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OTT Media Service and Use of Internet in India during COVID-19 Pandemic: A study of Netflix

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Article Info

Abstract
Present paper is to check the relationship of OTT media service and the use of internet and comparing OTT service and internet use in the lockdown period against pre-pandemic period.

Quarterly secondary data from the year 2019 to 2020 are collected from the Indian Telecom Industry reports and NetFlix Incorporation. Paired 't' test and multiple linear regression models have been used. The study shows that there is a significant increase in the data use, internet subscribers and percentage of internet subscribers during the pandemic period. The NetFlix membership and revenue have been increased substantially in the same period. Highly significant positive impact can be found on the data use in relation to the increase in NetFlix viewers. The NetFlix revenue has also been substantially increased due to the increase in the percentage of internet users in India. The paper can be useful at the governmental policy making and the study can also be useful for further study to the researchers and to find better business scope by the companies.

1. Introduction
Background
In the recent period of pandemic, several studies have been conducted on the OTT media streaming business exploration and its development all-over the world. Undoubtedly, people have stopped going outside during the pandemic and, therefore, searching for home entertainment to use excess time. Studies are also available on the development of e-commerce and online business in this period with favourable output.

There are some studies on the increase of online learning or e-learning and its future scope. No doubt, most of these studies are in favour of its development and related with the use of online media or digital platform based on internet communication. Increase in the use of internet can also be seen in the COVID period. But, consideration of OTT in relation to the internet use has not been explored yet, especially on the Indian context. Considering this unexplored aspect, the present paper is to seek such relationship in a short period of pre-pandemic and on the pandemic time periods.

Existing literature
There are some selective literatures on the study related with OTT platform in the pandemic period. Specially, a very few studies can be found on the Indian context. Some of the relevant studies are mentioned here.

Madnani *et al*. (2020) [2] have done a study on the COVID-19 impact on OTT platform in India through focused group primary survey. The study reveals that there is increase in OTT viewership due to lockdown and 'work-from-home'. People are more satisfied as they can spend time with family and enjoy together and, therefore, resulting in an increase in OTT service consumption.

Sundaravel & Elangovan (2020) [3] have described and narrated about the present status of OTT platforms and its scope in India. In their paper, OTT has been considered as a commodity rather than a luxury product. Different factors have also been indentified to the growth of these OTT media services.

Gupta & Singharia (2021) [4] have emphasized the service quality of different OTT platforms and customer engagements to these platforms through structured equation model. The study has considered that the OTT service providers are using the pandemic situation to their advantage. This study is based on the social media respondents through the questionnaire distributed by Google Docs files.

There are other studies in relation to the improvement in OTT service consumption during the COVID-19 period and are found to have similar outcomes regarding improvement in the OTT service consumption, transfer of customers from traditional media to OTT media, age-wise consumers segmentation of OTT services etc. (Nijhawan & Dahiya, 2020; Saini, 2020) [5, 6]. These studies have basically emphasized on OTT service consumptions and customer preferences towards OTT service during the COVID-19 period. But it is very natural that customers' priority towards OTT services is also due to the availability of fourth generation internet service. Studies regarding OTT service consumption and internet use cannot be found on Indian context in the recent scenario.

A few countable studies can be found regarding the use of internet and its improvement on the pandemic period (Klwani & Surange, 2020; Subudhi & Palai, 2020; Fernandes *et al*., 2020) [7, 1]. But, none of these studies have focused on the relationship between OTT service consumption and use of internet in the COVID-19 pandemic on Indian context. Considering that unexplored area in literature, the presented paper is a little initiative to understand the degree of impact of the OTT service consumption on the internet use in pandemic and that of use of internet service on the revenue enhancement of OTT service providers in the same period.

Objective of the study
The objectives of the present study are to check the significant differences in the internet use and OTT use before pandemic period against the pandemic period and find out relationship between OTT and internet use in that same period.

2. Materials and methods
In order to accomplish the above-mentioned objectives, the following methodology has been used in the present study:
1) Samples: There is no such conventional sampling technique of sample here. Necessary data are taken from the TRAI and NetFlix quarterly reports from January, 2019 to December, 2020. Pre-pandemic period has been considered till December, 2019. Being the top-level OTT platform, NetFlix is taken here for study and it discloses a separate section in performance report on the Asia-Pacific region. It is just an initiation of this kind of study, researchers may append several other OTT service providers on the same model if sufficient secondary data are available.

2) Variables: There are three types of variables. First type is related with the NetFlix revenue amount in thousand US$ (FLIXREV) and average number of paid members (FLIXMEM). Second type of data are related with the use of internet. These are like total number of internet subscribers in million (TOINSU), minutes of internet use per month per subscriber (MUPMPS), amount of data use in terabyte (DATAU) and number of internet subscribers per hundred of population (PE100NET). Third type of data are the number of credit and debit card transaction at point of sale (POTR) and the amount of transaction as POAMT. This point of sale (POS) data is taken from the Reserve Bank of India web site, which is to indicate that people are not going outside and therefore POS data shows insignificant increase in the given period.

