

# THE RELATIONSHIP BETWEEN MONEY SPENT AND THE CONTENTS WATCHED ON SMARTPHONE APPS: A CORRESPONDENCE ANALYSIS APPROACH

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## ABSTRACT

Smartphones are an indispensable part of our existence, and it is not an exaggeration to state that they are like our body parts which cannot be separated from us. Interestingly, technological convergence has enabled Smartphones to provide us with many utilitarian and hedonic functions. Because of the advent of Smartphone apps, Smartphones have emerged as omnificent. The purpose of this study is to analyze the relationship between the amount of money spent and the type of video content watched on Smartphone apps. The data has been collected by using the mall intercept survey method. The proximal relationship between amount of money spent by the respondents and the type of video content selected using Smartphone apps has been visualized using Correspondence Analysis. The key findings of the study are that the respondents willingly pay a specific monthly subscription fee to view premier content of their choice on Smartphone apps.

**Keywords:** Smartphone Apps, User Engagement, Video, Content Consumption, Correspondence Analysis

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## INTRODUCTION

We live in times where we can access the entire world's information through a scroll of a finger on a device that fits in the palm. Interestingly, Eric Schmidt, in his book 'The New Digital Age: Reshaping the future of people, Nations and business' had proclaimed that "By 2025, at every level of society, connectivity will continue to become more affordable and practical in substantial ways. People will have access to ubiquitous wireless Internet networks that are many times cheaper than now" [1]. Digital communication has barred the boundaries of time and space. One of the early technological inventions in 1993, 'The Simon' from IBM, was predominantly introduced as an enterprise device and had features including email, internet, fax, web browsing, camera etc. However, the phenomenal revolution in the Smartphone ecosystem took place around 2008 after 'Apple' revealed its first Smartphone to the general consumer market, enabling them to download third-party applications, known as Smartphone Apps. Today, the enhanced user interface of the Smartphone apps and the advanced features of the Smartphone like internet access and Wi-Fi have helped people relate to themselves and connect with others [2]. Communication in everyday life, including in sales, is the key to satisfaction and success. Communication can be verbal or non-verbal. Non-verbal communication has a significant impact on the success of any business. It ranges from the behavior towards employees, partners, and co-workers to the relationship with potential customers buying a particular product or service [3]. Prominent research carried out in the domain of user engagement has formulated the definition of User Engagement as the initial reaction of the users to technologies. According to [4] it is also the process of evaluating the user's response and level of indulgence toward a technology. In the words of [5] users' engagement, the profound interaction of the user with the system, can also be determined by considering the re-engagement with the information systems over considerable time. The video streaming apps that all of us engage with occasionally or regularly, have an evolutionary timeline, which cannot be overlooked. There is a tremendous increase in the video traffic consumption that we experience today. The drastic improvements in the data speed and broadcasts-cost during the 2000s, saw the first-generation video streaming services flourish. Following the success trend of video streaming services, YouTube made a grand entry into the ecosystem in 2005. By joining the league, Netflix proved itself to be one of the booming online streaming services by 2010. Rest, as they say, is history and today the list of online streaming services is endless. By 2010, the word 'App' was buzzing around the Smartphone ecosystem and, in 2011 the revelation of the usage of Smartphone apps being more than mobile web usage, was made. Today it is expected that by 2023, Smartphone apps will be generating overall revenue of over \$935 billion globally [6]. The apps aim to make the target consumers smarter by providing them with useful information and value-added services in an effortless manner [7]. But because of the widening gap between the enormous media available on the apps and the limited attention span of the users, a massive challenge to attract the consumers lies in the competitive apps market [8]. In this context, the present study plots the relationship between the type of content preferred by the respondents and the choice made for viewing paid or unpaid content on Smartphone apps.

