

NETFLIX

The recent pandemic led to the usage of OTT a lot, here I have tried to do an content analysis of Netflix, this analysis focuses on what content Netflix targets and what is their target audience. I have also done a comparison with their direct competetion Amazon Prime.

NETFLIX DATASET: (<https://www.kaggle.com/datasets/shivamb/netflix-shows>
(<https://www.kaggle.com/datasets/shivamb/netflix-shows>)).

AMAZON PRIME DATASET: (<https://www.kaggle.com/datasets/shivamb/amazon-prime-movies-and-tv-shows>
(<https://www.kaggle.com/datasets/shivamb/amazon-prime-movies-and-tv-shows>))

```
In [2]: #Libraries
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
%matplotlib inline
```

The cleaning of Datasets is done seperately, Netflix followed by Amazon Prime to avoid confusion to readers.

```
In [3]: #reading the csv file
data = pd.read_csv(r'netflix_titles.csv')
```

The data set contains 8807 values spread across 12 Columns

```
In [5]: #EDA OF THE DATASET
data.head(5)
```

Out[5]:

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG-13	90
1	s2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thabane...	South Africa	September 24, 2021	2021	TV-MA	Season 1
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	NaN	September 24, 2021	2021	TV-MA	Season 1
3	s4	TV Show	Jailbirds New Orleans	NaN	NaN	NaN	September 24, 2021	2021	TV-MA	Season 1
4	s5	TV Show	Kota Factory	NaN	Mayur More, Jitendra Kumar, Ranjan Raj, Alam K...	India	September 24, 2021	2021	TV-MA	Season 1



```
In [6]: #shape of the dataset
data.shape
```

Out[6]: (8807, 12)

```
In [7]: #total values present in the dataset i.e the size of the dataset
data.size
```

Out[7]: 105684

```
In [6]: #info of the dataset that shows the count of values in the dataset and the dataty  
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>  
RangeIndex: 8807 entries, 0 to 8806  
Data columns (total 12 columns):  
#   Column          Non-Null Count  Dtype    
---  ---            -  
0   show_id         8807 non-null   object   
1   type            8807 non-null   object   
2   title           8807 non-null   object   
3   director        6173 non-null   object   
4   cast            7982 non-null   object   
5   country         7976 non-null   object   
6   date_added      8797 non-null   object   
7   release_year    8807 non-null   int64    
8   rating          8803 non-null   object   
9   duration        8804 non-null   object   
10  listed_in       8807 non-null   object   
11  description      8807 non-null   object   
dtypes: int64(1), object(11)  
memory usage: 825.8+ KB
```

```
In [8]: #name of the columns present in the dataset  
data.columns
```

```
Out[8]: Index(['show_id', 'type', 'title', 'director', 'cast', 'country', 'date_added',  
              'release_year', 'rating', 'duration', 'listed_in', 'description'],  
             dtype='object')
```

```
In [59]: #cleaning of data
#to check duplicate values
x = data.duplicated().value_counts()
print(x)

#there are no duplicates found in this dataset, if any:
data.drop_duplicates()
```

```
False      8807
dtype: int64
```

Out[59]:

	show_id	type	title	director	cast	country	date_added	release_year	rating
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NA	United States	September 25, 2021	2020	F
1	s2	TV Show	Blood & Water	NA	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	-
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	NA	September 24, 2021	2021	-
3	s4	TV Show	Jailbirds New Orleans	NA	NA	NA	September 24, 2021	2021	-
4	s5	TV Show	Kota Factory	NA	Mayur More, Jitendra Kumar, Ranjan Raj, Alam K...	India	September 24, 2021	2021	-
...
8802	s8803	Movie	Zodiac	David Fincher	Mark Ruffalo, Jake Gyllenhaal, Robert Downey J...	United States	November 20, 2019	2007	-
8803	s8804	TV Show	Zombie Dumb	NA	NA	NA	July 1, 2019	2018	TV-

	show_id	type	title	director	cast	country	date_added	release_year	rating
8804	s8805	Movie	Zombieland	Ruben Fleischer	Jesse Eisenberg, Woody Harrelson, Emma Stone, ...	United States	November 1, 2019	2009	
8805	s8806	Movie	Zoom	Peter Hewitt	Tim Allen, Courteney Cox, Chevy Chase, Kate Ma...	United States	January 11, 2020	2006	
8806	s8807	Movie	Zubaan	Mozez Singh	Vicky Kaushal, Sarah-Jane Dias, Raaghav Chanan...	India	March 2, 2019	2015	TV

