A Comparative Analysis on OTT Platforms: Netflix VS Amazon Prime

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Abstract:

In the olden days from each family, everyone sit together and watch TV shows. In today's world when we talk about TV shows, digital media and the availability of the latest movies or series the one word that comes to everyone's mind is OTT(over the top). The significant growth of OTT platforms has risen since 2013 and video streaming content will exceed $332 billion by 2025. The video streaming subscription of around 8 US$ billion in 2020 was reported by Deloitte. The total number of smartphone users is expected to double to surpass 700 million by 2022 in India.

The COVID-19 pandemic made consumers more interested in Netflix, Amazon Prime, and Disney + hotstar.

This paper is to showcase a comparison between the two popular OTT platforms namely Amazon Prime and Netflix. The comparison was performed with various metrics such as the number of subscribers subscribed, the programming language used and the recommendation algorithm utilized for implementation.

Keywords:

OTT, Netflix, Amazon Prime, Java, Python, Recommendation algorithms, Deep learning

1. Introduction

The OTT platform is a technology that enables the delivery of streamed content through internet-connected devices. This means viewers can watch video content across multiple devices without needing to be connected to cable or broadcast TV. There are two types of video or audio content played over the internet in an OTT streaming: Pay-to-access and Free-to-access. Subscription video-on-demand (SVOD) services offer access to film and television content, including shows and movies for which OTT acquires rights from the content owner. OTT services can be accessed through websites on PCs, apps on mobile devices, digital media players, or smart TVs with integrated platforms. As of 2019, 45% of the total OTT content streaming audience used Android and iOS, while another 39% used other devices to access OTT content.

Currently, Amazon Prime and Netflix are the two major competitors in the OTT platform industry. The analysis is based on the services and content of the two major video streaming players. Netflix and Amazon Prime Video are popular globally, not just in the United States. Netflix has 201 million subscribers, making it the world's most popular subscription video-on-demand service, while Amazon Prime Video had 117 million users as of September 2020. It is estimated that by 2026, there will be 270 million Netflix subscribers and 243 million Amazon Prime Video subscribers.

1.1Netflix:

Netflix is an incredibly popular OTT platform that operates on a subscription-based model and is known for its excellent customer engagement services. It's a media streaming platform that offers a vast collection of award-winning shows, documentaries, web series, movies, and much more. With Netflix, you can watch as much as you want without any interruptions, as it doesn't show any advertisements. And, all these services are available at a very affordable monthly fee, with new TV shows and movies being added every week.

Netflix can access on various devices such as smartphones, tablets, laptops, and smart TVs. So, you it can be watched anywhere, anytime, on any number of devices. All you need is to sign in with your Netflix account to start watching instantly on the web at Netflix.com from your personal computer or any other internet-connected device that offers Netflix apps, including smartphones, smart TVs, tablets, streaming media players, and game consoles.

Moreover, offline downloading is also an option available in the app, which enables you to enjoy the services even in areas with low internet connectivity. Netflix is also quite flexible when it comes to the subscription model. There are no contracts or prior commitments that restrict you to payment compulsions. You can withdraw your account whenever you wish to.

Figure 1.1 Netflix logo

1.2. Amazon Prime Video:

Amazon Prime and Netflix are major competitors in the entertainment industry. Amazon Prime offers a vast collection of movies and TV shows that are updated regularly, similar to Netflix. In addition to the entertainment package, Amazon Prime also provides unlimited music playlists with millions of songs in different languages, two-day guaranteed delivery, daily offers, and many more benefits to its subscribers. Although the subscription fees are not cheap, Amazon Prime provides its users with a wide range of services, making it a great value for money. Unsubscribing

from Amazon Prime is easy, and subscribing to it gives access to various Amazon perks. Overall, Amazon Prime is a straightforward and convenient service with a wide selection of available movies and series that are familiar to Netflix.

Figure 1.2. Amazon logo

2. Literature Review

Numerous research papers have analyzed video streaming apps, such as Netflix and Amazon Prime Video. One such study, titled "Determining the factors influencing customer engagement while using the subscription-based media streaming service providers (OTT) platforms: NETFLIX vs AMAZON PRIME" (Sheetal Pradeep Mehta, Rutuja Rajesh Mukne, Ankita Jayant Mishra - 2021), found that viewers prefer to watch offline videos because it allows them to enjoy entertainment in areas with poor network connectivity. Another article, "Customer perception towards networked streaming service providers concerning Amazon Prime and Netflix" (R. Vishnupriya, M. Banurekha - 2021), revealed that original content is the most important factor for customers when choosing a paid subscription to channels. The objective of this comparative study is to determine which OTT platform, Netflix or Amazon Prime Video, is the best and explore all of their features in detail.

