



WEB-BASED VIDEO SERVICES. A QUANTITATIVE AND DESCRIPTIVE STUDY

Servicios de vídeo basados en web. Un estudio cuantitativo y descriptivo



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Abstract

A quantitative and descriptive analysis of two hundred web-based video services is presented with an aim to shape the characteristics of these new audiovisual media and their relationship with users. The convergence of traditional television features with new media functionalities is determined via a statistical analysis based on observational techniques. Through a statistical analysis we identify the relationships between the established variables and how they shape our sample. Findings reveal that interpersonal communication acquires relevance just as it does in paradigmatic cases, so options for participation are limited in terms of user experience. Functions that allow interpersonal exchange, as well as the user-generated content, were insignificant for our sample. Therefore, according to the data obtained, interactivity is not a quality that defines our study sample. Streaming video and delivery networks are fully consolidated, being the activity of greater growing on the Internet. Currently there are no empirical studies that systematically analyze initiatives regarding the distribution of audiovisual content on the Internet. Audiovisual content is a media that is characterized by the convergence of broadcasters and user-generated content along with the typical features of traditional media and newer network technologies.

Keywords

Web-based video; Interactivity; Traditional media; User experience; Convergence.

Resumen

Se presenta un análisis cuantitativo y descriptivo de doscientos servicios de vídeo basados en la web con el objetivo de modelar las características de estos nuevos medios audiovisuales y su relación con los usuarios. La convergencia de las características tradicionales de la televisión con las nuevas funciones de los medios se determina mediante un análisis estadístico basado en técnicas de observación. A través de un análisis estadístico se descubren las relaciones entre las variables establecidas y la forma en que moldean la muestra. Los resultados revelan que la comunicación interpersonal adquiere relevancia sólo en casos paradigmáticos, por lo que las opciones de participación son limitadas en términos de experiencia de usuario. Las funciones que permiten opciones para el intercambio interpersonal, así como el contenido generado por el usuario resultó insignificante en nuestra muestra. Por lo tanto, de acuerdo con los datos obtenidos, la interactividad

Manuscript received on 12-07-2017

Accepted on 06-09-2017

no es una cualidad que defina nuestra muestra de estudio. Las redes de *streaming* y oferta de vídeo ya están bien consolidadas, siendo la actividad de mayor crecimiento en Internet, pero no tenemos estudios empíricos cuyo objetivo principal sea analizar sistemáticamente las iniciativas de distribución de contenidos audiovisuales en Internet. Se trata de un medio caracterizado por la convergencia de las emisoras y el contenido generado por los usuarios, y las características típicas de los medios tradicionales con las nuevas tecnologías de red.

Palabras clave

Vídeo basado en la web; Interactividad; Medios de comunicación tradicionales; Experiencia de usuario; Convergencia.

Arjona-Martín, José-Borja; Victoria-Mas, Juan-Salvador (2017). "Web-based video services. A quantitative and descriptive study". *El profesional de la información*, v. 27, n. 1, pp. 75-85.

<https://doi.org/10.3145/epi.2018.ene.07>

1. Introduction

Video streaming and online audiovisual delivery networks have been fully consolidated, a result of the greatest Internet growth to date, with the exception of social networks. Nevertheless, empirical studies have not been conducted that systematically analyze the distribution initiatives of audiovisual content on the Internet. For this reason, our research examines several variables related to the content and functions of audiovisual content in order to identify a relationship between these new audiovisual media and their users.

We suggest streaming video is a media characterized by the convergence of professionally produced videos (broadcasters) and user-generated content, along with a mixture of features from traditional media and new media. In other words, we are discussing a paradigmatic development of interactivity. According to Chung (2007, p. 43)

"the use of interactive features on the Internet has the potential to trigger a paradigm shift in mass media by challenging the traditional unidirectional flow of messages through features that provide bi-directional or even multi-directional communication".

The aim of this paper is not to provide predictions about potential changes in mass media because of interactive features on the internet, instead, we aim to identify the emergence of an embryonic interactive television ecosystem.

2. The nature of interactive TV

The convergence of computer and telecommunication technologies has resulted in a new media that combines interactive media communication with social cooperation between users and the production, distribution, and management of content, ultimately resulting in the user's experience. User experience with television has evolved greatly: in the past users simply switched between channels or used analogue teletext in the 1970s (Vinayagamoorthy *et al.*, 2002, p. 589); then, there was the "Red button" which users could press on their remote control to activate interactive television services; and now the current ecosystem where

"users increasingly choose TV devices with IP connectivity and the ability to run web applications. They expect a widening interaction through their connected TV platform" (Vinayagamoorthy *et al.*, 2002, p. 591; McDonald, 2007).

In addition, according to Toffler (1980), users are *prosumers*, meaning they are active figures involved in the production and distribution of audiovisual content.

According to Cesar and Chorianopoulos (2008), from a technological perspective the interactive television defines a

"user experience that involves at least one user and one or more audiovisual and networked devices".

Tsekleves *et al.* (2009) argued that the technological convergence of television and the Internet defined *interactive television* during the 90s. However, due to a plethora of definitions since the 90s (that included such terms as personalized, enhanced, and connected) it is necessary to continually redefine these emerging services (Carey, 1997). Currently, the concept of the *connected television* refers to the technological convergence of computers and television sets, in the same way that mobile technologies and computer systems converged to create smartphones (Soursos; Doulamis, 2012). The current environment of television broadcasting is focused on content that is produced specifically for online distribution and applications that deliver content independently from the telecommunication companies (the over-the-top players such as Netflix, Hulu, or Wuaki).

