

Creative Industries' Needs: A Latent Demand



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Abstract This chapter focuses on the needs of the creative industries and how the market for their services is increasing. For this purpose, the chapter is divided into two main analyses, the first covering the evolution of these sectors in the last years, while the second is focused on the advantages, advances and challenges that these industries are facing in relation to digitalisation and other emerging technologies. In the analysis of sectors, data about the number of enterprises, employees, turnover and value added were used. Concerning technologies influencing creative industries, a content analysis of 27 documents elaborated by leading consulting firms during the years 2016, 2017 and 2018 was elaborated. From this analysis, 160 codes were defined to express which advances, advantages and challenges these consulting firms have indicated for creative industries. These consulting firms are at the forefront, advising their clients on how to implement different emerging technologies, such as artificial intelligence, augmented and virtual reality and blockchain, among others.

1 Introduction

According to Culture Action Europe (CAE), the biggest European cultural network, “Culture is the foundation of European unity; it binds us together when pursuing shared objectives and underpins Europeans’ sense of belonging to a collective project”. Culture is challenging to define; a simple definition stands for “the way of life, especially the general customs and beliefs, of a particular group of people at a particular time”,¹ but tactically we understand much more than this definition when talking about culture. Culture creates a belonging feeling to a place, shared gastronomy, shared traditions, shared sights, shared heritage and many more shared feelings. However, it is not a static concept. Culture evolves with society, culture is alive

¹<https://dictionary.cambridge.org/es/>

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and creativity is one of its main characteristics. Culture is a network that generates economic, social and cultural impacts and that has to be supported.

The European Commission develops different initiatives to support Europe's cultural and creative sectors,² according to the Article 167 of the Treaty of the Functioning of the EU, which regulates the EU's role in the culture area. This area depends on the Directorate-General for Education, Youth, Sport and Culture department. One of this European Commission's framework programmes is Creative Europe,³ which is devoted to supporting Europe's cultural and creative sectors by strengthening their innovativeness and competitiveness by enhancing specific skills and experience, including adaptation to digital technologies, enhancing the international cooperation or by creating new opportunities and business models.

Creative industries face two main problems for transforming their creativity and innovative skills into economic benefits and revenues: their small size and difficult access to funding (European Commission 2011). Moreover, the technological development leads to a fast digitisation (Acker et al. 2015) that has been widely supported by society, changing the way consumers access products and services, which is mainly affecting creative industries like music, books, movies and audiovisual works, which need to rapidly adapt their business models and value creation in order to survive. The analysis of the services' demand will identify the current customers' needs and help to orient their service and product offer. Moreover, and according to the European Creative Industries Alliance (2014), it is needed for someone to map and measure the effects and value added created by creative transfers to the wider economy. We will contribute to disentangling the creative industries' structure, how each subsector adds value and how the demand for services directly related to this industry is increasing, providing opportunities for establishing new businesses and taking advantage of the significant amount of knowledge that European cultural and creative industries generate.

2 The Market for Creative Industries

The wealth created by creative and cultural industries (CCIs) in the global economy reached 3% of the world GDP and generated 29.5 million jobs in 2013 (EY 2015). Concerning Europe, the CCIs also represented 3% of its GDP, and the associated employment accounted for 7.7 million in the same year.

In this section, each of the CCIs in the European market is explained in greater detail. To introduce them, Fig. 1 shows the weight of each sector in relation to the total value of the creative industries. The two variables included in the figure are the share of each sector in relation to the total employment and the share of each sector in relation to total revenues. The figure also shows that some sectors are more labour-

²<https://ec.europa.eu/culture/>

³<https://ec.europa.eu/programmes/creative-europe/>

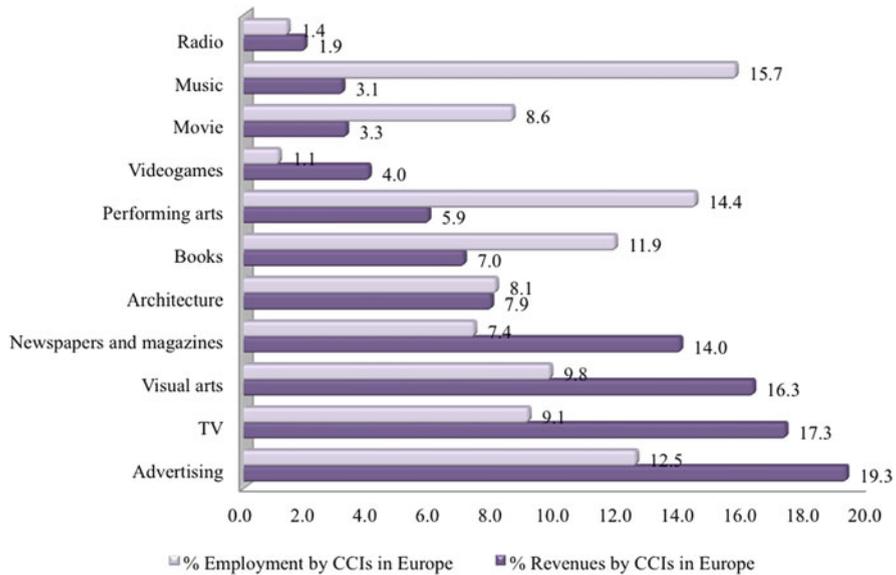


Fig. 1 Weight of each sector in the total value of CCIs in Europe. Source: Own elaboration from data in EY (2015)

intensive than others, as can be observed in music, performing arts and book sectors. In contrast, advertising, TV, visual arts and newspapers and magazines account for 67% of total revenues.

Considering the publishing industry as a whole, which includes newspapers, magazines and books, the percentage of revenues is similar to the percentage of employment of the total considered (27.3% employment and 21% in revenues), which positions the publishing industry as the most important within the creative and cultural industries.

