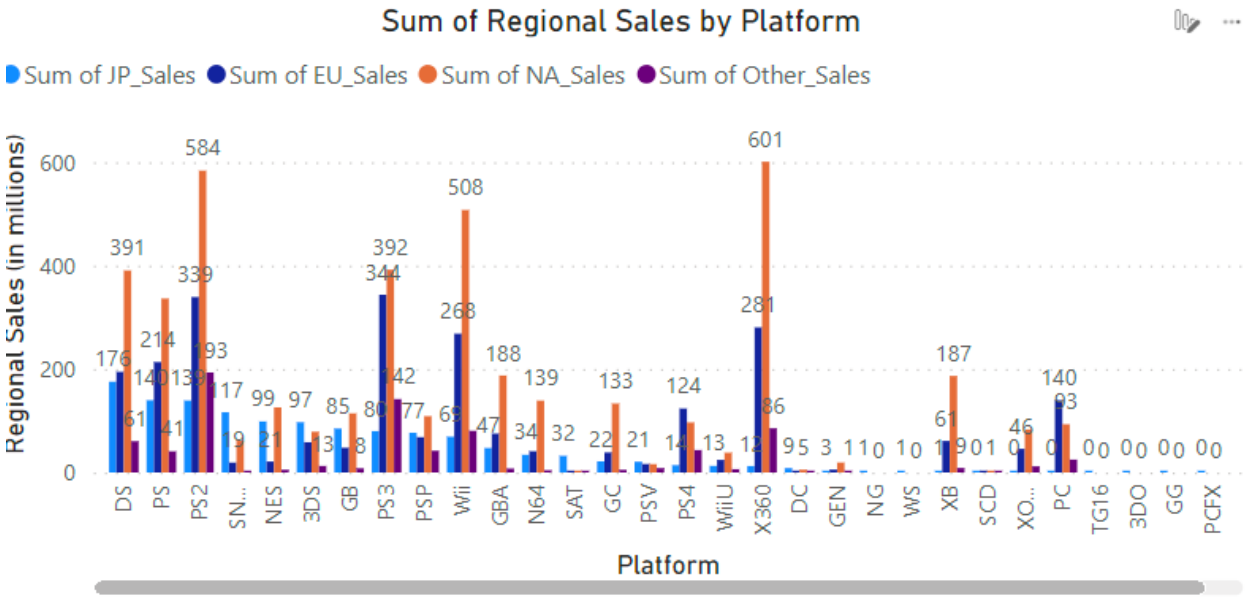
Region sales by Genre

	Sum of EU_Sales	Sum of NA_Sales	Sum of Other_Sales	Sum of JP_Sales
Action	525.00	877.83	187.38	159.95
Adventure	64.13	105.80	16.81	52.07
Fighting	101.32	223.59	36.68	87.35
Misc	215.98	410.24	75.32	107.76
Platform	201.63	447.05	51.59	130.77
Puzzle	50.78	123.78	12.55	57.31
Racing	238.39	359.42	77.27	56.69
Role-Playing	188.06	327.28	59.61	352.31
Shooter	313.27	582.60	102.69	38.28
Simulation	113.38	183.31	31.52	63.70
Sports	376.85	683.35	134.97	135.37
Strategy	45.34	68.70	11.36	49.46

