Revista de Comunicación y Salud, 2020, Vol. 10, nº 2, pp. 25-61
Edited by Cátedra de Comunicación y Salud
ISSN: 2173-1675

Received 15/08/2020
Accepted 23/09/2020

COVID-19: AUDIOVISUAL CONTENT FROM THE USE OF HOUSEHOLD TOOLS

COVID-19: contenidos audiovisuales a partir del uso de herramientas domésticas

Julio Blas Blas [1]
Complutense University of Madrid. Spain.
julioblas@ucm.es

Alberto Luis García García
Complutense University of Madrid. Spain.
algarci@ucm.es

Ignacio José Martín Moraleda
Complutense University of Madrid. Spain.
ignmar05@ucm.es

Abstract

The appearance of the Covid-19 virus meant the confinement of people and the cessation of activities. In the audiovisual industry it has meant changes in the production of content, such as the use of video calls as a production technique. Methodology: a qualitative methodology has been used through in-depth interviews with experts to learn about their analysis of the situation and its development. In addition, with the bibliographic review, the bases on which the changes have been articulated are established. Results: The study describes an adaptive scenario of the industry to continue producing with the implementation of new workflows. Discussion: The results have been analyzed under the perspective of a SWOT analysis model that allows to articulate in a simple way the consequences of the new scenario in the audiovisual industry and its influence in the future. Conclusions: the article focuses on the main areas of change in the audiovisual caused by the COVID: aesthetics, workflows and sustainability.

Keywords: teleworking; television; production; new tools; sustainability; COVID-19.

[1] Corresponding author: **Julio Blas Blas**[1] . julioblas@ucm.es. Associate Professor Complutense University of Madrid.

Resumen

La aparición del virus COVID-19 supuso el confinamiento de personas y el cese de actividades. En la industria audiovisual ha supuesto cambios en la producción de contenidos, como, por ejemplo, el uso de videollamadas como técnica de producción. Metodología: se ha empleado una metodología de tipo cualitativo mediante entrevistas en profundidad a expertos para conocer su análisis de la situación y su desarrollo. Además, con la revisión bibliográfica se establecen las bases sobre los que se han articulado los cambios. Resultados: El estudio describe un escenario adaptativo de la industria para seguir produciendo con la implementación de novedosos flujos de trabajo. Discusión: los resultados se han analizado bajo la perspectiva de un modelo de análisis DAFO que permite articular de manera sencilla las consecuencias del nuevo escenario en el audiovisual y su influencia en el futuro. Conclusiones: el artículo se centra en las principales áreas de cambio del audiovisual causados por el COVID: estética, flujos de trabajo y sostenibilidad.

Palabras clave: teletrabajo; televisión; producción; nuevas herramientas; sostenibilidad; COVID-19.

How to cite the article

Blas Blas, J., García García, A. L., & Martín Moraleda, I. J. (2020). COVID-19: audiovisual contents from the use of household tools. *Revista de Comunicación y Salud,* 10(*2*), 25-61.

doi: https://doi.org/10.35669/rcys.2020.10(2).25-61

1. INTRODUCTION

Crises hit all productive sectors and the audiovisual sector, in particular, is usually one of the hardest hit. In times when the economy is faltering, each industry adapts and modifies to the needs and challenges that arise.

Already in 2011 and 2012 the Annual Television Analysis (Barlovento, 2009-2013 in Francés, 2014, p. 146) reflected that, given the situation of global economic crisis, the audiovisual production market was going through a bad economic moment as a result of the advertising funding crisis and, more importantly, there was no hope for growth in the short term. Fewer and cheaper productions were being commissioned.

Times of crisis imply a change and an adaptation of the industry to the new circumstances. As economic situations become more complicated, employment suffers, leading to job insecurity in all professional profiles along the value chain of the audiovisual industry (Francés, 2014).

Francés (2014) also points out that the mass media have had a relevant presence and role in every historical event since their birth in the mid-twentieth century. So the

first pandemic of the 21st century has been an active part of the media and, consequently, it is necessary to know how it has affected them.

Technological development and different computer applications have also been progressively implemented in audiovisual productions (Clemente, 2004). But what has played a fundamental role in the way of working and producing in television has been the growing use of communication networks through the Internet.

During the confinement, video calls have taken over the screens, which indicates the correctness of the trend reflected by Menéndez-Manjón (2003) that the improvement in digital communications and data flow drives the production and distribution of content.

What has been observed for years is that it is no longer necessary to leave the newsroom to know what is happening in the world, (Heredero and Reyes, 2016) and that, in the current working conditions of communication professionals, subject to the law of "do it yourself" (DIY-Do *It Yourself*, in English), they have to produce, write, record and edit their pieces. This is one more consequence of the integration of technology in the workflow, which not only makes the media professional a multitasking subject, but also imposes the difficulty of competing with all those who have the same technology at home.

One of the most relevant effects of the 2008 economic crisis in the audiovisual sector had to do with the total replacement of analogue technology by digital technology. This led to a reduction in the costs of procedures and tools, boosted, moreover, by the rise of platforms such as *YouTube (*Heredero and Reyes, 2016) that allowed greater reach in the distribution of content.

For years, to create any audiovisual product - a simple press conference, for example - required a large amount of technical and human resources (Casanova, 2016). The evolution towards digital production technologies has examples of low-budget production such as the music video *Lost Ones*, by the artist Joan Thiele, directed and produced by Giada Bossi for the Universal record label, in which the entire budget - including all the phases- was 5,000 euros, using a reflex camera with the capacity to shoot in 4K (Pérez-Rufí, 2018, p. 297).

The effects of the crisis also meant the democratisation of production: as access to audiovisual technology to produce is cheaper, new formats such as *webseries* appear, in which companies find a new advertising window influenced by social networks. (Segarra et al., 2017). And the fact is that "video clips have positioned themselves as one of the central formats of audiovisual renewal due to their ability to adapt to digital distribution channels and hybridisation with other formats" (Sedeño et al., 2016).

COVID requires research on television that analyzes its role in communication and its effects, as indicated by Hermes and Hill (2020) where they point out that television offers ontological security and undoes social distance.

The financial crisis of 2008 also led to the birth of the figure of the multitasking worker. The emergence of cheaper technology and the loss of the requirement of technical quality in certain products brought with it, as we have seen, production strategies based on the *low cost* in which quantity has been prioritized over quality. This new paradigm known as *the democratization of digital media,* brought with it a significant reduction in human resources, the absence of job stability and well-paid productions, a consequence that continues today (Casanova, 2016).

Another fundamental factor, a consequence of technological development, was the appearance of smartphones. In the early days, their use as a platform for the distribution and consumption of content was already being envisioned, and different specific proposals were formulated to adapt them to their small and portable format and also to viewing in short periods of time and in any place, outside the controlled comfort of the home or cinemas (Vinader et al., 2010).

In a single device we have a high resolution camera, audio and video editing and post-production programs and the possibility of data transmission. This feature has been, at this time, of vital importance to maintain communications with the intention of broadcasting television content. Until very recently, we went from needing complex communication systems; such as terrestrial satellite transmission antennas (DSNG), to simpler devices; such as 4G backpacks, which still required the contracting of certain services.

At the moment that has disappeared. Only the mobile terminal is enough. It is the *smartphonograpy*, which is defined as:

> The tendency to capture the everyday, what accompanies us in our day to day, the urban landscape, to represent the scenes around us from the most creative look, with personalized touches through multiple applications to finally disseminate and publish its content. (Casanova, 2016)

This trend has jumped directly from the domestic to the professional sphere. Although what can have negative consequences when it comes to certain work relationships and quality, it also has positive consequences such as uncovering creative talent that before, without access to professional tools, were difficult to discover and manage.

But one of the variables that have changed the most in the 2020 crisis compared to the 2008 crisis has been the environmental variable. On the one hand, there has been an increase in plastic waste due to the increase in the consumption of packaged products and the use of masks and sanitary waste (Cepeda, 2020). On an industrial scale, the halt in activity has meant a decrease in the emission of polluting gases into the atmosphere. Resources are finite and since the mid-70s of the twentieth century, there was already concern about the legacy that would be left to future generations (Gómez, 2020). (Gómez, 2020). The interaction of human activity with the environment has to maintain a delicate balance:

> It has been confirmed that health problems are always subject to the interaction of each civilization with its environment, which depends, in essence, on the character of the human-nature relationship. (Gomez, 2020)

So there is a direct relationship between industry and the environment. Gómez, (2020) states that "we must learn to responsibly manage the waste that is generated, because what is done today will have implications in the future and what is done in one place on the planet will have repercussions in another, because this world is a single, continuous and three-dimensional whole".