8807 rows × 12 columns

```
In [10]: #now to check if there are any null values in the dataset
nul = data.isnull().sum()
print(nul)
```

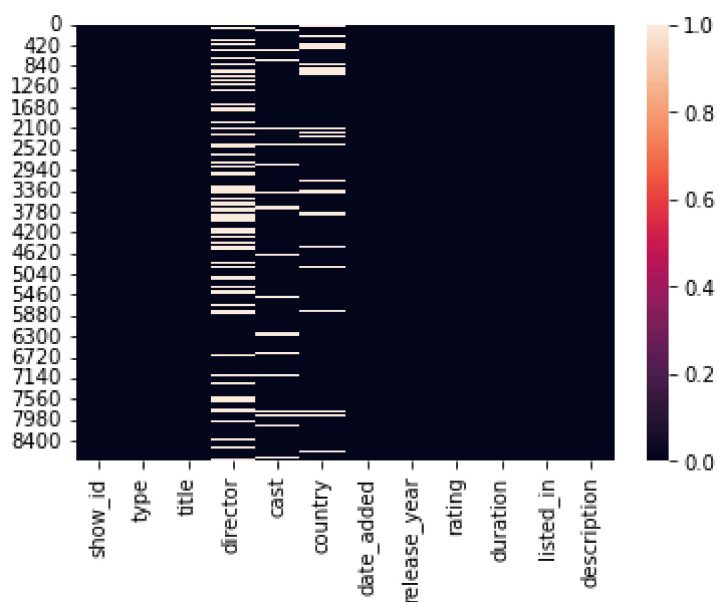
```
show_id      0
type         0
title        0
director    2634
cast        825
country     831
date_added   10
release_year  0
rating       4
duration     3
listed_in    0
description  0
dtype: int64
```

I have created an heatmap to show where the null values are concentrated more, we can see that it is concentrated more in the director column.

```
In [64]: #heatmap to show where the null values are concentrated more  
sns.heatmap(data.isnull())
```

#We can see that the null values are concentrated more in the director column

```
Out[64]: <AxesSubplot:>
```



My aim in any dataset is to not remove any data unnecessarily, so we try to retain those null values and fill it with 'NA' indicating only those values are not available.

```
In [11]: data.fillna('NA',inplace = True)
data.isnull().sum()
```

```
Out[11]: show_id      0
         type        0
         title       0
         director    0
         cast        0
         country     0
         date_added  0
         release_year 0
         rating      0
         duration    0
         listed_in   0
         description 0
         dtype: int64
```

```
In [12]: #To check how many values we actually don't have, significant number of values are
data['director'].str.contains('NA').sum()
```

```
Out[12]: 2634
```

I have saved the file to a CSV file, for the visualisation part I will be using PowerBi.

```
In [17]: data.to_csv('netedited.csv',index=False)
```

```
In [13]: data['listed_in'].head(10)
```

```
Out[13]: 0      Documentaries
1  International TV Shows, TV Dramas, TV Mysteries
2  Crime TV Shows, International TV Shows, TV Act...
3      Docuseries, Reality TV
4  International TV Shows, Romantic TV Shows, TV ...
5      TV Dramas, TV Horror, TV Mysteries
6      Children & Family Movies
7  Dramas, Independent Movies, International Movies
8      British TV Shows, Reality TV
9      Comedies, Dramas
Name: listed_in, dtype: object
```

If you observe the listed_in(genre) column you can see one TV show can be put under multiple genre, so here I am creating a new dataframe and splitting those genres separately and mapping them to their show_id so that we do not create a data mess of it.

```
In [10]: #Listing unpacking and making a dataframe
df_listing = pd.DataFrame()
df_listing['listed_in'] = data['listed_in'].str.split(', ').explode()
df_listing['show_id'] = data['show_id']
df_listing['title'] = data['title']
#to check the count of each category
xyz = df_listing['listed_in'].value_counts()
#print(xyz)
print(df_listing['listed_in'].nunique())

#saving it to a csv file
df_listing.to_csv('df_listing.csv', index = False)
```

