



United Nations  
Educational, Scientific and  
Cultural Organization



Diversity of  
Cultural Expressions

# 12 IGC

DCE/18/12.IGC/INF.10  
Paris, 30 November 2018  
Original : English/French

## INTERGOVERNMENTAL COMMITTEE FOR THE PROTECTION AND PROMOTION OF THE DIVERSITY OF CULTURAL EXPRESSIONS

Twelfth Session  
Paris, UNESCO Headquarters  
11-14 December 2018

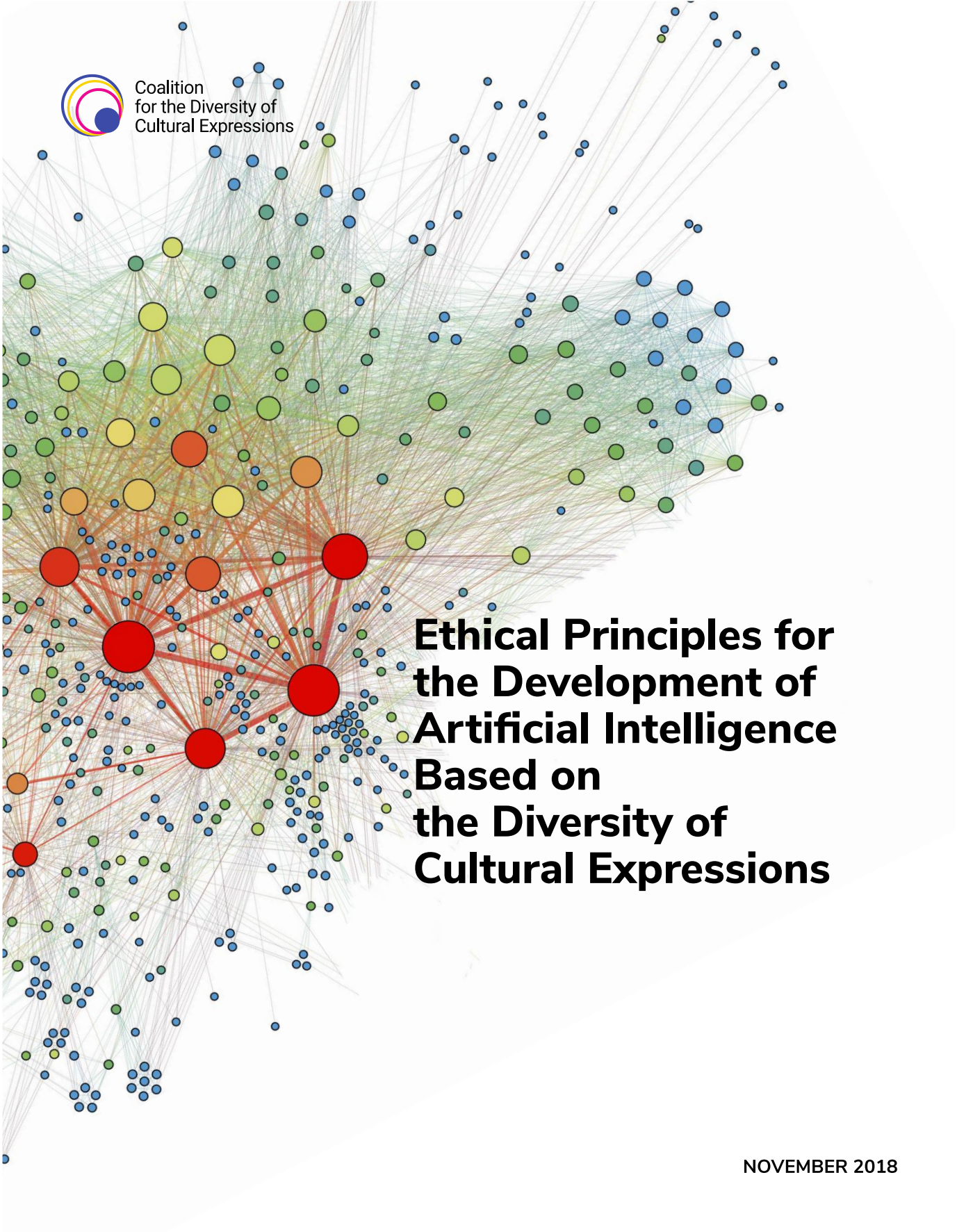
### INFORMATION DOCUMENT

#### ETHICAL PRINCIPLES FOR THE DEVELOPMENT OF ARTIFICIAL INTELLIGENCE BASED ON THE DIVERSITY OF CULTURAL EXPRESSIONS

This document has been prepared in 2018 by the Coalition for the Diversity of Cultural Expressions (CDCE) for the twelfth session of the Intergovernmental Committee for the Protection and Promotion of the Diversity of Cultural Expressions. The author is responsible for the choice and presentation of the facts contained in this Report and for the opinions expressed therein, which are not necessarily those of UNESCO and do not commit the Organization.



Coalition  
for the Diversity of  
Cultural Expressions



# Ethical Principles for the Development of Artificial Intelligence Based on the Diversity of Cultural Expressions

NOVEMBER 2018

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## Introduction

On September 25, 2018, CDCE representatives and collaborators met with the Montreal Declaration team to reflect on the interaction between artificial intelligence (AI) and the diversity of cultural expressions (DCE). This text is the result of this meeting, additional research and feedback from CDCE members or allies, in particular on the occasion of the 20th anniversary of the CDCE on October 25, 2018. It is not intended to be exhaustive. Rather, it relies on simplicity and conciseness to encourage the greatest number of people to read it.

This text is therefore a first reflection in this area for the CDCE, which hopes that the discussions on AI will better integrate cultural issues in general, and those of the diversity of cultural expressions in particular. This document will undoubtedly know its fair share of modifications in the coming months.

The objective of the CDCE is to identify the challenges raised by artificial intelligence and the opportunities it creates for the diversity of cultural expressions, propose ethical principles to guide the development of AI in the cultural field and make recommendations to implement these principles.

## Some definitions

AI is a vast field and the definitions found are neither short nor consensual and often refer to a number of characteristics:

