

Patents and Technology Innovation in The Latin-American Audiovisual Industry

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Abstract

To investigate the intellectual property dynamics of the audiovisual industry in Latin America, the study searches and analyzes patent applications in the region, using the World Intellectual Property Organization database, restricted to the LATIPAT group. With this data, was possible to obtain information about the origin of these requirements, companies that are most active in the sector, requesting countries and where the technologies were protected, the time of request and the technology's areas of activity. Thus, such mapping provided an overview of audiovisual technologies and their commercial exploitation in the region.

Keywords

Innovation, patent, technology, audiovisual.

1. Introduction

Creative industries have cultural, identity and economic development importance for a country. Through them, a society expresses itself to the world and to itself. In addition to the cultural factor, these industries generate jobs, income and technologies that are fundamental to their operation and collaborate with other sectors of the economy (United Nations Conference on Trade and Development - UNCTAD, 2012). In general, they involve equipment and activities, each with its specificities, which are constantly updated and therefore in direct relation with research, development and innovation.

Since innovation can occur in any sector of the economy, whether in the manufacturing industry, the primary industry, the service sector or the public sector, analyzing innovation in the audiovisual industry is a possibility to understand a part of the sector that has been overlooked. The audiovisual industry, among the creative industries, is important in cultural, social and economic aspects. In this last aspect, there are several ways to measure the impacts of the audiovisual sector within the general economy of a country, or even globally. Among these measures are exports of audiovisual products and services, which accounted respectively for US \$ 811 million and US \$ 26.4 billion in 2008 (UNCTAD, 2012), being 2008 a year of great international crisis. The high numbers put the sector in a significant position with regard to world economic transactions, which unfold on cultural and social issues. These transactions occur strongly when dealing with products in the audiovisual distribution and exhibition markets in peripheral countries, which are historically occupied by foreign companies and products (Canedo, Loiola & Pauwels, 2015). By focusing on the technological part of this industry the intention is to understand if this economic operation of occupation and exchange also follows the same logic.

The audiovisual production chain is based on technologies that are constantly changing. For an invention to become an innovation and commercially exploitable, it must be registered. These registers are mainly filed by patent applications. Therefore, for commercial circulation and use of a new technology, it must have its patent required in the country where it is to be exploited. Thus, when analyzing patent applications existing in a territory, is possible to map the potential interest of economic exploitation of that location and how it relates to innovations in/from a particular sector. When focusing on a region like Latin America, the data reveals which countries are interested in

protecting their inventions and what are the types of these inventions. Thinking about the inventions related to audiovisual in this region, lead to mapping the technologies used in the chain, the countries that are developing knowledge in the area, and the countries that are receiving these patent applications and therefore will be commercially exploited, besides a first look at the existing relationships in this market.

Thus, understanding the dynamics of technologies and their operation within the audiovisual chain is also a way to map the region's possible weaknesses in this sector and move towards improvements. Such advancement can occur by encouraging local and regional innovation, research, training and industrial development.

The study aims to understand how innovation occurs in the Latin American audiovisual industry through the analysis of patents. The difficulties that countries in the region are facing both in their global economic development and in the consolidation of their audiovisual industries are well known. The presence of large companies, more economically developed countries and consolidated creative industries influence the strengthening of industries of smaller economies. Understanding the operation of the technologies of this industry not only gives us insight into the insertion of the region in the international market of audiovisual technologies, but also points to possible gaps to overcome in the creative and innovative fields. To this end, the World Intellectual Property Organization (WIPO) databases were searched, focusing on audiovisual technologies in Latin American countries and further analysis. This survey, therefore, leads to a reflection on the position that Latin American countries occupy in these markets and what this may mean in terms of industrial, social development and knowledge production.

2. Technology, innovation and economic development

Innovation initiatives in organizations and countries are developed in different ways. Measuring such initiatives is relevant from the moment innovation is linked to the economic development of a region. Thus, comparing with other organizations or with one specific background is critical to understanding the operation and growth of each company or region. Given this need, since the 1960s, the Organization for Economic Cooperation and Development (OECD) has been working on norms to standardize what is understood by innovation. Among them is the Oslo Manual (OECD, 2006), which sets out categories to assist in data collection. According to the Manual, there are two ways to investigate innovation: through the subject and the object. While the first aims to understand the innovative behaviour of a given organization and the activities resulting from it, which enables the comparison of actions performed between organizations; the second focuses on a specific innovation, its operation and characteristics (OECD, 2006). It is also possible to understand object-based analysis as a way to investigate different innovations in the same sector, or innovations that have the same objective. When analyzing the object, whether in itself or compared to related objects, its characteristics need to be well defined and presented, as well as its proprietary information. Since they are someone's creations, they are objects of intellectual property registration and can be protected for commercial exploitation. Among the various types of intellectual property protection is patent registration.

