



FIRST PORTRAYAL OF QUEBEC'S DIGITAL CREATIVITY INDUSTRY

TABLE OF CONTENTS

Introduction	8
Mandate	8
Partners.....	9
Study execution.....	10
Methodology.....	11
Origin of respondents	12
Portrait.....	14
Ten years ago: multimedia producers	14
Ten years later: a fragmented ecosystem.....	15
Today: digital creativity sector.....	17
Characteristics of Quebec's industry	20
Young companies.....	20
Varied sectors of activities	22
Funding sources	24
Markets.....	25
Economic portrait.....	28
Total revenue	28
Profit margin.....	29
Number of employees	30
Economic impact of the industry in Quebec	31
International comparison: digital creativity in the world.....	37
The concept of creative industries	37
Some national industries.....	39
The United Kingdom, a champion of the creative economy	39
France: where gastronomy rubs shoulders with video games	40
China: the new Cultural Revolution	41
Needs, challenges and key issues	44
Workforce	44
Recruitment and retention	45
Training.....	47
Technical skills	47
Business skills	47
Financing.....	48
Intellectual Property: A Multi-faceted Issue	50
Conclusion	54

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FOREWORD

The aim of this study is to define the profile of a young and dynamic industrial sector, whose emergence over the past thirty years has been marked by accelerated growth in the last ten years.

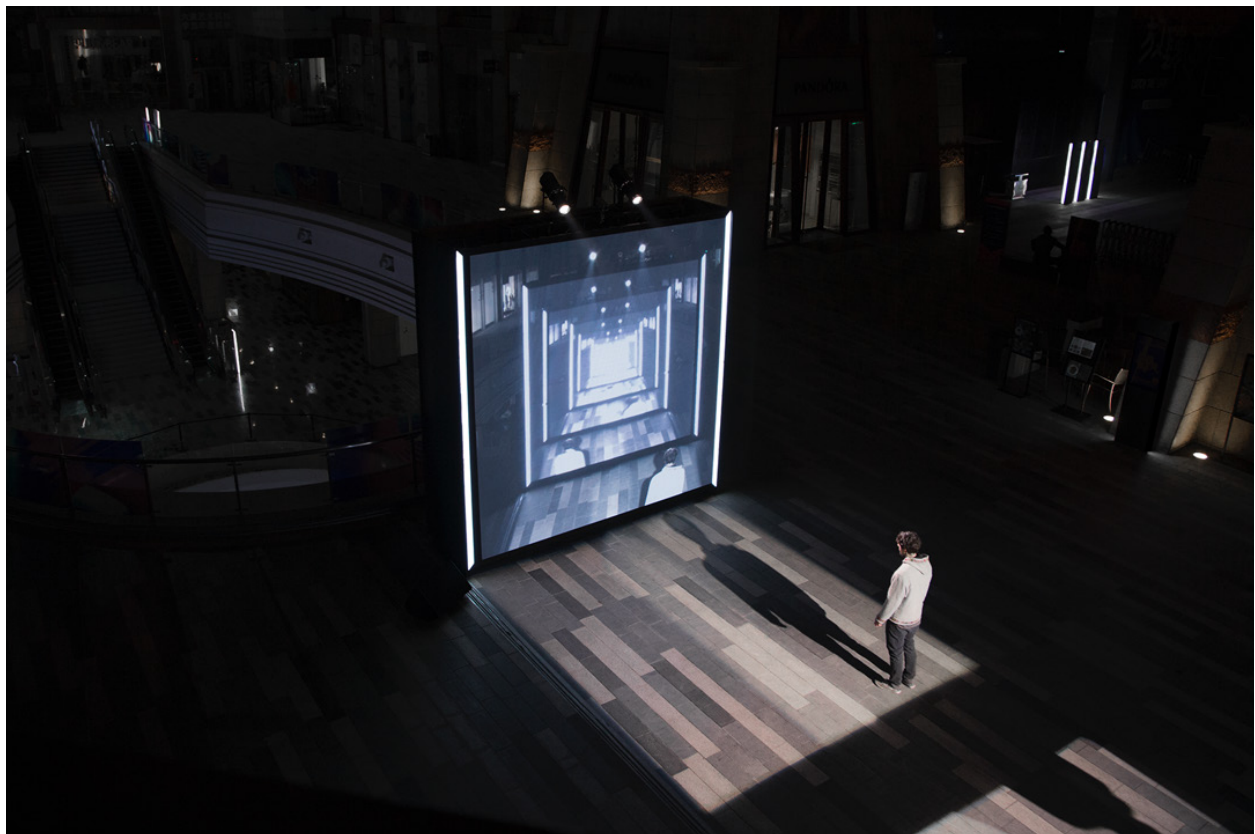
The digital creativity sector is organized around the production - for commercial purposes - of content and experiences using new technologies, the scope of which has been amplified by the advent of the internet and the web. In short, it is the first portrait of a complex sector operating within a complex ecosystem whose main parameters are largely determined by major foreign transnational platforms.

Why “digital creativity”? Creativity is the raw material of the sector profiled here, while digital - though it has become a catch-all word that can designate as many tools and means of communication as abstract concepts like revolution and culture - is also essential for talking about everything that is part of the DNA of the companies in our study, from technologies used, to production methods, distribution and dissemination, content and products.

In this sector, technology, creativity, and culture are closely linked, much more so than in any other cultural industry, where most of the processes, formats or business models depicted here did not even exist ten years ago. As a result, the activities and companies of this new sector and its multiple ramifications are not compiled separately in the national statistics, but rather embedded by default in various sectors and sub-sectors.

The more traditional cultural sectors, such as television and film production, have benefited from strong government support which has historically helped to standardize business models and facilitated the compilation of consolidated data for these sectors. In the digital creativity sector, business models, business practices and financing methods are diversified and often unprecedented.

In this context, this first portrait of Quebec's digital creativity sector is a basic profile, a snapshot of its current state that allows us to measure its vitality and to define indicators for its future development.



SUMMARY

Quebec's digital creativity industry: sector engaged in commercial activities that involve the production of content and experiences through computer tools and digital technologies.

Xn Québec (the Digital Experiences Producers Association), whose mission is to support the development, consolidation and outreach of digital creativity companies, has partnered with Alliance numérique and Coop La Guilde to carry out this study.

The mandate given: delineate the contours of the digital creativity industry, assess its economic importance in Quebec and identify its main needs and issues.

To achieve this, the authors of the study solicited the participation of the 270 member businesses from these three associations. Sixty-seven of them agreed to participate in a semi-structured interview. Respondents also received a link to an anonymous online survey that focused on more sensitive elements, including the financial dimension of their activities.

Based on the interviews conducted and the data collected through the anonymous survey, the following portrait of companies in the sector can be drawn:

- Digital creativity is a dynamic sector that contributes C\$1.2 Billion to Quebec's economy and is growing at an annual rate of more than 13%.
- It consists of young companies with an average age of ten years, 20% of which are less than three years old.
- As a skilled jobs sector, it contributes to the creation of tens of thousands of direct jobs, and employment growth in the sector is increasing by more than 10% each year in Quebec.
- It is a sector that depends on a variety of financing mechanisms, including public funds (subsidies and tax credits), but also self-financing through service activities.

- Half of the companies in the sector are small, with less than 10 employees.
- Several companies operate according to a hybrid model between original production and service production: 38% have been self-financing.
- 35% of them are involved in only one activity, primarily in the video gaming and corporate communications (video production, communications and marketing) sectors, while 22% maintain five or more activities.

The digital creativity sector has a strong growth:

- Almost half of the companies had revenues of less than \$ 500,000 in 2015, while today more than a third of them generate between \$ 1M and \$ 5M in annual billings.
- The net profit margin reported by 42% of respondents exceeded 10% in 2018 (compared with only 20% of firms reaching this level in 2015).
- Beyond production intended for the local Quebec market, the main export markets are North America and Europe to a lesser extent. 39% of the companies surveyed are present in China. The markets outside Quebec that interest them most are North America and Europe. Among companies that are not present in China, less than 10% have expressed interest in this market.

In terms of the impact of the sector on the Quebec economy, the latest available data with a degree of granularity relatively close to that of our sample are those of the “Interactive media” sub-category and date from 2016.



According to Statistics Canada, this grouping of activities:

- contributes \$ 5.437 billion to the Canadian economy and \$ 1.128 billion to the Quebec economy;
- experienced a cumulative growth of 62% from 2010 to 2016, a figure that remains consistent with the growth rate of 10% per year reported by the companies that responded to our survey, which is almost double that of the audiovisual sector in which it is attached (+ 35%) and quadruple to the broader sector of culture (+ 17%) over this period.

Unsurprisingly, the main issue identified by respondents is workforce, especially specialized labor. This challenge is expressed in terms of recruitment, retention and training.

Several executives interviewed also mentioned that the search for funding was complicated by the low level of understanding of the realities of the sector within public and private organizations.

INTRODUCTION

Mandate



The digital creativity sector, which uses computer software and hardware to create content and experiences, touches a wide variety of practices and forms and is aimed at diverse audiences with different, and sometimes divergent, interests.

Digital technologies are at the heart of this sector's business, and their extremely rapid and unpredictable evolution regularly disrupts its environment, markets, business models and infrastructure.

In this context, it has become urgent to delineate the contours of the digital creativity industry, to assess its economic impact in Quebec and to identify its main needs and issues. This is the mandate that Xn Québec (the Digital Experiences Producers Association), whose mission is to support the development, consolidation and outreach of companies in the digital creativity sector, gave to SAGE Consulting and La Fabrique de sens.

In order to reach as many practitioners as possible in a variety of fields, Xn Québec has decided to join forces with Alliance Numérique and Coop La Guilde for this study.



Partners

Xn Québec (Digital Experiences Producers Association)

The Digital Experiences Producers Association, Xn Québec (formerly known as RPM) brings together the main players in Quebec's digital creativity industry, representing more than 130 producers of original and commissioned content for different technology platforms, various networking activities, conferences, clinics, creative forums and international showcases, Xn Québec occupies a prominent place in the Quebec digital creativity industry.

Alliance numérique

Since its creation in 2001, Alliance numérique has been the business network for Québec's new media and interactive digital content industry. The Alliance has more than 100 active members in the video gaming and interactive digital entertainment sector. It supports their development by offering them a wide range of services and activities. It also multiplies the partnerships, the meetings and the exchanges on the national and international scenes in order to favor the growth, the competitiveness and the influence of the industry, in the respect of all its stakeholders. The Alliance also acts as the industry's primary point of contact with governments.

COOP La Guilde

The Independent Video Game Developers Guild of Quebec is the world largest producer cooperative in the video games industry. In addition to developers, it brings together creators and entrepreneurs from related fields in Quebec. Coop La Guilde's vision is to pool resources and services and to cultivate a fertile ground for cooperation between developers of interactive technologies in order to strengthen Quebec's status as one of the world's leaders in video games.

Study execution



Groupe SAGE

Groupe SAGE (formerly SAGE and FG8) works hand in hand with the leaders of some of the most innovative and prestigious companies in the world since 1990. The firm has developed a deep understanding of the role that strategy, innovation, change management and leadership must play in redefining business models. Its economic research department has earned mandates and led studies for the Canada Media Fund, the Canadian Media Producers Association (CMPA) and numerous media production companies. Its partners & researches have published countless articles and white papers, including a review of Netflix's economic dynamics & strategy.

La Fabrique de sens

La Fabrique de sens specializes in producing documents based on in-depth research and rigorous analysis of proven facts and evidence. Thanks to its mastery of strategic planning and monitoring processes and tools, La Fabrique de sens offers an interpretation of the facts and trends and a decoding of the environmental signals for its customers, who come mainly from the fields of culture and medias. La Fabrique de sens has produced memoirs, articles, blog posts, reports and studies for renowned organizations and institutions such as the ADISQ, the Canada Media Fund, Télé-Québec, the CRTC and the Observatoire de la culture et des communications du Québec.

