USE OF BIG DATA ANALYTICS IN THE OTT INDUSTRY IN PLATFORMS LIKE DISNEY+ HOTSTAR, NETFLIX AND AMAZON PRIME

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Abstract

The maturation of OTT streaming services has led to a manifold increase in content consumption across the globe. This research makes use of big data analytics to analyse and visualize movie and show ratings across three major platforms, Amazon Prime Video, Netflix and Disney+Hotstar. By using R's ggplot2 package, the study unveils patterns related to ratings, awards, region and more. By analysing vast datasets, the providers can increase variety, make amends to the pricing model, and manage the platform in a more efficient manner. The paper also delves into the challenges faced by these platforms such as catering to a multi-lingual audience. This research aims at highlighting the important role that big data plays in shaping the future of digital media consumption.

Introduction

The exponential growth of OTT services has changed the way in which audiences consume content, leading to a massive increase in the number of movies and shows. The COVID-19 pandemic further, gave a rise to the adoption of these platforms, as consumers sought alternative ways to access entertainment during lockdowns and social distancing measures.

When giants like Amazon Prime Video, Netflix, and Disney+Hotstar compete for views, the understanding of audience preferences becomes of prime importance. By using the latest data visualization techniques, we identify correlations related to awards, demographics, language etc.

These insights help users decide which platform suits their needs the best. For OTT platforms, the analysis offers valuable feedback on content strategies and user engagement, enabling them to optimize their offerings, attract more subscribers, and improve customer satisfaction..

Literature Review

According to Yagneshkumar A. Patni & Dr. Shamina Ansari (2024) [1] international

research from 2018-2019 showed that OTT platforms were less preferred over traditional TV, with many users facing "subscription fatigue." Demographic factors like age, income, and occupation influenced OTT adoption, and by 2023, viewers still struggled to choose between TV, cinema, and OTT platforms, with Netflix and Disney+ leading. In post-pandemic India, OTT platforms were essential for releasing films when cinemas were closed, and they continue to serve non-commercial films. Youth-centric content has become a focus due to the high internet usage by younger audiences. However, regional content on OTT platforms remains underexplored, and shifting traditional TV viewers to OTT is still a challenge.

In his paper, Dr. Vishwanath Karad (2022) [2] explores movie recommender systems and the factors influencing a film's recognition, such as geographic location, genre, actor and director reputation, and the director's history. Using Exploratory Data Analysis and Tableau, the research visualizes key relationships, including the correlation between directors, movie budgets, and country of production. It also analyzes movie durations and critic reviews. The study uses various visual tools like bar graphs, scatter plots, and pie charts to depict insights, such as year-wise profit trends and voter distribution by country, revealing that the UK has the most voters for movies in the dataset.

Dr. Eknath Shankarrao Mundhe (2020) [3] explores the increasing impact of digital platforms, specifically OTT (Over-the-Top) services, on society. With affordable internet access, more people are using OTT for entertainment due to its convenience and content variety. The study tested two hypotheses, concluding that OTT positively affects society by raising awareness and shaping youth psychology. It shows that web series educate and change youth's perceptions of the social world. The research also highlights OTT's growing preference over traditional entertainment due to accessibility, affordability, and its broad content options, concluding that OTT is favourably transforming societal behaviour and perspectives.

The paper "A Study on User Perspective on OTT Platform in India" by Dr. Swati Manoj Yeole and others (2022) [4] highlights the evolution of entertainment consumption, from CDs and DVDs to OTT (Over-the-Top) platforms. The shift from cable TV to video streaming has been driven by advancements in technology and the growing demand for accessible, diverse content. Deloitte's report estimates the video streaming subscription market reached $8 billion in 2020, with smartphone usage in India expected to double by 2022, driving demand for mobile video content. The study emphasizes user-friendliness, content variety, and cost sensitivity as key factors influencing OTT adoption. It also notes that Netflix, offering international content, has the highest demand among OTT platforms. Millennials and Gen Z are not driven by peer pressure but by convenience and control over content consumption.

In their analysis, Dr. Rajendra Prasad Meena (2023) [5] explored the rapid growth of OTT (Over-the-Top) platforms in India. Indian consumers, influenced by affordable internet, smartphones, and high-quality content, are increasingly adopting OTT services. Global platforms like Netflix and Amazon Prime have gained ground, while homegrown services like Hotstar and JIO

Cinema continue to compete. The research highlights key factors driving OTT adoption, including content availability, innovation, pricing, and ad impressions, with millennials and Gen Z favouring platforms like Netflix and YouTube. The COVID-19 lockdown further boosted OTT consumption, with users preferring mobile devices for streaming. The study predicts continued growth for OTT platforms as internet access expands into rural India.