2.1 *The Publishing Market in Europe: Books, Newspapers and Magazines*

The publishing industry, which includes books, newspapers and magazines, has been one of the industries most affected by the digitalisation phenomena (Acker et al. 2015). Despite this, the importance of the publishing sector in Europe remains, despite the effects of the economic crisis, as can be seen in Table 1. More precisely, and according to the Federation of European Publishers (FEP 2017), the book sector shows a recovery from 2014, while most of the growth of the business is due to the digital side (Acker et al. 2015). Among the data explaining the importance of this industry, it can be noted that (FEP 2017, Statista, Eurostat):

Table 1 Main indicators evolution: The publishing industry in the European Union

European Union (28 countries)	Y2012	Y2013	Y2014	Y2015	Var. Y2015/ Y2014 (%)	Main countries
N° Enterprises- Publishing of newspapers	7374	7654	7447	8120	9.0	France, Germany
N° Enterprises- Publishing of journals and periodicals	21,332	20,795	21,235	20,885	-1.6	France, UK, Germany, Italy
Employees: Publishing of newspapers	295,600	277,200	259,989	244,044	-6.1	Germany, UK, France
Employees: Publishing of journals and periodicals	200,900	186,600	189,364	180,633	-4.6	Germany, UK, France
Turnover or gross premiums written (million €)	38,295.6	36,743.7	36,773.3	37,754.6	2.7	Germany, UK, France
Turnover or gross premiums written (million €)	34,595.3	33,448	32,580.9	32,595.5	0.0	UK, Germany, France
Value added at factor cost (million €)	14,849.4	14,477.4	14,542.5	14,496.6	-0.3	Germany, UK, France
Value added at factor cost (million €)	15,029	14,255.1	13,887.1	13,368.9	-3.7	UK, Germany, France

Source: Eurostat, Structural Business Statistics

- Total annual sales revenue of book publishers in the EU (European Union) and EEA (European Economic Area) in 2015 were 22,300 million € and estimations for 2016 are that this value will increase to 22,500 million €.
- Concerning newspapers, although print circulation increased globally between 2012 and 2016, there was a decline of around -20% in Europe during this period (WAN-IFRA 2017).
- People employed in book publishing are 125,000, whereas the hole value chain employs around 500,000 people.
- The number of enterprises in the sector was 25,797 in 2008, while the number increased to 29,123 in 2014.
- The majority of the top publishing groups in the world are from Europe (6 to 8 of the top 10). Among the biggest European groups are Pearson (UK), RELX Group (UK/NL/US), Bertelsmann (Germany), Wolters Kluwer (NL), Hachette Livre

(France) and Grupo Planeta (Spain). In addition to large groups, small independent companies are common in the sector.

- The world's major book fairs take place in Europe (Frankfurt, London, Bologna).
- More than 500,000 new books are published by European groups every year. Concretely, the number of new books in 2016 was 590,000.
- The structure of revenues by category has been stable during the last years. These categories are four: (a) the trade/customer segment (48.4% of the net turnover), (b) school books (19.9%), (c) academic/professional (19.5%), and (d) children books (12.2%).

On the other hand, the sector has encountered different challenges during the last ten years, the majority as consequence of the economic crisis but also due to changes in technologies and their impact on the means available to read books. All these challenges have resulted in:

- Lower sales and revenues, due to the economic crisis. As a result, total annual sales revenue in the EU and EEA which had reached 24,500 million € in 2007, went down to 22,000 million € in 2014 when sales hit rock bottom. Reports (PwC 2016) state that the tendency in the sector is plane.
- People employed in book publishing were 169,400 in 2008 and 150,791 in 2014.
- More options for reading books, such as on mobiles and tablets, as e-book market emerged in 2007. Although the impact on printed books has not been as high as was predicted, the percentage of the e-book market ranges from 11% in the United Kingdom to 3% in Spain, with the average of the European market of 6%.
- Growth in self-publishing, books usually with lower prices and quality (PwC 2016).
- In some countries, the education authorities have promoted the use of books in digital format (PwC 2016).

In the last several years, publishers have needed to look for innovative solutions (Sandler 2017), including supporting start-ups to obtain ideas even from outside the book industry (Voigt and de Bruijn 2017). Some of the innovative projects include e-book signing technology and adding additional digital content to the books. In these solutions, digitalisation and other technologies are seen as opportunities instead of as threats.

2.2 The Advertising Market in Europe

The advertising industry is the second largest in terms of revenues (see Fig. 1) within the creative and cultural industries in Europe. The evolution of the sector is good, as all the analysed variables had a positive variation. The total number of companies belonging to the advertising industry surpassed 270,000 in 2015 with a workforce which exceeds 780,000 people. However, what seems more important when looking at the data (see Table 2) is that the value added has increased by 18 points from 2012 to 2015.

Table 2 Main indicators evolution: the advertising industry at the European Union

European Union (28 countries)	Y2012	Y2013	Y2014	Y2015	Var. Y2015/ Y2014 (%)	Main countries
N° Enterprises	243,564	248,658	263,866	270,548	2.53	Germany, Netherlands, Spain, Poland, France
Employees	770,000	776,400	747,869	780,496	4.36	Germany, UK, France, Spain
Turnover or gross premiums written (million €)	140,000	141,105.2	144,000	157,641.4	9.47	UK, Germany, France, Spain
Value added at factor cost (million €)	42,800	44,937.5	46,000	54,271.3	17.98	UK, Germany, France

Source: Eurostat, Structural Business Statistics

The advertising industry is usually split into different subsectors, such as Television advertising, Newspapers advertising, Magazine advertising, Cinema advertising, Radio advertising and Outdoor advertising, which confirm the traditional media. According to Statista (2018a, b), in 2016 the expenditure on traditional advertising in Europe (in million €) was as follows:

- 31,415 on Television advertising (↑).
- 14,535 on Newspapers advertising (↓).
- 6682 on Magazines advertising (↓).
- 737 on Cinema advertising (↑).
- 5148 on Radio advertising (↑).
- 5941 on Outdoor advertising (↔).

The digital revolution has also affected this sector and, since approximately 2006, there has been an explosion in digital advertising. Digital advertising includes online and internet advertising. The first one has increased from 6600 million € in 2006 to 41,900 million € in 2016.⁴ Something similar occurred with internet advertising, which tripled its expenditure in the EU, from 13,586 million € in 2009 to 36,836 million € in 2016. The data show that digital advertisement is leading the industry and will surely define the trends and technological development that will affect the whole industry. This is why it is the main subsector to look at when looking for the identification of future needs.

