Journalism and drones. Challenges and opportunities of the use of drones in news production

Periodismo y drones. Retos y oportunidades del uso de drones para la narración informativa en España

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Abstract:

With drone journalism it is possible to obtain aerial images in situations that are difficult to cover, with perspective, speed, mobility, greater safety for journalists, and at a lower cost. In this paper, an attempt is made to analyse the opportunities offered by the use of drones for news production in Spain, where an emerging industry has been detected. This is followed by a debate on the circumstances and causes behind their slow incorporation into newsroom routines, such as the cost of investing in a technology with a short lifetime due to its constant evolution and high accident rates, the technical and administrative complexity involved, the lack of specialized journalists, and restrictive laws which, until only recently, limited filming to rural areas.

Keywords:

Journalism; dron; news story; mass media, aerial images

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Resumen:

El uso de drones en el periodismo permite la obtención de imágenes aéreas de difícil cobertura, con un consiguiente abaratamiento de costes, perspectiva, rapidez, movilidad y mayor seguridad para los periodistas. En este ensayo científico pretendemos analizar las oportunidades que brinda el uso de drones al relato informativo en España, con una industria incipiente, y debatir acerca de circunstancias que frenan su desarrollo para su incorporación a las rutinas periodísticas, como el coste que supone para los medios una inversión en una tecnología con una alta siniestralidad, escasa durabilidad y constante modernización, la complejidad técnica y administrativa que implica su uso, la escasez de periodistas especializados o las limitaciones de una legislación restrictiva, que hasta hace poco circunscribía la obtención de recursos gráficos a espacios rurales.

Palabras clave:

Periodismo; drone; relato informativo; medios de comunicación; imágenes aéreas

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1. Introduction

In a short time, the versatility of drones has allowed them to be adapted to such diverse disciplines as agriculture, engineering, and journalism, where the terms 'drone journalism' and 'dronalists' have already been coined. In journalism, its main application to date has been to obtain images when the circumstances advise against dispatching reporters, such as armed conflicts, other dangerous situations, and areas that are hard to reach. For the media, the possibility of safely capturing images and video footage of wars, natural disasters, and demonstrations would now be a reality, if it were not for the legal constraints, differing from country to country, on the use of drones for different public safety reasons.

Since their military origins, a new lucrative market has opened up for drones including civil, entertainment, business, and professional uses, although the experts predict that this young market will come into its own with a more flexible legislation. In Spain, the new legal framework established by Royal Decree 1036/2017, of 15 December, and in force since 30 December 2017, which is both more comprehensive and more flexible, now allows drones to be flown in places where this has been prohibited hitherto, i.e. in the vicinity of buildings, built-up areas, and outdoor gatherings. Night flying is also now permitted, provided that drones meet the requirements established to guarantee their safe use. In short, it is a very recent piece of legislation whose purpose is to promote the fledgling drone industry.

However, this is not the only factor that has delayed the introduction of drone journalism in Spain, where the major media companies have not envisaged the incorporation of this technology into their production processes. In contrast, small production companies and freelancers offering these services to third parties have indeed proliferated. Other factors that have also hindered the development of the drone market include the media's concern over the administrative red tape involved in obtaining flight permits; the investment in assets with a planned obsolescence; and the distrust generated by associated ethical conflicts, such as breach of privacy and the technology's suspect military past.

2. Methodology

2.1. Objectives

The primary aim of this paper is to analyse the uses of drones in journalism, with respect to news coverage and its production processes, the pursuit of journalism as a profession, and the internal workings of the media. A second objective is to identify and theorize about the different factors that help to explain the scant use of this technology in news production in Spain to date. And thirdly, based on an analysis of the causes suggested by theoreticians and journalists from an academic and professional point of view, respectively, an attempt is made to inquire into how these obstacles might be overcome in order to offer an overview of possible future trends.

2.2. Procedure

To establish a theoretical framework, we first conducted a bibliographic and documentary review of academic and science popularization books and papers with a view to tracing the origins of the term, concept, and technological design of drones and their media applications. This review has allowed us to identify the main opportunities that this technology can

bestow the media industry and the challenges that it must face in order to become fully incorporated into news production processes.

However, the fact that drone journalism is still in its infancy means that theoretical studies and academic research in this regard are still thin on the ground. Accordingly, the bibliographic review was supplemented here with newspaper archives and statistical reports on the media industry and the use of drones.

We also conducted a series of in-depth, open-ended and targeted interviews with professionals working in the sector, for the purpose of enriching the theoretical framework with testimonies of media and production companies and ascertaining whether there is any truth in the claims of theoreticians as regards the barriers to the use of drones in the media industry and the opportunities that this technology can afford journalism as a whole. In light of the result of an initial survey that allowed us to verify that the major TV broadcasting companies in Spain do not own their own drones, we also decided to interview the managers of production companies that provide television channels with these services.

Lastly, we reviewed the legislation on drones to analyse the legal framework governing their professional use in Spain, including the new regulations established by Royal Decree 1036/2017, of 15 September 2017, on the civil use of aircraft piloted by remote control (BOE, Friday, 29 December 2017).

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3. The origins of drones

3.1. The flight of the drone

When drones began to be used in journalism during the first decade of the twenty-first century, they had already been employed for military purposes for over 70 years. Nevertheless, the drone concept can be traced back to the mid-nineteenth century, when Austria launched an attack against Venice using hot air balloons loaded with explosives (*Muy Interesante*, 2014). And by the end of the century, the inventor Tesla had already predicted the advent of remote-controlled military vehicles and the broad range of possibilities opened up by radio control technology, as can be glimpsed in the patent that he took out in 1898 'Method of and apparatus for controlling mechanism of moving vessels or vehicles'. For Tuan Nguyen (2016), Tesla was the true visionary in this regard and, during World War I, the warring parties began to test formulas with a view to fulfilling his prophesies.

However, the term 'drone' dates backs to at least 1935, according to the linguist and lexicographer Ben Zimmer (2013), who recalls how after watching a demonstration of the DH 82B Queen Bee, a new remote-controlled aircraft that the British Royal Navy used for target practice, US Admiral William H. Standley commissioned Commander Delmer Fahrney to develop something similar for the US Navy. And it was Fahrney who adopted the term 'drone' to refer to this unmanned aircraft which could be controlled by an operator on land or by a 'mother' aircraft.