Prof. (Dr.) Surbhi Dahiya and Garima Sharma Nijhawan (2020) [6] in their research show that the COVID-19 pandemic significantly accelerated the adoption of OTT platforms, reshaping media consumption patterns globally. In India, over 87% of respondents reported increased screen time post-pandemic, with OTT platforms becoming a preferred medium over traditional TV. Key drivers included a broader content selection, flexible access, and the ability to stream across multiple devices. Netflix, YouTube, Amazon Prime, and Hotstar emerged as the top platforms. Despite concerns over high subscription costs, content overload, and lack of censorship, users appreciated the diversity, portability, and ad-free experience. COVID-19 highlighted the potential for further OTT growth, particularly in regional Indian markets, driven by evolving viewing habits.

Telladala Anusha and K. Ravi Kumar (2024) [7] in their paper titled “A Comparative Study on Top Two OTT Platforms: Amazon Prime vs. Netflix”, explore the usage and preferences of OTT platforms, specifically Netflix and Amazon Prime, among residents of Hyderabad. While Netflix leads globally with 231 million subscribers, local findings indicate Amazon Prime is more popular. The research examines factors such as age, gender, and income, concluding that these variables do not significantly influence OTT subscriptions. It reveals that 40% of users have subscribed to both platforms, with 36% finding Netflix more user-friendly. In terms of content, Amazon Prime is preferred for regional shows, while Netflix leads in categories like documentaries and stand-up comedy. The study also highlights that Amazon Prime is considered more affordable, offering additional services beyond video streaming. Both platforms engage viewers through notifications and offers, with Amazon Prime being more active in sending notifications. This research underscores that content diversity and engagement strategies play key roles in user preference and retention for OTT platforms.

The work of Dr. Amisha Gupta and others (2021) [8] explores the rapid rise of OTT (Over-The-Top) platforms in India, highlighting how Industry 4.0 and Artificial Intelligence enhance user experience through personalization and optimized content delivery. By analyzing user preferences and behaviours, OTT providers can tailor recommendations and improve service quality. The research employed exploratory factor analysis on data from 220 respondents to identify key factors influencing OTT adoption. Findings indicate that OTT platforms are evolving from traditional television, with personalization, content quality, and delivery optimization being crucial for user engagement. The study suggests that future research should consider factors like perceived risk and competitive advantage to further understand OTT adoption dynamics.

Authors Dongnyok Shi, Changjun Lee & Inha Oh (2022) [9] explore the Korean OTT market using market segmentation theory to identify profitable niches and effective content strategies. By applying a latent class regression model to survey data, the research segments Korean OTT users into three distinct submarkets based on usage patterns. The third segment, which represents about 36% of users, is identified as the most profitable niche. Key findings highlight that bundling content, including foreign shows, original series, and movies, is crucial for converting free users into paying subscribers. The study emphasizes that understanding usage behaviour and demographic characteristics is essential for targeted marketing. While providing insights into effective strategies, the research also notes limitations, such as the need for more behavioural variables and the differentiation between various OTT service types.

According to Asst. Prof. Anu Yadav and others (2021) [10] the rise of Over-the-Top (OTT) media services in India is reshaping media consumption habits, driven by technological advancements and increased internet availability. This shift is evident as users move from traditional television to OTT platforms like Netflix, Amazon Prime, Disney+ Hotstar, and others. OTT platforms offer advantages such as fewer ads, better access to international content with subtitles, and the convenience of on-demand viewing. A survey of 402 respondents revealed that while OTT platforms generally incur higher costs than television, they are preferred for their entertainment value, mobility, and content variety. Netflix is the most popular platform, followed by Amazon Prime and Disney+ Hotstar. The study found that the COVID-19 pandemic significantly increased OTT consumption, with users spending 1-3 hours daily, particularly consuming web series. Overall, the rise of OTT platforms is marked by a significant shift in content consumption patterns, with younger demographics leading the trend.