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It is the same case with the country column so I have followed similar steps and created a new dataframe for it.

```
In [14]: #country column unpacking and making a dataframe
df_country = pd.DataFrame()
df_country['country'] = data['country'].str.split(',').explode()
df_country['show_id'] = data['show_id']
df_country['title'] = data['title']
countt = df_country['country'].value_counts().head(10)
print(countt)
df_country['country'].nunique()

#Saving it to CSV file
df_country.to_csv('df_country.csv')
```

United States	3211
India	1008
NA	831
United Kingdom	628
United States	479
Canada	271
Japan	259
France	212
South Korea	211
France	181

Name: country, dtype: int64

Out[14]: 198

In this duration table we can observe that Movies and TV Shows are in the same column i.e it is in min and seasons, so I have created to seprate dataframes respectively to remove 'min' and 'season' and convert it to numerical type for easy calculation.


```
In [17]: #creating duration table for movies
duration_df = pd.DataFrame()
duration_df['show_id'] = data['show_id']
duration_df['duration'] = data['duration'].replace(['Season 1','Season 2','Season 3'])
duration_df['duration'] = duration_df['duration'].str.split(" ").str.get(0)
duration_df.dropna(inplace = True)
duration_df['duration']

#saving it as a CSV file
duration_df.to_csv("dmovies.csv")
```

```
Out[17]: 0          90
        6          91
        7         125
        9         104
       12         127
        ...
      8801          96
      8802         158
      8804          88
      8805          88
      8806         111
Name: duration, Length: 6140, dtype: object
```

```
In [43]: #creating duration table for TVShow
tv_df = pd.DataFrame()
tv_df['Seasons'] = data['duration'].str.split(' ').str.get(0)
#I have replaced those 3 values with average seasons of the available dataset
tv_df['Seasons'].replace("NA",np.nan,inplace = True)
tv_df["Seasons"].fillna("1.8",inplace = True)
tv_df['Seasons'] = pd.to_numeric(tv_df['Seasons'])
tv_df['Seasons'] = tv_df[(tv_df["Seasons"]>=1) & (tv_df['Seasons']<=17)]
tv_df['show_id'] = data['show_id']
tv_df.dropna(inplace = True)
tv_df.count()

tv_df.to_csv("tvduration.csv")
```

```
Out[43]: Seasons      2702
show_id      2702
dtype: int64
```

AMAZON PRIME DATASET AND DATA CLEANING

```
In [44]: data_am = pd.read_csv('amazon_prime_titles.csv')
```

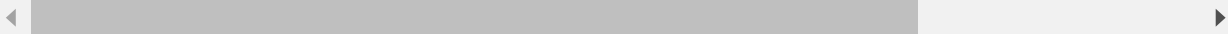
```
In [45]: data_am.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9668 entries, 0 to 9667
Data columns (total 12 columns):
#   Column          Non-Null Count  Dtype
---  -
0   show_id         9668 non-null   object
1   type            9668 non-null   object
2   title           9668 non-null   object
3   director        7586 non-null   object
4   cast            8435 non-null   object
5   country         672 non-null    object
6   date_added      155 non-null    object
7   release_year    9668 non-null   int64
8   rating          9331 non-null   object
9   duration        9668 non-null   object
10  listed_in       9668 non-null   object
11  description      9668 non-null   object
dtypes: int64(1), object(11)
memory usage: 906.5+ KB
```

In [46]: `data_am.head(5)`

Out[46]:

	show_id	type	title	director	cast	country	date_added	release_year	rating	dur
0	s1	Movie	The Grand Seduction	Don McKellar	Brendan Gleeson, Taylor Kitsch, Gordon Pinsent	Canada	March 30, 2021	2014	NaN	11
1	s2	Movie	Take Care Good Night	Girish Joshi	Mahesh Manjrekar, Abhay Mahajan, Sachin Khedekar	India	March 30, 2021	2018	13+	11
2	s3	Movie	Secrets of Deception	Josh Webber	Tom Sizemore, Lorenzo Lamas, Robert LaSardo, R...	United States	March 30, 2021	2017	NaN	7
3	s4	Movie	Pink: Staying True	Sonia Anderson	Interviews with: Pink, Adele, Beyoncé, Britney...	United States	March 30, 2021	2014	NaN	6
4	s5	Movie	Monster Maker	Giles Foster	Harry Dean Stanton, Kieran O'Brien, George Cos...	United Kingdom	March 30, 2021	1989	NaN	4