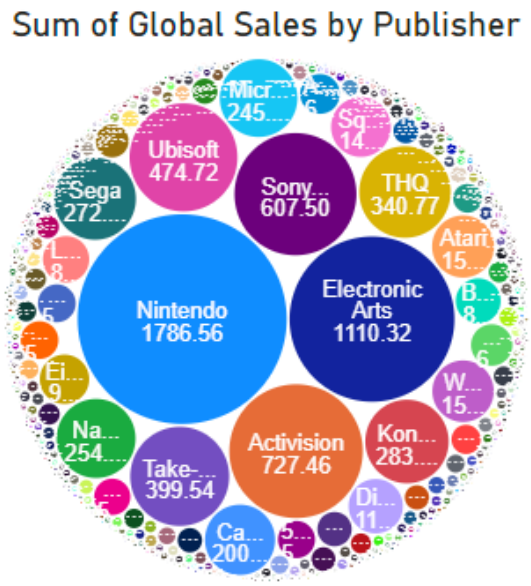
This design conducted in power bi is depicting a heat map of the video game genres with the sales of each region. Each cell in the grid will represent the total sales for the specific genre and region. The yaxis here represents the genres while each region is represented in the x-axis. The color intensity is used to encode the sales values, with lighter colors indicating higher sales and darker colors indicating lower sales. The color scale on the bottom depicts how these values are being scaled. In addition to adding colors, I also displayed the numbers inside the boxes to facilitate better comparison, especially for individuals who may have difficulty distinguishing between certain color shades. The overall purpose of this heat map is to basically represent the relationship between video game genres and their sales in different regions. It allows viewers to quickly identify which genres perform well in specific regions and which genres are less popular. Overall, the heat map serves as a powerful visual tool for understanding the relationships between video game genres and sales in different regions which will help identify the dominating genre in the market.



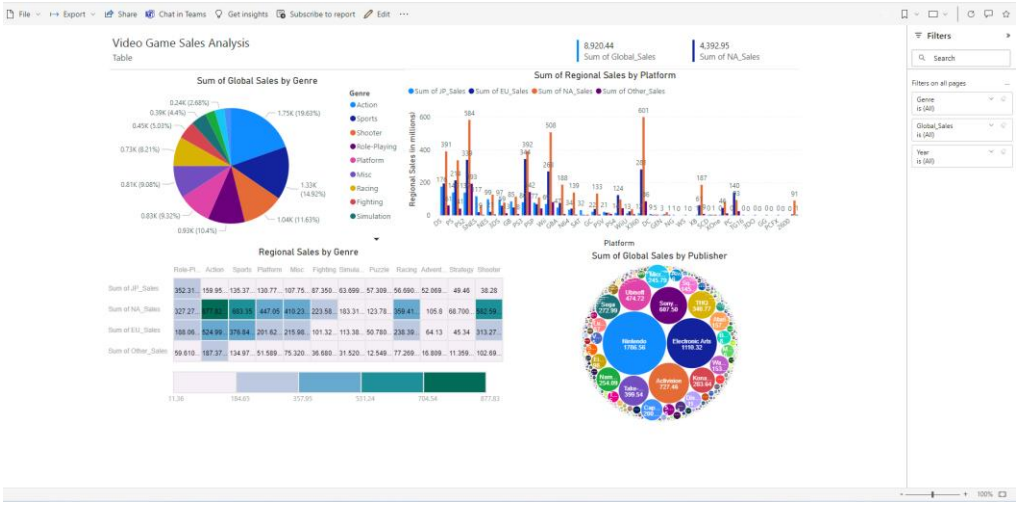
This next visualization is a pie chart of the different genres in video games and how they perform in the market. The legend on the right helps depict the different colors in the pie chart with the percentage display on the pie chart for each section. The usage of a pie chart allows for clear genre distribution because we see that each genre represents a slice of the gaming industry providing an instant visual understanding of how the sales are distributed for each genre. Users can quickly identify which genres dominate the market, showcasing relative proportions with clarity. In this case the number of genres is limited so it did not clutter the pie chart. Overall, my usage of a pie chart is due to it delivering a clear, digestible, and visually appealing snapshot of the global sales by genre.



The next chart for this question is the clustered bar chart which allows for a comparison between different categories within the same group. In this design the X-axis represents the platforms, and the y-axis represents the sales values. The bars represent the regional sales for each region with a legend at the top of the chart with what each of the colors the regions are being presented as. The purpose of this clustered bar chart is to visually compare the sales performance of different platforms across different regions. The purpose of the chart will allow us to represent which platform has been dominating the most in each region. This would allow us to depict how each platform can affect sales of a certain game. So, if a publisher wanted to figure out what platform sells the most, they can focus on making a game on that platform. Choice of clustered bar chart allows to see how each region chooses what they want, and a bar chart allows for easy comparison between different categories.



