



Analysis of Netflix User Behaviour Using Interactive Data Visualization Dashboard

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ABSTRACT

Streaming services growing fast have shaken up how people watch shows worldwide, shifting habits away from regular TV toward watching what you want when you want it. Not just one company leads here - Netflix stands out by offering thousands of films, series, and online-only content from many countries and styles. To understand how users interact, researchers rely on live visual dashboards built with Power BI (Business Intelligence), turning messy numbers into clear insights without clutter. Instead of guessing, they examine real usage trends using a core collection of 4,529 entries from Netflix's catalog plus extra details pulled from web-based series sources. Patterns emerge around which kinds of stories get made, what age groups they target, where they come from, and how viewer tastes change over time. Starting off, the process moves step by step through a clear cycle for handling data - first tidying up messy inputs via Power Query, then linking related pieces using a star-shaped structure. It turns out films make up nearly all entries in the collection - about 95.5 percent - but series episodes still play a key role because they keep users coming back, building routines around extended viewing sessions. Right after that, findings show many titles carry higher age ratings such as TV-MA or TV-14, pointing toward programming aimed mostly at teens and grown-ups. Near the end, it becomes obvious that live dashboards work better than old-style reports when studying streaming platform trends,

giving clearer insights that support choices across online entertainment businesses.

Keywords: Netflix, OTT Platforms, User Behavior Analysis, Data Visualization, Power BI, Business Intelligence.

INTRODUCTION

Streaming services changed how people watch shows online, making it possible to view whenever you want. Across the globe, Netflix adjusts what it offers by studying what viewers tend to pick. Patterns in choices show up through details such as categories, scores, and when titles appear. Seeing numbers clearly often means shaping them into images that make sense at a glance [6].

1.1 Background of the Study

- Now streaming beats old TV. Faster web connections helped shift how people watch shows. Phones in pockets changed viewing habits too. Broadband everywhere made big files move fast. Old cable setups fade as online services grow.
- Viewers pick when, where they play videos now. Internet gadgets handle what networks once controlled alone Streaming giant Netflix operates across more than 190 countries [1], serving tailored shows alongside worldwide

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hits. Because of how it handles information, personal viewing records stay hidden from public view. Insights still emerge through details such as genre tags, age ratings, production origins, and when titles came out.

- Most folks move through this space in similar ways, almost without thinking. Spotting these habits helps spot which stories catch on - or quietly vanish. Visuals like charts [6] take huge stacks of figures and give them shape, helping eyes grasp what words alone might bury. Seeing the numbers changes how they feel, less cold, more clear.

1.2 Importance of Data Analytics in OTT Platforms

- Staying in the viewer's mind counts heavily, even alongside drawing new audiences for streamers. Patterns hiding within watch history reveal which tales, tones, or age-focused content hold attention longest. Past picks guide future ones - studying them shapes what gets greenlit or acquired later. Trends once successful quietly steer today's programming paths. Decisions emerge less from guesses, more from traces left behind.
- Most of what Netflix knows about viewer habits comes from number patterns, showing which series succeed in certain regions. Genre popularity reveals itself through repeated viewing trends across countries. Relevance duration for each title also appears clearly when measured over time. Displayed visually, the information lets staff explore details interactively during meetings. Newcomers grasp key points quickly, guided by dynamic dashboards [5]. Behind these views sit systems designed to turn raw data into clear summaries.

1.3 Role of Power BI in User Behavior Analysis

Most people choose Power BI (Business Intelligence) [4] because it combines sorting raw information, cleaning it, yet also turning it into clear visuals within a single environment.

Within this system, individuals create interactive dashboards - selecting a chart element adjusts related displays instantly. Instead of fixed reports, they examine figures dynamically, changing perspectives, filtering segments, even broadening groups as needed. Such flexibility shapes how groups uncover insights hidden behind overall summaries. Every interaction reflects actual decisions taken when moving through details easily overlooked initially.

In this work, Power BI is used to:

- Clean and reshape data with Power Query
- Model data relationships using a star schema
- Design interactive dashboards for examination of patterns
- Visualize trends related to content distribution and user preferences

1.4 Objectives of the Research

The main goals of this research are:

- To study Netflix content spread through live-updating dashboards: Human behavior emerges when reviewing story types chosen, ratings given, alongside whether titles are series or movies.
- To identify trends in content by country and year of release
- One way to see how well Power BI works is by exploring its visual reports. Through real examples, the software reveals patterns clearly. Using dashboards helps users grasp trends quickly. Instead of spreadsheets, interactive charts tell stories differently. Each feature supports decision making without extra steps. Seeing data shift live builds stronger insight naturally.

