Exploratory Data Analysis on Video Game Sales

**What are the top-selling games globally?**

* Top 15 is made by Nintendo based off global sales so we will look at the games who are most successful that is NOT published by Nintendo
* I noticed that top 16 and after (not made by Nintendo) have a popularity in shooter and action genre so we will dive into this deeper when we analyze the genre popularity regionally.

**What regions contribute to the most global sales in all the data?**

* Majority of gamers are coming from North America (49%) then Europe (27%) then Japan (15%) then other parts of the world make up the rest of global sales which is about ~8820 million (8.8 billion)

**How have video game sales pattern trended over the years?**

* If we were to grab the average, it looks like there’s a progressing downward trend starting at 4.32 in the 1990s then to 0.4 in 2015. But this isn’t the bigger picture and there could be a few reasons for this:
  + One being that there has just not been enough data gathered in 2010s and higher when this data came out, this means that because games from the 1990s have been out for longer, we can't really see the growth patterns of the games that were released in 2010s.
  + There is also market saturation, so increased competition especially now that people are becoming more aware of video games and becoming more normalized
  + The above would also lead to diversification of genres, platforms
  + Lastly, there could be changes in Consumer Behavior: Shifts in gaming habits (e.g., moving to free-to-play or subscription models) might not be fully captured by the traditional sales metrics.
* If we were to look at the top selling game for each year:

when we look at the specific games, the ones that did best overall within their respective years, there is not really a common genre that was dominating in the industry, we can observe that there are shooters, puzzle, platform, sports games, role-playing etc. but it’s important to keep in mind that these are the top performing games so it does not represent the best when we look at the average sales for each genre (will take a look at this later). In terms of small trends over the years, there is a dominant publisher which is Nintendo from 1983 - 2010s. All those games also use Nintendo's platform which is the Nintendo or super Nintendo entertainment system. Also, if you are a big gamer, you might have also experienced that starting around the 2010s, the mainstream consoles found today such as Xbox and PlayStation have become more dominant. Not only that but also a rise in Shooters and Action can be observed. In fact, this is when people started becoming more concerned for kids and teenagers as people were saying that these violent games could have a major influence on their adolescence. It is also worth noting that the publisher Activision was responsible for making these types of games and they are still very popular today for continuing the Call of Duty Franchise.

**Are there genres that succeed better in specific regions / globally? Do regions correlate with game genre?**

* For NA: Most played: common games are Action, Sports, shooter, racing, misc Least Played: strategy, puzzle, platform
* For EU: Most played: action, sports, racing, strategy, shooter, misc Least Played: Fighting, platform, puzzle
* For JP: Most played: Role- Playing, adventure, action, sports, Fighting, strategy, misc Least Played: Racing, platform, puzzle, shooter
* For Global: Action, sports, misc, role playing Least Played: Puzzle, Strategy Fighting.

**How about trends in genre over the years? (Checked number of game titles per genre)**

* Genres in 1980 - 2000: Most Played: Sports 408, Action 272, Racing 234, Fighting 226, Role-Playing 210. Least Played: Puzzle 102, Simulation 104, Adventure 115, Strategy 139
* Genres in 2001 – 2015: Most Played: Action 2861, Sports 1857, Misc 1548, Role-Playing 1219, Adventure 1127. Least Played: Puzzle 469, Strategy 522, Fighting 596

**I then looked at the total sales compared to the number of games and the year the GENRE of game was made**

* So, I was correct in that there is way more games that people could explore starting in the 2000s. However, action and sports are very dominant and so this is probably why there is a high correlation between successfulness and most played in commonality of all the regions provided. However, what I found was good for developers was that genres like Miscellaneous and Adventure have become more popular, so it looks like people are starting to explore different types of games. Maybe this has to do with the fact that old gen consoles just did not have the capacity for handling intense games that we can see today. It is also worth noting that Puzzle, is just not what people want to do when playing games and are struggling to find success in the gaming industry. We can also see that fighting is becoming less trending.
* What I did find surprising was that no matter what, it looks like majority of the gamers always come from North America no matter what genre it is because they make up most of the total global sales. Even when it seemed like NA played genres like strategy and puzzle the least compared to other genres, they still make up majority of the gamers within those genres.
* From 1980 - 2000 vs. 2001 - 2015, when looking at the genre correlations with sales, it seems like no matter what genre it is, although some have grown more than others, all of them seem to be growing in sales revenue. An example of huge growths globally can be seen in the genres Action (660% increase), Sports (488%), Misc (813% increase), Shooter (645% increase). If we were to look at the lowest increase in values, the genres Puzzle (129% increase), Platform (138 % increase), Strategy (164%). What I think is very interesting is genres like Misc started at 87 mill and Platform started at 300 mill yet Misc is now at 700 mill while Platform only had a 100 mill increase. This means that Platform is probably stabilizing and is probably not as popular as it was back in the 1900s.