In terms of entrepreneurial activity, Lopez and Bulmer (2020) point out that:

> At a business level, sustainability has to exist from the *core of* the business and be present transversally throughout the organization. And if we are talking about sustainability, it is necessary to focus, from the beginning, on the fulfillment of the 17 Sustainable Development Goals. (López and Bulmer, 2020)

That said, it is crucial to consider new workflows in audiovisual productions that take into account the environmental factor, as well as technological resources, global distribution capacity and virtual management of human resources.

The current crisis has brought with it a double consequence: health, forcing people to confine themselves indoors, which has modified, among other aspects, the space for interaction with audiovisual content and, on the other hand, a financial crisis caused by the economic standstill it has entailed. If any time of crisis implies reinvention, adaptation, resilience and learning from previous lessons learned, the following questions arise:

How have the production and production processes been adapted to the circumstances of zero mobility? Has this zero mobility had an impact on sustainability issues? Also, given that employees had to stay at home, what impact has it had on human resources management?

2. OBJECTIVES

The purpose of this research is to know the way in which the audiovisual industry has continued with its activity during the confinement, motivated by COVID-19 and in what way it has influenced these companies in order to be able to propose management modes and workflows applicable in the near future in the audiovisual sector.

It is therefore essential to establish or, at least, to reflect on the possibilities, within a real scenario, in which the important technical needs to produce television are integrated with the correct training on the use of these tools. The objective is to establish reliable workflows with the capacity to create a quality product in line with what viewers are going to demand.

The scenario that teleworking has brought with it, has also generated new employment opportunities conditioned by the technical and operational possibilities used in the television processes.

And in relation to the environment, the general objective is the study of the implementation of sustainable practices in production as a fundamental variable to understand the future of the economy.

To this end, it is necessary to approach the research from two perspectives:

- The first has to do with the academic point of view since, although a crisis such as the one raised by COVID-19 had not occurred previously, there are research works in relation to *low cost* production and new audiovisual production formulas that imply economy in the means of production.
- Second, it must take into account direct professional experience. Audiovisual production, and specifically television, has suffered an extraordinary increase in audiences during the pandemic. From March 16 to June 21, television consumption increased 22% more than in the same period last year, 278 minutes per person per day (Barlovento Comunicación, 2020, p. 4). And as a result, the most watched programs have had to adapt their production strategies in a mandatory way to comply with state regulations.

It should be borne in mind that the situation being experienced by COVID-19 is so exceptional that, in all likelihood, it will be difficult to repeat it under the same circumstances.

Therefore, the specific objectives we will try to achieve are:

- To establish which of the research works and the results achieved for low cost production formulas, can help to explain the possibilities that have appeared with telework explained as a reality assumed by companies and workers.
- In this environment, the solution to the problems arising from the situation of reduced mobility will be investigated, as well as the solutions and improvements provided.
- To explain and make known the television production and production techniques that have been developed during the pandemic. This objective is valid insofar as it is the same professionals who have carried out this transformation who explain this fact.
- In addition, the possibilities derived from remote work will be addressed and, more specifically, in the area of television, taking into account aesthetic and workflow criteria. The aim is to alleviate production needs in such a critical sector, from an economic point of view, as is the audiovisual sector.
- Regarding the environmental aspect, the objective is to investigate the measures applied by the companies on sustainability issues and if they are present in the implementation plans of the projects.

3. METHODOLOGY

Two main research methods have been followed. On the one hand, the bibliographic review and reviews in specialized audiovisual websites and national press. On the other hand, a series of unstructured qualitative interviews (table 1) with directors, technical managers and producers of different television channels and audiovisual production companies in Spain (table 2), with sufficient experience and professional qualifications to be considered experts in the field.

Table 1. *Questions from the interviews with professionals.*

1. What technology have the networks implemented to establish communications? What software have they used and how have they managed communications?
2. How have you solved the problems of monitoring and sending order signals?
3. What impact has it had on the implementation processes in control? Have there been substantial changes?
4. Will the techniques and contents used during these months be considered just another tool for content production?
5. What impact has it had on staff and human resources?
6. Can there be a reorganisation of human resources and teleworking in content production?
7. From the point of view of content, audiovisual companies have adapted to the changes. Are they forms of storytelling that will become another tool for content development? Or are they a temporary resource motivated by the situation?
8. Have protocols been implemented in case similar circumstances occur again?
9. Has it had any impact on sustainability, reduction of waste, transport costs, vehicles or lighting?
10. Are the new processes and lessons learned here to stay or was it a temporary experience that will not be used again?

Source: Own elaboration.

The interviews were carried out by means of telephone conversations, which were subsequently transcribed and from which the information was extracted.

Given the number of formats that exist in the audiovisual field (news, fiction, *reality*, docudrama or competitions, etc.), it has been decided to make a map of common elements used in different formats, paying more attention to the procedures than to the final purpose. The intention is to establish a general framework of use in different programmes, without wishing to limit the research to a single product.

In addition, press articles have been reviewed in which solutions and adaptations that have been produced in this situation have been published. The novelty of the object of the research means that there are hardly any references to previous research.

To finish with the triangulation in the methodological research, the results of the data obtained in the research will be analysed through an analysis that maintains the methodological structure of the SWOT method, but which has not had - for obvious reasons - a second wave of analysis.

The objective of applying this methodology is to lay the foundations on which to articulate premises for the construction of a possible virtual production scenario, based on the experience of those professionals who have had to make executive decisions during the pandemic to adapt, almost instantaneously, the workflows to the production needs imposed by the health crisis.

Table 2. *Interviewees, company and professional profile.*

Name	Company	Professional Profile
Jorge Alonso	Mediaset Spain	Head of News Production
Federico Atienza	Mediaset Spain	Head of News Production
Vicente Peña	Quartz	Head of Production
Emili Planas	Mediapro	Chief Technical Officer (CTO)
Victor Santamaria	Movistar+	Head of Sports Production
Javier Torrijos	Telefónica Broadcast Services (TBS)	Branded Content Supervisor
Álvaro Santamarina	Atresmedia	Filmmaker
José Jiménez	Andalucía Digital Multimedia	Filmmaker
Pedro Martín Ortega	Telefónica Broadcast Services (TBS)	Head of Mobile Units

Source: Own elaboration.

4. ANALYSIS AND RESULTS

In January 2020 the first news of a "mysterious coronavirus emerged in China" (ABC, 2020). On 31 January the WHO declares a health emergency (Güell, 2020). In Spain, on March 13, 2020, a State of Alarm was decreed, forcing the population to confine themselves to their homes.

The main consequence is the dry stop in production, also in the audiovisual sector, which was forced to modify its personnel structures, forms of production and content production.

In the different programming schedules, live programs are no longer broadcasted and the production of delayed programs is drastically slowed down due to the impossibility of recording on set. Adaptation to this new circumstance is imminent, making the maintenance of broadcasting capacity in the event that the coronavirus appears among its technical staff the greatest concern of television network executives (How the coronavirus hits television networks, 2020), so reinventing new workflows is essential.

But at the same time, creativity makes it possible to create television programmes made from private homes: presenters, collaborators, guests, etc., who appear in front of the cameras - with their bookcases on their backs - through their electronic devices, mobiles and computers. *El Intermedio* or *Zapeando* (Mediapro Studios, 2020) are produced with all the artistic staff in their homes. *El Hormiguero (*Siete y Acción, 2020) on the other hand opts for a hybrid format with part of the staff on set and others at home. The audience bleachers begin to empty. First to fifty percent of the capacity. Then completely empty (This is how the coronavirus hits the television networks, 2020).

On the other hand, the contents are also affected insofar as new formats and programmes created specifically for the situation arise, made with mobile technologies and with scripts focused on the pandemic (Pérez, 2020), such as *Diarios de la cuarentena* for TVE (RTVE, Morena Films, 2020), or the production company El Terrat, which launches its webseries *Coronavídeos: historias confinadas (*El Terrat, 2020).

In addition, all sectors within the audiovisual industry are working to adapt to the situation and continue producing as much as possible. An example of this is the film dubbing sector, which implements a workflow so that actors have a professional *Newman* type microphone at home connected to a computer that, remotely, is linked to the sound system and viewing of *takes* (fragments of sequences into which the audiovisual product is divided at the time of dubbing work), in order to synchronize and record the takes (Abel, 2020).

For its part, the audiovisual equipment rental company Ovide (Remote production, production and professional *streaming* for production companies, n.d.), offers a service for remote virtual production where each worker can be at home.