3. Research methodology

The researchers conducted exploratory research to obtain vital information about two leading media streaming service providers - Amazon Prime Video and Netflix. They used different exploratory research methods, including case study analysis and secondary data analysis. Additionally, they gathered data from secondary sources, such as research articles, case studies, and websites, which are all cited as references in the paper.

4. Programming languages

4.1. Netflix

Netflix heavily relies on the Python programming language for a diverse range of tasks, including recommender systems, security management, and vulnerability detection. In this section, we will explore how Netflix utilizes Python programming to cater to its extensive user base.

- **Machine Learning:**
  Netflix employs machine learning in various aspects of its operations, using Metaflow, a Python framework, to carry out its machine learning projects from the initial stage to production. Metaflow uses parallel programming and optimized Python codes to handle millions of data points in memory and orchestrate computations across thousands of CPUs.

- **Statistical Analysis:**
  The team responsible for the CORE system at Netflix utilizes Python for statistical analysis tasks. They employ several mathematical and statistical libraries such as Numpy, Scipy, Pandas, and Ruptures to automate the analysis of signals received at alerting systems. Additionally, Netflix has developed a time series correlation system that enables parallelization of large amounts of data analysis tasks.
- **Information Security:**
  Netflix's information security team employs Python programming to carry out tasks such as categorizing risks, identifying vulnerabilities, and automating security processes in order to accomplish numerous high-impact objectives. In the field of information security, Python programming has been used to create open-source projects such as Security Monkey and Prism to perform various tasks.
- **Recommendation Systems:**

  Netflix relies heavily on Python in its personalization machine learning infrastructure to train machine learning models. They use various Python libraries like TensorFlow, Keras, PyTorch, XGBoost, and LightGBM, along with other tools like Numpy, Scipy, Sklearn, Matplotlib, pandas, and CVXPY to facilitate tasks such as movie recommendations.

- **Orchestration:**

  The big data orchestration team at Netflix provides tools for scheduling and executing ETL and ad hoc pipelines. Various components in the orchestration service at Netflix use Python programming. For example, the scheduler uses Jupyter Notebooks with papermill to provide job types in templates, making it easy for users to express tasks that need to be performed.

- **Experimentation:**
  The scientific computing department at Netflix is working on a new platform to analyze AB tests and other experiments using data, statistics, and visualization. They have developed a system called Metrics Repo, which is based on PyPika. This tool allows contributors to write reusable SQL queries that accept parameters, and it serves as an entry point for any new analysis.
- **Video Encoding and Media Cloud Engineering:**
  Netflix utilizes Python for various projects such as VMAF and Mezzos. With the media map-reduce platform Archer, Netflix has built computer vision applications using Python programming. Additionally, Netflix has also outsourced tools designed in Python to aid in developing projects like Pickley and Setupmeta.
- **Animation and NVFX:**

Netflix engineers use Python programming language to create all the industry-standard animation and VFX content. Python is used to implement Netflix's integrations with Nuke and Maya, and most of the Shotgun tools in the Netflix are also developed using Python.

- **Monitoring, Alerting, and auto-remediation:**

Netflix's insight engineers build and operate tools for diagnostics, alerting, operational insight, and auto-remediation. They use the Spectator Python client library to record dimensional time series metrics. Netflix engineers have also built various Python libraries to interact with different platform-level services.

- **Notebooks:**
  The engineers working at Netflix utilize Jupyter Notebooks and Python as their primary language for various tasks such as development, debugging, exploration, and prototyping. They have designed custom extensions for the Jupyter server to manage several activities like logging, publishing, cloning, and archiving of notebooks.
- **Content Delivery:**

  Netflix's content delivery network, Open Connect, is designed, built, and operated using various software written in Python. Most of the network devices used by Netflix are managed by applications written in Python programming language.

4.2.Amazon

- **Machine Learning:**
  Amazon utilizes machine learning and artificial intelligence to meet customer expectations and improve service quality. By analyzing customer feedback and reviews, Amazon leverages the vast amount of data stored in its cloud databases to feed machine learning algorithms. This, in turn, allows for meaningful analysis and decision-making that further enhances its business.
- **Statistical Analysis:**

  Amazon utilizes data analytics to analyze customer data, including purchase history, browsing behavior, and customer feedback. The aim is to identify common issues and address them proactively. Additionally, Amazon employs data to personalize the customer experience by providing tailored product recommendations, promotions, and offers.