For his part, Zimmer, who builds upon the theories of the military historian Steven Zaloga, the author of *Unmanned Aerial Vehicles* (2008), claims that during World War II, the US Armed Forces stepped up the production of 'target' and 'assault

drones'. Based on the model designed by the British actor Reginald Denny, with the company Radioplane, the US Army introduced the OQ-2 Radioplane, while the US Navy had its own contract and designated the drone 'Target Drone Denny 1' (TDD-1). Notwithstanding the technology's limitations, in the 1940s radio-controlled models were also used to bomb German targets, although their military applications would not come into their own until the outbreak of the Cold War.

In point of fact, as of 1964 the USA began to use drones to monitor sensitive areas, such as Cuba, North Korea, and the People's Republic of China, and during the Vietnam War it frequently resorted to Lightening Bugs, which were widely used to take aerial photographs of the armed conflict. The experts call this and other models at the time 'pre-drones', which could be equipped with cameras and whose flightpath could even been modified. Even so, they associate contemporary drone history with the appearance of the Predator model in the 1990s, a remotely piloted aircraft (RPA) that was the first to use the global positioning system (GPS), which made it more reliable than its predecessors. Based on this model, other more advanced prototypes were designed with many improvements: longer ranges, faster speeds, and higher ceilings.

Drones were first fitted with missiles at the end of the 1990s, and in February 2002 the CIA used a Predator armed with Hellfire missiles to eliminate someone who had been identified as Osama bin Laden in Afghanistan. A man died in the attack, but it was not the leader of al-Qaida. The USA continued to deploy surveillance and combat drones in the region in the context of the War on Terror, whose use was justified by the argument that they were a necessity that could save American lives, a justification that still holds today. More recently, the Predator and Reaper models armed with laser-guided missiles and bombs have also been used against targets in Pakistan, Iraq, Somalia, and Yemen. All this has led to the widespread deployment of this new remote-controlled weapon of war, capable of targeted killing with no risk to the person pulling the trigger.

Different experts in international law have argued that they increase the accuracy of attacks, thus helping to reduce collateral damage. For their part, Gustavo H. Krasñansky and María Elena Rossi (2014: 18) conclude that the particular nature of drones 'is not intrinsically abhorrent per se to international humanitarian law,' for

> it is more of a transport than a weapons system or a combination of both, at the very least just as permissible as any other type used in a theatre of operations, with control, surveillance, and precision capabilities resulting from cutting-edge high technology (idem.).

These authors put the spotlight on the people who operate the system, identify the target, and fire the missiles, for 'they are no different from the pilots of manned aircraft with regard to their duty to respect international humanitarian law' (idem.).

On the contrary, there are many authors who insist on the dangers posed by these devices when waging war with them. Javier Valenzuela (2012) revealed in *El País* that military drones, which cost about 13 million dollars each, have become the new remote-controlled weapons of war. He calls them 'metal birds of death' and notes that the Pentagon has some 19,000 for espionage or combat purposes, while the CIA has its own fleet. The military use of drones continues to prevail in the coverage that the media give this technology. As a matter of fact, at least half of the first 10 news stories on drones offered by Google News focus on their military applications and accident rates.

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3.2. Recording images from the sky

Drone journalism is not only indebted to the military use of these devices, but also to aerial photography which dates back to the mid-nineteenth century, long before their advent. Nadar took the first aerial photography from a hot air balloon in 1858, temporarily immortalizing the rooftops of Petit-Becetre in France. Unfortunately, this image has not come down to us. The first that has indeed survived was taken by the American James Wallace Black over Boston in 1860.

Several decades afterwards, at the beginning of the twentieth century, very light cameras were developed which could be used with carrier pigeons, which avoided the hazards involved in taking photographs from hot air balloons. In this regard, Álvaro Hernández (2014) describes how in December 1908 the pharmacist Julius Neubronner patented a method for using carrier pigeons to take aerial photographs by fitting them with an aluminium breast harness to which a lightweight time-delayed miniature camera could be attached. Neubronner's aim was to find a way of detecting the route followed by his carrier pigeons –with which he delivered small amounts of urgent medication– which had gone astray.

Although kites were also used for aerial photography during World War I, carrier pigeons were mainly employed for spying on and photographing the enemy. Hernández notes that to overcome the dilemma of pigeons having to return home, mobile lofts were devised, i.e. 'a two-level trailer, with a dark room in the lower part for film developing and the loft per se above.' Their use during World War II, according to Hernández, is still open to debate, classified documents in this respect do exist, although he points out that 'there are indeed indications that trained dogs were used to carry them in baskets across enemy lines.'

Although aircraft began to be used to take aerial photographs, pigeon photography was a much more discrete and safe method. Motivated by both ideas, the armed forces of different countries developed a method for attaching cameras to unmanned aerial vehicles. The use of drones fitted with cameras became widespread during the Vietnam War. The Ryan Firebee, one of the most popular models, incorporated a camera for spying on the enemy during reconnaissance missions. Launched from the ground with a rocket engine or deployed by a manned aircraft, it could be recuperated thanks to its parachute which could be opened when it returned to a suitable landing area. After returning to base, the photos taken by the drone were developed. Later on, at the beginning of the 1990s, the Gnat, a model developed by General Atomics, featured a video camera.

The Initial results left a lot to be desired since the quality of the images obtained was fairly poor due to the interferences caused by lights or bad weather, although the technology was good enough to capture footage of pedestrians crossing a bridge in Mostar (Bosnia). The Predator, the Gnat's successor, would feature significant technical improvements, thus hailing a new age as regards the evolution of drones.

The contemporary era of military drones has also coincided with a boom in their civil and commercial use. Steadily smaller and cheaper lightweight cameras can now be attached to increasingly smaller and cheaper civil and military models, with which aerial photography and filming have entered a new dimension.

Although these cameras capture images with an increasingly higher resolution, as the Australian firm Swarm UAV specializing in aerial photography explains (2015), with regard to drones there is a growing gap between their amateur

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use in quadcopters and professional use. The image quality of the small cameras (GoPros) installed in quadcopters, for instance, is not sufficient for aerial cinematography. According to the experts, the use of drones fitted with cameras for professional purposes is still in its infancy. It is a young market that is currently taking shape and whose future depends to a great extent on future technological innovations that allow high-resolution cameras offering the highest quality images to be attached to smaller devices.