In short, the forced production stoppage and the consequent need for reinvention, has reflected positive changes in different sectors:

> The irruption of the coronavirus has also left positive traces, such as the heroic work of many professionals, the solidarity of societies, the environmental respite or the boost it has given to teleworking and the Fourth Industrial Revolution and its technologies, to which the press is no stranger in any of its formats. (Corral, 2020)

We can see that the situation has produced changes in different elements of the production process. On the one hand, the production of programmes has left the set and it is essential to consider the efficiency of the solutions to the workflows that, on a technical level, have been adopted for the production of programmes.

The physical space itself has been modified and the personnel who have to travel to the controls have a new element to prevent possible contagion, such as the separation screens between posts (Custom Consoles launches a screen for production controls in response to COVID-19, n.d.). The sets are emptied or coexist with the homes. There is a need to integrate that communication between production centers and the tools

available in homes or those that can be brought into workers' homes to create entirely new workflows. And if many people have stayed at home without physically going to the production sites, how has it affected the way they work?

On the other hand, production management is also affected by having to modify location and transport needs. The confinement itself has led to a decrease in the emission of toxic gases into the atmosphere. So much so that the NO2 levels recorded during the state of alarm are the lowest for the second half of March and the month of April in the last decade (Ceballos et al., 2020, p. 11).

In terms of waste generation, targets such as the reduction of plastics have meant a setback in the milestones achieved so far. The reason for this has been the increase in food packaging or sanitary waste such as masks (Cepeda, 2020).

The impact of both CO2 emissions and the increase in the average temperature of the planet show the environmental unsustainability and the urgency of finding solutions to alleviate its effects (López and Bulmer, 2020). The question arises whether production companies take into account sustainability factors for their industry.

After observing publications in the press, reports from institutions and the observation of television programmes, a search was made for specific academic information on the subject.

First of all, it was decided to choose the two most general words: audiovisual and COVID, and the search was limited to the year 2020.

The results returned by *Scopus* are twenty, all related to telemedicine, virtual reality in medical applications, surgery, radiology. In short, it does not return any topic of interest for our study.

We carried out the same search in *Web Of Science*, which gave us the same results as *Scopus*, but added an article by Giulio Latini (Latini, 2020) that deals with the textual analysis of image and communication, based on epistemological and language issues, in a way that is far from our object of study.

Next, we proceed to execute the same search in Dialnet, which yields a total of seven results for the year 2020 and none of the object of our study.

Finally, *Google Scholar* offers us 3,550 results. Reviewing the first ones, the search returns medical articles, but we have found one that reviews the general audiovisual communication during the pandemic and analyzes the contents, from television programs such as *El Hormiguero* to social networks such as *Instagram* (Pérez-Rufí, 2020).

Next, we make a change in the search. We replace audiovisual with television and keep COVID and the time limitation to 2020.

The *Scopus database* yields 63 articles, mostly from the healthcare environment, but returns two that are close to our purpose. One of them superficially describes the environment and ways of communicating during times of pandemic (Hermes and Hill, 2020).

On the other hand, we found another document that deals with communication tools through the Internet but we have not been able to access it (Suciu et al., 2020).

The search in *Web Of Science* offers us a total of 38 results for the words television and Covid in 2020, of which we found one on the treatment of messages and information (Casero-Ripollés, 2020). Another article is also extracted with a reflection on the general influence on content, but without the intention or depth of our research (Ong and Negra, 2020).

On the other hand, Dialnet, once the same search has been made, does not offer any results for the year 2020.

Finally, we searched in *Google Scholar.* It offers us 6,360 results for the year 2020. Among the first 50 results, none of them are of interest to us since they focus on medical topics. We did find some of the previous references returned in other search engines.

So, having searched the four main engines of academic articles without having relevant information, we have conducted interviews to obtain quantitative data on the impact of the health crisis on the forms of television production.

4.1. Communications

Communications during the pandemic have had to adapt quickly to support programme production.

Regarding issues related to the signals involved for the audiovisual production, Vicente Peña, head of production of the production company Cuarzo (Peña, V., personal communication, May 13, 2020) indicates that, they are established by means of *Zoom* type video call systems or through the integrated system of virtual production *LiveStream Studio.*

The communications and technical orders with the people who are outside, depend on the system used. In the case of *LiveStream Studio*, being a standard system of realization; although virtual, it first sends an invitation, which, when accepted, becomes integrated into the remote realization system and, therefore, sends and returns are made as would be done from any control (Peña, 2020).

For his part, Víctor Santamaría, Head of Sports Production at Movistar+ (Santamaría, V., personal communication, June 1, 2020) adds the use of messaging and video-calling

systems such as Skype, *Zoom or Microsoft Teams in* addition to the DMNG App from Aviwest*, which* is a provider of 4G backpack communication systems.

In other programmes of the Cuarzo production company, such as *Liarla Pardo*, Peña (2020) indicates that the signals arrive at production control once they have been managed by the engineering and central control departments. This procedure of ingesting signals through an intermediate process is the one used by Mediaset, as described by Jorge Alonso, Head of News Production, and Federico Atienza, Head of News Production, both from Mediaset España. (Atienza, F. and Alonso, J., personal communication, 26 May 2020):

> We have set up a technical room in Mediaset, created for the occasion, where *Zoom, Skype, Microsoft Teams, Facetime, Whatsapp* have been implemented. Here it has been centralized - as a mini MCR (*Master Control Room*) - to serve all Mediaset programs. It is operated by two technicians and has been configured by matrix to reach all the studios in our facilities. In this way, they make the calls of all the collaborators (own, external, guests) adapting to the system they have at home and from this room is transferred by internal fiber to any program (eg. *News, Ana Rosa, Sálvame, Cuatro al día or Viva la vida*). From here, before passing it to the production control, they make the connection, regulate the audio in case it needs to be amplified, adjust the shot and retouch small parameters. They also establish the different audio monitoring sends. (Atienza and Alonso, 2020)

On the other hand, Atienza and Alonso (2020), indicate that "the orders always go through this mini control that is who has the interlocution with the person in video call and what is transferred is only the IFB (*Interruptible foldback*) and communication with the opportune study by Intercom".

If we look at the type of production depending on whether it is live or recorded, Emili Planas; *Chief Technical Officer* (CTO) of Mediapro (Planas, E., personal communication, May 29, 2020), indicates that the processes are not the same considering a live and a recording, something that Peña (2020) also points out and that Javier Torrijos, *Branded Content* Supervisor at TBS, Telefónica *Broadcast Services* (Torrijos, J, personal communication, May 20, 2020), who have used Microsoft *Teams*, the video call tool that Movistar uses corporately, confirms. In their case, since they are making recorded product, pre-production and post-production is done remotely, except for the shooting phase, which is done in person, but with reduced equipment.

Planas (2020) explains that for the realization of live performances, specific video management systems were enabled over the Internet (*NDI Network Device Interface*) through virtual private networks. One of the problems of working in this way is the speed and quality of the images, but for this occasion, the results obtained are acceptable. When the networks used have been public, certain security protocols have been used to guarantee privacy and, as the networks have a lower data transmission speed, video files encoded in H.264 or H.265 have been used to lighten the flow of information.

As for live programs, Santamaría (2020) indicates that the orders to the people intervening from home and the return signals necessary for communications were sent to them via a second mobile phone line.

The company specializing in audiovisual production *software* and *hardware Newtek,* offers a management system for multiple video calls. It has a hardware with different inputs and outputs that allow the connection of up to four signals, with the possibility of making technical adjustments of image of sound as, for example, equalization, white balance, color retouching and sending monitoring (*NewTek TalkShow* VS 4000: a solution to take into account in contributions from home, n.d.).

Even so, Torrijos (2020) indicates that, sometimes, for personal reasons, the invited characters prefer to intervene via video call to avoid people going to their homes. In this case, the communication tool available to the guest is used and recorded full screen using the tools available to the platform itself. This material, which has been stored in the cloud, is then sent to first-level post-production, as the final editing will be carried out physically at Movistar+'s facilities.

As for live programs, as informative Torrijos (2020) points out that VPN's (*Virtual Private Networks)* have been used to remotely use the equipment that was physically located at the Movistar+ headquarters.

In the case of using virtual remote productions, Torrijos indicates that both for programs such as *Late Motiv* and for events organized by Telefónica Broadcast Services they have used *Vmix*, another virtual production system that works in a similar way to *Livestream,* described by Vicente Peña.

Movistar, in this case as a telecommunications operator together with RTVE, developed months before the health crisis, a remote production test using an *edge computing* system. The exercise consisted of the broadcasting of a sound fiction with three cameras connected to the *edge* system *and which were* carried out remotely in Torrespaña (RTVE and Telefónica make the first remote production without a mobile unit thanks to *edge computing*, 2019).