The last chart for used in the dashboard is a bubble chart that depicts the global sales by each publisher. Since there are a lot of publishers for video gaming the best way to encapsulate the data for the most sales were a bubble chart. It immediately captures the attention with the varying sizes of bubbles representing the magnitude of the global sales. This helps users focus on key players and establish trends without plunging into detailed numbers.



The overall dashboard seamlessly integrates various visualizations, with the pie chart positioned at the top left intentionally scaled down for ease of interpretation. Its compact size

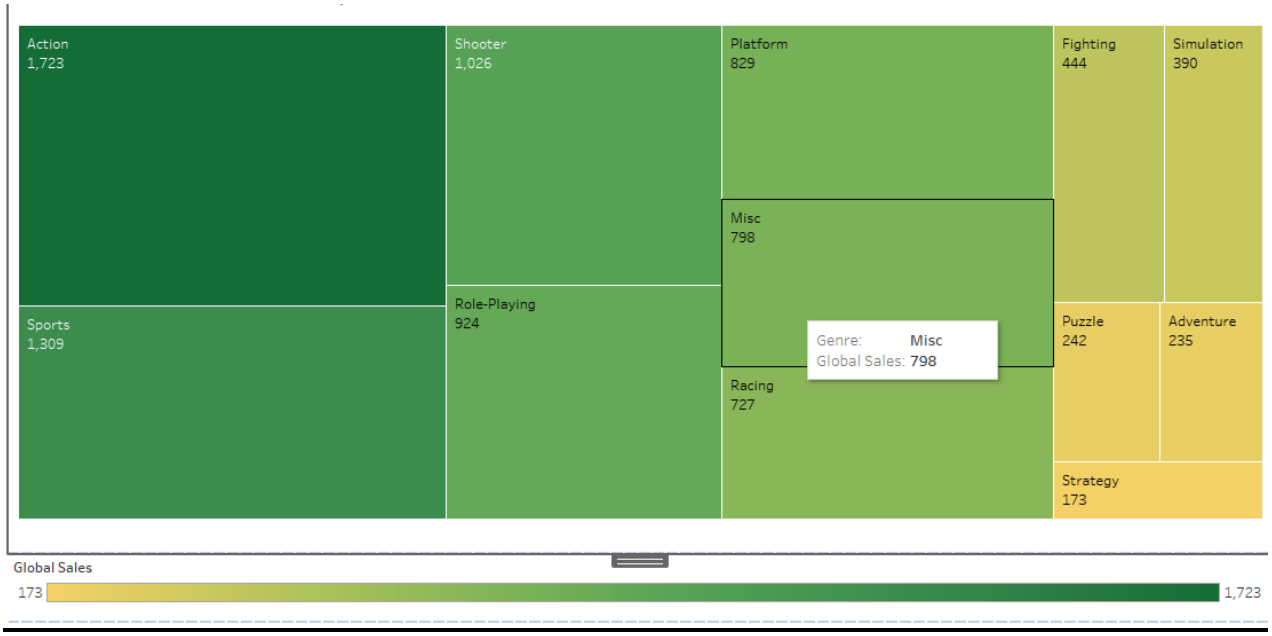
facilitates quick insights into genre distribution. Similarly, the bubble chart commands immediate attention with its emphasis on large bubbles, offering a snapshot of dominant publishers and their impact on overall sales. These two charts alone empower users to discern key trends, aiding decision-making for game development.

Moving to the bottom left, the heatmap captures user focus, revealing geographical hotspots of gaming activity. This geographical insight helps users identify regions significantly contributing to the overall sales landscape. Complementing this, the clustered bar chart provides an additional layer of understanding. By amalgamating these visualizations, users gain a holistic view of how video game sales unfold, from market dominance to regional variations.

