

Successful Cases of the Use of Innovative Tools and Technology in the Creative Industries Field



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Abstract The aim of this chapter is to present successful examples of technology and the creative industries complementing each other and working together, as well as to highlight how the transfer of tech-knowledge can be applied to creative industries, such as filming. In order to do this, we analyse in detail successful case studies between new technology and innovation in general, discussing some examples that are either currently emerging or fully consolidated. Subsequently, we explore the successful use of drones within creative industries in recent years, across a variety of culturally important industries such as professional photography, aerial photography and filming, advertising, the film industry, television, performing arts, video gaming, architecture and heritage. The aim of this to highlight the impact they generate in the creative sector, which in turn has led to a revolution in the means of generating content and creative experiences.

1 Relationship Between Technology and Creative Industries

The CI is the sector that most uses new and innovative technologies and tools to make progress in its projects, in order to search for opportunities at a business level. If there is something that distinguishes different sectors within the creative industries from other industries, it is their entrepreneurial capacity and heightened use of innovative tools.

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It could be said that they serve as a link between technological resources and the cultural fabric, of society. The CIs have the possibility of generating creative discourses, which reach a wide sector of society and are echoed by social networks. These industries spark interest across these channels due to their capacity to be thought-provokingly innovative and, as such, technology and innovation and the creative industries are able to share the interest of the general public. Since they have been united in recent years, they have managed to change the context and the content they represent, making it more playful and attractive, succeeding in appealing to an ever-greater majority of the public, motivating them and generating an expectation with respect to novelties, due to the speed with which advancements are made.

1.1 The IC: Social and Economic Context

Creative industries account for 3% of the world GDP, according to the International Confederation of Societies of Authors and Composers (CISCAC 2015), which implies an economic impact of almost 1835 billion euros, generating employment for 1% of the society, around 29.5 million people, according to the aforementioned report.

Within Europe, the same report shows that 7.7 million people currently work within creative industries, with about 578 billion euros in revenue, making it the second largest CCI market and number one in advertising (CISCAC 2015).

Taking these figures into account, the economic impact of this sector immediately redounds to the social fabric. This economic data clearly indicates very high revenue and shows that focus on culture and sectors which have great culturally symbolic value are a driving force for development that generates income both directly and indirectly.

The Global Report on Cultural Policies: Focus on UIS Data and Analysis (UNESCO 2017), points out that digital distribution platforms, exchange networks and export strategies, mainly in the audiovisual sector, are helping Southern countries to enter into the international market of cultural goods and services. As such, an economic impact linked to the development of the different regions is seen.

Snowball demonstrates that culture plays an essential role in many fields that are inherent to it, such as entertainment and education, as well as in creating and stimulating social awareness, without losing sight of its cohesive value to social collectives (Snowball 2016). Culture transcends any economic model, however, and when discussing creative industries, it is necessary to take into account business models that are economically viable and profitable. Culture is a universal basis for all societies and is capable of generating inclusive social development based on very fragmented realities. It has an impact on the entirety of society, on education and on the transmission of ideas, and sometimes results in less-quantifiable data, such as social enrichment.

After evaluating the impact of culture, CI is projected in society, having results which are highly valuable to society. This value motivates various governments to

generate public economic aid to invest in their development, thus supporting production.

1.2 Use of Innovative Tools and Technology in the CI

According to the European Economic and Social Committee, CI must have a technological component and also add creative value that protects intellectual property rights in the internal market. Additionally, CI must promote the search for new technologies and innovative uses of products and processes on an international scale. These processes must meet the European quality regulations and therefore guarantee the development of value chains through networks and common distribution systems (Pezzini and Konstantinou 2013).

It is also important to point out that some of the common challenges of CI include an increasing impact on the production and distribution processes caused by the conversion to a digital system and the diffusion of new technologies, and the demand for greater synergies between the creative world and cultural and technological innovations (Pezzini and Konstantinou 2013).

According to Wang (2012), the creative industry “is an emerging industry formed on the basis of integrating and using information technology and relevant literature-based business models in combination with research analysis regarding various factors in the industry”.

2 Successful Uses of Innovative Tools and Technology in the CI

In the following section, we analyse various successful cases of innovation tools in the creative industries and the impact of technologies in the various areas that make up these industries in general. Also in this section, we take a look at the infinite possibilities offered by technology regarding creative industries. Some instances of this occurring demonstrate the development, expansion and visibility of these technologies in the CI. These drones are one of the most important technological assets of recent years, considering the use of RPAS has disseminated in CI.