In the case of Telefónica's platform, to solve the problem of video editing, they have worked with a protocol designed with the companies Avid and Datos Media commissioned to Teradici, a company expert in remote desktop solutions and cloud servers. The system allows to connect up to 120 remote editing stations with qualities close to 4K. "It was hard to imagine before this international crisis and today it is a reality," says Manuela Martínez, head of engineering and maintenance at Movistar+ (Avid and Datos Media are part of the largest remote editing access project in Spain, 2020).

Communications may also improve in the medium term with the implementation of 5G technology, which is expected to be implemented between 2020 and 2030 in Europe,

which is a breakthrough in mobile broadband, with a highly reliable and low latency communications system, and a massive communications network between machines (Crusafón, 2018). All communications will improve, achieving data transmission speeds that can reach 20 Gb per second and with almost zero delay so that a near real-time connection would be achieved (Corral, 2020).

4.2. Implementation

Once we have seen the communications and the tools and techniques that have been used, we move on to gather information about the processes of the implementation and control team.

The role of the director plays an essential role in these new circumstances. When the production control is totally virtualized, it is he who directly launches the invitations to join the multiple video call and has control over the participation and the choice of shots, supplanting the role of other professional profiles such as the technical assistant mixer.

The main drawback is the aesthetic limitations, as the virtual technical control is very limited. However, it can record up to four video signals, which work synchronously through the same timecode, allowing multi-camera or multi-screen realization, and the possibility of doing usual operations of a realization control such as framing the images (*catching)* or labeling.

Regarding the realization of a program in physical and face-to-face control, there are no differences with respect to the traditional realization, since the video call is contemplated as any usual DSNG or 4G backpack exterior. (Atienza and Alonso, 2020), something in which Peña (2020) and Santamaría (2020) also agree.

In this sense, the use of mobile telephony is proposed as an alternative to sending ENG teams composed of camera and journalist. In such a way that the journalist acts as a camera with his phone and the Aviwest application allows to have control of the sending and return between the central server and each terminal. Although it is true that it requires a different, less expensive technical production team.

This new workflow changes the face of ENG equipment (tripod, wireless handheld mic for the journalist, lighting and camera) to add other technical requirements, such as handheld stabilizer; phone audio cable; battery; terminal optics and torch. These items are covered in Aviwest's webinar[2]on how COVID has affected production.

4.3. Aesthetics and narration

Narrative with this type of tool conditions the format due to its lack of rhythm, its quality and the type of shot that is less visually attractive, but, on the contrary, it

[2] Aviwest Webinar. How the Coronavirus is affecting the media industry. 30 April 2020. Conference with participants from all over Europe. https://bit.ly/3iVZeBk

> implies greater naturalness and many times, entering the home of the interviewees, interviewees or guests, generates a plus of incentive for the viewer. (Atienza and Alonso, 2020).

These are tools that have been implemented due to the current situation we live in and that will remain for some time, although in radically lower number and volume than at present. Santamaría (2020) believes that they are an occasional resource that can have a certain freshness for certain programmes, but they do not replace the traditional way of producing.

The problem is, in the opinion of Santamaría (2020), that the quality of the audio and video they generate is quite low, apart from the lack of control in lighting and staging that they carry with them. According to those interviewed, they do not have the professional invoice that should be required of a broadcaster. Nor has this crisis led to innovation in production, but rather, due to needs outside the profession, they have had to use lighter tools that have a series of obvious technical limitations. Apart from the aesthetic limitations, because seeing the roof or the bookshelves of the interviewees' houses is a one-off event and, over time, viewers lose interest due to the monotony and lack of spectacularity.

Aesthetics is also a fact that, according to Torrijos (2020), has evolved throughout the period of confinement. The technical possibilities have been implemented to improve aesthetic and narrative issues: better cameras, *auto cue* reading systems, higher level of data flow; which affects the fluidity of the television signal. But even so, the aesthetics of video calls end up exhausting the viewer. That's why Movistar has started to work on set, although there are still guests at home using video calls.

> I wouldn't like it as a professional to lower the aesthetics that much. Let's take the good out of it. Maybe we don't need to send an editor with a DSNG to do an interview. Maybe we can do a live one, but we can do it better, not from below, badly illuminated as it is done now. But I would not like to continue seeing triple and quadruple windows with people using *Team*. (Torrijos, 2020)

On the other hand, the filmmaker Álvaro Santamarina, (Santamarina, A., personal communication, July 10, 2020) considers that the use of camera positions, the hot head and other technical resources, whose use has been modified and even eliminated, has influenced the narrative of the shots. The need to adapt the scenographies, which in live performance transmit a sensation of spectacularity, has altered the sensation of the construction of the space, evolving towards dreamy atmospheres, through darker, more intimate lighting and the use of longer shots.

The fact that there is no need for an audience on the set has also forced us to look for other frames, types of shots, movements and less depth of field. Consequently, the use of cameras, movements and longer shots, scenery and lighting in live production has been affected.

4.4 Television and telework

As for the staff involved in the production of television programmes, they have been forced to stay at home (This is how the coronavirus hits television channels, 2020). This situation has meant a forced acceleration of teleworking that has served to see the pros and cons involved in each area.

> Teleworking is here to stay. Although it is too early to tell, we are still in the experimentation phase, it is being an extraordinary test bed to implement future advances that benefit both the company and the worker and improve variables such as work-life balance, productivity or profitability within the company. (Atienza and Alonso, 2020).

Santamaría (2020) also considers that teleworking will almost certainly form part of our working reality, so it will be necessary to delimit what work is done from home and what is done in person, which will create a new situation of relationship with the company, in which according to the director "the presence is not obliged in many cases and there will be more opportunity for family reconciliation and a more personal orientation of the day to day of each one".

In this line, the concept of ENG or news reporter has been affected during the confinement, as José Jiménez from Andalucía Digital Multimedia indicates (Jiménez, J., personal communication, July 15, 2020). To a certain extent this work process, the polyvalence of camera and journalist can be considered to have come to stay in news production, which is perceived as a threat, as it alters the workflow and, by extension, the contractual conditions.

But, in addition, for cameras and journalists, this cost saving involves the appearance of other factors such as poor audio and video quality, composition, stabilizer, sound, movement, framing are some factors that are mutated according to the Association of Cameras of Spain[3].

Planas (2020), for his part, highlights the possibility of reinventing the criteria for personnel selection since, to a large extent, the limitation of the professional's location disappears. In an international company like Mediapro, it opens up the possibility of forming better technical and creative teams without having to think about where each person lives. It clearly points out the "talent" as an important intangible value to be able to count on a member of a team that cannot be otherwise through offshore production.

Santamaría (2020) stresses the importance of being able to work from home in real time with video and audio material, given that very large data packages need to be handled. For Peña (2020) and thinking as a filmmaker, this situation has conditioned the technique, but also the contents. Things are going to be done on set, but maybe not everyone will be on set.

[3] Publication on *Linkedin*. 1 July 2020. https://bit.ly/32R29G2

Regarding teleworking, Torrijos (2020) considers that in his production sector it is possible to work from home, but it is necessary to work as a team, to have face-to-face meetings because they are important. For this producer everything depends on the format of the product, since it is not the same a news program, a documentary or a feature film.

However, he believes that it is necessary to delimit and regulate the periods of work since during the confinement they were connected 24 hours a day. In this line both Jiménez (2020), Santamarina (2020), and Pedro Martín, head of mobile units in TBS (Martín, P., personal communication, July 5, 2020), point out that teleworking can be considered for daily and recorded programs.

However, for live or news, working remotely is more complicated. They are a major challenge in all aspects. First of all, they require an investment in a cloud storage system that is fast and fluid. This type of programs move under a collaborative work structure that demands availability times, access, processing, downloading, uploading and modification of large amounts of data in a very short time.

On the other hand, there is the added complexity of coordinating all the teams and the supervision of content prior to broadcasting, but for Corral (2020) all these aspects will be improved with the implementation of 5G networks that involve a process of continuous offshoring.

4.5 Implementation of protocols

During the State of Alarm, problems were solved as they arose and professionals focused on achieving the highest possible final quality productions. However, once the situation has passed and based on the data collected during the crisis, protocols are being improved (Atienza and Alonso, 2020).

Therefore, we are, at the moment, in a phase of direct action. Subsequently, there will be a phase of analysis and assessments that will end with a draft on improvements, optimizations and processes, in order to develop a protocol for action in similar situations. In this way, it will be possible to guarantee faster action, greater efficiency and, in short, a better response to crisis situations.

The new protocols will be more refined and prepared and, although, as Planas (2020) points out, there are tools to cover very different circumstances, in most operations no one had been able to imagine a situation like this. Some additions will have to be made to the systems of action in case of emergency, usually known as "*disaster recovery*", in order to contemplate similar situations.