- **Information Security:**
  As per the terms of service, the service has permission to gather the location and mobile device details of its users. This includes a unique identifier that enables the delivery of location-based services. Amazon showcases interest-based ads on its own and unaffiliated websites. These advertisements are based on user activities such as purchasing on the site, browsing sites that contain Amazon ads, interacting with Amazon tools, or using payment services. The service is committed to following the self-regulatory principles for online behavioral advertisement formulated by the Digital Advertising Alliance while providing interest-based ads.
- **Recommendation Systems:**
  The recommendation system of Amazon Prime offers personalized recommendations by analyzing user behavior, preferences, and content. It

employs machine learning algorithms to scrutinize your viewing history, ratings, and the preferences of users with similar tastes to suggest content that suits your taste. Additionally, it takes into account factors such as genre, actors, and trending content to enhance the accuracy of its recommendations, providing a more personalized and engaging user experience.

- **Orchestration:**
  Amazon Prime utilizes orchestration to coordinate and manage various components and services within the platform to ensure seamless and efficient operation. The platform employs advanced orchestration tools and frameworks to handle tasks like content delivery, user authentication, and recommendation services. These orchestration systems streamline processes, enhance scalability, and optimize resource utilization, ultimately contributing to a smoother and more reliable user experience on the platform.
- **Video Encoding and Media Cloud Engineering:**
  Amazon Prime uses video encoding and media cloud engineering to deliver multimedia content in an efficient and optimized manner. Video encoding is the process of converting raw video files into compressed formats for streaming, while media cloud engineering involves utilizing cloud-based infrastructure for storing, processing, and delivering media content. Amazon Prime employs advanced encoding techniques and cloud services like AWS to ensure a high-quality streaming experience. This enables users to enjoy seamless viewing across various devices and allows for scalability as the user base grows.
- **Animation and NVFX:**
  Based on my last knowledge update in January 2022, there is no specific information available about Amazon Prime's use of Animation and NVFX (which could refer to Nvidia's Visual FX) on their platform. Amazon Prime Video, like many other streaming services, uses various technologies for content delivery and user experience, and they may utilize animation techniques for interface elements.
  To get the latest and specific information on Amazon Prime's use of Animation and NVFX, I suggest checking the latest technical documentation from Amazon or relevant announcements from the company. However, please keep in mind that the technology landscape evolves quickly, and new updates may have occurred since my last knowledge update in January 2022.
- **Monitoring, Alerting, and auto-remediation:**
  Amazon Prime uses monitoring to continuously track system metrics and user interactions. Alerting is used to notify stakeholders when predefined thresholds or issues are detected. Auto-remediation is the automated process of resolving identified problems. Amazon Prime relies on robust monitoring tools, such as Amazon CloudWatch, for real-time performance tracking.

Alerts are triggered based on predefined criteria, and auto-remediation mechanisms, often powered by AWS services and scripts, automatically address issues to maintain service reliability and performance.

- **Content Delivery:**

Amazon Prime utilizes a Content Delivery Network (CDN) to effectively distribute multimedia content to its users. This is accomplished by placing the content on strategically positioned servers worldwide. Whenever a user requests content, it is delivered from the nearest CDN server. This reduces latency and enhances streaming speed, ensuring a seamless and high-quality viewing experience for Amazon Prime users across the globe.

5. Recommendation algorithms

5.1. Netflix recommendation system:

Internet TV has a lot of benefits compared to traditional TV channels. With Internet TV, you have the flexibility to select what you want to watch, when you want to watch it, and where you want to watch it. Additionally, it offers a wide variety of videos that cater to different interests and preferences. However, the abundance of options can be overwhelming, and some people may end up making poor choices or not selecting anything at all. Studies indicate that most people lose interest in browsing after a minute or two and may leave the service if they do not find anything to watch. To address this issue, Netflix has been working on providing personalized recommendations to its users. Initially, Netflix used an algorithm that predicted how many stars a user would rate a video. However, they now use various algorithms based on user data, such as what they watch, how they watch, and when they watch. The Netflix homepage is the primary place where users can find recommendations, and it's where two out of every three hours streamed on Netflix originate. The homepage has a matrix-like layout, where each row contains recommendations with a similar theme, making it more user-friendly and intuitive.

