

Finance, Learning, Innovation and Patenting for CCI

## ■ FINAL REPORT

Work Package 4

# PATENTING

in the CULTURAL and CREATIVE  
INDUSTRIES



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## Intro/General Info about FLIP

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Creative FLIP - Finance, Learning, Innovation and Patenting is a Pilot project co-funded by the EU whose main objective is to support healthy and sustainable ecosystems for Cultural and Creative Industries (CCIs) with respect to these four key policy areas.

For more info, see: [www.creativeflip.eu](http://www.creativeflip.eu)



## Abstract

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The purpose of Work Package 4 (WP4) is to outline the patenting landscape in the Cultural and Creative Industries in order to support CCIs actors to capture value from their Intellectual Property, thereby strengthening their business capacities.

With this purpose in mind, the WP4 activities consisted of (i) carrying out a state-of-the-art analysis of patenting activities within the CCIs, (ii) performing a statistical analysis to reveal the actual use of patents, (iii) conducting a survey of current patent practices, and (iv) developing recommendations to increase the CCIs' business capacities through the use of IP and patenting. Additionally, via interviews conducted with CCIs representatives, this WP unveils some best practices in patenting to inspire the sector players.

This Final Report presents the outcomes of these activities, which were carried out within the Creative FLIP project.

This document is part of the Creative FLIP Final Report, requested by the European Commission as part of the project deliverables.

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Apart from the widely known three patentability requirements (i.e. novelty, inventiveness and industrial applicability), the principal condition for patentability is that there must be an "invention", belonging to any field of "technology". For this reason, patenting activities are not seen at the core of the cultural and creative industries (CCIs) as by their very nature, these businesses focus on artistic or literary creativity rather than on technological inventiveness.<sup>1</sup>

In this vein, the 2019 report of the European Union Intellectual Property Office (EUIPO) and of the European Patent Office (EPO) on "IPR-intensive industries and economic performance in the European Union"<sup>2</sup> does not count any of the CCIs sub-sectors in the top-20 ranking of the "most patent-intensive" sectors. Instead, CCIs sub-sectors dominate the list of copyright-intensive sectors, and are quite apparent in the report's design-intensive and trademark-intensive sectors.

Nevertheless, this does not necessarily mean that patenting activities are completely irrelevant to the cultural and creative industries as a whole. In line with the objectives of the Creative FLIP project,<sup>3</sup> this report sheds light on the patenting (and to a certain extent, on the general intellectual property (IP)) characteristics of the CCIs under three main headings, namely:

- state-of-the-art of patenting activities in the sector with patenting case studies (interviews),
- statistical analysis of such activities, and
- current patenting practices and perceptions.

These three headings are covered in the different chapters (reports) of this extensive study, and are supplemented by a "recommendations" section that constitutes a "call for action" based on our findings.

### State-of-the-art analysis

As mentioned above, although the CCIs are not seen as highly patent-intensive, generally speaking, the relation with patents in the CCIs is noticeable at the level of ancillary goods and services, which mainly use technological and inventive products. Namely: creators and designers, producers and publishers, content providers, broadcasters, etc. are the chief actors who are the inventors and/or owners of such patent applications, or at least make use of such inventive products.

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<sup>1</sup> The European Patent Convention [Art.52](#) sets the conditions for patentability. Paragraph 2 of the same article excludes several activities e.g. aesthetic creations, schemes, rules and methods for performing mental acts, presentations of information, etc. which might fall in the business areas of the CCIs.

<sup>2</sup> See the report: "IPR-intensive industries and economic performance in the European Union", Third edition, EUIPO, September 2019. Available [here](#).

<sup>3</sup> The general objective of the Creative FLIP project is to support healthy and sustainable ecosystems related to Finance, Learning, Innovation and Patenting for Cultural and Creative Industries. More specifically, one of the specific objectives of the action reads as "strengthening CCIs' capacities for growth and development through improved access to finance, value recognition, and capacities to capture value from Intellectual Property (IP) for actors in the CCIs."

In particular, patent and patenting seem highly important, if not crucial, in the Media and Content Industries (MCIs). Indeed, besides a number of European technological SMEs who file patents in this sub-sector, most companies are mainly users of patented tools and technology, not their inventors.

Our state-of-the-art analysis has shown that the US giants and Japanese technology companies are the main players of CCIs, especially of MCIs, where they dominate most of the downstream value chains. They are also present in the upstream as some of them are content producers or creativity-related technology producers, whose (patented) products are used by the CCIs. The same phenomenon also occurs in some other CCIs sub-sectors, namely in the advertising (patenting activities are mainly seen in the upstream), design and visual arts (both upstream and downstream) sub-sectors.

Compared to other CCIs sub-sectors, architecture and fashion industries deserve an individualised assessment of their patenting practices. Architecture and fashion industries have their own specificities with regards to patenting as these sub-sectors directly utilise (high-) technology products, and the practitioners of these sub-sectors (i.e. architects, fashion designers), even if they are not always mentioned as inventors in the patent applications, are often key in the technology development process.

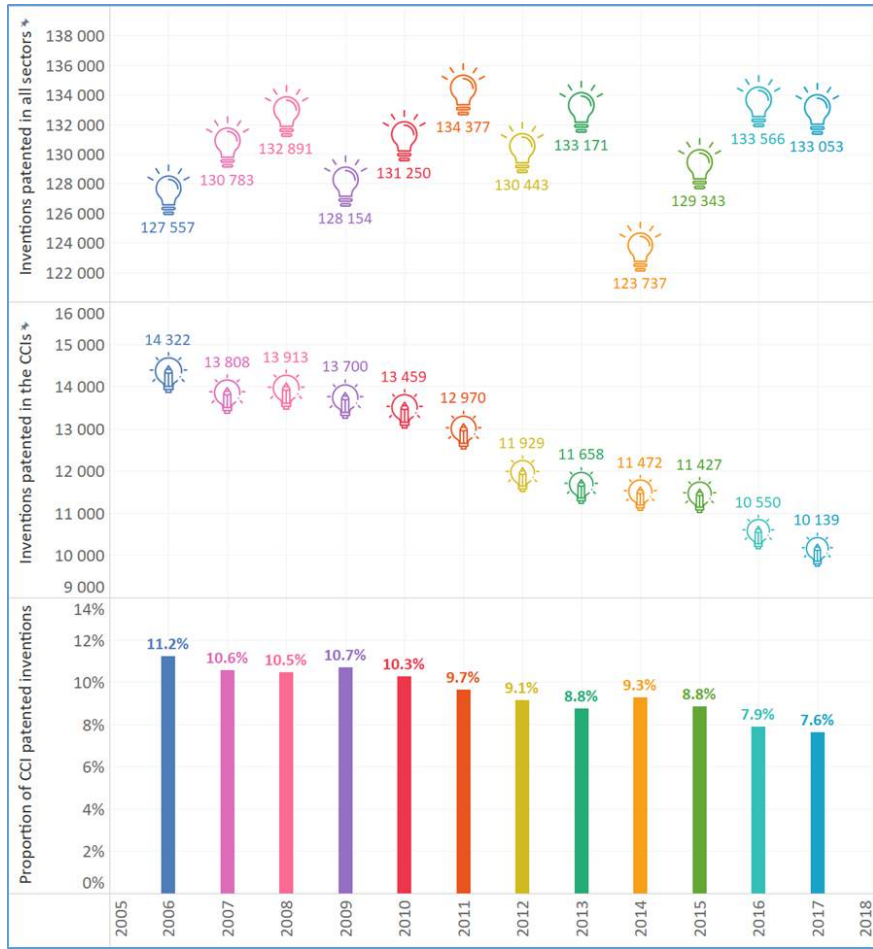
In architecture, besides the use of patenting in the value chain, “development” activities leading to patenting are also important, as demonstrated, for example, by the development and use of new materials or by the development and use of novel building parts.

Technological innovation in the fashion sub-sector is driven by three major trends: automation of the production apparatus, digitisation of the value chain, and innovative materials research. Therefore, the “development” and use of new fabrics, namely technical textiles such as non-iron fabrics, water-resistant fabrics, PVC coated textiles, etc., new production techniques (e.g. development of a less polluting and less water-consuming production apparatus) and IT/AI-related applications demonstrate the inventiveness (and highly patent-related) character of the sub-sector. Needless to say, there are also patent-relevant activities both upstream and downstream in the value chain, for example in the use of patent-protected tools for creation and commercialisation processes. The players who file patent applications in the fashion industry are mainly suppliers of machinery, electronics and IT companies, manufacturers of sports clothing and footwear, and textile manufacturers.

## **Statistical analysis**

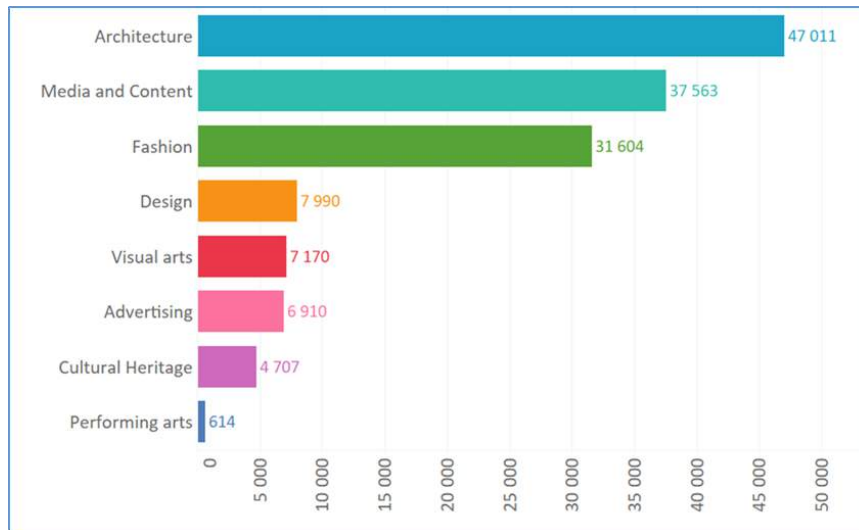
The above findings of the state-of-the-art analysis correspond quite well to the findings of the statistical analysis, which was carried out within the PATSTAT database of the European Patent Office (EPO).

Looking at the overall patenting activities of the CCIs, we see that the patents in the CCIs represent on average 9.5% of all inventions, which confirms the not-so-close relationship (i.e. low patent intensity) between the CCIs and patenting.



**Patenting activities in the CCIs and other sectors by year**

In our further sub-sectoral analysis as summarised below, the most active sub-sectors in the patenting field are Architecture, MCIs and Fashion.



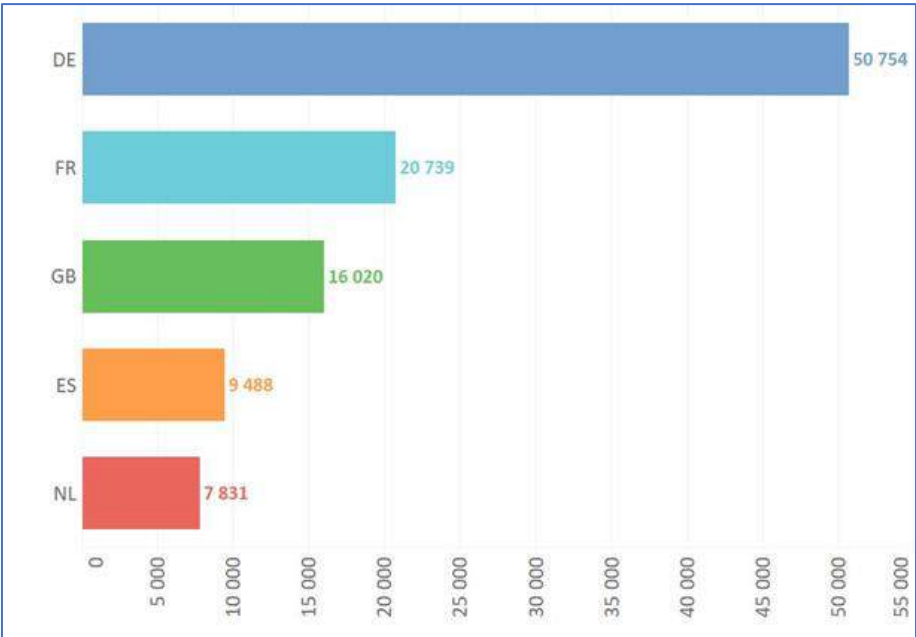
**The most active CCIs sub-sectors in patenting**



Although the macro-level numbers may seem discouraging in terms of the proportion of CCIs patents, when analysed in depth, a considerable relation with CCIs value chains and patenting becomes visible. Quite a number of patent applications located at the different levels of CCIs' value chains, both upstream and downstream, reveal the invisible patent intensity of CCIs and the inventive characteristics of the sector players.

Here, a parenthesis must be opened for the performing arts sub-sector, which is an apparent outlier in all CCIs in regards to patenting. Although it is quite an anticipated outcome, seeing as the sector itself has more visual/artistic characteristics than technological features, one can still see the inventive (read "patentable") traits especially in the downstream activities, namely in lighting, which is an integral part of the sector.

In terms of country analysis, we see Germany, France and Great Britain in the lead, with Germany being the far front-runner in the ranking. This is rather unsurprising, as German actors traditionally lead almost all European patent rankings,<sup>4</sup> which is explained by the country's long-standing patenting culture.



Top countries in patenting in the CCIs

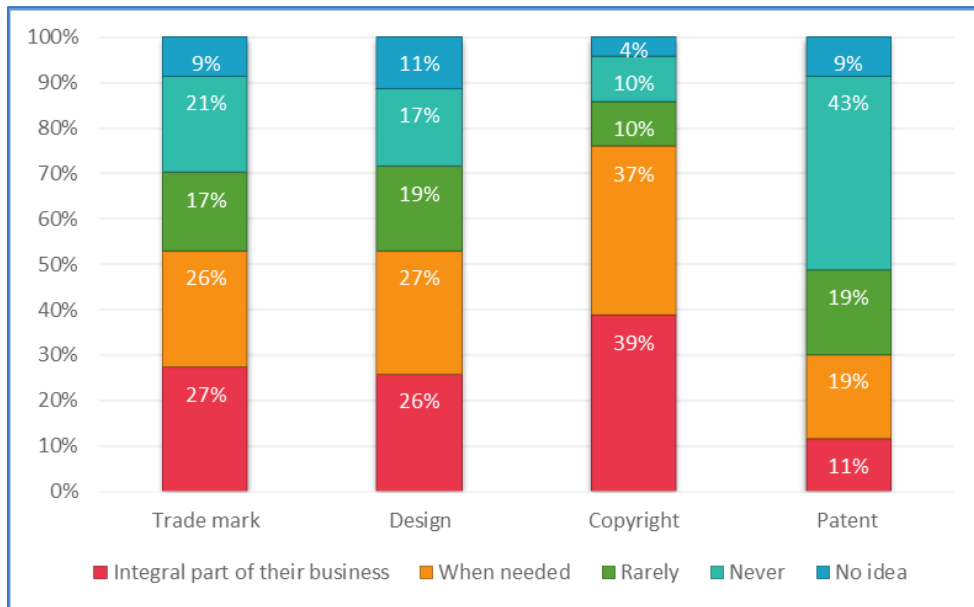
**Survey on patenting practices and perceptions**

This report also includes the results of a survey to reveal the current IP and patenting practices of the CCIs, which was concluded with 70 answers from 16 different countries.

According to the results, 43% of the sector has never used patenting as a protection tool, which again confirms the phenomenon of "irrelevancy of patenting" to CCIs and the relatively low use of patenting in the sector, as demonstrated by the statistical analysis summarised above. Obviously, patenting is the least popular IP title, compared to other IP titles covered in this survey (copyright, design and trademarks).

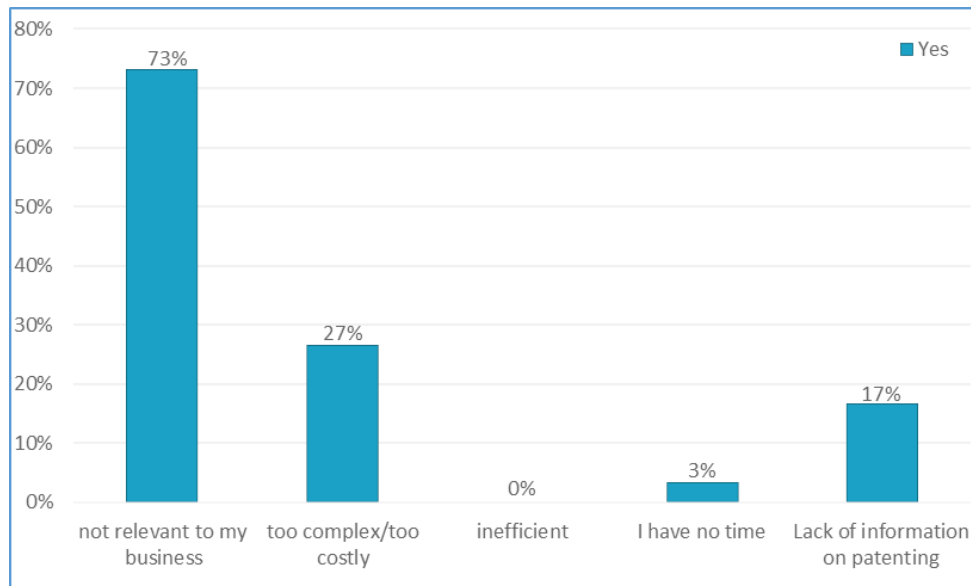
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<sup>4</sup> The EPO patent statistics can be accessed [here](#).



**Use of IP rights among the CCIIs**

Indeed, this relevancy issue becomes even more explicit when the reasons for non-patenting are asked of the survey participants:



**Reasons for non-patenting**

Considering the above figures, another point which must be contemplated is the high ratio of “no idea” in almost all IP titles and the significant share of respondents (17%) who stated that they lack information on patenting. From this, we conclude that there is a need for IP and patent training within the sector. And indeed, this is verbalised when a question on training need is asked:

### Training need on patenting

	Yes
<b>Individuals:</b> Do you need more information/training about patenting?	59%
<b>Intermediaries:</b> Do you think the companies in the CCI sector would need more information/training about patenting?	90%
<b>Individuals + Intermediaries:</b> Training need on patenting - TOTAL	69%

### Recommendations

In view of the findings of these three reports put together, the following main conclusions and recommendations can be drawn up to further support the innovation and invention capacity of the CCIs:

- there is a clear need for IP awareness within the sector as a whole,
- better coordination of innovation platforms should be ensured,
- new ways should be found to harness the use of IP as an asset,
- giving more visibility to IP success stories in the CCIs could create eagerness for the use of IP and patenting,
- more projects to develop and promote IP and to provide policy support within the CCIs could have a proliferation effect,
- adaptation of IP services to the specific needs of the CCIs could increase awareness and encourage the creatives to use the patenting and IP tools.

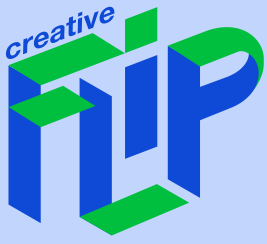
Seeing as the intensive use of patenting strongly contributes to the EU economy,<sup>5</sup> without any doubt, increasing the awareness of IP and patenting, and stimulating the use of patents in the CCIs businesses, will have a positive impact on the success and competitiveness of the European CCIs.

Although patenting is not a core activity for many CCIs businesses, the increasing use of novel technologies in the CCIs value chain through industry 4.0, and several examples of patenting in this field, demonstrate that patenting will gain more and more importance in the coming years. Therefore, carrying out more studies in this area, presenting good practices to inspire others, and providing training on IP and patenting to the actors of CCIs will all help to build up a more competitive creative business sphere in Europe. We hope that this study will pave the way to carry out more studies in this particular field and European CCIs will take a prominent position in innovation and patenting.

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<sup>5</sup> See the report: IPR-intensive industries and economic performance in the European Union. Industry-Level Analysis Report, by EPO and EUIPO, September 2019. Available [here](#).





Finance, Learning, Innovation and Patenting for CClIs

## ■ **REPORT - I**

# *STATE OF THE ART ANALYSIS*

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## LIST OF ABBREVIATIONS

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<b>AFD</b>	Agence Française de Développement (France) (French Development Agency)
<b>AI</b>	Artificial Intelligence
<b>APCI</b>	Agence pour la Promotion de la Création Industrielle (France) (Agency for Promotion of Industrial Creation)
<b>AR</b>	Augmented Reality
<b>CCIs</b>	Cultural and Creative Industries
<b>EC</b>	European Commission
<b>EESC</b>	European Economic and Social Committee
<b>EPC</b>	European Patent Convention
<b>EPO</b>	European Patent Office
<b>EU</b>	European Union
<b>EUIPO</b>	European Union Intellectual Property Office
<b>FIAC</b>	Foire Internationale d'Art Contemporain (International Fair of Contemporary Art)
<b>ICT</b>	Information and Communication Technologies
<b>INPI</b>	Institut National de la Propriété Intellectuelle (France) (National Intellectual Property Office)
<b>IP</b>	Intellectual Property
<b>IPC</b>	International Patent Classification
<b>MCIs</b>	Media and Content Industries
<b>NACE</b>	Nomenclature statistique des Activités économiques dans la Communauté Européenne (Statistical Nomenclature of Economic Activities in the European Community)
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>PCT</b>	Patent Cooperation Treaty
<b>R&amp;D</b>	Research and Development
<b>SME</b>	Small and Medium-sized Enterprise
<b>STS</b>	Specialised Technology Provider SMEs
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>WIPO</b>	World Intellectual Property Organization



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## STATE OF THE ART ANALYSIS

### 1. INTRODUCTION

#### *Defining the cultural and creative industries*

Due to its wide coverage, **the definition of the cultural and creative industries (CCIs) has been extensively discussed** in various countries. There is no exact Europe-wide description to identify these industries and no precise listing of the (sub-) sectors which are considered to be part of the CCIs. It is worth mentioning that there are also **national approaches** in which countries favour certain activities according to their traditions or cultural backgrounds driven by their specific economic motives.

For example, the UK, one of the strongest countries in the creative sectors,<sup>6</sup> defines CCIs in a broad sense as *“those industries which have their origin in individual creativity, skill and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property”* [3]. On the other hand, the Dutch Government, for instance, proposes a clustered definition consisting of three main groups (the arts, media and entertainment, and creative business services), and even defines the sector in a much more comprehensive manner as *“creative business sectors, whose considerable part of industry is not engaged in actual industrial production”* [49].

However, at EU scale, within the context of the European Programme “Creative Europe”, Article 2 of EU Regulation No 1295/2013 defines CCIs as ***“all sectors whose activities are based on cultural values and/or artistic and other creative expressions, whether those activities are market- or non-market-oriented, whatever the type of structure that carries them out, and irrespective of how that structure is financed”*** [4].

According to the Regulation, this definition includes a “non-exhaustive” delineation of CCIs as architecture, archives, libraries and museums, artistic crafts, audio-visual (including film, television, video games and multimedia), tangible and intangible cultural heritage, design, festivals, music, literature, performing arts, publishing, radio and visual arts.

Taking this description as a basis, reports and studies at EU scale generally base their research on this definition while restricting the focus on companies having a commercial goal. Such is the case, for example, of the 2015 European Commission (EC) report “Boosting the competitiveness of cultural and creative industries for growth and jobs” [5].

Therefore, the **patent-specific methodology** of this state-of-the-art analysis is based on the EU’s above CCIs definition, particularly when outlining this study’s **final delineation of CCIs sub-sectors**. Furthermore, this specific approach is also based on another reference document, namely “Mapping the Creative Value Chains” [6], **which suggests different “value chains”** for CCIs sub-sectors.

See the following “methodology” section for more detailed information on the specific methodology of this report.

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<sup>6</sup> See the report “Staying Ahead: The Economic Performance of the UK’s Creative Industries” by the Work Foundation, p.16, available [here](#).

### ***The phenomenon of patenting in CCI***

Seeing that the CCI activities as such, by nature, mainly consist of aesthetic creations, performing acts, and presentations of art and information, the contents of such activities -in general<sup>7</sup>- **do not fall in the scope of the definition of “invention” in the context of the European Patent Convention**, and therefore cannot be patentable.

This (over-) generalisation may cause an *illusion* of “exact non-relevance of patenting to CCI”, however it is worth noting that, as in other sectors, the sub-sectors of all creative industries have extensive value chains, and the **different elements in these chains include considerable innovative and inventive characteristics** which may be subject to patenting.<sup>8</sup>

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According to the Article 52 of the European Patent Convention, the following in particular shall not be regarded as inventions, and therefore cannot be patented:

- (a) discoveries, scientific theories and mathematical methods
  - (b) aesthetic creations
  - (c) schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers
  - (d) presentations of information
- 

From this perspective, and in order to carry out a more detailed patent-specific analysis in this study, technology/invention-oriented, non-exhaustive value chains have been developed, and the research has been carried out according to these value chains.

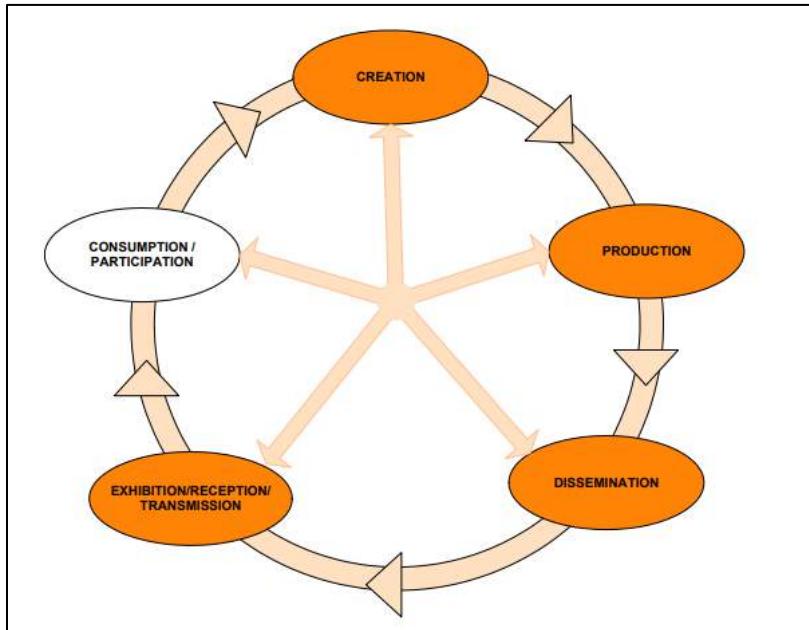
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<sup>7</sup> There definitely are some CCI sub-sectors, whose core activities directly concern inventive technologies, thus subject to patenting. A good example for such sub-sectors is “software and games” [2]. Media and content industries in general, architecture (not mere design), and fashion are also other examples of CCI sub-sectors that have direct relevance to patenting activities. Please see the related parts of this report for the patenting specificities of these and other sub-sectors.

<sup>8</sup> In literature, there are also examples of “CCI patents” sourcing from projects on creative industries but they generally serve a purely utilitarian purpose, e.g. the patent of the artist and musician Max Neuhaus for the development of sirens for emergency vehicles [9].

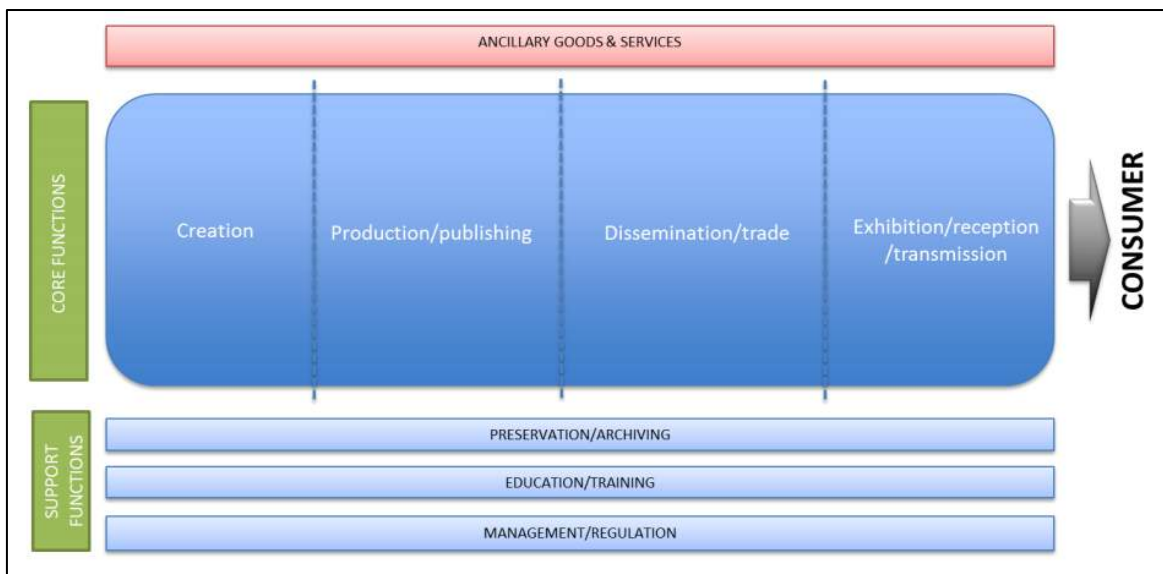
**Defining the value chains**

The following figure shows a model (“culture cycle”) defined by UNESCO<sup>9</sup> to represent all of the different phases of the creation, production, and dissemination of culture [50], which is a basis of similar value chains for all CCI sub-sectors:



**Figure 1: “Culture cycle” defined by UNESCO**

Taking this general value chain structure into account, the EC report “Mapping the Creative Value Chains” [6] suggests the following stylised creative value chain model which clearly differentiates the core activities of a sector from its support/ancillary functions.



**Figure 2: Creative value chain model (stylised)**

<sup>9</sup> Contrary to the general linear presentation of value chains, UNESCO consciously chose a (cycle) network form to draw attention to the interconnections between these activities, often associated with new technologies [6].

Because a state-of-the-art analysis would not be sufficiently comprehensive without considering such value chains (including support functions as above), **different support (ancillary) activities of the value chains of each sub-sector have been included in this study** in order to **extend its coverage, define the various actors involved, and to understand where the innovation in each sub-sector might be rooted**, in case it is not directly related to the core activities of that sub-sector.

However, since this state-of-the-art analysis focuses on the patenting (and thus inventive) activities of CCIs as mentioned above, **a modified and simplified value chain model** has been developed that blends different examples in the literature. This model, which is **specific to this study**, is used when defining the value chains in each sub-sector.

### ***The inception***

This state-of-the-art analysis is designed to understand the structure of the possible inventive activities in the different parts of the CCIs value chains with an exclusive focus on patenting.

With the definition suggested by the EU regulation No 1295/2013 [4], and considering the value chain structure suggested by the “Mapping the Creative Value Chains” [6], this report synthesises information in the state-of-the-art for the following sub-sectors:

1. Advertising
2. Architecture
3. Design
4. Crafts
5. Visual Arts
6. Media and content industries (radio & TV, software & games, video & film, music, and books & press)
7. Performing arts
8. Cultural heritage
9. Fashion

## 2. METHODOLOGY

This study is aimed at **identifying the patent practices of CCI in literature**. Statistical data analysis and full patent searches are not intended in the scope of this state-of-the-art study, as this specific research has been made within the scope of the Report-II “Statistical Analysis/Patent Mapping of CCIs”.

The four main principles behind the methodology of this state-of-the-art analysis are:

1. introductory activities –as explained in the previous section:
  - a. **defining the CCIs delineation** to be followed in this report by scanning the related literature;
  - b. **identification of each sub-sector** and specification of the related NACE codes, thus allowing for consistency with the forthcoming statistical analysis;<sup>10</sup>
  - c. **developing a simplified value chain** for each sub-sector to detect the sources of “inventiveness”;
2. **conducting keyword searches in literature** based on the concepts of CCIs and patenting to define the innovation characteristics and patenting practices of each sub-sector, and catch the related documents;
3. **compiling and analysing the findings**; and
4. finally, in order to materialise the outcomes and inspire the CCIs, several **interviews and case studies** are also presented within the contents of this report.

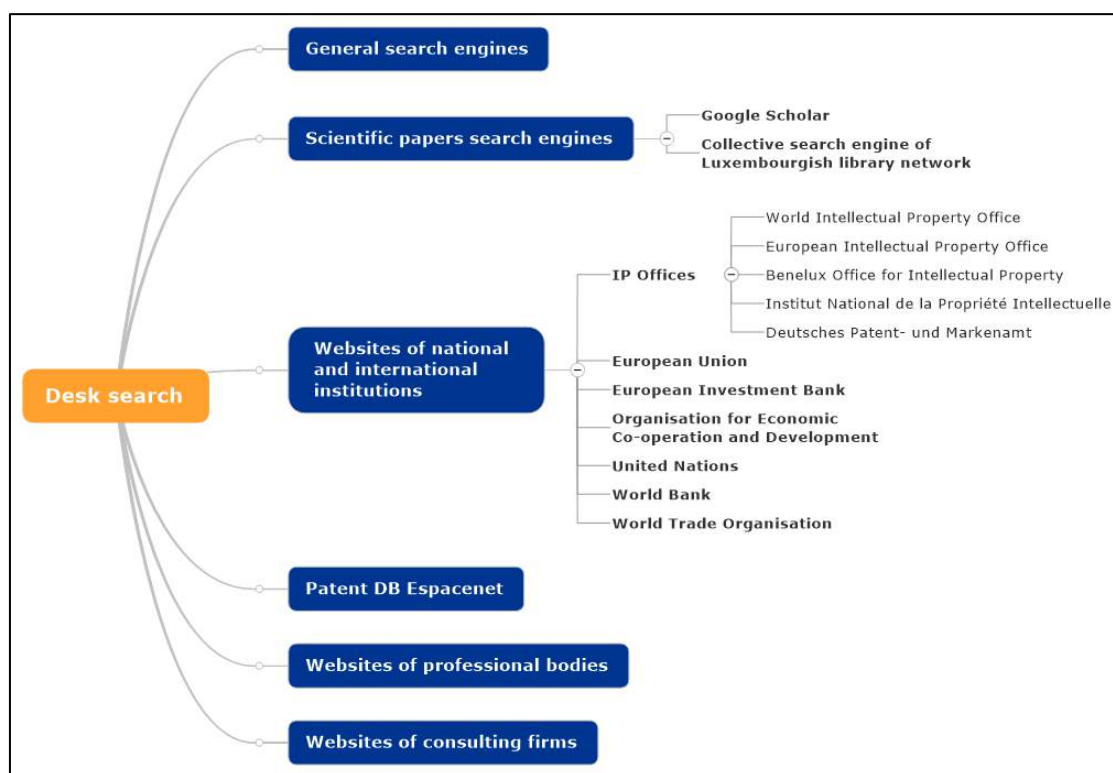


Figure 3: General Mindmap diagram of the state-of-the-art search methodology

<sup>10</sup> The full mapping of the sub-sector definitions vs. NACE codes can be found in Annex I.

### ***The search strategy in the study***

The search has been carried out in two parts: (1) initial research to catch the main sources of information specific to the CCIs. On the basis of the results, we drew the framework of the second search, (2) a broader search to access useable information for the analysis.

The following types of sources have been utilised when conducting searches:

- Generalist search engines and search engines for scientific articles (e.g. Google, Google Scholar);
- Generalist scientific databases (e.g. Springer, Oxford University Press Journals Collection);
- Databases in the Humanities and Social Sciences (e.g. Erudit);
- Scientific databases-oriented Arts or Arts and Techniques (e.g. ART Bibliography Modern, Oxford Art online);
- Websites of international IP organisations (e.g. WIPO, EUIPO, EPO);
- Websites of international organisations that finance studies of an economic or statistical nature (e.g. EC, OECD, World Bank); and
- Technical or technological trend reports from the main consulting firms (e.g. McKinsey, EY, PwC).

**The initial research** revealed a certain number of examples, mainly from the World Intellectual Property Organization (WIPO), which attest to the use of patents by cultural or creative companies. However, only brief and often general information could be extracted from these documents. Moreover, the few articles available on the subject proved to be imprecise and/or incomplete.

**A second search** was then undertaken by broadening the initial search criteria along two axes. On the one hand, on a thematic axis, the concept of “patent” was broadened to the concept of “technical or technological innovation.”<sup>11</sup> On the other hand, on a linguistic axis, the search was extended to French documents as French is one of the most widely spoken languages in the CCIs (e.g. in design, fashion, performance arts, etc.).

This second research made it possible to gather a corpus of documents that establish and detail the innovation practices of the sector. In the end, the results of this research highlighted the global phenomenon of “digitisation” of the industry, which becomes evident in the value chains of each sub-sector. Thus, this second search was also utilised as a double-check mechanism for the simplified value chains and allowed us to fine-tune the structure of the core and ancillary functions within them.

In cases where the results of the second search did not comprehensively mention any significant patent documents and/or innovation (or did so in a quasi-anecdotal manner), additional targeted and complementary searches were carried out on the Espacenet database.<sup>12</sup> Such searches were performed in order to give an overall idea of the innovations patented by the main players in the sector. Further analysis is made in the statistical part of the report.

However, as already stated, this state-of-the-art analysis neither aims to list the patent documents in the CCIs nor to provide a statistical outlook on the patent practices of the sector. The purpose of this study is to provide general information on where technical innovation characteristics are located in the sector, and to show the integration of innovation and patenting activities in CCIs practices.

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<sup>11</sup> A patent is indeed a means of protecting the results of research and technical inventions. Thus, taking an interest in cultural and creative enterprises that patent also means taking an interest in the technical or technological innovation capacities of enterprises in this sector.

<sup>12</sup> The patent searching and information database of the European Patent Office (EPO).

### 3. ADVERTISING SUB-SECTOR

#### 3.1. Sub-sector definition and its value chain

In reference to the report on “Boosting the competitiveness of cultural and creative industries for growth and jobs” [5], the advertising sub-sector is characterised/composed by the following activities:

- Public relations and communication services (NACE 70.21);
- Advertising agencies (NACE 73.11); and
- Media representation (NACE 73.12).

It is commonly considered that the production of radio and TV advertising is not a part of the advertising sub-sector as defined in the CCIs context, but rather falls into the “Radio and TV broadcasting” sub-sector.

The core functions of the value chain of the advertising sub-sector include production operations together with distribution and exhibition infrastructures to disseminate the products that are directly attached to the production chain. There are ancillary functions providing technical support to serve these two core chains with technical equipment. The sector’s production supply is generally triggered by the demands of the clients.

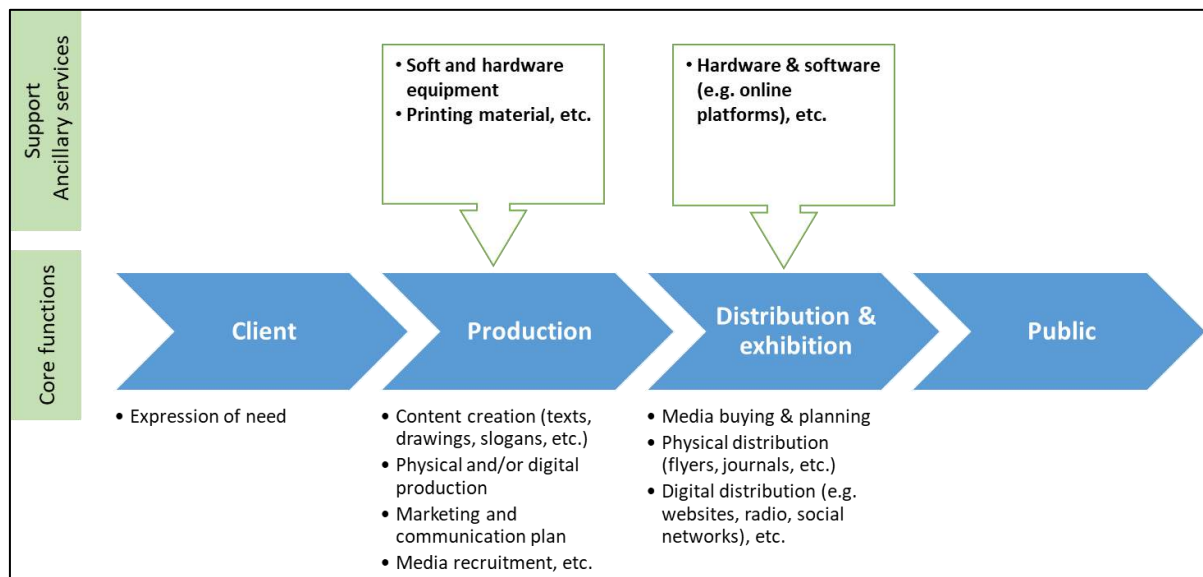


Figure 4: Simplified value chain of the advertising sub-sector

#### 3.2. Innovation characteristics of the sub-sector

Innovation in the advertising industry is primarily a service innovation [10] and not a product or a process innovation. Indeed, the European Patent Convention (EPC) clearly excludes the “presentation of information” from patentability (EPC Art.52/d). As a result, companies’ innovation efforts are mainly focused on innovative service concepts that are unlikely to be patentable.

As we can see from the advertising sub-sector value chain, the technical innovations used by its actors are not produced by them. The innovations used in the industry are products acquired from specialised developers/suppliers.



Even if not directly involved in the innovation process, the actors in the advertising field might have an influence on technical developments, providing feedback on the existing technical solutions for their improvement, some needed requirements and specifications for the development of new solutions, etc. As such, they can be involved in the innovation processes linked to ancillary tools used in their activity and be recognised as co-inventors and/or co-assignees in patent applications.

It should also be noted that since the democratisation of the Internet and the widespread digitisation of traditional media, the sector's value chain has undergone a radical transformation from its traditional business model: the sector has seen the emergence and then the devouring growth of technology industry giants such as Google or Facebook. These companies, owners of platforms with a huge audience, have developed a particularly lucrative business model based on the sale of advertising spaces, in direct competition with the advertising agencies of traditional media and their historical distribution channels (television, radio, newspapers).

With the massive and gradual switch of advertisers (and consumers) to the Internet, the traditional media have globally adapted to offer digital versions of their content, and new purely digital media have thus appeared. At the same time, the advertising agencies associated with the historical media have also adapted to offer advertising inserts on the platforms under their control, and they are now offering advertising campaigns that are primarily web-based.

We can see that innovation in the advertising industry is not key in the sub-sector but is generally related to tools and/or devices used by actors from the field.

For example, although digitisation is a significant feature of the advertising sub-sector, the development of non-ICT-related technical inventions (e.g. billboards) is also a reality (in distribution and exhibition chains), albeit not well documented.

A second example, from Kane [11], reports the history of the synthetic fluorescent pigment “Day-Glo” that is able to “glow” in broad daylight. The Switzers Brothers, inventors of this pigment, found significant outlets for their product in the field of graphic arts in general and advertising posters in particular.

According to the advertising sub-sector value chain, the companies that develop and sell such products could be considered as providers of **ancillary goods and services**. Moreover, this type of company, as in the case of Day-Glo, can serve more than one creative market (advertising, textile, graphic arts, etc.).

### 3.3. Patenting practices in literature

The literature review shows that the development of technological solutions and the exploitation of these inventions in this sector are of primary importance and actors in the advertising sub-sector make extensive use of the new technological tools (which may be patentable) developed by the technology companies. For example, technology companies that develop advertising tools for e-platforms (audience measurement, advertising placements, audience targeting...) are commonly used by advertising professionals offering web-oriented services.

Regarding advertising agencies, a 2011 WIPO study on the management of IP rights in the advertising industry [12] highlights that in the sub-sector, the patent system is seen as **complex, lacking transparency and requiring skills that companies do not have, including legal assistance, which is considered costly**. It also points out that advertising agencies can develop proprietary technologies that can be kept as trade secrets. Indeed, the agencies' development teams have the capacity, by nature, to develop technical solutions to technical problems.

Consequently, although there is not much information in the literature about patenting activities in the European advertising sub-sector itself, there are several patenting examples in the advertising value chain and especially in the area of distribution and exhibition of advertisements. In parallel to this finding, WIPO notes that **companies in the sector rarely patent**, and when they do, the patents relate to the field of **advertising technology or software** and tend to occur in the United States [12].

## 4. ARCHITECTURE SUB-SECTOR

### 4.1. Sub-sector definition and its value chain

In reference to the report “Boosting the competitiveness of cultural and creative industries for growth and jobs” [5], the architecture sub-sector is identified in the NACE classification as NACE 71.11 related to Architectural activities.

With respect to the value chain of the sector, the document “Mapping the Creative Value Chains” [6] does not provide any for the architecture sub-sector. Furthermore, **architecture appears as an activity of the construction sector rather than as an individual standalone sector**. It is nevertheless possible to identify a simplified value chain for this sub-sector as below:

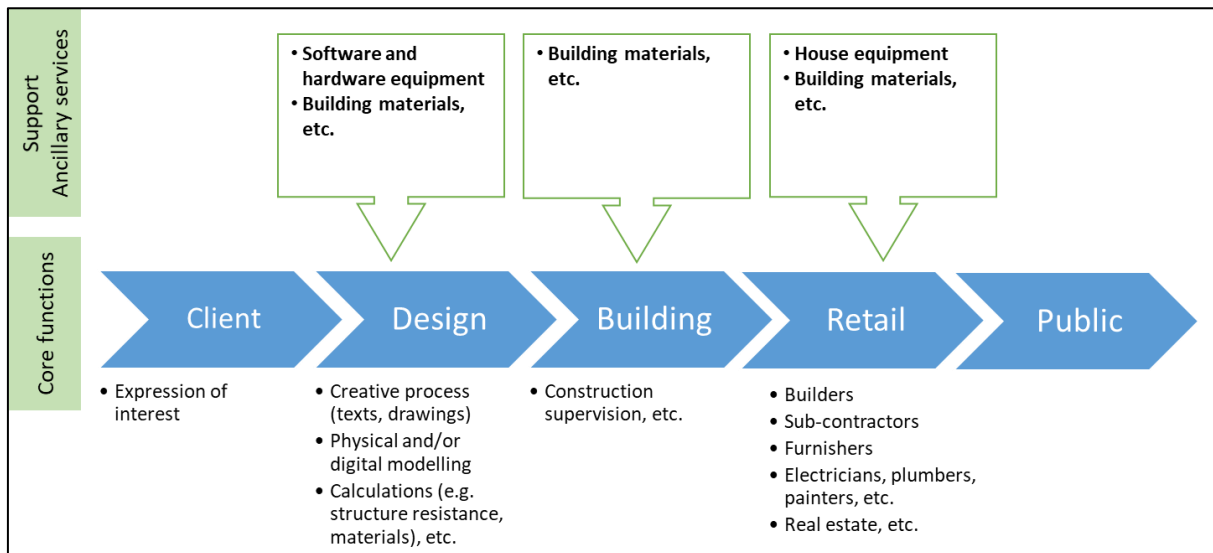


Figure 5: Simplified value chain of the architecture sub-sector

The technical invention lies generally in the support services of this sector, therefore patents are expected to be sourced in the ancillary services such as in software and hardware equipment,<sup>13</sup> materials and retail equipment. The core activity of this sector (architectural design) is more aesthetic than technical. Thus, in terms of IP protection, the patent title does not apply, but rather that of “design” (or “industrial design” in some national legislations).<sup>14</sup>

<sup>13</sup> Software (computer programs), as such, are excluded from patentability. However, there are specific conditions on software patents (“computer-implemented inventions” as in the terminology of the European Patent Office). For more information about this topic, please refer to EPO’s dedicated pages [here](#).

<sup>14</sup> Designs (or industrial designs) protect the visual appearance of products (i.e. not technical inventions as in patenting). Apart from national protection procedures of design, there is an EU-wide protection route, namely “Community Design” managed by the EUIPO based in Alicante, Spain. More information on Community designs is available [here](#).

## 4.2. Innovation characteristics of the sub-sector

Historically, the field has seen a movement towards **industrial rationalisation**, with as main objective to **reduce the manufacturing costs** of a building and its sub-systems. This movement has led in particular to the **development of innovative manufacturing processes, including patented ones**, in the various technical fields of construction.

Starting from the 21<sup>st</sup> century, research activities began to play a major role in structuring the innovative characteristics of the sector. Aksamija [14], who wrote a book specifically focused on **technical innovation in architectural projects in the United States**, highlights that, in practice, **research has become an integral component of the architectural design practices of the most innovative architectural firms**. The purpose of the research in this sub-sector consists essentially in evaluating and comparing (benchmarking) the new concepts of architecture or construction. Such research is particularly driven by the overriding concern of the contemporary architect, namely, satisfying the traditional expectations of speed of delivery and profitability while taking into account new **technical and ethical challenges** (such as **energy efficiency**).

The very same challenges also provide new specifications for **technical or technological innovations proposed by innovative companies** in the field of construction. Those innovations can relate to all sub-systems that make up buildings (facade, lighting, ventilation, etc.), the architectural design itself, or the planning and management of the worksite, for example: intelligent, reactive or sensitive materials, building information management, simulation or digital manufacturing technologies, building automation systems or even robotisation of worksites, etc.

However, Aksamija [14] specifies that integration of research and innovation concerns a particular profile of architectural firms: the author speaks of **idea-driven firms** that generally work on unique projects whose innovative aspects, and the associated additional costs, are desired and financed by the client. This type of firm differs from the service-oriented businesses which generally apply catalogue-based construction solutions.

Berthier [15] clarifies the role of a **contemporary architect as an innovator**. Confirming the role of the architect as an experimenter, he emphasises that the architects studied in the framework of his thesis (centred on the wood sector) seek to distinguish themselves by **betting on an outsider material**. They will then seek to demonstrate the qualities of the material, through experimental work, in order to compete with masonry or steel construction materials.

In his study, Berthier also underlines the importance of the technological possibilities offered to **architects** that allow them to use a range of digital tools during the process of creation.

In summary, the literature shows that contemporary **architecture is a particularly favourable ground for technical innovation** and that some architectural firms involve themselves in advanced research and innovation projects.

## 4.3. Patenting practices in literature

The profession of architect is a liberal profession and as such has **a special relationship to profit**.

At European level, the European Economic and Social Committee (EESC) proposes a unified definition of the concept of liberal profession [16] and more specifically of the relationship of this profession to profit:

*“A liberal profession is characterised by: provision of a valuable intangible service that is distinctly intellectual in nature, based on advanced (academic) training; a service that is in the public interest;*

*substantive and economic independence in executing tasks; provision of services in a personal capacity, on the provider's own responsibility and in a professionally independent manner; a particular relationship of trust between the client and the service provider; a focus on providing the best possible service rather than on maximising profit; and compliance with precise, strict professional regulations and codes of professional ethics.”*

Moreover, in some European countries, the profession of architect is regulated, i.e. it must be carried out according to a code of conduct (deontology) defined by the representatives of the profession. For example, in Luxembourg, “the practice of the profession of architect and consulting engineer in a self-employed capacity is **incompatible with any commercial activity.**”<sup>15</sup>

At first glance, such provisions might seem to discourage architects from filing patents and/or exploiting patented innovations, but there are codes of conduct specific to the architectural profession in some Member States which explicitly mention patents, and make it possible for architect-inventors to derive some form of remuneration from them. For example, the French code stipulates that remuneration of architects practising as liberals may also take the form of “fees or royalties, in the case of exploitation of a standard model or a patent of invention.”<sup>16</sup> The Luxembourgish and the Belgian codes are even more precise, stating: “**Architects and consulting engineers<sup>17</sup> who develop new techniques or processes may have them protected by patents or other legal means. They are authorised to collaborate in the exploitation of these patents and rights, provided that these rights are not of such a nature as to jeopardise their independence.**”<sup>18</sup>

In the literature, it is possible to see some examples of several patented inventions whose inventors are architects. For instance, the Preflex beam invented and patented by Lipski in 1938 (BE) and 1941 (US), a pre-bent high-strength steel beam with the lower part cast in concrete [13].

A question arises as to whether it is in the interest of an architect to be an inventor or an owner in terms of remuneration.

In our study, two cases have been found:

- **Some architectural firms are applicants**, which would suggest that they would consider either licensing or assigning the patent in its entirety to third parties; and
- **Some architects are inventors while the applicant is a company**, which would suggest that the architect has waived the rights to exploit the patent in exchange for some form of compensation.

Concerning the overall patenting activities in architecture, Berthier [15] points out that “**patents for inventions are rather rare in the field of architecture.**”

However, this does not mean that there is a shortage of examples of patent applications filed by architects. The following table shows the number of patent applications in which some **famous architects** are inventors (or co-inventors) or applicants.

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<sup>15</sup> Règlement grand-ducal du 17 juin 1992 déterminant la déontologie des architectes et des ingénieurs-conseils. The regulation can be found [here](#).

<sup>16</sup> Décret n°80-217 du 20 mars 1980 portant code des devoirs professionnels des architectes. The regulation can be found [here](#).

<sup>17</sup> Consulting engineers are mentioned in the Luxembourgish code only.

<sup>18</sup> 18 avril 1985. - Ordre des architectes. - Règlement de déontologie. The regulation can be found [here](#).

Table 1: Patent applications of some famous architects

Architect	Date (earliest priority)	Applicants (companies)	Number of applications
Jean Prouvé	1929-1967	<ul style="list-style-type: none"> <li>Société Anonyme Des Ateliers Jean Prouvé</li> <li>Les Techniques Jean Prouvé</li> </ul>	31
Herzog & de Meuron	2001	<ul style="list-style-type: none"> <li>Herzog &amp; De Meuron Architekten AG</li> </ul>	1
Norman Foster	2003	<ul style="list-style-type: none"> <li>Art Andersen AS</li> <li>Foster and Partners</li> </ul>	1
Jean Nouvel	1970-2012	<ul style="list-style-type: none"> <li>Coopsette Societa Cooperativa</li> <li>Feliu de la Penya SLJ</li> <li>Grupo Luxiona SL</li> <li>Artemide SPA</li> <li>Luceplan SPA</li> <li>Molteni &amp; C</li> </ul>	8 <sup>19</sup>

The following figure shows the screenshot of an excerpt from the results of a sample patent search for applications filed by architects in selected countries during the past decade.

**Result list**

Select all (0/25) Compact Export (CSV | XLS) Download covers Print

Approximately 99 results found in the Worldwide database for:  
 IT or ES or PT or FR or DE or AT or GB or BE or LU or NL as the publication number AND 2010:2020 as the publication date AND  
 architect\* OR architek\* OR archit\* OR arquitect\* OR arquitet\* as the applicant AND E04 OR E06 as the IPC classification

Sort by Publication date Sort order Descending Sort

1. DOUBLE HOSPITALIZATION ROOM (Machine-translation by Google Translate, not legally binding)

Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
MARTINEZ GONZÁLEZ PATRICIO [ES] TORRUELLA CASTEL MAXIMIA [ES] (+4)	PATRICIO MARTINEZ MAXIMIA TORRUELLA ARQUITECTURA S L [ES]		A61G10/00 A61G12/00 E04H3/08	ES1239514 (U) 2020-01-16	2019-10-16

2. an assembly type building wall joint device

Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
WEI JING [CN]	JIANGSU VOCATIONAL INST ARCHITECTURAL TECH [CN]		E04B2/00	NL2023016 (A) 2019-10-31	2018-04-27

3. PAVIMENTO PERMEABLE DRENANTE

Figure 6: Screenshot from a sample patent search

<sup>19</sup> Three applications are exclusively on architecture. The others are mostly related to lighting devices; some could be assimilated to design or interior decoration. Two applications are patent applications, the others are utility model applications.

## A STORY BEHIND THE SUCCESS

*in architecture*



***Raymond Mattioli, R&D Director of Solarafi, a Luxembourgish firm in the construction industry, explains to us his story in patenting as an inventor.***

*“The patenting process may take some time, but in my case, that has given me sufficient time to develop partnerships and mature a sound business strategy to bring my invention into the market.”*

**Raymond, could you first introduce yourself and your story with patenting?**

I am 56 years old and was always passionate about innovation. My first patent was about a windmill, but I was not able to push the development further as an individual. At that time, I created my company, SOLARAFI, in order to host the patent. I continued developing products and solutions, and I have made two inventions for life protection in the domain of high voltage distribution lines. My last patent is about an eco-modular construction system.

**Actually, we have identified you with this patent. Can you give us some more information about this eco-modular construction system? What makes it different?**

My invention, namely FIBS -Fast Interlocking Building System-, consists of handy wooden building blocks that can be easily assembled to build walls and complete rooms and buildings. The building blocks are sturdily held together by the patented FIBS-key system. One great advantage is the reusability of the building blocks. That contributes to a large reduction of waste in the construction sector and is an improvement towards the circular economy life cycle of construction materials. The use of wood as a renewable material makes it a very ecological system.



FIBS building blocks are designed to be easily assembled by everyone, in order to make construction more user-friendly.

**That sounds really impressive and very useful, especially in this era of eco-friendly products. Then, getting back to patents, we want to ask about your motivation to apply for a patent for this invention – why did you want to get a patent? What is your patenting strategy, and what steps did you take in the commercialisation of your patent?**

Patenting is an efficient way to protect industrial property. The process may take some time, but in my case, that has given me sufficient time to develop partnerships and mature a sound business strategy to bring my invention to the market. Later on, when the product is successful in the market, it gives a good safety from copying.



Collaboration with a good patent lawyer is key in the patenting process. But before all else, you have to make a deep technical research of the market and the existing technologies, throughout the internet and the patent databases such as the European Patent Office's Espacenet. Because it is essential to have a good knowledge of the technological environment and of who the competitors are.

The commercialisation strategy depends on several criteria. Assignment and licensing have some advantages since you do not need too many financial resources for marketing. For the FIBS, after I decided that it is a promising product in the market, I picked the right time and started looking for some business partners in order to get the necessary financial resources.

**Do you think it's worth it in the end? What are the positive outcomes of patent/intellectual property protection in your case?**

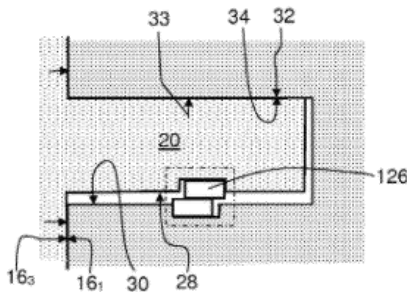
I have been able to sell two of my patents. So, yes, I am convinced that patenting provides vital assurance against infringement, and gives inventors different possibilities to bring their invention into the market.

**We would like to ask, lastly, your recommendations for businesses regarding patenting and IP.**

I believe that, especially in today's global economy, it is mandatory to have strong IP protection for creative and inventive businesses. Not every idea must find its way to a patent, but strategically essential improvements should be patented, unless you protect your innovation through trade secrets like Coca-Cola does. For inventions, which can be, for example, reverse engineered, patenting is a very efficient tool to keep your business and innovation safe against infringers.



**FIBS: A NOVEL SOLUTION FOR ECO-FRIENDLY MODULAR CONSTRUCTIONS**



The [patent application](#) number WO 2019/038268 "Construction system with construction elements that can be assembled by means of tongues and grooves", filed by Solarafi Luxembourg, explains a modular building system that can be assembled using OSB and ESB panels to form a joint at combined surfaces.

This ingenious new system allows the construction of walls and partitions of offices to easily create a space to work and perform renovations. Unlike competing construction systems, the FIBS Building System allows the reuse of its components, and thus brings an environmentally friendly approach to the domain of architecture.





## 5. DESIGN SUB-SECTOR

### 5.1. Sub-sector definition and its value chain

The report on “Boosting the competitiveness of cultural and creative industries for growth and jobs” [5] defines the design sub-sector under the NACE code M74.10 for specialised design activities.

The design sub-sector has its own specificities as **it is interrelated with many other sectors, and therefore it appears as an activity covered by many different value chains**, all of which have in common the production of physical objects (automotive, furniture, fashion, sports and outdoor equipment, perfumery (perfume bottles), household appliances, hardware etc.).

**This section will thus be limited to the state-of-the-art analysis of the innovations developed by the designers themselves**, i.e. excluding innovations developed within the framework of the other related value chains.

A simplified value chain of this sub-sector can be visualised as below. As in the architecture sub-sector, the core activity of this sector (simply “design”) relates more to design protection, as explained in the following section.

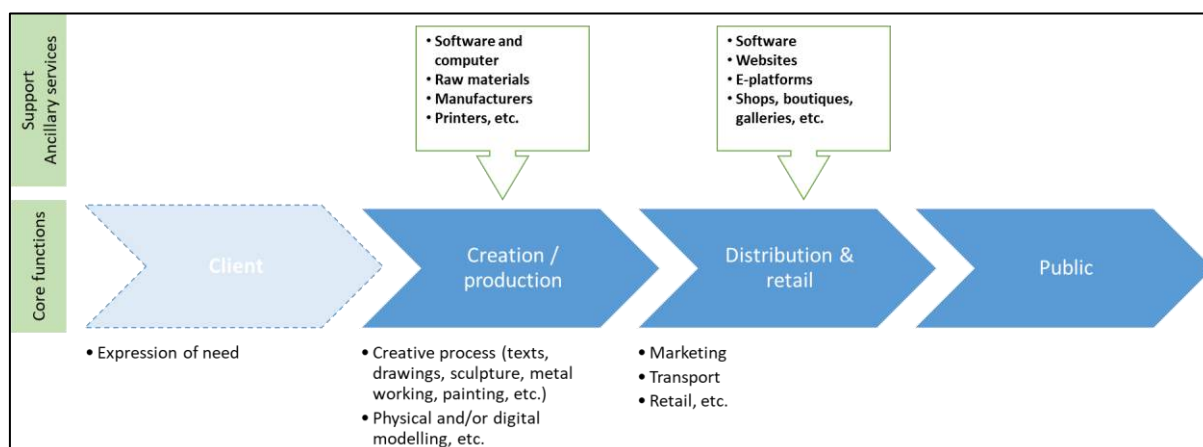


Figure 7: Simplified value chain of the design sub-sector

### 5.2. Innovation characteristics of the sub-sector

Because of its highly integrated character with the other sectors, it is not fully possible to isolate the design sub-sector and analyse its standalone innovation characteristics without considering the other industries.

On the other hand, the design sub-sector has its own typical IP protection, namely “design” (industrial design or design patent, depending on the legislation). As designs protect the aesthetic features of a product – not the technical invention and/or the solution itself – “inventiveness/inventive step” is not a requirement for design protection. However, the two main conditions for design protection, “novelty and individuality (originality),” establish a definition of “innovation” that is exclusive to designs.

In terms of the innovation activities for the design sub-sector around patents, the French National Intellectual Property Institute (INPI)’s **study which specifically focuses on patenting practices among designers** [52] must not be neglected. This study, published in 2011, was carried out on the basis of a quantitative questionnaire survey, interviews with designers, the use of the Espacenet patent database and expert contributions from INPI, APCI (an association in France for the promotion of design) and AFD

(French Agency for Development). In particular, the survey took the form of a questionnaire sent to members of three French professional associations of designers: APCI, AFD and *Designers Interactifs*.

The study distinguishes between two types of design activities: **design agencies** that work as subcontractors for other companies and **manufacturing companies** that have a design department. The questionnaire received 167 responses from design agencies and 62 responses from other types of companies.

According to the results, **20% of the design agencies have filed a patent**, alone or in collaboration with a third party. This reflects a **minority but possibly not a marginal practice** among all respondents.

Moreover, **28% of agencies claim to have contributed to the filing of a patent by their clients**. However, for more than half of them, their designers are not mentioned as inventors in the patent.

The clients of design agencies that have filed a patent with the assistance of the agency's designers have done so mainly in the following sectors:

- **Industrial capital goods, machines, tools;**
- **Decoration, furniture, furnishings;**
- **Sports/outdoor articles; and**
- **Medical devices.**

On the side of manufacturing companies, 47% of the respondents claim that designers have had a major role in at least one patent application in the five years preceding the survey. For 8% of respondents, designers have had a major role in almost all patent applications. **So, designers intervene to propose original technical solutions, notably by their reflection on the function or use of a product.**

### 5.3. Patenting practices in literature

In practice, the above INPI study highlights that designers can become inventors or co-inventors of patentable inventions, if their intervention in the project allows them **to participate in the resolution of technical problems**, in particular **problems related to product use**.

Conversely, the report underlines that when designers are asked to intervene too far upstream (concepts) or too far downstream (product covering) in the process of creating an object, they are *de facto* excluded from work aiming at providing solutions to technical problems related to object design.

On the agency side, **the majority of respondents file patents related to their own R&D work rather than for work initiated for a client**. 79% of agencies say that they are satisfied with the outcome of the operation. From the point of view of contractual relations with their clients, half of the respondents do not address patent in contracts that bind them to their clients.

Generally speaking, **co-applications are in the minority**, both on the agency and corporate sides. Finally, a little more than 60% of respondents, both agencies and companies, believe that knowledge of patents is important for their profession, but **only 33% of them consider that designers have satisfactory knowledge in this area**.

In addition to the INPI study, Agfa's Industrial Printing Business Unit [17] offers **feedback on patent filing in the framework of co-inventions**, i.e. inventions developed with third parties.

The Industrial Printing Business Unit specialises in the development of inks for printing on manufactured products. This includes **decorative printing** on all types of materials such as glass, wood, textiles, etc.

From this point of view, the business unit can be considered as implementing skills in the field of design and engineering, but it is also present, as a supplier, in the value chain of other creative sectors such as interior decoration or textile manufacturing.

Agfa distinguishes between two types of co-creation in a b2b context:

- Co-inventions developed with a customer (e.g. a manufacturer of decorative laminates); and
- Co-inventions developed with a partner that is not the final customer (e.g. a bottling line manufacturer whose customer is a food manufacturer; in such a case Agfa could intervene to integrate a decorative glass printing solution into the bottling line).

As shown in the table below, Agfa warns about the factors that can lead to collaboration failure and recommends solutions to prevent such failures:

**Table 2: Agfa’s failure factors and recommendations**

Failure factor	Recommendation
<b>Misinterpreting the intentions of the client or partner</b>	Find out about the client or partner, including their level of IP knowledge (e.g. have they already filed patents?).
<b>An over-enthusiastic management that underestimates failure risks related to the co-creation<sup>20</sup></b>	<ul style="list-style-type: none"> <li>• Asking for an <b>IP specialist’s</b> critical view on the project.</li> <li>• Taking the time needed to clarify and draft <b>contractual terms of collaboration</b>.</li> <li>• Specifying exactly <b>co-creators’ rights</b> on the invention (licence, exploitation, etc.).</li> </ul>
<b>Making mistakes about how patent is appropriated</b>	<ul style="list-style-type: none"> <li>• <b>Avoiding co-filing:</b> patent must belong to one company and one company only.</li> <li>• Prefer patent ownership by the company specialised in the technical field (rather than ownership by the “inventor” company).<sup>21</sup></li> </ul>
<b>Lack of team spirit</b>	<ul style="list-style-type: none"> <li>• <b>Collaboration must be sincere and the parties should be keen on sharing information.</b> Final quality of patent is at stake, particularly by minimising risks of incomplete technical or administrative information of patent applications, poorly written contents or content based on poor decisions.</li> <li>• <b>IP strategy</b> (including ownership arrangements) must be clear and fair: the partner who would waive the ownership of the patent should benefit from the collaboration.</li> </ul>

<sup>20</sup> According to the author, 90% of co-invention projects fail.

<sup>21</sup> The author is not explicit on this point and seems to mean that the company with technical expertise should prevail over the company employing the inventor – and that these may differ. Indeed, engineers or designers from two companies working on the same project may share a common background, close technical skills that make them capable of adapting (learning, understanding) to their partner’s field. It therefore seems realistic to think that an engineer or a designer from company A could be inventive on a problem whose solution would mainly fall within the expertise of the partner company B.

- In addition, the partner waiving ownership of the patent should also ensure **freedom to exploit** the invention for its own benefit.
- **Avoiding conflicts of interest.**

In addition, Agfa points out that insofar as the above-mentioned pitfalls can be avoided, a **co-invention context constitutes a real advantage for filing a patent** in that:

- Co-writing a patent is an “excellence factor” in terms of content and claims quality;
- The ability to cope with project difficulties is strengthened; and
- Generally speaking, the inventive capacity of an inter-company team seems to be much higher. In particular, people involved are stimulated by a context where stakes for the partner companies are high, where work carried out involves the acquisition of new knowledge, development of new skills, a break with routine and public recognition prospect (awards).

A basic search on famous designers who have filed patent applications shows that there are inventions protected by such designers. Most of the designers listed below are registered as applicants, thus they own(ed) related inventions while some of them are only registered as inventors. This may demonstrate that awareness of patenting is not so low among famous designers, possibly because of the motivation to protect themselves against infringers.

The following is a short and non-exhaustive list of renowned designers who have applied for patents.<sup>22</sup>

- |                                   |                                  |                                  |
|-----------------------------------|----------------------------------|----------------------------------|
| • Achille Castiglioni (applicant) | • Jaime Hayon (applicant)        | • Mathieu Lehanneur (applicant)  |
| • Andrée Putman (applicant)       | • Jasper Morrison (inventor)     | • Naoto Fukasawa (applicant)     |
| • Antonio Citterio (applicant)    | • Jean-Marie Massaud (applicant) | • Ora-ïto (inventor)             |
| • Bruno Munari (applicant)        | • Joe Colombo (inventor)         | • Philippe Starck (applicant)    |
| • Charles Eames (inventor)        | • Karim Rashid (applicant)       | • Pierre Guariche (applicant)    |
| • Constance Guisset (applicant)   | • Konstantin Grcic (inventor)    | • Ron Arad (applicant)           |
| • Eero Saarinen (inventor)        | • Marc Newson (applicant)        | • Ross Lovegrove (applicant)     |
| • Ettore Sottsass (inventor)      | • Marcel Wanders (inventor)      | • Verner Panton (applicant)      |
| • Ingo Maurer (applicant)         | • Marco Zanuso (inventor)        | • Yves Béhar (applicant)         |
|                                   | • Matali Crasset (applicant)     | • Yves Saint Laurent (applicant) |

<sup>22</sup> Including utility models.

## A STORY BEHIND THE SUCCESS

*in design*



***Riccardo Lucatello, from the Italian SME Reflex SpA, shares his experiences in innovative design and patenting.***

*“Excellence and innovation are in fact the results of long studies, intense work, various attempts and numerous tests, all of which must be protected and recognised. Thus, I believe that patenting is very important in all sectors.”*

**Riccardo, first of all, we would like to thank you for accepting our interview request. Now, let’s start with your company: Can you tell us a bit about your business and your experience with IP?**

Our company, Reflex SpA, has been engaged in the design furniture sector since 1989. We always aimed for excellence and innovation in our business strategy, and we have invested a lot on innovative techniques and the development of novel and advanced products. It is therefore of vital importance for us to patent a product, which also helps boost the commercial value of our products and makes them unique and highly competitive.

**As an Italian family SME working in the cultural and creative industries (CCIs), you value intellectual property, and you have quite a lot of applications for trademarks, designs and even for patents. But I want to ask how your story started with “patents”, and why there was a need to patent your inventions?**

It is true that in our industry, patenting is not very common. However, we have always believed in the importance of creating products of excellence, using new technologies and innovative design, and investing in economic resources.

Excellence and innovation are in fact the results of long studies, intense work, various attempts and numerous tests, all of which must be protected and recognised. Therefore, I believe that patenting is very important in all sectors.

One of our first patented items was the Policiceto table – which then became one of the pillars of our company with its innovative mechanism and unique design.



**Have you seen any true benefits of patenting in your business? I mean with regards to your business growth, motivation to innovate, increased awareness in your sector, etc.**

Patenting places a safe barrier between our original products and our competitors’ imitated products. As I said, it also increases our company’s brand reputation and visibility in the sector.

Having a patented –and therefore protected– product is always pushing us more to invest and to improve in both design and technology. I believe that patented products contribute to generating a recognisable, identifiable and high-quality brand in the market by its reputable character.

**What is novel and different about your patented inventions?**

It depends on the product. For example, in our “Policleto” and “Archimede” series, the novelty lies in the technical and mechanical difference in design. For our product family “Vetro Marmo” (marble glass), the innovative component is the material which is the result of our research and development activities. In our lighting series “Bulles”, and in our “Segno” seating series, the originality is based on their intuitive technique and design.

**Patenting itself is insufficient unless you support your business strategy with a concrete IP strategy. How are you managing your overall IP strategy with your business strategy? And do you have any recommendations for CCI's businesses regarding patenting?**

True, patenting alone is not enough! It is just a part of a whole intellectual property strategy and it should be supported by innovative designs and correct branding. Therefore, it is necessary to develop a strong collaboration with a team of specialised professionals; I mean designers, R&D staff, marketing staff, etc. from the very beginning of the product development and right up to marketing. It is important to incentivise these connections among the company in order to guarantee synergies to get the maximum benefit from IP protection.



**AT THE INTERSECTION OF AESTHETIC DESIGN  
AND TECHNICAL INNOVATION: POLICLETO**

Policleto is an extendible table with glass top. Its special hinges allow the extendible table surface to move in the different axes of the table so that it may be placed under the main surface or in any desired direction. Thanks to this modular type of design, the users may shape their table on their own, according to their needs or space.



## 6. CRAFTS SUB-SECTOR

### 6.1. Sub-sector definition and its value chain

The document “Mapping the Creative Value Chains” [6] defines a value chain for crafts whose products, according to UNESCO's definition, must be produced in a meaningful way by hand, possibly using hand tools or mechanical means.

