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

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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 COVID-19 pandemic had a profound impact on the worldwide video streaming market, driven by the implementation of strict lockdown measures and social distancing guidelines. With the closure of traditional entertainment venues, such as movie theatres and live event spaces, consumers turned to video streaming platforms as their primary source of entertainment. This shift in consumer behaviour resulted in a significant surge in demand for streaming services, leading to increased subscriptions and viewership across major platforms. The industry responded by investing in expanding content libraries, improving technological infrastructure, and diversifying offerings to cater to evolving consumer needs. However, the effects of the pandemic on the video streaming market varied regionally and were influenced by factors such as internet connectivity, socio-economic disparities, and regional regulations.

The COVID-19 pandemic also disrupted the production and distribution of video streaming content. Filming schedules were delayed, and production sets were temporarily shut down, resulting in content release delays and changes in production methods. The industry adapted to these challenges by embracing remote or virtual production approaches. These disruptions had a profound impact on the overall industry landscape, prompting stakeholders to adjust their strategies and operations. This research seeks to provide a comprehensive analysis of the pandemic's impact on the worldwide video streaming market. By examining market indicators, consumer behavior, and industry trends, the study aims to reveal the transformative effects of the pandemic, as well as the lasting implications for content creators, distributors, and consumers.

# 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

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

In the scope of the data, Subscription-based-Video-on-Demand services, e.g. While Netflix and Amazon Prime Video are included, Ad-supported services, Pay-per-view offerings, or Services that require a Pay-TV subscription (e.g. HBO Go) are not included. This provides the opportunity to examine the data of the fully focused market insight. The data, which consists of 6 different sheets named Intro, Revenue, Users, Global Comparison, Key Players, and Key Market Indicators, allows the research question to be answered from different perspectives. While all data covers the years 2017-2017, the year 2023 and beyond is obtained as a result of the projection obtained as a result of forecasting based on past data and various indicators. In the intro sheet, the markets that are or are not in the scope of the data are mentioned, while the Video Streaming or Video Demand market is explained. In the Revenue sheet, the revenue of the market in USD, its change over the years, and user-based revenue are explained. On the Users sheet, there are the total number of users, penetration rate, and service-based user distribution of the market. In the Global Comparison sheet, the country-based revenue and penetration rate situation is clarified. In the Key Players sheet, the revenue amount of the top 10 companies in the market by year is in dollars. Finally, the Key Market Indicators sheet contains demographic and general data such as population, households, and consumer spending, which may affect all other tables.

# 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

In order to analyze the impact of Covid-19 on the Video Streaming Market, it is first necessary to examine the course of the market over the years. Undoubtedly, with the development of technology, the number of TVs, game consoles, computers, tablets, and smartphones has increased the possibility of using video streaming platforms. Therefore, it is inevitable to see an increasing trend in general. However, how has this increase been affected, especially in 2020 and 2021, when the pandemic has picked up? To answer this question, it is necessary to analyze the dataset.

Undoubtedly, revenue stands as a pivotal metric in gauging corporate performance and assessing the efficacy of investments. To comprehensively analyze the macroeconomic landscape, a preliminary investigation into the aggregate market revenue is imperative. The Video Streaming industry experienced substantial growth, surging from 28 billion dollars in 2017 to 81 billion dollars in 2022, nearly tripling its initial value. (Figure 2) Notably, this upward revenue trend exhibits annual fluctuations in growth rates, thereby limiting the chart's capacity to fully capture the pandemic's impact.

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

Upon analyzing the Revenue Growth graph, it becomes evident that the most substantial advancement in the past quinquennium occurred in 2020, exhibiting a remarkable surge of 34.56% (Figure 3). This noteworthy upswing from the 27.43% figure in 2019 underscores the positive impact of the pandemic on the industry. Nonetheless, the anticipated growth percentage was not attained in 2021. While the ascending trend persisted, the revenue growth rate lagged behind that of 2019, settling at 24.36%. This phenomenon may have been attributed to the unforeseen market acceleration experienced in the preceding year. In sum, the year 2020, coinciding with the outbreak of the pandemic, proved to be advantageous for Video Streaming platforms in terms of total market revenue performance.

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

Concerning revenue, an alternate perspective involves assessing the average revenue per user, which serves as a crucial performance metric offering valuable insights for industry advancement. Within an evolving landscape characterized by both expanding total revenue and varying user counts, the pursuit of augmenting user-based revenue becomes an inevitable objective. Examining the temporal trend over the last five years, it is evident that the average revenue per user demonstrates consistent year-on-year growth (Figure 4). Specifically, the average revenue value escalated from $45.14 in 2017 to $60.25 during the pandemic year and further surged to $69.95 in 2022. This persistent upward trajectory implies a certain resilience against adverse effects from the pandemic; however, closer scrutiny of the rate of increase remains imperative.