In their papers, Allu Sasikala Manoharan & K. Satya Savithri (2024) [11] analyse how the rise of Over-The-Top (OTT) streaming services has transformed entertainment consumption, particularly impacting engineering graduates and younger demographics. This study examines how OTT platforms affect students, highlighting both benefits and drawbacks. Positive aspects include access to diverse content and global cultural enrichment, while negative effects involve excessive screen time, which can lead to physical and mental health issues, social isolation, and academic performance declines. The research emphasizes that excessive OTT consumption disrupts sleep patterns, contributing to fatigue, reduced focus, and impaired cognitive abilities. The study underscores the need for parental guidance, content regulation, and healthy screen time habits to balance the advantages of OTT services with potential negative impacts on health and education.

In his research, Narayan Parab (2022) [12] explores the impact of OTT platforms on Indian youth, focusing on content, language, and cultural values. With the rise of the internet and smartphones, OTT platforms have become popular among young audiences. The study highlights concerns about the offensive language and explicit content frequently found on these platforms, which may negatively influence youth behaviour and cultural values. A survey of 100 Mumbai residents and a

review of related research revealed that while OTT platforms have significantly increased media consumption and have become popular during the lockdown, they have also been criticized for promoting obscenity. However, the study found no evidence that OTT platforms alter youth language or lead to the imitation of harmful behaviours. Instead, OTT platforms are seen as creating new cultural norms, though they do not necessarily promote destructive societal changes.

In their paper, Dr. Bob Deutsch and Steve Wong (2015) [13] find that the shift to Over-the-Top (OTT) TV is transforming how audiences consume movies and television. With the boost of mobile devices and smart TVs, real-time data analysis allows for the matching of viewer profiles to buyer profiles, enabling predictions of consumer behavior. This paper discusses the challenges and opportunities presented by big data analytics in the OTT space. Key emotional factors — familiarity, appeasement, and power — are essential for advertisers to connect with consumers, enhancing their self-expansion desires. While the vast data from OTT platforms and social media can reveal patterns in human behavior, understanding the complexity of consumer emotions and motivations is crucial. The development of new statistical techniques is necessary to manage this data effectively, but the real breakthrough will come when marketers grasp the intricacies of consumer behavior, enabling them to leverage big data for effective strategies.

In their analysis, Nirmal G K and others (2024) [14], presents a novel movie recommendation and filtering system designed for Over-the-Top (OTT) platforms like Netflix and Amazon Prime. The system addresses the challenge of selecting movies from vast databases by incorporating user-specific criteria, such as subscription availability and personal preferences. Utilizing big data analytics and MapReduce programming, the proposed system efficiently processes statistical queries and filters data across multiple platforms. Users can choose between filtering by director, scores, release year, or country, and receive tailored recommendations, even if their specific title isn't available. Key features include cross-platform capabilities, which allow for comprehensive search results, and the ability to indicate required subscriptions for recommended movies. Future enhancements aim to improve the user interface and automatic visualization, with plans to make the system open source. Overall, the system leverages advanced analytics to enhance user experience in movie selection.

In their paper titled “Big Data: Real-Time Video Streaming and Log Analytic for Improving Quality of Experience” Reza S. Kalan (2024) [15] examine the challenges of client-side adaptive bitrate algorithms in optimizing Quality of Experience (QoE) for video streaming amid network heterogeneity. It highlights how variations in network performance across different regions and times complicate the delivery of consistent video quality. The authors advocate for leveraging big data analytics and cloud computing to enhance real-time video analysis, enabling quicker decision-making and improved user experiences. They present a cloud-based ELK analytics system that captures and processes log data from multiple Content Delivery Networks (CDNs), facilitating effective monitoring of QoE and fraud detection. The proposed solution aims to optimize live video service

during peak times while reducing CDN costs by identifying and eliminating fraudulent users. Future work includes integrating machine learning to refine multi-CDN content delivery, adapting dynamically to user needs and network conditions for enhanced performance and cost efficiency.

The paper titled “A Comparative Study of OTT Market Demographic Grouping” by Akshay Rai, Arayan Kataria, Vishnupriya (2024) [16] analyze the potential viewership demographics across three distinct clusters of states in the U.S., focusing on age, gender, and employment status. Using K-means, Birch, Agglomerative, and Spectral clustering techniques, the study identifies unique demographic features within each cluster, such as a high concentration of younger male viewers in one group and older female viewers in another. The analysis highlights states and demographic groups with the highest potential viewership, providing insights into audience characteristics that can inform marketing and content strategies for streaming services. The findings emphasize the importance of advanced clustering methods and demographic data in understanding viewer behavior in the Over-the-Top (OTT) market. Ultimately, the research offers actionable insights for optimizing strategies in a dynamic industry, with a framework for future exploration of viewer preferences and trends.