For the purposes of this report, a simplified value chain diagram can be drawn as follows:

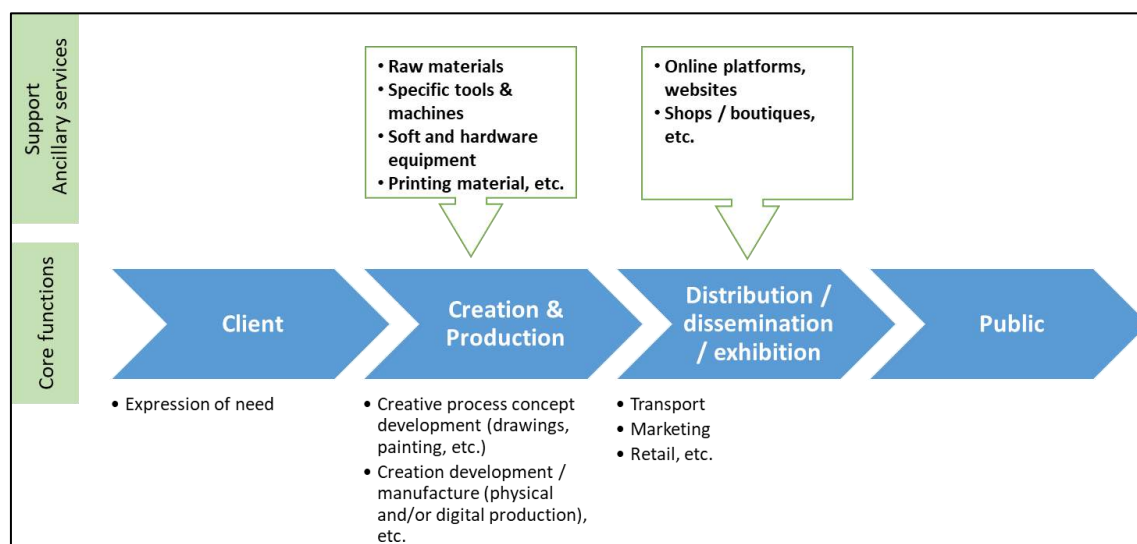


Figure 8: Simplified value chain of the crafts industry sub-sector

Crafts’ technical expertise tends to be located in the creation and production phase (the creative process) and in the support services, especially during the supply of raw materials, use of specific tools and machines, utilisation of equipment, etc. There are also technical (therefore patent-related) aspects in the post-creation processes, i.e. in distribution, dissemination, exhibition phases where innovative marketing tools and platforms may be deployed.

### 6.2. Innovation characteristics of the sub-sector

Craftsmanship is a trade that requires technical skills, even though in the case of arts and crafts, these may be inherited from a long tradition, which as such, may seem to leave little room for innovative ways of doing things.

However, the craftsperson could, like the designer, be confronted with technical problems which would not find obvious solutions in traditional knowledge and know-how. Such problems, depending on their nature (use of the object, purpose of the object, etc.) could find solutions either in the **object itself** or in the **processes used to produce these objects**, which may have a relationship with patenting.

### 6.3. Patenting practices in literature

In the handicrafts sector, WIPO [1] mentions that **most patents relate to the improvement of materials' quality, functional improvements of hand tools or production techniques.**

For example, a WIPO article details the case of Anna Grindi [18], a Sardinian seamstress who, with her team, developed an innovative fabric, Suberis, based on cork made from oak bark. **Anna Grindi filed a patent application in 1998 which enabled her to successfully establish her company in many markets around the world.**

Similarly, a France Culture programme [19] reports the testimony of **Atelier Steaven Richard**, a craft workshop specialised in artistic ironwork, owning a patent<sup>23</sup> on a process for marking sheet metal by rolling, as part of a project for a textured metal floor for the fashion sector. This patent is the consequence of the cooperation between the **craftsman and an innovation centre** (CM2T, Metz/France). The broadcast also mentions **Fablabs as interesting actors to experiment in the field of craftsmanship.**

According to the document "Mapping the Creative Value Chains" [6], (innovative) **technologies do not seem to be widely used in this sub-sector.** The document takes the example of Great Britain, where 30% of craftspeople would use technologies in the creation phase, and 18% in the production phase (e.g. using 3D printing). The Craft Council, who produced these figures, suggests a relationship to materiality, which is essential for this profile of creative people.

The research we have carried out has not brought up any innovations, let alone patent applications, filed by craftspeople in the field of technology.

Our state-of-the-art study **did not bring up any other overall literature or figures on patenting activities in the crafts sub-sector**, either at a national or European level.

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<sup>23</sup> Method for Marking a Sheet and Rolling Mill for Carrying Out Said Method (source: [Espacenet](#)).



## A STORY BEHIND THE SUCCESS

*in crafts*

***Rosalie Bogaard, the owner of the Belgian company Rose d’Anvers, answered our questions about her unique crafting method in jewellery and her remarks in patenting and IP protection.***

*“We needed to patent our crafting technique in order to position ourselves against our competitors, and protect our high-quality products from the infringing ones, which would otherwise harm our reputation.”*



**Thanks a lot for joining our interview study, Rosalie. Before getting into the topic, would you please introduce yourself and your company a bit?**

I started building up the marketing concept of Rose d’Anvers in 2014, and the company Rose d’Anvers BV was founded in 2016. We bring the world-renowned diamonds of Antwerp and the beauty of rose together in our crafts. To maintain our standards, instead of working with rose brokers, we have our own rose farmers for Rose d’Anvers in Ecuador and Colombia. Also, Rose d’Anvers stands for high-quality natural diamonds, so we work neither with lab-grown nor with synthetic diamonds.

In October last year, we started a Diamond Gallery in the Centre of Antwerp near the river. We will have four exhibitions per year with the best creations of Antwerp diamonds from different diamond traders.

**We know that Antwerp is famous for its diamonds. What is special about Antwerp diamonds and what makes Rose d’Anvers different?**

That is so true! Antwerp diamonds are exceptionally beautiful and very well-known in the world with its unique cuts. These cuts represent the excellence of Antwerp’s exquisite craftsmanship, scintillation, and brilliant light refraction for more than 570 years.



Thanks to our extensive R&D, we can now combine the best Antwerp diamond creations and cuts with the best natural roses with our unique way of craftsmanship, so that you will have a natural rose with handcrafted diamonds on it. The flowers undergo a preservation process to maintain the appearance and texture of a fresh rose despite the passage of time and just by avoiding humidity, direct sunlight and hand contact with the petals, the rose will retain its beauty and appearance.

**Actually, it seems that you are not only different in terms of your product and your quality. You are also one of the rare companies in your sector to have a patent. What is the story behind it? What made you file a patent application?**

We have patented the preservation method and the crafting technique of our products because the competition in preserved roses is very high. We made a lot of efforts to find the right cut to put on the rose petals which makes us unique in this business. Therefore, we needed to patent our crafting technique in order to position ourselves against our competitors and protect our high-quality products from the infringing ones, which would otherwise harm our reputation. The risk in our business is very high because we have very transparent communication with potential buyers. But now, our patent deters the copycats.

As an additional IP protection measure, we have also registered our trademark “Rose d’Anvers” with a derivative and distinctive version of the coat of arms of Antwerp city, so that nobody can use our logo and name, and damage our brand in the market.



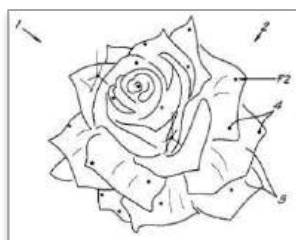
**Have you seen any positive effects of IP in your business? Do you think it pays off, that it’s worth it?**

Honestly speaking, it is not always easy for companies like us to enforce our rights. However, we know that we have our rights, and we can do as much as we can in order to defend our rights in order not to be copied thanks to our patent. Besides, our trademark protection also gives us an important market advantage.

**Lastly, I would like to ask about your recommendations for companies in your sector regarding patenting and your opinion on the importance of intellectual property rights.**

Intellectual property rights are a kind of weapon for businesses with which they can protect themselves against infringers. Therefore, if you want to survive in a market which is very transparent like ours, it is essential to safeguard your inventions and brands. Furthermore, IP rights also enhance the reputation of your business and provide support in the market where there are many copycats around.

## A TRADITION FOR MORE THAN 570 YEARS ON THE FLOWER OF LOVE



[The Belgian patent](#) of Rose d’Anvers describes an ornament in the form of a natural rose that is subjected to a stabilisation process to preserve its natural look.

The technique concerns the stabilisation of the diamond cuts, and the characteristics of the diamonds on the flower.



For more information about Rose d’Anvers, you can visit the company website at <http://www.rosedanvers.com>.

## 7. VISUAL ARTS SUB-SECTOR

### 7.1. Sub-sector definition and its value chain

The definition of visual arts, according to the NACE classification represented by M74.20 for Photographic activities, is extremely restrictive.

On the other hand, the document “Mapping the Creative Value Chains” [6] defines a broader value chain for the field of visual arts which includes, in addition to photography, plastic arts (paintings, sculptures, drawings, etc.) as well as “digital” arts, i.e. graphic arts that are displayed on technological media.

In this report, for the purposes of identifying the patenting activities, a simplified diagram of the visual arts’ value chain can be pictured as follows:

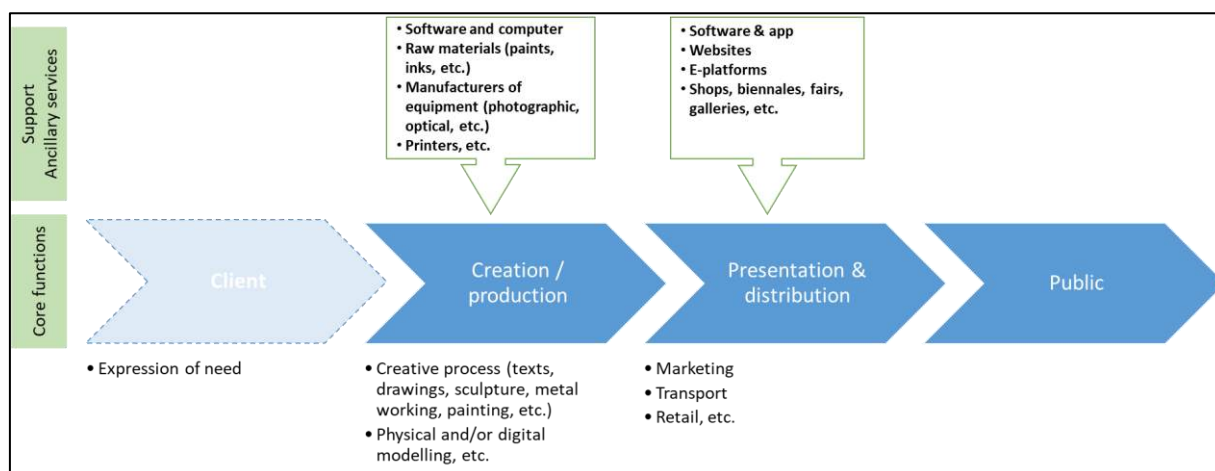


Figure 9: Simplified value chain of the visual arts sub-sector

### 7.2. Innovation characteristics of the sub-sector

The study “Mapping the Creative Value Chains” [6] makes it possible to locate three main functions in the value chain where it is possible to find **technical expertise** that may be subject to technical or technological innovations:

- **Ancillary goods and services**, more specifically manufacturers of paints, varnishes, decorative coatings, inks, sealants as well as specialised software or database developers;
- **Upstream creation/production** functions which concentrate the bulk of artists’ creative work; and
- **Downstream** function of **distribution** and **marketing** of artists’ work. This is represented as “presentation & distribution” in the simplified value chain above.

In **ancillary goods and services**, technological expertise mainly concerns **manufacturers of paints, varnishes, decorative coatings, inks, sealants, etc.** as well as developers of specialised software or databases. In addition, alongside large industrial groups specialised in the supply of decorative products, it is possible to find SMEs with research and development capacities. The French company **Peinture Décor Fischer Sarl**, which is working on the “*research and development of paints and decorations composed solely of natural products*” [20], is an example of such an SME.

Like designers or craftspeople, visual artists may also encounter technical problems whose resolution goes beyond the traditional techniques in use in their artistic field. More radically, some artists may also design works whose subject matter requires the mastery and design of high-tech tools such as the American artist **Amy Karle** who is working in the field of BioArt, an artistic discipline that makes living organisms the very matter of the work.<sup>24</sup>

Furthermore, the innovation agency Decalab shows that **world-renowned companies can also call on artists to explore the potential of their product**, for example, in terms of new uses, or to identify problems of use or ergonomics related to a product and, possibly, associated solutions [21]. For example, the agency called on artists on behalf of the car manufacturer Peugeot S.A. to elaborate a programme studying the behaviour of bacteria for the development of the organic autonomous vehicle. In this way, the intervention of artists, like that of designers, can have the effect of stimulating, through their creative approach, companies' innovation efforts.

The spectacular results of **artificial intelligence** (AI) in the field of **painting** deserve to be highlighted, notably with the project The Next Rembrandt,<sup>25</sup> aimed at producing a 3D-printed painting in the style of Rembrandt, based on a data analysis of the Dutch painter's existing works.

Another exciting example is the portrait of Edmond de Belamy created by an AI named Generative Adversarial Network, driven by a collective of artists and AI researchers, which reached \$432,500 at an auction organised by Christie's.<sup>26</sup>

Apart from the above examples, down the value chain, the document "Mapping the Creative Value Chains" [6] highlights that **new e-commerce SMEs** have emerged to offer various services such as digital auctions, reproduction of artistic works or access to digital copies of artworks.

### 7.3. Patenting practices in literature

Because of the nature of the sector itself, patenting is not considered to be "highly-related" to visual arts activities. Nevertheless, the rise of AI-accompanied visual works and of digital artworks may boost the patenting activities in this field, as such innovative technologies appear to be more and more used in this sub-sector. Although it cannot be deemed as a visual art company, Microsoft's AI patent portfolio, with nearly 6,000 patents, may be a sign of the incremental importance of AI technologies in this sector.

The German company Artnet and its American subsidiary Artnet Worldwide Corporation's patent applications on methods to develop an art index, and a non-linear searching tool and method for art databases<sup>27</sup> are two other examples of patenting practices in the downstream activities (i.e. distribution) of the visual arts sub-sector.

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<sup>24</sup> Definition from Wikipedia can be found [here](#).

<sup>25</sup> More information on <https://www.nextrembrandt.com>

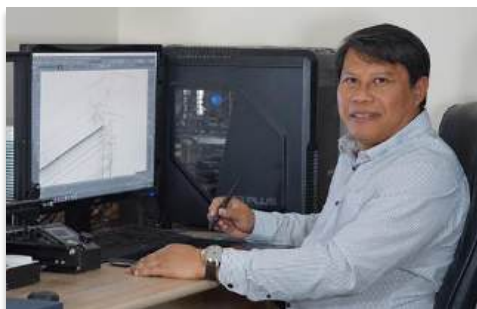
<sup>26</sup> More information on <https://www.christies.com/features/A-collaboration-between-two-artists-one-human-one-a-machine-9332-1.aspx>.

<sup>27</sup> See the Espacenet database for the patent documents:

<https://worldwide.espacenet.com/patent/search/family/049514724/publication/TW201407526A?q=Artnet%20Worldwide%20Corporation>

## A STORY BEHIND THE SUCCESS

### *in visual arts*



**Dr Arif Rochman, an Indonesian researcher from the University of Malta, explains to us how his hobby turned into a patented product.**

*“It is worthwhile to collect and read information about all aspects of patenting as much as possible. As by doing so, you can develop your own strategy before you make the first step of patenting.”*

**Thank you very much for accepting our interview request, Dr Rochman. Maybe, it is better to start with a short introduction about you?**

I am originally from Indonesia, and I obtained my Undergraduate and Master’s degrees from Germany, and finally my PhD from the UK.

Since January 2009, I’ve worked at the Department of Industrial and Manufacturing Engineering at the University of Malta. Teaching and research are my main activities at the university but my hobbies, photography and painting, have led me to the development of this new idea for which I now have a European patent.

**Indeed, this is actually what we want to talk with you about. You have filed a European patent for an artistic dry-erase board which combines artwork and whiteboard. Can you explain a bit about this interesting invention to us?**

As an undergraduate student, when I was living in Munich, I needed to choose either having a whiteboard for my notes and sketches or hanging one of my paintings on my wall, as there was not enough space in my tiny flat. In the end, I decided to hang my painting there, but the question of how to have both a whiteboard and an artwork on the same wall always remained in my head.

After having gained experience in running research projects at universities including patent filings, I started to think seriously about this idea and how it should work. Then, I came up with my invention. The main idea was to combine a whiteboard and a picture frame in one single product. Due to the combination, I named the product “WhiteboART”. So, when it is not used, it will not diminish the aesthetics of a room or office because it will serve as an artwork, and when needed, it may turn into a whiteboard when you pull the white screen down between the artwork and a transparent panel on which we can write. The screen can be pulled either manually or by winding the string using a small electric motor that can be controlled remotely.

**Now, you have a granted European patent. Can you tell us your experience about the patenting process? And do you think it pays off (or will pay off) in the end?**

I was already aware of the main steps of filing a patent but did not know much about the details. Thus, I used the service of a Maltese IP law firm to assist me during the patenting process. In order to reduce the patenting costs, I did the patent drafting by myself, and the IP firm supported me in reviewing my documents and made some revisions. When we received the report from the patent examiner requiring some amendments in my application, we worked quite hard on it with the IP firm again.

Have all these efforts paid off? Well, in terms of getting a granted patent, yes! Since many patent applications are rejected due to the lack of novelty, my grant shows that my idea was novel, and it was a wise decision to protect it. But whether it will pay off financially, we will see! WhiteboART is in the final stage of development, and I am currently in contact with a company to produce the most important sub-assembly of WhiteboART. I hope that, in a few months, the first WhiteboART products will be on the market.

**What are your plans for commercialisation? How do you foresee to exploit your invention such as direct marketing, licensing, etc.?**

Regarding commercialisation, my plan before the Covid-19 pandemic was first to create a successful crowdfunding campaign to obtain funds to produce WhiteboART, and afterwards, to sell it online. Licensing itself was not an option for me since this journey started from one of my hobbies and I still consider it as part of my hobbies, but for sure it would be great if this idea can be successfully commercialised. Now due to Covid, I leave all options open. The company with which I am now in contact could potentially also help in marketing.

**We would like to ask, lastly, your recommendations for all businesses and entrepreneurs like you in terms of patenting and intellectual property in general.**

Well, my recommendation would be valid only for private persons or small businesses that have no experience at all in patenting.

If you think that you have a useful and novel idea which can turn into a commercial product, even if it is a very simple one, protecting your invention is a must so that you can get and maintain the sole right for the commercialisation. However, since the cost for patent filing is not so low, it is worthwhile to collect and read information about all aspects of patenting as much as possible. As by doing so, you can develop your own strategy before you make the first step of patenting. That includes your own search on the prior art to have a strong indication that your invention is really novel. When it comes to the filing process, it is always recommended to get assistance and advice from a reliable patent attorney due to the complex legal issues.

**TURNING A SIMPLE WHITEBOARD INTO A PIECE OF ART WITH “WHITEBOART”**



The [patent](#) of Dr Rochman’s picture frame allows your painting to turn into a whiteboard within seconds just by pulling down the white screen in between the layers. So, you may still enjoy your art, when you are not using the whiteboard and you can just hide your art when you are drawing your sketches.

You may check for more information: <http://www.whiteboart.com>.

## 8. MEDIA AND CONTENT INDUSTRIES SUB-SECTOR

### 8.1. Sub-sector definition and its value chain

The OECD (2011)<sup>28</sup> defines the media and content industries (MCIs) as follows: “media and content industries are engaged in the production, publication and/or electronic distribution of content products”. These “content products” include –by definition– video games, music & audio recordings, films & videos, and books & periodicals. The economic specificities and the commercial exploitation mediums of these products are closely interlinked.<sup>29</sup>

Therefore, within the context of this state-of-the-art analysis, the following sub-sectors’ related activities have been gathered and studied together under this section, as summarised in the table below.

**Table 3: Activities analysed in this report for the MCIs sub-sector**

Activities	NACE Codes
<b>Radio &amp; TV</b>	<ul style="list-style-type: none"> <li>• Radio broadcasting (J60.10); and</li> <li>• Television programming and broadcasting activities (J60.20).</li> </ul>
<b>Software &amp; games</b>	<ul style="list-style-type: none"> <li>• Publishing of computer games (J58.21);</li> <li>• Other software publishing (J58.29); and</li> <li>• Computer programming activities (J62.01).</li> </ul>
<b>Video &amp; film</b>	<ul style="list-style-type: none"> <li>• Motion picture, video &amp; TV programme production activities (J59.11);</li> <li>• Motion picture, video &amp; TV programme post-production activities (J59.12);</li> <li>• Motion picture, video &amp; TV programme distribution activities (J59.13);</li> <li>• Motion picture projection activities (J59.14); and</li> <li>• Renting of video tapes and disk (N77.22).</li> </ul>
<b>Music</b>	<ul style="list-style-type: none"> <li>• Manufacture of musical instruments (C32.20);</li> <li>• Retail sale of music and video recordings in specialised stores (G47.63); and</li> <li>• Sound recording and music publishing activities (J59.20).</li> </ul>
<b>Books &amp; press</b>	<ul style="list-style-type: none"> <li>• Printing of newspapers (C18.11);</li> <li>• Other printing (C18.12);</li> <li>• Pre-press and pre-media services (C18.13);</li> <li>• Reproduction of recorded media (C18.20);</li> <li>• Retail sale of books in specialised stores (G47.61);</li> <li>• Retail sale of newspapers and stationery in specialised stores (G47.62);</li> <li>• Retail sale of second-hand goods in stores (G47.79);</li> <li>• Book publishing (J58.11);</li> <li>• Publishing of newspapers (J58.13);</li> <li>• Publishing of journals and periodicals (J58.14);</li> <li>• News agency activities (J63.91); and</li> <li>• Translation and interpretation activities (M74.30).</li> </ul>

<sup>28</sup> Reference is taken from the “OECD Digital Economy Outlook 2015”, p. 153. However, no further citation has been found to locate the “OECD (2011)” definition.

<sup>29</sup> Even if treated separately in the current document, the advertising sub-sector could also be integrated in the MCIs. [22]

From this perspective, an overall value chain for the whole MCIs sub-sector can be as follows:

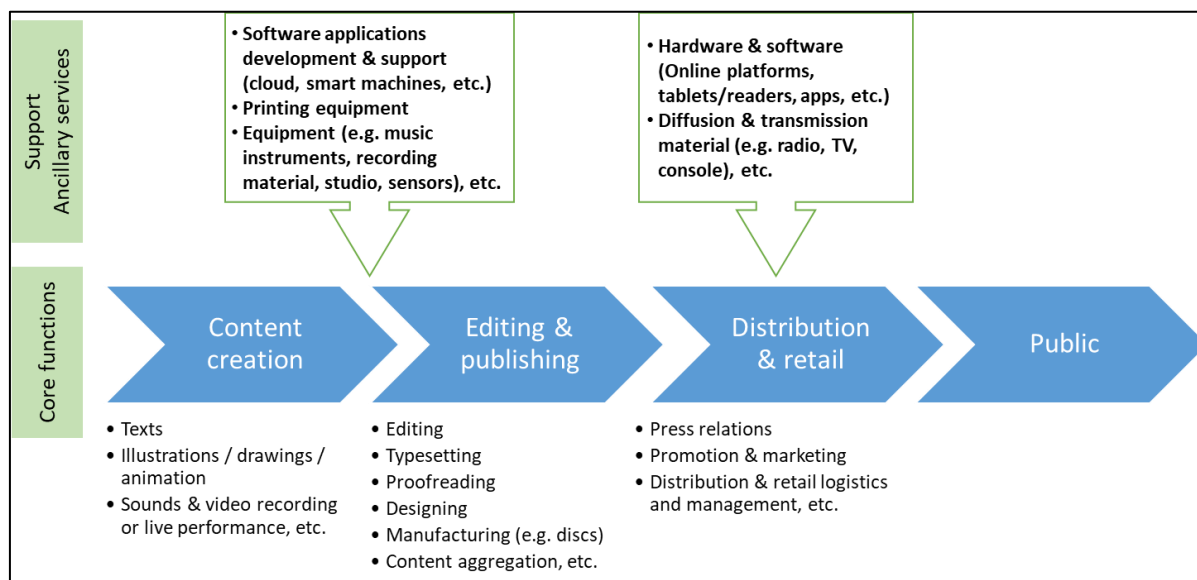


Figure 10: Simplified value chain of the media and content sub-sector

## 8.2. Innovation characteristics of the sub-sector

The values chains detailed in the document “Mapping the Creative Value Chains” [6] show that the technical expertise of the MCIs is at the level of the following functions:

- Goods and ancillary services of the different value chains;
- Upstream functions of creation/production of films and video games; and
- Downstream functions of content distribution and transmission.

MCIs, as a whole, are undergoing a massive **digitisation** of their value chains, influenced by the emergence of **major technological players** such as Google or Amazon. This digitisation is reflected in each of the three functions mentioned above.

Benghozi [23] examined the technological innovation capacity of MCIs where he points, in particular, to the emergence of **specialised SMEs which the author describes as “specialised technology provider SMEs” (STS)**. These technology experts appear as the new intermediaries in the MCIs value chains, and contribute significantly to the digitisation of other players.

Thus, three company profiles seem to stand out in terms of their relationship to technology:

- Historical players in value chains whose content or broadcasting techniques have been digitised: dematerialised content in publishing or music value chains, streaming techniques on digital networks or on the Internet in broadcasting value chains;
- Technology giants (mainly from the USA) such as Google or Amazon or Sony from Japan; and
- Specialised technology provider SMEs.



Moreover, Benghozi shows that R&D investments are unevenly distributed across the MCIs value chains: while not excluding content creation and production, **the majority of research efforts focus on content distribution, service provision, infrastructure, digital copyright management, audience measurement and analysis.**

However, Benghozi points out that the film and video game industries do not fit into this dichotomy between innovative suppliers and creative producers. Indeed, the author tells us that the relatively high investment to create **films and video games**, as well as the very nature of these industries, which are digital in essence for video games and considered high-tech for cinema, means that the **production and manufacture of such contents can incorporate phases of technological development.**

In terms of **balance of power**, Simon [24] summarises: “On a global scale, **the balance of power has shifted towards the downstream**, away from the upstream, or from the *production side* of the media toward the *distribution side*. In other words, there has been a collision between the economics of production of cultural goods and prototypes and the economics of distribution of digital goods and services.” While the production side is mainly based on the revenue generated by copyright related to content sold to consumers, the distribution side is mainly based on technological exploitation, in particular digital content access technologies, which may be protected by a patent (see Annex III).

### 8.3. Patenting practices in literature

Benghozi [23] names the companies in the field of cinema or video games that have a patent portfolio, such as **Thomson, Tencent, Image Metrics, Avid Technology, and DreamWorks Animation SKG.**

The document “Mapping the Creative Value Chains” [6] rarely mentions patents, and does not provide any examples of MCIs companies that patent. However, it mentions the names of the **companies covering all studied value chains.** By adding these names to those presented in the document “A Focus on the Cinema Sector” [23], which lists the Media sector companies that spend the most on R&D at the global and European levels, we can compile a list of the major companies representing the different types of players involved. On top of this list, an additional query on the patent database Espacenet then makes it possible to illustrate patenting practices in MCIs through the number of patent applications those companies have filed (see table in Annex II).

The table in Annex II shows that among those 50 companies:

- Within **all MCIs value chains** (and beyond), it is possible to find companies having filed patent applications;
- The types of players that file the most patent applications (more than 1,000 applications) are technology companies. During the previous decades, IT technologies became more and more present, leading to the entry into the sector of large IT companies that are investing massively in technology – this is visible through the patent filings;
- Among the main patent applicants are companies from the video games and cinema sub-sectors, illustrating their innovative dimension (e.g. Tencent, Walt Disney);

- A restriction of the results to the patents filed in the electric communication field (IPC code H04)<sup>30</sup> within the patent applications of MCI companies shows a dominance of **content distribution technologies along with content creation technologies** (see table in Annex III);
- In the “Radio & TV broadcasting” part of the MCI sub-sector, players who file the most patent applications are **telecommunications companies** (e.g. Deutsche Telekom, Vodafone, Comcast, etc.), showing that the innovation is mainly on the distribution side of the value chain; and
- **STS-type companies (e.g. Avid Technology) file patent applications**, as their business model directly relates to patentable activities.

In terms of business practices, Benghozi [23] provides the following details:

- **Large technology companies have in-house R&D centres** which may account for a significant proportion of their staff. For example, Benghozi states that more than 50% of Tencent's employees work in the R&D field;
- In addition to their technology activities, **STS develop skills considered unusual in the sector** such as **asset management, patenting and diversification of their technology assets** to other companies;
- Patents come into play alongside other types of protection such as copyright or trade secrets (e.g. DreamWorks); and
- **Publishers of the “Book & Press” activity have significantly fewer patent applications** compared to the “Video & film” and to the “Software & games” producers. This is an expected result, as “Book & Press” activities are not amongst the most high-technology activities in MCI (thus, not highly patent-related).

It also appears that by setting up **patent pools**, technology companies and media companies can **cross-license patents** protecting their respective technologies, whose complementarity is essential to develop innovative end products. The management of the payment of licences and the distribution of royalties to patent owners are often left to specialised companies, such as the company pool, MPEG-LA, which is the provider of one-stop licences for standards in this field. However, the complexity of the licensing terms of patent pools in this area [25] has led a certain number of technological players to question the paid model of access to technologies that characterises patent pools by favouring a **free model** of access to these technologies.

In addition, some companies can turn their patent portfolios into a real **source of profit** (“cash cow”) through licensing. This was the case of Technicolor, which until recently derived a significant part of its profits from the valuation of its patent portfolio.<sup>31</sup>

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<sup>30</sup> IPC, the International Patent Classification system, provides for a hierarchical system for the classification of patents (inventions in the patent texts) according to the different areas of technology to which they pertain. It is used globally when searching and analysing patent information. Class H04 is for the technologies concerning electric communication including the transmission of information, broadcasting, pictorial/telephonic/telegraphic communication, communication systems, etc. More information is available [here](#).

<sup>31</sup> The decline in revenues from this activity has led the company to sell most of its patents to reduce its debt (Source: [Usine Nouvelle](#)).

## A STORY BEHIND THE SUCCESS

*in music*



*Andreas Schultze-Florey, German bassoonist in the Lower Saxony State Orchestra, welcomed us to answer our questions regarding his invention “Tremulant”.*

*“For me, patent is a recognition of all the efforts made during the long path of development.”*

**Let’s start with you, Andreas. Can you introduce yourself shortly? And maybe you would like to touch on your research areas in general?**

I am a musician, who has been playing the bassoon in the Lower Saxony State Orchestra in Hanover for 40 years. I have also been involved in pedagogical training for young artists, and my passion is to study the physiological processes when playing wind instruments and to use scientific knowledge for this purpose. By working with medical professionals, I carry out various research projects.

**Actually, we have identified you from your patent on an electrical device for musicians, and a novel method based on this device. Can you explain a bit about this invention to us? – But in a simpler way, as I assume that many of us are music listeners rather than musicians.**

During my research, I discovered that many musicians are exceptionally good at the technique of creating a nice vibrato. For musicians, vibrato means tones with small regular waves, which are changed in pitch, volume and timbre. This playing practice is an important stylistic device for professional musicians. However, the educational literature on this subject, especially for wind instruments, is insufficient.

When practicing with wind instruments, it is difficult to teach the students about the vibrato technique because the muscles that are necessary for the generation of vibrato are not clearly noticeable. After many experiments, I discovered that musicians (players and singers), who can hear their own tones simultaneously with an artificial vibrato, can learn the vibrato technique in a very short time and it even comes naturally. Furthermore, experienced musicians can significantly improve their vibrato with this method. Then, I decided to set up a small, practical device, “Tremulant”, so that every musician could easily utilise this technique.

**We know that patenting is not quite common among cultural and creative businesses. How did you come up with the idea of protecting your innovation with a patent, and how did you manage to handle all the patenting procedures (which, for most people, are very time consuming and very expensive) without owning a company?**

It is true. Actually, while developing the first prototypes of Tremulant, I realised that I should do something to protect this invention. First, I tested my prototypes on many wind instruments, string instruments and singers and after I concluded the tests, an enthusiastic music lover, who recognised that the method is an unconventional new invention, advised me to see an IP professional to obtain the IP rights.

By chance, the IP lawyer I consulted, was also a dedicated music lover. He immediately understood my situation and took all the necessary steps for patenting. Without his generous help, I would not have been up to the task as a musician, and the patent might never have been granted. Therefore, I was quite lucky in this case, and I realised the importance of working with an IP professional.

**In the end, now you have a granted patent. Do you think it pays off after all? And do you have any recommendations for our readers?**

For me, patent is a recognition of all the efforts made during the long path of development. However, frankly speaking, classical musicians generally take a sceptical view of scientific studies and technical devices. Even the metronome, which is now standard equipment for every musician, took a long time to be accepted because of the resistance to changing the traditions in this sector. Under these conditions, professional marketing was unrealistic for me as a private person. Thus, I decided to produce the Tremulant only in a small series currently, without any profit. However, I believe that my patent provides significant added value for my invention if any further marketing opportunities arise.

Without the support of an IP professional, I believe that it is not very easy to patent an invention, as it requires high expertise. Nevertheless, it is extremely important to obtain the IP rights to protect your inventions and to prevent infringement. If you are not lucky enough to get competent support, unlike me, it is a good start to check it with your country's national IP office and ask for their advice.

## AN INNOVATIVE WAY TO LEARN VIBRATO FOR MUSICIANS: TREMULANT



The tedious learning of vibrato can be significantly simplified with the help of the patented *Tremulant method*. The musician gets a listening impression of his/her sound with vibrato, and animated by this, s/he can unconsciously activate the muscles to generate his/her own vibrato.

The *Tremulant* has an immediate effect on the tone, regardless of whether the vibrato is to be produced primarily by changes in pitch, as with vocals and strings, or by a variation in volume or timbre typical of many wind instruments.

Check [www.tremulant.de](http://www.tremulant.de) for more information on the Tremulant method.

## A STORY BEHIND THE SUCCESS

*in book & press*

***We talked with Cristian Todié, the inventor of the Todiébook, about the patenting specificities of his very interesting invention.***

*“A single licence agreement for my patent brought me more income than the equivalent of one year of artistic activity.”*



### **Mr. Todié, can you tell us a bit about your exciting story? How did you start dealing with arts?**

In fact, I began at the age of six with the assimilation of classic oil painting! When I was 17, I had my first personal exhibition in Romania. Then, I tried to cross the Romanian border illegally, and was arrested and imprisoned. There, I created my first work of descriptive (narrative) art: “The geometrical place of blue dots equals FREEDOM 50 centimetres from a red dot in a Euclidean space.” In 1975, I managed to reach Paris and in 1977, I managed to reconcile my two passions: art and geometry. Later, in 1987, I wrote and published the “*Manifesto of Theoretical Art*”, which was presented during a performance at the Fiac fair the same year. After a meteoric rise in the 1990s on the Parisian art scene, I retired. For 30 years now, I have devoted myself entirely to creation and experimentation.

### **In which way do you direct your artistic research, and in particular the research that led to the creation we are talking about here, the Todiébook?**

In 1977, after several years of artistic experimentation with scientific connotations, I gave free rein to theoretical and mathematical inspiration, and I called my creation “*Theoretical Art*”.

I found printing to be the ideal industrial world for my artistic expression, and for experimenting with my geometry. By extrapolation, a volume of paper is a space with memory, and a sheet represents a plan of this space, and the image reproduces the imprint of the three-dimensional values of an object that would pass through it. In the volume of printed and superimposed sheets, at the exit of the machine, we find the image reproduced as extruded and fixed in the block of paper.



This new artistic material, shifted, sliced, folded or torn to infinity, makes the reprography images reappear, in deformations, anamorphoses, reflections and refractions that correspond perfectly to the laws of optics.

**This innovation has been protected by a patent, which is not very common in the cultural and creative sector. Could you tell us why you applied for patent protection?**

Filing a patent in my context is a creative act, an artistic performance belonging to Theoretical Art that affirms novelty and originality and also confirms authorship. Strengthening my rights, patenting becomes an argument in licence negotiations. I consider that the economic exploitation and management of this patent is an alternative to the economic exploitation of the art itself. The content of the patent itself is a work of art!

**You have in fact filed other patents, for other innovations. Therefore, you see this as an advantage, an opportunity. Could you tell us more about your approach in terms of intellectual property, the advantages you see in protecting your creations through intellectual property?**

Paraphrasing Napoleon Bonaparte, who said “*A good sketch is better than a long speech*”, I consider that “*A good patent saves us a long plea.*” And when Sacha Guitry says “*A sketch is not the beginning of a masterpiece to come, it's not the end - it's the essence,*” the subtlety and interest of patent drafting makes sense for me. The patent shows the quality and nature of the creation and brings a form of notoriety, the equivalent of a diploma. My use of protection through industrial property rights is part of a desire to affirm that the frontiers between creation, innovation and invention, as Leonardo da Vinci showed us, can remain open.

**What benefits have you been able to obtain from patent protection? And what do you see as the disadvantages you have had to face?**

Concerning the current patent, I am in the process of defining a new strategy: in the past, a single licence agreement for another patent brought me more income than the equivalent of one year of artistic activity.

I wrote and obtained the French patent myself. For the European, Japanese, Chinese, American and Korean phases, I faced difficulties with some professionals who did not understand my approach.

In terms of proposals for collaboration, after initial enthusiasm due to the originality of the invention, people step back because novelty requires adaptation at the level of manufacturing as well as at the level of distribution and promotion. The more avant-garde the product, the greater the reticence. On the artistic scene, the same phenomenon can be observed.

These difficulties provide a lesson that reinforces wisdom and stoicism, and paraphrasing Albert Einstein, I thank all those who not only did not support me, but rather discouraged me because I succeeded on my own.

**Finally, what would be your recommendations to creators regarding patent protection?**

It is important to properly assess the potential of the invention and its relationship to the industry. It is important to respect and integrate the usual terms in patent drafting, which allows for a better presentation of the innovation. The initial filing of a “*Soleau Envelope*” or an equivalent (digital time stamps e.g. iDepot, WIPO Proof, etc.) can be very useful to keep trace of priority. The secrecy being paramount, as disclosure nullifies patentability.

In the desire for a different approach that is closer to science and industry than to the classical creator, the patent may prove to be of prime importance. The applicability, the technical character essential to patentability, will allow, through licences, the development of derivative products, and thus allow the greatest number of people to benefit from originality.

## A STORY BEHIND THE SUCCESS

### *in software & games*

**This time, our guest is Pär Gunnars Risberg, from the Swedish tech start-up Gestrument, who shares his ideas about patenting in the software and gaming industry.**

*“If your business strategy is heavily based on a fundamentally new and innovative technology being leveraged, then I think patents can be key to long-term success, if done right.”*



**Mr. Risberg, how about starting with introducing yourself? How did your story with IP begin?**

Sure. I’m a tech entrepreneur with a past in mobile consumer electronics, more specifically in audio. Licensing IP into that industry, especially in Asia, was challenging, and that made the patent portfolio crucial to our success. That company got acquired by Cirrus Logic in 2015, and now I’m working with music software tech at Gestrument.

**We know that you have your original invention “Gestrument”, which allows people to play musical instruments with gestures through a music-making app. And as stated on your website, you have also filed a patent application for this invention. But before getting into your patenting experience, can you tell us a bit more about your invention?**

Gestrument opens the way for musical interaction by the masses. Just like Instagram invites anyone to take pretty decent photos, or Roblox allows anyone to make a video game, Gestrument allows anyone to play music that sounds good, regardless of musical training. Artistic freedom and the difficulty level can be set anywhere along a gradient from pre-composed music with limited interaction to a fully playable instrument.

**As your company name suggests, I guess your company’s business strategy is based on this invention and patenting should be a key for you. But let’s get back to the beginning: why did you file a patent application and why did you think it was important for you?**



We believe that the existing app is a good demonstrator for some of the tech’s capabilities and will be part of a bigger toolchain for composing interactive music for different kinds of applications.

The Gestrument technology represents a fundamentally new way of looking at music composition, based on musical rules as opposed to music described on a linear timeline. We see a multitude of relevant applications for this; one example is music in video games that today rely on switching between different pre-recorded loops and stingers while everything else in the game is calculated in real-time. Using the Gestrument Core technology integrated into the game engines, the music can be generated live in the game, based on the narrative, player actions and other parameters that are not known in advance. That specific application of the tech is the focus of our second patent application that has now also been granted.

**How did the patenting process go? Can you tell us about your experience?**

Since I had experience with patents in the past, we worked together with our IP firm pretty hands-on in the drafting stage. That made it rather time-efficient with fewer iterations than if they had done all the drafting on their own with limited information on the invention. What makes this rather complex for technology generalists is the deep level of new musical concepts in combination with software architecture to make the whole thing work as intended.

The rest was pretty much as expected with a couple of office actions to respond to before getting it granted. As our patenting strategy, we had first filed a Swedish application to get a priority date, then applied for an international patent application (PCT). Now in Spring 2021, it is time for entry into national phases to get our patents in different countries.

**Filing a patent is actually an initial step. The most important and maybe one of the most challenging parts of a company's patenting strategy is enforcement. What kind of measures have you taken/foreseen against possible infringers?**

Frankly speaking, as a start-up, we are too small to challenge any tech giants in court, but the goal is to get one or a few of them in our ringside pretty soon, by signing them on as partners generating revenue based on our tech. That way, our strategy gets stronger as it is in some larger companies' interest to make sure others do not infringe on our tech. With our patents, it is easier to attract these giants and negotiate with them about possible cooperation opportunities in parallel to our business goals. That is why, regardless of your company size, whether a small start-up or a large-scale company, having a patenting strategy in line with your business strategy is of key importance.

**We would like to ask, lastly, your recommendations to our audience in terms of patenting and intellectual property in general.**

As I mentioned, companies must be careful to not blindly go after patents without looking at the whole strategy. For some apps, user engagement and rapid growth is a much stronger block towards competitors than the actual tech. However, if your business strategy is heavily based on a fundamentally new and innovative technology being leveraged, then patents can be key to long-term success.



**IMPROVISE, COMPOSE AND PLAY MUSIC WITH YOUR FINGERTIPS**



GestruMENT PRO is a music-making app that lets you create music – scales, rhythms and sounds – and play this musical DNA in real-time with the help of the generative music engine.

The patented musical AI allows for an unprecedented level of personal expression and human touch. With this virtual instrument, the user can create new musical content in a simple and interactive way, regardless of the level of musical training obtained before using that instrument.

For more information, you may check [www.gestruMENT.com](http://www.gestruMENT.com).



## 9. PERFORMING ARTS SUB-SECTOR

### 9.1. Sub-sector definition and its value chain

The document “Mapping the Creative Value Chains” [6] defines the performing arts sub-sector as **“theatre and theatrical performances (e.g. musicals, opera, ballet, etc.), dance, cabaret, puppetry and object theatre, circus, performances by stand-up comedians, ventriloquists, jugglers, etc.”**

Contemporary performing arts also include any activity in which “the artist's physical presence acts as the medium, such as mime.” [6]

This sub-sector is characterised by the following NACE codes:

- Performing arts (R90.01);
- Support activities to performing arts (R90.02);
- Artistic creation (R90.03); and
- Operation of arts facilities (R90.04).

Technical innovation is clearly not at the core of this sub-sector, as “performing arts” concerns visual performances rather than technical or mechanical activities. However, technical devices, tools and/or machines are used before or during the artist’s performance, all of which can obviously be subject to patenting.

As seen in the simplified value chain below, use of software, technical components and/or features (such as lighting) during the creation phase, utilisation of specific tools and instruments in production such as infrastructural mechanisms, special make-up or costumes, involve technical elements that are relevant to inventiveness and thus patenting.

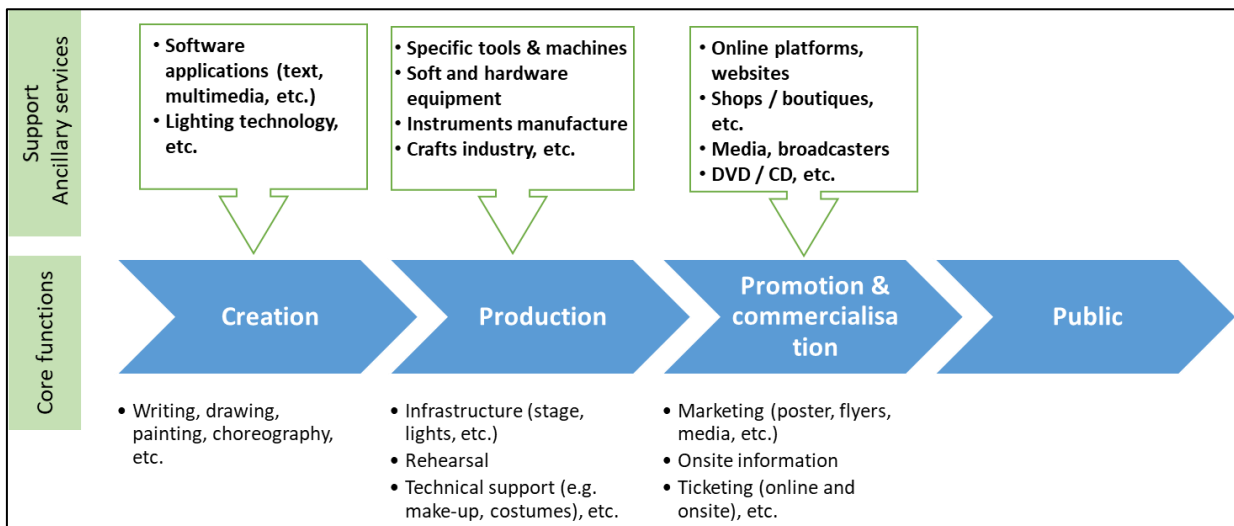


Figure 11: Simplified value chain of the performing arts industry sub-sector

## 9.2. Innovation characteristics of the sub-sector

Similar to our simplified value chain above, the document “Mapping the Creative Value Chains” [6] mainly locates **technological expertise outside the core of the value chain**, at the level of ancillary goods and services, in the hands of technology providers who are actively involved in the digitisation of the sub-sector's core functions:

- Technological innovation in the **production** phase: Technologies can be an integral part of the show. For example, Benghozi [23] cites the example of Walt Disney Imagineering which developed Audio-Animatronics, a kind of robot that is used in the group's theme park shows. In a similar way, an article from Le Point [27] reports concerts of the holographic character called Hatsune Miku and the associated Vocaloid<sup>32</sup> technology, which is a product of the company Crypton Future Media based on a Yamaha technology.
- Technological innovation in the **distribution** phase: Electronic ticketing is now a common way to promote and sell tickets for shows. Some ticket offices may be integrated into large media groups (e.g. digitick.com in the Vivendi group) or act as an independent STS-type supplier (e.g. Utick.be/Mediamorphose).
- Technological innovation at the **end of the value chain**: In addition to live shows that take place in a concert hall, live recording and broadcasting technologies can be used to enhance the value of the show on secondary channels that relate to MCIs value chain.

Even if technological expertise tends to be seen as being outside the core functions of the value chain, the document “Mapping the Creative Value Chains” [6] cites the **example of the ISADORA Software** developed by the artist and developer Mark Coniglio. Such an example shows that technological expertise can also be present in core functions of the value chain.

Moreover, the document highlights a penetration of the value chain by major MCIs players and a **vertical integration** of the value chain, giving the example of the acquisition of TicketMasters (electronic ticketing system) by the producer LiveNation. **The consequence of this phenomenon is to locate the *de facto* technological expertise of concerned companies in the core functions of the “Performing Arts” value chain.**

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<sup>32</sup> Vocaloid is a singing voice synthesizer software. Its signal processing part was developed through a joint research project led by Kenmochi Hideki at the Pompeu Fabra University in Barcelona, Spain in 2000 and was not originally intended to be a full commercial project. Backed by the Yamaha Corporation, it developed the software into the commercial product “Vocaloid” which was released in 2004. (Source: Wikipedia).

### 9.3. Patenting practices in literature

Through examples taken from the document “Mapping the Creative Value Chains” [6], the table below presents some companies in the Performing Arts sub-sector that have filed patent applications for their inventions<sup>33</sup> **both upstream** (distribution) and **downstream** (creation):

**Table 4: Some companies with patents in the performing arts sub-sector**

Company	Headquarter	Number of inventions <sup>34</sup>
<b>TicketMaster</b>	US (UK)	20
<b>Live Nation Entertainment</b>	US	31
<b>See Tickets (Digitick)</b>	FR	2

In addition, the document also mentions a collaborative project between the technology company ATOS and the company “Theatre in Paris” to develop glasses that display multilingual subtitles in augmented reality. This device is the subject of a patent filed by ATOS.

This demonstrates **the potential for companies in the sector to cooperate with each other** (and with technology companies from other sub-sectors), and in so doing, **to stimulate technological innovation**.

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<sup>33</sup> There may be more than one patent application for a single invention, particularly for the purpose of extending the geographical patent protection coverage (patent family). In order to avoid biased results, only the number of inventions is counted when conducting the search.

<sup>34</sup> Search results as of 24.04.2020 on Espacenet.

## A STORY BEHIND THE SUCCESS *in performing arts*

***We have talked to Julian de Juan, IP advisor and Board Member of the Spanish SME BlackBinder S.L., on how they contributed to the Performing Arts Industry through their patented invention.***

*“We have no better option to support our business strategy than to protect our core licensable technology by patents.”*



**Julian, first of all, let us thank you for accepting our request to interview you. Now, how about starting with your company? Can you tell us a bit about your business?**

BlackBinder S.L. was incorporated in 2017 as the holding company of the BlackBinder Group, which also includes NewMusicNow S.L. and Rolling Scores S.L. NewMusicNow acts as the R&D and product development business unit and is the applicant and holder of all the patents rights of the group.

**You have an invention called “BlackBinder” which automatically scrolls music notes but we are sure it is not as easy as it sounds. Can you give us some more information about this invention and what makes it different?**



Our invention is a solution to one of the main problems of performers: turning the pages of sheet music. Our invention is like a teleprompter to read music, in which the score is continuously scrolled in a display. It continuously adjusts its speed according to the music notation being displayed at any given time, and the tempo at which the performer is playing.

The invention is supported by a new digital format for music notation that, unlike PDF, contains all the information of a music score and enhances the live music experience for all, musicians and audiences.

Most other digital readers are limited to the use of PDF scores, or other formats that retain the concept of a “page” and therefore, they have to provide external (i.e. Bluetooth pedals) or internal (additional software) solutions to “turn the page”.

We keep improving our technology in collaboration with a selected group of musicians, a few ensembles and, especially, with the Spanish Radio Television Symphony Orchestra, which is advancing very quickly towards a complete digitisation of all their processes. We view these collaborations as an extended and essential part of our R&D team. They constitute our living lab.

**So, it is a perfect and novel tool for instrument players while they are performing their music. Speaking of novelty, I know that you took further steps to protect your invention. Which IP protection means have you used?**

To protect our invention, we have elected to maintain a dual approach: a) file for patents to protect our differentiating technology to scroll and synchronise scores, and b) to keep as trade secret our knowledge

to edit and visualise music notation in our proprietary digital format. We also have trademark registrations to protect our brands “BlackBinder” and “Rolling Scores”.

**Have you seen any positive effects of patenting in your business? And related to that, I should also ask if you have faced any difficulties while patenting and exploiting your rights.**

We are well aware that intangible assets represent most of the value of our business. In particular, patents are at the core of our business strategy since our business model consists mainly in providing our proprietary technology through licensing. Since our technology can be easily reverse-engineered, we have no better option to support our business strategy than to protect our core licensable technology by patents.

We have pursued the processing of our patent portfolio to achieve good, strong, enforceable, wide and difficult-to-circumvent patents.

Since 2014, our “music teleprompter” solution has served as an inspiration to other app developers, to introduce page-turning solutions in their music notation and music reading apps. A couple of years ago, we identified one of those solutions that infringed on our patents. We sent a warning letter to the potential infringers and that was enough to make them remove the scroll feature from their app. At that time, we were not ready to offer a license for our technology, as we are today.

Since the middle of 2020, we have started to offer our scroll solution to developers of digital solutions to work with scores, since they represent the segment with the highest potential to capture the value proposition of our licensed technology. Among them, we have identified a few which could be infringing our patent. We are hoping that these cases can be resolved in amicable terms.

## A REVOLUTION IN LIVE MUSIC PERFORMANCES THROUGH A PATENTED INVENTION



BlackBinder, an all-in-one system to facilitate working with scores in hands-free mode, converts pages into a continuous flow that adapts to the music score as musicians play their instruments, and automatically scrolls without interrupting the performance. Besides, the scroll, being a non-printable format *per se*, offers a measure of protection to copyright owners.

The app is available for download in the Apple Store and, since 2013, the private investment raised amounts to more than EUR 2 million with the post-capitalisation valuation of the company being EUR 4 million (2018).

The company currently has two European families of patents along with their extensions in the USA, Russia and China. This territorial extension covers more than 90% of the top 100 music schools and 80% of the leading orchestras in the world.

Please check the [European IP Helpdesk website](#) for the full case study. For more information about the company, click on [www.blackbinder.net](http://www.blackbinder.net).

## 10. CULTURAL HERITAGE SUB-SECTOR

### 10.1. Sub-sector definition and its value chain

The document “Mapping the Creative Value Chains” [6] defines Cultural heritage as “*objects, assets, practices, etc. that over time take on an additional symbolic meaning and significance for communities at various levels (local, regional, national, European global, etc.)*”.

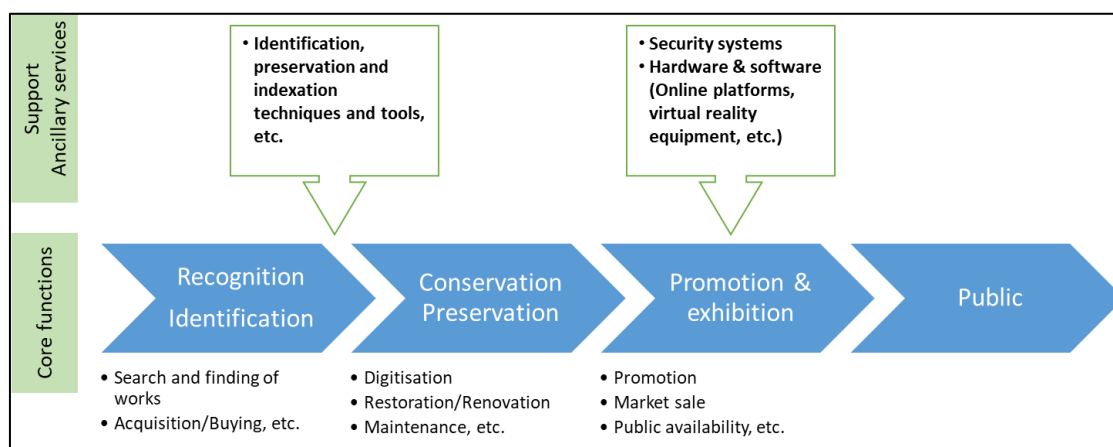
The report further states that “there are **three categories of cultural heritage** that have been distinguished by National legislators and International organisations:

- (i) **tangible movable cultural heritage**, including cultural objects and sources such as artwork, artefacts, historic objects, but also books, archives, etc.
- (ii) **tangible immovable cultural heritage**, including culturally or historically significant real estate, historic towns, archaeological sites, monuments, etc., and
- (iii) **intangible cultural heritage**, (...) practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage.”

When studying this sub-sector, the following NACE codes have been considered with reference to the document “Boosting the competitiveness of cultural and creative industries for growth and jobs” [5]:

- Library and archives activities (R91.01);
- Museums activities (R91.02);
- Operation of historical sites and buildings and similar visitor attractions (R91.03);
- Activities of amusement parks and theme parks (R93.21); and
- Other amusement and recreation activities (R93.29).<sup>35</sup>

The document “Mapping the Creative Value Chains” [6] defines two different value chains, one for tangible cultural heritage, another for intangible cultural heritage. But for the purpose of patenting activities in this sector, the following simplified value chain can be used:



**Figure 12: Simplified value chain of the cultural heritage sub-sector**

<sup>35</sup> The document “Boosting the competitiveness of cultural and creative industries for growth and jobs” [5] includes **amusement parks**, which can be associated with **amusement ride manufacturers**. However, the **manufacture of amusement rides is considered as part of the Craft sub-sector** [28] and includes activities or skills related to design and, through civil engineering (structural engineering), architecture. Therefore, this section also covers the manufacturing of amusement rides, (e.g. merry-go-rounds) without necessarily assuming the Cultural Heritage sub-sector is the most relevant for this activity.

The value chain above identifies the following functions:

- **Recognition/identification**, which is an integral part of the main “conservation/preservation” function. Within the process of the preparatory work such as searching and/or acquisition, technical components (techniques and tools) are widely used;
- **Conservation/preservation is the main core activity of this sub-sector** which entails restoration (renovation), digitisation, maintenance, etc. This function is strongly relevant to the Architecture sub-sector; and
- **Promotion and exhibition**, involving technologies in the sale, marketing and promotion such as virtual or augmented reality or 3D visualisation. Moreover, the deployment of security systems also involves the use of technology (sometimes high-end technology such as lasers, etc.). In this domain, it is possible to find commonalities with technologies implemented in the Performing arts (e.g. ticketing).

## 10.2. Innovation characteristics of the sub-sector

- Virtual reconstruction of destroyed buildings via augmented reality [30];
- Interactive visit experiences; and
- Online sales of tickets or automatic ticket machines.

The above technologies seem to be the main vector of innovation in this sub-sector [29]. They are mostly related to **technologies such as virtual or augmented reality or 3D visualisation**, and it is clear that these technologies have the capacity to make cultural heritage discovery an attractive educational experience. Technologies for 3D viewing are also used by researchers and curators to limit the physical manipulation of objects and thus limit situations of damage.

There are also specialised **scientific research** programmes [31] in the fields of **chemistry** and **materials** for the **restoration** of cultural heritage that provide opportunities to develop innovations that can have an indirect impact on the construction sector in general [6].

## 10.3. Patenting practices in literature

There is a limited number of patent information in this field, however, the literature suggests that universities and research centres play a key role in patenting in this domain, which shows the **importance of academic actors** especially in the technical field of heritage restoration.

Apart from the universities and research centres, **some museums have filed patent applications** concerning technologies for the cultural heritage sub-sector. However, the inventions in this domain are more likely to come from specialised players such as **STS** or **large technology companies**.

As mentioned in the previous section, the manufacturing of amusement rides has its own prominent part in this sub-sector as this activity significantly relates to technology (e.g. architecture, mechanical engineering and safety). Moreover, an international patent classification code assigned specifically to merry-go-rounds shows this particular link, which helps in the provision of accurate numbers of patent filings in this field.<sup>36</sup>

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<sup>36</sup> The document “Mapping the Creative Value Chains” [6] provides an example of the Walt Disney Imagineering company that has filed around 115 patent applications, 21 of which relate to merry-go-rounds.

## A STORY BEHIND THE SUCCESS *in cultural heritage*



**Luigi Percuoco, the Chief Technology Officer of the Italian Art Glass Srl., shares his experiences and views about the company's patenting story.**

*"The process of drafting and assessing a patent requires companies to carry out a rigorous analysis of their technological capacities especially through the patent searching process prior to the filing."*

**First of all, thanks a lot for accepting our interview request, Luigi. We would like to start with ARtGlass, first. Can you introduce your company, shortly?**

We are an Italian company developing a proprietary augmented reality platform to serve the unique needs of cultural sites. We guide visitors during their interactive tours of cultural sites, such as museums and historic sites, by creating dynamic, educational experiences through immersive storytelling.

Our augmented reality (AR) and mixed reality (MR) tours are Wi-Fi independent and are 3D, fully immersive, and hands-free. By freeing up visitors' hands, ARtGlass smart glass tours eliminate a barrier



and allow visitors freedom to fully immerse themselves in site exploration. We launched our technology first in Italy, and then expanded to the US, launching at iconic sites like George Washington's Mount Vernon, James Monroe's Highland and Madame Tussauds.

**We came across your patent regarding your invention on augmented reality to be used at cultural sites, which seems to create an exciting experience for visitors. Can you explain a bit about this invention to us? – how do you think it will create an added value to the cultural heritage sector?**

Our invention concerns two fundamental aspects in the creation of interactive stories: the way in which the story is created and the realisation of the experience. The patent of ARtGlass includes ways of creating stories that are very close to the needs of curators, archaeologists and museum experts.

It has a very intuitive visit mode that is based on natural behaviour, without any interaction with digital interfaces. The visitor simply has to move around the cultural site and look at the objects of interest, explore them by physically moving in space without the need to use controllers. The experience is purely AR through the use of devices with completely transparent lenses and this makes it possible for visitors to always be aware of where they are and to be able to move in the surrounding environment. Contact with reality is never lost, unlike what happens with virtual reality. Therefore, the invention offers a unique experience for the visitors and brings out a novel technology to be used for the cultural heritage industry.



**How did you decide to get a patent for your invention, what was your initial motive? And in the end, can you tell us about your experiences with the patenting process?**

We filed our patent at the beginning of 2014 because we had realised that there was still a need in the cultural heritage sector for the use of new technologies. The initial filing process was quite simple, we had some difficulties in the later stages of responding to the observations of the patent examiners. This resulted in the need to turn to IP professionals who helped us.

**Do you think patenting pays off after all? What benefits have you observed and what are your next steps in terms of enforcing and exploiting your patent?**

Having a patent brings several benefits, for example some European institutions allow EU public administrations to be able to use patented inventions without entering into long tendering processes. Furthermore, the EU Member States tend to support patentable inventions by funding the R&D activities. Another very important benefit is that the process of drafting and assessing a patent requires companies to carry out a rigorous analysis of their technological capacities especially through the patent searching process prior to the filing.

**I would like to ask, lastly, your recommendations, for the actors in the Cultural and Creative Industries/Cultural Heritage sector, in terms of patenting and intellectual property in general.**

I believe that an area to be explored is that of the new languages of communication with visitors that are rapidly changing compared to the traditional audio guides and mobile apps. Furthermore, I believe that the interaction between AR and AI should further be explored, to make the visitors' experience even more exciting and exceptional while they are visiting the cultural sites. This is an area in which we will definitely try our hand.

## A UNIQUE STORYTELLING EXPERIENCE WHILE VISITING CULTURAL SITES



The patent "*Augmented reality smart glasses for use at cultural sites*" describes an innovative smart glass, which creates an immersive AR experience for visitors of cultural sites using object identification and optical flow tracking.

The system, software platform and methodology are especially suited to design and deploy an immersive augmented reality experience to the visitors of cultural sites on user-wearable devices.

Contrary to conventional handheld AI devices, this invention allows users to roam through augmented environments freely, letting a story unfold before their eyes. As a result, thanks to the ARtGlass technology, cultural sites come alive to increase the educational outcomes for heritage destinations. For more information about ARtGlass, visit [www.art-glass.it](http://www.art-glass.it).

## 11. FASHION SUB-SECTOR

### 11.1. Sub-sector definition and its value chain

The document “Boosting the competitiveness of cultural and creative industries for growth and jobs” [5] delineates the fashion industry according to NACE codes:

- Textile industry excluding textiles not intended for use in clothing, including technical and industrial textiles, and excluding the manufacture of yarn (NACE 13.10 and 13.20);
- Clothing industry, the manufacture of clothing) (NACE 14);
- Leather and footwear industry (NACE 15);
- Manufacture of articles of jewellery, including costume jewellery (NACE 32.12, 32.13); and
- Wholesale and retail trade of textiles, clothing, furs, leather goods, footwear, watches and jewellery (NACE 46.16, 46.42, 46.48, 47.71, 47.72 and 47.77).

These codes broadly correspond to the whole value chain of the textile and clothing industry, excluding suppliers to these industries (manufacturers of machinery or equipment, chemical industry).

This definition is in line with the value chain proposed by the Consortium Europe INNOVA in its 2011 report on innovation in the textile and clothing sector [32].

However, in light of other information found in this state-of-the-art report, it seems that the exclusion of yarn manufacture, as well as the exclusion of technical textiles (which is one of the most inventive, thus patent-prolific, segments of the industry), does not reflect the following trends in the fashion sub-sector:

- Developing an environmentally friendly production chain which also involves the development of new textile fibres or the production of fibres from recycled waste (in yarn manufacturing); and
- The development of technical textiles specifically designed for the clothing sector (in technical textiles).

A simplified value chain diagram for the fashion sub-sector can be drawn as follows:

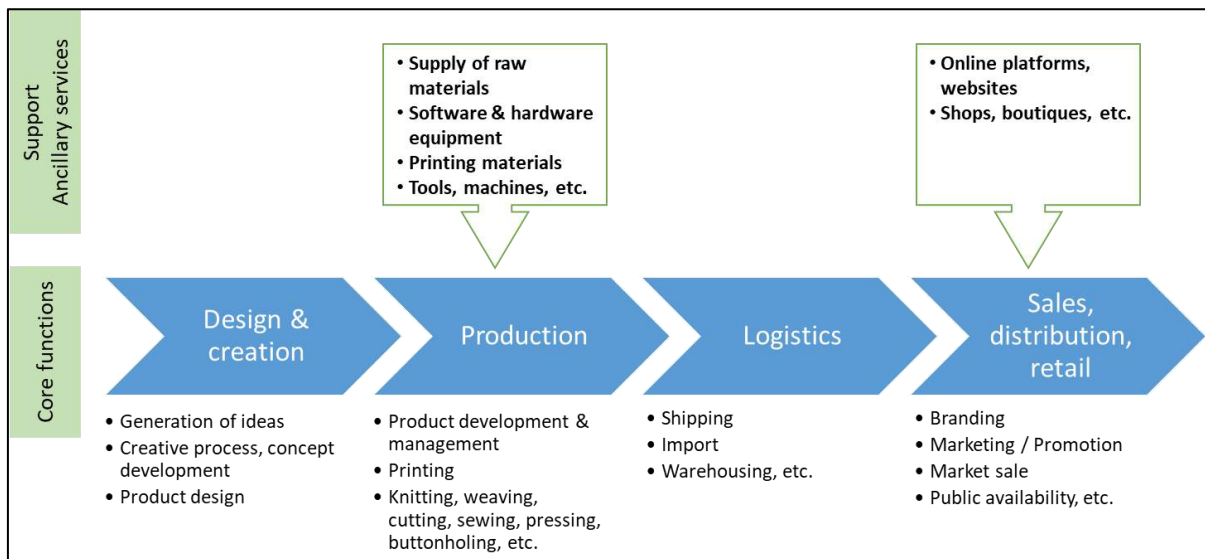


Figure 13: Simplified value chain of the fashion sub-sector

## 11.2. Innovation characteristics of the sub-sector

Generally speaking, the development of the fashion sector has been conditioned by technological innovations in the fields of mechanics, chemistry and ICT. The appearance and development of the textile industry is in itself a symbol of the first industrial revolution. Among the many innovations that have marked the development of this sector, the following historical innovative milestones have shaped the inventive characteristics of the fashion industry [33]:

- 18<sup>th</sup> century: mechanisation and automation of weaving with the flying shuttle, the spinning-jenny, the spinning-mule and the steam loom;
- 19<sup>th</sup> century: automation of pattern weaving with the Jacquard loom; industrial production of viscose by chemical treatment of cellulose; discovery of new synthetic pigments derived from coal; invention and improvement of the sewing machine; introduction of chemical tanning based on mineral salts; and
- 20<sup>th</sup> century: development of synthetic textiles from fibres produced by the petrochemical industry (polyamides, polyesters, polyurethanes, etc.); development of non-woven textiles; development of CAD (Computer Aided Design) and CAM (Computer Aided Manufacturing) software for fashion; the beginnings of textile cutting automation.

Therefore, historically, the fashion value chain has mainly involved three types of technological innovations, in the fields of mechanics, chemistry and ICT. These innovations tend to be made by suppliers specialised in the fashion sector, mainly: manufacturers of machinery for the textile and clothing industry, chemical companies supplying synthetic materials, pigments and various other substances used in the manufacturing or dyeing process of textile materials (including leather and fur), and ICT companies supplying CAD/CAM solutions [34]. The main effects of technological innovation can be witnessed in the productivity of textile mills and garment factories and in the reduction of the production costs through automation. They also include the expansion of the range of available materials and colours, the development of non-woven textiles, and recently, wearable technologies (e.g. intelligent textiles), which requires strong cooperation between ICT/artificial intelligence (AI) and fashion.

In a 2019 working paper [35], the International Labour Office (ILO) highlights the three major technological areas whose advance will have a major impact on this sector: robotics and automation, digital technologies and new materials.

Robotics and automation innovations primarily concern the garment sector: technologies such as laser cutting, sewing robots, 3D printers, robotic arms, and knitting machines make manufacturing processes faster and more cost-effective. These technologies offer the opportunity to bring production sites closer to the places of consumption and are seen as possible means of relocating mass production activities when needed.

Digital technologies offer opportunities for innovation in most of the industry's value chain functions: market intelligence, design, materials, supply chain, production, marketing, retail and customer service. For example, these technologies offer new services to consumers such as digital tailor-made cutting or remote fitting. They contribute to the development of direct-to-consumer business models [36], adjusting supply to demand especially to avoid the overproduction problems inherent in the fast-fashion business model.<sup>37</sup> In conjunction with robotisation and automation technologies, the complete

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<sup>37</sup> Between the end of the 20th century and the contemporary period, the fashion industry saw the emergence and prosperity of the fast-fashion business model. This model is mainly based on a globalised value chain, where consumer brands mass-produce ready-to-wear items whose collections are renewed at the rate of a few weeks. The garments are designed in Europe or North America, while production takes place in low-cost countries, mainly around the Mediterranean and in Asia.

automation of clothing production can also be envisaged. Digital technologies also present opportunities to control working conditions or the environmental performance of the various manufacturers involved in the value chain. Digital tracking technologies offer opportunities for effective IP management tools to develop anti-counterfeiting solutions. Indeed, in a report dated 2015, EUIPO states that counterfeiting causes the clothing, footwear and accessories sector to lose approximately 26.3 billion USD in annual revenues [37].

Innovation in the field of materials is mainly aimed at reducing the environmental impact of the fashion industry [38] and at functionalising fabrics (functional/technical textiles).

New textile fibres are being developed to offer an alternative to synthetic or natural fibres whose production is particularly polluting or water-consuming. Some of these fibres come from the recycling of waste of various kinds (textile, food processing, plastics) and could therefore make it possible to develop a circular economy model in the sector.

The functionalisation of fabrics consists in adding particular properties to them, and can be linked to utilitarian or aesthetic objectives such as developing antibacterial fabrics or deep black fabrics that resist washing [32]. Within those technical textiles specifically designed for the clothing industry, there is the special case of “intelligent textiles” that have the particularity of interacting with their immediate environment [39]. Interactions can be an effect of the material’s physicochemical properties or can be due to the incorporation of flexible and miniaturised electronic devices into the fabric.

According to “Sectoral Innovation Watch Textiles and Clothing Sector” [32], innovation<sup>38</sup> in this sector depends mainly on the acquisition of new technologies from suppliers and to a lesser extent on internal R&D projects. Textile companies stand out from clothing companies in that they invest a larger share of their sales in innovative activities. Non-technological innovation (e.g. organisational innovation, innovation in marketing, social innovation, etc.) plays a more important role than in other manufacturing industries.

However, the involvement of fashion players in technological innovation can also go beyond a simple customer-supplier relationship. For example, the global luxury group Kering highlights its massive involvement in financing and supporting technological innovation in the fashion sector, notably to develop a sustainable production tool [40]. The Kering group has thus developed a method for evaluating the environmental performance of its activities.<sup>39</sup> It offers, through the Material Innovation Lab, a library of around 3,800 sustainable materials which is available to the different companies in the group. It has also invested in the start-up Worn Again, which conducts research to recycle mixed textiles containing cotton and polyester fibres.

Regarding the creative function of the value chain, the *haute couture* sector has also seen the emergence of a so-called fashion-tech movement. Designers involved in this movement have taken advantage of the ability of 3D printing to create complex shapes or have developed garments with special features such as imposing social distancing [41].

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<sup>38</sup> The study is based on indicators characterising the innovative profile of a company from the fourth edition of the Community Innovation Survey.

<sup>39</sup> Environmental Profit & Loss (EP&L).

### 11.3. Patenting practices in literature

According to the study “Sectoral Innovation Watch Textiles and Clothing Sector” [32], innovative companies in the textile and clothing sector patent very little. However, the study also stresses that IP rights are of paramount importance in protecting the innovative efforts of companies in the sector, including patents for those producing technical textiles or specialised in fabric processing. Among innovative textile and clothing companies, it is the textile companies that patent the most, on average twice as many as the clothing companies. The study highlights that trademarks and registered designs are significantly more important for companies in the sector, especially clothing companies.

In a fairly conventional way, the paper distinguishes between large companies that implement a clearly defined IP strategy, and the SMEs in the sector, which are in the vast majority, and are discouraged from doing the same mainly for reasons of cost, lengthy registration procedures and lack of information on the subject. In terms of practices, the paper states that most textile SMEs prefer market access strategies based on speed, quality of delivery and reputation, rather than on patents.

Nevertheless, a basic desk search highlighted examples of SMEs that have filed patent applications in the field of textiles or textile fibres:<sup>40</sup>

**Table 5: Some companies with patents in the field of textiles**

Company	Country	# Patent filings	Invention
<b>Orange Fiber</b>	Italy	1	Textile production from citrus fruits
<b>The Movement</b>	The Netherlands	1	Polyester fibre from recycled plastic waste
<b>Aquafil</b>	Italy	9	Recycling polyamide fibre from elastomers
<b>Candiani Denim</b>	Italy	2	Manufacture of fibres and elastic fabric
<b>Getzner Textil</b>	Austria	2	Weaving machine
<b>Worn Again</b>	UK	6	Process for recycling polyester from packaging or fabrics
<b>Intelligent Textiles</b>	UK	8	Conductive textile

The case of Orange Fiber highlights an innovation strategy carried out in collaboration with the Polytechnic University of Milan.<sup>41</sup> The textiles produced by Orange Fiber have the property of delivering vitamins to the skin. They are made from citrus pulp resulting from the industrial production of orange juice. The production technology was the subject of a first patent application co-filed in Italy in 2013 in the names of the University of Milan and Orange Fiber’s co-founder Adriana Maria Santanocito, followed by a PCT application in 2014. Subsequent extensions were then filed in several countries such as EPO member states, Mexico, Brazil and the US.

<sup>40</sup> For more information about the patenting activities and statistics in this sector, please refer to the Report-II “Statistical Analysis/Patent Mapping of CCI’s”.