Methodology



The authors conducted a consultation with members of the three partner associations to produce this study. The sectors in which these companies operate vary to a large degree. It includes producers of podcasts or linear content for online markets (web series, web documentaries), creators of web portals or mobile applications, companies that generate projections and assemble technical facilities to support popular music concerts, video game studios, creators of interactive art installations, interactive book designers.

The three partner associations in the study include 270 companies when duplicates are eliminated, several firms being members of two or even three organizations. Of those, 67 interviews were conducted. The interviews were conducted with volunteer member companies from the associations mentioned above. Since digital creativity activities do not have their own NAICS code, it is not possible to know the total comprehensive population of the sector. Non-probability sampling was therefore the only possible solution for this study

It is difficult to accurately estimate the representativeness of such a sample. However, companies of various sizes and sub-domains were targeted for data collection. With a response rate of 25%, we consider our sample representative of the size of the three partner associations. In order to come up with useful economic estimates, we have chosen to take these 270 companies as a proxy for the sector. A proxy is a variable that is not significant in itself but acts as an unobservable or non-measurable variable. As a result, the economic data published in this study represent a minimum threshold for the size of the sector as a whole.

The interviews included seven qualitative and quantitative questions, with a number of sub-questions. The 67 participants were subsequently invited to respond to an anonymous survey targeting sensitive topics (total revenue, profit margin, payroll, employee status, growth data).

In order to link these results to the local and international context in which the industry is evolving, a literature review of similar studies and specialized media articles has also been conducted.

Origin of respondents



The interviews were conducted with the founders or senior executives of the companies. The companies that answered the questions ranged from the very very small start-up companies, to video game multinationals established in Quebec, to small and medium-sized businesses in multiple domains and sizes. The interviews were designed to document the industry sectors and the proportion of activities in the sector as a whole.

The interview grid questions were grouped under six themes:

- Fields of activity
- Challenges
- Competition
- Growth factors and opportunities
- Funding
- External support

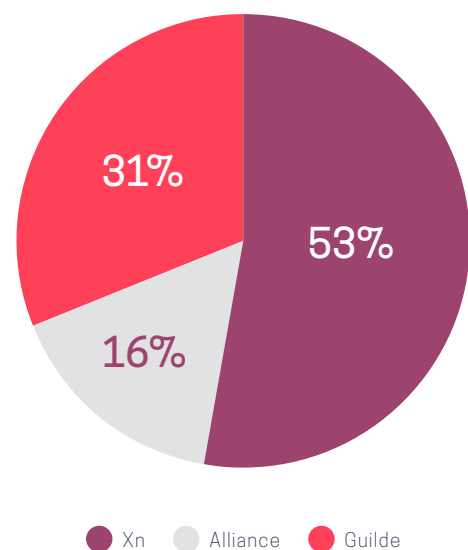
To determine the size of the sector and the scale of the activities of the companies working in digital creativity, the following actions were undertaken:

a) Participants answered an anonymous survey collecting more sensitive information such as:

- total revenue,
- number of employees,
- level of activity,
- etc.

b) While economic research has been conducted to identify the number of companies active in the Quebec digital creativity sector, it appears that the disparity between the activities of the digital creativity sector and the codes

Fig.1 : Origin of respondents



used by institutions listing the Canadian industrial sectors has produced inconclusive results;

- c) A comparative assessment using the results of the survey, results of our secondary research and the figures extracted from the interviews was carried out to give indications as to the importance of the sector for the Quebec economy.



PORTRAIT

Ten years ago: multimedia producers



In 2009, Xn Québec's previous instance, the Regroupement des producteurs multimédia (RPM), commissioned a study on its industry. The research paper, entitled "A full-fledged industry - The portrait of commissioned, convergent & original multimedia production on new platforms in Quebec" presents a brief history of multimedia production in Quebec that is relevant to reproduce here:

The production sector that we associate with multimedia has mainly developed over the last fifteen years in Quebec. From the beginning of the 1990s, more or less interactive initiatives appeared, integrating several media (text, sound, animated images). From there, a number of further applications appeared, using CD-ROM or CD-i (Compact Disc Interactive of Philips) supports. This multitude of applications included educational, edutainment, cultural content, reference material, or others. (...)

Towards the end of this decade, while the dot-com bubble was as inflated as it would ever be, Quebec had its own local companies like Netgraphe, Intellia, ZAQ, Branchez vous!, etc. At the same time, in 1997, the installation of Ubisoft in Montreal set the stage for the electronic gaming industry.

In the early 2000s, the commissioned audiovisual production sector lived through its own small digital revolution. Starting from its roots in the industrial film sector dating back to the years 70-80, it evolved towards corporate video in the 80s, and had to struggle to compete with the arrival of internet and its unavoidable impact on corporate communication practices.

In terms of measures and public policies, a series of programs, some of which are still effective today, were developed in this period. In the mid-1990s, the Government of Quebec created the Information Highway Fund (IAF), set the foundation for the tax credit for the production of multimedia titles and focused on the location of businesses in the ICT industry by announcing the creation of the Cité du Multimédia in Montreal, the CDTI (Information Technology Development Center) and the CNE (Center for the New Economy) in various locations in Quebec.

Around this same time, the federal government made its first incursions into the sector by creating a multimedia pilot program at Telefilm. On this basis, the Canada New Media Fund was set and subsequently merged into the new Canada Media Fund (CMF) in April 2010. At the federal level, under the auspices of the CRTC, specialized funds were created for the production of interactive content related to broadcasting content, namely the Bell Fund and the Quebecor Fund.¹

At the time, multimedia production was defined as the “production of original media content with audiovisual segments and being used on a medium or in a digital and potentially interactive environment.”

Ten years later: a fragmented ecosystem



The 2009 study focused on web-centric production, including commissioned production, convergence and original production. Video games were not taken into account.

Ten years later, we cannot present a portrait of digital creativity without including the video game industry.

Meanwhile, the economic landscape changed profoundly, and this transformation is attributable, in large part, to a boom in this sector: in 2009, there were 48 video game studios in Quebec while in 2017, there were 198². It is also in 2009 that the Canadian Television Fund and the Canada New Media Fund were merged into the Canada Media Fund (CMF). The two funding streams of the new fund, the convergent component (content for distribution on at least two platforms, including television), and the experimental component (digital media content and interactive application software) became effective in April 2010. In addition, alongside transnational giants

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1. RADAR services médias, December 2009
 2. Sources : Entertainment Software Association of Canada. 2009 Economic Impact Report (online : <https://bit.ly/2KQZEsN>) and 2017 Economic Impact Report (online : <https://bit.ly/2irw0w5>)

such as Ubisoft and Warner, there are a large number of independent studios (to date, Coop La Guilde has 160 studios among its members).

It is to take this evolution into account that the members of three professional associations — Alliance numérique, Coop La Guilde and Xn Québec — were invited to participate in this study.

Members of these associations — companies as well as individual members – all engage in commercial activities involving the production of content and experiences through computer tools and digital technologies.

This is the definition we suggest to designate the industrial sector analyzed in this study.

Digital content is now embracing a wide variety of forms and increasingly breaks off from conventional distribution platforms and channels. After being dematerialized, content is transformed into collective experiences and deployed in public spaces. Companies such as Moment Factory in Montreal, Noctura in Quebec City, or Ingrid Ingrid, all create, at their own level, immersive and interactive experiences in public environments and new narrative experiences in physical space.

Digital creativity

Sector engaged in commercial activities that involve the production of content and experiences through computer tools and digital technologies.

The digital creativity industry also includes eclectic companies like Urbania, a content agency that makes both traditional TV production, branded content, original web creation and webcasting.

The boundaries between different sectors are disappearing and circumscribing the profile and scale of the industry is becoming a complex task. Its territory cuts across traditional sectors including, among others, information and communication technologies, broadcasting, audiovisual production and cultural industries.

Today: digital creativity sector



A complex industrial fabric

As pointed out in the sectoral diagnosis of the ICT workforce by TECHNOCompétences, the Sector Committee for ICT Workforce, it is “increasingly difficult to establish an effective sectoral cohesion. Some industrial and market niches tend to create their own ecosystem. In this context, the most publicized examples — digital creation and artificial intelligence — contribute to “create confusion in an already complex whole.”³

In a study on creative industries published in November 2018 by the Chamber of Commerce of Metropolitan Montreal (CCMM), authors define digital creativity as follows:

*(...) companies and support organizations that revolve around digital creative centers. Although digital is used to varying degrees in all creative sectors (whether for production, marketing or distribution), it is for some fields the raw material present at all stages of the production and distribution chain. The industries that make up the subset of “digital creativity” include: video games; visual effects and animation; virtual and augmented reality; and immersive and interactive environments.*⁴

Representative companies from the video game industry, virtual and augmented reality, and immersive and interactive environments participated in our study. We also sampled companies that produce different content for the web and mobile media (web series, web documentaries, applications). We excluded the visual effects sector from our study as it does not — in the current context — properly act as an intellectual property-creating industry.

Despite this exclusion from our sample, the VFX contributes directly to the dynamism and excellence of the Québec digital creation ecosystem. It participates by creating

3. TECHNOCompétences. Diagnostic sectoriel de la main-d’œuvre dans le secteur des technologies de l’information et des communications (TIC) au Québec 2018. Online : <https://bit.ly/2MbqGvo>

4. Chambre de commerce du Montréal métropolitain (CCMM). Industries créatives : réussir dans un environnement en mutation rapide. Online : <https://bit.ly/2K0XObN>

many jobs, taking part in the training and continuous development of the workforce in the sector, in addition to getting international recognition thanks to the excellence of its main players.

Characteristics

We chose to describe the object of this study under the name “digital creativity sector”.

In order to come to this denomination, we aggregated the various meanings and definitions adopted around the terms “creative industry” and “cultural industry”. In conclusion, the UNESCO definition seemed most appropriate.

The UNESCO defines **cultural and creative industries** as “business sectors whose principal object is the creation, development, production, reproduction, promotion, dissemination or marketing of goods, services and activities which have a cultural, artistic and/or heritage content.”

According to this organization, the main characteristics of these industries are:

- The intersection between economy and culture;
- Creativity at the heart of the activity;
- Artistic, cultural or inspired content from the creation of the past;
- Production of goods and services frequently protected by intellectual property — copyright⁵ and related rights⁶;
- The dual nature: economic (wealth generation and employment) and cultural (generation of values, meaning and identity) ;
- Innovation and creative renewal;
- Demand and public behavior difficult to anticipate;

5. Copyright refers to all the rights available to the creator on his original works. The holder of these rights is generally the author of the work.

6. Related rights are moral and economic rights granted to artists (generally performers) in order to protect their performance. These are rights related to copyright that protect persons who are not authors and who, as such, are not entitled to exercise copyright.

- A sector marked by the non-systematization of wage labor as a method of remuneration for work and the predominance of micro-enterprises.⁷

Most of these characteristics are found in the industrial fabric that is the subject of this study:

- **Economy** and **culture** interacts, and this is particularly true for the video game industry, which is made up of billion-dollar companies and small startups, where technology and artistic **creation** intersect, but also for the interactive digital installations sector, which sits on the fence , being both an **artistic** enterprise (performing arts) and an industrial enterprise based on cutting-edge digital technologies.
- Intellectual property is an essential element in the activities of most of the companies that participated in the study. The development and valuation of these companies are among the most important issues facing the industry.
- Its commercial activities also bear, to varying degrees, values and cultural identity. These may take the form of promotional activities that necessarily refer to a system of values, or video games that — in France at least — are recognized as an element of national heritage in the same way that films or books are. For instance, they have been subject to legal deposit at the National Library of France since 1992.
- If **innovation and creative renewal** are assets for any company that wants to ensure its sustainability, these are elements inscribed in the DNA of companies in our study. They must navigate a complex industrial context, in rapid and constant evolution, at the pace of accelerated transformations, both in terms of market and consumer behavior.
- In fact, because of the innovative nature of their activities and offerings, it is difficult for digital creativity companies to predict **public behavior**. For this reason, investments carry a high level of risk that private sector funding agencies are reluctant to run.