3) Hypotheses: Considering the objectives of the study the following hypothesises can be narrated as:
Alternative H1: Pandemic period internet use and OTT use have been increased substantially,
Alternative H2: Internet use has been substantially increased due to OTT use, and the third Alternative H3: NetFlix revenue has been significantly influenced by increased internet users.

4) Statistical Tools & Models: For all the hypothesises, descriptive statistics and Pearson's bi-variate correlation analysis are made. Paired 't' test has been used for the hypothesis H1 and for the other hypotheses multiple linear regression models are formed. These models are mentioned below.

$$DATAU_t = \alpha_0 + \alpha_1 FLIXMEM_t + \alpha_2 POTR_t + \varepsilon - -(1) \text{ for H2.}$$
$$FLIXREV_t = \alpha_0 + \alpha_1 PE100NET_t + \alpha_2 POTR_t + \varepsilon - (2) \text{for H3.}$$

The Equation-1 (Eq-1) is to understand the effect of number of NetFlix members on the use of data and the number of POS transaction on the use of data. Considering second hypothesis, it is expected that FLIXMEM and POTR will have positive impact on DATAU. In case of Eq-2, it is expected that PE100NET and POTR will have positive impact on the FLIXREV. POTR is taken as control variable to indicate that e-commerce transaction also has significant impact on the selected dependent variables. The subscript 't' is to indicate quarterly time span.

3. Results and discussion
The study results are divided as descriptive statistics, 't' test, correlation analysis and regression analysis.

1) Descriptive & Paired 't' Test
The Table-1 is showing minimum, maximum, average and standard deviation (SD) values of the necessary variables. The table also depicts percentage change in maximum value against minimum value. Here, it can be seen that on average 721.54 million internet subscribers in India and each subscriber on average uses 730 minutes internet service per month, The SD values of TOINSU and MUPMPS are lower than DATAU. This indicates that there is significant increase in the use of data than the increase in the internet subscribers and time to use internet. Significant increase (above 100 %) in the Netflix Asia-Pacific revenue and average paid subscribers are also found from the same Table. The SD value of POS transaction and amount are also high, which are showing significant volatility in it. To realize statistically significant difference of these variables between two years (pre-pandemic and on-pandemic), paired 't' test has been calculated in Table-2.

Table 1: Descriptive Statistics

	Min	Max	Mean	SD	Max % of Min
TOINSU	636.73	795.18	721.54	55.00	25.00
MUPMPS	691.00	785.00	730.75	36.03	13.60
DATAU	15850560.00	27038720.00	21953271.38	4005726.35	70.58
PE100NET	48.48	58.51	53.96	3.39	20.68
FLIXREV	319602.00	684609.00	480227.63	136249.68	114.21
FLIXMEM	11374.00	24498.00	17460.38	4984.62	115.38
POAMT	2038224.00	3912254.00	3303842.00	597589.48	91.94
POTR	1084348512.00	1920010962.00	1631780521.88	266652434.09	77.10

Source: Authors' own calculation.

From Table-2, it can be seen that the Pair-7 & Pair-8 have positive 't' value and not much significant. The 't' test is made between the year 2019 and 2020 and the positive 't' value shows that the mean value of POS transactions and amount of 2019 are more than the 2020. It is expected that due to lockdown, the POS facilities and POS users have been reduced against previous year. But, significant and reverse results can be found for the 't' test values of Pair-1 to Pair-6.

These are showing that internet use, data use, time to use internet, proportion of internet users, NetFlix membership and revenue have been increased significantly over the previous year. From these results, it can be said that the lockdown period caused people to stay at home (from the reduced number of POS) and use internet-based entertainment services (from data use, internet subscribers' number etc.) more.

Table 2: Paired 't' Test

No.	Pair Name (2019 Vs. 2020)	t	df	Sig.
Pair 1	TOINSU	-13.903	3	.001
Pair 2	MUPMPS	-13.313	3	.001
Pair 3	DATAU	-19.270	3	.000
Pair 4	PE100NET	-10.270	3	.002
Pair 5	FLIXREV	-9.911	3	.002
Pair 6	FLIXMEM	-13.913	3	.001
Pair 7	POAMT	.936	3	.418
Pair 8	POTR	1.462	3	.240

Source: Authors' own calculation.

2) Correlation

The Table-3 is formed to understand nature of relationship between the NetFlix data and internet related data. Here, it can be seen that FLIXREV and FLIXMEM are having significant positive correlation with TOINSU, PE100NET, MUPMPS and DATAU. These are showing same direction

or trend in internet use and NetFlix OTT service consumptions. It is also noticeable that POS transaction and POS amount have negative insignificant correlation values. Although these values are insignificant, the inverse trends have some vital outcome for consideration.