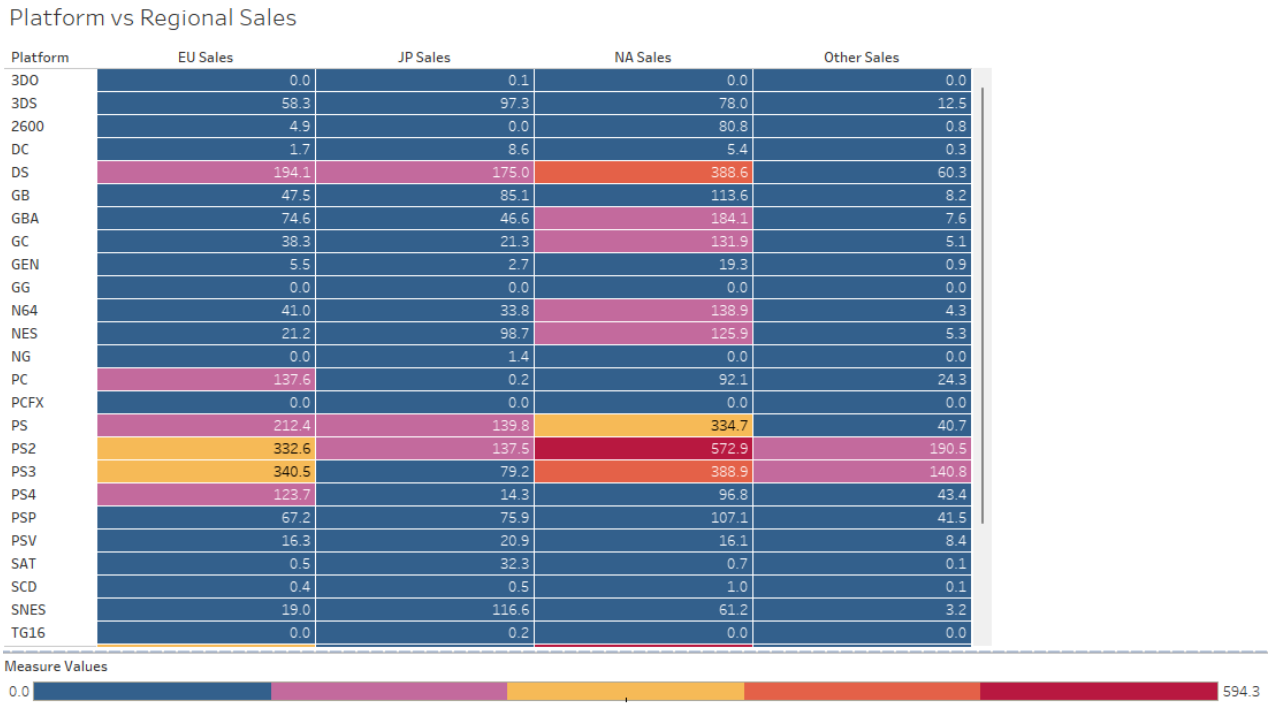
The chosen filters genre, year, and global sales act as directional tools, enhancing user control and customization. The year filter proves pivotal, enabling users to pinpoint dominant trends within specific timeframes. Simultaneously, the genre filter allows individuals to tailor their focus, delving into specific genres of interest. The global sales filter serves to refine the dataset, eliminating low-end values and outliers, ensuring a clearer and more accurate depiction of significant sales dynamics.

In principle, the dashboard isn't just an assembly of charts but a considered arrangement of visual elements, thoughtfully scaled and filtered to empower users with actionable insights. It transforms complex data into a user-friendly interface, guiding decision-makers through the intricate landscape of video game sales with clarity and precision.