<sup>41</sup> For more information about the patent, please see [here](#).

In the field of intelligent textiles, the French Textile Industries Union (*Union des Industries Textiles*) mentions a 2015 study [39] carried out by the French IP investment fund, France Brevets, which shows that European companies registered few patents in this field over the ten years preceding the study. Those that have done so are mainly German companies. In general, patent applications related to the fashion sub-sector are filed by companies from the field of electronics rather than the field of textiles. For example, the British company Intelligent Textiles Ltd. is marketing a patented technology for incorporating electronic circuits into conductive fabrics such as cotton, wool and polyester [42]. The company's founders developed and patented the invention as part of their research at Brunel University in west London. They then founded Intelligent Textiles to develop the commercial potential of their invention, buying the patent rights from the university as part of a technology transfer process. According to the WIPO article on the company's case, the decision to protect the invention in Europe with the filing of a European patent significantly increased the value of the invention in the eyes of its very first Australian customer.

IT giants such as Google and Amazon are also among the companies filing patents for the fashion industry. Amazon, for example, has patented an on-demand apparel manufacturing system involving textile printer, textile cutter and computing device [36]. On the other hand, Google holds a patent on the haptic feedback mechanism of the Jacquard technology [43]. This technology consists of an electronic system of sensors and gesture control interface designed to be inserted into a garment. This system was the subject of a jacket project in collaboration with the *Levi's* brand.

Manufacturers of sports clothing and footwear<sup>42</sup> are actors who regularly patent. For example, a basic search in the Espacenet patent database shows that between 1964 and 2020, approximately 3,600 patent applications were published in the name of Adidas. A study published in 2005 on the Montebelluna sports footwear cluster in Italy underlined that this cluster invested more in R&D than in market research and that a high proportion of its companies (65%) had at least one patent<sup>43</sup> [45].

In the field of sports clothing and footwear, the patent is also used to justify acquisition operations on technologies considered as strategic. Indeed, brands seek to develop a direct-to-consumer business model. This model aims at selling customised products directly to the consumer without the use of wholesale or retail intermediaries, in particular, to avoid high commissions from operators such as Amazon [46]. This type of commercial strategy is at the source of technological innovations in the fields of mobile application development, data science and personalisation of the commercial offer. In order to serve this strategy, Nike is notably proceeding by external growth, and since 2018, the brand has acquired technology companies such as Zodiac, Invertex and Celect. Among the arguments put forward by Nike to justify its interest in Celect is the fact that the company has a patent portfolio of cutting-edge technologies in the fields of software engineering and data science [47].

Among garments and footwear manufacturers, the Italian company Geox is an example of a company in the fashion sector that makes patents a key element of its competitiveness [48]. Since its creation in 1995, according to the Espacenet records (and up to the time of writing this report), the company has filed 107 patent applications, the most recent of which dates from 2018. Offering new products based on patent-protected technologies allows the company to stay ahead of the competition when its oldest patents fall into the public domain. In particular, the company has earned a worldwide reputation for developing soles that are both waterproof and permeable to perspiration.

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<sup>42</sup> Since the 1980s, first in the United States and then in Europe, sports brands, such as the American Nike or the German Adidas, have gradually become fashion phenomena and have become major players in the fashion industry [44].

<sup>43</sup> In the studied panel: 20 companies.

In its White Paper [39], the French Textile Industries Union sets out the following recommendations:

- To patent on a regular basis; and
- To implement a confidentiality strategy from the beginning of the R&D phase (non-disclosure of new and/or inventive elements).

To determine whether an invention deserves a patent, the report recommends that companies consider the impact of such an invention if it were owned by a competitor. According to the report, companies in the sector tend to exploit their innovation before seeking to protect them. The report highlights the potentially high cost of patent filing procedures for smaller companies in the sector (micro-enterprises, start-ups, SMEs).

The report sees patents as an inescapable reality in the intelligent textiles sector, mainly due to the electronics/IT sector: developing intelligent textiles based on electronic/IT technologies may involve taking out licenses to use these technologies when they are patented (e.g. Bluetooth).

The report also recommends carrying out a patent and legal watch in the field of intelligent textiles, in particular to monitor the emergence of possible patent pools that could become essential to develop smart textiles.

## A STORY BEHIND THE SUCCESS

*in fashion*



*The Finnish entrepreneur, Niklas Kuusela, made a great success with “Neckpacker”. Here is his story about how his skiing holidays ended up with a patented product.*

*“Our patent not only gives us a competitive advantage towards our competitors. It also provides us with a lot of options when collaborating with bigger players within the industry.”*

**Niklas, we have identified you from your Kickstarter campaign and with your interesting story. So, can you tell us a bit about how it all started?**

Indeed, it is quite interesting. In 2012, when driving back from my Easter skiing holidays in the Finnish Lapland, I was struggling with my inflatable travel pillow, as we all do. You know, the ones which you need to huff and puff, then keep the air in, while closing the plug. A nightmare! That’s exactly when I began to imagine a pump to inflate my ideal pillow, which would cover my head like a helmet. The very next day, I started working on the design and thought about a hood-type cushion with diagonal straps on both sides attached to the shoulders for better support. That was the moment the idea of a vest with an integrated inflatable hood was born!

But I didn’t stop there. With the support of my best friend, we developed my idea by adding storage pockets to the vest, and when we felt we had the right prototype, we presented it to TEKES, which is a governmental innovation fund for start-ups. They provided an investment grant that was large enough for more testing and prototyping and, eventually, to start the patenting process. Following the birth of our final product Neckpacker, we launched a Kickstarter and IndieGoGo campaign and raised over 133K USD in 2017.



**NECKPACKER**

In 2020, we were selling our products in over 70 countries around the world and the group of Neckpacker users is growing fast! Our team also keeps growing and I have to say that I’m very proud of everyone!

**It can really be a pain to find the right pillow when travelling and to carry this pillow with you all the time while pacing airports. But you have an innovative solution for this with your product Neckpacker, a travel jacket with a built-in pillow. Can you give us some more information about this invention? What makes it different?**

For the first five years, we spent a lot of time investigating and experimenting for the best solution to tackle the “tired-head-syndrome”, the problem where your head falls to the sides while sleeping even when using a traditional neck pillow. Our solution addresses this problem, and with its integrated neck support system and side straps, it really provides the best support for sleeping “on-the-go”. You can also remove this support system and use it just as a basic jacket. There’s even a possibility to use the neck support system totally independently from the jacket.



**This is not only an innovative product, but you have a patent too! And Neckpacker is a perfect example in the intersection of technology, design and fashion. What was your motive when you were applying for a patent, and what is your overall patenting strategy?**

Neckpacker has lots of innovative aspects, and we wanted it to be used worldwide. However, this would make our invention open to infringements. That is why we realised that it is important to protect our innovation globally. Besides, we have ongoing negotiations with some large industry players, and our IP protection is very advantageous in these talks. In the end, I am sure that there will be an increasing global demand for our innovation especially when the Covid-19 situation starts to ease up and, as a start-up company, we feel safer thanks to our IP strategy, which is in line with our global business strategy.

**Do you think it's worth it in the end? What are the outcomes of IP protection in your case?**

Yes, we do think it has been worth it! The whole patent and trademark filing process have really been an educational journey to the world of IP rights. One of the positive outcomes is the competitive edge that the patents and trademarks give us with respect to our competitors. Furthermore, as I said, our IP protection gives us a lot of options to collaborate with bigger players within the industry.

**Can you tell us a few words about your recommendations to entrepreneurs?**

If you have the right attitude and dedication towards your own project, trust your vision and your efforts. But also remember to often ask for feedback and opinions regarding your product/project. Regarding the IP rights, consult the professionals but also trust your own opinion before starting the long patenting process. Altogether, the entrepreneurial journey is going to be difficult, hard and has frustratingly slow progress at times, but be persistent and don't give up! No matter what happens - you will win anyway! At least you will gain loads of experience and have a hell of a story to tell. Good luck!

## THE MOST RELAXED AND FASHIONABLE WAY OF TRAVELLING: NECKPACKER



The hood system of the Neckpacker travel jacket is a patented invention under the [European Patent no. 3032976](#) "*Functional article for clothing*". The patent document explains the inflatable hood system which extends along the parts of the hood, and therefore supports the person's neck when it is worn.

The jacket makes sleeping on-the-go and travelling easier and more comfortable not only with its built-in air cushion but also with specifically tailored pockets to keep the travel bits such as passports, tickets, wallets, headphones, mobile phone, etc. safe and in a compact manner.

You can find more information about Neckpacker on their website at [www.neckpacker.com](http://www.neckpacker.com).

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## ANNEX I: CCIs sub-sector mapping

Related section in this state-of-the art analysis report	Sub-sector according to “Boosting the competitiveness of cultural and creative industries for growth and jobs” [5]		Value chain according to “Mapping the Creative Value Chains” [6]		Comparison
	Sub-sector	NACE codes	Value chain model	Definition	
1. Advertising sub-sector	Advertising	<ul style="list-style-type: none"> <li>Public relations and communication services (M70.21)</li> <li>Advertising agencies (M73.11)</li> <li>Media representation (M73.12)</li> </ul>	No value chain modelled		<ul style="list-style-type: none"> <li>Activities perceived in the majority of value chains as falling under the dissemination/commerce functions (promotion, marketing) with the exception of the Books value chain, where this activity is perceived as falling under the Production/Publishing function (Marketing of books).</li> <li>For both NACE sub-sector and TV &amp; Radio Broadcasting value chain, the production of radio and TV advertising does not fall under any Advertising sub-sector.</li> </ul>
2. Architecture sub-sector	Architecture	<ul style="list-style-type: none"> <li>Architectural activities (M71.11)</li> </ul>	No value chain modelled		<ul style="list-style-type: none"> <li>Compared to the modelled value chain, NACE code used refers only to Creation and/or Production functions.</li> </ul>
8. Cultural heritage sub-sector	Archives, libraries, cultural heritage	<ul style="list-style-type: none"> <li>Library and archives activities (R91.01)</li> <li>Museums activities (R91.02)</li> <li>Operation of historical sites and buildings and similar visitor attractions (R91.03)</li> <li>Activities of amusement parks and theme parks (R93.21)</li> <li>Other amusement and recreation activities (R93.29)</li> </ul>	Modelled under “Cultural Heritage”	<ul style="list-style-type: none"> <li>“Cultural heritage refers to particular (tangible and intangible) objects, assets, practices, etc. that over time take on an additional symbolic meaning and significance for communities at various levels (local, regional, national, European global, etc.).”</li> <li>“Cultural heritage is a public good.”</li> <li>“Monuments, sites, landscapes, skills, practices, knowledge and expressions of human creativity as well as collections conserved and managed by public and private bodies such as museums, libraries and archives.”</li> </ul>	<ul style="list-style-type: none"> <li>The two definitions correspond except for one item: the modelled value chain excludes recreational and leisure activities from its field of analysis (e.g. amusement parks).</li> <li>NACE codes exclude restoration/renovation activities of buildings or works. This is not the case for the Cultural Heritage value chain.</li> </ul>
6. Media and Content Industries sub-sector	Books & press	<ul style="list-style-type: none"> <li>Printing of newspapers (C18.11)</li> <li>Other printing (C18.12)</li> <li>Pre-press and pre-media services (C18.13)</li> <li>Reproduction of recorded media (C18.20)</li> <li>Retail sale of books in specialised stores (G47.61)</li> <li>Retail sale of newspapers and stationery in specialised stores (G47.62)</li> <li>Retail sale of second-hand goods in stores (G47.79)</li> <li>Book publishing (J58.11)</li> <li>Publishing of newspapers (J58.13)</li> <li>Publishing of journals and periodicals (J58.14)</li> </ul>	Books	<ul style="list-style-type: none"> <li>“The analysis of the book publishing value chain focuses on the book industry (therefore excluding press) with a primary focus on literature and encompasses the creation (including illustration), dissemination, production, distribution and preservation of books.”</li> </ul>	<ul style="list-style-type: none"> <li>The two definitions correspond except for one item: the modelled value chain excludes activities related to Press.</li> </ul>

		<ul style="list-style-type: none"> <li>• News agency activities (J63.91)</li> <li>• Translation and interpretation activities (M74.30)</li> </ul>			
<b>3. Design sub-sector</b>		<ul style="list-style-type: none"> <li>• Specialised design activities (M74.10)</li> </ul>	No value chain modelled		<ul style="list-style-type: none"> <li>• Design does not appear as such in the modelled value chain. It could nevertheless appear through Creation/Production activities of Artistic crafts or Visual Arts value chains. It could also appear through the ancillary activity of manufacturing musical instruments in the Music Industry value chain</li> </ul>
<b>5. Visual Arts sub-sector</b>	Design & visual arts	<ul style="list-style-type: none"> <li>• Photographic activities (M74.20)</li> </ul>	No value chain modelled	<ul style="list-style-type: none"> <li>• “Definition of visual arts largely follows the UNESCO FCS 2009 definition as well as the ESSnet-Culture 2012 definition.”</li> <li>• “As stated in UNESCO (2009), ‘Visual arts are art forms that focus on the creation of works, which are visual in nature. They are intended to appeal to the visual sense and can take many forms’.”</li> <li>• Unlike the UNESCO FCS 2009 definition, they do not include crafts. (see Artistic crafts)</li> </ul>	<ul style="list-style-type: none"> <li>• Definition of Visual Arts according to NACE classification represented only by code M 74.20, is extremely restrictive since it only covers activities related to photography.</li> <li>• See “Performing arts” for more information.</li> </ul>
<b>6. Media and Content Industries sub-sector</b>	Music	<ul style="list-style-type: none"> <li>• Manufacture of musical instruments (C32.20)</li> <li>• Retail sale of music and video recordings in specialised stores (G47.63)</li> <li>• Sound recording and music publishing activities (J59.20)</li> </ul>	Music	<ul style="list-style-type: none"> <li>• Mainly recorded music industry. Mass reproduction is part of the value chain.</li> <li>• Partly encompasses activities of live music industry (live performance, venues, festivals)</li> <li>• Manufacturing of musical instruments is considered as ancillary goods &amp; services</li> <li>• CMOs and right management belong to the chain as support function.</li> </ul>	<ul style="list-style-type: none"> <li>• The two sectors generally overlap, with the exception of: <ul style="list-style-type: none"> <li>○ Activities related to live performances that are not included in NACE code definitions.</li> <li>○ Mass reproduction activities of original recordings which are included in the Production function of music industry value chain but which is classified under NACE code C 18.20 (reproduction of recorded media) allocated to the Book &amp; Press sub-sector.</li> <li>○ NACE codes used to define this sub-sector explicitly exclude music recording and reproducing equipment from the industry-related activities. Regarding the music industry value chain: only musical instruments are explicitly mentioned. However, the general definition of ancillary goods and services also corresponds to this type of equipment.</li> </ul> </li> <li>• Both approaches consider copyright management activities.</li> </ul>
<b>7. Performing Arts sub-sector</b>	Performing arts & artistic creation	<ul style="list-style-type: none"> <li>• Performing arts (R90.01)</li> <li>• Support activities to performing arts (R90.02)</li> <li>• Artistic creation (R90.03)</li> <li>• Operation of arts facilities (R90.04)</li> </ul>	Performing arts Visual arts	<ul style="list-style-type: none"> <li>• Performing arts (ESSnet-Culture definition)</li> <li>• Presentation of live art to a live audience; if recorded or displayed on a screen, a performance falls under other domains (e.g. Film).</li> <li>• Theatre and theatrical performances (e.g. musicals, opera, ballet, etc.), dance, cabaret, puppetry and object theatre, circus, performances by stand-up comedians, ventriloquists, jugglers, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• This sub-sector corresponds to two distinct value chains: Performing Arts and Visual Arts.</li> <li>• NACE codes broadly overlap the activities related to the functions of the Performing arts value chain with the exception of the sale of tickets for performances and the activities of arts agents which are included in the value chain but not in the codes.</li> <li>• NACE codes also cover activities related to the functions of Visual Arts value chain.</li> <li>• Visual arts value chain and NACE code R 90.03 include the restoration of works in museums.</li> </ul>

				<ul style="list-style-type: none"> <li>Contemporary performing arts also include any activity in which the artist's physical presence acts as the medium, such as mime.</li> </ul>	
<b>6. Media and Content Industries sub-sector</b>	Radio & TV	<ul style="list-style-type: none"> <li>Radio broadcasting (J60.10)</li> <li>Television programming and broadcasting activities (J60.20)</li> </ul>	TV & radio broadcasting (or broadcasting)	<ul style="list-style-type: none"> <li>“Broadcasting” refers to “Radio and Television broadcasting”. It encompasses the creation, production, dissemination, exhibition/reception and preservation of content.</li> </ul>	<ul style="list-style-type: none"> <li>The sub-sector as defined by NACE corresponds broadly to the activities of Broadcasting value chain excluding:                             <ul style="list-style-type: none"> <li>The production of TV programmes produced by third parties.</li> <li>The distribution of programmes to third parties.</li> </ul> </li> </ul>
<b>6. Media and Content Industries sub-sector</b>	Software & games	<ul style="list-style-type: none"> <li>Publishing of computer games (J58.21)</li> <li>Other software publishing (J58.29)</li> <li>Computer programming activities (J62.01)</li> </ul>	Multimedia	<ul style="list-style-type: none"> <li>“Applied and entertaining video games and computer software. These can be PC-, console, handheld-based or mobile” (restrictive definition).</li> <li>Part of Audio-visual and Interactive Media sector</li> <li>The 2009 FCS of the UNESCO that divides the Audio-visual and Interactive Media in the following three groups:                             <ul style="list-style-type: none"> <li>Radio and Television broadcasting;</li> <li>Film and Video;</li> <li>Interactive Media (video games and new forms of cultural expressions that mainly occur through the Web or with a computer)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>The two approaches overlap on the upstream part of the Multimedia value chain (Publishing of video games).</li> <li>The Multimedia value chain concerns video games in the broad sense, i.e. recreational and edutainment software (e.g. serious games).</li> <li>NACE codes definition also includes software development service activity, which is not the case of the Multimedia value chain.</li> </ul>
<b>6. Media and Content Industries sub-sector</b>	Video & film	<ul style="list-style-type: none"> <li>Motion picture, video &amp; television programme production activities (J59.11)</li> <li>Motion picture, video and television programme post-production activities (J59.12)</li> <li>Motion picture, video and television programme distribution activities (J59.13)</li> <li>Motion picture projection activities (J59.14)</li> <li>Renting of video tapes and disks (N77.22)</li> </ul>	Film	<ul style="list-style-type: none"> <li>Part of Audio-visual and Interactive Media sector</li> <li>The 2009 FCS of the UNESCO that divides the Audio-visual and Interactive Media in the following three groups:                             <ul style="list-style-type: none"> <li>Radio and Television broadcasting;</li> <li>Film and Video;</li> <li>Interactive Media (video games and new forms of cultural expressions that mainly occur through the Web or with a computer)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Video &amp; film sub-sector as defined by NACE codes corresponds to Film value chain as defined by the document “Mapping the Creative Value Chains” [6]</li> </ul>
<b>9. Fashion Industries sub-sector</b>	Fashion	<ul style="list-style-type: none"> <li>Weaving of textiles (C13.20)</li> <li>Finishing of textiles (C13.30)</li> <li>Manufacture of leather clothes (C14.11)</li> <li>Manufacture of workwear (C14.12)</li> <li>Manufacture of other outerwear (C14.13)</li> <li>Manufacture of underwear (C14.14)</li> <li>Manufacture of other wearing apparel and accessories (C14.19)</li> <li>Manufacture of articles of fur (C14.20)</li> </ul>	No value chain modelled		<ul style="list-style-type: none"> <li>Overall, this sub-sector has no equivalent in the “Mapping the Creative Value Chains” [6] document. It nevertheless covers part of the Artistic crafts value chain.</li> </ul>



		<ul style="list-style-type: none"> <li>• Manufacture of knitted and crocheted hosiery (C14.31)</li> <li>• Manufacture of other knitted and crocheted apparel (C14.39)</li> <li>• Tanning and dressing of leather; dressing and dyeing of fur (C15.11)</li> <li>• Manufacture of luggage, handbags and the like, saddlery and harness (C15.12)</li> <li>• Manufacture of footwear (C15.20)</li> <li>• Manufacture of jewellery and related articles (C32.12)</li> <li>• Manufacture of imitation jewellery and related articles (C32.13)</li> <li>• Agents involved in the sale of textiles, clothing, fur, footwear and leather goods (G46.16)</li> <li>• Wholesale of clothing and footwear (G46.42)</li> <li>• Wholesale of watches and jewellery (G46.48)</li> <li>• Retail sale of clothing in specialised stores (G47.71)</li> <li>• Retail sale of footwear and leather goods in specialised stores (G47.72)</li> <li>• Retail sale of watches and jewellery in specialised stores (G47.77)</li> </ul>	
<p>4. Crafts sub-sector</p>	<p>Not mentioned</p>	<p>Artistic Crafts</p>	<ul style="list-style-type: none"> <li>• “According to the definition adopted by UNESCO, Artisanal products are those produced by artisans, either completely by hand, or with the help of hand-tools or even mechanical means, as long as the direct manual contribution of the artisan remains the most substantial component of the finished product. The special nature of artisanal products (...) can be utilitarian, aesthetic, artistic, creative, culturally attached, decorative, functional, traditional, religiously and socially symbolic and significant.”</li> <li>• “Crafts and visual arts have a mutually supportive and interdependent relationship, though a distinction can be made on the function of the products (useful art and decorative art)”</li> <li>• “Artisanal products are classified under broad divisions, primarily based on the materials used. The six main categories of this classification are: basket/wicker/vegetable fibre-work,</li> </ul> <ul style="list-style-type: none"> <li>• This value chain has no equivalent among the sub-sectors defined by NACE codes.</li> <li>• However, it covers the sub-sectors of the Fashion Industry and High-end industries.</li> </ul>

leather, metal, pottery, textiles and wood.”

- “Complementary categories could correspond to various additional animal/mineral/vegetable materials embracing those other materials in craft production that are either specific to a given country, region or area, or rare, or difficult to work, such as: stone, glass, ivory, bone, horn, shell, sea shells, mother-of-pearl, etc.”
- “Local anchorage strongly contributes to the value of crafts. Heritage (intangible and tangible) as well as natural environments influence the materials, processes and values attached to the production of crafts.”

## ANNEX II: Patent applications of some selected companies in MCIs

	Company	Sector	Headquarter	No. of Patent Applications <sup>44</sup>
1	Google	Cross-sectoral	US	21,325
2	Dai Nippon Printing	Book & Press publishing	JP	20,626
3	Tencent	Video games	CN	12,700
4	Amazon	Cross-sectoral	US	10,482
5	Sony (Computer Entertainment, Interactive Entertainment, Network Entertainment)	Video games	JP	7,851
6	Dolby Lab USA	Music recording, Films	US	6,479
7	Nintendo	Video games	JP	4,623
8	Deutsche Telekom	Radio & TV	DE	3,645
9	Vodafone	Radio & TV	UK	2,444
10	Disney	Cross-sectoral	US	2,110
11	Orange	Radio & TV	FR	1,757
12	Comcast	Radio & TV	US	1,096
13	Technicolor	Films	FR	980
14	Time Warner	Cross-sectoral	US	815
15	Canal +	Radio & TV	FR	535
16	Sony Pictures	Films	JP	408
17	Avid technology	Films	US	390
18	Netflix	Films	US	305
19	Spotify	Music recording	SE	221
20	Electronic Arts	Video games	US	204
21	Reed Elsevier	Book & Press publishing	UK	159
22	DreamWorks Animation	Films	US	138
23	Hulu	Films	US	114

<sup>44</sup> Numbers as of February 2020. Source: PatSnap database.

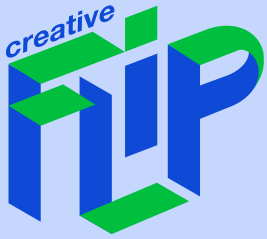
Creative FLIP Final Report Work Package 4 Patenting – State of the Art Analysis

24	King.com	Video games	US	90
25	Kobo	Book & Press publishing	CA	57
26	TicketMaster	Performing arts	US (UK)	54
27	Valve Corporation	Video games	US	47
28	Rovio	Video games	FI	26
29	Live Nation Entertainment	Performing arts	US	26
30	NBC Universal	Radio & TV	US	17
31	Paramount Pictures	Films	US	17
32	Image Metrics	Films	US (UK)	12
33	Ubisoft	Video games	FR	10
34	Sony Music	Music recording	JP (US)	10
35	JC Decaux	Advertising	FR	9
36	Youview TV	Radio & TV	UK	6
37	Vivendi	Radio & TV	FR	5
38	Universal Music Group	Music recording	US	5
39	British Sky Broadcasting	Radio & TV	UK	5
40	The New York Times Company	Book & Press publishing	US	4
41	Fox Entertainment	Films	US	4
42	Telenet	Radio & TV	BE	2
43	Hachette	Book & Press publishing	FR	2
44	Kobalt Music Group	Music recording	US	2
45	See Tickets (Digitick)	Performing arts	FR	2
46	Artnet	Visual arts	DE	1
47	RTL (Interactive) Group	Radio & TV	LU	1
48	Scribd	Book & Press publishing	US	1
49	Il Sole 24 Ore	Book & Press publishing	IT	1
50	TF1	Radio & TV	FR	1

## ANNEX III: Patent applications of some cinema and videogames companies

Company	No. of Patent Applications	Function	Number of applications in IPC class H04	% applications in IPC class H04
Netflix	305	Distribution (OTT)	238	78.03
Hulu	126	Distribution (OTT)	90	71.43
Avid technology	411	Creation / production	286	69.59
Sony Pictures	408	Production	201	49.26
Paramount Pictures	135	Creation / production	65	48.15
Disney	2,110	Creation / production / distribution	788	37.35
DreamWorks Animation	138	Creation / production	14	10.14
Image Metrics	13	Creation	0	n.a
Fox Entertainment	5	Creation / production	0	n.a





Finance, Learning, Innovation and Patenting for CClIs

## ■ **REPORT - II**

*STATISTICAL ANALYSIS*

*Patent Mapping of CClIs*

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## LIST OF ABBREVIATIONS

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<b>ALCH</b>	Archives, Libraries and Cultural Heritage (as a sub-sector)
<b>CBW</b>	Cross-Border Workers
<b>CCIs</b>	Cultural and Creative Industries
<b>DCMS</b>	Department of Culture, Media and Sport ( <i>British governmental department</i> )
<b>EC</b>	European Commission
<b>EPO</b>	European Patent Office
<b>GDP</b>	Gross Domestic Product
<b>IP</b>	Intellectual Property
<b>IPC</b>	International Patent Classification
<b>MCI</b>	Media and Content Industries
<b>NACE</b>	Statistical Classification of Economic Activities in the European Community ( <i>fr. Nomenclature statistique des Activités économiques dans la Communauté Européenne</i> )
<b>OECD</b>	The Organisation for Economic Co-operation and Development
<b>PCT</b>	Patent Cooperation Treaty
<b>PPP</b>	Purchasing Power Parity
<b>RTVF</b>	Radio, TV, Video and film (as a sub-sector)
<b>SME</b>	Small and Medium-Sized Enterprise
<b>WIPO</b>	World Intellectual Property Organization

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## 1. PATENT MAPPING STUDY

### 1.1. Introduction

Patent databases contain substantial amounts of information on novel inventions that can be transformed into knowledge by providing “unique insights into the processes and outcomes of inventive activities” [1]. Indeed, patent documents are not only detailed and well-structured texts on the content of inventions. They are also rich in technical and competitive information, which makes the patent databases an invaluable source of knowledge. Being well structured, the information contained in patent databases allows us to carry out extensive statistical analyses to shed a unique light on invention activities. In other words, apart from providing key information regarding the state of the art in specific technological fields, patent data can also provide unique knowledge which can help to develop business and innovation strategies.

So far, no comprehensive statistical study specifically dedicated to the patenting activities of the European Cultural and Creative Industries (CCIs) has been found in the literature. Thus, this report aims to study and to describe the evolution of patenting activities within the CCIs by analysing the last decade’s patent applications.

The analysis covers different CCIs activities which have been grouped in 8 sub-sectors including 395 726 patent applications covering the period between 2006 and 2017. These applications were grouped in 143 569 simple families in order to allow a comparison at the international level with less statistical bias characterised by multiple counting. The craft activities are not included in the statistical analysis because they are too heterogeneous to be clearly identified.

## 1.2. Methodology

### 1.2.1. Coverage of the study: a brief overview

The first and probably the most important element to start with when conducting such a study is to define the statistical universe of the study: What are the borders of the CCIs?

As the sector is inherently polymorphic, it covers various sub-activity areas which makes the identification and framing of the industry difficult. Besides, the term “creative” which is at the core of CCIs, has a vague and subjective meaning. Defining which sectors are deemed to be “creative”, and then drawing a line between these sectors and the others is actually not simple and, in some cases, quite unfeasible.

However, some efforts have already been made in the past to characterise the “creative industries.” The concept of “Creative Nation” emerged in Australia (1994) in order to promote its identity and cultural branding.<sup>1</sup> Thereafter, it was mainstreamed at European level by the British Government’s Department of Culture, Media and Sport (DCMS)’s report “The Creative Industries Mapping Documents” (1998) [2]. This report uses the term “creative industries” to extend the definition of the cultural sector, and follows the structural changes due to new technology developments. The original definition was as follows: *“those industries which have their origin in individual creativity, skill and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property.”* This definition of CCIs itself justifies that the Creative FLIP project focuses on a patent analysis, as patent is an intellectual property (IP) right and patenting activities are necessary to create value especially in this highly technological and competitive era.

To continue with the definitions in the literature, the seminal works and in particular those of D. Throsby [3] confirm that “CCIs industries include some forms of creativity which is embodied in some form of intellectual property.” Furthermore, another reference author in the CCIs, J. Howkins [4], explains that IP is of strategic importance in the CCIs: *“The way we treat ideas and inventions affects social, cultural and political issues. How we decide the ownership of ideas and inventions, and who decides, affects the kind of society we create for ourselves.”*

The DCMS report proposes a definition of the creative sector characterised by 13 sub-sectors, updated in 2001 [5] and in 2015 [6]. Nevertheless, this last definition has been criticised by some CCIs experts like J. Howkins (2013) who explains that it should include broader areas like toys and games, or research and development in science and technology. On the other hand, D. Hesmondhalgh [7] suggests to reduce the list to what he calls *“the core cultural industries”* of *“television and radio, film and music industries, print and electronic publishing, video and computer games or digital games, advertising, marketing and public relations, and web design.”*

In 2012, the European Commission (EC) also decided to define the European cultural and creative sectors so as to promote the CCIs as sources of economic growth and jobs [8]. In order to achieve its goal, the EC proposed a definition of the scope of CCIs which covers the main segments defined in 1998 by the DCMS but with an enlarged scope.

---

<sup>1</sup>*“Culture creates wealth; broadly defined Australian cultural industries generate 13 billion dollars a year. Culture employs; around 336 000 Australians were employed in culture-related industries. Culture adds value; it makes an essential contribution to innovation, marketing and design. The level of creativity substantially determines the ability to adapt to new economic imperatives. It is a valuable export in itself and an essential accompaniment to the export of other commodities. It attracts tourists and students. It is essential to economic success.”* - Creative nation: Commonwealth cultural policy, October 1994, Department of Communications and the Arts (now Office for the Arts), 1994. See also, Throsby D. (2001). Economics and Culture. Cambridge: Cambridge University Press.



As can be seen from the table below, the definition of the CCIs sub-sectors varies from institution to institution and even from country to country, although it can be seen that there is a certain consensus on a set of segments [9]. Table 1 shows the framework definition studies of selected institutions around Europe to classify the CCIs. It can be noted from the table that for most of the promoters of creative industries, the core element is the exploitation of the IP generated by creators.

It is essential to precisely define the CCI's sub-sectors in order to delimit the field of action – and hence the actors – who will be affected by policies developed in favour of the sector. This exercise is all the more important as the CCIs are quite sizable in terms of number of businesses, added value and employment.

From the Creative FLIP project aspect, the Austrian Institute for SME Research and VVA Europe<sup>2</sup> [10] propose the most exhaustive and precise mapping of CCIs, including all the CCIs activities affected by the digitalisation of the economy. As a consequence, we believe that this structure offers an optimal choice for this statistical study.

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<sup>2</sup> Hereafter, “VVA Report”.

Table 1: Classification framework for cultural industries in selected institutions

	DCMS 1998	European Commission 2013	DCMS 2015	Austrian Institute for SME Research and VVA Europe 2015	Common segments
Advertising	X			X	
Antiques	X				
Architecture	X	X	X	X	X
Crafts	X	Only artistic crafts	X		
Cultural heritage, archives, libraries, museums		X	Only museums and galleries and libraries	X	X
Design	X	Design, visual arts	product and graphic and fashion design	X	X
Education, management		X		Cultural education	
Fashion	X		X	X	X
Festivals		X			
Film	X	X	Only video	Including video	
Leisure software	X				
Literature, publishing		X		Books & press	
Multimedia		X			
Music	X	X	X	X	X
Performing arts	X	X	Including visual arts	Including artistic creation	X
Publishing	X		X		X
Radio & TV	X	X	Including photography	X	X
Software	X		IT, software and computer services	Including games	
Video games		X		X	
All sectors whose activities are based on cultural values and/or artistic and other creative expressions, whether those activities are market- or non-market-oriented		X			
High-end industries				X	

Source: DCMS 1998, DCMS 2015, European Commission, Austrian Institute for SME Research and VVA Europe

Considering all those definitions, this report analyses the CCIs in 8 sub-sectors,<sup>3</sup> namely:

- |                                 |  |
|---------------------------------|--|
| 1. Advertising                  | 6. Performing arts and artistic creation |
| 2. Architecture                 | 7. Cultural heritage                     |
| 3. Design                       | 7.1 Archives and libraries               |
| 4. Visual arts                  | 7.2 Amusement activities                 |
| 5. Media and Content Industries | 8. Fashion                               |

Within the scope of this report, there are two main differences from VVA Europe’s delineation:

- In the Cultural heritage sub-sector, two activities - Archives and libraries, and Amusement activities – demonstrate such different invention characteristics that a joint analysis would have yielded biased results. These two activities are therefore analysed separately.
- The Video and films, and Radio and TV sub-sectors have been merged under the Media and Content Industries (MCI) because they show similar specificities in terms of their invention characteristics: it was thus not possible to distinguish between these two sub-sectors with respect to patent classification codes.

### 1.2.2. Patent information

A patent is an IP right granted for technical inventions, allowing its holder to prevent others from making, using or selling the invention without his/her permission for up to 20 years. In order for an invention to receive a patent, it must meet three main criteria namely, (i) “novelty”, (ii) involving an “inventive step” and (iii) susceptible of “industrial application”.

As in other IP rights, patents are territorial rights, meaning that they are only applicable in the country or region in which they have been filed and granted, in accordance with the law of that country or region.

Patent information is generally published 18 months after the filing date, which means that public databases are progressively completed with an 18-month delay. As a consequence and to avoid incomplete data starting from 2018, this study covers 12 years from 2006 to 2017, unless otherwise specified.

In general, patent information available in European databases is well structured and codified, allowing for profound statistical analysis. Patent documents include detailed information such as inventors, applicants, technologies, territorial coverage, validity, etc. Moreover, they have a relatively standardised format and are classified according to technical fields (classes) to identify and analyse the documents in a methodological manner.

Patent classification, which is a hierarchical system for the classification of patents according to the different areas of technology to which they pertain, is the main key entry to use when analysing patent information: it generates a pool of patent bibliographic references that are representative of the sectors to be analysed.

As the purpose of our study is to identify the degree of “inventiveness” in the cultural and creative sectors, this report focuses on patent applications and utility models, although the latter is less popular.

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<sup>3</sup> See the Annex for the detailed activities for each sub-sector.

As a reminder, compared to patents, utility model systems “require compliance with less stringent requirements for example, lower level of inventive step, have simpler procedures and offer shorter term of protection” (WIPO).<sup>4</sup> However, not all countries have “utility model” systems. Therefore, for such countries, the analysis is based only on the patent data.

For the sake of simplicity, all patent and utility model data will be referred to as “patent data” within the scope of this study, as both patent and utility model applications (if any) are generally kept in the same databases.

### 1.2.3. Information sources

In order to perform the statistical analysis of patent data, we relied on two information sources:

- the PATSTAT database,<sup>5</sup> a database dedicated to patent statistical analysis purposes, developed by the European Patent Office (EPO); and
- the PATENTSCOPE database,<sup>6</sup> providing patent statistical data, developed by the World Intellectual Property Organization (WIPO).

#### a. PATSTAT

##### 1. Presentation

PATSTAT is this study’s main source of information, and a reference in the field of patent intelligence and statistics. It is a widely used worldwide database of bibliographic patent information that is maintained by the EPO. It contains bibliographic data on more than 100 million patent documents from the major industrialised and developing countries. The information from the database is structured in a specific way to allow for in-depth statistical patent analysis.

##### Time coverage

The chosen time frame is spread over 12 years, from 2006 to 2017. As this exhaustive database is updated twice a year, we used the most updated version at the date of data collection: the Spring 2020 edition. This edition covers patent information up to end of January 2020,<sup>7</sup> i.e. up to June 2018, as an 18-month period is necessary for the publication (disclosure) of patent information.

---

<sup>4</sup> For the complete definition, see [https://www.wipo.int/patents/en/topics/utility\\_models.html](https://www.wipo.int/patents/en/topics/utility_models.html)

<sup>5</sup> See <https://www.epo.org/searching-for-patents/business/patstat.html>

<sup>6</sup> See <https://www3.wipo.int/ipstats/index.htm>

<sup>7</sup> More precisely, “the date of data extraction from the source databases is end of January for the PATSTAT Spring Edition”, see [http://documents.epo.org/projects/babylon/eponot.nsf/0/225F09FAA60945C2C125855F002797C2/\\$File/PATSTAT\\_DataCatalog\\_Global\\_v5-15.pdf](http://documents.epo.org/projects/babylon/eponot.nsf/0/225F09FAA60945C2C125855F002797C2/$File/PATSTAT_DataCatalog_Global_v5-15.pdf)

Geographical coverage: the FLIP countries

The target countries of this study are EU27 and Creative Europe<sup>8</sup> countries. Note that the PATSTAT database covers all of these target countries with the exception of Kosovo, for which no data is available.

The study thus covers 40 of the 41 countries initially selected, which we call the “FLIP countries.”

**Table 2: FLIP countries**

EU27 COUNTRIES		COUNTRIES PARTICIPATING IN CREATIVE EUROPE	
Austria	Italy	Albania	
Belgium	Latvia	Armenia	
Bulgaria	Lithuania	Bosnia and Herzegovina	
Croatia	Luxembourg	Georgia	
Cyprus	Malta	Iceland	
Czech Republic	Netherlands	Kosovo *, **	
Denmark	Poland	Moldova	
Estonia	Portugal	Montenegro	
Finland	Romania	Norway	
France	Slovakia	Republic of North Macedonia	
Germany	Slovenia	Republic of Serbia	
Greece	Spain	Tunisia	
Hungary	Sweden	Ukraine	
Ireland		United Kingdom	

Source: European Commission

\*This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence. \*\* Is excluded from the report due to lack of data.

## 2. Data retrieval

The extraction of data from the PATSTAT database was made by means of 12 queries: one per category characterised by the International Patent Classification (IPC) codes. In the queries, we selected applicants whose address (residential or business) was located in one of the FLIP countries. The sub-sectors were selected on the basis of the best match between the definition of the sub-sector and the WIPO IPC codes (see the following section for further information on the NACE classification and IPC codes).

The tools Matheo Analyzer and Gephi were used to analyse the data retrieved from the PATSTAT.

<sup>8</sup> Article 8 of the Regulation No 1295/2013 from European Commission establishing the Creative Europe Program stipulates that countries other than EU Member States may participate in the Program Creative Europe of the European Commission for supporting Europe’s cultural and creative sectors.

### 3. Calculations

Due to the territorial character of the patent system, a single invention might have many individual documents associated with it, depending on the number of countries in which the applicant sought protection. The Paris Convention facilitates filing in different jurisdictions by claiming priority rights derived from earlier filings.

To simplify the dichotomy between inventions and the many patent documents associated with them, the concept of “patent family” was created [11]. Counting patent families prevents the multiple counting of single inventions and is used for the analysis at international level [12] in this study.

We chose to use simple patent families [13] that relate to collections of patent applications covering one single invention [14]<sup>9</sup> (identical technical content), in line with the OECD [15, 16] and WIPO recommendations for patent analysis.

It should be noted that the concept of simple family was preferred to that of extended family (collection of patent applications covering a technology) because the use of an extended family would have severely underrepresented the activity of the actors in the CCIs. The aim of the extended patent family is to count the technologies rather than inventions, as is the case for single patent families.

From the statistical point of view, counting single families instead of extended families was also preferred for two reasons: (1) simple families actually represent what we are searching for: a count of the number of inventions, and (2) the simple family data is stable over editions of PATSTAT [17].

#### b. PATENTSCOPE

This database is used to provide a general overview of worldwide patenting activity.

The WIPO database contains more than 95 million patent documents including around 4 million published international patent applications (known as PCT, Patent Cooperation Treaty, numbers as of January 2021).

WIPO's statistics come from several sources:

- data collected from national and regional IP offices;
- data generated from registration systems administered by WIPO; and
- data extracted/compiled from the PATSTAT database.

The indicators relating to patent families in the WIPO database are compiled from the PATSTAT and WIPO's PCT national phase data. The family indicator used is based on PATSTAT's concept of simple families.

#### 1.2.4. NACE classification and IPC codes

The VVA Report contains a table suggesting NACE codes for each CCIs sub-sector. In our methodology, we have decided to first look for relevant IPC codes for each NACE code assigned to the CCIs sub-sectors, and then to complete this information with a manual search of relevant IPC codes.

---

<sup>9</sup> Patent statistics based on counts from a single patent office would suffer from a home bias and overestimate the patent propensity of residents. For more information, see [14] in the References.

However, since there is no link between the NACE codes of the CCI and the IPC classification,<sup>10</sup> we have chosen the IPC codes offering the best match with the proposed NACE codes in the VVA Report by following the earlier methodological references [18, 19]. The detailed table comparing the NACE and IPC codes is presented in this report's Annex.<sup>11</sup>

#### Choice of IPC codes

A main issue when choosing the IPC codes to query the databases is that the sub-sectors defining the CCI include a broad range of activities. For example, the IPC codes for *Architecture* might cover the whole value chain of a sub-sector, including activities that lie outside of the CCI activities that we have defined.

Another example is for the sub-sector covering photography: If we included all IPC codes covering this sub-sector, we would select the codes covering the technical aspects of cameras, which would cause a bias, as camera manufacturers are by definition not included in the "creative sectors" (they are rather counted in the manufacturing industry). The problem is that such companies include large non-CCI players that patent a lot to protect their innovations: the innovations developed by CCI actors of the sub-sector would be drowned by these large actors and would thus not be visible. As it would not be possible to easily remove the patents owned by such companies from the thousands of patent documents, we decided to restrict the analysis to some parts of the value chain of the different sub-sectors studied, and to the central activities of these sub-sectors, thereby avoiding biased results "as much as possible." The central activity of the sub-sector is defined here as the activity that best fits the definition of cultural and creative activity.

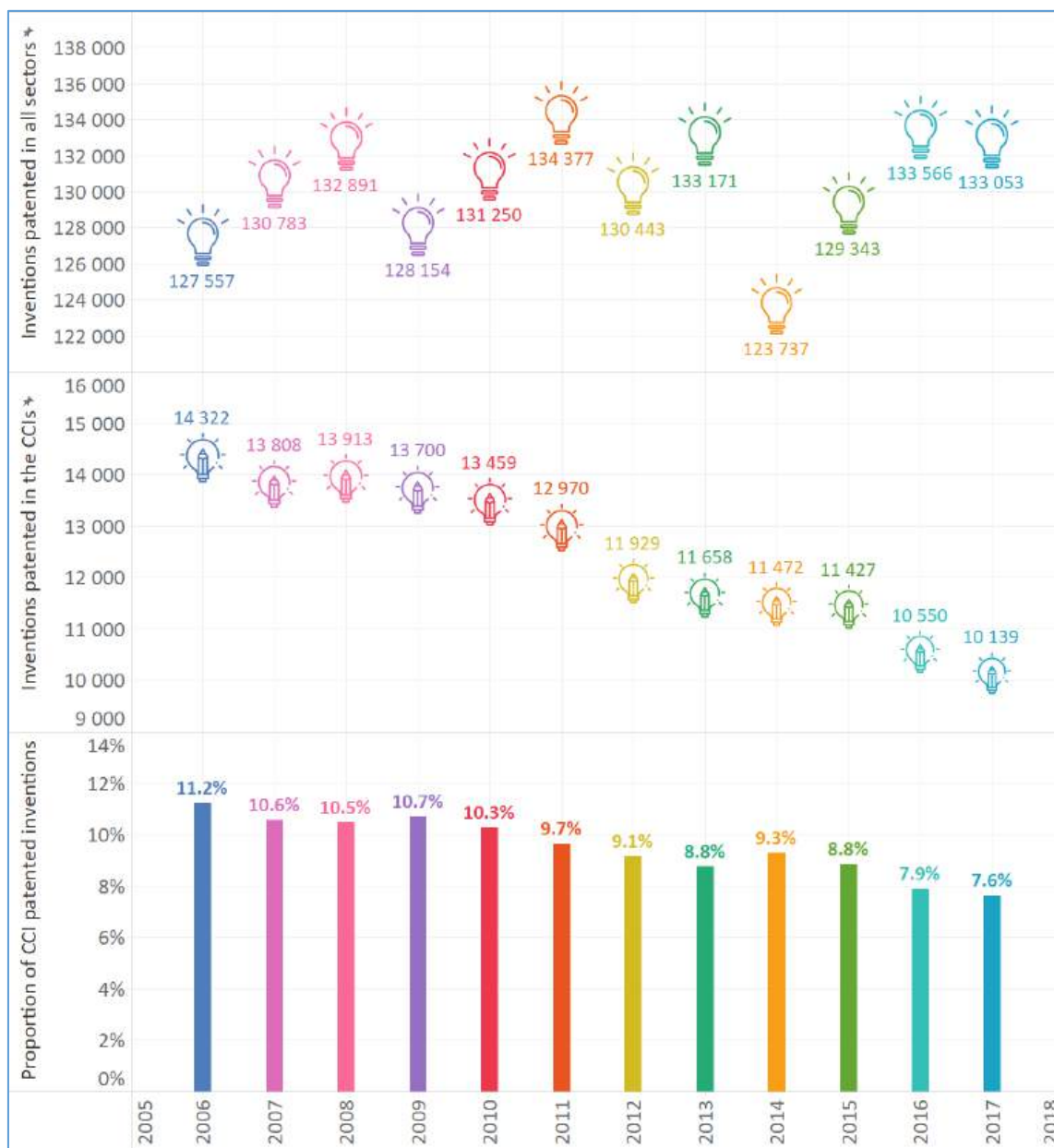
---

<sup>10</sup> IPC/NACE concordance tables from Eurostat and INCENTIM/ECOOM - KU Leuven are available but they are not relevant for the CCI in terms of accuracy and coverage.

<sup>11</sup> See Annex: NACE codes - IPC codes in the CCI

### 1.3. Global overview of the CCIs' patent landscape

First, it is necessary to locate the CCIs for the FLIP countries as a whole and to understand the evolution of their share among all patents over the past years.



**Figure 1: Number of patents over time in the CCIs**

Source: WIPO, EPO PATSTAT. Calculations by IPIL.

FLIP countries filed 1 568 325 simple patent families between 2006 and 2017, including 149 347 in the CCIs. The CCIs represent on average 9.5% of all patent families over the 10 years under review.

While FLIP countries show an overall upward trend in patented inventions, it should be noted that the number of patented inventions in the CCIs shows a downward trend.

As a consequence, the proportion of patents in the CCIs fell from 11.2% to 7.6% over this period.



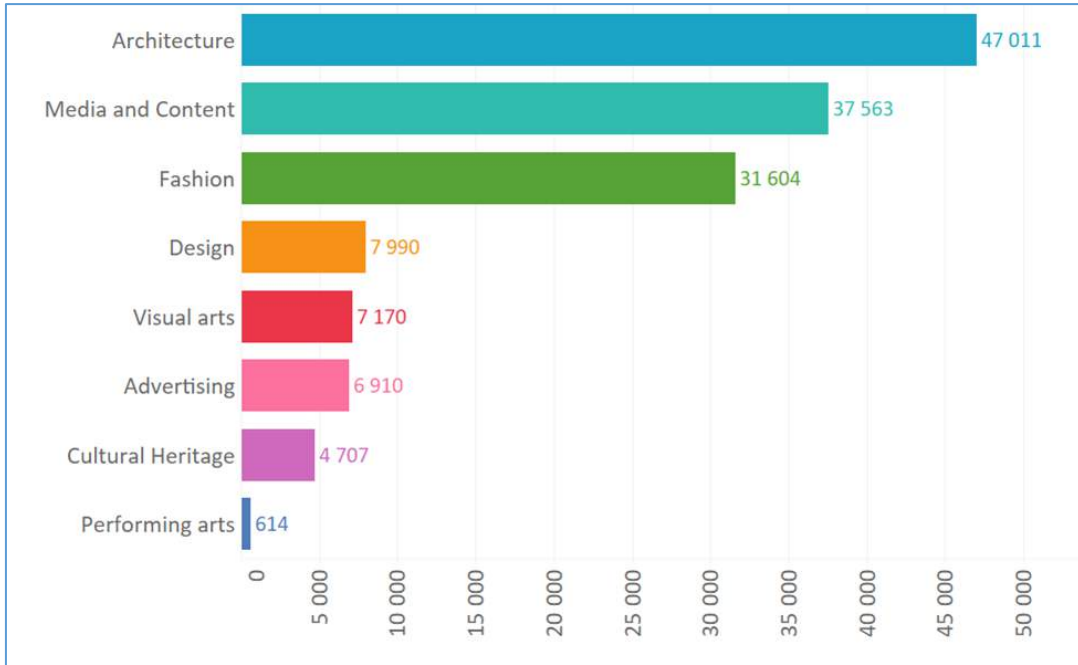


Figure 2: Patent breakdown by CCIs sub-sectors, 2006-2017

Source: PATSTAT, calculations: IPIL

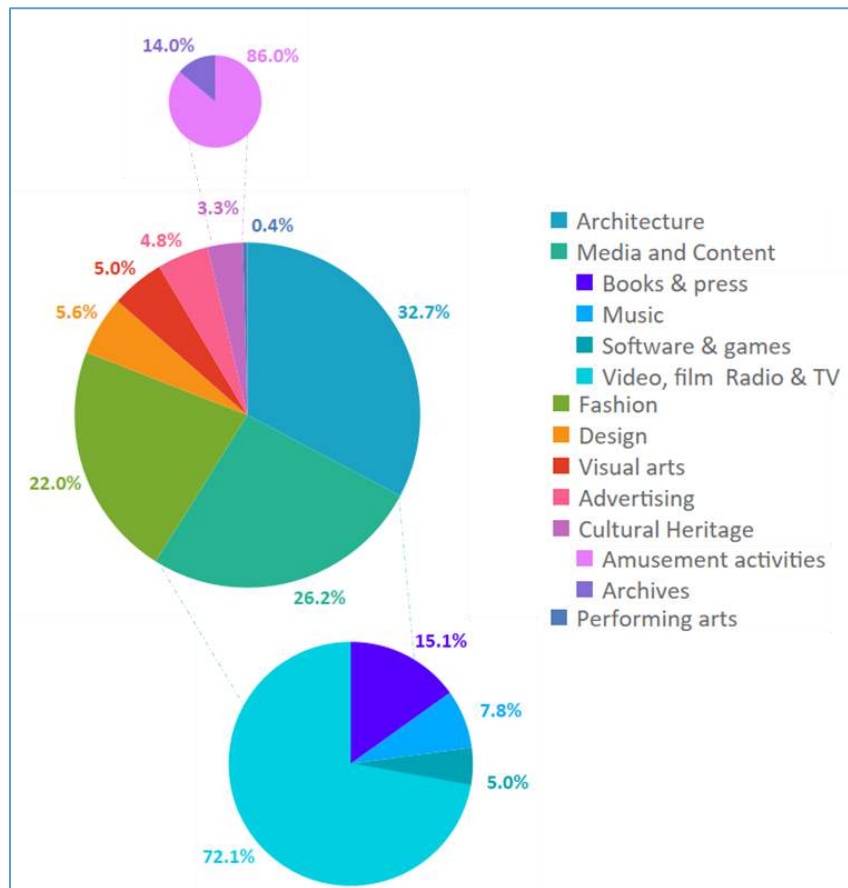


Figure 3: Relative part of sub-sectors in the CCIs (% of total CCIs sub-sectors), 2006-2017

Source: PATSTAT, calculations: IPIL

The three most active CCIs sub-sectors in patenting during the period under review are: Architecture, Media and content and Fashion, which represent 80.9% of all CCIs patents. More precisely, the Architecture sub-sector has the largest share, representing a third of all patents in the CCIs, closely followed by the Media and content sub-sector (26.5%).

Conversely, the Performing arts (0.4%), Archives (0.5%) and Amusement activities (2.8%) sub-sectors record the lowest number of patents, accounting for 3.7% in total.



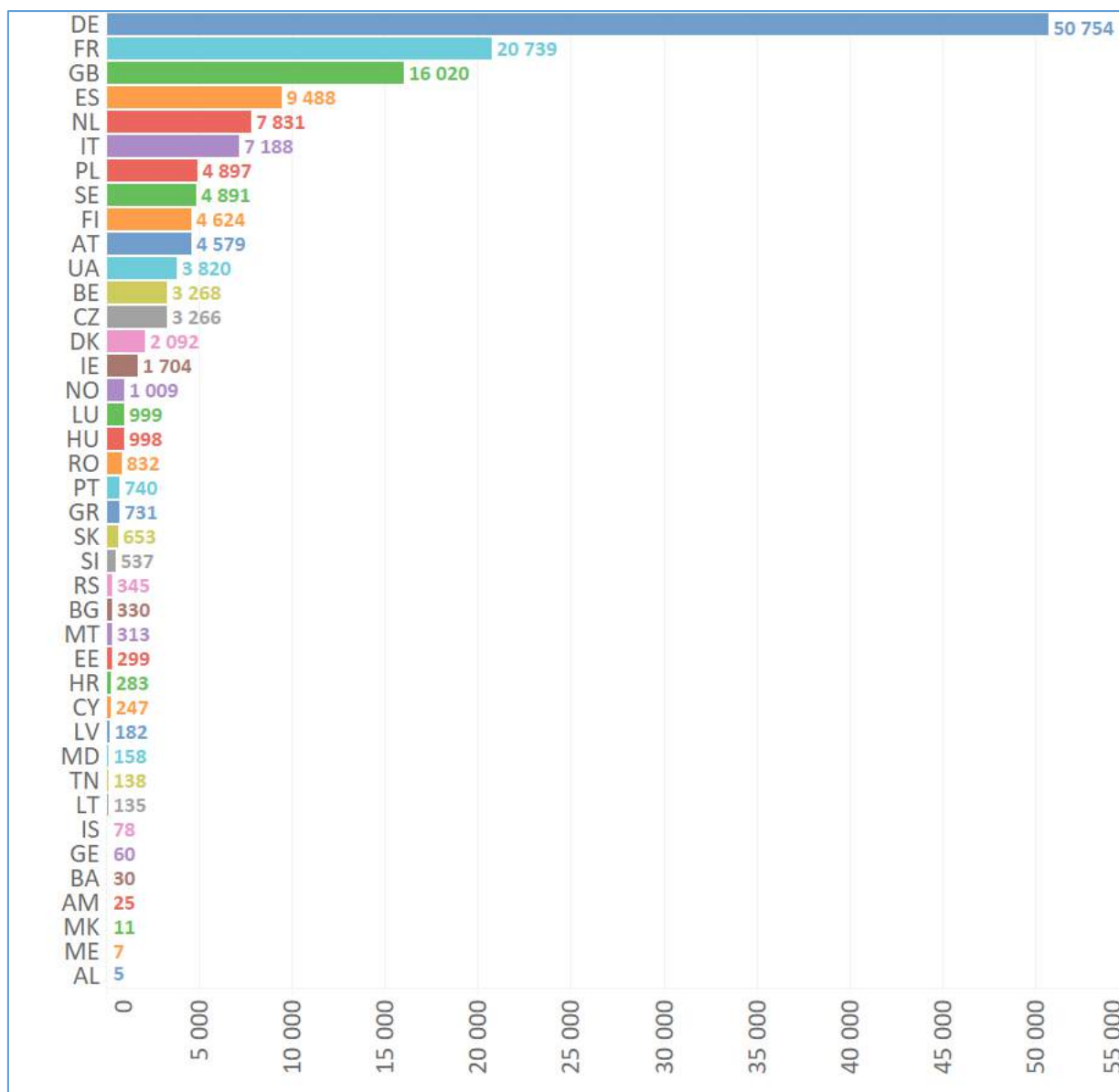
Figure 4: Evolution of patent filings by CCIs sub-sector, 2006-2017

Source: PATSTAT, calculations: IPIL

In parallel with the overall sectoral analysis, there is a general downward trend in patenting activity in all sub-sectors over the twelve-year period under review, with the exception of Software & games and of the two sub-sectors with the lowest number of patents which remained broadly stable. These sub-sectors stabilised but the very limited number of inventions patented does not point to a conclusive stabilisation trend.

The sub-sectors with the most significant declines are Advertising, Amusement activities and Design.

## 2. COUNTRY ANALYSIS

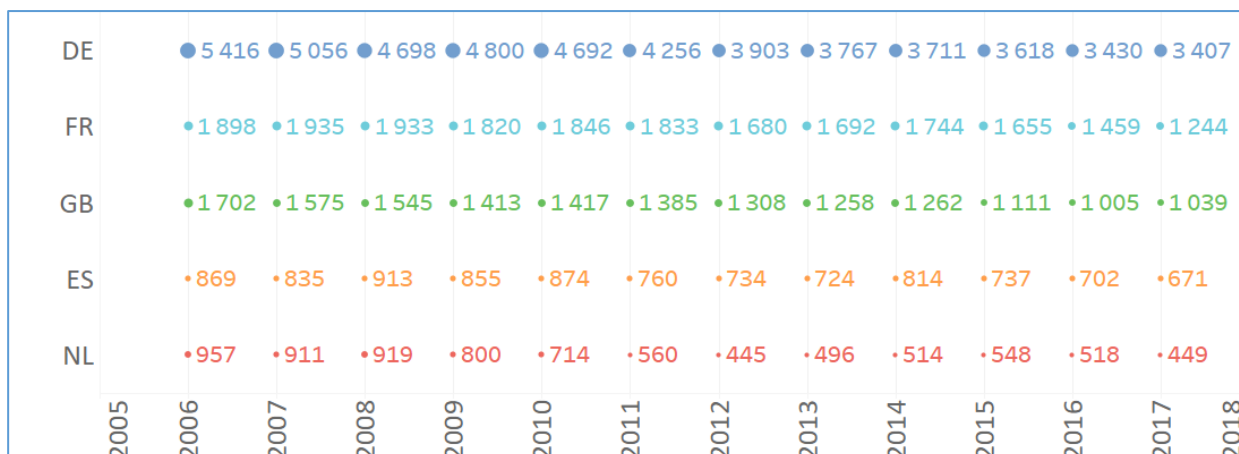


**Figure 5: Total patents by country of origin in the CCIs, 2006-2017**

Source: PATSTAT, calculations: IPIL

When delving into the numbers and studying the country data, we see that between 2006 and 2017, the largest number of patents in the CCIs were filed in Germany, with more than 50 000 applications.

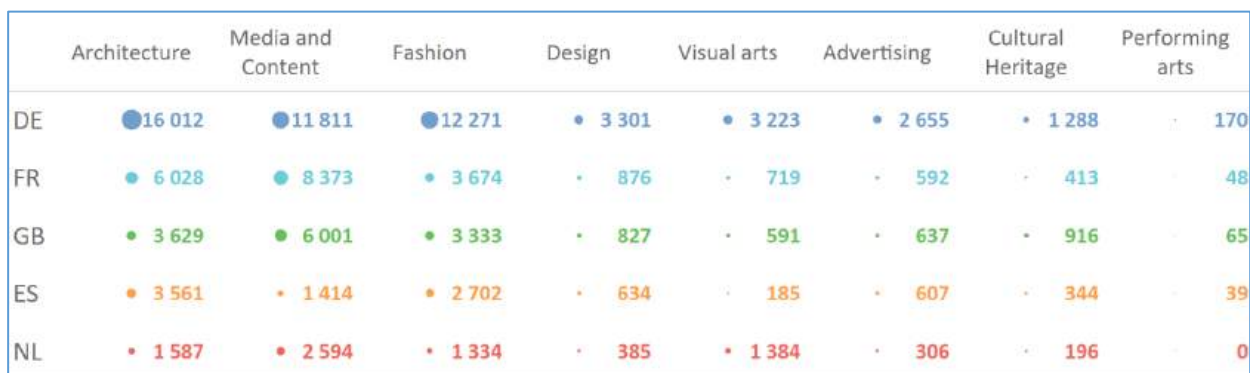
This country alone represents 33% of all patents filed in these industries for FLIP countries. It is followed by France (13%), Great Britain (10%), Spain (6%) and the Netherlands (5%).



**Figure 6: Top 5 countries, distribution of patents by country of origin, CCI, 2006-2017**

Source: PATSTAT, calculations: IPIL

As illustrated above, the trend towards lower patent filings for the CCIs, as illustrated in Figure 1, is confirmed by the decline in all of the main contributors to the patenting activities in the CCIs, including in all of the 5 most active countries.



**Figure 7: Top 5 countries, distribution of patents by countries and sectors, 2006-2017**

Source: PATSTAT, calculations: IPIL

The above chart shows that Germany has filed the highest number of patents to protect its inventions in the CCIs, particularly in the sub-sectors of Architecture, Fashion and Media and content.

From the above figure, the specialisation of each of these five countries also becomes clear: Architecture for Germany and Spain, Media and Content Industries for France, Great Britain and the Netherlands.

To understand the CCIs patent filing characteristics of these top 5 filers, in the following section we analyse the statistical patenting figures for each of these five countries.

## 2.1. Top 5 countries

### a. Germany

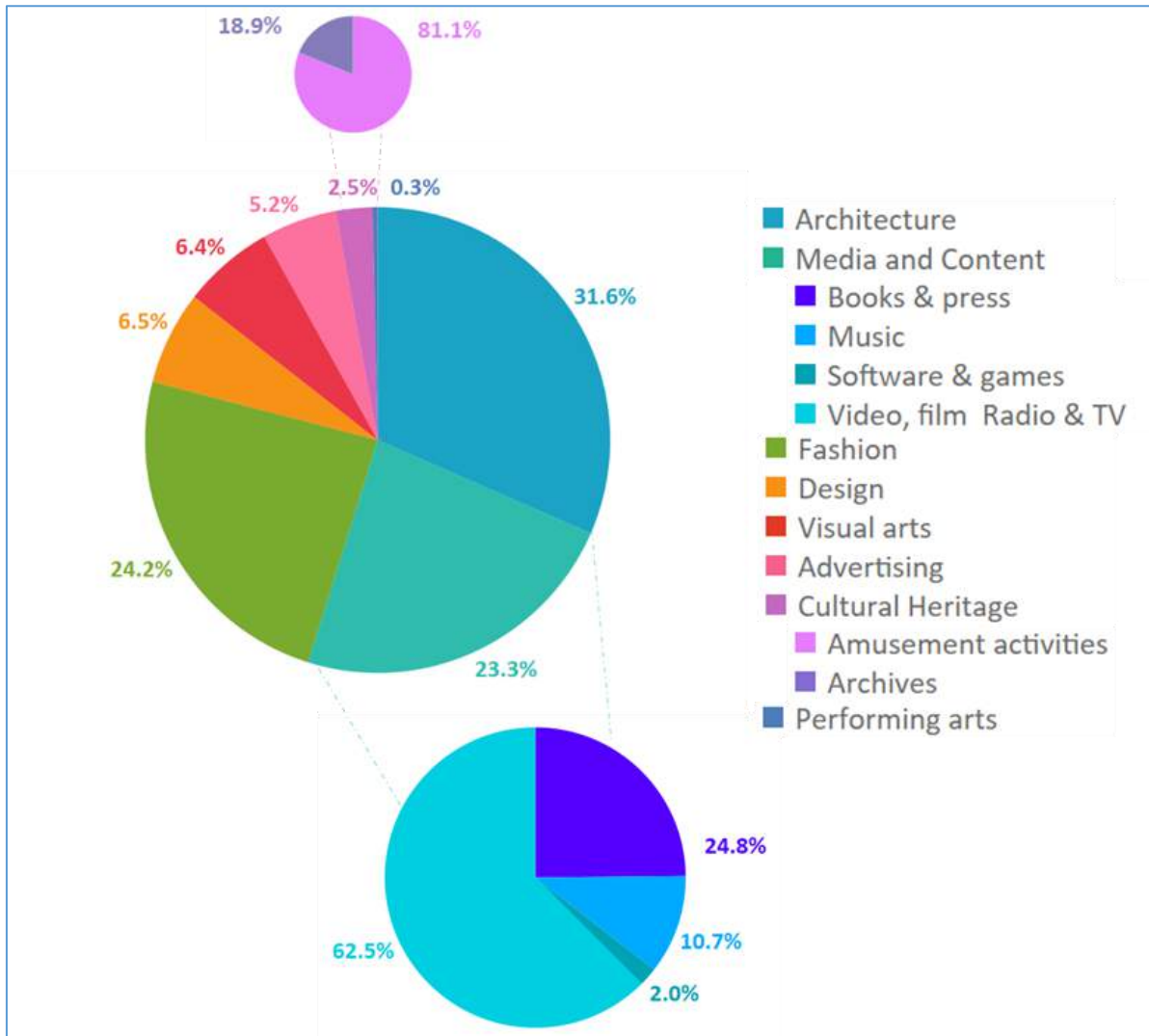


Figure 8: Patent breakdown by CCI sub-sector in Germany, 2006-2017

Source: PATSTAT, calculations: IPIL

Looking at the German CCI patents, the main sub-sectors are Architecture (31.6% of all inventions from 2006-2017), Fashion (24.2%) and Radio, TV, Video & film (14.6%).

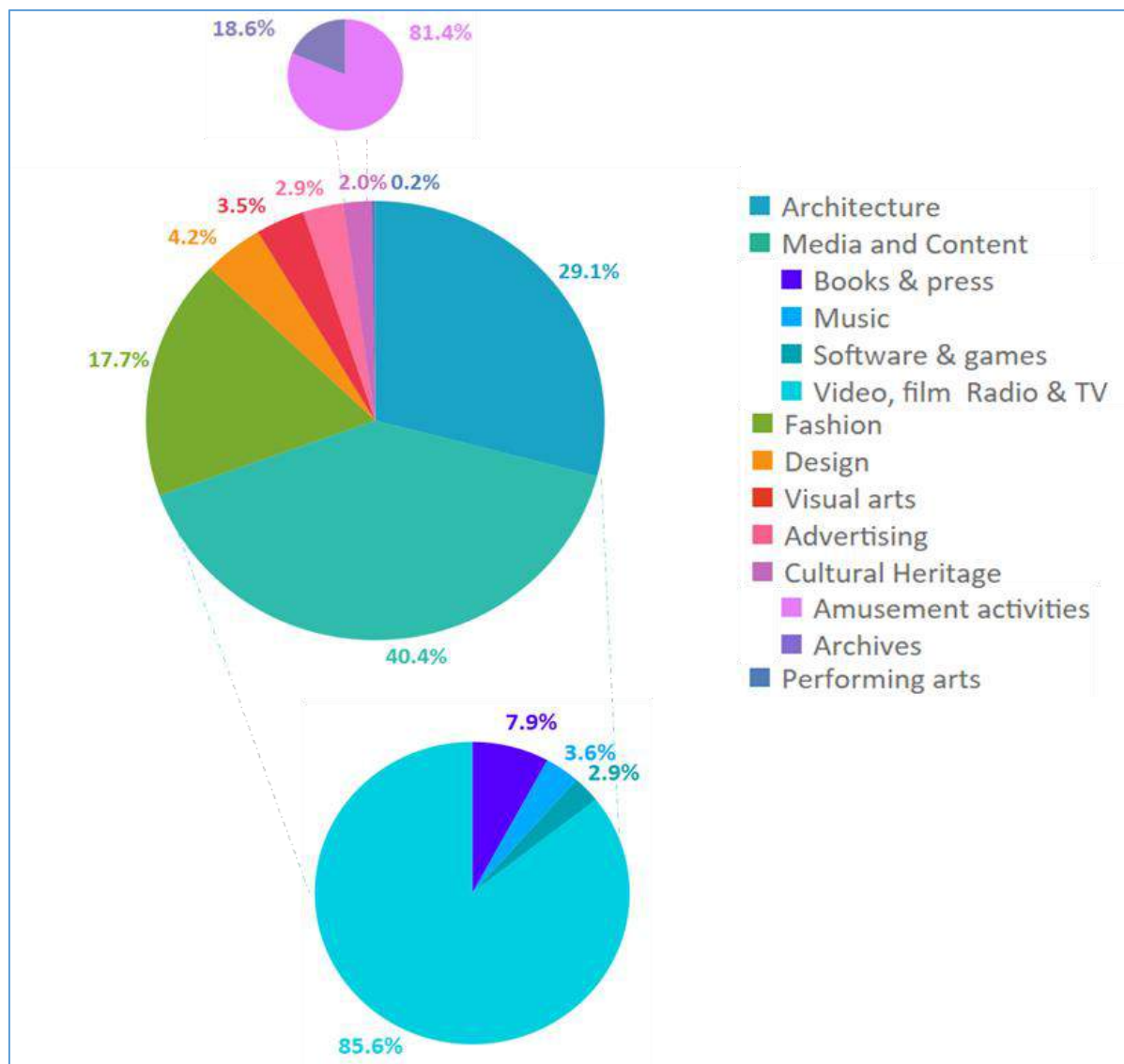
**Table 3: Patents filed by Germany according to the CCI sub-sectors, 2006-2017**

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total	Proportion in total sub-sector	
<b>1. Advertising</b>	319	291	269	285	249	224	190	186	174	164	168	137	2 656	5.2%	
<b>2. Architecture</b>	1703	1597	1460	1586	1583	1313	1247	1144	1122	1076	1062	1124	16 017	31.6%	
<b>3. Design</b>	377	367	353	341	352	265	259	212	188	220	189	178	3 301	6.5%	
<b>4. Visual arts</b>	343	284	321	283	262	284	243	236	251	233	231	255	3 226	6.4%	
<b>5. Media and content</b>	5.1 Radio, TV, Video & film	754	679	664	674	659	716	588	521	581	515	531	504	7 386	14.6%
	5.2 Music	135	115	108	117	137	121	96	108	90	92	75	69	1 263	2.5%
	5.3 Books & press	328	293	286	269	249	221	210	226	198	227	226	199	2 932	5.8%
	5.4 Software & games	19	23	20	26	14	13	15	12	21	31	28	16	238	0.5%
<b>6. Performing arts</b>	12	23	15	17	17	16	12	11	8	15	9	15	170	0.3%	
<b>7. Cultural Heritage</b>	7.1 Archives	28	21	30	17	17	21	18	19	18	16	16	22	243	0.5%
	7.2 Amusement activities	128	116	128	101	89	99	74	62	65	63	56	64	1 045	2.1%
<b>8. Fashion</b>	1270	1247	1044	1084	1064	963	951	1030	995	966	839	824	12 277	24.2%	
<b>Total</b>	5 416	5 056	4 698	4 800	4 692	4 256	3 903	3 767	3 711	3 618	3 430	3 407	50 754		
<b>Proportion in total</b>	10.7%	10.0%	9.3%	9.5%	9.2%	8.4%	7.7%	7.4%	7.3%	7.1%	6.8%	6.7%			

Source: PATSTAT, calculations: IPIL

The above table shows the statistical data of the German patent filings within the CCIs between 2006 to 2017. From this table, it can be inferred that all of the leading sub-sectors recorded a sharp decrease in patenting activity over this time period.

**b. France**



**Figure 9: Patent breakdown by CCI sub-sector in France, 2006-2017**

Source: PATSTAT, calculations: IPIL

In France, the main patent-active CCI sub-sectors are Radio, TV, Video & film (34.6% of all inventions), Architecture (29.1%) and Fashion (17.7%).