A patent is a right granted to a holder of exclusive commercial exploitation of his invention, excluding the possibility of exploitation by third parties, issued by the competent authorities of a territory. This right is valid only in the deposit territory, restricting the manufacture, sale and use of the invention to its holder. When applying for a patent, the inventor or guardian must submit a series of documents describing the invention, which should be something new, useful and not an obvious consequence of what already exists in its field. In order to keep the novelty aspect, some competent bodies keep patent applications confidential for a while, especially while they are in the early stages of their evaluation. Each territory has its own rules and forms of action with respect to the request, the time of analysis until the actual grant and the period of validity of the registration. In general, a detailed analysis is made, comparing the "state of the art" with the registration request and if it provides any progress. "State of the art" means anything that is already publicly known and that was registered before that request (WIPO, 2016).

Patenting an invention has some advantages, such as commercial exploitation. It is now quite unusual for a patent to generate profits for its unique inventor, as it used to with great inventions. What is most recurrently seen are large companies that have a patent portfolio licensed or manufactured by them and from which the wealth is generated. When patenting an invention, which is not the case with large companies, the prospect of licensing should always be in mind, even in the most difficult cases, such as competing markets, for it is through commercialization that, in addition to the revenue for the holder, the local economy grows.

It is from the possibility of this market segment domain through patents that this research continues. In the case of peripheral economies such as Latin America, it is often not just some companies that dominate technologies, but, above all, other countries. Patent applications are filed in the territory in which the technology is intended to be commercially exploited, or in more than one territory through international agreements. Thus, applications in one country are not only from natural citizens of that territory (residents), but also from people or organizations from other countries (non-residents).

Autonomy is a relevant issue for countries with emerging economies. Several authors note characteristics related to the use and development of technologies. Lima and Fernandes (2009) point to the constant adoption of existing technologies of large foreign companies to the detriment of the association between companies and local research institutes to generate innovations. Jasso, del Valle and Nuñez (2017) identify some structural difficulties common to countries in peripheral economies, even though they have different understandings about the role of science and technology. In general, these economies continue to operate on many fronts. This practice makes specialization and real development difficult for any sector, forcing the companies to import unreached technologies, which leads to a failure to transform the growth of some sector into real development by constantly resorting to unequal agreements with developed countries (Jasso, Del Valle & Nuñez, 2017). Since competition in the global marketplace is unbalanced, the role of the state in shaping industrial strengthening policies and protecting local production is critical. As a possibility to change the system of selling raw material and purchasing technologies and manufactured goods is the cooperation between countries of the same region, that have diverse and perhaps complementary productions and characteristics.

2. Creative industries and audiovisual production chain

According to the Creative Economy Report (UNCTAD, 2012), Latin America is slowly becoming more familiar with and deepening its studies of the creative industries. Efforts are still small compared to developed countries, but there is progress in recognizing the socioeconomic role of the sector. There are differences between the approaches of each country, but the need for cultural policies for the development of the creative economy is common and recognized by all countries in the region. From data collected by organizations such as “Mercosur Cultural”, it was possible to observe, however, that in practice cultural activities are still overlooked for their economic bias (Medeiros, 2012). The “economy of culture,” as it is called in the region, acts more to mediate the public policies and institutions that are responsible for promoting culture and the organizations that produce it. Therefore, the relationship is not established in actions that promote culture and economic development, but as an adjustment of existing possibilities.

In the case of the audiovisual chain, in addition to encompassing the industrial structures of film, television, video and radio, it interacts with equipment industries that are also part of the ICT industrial complex. This equipment is part of various sectors of the chain, including computers, living room equipment, transmission equipment, lighting, audio, filming, among others. Getino (1987) organizes the structure of the activities of the audiovisual chain, separating them into stages and sectors. According to the author, the industrial process begins with state management, which regulates actions for each of the three execution areas - production, distribution and exhibition. In addition to the axes of regulation and execution, there are the provision and services, and development. The first fits in with what was aforementioned about the ICT industrial complex. It is in this context that the specialized equipment and services are needed to assist the execution processes. The second concerns the formation of manpower and research and promotion of both the developed products and the chain itself. In this paper, the focus is, above all, on what Getino (1987) calls provision and services, that is, on markets and processes that are fundamental to the whole chain, but which are not its final object, but its support. These sectors include, for example, camera, lighting, machinery, sound, assembly, finishing laboratories, sound and mixing studios markets. This set of interactions is not only the technological base but also where the innovative capacity of the chain lies.