In [47]: `#to check duplicate values`
`data_am.duplicated().value_counts()`

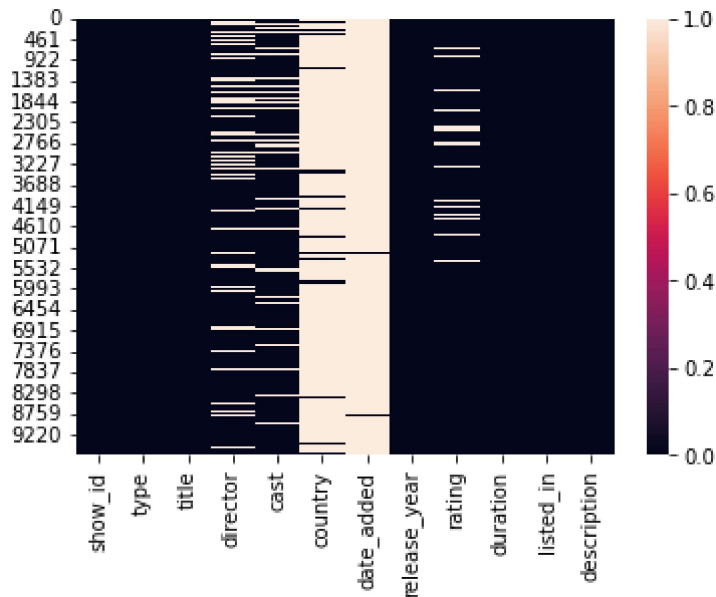
Out[47]: False 9668
dtype: int64

```
In [48]: #To check the number of NULL values  
data_am.isnull().sum()
```

```
Out[48]: show_id          0  
type          0  
title         0  
director     2082  
cast         1233  
country      8996  
date_added   9513  
release_year  0  
rating       337  
duration     0  
listed_in    0  
description  0  
dtype: int64
```

```
In [51]: sns.heatmap(data_am.isnull())
```

```
Out[51]: <AxesSubplot:>
```



```
In [52]: #Filling the null values with NA  
data_am.fillna("NA",inplace = True)  
data_am.isnull().sum()
```

```
Out[52]: show_id      0  
type      0  
title     0  
director  0  
cast      0  
country   0  
date_added 0  
release_year 0  
rating    0  
duration  0  
listed_in 0  
description 0  
dtype: int64
```

```
In [53]: #genre table  
  
lista_df = pd.DataFrame()  
lista_df['genre'] = data_am['listed_in'].str.split(', ').explode()  
lista_df['show_id'] = data_am['show_id']  
#grouping it according to show_id  
groupd = lista_df.groupby('show_id')  
groupd['genre'].value_counts()  
lista_df['genre'].nunique()  
  
#CSV Genre Table  
#lista_df.to_csv('amazongenre.csv')  
#sql: select show_id,count(genre) from lista_df group by show_id
```

```
Out[53]: 31
```

```

In [55]: #Duration in min
dur_df = pd.DataFrame()
#data_am[data_am['duration'].str.contains('Seasons')]
#Keeping the dataset to min and season differently
dur_df['dmin'] = data_am['duration'].replace(['11 Seasons', '12 Seasons', '14 Seasons'])
dur_df.dropna(inplace = True)
dur_df[dur_df['dmin'].str.contains('Season')]

#Now removing the min in the table and convert it into numeric type
dur_df['dmin'] = dur_df['dmin'].str.split(' ').str.get(0)
dur_df['dmin'] = pd.to_numeric(dur_df['dmin'])
dur_df.dtypes

dur_df['show_id'] = data_am['show_id']

dur_df['dmin'].head()

#creating a CSV file for the duration_min:
#dur_df.to_csv('amazonmovie.csv')

```

```

Out[55]: 0    113
         1    110
         2     74
         3     69
         4     45
         Name: dmin, dtype: int64