7. UNESCO. « Qu'entend-on par industries culturelles et créatives ? » En ligne : <https://bit.ly/2dponUV>

- The **wage system is not the systematic mode of remuneration** for digital creativity companies that rely heavily on freelance services. This practice is inherent in the way businesses operate by project.

Characteristics of Quebec's industry



Young companies

The members of the three associations turn out to be quite young. Figure 2 shows that 60% of firms have been created since 2010 and 19% of firms were launched in the last three years.

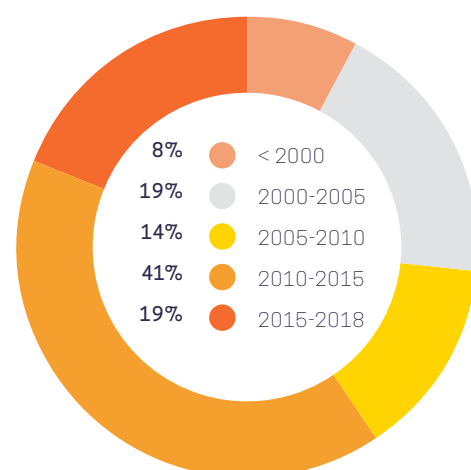
The digital creativity industry is therefore a very young industry, which is undoubtedly a direct consequence of the opportunities created by new digital technologies in recent decades. The strong growth rates of the sector have also favored the entry of new players.

Regional distribution of companies

Regarding the regional representation, 80% of the firms sampled have offices in Montreal only, while 11% of them have offices in other Quebec regions only. The remaining 9% have offices in Montreal and in other cities. For half of these latter cases, secondary offices are in Quebec City, while others prefer metropolises elsewhere in Canada, the United States or Europe.

Based on discussions with executives from firms with subsidiaries outside the major centers, we find that regional companies tend

Fig.2 : Companies by year of establishment



to carry out their commercial activities abroad more than in the local Quebec market, and tend to do more business development abroad. Some say that they come to Montreal or Quebec City almost exclusively to fly abroad.

It can therefore be presumed that several activities taking place outside of Montreal and Quebec City are not documented due to the fact that these companies are not members of the organizations representing the industry, and do not maintain intensive commercial links with the local ecosystem.

This dominance of the greater Montreal area in the sector is also highlighted in the 2018 sectoral diagnosis of the workforce in the information and communication technologies (ICT) sector produced by TECHNOCompétences. According to their compilation of Statistics Canada data, the greater Montreal area, which is home to major centers in video games, virtual reality, animation and digital creation, employs 75% of ICT workers in Quebec. The Quebec City Region accounts for 8.8% of Quebec's ICT jobs.⁸

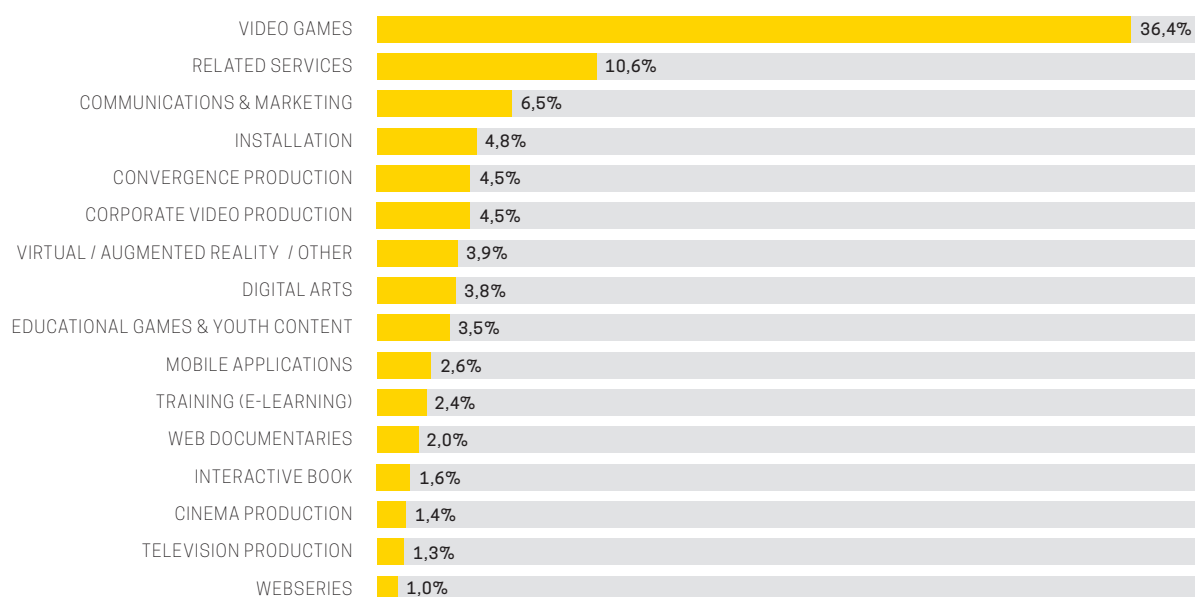
8. TECHNOCompétences. Diagnostic sectoriel 2018 de la main-d'oeuvre dans le secteur des technologies de l'information et des communications (TIC) au Québec. Online : <https://bit.ly/2MbqGvo>

Varied sectors of activities

Figure 3 illustrates the industry activity sectors. The results were obtained by asking respondents the percentage of their individual activities in the sectors mentioned.⁹

For example, a firm claiming to deploy 60% of its production capacity making digital installations and 40% to offer its services for third-party projects contributed 0.6 points to the “installation” category and 0.4 points to the category “related services”.

Fig.3 : Detailed industry activity sectors (>1%)



We thus obtain a distribution which shows a strong concentration in the video game industry. This percentage (36%) is related to the high proportion of respondents who are members of Coop La Guilde and Alliance numérique (47% of respondents).

It should also be noted that while a large proportion of respondents provide related services (services for a third-party), this represents only 11% of total sector activity.

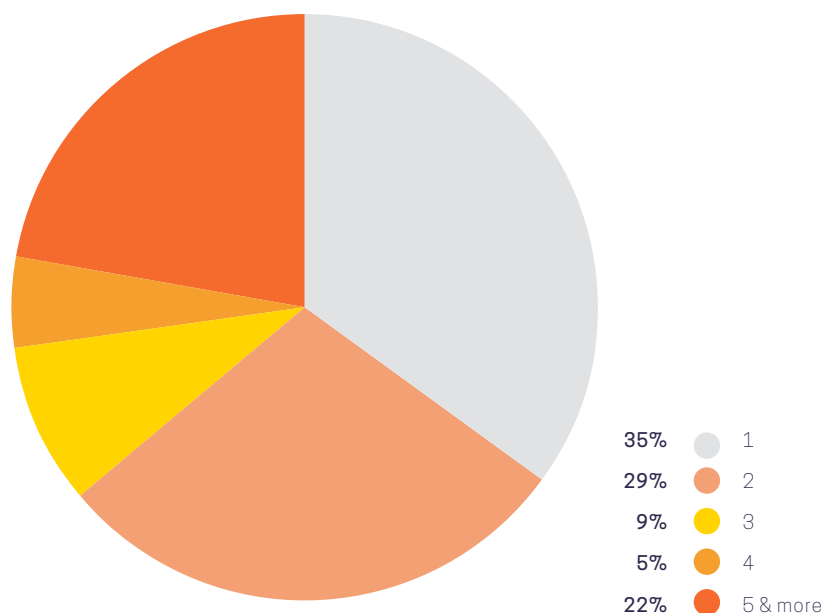
9. Convergence production is digital content related to and complementary to a television production.

Number of business sectors

Figure 4 shows the large quadrants in terms of the number of business sectors. It should be noted that 35% of the companies manage to specialize in one sector, mainly in the video game and corporate communications sectors (video production, communications and marketing).

In the same vein, 29% of companies have only one second sector of activity, often by offering services that exploit their surplus production capacity to third parties. It should also be noted that 22% of companies have gone the route of diversification, by choice or necessity, by maintaining five or more activities. One of the companies interviewed was active in 11 industries. We did not observe any relationship between the size of firms and the number of activities they carry out.

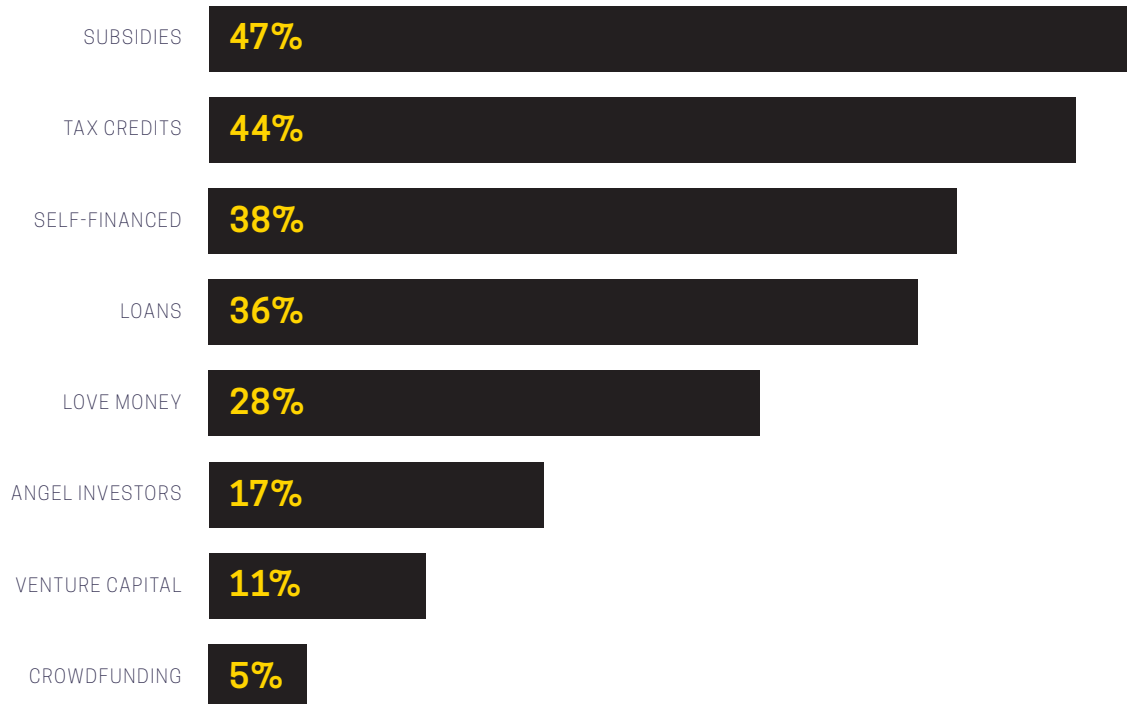
Fig.4 : Number of business sectors



Funding sources

Figure 5 illustrates the extent to which firms used different types of financing.

Fig.5 : Funding sources



Nearly half of digital creativity firms (47%) used subsidy programs and a nearly similar proportion benefited from a tax credit program (44%). 28% of the firms appealed to family and friends (love money) to raise the necessary capital for start-up or growth.

Regarding funding from angel investors, it should be noted that this category included instances where founders lent to the company and repaid themselves over a short period of time, thus adopting angel investor behavior. Otherwise, the proportion that benefited from investments from angel investors proper is closer to the proportion that benefited from venture capital, around 10%.

If the proportion of funding from venture capital or angel investors is minimal, it is likely because most firms in the industry are growing rapidly, but not explosively. Angels and venture capitalists (VCs) are looking for companies that will grow quickly, a hundred times their size (100X). Smaller growth firms are generally less attractive to them.