## EMPIRICAL REVIEW

Consumer behavior affects individual behavior in the process of procuring, using, and disposing of products. Every day, consumers make a series of decisions regarding the aforementioned processes, often unconsciously, so that the process is interactive and most often routine [9]. The constant engagement of the users with Smartphones is driven by many motivating factors like functional and hedonic fulfilment. Over the years, many studies have been conducted on internet service adoption. [10] in their study found out information and entertainment as the significant antecedents to the adoption of technology. [11] determined that users obtained gratifications from Smartphone usage due to factors such as convenience, browsing the internet for novelty and entertainment and the constant availability of the Smartphone. According to [12] user engagement behavior is a result of the user's choice, convenience and opportunities offered. 'Convenience' in user engagement with Smartphone video apps can mean selecting a convenient time and place to view the content. Smartphone being portable device is convenient to be accessed at any time and any place. The study on the factors leading to adopting the streaming service, conducted by [13] has discovered - cost, content availability, convenience, user experience and internet penetration as significant determinants. The study by [14] found out factors like time convenience, interactivity, and compatibility positively influence mobile app engagement. Many studies have enumerated various factors

leading to user engagement with the Smartphone and the consequent adoption of Smartphone apps for various purposes. The phrase “Content is King”, excerpted initially from the essay by Microsoft founder Bill Gates, has gained much value today as the viewers of the media content have ample variety and options of content to choose from, just by a touch of the thumb. The ability of the companies to engage customers is an essential tool for enhancing future content consumption and building a long-term sustainable business relationship with them [15]. The commercial video streaming services which provide access to unlimited content to the users for a monthly or yearly subscription are also known as Subscription-based video-on-demand services. These services, which were initially the content aggregators, have now indulgently, become the original content creators also, as they realize the competition that lies in front of them in the race to gratify the users’ need for content consumption [16]. The studies on the type of content which is preferred by the viewers are still in a nascent stage. The present study aims to probe the proximal relationship between the usage of Smartphone apps for video content consumption by the respondents and their viewing choice by either subscribing to the content or watching it for free.

## METHODOLOGY

This study used correspondence analysis, a visualization technique, to find out the relationship between the categories. Using this method, one can arrive at a specific spatial interpretation of the relative position of the points on the map. The two-way table in correspondence analysis is obtained by calculating coordinates representing its rows and columns. The first variable chosen for the study is the type of content watched by the respondents, and it is labelled as ‘content watched’. The second variable chosen is the amount of money spent to watch the video content, and it is labelled as ‘payment made’. The first variable is represented in the column and the second variable is represented in the row. The relational variables result from decomposition of a matrix of chi-squared values, which have been derived from the rows and columns of the expression matrix.

*Table 1. Correspondence Table*

Content watched	Payment made			
	Zero Rupee	1-1000	More than 1000	Active Margin
Web Series	122	166	13	301
Presently running TV shows	46	41	2	89
Stand-up Comedy shows	111	122	10	243
Movie Trailers/Movies	111	144	13	268
News	82	79	6	167
Repeat telecasts of TV shows already telecasted	42	52	5	99
New and old songs on Youtube	120	120	10	250
TED Talks/Motivational talks	91	99	10	200
Adult content	18	28	3	49
Spiritual lectures	25	27	2	54
Cooking shows	34	45	4	83
Academic/ Educational content	110	106	10	226
Active Margin	912	1029	88	2029

*Source: Survey Data*

The correspondence table (Table 1) is a cross-tabulation frequency table which depicts the frequency for each category of variables. It can be noted that in eight out of the twelve content categories, the respondents are spending a hefty amount of up to Rs.1000 monthly to view the video content of their choice. The content the respondents tend to watch maximum is web series, followed by movies and the trailers of movies.