⁴<https://www.statista.com/statistics/436045/online-advertising-spending-by-format-europe/>

Table 3 Main indicators evolution: the Radio and TV broadcasting industry in the European Union

European Union (28 countries)	Y2012	Y2013	Y2014	Y2015	Var. Y2015/ Y2014 (%)	Main countries
Radio						
N° Enterprises	6570	6557	6396	6243	-2.4	Spain, UK, Italy, Greece
Employees		58,900	58,774	55,734	-5.2	Germany, France, Spain, UK
Turnover or gross premiums written (million €)	8160.2	7951.5	8416.7	6771.7	-19.5	UK, France, Germany, Spain
Value added at factor cost (million €)	4575.3	4374.8	4437.6	4744.9	6.9	Germany, UK, France
TV						
N° Enterprises	5212	5159		5416	5.0	UK, Italy, Spain
Employees	183,400	189,500	177,248	182,350	2.9	Germany, France, Italy, Spain
Turnover or gross premiums written (million €)	58,354.2	57,602.2	59,580.8	62,603.7	5.1	UK, France, Italy, Germany
Value added at factor cost (million €)	22,521.6	22,522.3	23,305.7	32,305	38.6	UK, Germany, France, Italy

Source: Eurostat, Structural Business Statistics

2.3 *The Markets for Film, TV and Radio in Europe*

In third place, with a 17.3% of revenues of the total CCI industries, we find the TV sector (see Fig. 1). This figure is close to 20% if we analyse TV and radio activities together.

In Table 3 we have displayed the main indicators for TV and radio. Data show that the value added of the TV activities expenditure is important when broadcasting is delivered on TV; however, radio is only getting back 6% of the total investment, while the rest of indicators are also decreasing, which does not suggest a promising future for the radio sector unless they introduce changes. These changes should be related to the digital revolution, including for example, internet-based radio, multi-media and on-demand audio. At the moment, the different technological options still

coexist (DAB, DRM, DBM, etc.⁵) and there is no dominant model yet (Ala-Fossi et al. 2008; Delaere and Ballon 2017).

2.4 *The Music Market in Europe*

Although the critical situation that the music industry suffered in the late 1990s due to the technological and digital revolution (Dolata 2011) and related problems associated with copyright regulations (Dobusch and Schüßler 2014), the expected music industry revenue worldwide is increasing, moving from 37 billion € in 2012 to an expected 46.4 billion € in 2021 (Statista 2018c).

Despite the continued decline in music sales in physical format, total revenues in 2016 grew by 6%, similar to the turnover increase in the European market. Digital incomes account for 50% of global music revenues and there are 112 million users of paid streaming subscriptions (IFPI 2017).

The leading markets in Europe for the music industry are the United Kingdom, Germany and France (see Table 4). However, when recorded music revenues per capita are considered, the most important countries are Norway, the United Kingdom, Sweden, Denmark and Germany (Statista 2018c). This data indicates that users in Nordic countries spend more on music than do users in other countries. For example, during 2014, Norwegian users spent 19.15 € in music, whereas French or Spanish users spent an average of 3.1 € on music (Statista 2018c).

The music industry is split into three parts: recorded, digital and streaming music. According to Statista (2018c), the evolution of each of them, in million €, is as follows:

- Recorded music, from 6600 in 2006 to 4300 in 2016 (↓).
- Digital music, aggregated data not available (↑).
- Streaming music, aggregated data not available (↑).

The adoption of streaming formats in Europe is different depending on the country. For example, in Sweden (country of origin of Spotify) the revenues from streaming are 69% of the total, whereas in Germany physical sales are 52% of the total market (IFPI 2017). According to the Eurobarometer (2016), almost 71% of the respondents indicated that the main reason for selecting an online music service was that it was a free service, followed by good quality (53%).

The type of access for online music does not vary too much depending on the user's age and the video or music sharing websites with a variety of music/videos that are uploaded by individual users, artists or companies is the most used type of access. What is different depending on the user's age is the time spent listening to

⁵DAB, digital audio broadcasting; DRM, Digital Radio Mondiale; DMB, Digital Multimedia Broadcasting.

Table 4 Main indicators evolution: the sound recording and music publishing activities industry in the European Union

European Union (28 countries)	Y2012	Y2013	Y2014	Y2015	Var. Y2015/ Y2014 (%)	Main countries
N° Enterprises	23,080	25,000	25,820	25,614	-0.80	France, Sweden, UK, Netherlands, Germany
Employees	25,900	26,500		29,000	9.43	UK, Germany, France
Turnover or gross premiums written (million €)	7000	8001.5	8745	9100	4.06	UK, Germany, France
Value added at fac- tor cost (million €)	3300	3911.9	4189.9	4400	5.01	Germany, UK

Source: Eurostat, Structural Business Statistics

digital music. In this case, people aged 15–24 spend almost two hours per day, while those in the 25–44 range, listen for approximately only one hour (Statista 2018c).

What we can extract from this analysis is that young people aged 15–24 years, who are the potential users in the near future, are totally adapted to the new music formats, digital and streaming, while traditional formats are rapidly declining.

3 Creative Industries and Emerging Technologies

During the last 15 years, internet and the digital technologies have impacted the cultural and creative industries, with special emphasis on publishing, TV and radio and music sectors. Although adapting to this change and constantly innovating, especially offering the final user new services options is necessary, it is most important to detect what the emerging technologies are that will impact the creative and cultural industries.

For the last two years, the biggest consulting firms and other important organisations have elaborated documents about emerging technologies and their use by creative industries. In this section, we have developed a content analysis of 27 documents elaborated by those firms and organisations. The documents are from the following sources and were published in the years 2016, 2017 and 2018:

- Accenture: 1 document (Accenture 2018).
- Arthur D. Little: 2 documents (Arthur D. Little 2017, 2018).
- Deloitte: 1 document (Deloitte 2018).
- EY: 2 documents (EY 2017, 2018).

- KPMG: 1 document (KPMG 2017).
- MIT Technology Review: 1 document (MIT Tech Review 2018).
- NESTA: 8 documents (NESTA 2017a, b, c, d, e, f, g, h).
- NESTA & Golant Media Ventures: 1 document (NESTA and Golant 2017).
- World Economic Forum: 7 documents (Harding 2016; Takahashi 2017; Hall and Takahashi 2017a, b; Hall 2018a, b; World Economic Forum 2018).
- World Economic Forum & McKinsey: 1 document (World Economic Forum 2018; McKinsey 2018).
- World Economic Forum & Accenture: 2 documents (World Economic Forum 2018; Accenture 2018).

