Consumption of musical content and movies/series online in Portugal

Ana Filipa Silva
afsilva2307@gmail.com

Graça Trindade
Maria da Conceição Santos
Instituto Universitário de Lisboa (ISCTE-IUL), Lisboa, Portugal
Business Research Unit, (BRU-IUL)
Av. das Forças Armadas, Lisboa
1649-026 Lisboa, Portuga
graca.trindade@iscte-iul.pt; maria.santos@iscte-iul.pt
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Abstract **—This study addresses the online consumption according to the frequency of Internet use. The time spent on Internet goes beyond a simple search or checking the email. Although globalization implies visualizing a trend among various subcultures, the present study seeks to understand if there are differences in the Portuguese users' behavior or perception about the consumption of Internet content in terms of music (or music videos) and films and television series. Are there sociodemographic differences of Portuguese users? Are the Portuguese users' choices homogeneous in how often they use the Internet to access music and movies online? The answer to these research questions is the purpose of this study.**

Using the Flash Eurobarometer 437 database, it is identified that age is significantly related to the frequency of using the Internet to access music and movies online. It is also observed that gender is significantly related to frequency of using the Internet to access movies online. However, the perception of quality and speed of Internet connection are not significantly related to frequency of using the Internet. The choices facing the Portuguese users are not homogeneous regarding the frequency of Internet use to access music and movies online as observed in four clusters with different characteristics. These results can be an indication that policies concerning the music and movies contents should fit the characteristics of each of these clusters.

Keywords - Internet; Streaming platforms; Music online; Movies online.

I. INTRODUCTION

At the beginning of the 21st century, the information and communication technologies (ICT) became a basic element in the daily lives of many people. Since then, the level of instant connectivity offered by ICT advances is unprecedented [1]. Today, there are more than 3 billion Internet users worldwide, representing around 40% of the world population [2]. The growth of the demand and supply of digital contents, both informative and entertaining, has led to significant changes in the media ecosystem reaching its production, distribution and reception [3].

Meanwhile, telecom operators have been forced to change their strategies and provide access to the Internet. Several authors [2] state that the Internet is supposed to change the terms of competition by establishing fair conditions between business giants and small businesses. Other authors argue that, as social networks become ubiquitous as the principal tool for the dissemination of information, forecasting the popularity of online content is increasingly important for the management of brand reputation, growth of business opportunities and effective communication [4].

The Internet has brought new ways of accessing and creating content. Online content covers a wide spectrum of news, search results, referrals, entertainment, and shopping guide information [5]. Moreover, people are increasingly sharing information and knowledge in online communities with the growth of convenient Internet access [6].

As Internet access is becoming more required in all levels of society, there are platforms that deliver specialized contents through this network. Streaming platforms provide a set of own or third-party content through large content catalogs that can be accessed via the Internet [7]. These platforms tend to take advantage of the multiplicity of media and displays that are currently available to the majority of the public. Direct and inter sectorial competitiveness emerged due to the appearance of new concepts and technologies, such as streaming.

In spite of this fast and global spread of the new platforms to access music and movies and/or series, it is scarce the research about how global is the consumer behavior online. A group of authors [8] examined the consumption of online news video in six countries (Denmark, France, Germany, Spain, United Kingdom and United States) and the findings reflect the power of social media platforms in influencing news consumption habits. Regarding the music online habits, other authors [9] explored whether there are country-specific differences in users' listening behavior on music platforms, based on the data from consumers of 47 countries. Their study results show the existence of country-specific differences in music listening behavior with respect to the degree of deviation from the global mainstream.

As in many other countries, Netflix and Amazon streaming services became increasing popular in Portugal. Professional experience integrating content and a management team from one of the largest Portuguese telecommunications companies enables the evaluation of challenges faced by this sector. Direct and inter sectorial competitiveness emerged due to the appearance of new concepts and technologies, such as streaming.

A study on digital consumption of Portuguese youth [10] show that nearly 90% of respondents surf the Internet every day to listen to music online, to watch movies/series/videos online and to participate in social networks.

What are the sociodemographic characteristics of Portuguese users? Will the Portuguese users' choices be homogeneous with regard to how often they use the Internet to access music and movies online? The answer to these research questions is the purpose of this study.