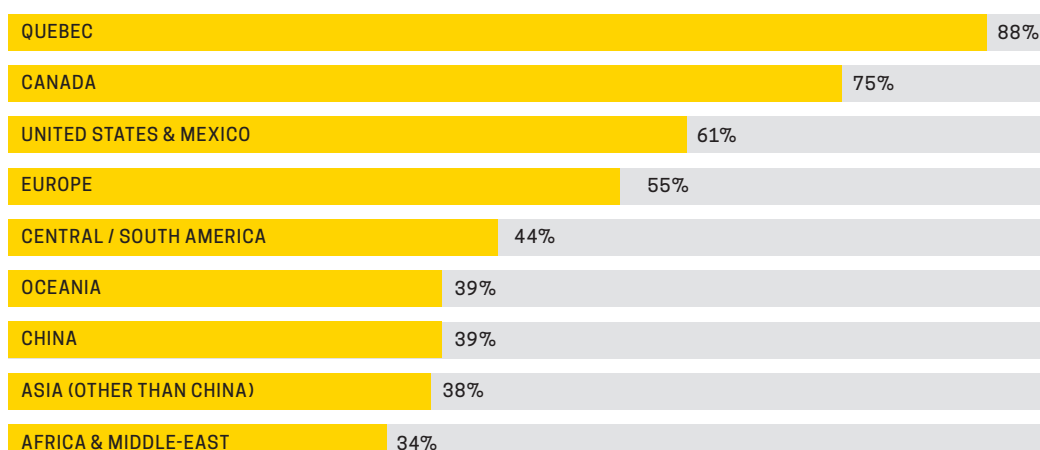
Crowdfunding is a mechanism that is almost exclusively used by small video game studios to test interest in a project and raise seed money. As such, it operates as a marketing and funding mechanism.

Finally, 38% of the firms financed themselves through their own business activities or the profits of an associated company. This hybridization is indicative of a reality experienced by several companies: service activities for other companies serve as a basis from which the original productions will be developed. According to some stakeholders, this situation is rooted in the financing issues of original productions. For example, a few respondents mentioned that they would like to work solely on the development of their IP, but that as long as their cash flows would not allow it, they would continue to focus on secondary activities.

Markets

Figure 6 illustrates the markets in which the surveyed businesses conduct their economic activities. The percentage indicates the proportion of firms operating in each relevant market.

Fig.6 : Companies' markets



There is a strong trend: the concentration of export activities in the markets of North America and Europe. This trend is also reported by the Entertainment Software Association of Canada. According to its report Economic Impact Report 2017¹⁰, 75% of the revenues of the Canadian video game industry come from exports, with 46% of these revenues coming from the US and 42% from Europe.

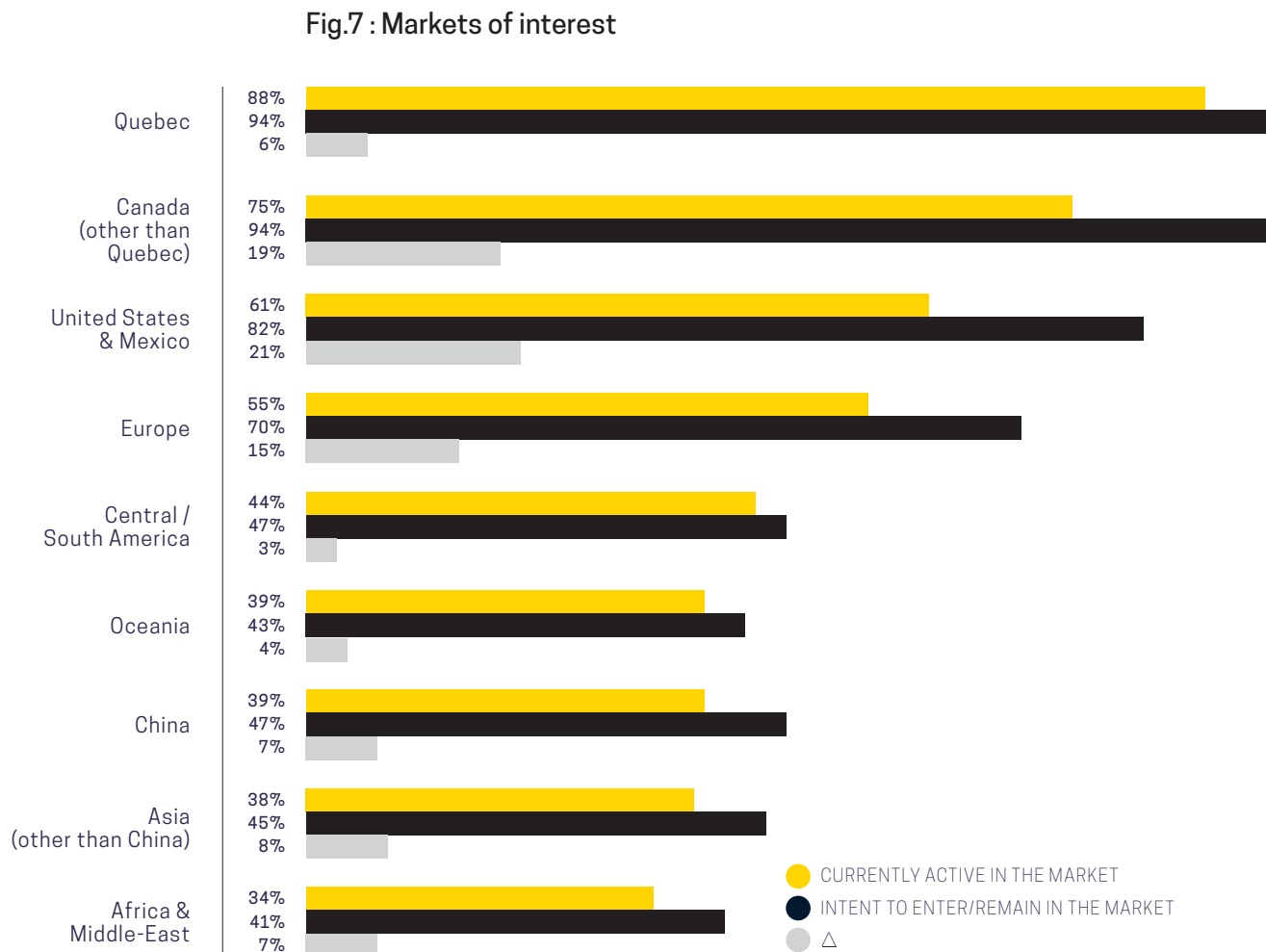


Figure 7 illustrates respondents' current geographic areas of business activity (yellow) and areas where companies wish to offer their products or services in the future (black).

10. Entertainment Software Association of Canada. Canada's Video Game Industry 2017.
 Online : <https://bit.ly/2Ed9z8Z>

In gray we calculated the difference between the desire to be active or to remain active in a market and the current markets. This differential can be understood as future interest for a particular market among respondents. Thus, although the Chinese market is part of many conversations in the business environment, it appears, from the results, that those wishing to be there already are, and that the appetite for this market in others is pretty weak.

It can be understood from this indicator that the expansion markets of interest to the most respondents are North America (21% of members) and Canada (19%), followed by Europe (15%). It should be noted that some members indicated that although the Mexican market is part of NAFTA, the per-capita GDP of the country makes it a less attractive market for more expensive products and is therefore not as interesting as the United States¹¹. However, at the technological and creative levels, Mexico seems to be appreciated and at the same level as Quebec, making it an interesting market for partnerships or commissioning of certain activities.

The fact that companies in our sample favor future growth strategies focused on the Canadian, North American and European markets can probably be attributed to their proximity. The cultural, administrative, geographical and economic distances being reduced between these markets and the Quebec market, and legislative frameworks, linguistic bases and similar cultural norms, naturally makes business environments easier to penetrate and decipher than other proposed markets.¹²



11. GDP per capita: United States: \$59k; Canada: \$46k; Mexico: \$18k (World Bank, 2017).

12. According to Pankaj Ghemawat's CAGE model, cultural, administrative, geographical and economical distances between two countries - i.e. the degree of distance between these parameters - have an impact on the ease of doing business there and, therefore, on the development of internationalization strategies.

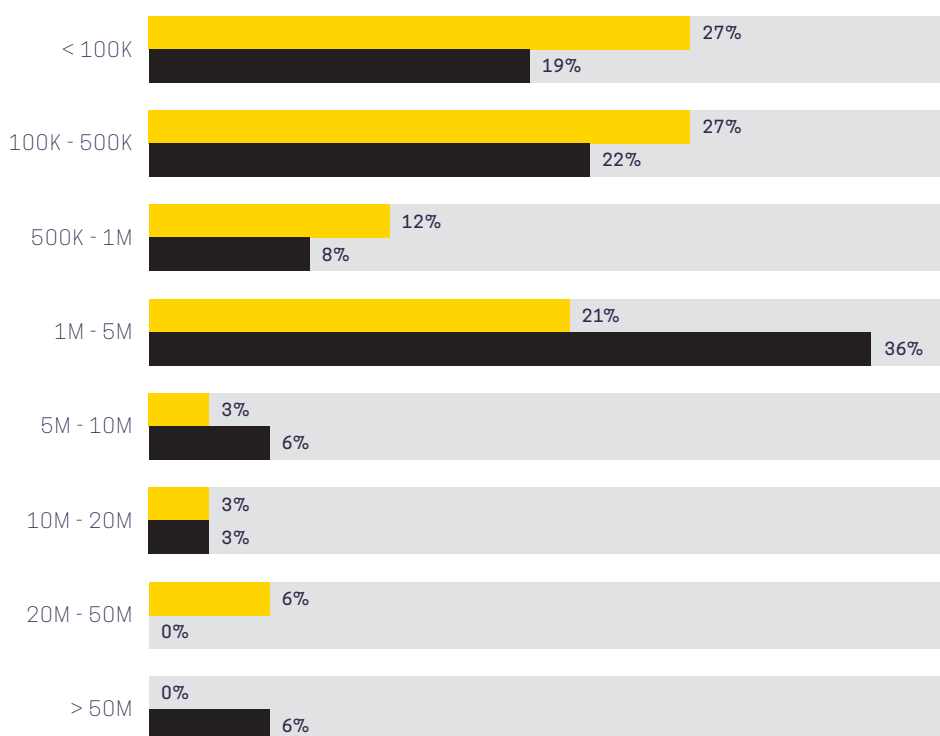
Economic portrait



Total revenue

While just over half of the companies were making less than \$ 500K in 2015, today just over one-third generates a total revenue between \$ 1M and 5M. This \$ 1-5 million segment of sales had the largest growth in three years, from 21% of businesses surveyed in 2015 to 36% in 2018.

Fig.8 : Companies' annual total revenue (2015, 2018)



The growth rates of firms' total revenue vary enormously, but it is possible to release an average of about 10-20% annual growth. That's more than the growth of the payroll (about 8% per year). Considering that the profit margins are quite low, which is normal for a fast-growing industry where the majority of the profits are reinvested, this indicates that firms invest a little less than 50% of their surplus in human capital.

The other half would be, in all probability, redirected to tangible assets such as infrastructure and equipment, debt repayments or dividends.

Profit margin

The profit margins of the majority of firms in the sector were very low in 2015. This is consistent with the financial situation of fast-growing companies whose net revenues are reinvested into the firm to finance this growth.

Note, however, that the situation has improved in the last three years, with 42% of the firms surveyed saying that they had a net profit margin of 10% or more in 2018, whereas this was the case for only 20% of firms in 2015.