LITERATURE REVIEW

Most past work around streaming services looks at what kinds of shows people pick, age-based labels, or where they live - each shaping how users interact [2]. When it comes to Netflix, analysts lean on open data sources that reveal

patterns across titles. Though algorithms can forecast certain results, visual reporting systems let teams see insights more clearly, guiding choices behind the scenes. Understanding viewer habits ties back not just to prediction models but also simpler tools making sense of complex details.

2.1 Studies on OTT Platforms and User Behavior

- Multiple studies have looked at the evolution of OTT platforms and their effects on viewing habits [2]. Research indicates that flexibility, personalization, and on-demand access are the reasons why users adopt OTT services. Genre preference, maturity ratings, and regional access are major factors that allow users to engage with the platform.
- Studies focusing on user behaviour analysis often rely on metadata like content categories, ratings, and release dates to interpret viewing patterns. Findings show that genres such as drama, documentaries, and crime attract more viewers. Additionally, mature-rated content dominates OTT platforms [8], indicating a shift toward more complex and adult-themed storytelling.

2.2 Netflix-Centric Analytical Studies

- Netflix has often been studied by researchers because information about its content datasets is publicly available and easy for academics to access and analyse. Various studies have analysed the Netflix Titles dataset to discover trends in genre distribution [10], content growth over time, and production patterns by country. These studies highlight the fact that most of the content available on Netflix comes from the United States [9] while countries like India and the United Kingdom are also the emerging participants in contributing content.
- Some researchers have applied machine learning techniques to Netflix data for recommendation systems and predicting user patterns. While these methods offer detailed

knowledge about the data, they typically require complex models and technical skills. On the other hand, approaches that use charts, graphs [6], business intelligence tools make it easier to explore and understand information, especially in academic environments.

2.3 Role of Data Visualization and Business Intelligence Tools

- When dealing with large, jumbled sets of facts, images often help more than words. Rather than static pages filled with numbers, animated graphs [6] and real-time screens make it easier to notice trends, connections, or strange details quickly. What stands out visually tends to stick in the mind longer. Seeing shifts happen over time reveals what raw columns cannot show alone.
- Here's why some tools feel different: they clean chaos into clarity, even as visuals form. Streaming services notice when certain stories travel - thanks to dashboards that catch drifts between places. Screens shaped right reveal patterns hidden before. Tools like Tableau [4] or Power BI turn noise into clear signals, outpacing outdated ways of reading data. Faster understanding means fewer blind spots in picking what gets made next.

2.4 Research Gap

- Research into streaming services usually relies on data numbers or smart algorithms. Still, among college projects, visual reports built with business intelligence software stay rare. Many studies fixate on films or old-school TV programs instead. Web-based series tend to miss attention - things such as how many episodes exist, storylines across seasons, or which studios back them. Most folks skip these angles. Left-out bits stick around, especially when research blends Netflix show facts with info from elsewhere. Because of that hole, what we learn about binge-watching stays thin. The view just doesn't go deep enough.
- Most dashboards showing user behavior

draw from just one place. When info stays split, spotting trends becomes a guessing game. Seeing how people really watch takes more than isolated numbers. Puzzles form when different records don't connect. Clearer pictures fade if logs stay separate. Most efforts never tie what people watch to how a show looks on screen. Yet, spotting that pattern might explain things raw numbers simply miss.

- Presenting a clear, visualization-driven approach that is suitable for academic evaluation

This research shows how business intelligence and data visualization [4] techniques can be effectively applied to OTT platform analytics, making it relevant and useful in both academic and practical contexts.

DATASET DESCRIPTION AND METHODOLOGY

2.5 Contribution of the Present Study

This study addresses the identified gaps by:

- Using Power BI to create interactive dashboards for Netflix analytics
- Merging Netflix Titles data with a focused web series dataset
- Analysing content trends across genres, ratings, countries, and release years

This study uses two datasets: the Netflix Titles dataset, which contains 4,529 records, and an additional web-series dataset [10]. Data cleaning and transformation were done using Power Query. A star schema was used for data modelling, and we created interactive dashboards [5] in Power BI following the data analytics process.