II. LITERATURE REVIEW

The literature review begins by portraying the evolution of the Internet. Next, it presents the industry, offers of products and services from telecommunication operators in Portugal, as well as the identification of the streaming and download services. Lastly, it is analyzed the consumption of Internet services and contents, namely music content (or music videos) and online movies and TV series.

A. The Internet evolution

From the creation of the Internet to the present day, there are several differences with regard to the forms means and type of access, type of equipment, frequency of use and speed of access to the networks that allow us to send and receive data faster and faster. Regarding the use of the Internet in today's society, three dimensions can be identified: quantity, variety and type of Internet use [11]. The first dimension is viewed as the amount measured in terms of frequency of Internet use in everyday life rather than the time spent surfing the Internet. The second dimension, the variety of Internet use, should be measured by the number of different activities that individuals perform online. The third dimension, the type of Internet use is measured by the number of different activities that people access online. But, while the frequency of Internet is measured by the number of times we access it in a given period of time, the intensity of use refers to the amount of data transferred/consumed or with diversity of researched content [12].

Concerning the location of use, some authors report that people who use Internet at home or work are less likely to be occasional users than those who access the Internet elsewhere, such as coffee houses, schools or universities [12]. They also find that users who have a high-speed connection in data transfer are more likely to be active users. These authors identify that active users access the Internet to read online newspapers, to work from home, to make personal and work communications, and perform a job search, or a travel/hotel information queries. Occasional users, however, tend to use the Internet to participate in online games and search public information.

Regarding the quality of the connection, other authors argue that from a current broadband subscription, the higher the perceived service quality, the more likely it is for the consumer to renew the subscription [13].

B. Internet offers and services of streaming and download

The industry players combine a global and local offer, also explained by the multinational corporate government, but also in searching for a differentiation strategy in respect of the consumer behavior trends. Portuguese telecommunication market includes four operators: NOS, ALTICE-MEO, Vodafone and Nowo. All operators offer television, fixed internet, mobile internet, landline and mobile phone services.

NOS is the leader in pay-tv with a positioning of the best entertainment operator, holding more than 200 cinemas across the country. This operator has a wide video club catalog. In music content, in addition to its strong connection to the NOS Alive and NOS Primavera Sound festivals, in certain tariffs, the operator provides 5 GB of mobile data for use on YouTube and Spotify.

ALTICE-MEO's fixed internet packages provide quality speed of download. Regarding the films and series contents, the operator has a wide catalog of video club and also the channel Eurochannel. In terms of music, MEO bets on Stingray content. Alongside NOS, MEO also has a strong presence in music being *naming sponsor* of the festivals MEO Sudoeste and MEO Marés Vivas. The operator also offers the MEO Music streaming service with more than 30 million songs and 1 million video clips to listen to without limits, advertising free and with free traffic included.

Vodafone presents itself as having the fastest wireless internet offering the latest fiber generation. Vodafone was the first operator in Portugal to integrate the Netflix streaming service, and also has Indie World. It features a video club with more than 10,000 movies and series episodes from the best channels. Regarding music content, the operator has the advantage of Stingray djazz (exclusive channel) and the Vodafone FM (radio broadcasting) app. Vodafone also has a presence in music festivals with Vodafone Paredes de Coura and Vodafone Mexefest.

Nowo stands its base product on the fixed internet, where it is possible to choose between 100 or 200 Mbit/s. In terms of movies and series, the operator also presents a video store catalog. In the music area, it features a unique channel: Ofive. It has no integrated streaming service.

Concerning the streaming and downloading platforms, the main difference between different operators is the storage location of the content. These platforms can be classified according to the source of its revenue, through a free advertising-based template or a subscription model based on a monthly fee [13]. According to these authors, streaming content is increasingly the most popular way to listen to music or watch movies and series.

The movie streaming platforms released in Portugal, include Amazon Prime Video, Google Play Movies & TV, N Play (launched by NOS), Netflix, and Rakuten TV. Concerning the music streaming platforms, Amazon Prime Music, operated

by Amazon.com, Apple Music, Deezer, Google Play Music, MEO Music with free and paid versions, Napster, and Spotify are the most popular, whose paid subscription removes ads, improves audio quality, and lets one download music for offline listening.

According to the 2017 Net Neutrality regulation [14], the telecommunication operators may not prejudice or favor apps such as YouTube or Spotify. Thus, a single cost should be applied for the use of the Internet as well as a single speed. Tariffs with data traffic in music/movie and series online cannot be discriminatory. These companies should give equal access of their services in all European countries.