2.1 Successful Examples in CI in General

New technologies have revolutionised the creative industries, given that it is the field where they are most visible and where they are most applicable. It is not surprising that specific terminology has emerged that unites both fields as the so-called “digital artists”.

We could list a multitude of success stories, such as the use of 360° videos and virtual augmented reality in the cinematographic or publicity field. There is also the additional example of curved television screens to provide an immersive experience, improving the panoramic effect and giving an experience closer to that of reality. Another noteworthy use of technology is audiovisual and interactive installations, experimental electronic music and multimedia presentations.

In these categories, we observe the growing incorporation of art and technology in companies destined to the movie industry, such as Pixar®. Art and technology comes together through interactive Video Mapping, used to create virtual spaces in 3D and 4D, for various mediums such as dance, sculpture, performances or reproductions of existing architecture, with the unification of illustration and new technologies or interactive Video Mapping creating virtual spaces in 3D and 4D for dance, sculpture, performance and the reproduction of architectural works. Video Mapping has multiple uses in CI (Higgs and Cunningham 2008), and it is also used in the field of filmmaking and videogames, in which it facilitates the creation of immersive virtual spaces.

The example of electronic textiles applied to fashion has also gained special relevance in recent years. Electric clothes and smart clothes have taken form as so-called “wearables” or smart devices applied to haute couture. An example of this is Adrenaline Dress®, which incorporates an Intel® chip that interacts with various moods. Another example is the creation of an intelligent shelter that incorporates infrared technology or fabrics that measure the pollution of the air. Google Jacquard® has taken initiative in the field of the textile industry, creating the first garments that integrate the understanding of tactile gestures capable of activating digital services. As Google® indicates in the description of the clothing created with textile raw materials, together with technological materials, “By starting with raw materials, such as yarns and textiles, we found ways to provide unprecedented access to the digital world through items that are not typically considered to be technology. So, your most beloved items—a favourite jacket, a pair of shoes, the bag you take everywhere—will keep you connected to your digital life in new, seamless ways” (Google 2015). The idea arose in 2014 and, together with the company Levi’s®, they have been working on this innovation, which was presented at the Cooper Hewitt Smithsonian Design Museum in 2016, for their permanent collection as a part of the history of American Design (Google 2015). Their technological garments can be purchased through their website.

Also from Google® came Magenta® projects, which uses neural networks for the creation of musical and artistic compositions, and Deep Dream® software that uses algorithms and adjusts them to the neural network to create psychedelic images.

Another function of this technology and a great success in innovation is the ability to bring the creative industries closer to spectators who have disabilities and allow them to enjoy them as well. 3D Printers have revealed themselves as one of the most capable technological tools to offer themselves in a versatile way in a myriad of fields, including breaking down sensory barriers. Examples of this are cases such as transferring works of art, photographs or comics, among other works, into a tactile format so that the blind can enjoy works that they otherwise would be able to experience. The Prado Museum in Madrid presented the Touching the Prado project

in 2015, being the first initiative to reproduce works with 3D printers, aimed at visually impaired visitors, so that blind people can experience art. This initiative has been followed by other museums and academic institutions as well (Museo del Prado 2015). Likewise, 3D printers have been used for a multitude of aspects, such as for creating replicas to preserve the heritage of digital art works, such as for MOMO's Project, or to make musical instruments or short films.

In short, CIs are the ideal platform for new technologies to reach all audiences, due to their capacity for dissemination. It would be impossible to discuss every case of these recent innovations, since with each passing day comes a new invention in this field.

2.2 Successful Cases of the Use of Innovative Tools and Technology in the CI in the RPAS Field

If one technology could be said to have revolutionised the creative industries, in practically all areas, it would have to be drones. Drones are highly versatile pieces of technology, producing aerial images impossible to achieve by other means. They are undoubtedly the fashionable gadget of the moment and as such are evolving quickly due to their wide-reaching possibilities. Drones are in themselves a centre of emerging technological innovations, given the number of supported formats, which are also evolving, using both images as high-resolution frames or as video in multiple formats.

Job opportunities have started to emerge in the field of RPAS and there are now multiple companies that are producing work using aerial imagery, which has in turn made the legal regulation of these activities necessary. Legislation regarding drones is currently still being developed. According to Santamarina-Campos (2018), “[...] the European Agency of Safety Aviation (EASA) is continuing to work to provide a common regulatory framework to support the European competitiveness and leadership in the drone sector to deliver new employment and business opportunities”.