5.2. Amazon recommendation system:

Amazon uses a content-based filtering system to suggest products to users. It relies on the user-item and item-item matrices to achieve this. When you interact with a product, Amazon's recommendation engine looks for other products with similar features and recommends them to you. For example, if you browse a Dell gaming laptop, you'll be shown other gaming laptops with similar features such as CPU cores, processor type, RAM, storage capacity, and more. This is how Amazon generates "related to items you have viewed" and similar recommendations. Amazon personalizes product recommendations using AI in three main ways. First, through in-store (web and mobile) recommendations that are tailored to individual users using a recommendation engine. This includes products shown on the homepage,

suggested items on the product page, and more. Second, Amazon's voice assistant, Alexa, uses AI to collect data points and deliver personalized recommendations. For example, Alexa creates personalized playlists and suggests music based on what a user tends to listen to. Third, Amazon GO is an unmanned physical store that uses cameras and AI for computer vision to track users and products. When a user picks a product, the barcode is scanned, and it is added to their Amazon GO app. The user can pay later, or the money is deducted through a preselected payment method. This purchase data is attributed to the user who then receives personalized recommendations on other Amazon platforms, such as Alexa and Amazon.com

6. Discussion and Suggestion

6.1. Subscription Netflix vs Amazon Prime:

Netflix recently launched a new subscription tier that costs $6.99 per month and comes with ads. This plan provides a cheaper alternative to other streaming services. However, it does not include all the features and content available in Netflix's full library. To access the complete Netflix experience, users must subscribe to the Standard tier, which costs $15.49 per month.

On the other hand, Amazon Prime Video offers an ad-free subscription for $8.99 per month, which includes all the features and content in its library. Users can also rent or buy additional content and subscribe to add-on channels, such as Amazon Prime, at no extra cost. The Amazon Prime subscription includes Prime Video. Both Netflix and Amazon Prime Video are available on various platforms, including media streaming devices, mobile devices, game consoles, smart TVs, and the web.

Figure 6.1. Netflix's annual subscriber base

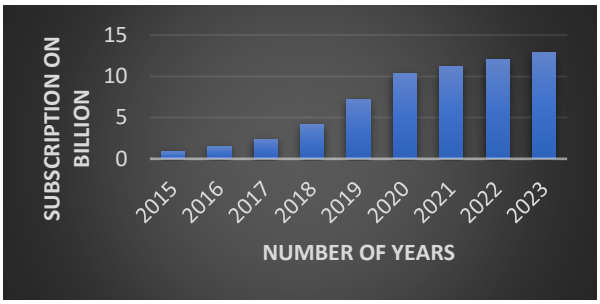
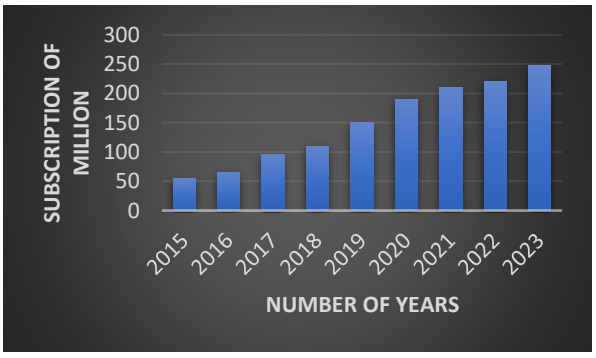


Figure 6.2. Amazon's annual subscriber base

As of the third quarter of 2023, Netflix had around 247.2 million paid



subscribers worldwide, whereas Amazon recently announced that they now have over 200 million Amazon Prime subscribers worldwide. Since early 2018, Amazon has doubled its Prime subscriber base from 100 million to over 200 million.

6.2. Video Streaming Service on, Netflix vs Amazon Prime:

Netflix and Amazon Prime Video are

both competing to become the only streaming service that consumers need. Their libraries cover almost all genres and age groups, although more niche services may provide deeper content in specific categories. However, evaluating their existing catalogs can be challenging because these catalogs change over time. New movies are added while old shows are removed as licensing deals expire or get renewed. Amazon recently acquired MGM, which gives the company more Hollywood credibility. Unlike Netflix, Amazon also offers live sports through its exclusive Thursday Night Football deal. With its considerable resources, Amazon has financed many original TV shows and movies, such as Bosch, The Boys, Catastrophe, Electric Dreams, Fleabag, Good Omens, Hanna, Homecoming, Hunters, Jack Ryan, The Marvelous Mrs. Maisel, Patriot, Tales From The Loop, Undone, Upload, and Utopia. However, Netflix is still the leading provider of original mainstream streaming entertainment. Its library includes fashionable anime, award-winning dramas and documentaries, and even the trashiest reality shows you can imagine. Netflix's lineup features popular series like Black Mirror, BoJack Horseman, The Crown, Dead to Me, Locke and Key, and many more.