The changes in product and process are constant in the creative economies and are critical to their growth. However, since such changes occur from innovations and these innovations come through research, financial and structural support is required for their viability. As in other areas of knowledge and industry, innovation is linked to several factors and shifting it is among the functions of governmental spheres. In the case of the creative industries, owing

to its not-basic production and its other logics of gain, investments and interests remain low. Considering all this, the objective of this research is to map, through patent applications, the scenario of innovation in the audiovisual chain.

3. Methodology

In order to analyze protected technologies in Latin American countries, was used the WIPO's patent database, PATENTSCOPE, restricting the search to LATIPAT data only. LATIPAT is a specific database that gathers patent information in Portuguese and Spanish, and keeps Latin American regional patent data up to date. It was developed by the Spanish Patent and Trademark Office, European Patent Office (EPO) and WIPO, and currently has information from the patent offices of Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, and Uruguay. In addition to the registrations made in the countries, the database also has data from the Patent Cooperation Treaty (PCT). Since this type of registration gives property coverage in all treaty signatory countries and not in specific territories, this analysis will not use them in order to concentrate patent filing information only from Latin America.

To this end, some searches and analyses were made aiming to reach a significant display of information concerning the countries involved and the analyzed chain from the data obtained. The searches performed, as well as the processes of data exclusion and processing, are outlined in Figure 1. Thus, in the first search the terms used were ALLTXT: "cine OR audiovisual", which means the words 'cine' or 'audiovisual' in all texts in each record, including title, summary, requisitions and other documents. From this, were obtained a total of 1711 results. Of these, two were duplicates, leaving 1709.

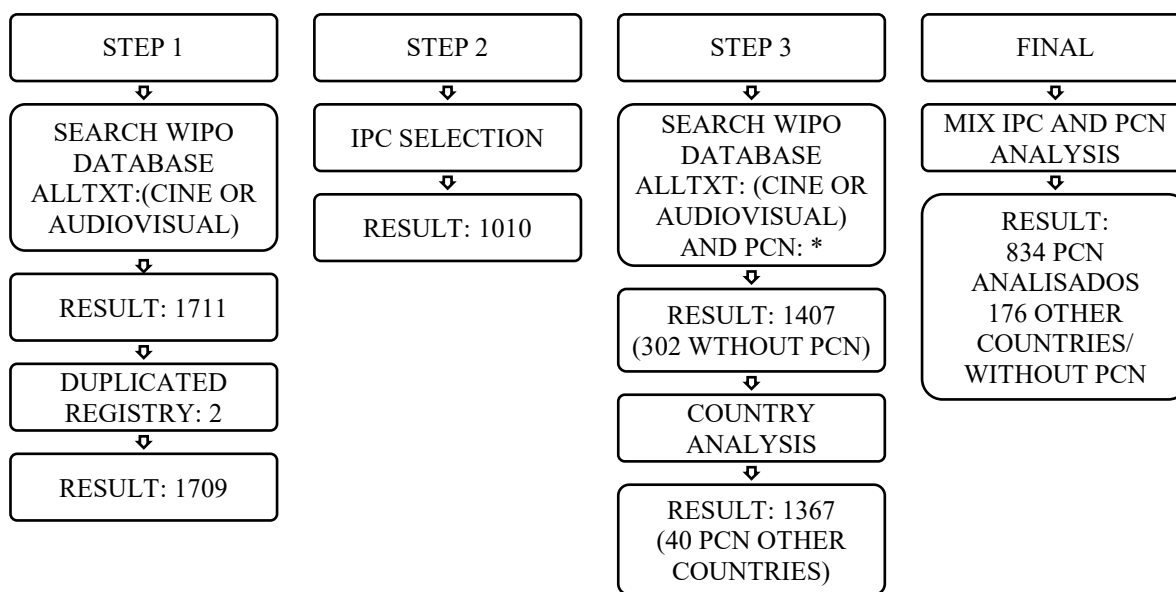


Figure 1. Organization of the methodology

As the main selection criterion, referring to step 2 of Figure 1, the data obtained was analyzed in relation to the International Patent Classification (IPC). Each deposit request has an IPC that relates to the area to which the technology in question belongs. This division was established in the Strasbourg Agreement in 1971 and has been updated annually since then. The 2017.01 version used in this study have eight categories, labeled from A to H, subdivided into approximately 70,000 subsections, forming a hierarchical system of symbols to represent each area. The codes obtained were divided on being related or not with the audiovisual industry. It is possible to see this division in Table 1, which contains the IPC codes used as inclusion and exclusion criteria for our sample data.