Both the **photography** industry in aerial photography and **filming** present an indispensable resource for the creative industries (CIs). Due to the different heights that drones can reach and their ease of use, they are at present one of the sources of fundamental aerial images. The RPAS have revolutionised the taking of images throughout various sectors. Professional photography is highly competitive, and offering a new and different high-quality service could be the key to an individual's success.

The possibilities are endless, given that what was previously filmed with hand-held cameras, which obviously cannot fly, can now be filmed using drones (Image 1), and they are fast becoming a fundamental resource for the creative industry in all its sectors, at all levels, including professional. Because of their capacity to capture entirely different aspects from what we consider traditional images, there are already many photographic contests that reward the best images

Image 1 Drones used in filming. Source: Clearhead



obtained from RPAS. An example of this is Skypixel Aerial Photography Prize, in which images that are difficult to achieve by other means are obtained.

One of these fundamental sectors is **Architecture and Heritage**. This is one of the sectors where drones have been most utilised and have already saved a lot of time in carrying out tasks such as monitoring and inspecting the interiors of buildings, a common task for architects. Within the field of heritage studies, drones are used for tasks related to the conservation or maintenance of buildings or large structures, for inspections of structural stability, etc., without the need to use scaffolds or other safety equipment for images at a certain height. They are also used to help with tasks in new construction sites, from inspecting the land, to mapping it, to taking measurements and coordinates. They save time and money for this type of operation, where previously it was necessary to use expensive supplementary means or equipment, which often-required complicated assembly.

UAV Photogrammetry for Mapping and 3D Modelling is another of the disciplines that can be developed within the sector. When creating surveys of sites and buildings, generating 3D spaces, with exact measurements is practically impossible to achieve with other technologies.

In the **Arts and crafts** sector there is also a union between drones and graffiti. An example of this is the creation of graffiti with RPAS, in the Painty by Drone[®] project, developed by the design and innovation firm Carlo Ratti Associati. They completed a project that, due to its great height, would have cost more time and more money without the use of the drone. The project utilised four drones that carried sprays with primary colours, in the CMYK system—magenta, cyan, yellow and black—as prints have traditionally been made. The drones had built-in sensors to spray the walls with colour and a central control system which allowed the drones to fly and to keep track

Image 2 Technology used in advertising. Source: Clearhead



of their position. These unmanned aircraft move within a network to prevent accidents. The drones painted drawings that were transmitted via an application. The work appeared on buildings and was a combination of pieces created by a single individual and of more people collected through crowdsourcing platforms” (Ratti 2017).

Advertising agencies provide a creative point of view to the marketing and branding strategies of their clients in order to promote and sell their products or services. These agencies are, above all, seeking to have more freedom of movement to explore new perspectives for their creative and artistic processes (Image 2). In an era where audiences are barraged with more advertising content than ever, marketers have to work hard in order to stand out. RPAS are literally unlocking an entirely new vantage point on the world, making aerial footage convenient, fast and cheap. They are used as innovative video tools and offer new perspectives.

An example of this would be the recording with drones for the **real estate** industry. Drones offer the possibility of registering a building from a ‘polyangular’ point of view, thereby offering a complete view of the property in a way that facilitates the task of advertising in an attractive and very visual way, of an exceptionally high quality, with access to hard to reach areas, and by minimising risks, costs and time.

Also, the use of promotional videos of sites, cities or localities and, fundamentally, intangible heritage, which are collected in video format, support uses and

customs that form the identity of a certain group and that, not being material, serve as a conservative and promotional document to attract tourism. The drones have changed the way of filming these traditions and showing them to us from multiple points of view, adding plasticity and polyangularity to advertising videos, making them more attractive. An example of this can be found the ephemeral traditions, such as the Fallas of Valencia, Spain, recently named “Intangible Heritage of Humanity”, whose transitory nature makes the filming and photographs taken from the drones become the heritage document itself that will preserve the experience historically. Some companies have recorded promotional videos with RPAS of the Fallas of the City Council of Valencia, which gives the possibility of visiting the now-disappeared monument, with a recording that serves as a documentary record for the exhaustiveness of its images (Airworksmedia 2014).

The use of drones applied to **fashion** has recently succeeded in the media, at the Dolce & Gabbana fashion show in Milan Fashion Week 2018. On this media catwalk, eight drones flew, each with a luxury bag from the Italian firm for the Fall Winter 2018/19 collection. A 3-minute choreography was orchestrated (CNBC 2018) in the middle of a music and light show, in the patrimonial area of the Oratory baroque di Santa Città Church in Palermo, Sicily.