**How does platform affect game sales?**

* I grabbed the average sales for each platform and then compared this: It looks like Gameboy does have the highest average sales and old consoles like Nintendo entertainment system. But this does not really give good information for game developers today because it doesn’t tell us the years they were thriving
* To solve this, I queried and separated the years into 1980 -2000s vs 2001 – 2015 and changed it total sales because more diversity would lead to lower average: ome consoles that existed in 1980 -2000 are non-existent in 2001-2015. Also, we can see that consoles like DC, Gameboy, N64 are showing a HUGE decline in sales from 1980 -2000 vs 2001 - 2015. This is probably because developers are focusing more on the newer gen consoles. An example of this is Gameboy Advanced having total sales of 0.06 million compared to Game Boy 245.18 million in 1980-2000 but in 2001 -2015, Gameboy Advanced is now 313.5 while regular game boy dropped to 9.24 million. Speaking of newer-gen consoles, we can also see that although the newest gen in the data like PS4 and Xbox One have a much lower sales total compared to their older counter part PS3 and Xbox 360, we have to keep in mind that the newer consoles are were only released in 2013 compared to their 2006 versions. This means that they haven't had as much time to grow in the market and so If we had more accessible data, the numbers would be much different.
* Another thing to keep in mind is that PC (Personal Computers) is its “own thing” and will not be replaced by another generation. Additionally, there has a been a huge growth in sales from 54 -> 197 million which means that there has been a steady growth over time. This could be a safe investment as we know that there is no system replacing PC anytime unlike the 2600 console which was popular from 1980 -2000s but is just not converting anymore sales since it is probably outdated.

**Do certain platforms have higher sales in specific regions (e.g., Xbox in NA, PlayStation in EU)?**

- When I looked at the highest global sales, It looks like there is a very recurring

pattern of NA sales always making up the highest percentage then EU then Japan.

- For Japan: There were actually platforms that JP had 100% sales in which could mean that it was a console exclusive to Japan (after doing some research I was correct that they were released in Japan) or was just not popular because the ones with 100% Japan sales only had total global sales of 0.03 - 1.5 million which is not very significant. However, if we look at the SUPER Nintendo ES, it makes up 200 million global sales and majority of about 60% of sales actually come from Japan users. However, for the normal Nintendo entertainment system majority of 60% were NA users. Lastly, it looks like Japan users weren't a fan of or weren't familiar with 2600 (0%), PC, Xbox, PlayStation or Wii/U since they make up less than 10% of those sales. I found that Japan is very involved when it comes to old gaming consoles that were made before the 2000s.

- For Europe: They make up the majority of PC Users which is 54%. But for the PlayStation, EU and NA seem to be approximately the same for PS3 and PS4 around the 40% range. Also, for the Xbox One, I found that only NA used the Xbox (23%) and Xbox 360 (28%) but when the Xbox One came around, the EU sales actually rose to 33% so there is an increase of Xbox users as time goes on.

- For North America: We have that they are big 2600 fans (93%). They are also big Xbox fans as they make up more than or equal to 60% of sales no matter what Xbox version it is. I think they only started decreasing percentage just because EU is starting to use it more as well.

-It looks like the PSVita, PSP sales were actually similar among the three regions. This is inconsistent in terms of PlayStation gaming consoles with how the PS2, PS3 and PS4 are being used by NA and EU mostly. Maybe this had to do with the portability of the consoles.

**How do games that launched on multiple platforms compare to exclusives in terms of sales?**

* Average Sales Per Game:

Multi-platform games tend to perform much better on a per-game basis, with an average of 1.69 million copies sold compared to only 0.49 million for exclusives.

* Number of Games:

There are significantly more platform-exclusive games (8643 titles total) than multi-platform games (2717 titles total).

-Total Sales Comparison: Despite having fewer multi-platform titles, their higher average sales allow them to achieve a slightly higher total global sales figure (4604.01 million) than the platform-exclusives (4216.34 million).

- Multi-platform releases seem to be more successful individually, this suggests that this is likely because releasing on multiple platforms gives them access to a larger audience. Platform exclusives are more common, but each game generally sells less on average.

- Market Implications: The data suggests that multi-platform releases are a strong strategy for achieving high sales per title. Conversely, while platform exclusives individually sell less, the sheer volume of exclusives still makes them a significant part of the overall market.

- Cost and Risk: Multi-platform development can be more expensive and riskier, but this data indicates it may pay off with higher sales per title.

**Addressing The Business Task**

1. Selecting the Best Game Genres

- The Shooter, Action, and Sports genres have some of the highest sales numbers.

- Role-Playing (RPG) and Adventure games tend to have dedicated but niche audiences.

- Misc is showing an insane growth which could mean that genre doesn't even matter to people these days. This could suggests that original games are the way to go, and people will play something as long as they have not seen it before and they want to try something new.

- Although Puzzle, Simulation, and Strategy games often see lower sales but could succeed in mobile markets.

**2**. Although PlayStation and Xbox gaming is growing, so is PC. It's better to focus on things that have not yet shown full growth in the market but only starting to show a rise. There is much more diversity on PC nowadays and in terms of genres and if gaming devs were to focus on something in the Miscellaneous genre, this platform is probably what they should focus on. Then afterwards, they should expand to specific consoles like Xbox and PC. The PC market is growing, with a growing player base and generally, it is considered easier to publish a game on Steam or other launchers on PC rather than on a console, since that requires more permission.

3. With games releasing over the years, comes with more advanced and different games which means more competition. This means that it is better to focus on a single game that developers are passionate about and work hard on it. I discovered that people are playing any genre nowadays compared to before the 2000s since all the genres are experiencing a profit in sales. Therefore, developers need to focus on **Long-Term Sustainability** **& Creativity:** As mentioned, the number of games being released is increasing over time, which lowers the average sales per game. Standing out in a crowded market is becoming more challenging.With market saturation increasing, games that innovate and refine gameplay mechanics stand out.Well-polished games with strong community support have better longevity. This can be done with publicity such as social media and listening to the players / community’s suggestions