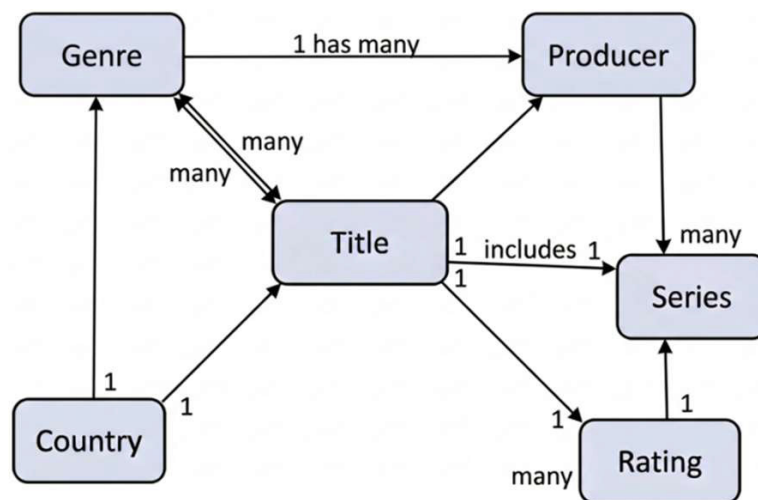


Figure 1: Star Schema data model used for analysis

3.1 Dataset Description

structured datasets that together help study Netflix content trends and user behavior.

The analysis in this research relies on two

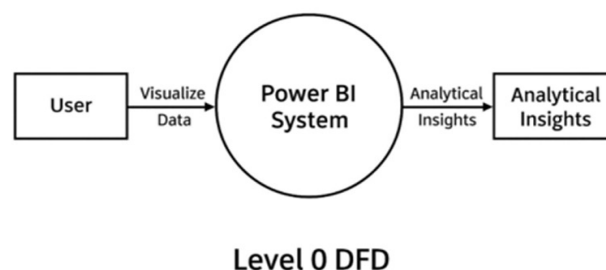


Figure 2: Level 0 Data Flow Diagram of the system

- Series Rating- IMDB rating of a series
- Release Year- releasing year of the series.
- Location- this includes longitude and latitude of the origin country
- Popularity- this tells us how popular a particular series is

series_id	series_name	total_seasons	total_episodes	producer	language	Genre	rating	released_year	origin_country	longitude	latitude	popularity
S001	The Vampire Diaries	8	171	Julie Plec, Kevin Williamson	English	Drama, Supernatural	8.2	2009	United States	-95.7123	37.0902	High
S002	The Originals	5	92	Julie Plec, Michael Narducci	English	Horror, Fantasy	8.2	2013	United States	-95.7123	37.0902	Medium-High
S003	Legacies	4	68	Julie Plec, Brett Matthews	English	Drama, Fantasy	7.4	2018	United States	-95.7123	37.0902	Medium
S004	The Witcher	4	32	Lauren Schmidt Hissrich	English	Action, Fantasy	8.1	2019	United States / Poland	-95.7123	37.0902	High
S005	Lucifer	6	93	Tom Kapinos	English	Fantasy, Crime, Comedy	8.1	2016	United States	-95.7123	37.0902	High
S006	Manifest	4	62	Jeff Rake	English	Mystery, Drama, Sci-Fi	7.1	2018	United States	-95.7123	37.0902	Medium-High
S007	Riverdale	7	137	Roberto Aguirre-Sacasa	English	Teen Drama, Mystery	6.5	2017	United States	-95.7123	37.0902	High
S008	Freaky	1	8	Victoria Schwab, Emma Roberts	English	Romance, Fantasy	6.4	2022	United States	-95.7123	37.0902	Medium
S009	Insatiable	2	22	Lauren Gussis	English	Dark Comedy	6.5	2018	United States	-95.7123	37.0902	Medium
S010	The Midnight Club	1	10	Mike Flanagan	English	Horror, Mystery	6.5	2022	United States	-95.7123	37.0902	Medium
S011	Never Have I Ever	4	40	Mindy Kaling, Lang Fisher	English	Teen, Comedy, Drama	8	2020	United States	-95.7123	37.0902	High
S012	My Life with the Walter Boys	1	10	Melanie Halsall	English	Drama, Romance	7.3	2023	United States	-95.7123	37.0902	Medium
S013	Friends	10	236	David Crane, Marta Kauffman	English	Sitcom, Comedy	8.9	1994	United States	-95.7123	37.0902	Very High
S014	Ginny & Georgia	2	20	Sarah Lampert	English	Comedy, Drama	7.5	2021	United States	-95.7123	37.0902	High
S015	Gossip Girl	6	121	Josh Schwartz, Stephanie Savage	English	Drama, Teen	7.4	2007	United States	-95.7123	37.0902	High
S016	101	1	10	Jenny Han	English	Romantic Comedy	6.6	2023	United States / South Korea	127.7669	35.9078	Medium
S017	Adolescence	1	10	Ashley Avis	English	Drama	5.8	2018	United States	-95.7123	37.0902	Low
S018	Mismatched	2	14	Akash Khurana	Hindi	Romantic Comedy	6.9	2020	India	78.9629	20.5337	High
S019	Anne with an E	3	27	Maria Vallety-Beckett	English	Drama, Historical	8.7	2017	Canada	-106.3466	56.1304	High
S020	True Beauty	1	16	Kim Sang-hyub	Korean	Romance, Comedy	8	2020	South Korea	127.7669	35.9078	High
S021	Young Sheldon	7	141	Chuck Lorre Productions	English	Comedy, Drama	7.7	2017	USA	-95.7123	37.0902	High
S022	The Big Bang Theory	12	279	Chuck Lorre Productions	English	Comedy, Romance	8.1	2007	USA	-95.7123	37.0902	Very High
S023	The Royals	4	40	Lionsgate Television	English	Drama, Romance	4.4	2015	UK/USA	-3.435973	55.378051	Low
S024	Boo, Bitch	1	8	Crazy Cat Lady Productions	English	Comedy, Fantasy	6.4	2022	USA	-95.7123	37.0902	Medium
S025	My Demon	1	16	Studio Dragon	Korean	Romance, Fantasy	7.6	2023	South Korea	127.7669	35.9078	High
S026	Hidden Love	1	25	Youku	Chinese	Drama, Romance	8.6	2023	China	104.1954	35.8617	High
S027	Suits	9	134	Universal Content Productions	English	Legal, Drama	8.4	2011	USA	-95.7123	37.0902	High
S028	Stranger Things	4	34	21 Laps Entertainment	English	Drama, Fantasy, Horror	8.6	2016	USA	-95.7123	37.0902	High
S029	Queen of Tears	1	16	Studio Dragon	Korean	Romance, Drama	8.2	2024	South Korea	127.7669	35.9078	High