Drones are fashionable and serve to advertise fashion. Drones are used to film or take pictures of this type of event, but in this case the function of the drones went further, forming part of the show itself. Dolce & Gabbana have used them to move mannequins, replacing human models, to present their new collection of handbags, combining fashion, with a luxury brand, new technologies and entertainment, to increase the media impact, generating an advertising strategy and pioneering the use of drones in this creative industry. The impact of the use of drones as mannequins has not only created a viral response from the mass media sector, but also from social media, becoming the protagonist of Milan Fashion Week 2018. They are a symbol of innovation and an introduction to the future (Image 3).

Movie industry This sector has greatly benefited from the use of drones, and has been incorporating them into their tools since the technology was first developed. In Hollywood (Flynn 2016), they are highlighted in the filming of films like *The Wolf of Wall Street* (2013), *The Expendables 3* (2014), *Chappie* (2015), *Specter* (2015), *Jurassic World* (2015) or *Captain America: Civil War* (2016). The first one is cited by the author in 2012.

There are now productions that are completely shot using drones and film festivals exclusively for drones, such as Flying Robot International Festival (FRIFF), which is a celebration of aerial cinematography and since 2015 awards prizes in different categories such as:

- X-Factor & best in show
- News/documentary
- Narrative
- Landscape
- Extreme sports
- Freestyle/fpv
- Architecture

Image 3 Drones used in movies. Source: Clearhead



- Featuring drones
- Dronie
- Shaw reel (FRIFF 2017)

Television is a media for mass audiences and TV producers are known for their craft, originality and creativity. Television is present in most homes, and drones have managed to transform television production. Since re-launching programmes such as Planet Earth II with this new tool, which allows recording in 4K, it has been possible to achieve complicated panoramas that are impossible through other means. “No other filming method can start a sequence inside a building and end up at 400 f. altitude in one shot”, says Ben Sheppard, managing director of Spider Aerial Filming. According to The Independent Spider, they have worked on programmes as diverse as Downton Abbey, 24 h in A & E and Channel 4’s Dispatches to give the viewer a more complete immersion into the subject from the air (Newall 2016). The concept of taking television images has changed completely thanks to the perspectives that the drones achieve and the possibilities that they offer.

Performing arts includes theatre, dance, music (festivals), opera, magic, illusion and circus. These disciplines are often synonymous with movement, spontaneity and creativity.

There have been performances in which several drones have been choreographed to fly at the same time, by way of choreography, creating a “firework display”, filling the sky with luminous RPAS, such as that in China in February 2017, organised by the company Intel®, presenting its prototype of drone Shooting Star®, a drone specifically designed to emulate fireworks with 4 billion colour combinations with LED lights, which combine colours and are built to be lightweight, in order to

enhance safety in these type of spectacles, potentially making luminous pyrotechnics nearly obsolete (Morris 2017).

Another example, is the one used in the Mother of the Nation Festival, in March 2018, that showed a spectacular 500-drone light show in celebration of the “Year of Zayed” in Abu Dhabi, at the 100th birthday of the founding father of the UAE, Sheikh Zayed bin Sultan Al Nayhan. These 500 Intel® Shooting Star™ Drones create a new form of night time entertainment and storytelling—allowing creativity to come to life with the sky as our canvas, and flying lights as ink (“Signature Events—Mother of the Nation Festival” n.d.).

The drones “dancing in formation” is another of the topics proposed and improved in performing art. It is a mixture of human, robotic and animal movements; a space for music, dance, lighting and drones in which the show is creative and immersive. Tamás Vicsek and his research team from the Department of Biological Physics at the Eötvös University in Budapest created drones that communicate with each other directly and solve tasks collectively in a self-organised manner, without human intervention in the “Dancing with drones” project. The project was established with the aim of understanding the universal rules of the collective movement of animals to create an “autonomous robotic herd”. The use of drones and robotics in this case becomes a spectacle, interacting with humans, shows technological progress and creative industries (Dancing with Drones 2015).

In the field of **music**, we find flying drones that become orchestral musicians, creating music and performing coordinated and synchronised musical pieces, including as a robot orchestra. KMel Robotics, a robotics company, designed RPAS capable of interpreting melodies and coordinating with each other (Waxman 2014). There are also hybrid musical shows between humans and drones, an example of which is “LOOP 60 Hz: broadcasts of The Drone Orchestra”, musician John Cale and the architect Liam Young, in which RPAS fly over in performance mode, in games of lights, while the musicians interpret the music to the rhythm that they generate, creating an immersive visual spectacle with choreography and instruments, and generating live music.