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Notwithstanding the fact that drones for amateur use are now relatively cheap, their professional counterparts are more expensive due to their higher specifications: they tend to be faster and more resilient and are equipped with a 4K video camera and an image stabilizer. According to the magazine *Newesc* (2017), drones for professional use have a greater range and can be controlled at a distance of more than a kilometre (0.62 miles), above all when they are radio-frequency controlled. Moreover, they have longer flight times (between eight and 25 minutes, depending on the model) and are equipped with a stabilizer. A medium-quality professional drone can be currently purchased for 1200 euros.

Ignacio Espinosa (personal interview, 21/12/17), head of audio-visual production at DroneMadrid, states that Spanish production companies tend to use very advanced image recording technology for drones, including 4K camera drones for film shoots. In this case, their cost is higher and, although very specific and controlled shots are usually requested, a day's work involves eight seven-minute flights. News programmes opt for a lower quality in HD, without lowering the standards required for television broadcasting, thus allowing for longer footage.

4. Opportunities for using drones in news reporting

In the past, the cost of the first military drones, the fact that they were not easy to operate, and their huge size made them impracticable for the media. Over the past decade, however, and despite the widening gap between their professional and commercial use, the picture has changed completely.

Miniaturization, lower costs, and improved user-friendliness have led to a booming industry whose versatility has been leveraged in very different professional fields, such as aerospace research, police surveillance, traffic control, rescue operations, organic farming, transporting and distributing light loads (food, the post, books, medicines, etc.), forest fire-fighting and control, archaeological and cartographic research, and HD photography and filming.

Different authors have resorted to Everett Rogers' diffusion of innovation theory (1985) in order to discuss the possible benefits that drones could bring to journalism. Rogers' theory attempts to explain how, why, and to what extent new technologies spread. He suggests that five elements influence the adoption or rejection of an innovation: relative advantage (how improved an innovation is over the previous generation); compatibility; complexity; trialability (how easily an innovation can be experimented with as it is being adopted); and observability. He also proposes that four main elements influence the spread of a new idea: the innovation itself, communication channels, time, and a social system.

Based on Roger's theory, Astrid Gynnild (2014: 334-343) offers an optimistic outlook for drone journalism. According to this author, the advantages are evident insofar as they could help to improve the working conditions of journalists and the quality of journalism as a product.

The relative advantage of using drones in news reporting can also improve business models and competitiveness, given that the cost of obtaining footage will always be lower than that of doing so with manned flights. In this regard, Borja Medio, a cameraman and drone pilot working for the production company Cabina Audiovisual, explains that renting a helicopter for filming 'can cost on average 2500 euros per hour,' while 'half a day's work with a drone only 250 euros' (Nimo and Barreno, 2015), and that with the current technology offered by image stabilizers footage can be filmed and delivered straight to the client, without the need for post-production work.

The compatibility to which Gynnild (idem.) alludes refers to the need to align the use of drones with existing news values and practices, an attribute that in her opinion they intrinsically possess, considering that their greatest value for journalism lies in their capacity to fulfil the dream of impartiality by means of a robotic bystander. Furthermore, she invokes, among other issues, the user-friendliness of commercial drones and the possibilities that the Internet offers when looking for free advice on their handling.

Gynnild and other authors highlight at least seven advantages that drones offer as regards news coverage:

– Covering protests, demonstrations, and rallies inasmuch as they make it possible to show their true size and calculate the number of people taking part, thus contributing a visual value to the news context.

– Automatically covering sports events. With drones it is possible to offer detailed coverage of athletes participating in long-distance sports. Stijn Postema (2015) predicts that, in a not too distant future, sports coverage could be more complete, without viewers having to miss crucial moments of action because of the lack of a camera covering the angle in question. Moreover, he notes that several studies have demonstrated that a point-of-view shot has a significant effect on the viewer's visual experience of sports broadcasts.

– Immediate coverage and live, real-time broadcasting.

– Coverage of unforeseen or unscheduled events because of their high mobility and rapid deployment.

– Filming illegal activities, to which must be added the value of whistleblowing.

– Monitoring and scrutinizing government activities, as a counter argument.

– Obtaining footage of geographical areas that are hard to reach as a result of the lie of the land (for example, footage of a desert or a cave for a documentary) or a natural disaster (floods, earthquakes, tidal waves, etc.), a point that not only Gynnild emphasizes, but other authors as well. As a matter of fact, in May 2011 both *The Daily* and the CNN resorted to drones to obtain aerial footage of the damage caused by a tornado in Alabama.

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For David Goldberg, Mark Corcoran, and Robert G. Picard (2013: 24), drone journalism has a great potential to obtain footage without journalists being observed or in places to which it is unadvisable to send reporters because of the risks involved, hence their utility for investigative and reporter journalism. In addition, according to Gynnild (idem.), reporters could obtain images with certain guarantees for their own safety, since they would not have to run the risk of being caught in unpredictable situations.

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On the use of drones for obtaining photos and video footage of armed conflicts, Postema (idem.) admits that this is a very controversial matter among authors. Not all are in favour of their use in these situations, in spite of the fact that they provide journalists with a new tool that can increase their safety when going about their work, bearing in mind the many reporters who have been killed or injured over the years in different theatres of war. He also underscores the advantages of using drones for covering armed conflicts in which reporters are no longer neutral figures but targets, or those in which they are not attached to specific military units, but given a certain degree of leeway to choose the images that they wish to obtain, with the aim of guaranteeing impartiality and objectivity. In these cases, drones could either be used to supply footage directly or to check the safety and possibilities of a specific area as regards coverage.

On the contrary, their critics argue that they are intimidating objects because of their physical similarity to their military spy counterparts, and that they obtain a mechanical vision that lacks the human touch. To reduce this mechanicalness, Postema (idem.) recommends combining images captured on drone cameras with other perspectives, since audiences are now used to versatile narratives.

Nowadays, there are many drone applications in journalism, but as Antonio López Hidalgo (2016: 249) cautions,

> the images taken by these unmanned aerial vehicles do not tend to be for the moment enough in themselves to create an autonomous work, but are more like pieces for completing investigative reporting with interviews, archive footage, and other resources typical of audio-visual reportage….

Irrespective of whether in the future this way of showing reality 'also conditions journalists when looking for a new narrative rhetoric' (idem.).