In addition, there is a new approach led by initiatives such as the HbbTV consortium (*Hybrid Broadcast Broadband TV*), which in 2010 unveiled a standard platform able to deliver content and applications through hybrid systems including digital video broadcasting (DVB) signals and broadband connections. Other projects, like *Android TV*, combine this operating system and its associated applications in order to develop new hybrid television technology. Philips, Sony, and other manufactures are developing television sets with this operating system based on *Android*.

In this respect, Kim and Sawhney (2002, p. 224) underlined the paradigmatic

"contradiction between interactivity as a communication form and television as an organizing model".

So already in those years we find a clear definition of interactivity in the current terms. Williams (1974), according to Kim and Sawhney (2002), considered the initiatives launched as *reactive TV* rather than *interactive TV*. As opposed to the "machine system", Kim and Sawhney (2002, p. 227) conceived of interactive media as an

“intelligent system based on the notions of flexibility and contingency”.

Previously, **Kim and Sawhney** (2002, p. 218) described two historical approaches to the concept of interactive TV: (1) a micro perspective, with implications about technology, media, markets, and regulations and the way the interactive communication structures for television are created, and (2) the macro perspective, which tries to conceptualize a “comprehensive domestic communication system” that promotes profound changes, not only in the media landscape, but also in the socio-cultural dimension.

It should not be forgotten that interactivity is also an interpersonal exchange, where messages are the core element of the communication process. Therefore, sharing and exchanging are

“the key elements in interactivity or interactive communication” (**Kim; Sawhney**, 2002, p. 220).

So interactive media can be a means to recreate an interpersonal-mode of communication—a dialog (**Victoria-Mas**, 2002; **Chung**, 2007) within a technological environment.

In this sense, communication deals with

“some elements of user control over narrative content in a media not determined by technology but constituted within culture as a means or desire to co-participate in the text” (**Cover**, 2006, p. 141).

But, interactivity is also a mediated experience, which emerges from information and communication technology. Accordingly, this approach puts the focus on technological systems that define certain communicative experiences (**Steuer**, 1995).

The current understanding of television has many facets. In media studies, the concept of “technological determinism” is commonly used to describe the power of technology in culture. **McQuail** (1994; in **Burnett; Marshall**, 2003) defines “technological determinism” as

“the links between the dominant communication technology of an era and the main characteristics of a society”.

We must not forget that the use of technology is also essential for defining media, without necessarily accepting determinism. In this sense, collective intelligence helps to define the form and content of new media as a result of the compilation of individual uses (**Malone; Laubacher; Dellarocas**, 2009). In addition, interactive communication depends on the level of control users have over the information system (**Khan; Vong**, 2014); and also, in the “communicational concept” (**Victoria-Mas**, 2002), on something so little empirical as the intention.

Our hypothesis is that “technological” (more than communicational) interactivity will be present in the main categories and successful elements of our sample. But this presence will be more declarative than effective in the communications our sample elements are going to develop at the level of interpersonal communication.

Based on this hypothesis, the objective of this paper is to define the users’ activities within web-based television and

video services (in the terms defined by **Simpson and Greenfield**, 2009) according to a model that examines users’ activities conventional and interactive features. The dimensions are related to:

- the transmission modes (one-way, one-to-many, or many-to-many);
- the interpersonal communication and exchange options;
- the responsiveness of the system (platform);
- the circulation of information and ideas; and
- the user’s creativity.

It is a model similar to that proposed by **Heeter** (1989) in the late 80s (applied to a wide range of new media), and **Kim and Sawhney** (2002) in the early 2000s (specifically for television), as explained in the next section.

2. Method

According to the established aim, this paper is a descriptive analysis that uses an observational technique to classify and define the object of the study. Through a statistical analysis we explore the relationships between established variables. In order to shape the study sample, we follow the definition given by **Simpson and Greenfield** (2009) for Internet video initiatives: web-based video services that use public networks, unmanaged QoS (quality of service), HTTP (hyper-text transfer protocol) key protocols, and user experience (which is similar to web surfing over a PC or mobile device).

According to **Wimmer and Dominick** (2006) in every observational analysis the category system represents the main tool to quantify the variables. We use a binary coding system (0 and 1 as possible values) to assign values for every case of our sample, which is formed by two hundred web-based video services (see Annex 2) [Sample updated on October 6, 2016]. In order to compile the sample the snowball sampling technique is used, which is a non-probability technique that uses existing subjects to help recruit other subjects from an unknown universe.

The categories studied (variables) are defined below:

Source: For this category two levels of analysis are defined (Table 1).

Content: This defines the thematic lines of the initiatives that form the sample. This classification shows the general programming goals for each subject. Just in this category the coding system ranges from 1 to 10 (Table 2).