- AI is “a set of concepts and technologies.”
- “It seeks methods for solving problems of high logical or algorithmic complexity.”
- “By extension, it refers, in everyday language, to devices that imitate or replace humans in certain implementations of their cognitive functions.”
- AI seeks to “imitate behaviour,” whether at the level of reasoning, “in the understanding of natural languages or in perception.”<sup>1</sup>

Its applications are numerous; they include machine learning<sup>2</sup> (*apprentissage automatique*<sup>3</sup>), which itself includes deep learning<sup>4</sup>. Algorithms are tools that can be used by various AI applications, but are not limited to them: “An algorithm is a finite and unambiguous sequence of operations or instructions to solve a problem or obtain a result.”<sup>5</sup> In fact, a recipe can be considered as an algorithm.

When we refer to algorithms nowadays, we almost always refer to the algorithms used by social media, marketing or cultural content platforms that exploit megadata. “The family of algorithms in question [related to big data or megadata] performs calculations from large amounts of data. They rank, select information, and deduce a profile, usually of consumption, which is then used or exploited commercially.”<sup>6</sup>

It is generally this type of algorithm that is most discussed in the cultural field, for example, to describe<sup>7</sup> how recommendations offered on platforms such as Spotify work.

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<sup>1</sup> [https://fr.wikipedia.org/wiki/Intelligence\\_artificielle#cite\\_ref-1](https://fr.wikipedia.org/wiki/Intelligence_artificielle#cite_ref-1)

<sup>2</sup> <https://bit.ly/2KNqvVO>

<sup>3</sup> <https://bit.ly/2FmZMB6>

<sup>4</sup> <https://bit.ly/2JnUJBW>

<sup>5</sup> [https://fr.wikipedia.org/wiki/Algorithme#cite\\_ref-11](https://fr.wikipedia.org/wiki/Algorithme#cite_ref-11)

<sup>6</sup> [https://fr.wikipedia.org/wiki/Algorithme#cite\\_ref-11](https://fr.wikipedia.org/wiki/Algorithme#cite_ref-11)

<sup>7</sup> <https://bit.ly/2zSj23u>

Recently, generative adversarial networks<sup>8</sup> (GANs) were introduced in the cultural field. These are unsupervised learning algorithms: “A GAN is a generative model where two networks are placed in competition in a game theory scenario. The first network is the generator, it generates a sample (e. g. an image), while its opponent, the discriminator, tries to detect if a sample is real or if it is the result of the generator.”