To analyse information in the 27 documents, QDAMiner 4 software was used and the content analysed was developed (Provalis Research, Canada). Each document was read line-by-line to define the categories (15) and codes (160). The content analysis aimed to answer the following questions:

- (a) What are the emerging technologies included in the documents and which creative industries are they for?
- (b) Why do documents indicate that emerging technologies are important for creative industries?
- (c) What challenges do firms in creative industries need to face in relation to emerging technologies?

Results obtained from the content analysis are included in the following subsections.

3.1 What Emerging Technologies and Creative Industries Are Included in the Documents?

The documents analysed different technologies, which have been organised into eight codes numbered from A1 to A8 (Fig. 2). Moreover, 21 codes were defined to indicate the creative industries cited in these documents and to indicate examples of current or potential applications of emerging technologies. Figure 2 presents the co-occurrences of codes for technologies and creative industries. Music and film industries were considered in more documents linked to artificial intelligence and digitalisation. Moreover, the newspaper industry was also considered in more documents about digitalisation, while music was included in more examples with virtual reality.

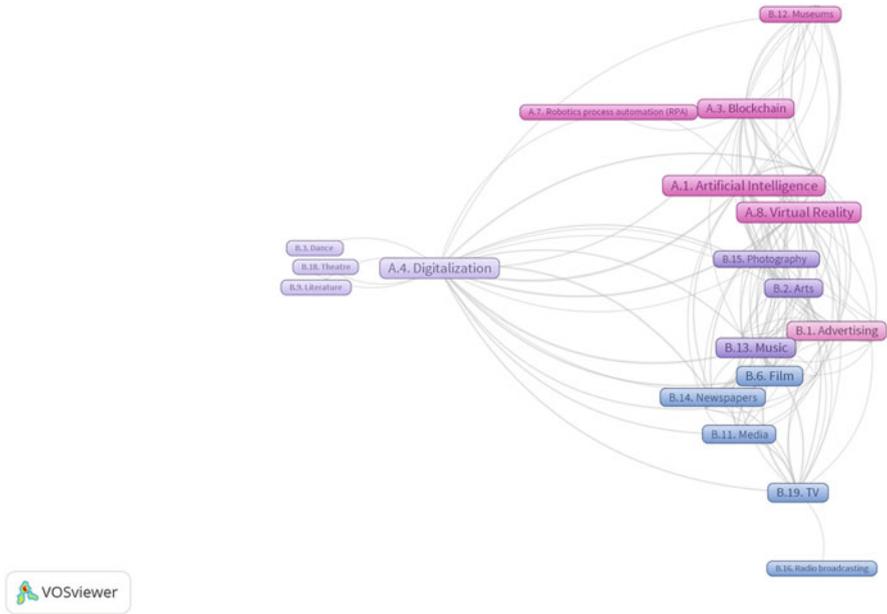


Fig. 2 Technologies by creative industries included in the documents analysed. Source: Own elaboration from content analysed of the 27 documents

3.2 Why Do Documents Indicate That Emerging Technologies Are Important for Creative Industries?

Through the content analysis, all the advantages and advances of emerging technologies were used to define different codes. These codes were grouped into four categories, one for each technology, as we explain in the next paragraphs.

Category C. Importance of Emerging Technologies for CIs in a General Sense This category includes information in the documents which did not refer to a specific technology, but to emerging technologies in general in this category; seven codes were defined that refer to what creative industries might obtain by incorporating some of these technologies in their business models, marketing and operations. The most cited code is the opportunity that these technologies offer for creating new experiences for customers. These codes, defined through the content analysis, are:

- C.1. Distribute content to a broader audience (World Economic Forum 2018; McKinsey 2018).
- C.2. Experiences in which digital and physical customers will converge (Arthur D Little 2017).
- C.3. Increasingly integrated into the platforms where content is consumed (Hall and Takahashi 2017b).
- C.4. New avenues for creativity (World Economic Forum 2018; McKinsey 2018).
- C.5. New experiences for consumers (KPMG 2017; EY 2018; Accenture 2018; World Economic Forum 2018; McKinsey 2018).
- C.6. Personalised content (Accenture 2018; World Economic Forum 2018; McKinsey 2018).

Category D. Artificial Intelligence (AI): Advantages and Advances In this category, we present the main ideas that the documents indicate about how artificial intelligence has been incorporated into different creative industries. Among the examples that documents give about AI application in creative industries are Recent.io (Hall and Takahashi 2017a), WordSmith (Hall 2018b), and Jukedek (Harding 2016). Codes referring to advantages include opinions found in documents which indicated what can be obtained when AI is used, while advances refer to specific achievements in different creative industries. The main advantages found in the documents are included in the following codes, and results indicate that the main advantage is the use of users' preferences to create tailored content:

- D.1. Analyse considerable datasets to learn specific behaviours (World Economic Forum 2018; McKinsey 2018).
- D.2. Cloud-Based AI is making technology cheaper and easier to use (World Economic Forum 2018; McKinsey 2018).
- D.3. Create tailored content through users' preferences (Hall and Takahashi 2017a; Hall 2018a; World Economic Forum 2018; McKinsey 2018).
- D.4. Faster access to data and visualisations updated in real time (Hall 2018b).
- D.5. General Adversarial Networks, GANs (MIT Technology Review 2018).
- D.6. Many creative activities can be automated by AI (Hall 2018b).
- D.7. Perform a task that is too difficult or time consuming for humans (Hall 2018a; World Economic Forum 2018; McKinsey 2018).
- D.8. Products and services are much more personalised (Hall and Takahashi 2017a).
- D.9. AI reduces the human element in the content creation process (Hall 2018b).
- D.10. Turn structured data into a compelling text (Hall 2018b).
- D.11. Understand how customers feel about products (World Economic Forum 2018; McKinsey 2018).

The examples for concrete creative industries show the advances obtained by firms in these sectors when they have applied AI. Among these examples, there are the following codes:

- D.12. In the advertisement industry, detect fraudulent ad impressions (World Economic Forum 2018; McKinsey 2018).