In order to establish the functionalities of the web-based video services in our sample, according to the categories above, some indicators are defined. These indicators represent the computers, web-based environments, and main applications in mass media. They shape the way in which users

Table 1. Subcategories in the *source* variable

Subcategory	Description	Code
Conventional	It is an extension of traditional broadcasters like web-based video services	0
Native	Those projects created only for their distribution over the web	1

Table 2. Subcategories in the *content* variable

Subcategory	Description	Code
Institutional	This refers to channels for institutions (public or private) as a means of communication (internal and/or external)	1
Business / Corporate	Channels refer to private companies.	2
Events	Serve as a medium for the coverage of different events	3
Social	Interaction system that promotes user-generated content (UGC), interpersonal communication and information processing	4
General information	Provide all sorts of current information	5
Specialized information	Provide information about specific topics	6
General interest	The extension of conventional broadcasters, defined for a general target audience	7
Local	As the previous one but with regional circumscription	8
Entertainment or Varied content	Distribution of varied entertainment videos	9
Platforms	This refers to television channel aggregators	10

are able to operate within the system: content organization and ways to access it, interpersonal exchange options and ways to interact with processed information (views, user's evaluation, and opinion about the content). Based on this definition, the binary coding system establishes whether the functionality is included in each subject of our sample (0 - it is not included; 1 - it is included).

Kim and Sawhney (2002) defined four core elements present in the interactive TV model:

- communicability (different forms of communication);
- malleability (the use of diverse content or systems);
- programmability (the platform itself serves as a production and processing environment); and
- creativity (user-generated content).

Table 3. Function indicators and their identification number

Functionality indicator	Description	Identification
Conventional broadcasting	Definition of timed schedule.	1
Video upload	Users are allowed to distribute their own video productions.	2
Video download	Users are allowed to download video onto local hard disk.	3
Tag clouds	Most searched topics or keywords. Represented as a kind of cell.	4
Comments	Applications to insert comments on the platform regarding the content.	5
Referencing via email	It allows users to send web addresses via email.	6
Evaluation	To rate or vote for the satisfaction level regarding the content.	7
Content search	Search applications through descriptors or keywords.	8
Channels	It allows users to create their own channels within the platform. It is configured as an independent managing system.	9
Popular rankings	To collect user information about votes, rates, and viewing data. Content is organized by means of user's behavior.	10
Sharing	It permits the user to publish and/or refers to content in social networks or via bookmarks.	11
RSS	RSS subscriptions allow spreading content through <i>adders</i> .	12
Related contents	Lists with related videos that share keywords with the original one.	13
Groups	Space for spots for users' association with regard to a common theme.	14
Chats	Space for spots for real-time conversations (one-to-one, one-to-many, or many-to-many)	15
Forums	No real-time conversations through a common theme (asynchronous).	16
Tags	To label video content through keywords.	17
Embed codes	It allows the insertion of video content on a website from the original source.	18
Free content	Video freely delivered.	19
Paid content	Restrictions in content access (pay-per-view or subscriptions).	20
Live video	Real-time streaming.	21
Complementary content	To publish other kinds of content that serve as a complement to the video or live streaming.	22
Advertisement	To deliver ads that work as funding sources.	23
Theme categories	To classify content under topics (or keywords) or genres.	24
Links	Redirecting to external websites. These websites may be the information sources or content providers.	25

Table 4. Function indicators grouped according to the quality of communicability

Variable/Category	Description	Group of function indicators
Unidirectional	In this variable all the functionalities that define a one-way transmission mode (close to mass media features) are grouped.	1; 3; 9; 13; 21; 22; 24
Multidirectional	Also, this variable collects those capabilities that allow users to exchange and interact with –and through– the system (user-community and user-system).	2; 4; 5; 6; 7; 8; 10; 11; 12; 14; 15; 16; 17; 18; 25

Table 5. Function indicators grouped according to the qualities of malleability, programmability, and creativity

Variable/Category	Description	Group of function indicators
Spreading	This allows content spreading throughout external systems (other websites or social networks).	3; 6; 11; 12; 18
UGC (user-generated content)	This allows publishing videos and real-time streaming.	2; 9; 21
Evaluation	This category collects those functionalities that provide information about users' evaluations (comments and voting), and those tools that set up rankings from these inputs.	10; 24; 7; 5
Aggregation	Virtual spots within websites that serve as vehicles for discussion and interpersonal communication and exchange.	14; 15; 16
Thematic and genre classification	Functionalities to locate and classify videos through keywords and themes or genres.	17; 13; 8

Using these elements, we gathered the identified functionalities into different groups. In the first phase, the statistical analysis is based on a multidirectional or conventional communication model (communicability) (Table 4).

In the second statistical analysis, we detailed a classification in terms of malleability (versatility of the medium), programmability (information process to share and exchange) and creativity (a non-professional content creation). All those functionalities that do not fit with the terms defined by Kim and Sawhney are rejected. Every new category is described in Table 5.

Therefore, we used nominal definitions to quantify the frequency of the variables per subject (functionalities) and to classify them within each category. In order to carry out the statistical analysis we used the software SPSS Statistics.

First of all, the distribution of the sample according to the content category was extracted. Then a contingency table was calculated to compare content and source categories. Also, the mean for each functionality indicator was calculated, just to observe the general penetration in the entire sample. After that, an Anova analysis was conducted to compare unidirectional and multidirectional categories with content and source categories. Once weighted average values were calculated for unidirectional and multidirectional dimensions, a T-Test for two related samples was carried out.

Finally, the Anova procedure was also used to determine the relationships between source and content with spreading, UGC, evaluation, aggregation, and thematic and genre classification categories.

