**WHAT IS THE IMPACT OF THE COVID-19 ON THE WORLDWIDE VIDEO STREAMING MARKET?**

|  |
| --- |
| *Hasan E. Guray* |
|  |
| MSc Data Science and Analytics student |
| University of Westminster |
| w1948912@my.westminster.ac.uk |

ABSTRACT

This research paper presents an exploratory data analysis and visualization study using Power BI to investigate the profound impact of the COVID-19 pandemic on the global video streaming market. The study analyses data obtained from Statista, exploring key metrics such as subscription trends, user penetration rate, and market revenues during and after the COVID-19 outbreak. Through 15 different graphs, the research delves into shifts in user behaviour, industry trends, and financial implications for streaming platforms, providing valuable insights for industry stakeholders to adapt their strategies and maintain a competitive edge in the transformed digital entertainment landscape.

**Keywords**: COVID-19, Video Streaming Market, Exploratory Data Analysis, Data Visualization, Power BI, User Behaviour, Subscription Trends, Market Revenues.

# Research question

The global video streaming market underwent a major transformation during the COVID-19 pandemic due to strict lockdowns and social distancing. As traditional entertainment venues shut down, like cinemas and live event spaces, people embraced streaming platforms as their main entertainment source. This shift boosted demand, subscriptions, and viewership on major platforms. To meet this demand, the industry invested in content, tech upgrades, and diverse offerings. However, regional variations emerged due to internet access, socio-economic gaps, and local regulations influencing the pandemic's impact on the streaming market.

The COVID-19 pandemic further hampered video streaming content production and distribution. Filming schedules were postponed, and sets temporarily closed, causing release delays and altered production methods. The industry countered by adopting remote or virtual production techniques. These interruptions deeply influenced the industry, compelling stakeholders to revamp strategies and operations. This study comprehensively analyzes the pandemic's influence on the global video streaming market by scrutinizing market signals, consumer conduct, and industry patterns. The research uncovers the pandemic's profound impacts and enduring consequences for content makers, distributors, and viewers.

# Data acquısıtıon

Undoubtedly, data is needed to apply the necessary comparisons and analyses. While this data should explain the progress of the industry worldwide, it should also reveal country and company-based changes. As a result of intensive source analysis, it was decided that Statista has the most reliable and comprehensive data. (<https://www.statista.com/outlook/dmo/digital-media/video-on-demand/video-streaming-svod/worldwide?currency=USD> accessed by 15 July 2023)

The relevant data was quite regular and up-to-date. The source of the data, which was last edited on June 17, 2023, was Statista Market Insights. The screenshot of the Revenue sheet of the data in xlsx format, which contains many tables. (Figure 1)

A screenshot of a spreadsheet

Description automatically generated

**Figure 1** *This is a screenshot of Statista video streaming market insights data*

The analysis focuses solely on Subscription-based Video-on-Demand services like Netflix and Amazon Prime Video, excluding Ad-supported services, Pay-per-view offerings, and Pay-TV subscription-dependent services like HBO Go. This deliberate scope ensures a concentrated market insight. The dataset comprises six distinct sheets as Intro, Revenue, Users, Global Comparison, Key Players, and Key Market Indicators. Enabling multifaceted exploration of the research question, the data covers the span of 2017-2022, with projections extending beyond 2023, derived from historical trends and diverse indicators.

The Intro sheet introduces the market's inclusion criteria, delineates the Video Streaming or Video Demand market, and defines its parameters. The Revenue sheet elaborates on market revenue in USD, charting its evolution over time and delineating revenue derived per user. Meanwhile, the Users sheet displays total user count, penetration rate, and user distribution based on different services. In the Global Comparison sheet, a country-wise revenue breakdown and penetration rate analysis provide a comprehensive view. Key Players sheet offers insights into the annual revenue of the top 10 companies in the market. Lastly, the Key Market Indicators sheet furnishes demographic and general data such as population, households, and consumer spending, contributing essential contextual information that impacts the entire dataset.