**Table 4: Patents filed by France according to the CCI sub-sectors, 2006-2017**

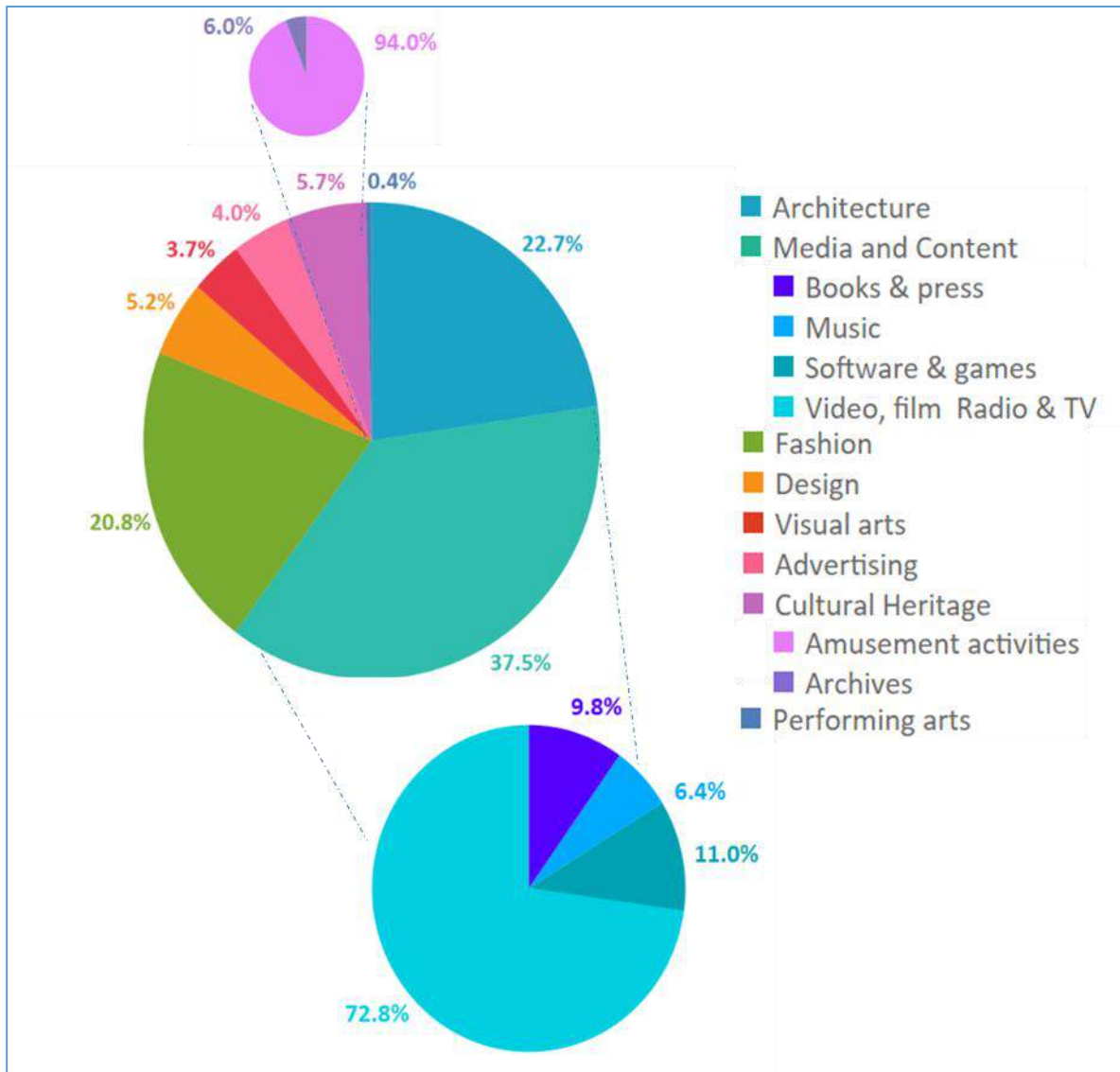
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total	Proportion in total sub-sector	
1. Advertising	77	62	62	68	53	45	43	45	32	37	43	25	592	2.9%	
2. Architecture	484	534	524	557	591	590	514	492	474	475	430	364	6 029	29.1%	
3. Design	89	80	83	80	83	67	69	62	67	77	70	49	876	4.2%	
4. Visual arts	62	64	59	61	66	59	61	60	53	67	51	56	719	3.5%	
5. Media and content	5.1 Radio, TV, Video & film	682	736	747	584	599	591	569	605	632	583	447	393	7 168	34.6%
	5.2 Music	28	20	28	24	26	25	30	23	32	20	20	24	300	1.4%
	5.3 Books & press	54	55	55	77	57	67	55	55	68	47	39	33	662	3.2%
	5.4 Software & games	14	20	25	15	32	24	15	24	24	22	26	9	250	1.2%
6. Performing arts	0	3	4	3	6	2	4	7	2	6	8	3	48	0.2%	
7. Cultural Heritage	7.1 Archives	4	4	10	10	4	10	3	5	3	9	6	9	77	0.4%
	7.2 Amusement activities	37	33	34	30	44	38	26	24	28	18	16	14	342	1.6%
8. Fashion	367	324	302	311	285	315	291	290	329	294	303	265	3 676	17.7%	
<b>Total</b>	1 898	1 935	1 933	1 820	1 846	1 833	1 680	1 692	1 744	1 655	1 459	1 244	20 739		
<b>Proportion in total</b>	9.2%	9.3%	9.3%	8.8%	8.9%	8.8%	8.1%	8.2%	8.4%	8.0%	7.0%	6.0%			

Source: PATSTAT, calculations: IPIL

The leading sub-sectors recorded a sharp decrease in patenting activity in France over the time period and noticeably, Radio, TV, Video & film sub-sector recorded the most significant decrease (43%) between 2006 and 2017.



**c. Great Britain**



**Figure 10: Patent breakdown by CCI sub-sector in Great Britain, 2006-2017**

Source: PATSTAT, calculations: IPIL

Over this time period, Radio, TV, Video & film (27.3%), Architecture (22.7%) and Fashion (20.8%) are the 3 most patent-active sub-sectors in the CCIs in Great Britain.

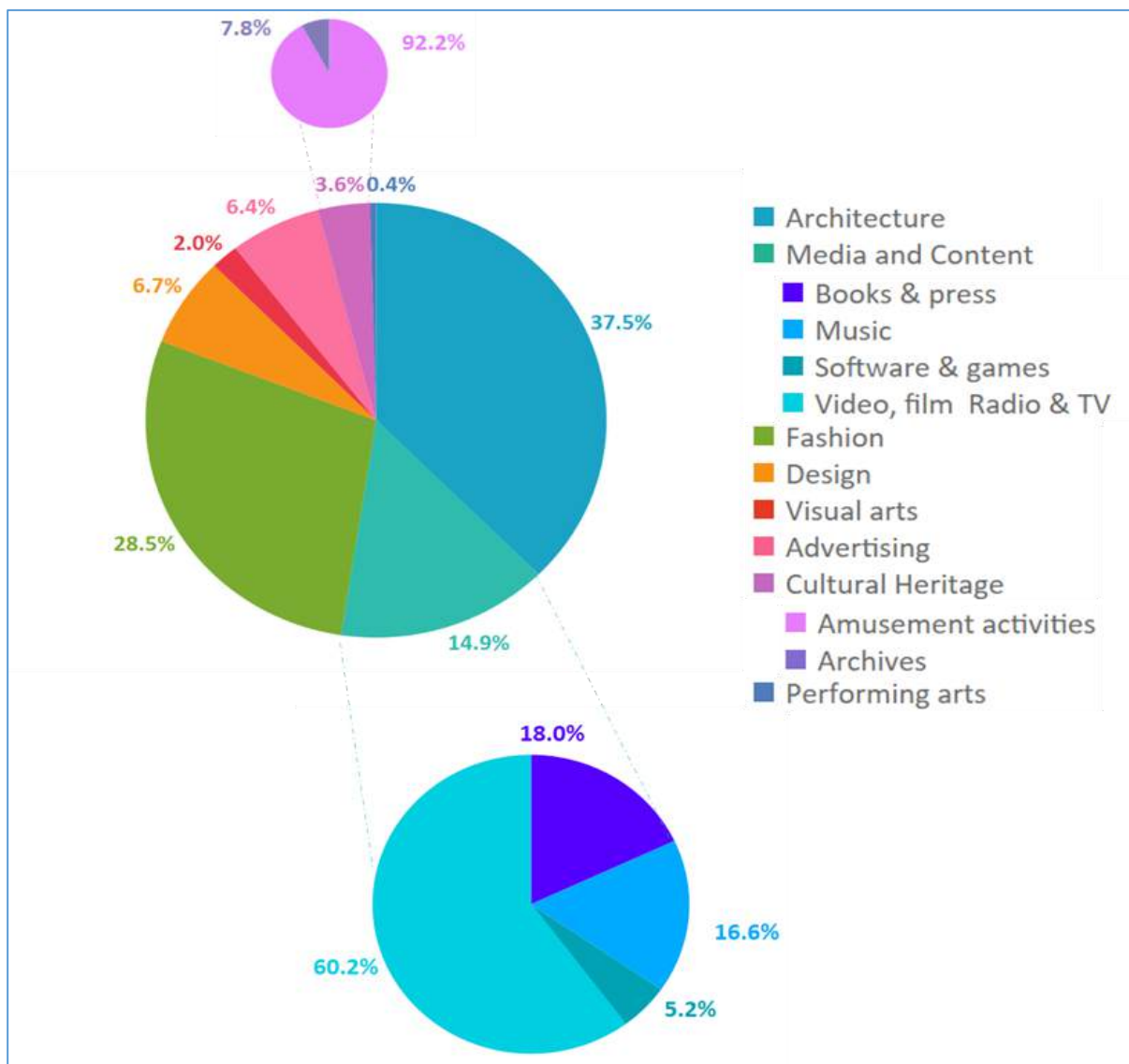
Table 5: Patents filed by Great Britain according to the CCI sub-sectors, 2006-2017

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total	Proportion in total sub-sector	
1. Advertising	72	72	71	66	55	50	53	47	57	28	34	32	637	4.0%	
2. Architecture	378	381	343	347	331	304	292	286	260	248	218	242	3 630	22.7%	
3. Design	105	106	95	83	57	71	72	49	50	46	45	48	827	5.2%	
4. Visual arts	59	48	73	43	55	43	53	44	51	40	42	41	592	3.7%	
5. Media and content	5.1 Radio, TV, Video & film	424	376	399	371	419	439	379	328	364	328	271	274	4 372	27.3%
	5.2 Music	21	25	34	39	38	31	40	39	40	25	22	30	384	2.4%
	5.3 Books & press	99	58	66	49	52	42	34	34	38	44	36	38	590	3.7%
	5.4 Software & games	77	73	55	53	41	53	50	64	65	40	46	48	665	4.2%
6. Performing arts	6	8	8	3	4	3	9	4	6	1	6	7	65	0.4%	
7. Cultural Heritage	7.1 Archives	11	2	6	7	7	2	4	3	5	1	1	6	55	0.3%
	7.2 Amusement activities	131	110	115	83	95	81	50	59	41	39	33	30	867	5.4%
8. Fashion	319	316	280	269	263	266	272	301	285	271	251	243	3 336	20.8%	
<b>Total</b>	<b>1 702</b>	<b>1 575</b>	<b>1 545</b>	<b>1 413</b>	<b>1 417</b>	<b>1 385</b>	<b>1 308</b>	<b>1 258</b>	<b>1 262</b>	<b>1 111</b>	<b>1 005</b>	<b>1 039</b>	<b>16 020</b>		
<b>Proportion in total</b>	<b>10.6%</b>	<b>9.8%</b>	<b>9.6%</b>	<b>8.8%</b>	<b>8.8%</b>	<b>8.6%</b>	<b>8.2%</b>	<b>7.9%</b>	<b>7.9%</b>	<b>6.9%</b>	<b>6.3%</b>	<b>6.5%</b>			

Source: PATSTAT, calculations: IPIL

Similarly to the two previous countries, since 2006 Great Britain has experienced a downward trend in many of the CCI sub-sectors, noticeably in Radio, TV, Video and film, Books and Press, Software and Games, Cultural Heritage and in the Fashion industries.

**d. Spain**



**Figure 11: Patent breakdown by CCI sub-sector in Spain, 2006-2017**

Source: PATSTAT, calculations: IPIL

In Spain, the main patent-active CCIs sub-sectors are Architecture (37.5%) and Fashion (28.5%).

**Table 6: Patents filed by Spain according to the CCI sub-sectors, 2006-2017**

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total	Proportion in total sub-sector	
<b>1. Advertising</b>	63	59	67	60	49	35	42	41	43	60	53	35	607	6.4%	
<b>2. Architecture</b>	375	375	365	340	309	318	278	255	270	233	229	215	3 562	37.5%	
<b>3. Design</b>	58	56	61	55	55	45	58	60	48	48	50	40	634	6.7%	
<b>4. Visual arts</b>	9	9	14	11	17	12	14	13	22	26	18	20	185	1.9%	
<b>5. Media and content</b>	5.1 Radio, TV, Video & film	71	67	83	108	105	68	59	61	63	70	49	48	852	9.0%
	5.2 Music	12	13	24	14	26	15	23	21	28	13	24	22	235	2.5%
	5.3 Books & press	32	29	23	19	22	25	21	22	19	20	11	12	255	2.7%
	5.4 Software & games	5	8	10	5	5	1	2	5	12	7	9	4	73	0.8%
<b>6. Performing arts</b>	5	0	5	4	1	5	4	0	5	5	4	1	39	0.4%	
<b>7. Cultural Heritage</b>	7.1 Archives	1	6	1	1	2	4	1	1	3	2	3	2	27	0.3%
	7.2 Amusement activities	20	20	31	24	38	26	31	20	31	26	26	24	317	3.3%
<b>8. Fashion</b>	218	193	229	214	245	206	201	225	270	227	226	248	2 702	28.5%	
<b>Total</b>	869	835	913	855	874	760	734	724	814	737	702	671	9 488		
<b>Proportion in total</b>	9.2%	8.8%	9.6%	9.0%	9.2%	8.0%	7.7%	7.6%	8.6%	7.8%	7.4%	7.1%			

Source: PATSTAT, calculations: IPIL

Although it is the most active CCI sub-sector in patenting in Spain, patent filing numbers in Architecture seem to have decreased over the time, whereas the Fashion sub-sector has recorded an increase of its patenting activity.

e. The Netherlands

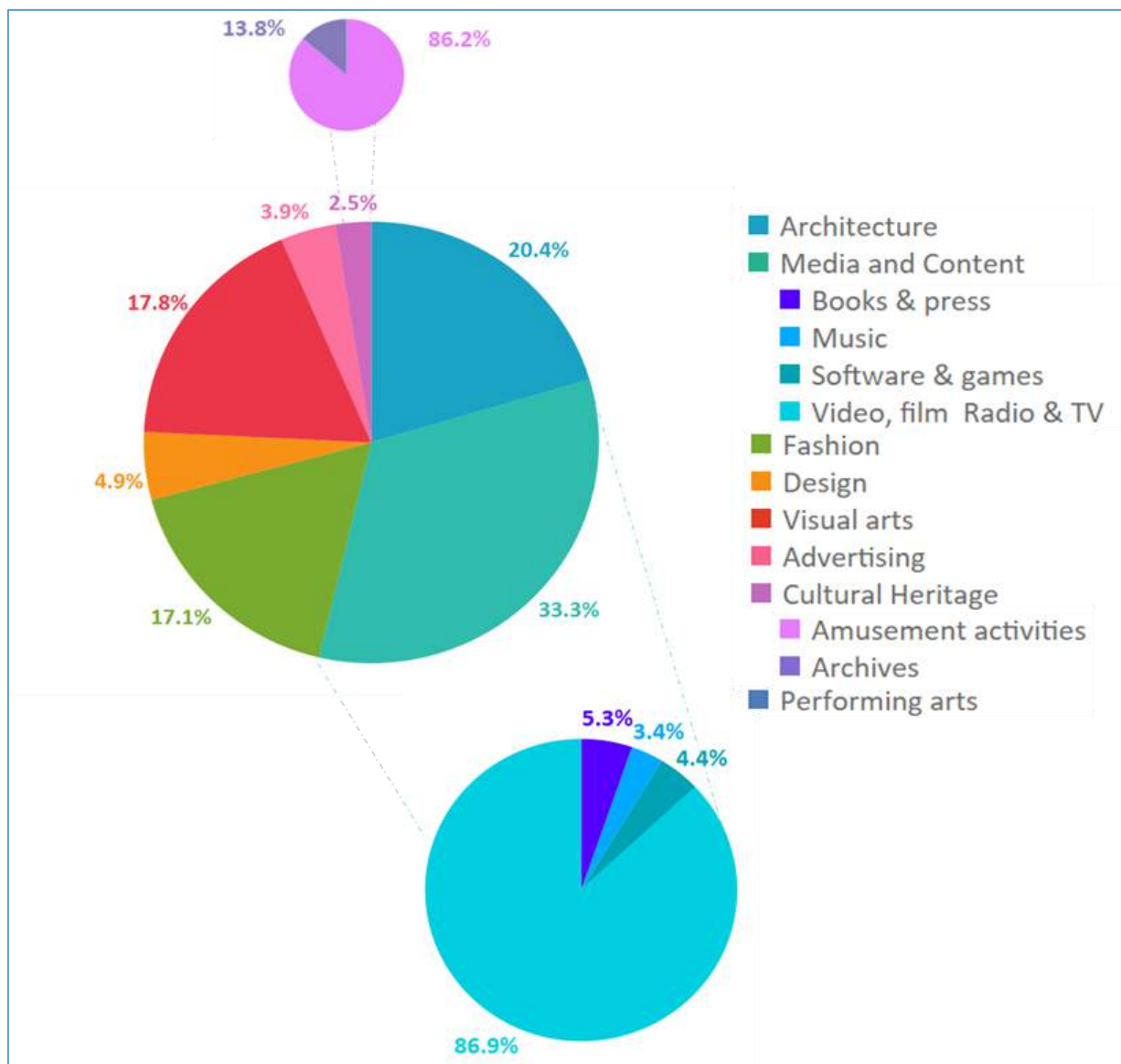


Figure 12: Patent breakdown by CCI sub-sector in the Netherlands, 2006-2017

Source: PATSTAT, calculations: IPIL

In the Netherlands, the four main sub-sectors are Radio, TV, Video & film (28.8%), Architecture (20.4%), Visual arts (17.8%) and Fashion (17.1%) in terms of patenting activity in the CCIs.

**Table 7: Patents filed by The Netherlands according to the CCI sub-sectors, 2006-2017**

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total	Proportion in total sub-sector	
1. Advertising	45	51	35	48	29	14	17	10	9	13	20	15	306	3.9%	
2. Architecture	176	152	170	184	148	98	81	90	125	117	120	126	1 587	20.4%	
3. Design	61	43	54	38	41	28	22	17	23	25	14	19	385	4.9%	
4. Visual arts	189	224	244	157	148	126	77	45	58	53	40	25	1 386	17.8%	
5. Media and content	5.1 Radio, TV, Video & film	307	253	244	232	189	179	144	171	154	141	137	106	2 257	28.8%
	5.2 Music	14	12	12	9	10	4	1	2	3	4	8	8	87	1.1%
	5.3 Books & press	25	11	15	19	14	7	10	6	4	10	9	8	138	1.8%
	5.4 Software & games	9	17	18	7	9	8	2	4	6	18	12	5	115	1.5%
6. Performing arts	6	2	8	5	6	2	0	2	0	4	1	4	40	0.5%	
7. Cultural Heritage	7.1 Archives	3	1	2	3	3	4	0	0	2	4	4	1	27	0.3%
	7.2 Amusement activities	21	19	19	9	20	14	6	12	8	16	12	13	169	2.2%
8. Fashion	101	126	98	89	97	76	85	137	122	143	141	119	1 334	17.1%	
Total	957	911	919	800	714	560	445	496	514	548	518	449	7 831		
Proportion in total	12.2%	11.6%	11.7%	10.2%	9.1%	7.2%	5.7%	6.3%	6.6%	7.0%	6.6%	5.7%			

Source: PATSTAT, calculations: IPIL

In the Netherlands, the three leading sub-sectors have recorded a sharp decrease since 2006, whereas the Fashion sub-sector has, on average, recorded an increase of its patenting activity over the period.

#### f. Country ranking by population

In order to classify the countries according to the intensity of their patenting activity, statistics have been normalised according to the size of the total population (per 100 000 inhabitants). This analysis allows for a more meaningful cross-country comparison, by weighting the number of patents according to a measure of country size.

Normalisation via demographic data was preferred to economic data i.e. the gross domestic product at purchasing power parity (GDP at PPP) (OECD 2009, WIPO 2007), because the latter is dependent on the economic situation, and was therefore very strongly impacted by the subprime crisis of 2007.

The data relating to population in this report comes from the Eurostat database, with the exception of Tunisia (World Bank).

The following figure shows the country ranking of the patenting activities normalised according to population size. The change in the top 5 countries is quite visible.

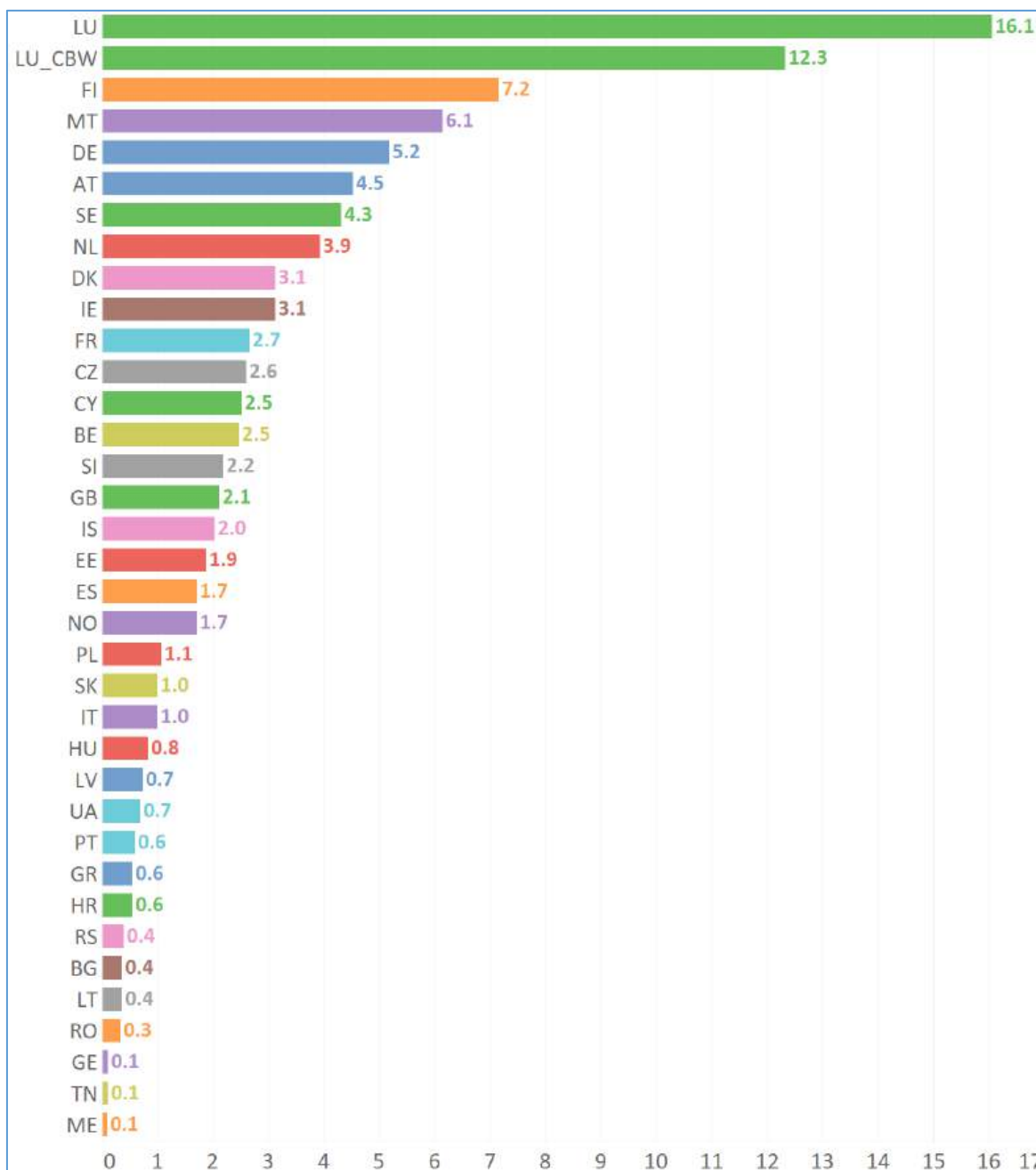


Figure 13: Total patents in the CCIs, by country of origin per 100 000 inhabitants, 2006-2017<sup>12</sup>

Source: PATSTAT, Eurostat, The World Bank, calculations: IPIL

<sup>12</sup> Note that no results are provided for Bosnia and Herzegovina, Albania, Armenia, Moldova and Republic of North Macedonia due to the lack or absence of data for these countries in the years under review.

LU\_CBW: Luxembourg with the cross-border workers included.

According to the chart above, Luxembourg is the top applicant in relation to its population. However, this leading position must be put into perspective due to the very high degree of *economic openness* of this country and the small size of its population. This *economic openness* implies that the border residents may have filed patents in Luxembourg but they are not counted in the population, which suggests an upward bias of the result (denominator is underestimated).

In order to correct this bias, cross-border employees have been added to the resident population in the statistical series entitled Luxembourg including cross-border workers (CBW) population, shown in the figure as LU\_CBW.

Although this correction has reduced the ratio and closed the gap between itself and the first runner-up, Luxembourg remains the leader and is followed by Finland, Malta and Germany.

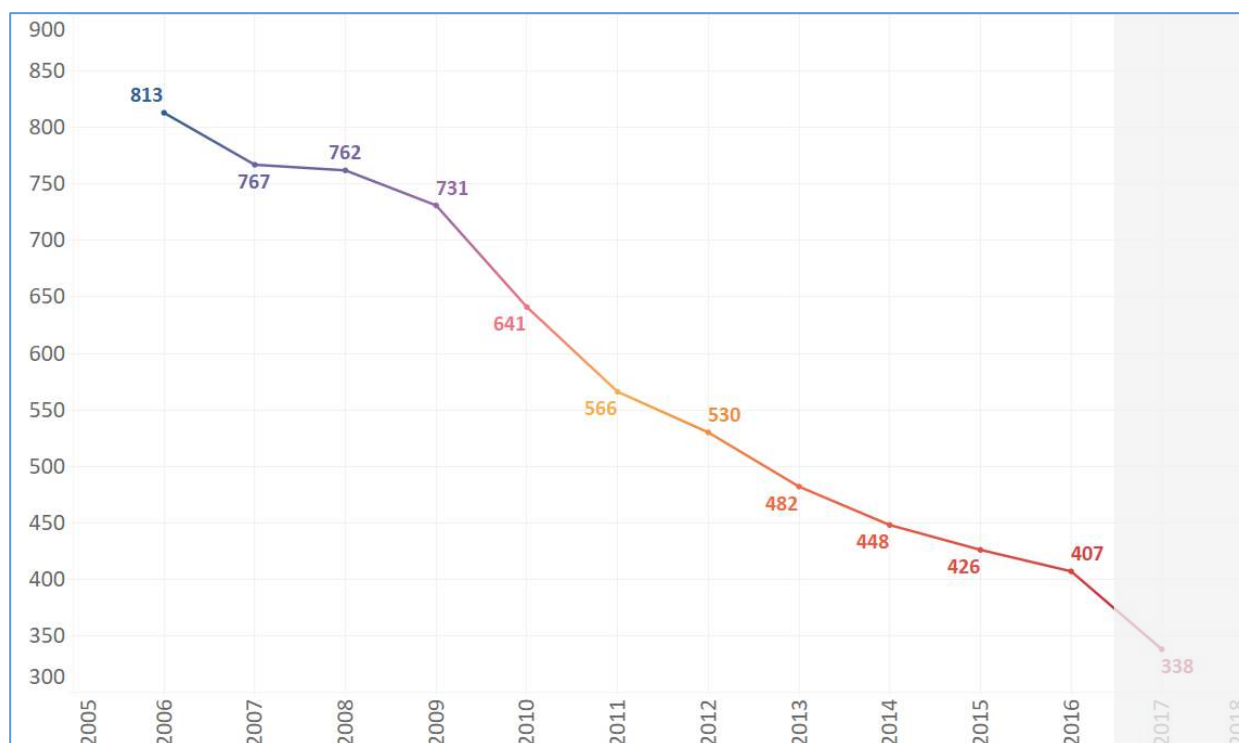
Malta's fifth position is explained by the fact that the patenting activity is developed in the following sub-sectors:

- Software & games (20.3% of all patented inventions from 2006-2017);
- Architecture (21.2%); and
- Design (15.8%).



### 3. SUB-SECTOR ANALYSIS

#### 3.1. Advertising



**Figure 14: Evolution of patent filings, Advertising sub-sector**

Source: PATSTAT, calculations: IPIL

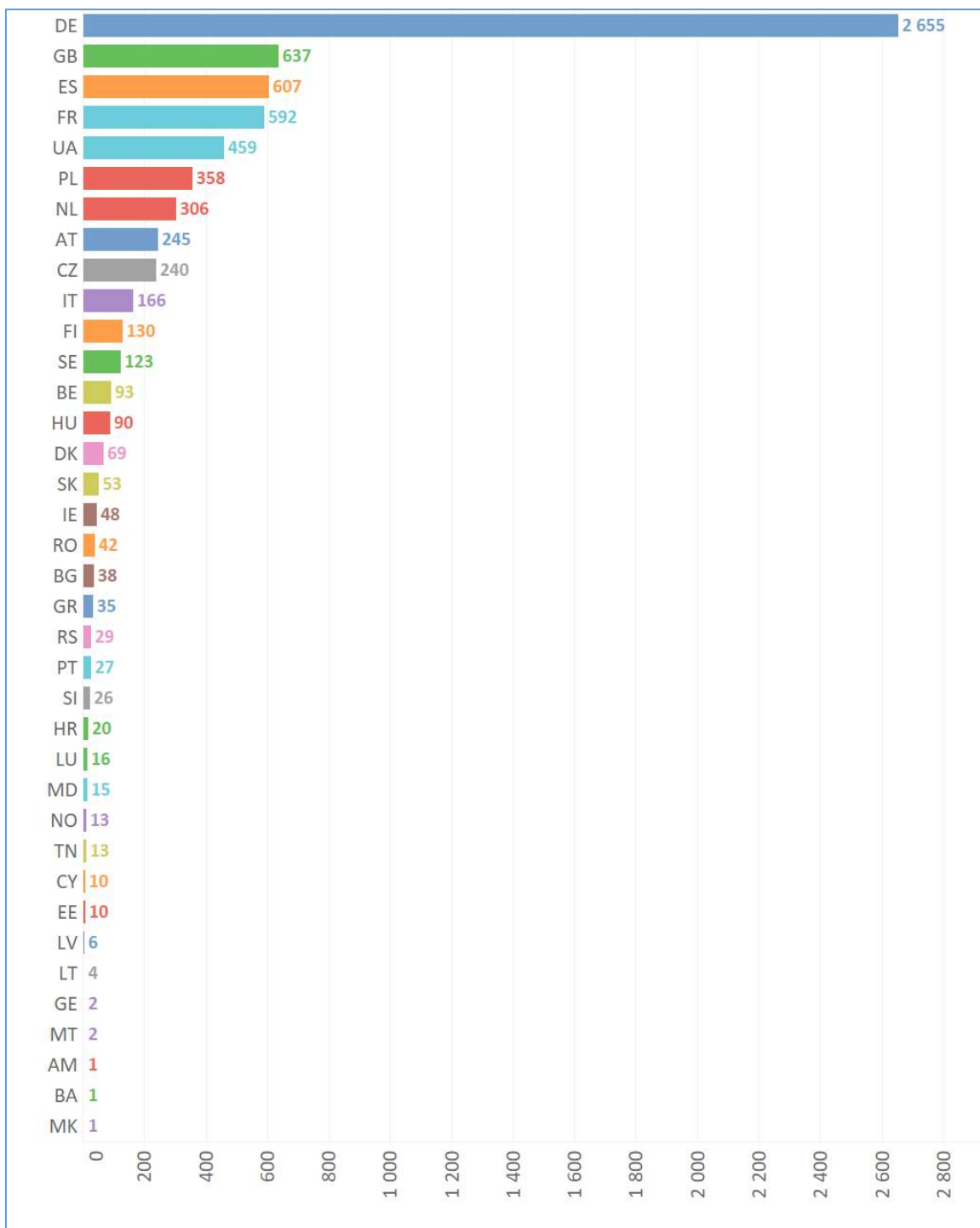
The Advertising sub-sector represents 4.8%<sup>13</sup> of all CCIs patents over the reporting period. It is in sixth place among all CCIs' sub-sectors (see Figure 2: "Patent breakdown by CCIs sub-sectors").

The total number of patents filed decreased sharply from 813 in 2006, with a loss more than 50%, to 338 in 2017. The decrease is particularly significant in 2010 (12.3%), 2011 (11.7%) and with a record fall in 2017 (17.0%).

The fall in 2017 should be considered with caution, because there is a delay in the recording of data: third parties – in this case, cooperating patent offices – provide data to the database, and it cannot be guaranteed that the data for the latter years are accurate or completely up to date.<sup>14</sup>

<sup>13</sup> 6 910 patents in the Advertising sub-sector and 143 569 in the CCIs over the reporting period.

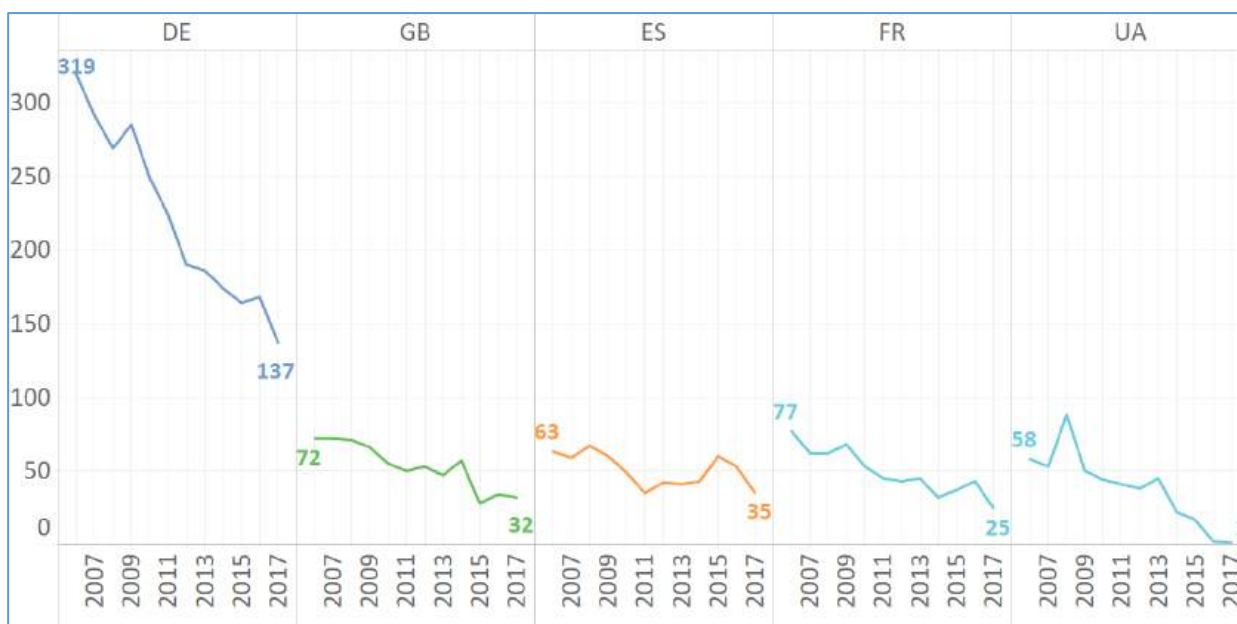
<sup>14</sup> This is the reason why the right-hand side in this chart (and in the "evolution" charts of the other sub-sectors), representing the filings after 2016, is blurred. The missing/unrecorded data is expected to be completed with the updated datasets in the upcoming editions of the PATSTAT. The current data is based on the Spring 2020 Edition.



**Figure 15: Number of patents by country, Advertising sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

Germany is the leading country in the Advertising sub-sector, with 38.4% of all CCIs patents. Armenia, Bosnia and Herzegovina and the Republic of North Macedonia are the smallest contributors, each with 0.01% of the total families.



**Figure 16: Evolution of patent filings, Advertising sub-sector, top 5 countries**

Source: PATSTAT, calculations: IPIL

The country analysis highlights that all leading countries follow this downward trend, with a more significant decrease for the leader, Germany.

**Table 8: Patented technologies, Advertising sub-sector, top 5, 2006-2017**

Technologies	Number of patents	%
Boards, hoardings, pillars, or like structures for notices, placards, posters, or the like	1 158	16.8
Signs, boards, or panels, illuminated from behind the insignia	729	10.5
Advertising on or in specific articles	629	9.1
Mobile visual advertising by land vehicles	462	6.7
Combined visual and audible advertising or displaying	430	6.2

The sub-sector is dominated by the development of technologies related to boards and illuminated signs and panels. It should be underlined that all of the top five groups of patented technologies show a downward trend over the period as shown in the chart below.

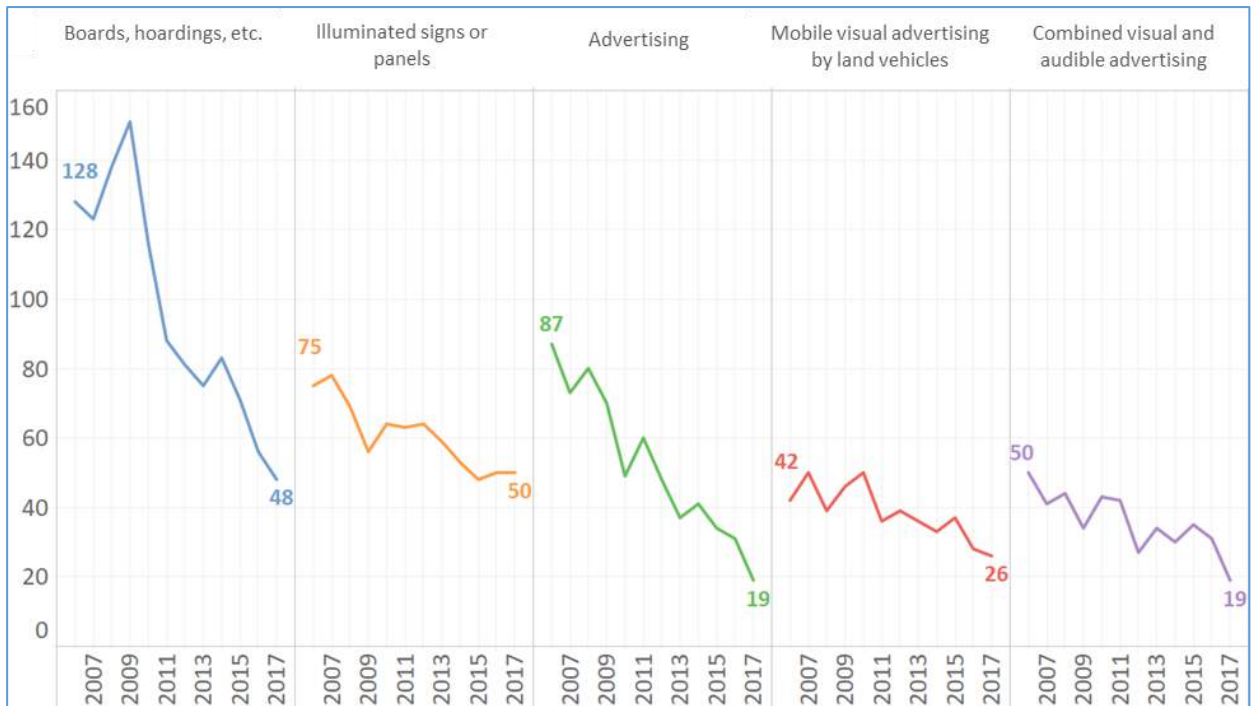


Figure 17: Evolution of top 5 patented technologies, Advertising sub-sector, 2006-2017

Source: PATSTAT, calculations: IPIL

A closer look at the technological innovations shows that the main innovations are related to fixed or mobile advertising using boards, hoardings, etc. with a significant proportion using electroluminescence or classic luminous solutions.

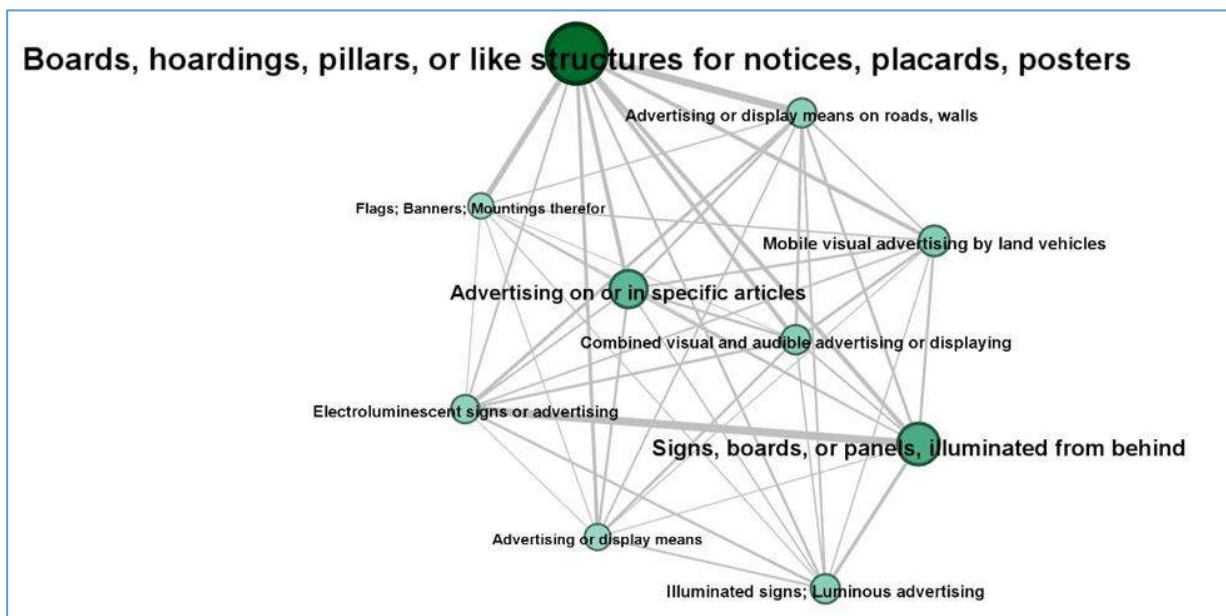


Figure 18: Relationship diagram, top 10 technologies, Advertising sub-sector, 2006-2017<sup>15</sup>

(frequency range 335 - 1 158)

<sup>15</sup> The intensity of the colour in the circle as well as the font sizes are representative of the frequencies of the technologies in our set of patent applications. The thickness of the links represents relationship intensity (frequency).

The top applicants in the sub-sector are mainly represented by big companies from the following sectors:

- lighting;
- automotive industry and their suppliers; and
- advertising

with the following top 10 applicants:

Applicant	Number of patents
PHILIPS	100
BOSCH SIEMENS	97
OSRAM	59
AUDI AG	39
ZUMTOBEL LIGHTING GMBH	31
DAIMLER AG	25
BURTSEV VALERII MYKOLAIOVYCH	25
STETSENKO OLEKSANDR PETROVYCH	20
SAINT GOBAIN	19
BAYERISCHE MOTOREN WERKE AG	16

As illustrated by the figure below, there is very little cooperation between applicants in the sector.

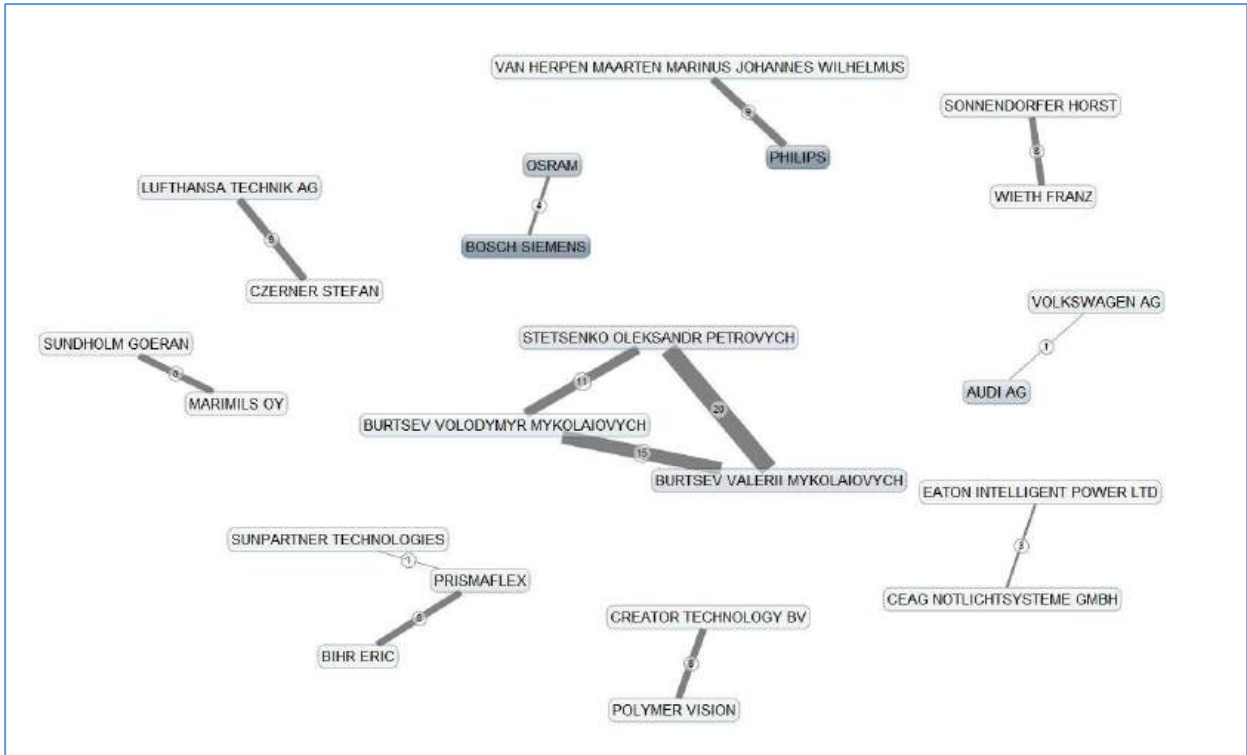


Figure 19: Collaboration diagram, applicants in the Advertising sub-sector, 2006-2017<sup>16</sup>  
 (assignee frequency from 8, pairs frequency from 1)

In our study, we noticed that the majority of the applicants file very few patents and therefore cannot be analysed to provide an overview of the fields in which they innovate. In the range of 1 to 2 patents filed, we count 6 991 applicants, representing 94% of all patent applicants.

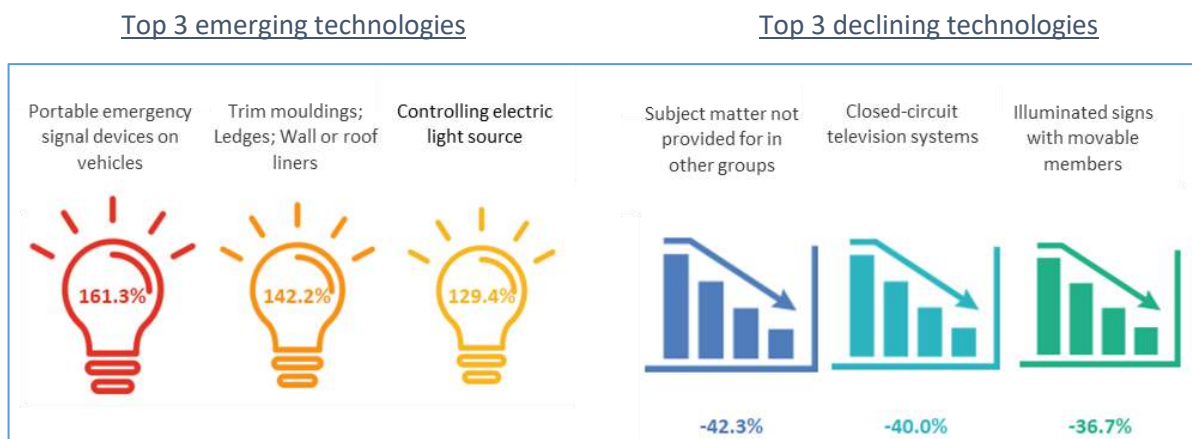


Figure 20: Top 3 emerging and declining technologies, Advertising sub-sector, 2012-2016<sup>17</sup>

<sup>16</sup> The thickness of the links between applicants are representatives of their intensity. Frequency is noted on each link.

<sup>17</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

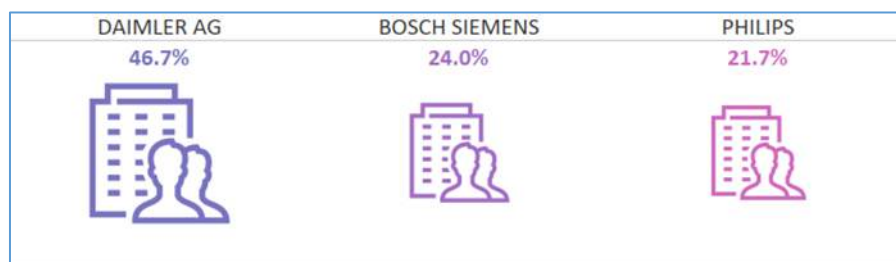


Figure 21: Top 3 most dynamic applicants in recent years, Advertising sub-sector<sup>18</sup>

### Summary

This sub-sector, which ranks 6<sup>th</sup> among the CCIs, recorded a downward trend in its patenting activity between 2006 and 2017. Germany has the highest inventive activity in this sub-sector, followed by Great Britain and Spain. However, Germany is the country that declined the most during the period under review.

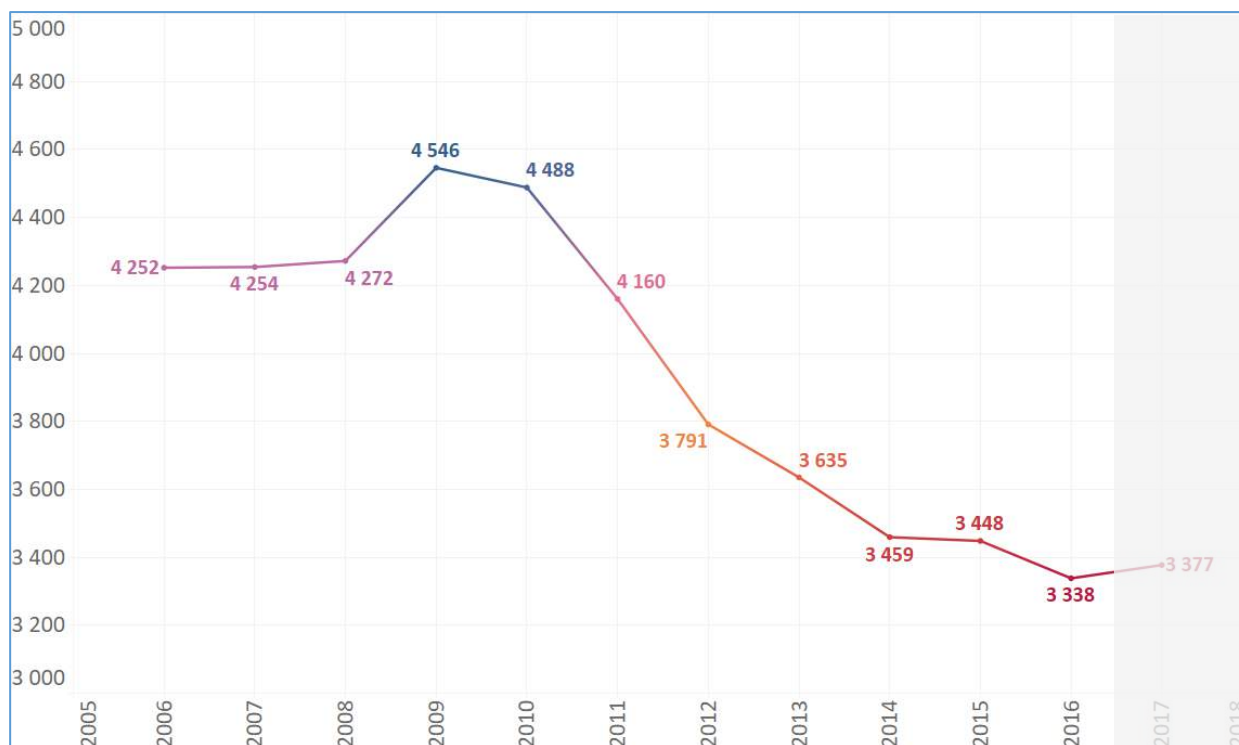
The main technological areas concerned relate to support structures (boards, hoardings, pillars, or like structures, etc.) for providing information or indications, related to a certain type of advertising but probably not to the core business of creatives from the Advertising sub-sector.

We can note the emergence of developments in portable and mobile means (e.g. in cars) and a decrease in more classical means of advertising (e.g. TV).

The technologies are mainly developed by the big players of the light and car industries (the patenting activities carried out by the main applicants, Philips and Bosch Siemens for instance, are reflected at the level of the main patented technologies).

<sup>18</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

### 3.2. Architecture



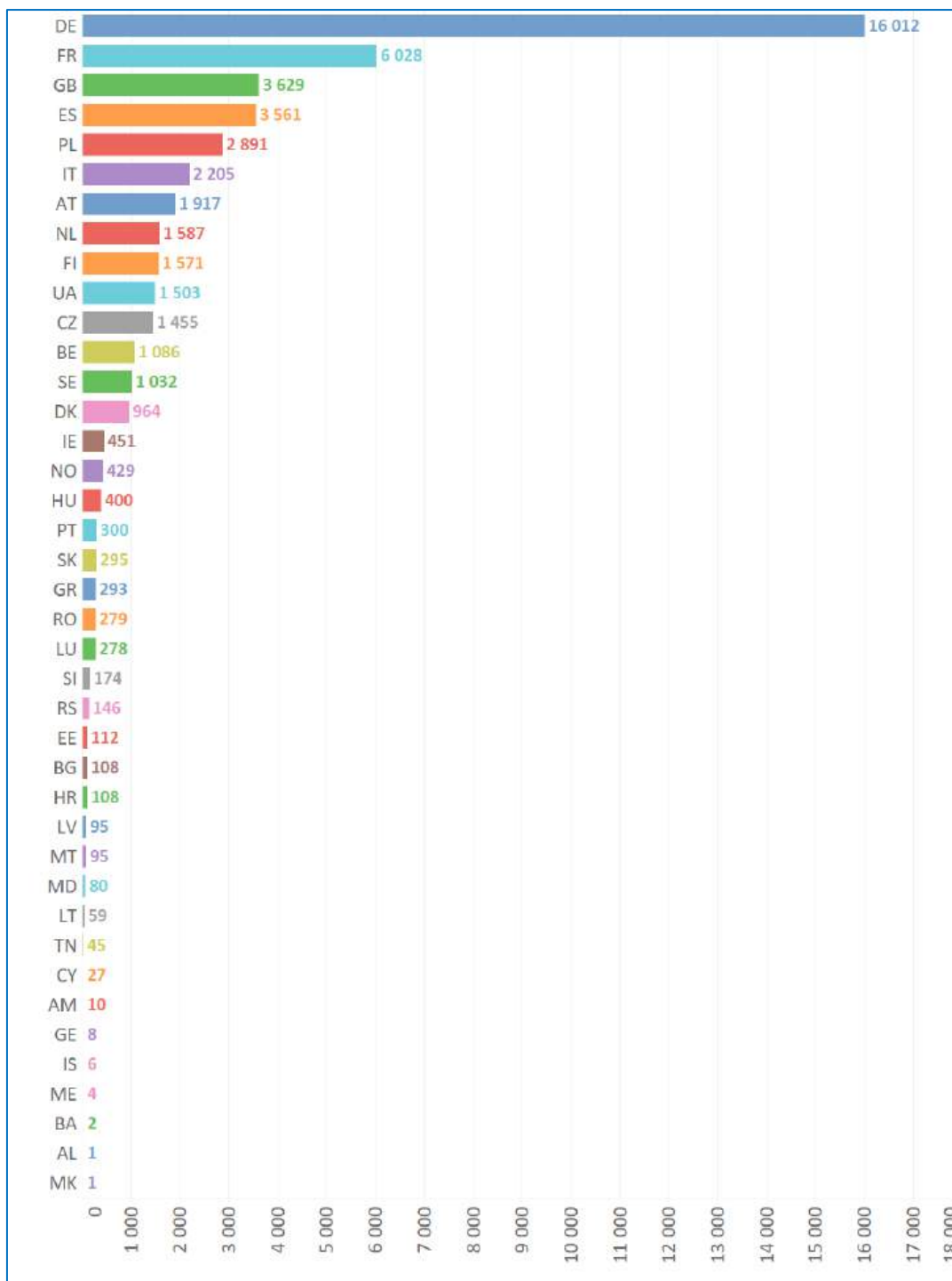
**Figure 22: Evolution of patent filings, Architecture sub-sector**

Source: PATSTAT, calculations: IPIL

Architecture is the CCIs sub-sector with the highest number of patent families during the period under review (47 011 patents), representing almost one third of all families in the CCIs from 2006 to 2017 (32.7%).

The development in this sub-sector is characterised by a slight increase from 2006 to 2009, followed by a particularly sharp decline between 2010 and 2014. The trend has stabilised since then albeit at a much lower level than in 2009.

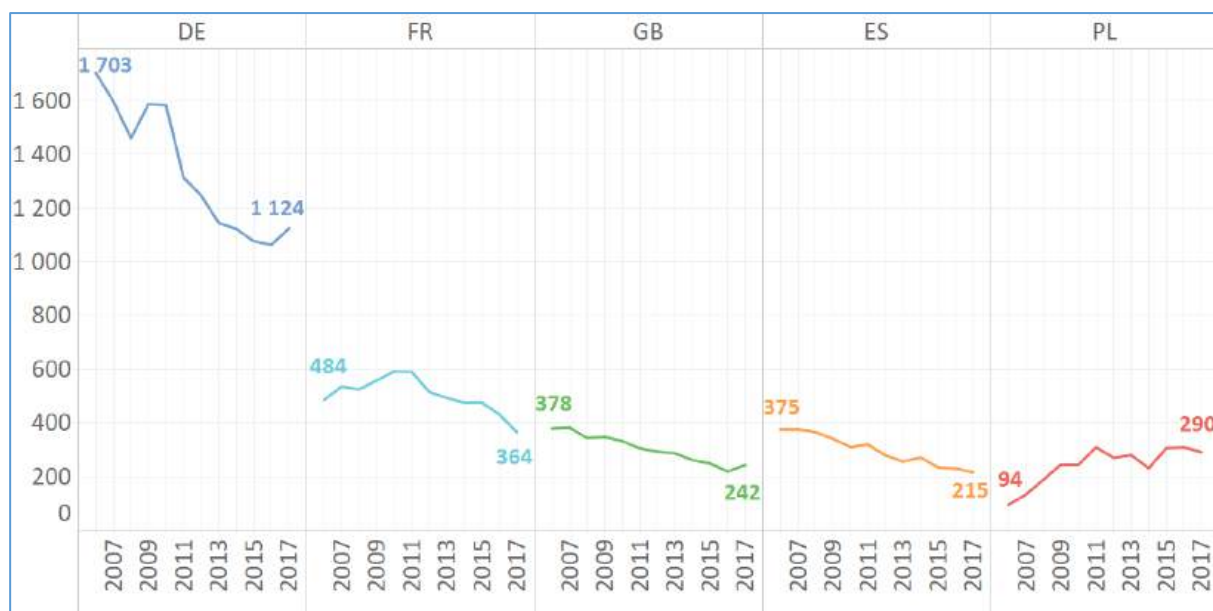




**Figure 23: Number of patents by country, Architecture sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

Germany is by far the most active country in terms of patent applications in the Architecture sub-sector, far ahead of France and Great Britain. With 16 012 patents, it is the source of more than one third of all patented inventions in this field (34.1%). The top 10 patent-filing countries in Architecture represent 87.0% of all patented inventions of the sub-sector.



**Figure 24: Evolution of patent filings, Architecture sub-sector, top 5 countries**

Source: PATSTAT, calculations: IPIL

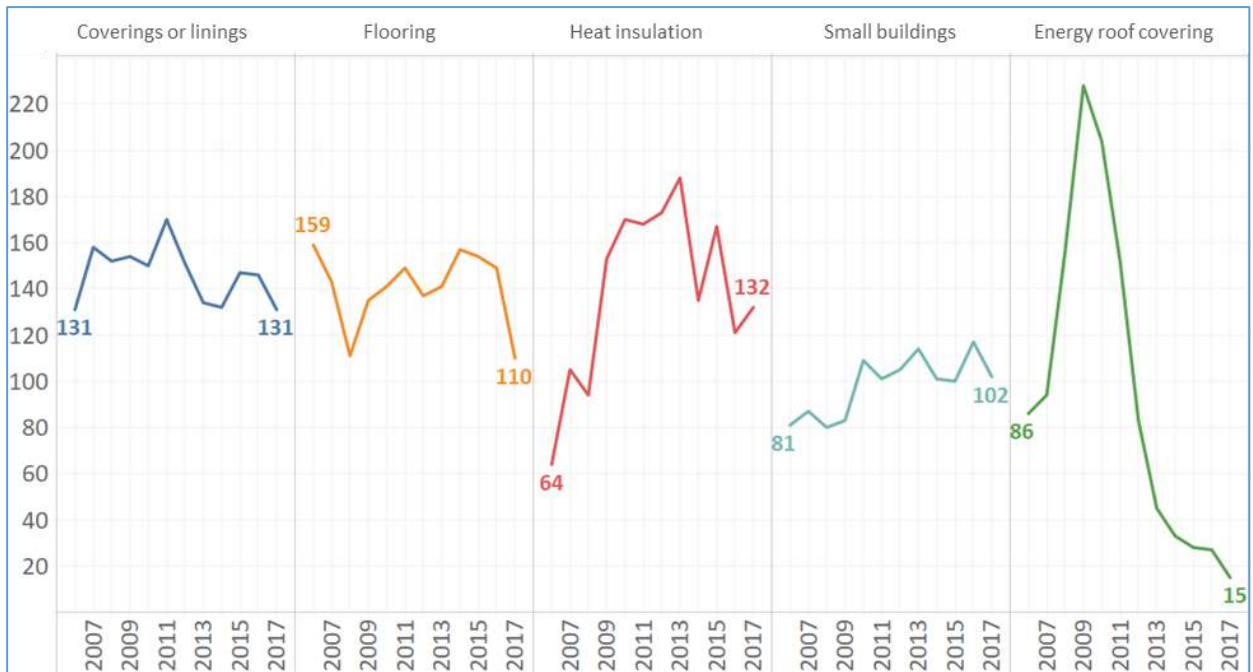
Although Germany is the leader of this sub-sector, the number of inventions patented in this country has dropped significantly (by 34%) since 2009, from 1 703 patents to 1 124, which explains the decrease in the overall numbers. France, Great Britain and Spain also contribute to this decline with their individual downward trends but to a rather lesser degree. Poland appears as an outlier in the top 5, as it recorded an ascending trend during the period.

The analysis of the technical domains covered by patents clearly shows a wide dispersion, with the top 5 covering 15.8% of all patents of the sub-sector. Coverings in general (floor, roof) represent most of the innovations, followed by heat insulation.

More specifically, the following innovation areas are covered in the patent applications in this sub-sector:

**Table 9: Patented technologies, Architecture sub-sector, top 5, 2006-2017**

Technologies	Number of patents	%
Coverings or linings composed of a plurality of similar elements	1 756	3.7
Flooring or floor layers composed of similar elements	1 686	3.6
Heat insulation	1 671	3.6
Small buildings	1 180	2.5
Roof covering aspects of energy collecting devices	1 150	2.4

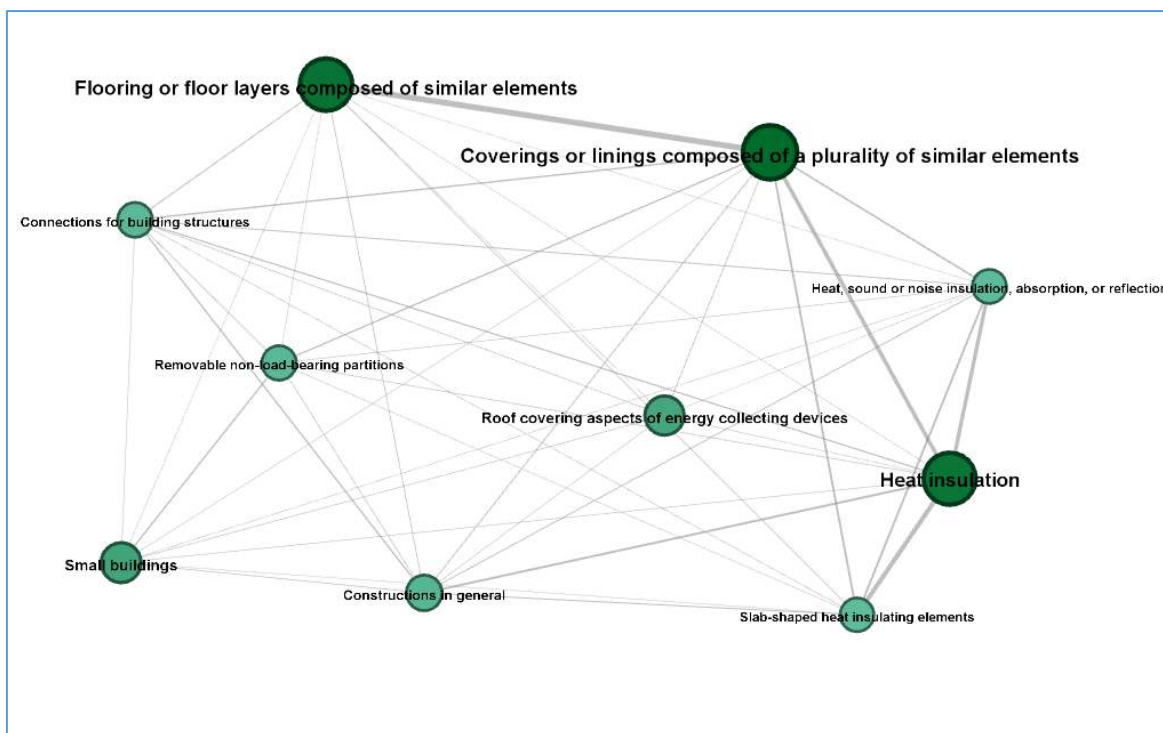


**Figure 25: Evolution of top 5 patented technologies, Architecture sub-sector, 2006-2017**

Concerning the evolution of the patenting activities, we can note a relative stability for the two leading technologies patented. For heat insulation, we note a global increase until 2013, with a tendency to subsequently decrease. Technologies patented for small buildings present a general increase up to 2010 and then stay more or less stable at more than 100 patents each year.

After an outstanding jump in patent applications from 2007 to 2009, we also note a dramatic fall from that date for “Roof covering aspects of energy collecting devices.”

An analysis of the relationship between the patented technologies in this sub-sector reveals that the main innovations are related to flooring and its insulation, especially for heat. The following figure illustrates the relativity of the technologies in Architecture.



**Figure 26: Relationship diagram, top 10 technologies, Architecture sub-sector, 2006-2017<sup>19</sup>**  
(frequency range 907 – 1 756)

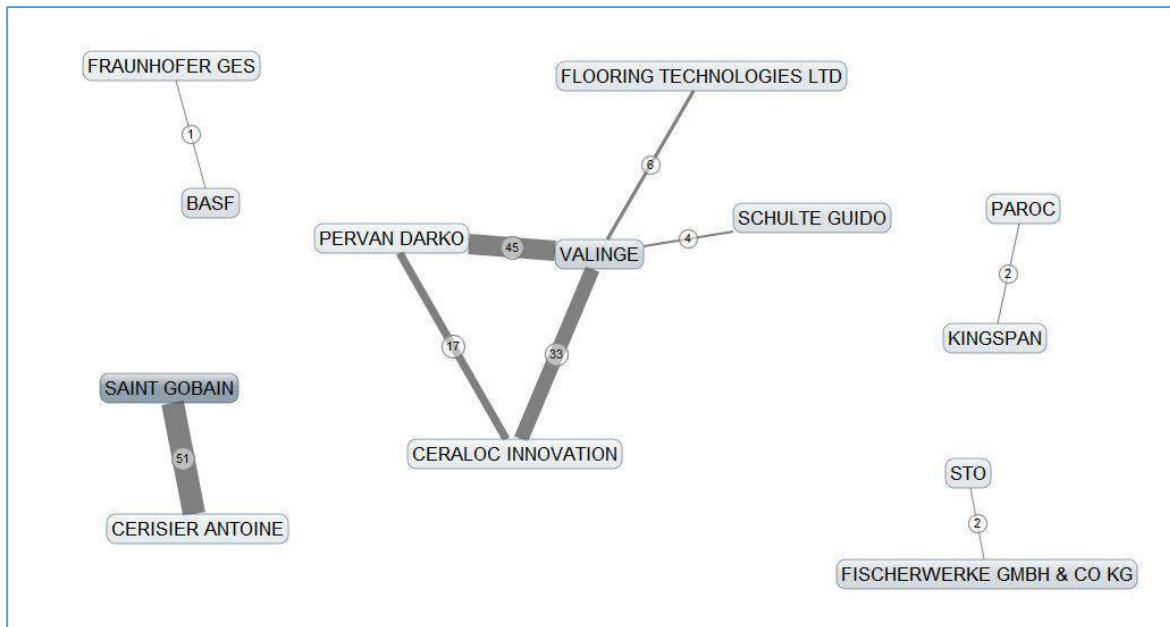
The related leading companies involved are from the following main industries:

- flooring;
- windows; and
- construction in general

with the following top 10 applicants:

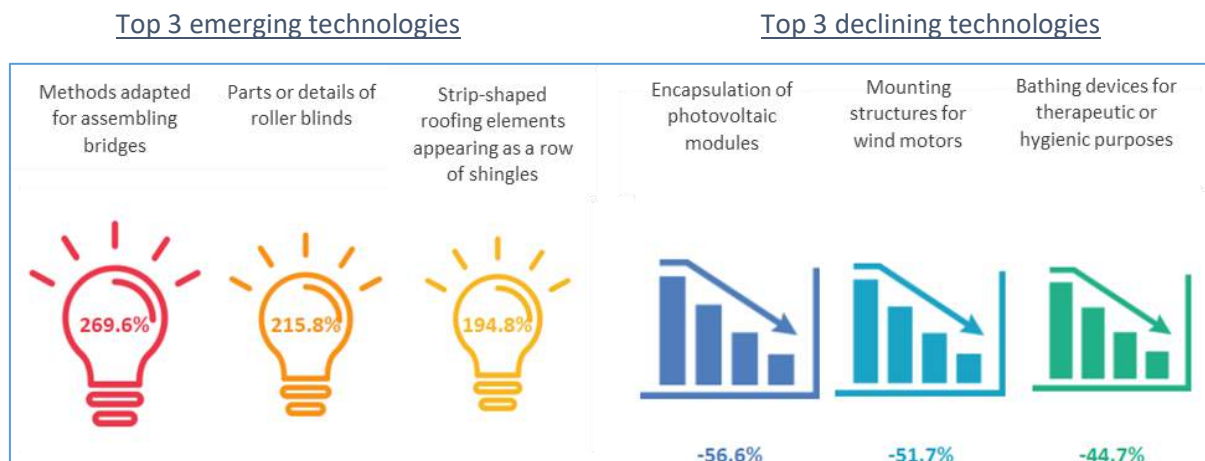
Applicant	Number of patents
SAINT GOBAIN	388
KNAUF	199
VKR HOLDING AS	181
VALINGE	157
FAKRO PP SP Z O O	126
ROCKWOOL	122
FISCHERWERKE GMBH & CO KG	121
SIEMENS	121
AIRBUS	119
BAYERISCHE MOTOREN WERKE AG	16

<sup>19</sup> The intensity of the colour in the circle as well as the font sizes are representative of the frequencies of the technologies in our set of patent applications. The thickness of the links represents relationship intensity (frequency).



**Figure 27: Collaboration diagram, applicants in the Architecture sub-sector, 2006-2017<sup>20</sup>**  
 (assignee frequency from 41, pairs frequency from 1)

As shown in the above graph, we can find very little cooperation between companies in the Architecture area.



**Figure 28: Top 3 emerging and declining technologies, Architecture sub-sector, 2012-2016<sup>21</sup>**

<sup>20</sup> The thickness of the links between applicants are representatives of their intensity. Frequency is noted on each link.

<sup>21</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

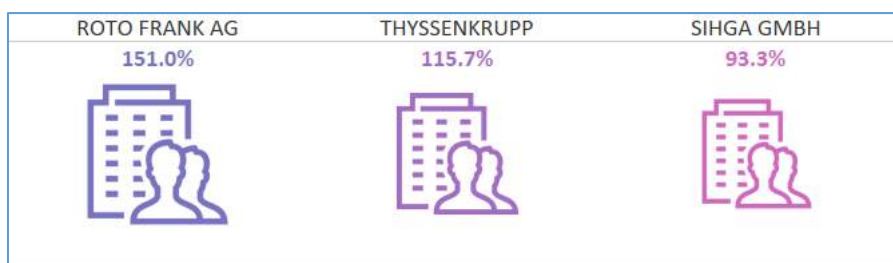


Figure 29: Top 3 most dynamic applicants, Architecture sub-sector, 2012-2016<sup>22</sup>

### Summary

The Architecture sub-sector, which is in pole position among the CCIs, has recorded a downward trend in its patenting activity since 2010. The four most prolific countries in terms of patenting activity within this sub-sector, namely Germany, France, Great Britain and Spain, conformed to this downward trend.