By the same token, Gonzalo Prudkin (2016: 7), who focuses on the multimedia narrative, claims that there is little evidence of the use of such technology as a contextualizing element in the coverage and construction of news stories using a differentiated narrative, language, and aesthetics, being used instead as 'more of a "novelty" or "foretaste" of a technical nature presented before the audience' (*ibid.*: 18).

Additionally, there are a number of drawbacks, such as the impossibility of using drones in bad weather conditions, the threat posed by the breach of privacy, their owners' fear of losing or crashing them, legal constraints, and the red tape involved in obtaining the necessary permits to fly them, none of which should be overlooked.

5. The media use of drones in Spain

The Spanish Aviation Safety and Security Agency (AESA), which is responsible for regulating the use of drones weighing up to 150 kg, registered a total of 2742 drone operators in Spain and 74 academies with authorized drone pilot training courses on 21 December 2017 (AESA, 2017). The agency currently permits the use of drones for research and development activities; crop spraying or protection and fire-fighting, among other activities that involve sprinkling substances on the ground or releasing them in the air; aerial surveys; aerial observation and surveillance, including filming and monitoring forest fires; aerial advertising, radio and TV broadcasting; emergency, search, and rescue operations; etc. Therefore, the media use of drones would fall into the radio and TV broadcasting category.

According to the first drone survey, conducted by Todrone (2016), for the 400 respondents (production companies and freelancers specializing in drone filming, among other actors), the broadcasting industry represents 46% of the market. This survey, which provides an overview of how the industry is currently evolving, reveals that the market is dominated by small, very new companies or freelancers (93% of the total), which makes it 'highly fragmented, volatile, and still very incipient, with a substantial growth in the number of operators' (ibid.: 5).

Todrone goes on to indicate that production companies using drones in Spain are, generally speaking, 'very small companies or freelancers that regard drones as an interesting tool for enhancing their video production or photographic services, or for starting up a business,' an industry in which 'innovation is more limited and capital expenditure is minimal' (ibid.: 10).

The drone boom in the broadcasting industry is due, according to Manuel Oñate (2016: 23), chairman of the Spanish Remotely Piloted Aircraft Association (AERPA), to the fact that it is an industry in which, instead of flying beyond visual line of sight (BVLOS), drones are flown at a low altitude and close by because 'on the contrary, they cannot be controlled,' so 'it is the application that makes most sense with the current limitations.' In 2016, Oñate predicted that, with the elimination of airspace restrictions, other applications with a greater potential would be developed, before cautioning that the main risks facing the industry were due to the absence of a 'clear and stable political and legal framework' (ibid.: 21). Other experts also envisage that in several years' time, with further progress in innovation, the tide could turn in favour of industries with a greater potential than the broadcasting industry, such as agriculture and public works, which still require specific applications.

In Spain, major newspapers and television channels have not for the time being embraced drone journalism. They usually outsource these services, either directly as with The Spanish Radio and Television Corporation (RTVE) or through agencies as in the case of Telecinco (I. Espinosa, personal interview, 21/12/17), Mediaset (accessed 12/01/2018), and other channels. As Jorge Gallardo-Camacho and Eva Lavín (2016: 217-220) have discovered through their interviews with production and documentation managers, the images obtained with this technology are purchased from third parties (other pilots or news agencies).

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In this respect, Luis Méndez (personal interview, 15/12/2017), a media technician at The Audiovisual Radio and Television Corporation (RTVA), explains that both at Canal Sur and at other channels services of this type are normally outsourced, since purchasing their own drones would not make economic sense due to the fact that the regulations in force restrict their use for image recording to uninhabited areas which do not as a rule respond to the interests of news programmes. Although they are indeed used for very specific or recurrent news in which the aerial perspective offered by a drone enhances the story, such as the pilgrimage to El Rocío and to the Virgen de la Cabeza (Virgin of the Head) which each attract around on a million people every year.

Before, this footage was obtained using a helicopter, but the large difference in cost between this and the same footage obtained with a drone led broadcasting companies to opt for the latter. Even so, as Méndez indicates, it is still impossible to film the main day of these pilgrimages due to legal restrictions concerning the filming of large crowds, and in this regard television companies try to comply with the regulations to avoid legal problems. In fact, he admits that they would be very useful for obtaining footage of demonstrations and protests.

For his part, Juan Fernández García (personal interview, 16/01/18), head of the production company UP Films, which supplies the major TV channels in Spain –including RTVE and Mediaset– with images, points out that the firm's services are usually engaged by programmes and only occasionally by their news counterparts. Requests tend to be for situational footage that offers viewers a clear perspective of a specific geographical area or location, like that obtained in Cancun for the programme, 'Casados a primera vista (Married at First Sight)', among many other reality shows.

Images have also been obtained for investigative reports, including the programme, 'En el punto de mira (In the Spotlight)', broadcast by Cuatro, although Fernández admits that the legal restrictions on where drones can be used for filming and the permits involved have prevented their wider use. In this respect, he notes that his firm has had to turn down many requests for footage that cannot be legally obtained, in order to comply scrupulously with the letter of the law.

According to Mariano García Sagospe (personal interview, 19/01/18), technical resource manager at Telecinco, the private TV channel does not have its own drones because it would not be cost-effective and, at any rate, either it outsources this service directly, although this is rarely the case, or leaves this up to the production companies making its programmes. In the last three years, Telecinco has directly engaged the services of a drone company on two occasions, specifically for two finals of the realty show Big Brother, in order to obtain aerial footage of the participants boarding the helicopter used to transfer them from the house to the TV channel's studios.

However, Mediaset –the group to which Telecinco belongs– often engages a number of production companies to provide drone services, for instance for the filming of the adventure programme 'Volando Voy' staring Jesús Calleja, broadcast on Cuatro. This programme offers aerial footage of different areas in Spain using a helicopter, which is then combined with footage obtained with cutting-edge drones which, in any case, use permitted radio frequencies. So it is not live footage, thus allowing the pilot to broadcast a low quality signal when filming. Sagospe claims that for commercial television it pays to

outsource drone services, as with other technical resources like LED displays, Hothead camera backpacks and cranes, since they are expensive items to purchase and maintain, difficult to use, and constantly evolving.

Méndez (idem.) notes that some years ago when drones arrived on the scene, to some extent television companies did indeed rush to purchase footage. But the entry into force of the new legislation in 2014 curbed this trend and resources were even removed from archives when it was found that they might have been obtained without complying with legal requirements.