```

```

In [56]: #Creating a timeframe table for TV Show for seasons
dur_tv = pd.DataFrame()
dur_tv['Seasons'] = data_am['duration'].str.split(' ').str.get(0)
dur_tv['Seasons'] = pd.to_numeric(dur_tv['Seasons'])
#What I have done here is, we know that seasons are between the number 1 to 29, so we filter it
dur_tv['Seasons'] = dur_tv[(dur_tv['Seasons'] >= 1) & (dur_tv['Seasons'] <= 29)]
dur_tv['show_id'] = data_am['show_id']

#to reference if the code has matched the correct show_id
dur_tv

#We can see it has created NaN values to the empty spaces so we drop those values
dur_tv.dropna(inplace = True)
#These are the number of TV Shows that are present
dur_tv.count()

```

```

Out[56]: Seasons    2204
         show_id    2204
         dtype: int64

```

```
In [57]: #Country Table
countrydf = pd.DataFrame()
#filling up the null values in the dataset
data_am['country'].fillna("NoData",inplace = True)
data_am['country'].isnull().unique()

#seperating the values
countrydf['country'] = data_am['country'].str.split(',').explode()
countrydf['country'].nunique()
countrydf['show_id'] = data_am['show_id']
countrydf.head()
```

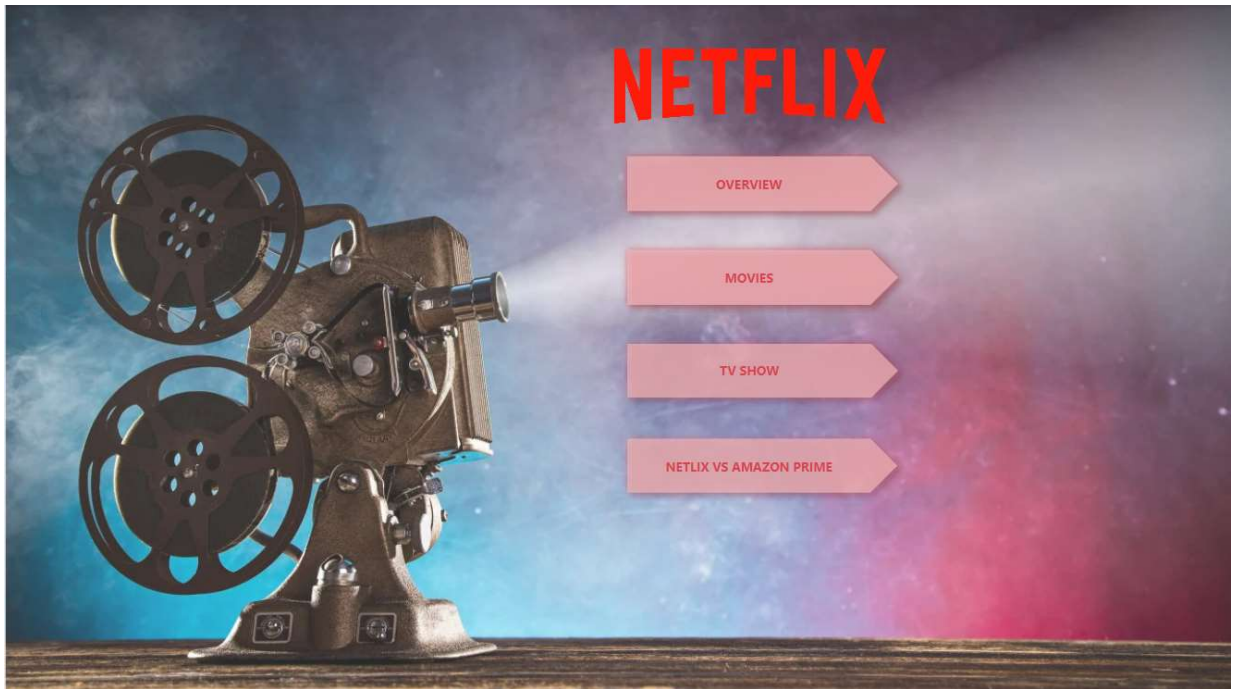
Out[57]:

	country	show_id
0	Canada	s1
1	India	s2
2	United States	s3
3	United States	s4
4	United Kingdom	s5

I have done the Visualisation part of this dataset using PowerBi, I will insert images of the report and I have attached the file of the report at the start.