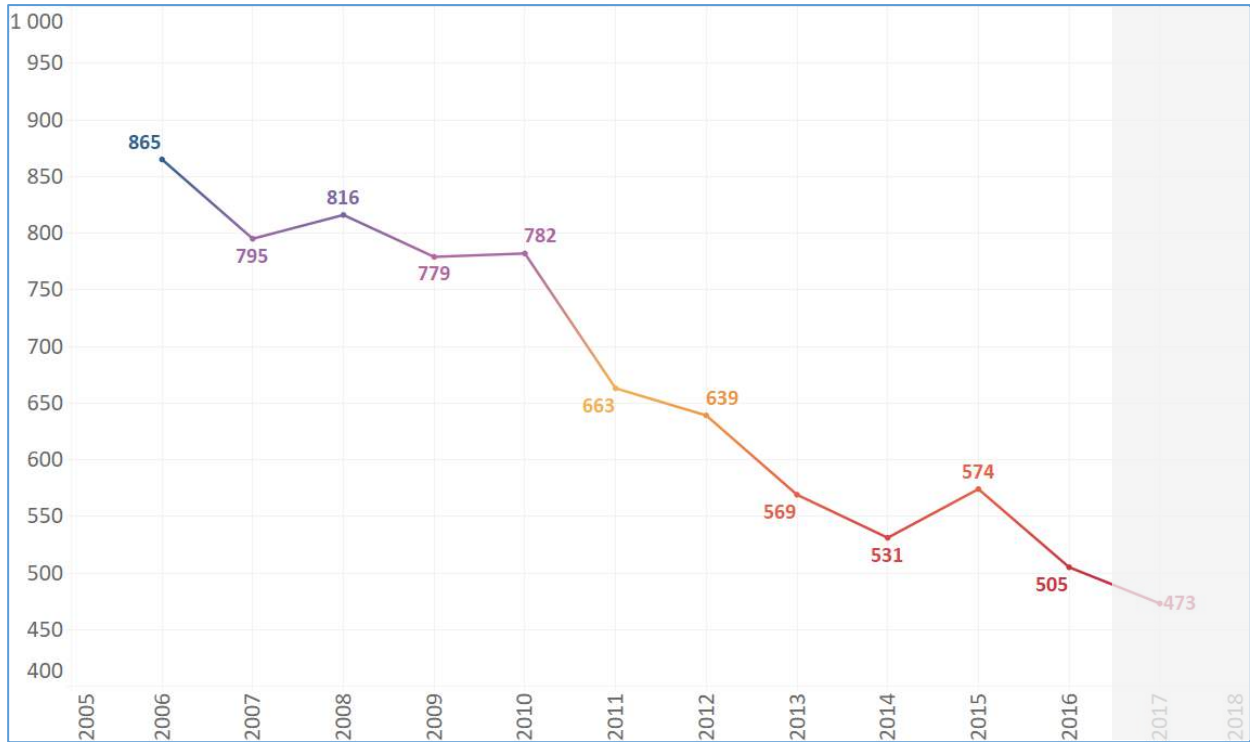
The main technological areas concerned in this sub-sector are related to coverings in general. A detailed analysis reveals that all of the top innovative areas followed a decrease in patenting, and especially the area of roof covering of energy collecting devices (after a remarkable jump in patent applications).

We can note for the very last years a remarkable increase in patenting for methods of assembling bridges, as well as for roller blinds and decorative surface effects, which is reflected by the most recently dynamic companies registering patents.

Regarding the companies involved in technological developments in the sub-sector, we can identify mainly big players of the construction sector, with almost no cooperation with any other company and/or inventors, other than within their group.

<sup>22</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

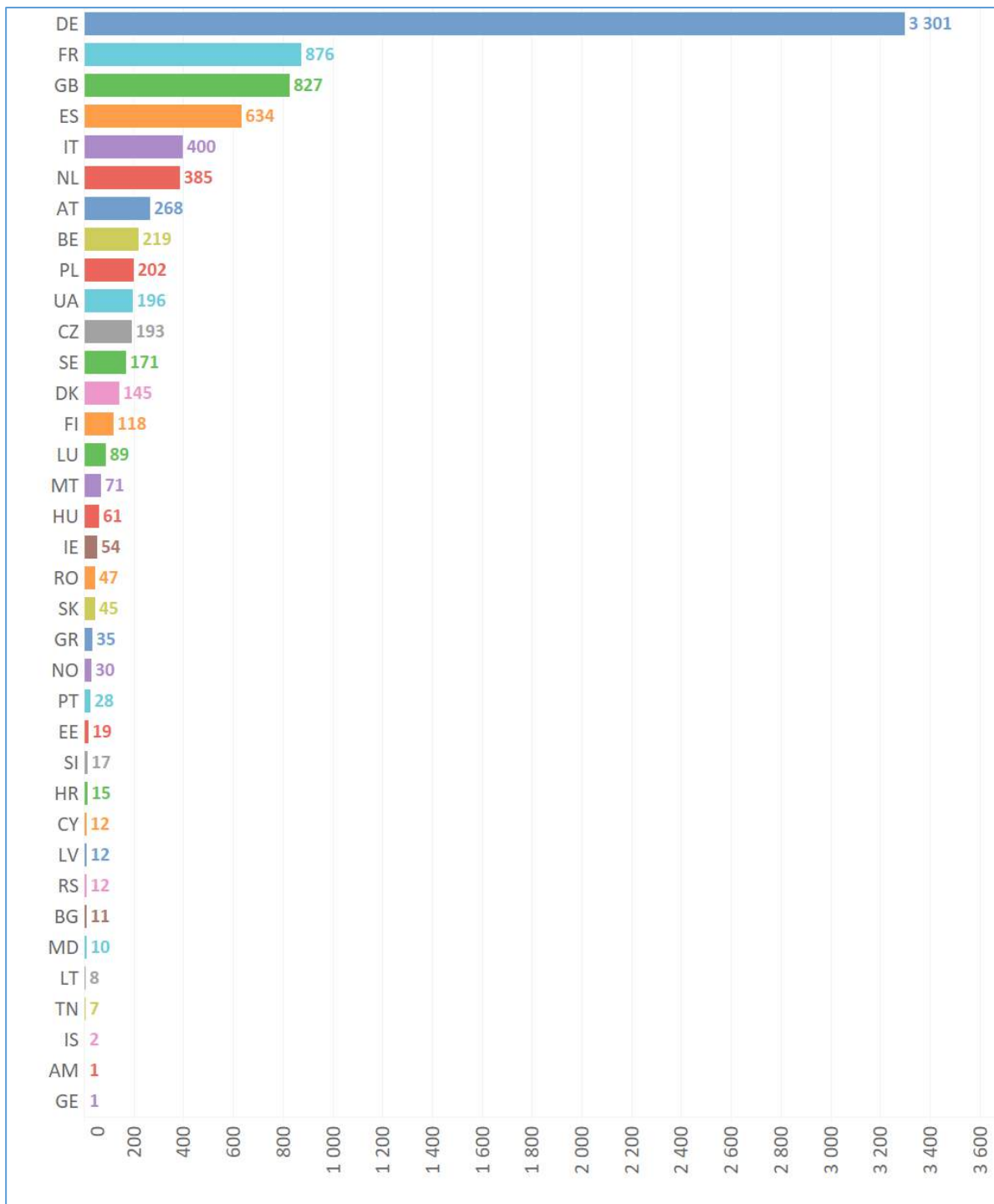
### 3.3. Design



**Figure 30: Evolution of patent filings, Design sub-sector**

Source: PATSTAT, calculations: IPIL

The Design sub-sector represents 5.6% of all CCI patents filed over the period (7 990 patents). The total number of patented inventions has followed a decreasing trend since 2006, from 865 families in 2006 to 473 in 2017.

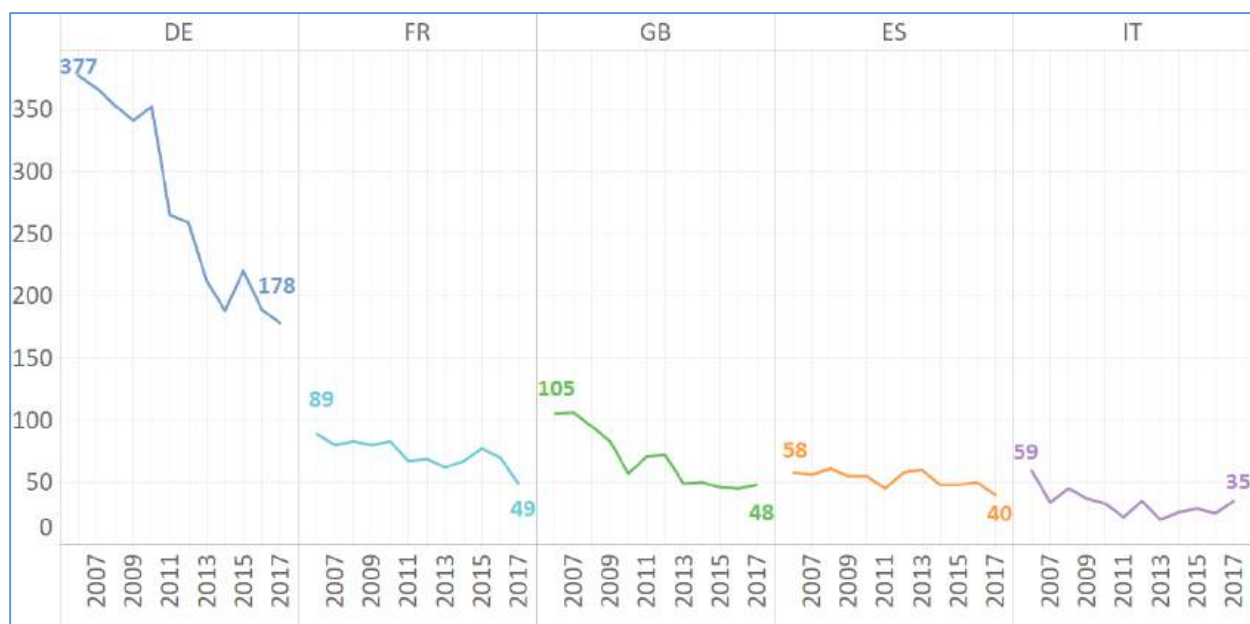


**Figure 31: Number of patents by country, Design sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

Germany is by far the leader in patenting in this sub-sector, with 41.3% of all patents over the period, followed by France (11.0%) and Great Britain (10.4%).





**Figure 32: Evolution of patent filings, Design sub-sector, top 5 countries**

Source: PATSTAT, calculations: IPIL

The decline in patenting activities in Germany and Great Britain over the study period is in line with the downward trend observed in this sub-sector while France, Spain and Italy followed a relatively stable trend over the period.

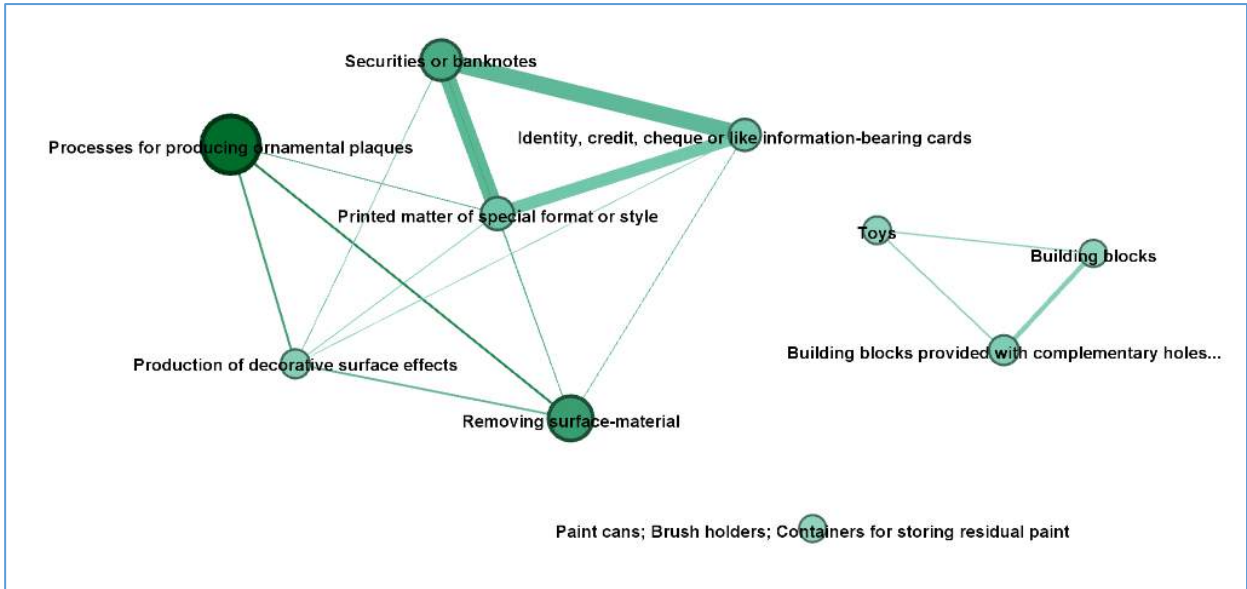
**Table 10: Patented technologies, Design sub-sector, top 5, 2006-2017**

Technologies	Number of patents	%
Processes for producing ornamental plaques	779	9.7
Removing surface-material	559	7.0
Securities or banknotes	492	6.2
Printed matter of special format or style	364	4.6
Identity, credit, cheque or like information-bearing cards	347	4.3

Innovations related to decorative arts are indeed the most patented activities in this sub-sector. It should be noted that printed matter that aims to protect identity or payment documents and banknotes are also widely represented here, due to the very high technicality they require during their manufacture to protect them against forgery.

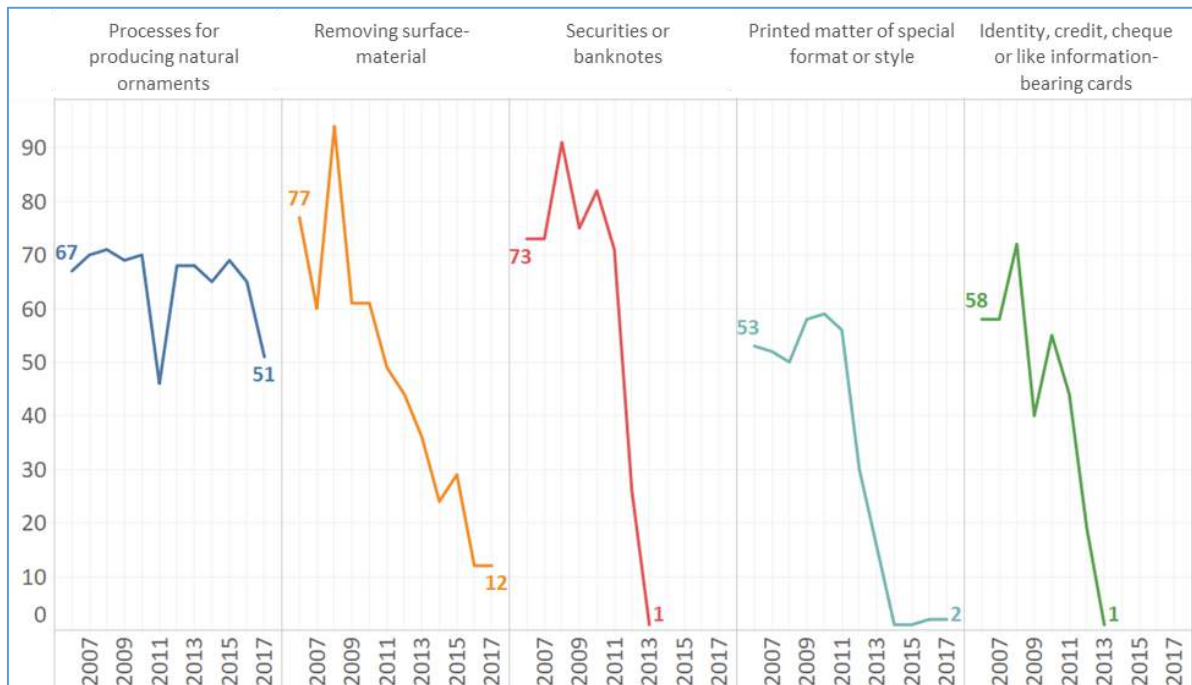
Different types of processes for the production of ornamental bodies and plaques are unsurprisingly the most important patented innovations as they are representative of the heart of the Design activity sub-sector.

We can also note a relatively important number of innovations related to payment modes (e.g. banknotes, cards), to the toys and to the painting industries.



**Figure 33: Relationship diagram, top 10 technologies, Design sub-sector, 2006-2017<sup>23</sup>**  
(frequency range 257 – 779)

The above figure clearly shows four main technological areas: (1) Securities, banknote, identification cards and (2) Ornamental plaques developed with removing of material, that present a few connections; (3) Building blocks for toys and (4) Cans for painting.



**Figure 34: Evolution of top 5 patented technologies, Design sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

<sup>23</sup> The intensity of the colour in the circle as well as the font sizes are representative of the frequencies of the technologies in our set of patent applications. The thickness of the links represents relationship intensity (frequency).

The evolutions of the main technologies patented in this sub-sector are very heterogeneous. The main patented technology has remained stable in terms of innovations. The decrease recorded at the end of the period is due to an incomplete encoding of patents.

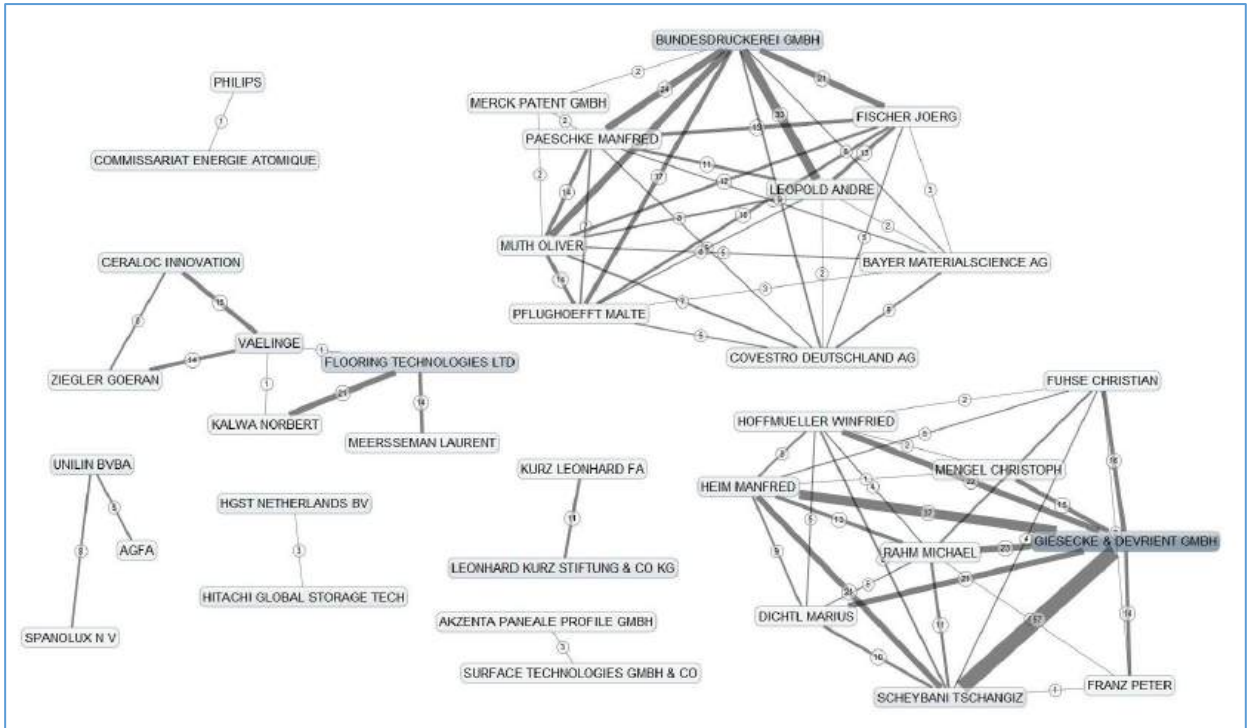
As regards the sharp drop observed in technologies aimed at protecting banknotes, credit cards or identity papers, this is an artefact due to the fact that the last three patented technologies were registered in other categories and so are not included here.

The top applicants in the sub-sector are mainly represented by large companies from the following sectors:

- flooring and construction;
- banking and identification solutions; and
- toys and games.

The top 10 applicants here are:

Applicant	Number of patents
GIESECKE & DEVRIENT GMBH	260
FLOORING TECHNOLOGIES LTD	103
BUNDESDRUCKEREI GMBH	102
PARROT DRONES	75
SCHEYBANI TSCHANGIZ	57
LEGO AS	57
LEONHARD KURZ STIFTUNG & CO KG	54
VAELINGE	48
BOSCH SIEMENS	46
UNILIN BVBA	40



**Figure 35: Collaboration diagram, applicants in the Design sub-sector, 2006-2017<sup>24</sup>**  
 (assignee frequency from 14, pairs frequency from 1)

As seen in the above figure, very little cooperation can be identified between companies in this sub-sector. The main connections are in fact related to the mentioning of inventors as assignees.

The trends analysis over time of the technologies in the sub-sector reveals that they all followed a downward trend during the last years.



**Figure 36: Top 3 emerging and declining technologies, Design sub-sector, 2012-2016<sup>25</sup>**

<sup>24</sup> The thickness of the links between applicants are representatives of their intensity. Frequency is noted on each link.

<sup>25</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

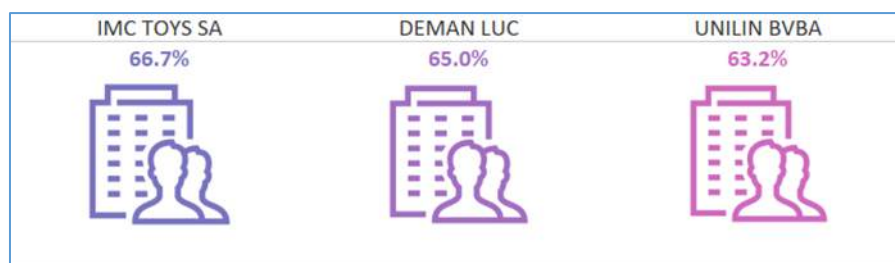


Figure 37: Top 3 most dynamic applicants, Design sub-sector, 2012-2016<sup>26</sup>

### Summary

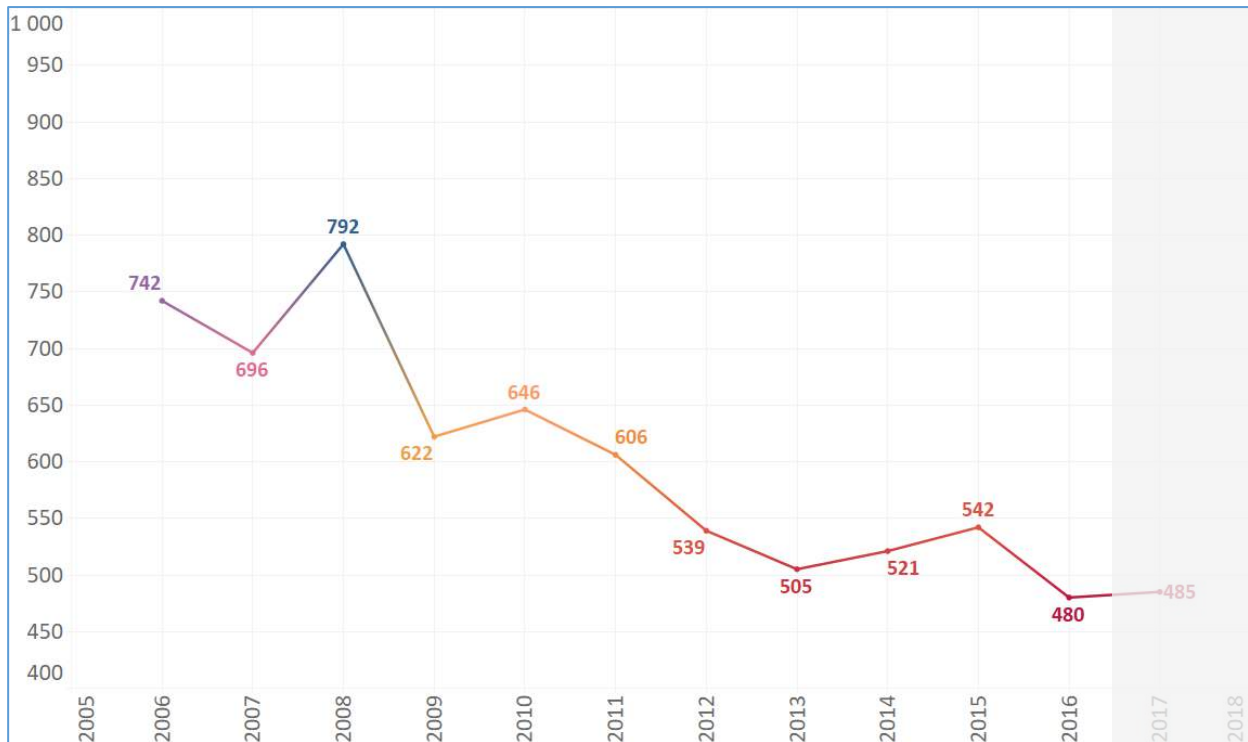
The patenting activity of the Design sub-sector, which ranks 4<sup>th</sup>, has experienced a downward trend since 2006. Germany is by far the leader in patenting in this sub-sector, followed by France and Great Britain.

Because Design covers such a wide range of applications, the main technological areas concerned in this sub-sector are heterogenous, from the production of decorative surface effects and in particular processes for producing special ornamental bodies, ornamental plaques, to banking and toys.

The flooring industry was and remains one of the main players of the sub-sector, just varying its technologies. The Toys industry is also gaining in importance, with actors like IMC toys, Lego or Parrot.

<sup>26</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

### 3.4. Visual arts

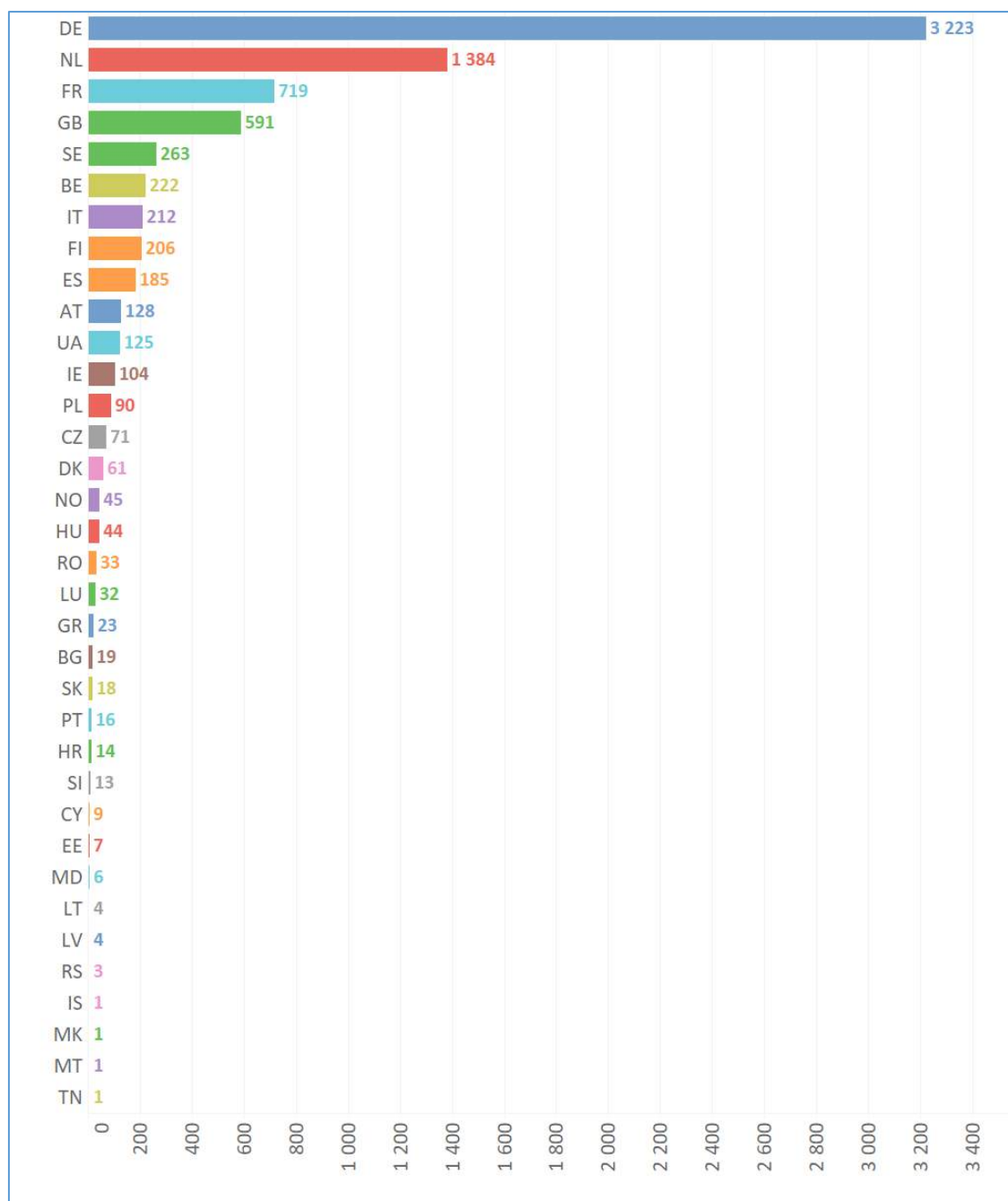


**Figure 38: Evolution of patent filings, Visual arts sub-sector**

Source: PATSTAT, calculations: IPIL

Visual arts include patenting activities related to photography. This sub-sector represents 5% of all patented inventions (7 170 patents) in the CCIs from 2006-2017 and it ranks in 5<sup>th</sup> place.

The development in this sector is characterised by a decrease in patented inventions from 2006 to 2013, followed by a near stabilisation of patenting activity since then.

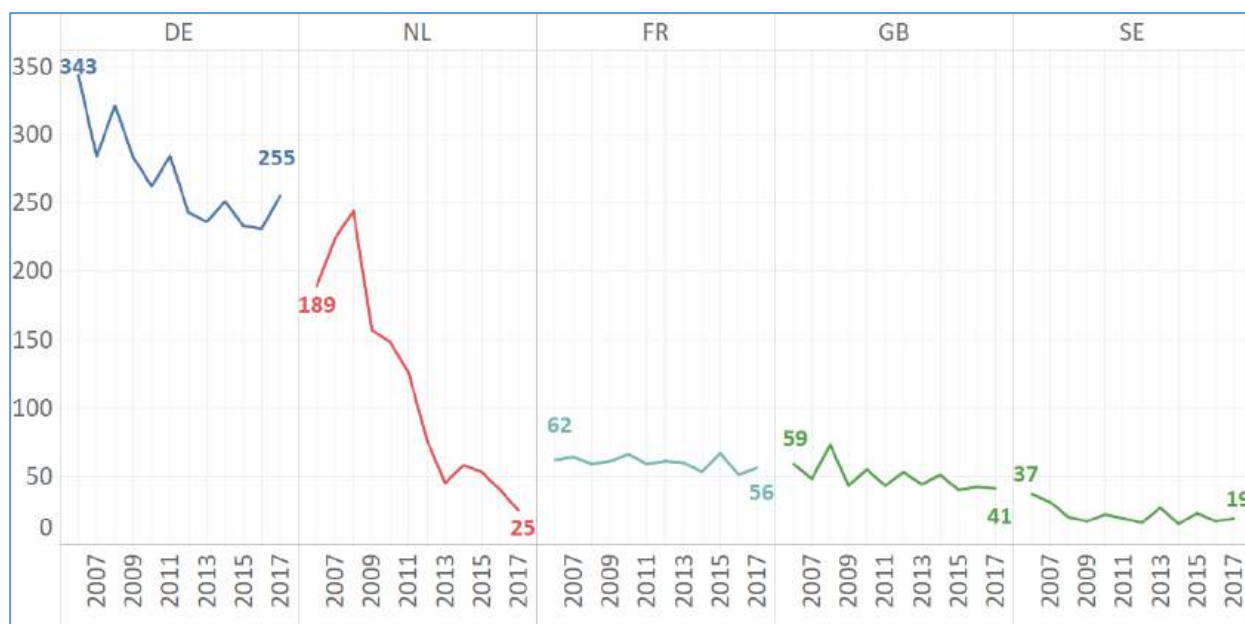


**Figure 39: Number of patents by country, Visual arts sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

Germany is by far the most active country in terms of patented inventions in this sub-sector, with 3 223 patent families representing 45.0% of all inventions in this sector. The position of Germany and the Netherlands actually reflects the fact that the two main applicants originate from these countries. With 99.6% of the innovations over the period, almost all the innovations within this sub-sector are in the hands of the top 10 innovator countries. It should be noted that five FLIP countries have no patenting activities based on the criteria used in the study.<sup>27</sup>

<sup>27</sup> No patent records have been found for Albania, Armenia, Bosnia and Herzegovina, Georgia and Montenegro for the IPC codes relevant to this sub-sector.



**Figure 40: Evolution of patent filings, Visual arts sub-sector, top 5 countries**

Source: PATSTAT, calculations: IPIL

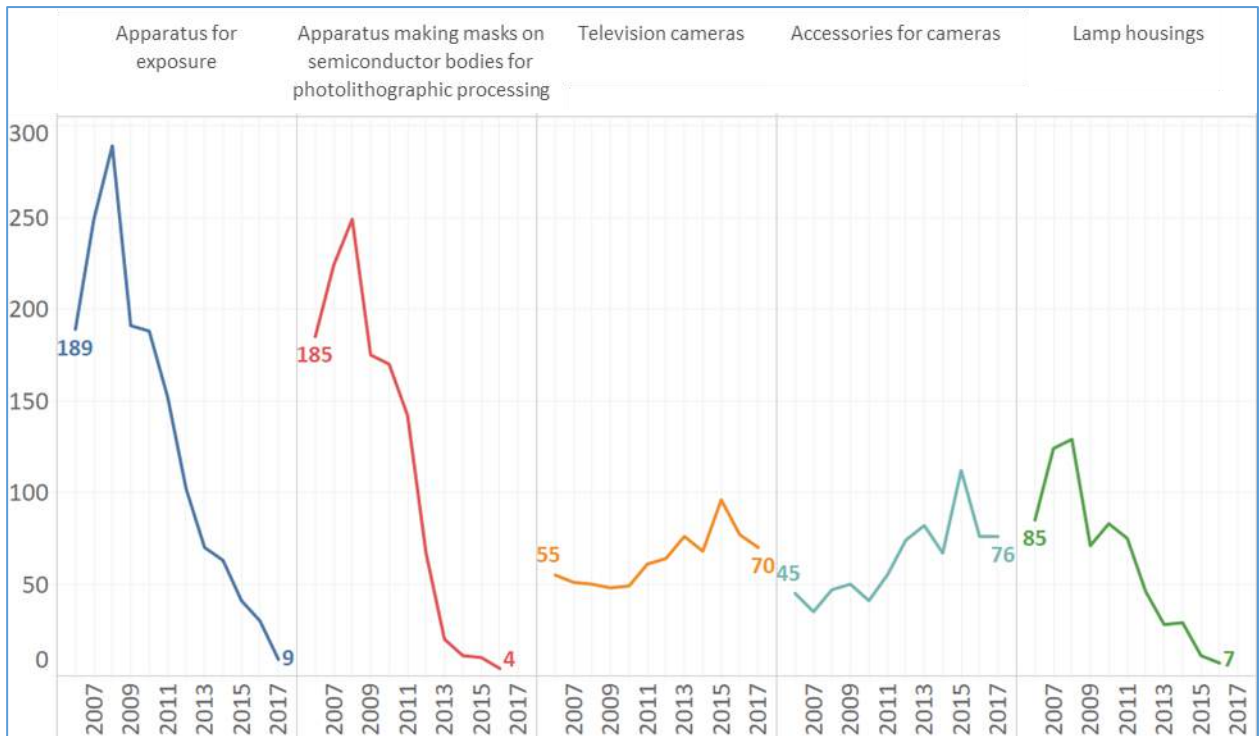
The number of inventions patented in Germany and in the Netherlands dropped during the previous years, contributing to the global downward trend in the sub-sector. The other countries in the top 5 are globally stable over the period.

**Table 11: Patented technologies, Visual arts sub-sector, top 5, 2006-2017**

Technologies	Number of patents	%
Apparatus for exposure	1 573	21.9
Making masks on semiconductor bodies for photolithographic processing	1 257	17.5
Television cameras	764	10.7
Accessories for cameras	760	10.6
Lamp housings	688	9.6

Apparatus for exposure and accessories or devices for cameras, and TV cameras represent the main groups of patented innovations in the field, as well as a quite distinct area related to photolithography on semiconductors.

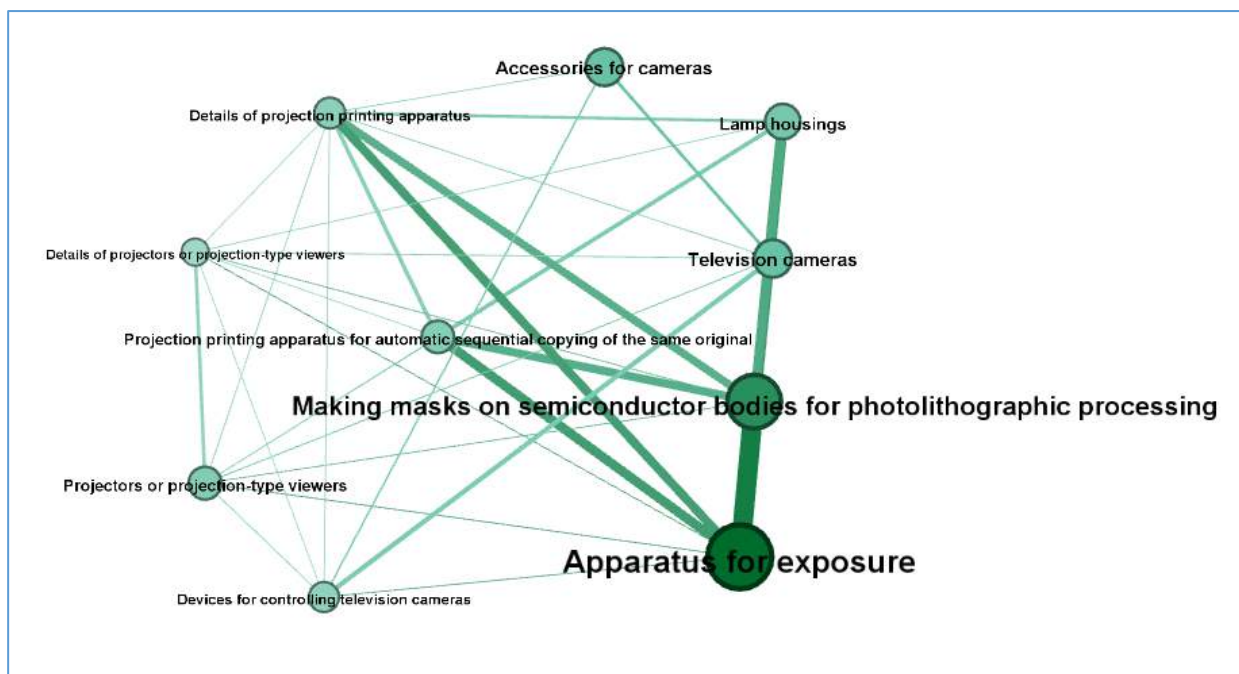




**Figure 41: Evolution of top 5 patented technologies, Visual arts sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

A more detailed analysis of the evolution of patented innovations shows that television cameras and the accessories for cameras are increasingly patented, particularly since 2011. On the other hand, the other main technological areas decreased in significance during the period under review.



**Figure 42: Relationship diagram, top 10 technologies, Visual arts sub-sector, 2006-2017<sup>28</sup>**  
 (frequency range 389 – 1 573)

From the above figure, we clearly see that the inventions related to exposure and to photolithography on semiconductors represent the main technological areas of the period analysed. As for cameras, the main sectors are camera accessories and control.

The main innovators of the sub-sector are involved in photolithography for semiconductors, in photography and TV systems, with the following top 10 applicants:

Applicant	Number of patents
ASML	1 079
ZEISS CARL	569
BOSCH SIEMENS	325
OSRAM	202
PHILIPS	137
NOKIA	132
THOMSON	83
FRAUNHOFER GES FORSCHUNG	79
SONY	76
LOOPSTRA ERIK	62

<sup>28</sup> The intensity of the colour in the circle as well as the font sizes are representative of the frequencies of the technologies in our set of patent applications. The thickness of the links represents relationship intensity (frequency).

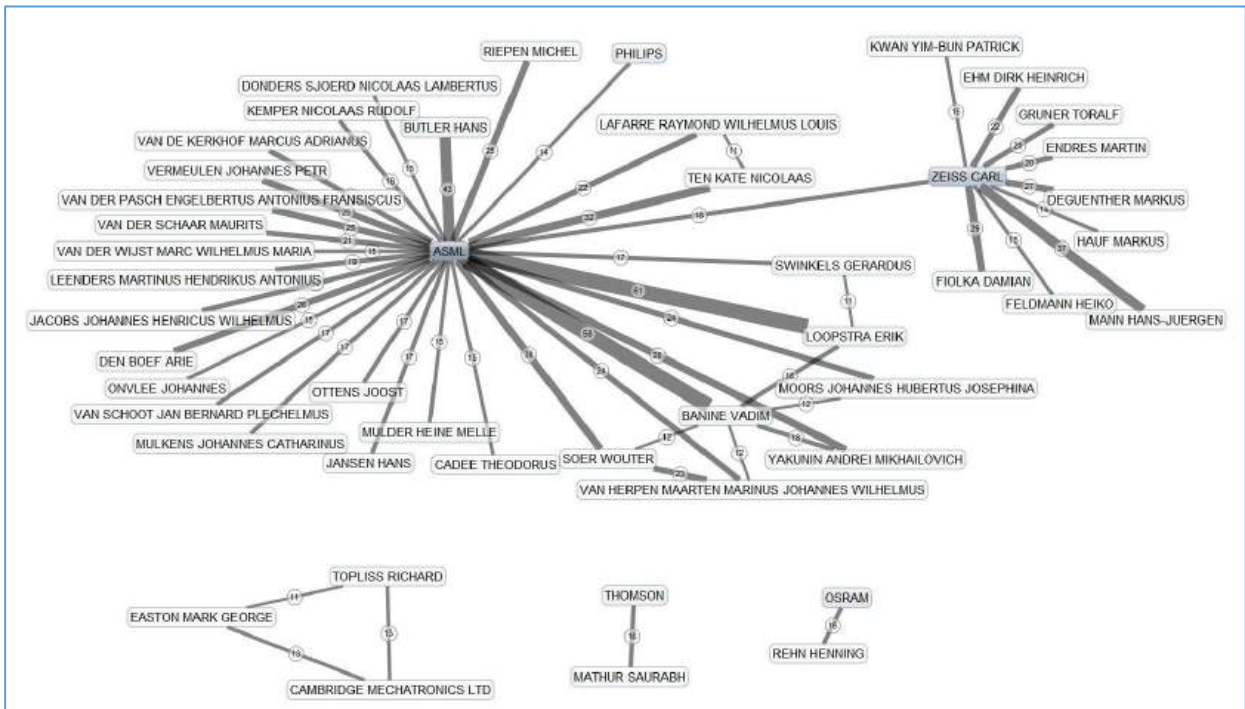


Figure 43: Collaboration diagram, applicants in the Visual arts sub-sector, 2006-2017<sup>29</sup>  
(assignee frequency from 15, pairs frequency from 11)

In this sub-sector, there is a network of relatively intense and numerous relationships between the main actors and their inventors. In this context, it should be noted that the two main applicants have collaborated on patented innovations (18) during the period under study.

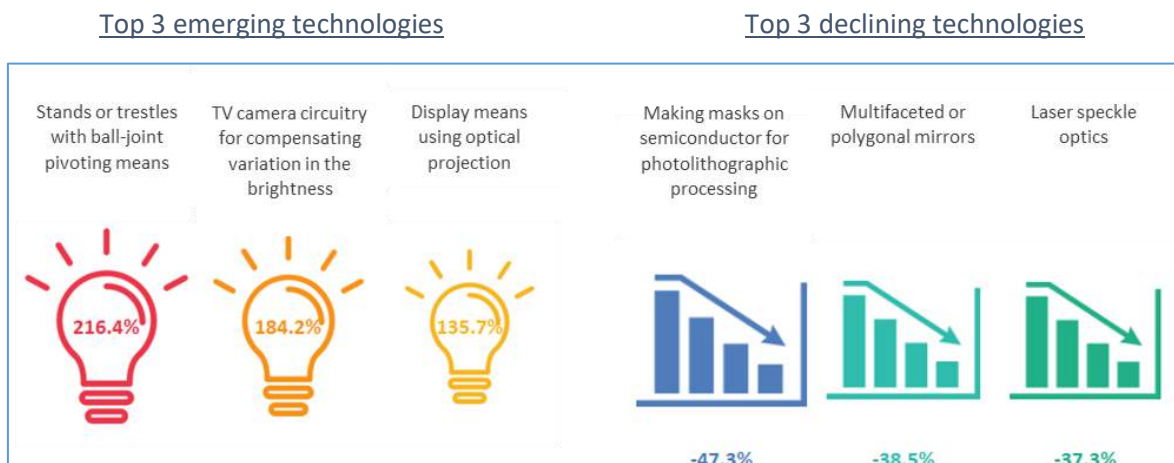


Figure 44: Top 3 emerging and declining technologies, Visual arts sub-sector, 2012-2016<sup>30</sup>

<sup>29</sup> The thickness of the links between applicants are representatives of their intensity. Frequency is noted on each link.

<sup>30</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

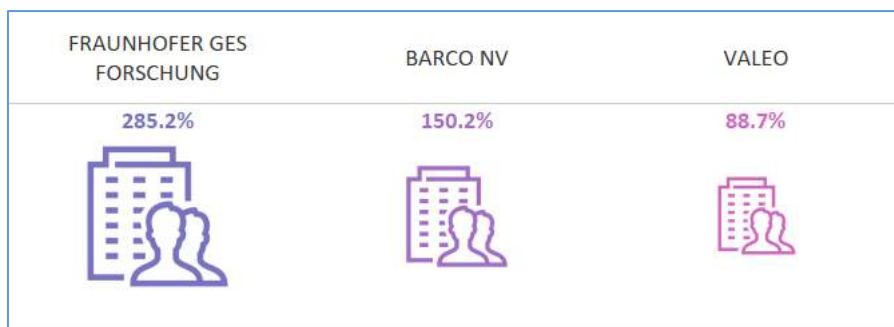


Figure 45: Top 3 most dynamic applicants, Visual arts sub-sector, 2012-2016<sup>31</sup>

### Summary

The patenting activity of the Visual arts sub-sector, which ranks 5<sup>th</sup>, has followed a downward trend since 2006. Germany is by far the leader in patenting in this sub-sector.

A detailed analysis shows that exposure technologies, linked to projection and printing apparatus, as well as photolithographic processes for the semiconductor business are the main contributors. However, such technologies have experienced a radical drop, to the benefit of technologies related to cameras and optical devices and the related actors.

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<sup>31</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

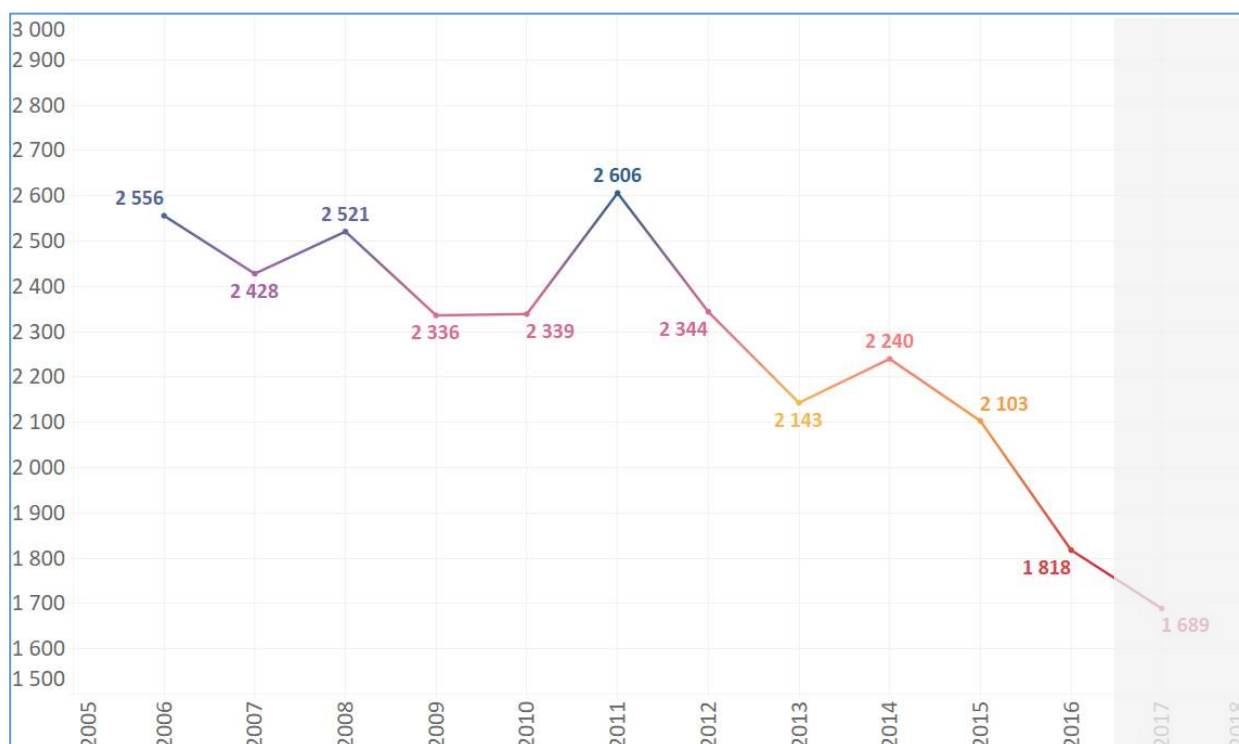
### 3.5. Media and content industries

This sub-sector is in fact a mosaic of several sub-sectors:

- Radio, TV, Video & film (RTVF);
- Music;
- Books & press; and
- Software & games.

Each of these is presented in detail in order to more accurately describe the patenting activity within each.

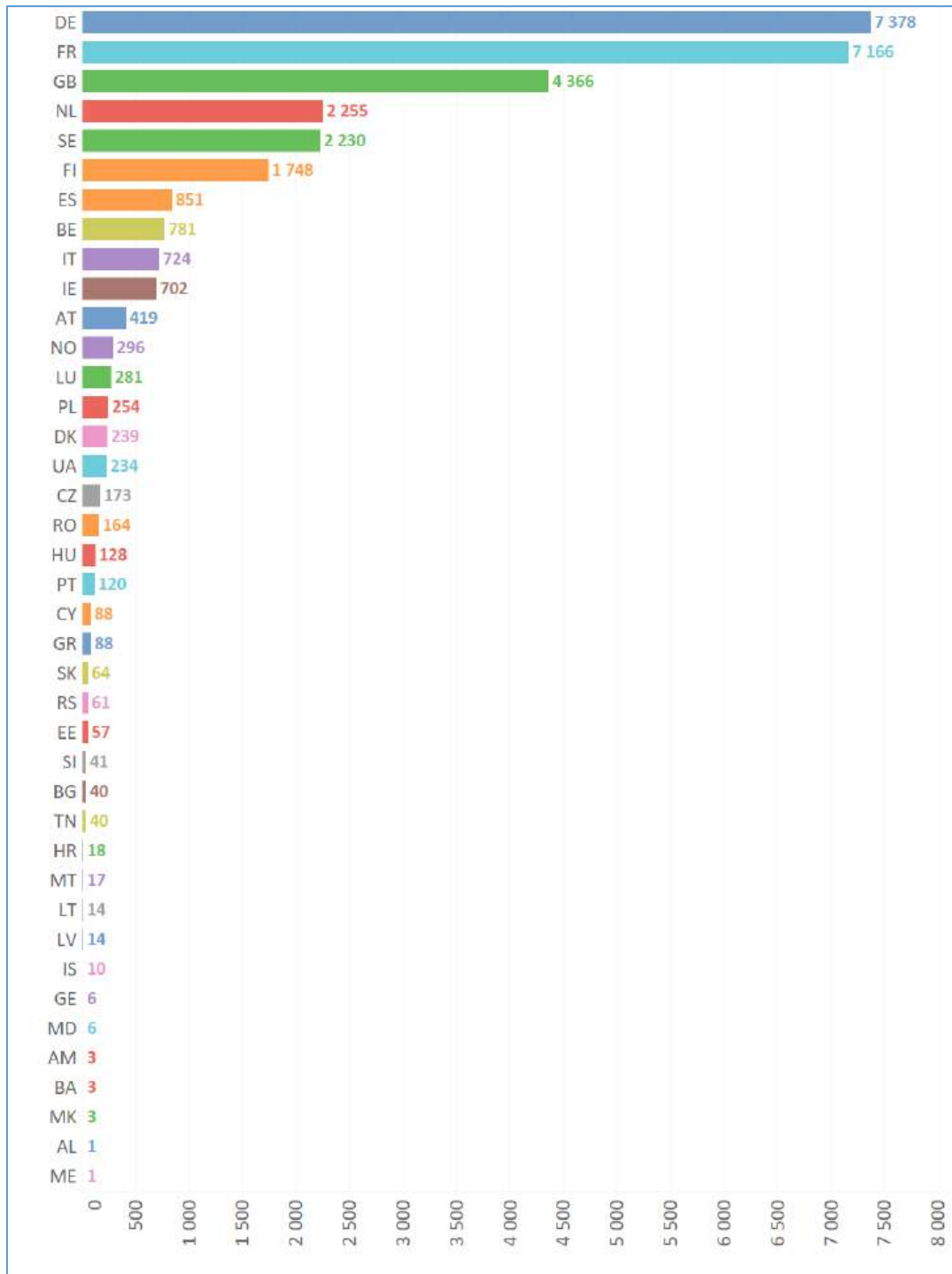
#### a. Radio, TV, Video & film (RTVF)



**Figure 46: Evolution of patent filings, RTVF sub-sector**

Source: PATSTAT, calculations: IPIL

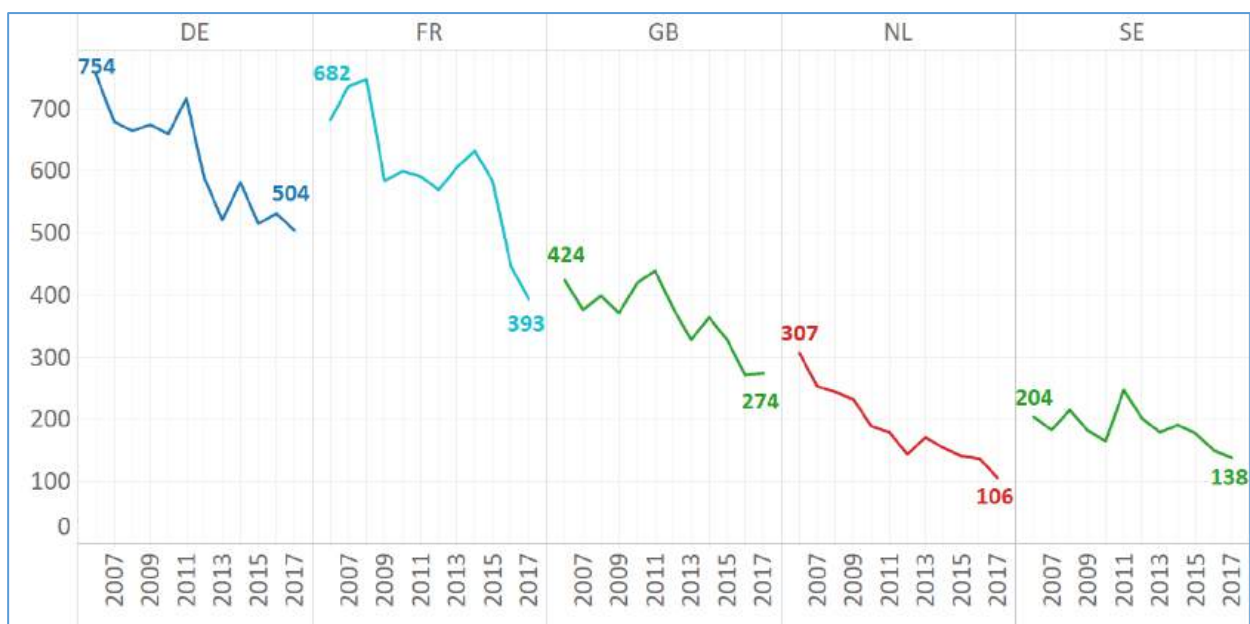
The Radio, TV, Video & film sub-sector represents 18.9% of all patents (27 086) over the reporting period and it is on the third step of the podium. The total number of inventions patented was stable from 2006 to 2012, but then took a downward path. The magnitude of the decline observed over the last few years must be put into perspective, however, as it is a statistical artefact related to the delayed recording of data in some jurisdictions.



**Figure 47: Number of patents by country, RTVF sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

Germany is the top applicant country in this sub-sector with 27.2% of all inventions patented, followed by France (26.5%). These countries represent more than half of the patents (53.7%) in this sub-sector.



**Figure 48: Evolution of patent filings, RTVF sub-sector, top 5 countries**

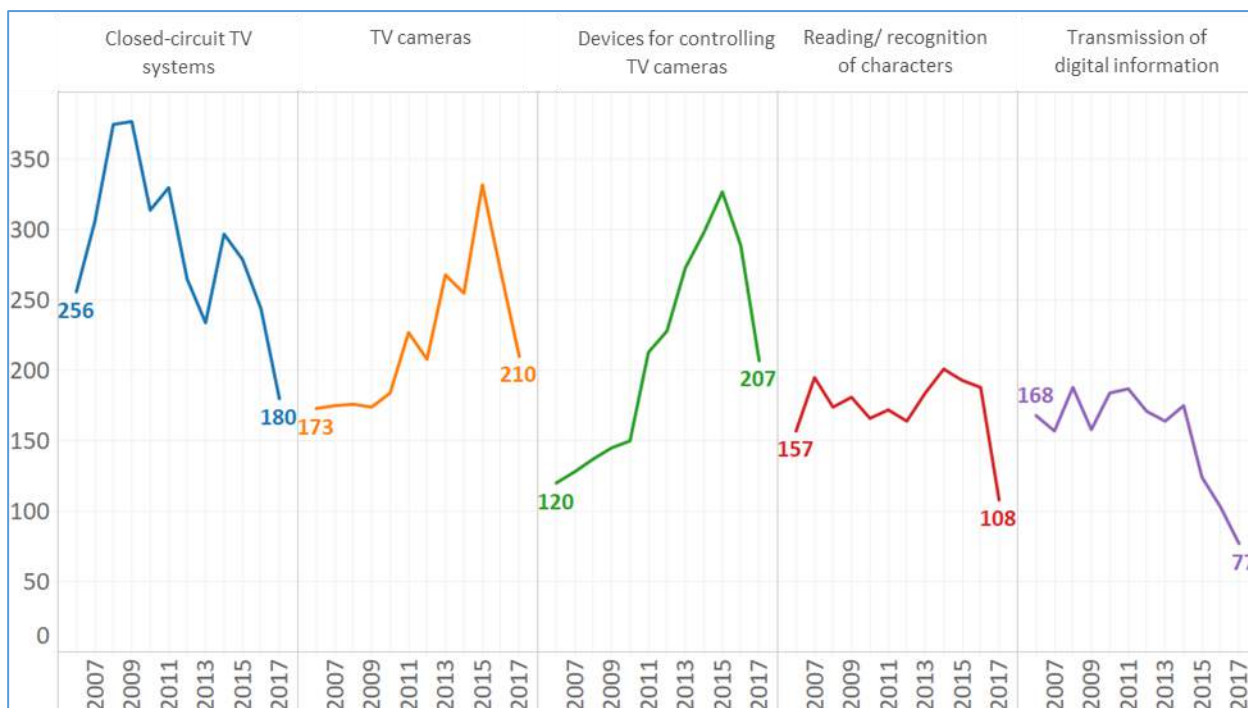
Source: PATSTAT, calculations: IPIL

All top 5 countries contributed to the downward trend of the sub-sector which began in 2012, with Germany and France, the two leaders, experiencing the greatest decline during the past years.

**Table 12: Patented technologies, RTVF sub-sector, top 5, 2006-2017**

Technologies	Number of patents	%
Closed-circuit TV systems	3 456	12.8
TV cameras	2 651	9.8
Devices for controlling TV cameras	2 513	9.3
Methods or arrangements for reading or recognising printed or written characters or patterns	2 082	7.7
Arrangements, apparatus, circuits or systems for transmission of digital information	1 851	6.8

The area of TV (cameras and systems) is predominant in this sub-sector. We can however note a quite diffuse spread of the technological areas covered within this sub-sector, without any predominant technologies.



**Figure 49: Evolution of top 5 patented technologies, RTVF sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

A more detailed analysis shows that the most important group of patented technologies has followed a significant downward trend since 2009, contributing to the global decreasing evolution in this sub-sector. The second and third subgroups related to television cameras substantially increased their patent activity over the first nine years under review and then recorded a decrease, but this last trend is certainly caused by delayed recording of patent data in some jurisdictions.

The last two areas are quite stable over the period.

A deeper analysis shows the interactions between the different elements of the patented technologies. The innovations in the sub-sectors are mainly related to the quality of the image, using either cameras, new processes (like digital signals) and at a second level to the pay-TV systems (see the graph below).



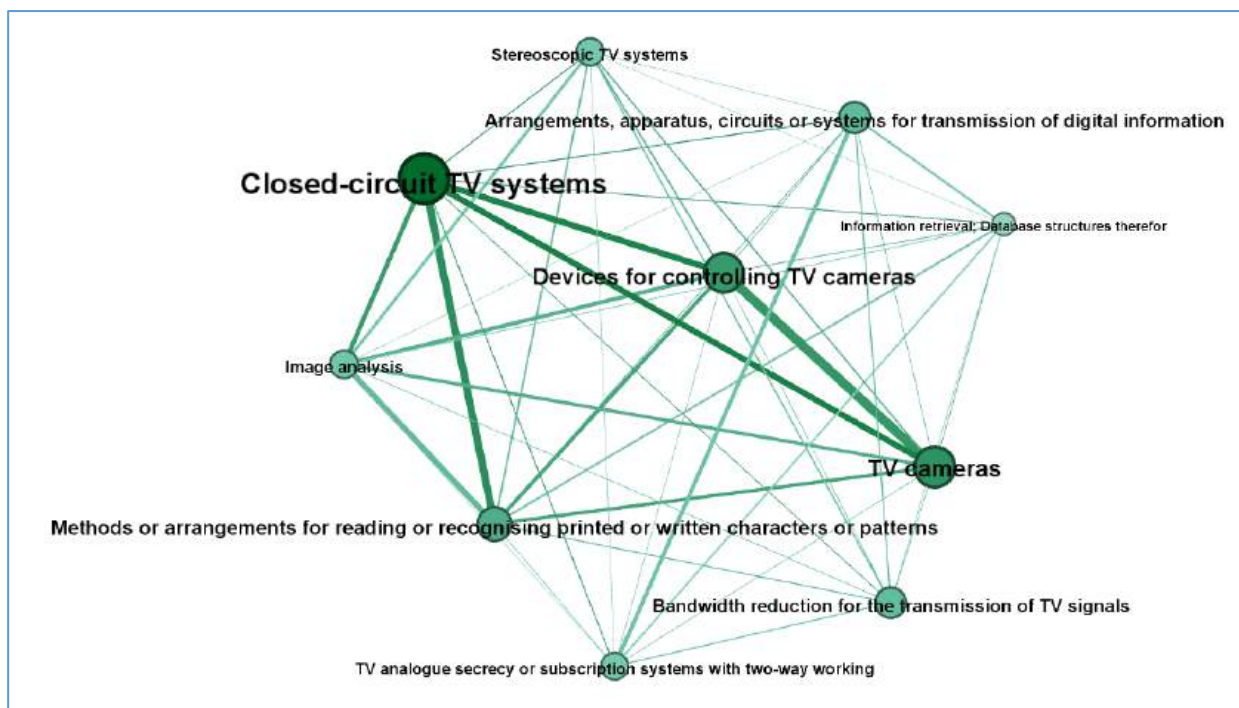


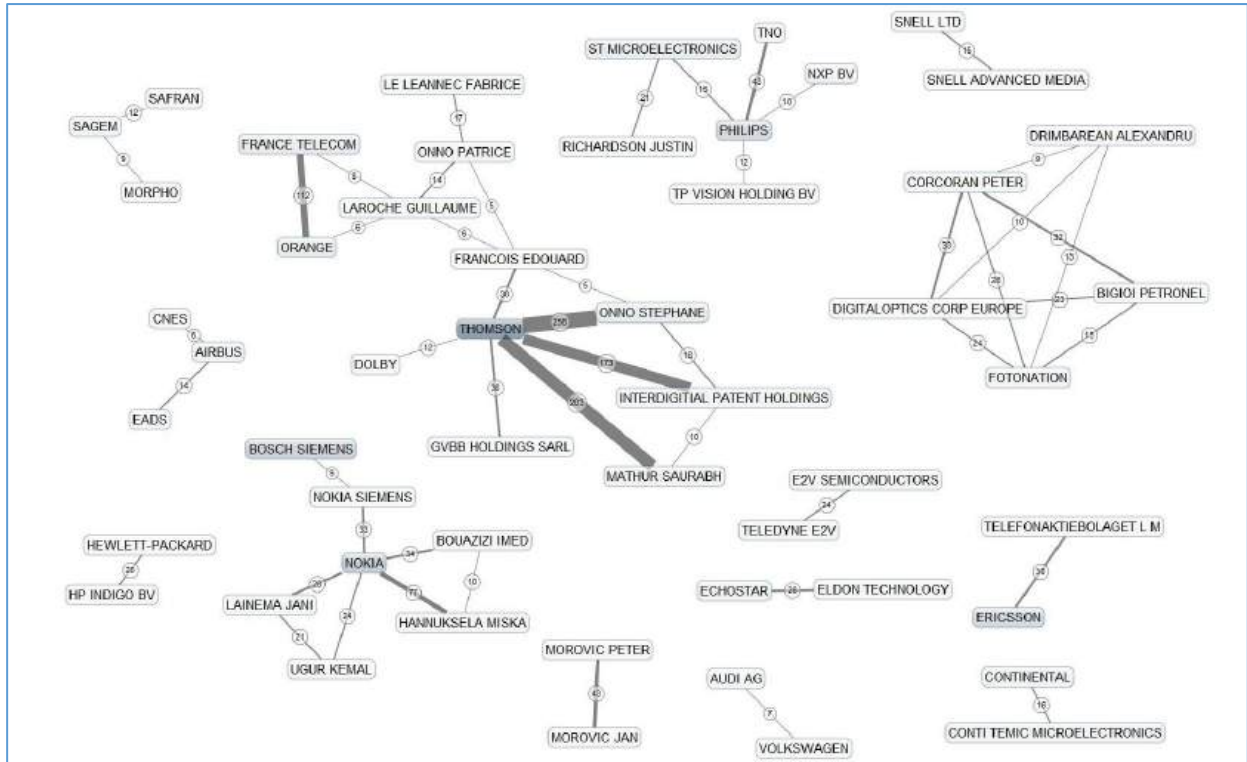
Figure 50: Relationship diagram, top 10 technologies, RTVF sub-sector, 2006-2017<sup>32</sup>  
(frequency range 1 127 – 3 456)

The main actors in the field are here again represented by important companies, from the TV and the telecommunications sectors.

Top 10 applicants:

Applicant	Number of patents
THOMSON	2 621
NOKIA	1 257
BOSCH SIEMENS	1 068
PHILIPS	939
ERICSSON	936
ALCATEL	628
SONY	585
FRAUNHOFER GESELLSCHAFT	361
ST MICROELECTRONICS	354
FRANCE TELECOM	303

<sup>32</sup> The intensity of the colour in the circle as well as the font sizes are representative of the frequencies of the technologies in our set of patent applications. The thickness of the links represents relationship intensity (frequency).



**Figure 51 Collaboration diagram, applicants in the RTVF sub-sector, 2006-2017<sup>33</sup>**  
 (assignee frequency from 25, pairs frequency from 5)

The main applicants show very few interactions between them. We can indeed clearly see that companies are developing their technologies almost independently from each other, with the following main groups:

- Thomson, with indirect links to Orange and France Telecom;
- Nokia, with Bosch Siemens;
- Sony Ericsson;
- Philips, working closely with ST Microelectronics;
- Digitaloptics and Fotonation (working respectively in the areas of camera and computational imaging); and
- Morovic brothers (involved in 2D and 3D printing).

<sup>33</sup> The thickness of the links between applicants are representatives of their intensity. Frequency is noted on each link.

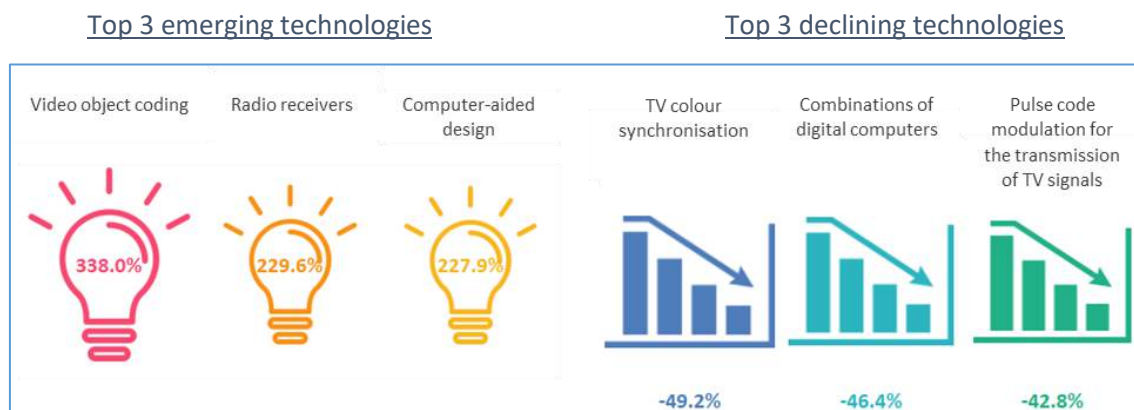


Figure 52: Top 3 emerging and declining technologies, RTVF sub-sector, 2012-2016<sup>34</sup>

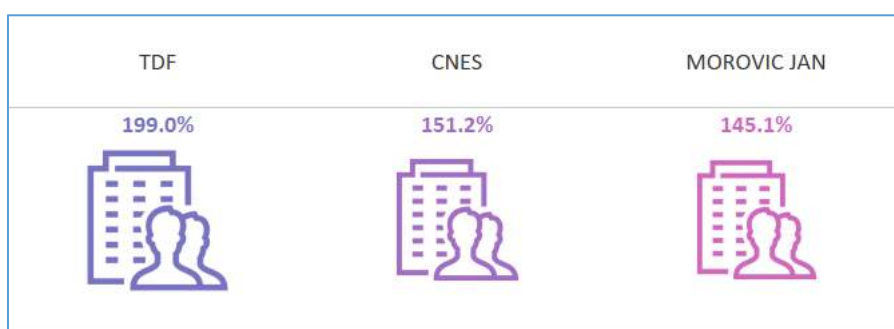


Figure 53: Top 3 most dynamic applicants, RTVF sub-sector, 2012-2016<sup>35</sup>

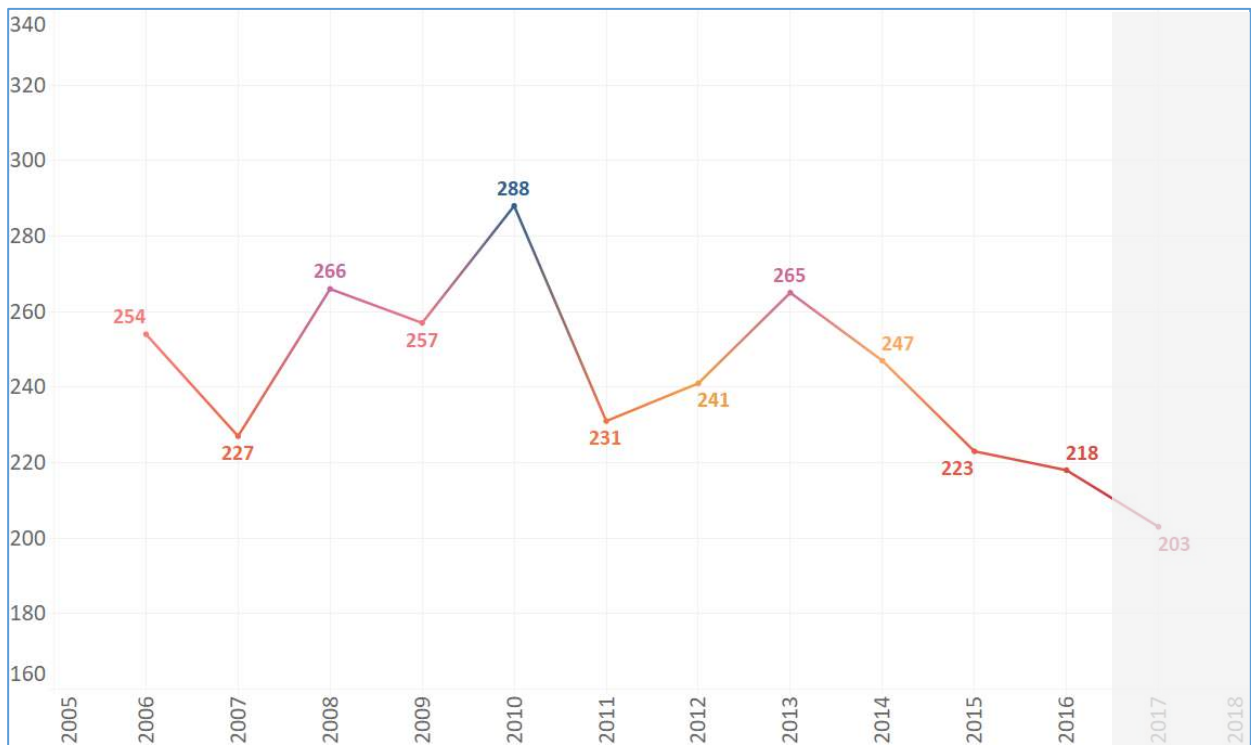
## Summary

The patenting activity of the RTVF sub-sector, which ranks in 3<sup>rd</sup> place, has been decreasing after its peak in 2011 except for a slight increase in 2014. Germany and France are the leaders in patenting in this sub-sector, followed by Great Britain.

The main technological area concerned in this sub-sector is related to television and more precisely to very specific areas like television cameras, devices for controlling television cameras, e.g. remote control etc. The trend seems to go in the direction of the selective distribution and reception of content as well as the control of devices (like cameras) to provide increased quality products. The actors identified tend to confirm this trend.