## Applications of AI in the cultural field

Without necessarily including all the interactions between culture and AI, the following three applications of AI are the ones that have the greatest impact on cultural ecosystems.

### Recommendation algorithms

The form of AI with which the population interacts most is probably algorithms. There are many types<sup>9</sup> of algorithms. They are used extensively by platforms offering or selling access to cultural content. They then determine the content that will be recommended to the user<sup>10</sup>, either in the form of inclusion in a list, a recommendation based on content listened to or purchased, the order in which it appears in a category and the order of the categories themselves, an advertisement, etc. The algorithm, based on certain criteria (our previous choices, the choices made by other users, the language used in the content, our consumption habits, etc.), plays a crucial role in the recommendation of content on online platforms and in the discoverability of cultural content.

While humans can intervene to correct algorithms, or can theoretically explain how they work, complex algorithms are often referred to as “black boxes” because of their ability to learn from their experiences and adapt their behaviour. In addition, platforms maintain opacity with regard to algorithm choices and parameters.

Finally, since algorithms are recommendation tools, many creators take them into account and this helps to shape<sup>11</sup> content, particularly towards greater homogeneity. For example, if several users stop listening to a song after a few seconds, it will eventually become less and less recommended. As a result, musical pieces may be designed with an increasingly shorter introduction.

### When AI participates in creation, or generates new creations

Many artists have been integrating AI into their creations for decades. Among them are Michel Bret<sup>12</sup>, Edmond Couchot<sup>13</sup> and Marie-Hélène Tramus<sup>14</sup>, Karl Sims<sup>15</sup>, Christa Sommerer and Laurent Mignonneau<sup>16</sup>, and Florent Aziosmanoff<sup>17</sup>.

AI systems are now able to generate or interpret creations. The Next Rembrandt<sup>18</sup>, an initiative supported by ING and Microsoft, generated an original painting using a software and algorithms that analyzed all of the artist’s works to extract the most common characteristics from the techniques used by the painter.

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<sup>8</sup> [https://en.wikipedia.org/wiki/Generative\\_adversarial\\_network](https://en.wikipedia.org/wiki/Generative_adversarial_network)

<sup>9</sup> <https://bit.ly/29rFNPI>

<sup>10</sup> <https://bit.ly/2xohWtd>

<sup>11</sup> <https://bit.ly/2zVHX60>

<sup>12</sup> [https://fr.wikipedia.org/wiki/Michel\\_Bret](https://fr.wikipedia.org/wiki/Michel_Bret)

<sup>13</sup> [https://en.wikipedia.org/wiki/Edmond\\_Couchot](https://en.wikipedia.org/wiki/Edmond_Couchot)

<sup>14</sup> <http://artnumeriqueposterite.labex-arts-h2h.fr/fr/content/mb-ec-mht>

<sup>15</sup> [https://en.wikipedia.org/wiki/Karl\\_Sims](https://en.wikipedia.org/wiki/Karl_Sims)

<sup>16</sup> [https://fr.wikipedia.org/wiki/Christa\\_Sommerer\\_et\\_Laurent\\_Mignonneau](https://fr.wikipedia.org/wiki/Christa_Sommerer_et_Laurent_Mignonneau)

<sup>17</sup> [https://fr.wikipedia.org/wiki/Florent\\_Aziosmanoff](https://fr.wikipedia.org/wiki/Florent_Aziosmanoff)

<sup>18</sup> <https://www.nextrembrandt.com/>

Several experiments have also taken place in the music sector. The song Break Free, performed by US singer Taryn Southern, was composed<sup>19</sup> by a software called Amper. Virtual singers, such as Alys or Hatsune Miru<sup>20</sup>, had previously been heard. Some systems such as Flow Machines<sup>21</sup> make it possible to support artists in the composition of pieces<sup>22</sup>, but also to create original music on their own.

Systems are developing rapidly in the world of writing. Already, media outlets like the *Washington Post* use an AI system<sup>23</sup> to write hundreds of stories. Even in the audiovisual sector, digital replicas<sup>24</sup> – with variable quality – of deceased actors<sup>25</sup> are now possible. If this still requires a lot of work, it is not impossible that virtual actors (clones, avatars, etc.) multiply their appearances on the screens.