Table 1. Inclusion and exclusion criteria according to IPC

INCLUSION	
IPC	DESCRIPTION
A47B 81	Cabinets, racks or shelf units specially adapted for other particular purposes
A47C	Chairs, sofas, beds
A47G	Household or Table Equipment
A63F	Card, board or roulette games; indoor games using small moving playing bodies; video games
A63G	Similar devices for public amusement
A63J	Devices for theatres
B25J	Manipulators; chambers provided with manipulation devices
B26	Cutting hand tools
B32	Layered Products
B44	Decorative arts
B60P	Vehicles adapted to carry special loads
B62B	Hand-propelled vehicles
C09	Dyes, paints, polishes, natural resins, adhesives
E04F	Finishing work on buildings
E04H	Buildings or like structures for particular purposes
F16M	Frames, casings, or beds, of engines or other machines or apparatus
F21	Lighting
G	Physics
G01R	Measuring electric variables
H	Electricity
EXCLUSION	
IPC	DESCRIPTION
A	Human necessities
B	Performin operations, Transporting
C	Chemistry, Metallurgy
D	Textiles, Paper
E	Fixed Constructions
F	Mechanical engineering, Lighting, Heating, Weapons, Blasting
G01	Measuring, testing
G04	Horology
G06Q	Data processing systems or methods
G08	Signalling
G21	Nuclear physics, Nuclear engineering
H01	Basic electric elements
H02	Generation, conversion, or distribution of electric power
H04M	Telephonic communication
H05	Electric techniques not otherwise provided for
What has no IPC	

4. Results and discussion

After this selection, a total of 1010 records were obtained, which will be the object of the analysis performed by the research. Still, in this phase of obtaining the data, a second search was made regarding the unionist priority of the requests, that is, the requesting country and holder of the rights of that deposit, presented in Step 3 of Figure 1. For this, it was used the string ALLTXT: "Cine OR audiovisual" AND PCN: *, where PCN refers to the country of priority. By placing * as a search factor, it is delimited that the results will be all records that have this information,

regardless of what it is. From this second search, a total of 1407 results were obtained, indicating that 302 requests do not have the unionistic priority information.

With these results, the first analysis was made, redoing the search, now with country-specific acronyms for the PCN. Of the total of 1407, 40 records were not among the countries sought, indicating, therefore, that other countries that did not come into our analysis own them. Following to the final stage of Figure 1 of the data treatment, the results of the selection of the records by the IPC and the analysis of PCN were merged, thus obtaining, from the 1010 records to be studied, 834 among the analyzed PCN and 176 without PCN or from other countries. The breakdown of requests concerning their unionist priority is shown in Figure 2.

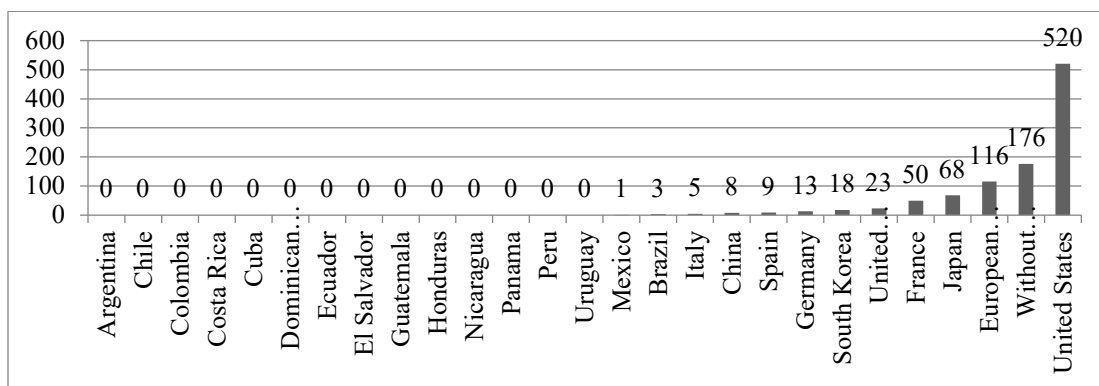


Figure 2. Unionist Priority Orders (LATIPAT, 1970-2018)