> This new way of working does not provide sufficient quality but the cost savings are enormous and the implemented infrastructure will not be disabled, among other things because outbreaks, alerts or exceptional situations will remain latent

> and from all this we learn, debug errors and improve processes. (Atienza and Alonso, 2020)

Planas (2020) does not consider these processes to be universal, but they do become known tools, which makes it easier for them to be used again when necessary. There has never been a single way of doing things, but what we have today are even more options on the table to choose from.

The ability to react in case of a new emergency would be shortened to a few hours according to Santamaría (2020) instead of weeks as has happened on this occasion. And it will be a tool that will be used when needed especially for programs, actions or campaigns aimed at social networks, *Youtube,* etc.

4.6. Sustainability

Sustainability in the COVID period can be pointed out as an effect on the daily reality of citizens, and in particular on the activity of audiovisual production and event companies.

This is a key issue in the economic activation of this sector and of the present and future economy. Accelerated by the health emergency situation, but whose approach based on circular cycles of the economy has been outlined for some years with a sustainable agenda, recommendations and directives of the European Commission, or the 17 Sustainable Development Goals of the United Nations.

Sustainability is a factor that measures the audiovisual activity in terms of care of processes, workflows, materials, consumption, uses and customs in relation to the environment in which the production is made.

> Technological and content issues require, by social demand and pure business logic, to be "sustainable" in environmental, economic, social, etc. terms. Many organizations already have as a strategic priority and brand image the reduction of its carbon footprint to reduce the impact on what we know as Climate Emergency (Corral, 2020).

Atienza and Alonso (2020) comment on the impact it has had on many budget items. Aspects such as live connections, international travel and coverage have led to environmental improvements due to the reduction in travel. However, on the other hand, the number of newsroom vehicles where only one person could travel per car, the separation of shifts, sick leave due to coronavirus, connections with international collaborators or minutes of broadcasting in news programmes have increased and have led to an increase in costs and environmental impact.

Planas (2020) argues that "remote or delocalised production has an impact on sustainability issues". Before the COVID-19 period, Mediapro has led remote production, and its calculations reflect a saving, in recent months, of 4,000 TN of CO_2.

For Peña (2020), sustainability does not depend on producers, but on general social awareness, on the government and on a State pact that generates tax regulations in all trades on this vital issue. In the production company Cuarzo we are making gestures such as the elimination of plastic cups and we try to use and recycle paper. The question of sets is a decision that depends more on the chains themselves because they are costs that are incurred. But they can be given a second life because a decorative panel (*panneau* or *panó*) can be polished, repainted and used in another program. In addition, he suggests that sustainability issues should be managed in a production by a person with specific knowledge.

On the other hand, all these factors present in working life and affecting workflows and results, also require a reflection on the very activity of production and exploitation of content. José Jiménez (2020) points out that sustainability has not only been affected in terms of travel savings, but its impact on the brake on activity is brutal. And in the processes of the company to build the audiovisual product it has been projected on the saving of light, refrigeration and use of sets, the decrease of waste in the contents, decrease of the garbage in the companies, displacements, a smaller wear of material and equipment, less quantity of diets of the personnel, important decrease of maintenances.

At Telefónica they have recycling points, the buildings are intelligent for efficient energy management, but at the production level it is more complicated, says Torrijos (2020).

> If you have to take a generator, that's the one you have, with gasoline and that's it. That we are going there, it is clear; but the electricity consumption in tv is what it is because the sets have to be illuminated. Although we try to use less HMI and change them for LED, for example. But there is a lot to do.

There is a tendency to use virtual sets because you build less and that means cost savings in construction materials, design, time, assembly and disassembly.

But it's not all positive. Networks, data storage and cloud servers also consume energy. The Internet consumes three times more energy than all the energy produced globally by solar and wind power plants (Corral, 2020). So, if we reduce face-to-face, increase teleworking and data consumption, sustainability is not guaranteed either. Global consumption of video on demand is responsible for 1% of gas emissions, which is the same amount as the equivalent of a whole year's emissions in Spain. So we must delve into sustainability studies, carbon footprint calculations and new production models to accurately define the improvements that remote work can make on the environmental impact.

4.7. Workflows

Regarding this important production factor, all the experts interviewed agree on the need to review the following processes that are susceptible to assessment by digital transformation:

- Downward adjustment of the number of working hours in editing and post-production, with special consideration in the choice and mixing of video formats.
- Adjustment in the assessment of technical *broadcast* or quality criteria that affect and will affect not only the editorial standards of television channels and production companies, but also an adaptation to the demand of users and advertisers on different entertainment platforms.
- Adjustment in budgets and the risk of a *low cost* implementation due to the need to cover broadcasting hours.
- Adjustment in the valuation and updating of archiving systems and the work of creating programmes from them.
- Possible adjustment in the criteria, functions and jobs in a work normality in which the number of people has been reduced and the supply of content covered with fewer staff. In this sense, one of the first signs is the figure of the ENG cameraman or reporter, replaced by a journalist with a mobile in the case of news and with contribution and direct links without a mobile unit, with a 4G, Wifi or 5G connection if the coverage allowed it.
- An adjustment of work processes in daily programmes and news programmes. In this case with the lack of audience on set, which has even reduced the spectacularity, the lighting and the use of new or scarce shots.
- Adjusting news workflows and editing.
- Adjustment in the realization and use of multi-plate controls and sets.
- Workflow adjustment towards a necessary quality control in continuity and production controls by the engineering department of each channel, not only in live shows but also in weekly fiction programs.
- Adjustment in the use and valuation of live contribution systems in terms of their audio and image quality. As well as a greater appreciation of intercommunication systems between areas, interconnected or external that hinder teamwork.
- Adjustment in the adoption of the live video call, adopting the radio model of participation in the program. The lower quality involves solving problems of sending audio and video, returns and management of *feed back* to each person. In addition to adding pre-production processes of instructions for program guests with lighting and sound. That is to say, a greater complexity.

5. DISCUSSION

In view of the results extracted from the interviews and the review of the published articles, we can extract the following data that summarize the new environment derived from the confinement. With regard to the technical and software tools used for communications and the realization in the data contained in Table 3 are extracted.

Table 3. *Analysis of implementation and communication tools.*

VIRTUAL REALISATIONS	VIDEO CALL SYSTEMS	REMOTE DESKTOP
Livestream Studio Vmix Use of *Edge Computing* technology	*Zoom* *Skype* *DMNG App (Aviwest)* *Facetime* *Whatsapp*	*Microsoft Teams*
SENDING AND RECEIVING VIDEO, AUDIO AND CONTROL MONITORING		
VIRTUAL REALISATIONS (With integrated signal management)	*Livestream studio* Vmix	
PHYSICAL CONTROL OF THE REALIZATION	Systel. Creation of an MCR room to manage video call signals and IFB and N-1 reception and sending.	Sending and processing on public networks under H.264 or H.265 encodings on SRT protocol Protocol NDI systems for signalling control in private VPNs

Source: Own elaboration.

In addition, we see that, in physical realization controls, the signals arrive as one more of those available, once managed by the corresponding department.

To structure the data obtained we have opted for the realization of a SWOT analysis. From the use of a diagnostic tool we measure the situation of the television industry in the state of confinement of the population, and thus draw one or more future strategies.

The internal factors refer to strengths and weaknesses. This is the simplest part of the study: the internal analysis, as it is the one that depends on the knowledge of the activity of the television industry and depends directly on us. But it has required an exercise of self-criticism and honesty of each and every one of the contributions of the experts from the interviews conducted.

The strengths can be considered as a competitive advantage. Both are quantified in the following importance values that correspond to the experts' assessment:

Table 4. *SWOT values.*

VALUE	MEASURE
1	Irrelevant
2	Not very important
3	Average importance
4	Very important
5	Crucial importance

Source: Own elaboration.

External factors are direct and indirect variables that affect television activity. That is to say, in the case of Spain, the political factors with the declaration of the State of Alarm, the economic aid decreed by the Government to the television stations[4], the political, economic and social situation, the competition with television subscription platforms, and the derived technical adaptation.

These external factors are defined in a series of variables grouped into threats understood as factors that negatively affect the development of the sector. And the opportunities understood as positive aspects offered by the environment.

In this way, values are added to the SWOT in Table 4, which express and quantify the responses of the experts with the variables provided, according to the importance and the existing consensus in the responses. They are quantified from a value of one, which is considered irrelevant, to five as being of crucial importance. In this way, values of average importance are established in three, and the answers obtained are quantified in the SWOT matrix.

Tables 5 to 14 detail and order each of the internal factors of self-analysis and external factors, both direct and indirect of the weaknesses and threats and divided into each of the areas extracted from the interviews.