In short, despite the limitations of the results to date, the movement is well underway and innovations should multiply in the coming years. In May 2018, researchers released the results of a survey<sup>26</sup> of more than 350 AI researchers. On average, they predict that AI will be able to outperform humans to produce school-level essays in 2026, popular songs in 2028 and best sellers in 2049.

The potential impacts of these developments on the diversity of cultural expressions are at several levels, starting with the ownership of content creating AI systems and the objectives of these companies. Would we want to sell subscriptions, or push innovation? What would be the level of subversiveness tolerated? Would we want to personalize the user experience? Who would have access to these technologies, how would they transform business models and how could human creators stand out from software creations?

Second, replacing humans with AI systems would have a significant economic impact and lead to job losses. But it would also have major social and cultural impacts. How would the significant decrease in the number of creators and artists affect individual and collective capacities for creation and innovation? How could humans learn to be artists or creators without immersing themselves in the practices of other artists or creators?

## **Use of data**

The use of megadata in culture can lead to new promotional strategies. In Quebec, some twenty organizations from the Quartier des spectacles responded to Amia and IVADO's call for a data sharing project<sup>27</sup>. This project allowed the various partners to answer some questions about their respective audiences. The sharing of organizations' data then improved their understanding of the behaviours of people attending institutions, making it possible to forecast traffic, improve coordination between cultural businesses and with other entities such as restaurants, transportation companies, etc.

In the United Kingdom, the Audience Finder<sup>28</sup> platform allows cultural organizations, by downloading a number of data, to receive free analyses of their audience, to compare their data with local and national averages and to have access to many other data about the cultural sector.

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<sup>19</sup> <https://bit.ly/2DluAiR>

<sup>20</sup> <https://bit.ly/2DluAiR>

<sup>21</sup> <http://www.flow-machines.com/>

<sup>22</sup> <https://bit.ly/2qNx6H8>

<sup>23</sup> <https://wapo.st/2PqzzGm>

<sup>24</sup> <https://econ.st/2PMP4EH>

<sup>25</sup> <https://bit.ly/2zX0oaK>

<sup>26</sup> <https://arxiv.org/pdf/1705.08807.pdf>

<sup>27</sup> <https://bit.ly/2QJR54Y>

<sup>28</sup> <https://bit.ly/2eg6yrB>

## Issues raised by the development of AI for the DCE

The issues of recommendation and discoverability of a diversity of content are probably the most obvious. Lost in a sea of global contents – often in the millions – cultural industries have had to invent and multiply the techniques to promote the content they generate. Depending on the sector, several phenomena are involved and not all are attributable to algorithms.

For example, the digitization of cultural content and the development of high-speed Internet access first led to the creation of huge catalogues that attracted a growing number of users. In the audiovisual sector, Netflix holds a virtual monopoly over streaming. Despite the growth of international content, local content is very limited<sup>29</sup>.

The current model, which is more subscription-oriented, leads to captivity of audiences. Users who try to limit the multiplication of monthly fees and develop a reluctance to pay to buy or rent content will tend to limit themselves to the platforms to which they subscribe. Content that is not available on major platforms is at risk of being ignored or pirated. The illusion of free access is spreading and the value of cultural content is being altered, affecting the viability of ecosystems for the benefit of only a few winners.

Unless he is looking for something specific, the user of a platform with thousands – and even millions – of titles, relies on algorithms that, by offering him titles similar to those he has liked or listened to, confine him to a taste or a style. For the user, the operation of this algorithm is opaque and he has no ability to dialogue to determine the extent of what he would like to discover. Cases of copyright<sup>30</sup>, particularly of certain works of visual art, have also been reported.

As is the case with social networks or other loyalty instruments, platforms that distribute cultural content accumulate a significant amount of private data, without it being clear which ones. In return, they refuse to share usage data that would allow society as a whole to assess the evolution of access to local content and the diversity of online cultural expressions.