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

The Average Revenue per User indicator exhibits a remarkable consistency in the rate of change over the years. (Figure 5) Notably, the Average Revenue per User chart demonstrates a conspicuously linear trend. Although the change rates exhibit proximity, hovering around the vicinity of 10%, no discernible increase is evident during the pandemic period. The most substantial growth rate observed within the past five years occurred during the transition from 2018 to 2019, with a notable advancement of 10.46%. However, with the advent of the pandemic, the rate of development witnessed a decline, tapering down to 6.89% in 2022. It is plausible that this outcome was realized through strategic initiatives targeting user expansion; nevertheless, a comprehensive analysis of the user count is indispensable to validate this conjecture.

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

The number of users serves as a paramount indicator alongside revenue, shedding light on the sector's vitality by elucidating the extent of audience reach, product integration into individuals' lives, and customer association. Each user represents a potential catalyst for further expansion, as an augmented customer base positively impacts revenue generation, fostering a virtuous cycle of growth. Notably, the Video Streaming market has exhibited remarkable progress over the past five years, surging from 0.61 billion users in 2017 to an impressive 1.16 billion users in 2022 (Figure 6). This momentous increase of 0.55 billion new users embracing companies within the Video Streaming market has nearly doubled the user count over the specified period. Notwithstanding the continued development amid the pandemic, a nuanced examination of the rate of change over the years will enable a comprehensive assessment of the pandemic's complete impact.

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

The fluctuation in the number of users over the years emerges as a pivotal indicator elucidating the positive impact of the pandemic on the Video Streaming market. The annual variation in user count, which stood at 12.92% during the transition from 2017 to 2018, attained its pinnacle within the last quinquennium at 22.65% in 2020, coinciding with the onset of the pandemic (Figure 7). Although this surge was not sustained in 2021, a notable growth of 14.94% was still achieved. Subsequently, in the post-pandemic phase, the rate of user count increase receded, dwindling to a modest 3.02% in 2022. Total Users Growth trend collectively underscores the complex interplay of external events, such as the pandemic, in shaping the dynamic trajectory of user expansion within the Video Streaming market.

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**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. This metric assumes paramount significance in a market characterized by high user volumes and the potential for direct user engagement. As described in the referenced source (https://www.sortlist.com/blog/penetration-rate/#:~:text=your%20penetration%20rate%3A-,Penetration%20rate%20%3D%20(Number%20of%20consumers%20or%20users%20or%20customers%20%2F,by%20that20%3D%20(Number%20of%20consumers%20or%20users%20or%20customers%20%2F,by%20%20product.20%)), 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%. Thus, the penetration rate metric reinforces the positive impact of the pandemic on the Video Streaming market.A graph with numbers and a line

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

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**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.

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

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

The examination of subscriber counts in services offers valuable insights into their overall performance. However, the ultimate fate of these services is intrinsically tied to the economic standing of the companies to which they are affiliated, primarily reflected in their revenue figures. Although subscriber counts and revenue share a direct proportionality, variations in subscription fees, promotional strategies, and the range of offerings may cause revenue disparities across services. Moreover, it is essential to acknowledge that companies are multifaceted entities and differences in revenue might not solely be attributed to the performance of their Video Streaming services.

In scrutinizing the revenue ranking of the leading companies by the end of 2021, Netflix, which tops the service subscriber ranking, occupies the 7th position in terms of revenue (Figure 12). The top three revenue-generating companies include Amazon, Apple, and Alphabet, which are associated with YouTube Premium. When analyzing Amazon and Netflix, the two services securing the top positions in the service ranking, Netflix's revenue constitutes a mere 6.3% of Amazon's. This substantial gap in revenue can be primarily attributed to the diversified business interests of Amazon, Apple, and Alphabet, with Video Streaming being only one aspect of their operations. In contrast, for Netflix, the Video Streaming market serves as its foundational purpose and primary revenue source. Hence, the assessment of companies' revenue might not yield an effective measure of the pandemic's impact, as it does not adequately encapsulate the Video Streaming market's exclusive significance.

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**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

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**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.

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**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.

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**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.

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**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 COVID-19 pandemic had a profound impact on the worldwide video streaming market, leading to a surge in demand for streaming services, increased subscriptions, and revenue growth. The analysis of key metrics such as subscription trends, user penetration rate, and market revenues revealed transformative effects during the pandemic, presenting valuable insights for industry stakeholders. While 2020 was particularly advantageous for the industry, with accelerated revenue growth and user expansion, 2021 saw a slight dip in growth.

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