In terms of production issues broken down in table 5, issues of lighting and objective picture quality carry the most weight as the most important weakness that can bring the perception closer to low-budget television. On the contrary, the types of shots acquire the least importance in terms of production weakness.

Focusing on the threats, having fewer cameras increases the feeling of monotony, while the lack of user experience in the handling of technical tools can be a problem of high impact on production.

Table 5. *SWOT. Analysis of Weaknesses and Threats. Scope of implementation.*

[4] On 1 April 2020, certain mandatory population coverage costs were approved for national digital terrestrial television services (private television stations), derived from maintaining certain percentages of mandatory population coverage for a period of six months during the confinement of the population in this period. Consulted on June 4, 2020. https://bit.ly/2FLl3FE

REALIZATION		
VALUE	**WEAKNESSES** Factors slowing down activity	**THREATS** Factors negatively affecting the activity
3	Low quality plans and resources Excessive multiscreen usage	
4	Critical plane stabilization Errors in plan composition	Lack of user experience in handling software tools Realization tools with technical and creative limitations
5	Low quality of lighting, connections, image and sound.	Lower number of cameras

Source: Own elaboration.

With regard to the aesthetic and content issues reflected in Table 6, the element that contributes the most weakness is the low-budget production identified as a matter of lower quality and less interesting content. It also becomes an external threat insofar as it could lead to audience declines and therefore a reduction in advertising revenue.

Table 6. *SWOT. Analysis of Weaknesses and Threats. Aesthetics, content and creativity.*

AESTHETICS, CONTENT AND CREATIVITY		
VALUE	**WEAKNESSES** Factors slowing down activity	**THREATS** Factors negatively affecting the activity
1	Lack of rhythm in the contents	
2		Monotony. Lack of interest of the spectator
3	Low quality scenery	Poorly maintained aesthetics Tendency not to do live programs
4	Aesthetic limitations Creative Constraints	.
5	Less audience on set Context of crisis: cheap programmes and ideas	Lack of innovation in content and production

Source: Own elaboration.

The negative impact on human resources reflected in table 7 is due to the elimination of some jobs as the functions are taken over by other people, as is the case of mixers or cameramen in news teams. Hyperconnectedness at work is also among the threats that interviewees perceive as a medium-high risk.

Budgets have also been affected, as can be seen in Table 7, where, while budgets have been reduced by cutting staff and per diems, they have been increased by paying for satellite connections to be able to cover all the information on the pandemic at a global level.

Table 7. *SWOT. Analysis of Weaknesses and Threats. Scope of work, human resources and budgets.*

TELEWORKING. HUMAN RESOURCES, BUDGETS		
VALUE	**WEAKNESSES** Factors slowing down activity	**THREATS** Factors negatively affecting the activity
1		Reduction of staff in specific profiles: production, set and news programmes.
2		More individual work with fewer coordination meetings
3	Daily program, absence of more people	Reduction of staff: scriptwriters and technicians
	Weekly distance learning programs	Hyperconnectedness at work
		Lower investment of equipment and resources
	Elimination of traditional ENG camera and editor equipment	Increased satellite costs and international connections to provide information
4		Reorganization of work center functions New workflows that are more individual and less team-based
5	Reorganization of work, flows and functions	Budget decrease

Source: Own elaboration.

In terms of communications, over-reliance on communication networks can be a threat due to possible failures as shown in Table 8, but also security, lack of innovation or presenters' expertise in using software tools.

Limited storage space on the other hand can pose a threat to the project.

Table 8. *SWOT. Analysis of Weaknesses and Threats. Area of communications.*

COMMUNICATIONS		
VALUE	**WEAKNESSES** Factors slowing down activity	**THREATS** Factors negatively affecting the activity
1		Network security
2		Lack of technical innovation
3	Increased physical and cloud storage space and data consumption	Lack of videoconferencing software information, professionals and guests
4	Absence of private VPNs	Fragility of communication networks
5		Dependence on communication networks

Source: *Own elaboration.*

Finally, in the area of sustainability, while confinement led to a reduction in gas emissions, there have been other circumstances that have led to an increase such as the duplication of trips or the growth in the use of data.

Table 9. *SWOT. Analysis of Strengths and Opportunities. Area of sustainability.*

SUSTAINABILITY		
	INTERNAL Self-analysis factors	**EXTERNAL** Direct and indirect factors
VALUE	**WEAKNESSES** Factors slowing down activity	**THREATS** Factors negatively affecting the activity
2	Increased data consumption and consequent carbon footprint Duplicity of trips due to health protocol and increase in certain trips Increased carbon footprint from increased satellite and international connections	

Source: Own elaboration.

On the other hand, tables 10 to 14 refer to strengths as competitive advantages, and opportunities as positive aspects to grow.

In terms of production, developed in table 10, the most valued variables refer to the recording of multiple signals, multi-camera production and lower infrastructure costs as strengths or competitive advantages, compared to the opportunity of a shared control with several sets of programs or sets.

Table 10. *SWOT. Analysis of Strengths and Opportunities. Scope of implementation.*

REALIZATION		
VALUE	**STRENGTHS** Competitive advantages	**OPPORTUNITIES** Positive aspects of the environment for growth
3	Tool for the entertainment of the population	
5	Multiple signal recording Multi-camera production Infrastructure cost savings	Shared control with multiple sets or programs

Source: Own elaboration.

In terms of aesthetics, content and creativity (table 11) the use or revision of "dead" or "fridge" programmes, discarded or not broadcasted versus the development of new content in a new context with production facilities.

Table 11. *SWOT. Analysis of Strengths and Opportunities. Aesthetics, content and creativity.*

AESTHETICS, CONTENT AND CREATIVITY		
VALUE	**STRENGTHS** Competitive advantages	**OPPORTUNITIES** Positive aspects of the environment for growth
4	Independent signal recording	Immediacy to get interviewees, news coverage Encouragement to enter the guest's home
	Informative, recorded, archive and fake live programs.	Cost savings
	Value of the audiovisual archive	Greater naturalness
5	Review of "dead" or "fridge" programs, discarded or not broadcasted.	Development of new content Production facilities

Source: Own elaboration.

The data provided in relation to teleworking, human resources and creativity (Table 12) contrast the lean cost policy and work-life balance with the acquisition of talent and human resources, together with new specialist profiles in networking and broadcasting.

Table 12. *SWOT. Analysis of Strengths and Opportunities. Area of telework, human resources and budgets.*

TELEWORKING. HUMAN RESOURCES, BUDGETS		
VALUE	**STRENGTHS** Competitive advantages	**OPPORTUNITIES** Positive aspects of the environment for growth
2	Reduction of electrical consumption in installations Reduction of per diem payments Reduced maintenance costs	.
3	Relocation of work	Hybrid face-to-face-remote workflows
4		Audience growth Reduction of travel New space and set designs
5	Tight cost policy Work-life balance	Talent acquisition and human resources. Worldwide New network and broadcasting specialist profiles

Source: Own elaboration.

In terms of communications (table 13), the use of reliable contribution and sending tools stand out: *Wetransfer, Filemale, Dropbox,* as opposed to the opportunities for handling large files in real time.

Table 13. *SWOT. Analysis of Strengths and Opportunities. Area of communications.*

COMMUNICATIONS		
VALUE	**STRENGTHS** Competitive advantages	**OPPORTUNITIES** Positive aspects of the environment for growth
2		Technological progress
3		Progressive technical improvement in systems for home use with the use of broadcast camera equipment and *prompter* or *cue* reading systems.

5	Use of reliable contribution and sending tools: *Wetransfer, Filemale, Dropbox*	Possibility to handle large files in real time

Source: Own elaboration

And in terms of sustainability, the most valued aspect refers to the importance of the reduction of toxic gas emissions versus the opportunities that emerge with the use of virtual sets and decorations.

Table 14. *SWOT. Analysis of Strengths and Opportunities. Area of sustainability.*

SUSTAINABILITY		
VALUE	**STRENGTHS** Competitive advantages	**OPPORTUNITIES** Positive aspects of the environment for growth
2	Reduction of electrical consumption in installations (refrigeration, light) and therefore reduction of carbon footprint. Waste reduction in production and television companies	Second life to sets. Circular economy
3	Reduction of travel	Creation of the external figure of the sustainability advisor
4	Reduction of toxic gas emissions	Use of virtual sets and scenery

Source: Own elaboration.

Regarding the standardization of processes and establishment of protocols, it is considered that, as it was an improvised situation, the techniques and lessons learned will have to go through an improvement filter. After that, they could become another tool to be used in certain circumstances. However, it is not considered that they will be universally standardised protocols.