The first relevant highlight of Unionist priority data is the fact that of the 16 countries that make up LATIPAT only two have requests for their priority, totalling only 4 registrations (Brazil, 3; Mexico, 1). It is noteworthy, however, that of the 176 that are owned by other undetermined countries or do not have PCNs in their registration data, many are from Latin American countries. By collecting the information from the order records it is possible to verify that many orders are made by residents of any of the Latin American countries, but this information is not present in the specific field of the PCN. This lack of data in the exact field is one of the research gaps, which ultimately leaves out important information because of the inaccuracy of the system or the filing of the patent application. This possible priority is verified above all by matching the depositor name information with the country where the request was made. Thus, in analyzing the overall number of requests made by residents, it is not possible to consider only what is described in Figure 3. The total of 4 requests is far below reality when considering records without PCNs. However, it is also not possible to claim that the 176 requests that do not contain the PCN information are necessarily from one of the LATIPAT countries, because, besides the inaccuracy of the information, some of these records are from other countries, which are not listed in the search. From the general data in the claims, it is only safe to assume that part of these 176 belongs to LATIPAT.

Thus, as the accuracy of these data cannot be confirmed, their analysis can only be made by comparison with other existing data. Even if the number of applications from residents of Latin American countries is greater than 4, it would not reach the values of applications for possession of other countries or offices, such as the European Patent Organization and the United States. When thinking not of the region, but of each Latin country individually, it would hardly reach the total orders from the United Kingdom, France and Japan.

These data reinforce what was previously discussed about the exploration of less developed markets and the little incentive for innovation in these countries. In a chain such as audiovisual, where technologies are critical to their progress and support, most patent applications are from foreign sources, indicating that there is not enough investment in research and development to drive innovation by these countries, or that there is no interest in creating their own technologies. Without a consolidated domestic market and the great need for such technologies, two actions occur: regional companies resort to foreign technologies and foreign companies exploit small markets that are not competitive.

This is even more pronounced when looking at the applicants of these requests. As shown in Table 2, 50% of the records studied are owned by only 29 companies, one of which has 135 applications alone.

Table 2. Patent ordering companies (LATIPAT, 1970-2018)

Applicant	Requests	% of total data studied
THOMSON*	135	13,4%
KONINKLIJKE PHILIPS*	45	4,5%
QUALCOMM*	39	3,9%
CANAL*	37	3,7%
SONY CORPORATION*	28	2,8%
SAMSUNG ELECTRONICS*	24	2,4%
PANASONIC CORPORATION*	22	2,2%
MICROSOFT CORPORATION*	19	1,9%
MATSUSHITA ELECTRIC*	16	1,6%
TELEFONICA*	13	1,3%
GENERAL INSTRUMENT CORPORATION*	12	1,2%
HUGHES ELECTRONICS CORPORATION*	10	1,0%
Motorola*	9	0,9%
NAGRA*	9	0,9%
NOKIA*	9	0,9%
FRAUNHOFER-GESELLSCHAFT ZUR FÖRDERUNG DER ANGEWANDTEN FORSCHUNG E.V.*	8	0,8%
EHOSTAR TECHNOLOGIES*	7	0,7%
NEW TRANSDUCERS LIMITED*	7	0,7%
THE GILLETTE COMPANY*	7	0,7%
XPAND, INC*	7	0,7%
ENRIQUE ,RAMIREZ MAGAÑA	6	0,6%
NIELSEN MEDIA*	6	0,6%
TELEFONAKTIEBOLAGET*	5	0,5%
THE DIRECTV GROUP*	5	0,5%
APPLE INC.*	4	0,4%
DOLBY*	4	0,4%
MATEL*	4	0,4%
TECHNICOLOR*	4	0,4%
UNITED VIDEO PROPERTIES*	4	0,4%
TOTAL	505	50,0%

The high order concentration restricted to a few companies gives us an overview of who is developing and exporting technologies in the sectors involved. As you can see, they are large and internationally renowned companies in the Communication and Information Technology industrial complex, such as Philips, Sony, Samsung, Microsoft, Canal Plus, among others. The company that owns the most orders is Thomson Licensing, Technicolor's subsidiary, which is responsible for the patent industry. Technicolor has been in the movie technology market since the early twentieth century and is responsible for consolidating the process of colouring films. Since then, the company has been developing imaging, postproduction, and visual effects and 3D technologies. In addition to the 135 orders placed by Thomson Licensing, Technicolor still has 4 more directly in its name.