Fig.9 : Companies' net profit margin (● 2015, ● 2018)

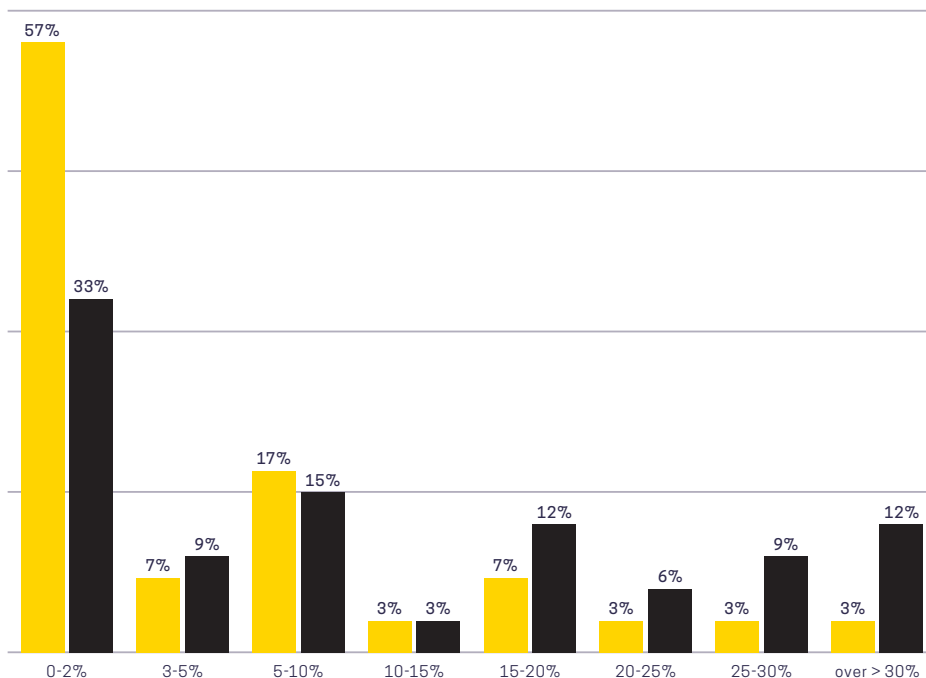


Fig.10 : Net profit margin (2015, 2018)

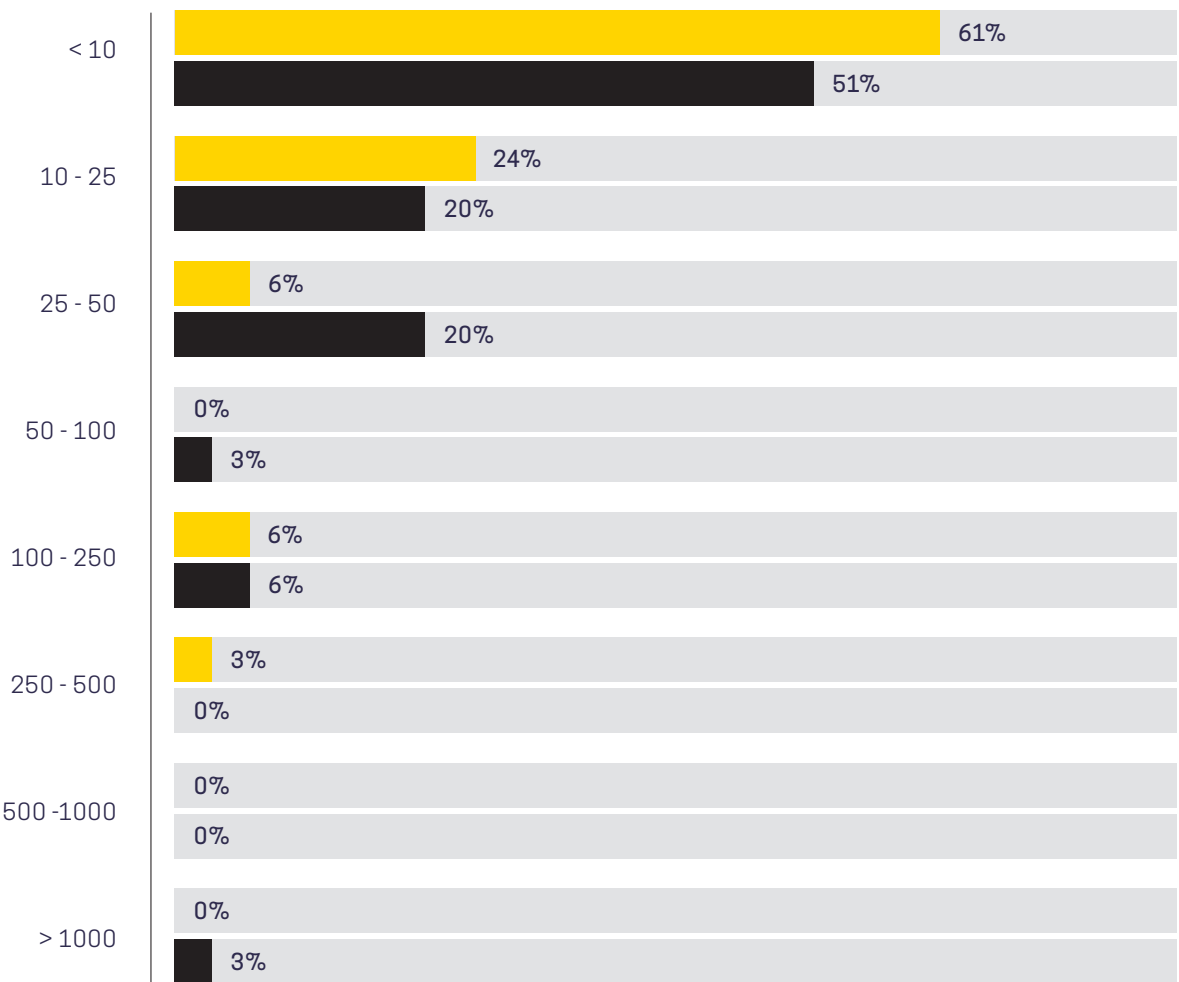


Number of employees

Digital creativity is a sector dominated by small businesses, with 50% of firms employing less than 10 people. This said, growth appears through a significant shrinking of this number since 2015, when 61% of firms had less than 10 employees. As Figure 11 below shows, many of these firms have graduated to a higher number of employees, with the firms totaling 25-50 employees growing from 6% in 2015 to a fifth of our sample in 2018.

90% of the companies surveyed use freelancers. Between 2015 and 2018, the number of freelancers employed by these firms also increased by 66%. The average budget of firms dedicated to hiring freelancers increased by 20% while their payroll increased by 25% for the same period.

Fig.11 : Number of employees by business size (● 2015, ● 2018)



ECONOMIC IMPACT OF THE INDUSTRY IN QUEBEC

As discussed above, it is difficult to accurately define the size of the digital creativity sector and its precise economic footprint as its activities and businesses are not separately identified in the System of National Economic Accounts of Canada (SCENC). Moreover, many “out-of-sample” organizations (traditional multimedia producers, telecom companies, software publishers) are engaged in digital creation activities without being able to distinguish them from their consolidated activities.

It also excludes the design, implementation and management of digital creation infrastructure, such as Mila¹³, an institution dedicated to developing & promoting Quebec’s excellence in artificial intelligence, or Zu¹⁴, Cirque du Soleil founder Guy Laliberté’s “creative hub” project aimed at encouraging incubation and staging of digital creation. These ancillary activities, both founded in recent years, are closely linked to the digital creativity industry in Quebec. Yet neither are counted in the official statistics, nor represented in our sample.

The economically transversal aspect of digital creation manifests itself in many other sectors of economic activity, such as real estate. It will be interesting to examine how the evolution of Quebec’s institutional and real estate portfolio, with the advent of smart buildings for example, will integrate digital creation in the coming years.

In general, the culture sector contributes 3.4% of Canada’s GDP. This includes all activities of the cultural and creative industries. More specifically, the “Audiovisual and Interactive Media” category represents 35.8% of the cultural sector, or just over 1% of Canadian economic activity. This category, however, includes traditional film

13. <https://mila.quebec/>

14. <https://zumtl.com/>

and television production activities that are not included in this study. However, Statistics Canada and the Institut de la Statistique du Québec published more granular data until 2016.

A contribution of more than \$1 billion to Québec's economy

We surveyed the members of Xn, Alliance numérique and Coop La Guilde, among other things by asking them to anonymously provide us with their financial results for the past three years. According to the data collected in this context, the digital creativity sector in Quebec represents at least \$1,250 billion, achieving growth of nearly 50% compared to 2015. We use the sample surveyed among the 270 unique members of the three organizations. It is therefore a minimum.

This result is quite close to the “interactive media” sub-category obtained in national statistics. This sub-category is the one closest to our own sample. According to Statistics Canada, this grouping of activities contributed \$5.437 billion to the Canadian economy and \$1.128 billion to the Québec economy in 2016. This means that the Statistics Canada indicator is more restrictive than the activities selected for this study. According to Canadian official data, the “interactive media” sub-sector has experienced a cumulative growth of 62% from 2010 to 2016, nearly double the audiovisual sector to which it belongs statistically (+ 35%) and quadruple the broader sector of culture (+ 17%). This is consistent with our observations of an annual growth rate of these activities of between 10% and 13%.



Growing exports

Exports to all commercial partners (x 1 000 000) CANADIAN DOLLARS					
Domain	2012	2013	2014	2015	2016
Film & video	1 867,7	1 876,6	1 945,0	2 343,9	2 087,1
Broadcasting	140,9	94,3	100,8	104,3	107,9
Interactive Media	642,4	934,2	937,4	887,9	1 092,4
Total	2 651,0	2 905,1	2 983,2	3 336,1	3 287,4

Source: Statistics Canada. Table 12-10-0117-01 International trade in culture and sport products by domain and sub-domain, and trading partner (x 1,000,000)¹⁵

Based on this same categorization, the review of the “Interactive Media” sub-category reveals a marked growth in the export of content. A detailed qualitative study of the export of television fiction content was also conducted by our team on behalf of the Canadian Media Fund in 2016, and many of the observations made at the time are still valid today.

Data on the export of content from digital creation is consistent with the respondents interviewed in the study. For the 2012-2016 reference period, Canadian cultural exports grew by an average of 24%, just over half of the 41% growth in digital creative product exports. In general, Quebec is at the top of the Canadian provinces in terms of its **cultural product** export capacity (overall), with a 46% increase over this period, compared with 40% for Ontario and 34% for British Columbia. In the more specific context of **interactive media**, Quebec’s growth was 83%, with the sector’s exports increasing from \$138M in 2012 to \$ 253M in 2016. This compares favorably with the notably high growth of 75% digital media exports from Ontario, and 51% in the case of British Columbia.

15. <https://www150.statcan.gc.ca/t1/tbl1/fr/cv.action?pid=1210011701>

International and interprovincial trade in culture and sport products by domain and sub-domain, provinces and territories (x 1,000,000) DOLLARS CANADIENS

Geography	2012	2013	2014	2015	2016
Newfoundland and Labrador	31,7	32,8	35,4	39,1	40,2
Prince Edward Island	7,2	8,8	9,2	10,7	11,6
Nova Scotia	93,2	124,7	124,2	140,1	141,5
New Brunswick	68,1	74,2	75,6	83,1	87,0
Quebec	2 037,7	2 722,2	2 653,3	2 914,8	2 975,0
Ontario	6 569,3	7 609,3	7 601,2	8 953,1	9 202,2
Manitoba	629,3	880,4	426,6	512,8	514,8
Saskatchewan	91,6	104,6	109,4	123,6	127,0
Alberta	421,2	685,7	690,7	749,6	777,5
British Columbia	1 564,0	1 723,4	1 953,7	2 240,5	2 102,3
Yukon	4,4	6,2	6,4	7,3	7,6
Northwest Territories	8,6	10,0	12,8	15,8	13,2
Nunavut	1,0	0,9	3,8	5,6	6,1
Outside Canada	0,0	0,0	0,0	0,0	0,0

Source : Statistics Canada. Table 12-10-0116-01¹⁶

Good financial health

In general, the decade that has ended has been a good time for the digital cultural industries. According to the Office of the Superintendent of Bankruptcy Canada, the insolvency rate for Information and cultural industries companies decreased from 2.6% to 1.3% between 2010 and 2017. Again, digital creation activities are an integral part of this category that is difficult to extract accurately.