Authors Aishwarya Kurre, Archana Rao (2023) [17], examine the significant role of Over-The-Top (OTT) platforms in entertainment, particularly among millennials who prefer streaming over traditional media. With OTT usage growing by nearly 50%, platforms like Netflix, Amazon Prime, and Disney+Hotstar have become essential for stress relief. The study focuses on the comparative analysis of machine learning implementations in OTT recommender systems, highlighting how these technologies can address existing challenges. It argues that collaborative filtering is more effective than content-based filtering and that incorporating diverse content features can enhance recommendation accuracy. Ultimately, the research concludes that hybrid filtering approaches—combining collaborative and content-based methods—offer the most effective solutions for understanding user preferences across various OTT platforms, thereby improving user experience and operational efficiency.

Author Eun-A Park (2019) [18] conducts an empirical analysis of business models in the Over-The-Top (OTT) video content distribution sector. It identifies five key attributes: ownership, vertical integration with content producers, platform compatibility, service type, and revenue model. Using cluster analysis on SNL Kagan’s global database of 798 OTT networks, the study reveals the most common attribute combinations. The findings indicate that ownership does not strictly correlate with business models, as diverse ownership types appear within various clusters. Notably, service types and revenue models are more closely linked, with specific revenue models preferred for different service types. Additionally, all models utilize common distribution platforms like PCs, smartphones, and tablets. The study acknowledges limitations, including the inability to analyze content types and market-specific attributes, suggesting that future research should address these gaps and explore the

evolution of OTT business models over time.

Adoption of OTT in India

The adoption of Over-the-Top (OTT) platforms in India has surged significantly in recent years, fueled by increasing internet penetration, affordable data plans, and the growing popularity of smartphones. Today, India enjoys services from over 40 OTT providers including domestic and international players like Netflix, Amazon Prime, Disney+ Hotstar, Zee5 and Eros Now. [6]. The shift from traditional cable and satellite TV to digital streaming platforms has been accelerated by factors such as convenience, on-demand access, and a wide range of content catering to diverse linguistic, regional, and cultural preferences.

Key drivers of OTT adoption in India include a young, tech-savvy population, urbanization, and an expanding middle class with disposable income. The COVID-19 pandemic further accelerated OTT growth, as lockdowns increased demand for entertainment at home.

In early 2020, Netflix received nearly 15.8 million paid subscribers as the lock-down audience had a limited number of entertainment alternatives. Moreover, similar video streaming systems inclusive of Disney+ Hotstar, Amazon Prime, and ZEE5 have also located a spike within the range of subscribers, introducing an experience of sanguinity inside the future of the Over-the-Top (OTT platforms) enterprise.[8]

However, challenges such as pricing strategies, copyright issues, and infrastructure limitations in rural areas still exist. Despite this, the OTT industry is poised to expand further, with innovative content strategies and Big Data Analytics playing pivotal roles in shaping user experiences and platform growth.

Methodologies

Data Collection

Data was collected from three major OTT platforms:

1. Amazon Prime Video: Movie dataset containing movie titles, languages, release years, IMDB ratings, and maturity ratings.
2. Disney+ Hotstar: TV Show dataset featuring awards, genres, IMDB ratings, and titles.
3. Netflix: Movie dataset containing titles, ratings, types, and dates on which the movie was added.

The read.csv() function was used to read the datasets into R.

Data Visualization

The analysis was conducted using R's ggplot2 library. This enabled us to create a variety of visualizations that were used to identify patterns and correlations between the information.

The important comparisons were:

1. Movie Name vs. Maturity Rating: Studied how viewers in multiple languages felt about how appropriate the content was
2. Title vs. IMDB Ratings: Examined the relationship between ratings, genre and content type.
3. Awards Analysis: Examined the connection between viewer ratings and awards.

4. Date Added vs. Ratings: Historical analysis of the trends for each platform Each visualization included bar charts, histograms, and point plots, all featuring a unique design to highlight essential data points to offer clarity.