Among the data obtained were few records that had universities or research institutes as applicants. These include the Singapore Agency for Science, Technology and Research, and Korea's Electronics and Telecommunications Research Institute, each with three applications. Then, with two requests each are the University of São Paulo (USP) and the State University of Campinas (UNICAMP). Other identified universities and research institutes have only one application for deposit.

Our analysis, focusing on patent applications for the audiovisual chain in Latin American countries, gives us insight into the state of these markets. Figure 3 shows the total orders registered in each of the LATIPAT countries.

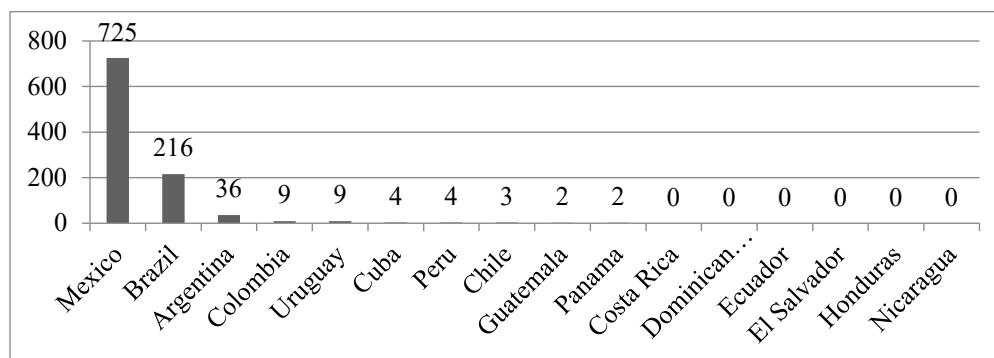


Figure 3. Total orders in each territory analyzed (LATIPAT, 1970-2018)

Of the analyzed requests, 71.8% (725 requests) were made in the Mexican patent office, 21.4% (216 requests) in the Brazilian, 3.6% (36 requests) in the Argentine, the other 3.2% are divided between Colombia, Uruguay, Cuba, Peru, Chile, Guatemala and Panama and none in the other countries. These numbers show, among other things, the interest and movement of markets in these countries concerning audiovisual technologies, since when filing a patent application in a certain territory exclusively that company in that location during the term of the patent may market the technology protected by a particular company.

Mexico, Brazil and Argentina are among the largest economies in the region and, more than that, are historically the countries with the most film productions. Among the three, Mexico has always been at the forefront since the beginning of the last century, with films widely distributed throughout Latin America. The country has relatively stable production - the most stable in the region - and has been responsible for US Hispanic-speaking products for decades (Getino, 1987). The physical proximity between the two countries facilitates the trade and, especially with regard to the audiovisual industries, the possibility of exploiting this market. In addition to US domestic demand for Spanish-speaking products for its immigrant population, Mexican productions reach other countries in the region. As discussed earlier, creative industries play a fundamental role in the identity of a country or region, and local production is the main way to strengthen this culture. Since foreign technologies are the basis of the technological part of the Mexican audiovisual industry, they are also indirectly present in the country's audiovisual markets. Commercial exploitation, however indirect, is also related. By providing high quality equipment and techniques, audiovisual productions will be more likely exported and thus have higher revenues.

Between Brazil and Argentina the situation differs. While the former has considerable output but has difficulty reaching the screens, the latter has greater range both internally and externally. In both cases, however, the number of imports of audiovisual products and services is quite large (PMA, 2014). In any of the countries that can perceive the predominance of foreign technologies, the low interest in the development of the technologies themselves is evident. The reasons are diverse and can be further explored in later studies, as well as trade relations between countries and the exploitation of these technology markets. Overall, however, the country of registration data within LATIPAT puts us in touch with the relationship between patent application numbers, business operations, and economic development. These relationships are quite complex and can be explored in the future.

Within the separation made in relation to IPCs, Figure 4 shows the main development interests of the sector based on the classification codes.