When the recommendations are based, among other things, on the popularity of content, they contribute significantly to the concentration of listening (0.7 % of titles represent 87 % of plays on online music services in Canada<sup>31</sup>), favouring a minority of artists. In the field of music, songs that are not in English are frequently found in a category related to their language, for example francophone music, which is not a style. This does not promote the discoverability of local or Francophone content, neither for non-French speakers nor for Francophones who are particularly fond of a particular style. We find essentially the same dynamic in the audiovisual sector, while in the book sector, according to an INRS study, Quebec books are more recommended on Amazon.fr than Amazon.ca.

The registration of metadata, i.e. data describing cultural content, is a necessary step to increase the potential for discoverability, and a prerequisite for any statistical measurement. Metadata operations are very demanding in terms of consultation, capture and storage. Similar issues affect the necessary digitization – and re-digitization – of content, to keep up with the evolution of file formats. While this does not pose so many problems for contemporary content, the treatment of historical cultural expressions is a huge undertaking, particularly for public institutions, which requires the investment of significant resources.

Obviously, the dematerialization of cultural content, technological changes and the arrival of new players who have transformed business models have a major impact on artists' remuneration and the payment of copyright royalties. In the music sector, more and more artists are denouncing the low salaries that depend on the number of plays. In other sectors, royalties paid into funds to

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<sup>29</sup> <https://bit.ly/2zSegD4>

<sup>30</sup> <https://bit.ly/2DEHeur>

<sup>31</sup> According to figures provided by a Nielsen Music representative by email.

support the creation and production of audiovisual content, for instance, are decreasing due to the decline in cable subscriptions in favour of streaming sites, which are still exempt from contributing to these funds. All this undermines the dynamism of the local cultural sector and its ability to generate a quality and quantity of cultural content that conveys identity, value and meaning and thus offers an invaluable contribution to societies. This is in addition to the significant economic benefits of the cultural sector.

Co-creation, or creation by AI, adds complexity to the issue of copyright, and these emerging issues will continue to raise many legal and ethical questions<sup>32</sup>. How do we recognize the contribution of the creators of the content on which the program was built to learn? What about the people who designed this program, or those who make it work? For how long and in which type of regime?

It would be necessary to assess the impact of increasing participation of AI programs in the creation process on the number of jobs in the long term. The cultural sector employs more than 600,000 people in Canada. While not all are at risk, and even less so in the coming years, the prospects based on current advances suggest the possibility of content created entirely or almost entirely by AI systems. Together with the massive accumulation of data by a few private companies, it is not forbidden to consider the personalization of cultural content according to individual tastes and preferences<sup>33</sup>. With the cost reductions that such technologies could bring, it is not unrealistic to think that the number of artists could decline significantly. Especially since the fall in income for many cultural workers and artists would already have a negative impact on employment, at least on remuneration conditions, particularly in certain sectors such as music.

Artists and creative circles play a fundamental role in societies. We might think, for example, about their role in questioning the established order, in imagining a better world or analyzing social conflicts. Will AI be able to make this contribution?

## **Opportunities offered by AI**

As in all fields, the development of AI presents real opportunities for the cultural sector.

Discoverability, while presenting numerous challenges for many, offers unprecedented opportunities for others. Properly configured, recommendation algorithms could be extraordinary tools to discover an unparalleled diversity of content and connect creators and their audiences. Niche content can already expand its audience through the platforms' global audiences, and thus generate sufficient revenue to continue its development.

Artists now have new opportunities to make themselves known without having to be supported by intermediaries. For some people, this represents a democratization of artistic creation, while for others, democratization is limited to the use of technologies (computers, software, cameras, microphones, etc.).

Intersectoral promotion strategies can also be put in place, somewhat along the lines of initiatives aimed at sharing data. For example, we could imagine that a book on jazz would be offered to people returning from a jazz concert.

## **Ethical principles to guide the development of AI in the cultural field**

The issues we are discussing are not fatalities, and opportunities can be seized provided that the development of AI in the cultural field is guided by a few fundamental principles.

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<sup>32</sup> <https://bit.ly/2OJn5EI>

<sup>33</sup> <https://econ.st/2PMP4EH>



## **The diversity of cultural expressions**

According to the text of the UNESCO Convention on the Diversity of Cultural Expressions, cultural expressions “are those expressions that result from the creativity of individuals, groups and societies, and that have cultural content.” Cultural diversity, on the other hand, “refers to the manifold ways in which the cultures of groups and societies find expression. These expressions are passed on within and among groups and societies. Cultural diversity is made manifest not only through the varied ways in which the cultural heritage of humanity is expressed, augmented and transmitted through the variety of cultural expressions, but also through diverse modes of artistic creation, production, dissemination, distribution and enjoyment, whatever the means and technologies used.”