Stand-up comedy shows can tickle the funny bone of the respondents and provide them with an engaging experience, as it is evident that many respondents watch Stand-up comedy shows on Smartphone apps. An interesting observation with respect to viewing the academic/educational content on Smartphone apps is that respondents are seeking such content by paying the monthly subscription fee and from the apps, which are free of cost. Similarly, an equal proportion of respondents are consuming the entertainment content like watching old and new songs on YouTube App; free of cost and also by making a monthly payment. Around 20% of the respondents have opted to watch news on Smartphone apps without making any payment, and about 16% of respondents make a monthly payment of up to Rs 1000 to watch motivational speeches.

Table 2. Summary

Dimension	Singular Value	Inertia	Chi Square	Sig.	Proportion of Inertia		Confidence Singular Value	
					Accounted for	Cumulative	Standard Deviation	Correlation
1	.074	.005			.904	.904	.022	-.025
2	.024	.001			.096	1.000	.021	
Total		.006	12.342	.950 <sup>a</sup>	1.000	1.000		

a. 22 degrees of freedom

Source: Survey Data

In the summary table displayed in Table 2, the rows represent the calculated latent variables. The columns represent the various statistics associated with those latent variables. The cumulative column under the proportion of inertia is the crucial data to be considered. This inertia column indicates the breakdown of the inertia of each dimension to the total inertia. This gives the proportion of the accounted for variability (inertia) attributed by that latent variable. First latent variability accounts for 90.4% of the total variability. With the single dimension, 90.4% of inertia is explained and, a cumulative of 99% is explained by the first and second dimensions. The chi-square test is applied to test the hypothesis that the total inertia value is not different from zero. The chi-square statistic is 12.34 with a significance value greater than 0.05, which indicates that the total inertia value is not significantly different from zero. The correlation is noted to be -0.025, which is a low correlation indicating the latent variables are orthogonal, and the variables are uncorrelated.

Table 3. Overview Row Points<sup>a</sup>

		Mass	Score in Dimension		Inertia	Contribution					
			1	2		Of Point to Inertia of Dimension		Of Dimension to Inertia of Point			
						1	2	1	2	Total	
Content watched											
Web Series		.148	-.314	.195	.001	.197	.233	.888	.112	1.000	
Presently running TV shows		.044	.532	.377	.001	.167	.258	.859	.141	1.000	
Stand-up Comedy shows		.120	.058	.039	.000	.005	.008	.867	.133	1.000	
Movie Trailers/Movies		.132	-.264	-.013	.001	.124	.001	.999	.001	1.000	
News		.082	.314	.059	.001	.110	.012	.989	.011	1.000	
Repeat telecasts of TV shows already telecasted		.049	-.198	-.119	.000	.026	.029	.894	.106	1.000	
New and old songs on YouTube		.123	.226	-.023	.000	.085	.003	.997	.003	1.000	
TED Talks/Motivational talks		.099	.023	-.235	.000	.001	.225	.028	.972	1.000	
Adult content		.024	-.629	-.217	.001	.129	.047	.963	.037	1.000	
Spiritual lectures		.027	.112	.144	.000	.004	.023	.649	.351	1.000	
Cooking shows		.041	-.296	.017	.000	.048	.000	.999	.001	1.000	
Academic/ Educational content		.111	.263	-.187	.001	.104	.162	.858	.142	1.000	
Active Total		1.000			.006	1.000	1.000				

a. Symmetrical normalization

Source: Survey Data

The overview row points table, as displayed in Table 3, allows the researcher to interpret how the row contributes to the dimensions and vis-e-versa. News, Academic/Educational Content and Songs (new and old) contribute more to dimension 1. Web series and Spiritual lectures contribute more to dimension 2. Presently running TV shows contribute both to dimensions 1 and 2.

The mass column, which refers to the proportion of the category in the sample, is taken as a measure of the importance of that category amongst the whole sample. Under the 'Score in Dimension', the values of column 1 and column 2 are the category coordinates on the respective latent variable. The inertia column indicates the relative effect that category is having upon the solution as a whole, which in the above table is relatively small; hence it can be derived that no category is dominating the solution.