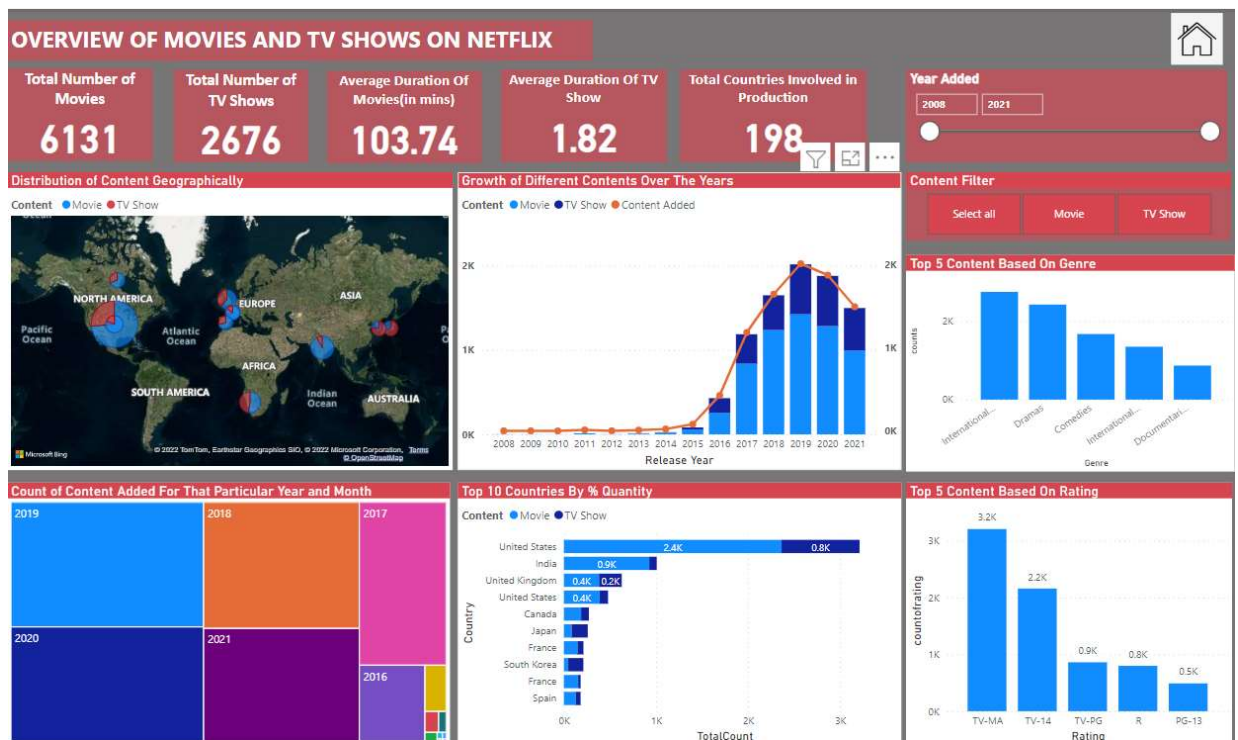
Since Netflix debuted in 1997, the streaming market started to soar in 2015 and 2016 with tremendous growth as they were gradually released in international countries. Netflix Movies and TV Shows Analytics dashboards detail the growth of international digital contents on Netflix over the years. It helps users understand and study the development of the streaming services ecosystem that is associated with each content/genre/maturity rating type/IMDB rating, segmented based on different factors.

Introduction Page: This Page was designed for users to navigate easily through the sections



Overview Of Data:

- 1) Out of the total available data, we can clearly see that Netflix has a lot more Movies(6131) in its list compared to the TV Shows(2676).
- 2) There has been a change in approach to this from Netflix from the year 2016, it is slowly shifting its attention to add TV Shows, the pandemic was an added advantage to their change, so we can see there is a slight rise in the number of TV shows added from 2018 - 2020.
- 3) Since Netflix is based off USA, the number of content producers is significantly more there a total of 3211, which is followed by India.
- 4) Netflix has focused on the International Movie genre to attract crowd all over the world, focus is to increase their target audience seeing the number of International Movies are more in its content list.
- 5) The average duration of a Movie in Netflix is 103.74 minutes and where as a TV show averages 1.82, this indicates that Netflix understands that people don't have time to sit for long hours.