C. *Demand for music and movie content online*

The study conducted by Ericsson shows that the consumption habits of Internet users are changing. In 2011, it was estimated that people spent 2.9 hours per week watching streaming TV shows, shows and movies, but, in 2015, this number doubled to 6 hours per week [15]. This growth can be attributed to easiness to use and competitiveness on pricing. Portugal follows this trend, according to several market studies [15].

Regarding the content of online music, the International Federation of the Phonographic Industry, IFPI, states that Europe grew by 4% in 2016, a slightly higher increase than in 2015, at 3.7%. Europe had a marked increase with streaming revenues at 45.5% [16].

About the consumption of movies and series online, a study done in 2017 shows that video on demand (VOD) is becoming part of the daily viewing habits of content online [17]. Among those who claim to watch any type of VOD content (65%), 43% say they do it at least once a day. However, just over ¼ of global online respondents (26%) say they pay to watch broadcast or VOD programs through a subscription from an online service provider like Netflix, Hulu or Amazon, compared to 72% who say they pay a monthly subscription from a traditional TV service provider. Therefore, it is expected that the use of streaming/download platforms is complementary and not a substitute for a Pay TV subscription.

III. CONCEPTUAL REFERENCE FRAMEWORK

From the literature review, it is clear that the consumption of music and movies online is not a recent practice, although it is a recent research topic.

Some authors suggest several predictors in explaining whether a user is active or casual [12]. The authors argue that, for example, the sooner the contact with the Internet is made, the more likely it is to be an active user; and if the Internet is accessed from a home with two or more people, the likelihood of being an active user is greater. Thus, it is intended to test whether the frequency with which access to musical contents and to films or online TV series is related to age and household composition:

Hypothesis 1 - The frequency of use to access musical contents and films or series online is related to the age level of users.

Hypothesis 2 - The frequency of use to access to musical contents and films or series online is related to the personal variable "household composition".

Other study shows that, (1) the consumers with a higher education tend to use the Internet more often and with a greater variety of use, (2) the employed workers tend to have higher frequency of Internet use than students, (3) gender is significantly relevant in all types of Internet use other than email; and, (4) urban users are prone to greater frequency of Internet use [9]. Thus, it is intended to test the following hypotheses:

Hypothesis 3 – The consumers with higher education, who concluded studying in their 20's, tend to be more frequent users of the internet.

Hypothesis 4 – Self-employed consumers tend to be more frequent users of the internet.

Hypothesis 5 – Males are more frequent users of the internet than females.

Hypothesis 6 - Urban consumers tend to be more frequent users of the internet.

In other study, the authors argue that the higher the perceived service quality, from the current broadband subscription, the more likely it is for the subscriber to subscribe it [13]. So, hypotheses 7 and 8 are proposed:

Hypothesis 7 - A greater perceived service quality leads to more frequent use of the Internet.

Hypothesis 8 – The Portuguese respondents of music and movies online are not homogeneous in their frequency of Internet use to access music and movies online.

From these relationships, the following conceptual model is drawn:

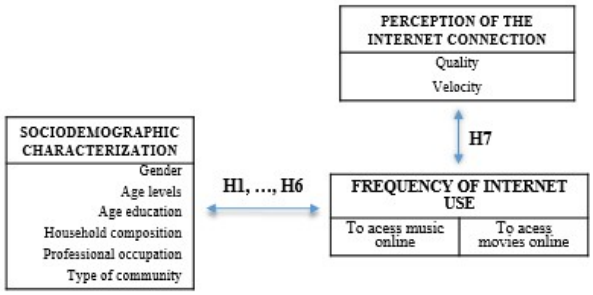

Figure 1. Conceptual model

IV. METHODOLOGY

In this study, it is intended to characterize the profile of Portuguese consumers regarding several sociodemographic variables, taking into account the Flash Eurobarometer 437 - *Internet Users' Preferences for Accessing Content Online* and using descriptive techniques of univariate and bivariate analysis. Inferential tests for the detection of significant relationships between nominal qualitative variables (or treated as such) are also highlighted. The questionnaire supporting this study is divided in two sections:

Section 1: Questions about sociodemographic data, particularly gender, age, professional occupation, type of community, age education, and household composition;

Section 2: Questions on frequency of Internet use, quality and speed of Internet connection, as well as the type of equipment most used to access the Internet.