Annual Business Insolvency Rates by NAICS Economic Sectors — 2000-2009

	Taux	2010	2011	2012	2013	2014	2015	2016	2017
Information and Cultural Industries	Insolvency	2,6	2,4	1,9	1,4	1,8	1,6	1,5	1,3
	Bankruptcy	1,6	1,6	1,6	1,1	1,3	1,2	1,2	1
	Proposal	1	0,8	0,3	0,3	0,5	0,4	0,3	0,3

Source : Statistics Canada¹⁷

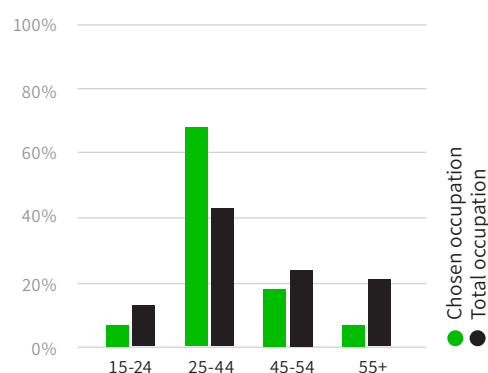
16. <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1210011601>

17. <https://www.ic.gc.ca/eic/site/bsf-osb.nsf/fra/br02234.html>

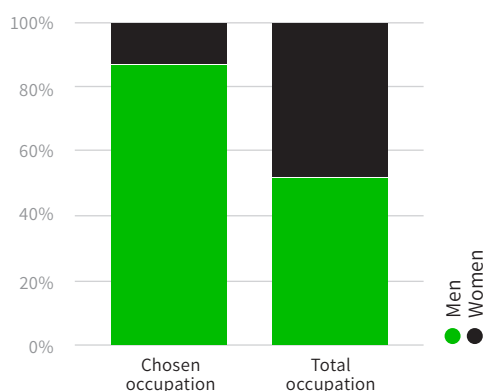
From an individual point of view, programmers and interactive media developers earn on average 15% more than the Quebec median, with a median salary of \$68,000 per year. For the Greater Montreal area, the median wage is even higher at \$71,000. According to Emploi Québec data, the occupation is marked by a significant overrepresentation of young people aged 25-44 (72% versus 43% in the general population) and men (82% versus 53% in the general population). Almost all jobs in the field (95% +) are full-time jobs.

Computer programmers & interactive media developers	
Employment in 2016	32 000
Annual income in 2015	68 000
Estimated hourly wage in Quebec (2016-2018)	
Minimum	18,00
Median	30,05
Maximum	46,00

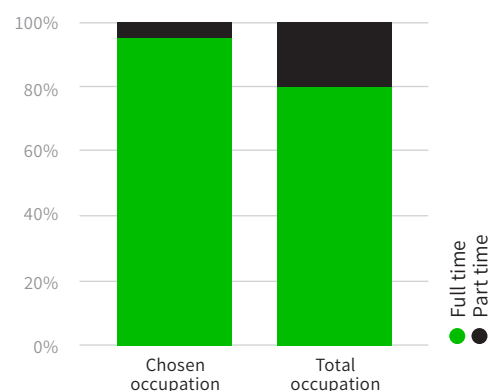
Employment by age group



Employment by gender



Part-time & full time employment



Source : Emploi Québec¹⁸

18. http://imt.emploiuebec.gouv.qc.ca/mtg/inter/noncache/contenu/asp/mtg122_statprof_01.asp?pro=2174&PT2=17&lang=FRAN&Porte=1&cregn=QC&PT1=0&PT3=9&PT4=53

Statistics poorly adapted to a new industrial reality

The lack of accurate statistics for a general profile of the cultural and creative sectors creates significant methodological and statistical challenges that can affect their development. On a website dedicated to cultural economics, the European Union describes these effects as follows:

“The difficulties faced by these sectors are compounded by the lack of clear data and information about them, which limits the capacity of funders to recognize their potential, as well as other legislative obstacles, such as intellectual property rights, disparate tax regimes and mobility issues”¹⁹.

The Working Group of Experts from the Member States of the European Union on Access to Finance for the Culture and Creativity Sectors made a recommendation on this subject in a recent study: “Providing better data on the culture and creativity

sector (CSC) and businesses in these sectors. It is difficult to measure the impact and dynamics of CSC. It is therefore necessary to support initiatives and cooperation aimed at collecting relevant and accurate data on the CSC, as a sector in its own right but also as a driver of innovation and growth in the rest of the economy²⁰.”



19. https://ec.europa.eu/culture/policy/cultural-creative-industries_fr

20. European Union, 2016. Towards more efficient financial ecosystem. Innovative instruments to facilitate access to finance for the cultural and creative sectors (CCS) : good practice report — Study.

Online : <https://bit.ly/2ToxnjS>

INTERNATIONAL COMPARISON: DIGITAL CREATIVITY IN THE WORLD

The concept of creative industries



The concept of creative industries appeared in Australia in the 1990s, but it was really developed in the United Kingdom in the late 1990s as a result of a shift in the government of the day, aimed at highlighting the role in the British economy of a rather wide and heterogeneous range of sectors of economic activity grouped under the label of creative industries.

In the United Kingdom, the creative industries have thus become a central issue in support policies for the economy. Gradually, “the notions of creative industries and economics became prominent in the debates affecting the cultural industries, and in particular they helped to highlight the importance of the role of the cultural sector in economic development and growth policies at local, national and international levels.²¹”

Other national jurisdictions have followed suit and adopted their own definition of cultural and creative industries. These definitions vary according to the areas that each chooses to include, the importance that is attached to their economic and cultural scope, and serve to guide and justify supportive programs and policies.

21. Felipe Verdugo, CEIM, dans Culture, commerce et numérique, volume 11, numéro 7 (octobre 2016).
« Industries créatives et jeux vidéo : vers une redéfinition des contenus culturels à l'ère du numérique ? »
Online : <https://bit.ly/2DyANaO>

If we add to this the diversity of methodologies, modeling, scope of economic value and impact estimates adopted by the various organizations, making comparisons between the value of the cultural and creative industries of different territories becomes a perilous exercise. This is truer for the digital creativity sector, often considered as a sub-sector of the cultural and creative industries, for which separate data are difficult to find.

By conducting a review of the recent literature on this subject, we can, in the absence of precise indicators, identify certain parameters that make it possible to understand the environment in which the sectors of digital creativity evolve, both internationally and in some territories.

This environment, as highlighted in a recent report of the UN Conference on Trade and Development (UNCTAD)²², is robust : the global creative economy — at the heart of which the creative industries are evolving — has gone through the economic crisis of 2008 without too much damage, and has even experienced growth, demonstrating in general that it is a business sector with a high return potential.

After all, it is an industry whose raw material, human creativity, is inexhaustible. Some observers also point out the fact that consumer demand is not likely to decrease, unlike what happens for fossil fuel-based industries, for example. UNCTAD report shows significant growth in trade in the creative economy: in just over a decade, from 2002 to 2015, the size of the global creative goods market has more than doubled from \$ 208 billion in 2002 to \$ 509 billion in 2015.

That said, the report also points to a decline in the export of creative goods in 2015, down almost 14% from 2014. The report speculates that this could be partly explained by a weaker demand in developed countries, political and economic tensions in developing countries and a difficult international environment. This is perhaps an indicator that the strength of this economy is not guaranteed.

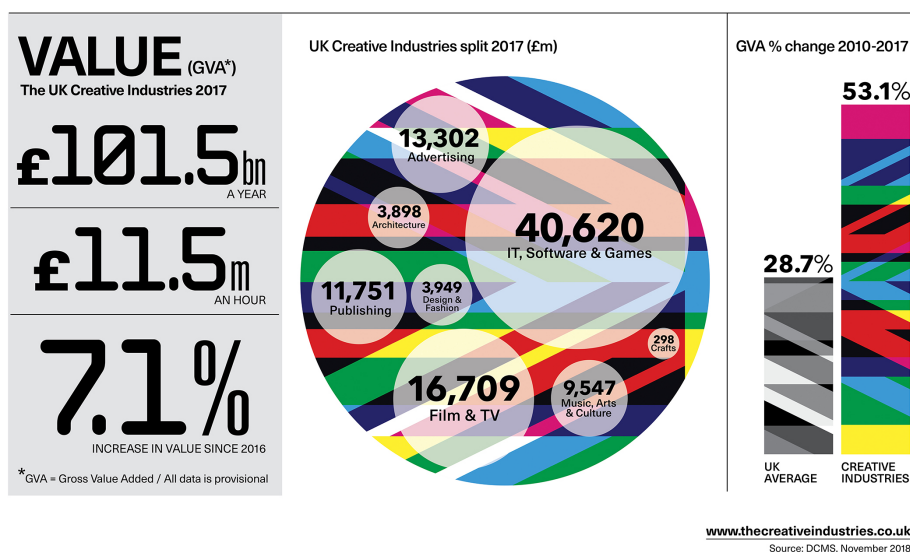
22. UNCTAD (2018). Creative Economy Outlook : Trends in international trade in creative industries, 2002-2015.
En ligne : <https://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=2328>

Some national industries



The United Kingdom, a champion
of the creative economy

The UK Creative Industries



Source : <http://www.thecreativeindustries.co.uk/resources/infographics>

According to the Creative Industries Council, a joint forum between the creative industries and the UK government, the gross value added (GVA) of UK creative industries was provisionally estimated at £ 101.5 billion in 2017 (174.5 billion Canadian dollars), or about £11.5 million per hour (17 million Canadian dollars). Since 2016, the gross added-value of the creative industries has increased by 7.1%. Between 2010 and 2017, gross added-value increased by 53.1% in the creative industries, much faster than the 29.7% growth of the overall economy over the same period.²³

The information technology (IT), software and video games sectors account for 41% of this value.

23. <http://www.thecreativeindustries.co.uk/resources/infographics>

In March 2018, the government announced²⁴ that it would invest, together with the industry, more than £150 million to help leading cultural and creative businesses thrive.

Of this amount, the government has pledged £33 million for immersive technologies such as virtual reality video games and augmented reality projects. The goal is to double the UK's share of the global immersive creative content market by 2025 — valued at more than £30 billion.²⁵

As elsewhere, hiring labor, especially for technical positions such as programmers and web developers, is a growing challenge. In addition, more and more employers are seeking a “fusion” of entrepreneurial, technical and creative skills, according to the UK Digital and Creative Sector report²⁶. This is an observation that some entrepreneurs encountered in our study also made.

France: where gastronomy rubs shoulders with video games

In France, culture has been historically conflated with “heritage”. The French rely on a strong cultural sector that doubles down as a powerful vehicle for international influence. This probably explains why the notion of cultural and creative industries is less widely used than in Anglo-Saxon countries and can sometimes encompass gastronomy, fashion, luxury and beauty as well as the video game sector.²⁷

For the French Ministry of Culture, video games are part of the cultural industries as a sub-sector of the audiovisual sector. In a document that calculates the direct economic weight of culture, that is to say the added value of all cultural branches, the French Ministry of Culture reports that in 2016 the edition of video games

24. <https://www.gov.uk/government/news/creative-industries-sector-deal-launched>

25. Virgin.com. « What does the future hold for the UK creative industries ? »
Online: <https://www.virgin.com/entrepreneur/what-does-future-hold-uk-creative-industries>

26. https://dma.org.uk/uploads/misc/59f9ae41f0bba-geminiguidantreport_59f9ae41f0b22.pdf

27. Bpifrance (juin 2017). « Créativité déroutée ou augmentée : comment le numérique transforme les industries de la French Touch ». Online: <https://www.bpifrance-lelab.fr/Analyses-Reflexions/Les-Travaux-du-Lab/Creativite-deroutee-ou-augmentee>

continued its strong growth (+130 million euros, + 20.1%), while the share of culture in the French economy as a whole (2.2%) has been steadily declining since 2003.²⁸

In France, the government began supporting video game companies in the mid-1990s, through support policies for the multimedia sector. But its tax credit policy for video games was developed later in 2007. If the rate of this credit is comparable to what is done in Quebec, the conditions attached to it are more restrictive, with a strong cultural component : the game must be developed by French and European creative partners and above all “contribute to the development of French and European video game creation as well as its diversity by distinguishing itself in particular by its quality, its originality or the innovative nature of the concept and the level of artistic expenditure.”²⁹

The French government also supports virtual reality through the New Media Fund established by the CNC (National Center for Cinema and Moving Image) in 2016. This fund has invested a little more than €3 million (\$4,5 million) in some 60 projects related to virtual reality. In October 2018, the CNC created the Digital Experiences Support Fund (XN Fund, not to be conflated with Xn Quebec), also with a budget of €3 million. The XN Fund supports innovative audiovisual works based on an interactive and / or immersive and creative approach, “including works for immersive technologies (virtual and augmented reality) and interactive narratives designed for the Web or mobile screens.”³⁰

China: the new Cultural Revolution

In China, the central government uses the term “cultural industries” to refer to the economic sector based on trade in cultural products and entertainment services. After being an instrument of propaganda during the Mao years, culture became,

28. Ministère de la Culture. « Le poids économique direct de la culture en 2016 ». Online: <https://bit.ly/2Bv4asq>

29. Pierre-Jean Benghozi et Philippe Chantepie. Jeux vidéo : l'industrie culturelle du XXI^e siècle ?, Paris, Presses de Sciences Po/Ministère de la Culture, coll. « Questions de culture », octobre 2017.