Where it is observed that the techniques learned can be implemented would be in products that need to be attended with immediacy: breaking news, interviews of relevant people.... The result of these could be improved through the speed of action and the implementation of the remote system.

The information extracted in terms of labour relations indicates that there has been an improvement in aspects such as the reconciliation of personal and family life,

productivity and profitability of the company thanks to the possibility of working remotely and in real time with high quality video and audio materials.

Without leaving the workplace, in terms of personnel selection, there is the possibility of forming better technical and creative teams without having to think about where each person lives in search of talent through offshore production.

But it also underlines the regulation in some way in the face of the risk of hyperconnection and *24/7* work versus the digital disconnection of work, especially in jobs closer to management. However, the possibility of dispensing with certain positions such as a mixing technician or a camera operator are negative aspects of this situation. More autonomous journalists and guests who do not need more than their devices to produce content for television.

Sustainability is the pending subject in the audiovisual industry. While the implementation of recycling and energy saving measures in offices is outdated, as an industry there are no actions that can contribute significantly to a sustainable improvement. It is assumed that audiovisual processes generate a large energy impact, especially in lighting, but it is difficult to reduce the usual practices in workflows.

This situation of economic and productive slowdown has had an impact on the budget items for travel and live connections. The adaptation to security measures, on the other hand, has affected other aspects such as the obligation to travel only one person per car or the separation of shifts.

Remote working has also had its environmental implications. It is questioned whether the excessive dependence on data networks is as beneficial at a sustainable level as it seems. The use of internet and mobile devices is not directly perceived by the user as a consumption and impact on carbon footprint.

Therefore, it should be noted that as long as there is no precise regulation, the industry will not adapt or will do so only partially. While in certain aspects there is a clear improvement, such as waste generation or transport, in others there is a greater impact such as almost individual mobility, the establishment of health and hygiene safety measures with the use of screens and masks of high ecological impact and energy consumption in the use of communication networks to send high amounts of data necessary for working with video materials.

So at the sustainability level there is no conclusive data on the influence of the pandemic. But an important reflection is that companies do not implement specific sustainability protocols in terms of their own production processes, which opens possibilities for studies on the reasons why the audiovisual does not consider this situation.

6. CONCLUSIONS

The appearance of the pandemic caused by COVID-19 has generated radical changes in the way of producing and may open new ways of execution and audiovisual creation. In order to broadcast television and television content, one can opt for a system of domestic tools, unprofessional and without attention to detail; or implement professional *broadcast* techniques and protocols, expensive and slow to implement.

All these new possibilities should be defined in working protocols agreed upon and articulated by the industry, since they modify workflows. These practices carried out during the months of confinement point to the generation of a mixed production system between the classic audiovisual production systems and the workflows made possible by the new information technologies.

In general, the elements used already existed, although they were little used because their technical quality of image, sound, control and availability was questioned. Aesthetic priority has taken a back seat in times of confinement. Quality standards will return once the usual tools are in use, but there are some elements that can be considered to become commonplace:

- Workflows, functions, processes and roles can be reconsidered in a less resource-intensive economic environment.
- Some production processes and techniques will remain in the industry, mainly due to the type of content or the adaptation of new technologies such as videoconferencing systems, high-capacity mobile communications or transmission backpacks.
- The narrative, lighting, number and position of cameras, as well as the scenography and lighting, specific to the quality inherent to the pandemic will be used as a regular resource.

The situation has opened up new labor relations, conciliation and, remarkably, the search for talent that will become independent of its geographical location. It also opens the doors to access direct testimonies in real time that, due to their relevance, can be available to the production at the same time they occur. The new post-COVID scenario opens the way, therefore, to new television formats in which instantaneousness and real time are a priority. This factor will come into conflict or will have to be integrated into the current business model proposal based on the quality of mega-formats whose main success factor is spectacularity and large audiences *(Operación Triunfo, Masterchef...)*.

Technological development will provide portable and low-cost equipment to help implement quality productions, without the need for large technological deployments. Nor should we forget that virtual production systems can add value to platforms such as YouTube and its content creators who want to distribute their creations on a global scale.

In terms of sustainability, it has been shown that less travel is beneficial to the environment and this could be reflected in the audiovisual industry. However, there is

some doubt as to whether the impact of teleworking and the use of data communications are as beneficial as they appear. More worryingly, however, production companies are not yet consciously considering the application of sustainable criteria in their work, which indicates that this aspect is neglected and opens up a wide field of technical development and research.

7. REFERENCES

Abel Núñez, C. (May 18, 2020). El revolucionario 'kit' de doblaje remoto que ha llegado para quedarse. *El Español* Retrieved 29 May, 2020, from https://www.elespanol.com/bluper/noticias/revolucionaria-herramienta-doblaje-desde-casa-mediapro

Al Menos 44 Afectados por misterioso brote de Neumonía en el centro de China. (January 5, 2020). *ABC*. Retrieved May 28, 2020, from https://www.abc.es/sociedad/abci-menos-44-afectados-misterioso-brote-neumonia-centro-china-202001050145_noticia.html

Así golpea el coronavirus a las cadenas de televisión (March 13, 2020). *La Vanguardia.* Retrieved May 28, 2020, from https://www.lavanguardia.com/television/20200313/474108662413/coronavirus-television-covid-19-telecinco-antena-3-tve-cuatro-la-sexta-programas.html

Asociación de Cámaras de España. (2020) *Esto es lo que pasa cuando las cadenas se quieren ahorrar el trabajo de un operador de cámara.* [Publication]. Linkedin. Retrieved July 3, 2020. https://www.linkedin.com/posts/c%C3%A1maras-espa%C3%B1a_manolo-garc%C3%ADa-espejo-p%C3%BAblico-antena-3-activity-6685911282354294784-c2J0. https://www.linkedin.com/posts/c%C3%A1maras-espa%C3%B1a_manolo-garc%C3%ADa-espejo-p%C3%BAblico-antena-3-activity-6685911282354294784-c2J0

Avid y Datos Media integran junto a Movistar+ el mayor proyecto en España de acceso remoto a ediciones. (n.d.). *Panorama Audiovisual.com*. Retrieved May 29, 2020, from https://www.panoramaaudiovisual.com/2020/05/19/avid-y-datos-media-movistar-mayor-proyecto-acceso-remoto-ediciones/.

Barlovento Comunicación. (2020). *Balance del consumo de televisión durante el Estado de Alarma*. (Report). https://bit.ly/360EkgH

Casanova Mascarell, J. (2016). La producción audiovisual móvil. *AdComunica. Revista Científica de Estrategias, Tendencias e Innovación en Comunicación,* 12, 231-234. doi: 10.6035/2174-0992.2016.12.14.

Casero-Ripollés, A. (2020). Impact of Covid-19 on the media system: Communicative and democratic consequences of news consumption during the outbreak. *El profesional de la Información*, *29*(2). doi: 10.3145/epi.2020.mar.23

Ceballos, M. et al. (2020). *Efectos de la crisis de la COVID-19 en la calidad del aire urbano en España.* (Report). Ecologists in Action. https://www.ecologistasenaccion.org/140177

Cepeda, D. (May 16, 2020). El coronavirus pone en peligro las metas de reciclaje. *Cinco días*. Retrieved September 21, 2020, from https://cincodias.elpais.com/cincodias/2020/05/15/companias/1589546188_937111.html

Clemente Mediavilla, J. (2004). La incorporación de las nuevas tecnologías al audiovisual: una aproximación a la informatización de la gestión de la producción audiovisual. *Área Abierta,* 9.

Corral, D. (April 30, 2020). Periodismo tecnológico o ¿tecnología para el periodismo?…. en tiempos de pandemia. *OI2. Observatorio para la innovación de los informativos en la sociedad digital. Rtve.es.* Retrieved July 05, from https://www.rtve.es/rtve/20200430/periodismo-tecnologico-tecnologia-para-periodismo-tiempos-pandemia/2013145.shtml

Crusafón, C. (2018). La industria audiovisual ante el despliegue del 5G: el caso de la unión europea. *Fonseca, Journal of Communication,* 17, 11-22. doi: 10.14201/fjc2018171122.

Custom Consoles estrena una mampara para controles de realización como respuesta al COVID-19. (n.d.) *Panorama Audiovisual.com.* Retrieved July 3, 2020, from https://www.panoramaaudiovisual.com/2020/07/03/custom-consoles-mampara-covid-control-realizacion/

El Terrat (Production Company). (2020). *Coronavídeos: historias confinadas* [Television show]. Barcelona: El Terrat

Francés Domènec, M. , Gavaldà, J., Llorca, G. & Peris, Á. (2014). *La televisión de la crisis ante el abismo digital*. Gedisa.