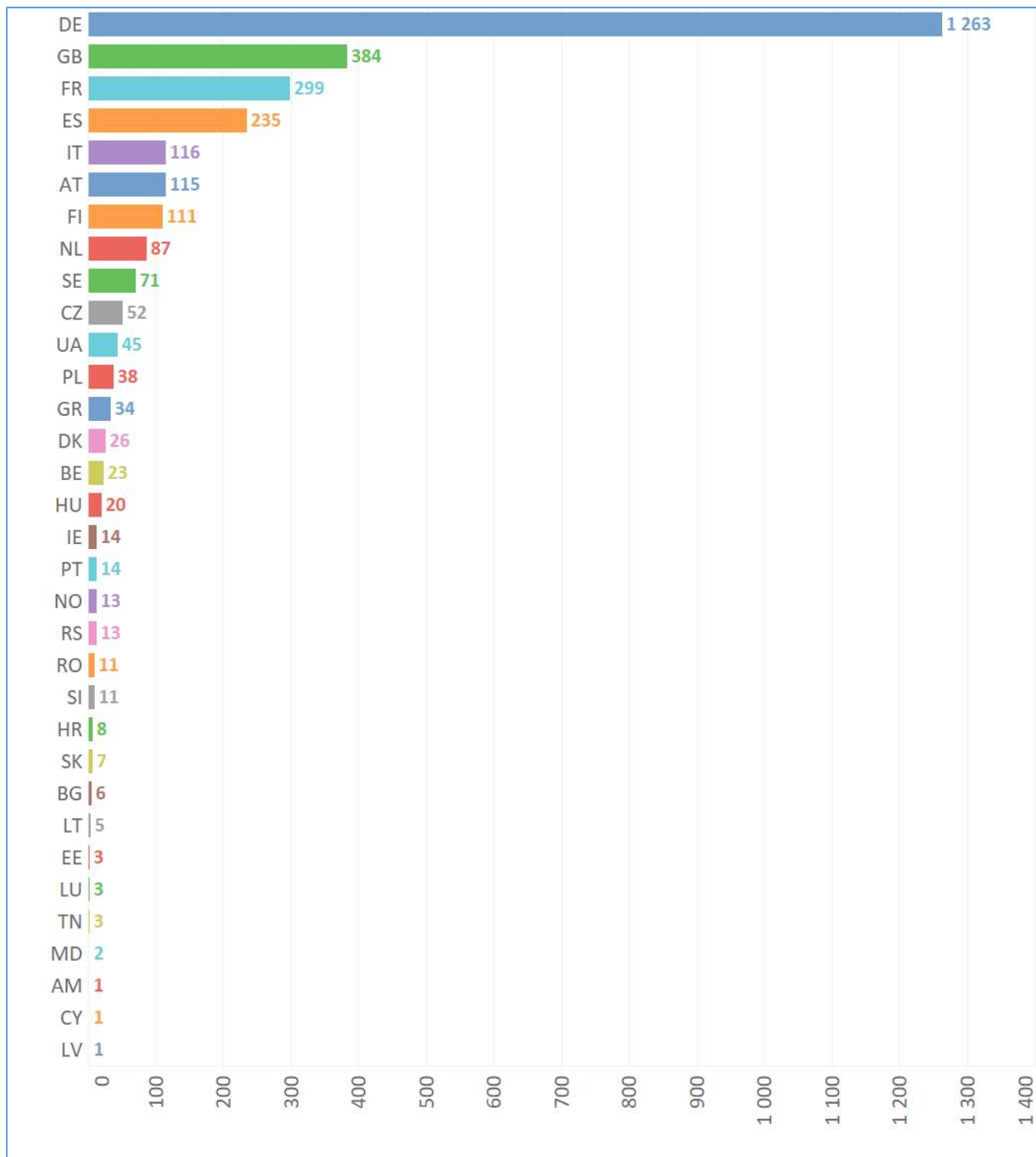
<sup>34</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

<sup>35</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

**b. Music****Figure 54: Evolution of patent filings, Music sub-sector**

Source: PATSTAT, calculations: IPIL

This sub-sector represents 2% of all patented inventions (2 919 inventions) in the CCIs from 2006-2017 and it ranks 9<sup>th</sup>. The evolution in this sector is almost stable at around 250 patented inventions per year from 2006 to 2015. The downward trend observed in recent years is linked to a delay in the recording of data in some jurisdictions.



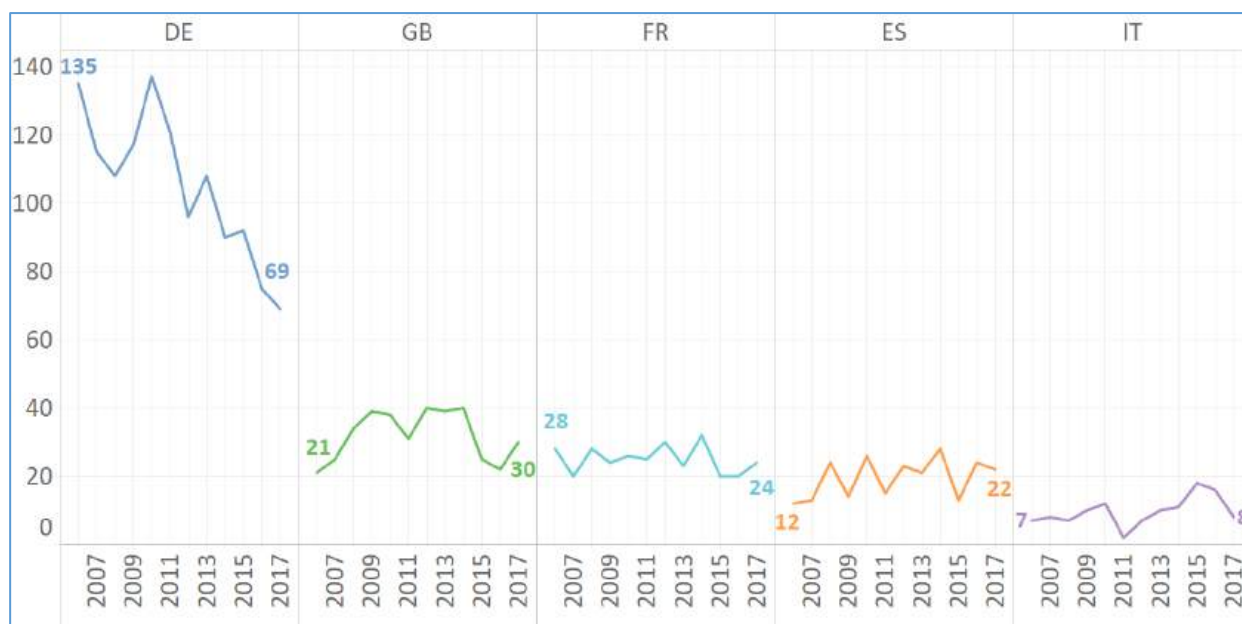
**Figure 55: Number of patents by country, Music sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

Germany is by far the most active country in terms of patented inventions in the Music sub-sector, with 1 263 patents. It is the source of 43.3% of all inventions in this sub-sector. The top 10 countries in this sub-sector represent 93.7% of all its inventions.

It should be noted that seven FLIP countries have no patenting activity in this sub-sector.<sup>36</sup>

<sup>36</sup> Albania, Bosnia and Herzegovina, Georgia, Iceland, Malta, Montenegro and Republic of North Macedonia, according to the IPC codes identified and used to gather the data set analysed.



**Figure 56: Evolution of patent filings, Music sub-sector, top 5 countries**

Source: PATSTAT, calculations: IPIL

The number of inventions patented in Germany dropped significantly – by 48.9% – over the period, fiercely contributing to the global downward trend in the sub-sector. The other countries of the top 5 are globally stable over the period but the very limited number of inventions patented does not lead us to draw a conclusive stabilisation trend.

**Table 13: Patented technologies, Music sub-sector, top 5, 2006-2017**

Technologies	Number of patents	%
Details of electrophonic musical instruments	398	13.6
Drums; Tambourines with drumheads	257	8.8
Percussion musical instruments	228	7.8
Supports for musical instruments	215	7.4
Details of, or accessories for stringed musical instruments	192	6.6

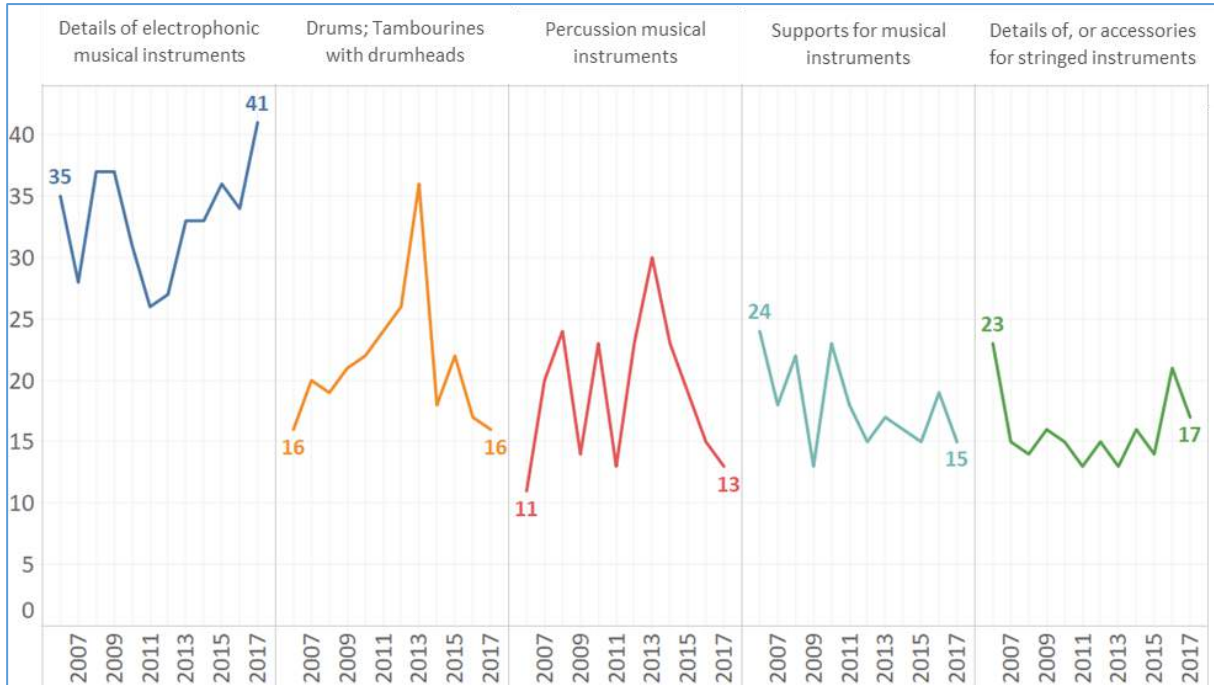


Figure 57: Evolution of top 5 patented technologies, Music sub-sector, 2006-2017

Source: PATSTAT, calculations: IPIL

A more detailed analysis reveals that all main patented technologies show very erratic fluctuations which do not allow a clear trend to be detected over the 12 years under review.

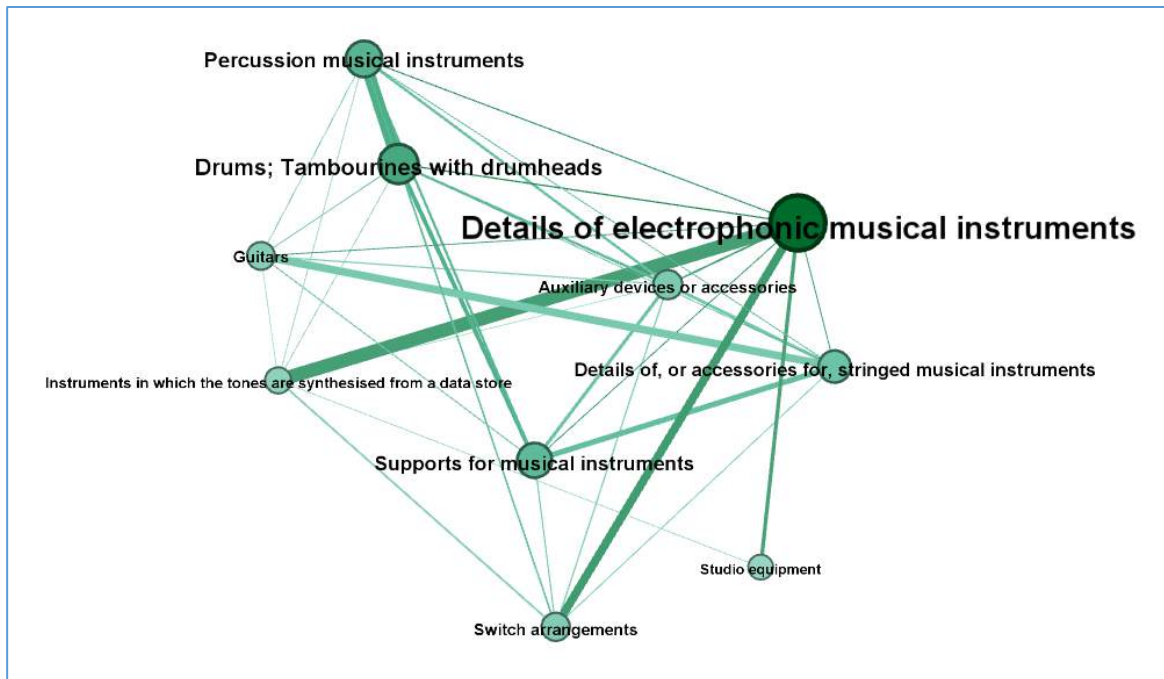


Figure 58: Relationship diagram, top 10 technologies, Music sub-sector, 2006-2017<sup>37</sup>

(frequency range 106 – 398)

<sup>37</sup> The intensity of the colour in the circle as well as the font sizes are representative of the frequencies of the technologies in our set of patent applications. The thickness of the links represents relationship intensity (frequency).

The detailed analysis reveals that apart from the electrophonic musical instruments (which are clearly relevant to patenting), percussion musical instruments were the most patented musical instruments from 2006-2017.

The analysis of the main applicants (frequency range 15-81) shows three main types of actors: companies involved in the “traditional” instruments business, those from the IT field (treatment of digital data), and research laboratories.

Top 10 patent-active applicants in the Music industry are:

Applicant	Number of patents
NOKIA	42
SONY	24
AMEND UDO	19
ROLAND MEINL MUSIKINSTRUMENTE	19
PHILIPS	18
FRAUNHOFER GES FORSCHUNG	17
THOMASTIK INFELD GMBH	15
DOLBY	14
PRIEL GERHARD	13
CENTRE NAT RECH SCIENT	13





Figure 59: Collaboration diagram, applicants in the Music sub-sector, 2006-2017<sup>38</sup>  
(assignee frequency from 3, pairs frequency from 3)

We can note a quite important number of clusters in the industry, but they show very few collaborations between companies – perhaps because of the strong competition characteristics in this sub-sector.



Figure 60: Top 3 emerging and declining technologies, Music sub-sector, 2012-2016<sup>39</sup>

<sup>38</sup> The thickness of the links between applicants are representatives of their intensity. Frequency is noted on each link.

<sup>39</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.



Figure 61: Top 3 most dynamic applicants, Music sub-sector, 2012-2016<sup>40</sup>

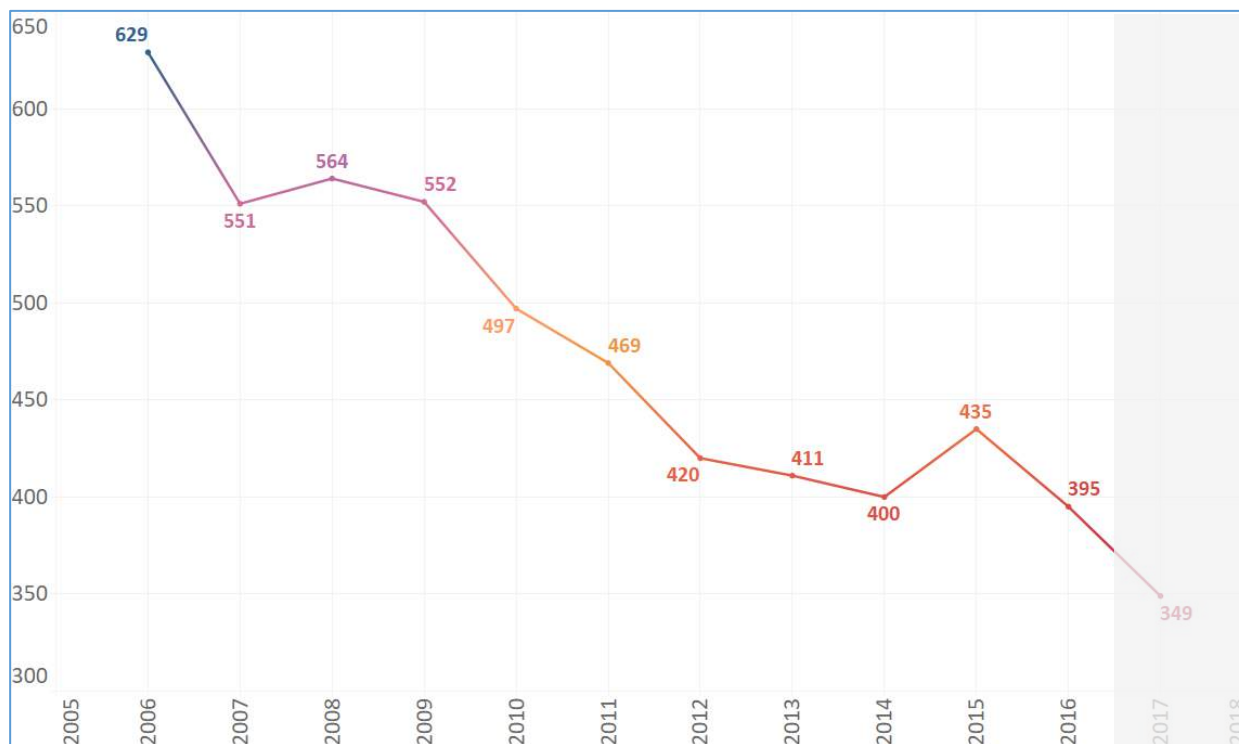
### Summary

The patenting activity of the Music sub-sector, which ranks 9<sup>th</sup>, was stable over the period. Germany is by far the leader in patenting in this sub-sector.

The detailed analysis of patented technologies shows that electrophonic and percussion musical instruments were the most patented instruments during the study period, but the small number of observations does not allow to comment on the evolution of numbers.

<sup>40</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

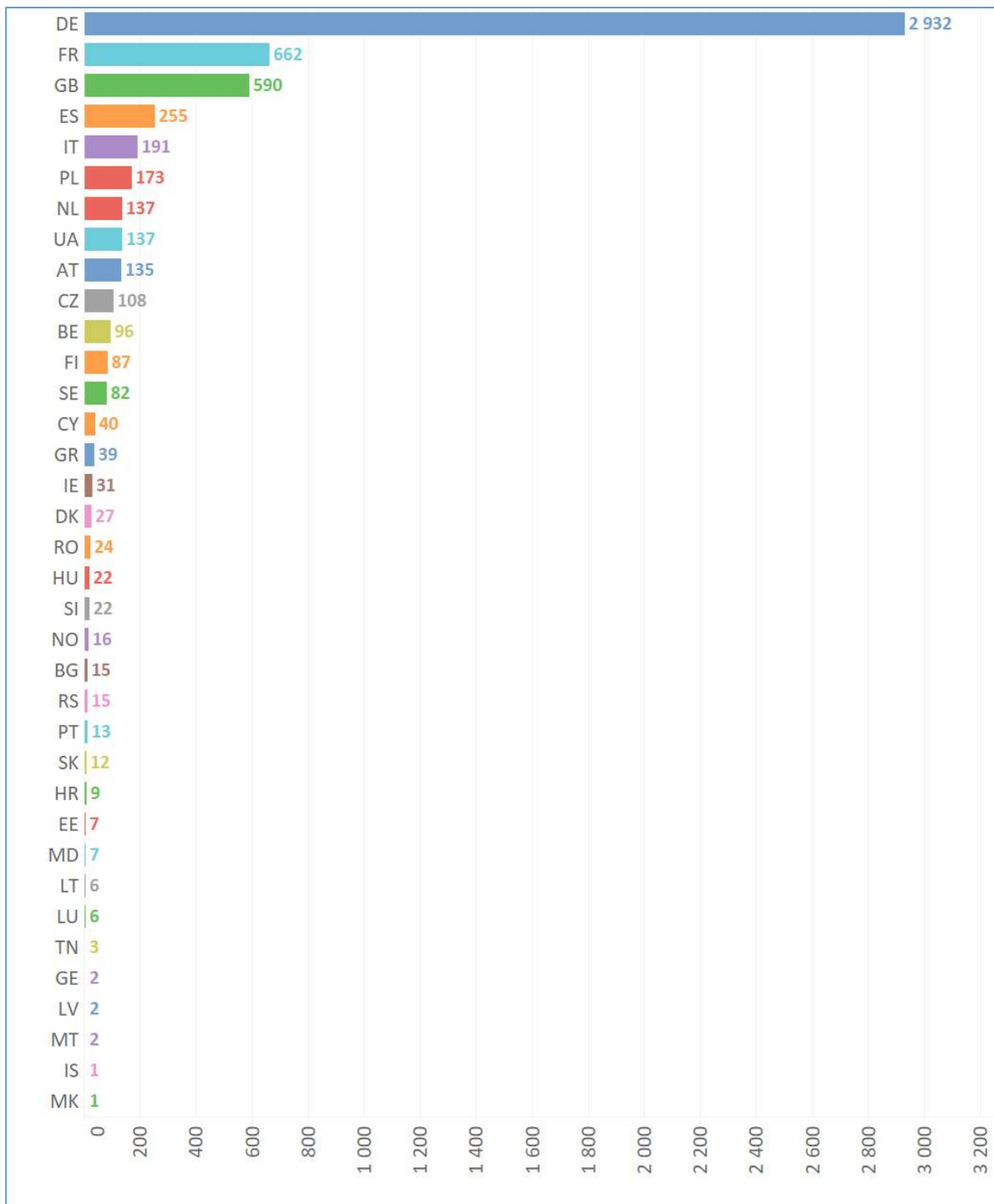
### c. Books & press



**Figure 62: Evolution of patent filings, Books & press sub-sector**

Source: PATSTAT, calculations: IPIL

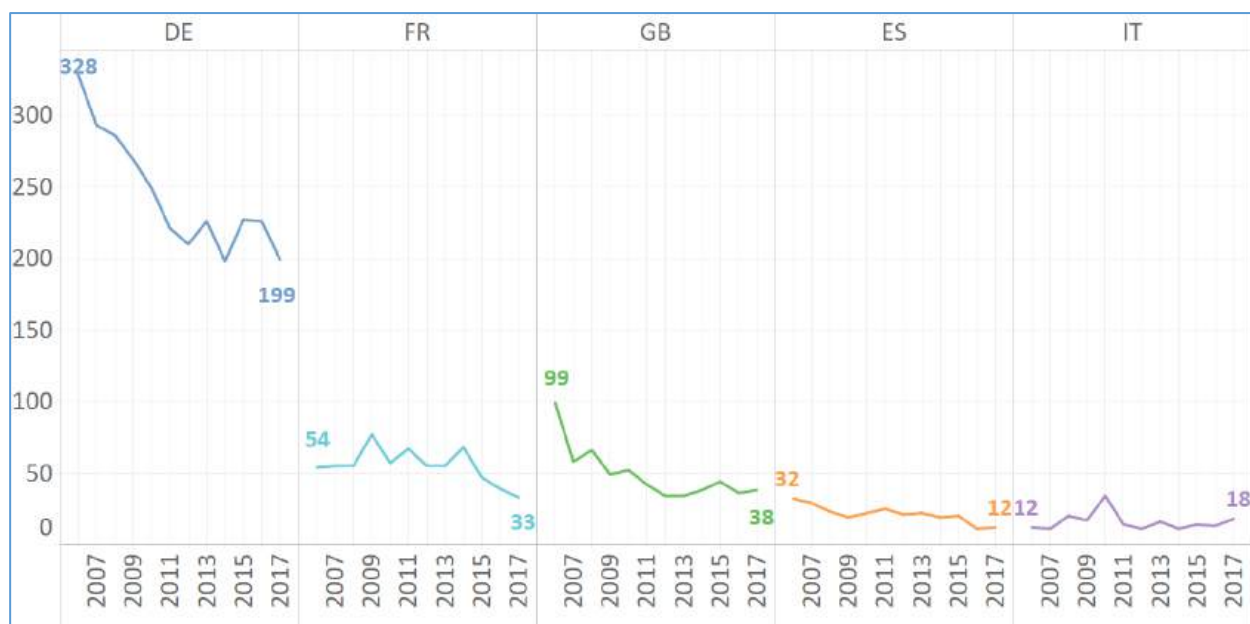
The Books & press sub-sector represents 4% (5 669) of all patented inventions in the CCI over the reporting period. It ranks 7<sup>th</sup> among all CCI sub-sectors. It has followed a considerable downward trend since 2006.



**Figure 63: Number of patents by country, Books & press sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

Germany is the leader in patenting in this sub-sector with more than half of all patents over the period (51.7%) followed by France (11.7%) and Great Britain (10.4%).



**Figure 64: Evolution of patent filings, Books & press sub-sector, top 5 countries**

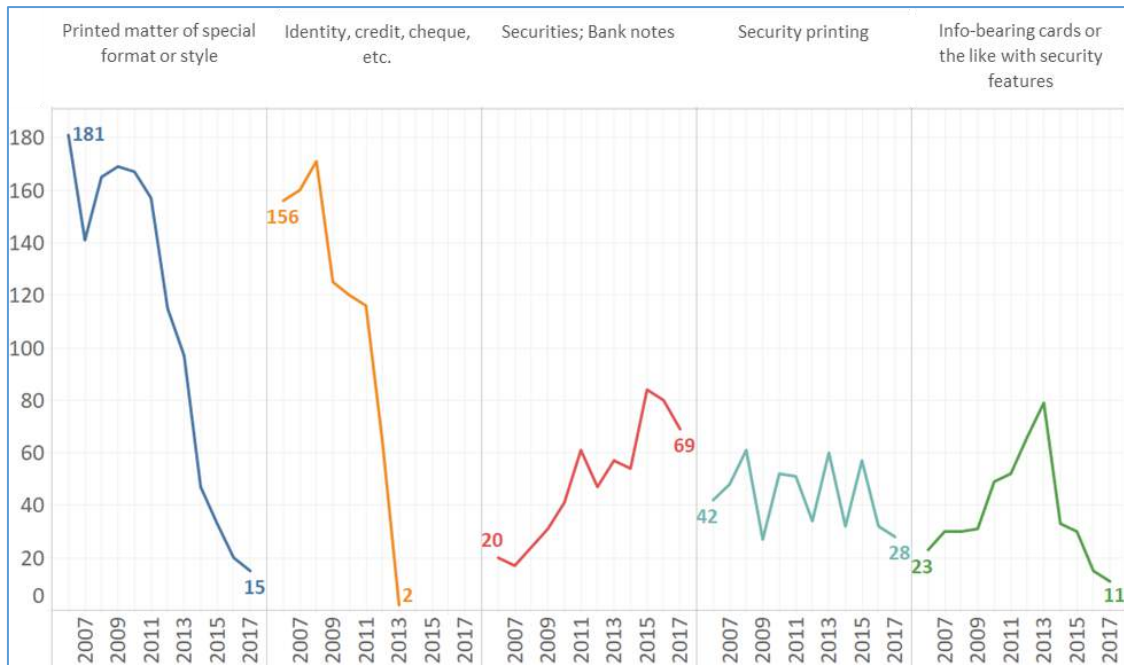
Source: PATSTAT, calculations: IPIL

Germany and Great Britain experienced a decline of their patenting activity in this sub-sector, which accounts for the decreasing numbers explained in the previous chart. The other countries in the top 5 have seen a stable patenting activity.

**Table 14: Patented technologies, Books & press sub-sector, top 5, 2006-2017**

Technologies	Number of patents	%
Printed matter of special format or style	1 306	23.0
Identity, credit, cheque or like information-bearing cards	914	16.1
Securities; Bank notes	585	10.3
Security printing	524	9.2
Information-bearing cards or sheet-like structures with security features	449	7.9

The analysis of the technologies patented shows that 23% of all inventions of this sub-sector are related to printed matter of a special format or style, followed by material presenting security features (that are also found under the Design sub-sector). We have the below evolution for those technological areas:



**Figure 65: Evolution of top 5 patented technologies, Books & press sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

The above graph on the evolution of the top 5 patented technologies shows an overall decrease since 2010, with a remarkable fall in the two leading technologies. It should be noted that the fall observed in the technology related to the inventions for Identity, credit, cheque is explained by the fact that this classification element has been removed from the patent classifications codes used to analyse the sub-sector.

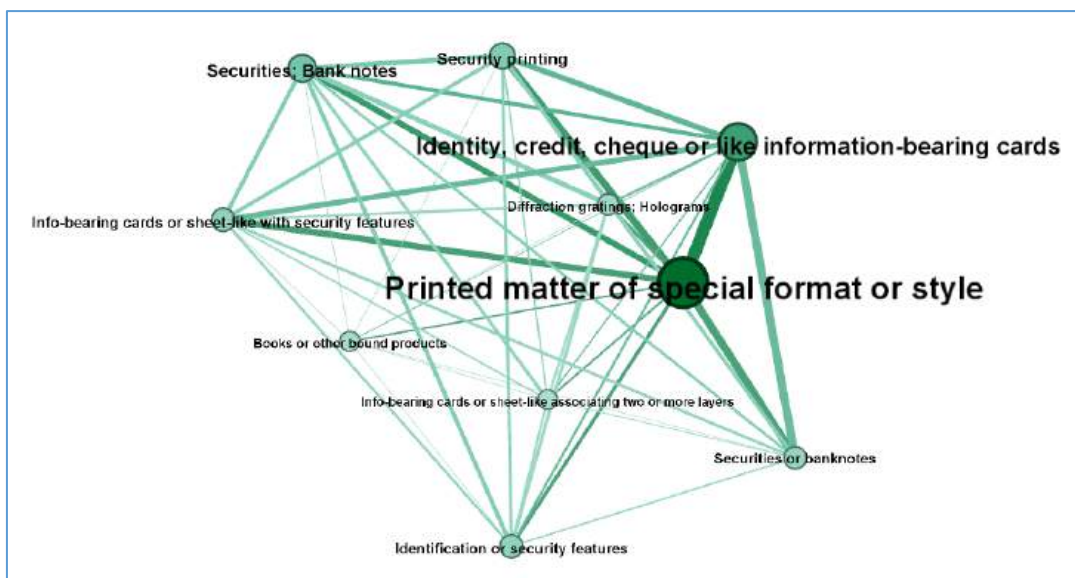


Figure 66: Relationship diagram, top 10 technologies, Books & press sub-sector, 2006-2017<sup>41</sup>  
(frequency range 300 – 1 306)

According to the above figure, security, especially applied to banking elements, is the main object of patenting in this sub-sector.

An analysis of the applicants shows the main relationships/co-operations and the main sectors involved:

- security papers (banknotes, cards, passports, etc.) and
- traditional printing industry.

The top 10 applicants in this sub-sector are:

Applicant	Number of patents
GIESECKE & DEVERIENT	1 218
BUNDESDRUCKEREI GMBH	694
RUE DE INT LTD	338
OBERTHUR	240
ARJOWIGGINS	212
SCHEYBANI TSCHANGIZ	164
KOLBUS GMBH & CO KG	140
GEMALTO	126
HEIDELBERGER DRUCKMASCH AG	122
HOLMES BRIAN WILLIAM	110

<sup>41</sup> The intensity of the colour in the circle as well as the font sizes are representative of the frequencies of the technologies in our set of patent applications. The thickness of the links represents relationship intensity (frequency).

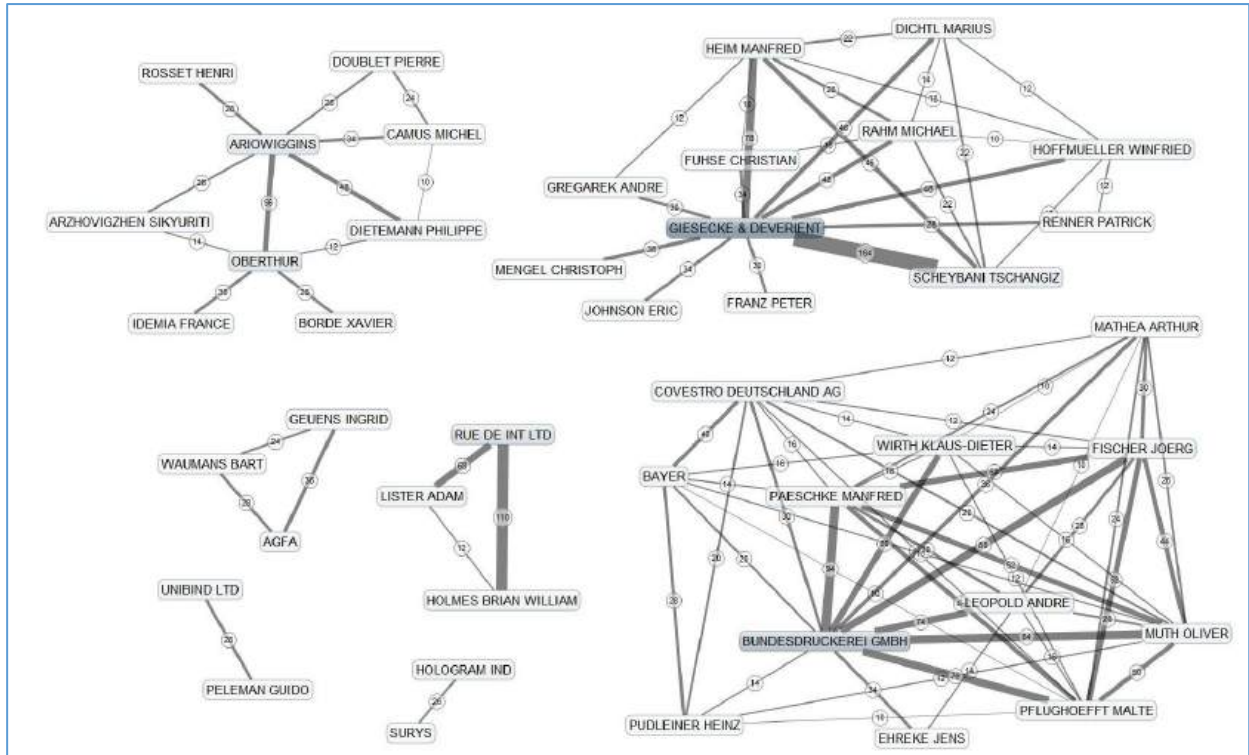


Figure 67: Collaboration diagram, applicants in the Book & press sub-sector, 2006-2017<sup>42</sup>  
(assignee frequency from 25, pairs frequency from 10)

There is little cooperation in the sub-sector, with the exception of Bundesdruckerei working with chemical companies (Bayer and Covestro), and Oberthur and Arjowiggins (printing company and a paper manufacturer, respectively).

Top 3 emerging technologies

Top 3 declining technologies



Figure 68: Top 3 emerging and declining technologies, Book & press sub-sector, 2012-2016<sup>43</sup>

<sup>42</sup> The thickness of the links between applicants are representatives of their intensity. Frequency is noted on each link.

<sup>43</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.



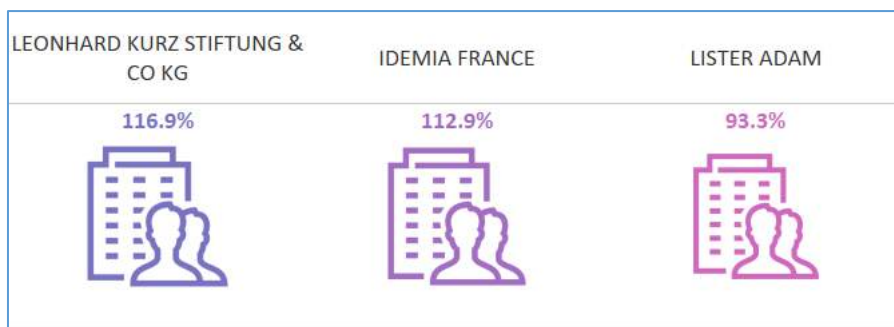


Figure 69: Top 3 most dynamic applicants, Book & press sub-sector, 2012-2016<sup>44</sup>

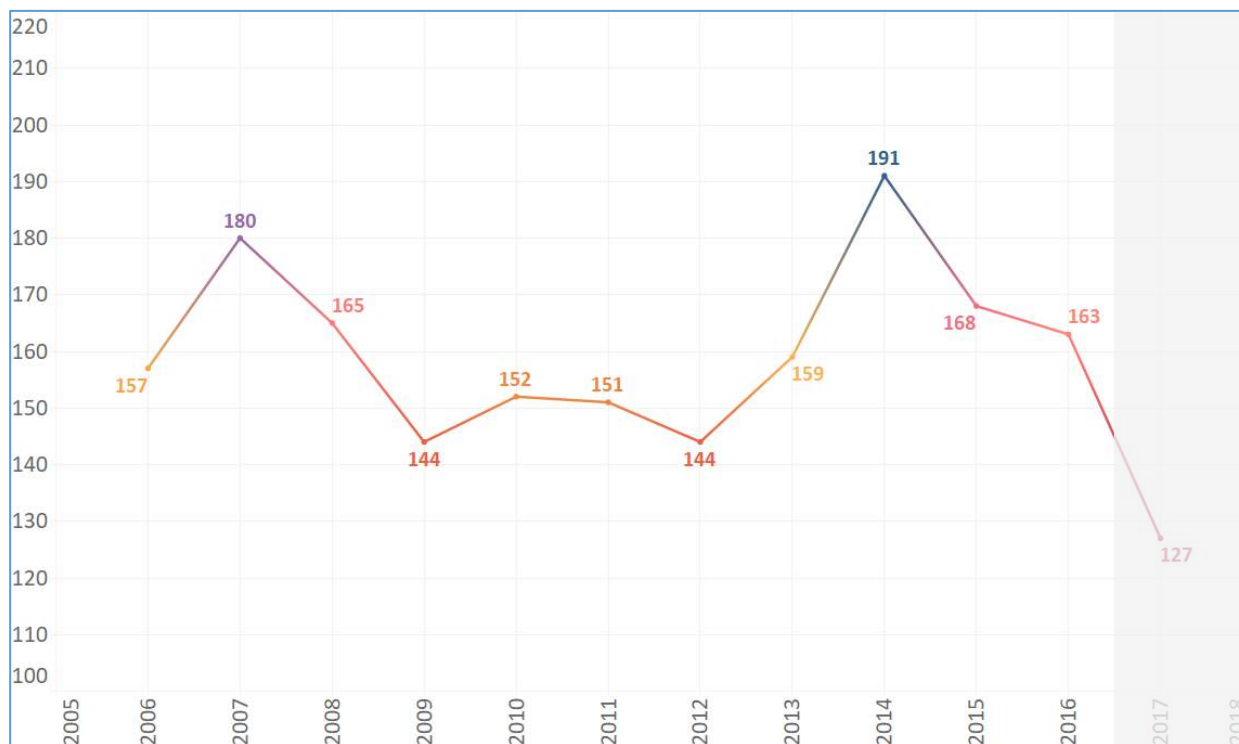
### Summary

This sub-sector, which represents 4% of all patented inventions, has seen its activity decline between 2006 and 2017.

Germany is the leader, as the main applicants come from this country. It should also be pointed out that traditional activities are most subject to patenting, but the protection of identity papers and means of payment such as banknotes are also particularly protected by patents because of their highly technical nature.

Unsurprisingly, we note a shift from the traditional means of identification, security or payment towards the use of electronic means, with the emergence in the last few years of patented technologies for magnetised or liquid crystal security means and cutting cards solutions.

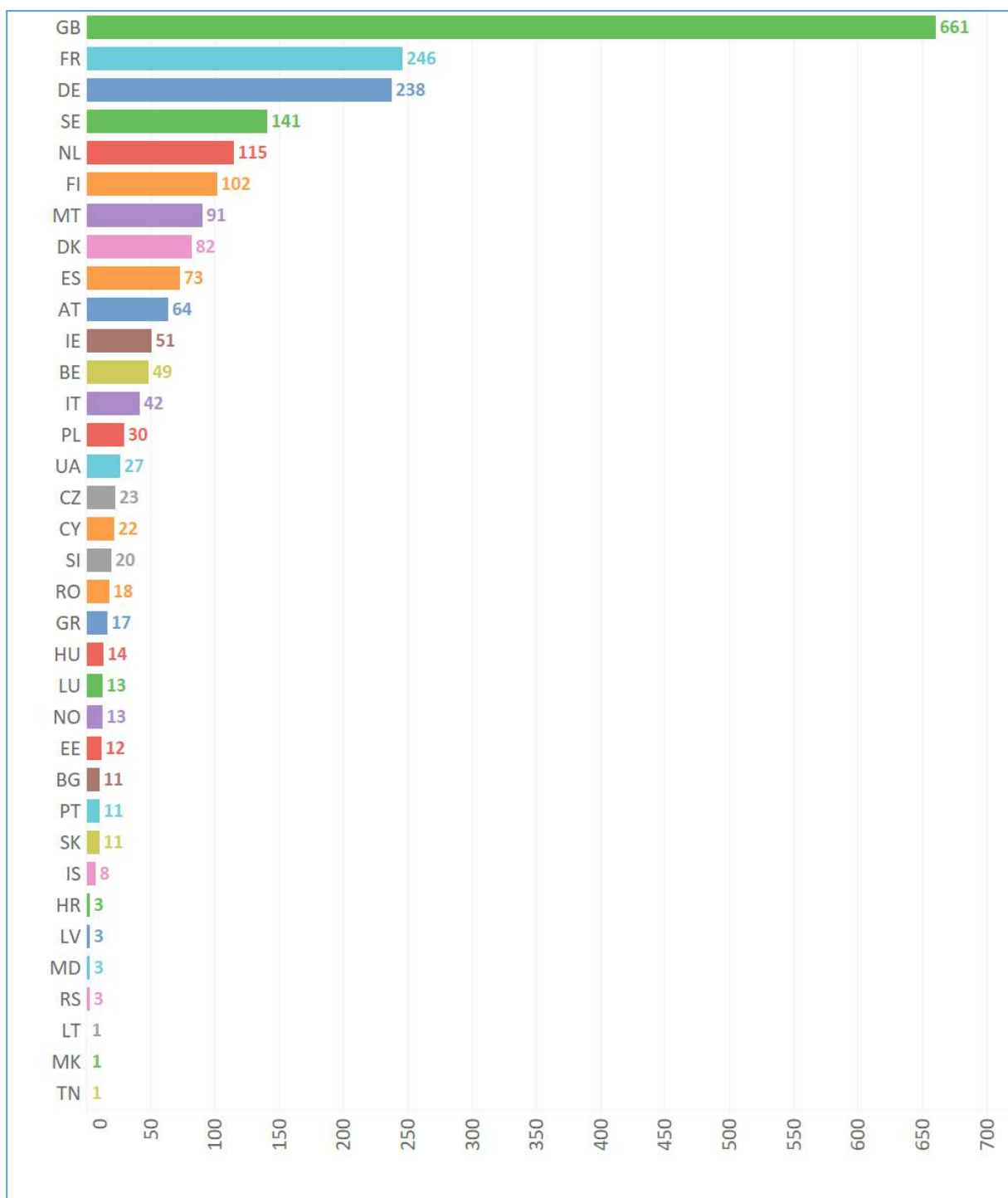
<sup>44</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

**d. Software & games****Figure 70: Evolution of patent filings, Software & games sub-sector**

Source: PATSTAT, calculations: IPIL

The Software & games sub-sector represents 1% of all CCIs patents (1 889) over the reporting period. It is assumed that although this field could be seen as one of the most inventive (thus, patent-related) sub-sectors in the CCIs, because of the specific patentability requirements for software-based inventions,<sup>45</sup> it is ranked only 10<sup>th</sup> among all CCIs. The total number of inventions followed an erratic trajectory from 2006 to 2017.

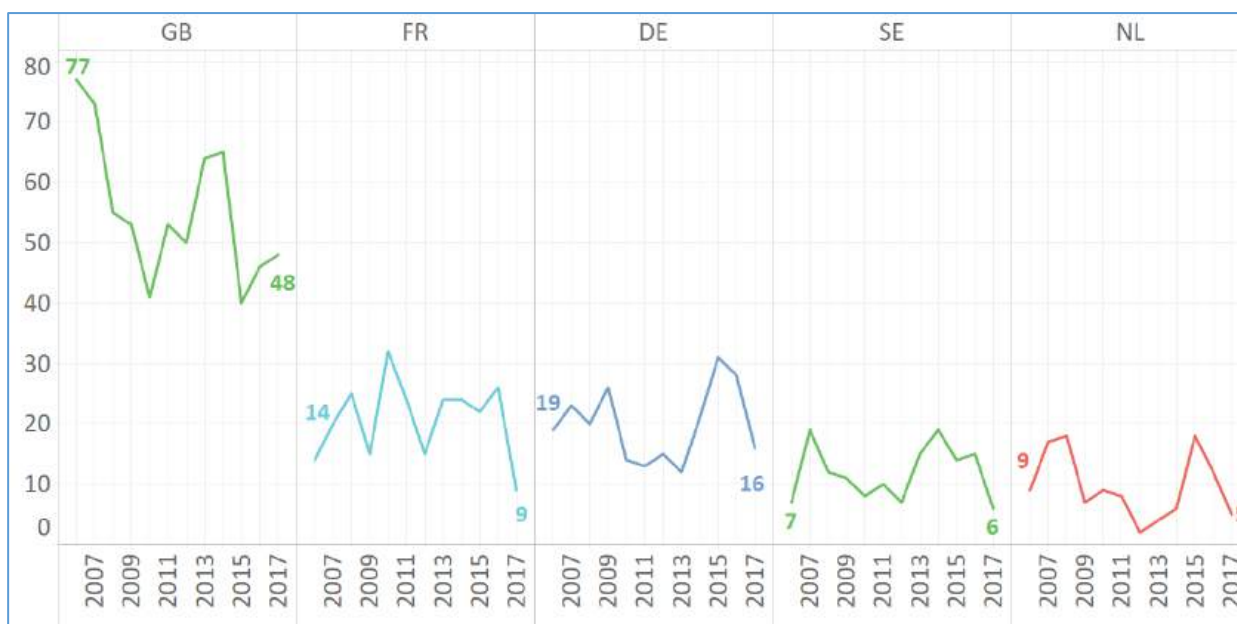
<sup>45</sup> For more information about software patenting, please check the EPO Guidelines for “Computer Implemented Inventions” [here](#).



**Figure 71: Number of patents by country, Software & games sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

Great Britain, with a 35.0% share of inventions patented, is the patent leader in this sub-sector. France and Germany take second and third place, respectively with 13.0% and 12.6% of all patented inventions.



**Figure 72: Evolution of patent filings, Software & games sub-sector, top 5 countries**

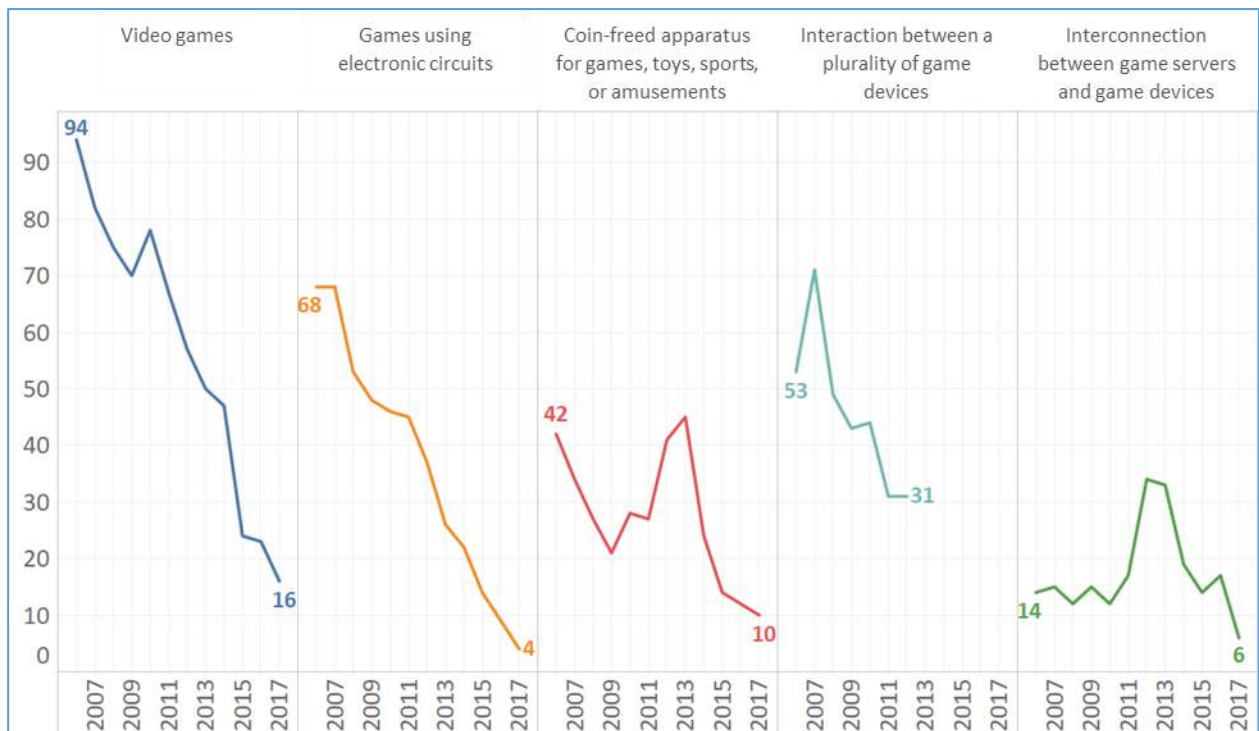
Source: PATSTAT, calculations: IPIL

No clear trend emerges for each of these five countries because of the erratic trajectory of the data on the one hand, and because of the limited number of observations on the other hand.

**Table 15: Patented technologies, Software & games sub-sector, top 5, 2006-2017**

Technologies	Number of patents	%
Video games	681	36.1
Games using electronic circuits	436	23.1
Coin-freed apparatus for games, toys, sports, or amusements	324	17.1
Aspects of games involving interaction between a plurality of game devices	322	17.0
Interconnection arrangements between game servers and game devices	208	11.0

Unsurprisingly, the patented inventions in this sub-sector are related to video games.



**Figure 73: Evolution of top 5 patented technologies, Software & games sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

All top technologies in this sub-sector show a downward trajectory, but it is difficult to draw a conclusion because the number of observations is very limited within each subgroup.

The magnitude of the decline observed for some technologies since 2014 must be put into perspective, as it is a statistical artefact related to the delayed recording of data in some countries.

A deeper analysis helps to understand the type of innovations protected around video games, as shown below through the relationships between the different specificities of the patented technologies:

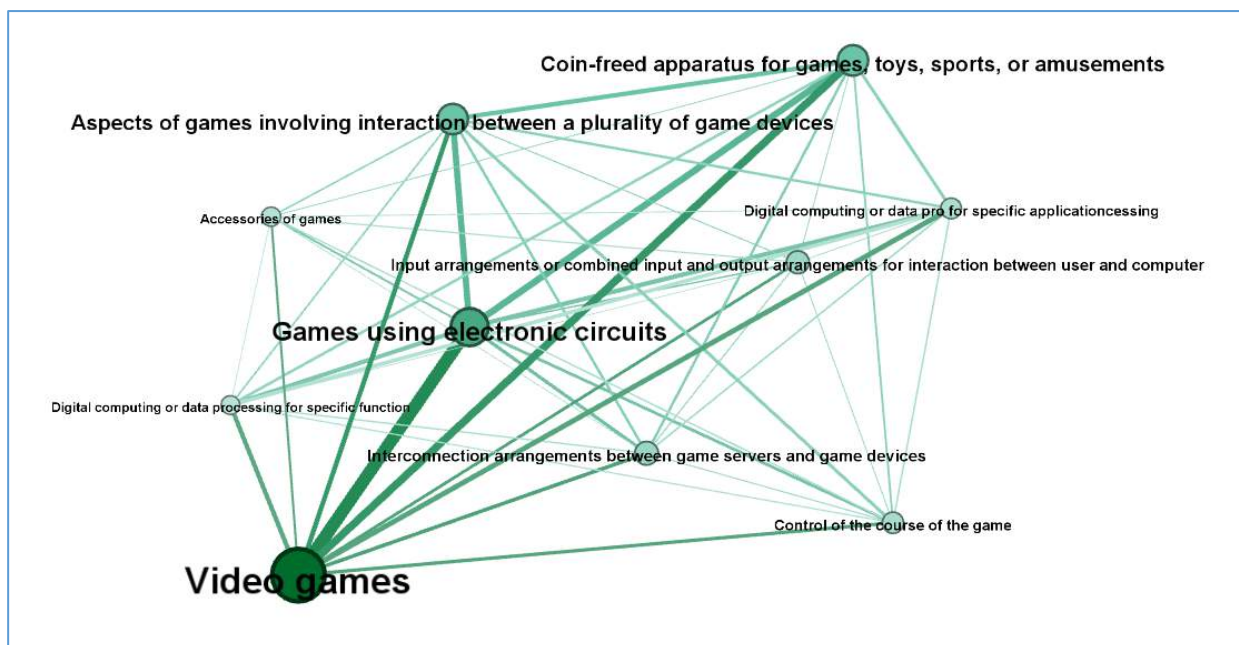


Figure 74: Relationship diagram, top 10 technologies, Software & games sub-sector, 2006-2017<sup>46</sup>  
(frequency range 133 - 681)

The most popular inventions are related to coin-freed video games, providing interaction.

The competitive landscape is mainly composed of big companies involved in the online and traditional video gaming industry, mobile business as well as in gambling.

Top 10 applicants:

Applicant	Number of patents
SONY	101
KING COM LTD	82
NOKIA	40
STEELSERIES	40
NOVOMATIC	36
BIGBEN INTERACTIVE SA	32
WATERLEAF LTD	31
ACEI AB	30
PHILIPS	29
GAMESYS LTD	26

<sup>46</sup> The intensity of the colour in the circle as well as the font sizes are representative of the frequencies of the technologies in our set of patent applications. The thickness of the links represents relationship intensity (frequency).

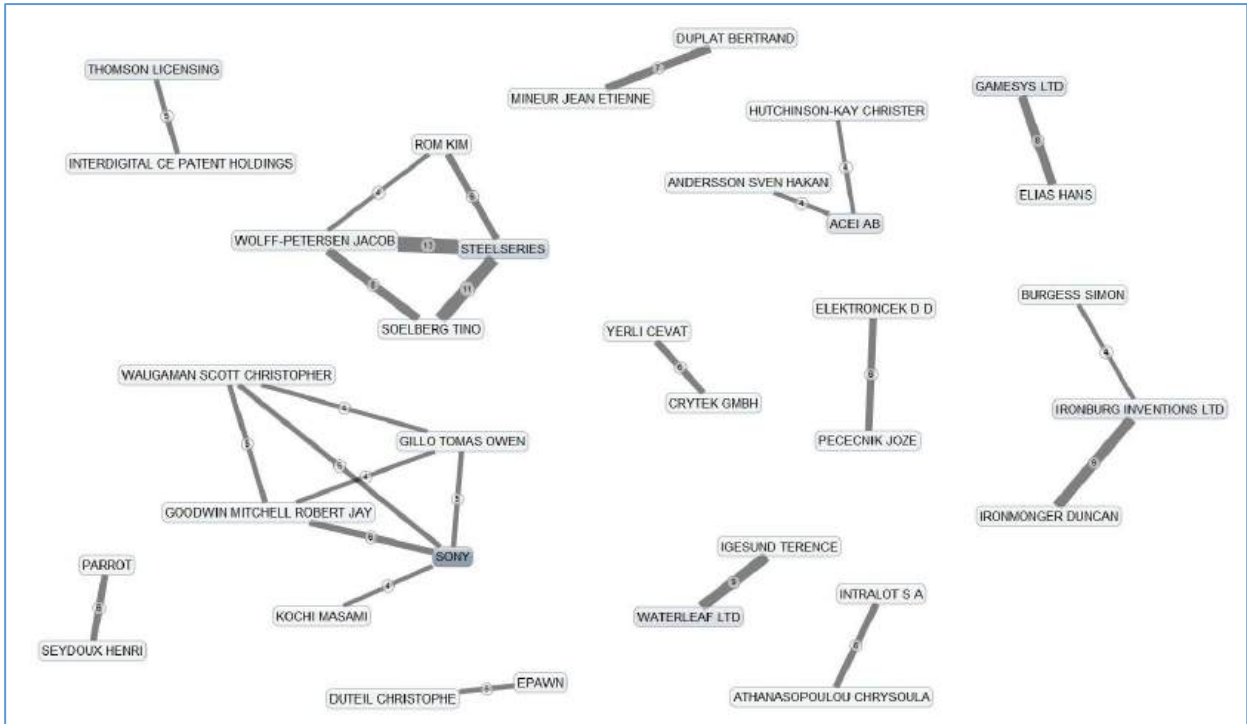


Figure 75: Collaboration diagram, applicants in the Software & games sub-sector, 2006-2017<sup>47</sup>  
 (assignee frequency from 5, pairs frequency from 4)

We do not note any particular collaboration between companies in this sub-sector (cooperation is mainly due to the mentioning of inventors as assignees).

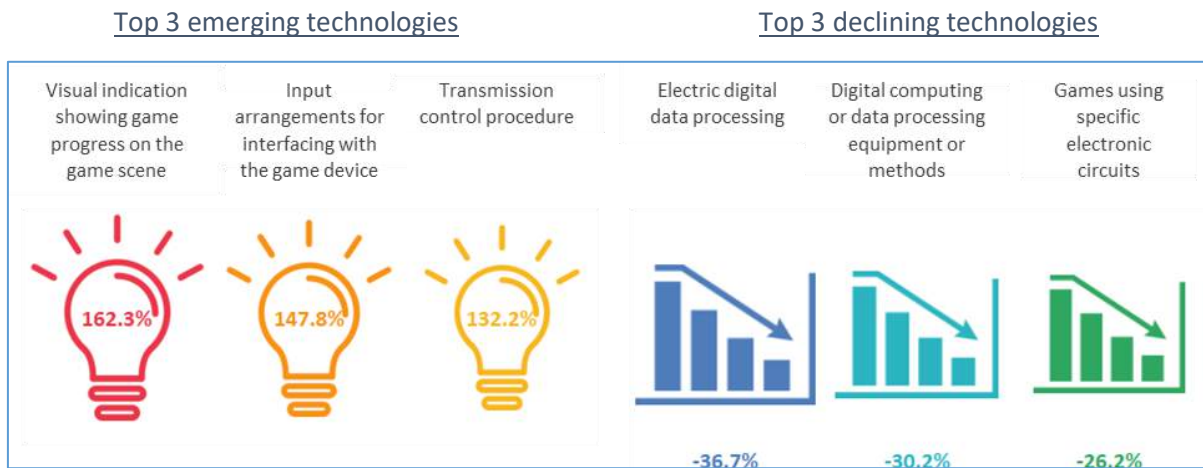


Figure 76: Top 3 emerging and declining technologies, Software & games sub-sector, 2012-2016<sup>48</sup>

<sup>47</sup> The thickness of the links between applicants are representatives of their intensity. Frequency is noted on each link.

<sup>48</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

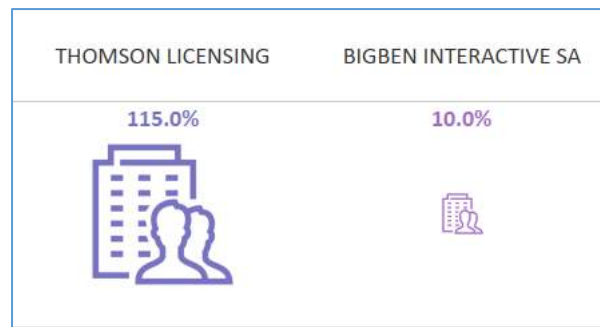


Figure 77: Top 2 most dynamic applicants, Software & games sub-sector, 2012-2016<sup>49</sup>

### Summary

The patenting activity of the Software & games sub-sector, which ranks 10<sup>th</sup>, has been erratic since 2006 but the small number of observations does not allow to comment on its evolution.

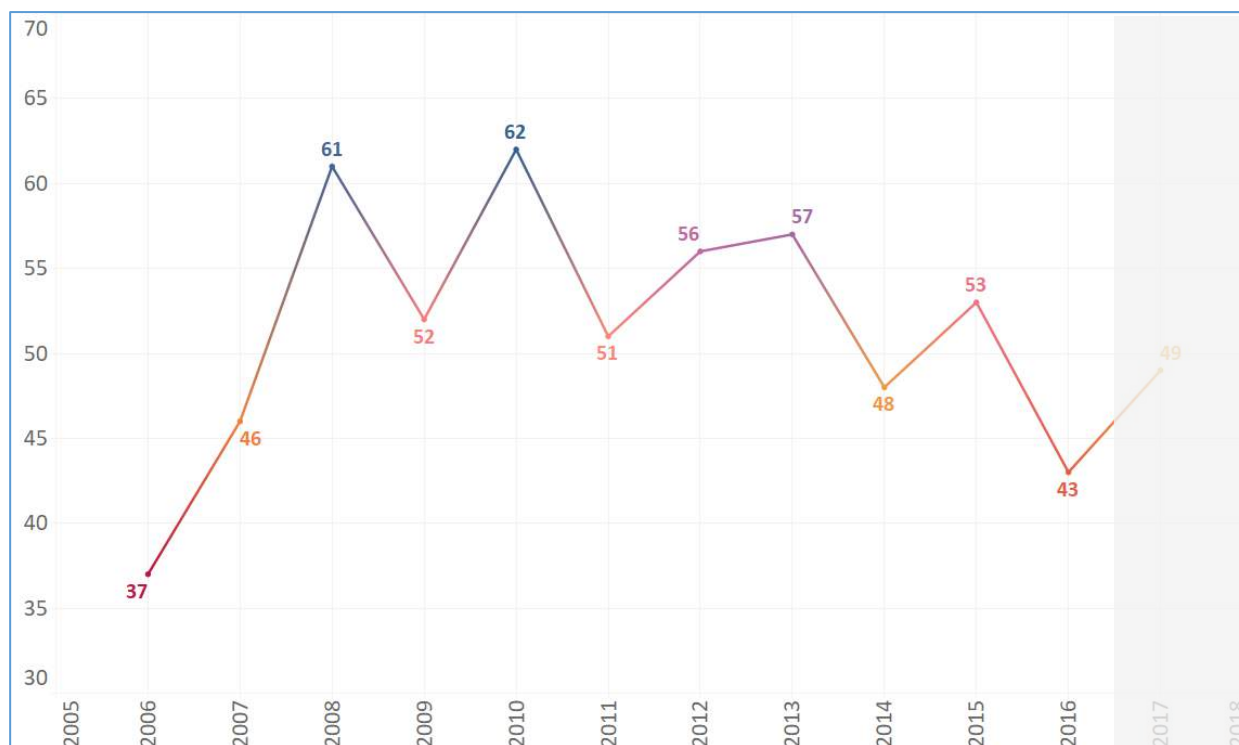
Great Britain is by far the leader in patenting in this sub-sector, followed by France and Germany.

The main technological area concerned in this sub-sector is related to video games and using an electronically generated display having multidimensions, e.g. on a television screen, being mainly interactive as well as related devices. However, the limited number of observations does not allow a conclusion about the trend to be drawn.

<sup>49</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.



### 3.6. Performing arts & artistic creation



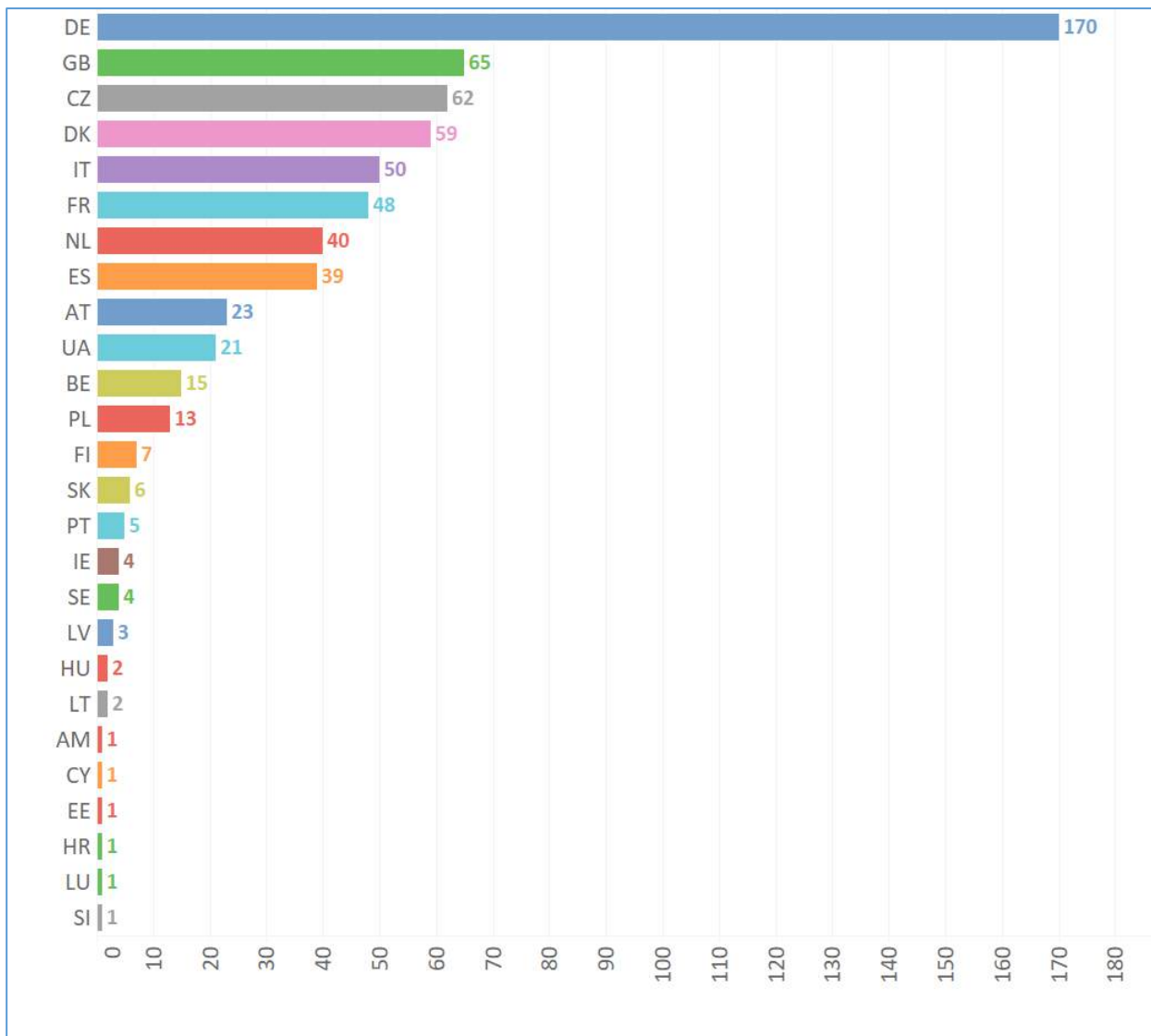
**Figure 78: Evolution of patent filings, Performing arts sub-sector**

Source: PATSTAT, calculations: IPIL

With 614 inventions, the Performing arts<sup>50</sup> sub-sector represents only 0.4% of all CCI patents over the reporting period and is ranked in last position.

The numbers remain quite stable over the time period, but the very limited amount of data available does not allow any statistically meaningful conclusions to be drawn.

<sup>50</sup> Throughout this report, “performing arts” should be interpreted to mean “Performing arts & artistic creation”, as this sub-sector includes artistic creation in the VVA Report, which is the basis of this study in terms of delineation of the CCIs.

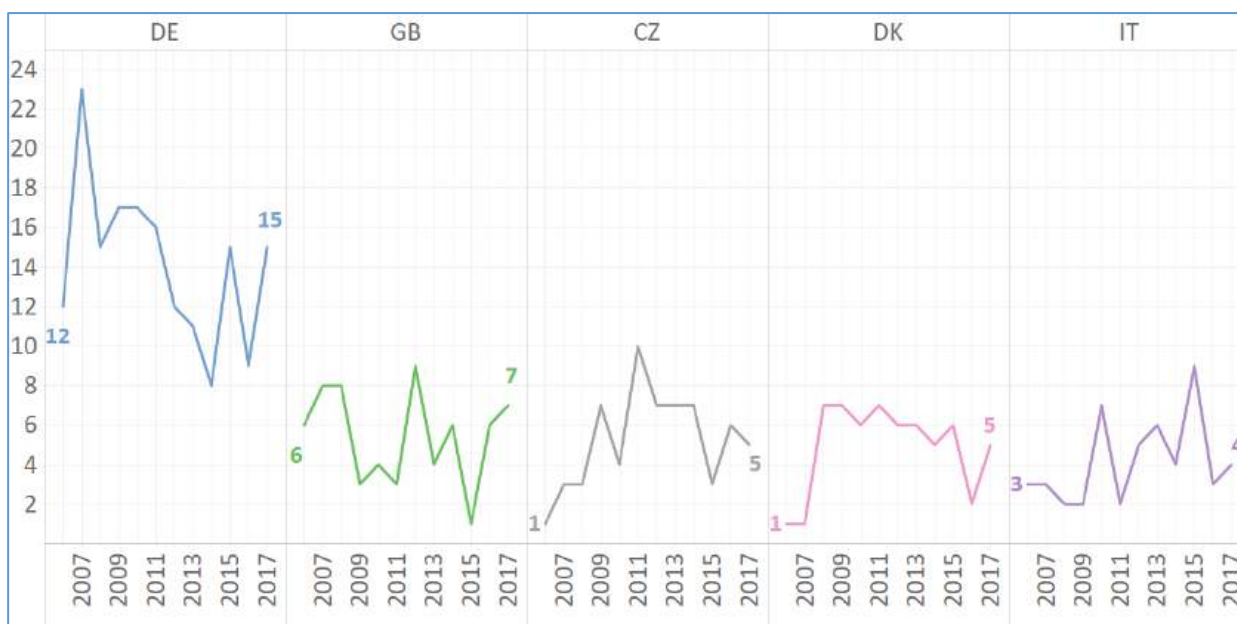


**Figure 79: Number of patents by country, Performing arts sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

The country analysis highlights that Germany is the leading country in terms of patenting of inventions in the Performing arts sub-sector (27.7% of all patents), almost triple that of the second-ranking country, Great Britain. A third of the FLIP countries did not file any patent in this sub-sector during the period under review.<sup>51</sup>

<sup>51</sup> Norway, Greece, Romania, Republic of Serbia, Malta, Bulgaria, Moldova, Tunisia, Iceland, Georgia, Bosnia and Herzegovina, Montenegro, Republic of North Macedonia and Albania.



**Figure 80: Evolution of patent filings, Performing arts sub-sector, top 5 countries**

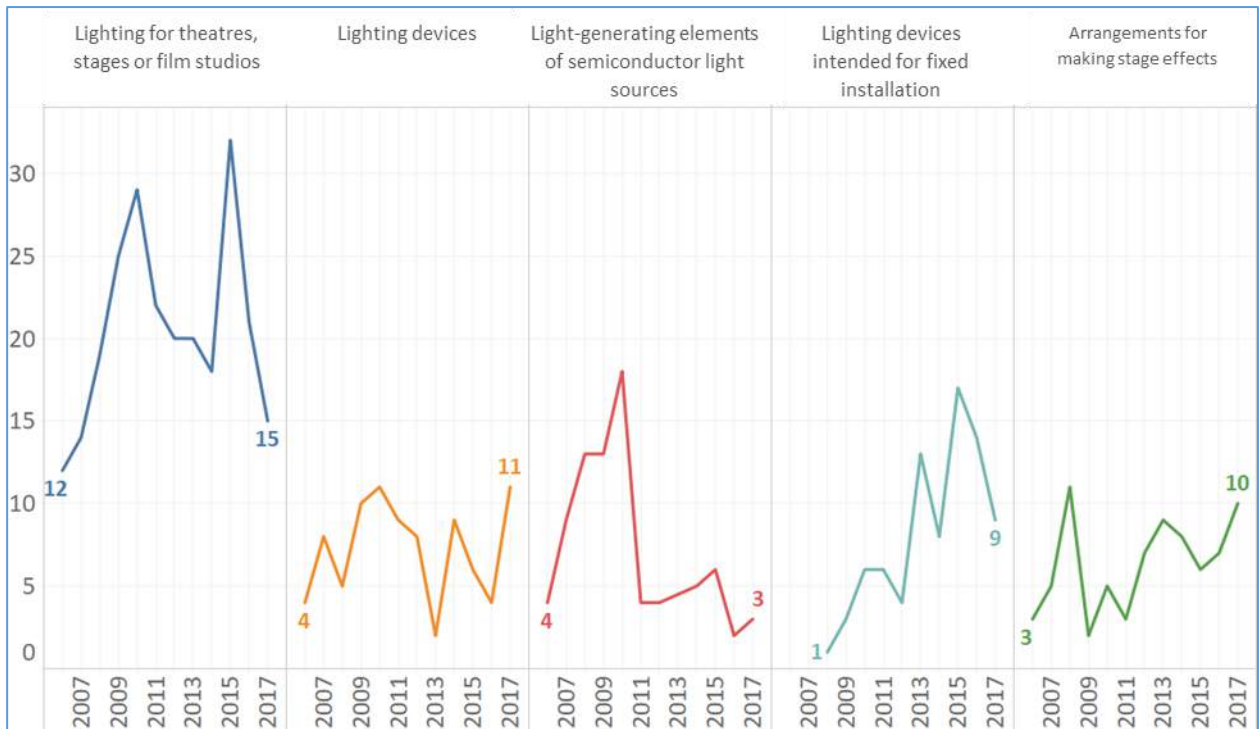
Source: PATSTAT, calculations: IPIL

Although Germany seems to be the clear leader in the country rankings, an erratic trend in many of the top5 countries is noticeable. However, the very limited number of patents for each of the main countries contributing to the patenting activity in this sub-sector does not allow any concrete conclusion to be drawn.