30. Centre national du cinéma et de l'image animée. « Fonds d'aide aux expériences numériques ». Online: <https://bit.ly/2T1iUuB>

with the opening of the country to the market economy, one of the pillars of the Chinese economy.³¹

For example, in 2011, the Chinese Ministry of Finance launched the first government-sponsored private investment fund, the China Culture Industrial Investment Fund, whose mission is to invest in China's cultural industries, including film and television, internet content and editing³².

According to data compiled by UNCTAD, China's cultural exports increased from US \$ 55 billion in 2005 to US \$ 191 billion in 2014, an increase of 247 percent. Sign that China is more open to exporting its cultural products outside its borders than to opening up to foreign products: the country's trade balance for cultural products showed a surplus of 177 billion 2014 (in comparison, Canada had a trade deficit of \$ 8 billion in cultural products in 2014.³³)

China is the largest video game market in the world with an estimated 600 million gamer population that would have spent nearly 40 billion US dollars in 2018 (25% of the global market).³⁴

These are figures that make the Chinese market eminently attractive. But it is an extremely complex market dominated by local businesses. For example, Tencent, the Chinese Internet company whose market capitalization has in the past surpassed that of Facebook³⁵, owns 50% of the Chinese video game market, which has allowed it to reap revenues making it the first game publisher in the world since 2013. Another Chinese company, NetEase, is the fifth largest publisher of games in terms of revenue (behind Sony, Apple and Microsoft)³⁶.

31. Yang Jianfei (2011). « The Chinese Understanding of Cultural Industries ». Santalka : filosofija, komunikacija. 19. 90-97. 10.3846/coactivity.2011.18. Online : <https://bit.ly/2FY05zN>

32. Screen Daily (2011). « Chinese government launches \$3bn fund for cultural industries ». Online : <https://bit.ly/2Sh7cuT>

33. CNUCED, op cit.

34. Newzoo Global Games Market Report 2018. Online : <https://bit.ly/2KFuy5k>

35. CNBC (november 2017). « China's Tencent surpasses Facebook in valuation a day after breaking \$500 billion barrier ». Online : <https://cnb.cx/2zown6d>

36. Newzoo. « Top 25 Public Companies by Game Revenues ». Online: <https://bit.ly/2rp>

Another market whose development will be interesting to follow is the immersive technologies of virtual, augmented or mixed reality. The Chinese government has given high priority to this type of technology in its 2016-2020 Five-Year Plan for the Economy and has dedicated national competitions, a flood of grants, incentive programs and support policies.

And these initiatives do not unfold in a vacuum. According to observers, the Chinese consumer who has embraced mobile technologies with great enthusiasm is much more likely to adopt immersive technologies than the Western consumer.³⁷



37. Venture Beat (13 may 2018). « It's time to embrace China's mixed reality market ». Online : <https://bit.ly/2Ss51k8>

NEEDS, CHALLENGES AND KEY ISSUES

The main issue, mentioned by the vast majority of participants, is the one related to the management of the workforce, particularly as it concerns specialized labor, both in terms of recruitment, retention, and training. Several stakeholders, especially those from small producers and developers, also reported weaknesses in their own business management, advertising, and marketing skills.

Several executives mention that the search for funding to drive growth is complicated by the fact that support agencies, both public and private, have partial and sometimes incorrect knowledge of the realities of their sector. This is true in sectors that are still in the development phase such as virtual reality, but it is also true for a mature sector such as video games, among other things because of the constant transformation of technologies, markets and business models.

Some leaders also mentioned the difficulty of staying “ahead of the parade”, staying informed of the latest technological and business model innovations in this ever-changing sector.

Workforce

The digital creativity industry relies heavily on its specialized workforce. It has many needs in management, creation, media production, design and manufacture of physical objects (installations), as well as computer / software design.

Because it is a constantly evolving sector, the workforce must also be constantly evolving. The multiplatform nature of the industry results in a very wide variety of diverse activities and human capital is dispersed in a variety of different and traditionally unrelated sub-sectors. A firm may have needs in software engineering, in order to design computer products, in networking, to maintain the IT

infrastructure, and also in visual design, 3D animation, video production, scripting, sound design, event production, interface design, in production, etc.

The requirements for the practices required to support these activities generate a constant tension between extreme specialization and absolute generalism among workers in the sector. This tension is a challenge for all businesses, regardless of size. All of them declared this is one of their main issues.

In the case of small businesses, the small size of the teams forces staff to be versatile, using different tools and taking on multiple roles to deliver projects. Generalists are popular because an individual with multiple skills is able to contribute more widely to a project. On the other hand, SME entrepreneurs report that they find it hard to hire people with highly specialized skills, who usually command higher pay.

In the case of large corporations, one of the issues identified by executives is the overspecialization of certain roles: people who rush into very narrow professional avenues are difficult to reassign when their role in some projects expires. This causes some “calcification” of companies that lose agility by becoming more rigid at the structural level. Managers say they prefer a state of affairs where people are specialized but retain some flexibility to contribute to other tasks.

Recruitment and retention

All players, regardless of size or industry, identify recruitment and retention of talent as the greatest risk factor they are exposed to, whether it is a large enterprise



with vast financial resources and huge production teams, or a small start-up firm that manages a team of three people.

Large companies say their biggest challenges in terms of recruitment and retention are:

- a. the attractiveness of other large similar firms in the sector;
- b. the attractiveness of SMEs given the willingness of certain individuals to work in “human-sized” teams;
- c. scarcity and very high demand for some specialized skills; and
- d. the inability of the academic sector to train enough technical succession (software engineers, programmers, etc.) to meet the needs of the entire industry.

SMEs, for their part, say that their biggest challenges are:

- a. the attractiveness of large companies that manage big ambitious projects with great visibility for the artisans who work there;
- b. the means available to large companies for paying very competitive wages;
- c. scarcity and very high demand for some specialized skills; and
- d. the inability of the academic sector to train enough technical succession to meet the needs of the entire industry.

This difficulty in identifying and hiring the skilled workers needed to perform the works that firms are developing is one of the biggest barriers to growth identified by respondents, as well as the shortage of experienced workers who stand out through their business experience and level of productivity and professionalism.

Another recruitment issue raised by respondents from small or medium-sized firms is the difficulty in developing roles related to human resources management (CHRO) and financial management (CFO). This is again due to the difficulty of supporting a full-time position of this type. Some small firms have started to use part-time CFO services, for example a VP Finance that will manage the finances of several SMEs.

Training

As the digital creativity industry is a constantly evolving sector that benefits from the advancement of digital technologies, its training needs are often new and constantly changing. While the sector has demonstrated its ability to seize new opportunities, develop new products and offer new services, academic institutions are struggling to adapt their training to the new realities of the community.

This agility shown by the industry is thus confronted with the rigidity of academic programs, stuck in an academic loophole that is not very flexible and requires years to evolve or to create new programs. During this period the sector can change completely because of something as simple as the appearance of a new tool or application that introduces creative practices or possibilities leading to new business opportunities.

The delay of educational institutions to create an offer based on the needs of industry thereby leads to a difficulty for the sector to seize new business opportunities.

Technical skills

The industry deplores the shortage of IT professionals, programmers and software engineers, trained by academic institutions. In addition, because of the rivalry of large technology companies who come to recruit directly on campus, there are few students interested in working in the field of digital creativity.

The sector also criticizes educational institutions for training young workers on software / platforms that are out of date, forcing companies to train new employees to update them. The long cycle of creating new programs and courses within these programs is targeted as one of the factors that does not help educational institutions adapt quickly to the needs of the industry.

Business skills

Respondents also reported a gap in the recruitment of knowledgeable professionals who are trained in marketing and new development strategies, such as crowdfunding.

Once again, the very long cycle of creation of new programs or courses is pointed out to explain this lack of professionals in this sector.

Financing

Most companies have identified funding as a major challenge, a problem that blocks their efforts to manage the issues they face. Issues arising from funding challenges include:

- a. launch;
- b. growth;
- c. research and development;
- d. export and opening to new markets;
- e. marketing and discoverability.

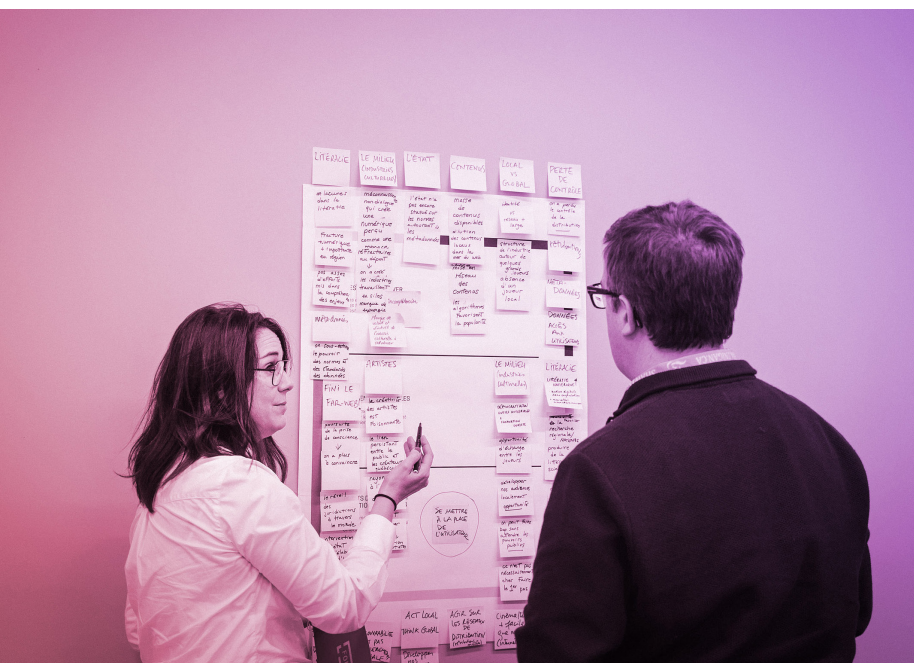
Some respondents spoke about general issues related to the financing of intellectual property, but also that of businesses as such. The intellectual property issue is well-known: some find it regrettable that the passive income of IPs from foreign-controlled companies leave Quebec. Regarding the ownership of Quebec companies, mention is made of the difficulty of finding Quebec investors when the founders want to sell and leave the company or to make it grow rapidly.

In particular, companies highlight the extent to which funding agencies, both public institutions and the business community, have a poor understanding of the digital creativity sector. For example, a firm that creates educational games has been placed in the “lottery and gaming” category at its bank, a situation that has severely affected its ability to borrow capital.

Another who offers interactive training withdrew from the financial support of a parapublic institution because the proposed categories did not allow it to properly define its business activities. In addition, some public funders are criticized for having unrealistic expectations with respect to the production capacity of subsidized firms. Their creative process, their development and the marketing needs of digital productions are different from other “traditional” creative areas.

Another criticism targeted at funding agencies is the lukewarm reaction of investors and their unwillingness to inject capital in its ecosystem while its growth is an eloquent proof of its profitability. Another often heard grievance: the lack of interest from venture capital funds and angel investors, who are uninformed about business practices and the potential benefits of certain areas of the industry.