Besides news programmes, according to Méndez, drone footage of uninhabited areas is used for advertising and headlines, in which case the service is outsourced by the production department, a procedure too lengthy for news services. Moreover, he alludes to the strict legal requirements for obtaining flight permits and the technical specifications of the drones. Professional drones weighing more than 12 kg equipped with advanced gimbal stabilization systems to counteract vibrations are required to transport a quality television camera, thus calling for a very high level of specialization for the very limited use to which they can be put by the media.

At football matches, concerts, and festivals, aerial footage is gathered using the cable cam system, comprising a cable (or rope) tensed between two anchor points, a remote-controlled camera rig that moves back and forth along the cable, and a digital stabilized camera gimbal which also functions via a wireless remote control. Thus, the operator in the control cabin can move the rig at different speeds from one end of the cable to the other. With this system it is possible to obtain footage similar to that obtained with a drone, including aerial filming and multi-dimensional travelling with a high level of precision. This system and other alternative ones, together with the aforementioned obstacles, have led some production companies to dispense with drones.

As with Méndez, Ignacio Espinosa (personal interview, 21/12/17), based on his experience at DroneMadrid which offers drone filming services adapted to different sectors, including the media industry, claims that the greatest drawback for television news programmes has to do with the places where drones can be flown, restricted for many years to the countryside, uninhabited areas, and indoor venues where they cannot go astray. These limitations have also affected the frequency with which television companies outsource these services to production companies. Pending a more flexible legislation, some of the latter have diversified into training courses for obtaining a basic or advanced civil unmanned aircraft system pilot certificate.

Fernández García (idem.) believes that, in addition to the legal restrictions on where drones can be flown for filming, the administrative permits required are a further hindrance in contexts, such as that of television, in which speed is the key, above all with respect to news programmes. At all events, he emphasizes the advantages of drones versus the cable cam system, insofar as the former do not require any type of prior installation and can be in the air in just 10 minutes, with a higher ceiling and more freedom of movement than the latter. Drones are also quieter and, therefore, the best option for television and film sets, as well as being safer, for which reason their use is recommended for the coverage of multitudinous events such as concerts and marathons.

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Neither does one of Spain's major public broadcasting companies, have its own drones for aerial filming, and as with RTVE outsources this service for co-productions and advertising, always within the limits of the law and ensuring that the outsourced services also comply in this regard. César Abánades (personal interview, 28/12/2017), deputy head of media development at RTVE, insists that the main obstacle is safety: a drone equipped with a professional camera is a heavy object that, in the event of a crash, could cause damage to property and/or personal injury. Under the previous regulations (in reference to the legislation governing these activities before 30 December 2017), however, they could only be used to obtain footage in uninhabited areas and the countryside.

According to Abánades, RTVE considered the possibility of purchasing its own drones for obtaining aerial footage, but discarded the idea in light of the airspace restrictions established by law, the costly and lengthy process of obtaining the pertinent pilot licence, including specialist courses, and the price tag of the drones. Instead, the public broadcasting corporation has opted for the use of helicopters, hired by means of a public invitation to tender, to cover events in which aerial coverage is essential, including La Vuelta (Cycling competition), marathons, the Armed Forces parade, and some demonstrations. These helicopters have to comply with special safety requirements, such as a dual turbine system, in order to fly over cities and populated areas. Normally, RTVE assesses the news content that this aerial footage can provide before putting a helicopter in the air. For broadcasting some sports and the San Fermines, RTVE also rents the cable cam system, also rented.

Given the possibility of a more flexible legislation, Méndez (idem.) does not anticipate that the country's TV channels will rush out and buy their own drones, because the technological expertise required to operate them far outweighs the limited uses to which they can be put. To his mind, they will continue to outsource this service, as with the 4K wireless mobile broadcasting backpacks which are faster than the live connections of mobile units (digital satellite news gathering – DSNG) because they do not require cables.

For his part, Sagospe (idem.) considers that one of the main drawbacks of drones when using them for television is live broadcasting, and for a channel like Telecinco, with a schedule that includes 18 hours of live broadcasting a day, they have a limited utility. Coverage, flight ranges, the need to control the drone's orientation, and flight preparations are all aspects that should be greatly improved before they can be used for this purpose. With regard to their use on television or film sets, other hurdles will have to be negotiated, including noise levels and audience safety issues.

In contrast, Abánades (idem.) predicts that, in view of a change in legislation envisaging greater flexibility as regards airspace, RTVE might consider the option of purchasing its own drones. In fact, he says that this plan is in the pipeline and that a preliminary draft budget has already been drawn up which includes both the purchase of drones and the introduction of specialist training courses, although no final decision has been reached as yet. And, in his opinion, safety is the main pitfall because the lack of specialist knowledge can be resolved with training.

Concerning the possibility of the legislative changes leading to a wider market, Fernández García (idem.) is not convinced. He claims that the permits are still the main stumbling block, for the Royal Decree itself establishes that the competent

authorities can take a maximum of six months to decide on applications, an aspect that he considers impracticable for television channels and even for film production companies, which also have to take into account several environmental factors on the day of filming. In his view, this decision process should take no more than three days at the very most. Nor is there currently any standard permit application form, for which reason adaptation to the new regulations established by Royal Decree 1036/2017 will not be automatic. On the other hand, he indicates that the new safety requirements could drive up the price of a product whose running costs include insurance coverage, maintenance, and replacement, since the technology is obsolete in two years.

In the regard, Sagospe (idem.) underscores that in the future drones could become an excellent media broadcasting tool that in all likelihood will eclipse hot heads, provided that a number of technical problems (noise, flight ranges, loss of control, etc.), safety issues (flying over public gatherings), and the red tape involved in obtaining the necessary filming permits are resolved. Their use is currently limited to advertising and documentaries because, besides the aforementioned aspects, news programme and commercial production are based on immediacy.

For Alberto Bote (interview, 17/01/18), head of Aerovision Films Technology, under the new legislation the prospects are good, although operators are still trying to decipher and assume the different requirements laid out in Royal Decree 1036/2017.

Gallardo-Camacho and Lavín (idem.) have also drawn attention to the acquisition of footage released free by institutions and organizations (the armed forces, NGOs, etc.). In this respect, Goldberg, Corcoran, and Picard (idem: 25) have warned about the danger posed by the unreliability of sources, especially when these are anonymous and unrelated to the media, which could ultimately undermine the credibility of the news itself. There are many risks involved: that the footage has been obtained while violating aviation regulations, invading someone's privacy, or giving rise to other ethical conflicts.