Table 4. Overview Column Pointsa

Payment made	Mass	Score in Dimension		Inertia	Contribution				
		1	2		Of Point to Inertia of Dimension		Of Dimension to Inertia of Point		
					1	2	1	2	Total
Zero Rupee	.449	.299	-.024	.003	.540	.010	.998	.002	1.000
1-1000	.507	-.229	.080	.002	.359	.134	.962	.038	1.000
More than 1000	.043	-.416	-.691	.001	.101	.856	.526	.474	1.000
Active Total	1.000			.006	1.000	1.000			

a. Symmetrical normalization

Source: Survey Data

The contribution of the ‘Dimension to Inertia of Point’ column in Table 4 shows the role each dimension plays in each column. The two categories, spending zero rupees, and spending between the amount of (Re 1 – Rs 1000) contribute the most to dimension 1. The category - spending an amount of more than Rs1000 monthly, contribute more to dimension 2. Both categories, spending zero rupees (watching free content) and spending between (Rs 1 -1000) have positive and negative magnitude, in column scores in dimensions. The category spending more than Rs 1000 has both the negative magnitudes. The inertia is relatively less, and it indicates that no category dominates the solution.

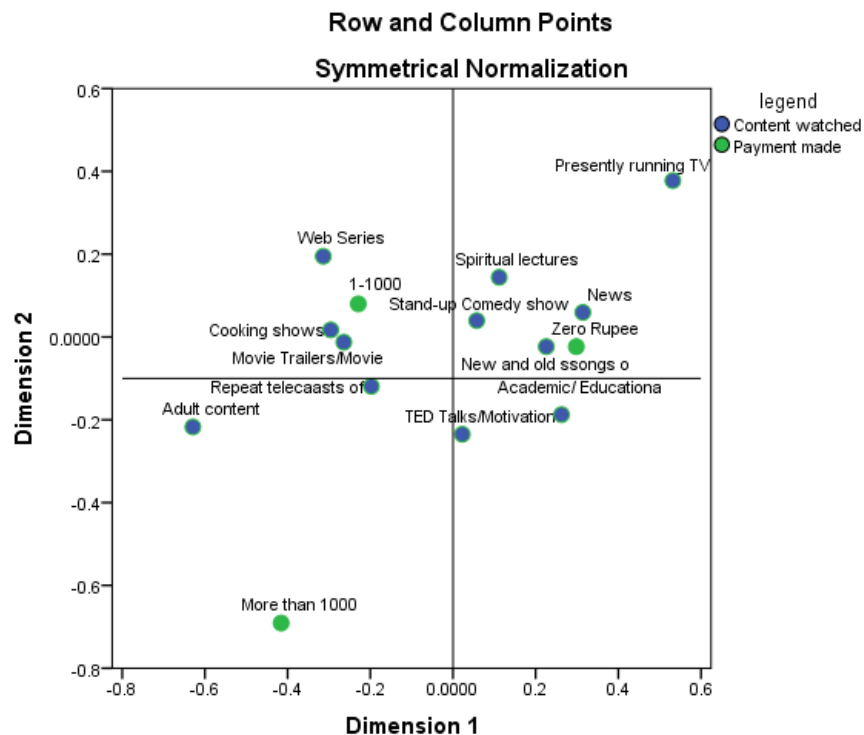


Figure 1: Correspondence Map

Source: Survey Data

The correspondence map in figure 1 depicts each category plotted against two dimensions simultaneously for the type of content watched and the amount of payment made by the respondents. Both the variables can be seen in terms of latent variables, and any proximity between the categories of either variable on the biplot, is interpretable as substantive proximity.