# Preparation

Power BI was used for exploratory data analysis and visualization, as it provides a very useful and convenient opportunity in terms of user experience, and data preparation operations can be seen with the Power Query support in its background. In addition, the Power BI preference was supported by the ability to collect all graphics on one page and perform filtering operations with the help of a slicer.

Since the dataset consists of many independent tables, it is necessary to create a separate query for each visualization. In addition, since there are multiple tables in a sheet, operations such as row and column deletion are required for these tables to be included in separate queries. Since the relevant units are different in each table (in million, in billion, and percent), these need to be standardized. This is done with the support of Power BI's Custom Formula. In addition, some tables use the Transpose functionality to reduce the number of columns and collect the years in a column. Since the rate of change by years, which is a critical point for the related research question, is not for every perspective, Index and Custom Formula functionality are used in the preparation of these. With the completion of all preparation processes, the dataset comes to the stage where exploratory data analysis can be done. And since the important time period for this research question is 2017-2022, data from 2023 and later (projection) were filtered out.

# Exploratory Data Analysis (NARRATIVE) and Visualizations

Examining the Covid-19 impact on the Video Streaming Market requires a historical overview. Advancements in technology and the proliferation of devices like TVs, game consoles, computers, tablets, and smartphones have fostered a rising trend in platform usage. Amid this backdrop, assessing the pandemic's influence, particularly in 2020-2021, becomes crucial. Parsing the dataset provides these insights.

Undoubtedly, revenue serves as a pivotal gauge of corporate performance and investment efficacy. A holistic grasp of the macroeconomic scenario demands an initial exploration of total market revenue. The Video Streaming sector witnessed remarkable expansion, soaring from $28 billion in 2017 to $81 billion in 2022, nearly tripling its initial value (Figure 2). However, the fluctuating annual growth rates within this upward trajectory present limitations in fully capturing the pandemic's effects.

A graph with numbers and a line

Description automatically generated

**Figure 2** *This is a screenshot of the Total Market Revenue line graph from Power BI*

The Market Revenue Growth graph analysis reveals a significant surge in the past five years, with 2020 standing out, boasting a remarkable 34.56% increase (Figure 3). This surge, compared to 2019's 27.43%, highlights the pandemic's positive impact on the industry. However, the expected growth wasn't achieved in 2021. Despite a continuing upward trend, the growth rate settled at 24.36%, lower than 2019. This could be due to the unexpected market acceleration in the previous year. 2020, marked by the pandemic, proved advantageous for Video Streaming platforms in terms of market revenue performance.

A graph with numbers and a red line

Description automatically generated

**Figure 3** *This is a screenshot of the Total Market Revenue Growth bar graph from Power BI*

Regarding revenue, an alternative perspective involves assessing average revenue per user—a pivotal metric offering insights for industry progress. Amid a changing landscape of expanding revenue and user counts, boosting user-based revenue becomes a key goal. Over the past five years, the average revenue per user consistently grew (Figure 4). Starting at $45.14 in 2017, it reached $60.25 during the pandemic and surged to $69.95 in 2022. This upward trend suggests resilience against pandemic effects; yet, a closer look at the growth rate is vital.

A graph with numbers and a line

Description automatically generated

**Figure 4** *This is a screenshot of the Average Revenue per User line graph from Power BI*

The Average Revenue per User metric displays consistent change rates over the years (Figure 5). Notably, a conspicuously linear trend is evident in the chart. Despite change rates hovering around 10%, no significant increase is observable during the pandemic period. The most substantial growth rate in the past five years occurred from 2018 to 2019, with a notable 10.46% advancement. However, the pandemic led to a decline in the growth rate, reaching 6.89% in 2022. This outcome may stem from strategic user expansion initiatives, but a comprehensive user count analysis is essential to validate this notion.