Statistical Analysis

To give an overview of the datasets, descriptive statistics were generated using R's summary() and str() functions. This made it easier to comprehend the distributions and spot any irregularities or potential research areas.

Result

Maturity Ratings and Viewer Preferences: The analysis revealed that movies with higher maturity ratings tended to attract a more diverse viewer demographic. Color-coded plots indicated variations in language and regional preferences.

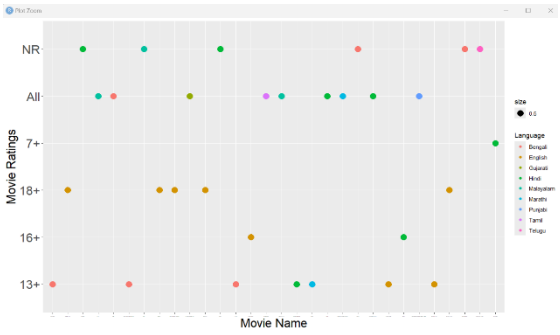
IMDB Ratings Correlation: A significant correlation was observed between IMDB ratings and awards won, suggesting that higher-rated content is often recognized in industry circles, which in turn affects viewer engagement.

Trends Over Time: The year of release analysis highlighted a growing trend in the production of high-rated content, particularly in the last five years, reflecting an industry's shift towards quality content creation.

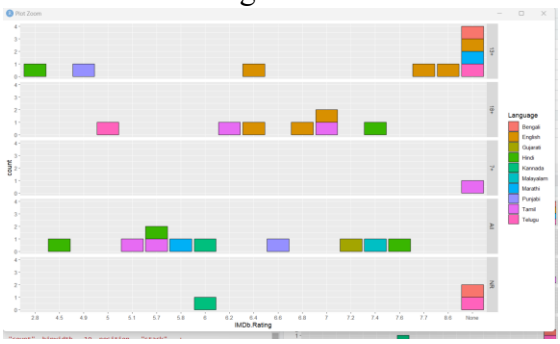
Awards Impact on Ratings: Content that received awards showed a marked increase in viewer ratings, affirming the influence of accolades on consumer choices.