Figure 4: Web-series dataset

This dataset allows for insights into binge-watching patterns, preferences for series length, and how producers impact content popularity.

3.2 Tools and Technologies Used

The following tools and technologies helped implement the analytical framework:

- Power BI: For creating dashboards and visualizations [4]
- Power Query: For data cleaning and transformation [4]
- DAX (Data Analysis Expressions): For creating calculated measures
- Microsoft Excel: For initial dataset inspection
- Windows Operating System: For running the analysis

These tools were chosen to ensure efficient data pre-processing, modelling, and visualization within a streamlined workflow.

3.3 Methodology Adopted

Fresh insights begin when raw numbers move through clear steps. Each stage links to the next, building understanding without skipping details.

3.3.1 Data Collection

Out in the open, data came from public spots

- two batches matching figure 3, others like those in figure 4. These landed inside Power BI using its standard import path. A quick glance followed, just to see if columns matched up across spreadsheets. Nothing moved ahead until each piece of every set was verified in place

3.3.2 Data Understanding

Looking through the data sets, patterns could be spotted right away. A closer look showed certain trends standing out more than others. From that point onward, the analysis began to yield progressively coherent insights. Emerging patterns prompted further inquiry, which in turn informed subsequent directions of investigation. This iterative process ultimately contributed to the development of a more comprehensive understanding of the data.

- Missing or null values
- Duplicate entries
- Inconsistent formatting
- Multi-valued fields like genres and countries

Consequently, it became evident which data preparation techniques were essential for effective analysis.

3.3.3 Data Cleaning and Transformation

Power Query handled the clean-up of messy information. Cleaning up began by reshaping number rows into clearer formats. Through this

step, odd labels turned into consistent headers. Where gaps showed up, they got filled using nearby values. Duplicates were tossed aside without hesitation. Each column then shifted to match correct types - text stayed text, numbers acted like numbers. Before moving on, unwanted parts vanished quietly. Smooth transitions followed, linking pieces together behind the scenes. What emerged was ready for what came next.

- Removal of duplicate records
- Handling missing values by replacement or exclusion
- Splitting of multi-valued columns
- Standardizing date formats

3.3.4 Data Modelling

A main table ties into categories like genre, score, nation, also maker, setting the layout we built on. Speed improved when searches got sharper, while visuals narrowed better.