A graph with numbers and a number of squares

Description automatically generated

**Figure 5** *This is a screenshot of the Growth of Average Revenue per User bar graph from Power BI*

User count stands as a crucial gauge alongside revenue, illuminating the industry's vitality by revealing audience reach, product integration in lives, and customer connection. Each user acts as a potential driver for expansion, amplifying revenue and nurturing a cycle of growth. The Video Streaming sector notably surged from 0.61 billion users in 2017 to an impressive 1.16 billion in 2022 (Figure 6), almost doubling its user base. Despite pandemic challenges, a detailed analysis of change rates over time will provide a comprehensive understanding of its full impact. This surge of 0.55 billion new users embracing the Video Streaming market underscores its enduring development.

A graph with numbers and a line

Description automatically generated

**Figure 6** *This is a screenshot of the Total Users line graph from Power BI*

User count fluctuations over the years highlight the pandemic's impact on the Video Streaming market. Annual variations in user count peaked at 22.65% in 2020, aligning with the pandemic's onset (Figure 7). Though not sustained in 2021, notable growth of 14.94% was achieved. Post-pandemic, user count growth receded to 3.02% in 2022. The Total Users Growth trend underscores external events like the pandemic shaping user expansion in the Video Streaming market.

A graph with numbers and a bar

Description automatically generated

**Figure 7** *This is a screenshot of the Growth of Total Users bar graph from Power BI*

The dynamics of the number of users, while indeed an illuminating metric for the Video Streaming market, also serve as a crucial determinant of how effectively companies within the sector can attain their objectives. A vital aspect in this context is the penetration rate, which offers valuable insights into the extent to which the targeted customer audience is reached (<https://www.sortlist.com/blog/penetration-rate/?repeat=w3tc#:~:text=your%20penetration%20rate%3A-,Penetration%20rate%20%3D%20(Number%20of%20consumers%20or%20users%20or%20customers%20%2F,by%20that%20product%20or%20service> accessed on 5 August 2023). This metric assumes paramount significance in a market characterized by high user volumes and the potential for direct user engagement. The penetration rate exhibited a noteworthy growth of 8.47% in 2017, surging to 15.24% in 2022 (Figure 8). Remarkably, the onset of the pandemic in 2020 witnessed the most substantial leap within the last five years, ascending from 10.80% to 13.11%. This progress represents the most significant improvement observed in the preceding quinquennium, amounting to an impressive 21.41% (Figure 9). Thus, the penetration rate metric reinforces the positive impact of the pandemic on the Video Streaming market.A graph with numbers and a line

Description automatically generated

**Figure 8** *This is a screenshot of the Penetration Rate line graph from Power BI*

A graph with blue squares

Description automatically generated

**Figure 9** *This is a screenshot of the Penetration Rate Growth bar graph from Power BI*

The assessment of the pandemic's influence on the market is typically accomplished through a holistic examination of all services in unison. However, scrutinizing individual services that constitute the market's dynamics presents an opportunity to explore their effects on a micro-scale. An appraisal of the subscriber counts at the end of 2022 reveals that Netflix, boasting 221 million subscribers, held the position of the Video Streaming service with the highest subscriber count, followed closely by Amazon Prime Video with 208 million subscribers (Figure 10). While there exists a considerable disparity between these two services and the others, Disney+ secures a respectable third place. Notably, the majority of services experienced an augmentation in their subscriber base during the pandemic's impact, except iQIYI, which encountered a decline of approximately 5 million subscribers (Figure 11). Nevertheless, the pandemic era has proved opportune for compensating for this shortfall, especially for Netflix and Amazon Prime Video. HBO Max (https://variety.com/2020/digital/news/hbo-max-launch-date-price-streaming-1234585776/ accessed by 20 July 2023) and Apple TV+ (<https://www.apple.com/newsroom/2019/09/apple-tv-launches-november-1-featuring-originals-from-the-worlds-greatest-storytellers/> accessed by 20 July 2023), both launched in early 2020, Disney+(<https://thewaltdisneycompany.com/disney-launches-today-and-a-new-era-of-disney-entertainment-begins/> accessed by 20 July 2023) launched in late 2019 and despite the inability to precisely measure the pandemic's effect, they have demonstrated progress by augmenting their subscriber counts since their respective launch dates. Collectively, the pandemic has manifested a predominantly positive impact on nearly all Video Streaming services in terms of subscriber count.