The drone footage used in news programmes usually has to do with situations that could pose a hazard for the pilot of a manned aircraft or helicopter, like natural disasters, forest fires, or the aftermath of a hurricane. In this connection, Gallardo-Camacho and Lavín (ibid.: 22) have showed that out of all the drone footage included in news programmes in Spain, 72% has to do with natural disasters, specifically forest fires (37%), floods (16%), snowfalls (9%), earthquakes (5%), and hurricanes (5%). Furthermore, they have pointed to two of the most pressing problems that could hinder the development of drone journalism, i.e. low profitability (the price of footage does not usually exceed 300 euros) and unqualified practice:

> The pilots recognize that they do not only work for television companies because it is one of the 'worst paid' jobs, but also accept more profitable work: corporate videos, advertising, corporate and industrial commissions, etc. They also agree that unqualified practice is a big problem that affects profits (ibid.: 222).

These difficulties have led them to predict an uncertain future for drone journalism in Spain.

To this must be added the media industry crisis in Spain (APM, 2016: 38), with serious consequences for employment. During the period 2008-2015, 375 media companies, including newspapers, magazines, television stations, digital media,

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and news agencies, went under. The largest number disappeared in 2012 and 2013, coinciding with the advent of drone journalism. Under these circumstances, the media have postponed investment in technology with a questionable utility.

On a more optimistic note, the report released by the Madrid Press Association (AMP) envisages an outlook of incipient change in the Spanish media industry linked to the end of the economic crisis, which has already made it possible to glimpse a new media environment characterized by a high ownership concentration in the television industry, with a clear increase in marketing investment and turnover. In contrast, the newspaper industry, which has also been affected by digitization, is steadily losing ground as an advertising medium. All in all, this new panorama is again opening up opportunities for technological innovation and experimenting with new applications and, as the AMP (ibid.: 36) has cautioned,

> Now remains to be seen what levels of employment are reached in the journalistic profession in the future and whether the ongoing technological revolution will generate a significantly larger labour market than at present.

Drone journalism practices differ from country to country, two of the main reasons for this being the health of the newspaper industry and the laxness of the legislation in force. In the USA, for example, the commercial use of drones has been permitted since 2016, which has opened up a new market for journalism.

The channel CNN was the first to receive permission from the Federal Aviation Administration (FFA) to use drones and supply the different stations that it operates with the aerial footage obtained. However, many major newspapers have been reluctant to use them because they question the FFA's regulations. They believe that the interpretation of the freedom of press enshrined in the First Amendment is too strict. In point of fact, to obtain a licence from the FFA it is necessary to pass an exam requiring knowledge of airspace regulations and aeronautic navigation maps. There is a speed limit of 160 km/h (100 mph), a maximum altitude of 120 m (400 feet), and the drone must remain in the pilot's visual line of sight (VLOS). Moreover, night flying is prohibited.

6. Legal regulation

6.1. Breach of privacy and other potential risks

The civil use of drones, which initially experienced a boom, has been limited by the legislation which is being developed at this moment, an aspect that has had a direct impact on drone journalism.

Different countries are studying how to regulate legally and ethically issues affecting air safety, including not only drone design, flight control or violations of commercial airspace, but also public safety and the use of drones for criminal or terrorist purposes.

Gallardo-Camacho and Lavín (idem.) alert against the high accident rate of drones that, albeit equipped with GPS and an online map, can easily go astray and cause accidents at 50 km/h (30 mph); like the case of an athlete who was injured in the head by a drone filming a race in Australia in April 2014. By the same token, the potential danger of collisions with

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manned aircraft has caused aviation authorities much concern, since neither the Traffic Alert and Collision Avoidance System (TCAS) nor air traffic controllers can detect drones, so this is left up to the pilot's visual acuity.

The BBC's editorial guidelines (2016: 1-3) limit the use of drones to situations in which 'any use of the footage gathered must be justified in the public interest' and there is a strong 'editorial reason, given the potential safety risks with flying an aircraft.' Thus, it urges users to comply scrupulously with legal requirements, except when there is a 'strong editorial justification for not doing so,' like footage of armed conflicts.

One of the most worrying aspects, from a legal point of view, is that of the protection of the privacy of individuals. To illustrate this, out of all the different potential risks associated with the use of drones, the BBC (ibid.: 5-7) places the accent on the breach of privacy and warns that drones

> should not normally be used to identify individuals without their consent or capture close-up images of private areas such as houses, gardens or offices without the consent of the owner, unless these areas can be seen from a public vantage point or there is a public interest in showing them.

For the BBC, only public interest would justify filming. For example, public or semi-public places, such as train stations, do not pose such an ethical dilemma for the corporation, for it understands that it is not necessary to 'obtain the consent of individuals who are accidently caught on camera as part of a general view, unless they are engaged in an activity where they have a legitimate expectation of privacy.' At any event, the BBC 'normally obtains consent before filming on private property,' although intrusion of privacy will depend more specifically on the flight range of the drone and the type of images captured.

In the digital era, the privacy of individuals and their private property has been eroded, while the line separating the public from the private has become blurred, as spelled out by Mark Tremayne and Andrew Clark (2014: 233-234), an erosion to which drones equipped with video cameras have contributed their fair share. These authors hold that in a culture accustomed to observing the life of others and, at the same time, to being observed, the acceptance of new forms of surveillance is practically inevitable.

Goldberg, Corcoran, and Picard (idem: 24) point out that typical multi-rotors cannot efficiently lift the big heavy lenses that most paparazzi prefer for 'stand-off' shots, and that at any event the development of quieter drones and better digital photography may make them unnecesssary. They claim that in the 2010 documentary 'Sharks of the French Riviera', drones equipped with cameras managed to capture images of Paris Hilton and other celebrities at the Cannes Film Festival and hotels on the C*ôte d'*Azur. At the 2017 edition of the festival, the use of drones for gathering images or footage was prohibited. They also stress that serious journalism should also try to gain the trust of the public by respecting the privacy of individuals going about their daily lives who have no desire to become unpaid extras in footage filmed from above.

Before gathering information for a news story with drones, in which anonymous individuals can be recognized, the BBC (idem.: 5-6) suggests that journalists should bear in mind a number of aspects:

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– Is it necessary and proportionate for the recording to be continuous?