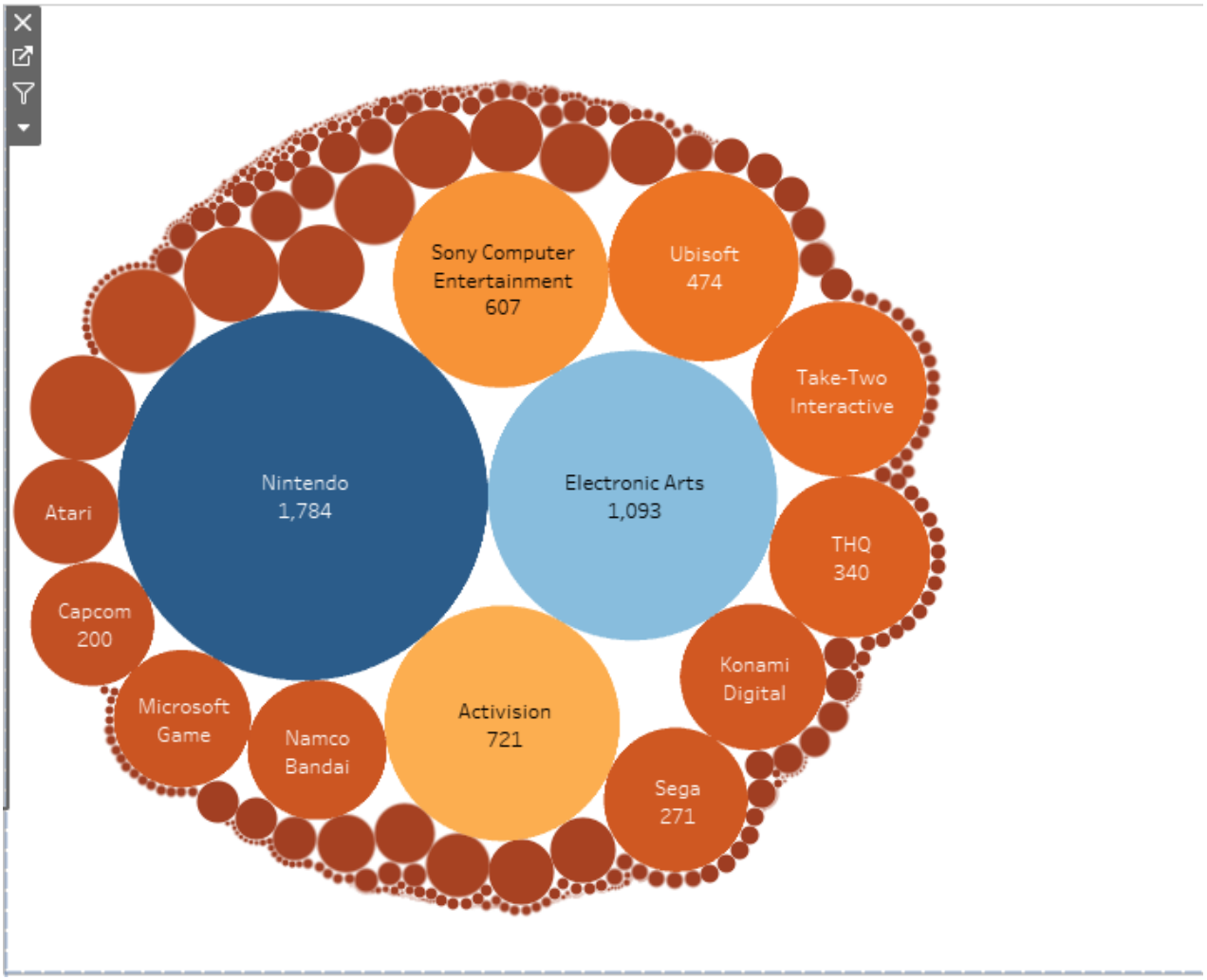
Tableau design:



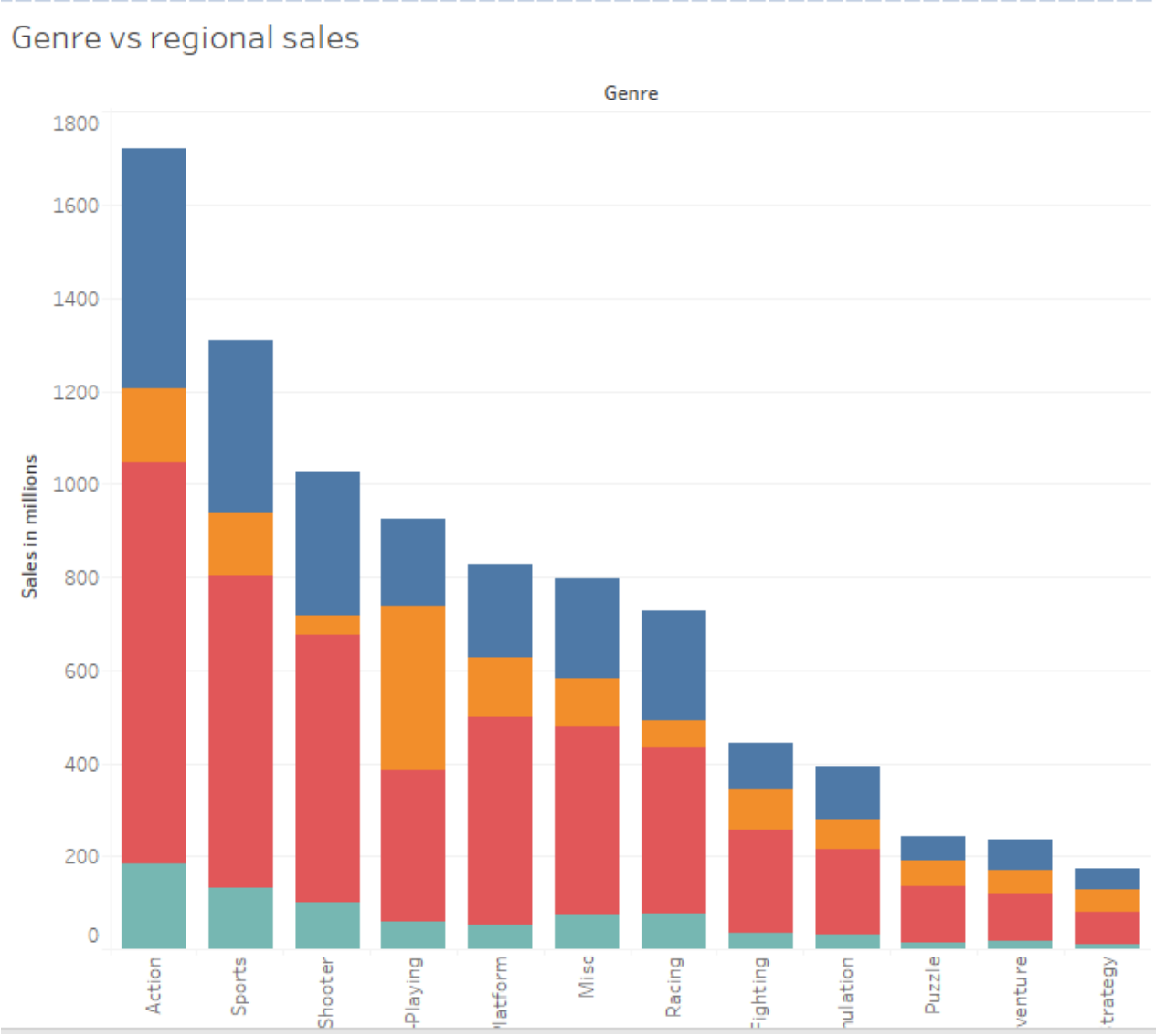
The first visualization begins with the tree map, depicting hierarchical data through nested rectangles. Each rectangle's size corresponds to the number of sales, offering a quick visual indicator of a genre's success on different gaming platforms. This interactive tool empowers users to explore deeper by clicking on each square, revealing additional metrics behind each genre. Placing these visualizations side by side facilitates easy comparison, improving the user's ability to identify the most successful platforms.