3.3.5 Dashboard Development

A dashboard came together through hands-on design work powered by Power BI tools. Visual pieces took shape - each built using methods tailored for clarity and interaction

- Cards for summary metrics
- Bar and column charts
- Donut charts
- Line graphs for trends over time
- Geographic maps
- Filters and slicers for user interactions

3.3.6 Insight Generation

Patterns on dashboards started revealing shifts over time. As genre gaps caught attention, links to what viewers picked came into view. When content types switched, rating movements followed - particularly noticeable with longer observation. Country details mixed with launch years brought a key point forward. Category divides alone didn't show it, but broader contrasts made preferences visible.

Our methodology ensures organized data

flow shapes clear visuals, then leads to precise insights. Through blending BI methods alongside live-updating dashboards, the research builds a flexible path for studying streaming platforms. Not rigid, but responsive.

RESULTS AND DISCUSSION

Most Netflix's shelves comes from movies. Yet its TV shows and online series that keep viewers sticking around longer. Documentaries pull in steady interest, just like emotional dramas and stories filmed abroad. Content meant for adults - rated TV-MA or TV-14 - pops up again and again. From country output, two stand tall: the U.S. leads, but India follows close behind. When it comes to web-based episodes, tight plots matter more than run time.

Figures 5 and 6 show the interactive dashboard built in this work:

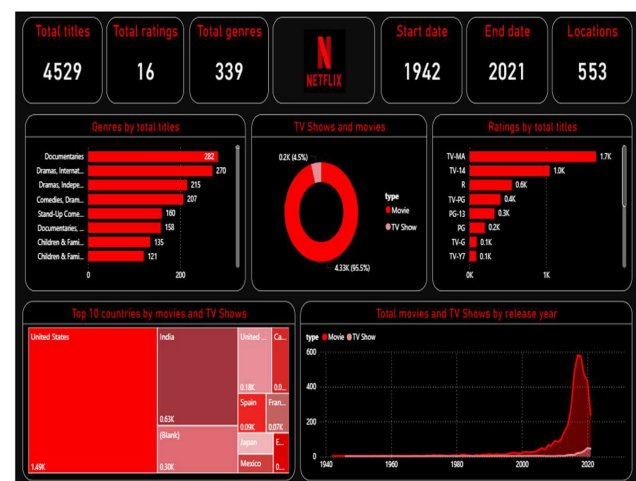


Figure 5: Dashboard on Netflix titles analysis

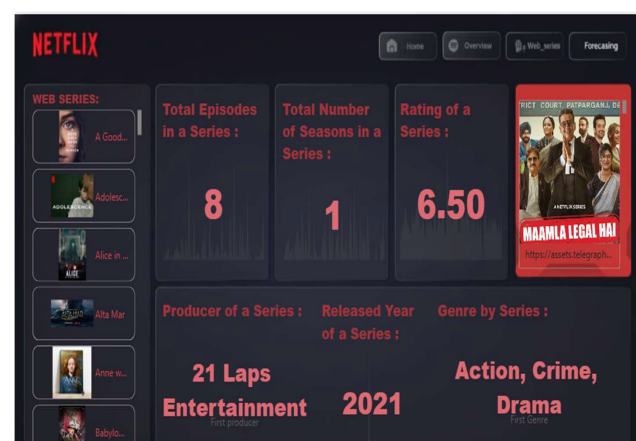


Figure 6: Web-series analysis dashboard

4.1 Overview of Analytical Findings

- The results in this section come from interactive dashboards created using Power BI [4], which allow the studying of Netflix content information from different angles to better understand patterns, trends and different types of shows and movies available on the platform. The dashboard helps in exploring the information by allowing users to filter content by type, genre, maturity rating, country of origin, and release year.
- This discussion interprets observed trends and connects them to inferred user behaviour analysis on OTT platforms.

4.2 Content-Type Distribution

- The analysis of content-type distribution shows that movies clearly dominate the Netflix library over television shows. Movies make up most titles, suggesting that feature-length content remains a crucial part of Netflix's content collection.
- Although TV shows and web series form a smaller part of the dataset, they help keep viewers engaged because people watch multiple episodes. This shows that Netflix offers many movies while also investing in series to keep subscribers interested.