Major players in the video game sector have pointed to the inaction of large public and parapublic investment funds (CDPQ, FTQ, CSN, etc.) in the face of acquisitions of Quebec studios by foreign interests. They observe that if American or French firms are able to perceive the wealth creation potential of this type of Quebec business, perhaps Quebec and Canadian players should educate themselves about the business models they are exploiting and the potential revenues of these companies.



In the same vein, we have been told that it is difficult for some companies that depend on advanced technical equipment to obtain loans for infrastructure investments. This would allow them to repatriate part of the production internally and thus reduce their costs. This is due, according to some executives, to bankers' poor understanding and lack of interest towards this sector.

Intellectual Property: A Multi-faceted Issue



In terms of intellectual property, digital creation is characterized by a number of important features. Depending on the type of creation and the geographical area targeted, uses, standards and jurisprudence allow more or less protection. As the value generated by digital creation typically stems from highly intangible assets, intellectual property tends to be held where companies' elect their tax residency. This is where value is deemed to be created: it is therefore essential to take an interest in this dimension.

In the particular case of coding, software or an algorithm, legal protection is currently considered to be, at best, indirect and imperfect. The Canadian Intellectual Property Office, like most intellectual property organizations, requires an invention to be new, useful, and non-obvious. This excludes many aspects of digital creativity.

For example, in France, the Intellectual Property Code “expressly excludes *scientific theories and mathematical methods*, but also *computer programs*” from patentability.³⁸

In Canada, the CIPO website is explicit in this regard, “software is considered to be a literary work and, as a general rule, cannot be protected by patent”³⁹. These regionalized nuances are important in that many sub-sectors of digital creation are fully globalized. In the specific case of video games, where the success is largely dependent on a wide distribution, the different intellectual property regimes must be considered upstream. The intellectual property strategy becomes an integral part of the creative process.

38. Marc Schuler et Benjamin Znaty (2015). La propriété intellectuelle et la transformation numérique de l'économie (rapport de l'Institut national de la propriété industrielle).

39. <https://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/fra/wr04317.html>

The creators of immaterial property in the digital creativity sector therefore tend to protect their creations by using copyright or, in the case of products in constant evolution, rely on industrial secrecy and continuous innovation to overcome the lack of protection.

A peripheral case, but nevertheless central to the evolution of digital creation, touches the personal data of users, commonly used to personalize digital products and services (in this case: immersive and interactive experience, video games, etc.). The “ownership” of such data remains to be established. In the case of databases related to the collection of personal information, companies have the legal responsibility to ensure the protection of the data they use.

On the legislative side, a growing number of states are trying to separate the concept of ownership of intangible assets, notably by distinguishing the producer of these data (often a particular individual, consumer of the digital product) and the producer of the artwork or algorithm derived from digital creation. It is difficult to establish the “ownership” of a database since the data itself does not belong to the enterprise, but to its users.⁴⁰ In Europe, the recent General Data Protection Regulation (GDPR) goes further, requiring companies to inform users that information is being collected, and to obtain their express approval according to specific uses. The personal data becomes personal property, and the user can at any time revoke the right to use this “property” by notifying the digital creator.⁴¹

Intellectual property issues also have a significant impact on business models and the economic success of digital creative companies. In financial terms, it is often difficult to rely on sustainable sources of funding for digital production, especially for small players operating in globalized markets. As we pointed out in the Equity Investment Guide produced for the Canadian Media Producers Association (CMPA)⁴²

40. See also: <https://www.cyberjustice.ca/actualites/2018/07/24/la-protection-des-donnees-personnelles-au-canada-a-lere-des-donnees-massives>

41. Carlo DiCelico (2017). « Personal Data as Personal Property : the GDPR as a Model for Privacy Regulation in the United States » : <https://medium.com/@carlodicelico/personal-data-as-personal-property-the-gdpr-asa-model-for-privacy-regulation-in-the-united-states-237a27f82b1>

42. <https://cmpa.ca/wp-content/uploads/2018/09/FG8-2018-Equity-Investment-Guide-Final.pdf>

in 2018, the financial evaluation of intellectual property in the audiovisual field can be difficult. This discourages many traditional mainstream players (large banks, investment funds, etc.) from becoming more involved in the sector: the risk and potential gains are excessively difficult to determine.

This difficulty arises from the low level of protection, but also from market volatility with respect to specific securities even when they benefit from copyright protection; the success of a particular opus within a franchise does not always guarantee the success of the next installment. In terms of financing and economic performance, this reality therefore favors larger studios and producers who can rely on a diverse catalog of intellectual properties, the success of one can overcome the difficulties of the other.

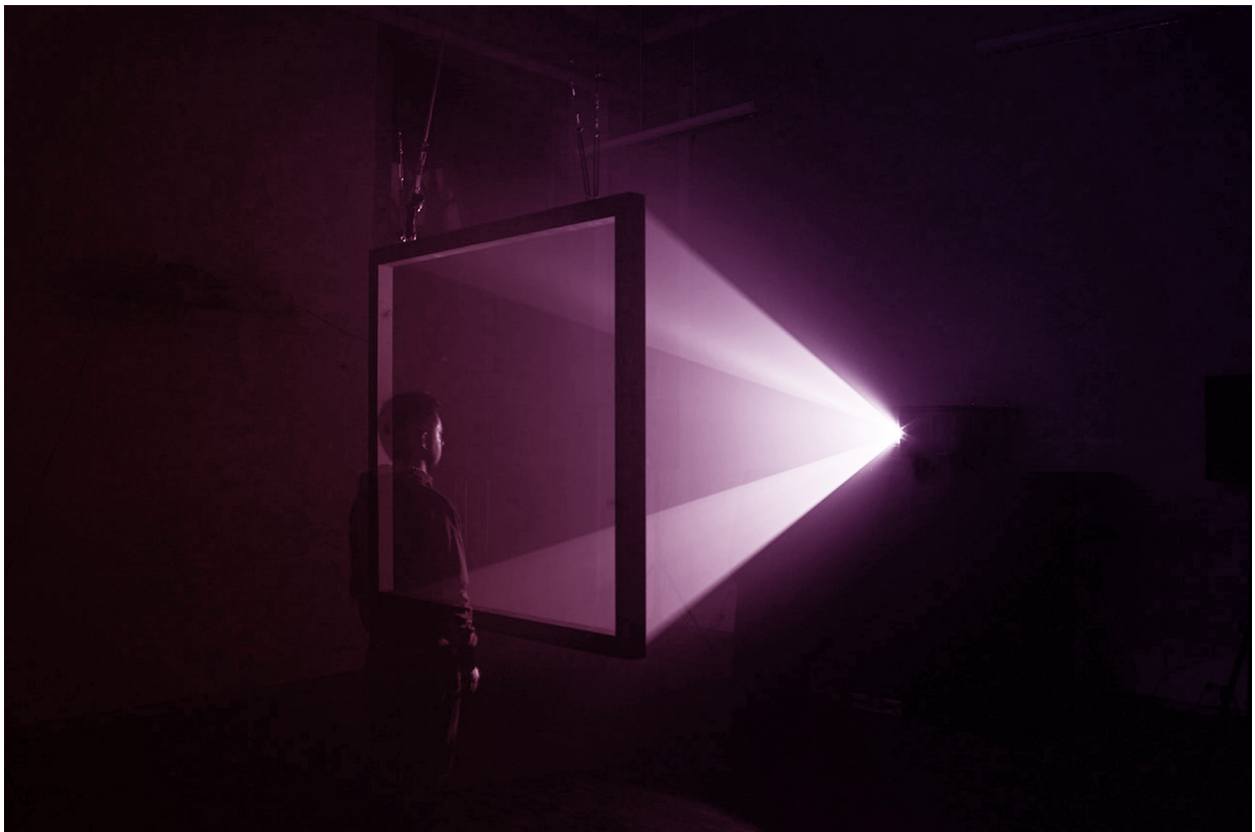
As such, we find that there is a very small number of medium and large studios owned by Canadians. Several companies in the digital creative sector have been the target of acquisitions by major foreign groups in recent years, including Beenox (purchased by Activision in 2005), Compulsion Games (purchased by Microsoft in 2018), and Behavior (20% capital was sold to the Chinese GAEA Interactive Entertainment in 2018).

Without embarking on a complete analysis of the reasons explaining the proliferation of small businesses and SMEs and the scarcity of major players in Quebec, our recent work has identified a number of issues endemic to the creative industry in Quebec, including:

- the low level of maturity of the audiovisual production sector in general and digital creation in particular, with respect to financing issues. By the same token, the limited number of organizations in the sector that have a person entirely dedicated to financing issues, like a CFO.
- the relatively limited number of actors dedicated to the financing of intangible assets in the digital domain, particularly with regard to the creative professions. Although many investment funds have been created in recent years in Quebec and in Montreal in particular, almost all of them are aimed at technology companies outside the digital creativity sector.

- the relative smallness of the immediate market, limiting growth beyond a threshold that would increase the sustainability of businesses and limit the dependence on public funding, particularly with respect to francophone creation.

Issues related to intellectual property in digital creation are numerous and complex. Several efforts have been put forward in recent years to support local production and to help maintain the ownership of these intangible assets in Quebec.



CONCLUSION

The purpose of this study was to draw a first portrait of Quebec's digital creativity sector, identify its main issues and assess its importance for the Quebec economy.

This portrayal of a “business sector that involves the production of content and experiences through computer tools and digital technologies”, includes a variety of activities that together form the basis of a creative ecosystem that benefits from rapid growth.

The portrait presented in this study delineated a fast-growing sector of economic activity, one that is increasingly mastering the new scripts of digital creation and is extremely well positioned to impose itself internationally.

However, in this ecosystem where technology, creativity and culture are closely linked - much more than in any other cultural industry - public policies, as well as financial and measurement tools are often inadequate and slow to adapt.

Most of the issues raised in our study fall into this state of affairs. For example, the shortage of qualified personnel is a phenomenon experienced in several industries during this period of full employment. For some stakeholders, however, this problem is exacerbated by fiscal policies that, while contributing to the ecosystem development, are seen today as an unfair advantage from which some large companies benefit most when it comes to recruiting the best talents.

The development of intellectual property is another issue that has been repeatedly cited by both industry players and public authorities. However, there is currently no real financing tool dedicated to the creation of sustainable brands of intellectual property in digital creation. These investments are often perceived as too risky for private funds, and the current funding model for the traditional creative industries of television and cinema relies on the funding of single projects, rather than the creation of brands that would ensure the sustainability of businesses.

The difficulty of compiling reliable statistics and data about the activities of the digital creativity sector, which are very diverse and often intertwined, may be detrimental to its development. This prevents it, among other things, from being considered as a separate sector for which policies and tools could be dedicated and that recognize the importance of its role as a driver of innovation and growth in the rest of the economy.



With the stabilization of emerging markets and business models in the field of digital creativity, and the inevitable consolidation of the players in the presence that will occur as it always happens with any mature market, it will become imperative that investors are mobilizing to retain the creative talents and their creations from here. Otherwise, several pessimistic scenarios could be realized: the greatest talents will be attracted abroad to work for multinationals, the sector will become an IP farm for foreign interests, or a service provider for transnational firms.

If it is accepted that the creation of wealth involves the possession of intellectual property, the main priority of the institutions cannot be limited to encouraging the development of IP. It must be ensured that the means to exploit these IPs locally exist and that the business environment is conducive to them being also locally owned.

Finally, and beyond the creation of IP, it is essential for the development of the industry that private investors and large public and parapublic investment funds understand the value of its activities and support them. To do this, a shift must be undertaken so that private investors and large public and parapublic investment funds understand the value of the products and support their exploitation. It has become necessary to replicate successes like those of Moment Factory, which

creates new forms of entertainment in public spaces, Silent Partners, specialists in design and production of images and content for the digital arts and the stage and who have collaborated with several internationally renowned artists, or the renowned game developer Ubisoft whose studio in Quebec, for example, leads the development of Assassin's Creed Odyssey, considered the best and most or Felix & Paul Studios, creators of immersive reality which owe their success to the development of a state-of-the-art proprietary immersive camera system, but also and more importantly, to their great contribution to worldwide digital creativity.