Amazon Prime

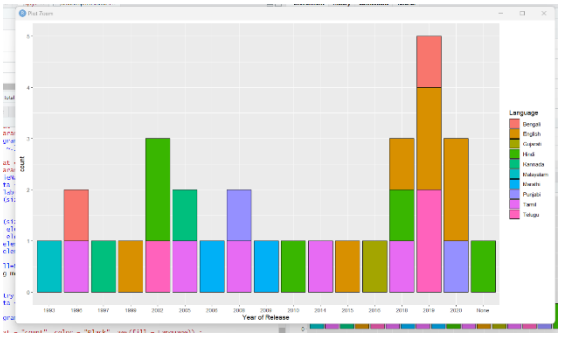
1. Movie Name vs Maturity Rating



2. Title vs imdb ratings

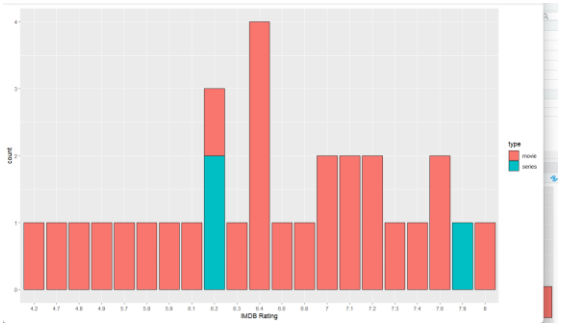


3. Title Vs Date Added



Disney+Hotstar

1. Title vs IMDB rating



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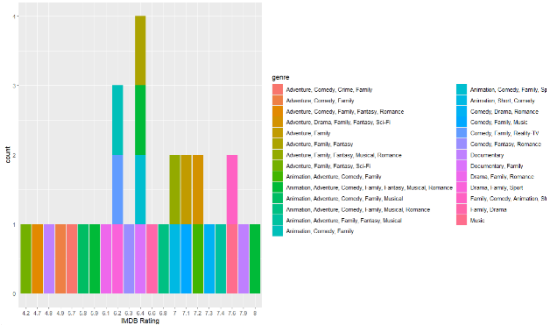
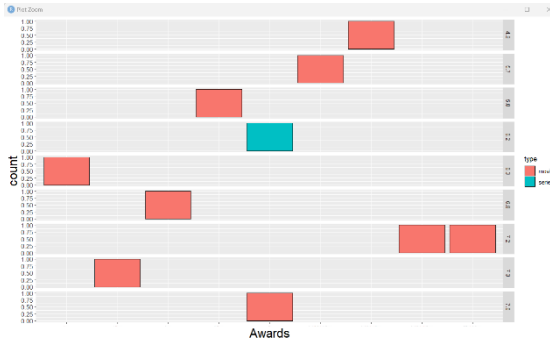
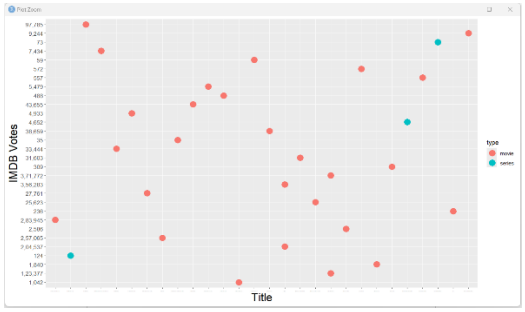


2. Title vs Awards



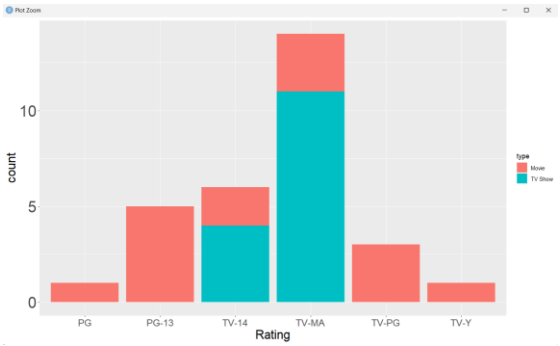
3. Tile vs IMDB Ratings



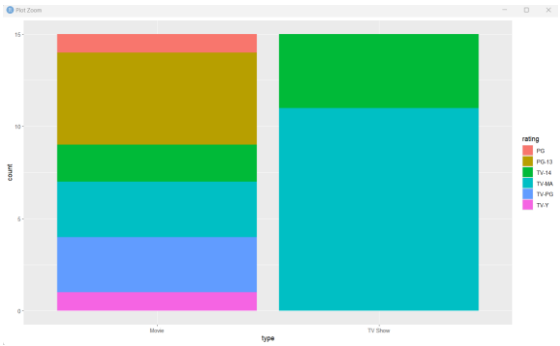
4. Rated comparison

Netflix

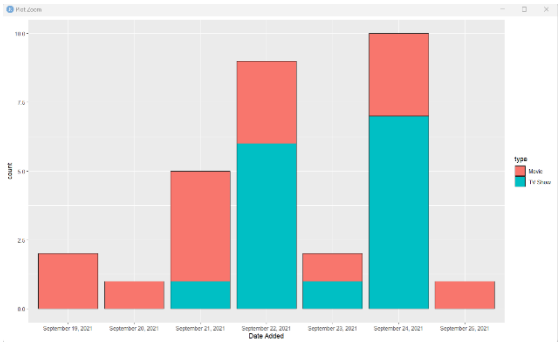
1. Title vs Rating



2. Rating vs Type



3. Title vs Date Added



Conclusion

This research shows the power of big data analytics in understanding viewer preferences within the OTT landscape. By analyzing and visualizing data from multiple streaming platforms, valuable insights emerged regarding content ratings, viewer demographics, and industry trends.

These results improve our comprehension of viewer behaviour and give content

producers a tactical advantage in a highly competitive market.

Future research can expand on this analysis by adding additional datasets and exploring the impact of marketing strategies on viewer engagement, thus offering a more comprehensive view of the OTT ecosystem.

References:

[1] Yagneshkumar A. Patni & Dr. Shamina Ansari (2024). A comprehensive review of literature on OTT platforms. International journal of management, economics and commerce. E-ISSN: 2584-2609

[2] Dr. Vishwanath Karad (2022). Evaluation of different OTT platforms with data analytics techniques for recommending personalized content to the users. International Journal of Research and Analytical Reviews (IJRAR). April 2022, Volume 9, Issue 2. E-ISSN 2348-1269, P-ISSN 2349-5138

[3] Dr. Eknath Shankarrao Mundhe (2020). The study on the impact of digital platform: over the top (OTT). Strad Research VOLUME 7, ISSUE 10, 2020. ISSN: 0039-2049