4.3 Genre-Based Analysis

- Looking closer at types of shows, docs pop up a lot alongside serious stories, funny ones, plus films from outside the US. Mixing these kinds together seems to be how Netflix keeps viewers hooked - shifting tones like changing lanes on a long drive. A drama with laughs here, a foreign film spliced with real-life tales there - it adds up without trying too hard
- Looking at how people watch, it turns out dramas and documentaries get lots of attention because folks like real tales and learning something new. Earlier research saw the same thing - mixing up what's offered helps keep users tuned in when they stream

online.

4.4 Maturity Rating Trends

- Most shows on Netflix carry a TV-MA or TV-14 label, pointing to programming built for older teens and adults. Content shaped for mature viewers clearly takes up the largest share of what's offered
- Fewer kids' shows suggest Netflix leans into grown-up narratives. Over time, what people want has shifted - complex plots about actual societal matters now draw bigger audiences online. Stories with depth are gaining ground where simpler ones once ruled.

4.5 Country-Wise Content Contribution

- Out west, a map lights up brightest where American shows pile high in Netflix's collection. Next comes India - its glow growing, tied to home grown stories finding space on the platform. This shift traces back to decisions made far from Hollywood, reaching toward local voices.
- Across many nations, shows appear in different forms - proof that Netflix shapes its offerings for local tastes. Because of this, more people around the world find something familiar. Reaching wider groups happens naturally when stories reflect real lives

4.6 Release-Year Trend Analysis

- Lately, more stuff has been made than ever before - that jump stands out once you pass 2015. Around then, Netflix started spreading worldwide while spending bigger on shows they create themselves
- Streaming platforms now favour stories told in episodes, drawing people in over time instead of all at once. A slow build keeps viewers coming back, not just clicking once. This way, attention sticks around longer than it did before. Patterns show that one episode after another works better than single moments alone

4.7 Web-Series Behaviour Analysis

- Viewers tend to stick with web series that wrap up early - most hits last just one to three seasons. Because of this pattern, shorter storylines seem more appealing than drawn-out ones. A clear trend appears when checking the data: simplicity wins attention. Instead of endless episodes, people favour focused plots that move quickly. Story length matters more than expected.
- Story types like crime, thrillers, or intense dramas show up often online. Fast plots with clear direction seem to grab attention easily. One name popping up again and again behind top shows suggests consistency matters. Strong builds and trusted teams might just tip the balance when it comes to what sticks. What works tends to repeat - quietly, steadily.

4.8 Discussion of Results

- It turns out Netflix shapes its offerings around what people actually choose to view. Viewers' tastes clearly influence the volume of adult-focused material available. Drama holds steady, documentaries keep gaining ground. Instead of sticking to one format, longer stories told in parts are becoming more common. Shows made outside the U.S. appear more often now. What gets produced seems less about guesses and more about patterns in how audiences spend their time watching. Preferences shift, so does the catalog.
- Most folks find charts that respond to clicks simpler to follow, since sliding through layers of info reveals shifts over time. These live displays let people dig into streaming service stats without getting lost in spreadsheets. Instead of static reports, moving parts inside the screen show what viewers prefer week by week. Tools like these help teams spot jumps in demand before they become obvious. Seeing numbers shift with a toggle beats reading paragraphs about averages.

Flexibility here means fewer guesses when planning new shows.

CONCLUSION & FUTURE SCOPE

Through this study, we explored inside Netflix's collection started with plain numbers turned alive through Power BI visuals. Not only did we check the main movie and show line-up, but also pulled in extra web-based series details to see broader patterns. Movies make up most of what's offered - no surprise there - but it is long-running TV formats that hook people across weeks or months. Instead of quick hits, audiences lean toward layered stories: drama leads, followed closely by real-life tales in documentary form. At the same time, non-English material has grown fast, reaching far beyond one country's tastes. Who gets served? Mostly older teens and full-grown adults - the kind drawn to serious themes and complex characters. Far from just plotting lines and bars, this work reveals how visuals expose habits, moods, and shifts in watching behavior right now.

Looking ahead, there is much more to uncover by making the data even more responsive and personal. The next logical step would be to move away from static datasets and use APIs to feed real-time information into the dashboards, allowing the analysis to grow as the library does. We could also dive deeper into the "why" behind the numbers by looking at actual engagement metrics—like how often a user finishes a series or when they choose to hit pause—which would provide a much more intimate look at human behavior. There is also an exciting opportunity to use predictive modelling to guess what the next big hit might be, or to analyze social media chatter to understand the emotions behind the views. Finally, by bringing platforms like Amazon Prime and Disney+ into the mix, we can move beyond Netflix and understand the broader shifts in how the entire world watches television

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