A colorful squares with white text

Description automatically generated

**Figure 10** *This is a screenshot of Subscriber by Service treemap from Power BI*

A graph of different colored lines

Description automatically generated

**Figure 11** *This is a screenshot of the Subscribers Trend by Service line graph from Power BI*

Examining subscriber counts in services yields valuable insights, yet their destiny is intertwined with the economic status of their parent companies, reflected primarily in revenue figures. While subscribers and revenue correlate, differences in fees, promotions, and offerings create revenue disparities. It's crucial to recognize that companies are multifaceted, so revenue differences may not solely stem from Video Streaming performance.

In assessing 2021's revenue rankings, Netflix leads in subscribers but ranks 7th in revenue (Figure 12). Amazon, Apple, and Alphabet, associated with YouTube Premium, top revenue generation. Despite Netflix and Amazon's top subscriber ranks, Netflix's revenue is just 6.3% of Amazon's. This gap arises from Amazon, Apple, and Alphabet's diversified interests, where Video Streaming is one part. In contrast, Video Streaming is Netflix's core and primary income source. Thus, revenue assessment may not fully capture the pandemic's impact, as it overlooks Video Streaming's exclusive importance.

A blue and white bar chart

Description automatically generated

**Figure 12** *This is a screenshot of the Worldwide Top Company Revenues funnel graph from Power BI*

The comprehensive examination and synthesis of global insights and analyses undeniably offer valuable information concerning the macroeconomic landscape. However, for a thorough understanding of the pandemic's impact, meticulous examination of each country individually becomes imperative, as the repercussions of the pandemic exhibit unique nuances within each national context. In the context of revenue-based analysis, the United States of America emerges as the paramount contributor to the Video Streaming market's revenue, closely followed by China. The disparity between these two nations and the rest of the countries is of such magnitude that when applying conditional formatting, the remaining countries appear homogenously crimson, signifying their substantial revenue gaps in comparison (see Figure 13). Though not readily apparent in color tone on the map, the United Kingdom holds the third position in revenue generation, a noteworthy distinction amid this prominent revenue dichotomy among nations.

A map of the world

Description automatically generated

**Figure 13** *This is a screenshot of Global Revenue Comparison by Country filled map from Power BI*

Upon conducting separate country-level analyses, it becomes apparent that revenue witnessed an increase in all the countries scrutinized by Statista during both 2020 and 2021 when compared to the preceding year. Nevertheless, a nuanced examination of the revenue growth rates over these years reveals that not all countries experienced an escalated pace of development. Specifically, when scrutinizing the revenue growth rates obtained from the Video Streaming market for the year 2020, juxtaposed against the figures from the preceding year 2019, it is revealed that 88 out of 149 countries observed an increase in growth rate. Conversely, 61 countries exhibited a continued growth trajectory, albeit at a diminished pace (Figure 14). As a result, it becomes evident that the pandemic directly impacted revenue growth positively in 59.06% of the countries during 2020. However, this phenomenon did not persist into 2021, as no country exhibited an acceleration in the rate of increase beyond that observed in 2020.

A green and red circle with a number of percentages

Description automatically generated

**Figure 14** *This is a screenshot of the Growth Change of Countries by Revenue in the 2020 pie chart from Power BI*

The significance of revenue as the primary metric for Video Streaming services necessitates a more granular country-wise analysis to discern the most successful nations, accounting for their relative contributions proportionate to their population sizes. A judicious approach involves conducting a penetration rate analysis, which aptly accommodates population-based normalization. In this context, the United States emerges as the vanguard, mirroring its top ranking in terms of revenue generation (Figure 15). Following suit, Canada and Norway secure second and third positions, respectively, in the User Penetration Rate metric. Remarkably, the United Kingdom, positioned third in the Revenue ranking, assumes a seemingly modest sixth rank in User Penetration Rate. In a contrasting trajectory, China, claiming the second rank in the Revenue ranking, regresses to the 18th position when gauged based on penetration rate. These findings underscore the intrinsic link between revenue performance and population dynamics, delineating a more comprehensive and insightful appraisal of the Video Streaming market's success across different countries.