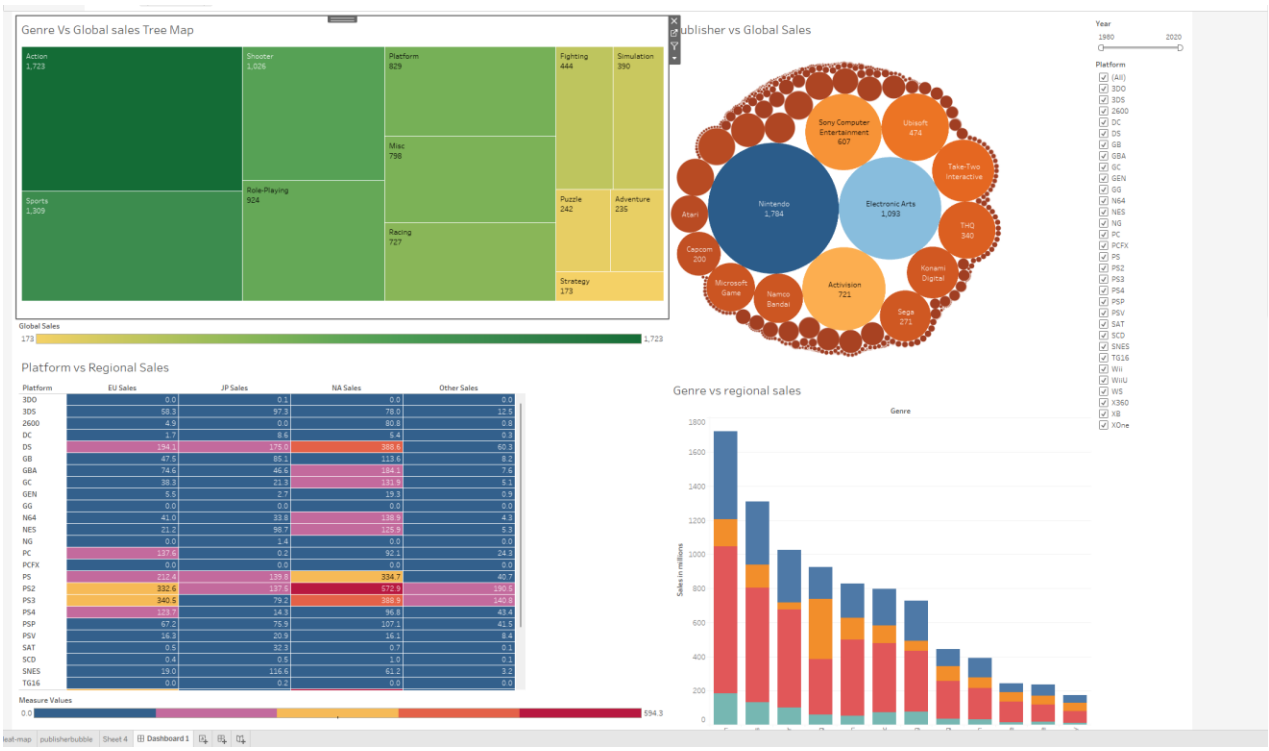
The heat map with a fresh perspective, using regional sales data by platform. Its uniform visualization, in contrast to the clustered bar chart, employs a straightforward color scale to highlight top-selling platforms. This choice simplifies the process of determining the leading platforms, providing a clear picture of which platform is dominating in sales.



The bubble chart takes the attention for portraying publishers by global sales. Its large bubbles serve as a visual hierarchy, immediately focusing on publishers with significant global sales. The interactive feature allows users to hover over each bubble, uncovering detailed information about each publisher. This visualization not only extends a comprehensive view of the video game market but also adds a layer of interactivity for a more engaging exploration.



The last chart in the lineup is the stacked bar chart, strategically chosen for its ability in efficiently conveying the regional breakdown of sales for each genre in a single view. This chart not only allows for an immediate comparison of regional sales within each genre but also offers interactivity, enabling users to drill down into specific genres or regions with a simple click. It's a dynamic tool for detailed exploration.



Merged on the Tableau dashboard, these visualizations form a consistent narrative on video game sales. Positioned for optimal understanding, the tree map and stacked bar chart sit side by side, enabling instant comparisons and revealing regional effects on genre success. At the bottom left, the heat map illustrates regional platform sales, while the bubble chart at the bottom right unveils the global sales hierarchy of publishers. Together, they create a dynamic and insightful dashboard, empowering users to navigate the intricate landscape of video game sales with clarity and precision.