- D.13. In books, create novels (Hall 2018a).
- D.14. In fashion design, generate new designs (World Economic Forum 2018; McKinsey 2018).
- D.15. In films, write scripts and stage instructions (World Economic Forum 2018; McKinsey 2018; Hall 2018a).
- D.16. In journalism, generate texts, saving journalists' time (KPMG 2017; World Economic Forum 2018; McKinsey 2018; Hall 2018b).
- D.17. In music, compose music and produce instrumental sounds that humans had never heard before (Harding 2016; Hall 2018a; World Economic Forum 2018; McKinsey 2018).
- D.18. In music, enable small-scale creators to use high-quality music at low cost (World Economic Forum 2018; McKinsey 2018).
- D.19. In photography, generate sophisticated images (World Economic Forum 2018; McKinsey 2018).
- D.20. In the media, the personalisation of news (Hall and Takahashi 2017a).

Category F. Augmented Reality (AR) and Virtual Reality (VR): Advantages and Advances In this category, benefits from using immersive technologies and their applications to creative industries are explained. Codes are defined from the analysis of content included in documents studied. These documents cite some examples of companies that have used immersive technologies. Some of these examples are Oculus VR (World Economic Forum 2018; Accenture 2018), Sony (Hall and Takahashi 2017b), Google (World Economic Forum 2018; McKinsey 2018), Facebook Spaces (Hall and Takahashi 2017a), Pokémon Go (Arthur D Little 2017), The Baltimore Ravens (Accenture 2018), The Denver Museum of Nature and Science (Accenture 2018) and The New York Times (Arthur D Little 2017).

Different advantages have been cited about firms in creative industries when using AR and VR, such as the option of creating immersive experiences through a smartphone. The information obtained and included in the codes about these immersive technologies is:

- F.1. They are changing the way people connect with information, experiences, and each other (Accenture 2018).
- F.2. They are tools for empathy and cognitive enhancement (Hall and Takahashi 2017a, b; World Economic Forum 2018; McKinsey 2018).
- F.3. They can make content more powerful than when presented through traditional media (World Economic Forum 2018; McKinsey 2018).
- F.4. Creators can replace rectilinear screens with full 360-degree fields of view (Hall and Takahashi 2017b; World Economic Forum 2018; McKinsey 2018).
- F.5. Digital experiences using a smartphone (Arthur D Little 2017; Hall and Takahashi 2017a; World Economic Forum 2018; McKinsey 2018).
- F.6. Smaller firms might create high-quality content at lower cost (Hall and Takahashi 2017b).
- F.7. Moving from observation to immersion (Hall and Takahashi 2017a, b; Arthur D Little 2017).

F.8. New modes of experiencing content (Hall and Takahashi 2017b; World Economic Forum 2018; McKinsey 2018).

F.9. Reducing production costs in creative industries (Hall and Takahashi 2017b).

Codes indicating the use of AR and VR in specific creative industries are the following, and are referred to sectors such as design, music and publishing:

F.10. In design, higher accuracy and quality in products (Hall and Takahashi 2017b).

F.11. In design, shorten time and cost of iteration in new product development (Hall and Takahashi 2017b).

F.12. In music, share experiences with fans, including those who lack financial means to see live music (Harding 2016).

F.13. In music, sell merchandise through VR experiences (Harding 2016).

F.14. In publishing, have publishers differentiate their content offerings (World Economic Forum 2018; McKinsey 2018).

Category H. Blockchain: Advantages and Advances In this category, codes obtained in the content analysis related to blockchain are included. Blockchain appeared among the ten emerging technologies of 2016 cited by the World Economic Forum (2018). The Forum listed different challenges and opportunities related to the use of blockchain, such as cost reduction when intermediaries are displaced in transactions. On the other hand, big tech firms (such as Google) might reduce some costs linked to the current systems, reaching higher levels of security and privacy for their users. Finally, they also consider that blockchain technology would incentivise higher ethical behaviour among the participants.

There are increasing examples of the potential benefits of using blockchains in the creative and cultural industries. Among these industries, music is considered as the sector which would be most affected by blockchain technology (O'Dair and Beaven 2017). Some of the advantages referred to the use of blockchain in creative industries are:

- Accuracy and availability of copyright data about songs and recordings. From this view, identifying ownership would be easier. Examples indicating this advantage can be found for digital works (McConaghy et al. 2017) and recorded song (O'Dair and Beaven 2017).
- For digital works, provenance could be obtained and information could arrive at the original registration by the creator (McConaghy et al. 2017).
- Facilitation of near-instant micropayment for royalties (O'Dair and Beaven 2017).
- Higher transparency about the value chain (O'Dair and Beaven 2017).

In the content analysis undertaken for this chapter, we have found examples of the use of this technology such as Ethereum (Arthur D Little 2018), PeerTracks, Ascribe.io, Streamium, and Brave (Takahashi 2017).

The codes obtained through the analysis of information in the documents and referring to how artists could benefit from using blockchain are:

- H.1. Allocate revenue to contributors (Takahashi 2017; World Economic Forum 2018; McKinsey 2018).
- H.2. Blockchain allows “micro-metering” or “micro-monetising” (Takahashi 2017).
- H.3. Allows artists to programme their IPRs, revenues and royalties into smart contracts (Takahashi 2017; World Economic Forum 2018; McKinsey 2018).
- H.4. Blockchain avoids intermediaries in transactions (Hall and Takahashi 2017a; Arthur D Little 2018; World Economic Forum 2018; McKinsey 2018).
- H.5. Creative content securely shared (Takahashi 2017).
- H.6. Higher transparency (Takahashi 2017; World Economic Forum 2018; McKinsey 2018).
- H.7. Creative work more accessible (Harding 2016; World Economic Forum 2018; McKinsey 2018).
- H.8. New business models based on blockchain (Arthur D Little 2018).
- H.9. Ownership can be traced (Takahashi 2017).
- H.10. Artists can be paid based on information about actual consumption (World Economic Forum 2018; McKinsey 2018).
- H.11. Ability to conduct dynamic prices (Takahashi 2017; World Economic Forum 2018; McKinsey 2018).