Metric	Netflix	Amazon Prime
Subscription Base	Netflix is expected to have 247.2 million subscribers in 2023.	Amazon Prime Video is expected to have 302.9 million subscribers in 2023.
Content Library	Netflix has a vast library of original content in different genres and languages.	Amazon Prime Video invests in original content and also has a mix of licensed content and exclusive Amazon Originals.
Global Reach	Both services are available in numerous countries worldwide, but the availability of specific content may vary by region like Latin America, North America, Mexico, and so on.	Global Availability of Amazon is high in Asia Pacific, India, and so on.
Revenue	Netflix relies primarily on subscription revenue from its streaming service.	Amazon Prime Video is part of the broader Amazon Prime subscription, which includes various services beyond video streaming
Monthly Subscription	The monthly subscription for Netflix in India is Rs 149.	Amazon Prime Video, it is Rs 299.

Free trial	Netflix does not offer a free trial	Amazon Prime Video provides a free 30-day trial
Streaming quality	Netflix provides SD quality.	Amazon Prime Video offers 4k quality
Logging profile per account	Netflix allows up to 5 profiles per account.	Amazon Prime Video allows up to 6 profiles per account.

Figure 6.2. Amazon's annual subscriber base

7. Conclusion

In conclusion, with different technological affordances of user interface, revenue models of subscription, and organizational cultures, OTT services have altered the competitive environments. Focusing on OTT competitiveness within the research framework, the five success factors of Netflix are better than Amazon's Prime. When we consider the comparison, in terms of the incredible selection of content Netflix offers reasonable subscription schema as well as the content collaboration whereas With Amazon Prime membership, you can enjoy a range of benefits such as free shipping on Amazon purchases, access to Amazon Prime Music, cloud photo storage, free e-books through Prime Reading, access to games via Amazon Gaming, a discount at Whole Foods and even free grocery delivery in selected areas. It was concluded that Netflix had the best performance, subscription plans; however, the QoS of Amazon Prime was also reasonably good so the performance of Netflix and Amazon are Satisfactory.

References

1. Sant Singh, “A study on factors leading to adoption of OTT services among millinennial consumers in India”

2. Dr.Swati Manoj Yeole, dr.Lambodar Saha, Prof.Charulata Bhaisare, (2022), “ A study on User Prespective on OTT platform in India”

3. Prof.Ria Patnaik, Prof .Reema Shah, Prof.Upendra More, (2023), “Rise of OTT Platforms : Effect of the C-19 Pandemic”

4. Song, Minzheong, (2021), “A Comparative study on Over-The-Tops, Netflix & Amazon Prime Video : Based on the Success Factors of Innovation”

5. Kumari Shalini, Vivek Kumar, Abhishek Chakraborty, Isha Agrawal, (2022), “ Amazon Prime video versus Netflix – Compare Market Entry Stratergies”

6. Sheetal Pradeep Mehta, Rutuja Rajesh Mukne, Ankita Jayant Mishra, (2020), “ Determining the factors influencing customer engagement while using the subscription-based media streaming services providers(OTT Platforms): Netflix Vs Amazon Prime”

7. Madhan Mohan Reddy Kodatala, Laxmi Prasanna Perla, (2022), “ Comparing the usability of Amazon Prime Video and Netflix application using HCI principles.

8. R.Vishnupriya, M.Banurekha, (2021), " Customer perception towards networked streaming service provides with reference to Amazon Prime and Netflix"

9. Xavier Amatriain, Justin Basilico, "Recommender System in Industry : A Netflix Case Study"

10. Gautam Kumar Mandal, Fabio Diroma, Prof.Rekha Jain, (2017), " Netflix: An In-Depth study of their proactive & adaptive strategies to drive growth and deal with issues of net-neutrality & digital equity"

Website Link:

1. **https://insideaiml.com/blog/How-Netflix-is-using-Python-1160**
2. **https://www.codingninjas.com/studio/library/recommendation-system-amazon-application-of-ml**
3. **https://medium.com/@Confetti-Design-Studio/part-2-who-has-the-better-user-experience-netflix-vs-amazon-prime-video-2812ebb73fef#:~:text=Amazon%20Prime%20Video%20also%20offers,about%20its%20users'%20watching%20habits.**
4. **https://www.quora.com/Whose-content-is-better-Netflix-or-Amazon-Prime#:~:text=You%20are%20charged%20Rs%20999,only%20Rs%2032.35%20a%20month.**