Therefore, in the face of homogenizing trends, the temptations of personalization, the dynamics of confinement, captivity and closed circuits, the principle of the diversity of cultural expressions should ensure that AI systems:

- enhance local cultural and linguistic content within the populations from which it originates, thus promoting social cohesion as well as the local economic fabric;
- encourage users to make discoveries outside their environment;
- facilitate the transition between technological families (e. g. Apple), rather than locking them in;
- promote interaction and content sharing.

## **Enhancement of culture, artists, creators and producers of cultural content**

Many people recognize culture as an important source of innovation in societies. Yet cultural content is undergoing an unprecedented devaluation. This has an important impact on the ability of artists and creators to make a living from their art. The development of AI can certainly be used to reverse this trend and prevent AI systems from promoting excessive appropriation of revenues that should be directed to cultural ecosystems.

## **Transparency and dialogue**

The development of AI has concrete and potentially significant impacts on many environments. Innovations and new applications must be better known to the public, and first and foremost to those who will be affected by the targeted developments. They can propose improvements or alternatives that will benefit the society as a whole. The transparency of algorithms should be increased, not with respect to the code, but at the level of the variables that are taken into account. Users could also shape the algorithms with which they interact or have a choice of different algorithms.

Finally, transparency also concerns usage data related to access to cultural content. These data are fundamental to empower societies to assess the state of the diversity of cultural expressions in order to better guide action.

## **The primacy of the public interest**

Not all technological innovations are desirable. The development of AI should always focus on improving the quality of life of the population, social cohesion and democratic practices. Governments must defend the public interest against developments that could have rather negative impacts on society.

## **Recommendations for implementing these principles in practice**

There are certainly many ways to ensure that the development of AI makes a positive contribution to society as a whole. The CDCE is also interested in pursuing its reflection with actors from various backgrounds to identify innovative strategies. At this stage of its reflection, the CDCE believes that the following avenues could be explored to protect and promote the diversity of cultural expressions, and to integrate the principle of the diversity of cultural expressions, as well as the others mentioned in the previous section.

### **Education and training**

It is essential to increase the digital literacy of the general population. Users should also be made aware of how the algorithms work so that they can make better informed choices.

Sectoral strategies must also be considered. In the case of cultural environments, priorities for the development of skills, techniques and knowledge should be identified for both education and training programs.

An ethical component must be set up or reinforced in the training path of certain disciplines particularly mobilized by the development of AI (computer science, engineering, mathematics, etc.).

### **Review of legislation affecting cultural circles**

Laws currently under revision (copyright, broadcasting, telecommunications and radiocommunication) must take into account the technological changes that have disrupted cultural ecosystems and help restore their balance. This implies that companies using AI systems to benefit from cultural content must be transparent and contribute to the system, particularly to the discoverability of content and to funds promoting content development, in addition to remunerating the rightful owners of such content.

At the September 25 workshop, other proposals were suggested, such as the adoption of a law on artificial intelligence and the creation of an independent public body on AI and technology. Then, at the CDCE conference on October 25, 2018, participants made other recommendations, such as developing a laboratory on AI in culture to observe the algorithms, learn to interact with them and eventually influence their development. It was also proposed that interim measures be adopted before more far-reaching changes could be implemented.

The CDCE will continue to reflect on these recommendations, as well as on all the issues raised in this reflection in the coming months.

## **About the Coalition for the Diversity of cultural Expressions**

Founded in 1998, the Coalition for the Diversity of Cultural Expressions (CDCE) is a pan-Canadian organization that brings together 29 associations representing the entire chain of culture, from creation to distribution, in the book, film, television, new media, music and performing arts sectors. It is particularly interested in the treatment of culture in trade treaties and the impact of the digital environment on the diversity of cultural expressions.

### **For information**

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*This publication is financially supported by the Ministry of Culture and Communications of Quebec and Canadian Heritage.*