V. DATA ANALYSIS

Since it can be assumed that the sample is quasi-random because the sampling process that follows was carefully done in order to replicate the present structure in the population (with the use of weights), it is possible to infer the results of the sample for the corresponding universe from where the sample was generated. Thus, chi-square independence tests were performed to estimate significant relations between nominal variables (or treated as such). The procedure of Two-Step Clustering analysis is used to group consumers in different groups, when the frequency of Internet use to access music and movies online are the classification variables. For the analysis of the data, the statistical software IBM SPSS is used.

A. Sample characterization, regarding sociodemograhic variables

The sample size includes 522 respondents.

Fig. 2 shows that the profile of Portuguese respondents, taking into account several sociodemographic variables, corresponds to a male respondent, over 24 years old and with more than two elements in his / her household, who finished studies aged 20 or over, is self-employed and does not live in a rural area or village.

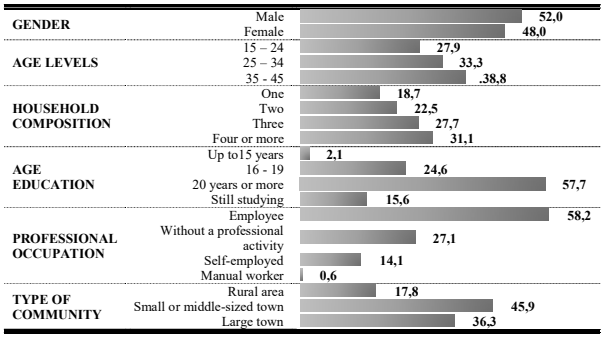

Figure 2. Sociodemographic profile

B. Sample characterization regarding the Internet frequency use, perception of the quality and velocity connection of Internet, and type of used equipment

The profile of the respondents regarding these variables is visible in Fig. 3 and corresponds to an individual who accesses the Internet at least once a day (99.3%), who agrees that the Internet connection is almost never interrupted (84.3%) and the connection speed is almost always constant (74.5%), and uses the computer (laptop or notepad) as the most frequent means of accessing the Internet (66.3%).

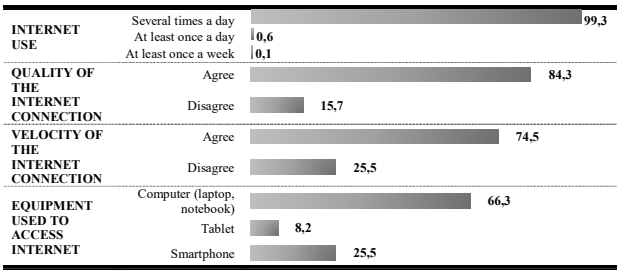

Figure 3. Profile of the respondents regarding the frequency of the Internet use, quality and velocity of the connection, and type of equipment most used

C. Relationship between the variables

A significant relationship was identified between the frequency of Internet use to access music online and the variable Age levels in the population ($\chi^2_{(8)} = 45.211; p - value = 0.000$), although, in the sample, this relationship is weak ($Cramer's\ V = 0.213$).

The sample relationship between these variables (Fig. 4) shows a greater percentage of the younger users of Internet that access music online *every day or so* (49.6%).

Regarding the variable frequency of Internet use to access movies and TV series online, two significant relationships were identified between this variable and the variables gender and age levels in the population ($\chi^2_{(4;Gender)} = 14.658; p - value = 0.005$) e ($\chi^2_{(8;Age)} = 48.737; p - value = 0.000$); however, in the sample, these relationships are weak ($Cramer's\ V_{Gender} = 0.172$ and $Cramer's\ V_{Age} = 0.222$).

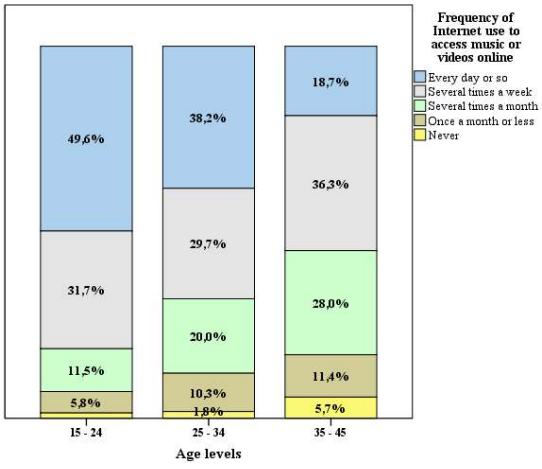

Figure 4. Distribution of Internet use to access music online by age levels

Fig. 5 shows that male respondents are slightly more frequent users than female users because they use the Internet *every day or so* (36.2% vs. 31.2%).