Category J. Digitalisation: Advantages and Challenges This category includes the codes defined which express benefits for firms in creative industries for integrating digitalisation in their organisations. This technology has had a significant impact on cultural organisations, as can be observed through NESTA works. Other advantages cited in the documents analysed include their impact on business models, marketing, efficiency and competitiveness. The codes defined for this category are the following:

- J.1. Create new experiences and content for audiences (NESTA 2017g, h; NESTA and Golant Media Ventures 2017; Arthur D Little 2017).
- J.2. Digital technologies are important for business models (NESTA 2017a, b, c, d, e, g, h; KPMG 2017; NESTA and Golant Media Ventures 2017).
- J.3. Digital technologies are important for creation (NESTA 2017e; NESTA and Golant Media Ventures 2017).
- J.4. Digital technologies are important in the digitalising of a collection in museums, preservation and archiving (NESTA 2017a, b, d, g).
- J.5. Digital technologies are important for marketing (Arthur D Little 2017; NESTA 2017a, c, e, f, g, h; NESTA and Golant Media Ventures 2017).
- J.6. Gain data about audiences and their behaviour (NESTA 2017h; NESTA and Golant Media Ventures 2017).
- J.7. Lower costs and higher efficiency (Arthur D Little 2017; KPMG 2017; NESTA and Golant Media Ventures 2017).
- J.8. Redefine customers' relationship (Arthur D Little 2017; World Economic Forum 2018).
- J.9. Strengthen competitiveness (Arthur D Little 2017).

Category L. Extended Reality (XR): Advantages and Advances This category involves an additional emerging technology, and information compiled is focused in the document elaborated by Accenture (2018). Information codified from this document is divided into the three following codes:

- L.1. This technology relocates people in time and space (Accenture 2018).
- L.2. This technology immerses the user through visuals, audio, olfactory, and haptic cues (Accenture 2018).
- L.3. XR expresses data in 3D environments, closer to the way humans see and imagine scenarios (Accenture 2018).

3.3 What Challenges Do Firms in Creative Industries Face About Emerging Technologies?

In this section, the content analysed focuses on the challenges that firms and professionals in creative industries face in relation to the emerging technologies analysed in Sect. 3.2. Technologies for which challenges were found in the documents analysed are artificial intelligence, immersive technologies (AR and VR), the blockchain and digitalisation. In the next paragraphs, codes defined for each technology are presented and advice is given about the challenges firms in creative industries need to consider for the next years. These needs include talent, business models, marketing and technical limitations, among others.

Category E. Artificial Intelligence (AI): Challenges Results from the content analysis indicate that AI systems are challenging to implement, that talent is difficult to find and that governance matters to assure trust. For specific industries, like journalism, AI could force journalists into obsolescence (Hall and Takahashi 2017a). Coexistence of AI and humans generates controversy when advantages in this technology are evaluated. Codes E.1. to E.7. cover the content analysis in this category:

- E.1. Lack of AI talent as the most significant barrier (EY 2017).
- E.2. AI use is dominated by a few big companies, such as Amazon, Google, and Microsoft (MIT Technology Review 2018; World Economic Forum 2018; McKinsey 2018).
- E.3. Governance about disinformation and misinformation is an issue (Hall and Takahashi 2017a; World Economic Forum 2018; McKinsey 2018; Hall 2018a, b; Accenture 2018).
- E.4. AI is not able to explain its output (Hall 2018b; World Economic Forum 2018; McKinsey 2018).
- E.5. Platforms influence creative content (Hall and Takahashi 2017a; Hall 2018a).
- E.6. AI disrupting markets and changing value chains for creative content (Hall 2018b; World Economic Forum 2018; McKinsey 2018).

E.7. AI is expensive and difficult to implement (EY 2017; MIT Technology Review 2018).

Category G. Augmented Reality (AR) and Virtual Reality (VR): Challenges In these technologies, challenges obtained through content analysis are primarily related to personal data that these immersive technologies can capture, and how the companies might use these data. More concretely, the codes defined in this category are the following:

- G.1. Immersive technologies capture more intimate personal data from users (Hall and Takahashi 2017a, b; World Economic Forum 2018; McKinsey 2018).
- G.2. One potential barrier to rapid progress is the lack of talent (Hall and Takahashi 2017b).
- G.3. Devices require high-spec stationary computers (World Economic Forum 2018; McKinsey 2018).
- G.4. Technical challenges, such as devices' size and battery life (Hall and Takahashi 2017b).
- G.5. Price of VR headsets (World Economic Forum 2018; McKinsey 2018).
- G.6. They could replace mobile computing (Hall and Takahashi 2017b).
- G.7. Potential overuse like what occurs with mobiles (World Economic Forum 2018; McKinsey 2018).

Category I. Blockchain: Challenges Challenges cited by authors about the application of blockchain to creative industries were related to costs, knowledge needed, the low level of development of this technology and governance issues. Concerning specific creative industries, the examples referred to the music industry, and codes defined indicated that some musicians might not be prepared to do the job that was traditionally done by labels and publishers (Hall and Takahashi 2017a; Takahashi 2017, World Economic Forum 2018; McKinsey 2018). Also, if these traditional agents develop the blockchain infrastructure, there would be little change from previous remuneration systems (Takahashi 2017). Concerning codes regarding general challenges from blockchain, they have been defined as follows:

- I.1. This is the least advanced of all the technologies and requires further development (Takahashi 2017; Hall and Takahashi 2017a; Arthur D Little 2018; World Economic Forum 2018; McKinsey 2018).
- I.2. Any business that could stand to benefit from an immutable database can be disrupted by blockchain (Accenture 2018).
- I.3. Blockchain-ready artists remain a small minority (Takahashi 2017).
- I.4. IP concerns regarding whether the creative content is stored directly on the blockchain (Takahashi 2017).
- I.5. Governance issues will be critical (Takahashi 2017; World Economic Forum 2018; McKinsey 2018).
- I.6. Blockchain requires knowledge of alphanumeric code and cryptography (World Economic Forum 2018; McKinsey 2018).
- I.7. Many stakeholders are uncomfortable with the level of transparency (World Economic Forum 2018; McKinsey 2018).

I.8. Costs regarding resources and time would be too high for creative applications (World Economic Forum 2018; McKinsey 2018).