The Cirque du Soleil has incorporated drones in its theatrical shows on multiple occasions, which have the possibility of adding to the magical effect in the circus environment, which give movement to inanimate objects, with choreography that generated special luminous effects, until creating the illusion of a ballet coordinated with precise algorithms (Rhodes 2014).

Another example of success in this field has been “Freedom Franchise”, whose world premiere was in December 2017 at Miami Art Week, of the Studio Drift, together with BMW. It is a performance that used 300 luminous drones to create the effect of a flock of birds; studying the patterns of starlings led to software being specifically designed to integrate into drones, creating an immersive effect and reproducing animal patterns (Rhijnsburger 2017).

Another example of a successful case was the use of drones in the first theatrical performance of “Aerial Ballet”, which was performed in 2015 in Laguna Beach, Beach, USA, in cooperation with development team Spark Aerial in San Diego. It was developed with seven Phantom 3 drones with integrated LED lights, that were synchronised to create artistic patterns. There is also the case of “24 drones” of Daito

Manabe, which combined the dance of drones with human interpreters, interacting with each other, generating emotional spaces (DJI 2015).

The **video game** industry uses registration of indoor environments for the development or exploration of game scenarios. These records can be used as a first step to creating more realistic video games. At the same time this industry seeks affordable and time saving solutions.

An example of successful use of drones for video games has been the UAVVisuals company, along with Milestone, for a MotoGP videogame. The mission of the drones has been to carry out photogrammetric techniques and map the spaces to obtain geometrical measurements of the spaces in the images themselves. According to UAVVisuals “there are more than 2 billion video game players worldwide, The eSports industry in particular is thriving. Revenue rose by 51.7%, to 401.8 million euros in 2016, and is expected to approach 1.22 billion euros by 2020. A huge part of this rise is thanks to advancements in technology and innovative new ways of acquiring imagery, such as with the use of drones. These advancements have meant game makers are able to produce products that are more realistic than ever before” (UAVVisuals 2018).

Another example of success is Airhogs Connect Mission Drone, the videogame that brings together augmented and virtual reality, from a tablet with real drones that perform the tours over a real space, piloted as part of the videogame. The real drone movements are mixed on the screen with augmented reality, uniting real space and virtual space. It is “the first real drone immersed in an augmented reality gaming world” (Airhogs 2018). It is a video game that allows you to “submerge yourself in augmented reality as you fly through power rings, rescue civilians and battle aliens in this massive mixed reality world” (Airhogs 2018).

Moreover, the Official Star Wars drones have had great success among fans of the saga. Three models have been released so far: the Star Wars 74-Z Speeder Bike, the Star Wars TIE Advanced X1 and the Star Wars T-65 X-Wing Starfighter. “The drones themselves are tiny, featherweight models that are controlled via an included 2.4 GHz remote control. This remote also pairs with your smartphone over Bluetooth, giving you control via the free Propel Star Wars Battle Drones app (iOS/Android), which runs both training simulations and live battle tracking” (Cohen 2017). The release of the Millennium Falcon drone is predicted to coincide with the premiere of the Han Solo spin-off movie (Trenholm 2017). This example is a union of multiple areas of the creative industries, combining video games with cinema, generating epic battles that create interactive and filmic spaces.

3 Conclusions

After the detailed study of some of the most outstanding success stories of the use of new technologies and innovation in the creative industries, we can conclude that innovation is inherently linked to CI in the first place, given that despite the fact that they apply to other fields, the CIs are the main experimentation sector and, at the same time, the main platform for reaching the general public. The CIs linked to

technologies arouse a great social interest, with which there is a transfer of innovation to the social fabric almost immediately, which is enhanced by social networks and the media. They have the capacity for instant dissemination because they adapt to society in an immersive way.

The CI, in addition to having the most diffusion of technology, at the same time generate a series of advances at an economic level, with entrepreneurship capacity, because they are integrated into social uses and because they generate benefits for around 1% of the world population, being 3% of world GDP. It is obvious that the advance of CIs is the advancement of culture, which has a direct impact on the production and distribution systems.

With this chapter, we want to point out the innovation applied to CI, but mainly the impact of the drones in the different areas of production, not only the ones we are accustomed to in sectors such as photography, video or cinema, in which they generate a visual documentation of great value, but also offering the possibility of being part of their own performances, video games, etc. In short, drones have proven to be the future and the possibilities they offer to CIs are endless.

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