3. Results

In figure 1 we can observe the distribution of the sample in relation to the variable content. From the 200 web-based video services analyzed, 52 subjects (26%) were classified as services that specialized in a specific kind of information (for instance politics, economy, health, government, or sports). In second place we found the subcategory entertainment with 48 subjects, 24% of the sample. Following these two main groups –together they represented 50% of the sample– we found social and institutional subcategories with 30 (15%) and 28 (14%) subjects respectively. Then 19 subjects were classified as general interest and 17 as general information. Finally, we had to consider as marginal subcategories business (1), events (1), locals (3), and platforms (1) sin-

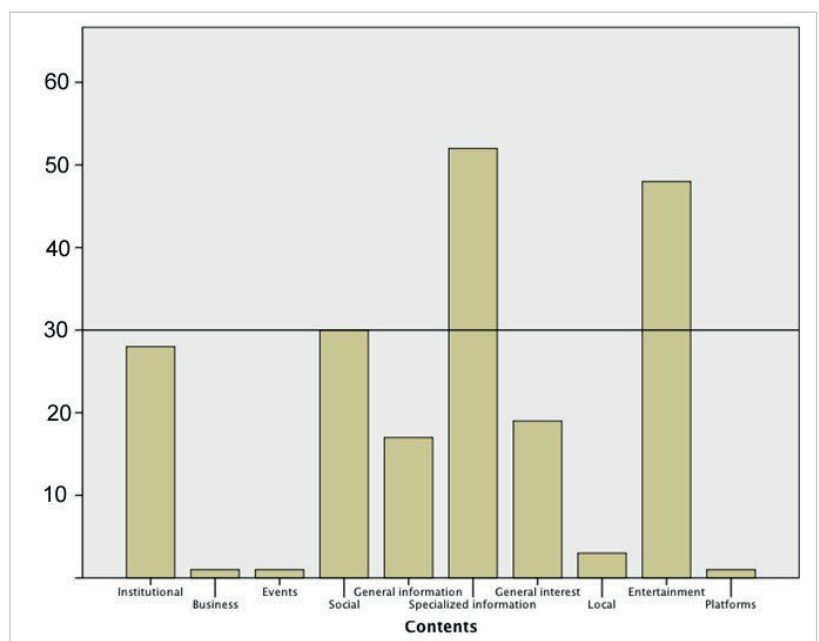


Figure 1. Sample distribution regarding content category

Table 6. Contingency table between content and source

		Source		Total
		Conventional	Native	
Content	Institutional	3	25	28
	Business	0	1	1
	Events	0	1	1
	Social	0	30	30
	General information	6	11	17
	Specialized information	4	48	52
	General interest	19	0	19
	Local	3	0	3
	Entertainment	11	37	48
	Platforms	0	1	1
Total		46	154	200

Contingency coefficient: 0.566; Sig.: 0.000 Phi: 0.686; Sig.: 0.000

ce they represented just 2.5% in sum. Virtually they do not have a significant weight in the data obtained.

A contingency table was extracted to compare the correspondence between *content* and *source* variables (see Table 6). When we observed the total results, we realized that 154 subjects classified as native were registered, i.e., 77% of the sample. But we had to consider that the *general interest* (19) subcategory of content could only admit subjects to a conventional source since it was an extension of traditional broadcasters on the Internet. So if we omitted this subcategory in the analysis, the percentage of native web-based video services increased to 85%. The *entertainment* subcategory alone obtained a significant number of subjects (11) that belonged to a *conventional* source. Mainly, this data signified the presence of thematic broadcasters such as *Comedy Central* (USA), *Mundo Max* (USA), or *Eurosport Player* (EU), and other traditional televisions devoted entirely to general entertaining content like *6Play* (France), *Televeo* (Mex), or *Kylin* (China), for example.

‘ Apart from the free content indicator, the most important functionalities within the sample were *content search*, *sharing options* and *categories* ,

As it was observed that there were no conventional subjects in the *social* subcategory, it registered just native initiatives (30). Also, the *specialized information* and *institutional* categories almost obtained a hundred per cent of native subjects (48 subjects, 92%; 25 subjects, 89%, respectively). It is important to underline that the result of this comparison was statistically significant (contingency coefficient: 0.566; Sig.: 0.000 Phi: 0.686; Sig.: 0.000)[Significance level <0.05].

With regard to function indicators, first of all, it was interesting to calculate mean values per each one of them concerning the entire sample. Thereby, we could make an individualized approach to this concept.

According to the data results, 97% of the sample offered

Table 7. Function indicators mean

	N	Mean
Conventional broadcasting	200	0.25
Video upload	200	0.15
Video download	200	0.11
Tags cloud	200	0.08
Referencing via email	200	0.48
Comments	200	0.49
Evaluation	200	0.47
Content search	200	0.85
Channels	200	0.21
Popular rankings	200	0.27
Sharing options	200	0.82
RSS	200	0.27
Related content	200	0.61
Links	200	0.32
Free content	200	0.97
Paid content	200	0.16
Live video	200	0.35
Advertisement	200	0.63
Categories	200	0.86
Groups	200	0.03
Chats	200	0.06
Forums	200	0.03
Tags	200	0.42
Embedding codes	200	0.54
Complementary content	200	0.44
N	200	

free content and just 16% included paid-content (usually through pay per view or/and subscription formulas). The latter was generally represented by initiatives like *Netflix*, *Wuaki*, *Hulu* or others from conventional broadcasters such as *A&E*, *CBS*, *NFB* (Canada), or *Atresplayer* and *MiTele*, from the Spanish media groups *Atresmedia* and *Mediaset*, respectively. Notice that none of the function indicators were mutually exclusive, so one case could include free and paid content. In fact, there were many cases that exemplified the combination of free and paid content (premium, generally); most of which were native: *YouTube*, *Classical TV*, *Play TV*, *Streamit* or *Vimeo*, among others.