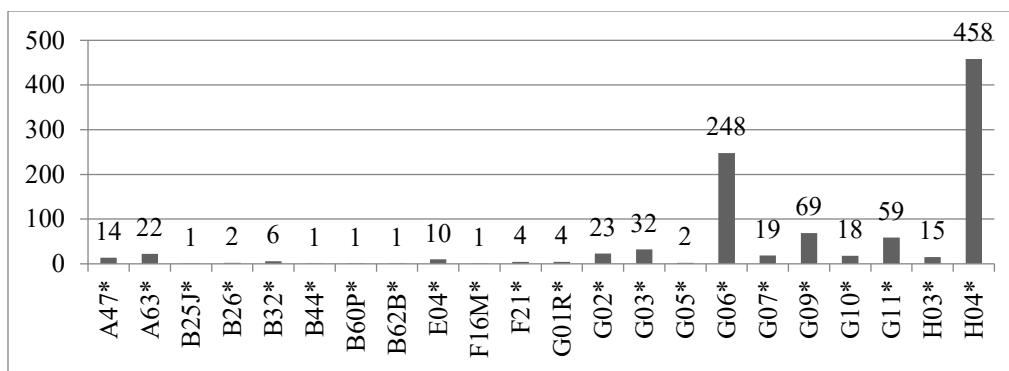


Figure 4. Order split by IPC (LATIPAT, 1970-2018)

Among the codes selected as inclusion and exclusion criteria for the records found in the initial search of the study, some have prominence in relation to the number of orders included in their coverage area. The index is quite broad in each of its definitions and even restricting with the different subsections, the possibilities of technologies within each one are quite diverse.

The two codes belonging to family A comprise furniture and devices for public entertainment, e. g. seats for movie theaters with new specifics, such as reclining or vibrating backrest, and different types of games and audiovisual simulators. Family B records are generally tools ranging from a multimedia cart to coil machines, roll deburring machines and aromatic polyamide fibers, for example. The E family, which for this study's purpose is composed only of the subsections that start with E04F and E04H, aggregates items related to buildings, that is, physical constructions such as rooms and their characteristics, e.g. a mobile screening room or interactive modules. The F16 and F21 codes, which appear in small numbers, refer to brackets and frames, and lighting equipment respectively.

The most prominent families in the data obtained are the G and H. The first has as its major area the technologies of Physics and the second of Electricity. The subsections of G correspond to: G01R - measurement of electrical variables; G02 - optics; G03 - Photography, cinematography and similar techniques; G05 - control and regulation; G06 - calculation and counting; G07 - test device; G09 - education, encryption, visual presentation, advertisements and logos; G10 - musical and acoustic instruments; and G11 - information storage. You can see the breadth of these categories and the amount of diverse technologies that are included in them. At first glance one might think that areas such as photography (G03), acoustics (G10) and storage (G11) would be the ones with the most patent applications. However, the data shows that there are other areas of more innovative activity such as education and advertising (G09) and, above all, the one that encompasses counting and counting technologies (G06). Just as the subsections of G, those of H have a large number of requests, with H03 – basic electronic circuits being the least expressive - and H04 - electrical communication techniques - the categories with the most orders among them. Figure 5 highlights subsections G06 and H04, showing how they fall into smaller categories and their descriptions are shown in Table 3.

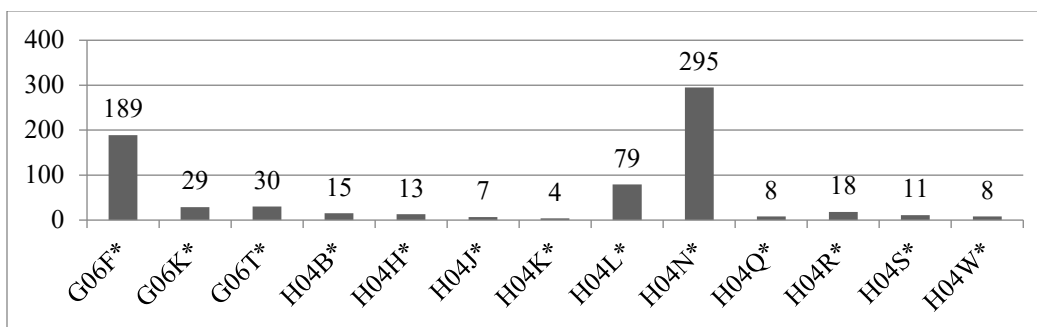


Figure 5. Highlight of IPC orders in subsections G06* and H04* (LATIPAT, 1970-2018)

Table 3. Highlight IPC families G and H (LATIPAT, 1970-2018)