## DISCUSSION

One of the important components that pulled us out from the gloominess, in which the world had been immersed for the last three years, is the 'entertainment quotient'. The pandemic forced everyone to sit inside the constraints of the four walls of their homes. But the bouquet of exclusive, original, free of cost/premium online content, streaming on the OTT platforms and the Smartphone apps, has kept the users engaged and entertained. Web series: series released episodically on the internet, are capable of immersing the viewers in to the imaginary lives of the characters portrayed in the series. This immersive experience slowly turns addictive as the viewers watch one after other episode of the series and indulge in 'Binge watching' the series [17]. YouTube, an online video sharing and social media platform, offers user-generated content free of cost and YouTube Premier, a subscription service offered by YouTube, provides access to ad-free content to the users. Along with the entertainment content, there is also a growing market of educational apps on Smartphone. Many educational apps; like Khan Academy, provide free learning content to the users. Many other learning apps like Unacademy and Biju's App, are examples of the subscription-based apps. According to [18], as digital technologies have enabled an infinite number of learning apps for the users, the apps which aim to promote active, engaged, meaningful and socially interactive learning are considered educational apps.

Premier content refers to the digital content, that is accessible for a fee, and is more desirable and of higher quality than free content. Expected to be original and exceptionally informative, the premier content is not easily available on the internet and is deliverable under a paid subscription [19]. Many Smartphone apps are streaming the original content for a paid subscription; however, this premier content is being pirated and is made available at free cost to the viewers. Internet piracy, which is the means of sharing and uploading copyrighted content digitally without permission, has more altruistic value than economic value [14]. The 'sharing is caring' motto is well exhibited by the respondents; as they admitted sharing their login credentials with friends, who have not subscribed to the streaming apps/platforms. Also, a significant chunk of the respondents has opted to pay the monthly subscription fee by dividing the cost among their friends. While the reasons for consuming pirated content can vary from non-accessibility of the content to non-affordability of the subscription amount by the users, [20] found that the creators and distributors of the content need to counter the hurdles of content piracy. The content distributors are formulating many hybrid models of payment to win over the consumers of video content, by offering them unlimited free content, premier content at an affordable subscription fee (weekly/monthly/yearly), and watch the content at pay and watch basis etc [21].

## LIMITATION AND FUTURE RESEARCH

The limitation encountered during this study is that the respondents are the inhabitants of the urban city in India, and this study cannot be generalised to the rural population in India, where the menaces of the digital divide and digital illiteracy persist. Apart from this, the researchers have embarked on the research area of 'user engagement with Smartphone apps', foreseeing many future research implications. The findings of this study can be used to study in detail the algorithmic patterns of the amount of money spent on one particular genre of content. The content can further be categorised as educational, entertaining, informative etc., and can be scrutinised further. Content analysis can be conducted on the type of content popular among the respondents of a particular age group. Specific analysis can be conducted on the program/genre/duration of the content that is preferred. This comparison can be further used to compare the content watching preferences of inhabitants of different countries. Limitless research based on this study can explore the factors which turn engagement to addiction. For the content producers and content distributors, it can serve as a reliable source to analyse what type of content, users are willing to pay for. The preference for watching specific type of content can be studied and compared for different gender. The future of online content consumption on the fourth screen (Smartphone) vs. content consumption on the first, second and third screen respectively can be analysed. This study used correspondence analysis, a visualization technique, to find out the relationship between the

## CONCLUSIONS

YouTube is the most viewed online content platform by the respondents. YouTube which provides free online content, user-generated content and premier-subscription based content, is offering many hybrid models of content consumption for the users. YouTube offers a vary of content flavors to the viewers; from educational, informational to entertainment etc. From cooking shows to spiritual shows, there are consumers for every type of content being offered. Smartphone apps have increased the consumption of video content consumption among the users, who prefer to watch the video content 'on the go', at any time and place, instead of tuning into the traditional and sedentary forms of media. Digital spaces are the new lookout for the distributors of video content. Affordable data surfing charges, improved internet connectivity, regional and vernacular content, high streaming quality etc. are the factors due to which the consumers of video content do not mind shelling out money to have an engaging and gratifying experience.

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