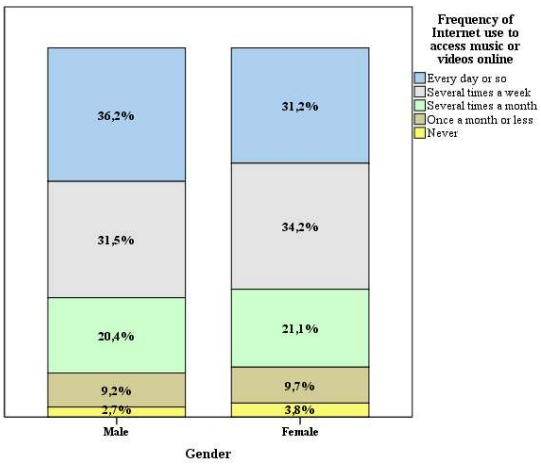

Figure 5. Distribution of Internet use to access movies online by gender

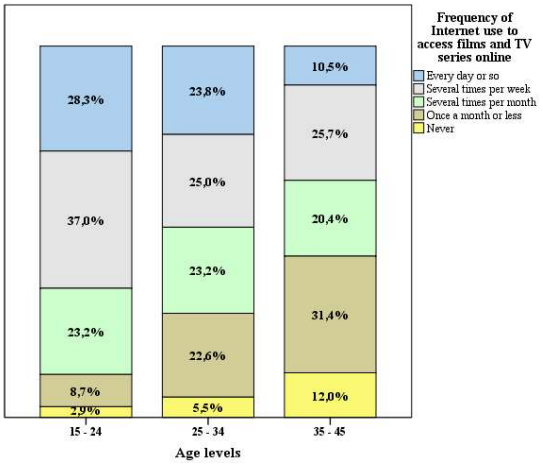

Figure 6. Distribution of Internet use to access movies online by age levels

Fig. 6 shows a trend that the majority of the younger respondents, aged between 15 and 24 years, are more active users to access films and TV series online in the categories *every day or so* and *several times a week* (65.3% = 28.3%+37%) than older users.

Thus, hypothesis 1 is validated for the frequency of use to access music online and hypothesis 5 is only validated for the frequency of use to access films online.

If service quality is measured by the perceptions of the quality of Internet connection (QIC) and the steadiness of the speed of the Internet connection (SIC), the only variables in this data set that can measured indirectly service quality, it can be inferred that hypothesis 7 (a greater perceived service quality leads to more frequent use of the Internet) was not validated in the population to access music and movies online once the p-values associated to the independence tests are greater that the corresponding significance level equal to 0.05; in the sample, the relationships between the variables are weak since the corresponding values for the $Cramer's\ V$ vary between 0.081 and 0.139.

About the identification of different groups of consumers in their frequency of Internet use, the Two-Step Clustering approach is used. The log-likelihood distance measure is chosen. To determine the best number of solutions with different number of clusters, it is used the Schwarz's Bayesian Criterion (BIC). The Silhouette coefficient combines the concepts of cluster cohesion and cluster separation and ranges between −1, indicating a very poor model, and +1, indicating an excellent model; an average silhouette less than 0.2 means that the data do not exhibit cluster structure [19].

The Two-Step clustering approach, applied to this database when the Internet use to access music and films online are the classification variables, identifies six clusters with an average silhouette of 0.6, meaning that this solution is a good one. Thus, hypothesis 8 is validated. The dimensions of the clusters are quite similar to each other, ranging from 12.8% in cluster 1 (with 63 subjects) to 20.6% in cluster 6 (with 101 subjects).