Apart from the free content indicator, the most important functionalities within the sample were *content search* (0.85), *sharing options* (0.82) and *categories* (0.86). The rest of the functionalities were more or less equally distributed: *advertisement* (0.63), *related content* (0.61), *embedding codes* (0.54), *comments* (0.49), *referencing via email* (0.48), *complementary content* (0.44), *tags* (0.42), *live video* (0.35), and *links* (0.32) were the most representative indicators.

On the flipside, indicators such as *groups* (0.03), *forums* (0.03), *chats* (0.06), *tag clouds* (0.08) or *video downloads* (0.11) recorded a really low mean value. Even *video uploads*, which represented the most relevant feature of

Table 8. Anova procedure comparing unidirectional, multidirectional, and content variables

		N	Mean		
Unidirectional	Institutional	28	0.4235	Anova F=5.461 Sig: 0.000	
	Business	1	0.2857		
	Events	1	0.5714		
	Social	30	0.4524		
	General information	17	0.4118		
	Specialized information	52	0.3434		
	General interest	19	0.6165		
	Local	3	0.3333		
	Entertainment	48	0.3482		
	Platforms	1	0.2857		
	Total	200	0.4043		
Multidirectional	Institutional	28	0.2738	Anova F=11.525 Sig: 0.088	
	Business	1	0.2667		
	Events	1	0.4667		
	Social	30	0.5911		
	General information	17	0.3137		
	Specialized information	52	0.3256		
	General interest	19	0.3088		
	Local	3	0.3333		
	Entertainment	48	0.3000		
	Platforms	1	0.3333		
	Total	200	0.3500		

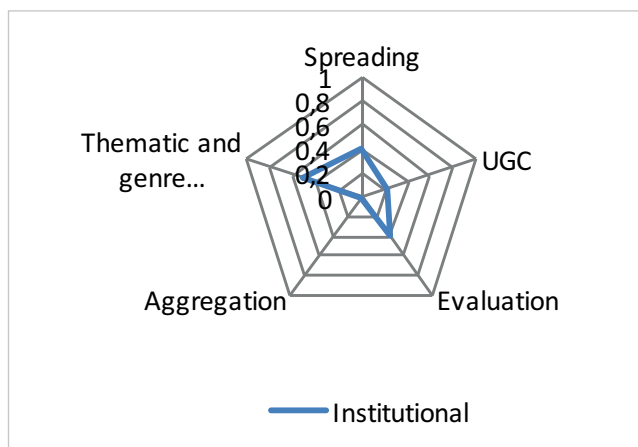


Figure 2. Institutional weighted mean values

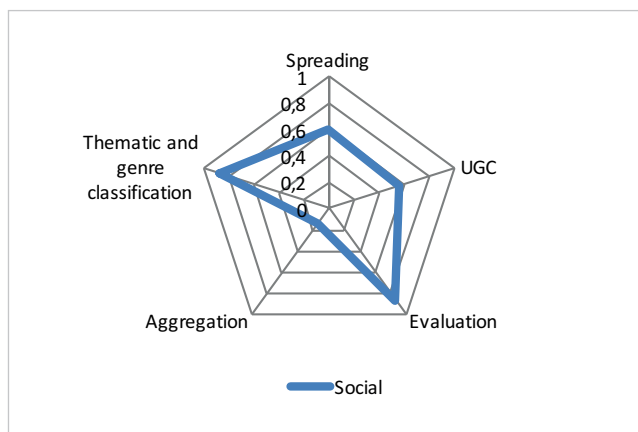


Figure 3. Social weighted mean values

the user-generated content category recorded one of the lowest means (0.15). The functionalities mentioned above (*groups, forums, and chats*), that were considered as digital spaces for interpersonal communication (one-to-one, one-to-many, or many-to-many) were irrelevant for the analyzed sample. So, the sample was actually defined by the options that related to the content with the platform and the users. Most of these functionalities were aimed at optimizing the content access (theme categories, list of related videos, and tags which served to label and improve searching) or to spread videos through other websites or social networks (sharing and embedding).

In terms of communication models, we conducted an Anova to extract significant relationships among content, unidirectional, and multidirectional categories (see Table 8). In global terms, unidirectional functions recorded a mean of 0.4043, i.e., 40% of the sample setup functionalities that belonged

to traditional communication models. However, the multidirectional variable or group reached a mean of 0.35, which signified that 35% of the sample incorporated functionalities that encouraged the interactive nature of electronic and connected media. Nevertheless, the relationships established in the multidirectional field were not statistically significant (F=11.525 Sig: 0.088) unlike the unidirectional field, which actually was statistically significant (F=5.461 Sig: 0.000).

We observed *general interest* has a conventional orientation with the highest mean of any subcategory in the unidirectional variable (0.6165), while it obtained just a 0.3088 mean to multidirectional functionalities (mean diff.=0.3077).

On the contrary, *social* subjects added up to almost 60% of multidirectional functionalities, a difference of 0.1387 points regarding unidirectional options (mean value=0.4524). So, a logical definition (based on the nature of the subjects) was established about both content subcategories (Table 9).