Gómez, L. (2020). El desafío ambiental: enseñanzas a partir de la COVID-19.. *MEDISAN*, 24(4), 728.

Güell, O. (31 January 2020). La OMS declara la alerta internacional ante la imparable expansión del coronavirus de Wuhan. *El País*. Retrieved May 28, 2020, from https://elpais.com/sociedad/2020/01/30/actualidad/1580399024_626205.html.

Heredero Díaz, O. & Reyes Sánchez, F. (2016). Los efectos profesionales de la crisis de la televisión pública española: el creador audiovisual low cost y las nuevas

tecnologías. *AdComunica. Revista Científica de Estrategias, Tendencias e Innovación en Comunicación,* 11, 95-118. doi: 10.6035/2174-0992.2016.11.7.

Hermes, J. & Hill, A. (2020). Television's undoing of social distancing. *European Journal of Cultural Studies*. doi: 10.1177/1367549420927724.

IABM (2020). *Entrevista con Live U*. [Video]. Retrieved April 24, 2020. https://theiabm.org/in-conversation-with-liveu-and-zixi/.

IABM. (2020). *Coronavirus impact tracker.* [Video]. Linkedin. Retrieved April 24, 2020. https://www.linkedin.com/posts/iabm_covid19-hpa-covid19-activity-6675683097700306944-nSZy. https://www.linkedin.com/posts/iabm_covid19-hpa-covid19-activity-6675683097700306944-nSZy

IABM. (April 30, 2020). *How the Coronavirus is affecting the media industry*. [Videoconference] https://zoom.us/webinar/register/WN_nv0n_tYqQzKvnEbVujOKqw?id=57af7506-177f-ea11-a811-000d3a0ba026

Latini, G. (2020). Intorno alle rappresentazioni della crisi. Pratiche audiovisive partecipative al tempo del covid-19. *Documenti Geografici*, 1, 453-462. doi: 10.19246/DOCUGEO2281-7549/202001_28

López, M. & Bulmer, E. (2020) *Sostenibilidad y COVID-19. La insostenibilidad del modelo actual y su impulso tras la pandemia*. Madrid: EAE Business School.

Mediapro Studios (Production Company). (2020). *El Intermedio* [Television programme]. Madrid: La Sexta

Mediapro Studios (Production Company). (2020). *Zapeando* [Television program]. Madrid: La Sexta

Menéndez-Manjón Cueto, C. (2003). *Repercusiones de las autopistas de la información en el entorno radiotelevisivo.* [Thesis, Complutense University of Madrid]. https://eprints.ucm.es/3796/

NewTek TalkShow VS 4000: una solución a tener muy en cuenta en contribuciones desde casa. (s.f.). *Panorama Audiovisual.* Retrieved May 25, 2020, from https://www.panoramaaudiovisual.com/2020/04/23/newtek-talkshow-vs-4000-solucion-contribuciones-desde-casa/.

Ong, J. C. & Negra, D. (2020). The Media (Studies) of the Pandemic Moment: Introduction to the 20th Anniversary Issue. *Television & New Media, 21*(6), 555-561. doi: 10.1177/1527476420934127.

Perez, A. (May 7, 2020). Así entra el coronavirus en las series. *El País.* Retrieved May 29, 2020, from https://elpais.com/television/2020-05-06/asi-entra-el-coronavirus-en-las-series.html

Pérez-Rufí, J. P. (2018). Producción y edición del vídeo de bajo presupuesto: estudio de caso de "Lost Ones" (Joan Thiele) de Giada Bossi. *Revista Mediterránea de Comunicación, 9*(2), 291-303. doi: 10.14198/MEDCOM2018.9.2.4.

Pérez-Rufí, J. P. (coord.) (2020). La comunicación audiovisual durante la crisis sanitaria del coronavirus COVID 19. *Eumed.* https://www.eumed.net/libros/index.html

Realización remota, producción y streaming profesional para productoras (n. d.). *Ovide.* Retrieved May 25, 2020, from https://www.ovide.com/alquiler/realizacion-remota/.

Royal Decree-Law 11/2020, of 31 March, adopting additional urgent measures in the social and economic sphere to deal with COVID-19. *Official State Gazette, 91/2020, 1 April, 27885-27972.*

RTVE (Production Company) and Morena Films (Production Company). (2020). *Diarios de la cuarentena* [Television programme]. Madrid: TVE

RTVE y Telefónica hacen la primera realización a distancia sin unidad móvil gracias al edge computing. (December 4, 2019). *Telefónica.com.* Retrieved May 29, 2020, from https://www.telefonica.com/es/web/sala-de-prensa/-/rtve-y-telefonica-hacen-la-primera-realizacion-a-distancia-sin-unidad-movil-gracias-al-edge-computing

Sedeño Valdellós, A. M., Rodríguez López, J. & Roger Acuña, S. (2016). El videoclip postelevisivo actual. Propuesta metodológica y análisis estético. *Revista Latina de Comunicación Social*, 71, 332-348. doi: 10.4185/RLCS-2016-1098.

Segarra Saavedra, J., Tur Viñes, V. & Del Pino Romero, J. (2017). Branded Web-Serie as an Advertising Strategy. The #EncuentraTuLugar case. *Revista Latina de Comunicación Social*, 72, 883-896. doi: 10.4185/RLCS-2017-1198en.

Siete y Acción (Production Company). (2020). El *Hormiguero* [Television show]. Madrid: Antena 3

Suciu, G., Stefanescu, S., Beceanu, C. & Ceaparu, M. (2020). WebRTC role in real-time communication and video conferencing. *2020 Global Internet of Things Summit (GIoTS)*. Dublin: IEEE.

Vinader, R., García, A. & Abuín, N. (2010). Contenidos digitales: el móvil como plataforma de distribución contenidos. En Francés, M., Gavaldá, J., Llorca, G. y Peris, Á. (Eds.), *La calidad de los contenidos audiovisuales en la multidifusión digital,* 172, 165-178.

AUTHOR/ES:

Julio Blas Blas
Associate Professor, Department of Applied Communication**.** Complutense University of Madrid. Graduate in Audiovisual Communication from the UCM, Master in Teacher Training for Secondary and Vocational Training (specialising in Audiovisual Communication and Processes) from the URJC and Advanced Technician in Audiovisual Project Production from the CES School. He has been an active professional for more than 25 years in television as a producer and editor and is also the founder of Echar a Rodar, Association for Audiovisual Sustainability. At UCM he has been tutor of Final Degree Projects in Advertising and Public Relations, Digital Audiovisual Production and Management and Audiovisual Technology. At OBS Business School he teaches Sustainable Communication in the Master's Degree in Corporate Social Responsibility and Sustainable Leadership.
Orcid ID: https://orcid.org/0000-0001-7235-296X

Alberto Luis García García
Associate Professor, Department of Applied Communication**.** Complutense University of Madrid. Associate Professor of the Department of Applied Communication Sciences of the Faculty of Information Sciences, Complutense University of Madrid. The key lines that define his research career are digital television and radio, virtual reality, postproduction, interactivity and cultural industries. He has extensive professional experience in post-production and television production. Member of the TV Academy. He has an active six-year research period. Lecturer in the Business Area, specialising in Radio Structure and Business, and lecturer in the Audiovisual Media Technology Area, specialising in production and post-production. Both subjects are taught in the Audiovisual Communication Degree. He is a specialist in digital environments and audiovisual production of fiction and non-fiction content.
Orcid ID: https://orcid.org/0000-0002-6805-6700
Google Scholar: https://scholar.google.es/citations?user=vMeHVQsAAAAJ&hl=es
ResearchGate: https://www.researchgate.net/profile/Alberto_Garcia20

Ignacio José Martín Moraleda
Associate Professor, Department of Applied Communication**.** Complutense University of Madrid. PDI Professor Department of Applied Communication. Complutense University of Madrid. PhD in Audiovisual Communication and Advertising. Extensive experience in production and production in radio, television, events, live. He has taught in the Technical Master of Radio and Television of the CES, Master in Audiovisual Communication for the Digital Era UCM. Updating trainer in Canal Sur, Telemadrid, Mediaset, Onda Cero, etc. Technical leadership in production and projects of radio, DTT, television, sets, news services, videoconferencing, streaming and LED in Spain and several countries. He has provided production and transmission services for Aviwest, Sony, Panasonic, JVC, Newtek. Professor of editing and postproduction at UCM with participation in several productions. Director of TFGs, TFMs, author of articles on technology, data, television and interactivity.

Orcid ID: https://orcid.org/0000-0001-9885-9187
Google Scholar: https://scholar.google.es/citations?user=8ASZmoAAAAAJ&hl=en