**Table 16: Patented technologies, Performing arts sub-sector, top 5, 2006-2017**

Technologies	Number of patents	%
Lighting for theatres, stages or film studios	247	40.2
Lighting devices	87	14.2
Light-generating elements of semiconductor light sources	81	13.2
Lighting devices intended for fixed installation	81	13.2
Arrangements for making stage effects	76	12.4

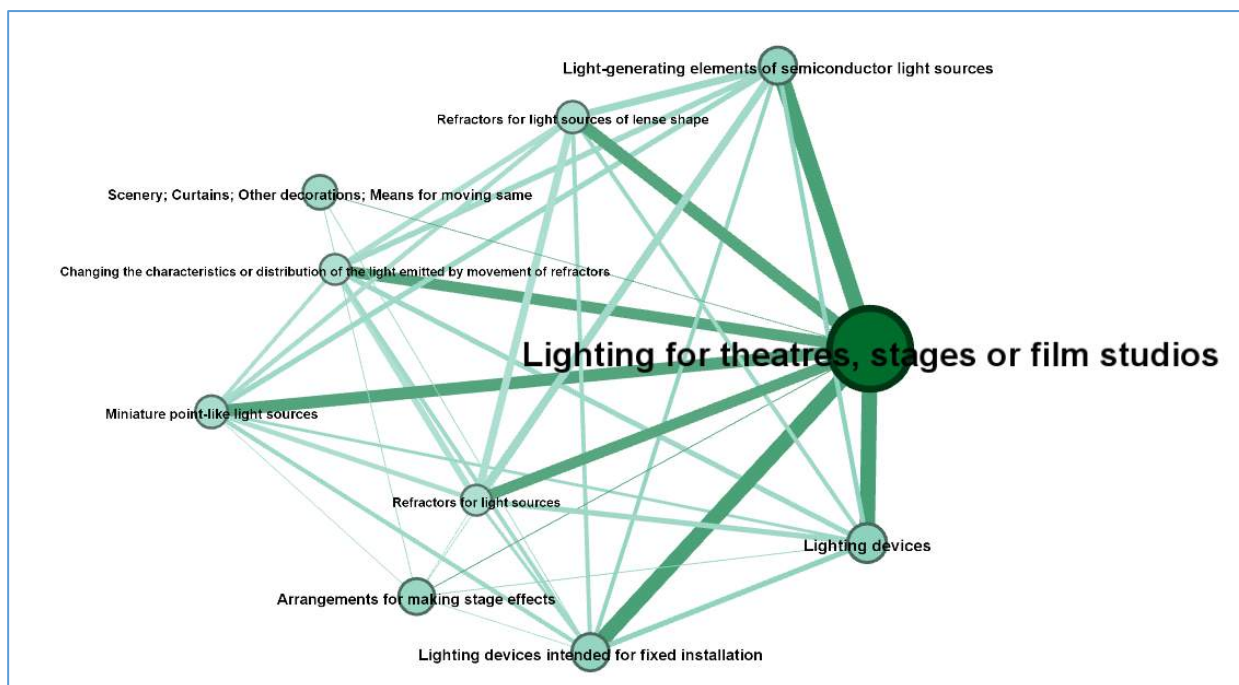
With at least 80.8% of patents, innovations related to lighting devices are preponderant in this sub-sector. This is mainly due to the technological advancements in stage lighting, which is an integral part of the performing arts. This becomes more evident in the detailed analysis below.



**Figure 81: Evolution of top 5 patented technologies, Performing arts sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

The very limited number of patents for each of the main countries contributing to the patenting activity in this sub-sector does not allow any conclusion to be drawn.



**Figure 82: Relationship diagram, top 10 technologies, Performing arts sub-sector, 2006-2017<sup>52</sup>**  
(frequency range 50 – 247)

A detailed analysis reveals that the auxiliaries for producing special effects on stage are protected by patents in order to guarantee the originality of the theatres, circuses or the like, and shows.

Regarding the main applicants, they primarily belong to large groups like Harman, Osram, Philips or Robe.

Top 10 applicants:

Applicant	Number of patents
MARTIN PROFESSIONAL	49
JURIK PAVEL	40
ROBE LIGHTING	34
PHILIPS	31
VALCHAR JOSEF	31
CLAY PAKY SPA	25
HARMAN PROFESSIONAL DENMARK APS	21
OSRAM	19
CHRISTOFFERSEN PETER SKYTTE	11
JOERGENSEN DENNIS	9

<sup>52</sup> The intensity of the colour in the circle as well as the font sizes are representative of the frequencies of the technologies in our set of patent applications. The thickness of the links represents relationship intensity (frequency).

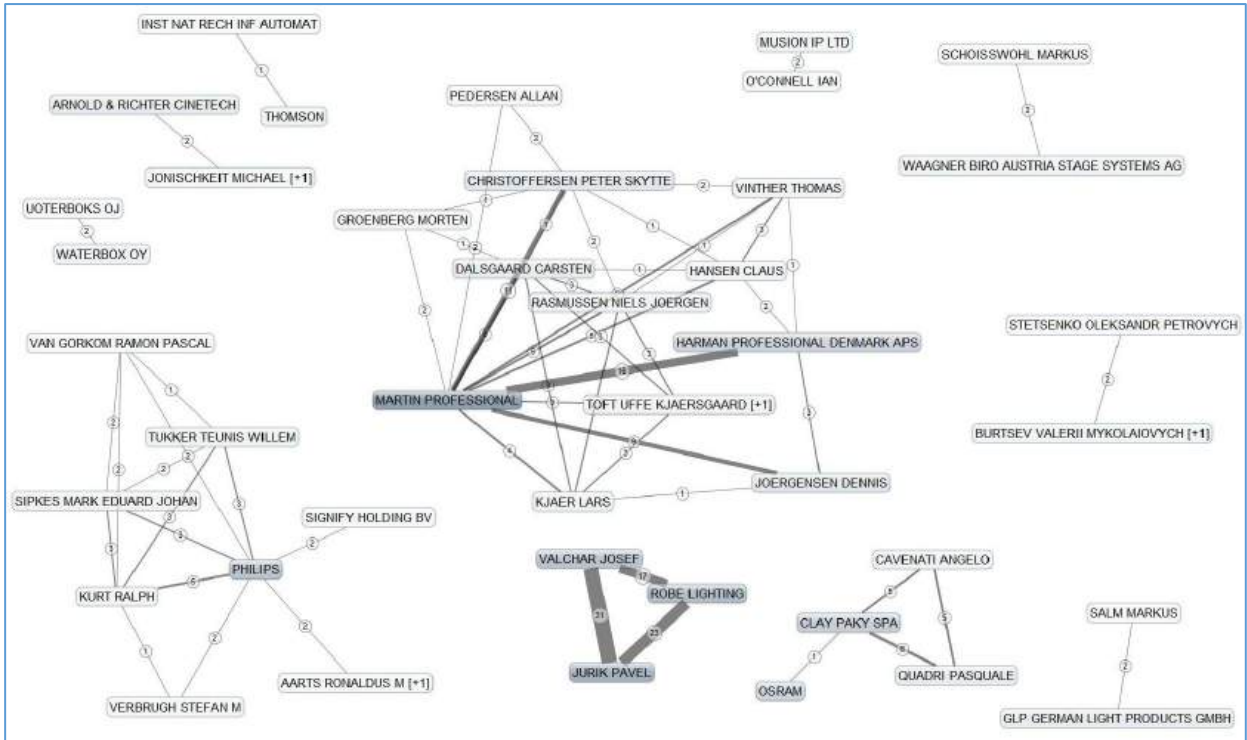


Figure 83: Collaboration diagram, applicants in the Performing arts sub-sector, 2006-2017<sup>53</sup>  
(assignee frequency from 2, pairs frequency from 1)

There is almost no collaboration between the main players in the industry. The majority of collaborations are performed with subsidiaries and with inventors from the companies (that are mentioned as co-applicants).



Figure 84: Top 3 emerging and declining technologies, Performing arts sub-sector, 2012-2016<sup>54</sup>

<sup>53</sup> The thickness of the links between applicants are representatives of their intensity. Frequency is noted on each link.

<sup>54</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

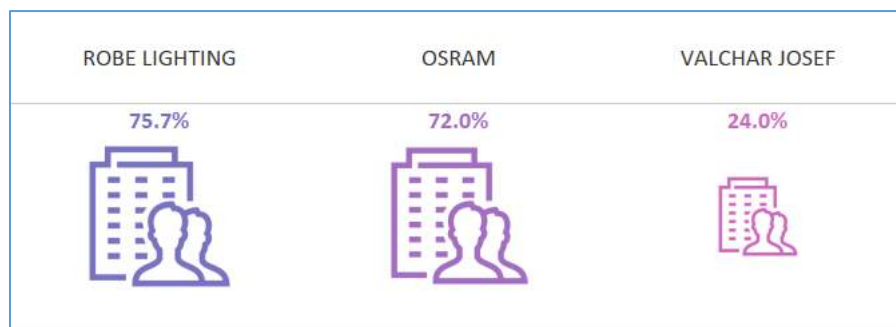


Figure 85: Top 3 most dynamic applicants, Performing arts sub-sector, 2012-2016<sup>55</sup>

### Summary

The patenting activity of the Performing arts sub-sector, which ranks 12<sup>th</sup>, has been broadly stable since 2006 but the small number of observations does not allow to comment on its evolution.

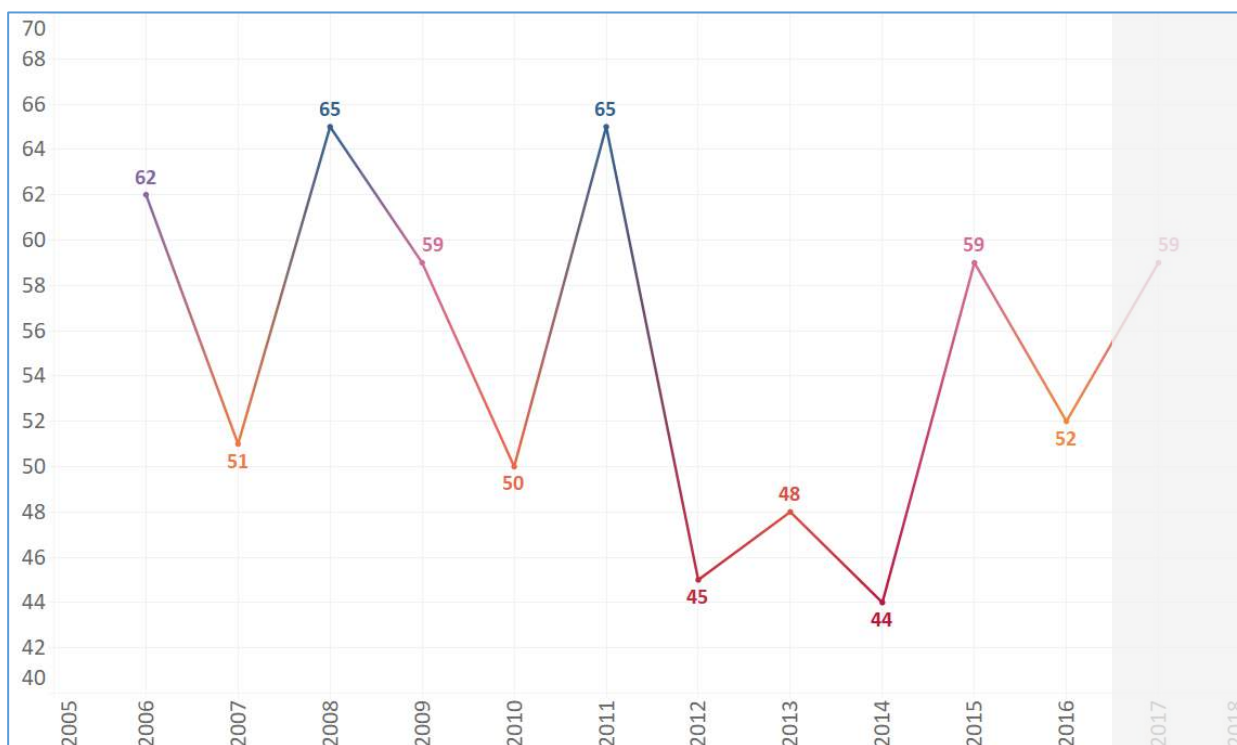
Germany is by far the leader in patenting in this sub-sector, followed by Great Britain and the Czech Republic.

The main technological area concerned in this sub-sector is related to indoor and outdoor lighting devices, thereby enhancing the originality of the theatres, circuses or the like, and shows.

<sup>55</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

### 3.7. Cultural heritage

#### a. Archives, libraries and cultural heritage (ALCH)

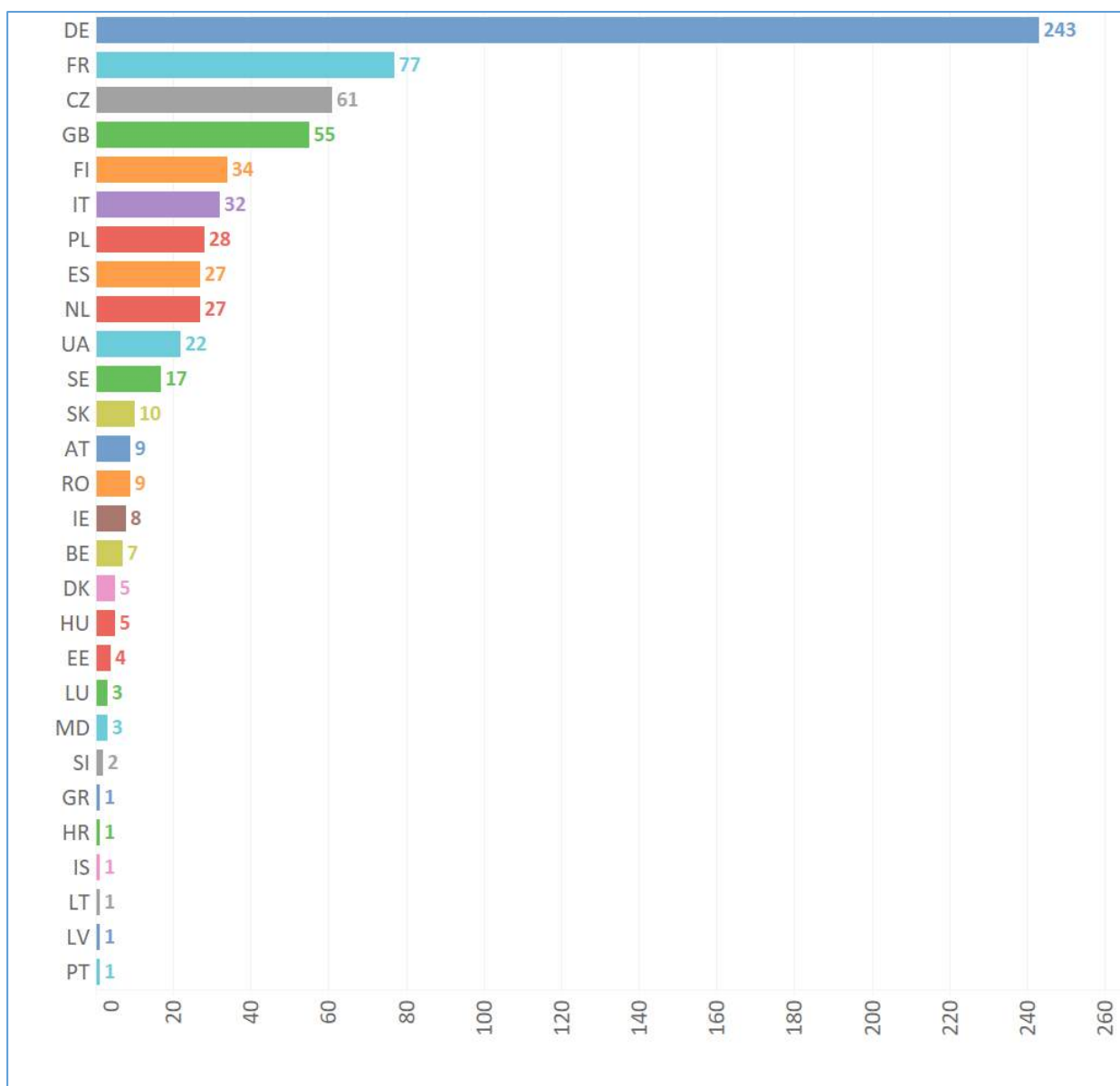


**Figure 86: Evolution of patent filings, ALCH sub-sector**

Source: PATSTAT, calculations: IPIL

The Archives, libraries and cultural heritage sub-sector represents 0.5% (659 patents) of all patents over the reporting period and it ranks 11<sup>th</sup> within all CCIs. This is indeed not a very unexpected outcome, as this sub-sector, by definition, is not counted amongst the most patent-prolific sectors since technology use in this field is rather limited. The total number of inventions has followed a stable trend since 2006, with an average of 55 patented inventions per year, but the limited amount of data available does not allow any conclusions to be drawn.



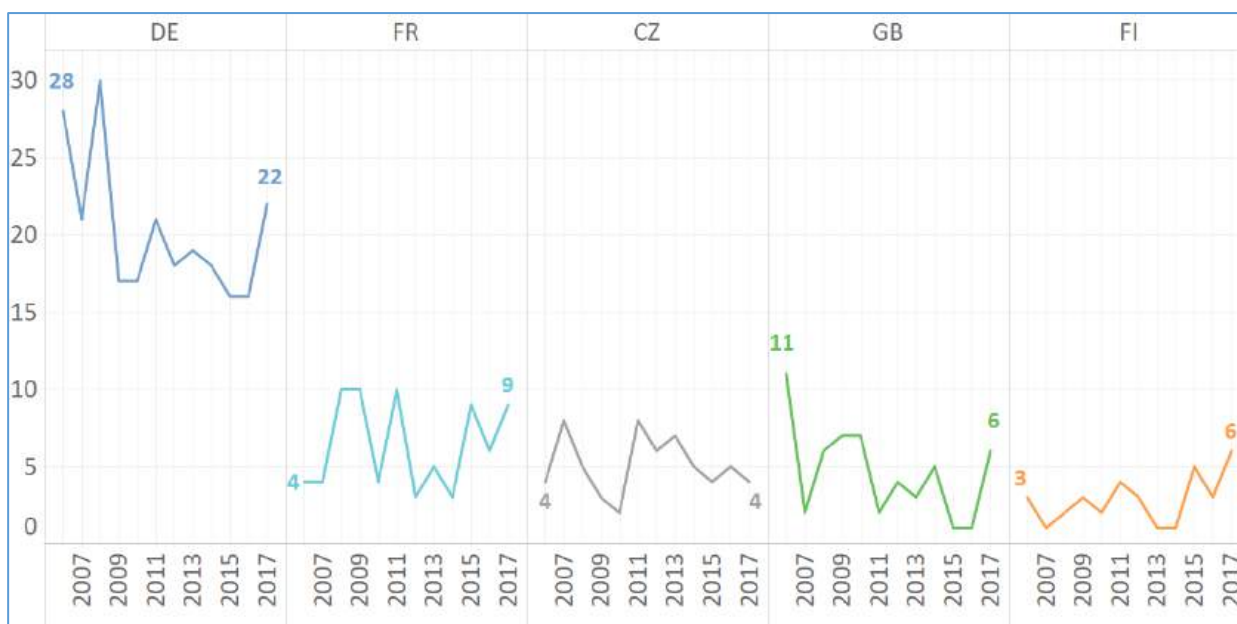


**Figure 87: Number of patents by country, ALCH sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

Germany is the top applicant in this sub-sector, with 36.9% of all patented inventions over the period. The three main contributors (Germany, France and the Czech Republic) represent more than half of all patented inventions over the time horizon (57.9%). It should be noted that in this sub-sector, more than a half of the countries did not have any patenting activity during the period under review, according to our definition of the sub-sector.<sup>56</sup>

<sup>56</sup> Finland, Norway, Greece, Romania, Slovakia, Slovenia, Republic of Serbia, Malta, Bulgaria, Croatia, Estonia, Cyprus, Latvia, Moldova, Lithuania, Tunisia, Iceland, Armenia, Georgia, Bosnia and Herzegovina, Montenegro, Republic of North Macedonia, Albania.



**Figure 88: Evolution of patent filings, ALCH sub-sector, top 5 countries**

Source: PATSTAT, calculations: IPIL

The top 5 contributors to patented inventions seemed to follow a more or less stable trajectory over the 12-year period under review; but the limited amount of data does not allow any explicit conclusions to be drawn.

**Table 17: Patented technologies, ALCH sub-sector, top 5, 2006-2017**

Technologies	Number of patents	%
Repairing, restoring, altering, enlarging buildings	582	88.3
File system administration	40	6.1
Drying or keeping dry	37	5.6
Non-metallic reinforcing elements	34	5.2
Information retrieval and database structures therefor	29	4.4

88.3% of all inventions of this sub-sector are related to works on buildings, which is in line with the need to carry out work in order to conserve and restore cultural heritage. Two additional technological areas are in line with this need (drying or keeping dry and reinforcing elements).

The remaining technological areas of this top 5 are related to the management of the archives, libraries.

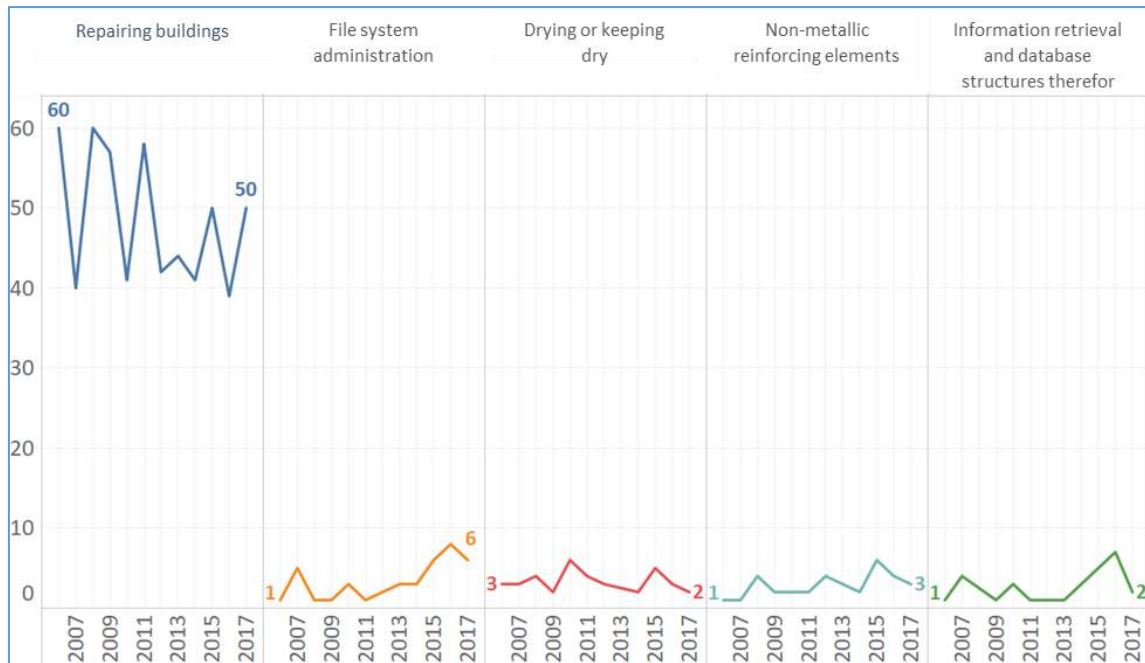


Figure 89: Evolution of the top 5 patented technologies, ALCH sub-sector, 2006-2017

Source: PATSTAT, calculations: IPIL

The four main technological fields for this sub-sector in the past years remained broadly stable over the period. Nevertheless, the limited number of data available does not allow to draw any conclusion.

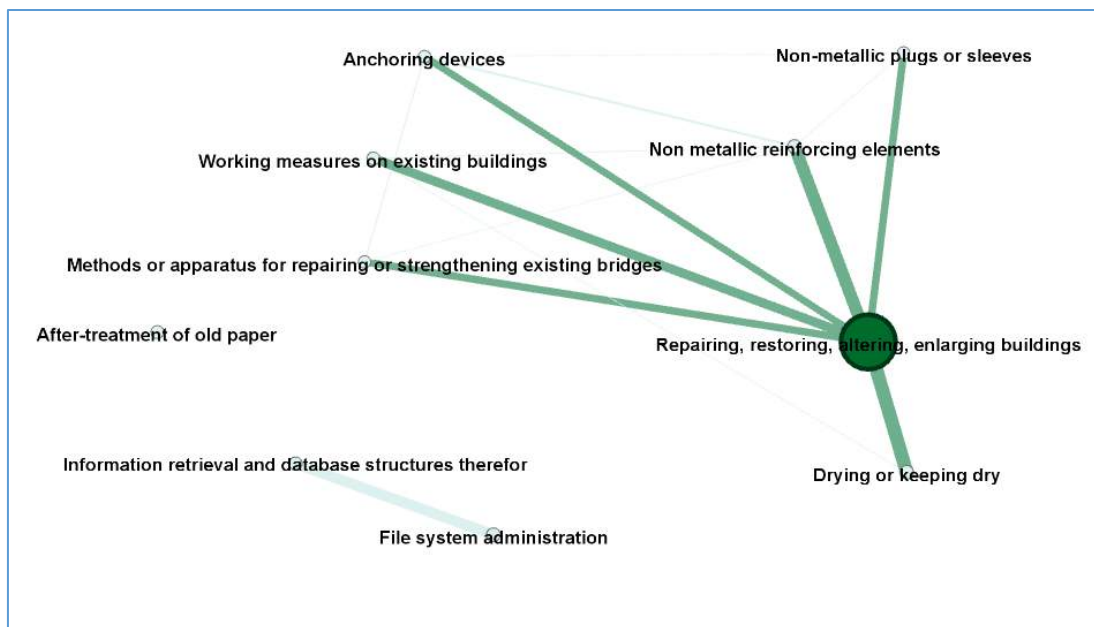


Figure 90: Relationship diagram, top 10 technologies, ALCH sub-sector, 2006-2017<sup>57</sup>

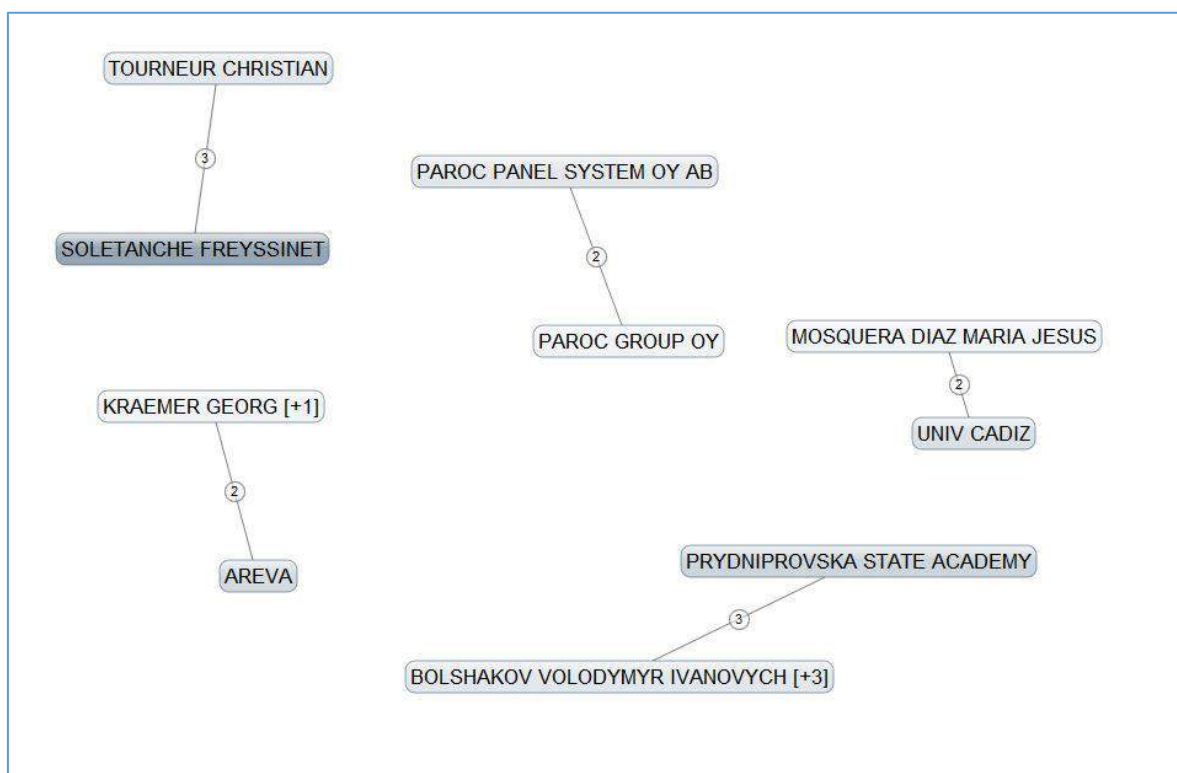
(frequency range 19-582)

<sup>57</sup> The intensity of the colour in the circle is representative of the frequencies of the technologies in our set of patent applications. For visibility purposes, the font size used in the above graphic is not proportionate to the importance of the technologies. The thickness of the links between the technologies are representatives of their intensity (frequency).

The top 10 applicants mainly come from the building and renovating area (Desoi, Soletanche, Koester) and from information management (SAP):

Applicant	Number of patents
CESKU VYSOKU UCENI TECHNICKU V PRAZE FAKULTA STAVEBNI	13
SOLETANCHE FREYSSINET	12
ROJIK VACLAV	10
SAP	8
DESOI GMBH	8
LEFEVRE M	7
PRYDNIPROVSKA STATE ACADEMY	6
MOLITOR VOLKER	6
HENNING KARIN	6
KOESTER BAUCHEMIE AG	5

As seen in the graph below, cooperation in this sub-sector is rare and the number of patents not sufficiently significant to perform a solid analysis at this level.



**Figure 91: Collaboration diagram, applicants in the ALCH sub-sector, 2006-2017<sup>58</sup>**  
 (assignee frequency from 2, pairs frequency from 1)

<sup>58</sup> The thickness of the links between applicants are representatives of their intensity. Frequency is noted on each link.

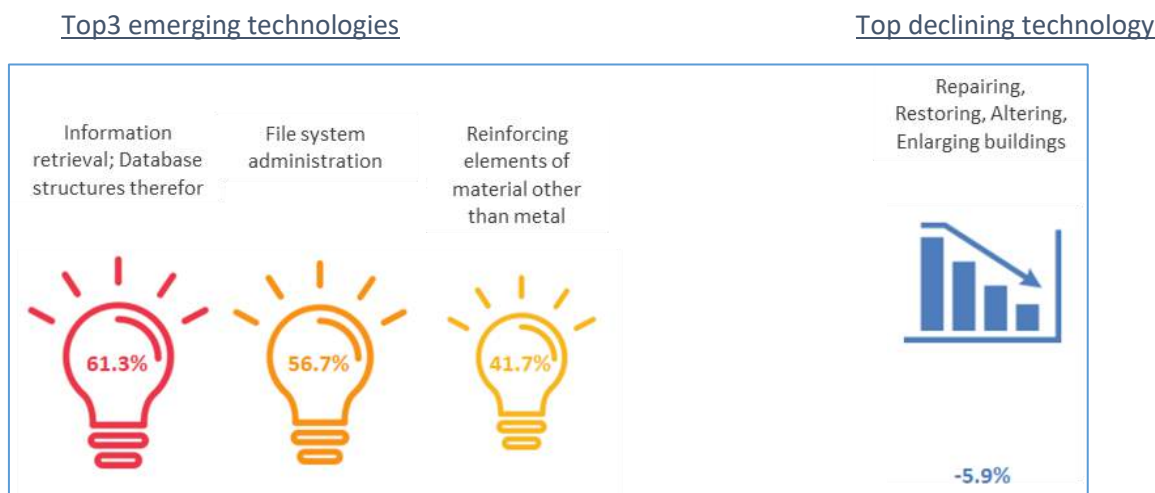


Figure 92: Top3 emerging and declining technologies, ALCH sub-sector, 2012-2016<sup>59</sup>

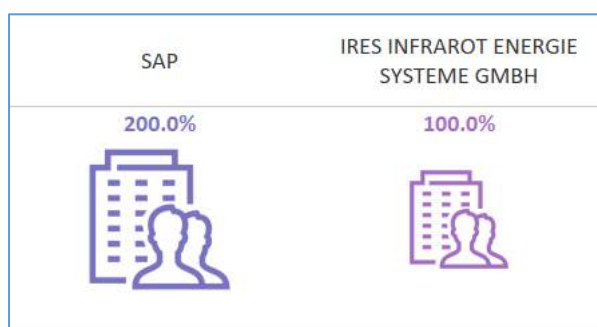


Figure 93: Top2 most dynamic applicants, ALCH sub-sector, 2012-2016<sup>60</sup>

It seems that more developments in the sub-sector are performed in the information management area and that the repairing and restoring of buildings is decreasing in the number of innovative solutions developed.

### Summary

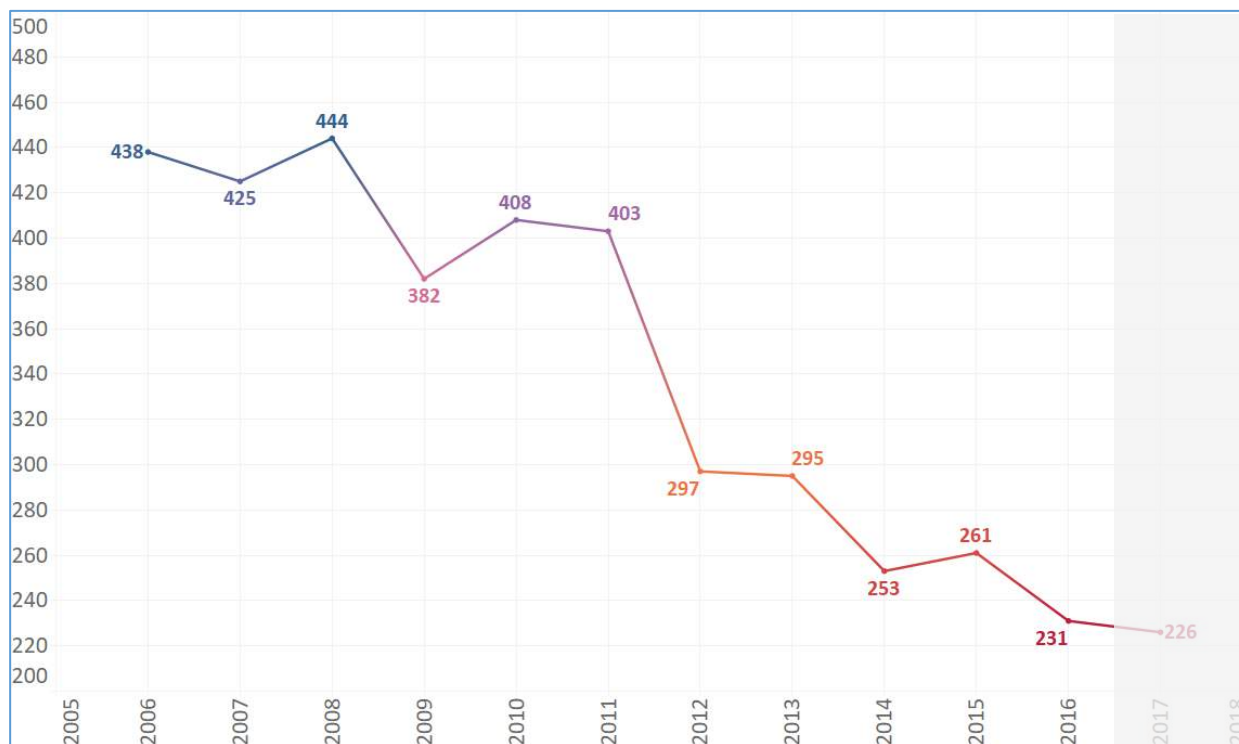
The patenting activity in the Archives, libraries and cultural heritage sub-sector, which ranks 11<sup>th</sup> among the CCIs, is difficult to identify firstly because there is an extremely small number of patents, and secondly because the activities that compose it are heterogeneous.

More than half of the patenting activity is concentrated in three countries, namely Germany, France and the Czech Republic. 23 out of 40 countries have no patenting activity in this field.

The main technological area in this sub-sector is related to building restoration (filling cracks, restoring, altering, enlarging supports, etc.) and it has remained broadly stable since 2006. However, we can also note a tendency towards the development of innovations in the area of information management (most likely for libraries).

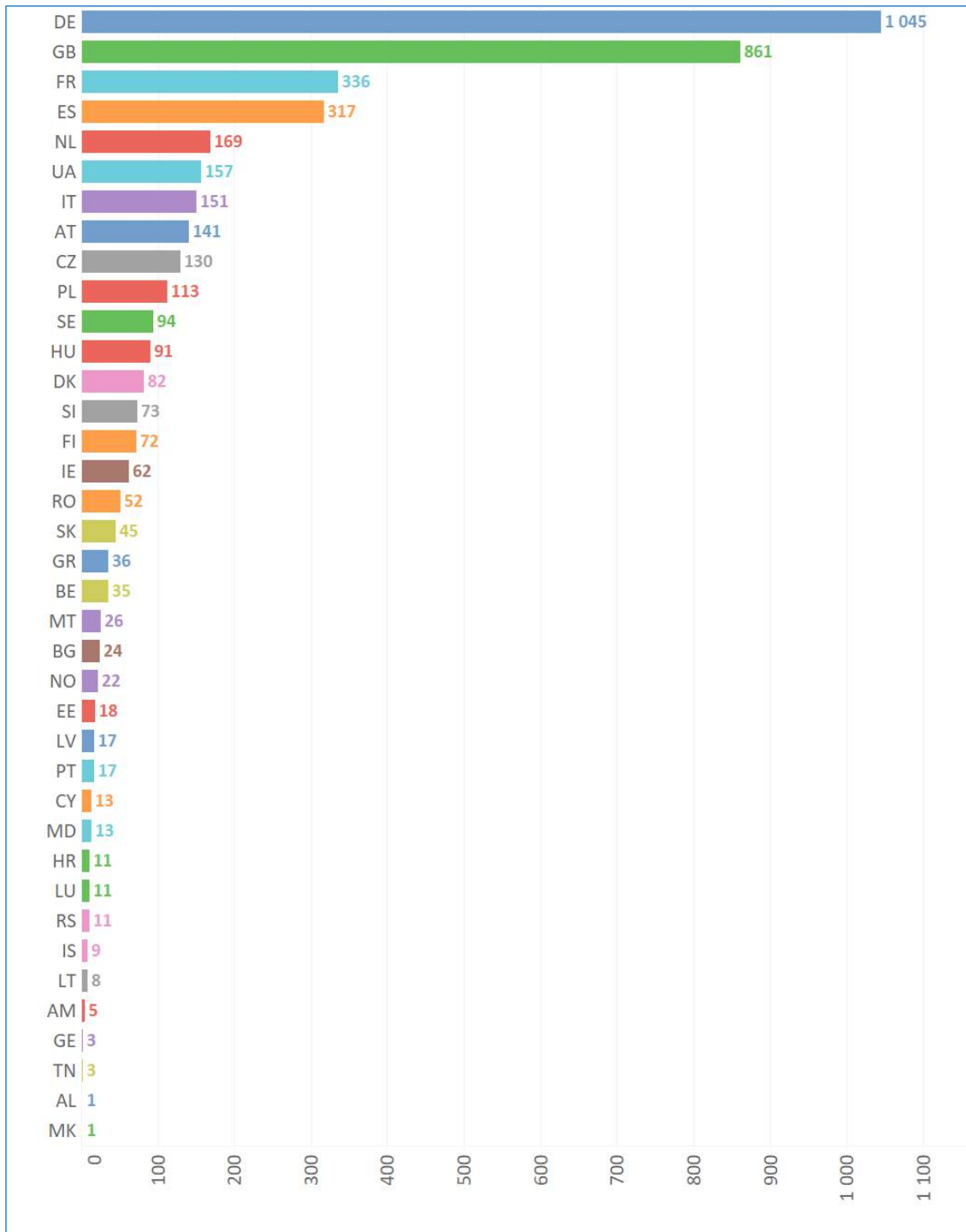
<sup>59</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

<sup>60</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

**b. Amusement activities****Figure 94: Evolution of patent filings, Amusement activities sub-sector**

Source: PATSTAT, calculations: IPIL

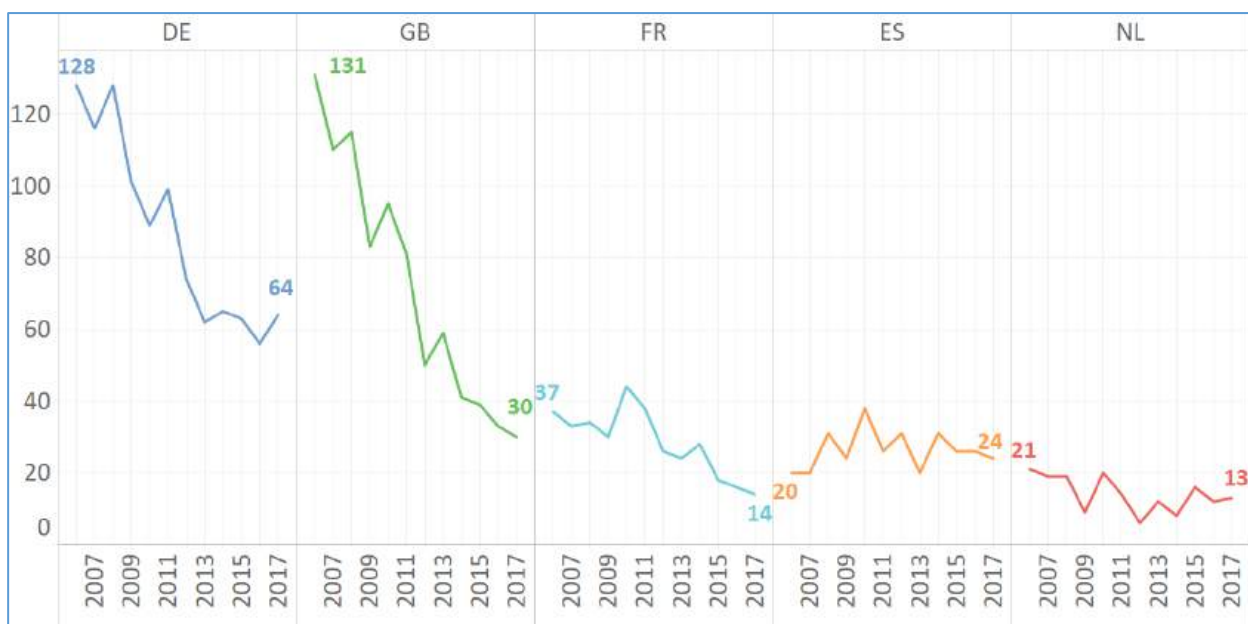
The Amusement activities sub-sector represents 3% (4 048 patents) of all patents over the reporting period and it ranks 8<sup>th</sup> among all CCI sub-sectors in terms of patenting activity. The total number of inventions follows a global downward trend between 2006 and 2017.



**Figure 95: Number of patents by country, Amusement activities sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

Germany and Great Britain are by far the leaders in patenting in this sub-sector, with respectively 25.8% and 21.3% of all patents over the period studied.



**Figure 96: Evolution of patent filings, Amusement activities sub-sector, top 5 countries**

Source: PATSTAT, calculations: IPIL

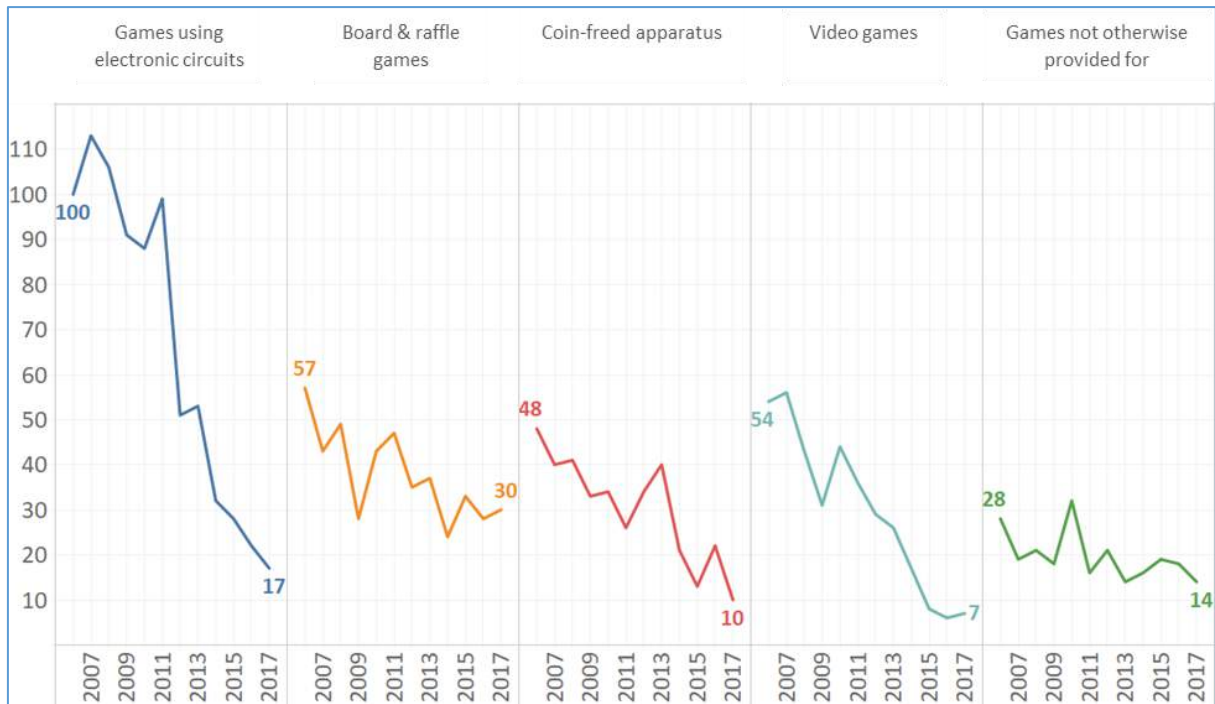
Germany, Great Britain and France experienced a decline of their patenting activities in the Amusement activities sub-sector during 2006-2017, while Spain and the Netherlands followed a relatively stable trend.

**Table 18: Patented technologies, Amusement activities sub-sector, top 5, 2006-2017**

Technologies	Number of patents	%
Games using electronic circuits	791	19.5
Board and raffle games	449	11.1
Coin-freed apparatus	360	8.9
Video games	356	8.8
Games not otherwise provided for	236	5.8

Our analysis shows that the technologies for games using electronic circuits are dominant in terms of patenting inventions.

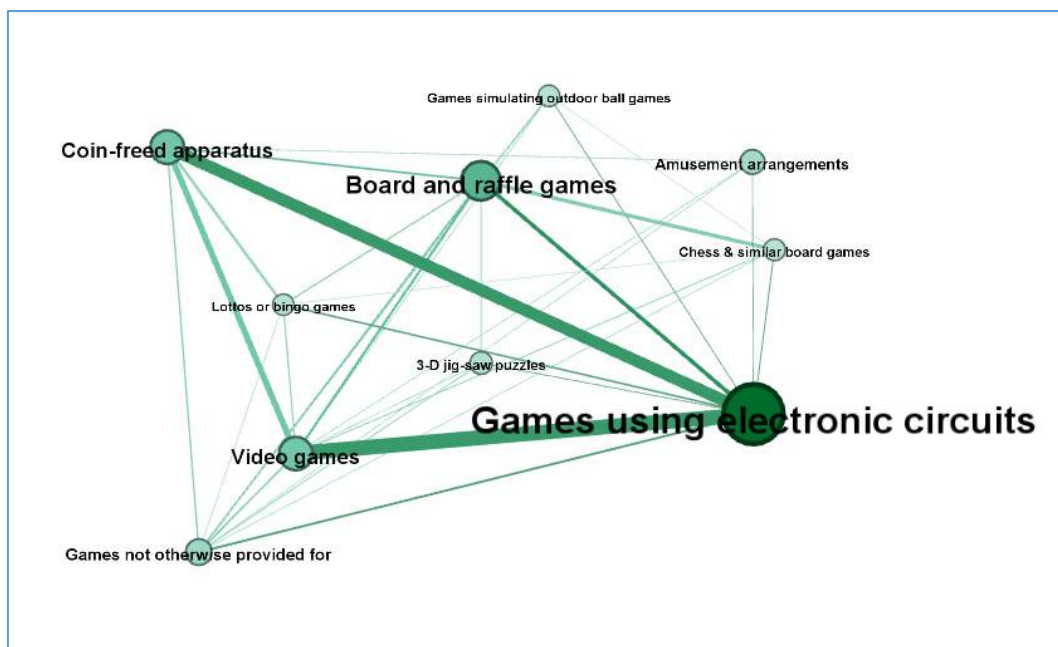




**Figure 97: Evolution of top 5 patented technologies, Amusement activities sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

All of the technologies belonging to the top 5 depict a downward trajectory, contributing to the general decrease in patenting activity within the sector during the period under review. However, the low number of patents in these subgroups does not allow any accurate conclusions to be drawn.



**Figure 98: Relationship diagram, top 10 technologies, Amusement activities sub-sector, 2006-2017<sup>61</sup>**  
(frequency range 156 - 791)

According to the above graphic, the most popular categories of games are the object of protection measures (Board and raffle, Ball, Chess and board, Lottos and Puzzles games), for the majority video-based.

Regarding the top companies involved, we can clearly identify the following three main groups:

- gambling, casino;
- amusement rides; and
- video games with the following top 10 most active applicants in this sub-sector:

Applicant	Number of patents
SONY ERICSSON	37
NOVOMATIC	37
SCIENTIFIC GAMES	26
MACK RIDES GMBH & CO KG	25
WATERLEAF LTD	22
GAMESYS LTD	22
STEELSERIES	21
AU-YEUNG CHI FAT	20
ZAMPERLA ANTONIO SPA	19
KING COM LTD	19

<sup>61</sup> The intensity of the colour in the circle as well as the font sizes are representative of the frequencies of the technologies in our set of patent applications. The thickness of the links represents relationship intensity (frequency).

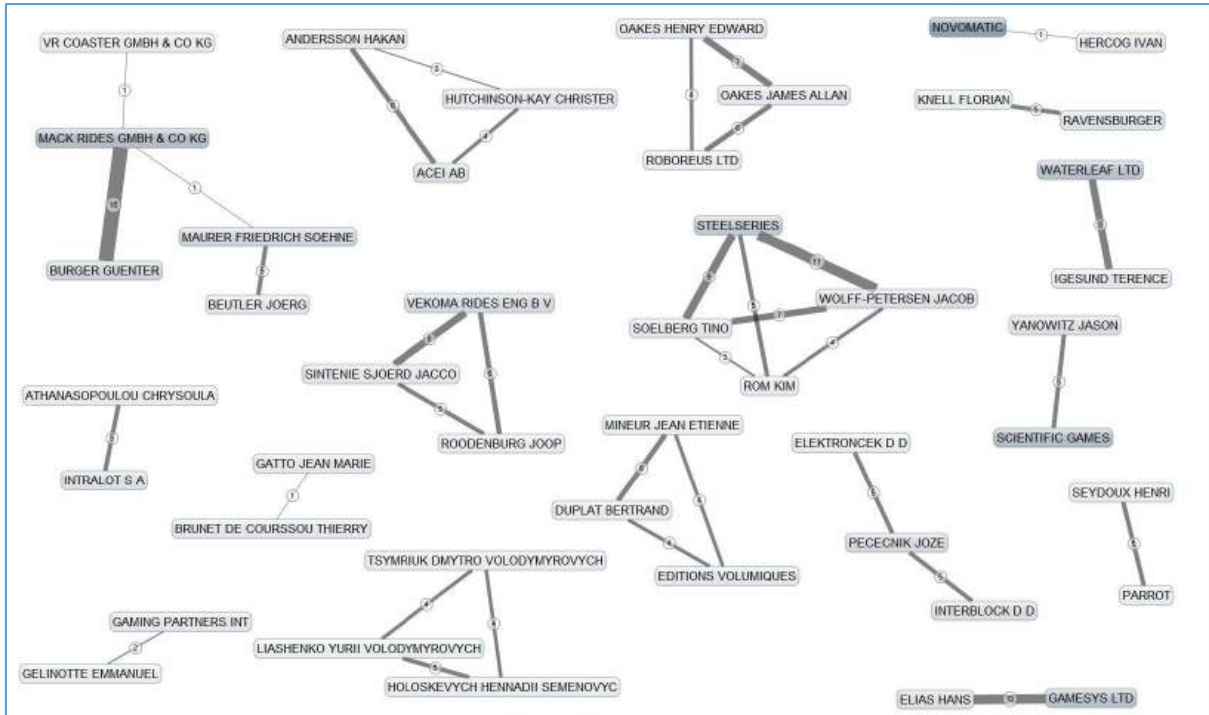


Figure 99: Collaboration diagram, applicants in the Amusement activities sub-sector, 2006-2017<sup>62</sup>  
(assignee frequency from 5, pairs frequency from 1)

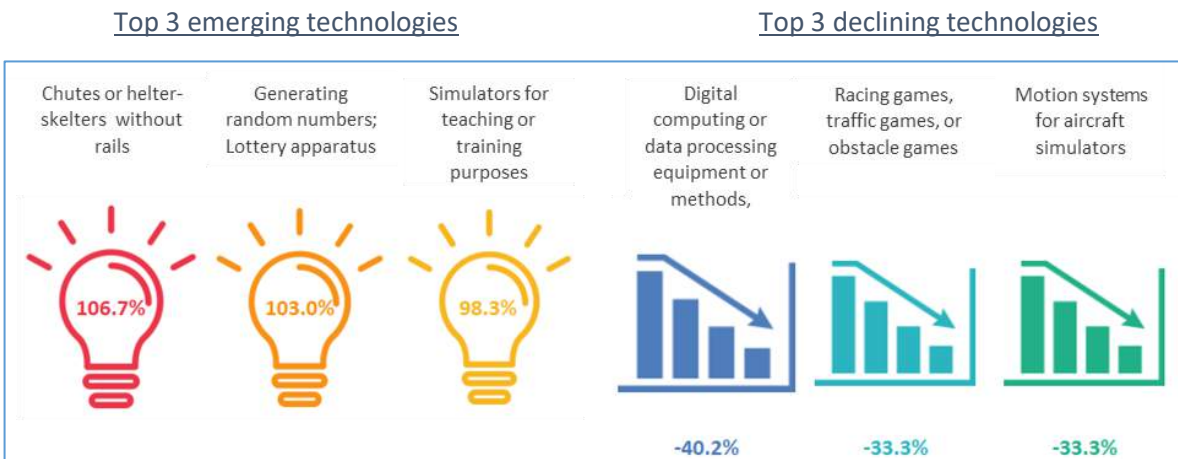


Figure 100: Top 3 emerging and declining technologies, Amusement activities sub-sector, 2012-2016<sup>63</sup>

<sup>62</sup> The thickness of the links between applicants are representatives of their intensity. Frequency is noted on each link.

<sup>63</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

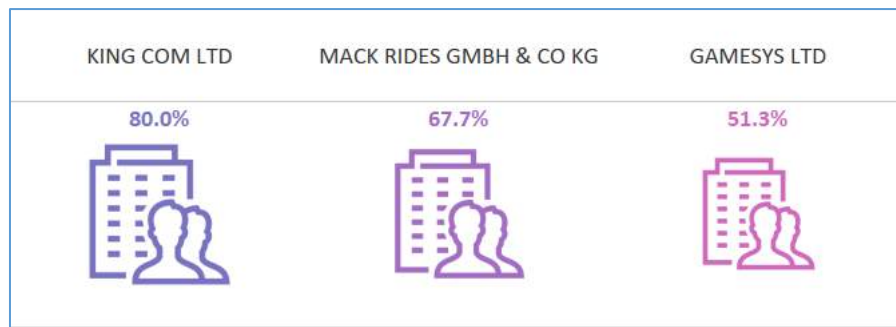


Figure 101: Top 3 most dynamic applicants, Amusement activities sub-sector, 2012-2016<sup>64</sup>

### Summary

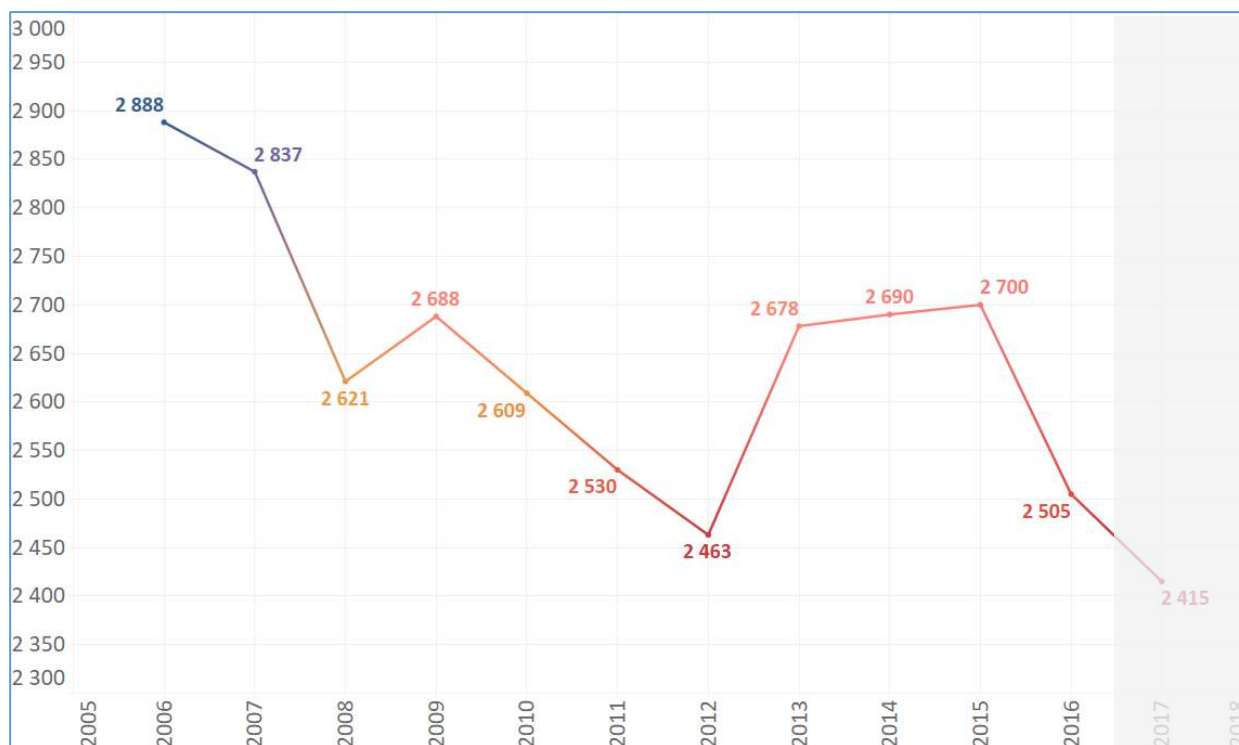
The Amusement activities sub-sector, which ranks 8<sup>th</sup>, has followed a downward trend in its patenting activity since 2006. The three leading countries of this sub-sector – namely Germany, Great Britain and France – experienced a decline of their patenting activity, contributing to the general trend.

The main technological area concerned in this sub-sector is related to games using electronic circuits, and this has declined sharply since 2006.

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<sup>64</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

### 3.8. Fashion

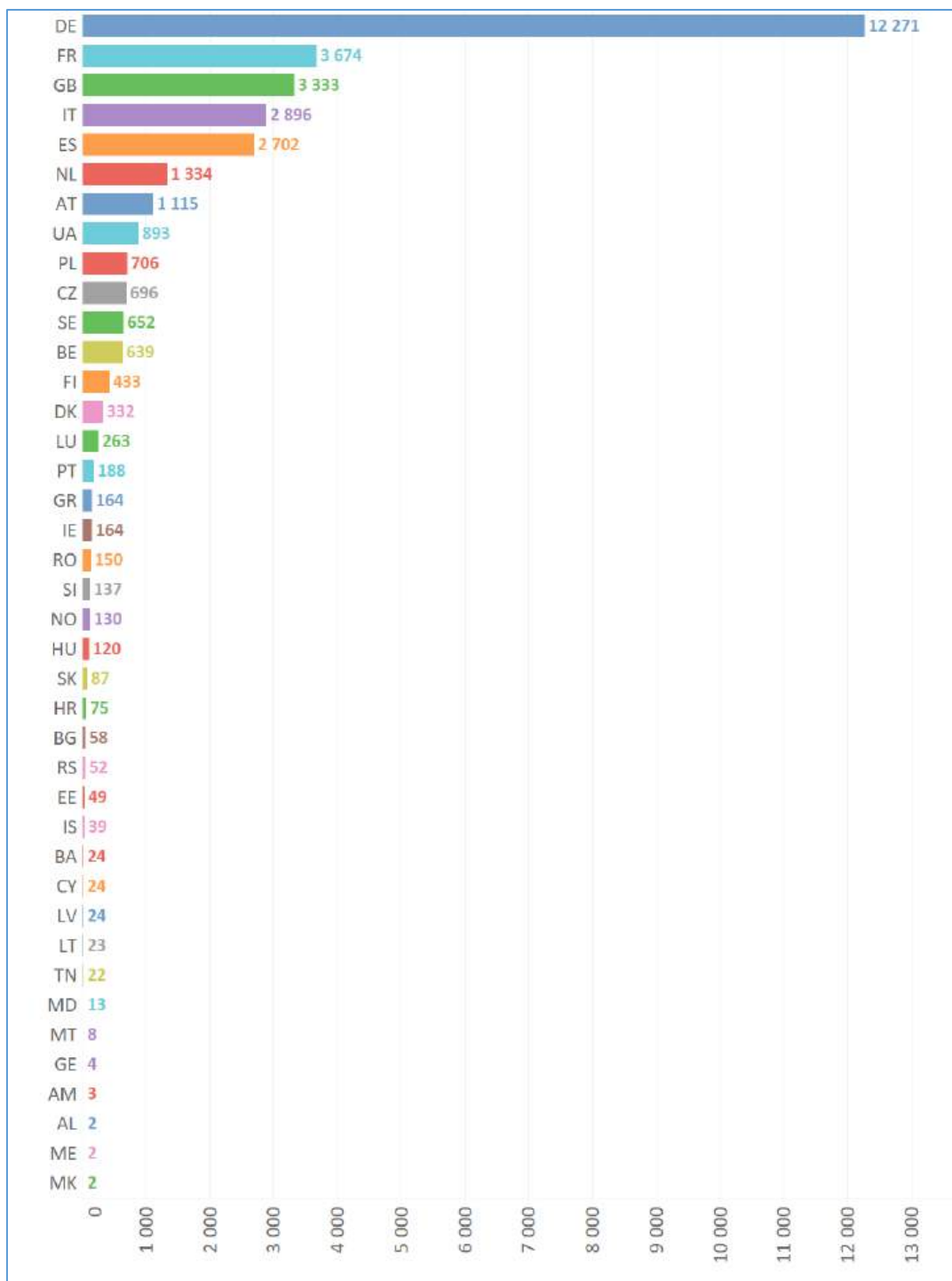


**Figure 102: Evolution of patent filings, Fashion sub-sector**

Source: PATSTAT, calculations: IPIL

With 31 604 patents to its credit, Fashion is in second place among the CCIs, behind the Architecture sub-sector. It represents 22.0% of all patented inventions in the CCIs over the 12 years under review. This result is in line with expectations, as the Fashion sector includes for instance technical/functional textiles, which is substantially related to technological developments and thus, to patenting.

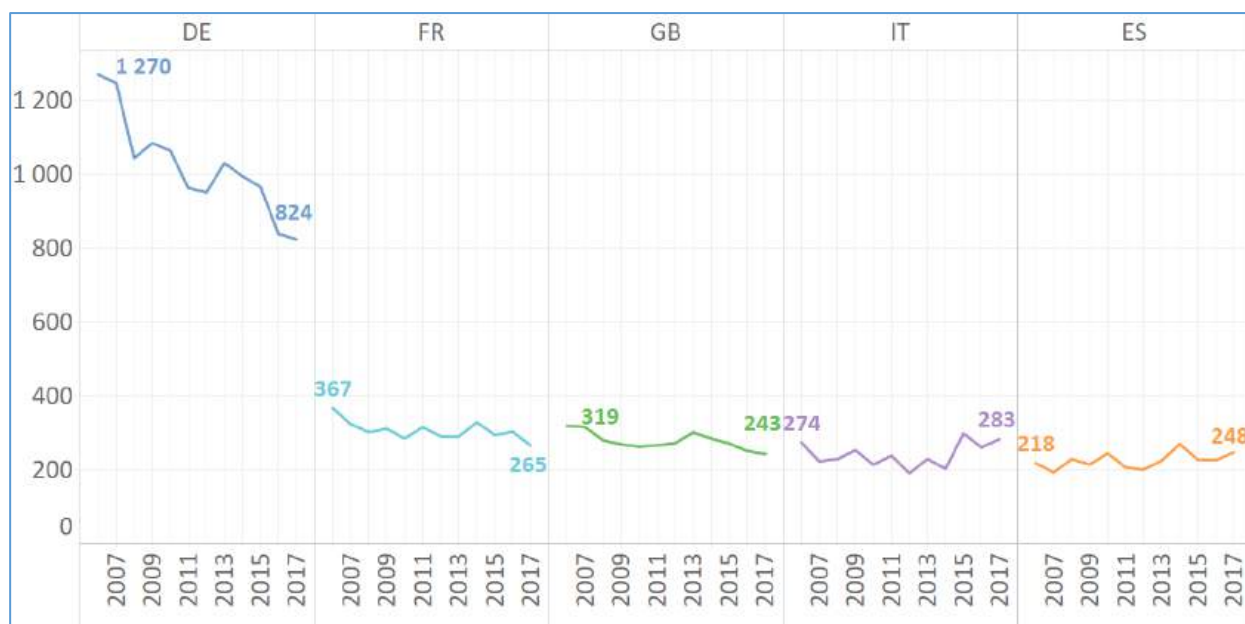
The total number of inventions patented decreased during the twelve years under review, from 2 888 in 2006 to 2 415 in 2017.



**Figure 103: Number of patents by country, Fashion sub-sector, 2006-2017**

Source: PATSTAT, calculations: IPIL

The country analysis for the Fashion sub-sector highlights that Germany is the leading country in terms of patented inventions, with 38.8% of all patented inventions in the CCIs. This reflects its technical capacity in functional textiles, which is closely related to chemistry, one of the most developed sectors in Germany. Following Germany’s strong lead, France, Great Britain, Italy, and Spain are closely grouped together.



**Figure 104: Evolution of patent filings, Fashion sub-sector for the top 5 countries**

Source: PATSTAT, calculations: IPIL

Despite leading the sub-sector, Germany showed a marked slowdown over the 2006-2017 period, while the other countries in the top 5 (France, Great Britain, Italy, Spain) remained broadly stable, but still far from Germany in terms of overall figures.

**Table 19: Patented technologies, Fashion sub-sector, top 5, 2006-2017**

Technologies	Number of patents	%
Professional, industrial or sporting protective garments	1 025	3.2
Non-woven fabrics	975	3.1
Woven fabrics	952	3.0
Soles	734	2.3
Woven fabrics to make specified articles	709	2.2

The analysis of the technologies clearly shows that protective garments are most significant with 3.2% of all patented inventions in the sub-sector, closely followed by the non-woven and woven fabrics. We can also note that the sub-sector is quite diversified, with no technological area standing out in the lead (max at 3.2% for protective garments).

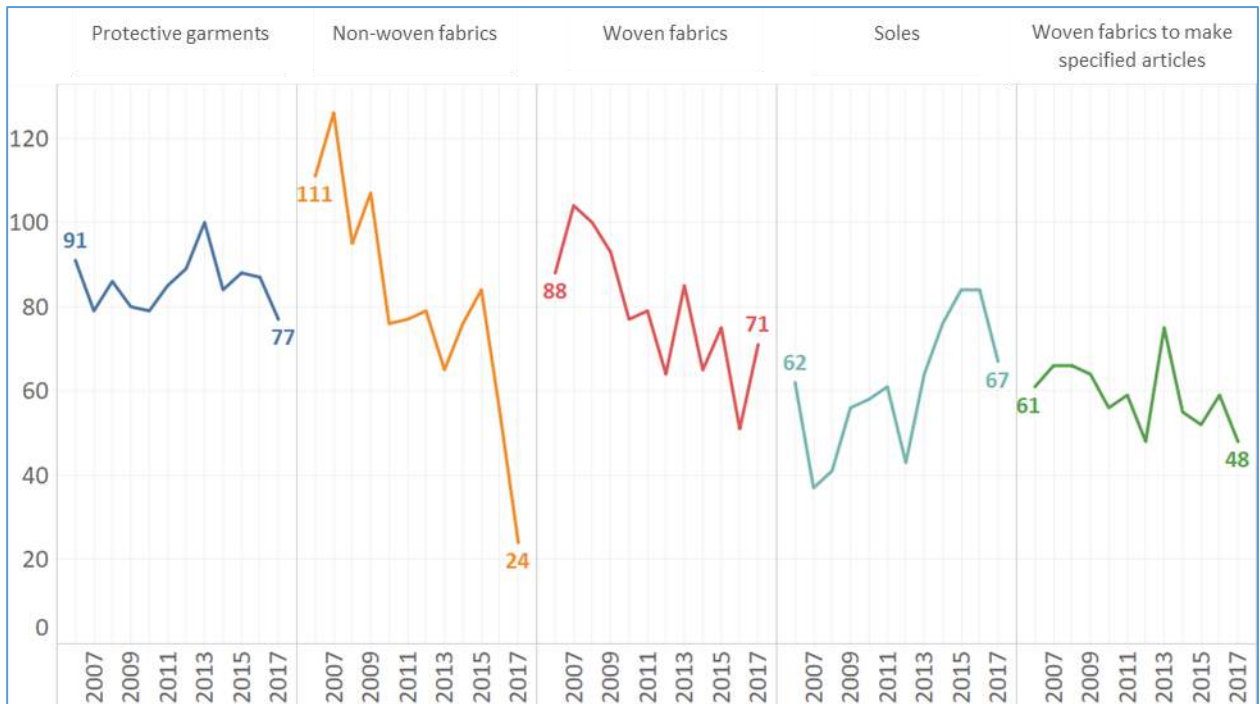


Figure 105: Evolution of top 5 IPC classes at group level, Fashion sub-sector, 2006-2017

Source: PATSTAT, calculations: IPIL

The number of patented inventions for protective garments and for woven fabrics to make specified articles remained broadly stable over the 12 years under review, while the other technologies were more erratic.

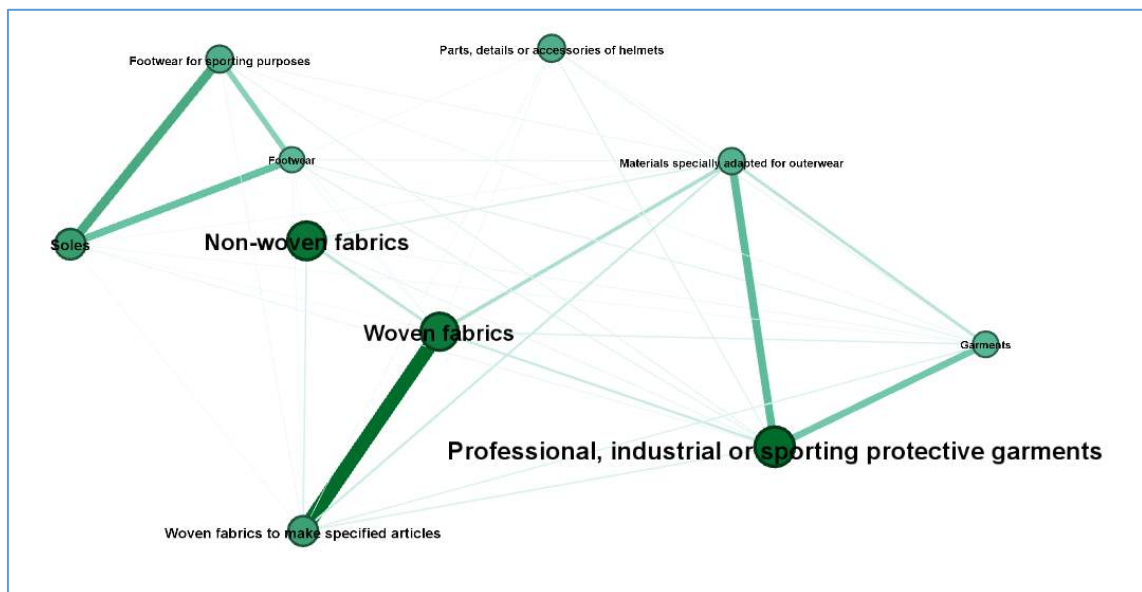


Figure 106: Relationship diagram, top 10 technologies, Fashion sub-sector, 2006-2017<sup>65</sup>

(frequency range 541 – 1 025)

<sup>65</sup> The intensity of the colour in the circle as well as the font sizes are representative of the frequencies of the technologies in our set of patent applications. The thickness of the links represents relationship intensity (frequency).



Three distinct technological areas can be identified in the patents filed:

- woven and non-woven fabrics;
- protective garments; and
- soles for (sport) footwear.