A blue and white bar chart

Description automatically generated

**Figure 15** *This is a screenshot of the Global User Penetration Rate by Country bar chart from Power BI*

The optimal approach to discern the pandemic's impact on User Penetration rates in a country-specific context entails meticulous scrutiny of growth rates. Specifically, an examination of growth rate differentials in 2020 vis-à-vis the preceding year unveils that 126 countries witnessed an accelerated growth pace during this period (Figure 16). In contrast, the remaining 23 countries experienced a curtailed growth rate as a consequence of the pandemic's influence. Stated differently, the pandemic had a favorable impact on 84.56% of the countries, signifying a substantial proportion of the user penetration rate. These findings substantiate the pandemic's influential role in shaping user penetration dynamics across the majority of countries, thus warranting a nuanced understanding of the localized variations in User Penetration Rate during the pandemic era.

A green and red circle with numbers and a red circle

Description automatically generated

**Figure 16** *This is a screenshot of the Growth Change of Countries by User Penetration Rate in the 2020 donut chart from Power BI*

# Conclusion

The global video streaming market underwent a seismic transformation in the aftermath of the COVID-19 pandemic, reshaping consumer behaviour and industry dynamics alike. Lockdowns and distancing measures led to an unprecedented surge in demand for streaming services, resulting in an exponential rise in subscriptions and revenue growth. A comprehensive analysis of key metrics, including subscription trends, user penetration rates, and market revenues, illuminated the far-reaching effects of the pandemic, offering invaluable insights for industry stakeholders. The pivotal year of 2020 witnessed unparalleled expansion, characterized by soaring revenues and an expansive user base, painting the economic landscape in vivid hues of success. However, as 2021 brought gradual normalization, a momentary deceleration in growth followed, a natural ebb after the feverish sprint. These fluctuations underscored the industry's adaptability and resilience in the face of adversity. In essence, the COVID-19 pandemic left an indelible mark on the video streaming landscape, prompting an era of transformation and providing enduring lessons that will navigate the path ahead amidst the ever-evolving realm of digital entertainment.

references

*Video Streaming (SVoD) - Worldwide* (no date) *Statista*. Available at: https://www.statista.com/outlook/dmo/digital-media/video-on-demand/video-streaming-svod/worldwide?currency=USD (Accessed: 15 July 2023).

Lebail, M. (2021) *Penetration Rate – Definition, Examples, and How to Calculate It in 2022*, *Sortlist Blog*. Available at: https://www.sortlist.com/blog/penetration-rate/?repeat=w3tc#:~:text=your%20penetration%20rate%3A-,Penetration%20rate%20%3D%20(Number%20of%20consumers%20or%20users%20or%20customers%20%2F,by%20that%20product%20or%20service (Accessed: 05 August 2023).

Release, P. (2019) *Apple TV+ launches November 1, featuring originals from the world’s greatest storytellers*, *Apple Newsroom*. Available at: https://www.apple.com/newsroom/2019/09/apple-tv-launches-november-1-featuring-originals-from-the-worlds-greatest-storytellers/ (Accessed: 20 July 2023).

*Disney+ Launches Today—and a New Era of Disney Entertainment Begins* (2019) *The Walt Disney Company*. Available at: https://thewaltdisneycompany.com/disney-launches-today-and-a-new-era-of-disney-entertainment-begins/ (Accessed: 20 July 2023).

Spangler, T. (2020) *HBO Max Sets Official Launch Date*, *Variety*. Available at: https://variety.com/2020/digital/news/hbo-max-launch-date-price-streaming-1234585776/ (Accessed: 05 August 2023).