IPC	DESCRIPTION
G06F*	Electric digital data processing
G06K*	Recognition of data
G06T*	Image data processing or generation
H04B*	Transmission
H04H*	Broadcast communication
H04J*	Multiplex communication
H04K*	Secret ommunication
H04L*	Transmission of digital information
H04N*	Pictorial communication
H04Q*	Selecting
H04R*	Loudspeakers, microphones
H04S*	Stereophonic systems
H04W*	Wireless Communication networks

In contrast to the broader CPI overview, shown in Figure 5, the breakdown of subsections with a large number of requests shows us greater consistency with respect to protected technologies and the sector studied. While in the overview seemingly unrelated areas or very specific features were present, here can be seen elements of the Communication and Information Technology complex. The repeated relationship between the data obtained and this industrial complex is due not only to the fact that the audiovisual production chain is inserted in it, but mainly because many of its industries act as supply and service industries and, therefore, are the technological base for audiovisual production.

Among the categories presented, it is worth highlighting those related to the image, either processing (G06T) or communication (H04N), which is the one with the highest absolute number of requests. Regarding the audio area, can be found H04R and H04S, and the others that pass between processing and data transmission, and areas across them.

Each of these categories highlighted here, as well as those previously discussed, has its place within the audiovisual production chain. Many of them are in the production sector, such as lighting, those related to image and sound capture, or specific machinery. The distribution and display industries are also widely covered by data storage and transmission, sound amplification, image projection, as well as furniture and physical elements of movie theaters. Many of them cross more than one sector, as they can be used in other industries and chains, such as those closest to telecommunications. It can be seen that they are widely used tools and processes and cover important fields of technological development, not just for the creative industries.

5. Conclusion

With the obtained data and the proposed discussions a first mapping of the existing and protected technologies in the Latin American countries was made. From this study, it was possible to visualize in a specific sector what is widely placed by theories about innovation: the importance of encouraging research, the predominance of foreign technologies and the low investment in own technologies.

Also, the study helps to identify which areas are most prominent within the audiovisual chain sectors and how patent applications have increased in recent years. Creative industries can be understood as sectors commercially strategic and also in recognition of identities and social empowerment. Some partnerships in this area exist at an early stage,

especially for content production and distribution in the region, but can be expanded into technological cooperation aimed at innovation.

The study has restrictions, such as search factors and selection criteria, but with the objective of mapping the existing technologies in Latin American audiovisual, it raises questions and opens space for further research. The relationship between innovation and creative industries, with a focus on the audiovisual production chain, still needs to be deepened, but its existence and importance can be seen. Like other industries and economic activities, creative industries need to be looked at as such, as sectors that need investment both for the production of their end product, and for the industries and companies that enable their actions. Thinking about the Communication and Information Technology complex with a focus on support sectors can be a prolific way to understand how audiovisual works in countries where the technology bases are mostly foreign. As discussed, national or regional technologies and the strengthening of internal markets contribute to the reduction of external dependence and, therefore, to the autonomy of each country and region.

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Biographies

Ana Lúcia Vitale Torkomian is graduated in Production Engineering (1987) from the Federal University of São Carlos and master's (1992) and doctorate (1997) in Administration, Science and Technology Management area, from the University of São Paulo. Since 1993, she has been a professor in the Production Engineering Department at the Federal University of São Carlos, working in the area of Technology Management, mainly in the following subjects: university-business cooperation, entrepreneurship, technology hubs and parks, technological innovation and intellectual property. From 2001 to 2009 she was Director of the Institutional Support Foundation for Scientific and Technological Development FAI.UFSCar and from 2002 to 2009 Advisor to the Rector, especially in topics related to Technology and Innovation Management. She was elected as a member of the national coordination of the National Forum of Innovation and Technology Transfer Managers - Fortec, in 2006 and re-elected in 2008. In May 2008 she took over the executive board of the UFSCar Innovation Agency, where she remained until October 2009, when it was assigned to the Ministry of Science and Technology. From November of that year to July 2011, she served as Assistant Secretary of the Secretariat for Technological Development and Innovation SETEC / MCT.

Debora Regina Taño is graduated (2014) and master (2017) in Image and Sound at the Federal University of São Carlos. Her research focused on contemporary Argentine cinema and on the creative possibilities and narratives of sound in audiovisual. She is currently a PhD student in Production Engineering at the same university, investigating the networks of organizations that structure the functioning of production and distribution in the Brazilian film industry. She is an audiovisual teacher and works with sound post-production and editing.