Category K. Digitalisation: Challenges Firms in creative industries face digitalisation technologies, which allowed others to disrupt the sectors. Codes obtained from the content analysis indicate that the majority of challenges are related to Management and Strategic issues. Taking the right decision at the right moment seems to be an essential aspect that companies in creative industries have to consider. However, scarcity of resources might be an important limit for some organisations, especially in the cultural sector. In the next codes, information for challenges are further specified:

- K.1. Existing business models are disrupted (Arthur D. Little 2017; NESTA and Golant Media Ventures 2017; World Economic Forum 2018).
- K.2. Customer behaviour is changing (Accenture 2018; Arthur D. Little 2017; World Economic Forum 2018).
- K.3. Digital technologies are used in all points of contact of the customer journey (Arthur D. Little 2017).
- K.4. The early-mover/fast-follower advantage matters (KPMG 2017).
- K.5. Services that previously were exclusively physical are now becoming increasingly digital (Arthur D. Little 2017).
- K.6. Indecision around business models can be fatal (KPMG 2017).
- K.7. Ecosystems and partner management are crucial in innovation and its application (Arthur D. Little 2018).
- K.8. Funding, lack of resources and time, among important barriers to the digital development (NESTA 2017b, c, d, e, f, g).
- K.9. Digital talent is crucial (World Economic Forum 2018).

4 Conclusions

In this chapter, two analyses of creative industries have been developed. The first analysis covers the study of the markets for creative industries in the last five years. For this purpose, variables like the number of employees, enterprises, revenues and value added have been used. Data indicate that the importance of these sectors in the European economy continues, despite the economic crisis. Digitalisation in these industries has been more a part of the solutions than it has been the cause of the problems, as can be observed in the sector such as publishing. However, this technology has boosted new business models based on self-publishing, thereby increasing the offering in the market and forcing incumbent companies to use new technologies across the entire value chain. In the advertising sector, digitalisation has increased internet advertising. Technologies have also impacted TV and music industries, in these cases spreading the use of streaming around European countries.

These technologies have changed how users consume TV and music content after disrupters entered the market, facilitating the shift to streaming.

The second analysis in this chapter focuses on the advantages of using emerging technologies and includes examples in specific creative industries. The advantages were explained through the content analysis of 27 documents of the most important consulting firms in the world. The documents were analysed, line-by-line, to search all the information indicating advantages, examples and challenges for technologies like artificial intelligence, augmented reality, virtual reality, blockchain and digitalisation. The analysis shows how these emerging technologies allow users to create and publish content for consumers in a different way, creating new experiences that are more personalised for users, and eliminating intermediaries in the creative process. AI, for example, can help with a task which is highly time consuming, while AR and VR increase the options for immersion in experiences. However, limitations occur in the implementation of these new technologies due to lack of talent, cost of investments, governance and technical issues. All these challenges are also included in the analysis.

References

- Accenture (2018) Accenture technology vision 2018. Available via ACCENTURE. https://www.accenture.com/t20180222T121502Z_w__us-en/_acnmedia/Accenture/next-gen-7/tech-vision-2018/pdf/Accenture-TechVision-2018-Exec-Summary.pdf. Accessed 15 Mar 2018
- Acker O, Gröne F, Lefort T, Kropiunigg L (2015) The digital future of creative Europe. The impact of digitization and the Internet on the creative industries in Europe. Strategy&PWC. Available via PWC. <https://www.strategyand.pwc.com/global/home>. Accessed 22 Feb 2018
- Ala-Fossi M, Lax S, O'Neill B, Jauert P, Shaw H (2008) The future of radio is still digital—but which one? Expert perspectives and future scenarios for radio media in 2015. *J Radio Audio Media* 15(1):4–25
- Arthur D Little (2017) The customer meeting of the future. Arthur D Little, Paris. http://www.adlittle.com/sites/default/files/viewpoints/adl_the_customer_meeting_of_the_future.pdf. Accessed 15 Mar 2018
- Arthur D Little (2018) Executive Roundtable: Digitalization. Arthur D Little, Paris. <http://www.adlittle.com/Digitalization>. Accessed 15 Mar 2018
- Delaere S, Ballon P (2017) Standards, innovation and business models: the case of digital radio. In: Hawkins R, Blind K, Page R (eds) *Handbook of innovation and standards*. Edward Elgar, Cheltenham, pp 321–352
- Deloitte (2018) Technology, media and telecommunications predictions 2018. Available via DELOITTE. <https://www2.deloitte.com/global/en/pages/technology-media-and-telecommunications/articles/tmt-predictions.html>. Accessed 15 Mar 2018
- Dobusch L, Schüßler E (2014) Copyright reform and business model innovation: regulatory propaganda at German music industry conferences. *Technol Forecast Soc Chang* 83:24–39
- Dolata U (2011) The music industry and the internet: a decade of disruptive and uncontrolled sectoral change. SOI Discussion Paper 2011–02. Research contributions to organizational sociology and innovation studies. *Stuttgarter Beiträge zur Organisations-und Innovationsforschung*
- Eurobarometer (2016) https://ec.europa.eu/culture/policy/cultural-creative-industries_en. Retrieved from April 2018