– Can the camera on the drone be switched on and off or re-directed so that privacy is not unnecessarily infringed if the aircraft captures images of people, property or land that is of no interest to the production?

– Are there ways of restricting the view or changing the angle of the lens to avoid capturing images where privacy may be unwarrantably breached, if for example the drone has to fly over someone's back-garden?

– Should a different take-off position or route be considered?

– Does the production need to provide information to make people aware drones are in use by the BBC or the purpose of filming? This might include the following:

  • Staff wearing highly visible clothing identifying themselves as BBC drone operators.

  • Signage in the area where the drone is being flown.

  • Information on posters or tickets at a live event or outside broadcast or similar.

  • Using social media to explain that filming is taking place from a drone in a defined area.

There is no need to warn people that they might be filmed if they cannot be identified in the footage because the shot is too wide.

– Whether an area needs to be cordoned off to prevent anyone entering.

The public broadcasting corporation (idem.: 8) also warranst an intrusion of privacy when drones are used for investigative reporting in witch the purpose is to gather evidence provided that there is a strong public interest justifying for the intrusion. For example, drones could be used to document illegal activities such as fly tipping, smuggling or illegal farming activities where evidence cannot be gathered without the use of an aerial vehicle. Any proposal to film with a drone where there is a privacy intrusion and no consent is obtained should be regarded as a proposal for secret filming which must be approved in advance for BBC, through the usual channels.

6.2. Legal regulation in Spain

Ana María Nimo and Jorge Barreno (2015) report that Spain was one of the first European countries to legislate on the use of drones, the AESA consequently having one of the most advanced legislations. Furthermore, the AESA claims that Spain legislated on the civil use of drones before the USA.

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In relation to Spanish legislation, Alberto González Martín (2017) identifies three legal milestones regulating the use of drones for commercial or professional purposes:

– The Memorandum of the AESA, of 6 April 2014.

– Royal Decree-Law 8/2014, of 4 July, on the adoption of urgent measures for growth, competitiveness, and efficiency.

– Act 18/2014, of 15 October, on the adoption of urgent measures for growth, competitiveness, and efficiency.

To which must be added Royal Decree 1036/2017, of 15 December, amending both Royal Decree 552/2014, of 27 June, implementing the Air Regulation and common operating provisions for air navigation services and procedures, and Royal Decree 57/2002, of 18 January, approving the Air Traffic Regulation, which regulates the civil use of remotely piloted aircraft (BOE of 29 December 2017).

This Royal Decree develops the temporal regulatory framework initially adopted by virtue of Act 18/2014 in order to 'facilitate the development of a nascent activity,' as explained by the Spanish Ministry of Public Works and Transport (2017: 2) in a statement released to the media. This act laid down a temporary legal framework applicable to aircraft and their uses, insofar as it adopted the statutory regulations of the second paragraph of its second final provision, which established that the Government would legally determine the legal framework applicable to remotely piloted civil aircraft, in addition to their operations and activities.

For its part, the EU is also working on new regulations to harmonize the criteria of the Member States and has proposed the creation of a U-space blueprint in which air traffic control would be automated for all drones weighing less than 150 kg and flying below an altitude of 150 m. The proposal has already been submitted and the final legislation is expected to come into force in 2019.

In Spain, the recently enacted legislation seeks 'the growth of an emerging industry, closely linked to development and technological innovation' (idem.) and introduces substantial changes for drone operations.

Moreover, it contains a novel aspect widely requested by operators and production companies by permitting drone operations in areas where these were prohibited before, such as flying over cities, towns, villages, and other inhabited areas with a high density of buildings – although to do so a safety study and prior authorization from the AESA are required, among other things. These operations should be carried out with drones whose maximum take-off mass (MTOM) does not exceed 10 kg and within the pilot's VLOS, in areas delimited for this purpose or maintaining a minimum horizontal safety distance of 50 m with respect to people who are not under the control of the operator. In addition, drones must be equipped with an impact energy limiting device.

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Night flights are also now permitted, although they require the express authorization of the AESA, upon request of the operator accompanied by a specific safety study, while the drone must be equipped with lights, reflective paint, or other adequate devices that guarantee its visibility.

Likewise, the new legislation allows flying within the pilot's extended visual line of sight (EVLOS), in which direct visual contract with the drone is maintained using alternative means, above all observers in permanent radio contact with the pilot; and BVLOS operations, with drones with a MTOM of more than 2 kg.

The regulations also permit flying in controlled airspace, although in this case a number of pilot training and drone specification requirements must be met and an air safety study performed in coordination with air traffic control, prior authorization from the AESA also being necessary. To fly in controlled airspace, drone pilots must demonstrate that they have sufficient knowledge by submitting an aircraft radio operator certificate (AROC), accredited in a pilot licence or issued by an approved training organization (ATO) or an ultralight aircraft school. And they must also demonstrate sufficient knowledge of the language or languages used by the air traffic controller.

Besides, the new legislation establishes the conditions that the firms designing, manufacturing, and maintaining drones must fulfil, as well as pilot training requirements, all in line with the provisions of other European legal frameworks in this regard.

The Spanish legislation in force from 2014 to 2017 restricted drone operations to places far-removed from built-up areas in cities, towns, villages, and other inhabited areas, and from crowds or gatherings in outdoor areas such as urban parks, beaches, and football stadiums (unless completely roofed over). Nor was it possible to film demonstrations, parties, or concerts, except when these were held at an indoor venue. Completely closed precincts (industrial premises, sports arenas, convention centres, and private homes) fell outside the jurisdiction of the AESA, so it was up to the owners to authorize the use of drones and establish flight conditions.

Furthermore, outdoor filming was also subject to several restrictions. This could be done with drones weighing less than 25 kg, but only during the daytime and under stable weather conditions, and at a prudent distance from built-up areas in cities, towns, villages, and other inhabited areas, and crowds in outdoor areas, in uncontrolled airspace, within the pilot's VLOS, at a distance of no more than 500 m (1640 feet), and at a maximum flight altitude of 120 m (400 feet). Commercial drone pilots had to stay 8 km (5 miles) away from airports and airfields and 15 km (9.4 miles) away for approved BVLOS drone flights.