The top applicants are mainly from the textile/knitting and footwear industry:

<b>Applicant</b>	<b>Number of patents</b>
KYIV NAT UNIV TECH & DESIGN	440
NIKE	399
VOITH PATENT GMBH	248
SALOMON	171
ADIDAS	168
BAYERISCHE MOTOREN WERKE AG	166
GROZ BECKERT KG	127
AIRBUS	116
FREUDENBERG CARL KG	116
MAYER TEXTILMASCHF	115

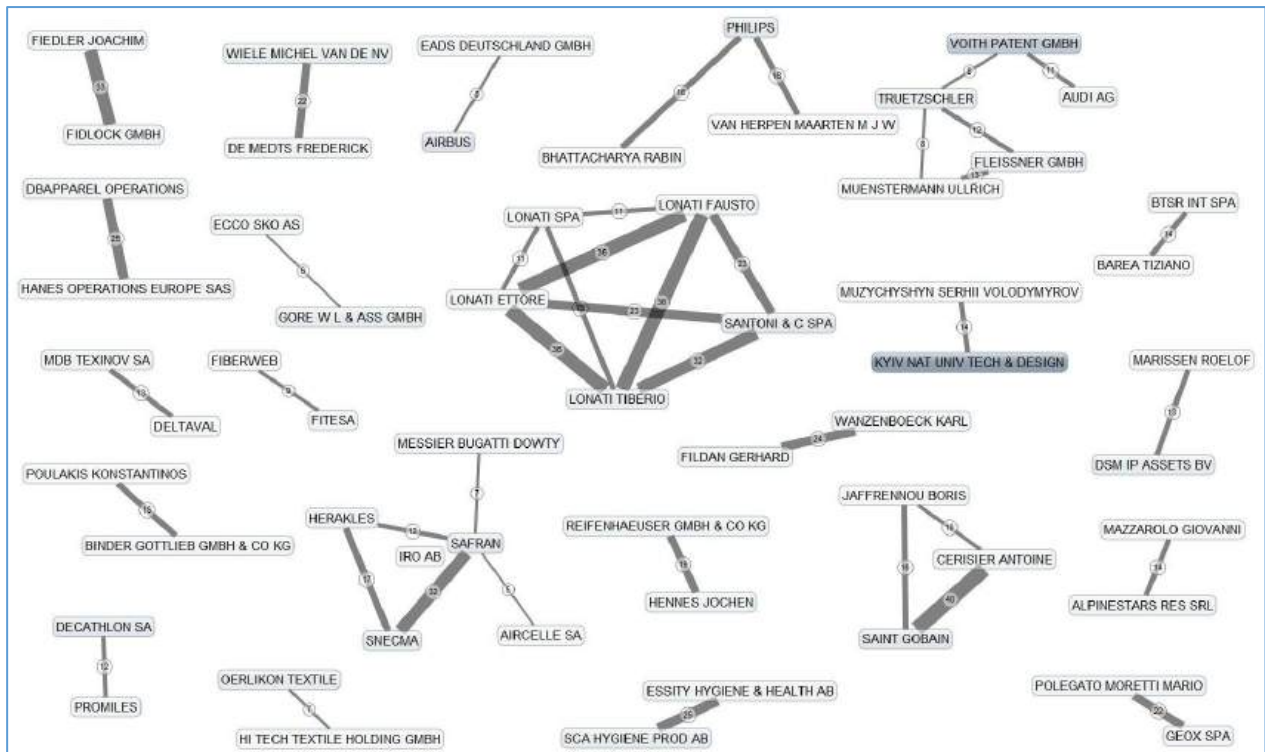
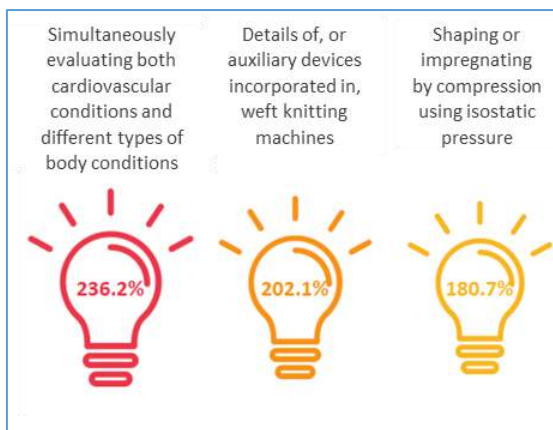


Figure 107: Collaboration diagram, applicants in the Fashion sub-sector, 2006-2017<sup>66</sup>  
(assignee frequency from 14, pairs frequency from 5)

We can see a major cooperation between companies in the sector, without noting any unexpected connections.

Top 3 emerging technologies



Top 3 declining technologies

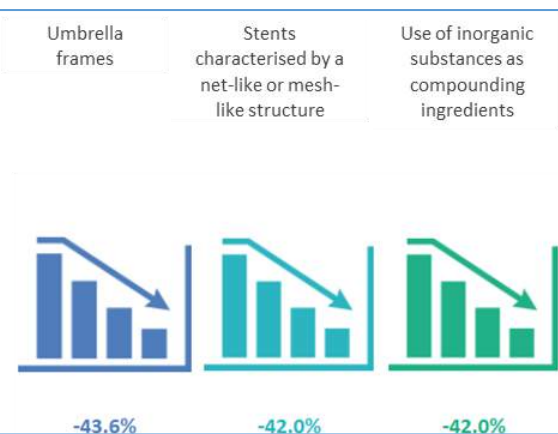


Figure 108: Top 3 emerging and declining technologies, Fashion sub-sector, 2012-2016<sup>67</sup>

<sup>66</sup> The thickness of the links between applicants are representatives of their intensity. Frequency is noted on each link.

<sup>67</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

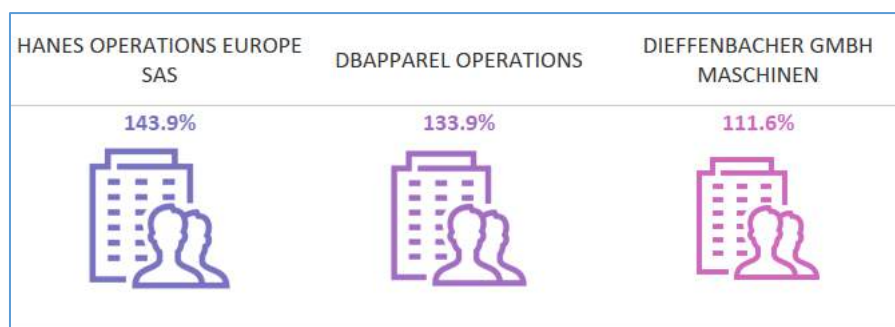


Figure 109: Top 3 most dynamic applicants, Fashion sub-sector, 2012-2016<sup>68</sup>

### Summary

This sub-sector, which ranks 2<sup>nd</sup> among CCIs, recorded a downward trend in its patenting activity between 2006 and 2017. Germany has the highest inventive activity in this sub-sector, followed by France and Great Britain.

The main technological areas concerned are related to professional, industrial or sporting protective garments. The detailed analysis reveals that the woven fabrics are the most patented in this subgroup. Another important group of patented technologies concerned the footwear area. We also note the emergence of technologies for evaluating body conditions (e.g. anti-bacterial textiles, or garments with sensor for health monitoring etc.).

<sup>68</sup> Methodology: ranking in descending order of the average annual growth rates over the 5-year period from 2012 to 2016. The year 2017 was not included due to incomplete data.

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## ANNEX: NACE codes - IPC codes in the CCIS

Sub-sectors	VVA Report	IPC (WIPO) - incl. explanations
<b>Advertising</b>	<p><b>M 70.21</b> Public relations and communication services</p> <p><b>M 73.11</b> Advertising agencies</p> <p><b>M 73.12</b> Media representation</p>	<p><b>G09F without G09F1, G09F3, G09F7/18, G09F9</b> -Displaying; advertising; signs; labels or name-plates; seals</p> <p><b>Exceptions</b> -Cardboard or like show-cards of foldable or flexible material -Labels, tag tickets, or similar identification or indication means; Seals; Postage or like stamps -Signs, name or number plates, letters, numerals, or symbols; Panels or boards, Means for attaching signs -Indicating arrangements for variable information in which the information is built-up on a support by selection or combination of individual elements</p> <p><b>Explanations</b> These IPC groups cover optimally the activities of the selected NACE classes.</p>
<b>Architecture</b>	<b>M 71.11</b> Architectural activities	<p><b>EE04, E01C1, E01D without E04G and E01D/101</b> -Buildings -Design or layout of roads, e.g. for noise abatement, for gas absorption -Bridges</p> <p><b>Exceptions</b> -Scaffolding; forms; shuttering; building implements or other building aids, or their use; handling building materials on the site; repairing, breaking-up or other work on existing buildings; -Material constitution of bridges</p> <p><b>Explanations</b> For this segment, it is relevant to select in the IPC codes all inventions relating to buildings and their restoration with the exception of scaffolding</p>
<b>Archives, libraries, cultural heritage &amp; amusement activities</b>	<p><b>R 91.01</b> Library and archives activities</p> <p><b>R 91.02</b> Museums activities</p> <p><b>R 91.03</b> Operation of historical sites and buildings and similar visitor attractions</p> <p><b>R 93.21</b> Activities of amusement parks and theme parks</p> <p><b>R 93.29</b> Other amusement and recreation activities</p>	<p><b>G06F16/11, B44D7, D21H25/18, E04G23/02</b> -Information retrieval; Database structures therefor; File system structures therefor; file system administration, e.g. details of archiving or snapshots -Preserving paintings, e.g. by varnishing -After-treatment of paper of old paper as in books or documents, e.g. restoring -Working measures on existing buildings; Repairing, e.g. filling cracks; Restoring; Altering; Enlarging</p> <p><b>Explanations</b> In these segments, each of the sub-segments was analysed in detail in order to find the best matches with the IPC codes. Thus, NACE library and archives activities are covered by the IPC code whose object is the after-treatment of special paper not otherwise provided. The museums activities are partially covered by the IPC preserving paintings group, due to the absence of other activities which could be the subject of innovations in museums.</p> <p><b>-A63D, A63F and A63G without A63F13</b> -Bowling games, e.g. skittles, bocce or bowls; installations therefor; bagatelle or similar games; billiards</p>

		<p>-Card, board or roulette games; indoor games using small moving playing bodies; video games; games not otherwise provided for</p> <p>-Merry-go-rounds; swings; rocking-horses (swings or rocking horses as nursery)</p> <p><b>Exception</b></p> <p>-Video games, i.e. games using an electronically generated display having two or more dimensions</p> <p><b>Explanations</b></p> <p>The NACE codes that contain activities of amusement parks, theme parks and other amusement and recreation activities are covered by all IPC classes that include these types of recreational activities, with the exception of beach activities, the installation of pleasure transport, skiing and the operation of dance floors which are activities for which there is no category in the IPC codification.</p>
<b>Books &amp; press</b>	<p><b>C 18.11</b> Printing of newspapers</p> <p><b>C 18.12</b> Other printing</p> <p><b>C 18.13</b> Pre-press and pre-media services</p> <p><b>C 18.20</b> Reproduction of recorded media</p> <p><b>G 47.61</b> Retail sale of books in specialised stores</p> <p><b>G 47.62</b> Retail sale of newspapers and stationery in specialised stores</p> <p><b>G 47.79</b> Retail sale of second-hand goods in stores</p> <p><b>J 58.11</b> Book publishing</p> <p><b>J 58.13</b> Publishing of newspapers</p> <p><b>J 58.14</b> Publishing of journals and periodicals</p> <p><b>J 63.91</b> News agency activities</p> <p><b>M 74.30</b> Translation and interpretation activities</p>	<p><b>B42 Bookbinding; albums; files; special printed matter</b></p> <p><b>Explanations</b></p> <p>The NACE class selected to describe the activities within these sectors in the VVA Report are partially covered by the IPC division and subgroups due to the fact that wider coverage would have led to the selection of actors who have activities that are not in line with cultural and creative activities but with IT companies.</p>
<b>Cultural education</b>	<p><b>P 85.52</b> Cultural education</p>	<p><b>G09B11, G09B15, G09B19/10, G09B19/20 without G09B11/08</b></p> <p>-Teaching handwriting, shorthand, drawing, or painting</p> <p>- Teaching music</p> <p>-Teaching not covered by other main groups of this subclass, modelling</p> <p>-Teaching not covered by other main groups of this subclass, needlework</p> <p><b>Exception:</b></p> <p>-Teaching shorthand</p> <p><b>Explanations</b></p> <p>This segment is partially covered by the IPC codes due to the fact that there are no subgroups in the WIPO classification in the fields of dance education, theatre education, performing arts education and photography education. It is important to note that inventions in teaching painting, music, modelling and needlework which are relevant activities in this sector have been fully covered by the IPC.</p>
<b>Design, visual arts &amp; photography</b>	<p><b>M 74.10</b> Specialised design activities</p> <p><b>M 74.20</b> Visual arts</p>	<p><b>B44, D06C23 and A63H</b></p> <p>-Decorative arts</p> <p>-Finishing, dressing, tenting or stretching textile fabrics; making patterns or design on fabrics</p> <p>-Toys e.g. tops, dolls, hoops or building blocks</p> <p><b>Explanations</b></p> <p>The IPC codes cover the NACE classes due to the fact that the decorative arts constitute design activities in and of themselves. Toys were included in this category both because of their creative nature and the design component they contain. We have to keep in mind that this sector is much</p>

		larger than what this table shows because it is diluted in the other sectors.
		<p><b>G03B</b></p> <p>-Apparatus or arrangements for taking photographs or for projecting or viewing them; apparatus or arrangements employing analogous techniques using waves other than optical waves; accessories therefor.</p> <p><b>Explanation</b></p> <p>This segment is perfectly covered by the IPC code.</p>
<b>Music</b>	<p><b>C 32.20</b> Manufacture of musical instruments</p> <p><b>G 47.63</b> Retail sale of music and video recordings in specialised stores</p> <p><b>J 59.20</b> Sound recording and music publishing activities</p>	<p><b>G10 and H04H 60/04 without G10K and without G10L</b></p> <p>-Musical instruments; acoustics</p> <p>-Arrangements for broadcast applications with a direct linkage to broadcast information or to broadcast space-time; Broadcast-related systems</p> <p><b>Exceptions</b></p> <p>-Sound-producing devices; methods or devices for protecting against, or for damping, noise or other acoustic waves in general; acoustics not otherwise provided for</p> <p>-Speech analysis or synthesis; speech recognition; speech or voice processing; speech or audio coding or decoding</p> <p><b>Explanations</b></p> <p>The IPC codes perfectly cover this sector with the exception of its commercial activities (e.g. retail sale of sporting music equipment). The absence of these latter activities is not in itself problematic because they do not have "patentable" characteristics as it is a sales activity.</p>
<b>Performing arts &amp; artistic creation</b>	<p><b>R 90.01</b> Performing arts</p> <p><b>R 90.02</b> Support activities to performing arts</p> <p><b>R 90.03</b> Artistic creation</p> <p><b>R 90.04</b> Operation of arts facilities</p>	<p><b>A63J and F21W131/406</b></p> <p>-Devices for theatres, circuses, or the like; conjuring appliances or the like</p> <p>-Use or application of lighting devices or systems not provided for in groups: for theatres, stages or film studios</p> <p><b>Explanation</b></p> <p>This segment is partially covered by the IPC codes because the NACE that covers artistic creations is diluted in the other IPC segments, for example in the <i>Design&amp;Visual</i> works sector, which includes CPI B44.</p>
<b>Radio TV &amp; film</b>	<p><b>J 60.10</b> Radio broadcasting</p> <p><b>J 60.20</b> Television programming and broadcasting activities</p> <p><b>J 59.11</b> Motion picture, video &amp; television programme production activities</p> <p><b>J 59.12</b> Motion picture, video and television programme post-production activities</p> <p><b>J 59.13</b> Motion picture, video and television programme distribution activities</p> <p><b>J 59.14</b> Motion picture projection activities</p> <p><b>N 77.22</b> Renting of video tapes and disk</p>	<p><b>H04H, H04N</b></p> <p>-Broadcast communication</p> <p>-Pictorial communication, e.g. television</p> <p><b>Explanation</b></p> <p>This segment is covered by the IPC groups that match with NACE classes.</p>
<b>Software &amp; games</b>	<p><b>J 58.21</b> Publishing of computer games</p> <p><b>J 58.29</b> Other software publishing</p> <p><b>J 62.01</b> Computer programming activities</p>	
<b>Fashion</b>	<p><b>C 13.20</b> Weaving of textiles</p> <p><b>C 13.30</b> Finishing of textiles</p> <p><b>C 14.11</b> Manufacture of leather clothes</p> <p><b>C 14.12</b> Manufacture of workwear</p> <p><b>C 14.13</b> Manufacture of other outerwear</p> <p><b>C 14.14</b> Manufacture of underwear</p> <p><b>C 14.19</b> Manufacture of other wearing apparel and</p>	<p><b>D03D, D03J, D04, D05, D06C, D06Q, A41B, A41C, A41D, A41F, A41G, A41H3, A41H5, A42, A43, A44, A45B and A45C without A41G1 and A43B7</b></p> <p>-Woven fabrics; methods of weaving; looms</p> <p>-Auxiliary weaving apparatus; weavers' tools; shuttles</p> <p>-Braiding; lace-making; knitting; trimmings; non-</p>



	<p>accessories</p> <p><b>C 14.20</b> Manufacture of articles of fur</p> <p><b>C 14.31</b> Manufacture of knitted and crocheted hosiery</p> <p><b>C 14.39</b> Manufacture of other knitted and crocheted apparel</p> <p><b>C 15.11</b> Tanning and dressing of leather; dressing and dyeing of fur</p> <p><b>C 15.12</b> Manufacture of luggage, handbags and the like, saddlery and harness</p> <p><b>C 15.20</b> Manufacture of footwear</p> <p><b>C 32.12</b> Manufacture of jewellery and related articles</p> <p><b>C 32.13</b> Manufacture of imitation jewellery and related articles</p> <p><b>G 46.16</b> Agents involved in the sale of textiles, clothing, fur, footwear and leather goods</p> <p><b>G 46.42</b> Wholesale of clothing and footwear</p> <p><b>G 46.48</b> Wholesale of watches and jewellery</p> <p><b>G 47.71</b> Retail sale of clothing in specialised stores</p> <p><b>G 47.72</b> Retail sale of footwear and leather goods in specialised stores</p> <p><b>G 47.77</b> Retail sale of watches and jewellery in specialised stores</p>	<p>woven fabrics</p> <p>-Sewing; embroidering; tufting</p> <p>-Finishing, dressing, tenting or stretching textile fabrics</p> <p>-Decorating textiles</p> <p>-Shirts; underwear; baby linen; handkerchiefs</p> <p>-Personal or domestic articles: corsets; brassières</p> <p>-Personal or domestic articles: outerwear; protective garments; accessories</p> <p>-Personal or domestic articles: garment fastenings; suspenders</p> <p>-Personal or domestic articles: artificial flowers; wigs; masks; feathers</p> <p>-Patterns for cutting-out; Methods of drafting or marking-out such patterns, e.g. on the cloth</p> <p>-Dress forms; Bust forms; Stands</p> <p>-Personal or domestic articles: headwear</p> <p>-Personal or domestic articles: footwear</p> <p>-Personal or domestic articles: haberdashery; jewellery</p> <p>-Personal or domestic articles: walking sticks; umbrellas; ladies' or like fans</p> <p>-Personal or domestic articles: purses; luggage; hand carried bags</p> <p><b>Exceptions</b></p> <p>-Artificial flowers, fruit, leaves, or trees; Garlands</p> <p>-Footwear with health or hygienic arrangements</p> <p><b>Explanations</b></p> <p>This sector is perfectly covered by the IPC codes except for the NACE classes G47.71 (retail sale of clothing in specialised stores), G47.72 (Retail sale of footwear and leather goods in specialised stores) and G47.77 (Retail sale of watches and jewellery in specialised stores) because these classes are not covered by patentable invention as they concern retail sale of clothing, footwear and leather goods, watches and jewellery in specialised stores. These sales activities are not patentable.</p>
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Finance, Learning, Innovation and Patenting for CClS

## ■ **REPORT - III**

### *SURVEY ON PATENTING*

## REPORT-III CONTENTS

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## SURVEY ON PATENTING

### 1. ABOUT THE SURVEY

Uses and practices of different intellectual property (IP) rights are not evenly important for the various activities in the Cultural and Creative Industries (CCIs). Furthermore, the level of knowledge and general perceptions regarding different IP titles (e.g. patents, trademarks, designs, etc.) also vary within the different sub-sectors.

In order to deal with this phenomenon, and to cover one of the aspects of the [Specific Objective 1](#) of the call for the Creative FLIP project, “strengthening the CCIs’ capacities for growth and development through improved access to finance, value recognition, and capacities to capture value from IP for actors in the CCIs”, the “Institut de la Propriété Intellectuelle Luxembourg (IPIL)” has developed a survey aimed at:

- (1) identifying the patenting and IP practices of the CCIs; and
- (2) unveiling their perceptions of patenting and IP in general.

The online survey was run from 24 September 2019 to 13 December 2019 through the web address <https://diagpi.ipil.lu/questionnaire/limesurvey/index.php/851321?lang=en> (closed).

The survey was open to all CCIs actors including companies, individuals, intermediaries and policy makers from the Creative Europe countries, as listed on p. 214 below.

For the purposes of this analysis, it is assumed that the respondents of the survey constitute a representative part of the CCIs.

#### Promotion Campaign

The survey was promoted through different social media channels including the project website, the project’s Facebook account and through LinkedIn. Partners of the Creative FLIP project also promoted the survey through their networks, in their events and on social media channels such as their websites, newsletters and via mailing.



Figure 1: Survey promotion: Social media promotion insert and banner



Figure 2: Survey promotion: Creative FLIP website announcement



Figure 3: Survey promotion: Facebook and LinkedIn posts



 **European IP Helpdesk** • 1st  
Stay Ahead of the Innovation Game  
2mo • 🌐

Are you an artist, a company or public body active in the cultural and creative industry? Take part in the online survey about protecting IPRs in Cultural and Creative Sectors: <http://ow.ly/DSC850wNHyl>



 **Luxembourg Creative Industries Cluster**  
November 5, 2019 • 🌐

Help us to understand your IP practices and to propose measures for an improved management of your most precious assets – your creative works! We are awaiting your inputs :  
👉 <https://diagpi.ipil.lu/questionnaire/limesurvey/index.php/851321...>

The answers will be collected and analysed anonymously, and will be used as an input to report on Patenting practices among CCI and provide recommendations for future policies in this field, within the Creative FLIP project.

Creative FLIP  
Show Attachment

👍 1

 **i-Portus**  
September 27, 2019 • 🌐

📣 Calling all #CCI stakeholders 📣

Help our colleagues from Creative FLIP to understand your #IP practices and to propose measures for improved management of your #creative works!

New #creativeFLIP #survey 📄 is out 📄 📄 <https://gd.lu/7b56wP...>

 **Voices Of Culture**  
September 27, 2019 • 🌐

📣 Calling all #CCI stakeholders 📣

Help our colleagues from Creative FLIP to understand your #IP practices and to propose measures for improved management of your #creative works!

New #creativeFLIP #survey 📄 is out 📄 📄 <https://gd.lu/7b56wP...>

See More  
Show Attachment

👍 6

Figure 4: Stakeholder campaign

## 2. SURVEY IDENTITY

**Name of the survey:** “14 Questions on IP for Creative Industries”

**Duration of the survey:** 24 September 2019 – 13 December 2019

**Target groups:** All actors of the CCIs, namely: artists, entrepreneurs, companies (micro companies, SMEs, large companies), intermediaries (creative networks/hubs, incubators, sectoral organisations, public bodies).

**Target countries:** EU27, Creative Europe and European Neighbourhood Policy (ENP) countries:

- Albania
- Armenia
- Austria
- Belgium
- Bosnia and Herzegovina
- Bulgaria
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Georgia
- Germany
- Greece
- Hungary
- Iceland
- Ireland
- Italy
- Kosovo\*
- Latvia
- Lithuania
- Luxembourg
- Malta
- Moldova
- Montenegro
- Netherlands
- North Macedonia
- Norway
- Poland
- Portugal
- Romania
- Serbia
- Slovakia
- Slovenia
- Spain
- Sweden
- Tunisia
- Ukraine
- United Kingdom

\*This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

### 3. RESULTS OF THE SURVEY

#### 3.1. Survey coverage

##### 3.1.1. Number of responses

70 responses were received in total, 49 of which came from individuals<sup>1</sup> (representing 70% of the respondents) and 21 from CCI intermediaries (representing 30% of total responses). 12 respondents (seven individuals and five intermediaries) did not complete the survey fully. However, their answers have been taken into account in this analysis for the questions to which they responded.

**Table 1: Number of responses**

	Completed	Not completed <sup>2</sup>	TOTAL analysed
<b>Individuals</b>	42	7	49
<b>Intermediaries</b>	16	5	21
<b>TOTAL</b>	<b>58</b>	<b>12</b>	<b>70</b>

##### 3.1.2. Country distribution of the respondents

In total, the respondents represent 16 different countries. Luxembourg's domination is well seen on the list as the project partner IPIL, who carried out the IP-related work package of the Creative FLIP project and developed the survey, is based in Luxembourg.

IPIL promoted the survey in all of its local events, which is thought to be the main reason why Luxembourg is the most represented country despite its small size.

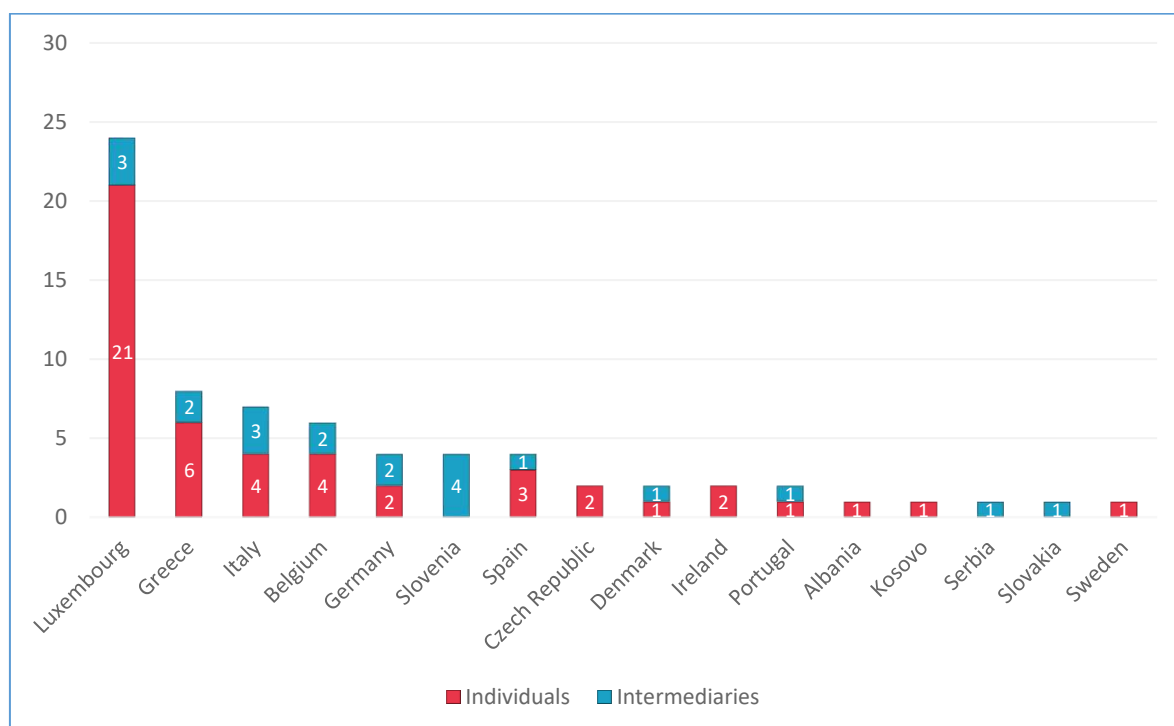
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<sup>1</sup> "Individual" respondents are artists, entrepreneurs, and representatives of micro-companies, SMEs and large companies. "Intermediaries" are classified as creative networks/hubs, incubators, sectoral organisations and public bodies. Respondents were asked the type of their entity at the beginning of the survey.

<sup>2</sup> Seven individuals and five intermediary representatives did not complete the second part of the survey (See fn.8).

**Table 2: Country distribution of survey respondents**

<b>Individuals: Country Distribution (49)<sup>3</sup></b>	Luxembourg	21	<b>Intermediaries: Country Distribution (21)</b>	Slovenia	4
	Greece	6		Luxembourg	3
	Belgium	4		Italy	3
	Italy	4		Greece	2
	Spain	3		Germany	2
	Czech Republic	2		Belgium	2
	Germany	2		Serbia	1
	Ireland	2		Spain	1
	Albania	1		Slovakia	1
	Denmark	1		Portugal	1
	Kosovo	1		Denmark	1
	Portugal	1		<b>TOTAL</b>	<b>21</b>
	Sweden	1			
	<b>TOTAL</b>	<b>49</b>			



**Figure 5: Country distribution of survey respondents**

<sup>3</sup> Numbers in brackets show the total population of the respondents for each specific question.

### 3.1.3. Sub-sector distribution in the population of respondents

Music (21%), Cross-sectoral businesses and organisations (19%) and Design and arts crafts (17%) are the most responsive sub-sectors in our survey. This result is statistically meaningful as Music, and Design and arts crafts might be seen as two of the most IP-relevant sectors within the CCIs. The high proportion from Cross-sectoral businesses is from the intermediaries (13 responses, 19%), mainly creative hubs/networks and umbrella organisations, who have relatively high IP awareness.

On the other hand, the Advertising and the Heritage, archives, museums sectors are the least responsive sub-sectors, both with a 1% response rate. These sectors are not known as the most IP-relevant sectors as they are generally deemed to be *IP-users* rather than *IP-creators*.

**Table 3: Sub-sectors of survey respondents**

CCIs Sub-sector	Individuals	Intermediaries	TOTAL
Music	13	2	15
Cross-sectoral	5	8	13
Design and arts crafts	11	1	12
Visual arts	8	0	8
Education in or research on arts, culture or creativity	3	4	7
Policy making and/or CCIs support	0	5	5
Audio-visual and multimedia	3	1	4
Architecture	2	0	2
Book and Press	2	0	2
Advertising	1	0	1
Heritage, archives, museums	1	0	1

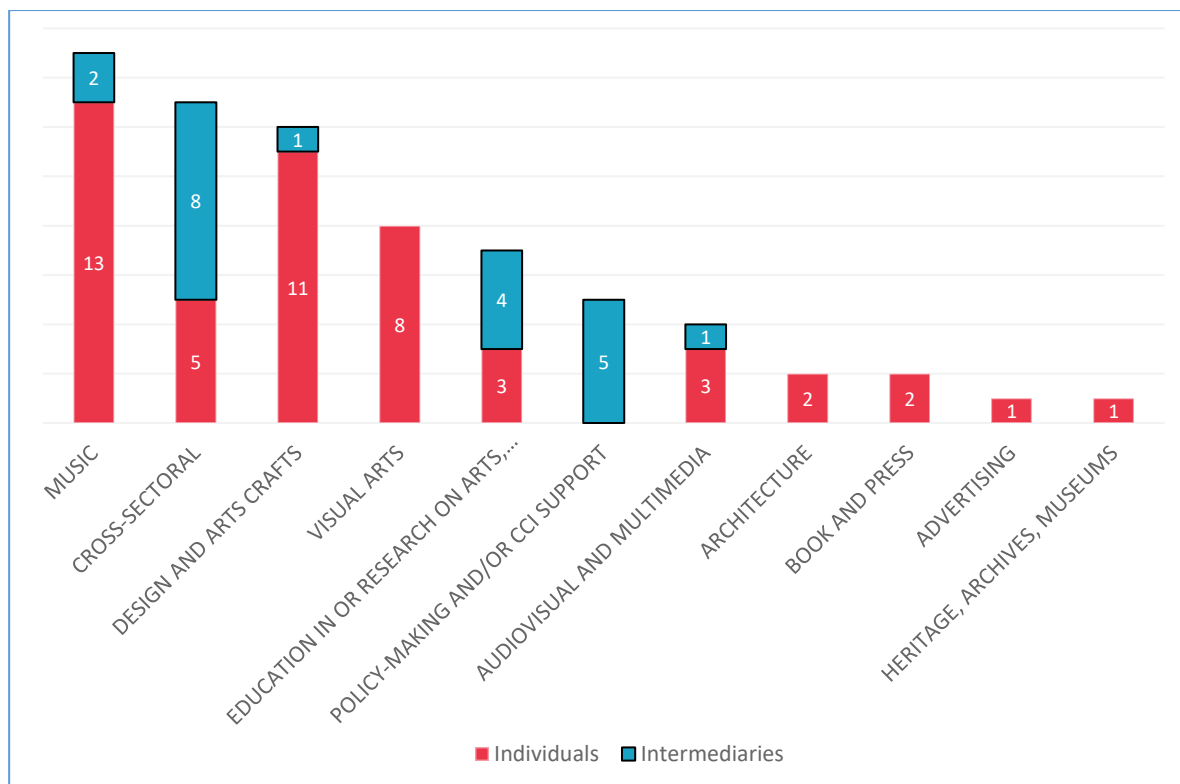


Figure 6: Sub-sector distribution of survey respondents

### 3.2. Inventiveness of the CCIs companies

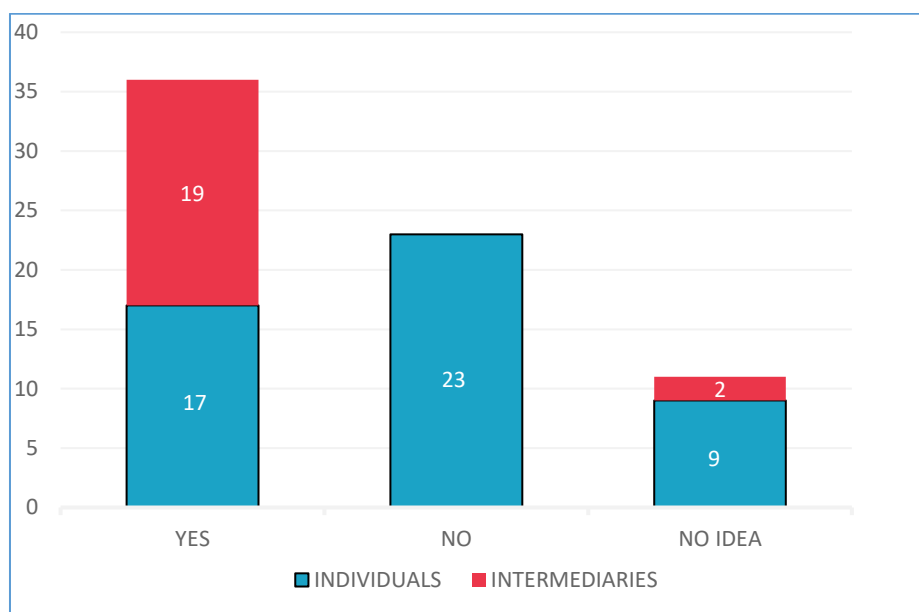
With this question, respondents were asked if they developed inventive or innovative products. This allowed us to understand whether their activities can be subject to patenting.<sup>4</sup>

Most of the companies and individual entrepreneurs believe that their activities cannot be deemed to be “technologically innovative or inventive”. Nevertheless, intermediaries are more “optimistic” in terms of CCIs companies’ invention capacities and their innovation characteristics:

Table 4: Inventiveness of CCIs actors

<b>Individuals:</b> <i>In the framework of your company's activities, do you develop products that can be qualified as technologically innovative/inventive (not necessarily as your main product)? (49)</i>	Yes	17	35%
	No	23	47%
	No idea	9	18%
<b>Intermediaries:</b> <i>In the framework of their activities, do you think the companies in the CCIs sector develop products that can be qualified as technologically innovative/inventive (not necessarily as their main product)? (21)</i>	Yes	19	90%
	No	0	0%
	No idea	2	10%

<sup>4</sup> In order for a product or process to be patented, it needs to be novel and inventive, i.e. to involve an inventive step. The third criterion is called “industrial applicability”.



**Figure 7: Inventiveness of CCIs actors**

Overall, 36 out of 70 respondents in the sector (51%) believe that the actors in the CCIs develop technologically innovative or inventive products. However, the relatively large ratio of “no idea” (16% in total) shows that the sector has a lack of knowledge on what qualifies as innovative/inventive and what does not. This is an early result showing the limited awareness of IP within the sector, which will be confirmed by another finding later in this analysis.

When different CCIs sub-sectors are assessed for this question, we see that “Education in or research on arts, culture or creativity” is the most innovative sector (with 6 positive answers), and Design and arts crafts is the least innovative sector (with 7 negative answers). This may be because although the Design and craft industry is an IP-intensive sector, it is mainly based on developing original designs (i.e. subject to copyright and/or design protection) rather than developing technological products (i.e. subject to patenting).

### 3.3. Current use of IP rights

The question of current IP rights usage was asked to discover which types of IP titles CCIs actors are currently using or are aware of.

As expected, for both individuals and intermediaries, the results show that the CCIs actors by far prefer to use copyright as an IP protection measure while patenting is the less popular IP title in the sector.

Patenting has never been used by 55% of individuals and companies in the CCIs, and 14% of the intermediaries believe that patenting is not a tool being used by the companies.

Remarkably, 31% of the individuals stated that they have never used trademark protection, which is (should be) the main IP title in commercialisation activities to differentiate products and services from others.

This might again be a sign of lack of general IP knowledge and commercialisation strategy in the sector among individual artists and small companies, since the intermediaries' ratio for non-use of trademarks is literally zero (i.e. trademark registration is used -at least to some extent- as an IP tool in the sector).

**Table 5: Current use of IP rights (individuals)**

		Integral part of my business	When needed	Rarely	Never	No idea
<b>Individuals:</b> <i>How often do you use the below protection methods in your current business? (49)</i>	Trademark	14	8	7	15	5
		29%	16%	14%	31%	10%
	Design	15	10	5	12	7
		31%	20%	10%	24%	14%
	Copyright	25	10	5	7	2
		51%	20%	10%	14%	4%
	Patent	8	6	4	27	4
		16%	12%	8%	55%	8%

**Table 6: Current use of IP rights (intermediaries)**

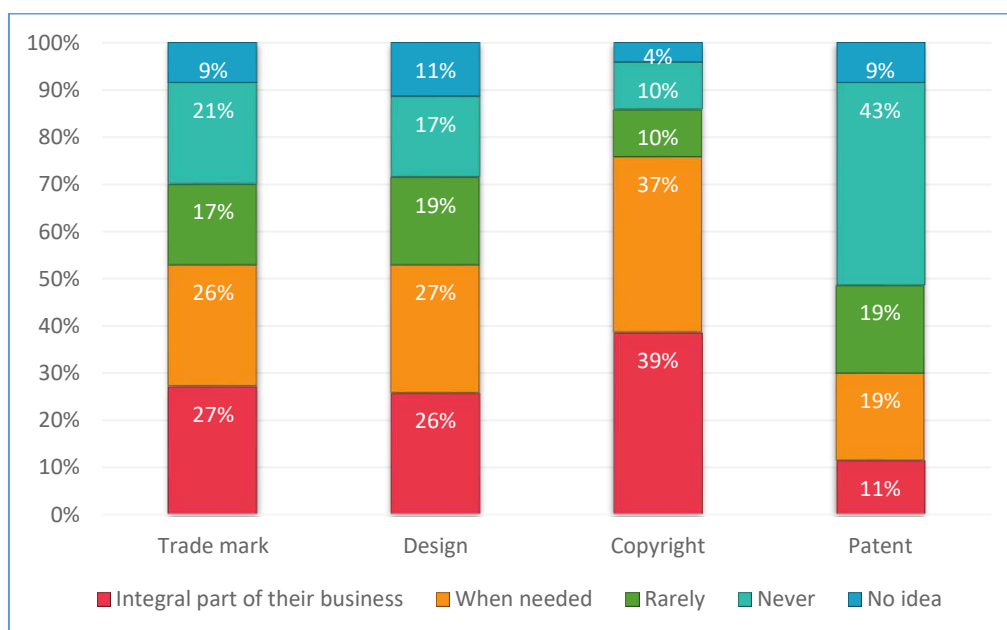
		Integral part of my business	When needed	Rarely	Never	No idea
<b>Intermediaries:</b> <i>According to your knowledge, do the companies in the CCI sector use the below protection methods? (21)</i>	Trademark	5	10	5	0	1
		24%	48%	24%	0%	5%
	Design	3	9	8	0	1
		14%	43%	38%	0%	5%
	Copyright	2	16	2	0	1
		10%	76%	10%	0%	5%
	Patent	0	7	9	3	2
		0%	33%	43%	14%	10%



When the overall results are considered (see Table 7 below), patenting is used effectively (as an integral part of their business and when needed) by only 30% of total respondents, meaning that 2/3 of the sector has not used or rarely uses patenting as an IP tool, and almost one out of ten CCI actors has no idea about patenting.

**Table 7: Current use of IP rights, overall results (individuals and intermediaries)**

		Integral part of my business	When needed	Rarely	Never	No idea
<b>Individuals + Intermediaries: Companies in the CCIs sector using IPR protection methods, overall (70)</b>	Trademark	19	18	12	15	6
		27%	26%	17%	21%	9%
	Design	18	19	13	12	8
		26%	27%	19%	17%	11%
	Copyright	27	26	7	7	3
		39%	37%	10%	10%	4%
	Patent	8	13	13	30	6
		11%	19%	19%	43%	9%



**Figure 8: Use of IP titles by CCI actors**

When we dig deeper into the sub-sectoral analysis for the patent users<sup>5</sup> (Table 8), we see that cross-sectoral businesses are the most patent-prone companies. This can be considered an unsurprising result as CCI's are not generally by themselves patent-intensive, but CCI's businesses having activities interrelated to other sectors (or as a result of a cooperative project) do use patents. Design and arts crafts are the first runners-up in the patent users ranking (18% of patent users) and the Music industry is next with 15%.

**Table 8: Patent user CCI's (individuals and intermediaries)**

	# patent users	Proportion in the whole patent user sectors (of 34 patent users)
Cross-sectoral	9	26%
Design and arts crafts	6	18%
Music	5	15%
Others	14	41%

An additional analysis<sup>6</sup> has been made for the sub-sectors to reveal which ones are the most “never-IP using” sectors amongst the respondents to the above question 3.3.

The results show that the Visual arts sector is the less patent-prone sector. We see from Table 9 below that 23% of the (30) non-patent users are from the Visual arts sector, and 88% of the Visual arts sector has never used patenting (i.e. proportion of the Visual arts sector respondents who declared that they have never used patenting within the total Visual arts sector respondents).

**Table 9: Most never-IP using sub-sectors in the CCI's by IP title**

	Most "never-IP" using sectors	# non-users	Proportion in the whole non-patent user sectors	Proportion in its industry
<b>TRADEMARK</b>	Design and arts crafts	6	40% (of 15 TM non-users)	50%
<b>DESIGN</b>	Music	6	50% (of 12 design non-users)	40%
<b>COPYRIGHT</b>	Design and arts crafts	3	43% (of 7 copyright non-users)	25%
<b>PATENT</b>	Visual arts	7	23% (of 30 patent non-users)	88%

<sup>5</sup> This analysis has been made on the 34 patent users who responded positively to the above question 3.3, i.e. who declared they used patenting “as an integral part of their businesses”, “when needed”, or “rarely” (at least once). See Table 7.

<sup>6</sup> This analysis has been made on the users who responded negatively to the above question 3.3, i.e. who declared they never used IP rights. See Table 7.

### 3.4. Benefits of patenting

This question was asked only to the users of the patenting system. Therefore, 34 participants were asked this question (18 individuals and 16 intermediaries), who answered the previous question 3.3 positively as “an integral part of my business”, “when needed” and “rarely”.

**Table 10: Benefits of patenting (individuals)**

		Yes	No
<b>Individuals:</b> Has any of your patents created any added value to your business? (18)  Asked only to the patent users – Question 3.3 Table 5	Increased turnover	2	10
		11%	56%
	Increased company value/reputation	9	3
		50%	17%
	Access to new markets (licensing, etc.)	4	8
		22%	44%
	I don't know	6	
		33%	

**Table 11: Benefits of patenting (intermediaries)**

		Yes	No
<b>Intermediaries:</b> Do you think that the companies in the CCIs sector consider patenting as a source of added value to their businesses? (16)  Asked only to the patent users – Question 3.3 Table 6	Increased turnover	2	8
		13%	50%
	Increased company value/reputation	5	5
		31%	31%
	Access to new markets (licensing, etc.)	5	5
		31%	31%
	I don't know	6	
		38%	

**Table 12: Benefits of patenting, overall results (individuals and intermediaries)**

		Yes	No
<b>Individuals + Intermediaries:</b> <i>Benefits of patenting, overall</i> (34)	Increased turnover	4	18
		12%	53%
	Increased company value/reputation	14	8
		41%	24%
Access to new markets (licensing, etc.)	9	13	
	26%	38%	
Asked only to the patent users – Question 3.3 Table 7	I don't know	12	
		35%	

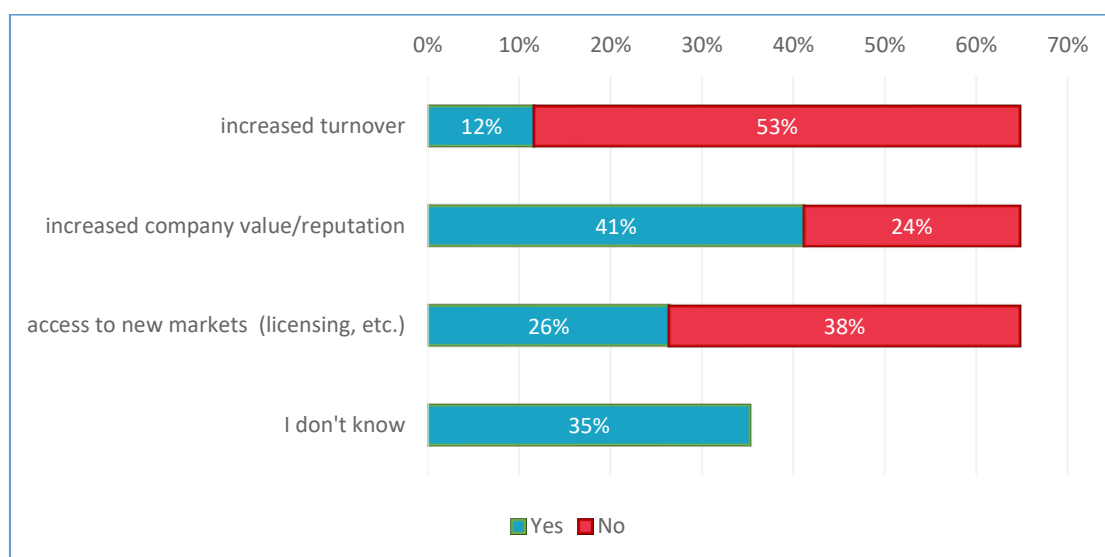
**Figure 9: Benefits of patenting**

Table 12 together with Figure 9 shows that for the CCI's industry players, patenting has a minor financial impact, since more than half of the respondents (53%) are of the opinion that patenting has no effect on turnover. Nevertheless, 41% of the participants believe that patenting has a positive effect on their company value and reputation, while 1/4 of the respondents do not.

Another noticeable result is that there are more people who do not see any supportive effect of patenting on access to new markets (38%) than people who do (26%). This is particularly surprising in light of the fact that one of the main advantages of patenting is believed to be in the area of market accessibility through commercialisation such as licensing, assignments, etc.

More than 1/3 of the total respondents declared that they don't know (or maybe could not recognise or measure) any effects of patenting on their businesses.

According to the joint report of the EUIPO and the EPO on “IPR intensive industries and economic performance in the EU”,<sup>7</sup> there is a strong correlation between patenting and business metrics. It is found that patent-intensive industries are shown to have generated 11% of all jobs in the EU, sharing 16% of the total EU GDP. What is more, in terms of commercial activities, the report states that patent-intensive industries have the highest trade surplus amongst IP titles.

Therefore, although the CCIs are not ranked as a patent-intensive industry, increasing the awareness of IP and patenting, and stimulating the use of patents in CCIs businesses, will have a positive impact on the success of businesses and on the competitiveness of European CCIs.

### 3.5. Reasons for non-patenting

In order to understand the reasons for non-patenting, a further question was asked of the respondents who responded to question 3.3 that they have never used patenting.

According to the results, the respondents are of the opinion that they have never used patenting since it is not relevant to their businesses. A relatively high ratio of “lack of information on patenting” (17%) is another notable result, which is a tangible sign of lack of IP knowledge in the sector, and will also be concretely revealed in a later question on the training need.

**Table 13: Reasons for non-patenting, overall results (individuals and intermediaries)**

		Yes	
<i>Reasons for non-patenting (30)</i>	Not relevant to my business	22	73%
	Too complex/too costly	8	27%
	Inefficient	0	0%
<i>Asked only to the non-Patent users – Question 3.3 Table 7</i>	I have no time	1	3%
	Lack of information on patenting	5	17%

*(More than one answer possible)*

<sup>7</sup> IPR-intensive industries and economic performance in the European Union. Industry-Level Analysis Report, by EPO and EUIPO, September 2019 available [here](#).

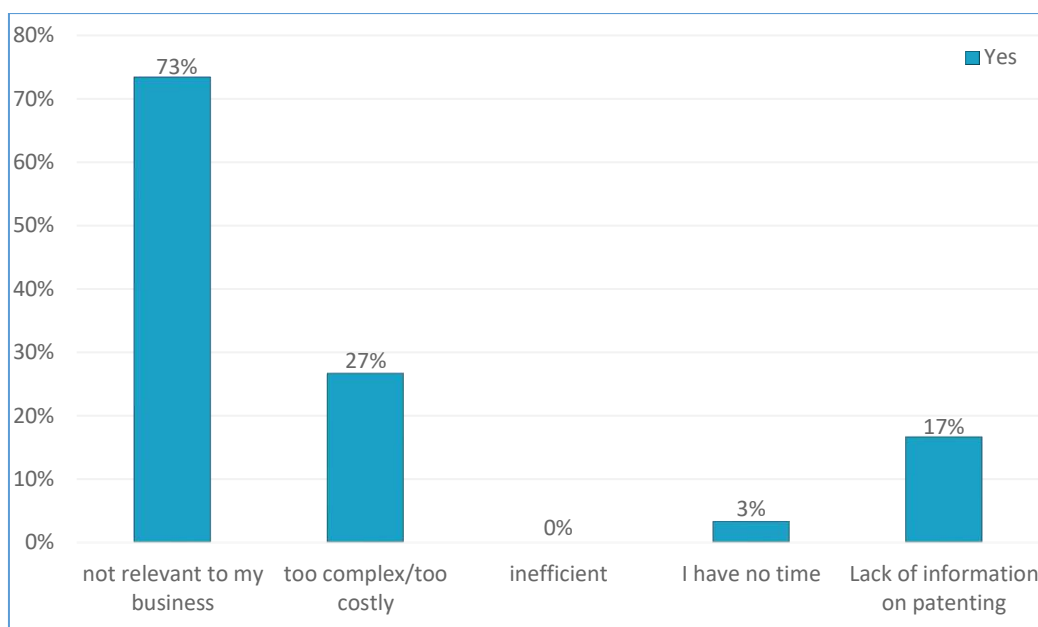


Figure 10: Reasons for non-patenting

### 3.6. IP disputes

A question on IP disputes was also asked to understand if the CCI actors have ever been in a dispute around any IP right.

Table 14: IP disputes in CCIs

	Yes			
<i>Disputes (e.g. infringement) around an IP right (70)</i>	17			
	24%			
		Copyright	Design	Trademark
<i>Subject of the IP disputes (17)</i>		10	7	4
<i>- Asked only to the respondents who have experienced IP disputes, declared above.</i>		59%	41%	24%
				Patent
				3
				18%

(More than one answer possible)

According to survey responses, almost one quarter of the respondents (17 out of 70) have experienced an IP dispute at least once in their businesses.

By being the most-used IP right among the CCIs community (see question 3.3, Table 7), copyright is the major subject of the disputes with 59%, followed by design disputes (41%). Patent disputes are not very common among the CCIs as only three respondents had issues in this field. This can be explained by the fact that patenting is the least used and known (therefore not subject to a dispute) IP right.

### 3.7. Training need on patenting

In order to reveal the patent training need for the CCI, an individual question was asked in the survey. According to the results, as much as 69% of the respondents believe that there is a need for patent training. Significantly, 90% of the intermediaries stated that their members need training on patenting.

**Table 15: Training need on patenting**

	Yes	
<b>Individuals:</b> <i>Do you need more information/training about patenting? (49)</i>	29	59%
<b>Intermediaries:</b> <i>Do you think the companies in the CCIs sector would need more information/training about patenting? (21)</i>	19	90%
<b>Individuals + Intermediaries:</b> <i>Training need on patenting (70) - TOTAL</i>	48	69%

### 3.8. Importance of IP protection in the CCIs

In addition to question 3.3, which reveals the current use of IP titles in the sector, an additional question was asked to obtain feedback from the respondents on their thoughts concerning the relevance of different IP titles to their businesses.

Similarly to the results of the question on the current use of IP rights, patenting seems the least essential IP right in the sector while copyright is believed to be the most essential.

**Table 16: Importance of IP protection for CCIs (individuals)**

		Essential	Quite important	No effect / not important	No idea
<b>Individuals:</b> <i>According to you, to what extent the below protection measures are important to CCIs businesses? (42)<sup>8</sup></i>	Trademark	18	15	0	9
		43%	36%	0%	21%
	Design	19	12	4	7
		45%	29%	10%	17%
	Copyright	32	5	0	5
		76%	12%	0%	12%
	Patent	18	11	3	10
		43%	26%	7%	24%

<sup>8</sup> Seven individuals and five intermediary representatives left the survey after this part of the questionnaire. Therefore, starting from this question, there are 42 individuals (entrepreneurs and company representatives) and 16 intermediaries (representatives of creative hubs/networks, sectoral umbrella organisations and public bodies) that continued answering the survey, and the analysis for this and subsequent questions is made over 42 individual and 16 intermediary participants (58 in total).

**Table 17: Importance of IP protection for CCIIs (intermediaries)**

		Essential	Quite important	No effect / not important	No idea
<b>Intermediaries:</b> <i>To what extent do you believe that the below protection measures are important to CCIIs sector? (16)<sup>9</sup></i>	Trademark	13	3	0	0
		81%	19%	0%	0%
	Design	9	6	1	0
		56%	38%	6%	0%
	Copyright	10	5	1	0
		63%	31%	6%	0%
	Patent	4	8	4	0
		25%	50%	25%	0%

**Table 18: Importance of IP protection for CCIIs, overall results (individuals and intermediaries)**

		Essential	Quite important	No effect / not important	No idea
<b>Individuals + Intermediaries:</b> <i>Importance of IP rights, overall (58)<sup>10</sup></i>	Trademark	31	18	0	9
		53%	31%	0%	16%
	Design	28	18	5	7
		48%	31%	9%	12%
	Copyright	42	10	1	5
		72%	17%	2%	9%
	Patent	22	19	7	10
		38%	33%	12%	17%

Although patenting is the least used IP protection title in the CCIIs (question 3.3, Table 7) it is still found to be important by the sector. Together with the training demand in this area as seen in the previous question, this might be an encouraging sign for the future exploitation of patenting within the CCIIs.

Nevertheless, as clearly seen in the following figure, it is still the least important IP right in the sector which is led by copyright. This result is in line with the previous results, since except for some specific sub-sectors, CCIIs are not highly patent-intensive and are, because of their nature, rather dominated by copyright, design and trademark, as discussed in the previous sections.

<sup>9</sup> Ibid.

<sup>10</sup> Ibid.



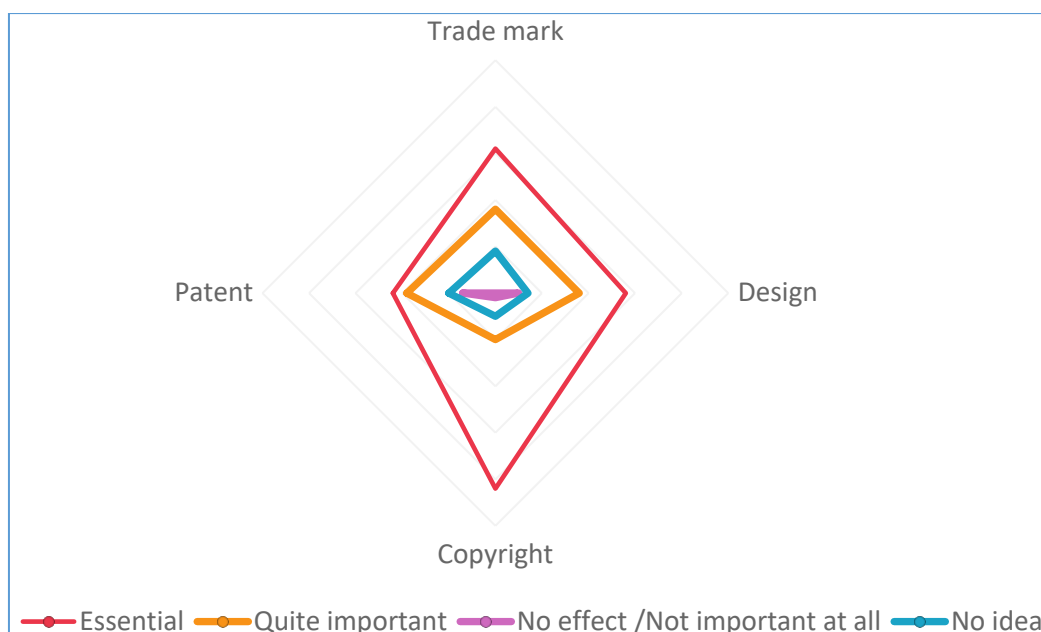


Figure 11: Importance of IP rights

### 3.9. Perceptions of IP among the CCIs

The last question of the survey concerned respondents' perceptions of IP in general and of patenting in particular. The participants were given five statements about IP and patenting, and were asked whether they agree with these statements or not.

The results indicate that patent protection is generally found too complex (48%), costly and inefficient (43%). In addition, the impact of patenting on CCIs businesses is found to be less significant than other IP titles (36% vs. 50%). On the other hand, high proportions of "no idea" for each statement once more confirm that there is a considerable lack of IP knowledge within the sector, as also shown by the previous results.

Table 19: Perceptions of IP

Perceptions of CCIs companies on IP (58)	Agree	Disagree	No idea
<i>"Patent protection has a positive impact on their business"</i>	21 36%	9 16%	28 48%
<i>"Other IP titles (trademark, design, copyright, etc.) have a positive impact on their business"</i>	29 50%	6 10%	23 40%
<i>"Patent protection is costly or inefficient"</i>	25 43%	9 16%	24 41%
<i>"Patent protection is too complex"</i>	28 48%	7 12%	23 40%
<i>"Patent protection is irrelevant to their business"</i>	18 31%	14 24%	26 45%

### 3.10. General comments on IP and patenting (open answers)

At the end of the survey, respondents were asked if they had any general comments about IP and patenting. Below are the anonymous comments collected.

<i>I am a small-scaled graphic designer and illustrator. If I design a logo no matter how low cost, I always tell the client that it is in their ownership now. I do not know how to build in a fee structure that takes into account how valuable their brand may become.</i>
<i>I struggle to protect my concept because someone copied my idea and I couldn't do anything. My idea applies to many topics, and in the book field it's possible to copy and change just a little thing and there is nothing I can do. I protected my company name but it's useless and expensive. I don't know how to protect my idea.</i>
<i>It is very expensive.</i>
<i>We edit critical editions and they are often performed without permission and without paying.</i>
<i>I think my product is not able to be patented. It's a platform of services for musicians. That's why we never did it.</i>
<i>I cannot say, as a performer, musician and composer I rely on the copyrights of my work. I am not owning a company and (my) art is not a business. And art shouldn't become a business; so far, I think, patenting doesn't make any sense if you are not inventing and protecting a product.</i>
<i>I am wondering how we can properly leverage the EU patenting law when doing business with foreign entities in China or America.</i>
<i>Positive, as I have worked with a law firm specialised in IP/IT who were able to advise us on every aspect on risks and benefits for our products</i>
<i>It remains very unclear to me what level of protection is suitable and reasonable for our designs.</i>
<i>As far as I know, my songs are automatically protected by SACEM standards. However, I am not sure how to protect everything visual that I put out. Logos, Pictures etc.</i>
<i>Patenting means protecting my songs from copy.</i>
<i>For years we have been working with IP lawyers to support CCIs stakeholders in protecting their IP: trade marks, designs, copyrights, mutual relations (IP transfers etc.).</i>
<i>Our experience is that it is very hard for most CCIs stakeholders to afford such professional IP services. This is why we have been seeking public funding for at least basic consulting from IP professionals and this is a good start of supporting them. But when the IP conflicts come these CCIs stakeholders absolutely do not have the financial capacities to fight with legal cases. So, any IP protection is basically meaningless.</i>

*The experience from our point of view is if your competition is coming from outside Europe then patenting is not much protection from copying.*

*I find it quite important to get an idea about what you should do when creating something new in order to protect your IP. Patenting could be one way to go if the requirements are met and you have the right people to set it up correctly. I guess also that when it comes to setting it up, incubators and or the ministry can also help a lot.*

*I don't think it is essential and is often even be preventing the entry of new business models and products in the market. This is not just a problem of patents but of all forms of IP, in general (except maybe, trademarks). The current IP system in Europe is suffocating more than boosting the flourishing of new companies and products. It needs to be updated in light of the possibilities offered by digital technologies (and other) and the opportunities they generate to society and not only in terms of established economic interests. Note: I don't believe it makes much sense to ask if CCI companies use copyright as, in most European countries, it is automatic, therefore, compulsory.*

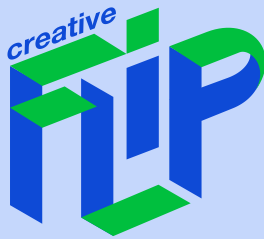
*Not enough awareness on that matter.*

*I think, that the knowledge about these subjects is not common to a lot of actors in the CCIs. Every sector of the creative jobs has its own vocabulary and specification and this makes it difficult to find information about the best way to apply protecting measures.*

*The CCIs have neither skills nor information and time to start a patenting process*

*Patents are usually considered costly, especially European Patents. CCIs are always complaining about high costs and seek public funds.*





Finance, Learning, Innovation and Patenting for CCI's

## ■ **REPORT – IV**

### *RECOMMENDATIONS*

## **REPORT-IV CONTENTS**

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## LIST OF ABBREVIATIONS

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<b>ADR</b>	Alternative Dispute Resolution
<b>CCIs</b>	Cultural and Creative Industries
<b>EDB</b>	Enforcement Database
<b>EDR</b>	Efficient Dispute Resolution
<b>EPO</b>	European Patent Office
<b>EU</b>	European Union
<b>EUIPO</b>	European Union Intellectual Property Office
<b>IP</b>	Intellectual Property
<b>OMC</b>	Open Method of Cooperation
<b>P2P</b>	Peer to peer
<b>WP</b>	Work Package

## RECOMMENDATIONS

During the different stages of the Creative FLIP project, several activities have been carried out within WP4 to unveil and analyse the patenting practices of the sector: these constitute the previous three sections of this final report.

As a final outreach activity specific to this WP, we also organised an online Cultural Workshop “Have your say: Unveiling the potential of European Creatives in Patenting” on February 10<sup>th</sup>, 2021 in order to:

- discuss possible recommendations;
- assess further actions to increase the exploitation of IP; and
- gather hands-on comments of the sector, in light of our findings as presented in our reports.

Eighteen participants representing the different actors of the sector, namely: sectoral organisations, companies, individuals and IP professionals – were gathered during the workshop with the presence of European Commission representatives.

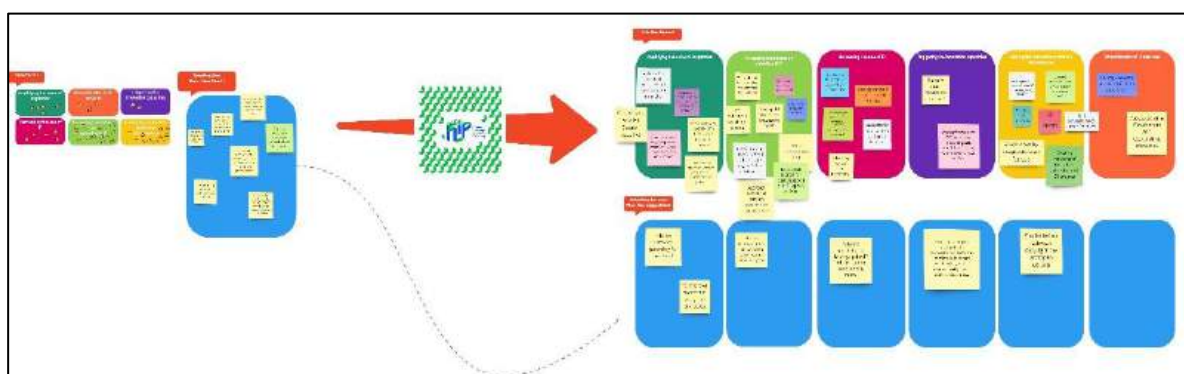


Figure: A screenshot from the workshop “Have your say: Unveiling the potential of European Creatives in Patenting”

Based on the findings presented in the previous three WP4 reports on patenting and the outcome of this workshop session, the following recommendations have been developed in order to support CCIs to manage and exploit IP rights.

### 1. RECOMMENDATION 1: INCREASING AWARENESS OF PATENTING AND IP

Increasing awareness is still of high importance for the sector. Especially, there is a clear need – confirmed by the survey results and repeatedly underlined during the workshop – to make intermediaries aware of the IP assets owned and developed by the CCIs companies and to train them on the best solutions to protect intangibles and exploit IP. Concrete activities in this area can be:

- **development of IP training programmes:** Entry-level programmes specific to CCIs intermediaries should provide the basics of IP as well as all necessary information and material enabling them to refer the creators to the right IP actors who are able to assist them in better protection and exploitation of their intangible assets. Intermediate-level programmes could also be developed in order to inform individuals and CCIs companies about the relevant types of IP rights and know



where to seek advice.<sup>1</sup> The content of the programmes should be developed in light of their different audiences, such as IP awareness-raising activities in schools, or IP training schemes for CCI businesses and creative communities. Such a training scheme may also be included in Art School programmes;

- **setting up patenting/IP information relays and IP communities** for creatives: Such an action could consist of developing thematic assistance offices or relays at national, regional or EU level. They could be complemented with the creation and animation of communities of practice that are able to pass the word, show and share experiences in IP;
- **promotion of IP** for creatives, and stressing the complementarities between patents and other IP rights: This activity may include using various communication and promotional channels to spread the message on the importance of patenting and IP with some inspirational examples about the best IP practices in the sector;
- **training** creatives about when to patent and why to (or not to) patent: An example for such an action would be to develop a specific training on the “Dos and Don’ts in patenting” or “using patenting as a business strategy for CCIs”;
- **development of gamification tools** that can be used in training and awareness-raising activities to attract creatives: Developing creative and entertaining tools and activities such as “serious games”,<sup>2</sup> role playing, and use of interactive software tools would help increase IP awareness and reach especially the beginner-level IP users; and
- **provision of training on software patenting** for creatives: As creatives are using software now more than ever, more training and info-sharing sessions on software patenting for creatives could be held with the support of successful examples.

## 2. RECOMMENDATION 2: LINKING THE INNOVATION PLATFORMS

Linking the innovation platforms (creative hubs, communities of practice, incubators, etc.) with creatives is also key in the development of IP and patenting awareness. To reach this target, the following types of activities can be considered:

- **provision of support for IP management** such as IP pre-diagnosis/IP scan services for CCIs:<sup>3</sup> Such activities could use the already existing programmes<sup>4</sup> and/or develop “IP diagnosis” tools tailored to the specificities and needs of the CCIs;
- **building up networks** around IP to bring the most IP-intensive CCI businesses together in order to share best practices:<sup>5</sup> In order to create a medium, communities of practice, exchange workshops and roundtables can be organised to showcase experiences around IP and promote the benefits of successful IP exploitation;

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<sup>1</sup> An activity related to this objective is foreseen in the future FLIP-3 project.

<sup>2</sup> An example of such a “serious game” was developed by the Creative FLIP project.

<sup>3</sup> As creative businesses are amongst the sectors suffering most as a result of the Covid-19 pandemic, these services could be provided free of charge for CCIs.

<sup>4</sup> In 2021, the EUIPO is co-financing with an SME fund an [IP pre-diagnostic \(IP scan\)](#) service developed under the Ideas Powered project where professional IP auditors will help identify the value of IP assets for EU SMEs. Similar IP pre-diagnosis services are also offered by many EU Member States.

<sup>5</sup> These networks can be set up within the circle of communities of practice or creative hubs as these structures are already well established and recognised.

- **connecting intermediaries** to exchange best practices in IP training schemes: This activity is similar to the previous one, but is focused on the CCIs' intermediaries (creative hubs, incubators, etc.), as their needs can be different from those of the businesses and individuals; and
- **creation of networks of innovation** specific to CCIs-focused EU projects which might increase the impact of these projects and form a unique platform of EU innovative creatives: EU projects are a major input to the creative world. Setting up and organising a specific tool for the project beneficiaries could have several impacts such as raising awareness, sharing experiences and showing the importance given to the topic of IP by the European Commission at EU level.

### 3. RECOMMENDATION 3: HARNESSING THE USE OF IP

In parallel with the Open Method of Cooperation (OMC) recommendations,<sup>6</sup> which were also discussed during the [Flipping the Odds Conference](#) organised by Creative FLIP, it is essential to find ways to harness the use of IP as an asset and collateral. In addition to the recommendations provided by the OMC expert group, further steps that can be taken are:

- **development of a toolkit database** for creatives to advise them about the services and tools already available to help the CCIs actors take informed decisions on IP:<sup>7</sup> For easy access, this toolkit can be in the form of an electronic database on a website;
- **provision of information and training on the use of P2P and open-source licences:** This activity would increase the awareness of P2P and open-source licenses, and present opportunities for creatives to turn their IP assets into a business asset while considering the very specific IP-related elements. In these training sessions, the complex characteristics of these licences must be clarified and the compatibility issues must be addressed in order to avoid putting the projects at risk;
- **provision of information about the current information sources and tools**, such as [EPO's Espacenet database](#), [EUIPO's Enforcement Database \(EDB\)](#), etc.: There are many sources and tools available in order to make efficient use of IP information (inspiring technical information, freely available technologies, legal information to avoid infringing others' rights, etc.). However, the use of such tools may require technical knowledge that creatives might not always possess. Therefore, organising at least introductory-level sessions on how to use these tools, the type of information they contain and their possible use would be highly instrumental in boosting the strategic IP exploitation capacities of creatives; and
- **strengthening the IP enforcement policies** for creatives and encouraging the use of dispute-resolution services (e.g. arbitration and mediation): Such activities would stimulate creatives to enforce their IP rights effectively and may also help them avoid high IP litigation and enforcement costs. Such an action would of course present the different dispute-settlement options available to companies, including the most effective alternative dispute-resolution mechanisms possible (including mediation, conciliation, assisted negotiation and expert determination), such as the World Intellectual Property Organization's ADR<sup>8</sup> system or the EUIPO's EDR<sup>9</sup> offer.

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<sup>6</sup> OMC Report on "Access to finance for cultural and creative sectors", 2016 can be downloaded [here](#).

<sup>7</sup> This is one of the aims of the upcoming FLIP-3 project.

<sup>8</sup> For more information on the WIPO ADR (Alternative Dispute Resolution) system, click [here](#).

<sup>9</sup> It is foreseen that the EUIPO's EDR (Efficient Dispute Resolution) SME Covid-19 special service, developed in 2021, will be extended. More information is available [here](#).

## 4. RECOMMENDATION 4: AMPLIFYING THE VOICE OF INSPIRATION

Real-life examples regarding IP use and success stories from the sector would have an inspirational effect on others and may help the sector “realise” the value of their intangibles. In this field, activities could include:

- **publication and promotion of success stories** from creatives concerning IP and patenting: Giving publicity to creatives who are successful in using IP as an integral part of their business strategies would demonstrate to the public the high potential of CCI in IP, and inspire the whole sector to make the most of their IP assets; and
- **further involve creatives in EU information campaigns:** Increasing the visibility of the CCI actors in such EU events (such as the [EU Open for Business](#) campaign) would help others realise their IP potential and motivate them to better exploit their assets in their businesses.

## 5. RECOMMENDATION 5: TRIGGERING THE IP CAPACITIES

Triggering the IP capacities of the European CCIs through new pilot projects or project calls. These would have a catalysing effect on the sector if they further support the use of IP within CCIs and/or encourage the exploitation of IP in CCI projects. Possible actions in accomplishing such an objective might be:

- **new projects for creatives on the use of IP** and increasing the impact of IP usage in EU projects: Raising the number of EU-funded projects related to IP and CCIs (e.g. FLIP-3) would ensure that IP and its importance remain a “hot topic” for the sector, stir up the systematic use of intellectual assets for business growth, and stimulate the IP capacities of CCIs; and
- **larger promotion of calls dedicated to creatives:** The project calls regarding CCIs are currently published on the [webpage of “Culture and Creative”](#) and/or under the “Creative Europe” programme of the [SEDIA Funding and Tender Opportunities portal](#). In order to increase accessibility and user friendliness, the project calls for creative industries could (also) be published on a stand-alone website with a large-scale promotion campaign. [The Creatives Unite portal](#) might be utilised as a one-stop-shop website for such an action.

## 6. RECOMMENDATION 6: DIVERSIFICATION OF IP SERVICES

Because the CCI sector is so broad and the needs of each sub-sector are highly diverse, the services and activities recommended above must be adapted and provided according to the specific needs of each particular sub-sector. Current free-of-charge IP advisory services are often too general and do not meet the specific needs of each sub-sector. For this reason, the possibility to develop bespoke IP services adapted to these different needs could be further investigated.