[4] Dr. Swati Manoj Yeole, Dr. Lambodar Saha, Prof. Charulata Bhaisare (2022). A Study on User Perspective on OTT Platform in India. Journal of Positive School Psychology 2022. Volume 6, Issue 3, ISSN: 7351-7364

[5] Suman Kumar, Dr. Rajendra Prasad Meena (2023). The rise of OTT platform: Changing Consumer Preferences. International Journal of Management (IJM) Volume 14, issue 5, July-August 2023. ISSN Print: 0976-6502 and ISSN Online: 0976-6510

[6] Garima Sharma Nijhawan, Prof. (Dr.) Surbhi Dahiya (2020). Role Of Covid as a Catalyst in Increasing Adoption Of OTTs In India: A Study Of Evolving Consumer Consumption Patterns And Future Business Scope. Journal of Content, Community & Communication Vol. 12 Year 6, December 2020. ISSN: 2395-7514

[7] Telladala Anusha, K. Ravi Kumar (2024). A Comparative Study on Top Two OTT Platforms: Amazon Prime vs. Netflix. Journal of Emerging Technologies and Innovative Research (JETIR). June 2024, Volume 11, Issue 6. ISSN: 2349-5162

[8] Dr. Amisha Gupta, Dr. M.S Verma, Rupanshi Toteja, Dimanya Narang (2021). Exploratory Analysis of Factors Influencing Users Adoption towards OTT Industry. International Journal of Science, Engineering and Management (IJSEM). Vol 6, Issue 5, May 2021 ISSN (Online) ISSN: 2456 -1304

[9] Dongnyok Shi, Changjun Lee, Inha Oh (2022). Analysis of OTT Users' Watching Behavior for Identifying a Profitable Niche: Latent Class Regression Approach. Journal of Theoretical and Applied Electronic Commerce Research. ISSN: 1564–1580

[10] Priya Malhotra, Akshay Kumar, Asst. Prof. Anu Yadav (2021). Market Research and Analytics on Rise of OTT Platforms: A Study of Consumer Behaviour. International Journal of Advances in Engineering and Management (IJAEM). Volume 3, Issue 7 July 2021, pp: 4005-4012 ISSN: 2395-5252

[11] Allu Sasikala Manoharan, K. Satya Savithri (2024). OTT - A New Era of Entertainment: A Study of its Influence on

Engineering Graduates. The International Journal of Indian Psychology ISSN 2348-5396 (Online), ISSN: 2349-3429 (Print). Volume 12, Issue 2, April- June, 2024

[12] Narayan Parab (2022). Impact of OTT Platform among Youth Audience with respect to Mumbai Region. International Journal of Advance and Innovative Research Volume 9, Issue 1 (I) January - March 2022. ISSN: 2394-7780

[13] Dr. Bob Deutsch (2015). Big Data Analysis for Effective Monetization of over the Top TV Content. SMPTE Technical Conference. DOI: 10.5594/M001648

[14] Nirmal G K, Kanumuri Tejaswi Venkata Durga, Narukurthi Hrishita, Ramsankar R and Manoj Panda (2024). A Cross-Platform Movie Filtering and Recommendation System using Big Data Analytics. International Conference on Machine Learning and Data Engineering. ISSN: 1877-0509

[15] Reza S. Kalan (2024). Big Data: Real-Time Video Streaming and Log Analytic (Online)

for Improving Quality of Experience. International Journal of Future Computer and Communication, Vol. 13, No. 2, 2024. DOI: 10.18178/ijfcc.2024.13.2.615

[16] Akshay Rai, Arayan Kataria, Vishnupriya (2024). A Comparative Study of OTT Market Demographic Grouping. International Journal of Innovative Science and Modern Engineering (IJISME). Volume-12 Issue-5, May 2024. ISSN: 2319-6386 (Online)

[17] Aishwarya Kurre, Archana Rao (2023). Comparative Analysis: Machine Learning Usage Across Recommender Systems of OTT Platforms. DIET - National Conference on Emerging Trends. Volume 8, Special Issue 5, April 2023. ISSN: 2454-8596

[18] Eun-A Park (2019). Prevalence of Business Models in Global OTT Video Services: A Cluster Analysis, International Journal on Media Management. DOI:10.1080/14241277.2019.1695257. ISSN: 1424-1277 (Print) 1424-1250