- European Commission (2011) Regulation of the European Parliament and of the Council establishing a creative Europe Framework Programme. Impact Assessment. Brussels, 23.11.2011 SEC(2011) 1399 final
- European Creative Industries Alliance (2014) A new policy agenda to maximise the innovative contributions of Europe's creative industries. Recommendations from the Policy Learning Platform. Available via ECIA. <http://eciaplatform.eu>. Accessed 20 Feb 2018
- EY (2015) Cultural times | The first global map of cultural and creative industries. <http://www.worldcreative.org/>. Retrieved from April 2018
- EY (2017) Putting artificial intelligence (AI) to work. Available via EY. <http://www.ey.com/gl/en/issues/business-environment/ey-innovation-matters-putting-artificial-intelligence-to-work>. Accessed 15 Mar 2018
- EY (2018) Opportunities and threats 2018. Media and Entertainment. Available via EY. [http://www.ey.com/Publication/vwLUAssets/ey-opportunities-threats-2018-media-entertainment-summary/\\$File/ey-opportunities-threats-2018-media-entertainment-summary.pdf](http://www.ey.com/Publication/vwLUAssets/ey-opportunities-threats-2018-media-entertainment-summary/$File/ey-opportunities-threats-2018-media-entertainment-summary.pdf). Accessed 15 Mar 2018
- Federation of European Publishers (2017) The book sector in Europe: facts and figures. Available via FEP. <https://www.fep-fee.eu/The-Federation-of-European-862>. Accessed 18 Feb 2018
- Hall S (2018a) It's time to tackle tech's growing influence on the creative economy. World Economic Forum. Available via WEF. <https://www.weforum.org/agenda/2018/02/its-time-to-tackle-techs-growing-influence-on-the-creative-economy>. Accessed 15 Mar 2018
- Hall S (2018b) Can you tell if this was written by a robot? 7 challenges for AI in journalism. World Economic Forum. Available via WEF. <https://www.weforum.org/agenda/2018/01/can-you-tell-if-this-article-was-written-by-a-robot-7-challenges-for-ai-in-journalism>. Accessed 15 Mar 2018
- Hall S, Takahashi R (2017a) This four technologies will shape the creative economy—for better or worse. World Economic Forum. Available via WEF. <https://www.weforum.org/agenda/2017/05/these-four-technologies-will-shape-the-creative-economy/>. Accessed 15 Mar 2018
- Hall S, Takahashi R (2017b) Augmented and virtual reality: the promise and peril of immersive technologies. World Economic Forum. Available via WEF. <https://www.weforum.org/agenda/2017/09/augmented-and-virtual-reality-will-change-how-we-create-and-consume-and-bring-new-risks>. Accessed 15 Mar 2018
- Harding C (2016) 3 tech trends that will overturn the music industry—again. World Economic Forum. Available via WEF. <https://www.weforum.org/agenda/2016/06/3-tech-trends-that-will-overturn-the-music-industry-again>. Accessed 15 Mar 2018
- IFPI (2017) IFPI Global Music Report 2017. Available via IFPI. <http://www.ifpi.org/downloads/GMR2017.pdf>. Accessed 15 Mar 2018
- KPMG (2017) A call to action. Disruptive technologies barometer: media sector. Available via KPMG. <https://home.kpmg.com/xx/en/home/insights/2016/12/disruptive-technologies-barometer-media-sector.html>. Accessed 15 Mar 2018
- McConaghy M, McMullen G, Parry G, McConaghy T, Holtzman D (2017) Visibility and digital art: blockchain as an ownership layer on the Internet. *Strateg Chang* 26(5):461–470
- McKinsey (2018) Rebuilding corporate reputations, by Sheila Bonini, David Court, and Alberto Marchi. Accessible at <https://www.mckinsey.com/featured-insights/leadership/rebuilding-corporate-reputations>
- MIT Technology Review (2018) 10 Breakthrough technologies 2018. Available via MIT. <https://www.technologyreview.com/lists/technologies/2018/>. Accessed 15 Mar 2018
- NESTA (2017a) Digital culture 2017. Combined arts. Available via NESTA. <https://www.nesta.org.uk/publications/digital-culture-2017-combined-arts>. Accessed 15 Mar 2018
- NESTA (2017b) Digital culture 2017. Dance. Available via NESTA. <https://www.nesta.org.uk/publications/digital-culture-2017-dance>. Accessed 15 Mar 2018
- NESTA (2017c) Digital culture 2017. Available via NESTA. <https://www.nesta.org.uk/publications/digital-culture-2017-literature>. Accessed 15 Mar 2018
- NESTA (2017d) Digital culture 2017. Available via NESTA. <https://www.nesta.org.uk/publications/digital-culture-2017-museums>. Accessed 15 Mar 2018

- NESTA (2017e) Digital culture 2017. Available via NESTA. <https://www.nesta.org.uk/publications/digital-culture-2017-music>. Accessed 15 Mar 2018
- NESTA (2017f) Digital culture 2017. Available via NESTA. <https://www.nesta.org.uk/publications/digital-culture-2017-theatre>. Accessed 15 Mar 2018
- NESTA (2017g) Digital culture 2017. Available via NESTA. <https://www.nesta.org.uk/publications/digital-culture-2017-visual-arts>. Accessed 15 Mar 2018
- NESTA (2017h) Digital culture 2017. Available via NESTA. <https://www.nesta.org.uk/publications/digital-culture-2017>. Accessed 15 Mar 2018
- NESTA & Golant Media Ventures (2017) The adoption of digital technology in the arts. Available via NESTA. https://www.nesta.org.uk/sites/default/files/difaw_gmv_e.pdf. Accessed 15 Mar 2018
- O'Dair M, Beaven Z (2017) The networked record industry: how blockchain technology could transform the record industry. *Strateg Chang* 26(5):471–480
- PwC (2016) Entertainment and media outlook 2016–2020, España. Available via PwC. <https://www.pwc.es/es/publicaciones>. Accessed 15 Mar 2018
- Sandler K (2017) Innovation in publishing: this is not an oxymoron! *Publ Res Q* 33:328–342
- Statista (2018a) Advertising in Europe, New York. <https://www.statista.com>. Accessed 15 Mar 2018
- Statista (2018b) Digital advertising in Europe, New York. <https://www.statista.com>. Accessed 15 Mar 2018
- Statista (2018c) Music industry in Europe, New York. <https://www.statista.com>. Accessed 15 Mar 2018
- Takahashi (2017) How can creative industries benefit from blockchain? World Economic Forum. Available via WEF. <https://www.weforum.org/agenda/2017/07/how-can-creative-industries-benefit-from-blockchain>. Accessed 15 Mar 2018
- Voigt M, de Bruijn W (2017) Dutch publishing industry seeks startups through the renew the book competition. *Publ Res Q* 33:10–13
- WAN-IFRA (2017) World Press trends 2017. Available via WPT. <http://www.wptdatabase.org/world-press-trends-2017-facts-and-figures>. Accessed 15 Mar 2018
- World Economic Forum (2018) Disrupting business models is not enough. We need tech innovation too. Accessible via WEF at <https://www.weforum.org/agenda/2018/03/sharing-economy-product-innovation-balance-disruption/>. Accessed on May 2018

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