Likewise, pilots had to submit an affidavit, together with the relevant documents, to the registry of the AESA, beforehand. Moreover, the AESA stipulated that to take photographs or video footage with any type of manned or unmanned aircraft, it was necessary to comply with Order of the President of the Government of 14 March 1957. Flying drones with a MTOM of more than 25 kg was also subject to the authorization of the AESA.

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As regards the use of drones for sports or leisure purposes, González Martín (2017) explains that until December 2017, there were also a number of requirements, including flying always in the pilot's VLOS and at a maximum flight altitude of 120 m (400 feet), as well as the prohibition of over urban centres or crowds, at night, or close to airports or airfields, or flying that endangered third parties. Drones had to be flown in suitable places, such as model airplane flying fields, uninhabited areas, or similar places.

7. Conclusions: opportunities and challenges

Drone journalism is a tool that offers great advantages when obtaining photos and video footage as an information source (for news stories, reports, documentaries, etc.):

- It can be used for obtaining photos or footage of places that are difficult to reach, either because of the lie of the land (caves, forests, oceans, deserts, etc.) or because of the consequences of natural (hurricanes, earthquakes, tidal waves, floods, etc.) or man-made (forest fires, spills or dumping, etc.) disasters.
- It can be used for obtaining photos or footage in dangerous situations, such as armed conflicts, without putting the lives of reporters and their teams at risk, and disguises their presence in the area.
- By removing the presence of the reporter, it offers a host of possibilities for investigative and reporter journalism and for obtaining information on illegal activities, although drones are rarely used for this purpose at the moment.
- It provides content with a high documentary value, which has a direct impact on news credibility.
- It is suitable for covering breaking news. Due to their size, drones can be transported and operational in a short time, which is very positive for immediacy. In fact, renting a helicopter is much more time-consuming. But the permits required by law to fly drones clash with the technical agility characterizing these devices, versus other aerial filming systems.
- It is ideal for obtaining panoramic views and tracking, thus providing viewers with striking visual information (demonstration, protests, etc.). These images can be captured from different perspectives, angles, and altitudes by using more than one drone, which could also be useful for sports broadcasting. However, filming inhabited areas has been restricted by law until only very recently, and television stations and operators are still cautious about public safety issues.
- It reduces overheads because drone filming is always cheaper than doing so with a manned aircraft.

In spite of all these advantages, the major media companies in Spain have not embraced this technology with enthusiasm and, for the meantime, prefer to outsource drone services. The major factors that, according to the experts, journalists, and the media, are contributing to this lethargy, include the following:

- Legislation. Until 30 December 2017, the statutory regulations were characterized by their restrictive nature, as regards both safety (minimizing the consequences of potential accidents) and the protection of the privacy of

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individuals. The passing of more flexible legislation with respect to flight zones could favour drone journalism, but also other professional uses with greater business prospects. Media industry professionals believe that it is still early days to envisage greater opportunities, since the need to obtain permits hinders a process that should be more agile for television companies. Moreover, the new regulations do not excuse the media from using extreme caution in order to ensure air and public safety. Similarly, the protection of the privacy of individuals continues to be in the spotlight, and the legal regulations will have to be reinforced with ethical codes and the firm commitment of the media.

– The cost of drone technology. Indeed, the commercial use of drones has pathed the way to lower prices, but professional drones offering suitable image quality are still expensive. Taking into consideration that drones can have a short lifetime because of accidents or ongoing innovation (the constant appearance of new models with better specifications), the investment required is still a stumbling block for the media, which in Spain have recently been through a period of deep crisis which has destroyed many jobs and has diminished investment in technology and research. In any case, studies of the current state of affairs in the journalistic profession have begun to paint a more optimistic picture, in line with the general improvement of the country's economic indicators, which could reactivate media investment in research and technology, provided that drone operations can be seen as feasible.

– In the meantime, Spain's commercial television stations and medium-sized broadcasting companies have opted for outsourcing these services, since they believe that this is the most viable approach in the case of emerging and rapidly changing technologies that are expensive to purchase and maintain.

– Technological limitations. Although drone technology is now sufficiently advanced to offer photos and footage of an acceptable quality and cameras are increasingly quicker and lighter, there is still much work to be done as regards size, image quality, stabilizers, flight ranges, and engine noise. In order to be able to make the most of the advantages that this technology can offer, journalism needs lighter drones to make them quicker to transport and deploy, a sufficient range to gather photos or footage without having to interrupt flights, and quieter engines to be able to be used on television and film sets. Drone size, lens quality, stabilizer systems, and flight ranges are all aspects in which technological research is forging ahead, but there is still much ground to be covered.

– Newsworthiness. In daily newsroom practices, unscheduled events with the right conditions of visibility in order to cover them from the air represent a small proportion of total news production. Under these circumstances, for medium-sized networks it is currently cheaper to outsource these services, insofar as there is a large number of agencies, production companies, and freelancers offering relatively cheap services versus other forms of aerial filming. It would only be cost-effective for the large channels to create a drone journalism department supplying

their different divisions with photos and footage. But if the cost of drones continues to fall as much as it has already, the picture could change.

– Distrust of this technology's military-related past has also caused apprehension in the media. The news that they offer about this technology still focuses on its military uses, rather than on other applications in professional fields like agriculture, surveillance, public safety, and investigating illegal dumping.

– Technical and administrative complexity. The literature insists on the ease with which drones can be flown and the abundance of advice on the Internet. Nevertheless, the appropriate expertise is required for their correct professional use, knowledge that is not currently taught at schools or faculties of journalism. Doubtless, training in the use of this new media tool would require a certain degree of academic involvement in the creation of specialist courses. Likewise, the doubts raised in the media concerning the red tape involved in obtaining the necessary permits for flying drones for professional purposes and knowledge of the legislation must also be taken into account.

– Unqualified practice. In recent years, the professional use of drones for journalistic purposes has been the reserve of production companies, agencies, and freelancers who do not always possess the necessary legal permits to operate or work in accordance with journalistic news criteria.

– The fall in price of these devices has led to a sharp increase in unqualified practice. Their professional use in compliance with technical requirements and journalistic ethics and standards would contribute to a more meticulous journalism. On the other hand, some experts also predict a wave of citizen journalism in this respect, with the release of highly newsworthy images. In this case, reporters would have to strengthen their role as gatekeepers to ensure news quality, while interdisciplinary collaboration with different actors who also use drones in a variety of professional settings (rescue teams, firemen, policemen, agrarian researchers, etc.) would open new doors to collaborative information seeking with a greater credibility.

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