Two main filters are used, one for the years and another for various platforms. The global filter for the years, like its Power BI counterpart, enables users to easily navigate through different timeframes, showing nuanced sales patterns over the years. On the other front, the platform filter grants users the freedom to selectively zero in on specific platforms. This gives users to curate their focus, perhaps determining for a closer assessment of newer platforms to make well-informed decisions in video game sales.

Discussion:

The overall power bi dashboard creates these visualizations into an organized narrative. The heatmap, clustered bar chart, pie chart, and bubble chart collectively provide a complete view of video game sales dynamics. These visualizations allow users to navigate easily, from understanding genre distribution to recognizing regional and global trends. The addition of filters further enhances user control and customization, ensuring that decision-makers can extract actionable insights from the complex data presented.

The Tableau dashboard systematically addresses key analytical inquiries through its array of visualizations, including the tree map, bubble chart, heat map, and stacked bar chart. The tree map serves as a visual guide to the dominant genre in the market, allowing users to discern which genre commands the highest sales. By manipulating global filters, users can dynamically adjust the time frame for a more nuanced exploration. Adjacent to the tree map, the stacked bar chart presents regional sales, providing an opportunity for users to delve deeper into the dominance of specific genres in particular areas. The heat map, showcasing platform performance through regional sales, offers a straightforward color scale for a quick assessment of the most successful platform in the market. The bubble chart, positioned strategically, unveils the most successful publisher through the size of the bubble, directly correlating with sales figures. This dynamic visualization provides a clear hierarchy, aiding users in identifying the key players in the industry. Overall, the Tableau dashboard delivers comprehensive insights by skillfully employing diverse visualizations, enabling users to explore genre dominance, regional variations, and key players in the market with ease and precision.

Each of the software's had their own challenges. In tableau the struggle was trying to figure a way to get the dimensions and measurements correct when trying to create the chart.

Creating the heat map in tableau was a lot easier than that in power bi. Power Bi at first had to change a lot of different things from the conditional formatting to the size of the chart. In a later point I found you can just add more visualizations to the list that you start off with. In comparison to the two I think power Bi makes it harder to make highly complex visualization in comparison to tableau. The interface in tableau was easier to understand due to the drag and drop approach simplifying the creation of tables.

Conclusion:

In conclusion, exploring the field of video game sales using both Tableau and Power BI has been a great learning experience, presenting unique perspectives and challenges in visualization design. Power BI's heatmap creation presented initial challenges with conditional formatting and chart size adjustments, but its ease of adding more visualizations later proved advantageous. On the other hand, Tableau showcased its strength in creating intricate visualizations with a user-friendly drag-and-drop interface. The integration of visualizations in both platforms, such as the pie chart and bubble chart in Power BI and the tree map and stacked bar chart in Tableau, empowered users to grasp complex data dynamics. Each platform had its own set of challenges, yet the thoughtful arrangement of visual elements in the dashboards, coupled with the use of filters, provided users with actionable insights and a holistic understanding of video game sales. In the end, the choice between Tableau and Power BI may depend on specific preferences and project requirements, but both tools proved instrumental in transforming data into accessible narratives.

Links:

PowerBI dashboard:

https://app.powerbi.com/groups/me/reports/7f0948d9-7047-4f43-828e-f62df074d1f6?ctid=9fa4f438-b1e6-473b-803f-86f8aedf0dec&pbi_source=linkShare

Tableau dashboard:

https://us-west-2b.online.tableau.com/t/tmuamar/views/Project3/Dashboard1?:origin=card_share_link&:embed=n

References

1. Smith, G. (2016, October 26). Video game sales. Kaggle. https://www.kaggle.com/datasets/gregorut/videogamesales
2. Understanding and using tree maps. Tableau. (n.d.). https://www.tableau.com/datainsights/reference-library/visual-analytics/charts/treemaps
3. Liu, M. (2020, August 24). 2 - data exploration. Machine Learning Blog | ML@CMU | Carnegie Mellon University. https://blog.ml.cmu.edu/2020/08/31/2-data-exploration/
4. YI, M. (n.d.). A complete guide to bubble charts. Chartio. https://chartio.com/learn/charts/bubble-chart-complete-guide/