TABLE I. CLUSTER DESCRIPTION BY INPUT VARIABLES AND SOME PREDICTORS

	Internet use to access music online	Internet use to access movies online	Age levels	Gender	Household composition
1	Every day or so (100%)	Every day or so (100%)	[25 – 34] (42.9%)	Male (63.5%)	Two (33.3%)
2	Every day or so (100%)	Several times a week (52.0%)	[15 – 24] (44.9%)	Male (52.0%)	Three (32.7%)
3	Once a month or less (66.7%)	Once a month or less (39.1%)	[35 – 45] (52.2%)	Female (52.6%)	Two (41.1%)
4	Several times a week (100%)	Several times a week (100%)	[35 – 45] (37.5%)	Male (56.2%)	Two (34.4%)
5	Several times a week (100%)	Several times a month (43.8%)	[35 – 45] (44.8%)	Female (50.7%)	Two (49.3%)
6	Several times a month (100%)	Once a month or less (33.7%)	[35 – 45] (52.5%)	Male (50.0%)	Two (43.0%)

To summarize the description of the clusters, it can be said that the Internet use to access music online is the classification variable that better distinguishes the clusters (Table 1).

- Cluster 1 is mainly composed by 63 active users to access music and movies online *every day or so* (100%), aging from 25 to 34 years old (42.9);
- Cluster 2 is constituted by 98 users, the youngest users who are also active users in accessing music online but less active in accessing movies online (52.0%); and 32.7% of them belong to a household with three elements;
- Cluster 3 is formed by the least active users (69), that access music and movies online *once a month or less* (66.7% and 39.1%, respectively), and is dominated by older and female users (52.2% and 52.6%, respectively);
- Cluster 4 has 64 users who show an intense Internet use to access music or movies online (100%) *several days a week,* it is dominated by male users (56.2%), and 37.5%

of them are older users and belong to a household with two elements (34.4%);

- Cluster 5 is formed by 96 users that access music online *several times a week* while access movies online *several times a month* (43.8%); it is dominated by female users (50,7%), and 44.8% of them are older users that belong to a household with two elements;
- Cluster 6 has 101 users that show a low intensity on the Internet use to access of music and movies online, dominated by older users (52.5%), half being males.

In sum, the Internet use to access music is chosen more often by Portuguese users than movies and TV series. Considering these characteristics, specific strategies can be addressed in order to improve the intensity of Internet use to access films and TV series, especially in clusters 3 and 6.

VI. CONCLUSION

The main contribution of this study is to show that the consumer behavior of music and movies online is not homogeneous in Portugal. The conclusions of this study are relevant for market segmentation and policies to be implemented by internet/telecom operators. These findings also contribute to the policy-oriented academic debate about market concentration in a few industries which can be enriched by the detection of relevant variables in explaining the frequency of Internet use to access music and films online. Indeed, this study is in line with recent studies that also showed the existence of specificities among consumer [7] and [8]. Although the internet adhesion is global wide, it is not the content searched and its consumption behavior. This diversity in content searched seems to be enhanced by the technical customization and share improvements of the social media platforms.

The suggestion made that the earlier the contact with the Internet, the greater the likelihood of being an active user [11] is validated. A significant relationship between gender and frequency of Internet use in the access of movies and series online was also confirmed. The link between education and frequency of Internet use in accessing music (or music videos) online, suggested by [9], was not confirmed. Also, the hypothesis that the Portuguese consumers are not homogeneous concerning their intensity of Internet use to access music and movies online is validated.

Some limitations of this study were faced. First of all, the database used was already built. Thus, the choice of studying relevant variables to the study was limited to the database. For example, if the sociodemographic profile of consumers of music and movie contents was possible to be done, the analysis of the perception of the provided quality of services to access contents online could not be tested. In addition, this is an exploratory study focused generally on the state of art. This study shows that younger users use the Internet more often to access music and/or videos online as well as films and/or TV series online than older users. The study also shows that male users use Internet more often to access films and/or TV series online than female users. Thus, it would be interesting to study the characteristics of younger users, the millennials (Generation Y) and, eventually, the Generation Z, in order to identify if there are differences between them and how the revealed characteristics would affect the segmentation analysis. Also, it is advisable to replicate this study, deepening the content analysis from a questionnaire with the variables most relevant to the study. For example, to allow a more detailed analysis of the contents, one can identify which series are most viewed by categories. Finally, in future research, it may be important to identify causal relationships between variables and not just significant relationships. For instance, the effects of Smartphones and Social Media on the frequency of use to access music or films online could be estimated.

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