Table 9. Anova procedure comparing unidirectional and source variables

Unidirectional		
Source	Mean	N
Conventional	0.5248	46
Native	0.3683	154
Total	0.4043	200

Anova F=30.121 Sig: 0.000

Table 10. Anova procedure comparing multidirectional and source variables

Multidirectional		
Source	Mean	N
Conventional	0.2826	46
Native	0.3701	154
Total	0.3500	200

Anova F=9,309 Sig: 0.003

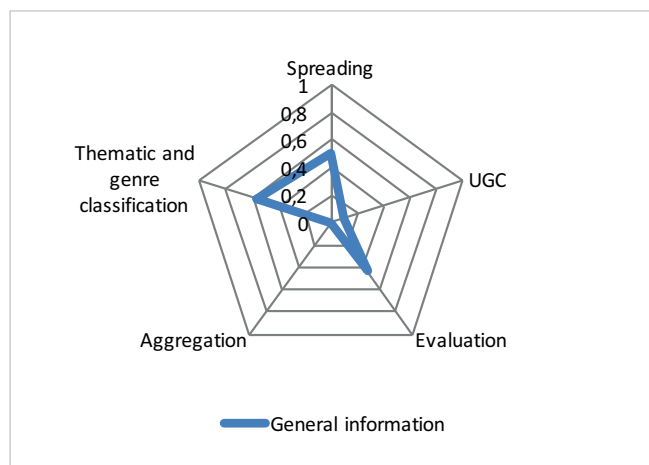


Figure 4. General information weighted mean values

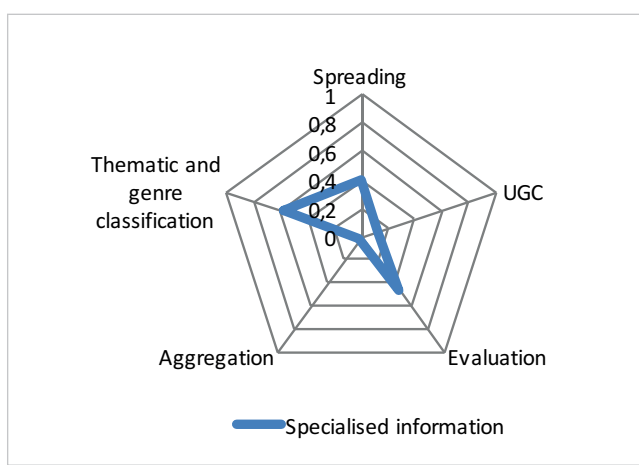


Figure 5. Specialised information weighted mean values

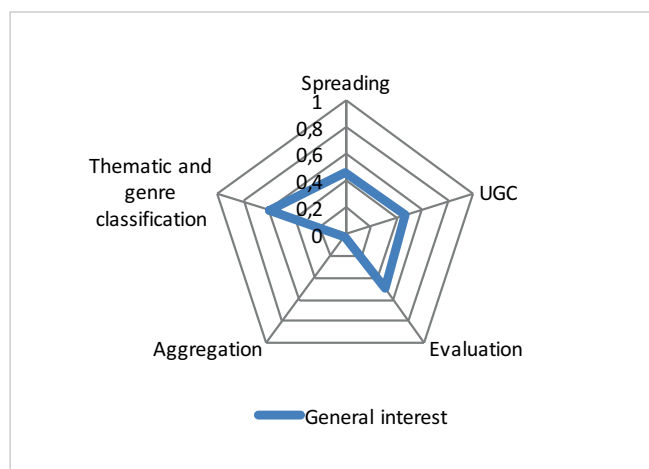


Figure 6. General interest weighted mean values

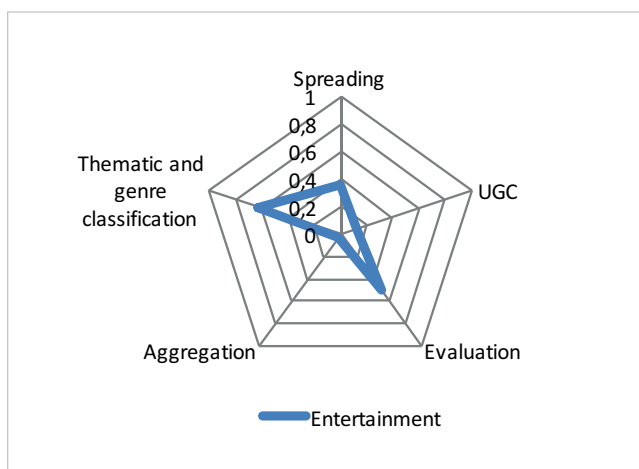


Figure 7. Entertainment weighted mean values

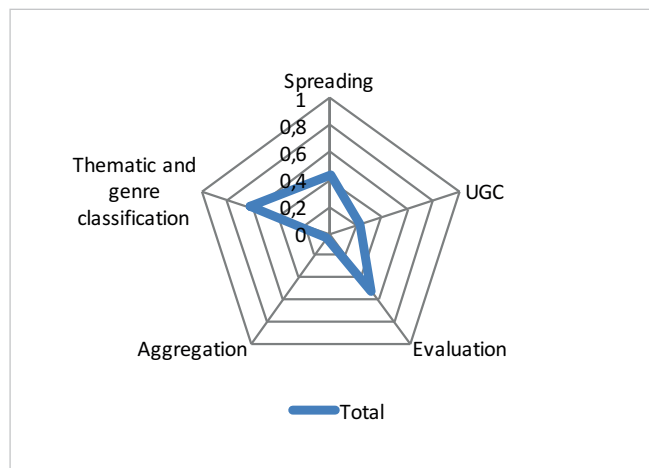


Figure 8. Total weighted mean values

But also, *institutional*, a purely native subcategory, registered an important mean difference in favor of unidirectional functionalities (mean diff.=0.1497). The rest of the content subcategories with enough representation in the sample also had a mean difference value in favor of unidirectional variable: *general information* (mean diff.=0.0981), *specialized information* (mean diff.=0.0178), and *entertainment* (mean diff.=0.0482). Thus, according to the data obtained, in the sample under study a conventional (mass media) communication model prevailed, even though the mean difference value with regard to multidirectional functionalities