MOVIE ANALYSIS:

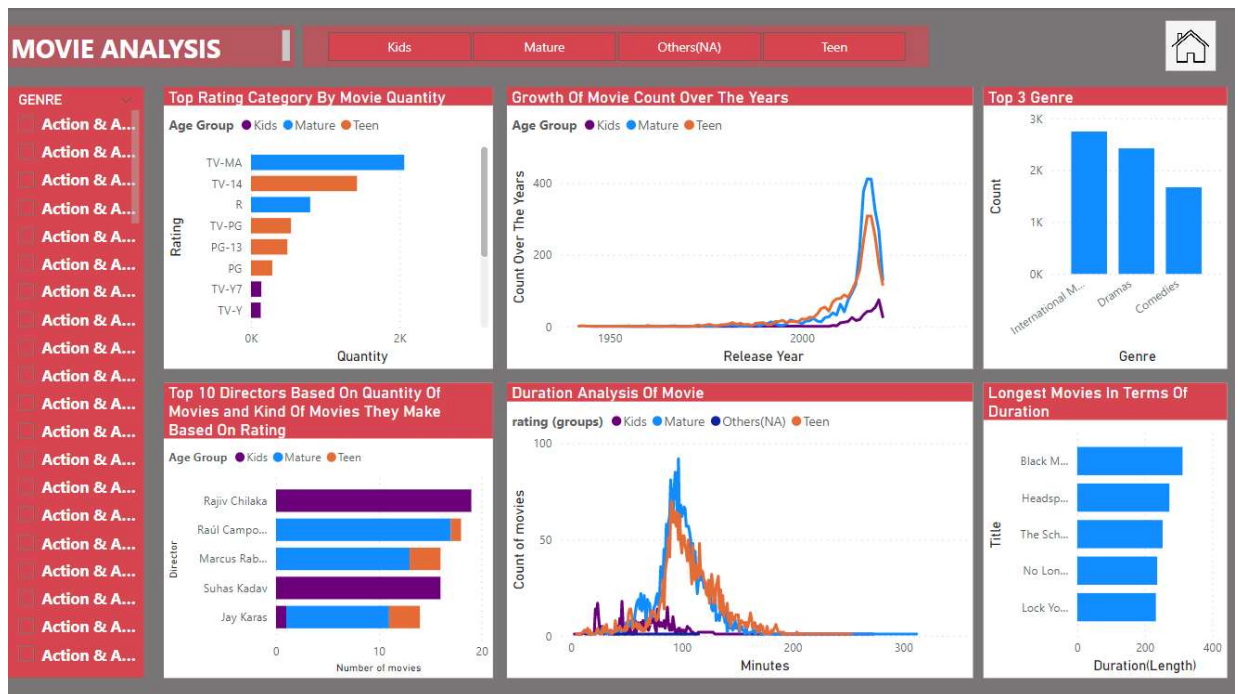
Note: I have grouped the ratings as Kids, Teens, Mature and the Unavailable data as Others.

Kids: G, TV-G, TV-Y, TV-Y7, TV-Y7-FV

Teen: PG, PG-13, TV-14, TV-PG

Mature: R, NC-17, NR, TV-MA, UR

- 1) Netflix focuses largely on the Mature group category, it shows that Netflix is targeting the group of 18-40+. It shows that there is a large section of people in this age group who are addicted to watching Movies.
- 2) The line graph also clearly indicates there is a significantly higher number of Movies that is being added of the maturity content in recent years.
- 3) Director Rajiv Chilika has a total of 19 Movies which is available in Netflix making him the highest.
- 4) Top 3 Genre's are International Movie, Dramas and Comedy.
- 5) The longest movie is Black Mirror which is 312 minutes long. The average movie duration in Netflix is concentrated in the region of 100-120 minutes.



TV SHOW ANALYSIS:

1)The TV Shows have a good balance of Content in them focusing on all kinds of Groups, Netflix has been trying to expand it's wings to all categories and there is a significant improvement towards that.

2)The duration of a TV Show might be a subject to disscussion since people tend to get attracted to the characters having short duration TV Show might not exactly be the right way to go about it, the average being close to 2. Netflix might want to look into that.