Table 3: Pearson's Correlation

		TOINSU	PE100NET	MUPMPS	DATAU	FLIXREV	POTR
PE100NET	Cor.	0.997**					
	Sig.	0.000					
MUPMPS	Cor.	0.942**	0.919**				
	Sig.	0.000	0.001				
DATAU	Cor.	0.985**	0.976**	0.940**			
	Sig.	0.000	0.000	0.000			
FLIXREV	Cor.	0.963**	0.948**	0.962**	0.975**		
	Sig.	0.000	0.000	0.000	0.000		
FLIXMEM	Cor.	0.970**	0.955**	0.968**	0.983**	0.998**	
	Sig.	0.000	0.000	0.000	0.000	0.000	
POTR	Cor.	-0.232	-0.408	-0.423	-0.449	-0.464	
	Sig.	0.580	0.316	0.297	0.265	0.246	
POAMT	Cor.	0.044	-0.110	-0.150	-0.125	-0.156	0.915**
	Sig.	0.917	0.795	0.722	0.768	0.712	0.001
**. at the 0.01 & *. at the 0.05 level (2-tailed) Pearson Correlation is significant (N=8)							

Source: Authors' own calculation.

To understand the nature of impact of internet use and OTT service consumption, linier multiple regression analysis is made with the help of results found in Table-4.

3) Regression

Considering the Eq-1 regression results, it can be seen that the R^2 value is more than 90% with significant F-Statistic

value (38.70). Here, the coefficient of constant and FLIXMEM (0.0016) are positive and significant at $p<1\%$. This indicates that increase in FLIXMEM by one unit can increase the DATAU by 0.16%. But in case of POTR, the coefficient is negative and insignificant. May be, increase in data may show a significant value. But it is as per expectation that the POS transaction will have inverse relation with datause.

Table 4: Regression Results of Equations

Eq	R^2	F	F-Sig	Variables	β	SE	Sig.	VIF	Test	Statistic	*p*
				LDATAU Dependent							
1	0.939	38.70	0.000	C	6.536	1.192	0.003				
				FLIXMEM	0.0016	0.001	0.000	1.26	Shapiro W	0.912	0.370
				LPOTR	-0.056	0.128	0.681	1.26	Breusch P	1.940	0.379
				LFLIXREV Dependent							
2	0.979	118.00	0.000	C	6.962	0.983	0.000				
				PE100NET	0.033	0.002	0.000	1.06	Shapiro W	0.974	0.527
				LPOTR	-0.335	0.103	0.022	1.06	Breusch P	0.687	0.709

Source: Authors' own calculation.

The regression results of Eq-2 are showing that the R^2 is nearly 100% with significant F-Statistic value. The intercept is positive and significant. The PE100NET coefficient value is also significant and positive. This is showing that one unit increase in the proportion of internet subscribers can increase the NetFlix revenue by 3.3 percent. The coefficient value of POTR is negative and significant at *p<5%*. It shows that there is considerable inverse relationship with the NetFlix revenue. It means, if the people go outside and get involved in buying or such kind of activities, then there will be less time to spend in OTT and therefore the OTT revenue may decrease. This issue can be studied elaborately.

However, both the above equations are having no or low multicollinearity (VIF less than 1.50). The Shapiro-Wilk normality test values are with *p*values more than 5%, which are showing normality of the regression results. The Breusch-Pagan test statistics have *p* values above 5%. It signifies that both the equations have no heteroscedasticity issue. Altogether, it can be said that both these regression models are valid and regression results are complying with the alternative hypothesis H2 and H3. On the basis of the analysis, conclusions are drawn in the next section.

4. Conclusions & Recommendations
In the pandemic lockdown phase, people are staying at home and spending time by 'working-from-home'. People are also using their spare time with family and through entertainment. Shopping and necessary products are ordered through e-commerce. In this scenario, present study has focused on the impact of OTT entertainment service consumptions on the internet use in India and its effect on the earning enhancement of the OTT service providers. The study clearly shows that the OTT service consumptions is causing substantial impact on the internet use and data consumptions from one side and there is significant increase in the OTT service provider's revenue due to the improvement in the number of internet users. The study also reveals that the pandemic and lockdown period are some vital issues for such results. This can be seen from the paired 't' test statistics.

Recommendation can be given for the government and business houses in this respect. Government should move early towards policy making and other related laws with respect to the OTT services on the consideration of the economic context and business houses should take these opportunities to earn revenue through the customer engagement in OTT service. Researcher may consider further study by increasing the study period in pre and on pandemic time. They can also include other OTT service providers in the Indian context or may do some comparative study in the context of developed and developing countries.

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