Table 11. Statistics from a T-test analysis for unidirectional and multidirectional variables

	Mean	N	Std. deviation	Std. error mean
Unidirectional	0.4043	200	0.18178	0.01285
Multidirectional	0.3500	200	0.17425	0.01232

Table 12. Significance value from the T-test procedure

	Paired differences					t	df	Sig. (2-tailed)
	Mean	Std. deviation	Std. error mean	95% confidence interval of the difference				
				Lower	Upper			
Unidirectional-Multidirectional	0.05429	0.23130	0.01636	0.02203	0.08654	3.319	199	0.001

was just 0.0543. Therefore, considering the previous observation, we found almost a balanced situation between both unidirectional and multidirectional variables.

Additionally, a comparison of weighted means in these two variables was calculated according to the source variable (see Tables 9 and 10). With regard to unidirectional functionalities, the data obtained from the analysis confirmed that conventional subjects achieved the highest value for this kind of functionality (M=0.5248). Unlike native subjects, which registered a mean of 0.3683, the difference was 0.1565 points between both variables. These relationships among variables turned out to be statistically significant (F=30.121, sig.=0.000). As it was expected, native web-based video platforms had a superior weighted mean for multidirectional indicators (M=0.3701), however, a smaller difference between means (mean diff.=0.0875) was recorded.

To conclude, with the first analysis a T-Test was conducted (see Tables 11 and 12) for two related samples in order to compare unidirectional and multidirectional variables (extracted by adding-up function indicators). This test served to confirm that the difference between both variables was statistically significant (means diff.=0.05429; t=3.319, sig.=0.001).

Regarding the second phase, it was statistically confirmed (see Table 13) that the social subcategory had the highest mean in every category (*Spreading* M=0.6067; *UGC* M=0.5667; *Evaluation* M=0.8667; *Aggregation* M=0.1444 and *Thematic and genre classification* M=0.8778). Figure 3 illustrates the importance of this content subcategory, mostly in the *Evaluation* and *Thematic and genre classification*, as happened in the entire sample, in which the abovementioned categories and *Spreading* are the most representative features of the sample (see Table 13 and Figure 8).

Also, entertainment and general interest subcategories got a high mean in *UGC* (General interest M=0.4561), *Evaluation* (Entertainment M=0.5; General interest M=0.4868) and *Thematic and genre classification* (Entertainment M=0.6250; General interest M=0.5965).

It is striking that a purely conventional subcategory such as general interest obtained high values in user-generated content indicators, but it was mostly due to the *channels* indicator, which serves to create and manage individual channels within the global website. In the social sub-category, independent users managed the majority of these channels, but the general interest subcategory included the broadcasters who handled the channels. So, it is a contradiction because the *channels* indicator was not representing users' content for the general interest subcategory.

When these categories were compared with the *source* variable the results were statistically significant for *UGC* (F=7.070; Sig.=0.008) and *Evaluation* (F=8.256; Sig.=0.005), in which the conventional subcategory gets the highest mean (M=0.3333) for the *UGC* cate-

Table 13. Anova procedure comparing *spreading*, *UGC*, *evaluation*, *aggregation* and *thematic* with content variables

		N	Mean	F	Sig.
<i>Spreading</i>	Institutional	28	0.4000	3.124	0.002
	Business	1	0.6000		
	Events	1	0.8000		
	Social	30	0.6067		
	General information	17	0.5059		
	Specialized information	52	0.4077		
	General interest	19	0.4526		
	Local	3	0.4667		
	Entertainment	48	0.3583		
	Platforms	1	0.4000		
	Total	200	0.4410		
<i>UGC</i>	Institutional	28	0.2262	13.576	0.000
	Business	1	0.0000		
	Events	1	0.0000		
	Social	30	0.5667		
	General information	17	0.0980		
	Specialized information	52	0.1218		
	General interest	19	0.4561		
	Local	3	0.3333		
	Entertainment	48	0.1250		
	Platforms	1	0.6667		
	Total	200	0.2383		
<i>Evaluation</i>	Institutional	28	0.4018	8.279	0.000
	Business	1	0.2500		
	Events	1	0.7500		
	Social	30	0.8667		
	General information	17	0.4412		
	Specialized information	52	0.4567		
	General interest	19	0.4868		
	Local	3	0.5000		
	Entertainment	48	0.5000		
	Platforms	1	0.2500		
	Total	200	0.5225		
<i>Aggregation</i>	Institutional	28	0.0000	3.263	0.001
	Business	1	0.0000		
	Events	1	0.0000		
	Social	30	0.1444		
	General information	17	0.0000		
	Specialized information	52	0.0192		
	General interest	19	0.0175		
	Local	3	0.0000		
	Entertainment	48	0.0347		
	Platforms	1	0.0000		
	Total	200	0.0367		
<i>Thematic</i>	Institutional	28	0.5238	20.897	0.003
	Business	1	0.3333		
	Events	1	1.0000		
	Social	30	0.8778		
	General information	17	0.5686		
	Specialized information	52	0.5833		
	General interest	19	0.5965		
	Local	3	0.5556		
	Entertainment	48	0.6250		
	Platforms	1	0.3333		
	Total	200	0.6283		