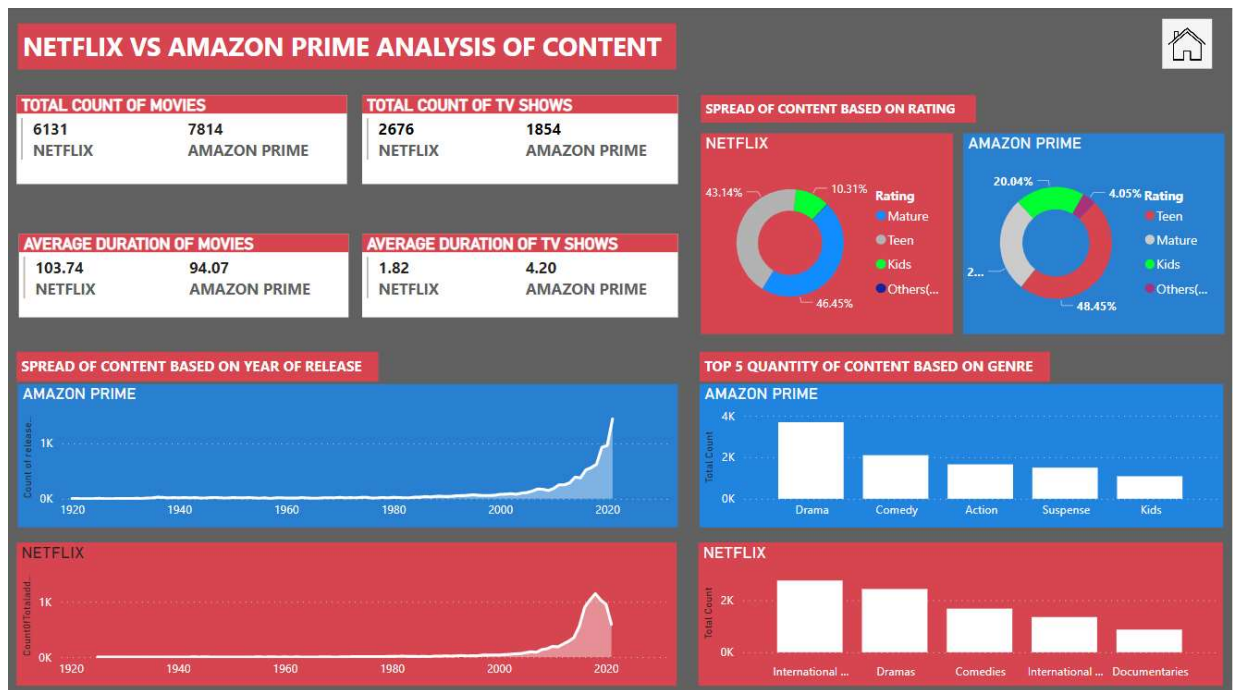
3)The longest TV Show Netflix has is Grey's Anatomy, John Was Trying To Contact Aliens, The Claudia Kishi Club and What did Jack Do?

4)As I mentioned the percentage of division is good Mature(43.05%) toping the list compared to Kids(17.41%) and Teen(39.46)



NETFLIX VS AMAZON PRIME CONTENT ANALYSIS:

- 1)Netflix has a total content of 8807, Amazon Prime has 9668 which includes both TV Show and Movies. Amazon holding a slight edge in this.
- 2)Netflix has an average duration of 103.74 min compared to 94.07 min of Amazon Prime, the difference comes in the TV Show duration, Amazon prefers shows which are longer averaging 4.20, this is a plus point considering people get attached to the shows.
- 3)We can see a dip in content added from the year 2020 to 2021 in Netflix where has the graph of Amazon has not dipped and continues to grow.
- 4)The major difference we can see is the target audience, Netflix prefers to target the Mature audience(18+) whereas Amazon targets the Teen group(7-18), very interesting approach taken by Amazon to target this section, I feel teens might get distracted and not focus on their career or studies given the lack of maturity at that age.
- 5)Netflix has stated previously targets International genre whereas Amazon targets the Drama genre, the one common genre between the two is comedy.



Note:

Although the dashboard provides a fundamental understanding of the content ecosystem on Netflix, the analytics could go much deeper if I am able to access users' data(ex: user subscription, user experience, user behavior, etc), which is usually not open to public due to confidentiality. As a next step, if I can break through the limitations of data, I may be able to provide more insights to help connect content usability with user data to discuss more in-depth insights for potential business growth opportunities.

Thank You for reading, I hope you liked it.

C Varun