Table 14. Anova procedure comparing spreading, UGC, evaluation, aggregation and thematic with source variables

		N	Mean	F	Sig.
Spreading	Conventional	46	0.4348	0.040	0.842
	Native	154	0.4429		
	Total	200	0.4410		
UGC	Conventional	46	0.3333	7.070	0.008
	Native	154	0.2100		
	Total	200	0.2383		
Evaluation	Conventional	46	0.4185	8.256	0.005
	Native	154	0.5536		
	Total	200	0.5225		
Aggregation	Conventional	46	0.0145	1.786	0.183
	Native	154	0.0433		
	Total	200	0.0367		
Thematic and genre classification	Conventional	46	0.5580	2.666	0.104
	Native	154	0.6494		
	Total	200	0.6283		

gory, because of the reason explained before, and the native subcategory registered the highest mean (M=0.5536) in the *Evaluation* category.

Interestingly, the differences between conventional and native were not statistically significant for *Spreading*, *Aggregation*, and *Thematic and genre classification* categories, in which the native subcategory obtained the highest mean in the three categories (M=0.4429; M=0.0433; M=0.6494, respectively).

“ The social subcategory had the highest mean in every category mostly in the *Evaluation* and *Thematic and genre classification*, as happened in the entire sample, in which these two categories and *Spreading* are the most representative features ”

4. Conclusions

In regards to our hypothesis, we can say that web-based video services have achieved an effective way to interact with audiovisual content through connected and electronic media and devices.

However, we found in our sample that interpersonal communication and interaction with social networks was relevant within limited spaces (the social subcategory) and the participation options were simplified in terms of user experience. Functionalities such as groups, forums, or chats, which allow a space for interpersonal exchange, were insignificant for our sample. Thus, the user’s influence was limited to simple and immediate actions (comments or votes).

On the other hand, user-generated content was restricted to paradigmatic subjects (such as *YouTube* or *Vimeo*),

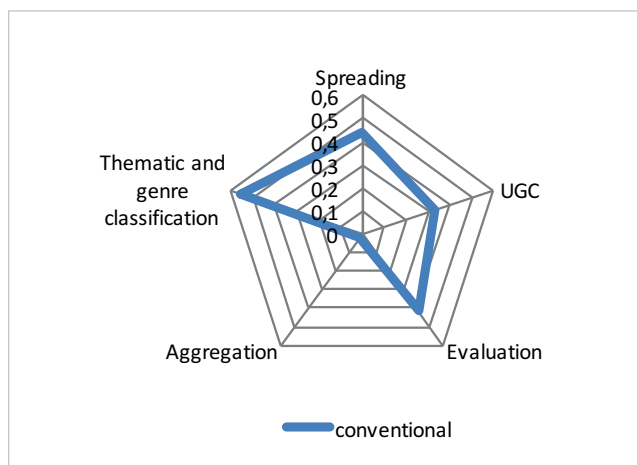


Figure 9. Conventional weighted mean values

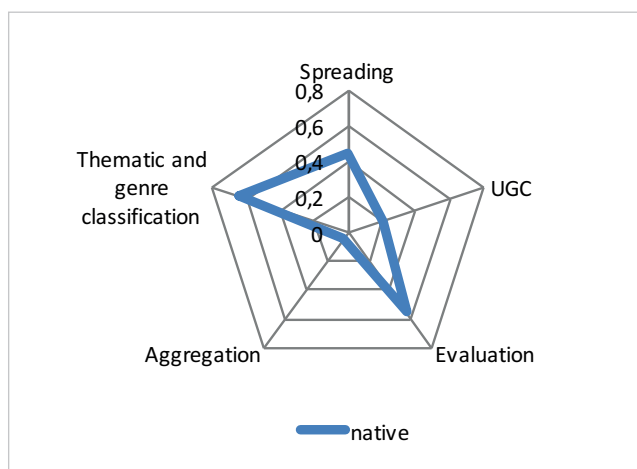


Figura 10. Native weighted mean values

so the collection of data about content usage, rather than the production and sharing of original content, defined user participation. This was confirmed by observing the weighted mean registered by *Evaluation* and *Thematic and genre classification* categories (M=0.5225 and M=0.6250, respectively), which gather functionalities to label, search, and classify content through genre, thematic topics, or popularity (rankings) and other options or tools that used qualitative information (comments) and average valuations based on numeric scales (votes) in order to organize the content. So, a way to interact with web-based video platforms that shapes the structures of how content is valued by the system was established. But just a small percentage of the subjects allowed users to really participate in exchanges with others in a synchronous or asynchronous way.

“ It is striking that a purely conventional subcategory such as general interest obtained high values in user-generated content indicators ”

According to the data obtained, the content subcategories *business*, *events*, *local*, and *platforms* were not significant in the study sample. This was probably due to the snowba-

ll sampling technique, which made it hard to collect other subjects that could be classified according to the established definitions for every content subcategory. Nevertheless, in a framework determined by a strong economic crisis, the chance of an inflation that leads to the disappearance of multiples and relevant initiatives that were encouraged by online communication promises also exists. So, we found a model influenced by conventional structures of television rather than by the native and interactive formulas set up by electronic and networked systems.

Finally, a comparative analysis between the users registered in every website and its level of interactive functionalities as well as the effective use of the diverse indicators may guide further academic research on new media and interactivity.

Web-based video services have achieved an effective way to interact with audiovisual content through connected and electronic media and devices

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